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1964

VOLUME TV-22

Television

Servicing Information

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Volume TV-22

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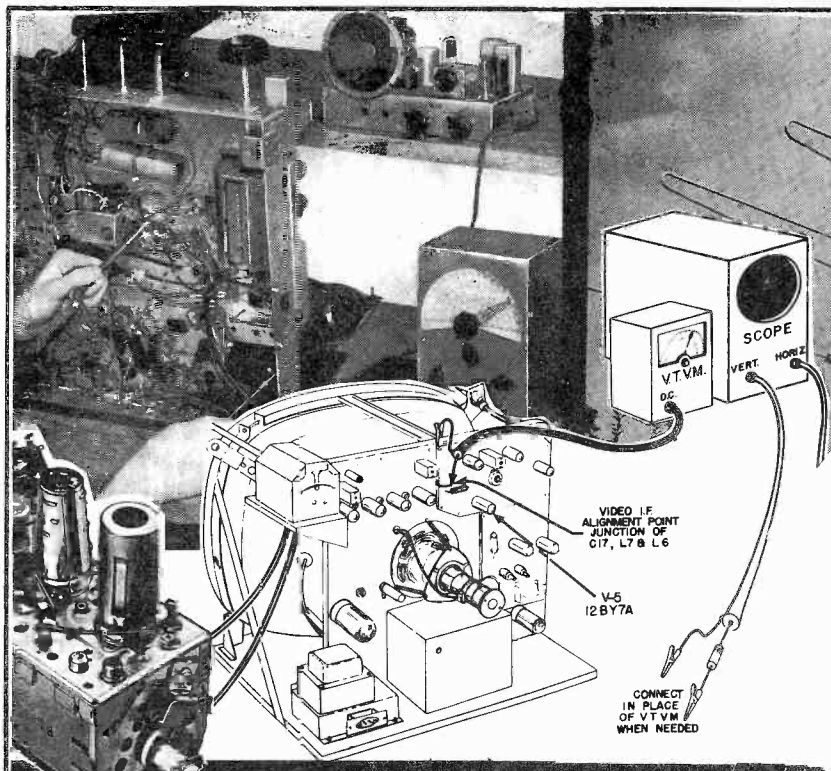

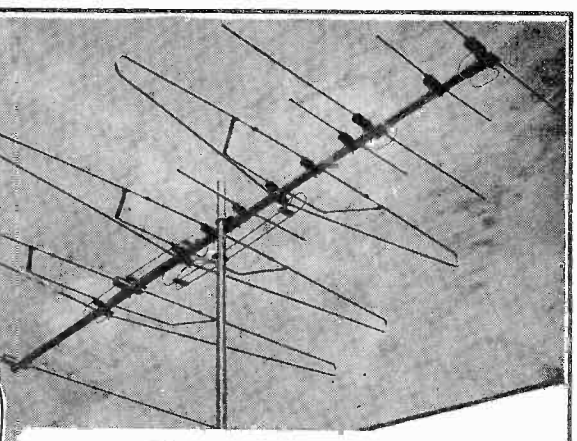

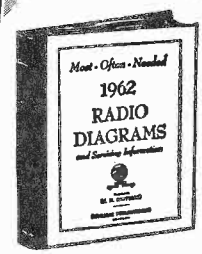

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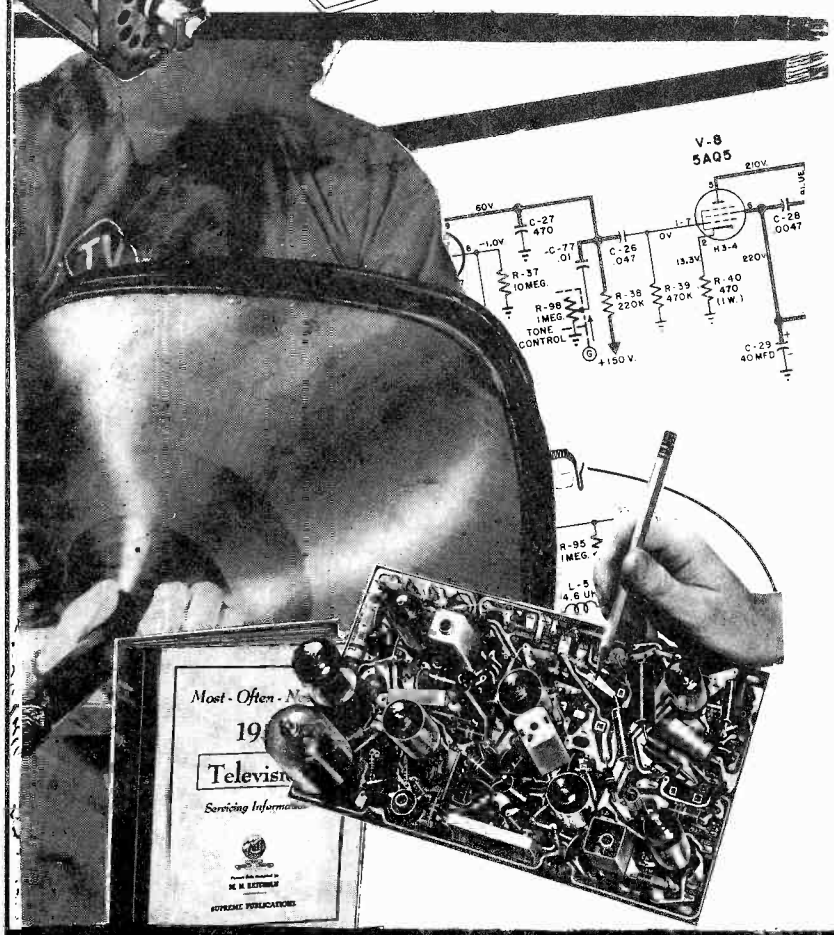

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ADMIRAL®

MODEL IDENTIFICATION CHART

Model	Chassis	Model	Chassis	Model	Chassis
P9002C	16A4C	P9009C	16A4C	P9109C	16B4C
UP9002C	16UA4C	UP9009C	16UA4C	UP9109C	16UB4C
P9002D	16A4D	P9009D	16A4D	AA9100C	16B4C
UP9002D	16UA4D	UP9009D	16UA4D	AAU9100C	16UB4C
P9004C	16A4C	P9100C	16B4C	AA9900C	16A4C
UP9004C	16UA4C	UP9100C	16UB4C	AAU9900C	16UA4C
P9004D	16A4D	P9101C	16B4C	AA9900D	16A4D
UP9004D	16UA4D	UP9101C	16UB4C	AAU9900D	16UA4D
P9005C	16A4C	P9102C	16B4C	AA9903C	16A4C
UP9005C	16UA4C	UP9102C	16UB4C	AAU9903C	16UA4C
P9005D	16A4D	P9103C	16B4C	AA9903D	16A4D
UP9005D	16UA4D	UP9103C	16UB4C	AAU9903D	16UA4D

The material on pages 3 through 8 is exact for models of chassis types listed at left. The models listed below using Chassis 16F4U is the same except for changes needed to utilize 5D9 remote receiver. The other sets listed using 16E4C, D, 16EU4C, D, 16G4U (remote), are similar but use 16BAP4 tube.

Model	Chassis
PS9002	16F4U
PS9004	16F4U
PS9005	16F4U
PS9009	16F4U
SAA9900	16F4U
SAA9903	16F4U
SAA9913	16F4U

MODEL IDENTIFICATION CHART

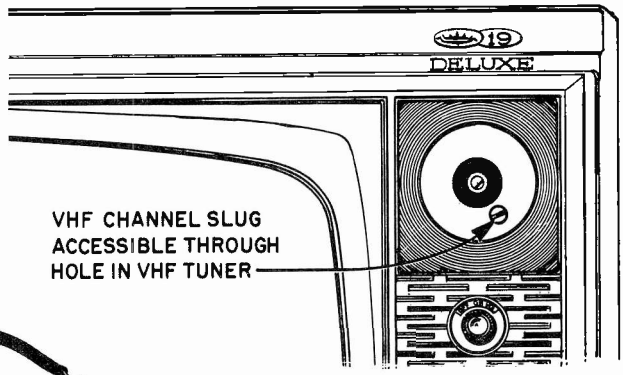
Model	Chassis	Model	Chassis	Model	Chassis
P6000C	16E4C	P6001C	16E4C	P6009C	16E4C
P6000D	16E4D	P6001D	16E4D	P6009D	16E4D
UP6000C	16UE4C	UP6001C	16UE4C	UP6009C	16UE4C
UP6000D	16UE4D	UP6001D	16UE4D	UP6009D	16UE4D

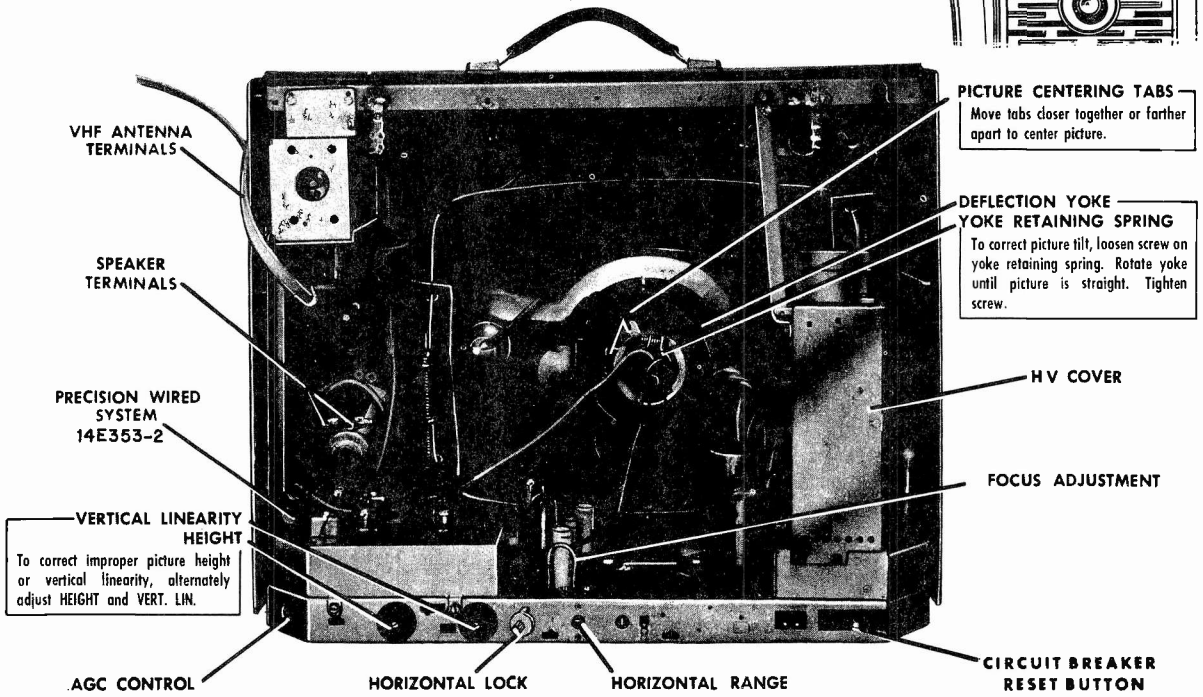
MODEL CHART

Model	Chassis
PS6000	16G4U
PS6001	16G4U
PS6009	16G4U

VHF CHANNEL ADJUSTMENT

1. Turn receiver on and allow 15 minutes warm up.
2. Set Channel Selector at highest channel to be adjusted. Set Fine Tuning control at center of tuning range, by rotating it one third turn counter-clockwise from full clockwise rotation. See other tuning controls for normal picture and sound.
3. Remove Channel Selector and Fine Tuning knobs.
4. Using a non-metallic alignment tool with $\frac{3}{32}$" blade (part number 98B30-22), carefully adjust channel slug for best picture. Note: Sound may not be loudest at this point. Repeat procedure for each channel to be adjusted.





Rear View of Chassis Showing Adjustment Locations (UHF Tuner only in VHF-UHF Models).

AGC CONTROL ADJUSTMENT

The AGC control is an AGC threshold control which is used solely to adjust the receiver for optimum operation under all signal conditions.

Note: This control is set at the factory and will not normally require field readjustment.

Improper AGC control adjustment can result in picture bending, tearing (overloading) or buzz in the sound. However, these same conditions can also be caused by other troubles in the set.

If adjustment is required, it should be made exactly as instructed.

1. Turn set on and allow 15 minutes to warm up.
2. Turn Channel Selector to strongest station in the area.
3. Turn Contrast and Brightness controls fully to the right.
4. Very slowly turn AGC control to the left, just to the point where picture is weak (loses contrast).
5. Adjust Horizontal Lock (at rear of set) and Vertical Hold control (at side of set) for steady picture, without bending of vertical lines at top of picture.
6. Very slowly turn AGC control to the right, until picture just begins to bend, tear, shift, or buzz is heard in sound. Then very slowly turn the AGC control to the left, to the point at which picture bending, tearing, shifting and buzz is removed.
7. Make final adjustment by turning AGC control approximately 10 degrees to the left.
8. Recheck at maximum contrast on all channels. Picture should not overload and should reappear immediately after changing channels.

IMPORTANT: AGC adjustment should always be made on the strongest TV station received.

HORIZONTAL LOCK ADJUSTMENT

Make adjustment if picture "slips sideways" or "tears" when switching channels. Adjustment is made by rotating flexible shaft extending from rear of set. Adjust as follows:

1. Allow a few minutes for set to warm up. Tune in weakest station, set Brightness and Contrast controls for normal Picture. Important: Before proceeding, be sure that AGC control has been adjusted according to instructions in this manual.

2. Reduce Contrast to minimum. Very slowly turn Horizontal Lock adjustment to the right or left until picture is in sync. Interrupt the television signal by switching Channel Selector off and on channel. Picture should remain in sync. If picture bends or loses sync, adjust the Horizontal Lock so that picture remains in sync and bending of vertical lines does not appear at top of picture. Check adjustment on all channels; if necessary, repeat procedure.

IMPORTANT: If adjustment cannot be made using the Horizontal Lock control, it will be necessary to make Horizontal Range adjustment as instructed below.

HORIZONTAL RANGE ADJUSTMENT

The Horizontal Range control is set at the factory and seldom requires readjustment. Adjustment need only be made if 6FQ7 tube (V403) has been replaced and the picture cannot be locked-in with the Horizontal Lock adjustment or if the Horizontal Lock adjustment has insufficient range (adjustment only possbile at extreme end rotation). Note: Horizontal Range adjustment is accessible after removing cabinet back.

Caution: Before proceeding with adjustment, be sure that the picture will sync vertically, as lack of both vertical and horizontal sync indicates sync circuit trouble. Lack of only horizontal sync generally indicates trouble in the horizontal sync (phase detector) circuit. Adjust as follows:

1. Remove cabinet back. Connect interlock cord.

2. Allow a few minutes for set to warm up. Tune in weakest station, set Brightness and Contrast controls for a normal picture. Important: Before proceeding, be sure that the AGC control has been adjusted according to instructions in this manual.

3. Using a piece of hook-up wire, short test point "R" (junction of R443, R444 and C417) to chassis ground. See figure B for test point locations.

4. Connect a .22 mf, 400 volt capacitor from test point "S" (junction of horizontal lock coil L401 and resistor R446, 15,000 ohms) to chassis ground. Caution: To avoid B+ shock, turn receiver off when making this connection.

5. With picture in vertical sync, set Horizontal Range control at point where picture is in horizontal sync and almost remains stationary with tendency to shift to left or right.

6. Remove the .22 mf capacitor from the horizontal lock coil. Set horizontal lock coil at point where picture is in horizontal sync and almost remains stationary with tendency to shift to left or right.

7. Remove wire short from test point "R". Set Channel Selector to weakest station. Switch Channel Selector on and off channel, picture should remain in horizontal sync. If necessary, adjust horizontal lock coil slightly to bring picture in sync.

IMPROVING FOCUS

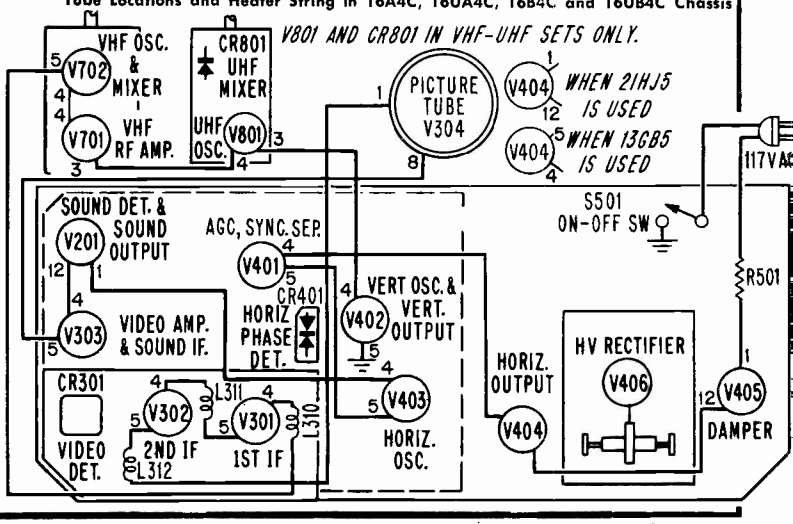
The picture tube of these receivers utilizes electrostatic focus in connection with a three position focus adjustment.

For obtaining best overall sharpness of pictures, focus adjustment should be checked at installation and when servicing. Once focus adjustment is properly made, no further need for readjustment is required.

From rear view of chassis on front page, note that there are three focus (pin) connections at bottom rear of chassis, points shown as "A", "B" and "C" on schematic. To make adjustment, connect plug-in focus lead to either of the three focus pins, whichever provides best focus at central area of picture tube. Important: Focus adjustment should be made with controls set for picture with normal contrast and brightness.

Caution: High B+ potential is present at focus terminals.

Tube Locations and Heater String in 16A4C, 16UA4C, 16B4C and 16UB4C Chassis



TO SIMPLIFY HEATER-STRING DIAGRAM, TUBE SOCKET PIN NUMBERS NOT SHOWN IN THEIR ACTUAL LOCATIONS.

ADMIRAL Chassis 16A4C, -D, 16UA4C, -D, etc., Alignment Information

IF AMPLIFIER ALIGNMENT

Connect isolation transformer between AC line and receiver. Connect negative of 6 volt bias supply to test point "T" (IF AGC), positive to chassis. See figure B.

Using needle nose alligator clip or looped end of hookup wire, connect signal generator high side to test point "G", low side directly to tuner, see figures E and F.

Connect VTVM high side to test point "V" through a decoupling filter, see figure A. Connect low side to chassis.

Set Channel Selector to channel 12. Connect jumper wire across antenna terminals.

†1. Set generator at 42.7 MC and adjust A1 for maximum.

†2. Set generator at 44.2 MC and adjust A2 for maximum.

†3. Set generator at 44.3 MC and adjust A3 for maximum.

4. Connect wire jumper across IF input coil L303.

†5. Set generator at 44.8 MC and adjust A4 for maximum.

6. Remove wire jumper from across IF input coil L303.

†7. Set generator at 43.0 MC and adjust A5 for maximum.

*8. Set generator at 47.25 MC and adjust A6 for minimum.

9. To insure correct IF alignment, make "IF Response Curve Check".

*If necessary, increase generator ouput and/or reduce bias to —1½ volts to obtain a definite indication on VTVM.

†Use —6 volts bias. When adjusting, keep reducing generator output to prevent VTVM reading from exceeding 2 volts.

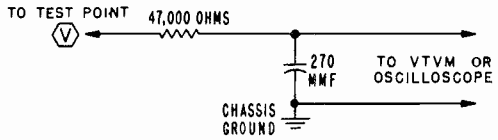
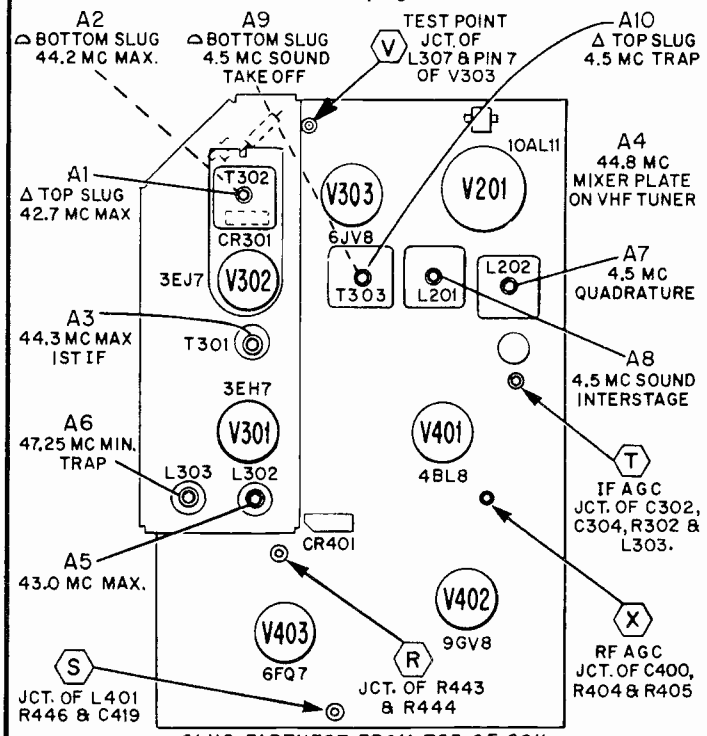


Figure A. Decoupling Filter.



SLUG FARTHEST FROM TOP OF COIL.
SLUG NEAREST TO TOP OF COIL.

Figure B. View of Precision Wired System Showing Test Point and Alignment Locations.

IF RESPONSE CURVE CHECK

1. Connect isolation transformer between AC line and receiver. Allow about 15 minutes for receiver and test equipment to warm up.

2. Set VHF tuner on channel 12. Connect negative of 6 volt bias supply to test point "T" (IF AGC), positive to chassis. See figure B.

3. Using needle nose alligator clip or looped end of hookup wire, connect sweep generator high side to test point "G", low side directly to tuner, see figures E and F. Set sweep frequency to 43 MC, sweep width approximately 7 MC. If external marker generator is used, loosely couple high side to sweep generator lead, low side directly to tuner. Marker frequencies indicated on IF Response Curve.

4. Connect oscilloscope high side to test point "V" through a decoupling filter (figure A), low side to chassis.

5. Check curve obtained against ideal response curve, figure C. Keep marker and sweep outputs at very minimum to prevent over-loading. A reduction in sweep output should reduce curve amplitude without altering the shape of the response curve.

If curve is not within tolerance or markers not in proper location on curve, adjust A4 to position 45.75 MC Video Marker. Adjust A1 to correct shape of curve.

4.5 MC SOUND IF ALIGNMENT

1. Tune in normal picture on strongest TV station. Allow about 15 minutes for set to warm up. See figure B for adjustment locations.

*2. Using non-metallic alignment tool (part no. 98A30-12), slowly turn slug "A7" several turns to the left until a buzz is heard in sound. Then slowly turn slug "A7" to the right for loudest and clearest sound. NOTE: There may be two points (approx. ½ turn apart) at which sound is loudest. The slug should be set at center of second point of loudest sound noted as slug is turned in (toward bottom of coil).

3. Reduce signal to antenna terminals until there is considerable hiss in sound. For best results, use a step attenuator, connected between antenna and antenna terminals. Signal can also be reduced by disconnecting antenna and placing it close to antenna terminals or leads.

4. Carefully adjust slug "A8" for loudest and clearest sound with minimum hiss. If hiss disappears during alignment, reduce signal to maintain hiss level. Readjust slug "A8". NOTE: Slug "A8" should be at end nearest bottom of coil.

5. Carefully adjust slug "A9" for loudest and clearest sound with minimum hiss. If hiss disappears during alignment, reduce signal to maintain hiss level. Readjust slug "A9". Caution: Slug "A9" is located nearest bottom of coil. Use care so as not to disturb slug nearest top of coil.

6. If above alignment is correctly made, no further adjustment is required. However, if sound remains distorted at normal volume level (when receiver is tuned for best sound), repeat entire procedure.

*CAUTION: Do not readjust slug "A7" unless sound is distorted. If "A7" is readjusted, all steps in alignment procedure should be repeated exactly as instructed.

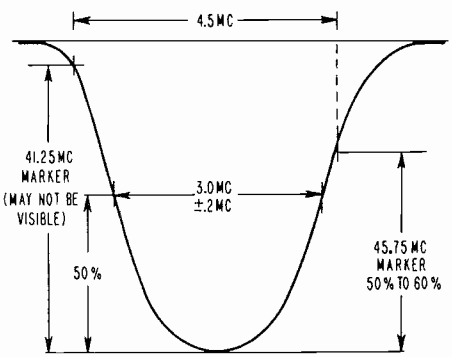
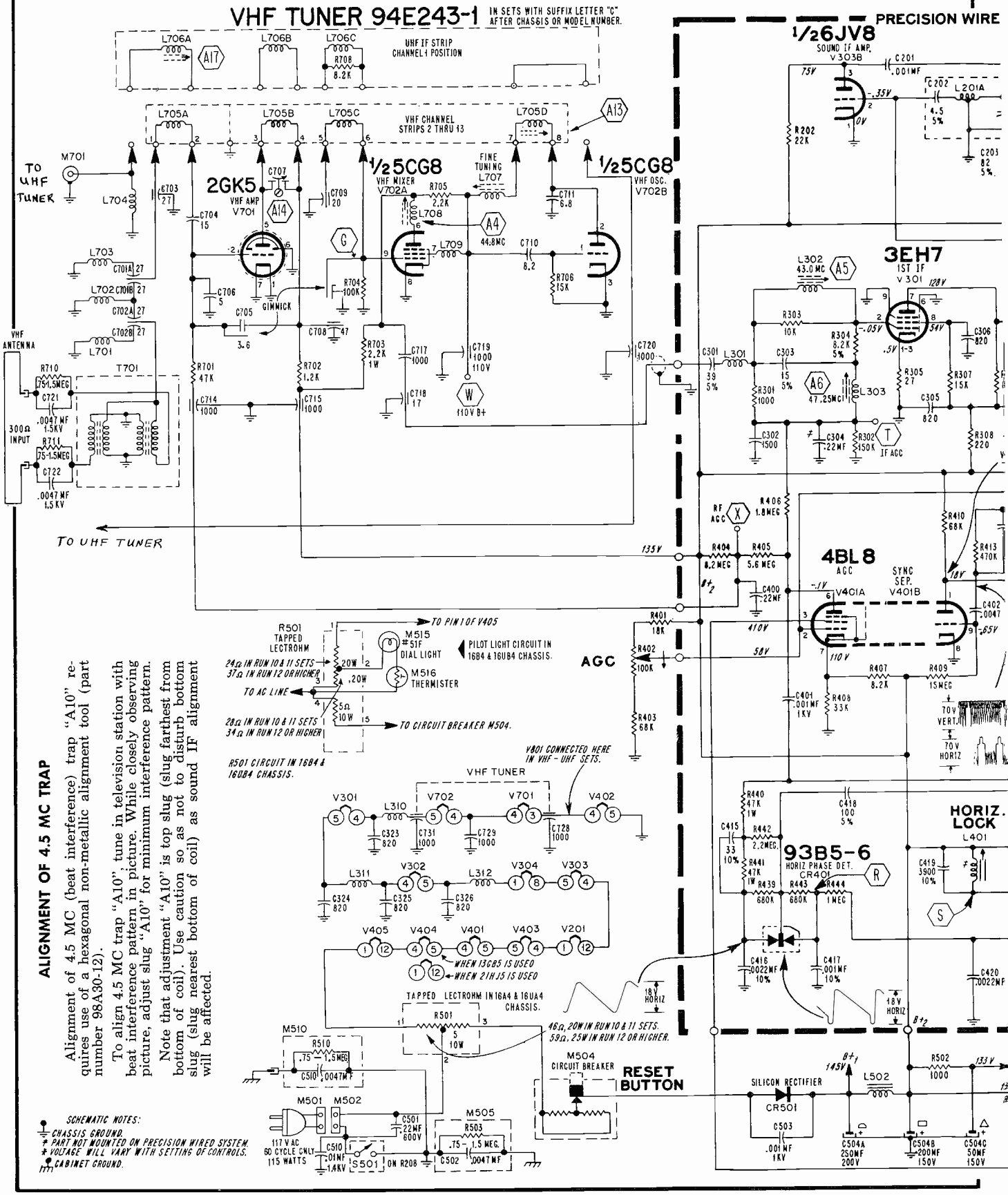


Figure C. Ideal IF Response Curve.

ADMIRAL Schematic of 16A4C, 16UA4C, 16B4C, 16UB4C (16A4D, 16UA4D diff. tuners)



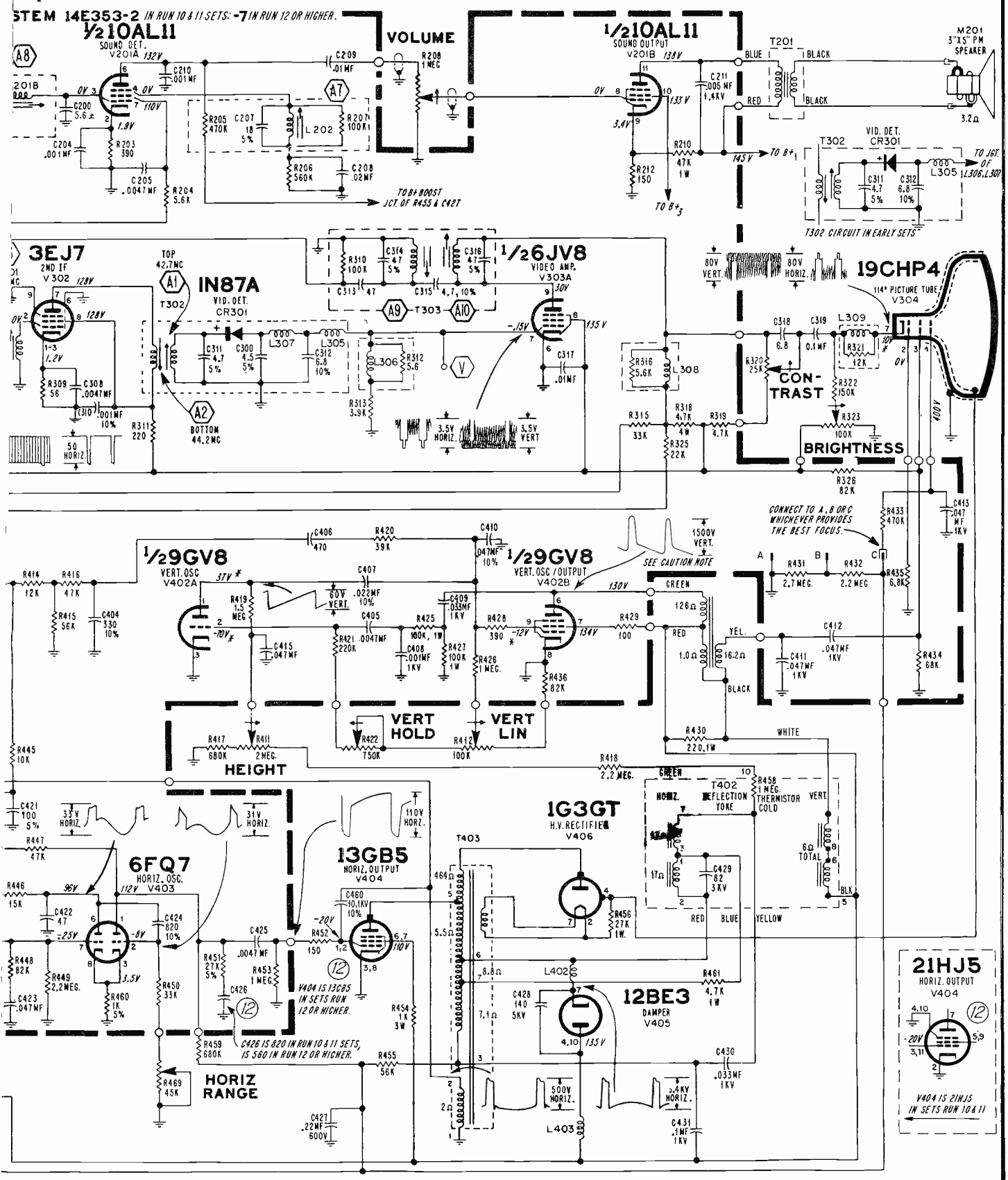
ALIGNMENT OF 4.5 MC TRAP

Alignment of 4.5 MC (beat interference) trap "A10" requires use of a hexagonal non-metallic alignment tool (part number 98A30-12).

To align 4.5 MC trap "A10", tune in television station with beat interference pattern in picture. While closely observing picture, adjust slug "A10" for minimum interference pattern.

Note that adjustment "A10" is top slug (slug farthest from bottom of coil). Use caution so as not to disturb bottom slug (slug nearest bottom of coil) as sound IF alignment will be affected.

ADMIRAL Schematic of 16A4C, 16UA4C, 16B4C, 16UB4C, Continued



ADMIRAL Remote Control 5D9

Used in Chassis 16F4U, etc.

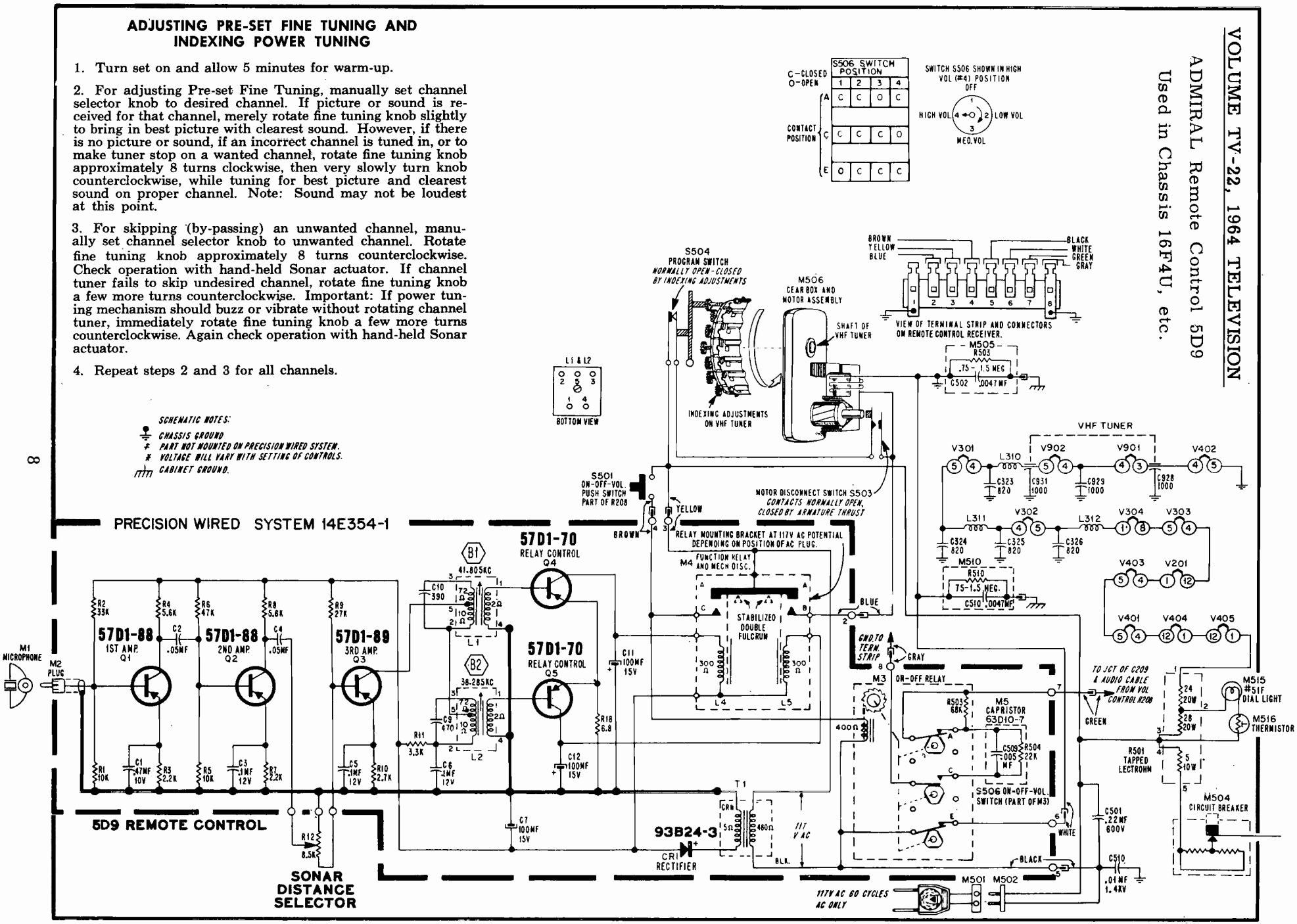
ADJUSTING PRE-SET FINE TUNING AND INDEXING POWER TUNING

1. Turn set on and allow 5 minutes for warm-up.

2. For adjusting Pre-set Fine Tuning, manually set channel selector knob to desired channel. If picture or sound is received for that channel, merely rotate fine tuning knob slightly to bring in best picture with clearest sound. However, if there is no picture or sound, if an incorrect channel is tuned in, or to make tuner stop on a wanted channel, rotate fine tuning knob approximately 8 turns clockwise, then very slowly turn knob counterclockwise, while tuning for best picture and clearest sound on proper channel. Note: Sound may not be loudest at this point.

3. For skipping (by-passing) an unwanted channel, manually set channel selector knob to unwanted channel. Rotate fine tuning knob approximately 8 turns counterclockwise. Check operation with hand-held Sonar actuator. If channel tuner fails to skip undesired channel, rotate fine tuning knob a few more turns counterclockwise. Important: If power tuning mechanism should buzz or vibrate without rotating channel tuner, immediately rotate fine tuning knob a few more turns counterclockwise. Again check operation with hand-held Sonar actuator.

4. Repeat steps 2 and 3 for all channels.



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The material on pages 9 through 14 is applicable to all sets listed in the groupings below. The material is exact for the group below at right; 21E5-61D uses 5D9B remote and necessary circuit changes; the group at left below (21D5, 21UD5) are similar with a different picture tube; and 21D5-62D, -63D are remote sets.

Model	Chassis	Model	Chassis	Model	Chassis
L3401C	21D5-32C	L3421C	21D5-31C	L3449C	21D5-33C
L3401D	21D5-32D	L3421D	21D5-31D	L3449D	21D5-33D
LU3401C	21UD5-42C	LU3421C	21UD5-41C	LU3449C	21UD5-43C
LU3401D	21UD5-42D	LU3421D	21UD5-41D	LU3449D	21UD5-43D
L3402C	21D5-32C	L3435C	21D5-31C	L3451C	21D5-33C
L3402D	21D5-32D	L3435D	21D5-31D	L3451D	21D5-33D
LU3402C	21UD5-42C	LU3435C	21UD5-41C	LU3451C	21UD5-43C
LU3402D	21UD5-42D	LU3435D	21UD5-41D	LU3451D	21UD5-43D
L3403C	21D5-32C	L3441C	21D5-33C	L3452C	21D5-33C
L3403D	21D5-32D	L3441D	21D5-33D	L3452D	21D5-33D
LU3403C	21UD5-42C	LU3441C	21UD5-43C	LU3452C	21UD5-43C
LU3403D	21UD5-42D	LU3441D	21UD5-43D	LU3452D	21UD5-43D
L3411C	21D5-32C	L3442C	21D5-33C	L3455C	21D5-41C
L3411D	21D5-32D	L3442D	21D5-33D	L3455D	21D5-41D
LU3411C	21UD5-42C	LU3442C	21UD5-43C	LU3455C	21UD5-43C
LU3411D	21UD5-42D	LU3442D	21UD5-43D	LU3455D	21UD5-43D
L3412C	21D5-32C	L3445C	21D5-33C	L3469C	21D5-33C
L3412D	21D5-32D	L3445D	21D5-33D	L3469D	21D5-33D
LU3412C	21UD5-42C	LU3445C	21UD5-43C	LU3469C	21UD5-43C
LU3412D	21UD5-42D	LU3445D	21UD5-43D	LU3469D	21UD5-43D

MODEL IDENTIFICATION CHART

Model	Chassis	Model	Chassis	Model	Chassis
T3400C	21E5-31C	TU3401D	21UE5-44D	TU3411C	21UE5-44C
T3400D	21E5-31D	T3404C	21E5-34C	TU3411D	21UE5-44D
TU3400C	21UE5-44C	T3404D	21E5-34D	T3412C	21E5-34C
TU3400D	21UE5-44D	TU3404C	21UE5-44C	T3412D	21E5-34D
T3401C	21E5-31C	TU3404D	21UE5-44D	TU3412C	21UE5-44C
T3401D	21E5-31D	T3411C	21E5-34C	TU3412D	21UE5-44D
TU3401C	21UE5-44C	T3411D	21E5-34D		

Model	Chassis
TS3400D	21E5-61D
TS3401D	21E5-61D
TS3404D	21E5-61D
TS3411D	21E5-61D
TS3412D	21E5-61D

Model	Chassis
LS3401D	21D5-62D
LS3402D	21D5-62D
LS3403D	21D5-62D
LS3411D	21D5-62D
LS3412D	21D5-62D
LS3421D	21D5-63D
LS3435D	21D5-63D

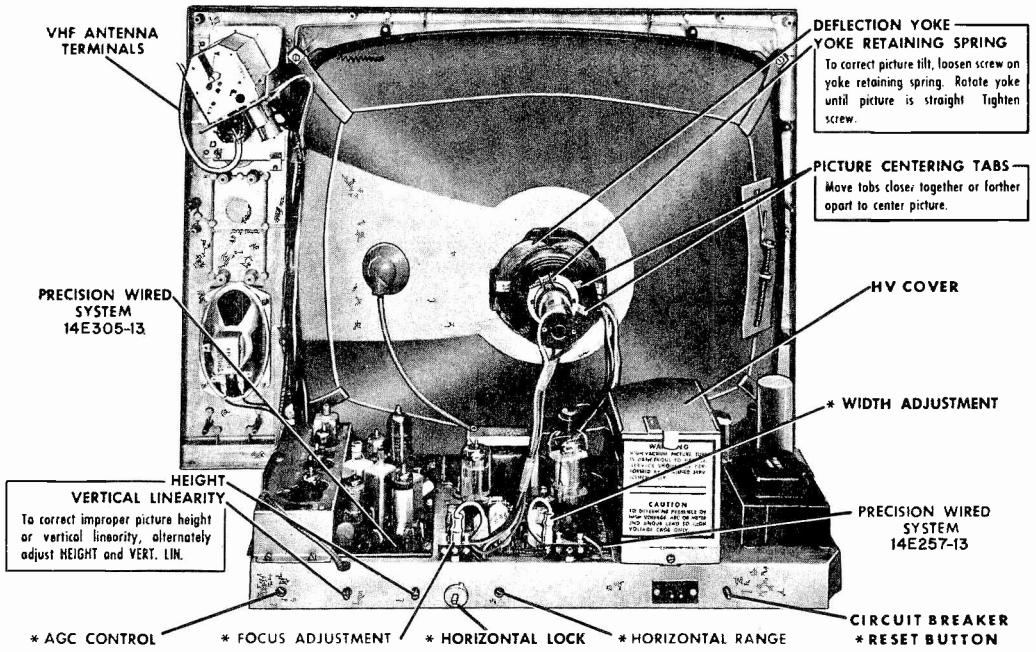
IMPROVING FOCUS

The picture tube of these receivers utilizes electrostatic focus in connection with a three position focus adjustment.

For obtaining best overall sharpness of pictures, focus adjustment should be checked at installation and when servicing. Once focus adjustment is properly made, no further need for readjustment is required.

From rear view of chassis on front page, note that there are three focus (pin) connections at top rear of Precision Wired System, points shown as "A", "B" and "C". To make adjustment, connect plug-in focus lead to either of the three focus pins, whichever provides best focus at central area of picture tube. Important: Focus adjustment should be made with controls set for picture with normal contrast and brightness.

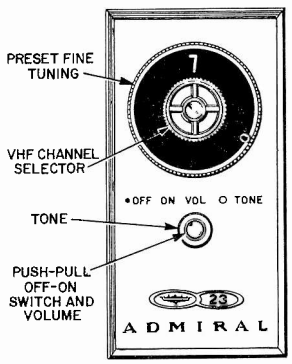
Caution: High B+ potential is present at focus terminals. To prevent electric shock, use care to avoid accidental contact with focus terminals.



* DETAILED ADJUSTMENT INFORMATION GIVEN ON OTHER PAGES.

ADJUSTING PRE-SET FINE TUNING

To insure good pictures and smooth operation, it is important that adjustment be checked when set is installed or serviced. NOTE: Before factory shipment, Pre-set Fine Tuning has been set properly for each channel. See control panel illustration at right Adjust as follows:



View of Channel Escutcheon.

1. Turn set on and allow 5 minutes for warm up.

2. Set VHF channel selector knob to desired channel. If picture or sound is received for that channel, merely rotate fine tuning knob slightly to bring in best picture with clearest sound. However, if there is no picture or sound or if an incorrect channel is tuned in, rotate fine tuning knob approximately 8 turns clockwise, then very slowly turn knob counterclockwise, while tuning for best picture and clearest sound on proper channel. Note: Sound may not be loudest at this point.

ADJUSTING SUPER-FINE TUNING CONTROL

The Super-Fine Tuning control is a customer operating control located at front panel of receiver. This control functions in the peaking circuit of the video amplifier. It permits the set owner to tune in the exact degree of picture "sharpness" or "crispness" most pleasing to an individual's personal taste. Note: Before setting Super-Fine Tuning control, set should be first tuned for best picture. Contrast and Brightness controls should be carefully set at proper level.

For maximum "sharpness" of picture detail, turn Super-Fine Tuning control fully clockwise. Note however, as control is turned counterclockwise, picture becomes "softer". Set control to position which provides most pleasing picture detail. If certain pictures are too "harsh", or when viewing old movies or programs from weak stations, picture quality can often be improved by turning control counterclockwise for "softer" picture.

AGC CONTROL ADJUSTMENT

The AGC control is an AGC threshold control which is used solely to adjust the receiver for optimum operation under all signal conditions.

Note: This control is set at the factory and will not normally require field readjustment.

Improper AGC control adjustment can result in picture bending, tearing (overloading) or buzz in the sound. However, these same conditions can also be caused by other troubles in the set.

If adjustment is required, it should be made exactly as instructed.

1. Turn set on and allow 15 minutes to warm up.

2. Turn Channel Selector to strongest station in the area.

3. Turn Contrast and Brightness controls fully to the right.

4. Very slowly turn AGC control to the left, just to the point where picture is weak (loses contrast).

5. Adjust Horizontal Lock (at rear of set) and Vertical Hold control (at side of set) for steady picture, without bending of vertical lines at top of picture.

6. Very slowly turn AGC control to the right, until picture just begins to bend, tear, shift, or buzz is heard in sound. Then very slowly turn the AGC control to the left, to the point at which picture bending, tearing, shifting and buzz is removed.

7. Make final adjustment by turning AGC control approximately 10 degrees to the left.

8. Recheck at maximum contrast on all channels. Picture should not overload and should reappear immediately after changing channels.

IMPORTANT: AGC adjustment should always be made on the strongest TV station received. If adjustment is made only on a weak station, AGC overload may occur when a strong TV station is tuned in.

HORIZONTAL LOCK ADJUSTMENT

Make adjustment if picture "slips sideways" or "tears" when switching channels. Adjustment is made by rotating flexible shaft extending from rear of set. Adjust as follows:

1. Allow a few minutes for set to warm up. Tune in weakest station, set Brightness and Contrast controls for normal Picture. Important: Before proceeding, be sure that AGC control has been adjusted according to instructions in this manual.

2. Reduce Contrast to minimum. Very slowly turn Horizontal Lock adjustment to the right or left until picture is in sync. Interrupt the television signal by switching Channel Selector off and on channel. Picture should remain in sync. If picture bends or loses sync, adjust the Horizontal Lock so that picture remains in sync and bending of vertical lines does not appear at top of picture. Check adjustment on all channels; if necessary, repeat procedure.

IMPORTANT: If adjustment cannot be made using the Horizontal Lock control, it will be necessary to make Horizontal Range adjustment as instructed below.

HORIZONTAL RANGE ADJUSTMENT

The Horizontal Range control is set at the factory and seldom requires readjustment. Adjustment need only be made if 6FQ7 tube (V403) has been replaced and the picture cannot be locked-in with the Horizontal Lock adjustment or if the Horizontal Lock adjustment has insufficient range (adjustment only possible at extreme end rotation).

Caution: Before proceeding with adjustment, be sure that the picture will sync vertically, as lack of both vertical and horizontal sync indicates sync circuit trouble. Lack of only horizontal sync generally indicates trouble in the horizontal sync (phase detector) circuit. Adjust as follows:

1. Remove cabinet back. Connect interlock cord.

(Continued on page 11)

TUBE COMPLEMENT

For VHF and UHF Tuners, see schematic

V201—6GX6	V305—23CP4A	V406—1G3GT
V202—6GZ5	V401—6BU8	CR301—1N87A
V301—6BZ6	V402—6EW7	CR401—93B5-6
V302—6GM6	V403—6FQ7	CR402—93B27-2
V303—6DK6	V404—6DQ6A	CR501—93B12-1
V304—6JV8	V405—6AX3	CR502—93B12-1

2. Allow a few minutes for set to warm up. Tune in weakest station, set Brightness and Contrast controls for a normal picture. Important: Before proceeding, be sure that the AGC control has been adjusted according to instructions in this manual.

3. Using a piece of hook-up wire, short test point "R" (pin 2 of V403, 6FQ7 tube) to chassis ground.

4. Connect a .22 mf, 400 volt capacitor from test point "S" (junction of horizontal lock coil L401 and resistor R443, 12,000 ohms) to chassis ground. Caution: To avoid B+ shock, turn receiver off when making this connection.

5. With picture in vertical sync, set Horizontal Range control at point where picture is in horizontal sync and almost remains stationary with tendency to shift to left or right.

6. Remove the .22 mf capacitor from the horizontal lock coil. Set horizontal lock coil at point where picture is in horizontal sync and almost remains stationary with tendency to shift to left or right.

7. Remove wire short from test point "R" (pin 2 of V403, 6FQ7 tube).

8. Set Channel Selector to weakest station. Switch Channel Selector on and off channel, picture should remain in horizontal sync. If necessary, adjust horizontal lock coil slightly to bring picture in sync.

WIDTH ADJUSTMENT

Width adjustment is made at the factory and generally does not require field adjustment. However, if raster is too wide (picture information is cut off) or if raster does not completely fill viewing area of picture tube, adjust width as follows:

1. Remove cabinet back. Connect interlock cord. Turn receiver on and allow a few minutes for warm up.

2. Tune in channel with normal picture. Set brightness and contrast controls to maximum (fully clockwise).

3. Location of width adjustment (connector) lead is shown in Rear View of chassis, front page. Note that there are two width (pin) connections at top rear of Precision Wired System, shown as pins 1 and 2 on chassis and in schematic.

To reduce raster width, connect lead to pin 2. To increase raster width, connect lead to pin 1.

Caution: High B+ potential is present at width adjustment pin terminals. To prevent electric shock, use care to avoid accidental contact with pin terminals.

4.5 MC SOUND IF ALIGNMENT

1. Tune in normal picture on strongest TV station. Allow about 15 minutes for set to warm up. See figure B for adjustment locations.

*2. Using non-metallic alignment tool (part no. 98A30-12), slowly turn slug "A9" several turns to left until a buzz is heard in sound. Then slowly turn slug "A9" to the right for loudest and clearest sound. NOTE: There may be two points (approx. ½ turn apart) at which sound is loudest. The slug should be set at center of second point of loudest sound noted as slug is turned in (toward bottom of coil).

3. Reduce signal to antenna terminals until there is considerable hiss in sound. For best results, use a step attenuator, connected between antenna and antenna terminals. Signal can also be reduced by disconnecting antenna and placing it close to antenna terminals or leads.

4. Carefully adjust slug "A10" for loudest and clearest sound with minimum hiss. If hiss disappears during alignment, reduce signal to maintain hiss level. Readjust slug "A10". NOTE: Slug "A10" should be at end of coil nearest bottom of coil.

5. Carefully adjust slug "A11" for loudest and clearest sound with minimum hiss. If hiss disappears during alignment, reduce signal to maintain hiss level. Readjust slug "A11". Caution: Slug "A11" is located nearest bottom of coil. Use care so as not to disturb slug nearest top of coil.

6. If above alignment is correctly made, no further adjustment is required. However, if sound remains distorted at normal volume level (when receiver is tuned for best sound), repeat entire procedure.

* CAUTION: Do not readjust slug "A9" unless sound is distorted. If "A9" is readjusted, all steps in alignment procedure should be repeated exactly as instructed.

ALIGNMENT OF 4.5 MC TRAP

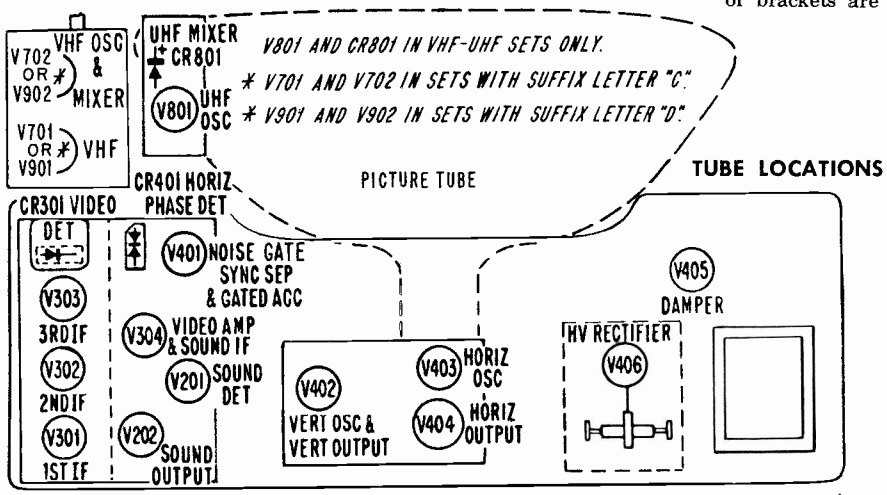
Alignment of 4.5 MC (beat interference) trap "A12" requires use of a hexagonal non-metallic alignment tool (part number 98A30-12).

To align 4.5 MC trap "A12", tune in television station with beat interference pattern in picture. While closely observing picture, adjust slug "A12" for minimum interference pattern.

Note that adjustment "A12" is top slug (slug farthest from bottom of coil). Use caution so as not to disturb bottom slug (slug nearest bottom of coil) as sound IF alignment will be affected.

UHF CONVERSION KIT AVAILABLE

UHF conversion kit is available for conversion of VHF only models to receive all UHF channels. All necessary parts and complete instructions are included in the kit. No special tools or brackets are required.



SCHEMATIC NOTES

Numbers or letters inside hexagons indicate alignment points.

Fixed resistor values shown in ohms ±10% tolerance, ½ watt; capacitor values shown in micromicrofarads ±20% unless otherwise specified.

VOLTAGES AND WAVEFORMS

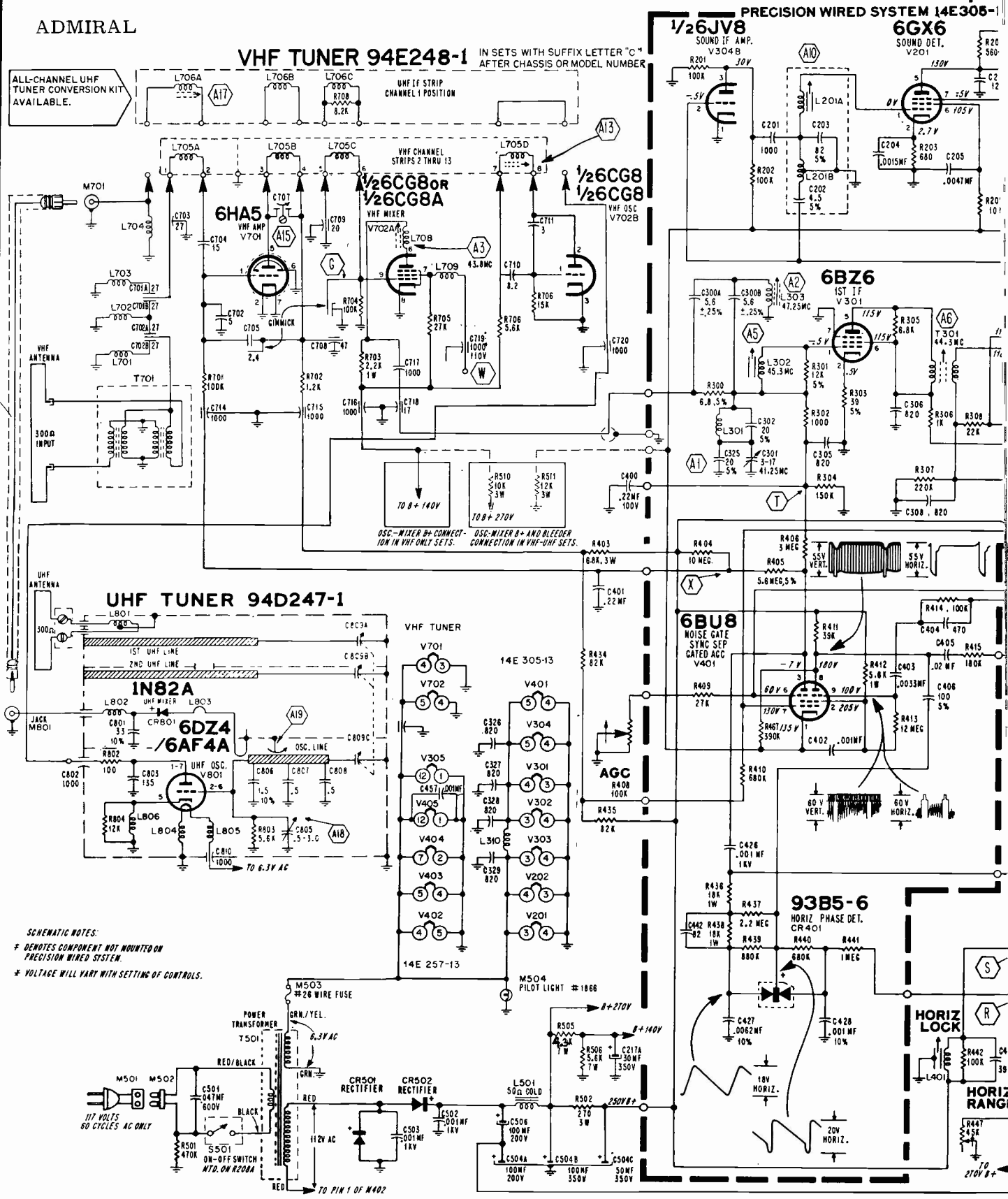
Line Voltage: 117.
Channel Selector on unused channel. Contrast control fully clockwise, all other controls counterclockwise. Do not disturb Horizontal Lock control.
Antenna disconnected and terminals shorted.
DC voltages measured with VTVM between tube socket and chassis, unless otherwise indicated.
Voltages marked (*) will vary widely with control settings.

Waveforms taken with transmitted signal input. For waveforms, controls set for normal picture. Peak-to-peak voltages may vary slightly.

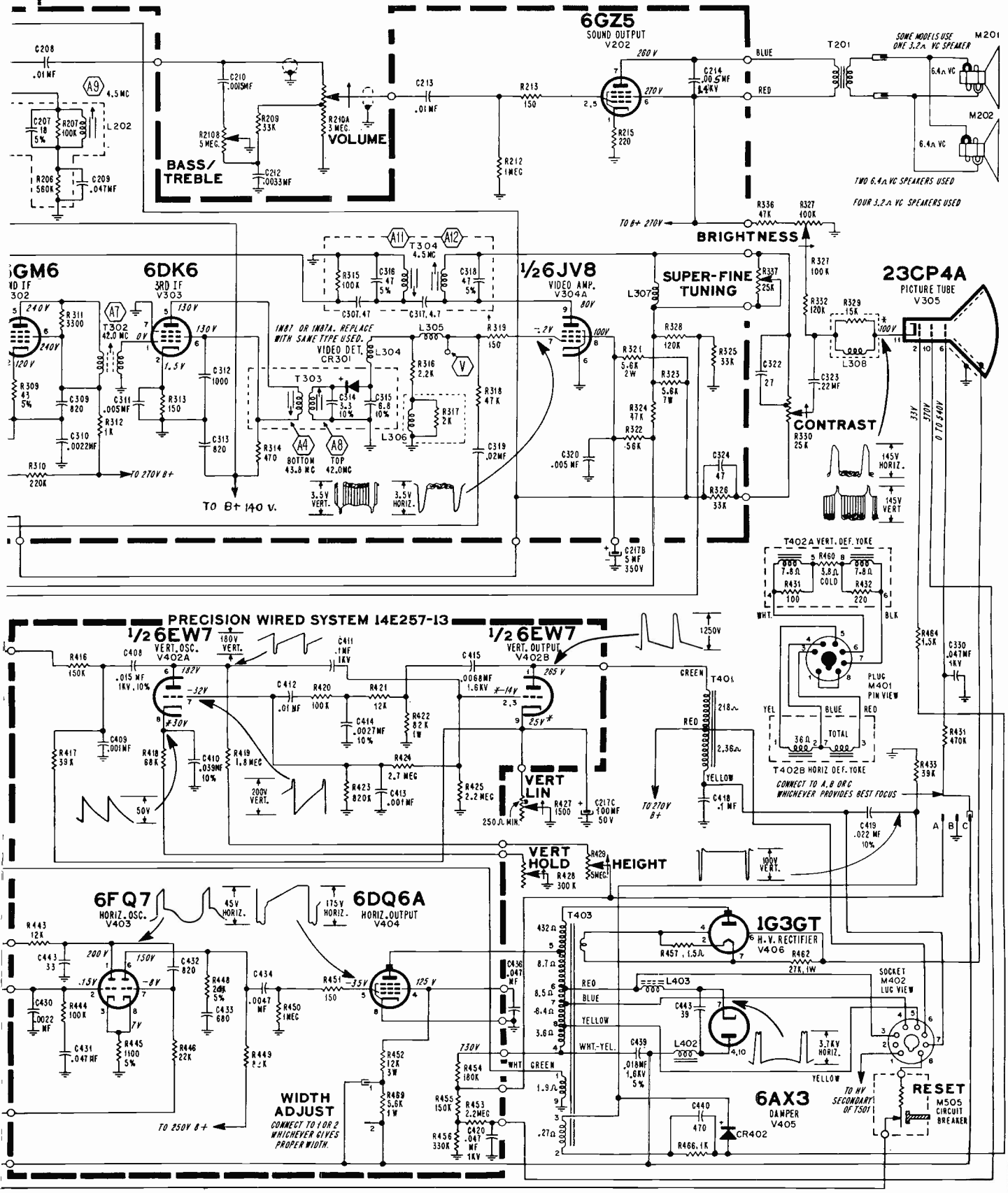
B+ Circuit Breaker: B+ supply of this receiver is equipped with a thermal type circuit breaker having a manual reset button. Allow a few minutes for circuit breaker to cool off before pressing the reset button.

Heater Fuse: A one inch length of number 26 gauge bare annealed copper wire is used. Fuse wire is located at underside of chassis.

Schematic for 21E5-31C, 21E5-31D, 21UE5-41C and 21UE5-41D Chassis Stamped Run 10 Showing VHF Tuner 94E248-1



ADMIRAL Schematic Continued



ADMIRAL Chassis Types 21D5, 21E5, 21UD5, 21UE5, Alignment Data, Continued

IF AMPLIFIER ALIGNMENT

Connect negative of 6 volt bias supply to test point "T" (IF AGC), positive to chassis. See figure B.

Using needle nose alligator clip or looped end of hookup wire, connect signal generator high side to test point "G", low side directly to tuner, see figures F and G.

Connect VTVM high side to test point "V" through a decoupling filter, see figure A. Connect low side to chassis.

Set Channel Selector to channel 12. Connect jumper wire across antenna terminals.

Allow about 15 minutes for receiver and test equipment to warm up. Use a non-metallic alignment tool, part no. 98A30-12.

Important: Before proceeding check signal generator against frequency standard for calibration.

*1. Set generator at 41.25 MC and adjust A1 for minimum.

*2. Set generator at 47.25 MC and adjust A2 for minimum.

3. Connect wire jumper across resistor R301 (12K) at terminals of IF input coil L302.

‡4. Set generator at 43.8 MC and adjust A3 for maximum. Remove wire jumper from across resistor R301.

‡5. With generator at 43.8 MC and adjust A4 for maximum.

‡6. Set generator at 45.3 MC and adjust A5 for maximum.

‡7. Set generator at 44.3 MC and adjust A6 for maximum.

‡8. Set generator at 42.0 MC and adjust A7 and A8 for maximum.

*9. Retouch trap adjustments A1 and A2 (steps 1 and 2).

10. To insure correct IF alignment, make "IF Response Curve Check" given at right.

* If necessary, increase generator output and/or reduce bias to —1½ volts to obtain a definite indication on VTVM.

‡ Use —6 volts bias. When adjusting, keep reducing generator output to prevent VTVM reading from exceeding 2 volts.

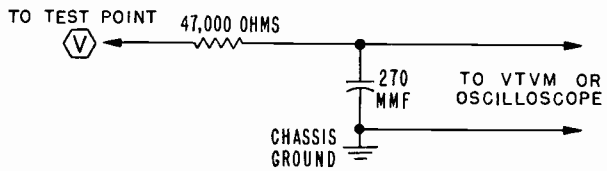


Figure A. Decoupling Filter.

IF RESPONSE CURVE CHECK

1. Allow about 15 minutes for receiver and test equipment warm up.

2. Set VHF tuner on channel 12. Connect negative of 6 volt bias supply to test point "T" (IF AGC), positive to chassis. See figure B.

3. Using needle nose alligator clip or looped end of hookup wire, connect sweep generator high side to test point "G", low side directly to tuner, see figures F and G. Set sweep frequency to 43 MC, sweep width approximately 7MC. If external marker generator is used, loosely couple high side to sweep generator lead, low side directly to tuner. Marker frequencies indicated on IF Response Curve.

4. Connect oscilloscope high side to test point "V" through a decoupling filter (figure A), low side to chassis.

5. Check curve obtained against ideal response curve, figure C. Keep marker and sweep outputs at very minimum to prevent over-loading. A reduction in sweep output should reduce curve amplitude without altering the shape of the response curve.

If curve is not within tolerance or markers not in proper location on curve, adjust A4 to position 45.75 MC Video Marker. Adjust A5 to position 43.5 MC marker and correct shape of curve.

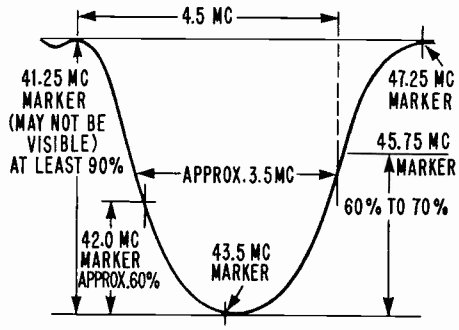
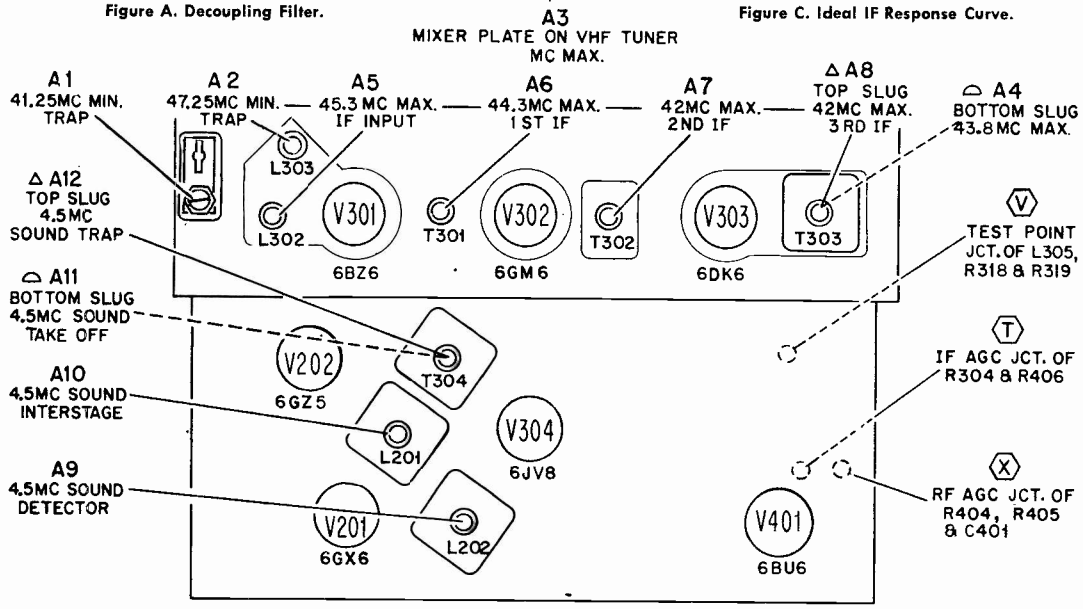


Figure C. Ideal IF Response Curve.



△ SLUG NEAREST TO
⌓ SLUG FARTHEST FROM

Figure B. View of Precision Wired System Showing Test Point Locations and IF Alignment Data.

ADMIRAL®

MODEL IDENTIFICATION CHART

†Model	†Chassis	†Model	†Chassis	†Model	†Chassis	†Model	†Chassis
AA9913	19G3	UP9014	19UG3	P9200	19A3	UP9219	19UB3
AAU9913	19UG3	P9015	19G3	UP9200	19UA3	P9221	19C3
AA9998	19A3	UP9015	19UG3	P9204	19A3	UP9221	19UC3
AAU9998	19UA3	P9020	19H3	UP9204	19UA3	P9229	19C3
P9010	19G3	UP9020	19UH3	P9211	19B3	UP9229	19UC3
UP9010	19UG3	P9029	19H3	UP9211	19UB3	T9408	19A3
P9014	19G3	UP9029	19UH3	P9219	19B3	TU9408	19UA3

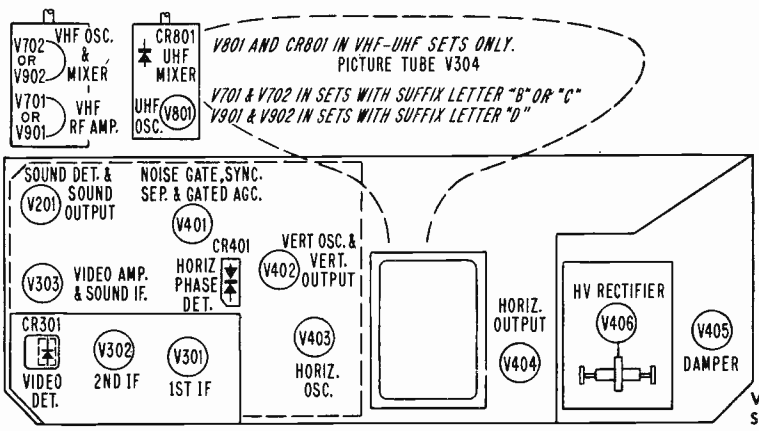
† Suffix letter after chassis and model number not indicated in chart. Suffix letter "B" indicates use of VHF tuner 94E229-3 or -4. Suffix letter "C" indicates use of VHF tuner 94E243-2. Suffix letter "D" indicates use of VHF tuner 94E202-27. Tone control only in 19B3, 19UB3, 19C3, 19UC3, 19H3, 19UH3 chassis. No dial light in 19G3, 19UG3, 19H3, 19UH3 chassis and in some models with 19A3 or 19UA3 chassis.

Material on the above listed sets is on pages 15 through 19. The sets listed in separate chart at extreme right are similar sonar-remote types.

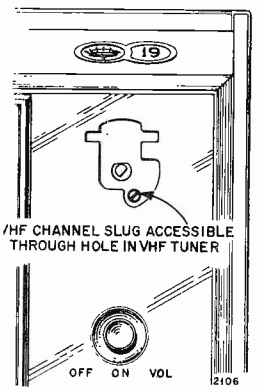
MODEL CHART	
Model	Chassis
PS9010	19K3U
PS9014	19K3U
PS9015	19K3U
†PS9020	19M3U
†PS9029	19M3U
PS9200	19R3U
PS9204	19R3U
†PS9211	19T3U
†PS9219	19T3U
SAA9913	19K3U

†Models have tone control.

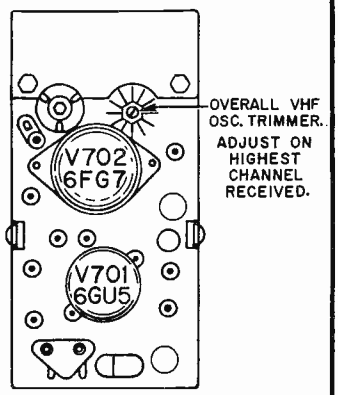
TUBE LOCATIONS



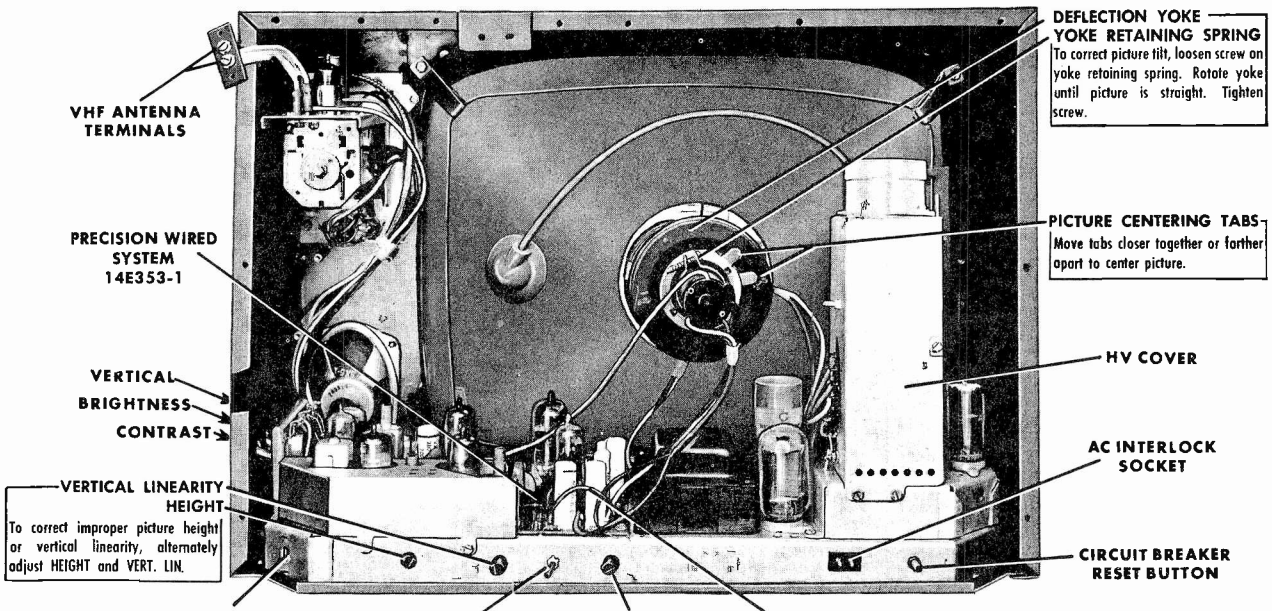
To align 4.5 MC trap "A11", tune in television station with beat interference pattern in picture. While closely observing picture, adjust slug "A11" for minimum interference pattern.



VHF Channel Slugs In Sets With Suffix Letter "C" or "D" After Chassis and Model Number. Channel and Fine Tuning Knobs Removed. Control Panel in 19G3, 19UG3, 19H3 or 19UH3 shown.



Location of VHF Oscillator Trimmer In Models With Suffix Letter "B" After Chassis and Model Number. Top View of VHF Tuner Shown.

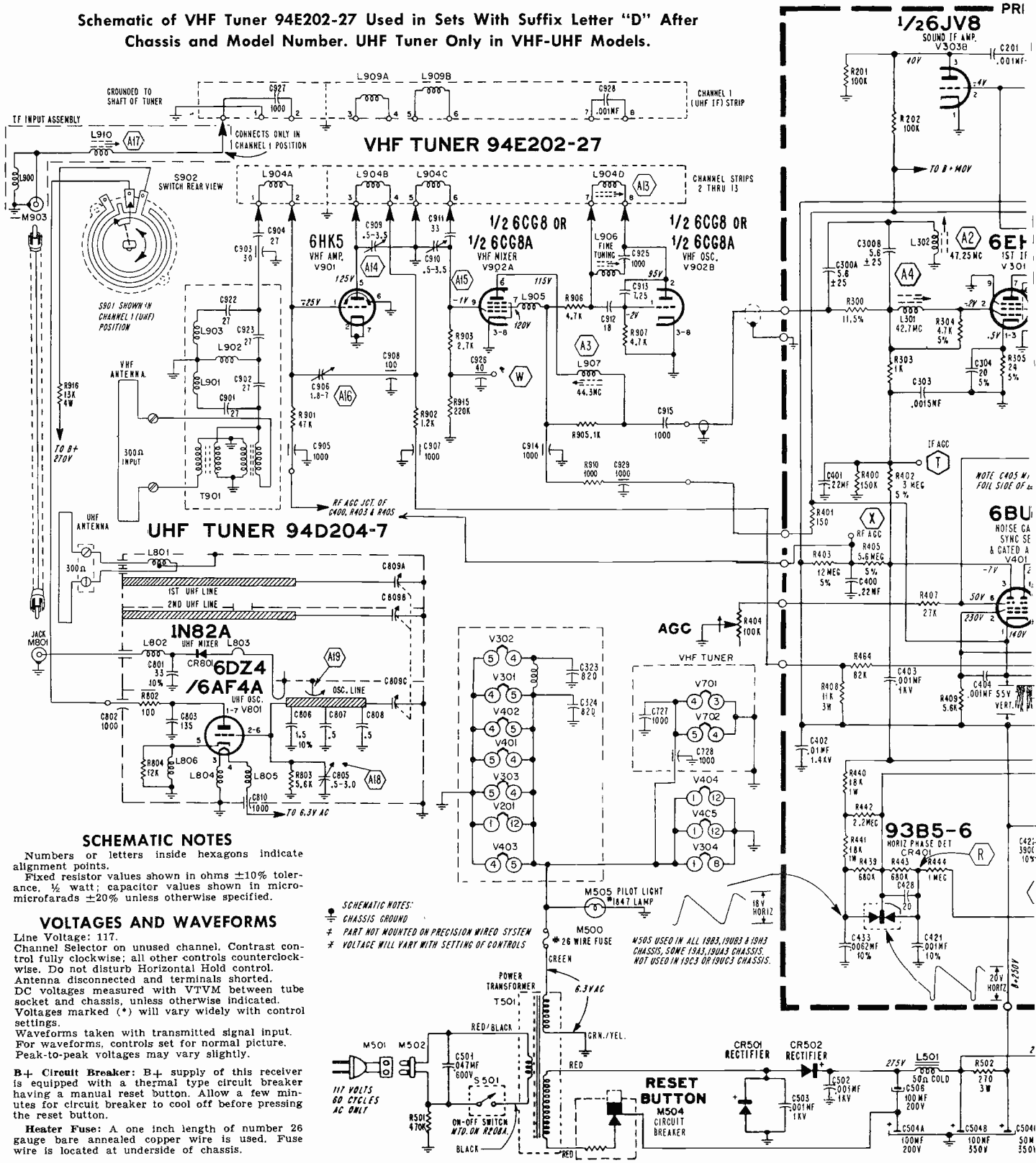


*DETAILED ADJUSTMENT INFORMATION GIVEN ON OTHER PAGES.

Rear View of Chassis Showing Adjustment Locations.

ADMIRAL Schematic Diagram 19A3, 19UA3, 19B3, 19UB3, 19C3, 19UC3, etc.

Schematic of VHF Tuner 94E202-27 Used in Sets With Suffix Letter "D" After Chassis and Model Number. UHF Tuner Only in VHF-UHF Models.



SCHEMATIC NOTES

Numbers or letters inside hexagons indicate alignment points.

Fixed resistor values shown in ohms ±10% tolerance, ½ watt; capacitor values shown in micro-microfarads ±20% unless otherwise specified.

VOLTAGES AND WAVEFORMS

Line Voltage: 117.
Channel Selector on unused channel. Contrast control fully clockwise; all other controls counterclockwise. Do not disturb Horizontal Hold control.
Antenna disconnected and terminals shorted.
DC voltages measured with VTVM between tube socket and chassis, unless otherwise indicated.
Voltages marked (*) will vary widely with control settings.
Waveforms taken with transmitted signal input. For waveforms, controls set for normal picture.
Peak-to-peak voltages may vary slightly.

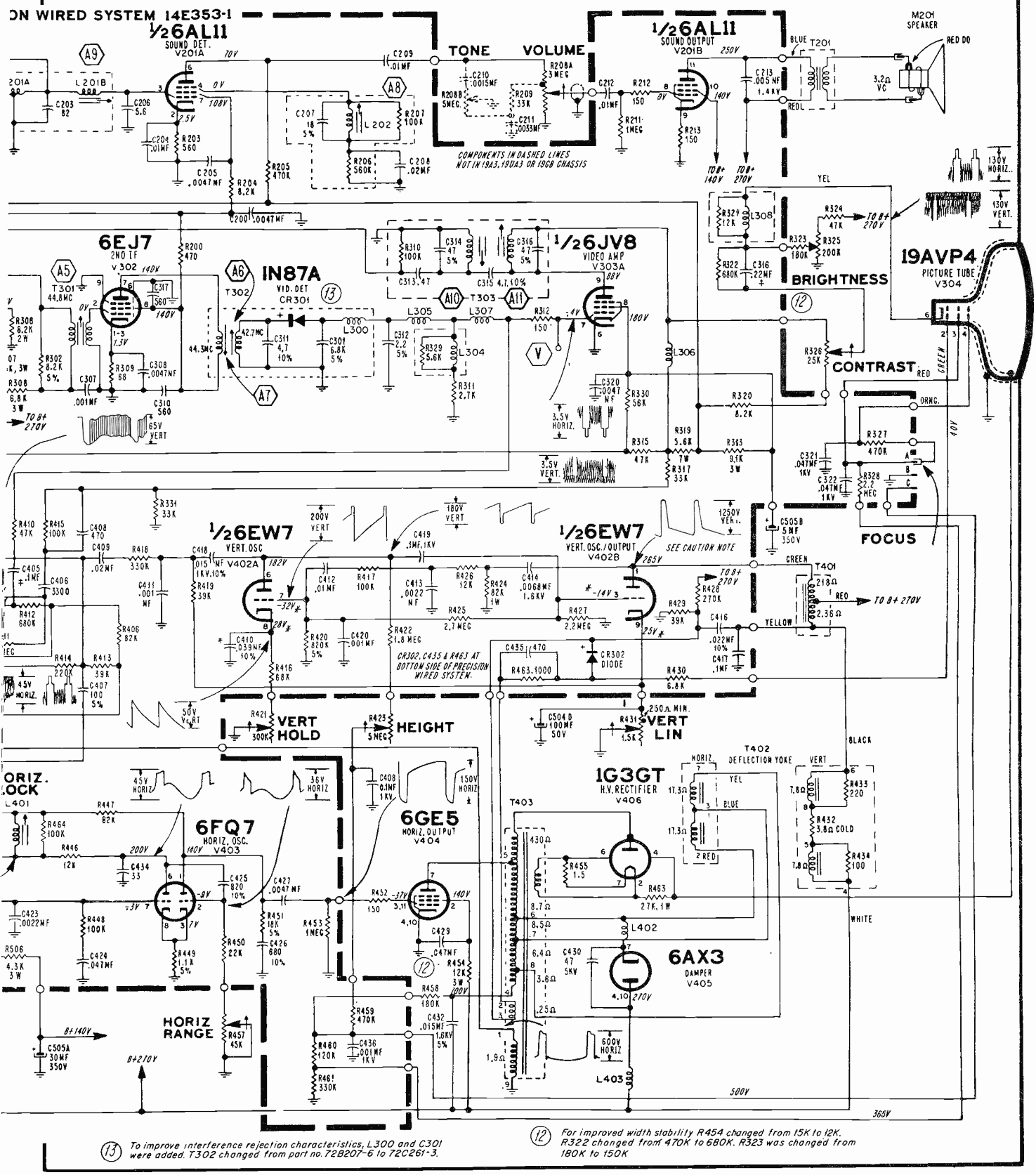
B+ Circuit Breaker: B+ supply of this receiver is equipped with a thermal type circuit breaker having a manual reset button. Allow a few minutes for circuit breaker to cool off before pressing the reset button.

Heater Fuse: A one inch length of number 26 gauge bare annealed copper wire is used. Fuse wire is located at underside of chassis.

SCHEMATIC NOTES:
⏚ CHASSIS GROUND
≠ PART NOT MOUNTED ON PRECISION WIRED SYSTEM
* VOLTAGE WILL VARY WITH SETTING OF CONTROLS

M505 USED IN ALL 1983, 19UB3 & 19H3 CHASSIS, SOME 1943, 19UA3 CHASSIS. NOT USED IN 1903 OR 19UC3 CHASSIS.

ADMIRAL Schematic Diagram of Models listed on page 15, Continued



(13) To improve interference rejection characteristics, L300 and C301 were added. T302 changed from part no. 72B207-6 to 72C261-3.

(12) For improved width stability R454 changed from 15K to 12K. R322 changed from 470K to 680K. R323 was changed from 180K to 150K

VHF CHANNEL ADJUSTMENT FOR SETS WITH SUFFIX LETTER "B" AFTER CHASSIS NUMBER

These receivers are provided with an overall VHF channel oscillator trimmer adjustment screw. See top view of VHF tuner on preceding page. Adjustment is made, using a "shorty" non-metallic alignment screwdriver with metal tip blade, part number 98A30-23. Note: If a short, non-metallic alignment screwdriver is not available, it is advisable to remove receiver from cabinet for access to trimmer screw.

Caution: Terminals at top of VHF tuner are at B+ potential. If a metallic screwdriver is used, exercise care to avoid shorting terminals or possible electric shock.

Make adjustment as follows:

1. Remove cabinet back. Connect antenna and interlock line cord. Turn set on and allow 15 minutes for warm up.
2. Set Channel Selector at highest channel received. Set Fine Tuning Control at center of tuning range, by rotating it one third turn clockwise from full counterclockwise rotation. Set other tuning controls for normal picture and sound.
3. Insert blade end of "shorty", non-metallic alignment screwdriver over trimmer screw located at right front of tube on tuner, see illustration below. When blade of alignment screwdriver engages slot of trimmer screw, very slowly adjust screw for best picture. Only slight rotation of screw is required. Sound may not be loudest at point of best picture.
4. Check adjustment on lower channels to be sure that good picture and sound can be tuned within range of the Fine Tuning control. If good picture and sound are not tunable on a lower channel, touch-up adjustment of the over-all channel screw may be made on the lower channel, as a compromise adjustment to favor all channels.

VHF CHANNEL ADJUSTMENT FOR SETS WITH SUFFIX LETTER "C" OR "D" AFTER CHASSIS

These sets are provided with a channel adjustment slug for each channel. See control panel illustration on preceding page. Adjust as follows:

1. Turn receiver on and allow 15 minutes warm up.
2. Set Channel Selector at highest channel to be adjusted. Set Fine Tuning control at center of tuning range, by rotating it one third turn counter-clockwise from full clockwise rotation. Set other tuning controls for normal picture and sound.
3. Remove Channel Selector and Fine Tuning knobs.
4. Using a non-metallic alignment tool with $\frac{3}{32}$" blade (part number 98B30-22), carefully adjust channel slug for best picture. Note: Sound may not be loudest at this point. Repeat procedure for each channel to be adjusted.

AGC CONTROL ADJUSTMENT

The AGC control is an AGC threshold control which is used solely to adjust the receiver for optimum operation under all signal conditions.

Note: This control is set at the factory and will not normally require field readjustment.

Improper AGC control adjustment can result in picture bending, tearing (overloading) or buzz in the sound. However, these same conditions can also be caused by other troubles in the set.

If adjustment is required, it should be made exactly as instructed.

1. Turn set on and allow 15 minutes to warm up.
2. Turn Channel Selector to strongest station in the area.
3. Turn Contrast and Brightness controls fully to the right.
4. Very slowly turn AGC control to the left, just to the point where picture is weak (loses contrast).
5. Adjust Horizontal Lock (at rear of set) and Vertical Hold control (at side of set) for steady picture, without bending of vertical lines at top of picture.
6. Very slowly turn AGC control to the right, until picture just begins to bend, tear, shift, or buzz is heard in sound. Then very slowly turn the AGC control to the left, to the point at which picture bending, tearing, shifting and buzz is removed.
7. Make final adjustment by turning AGC control approximately 10 degrees to the left.
8. Recheck at maximum contrast on all channels. Picture should not overload and should reappear immediately after changing channels.

IMPORTANT: AGC adjustment should always be made on the strongest TV station received. If adjustment is made only on a weak station, AGC overload may occur when a strong TV station is tuned in.

HORIZONTAL LOCK ADJUSTMENT

Make adjustment if picture "slips sideways" or "tears" when switching channels. Adjustment is made by rotating flexible shaft extending from rear of set. Adjust as follows:

1. Allow a few minutes for set to warm up. Tune in weakest station, set Brightness and Contrast controls for normal Picture. Important: Before proceeding, be sure that AGC control has been adjusted according to instructions in this manual.
2. Reduce Contrast to minimum. Very slowly turn Horizontal Lock adjustment to the right or left until picture is in sync. Interrupt the television signal by switching Channel Selector off and on channel. Picture should remain in sync. If picture bends or loses sync, adjust the Horizontal Lock so that picture remains in sync and bending of vertical lines does not appear at top of picture. Check adjustment on all channels; if necessary, repeat procedure.

IMPORTANT: If adjustment cannot be made using the Horizontal Lock control, it will be necessary to make Horizontal Range adjustment as instructed below.

HORIZONTAL RANGE ADJUSTMENT

The Horizontal Range control is set at the factory and seldom requires readjustment. Adjustment need only be made if 6FQ7 tube (V403) has been replaced and the picture cannot be locked-in with the Horizontal Lock adjustment or if the Horizontal Lock adjustment has insufficient range (adjustment only possible at extreme end rotation).

Caution: Before proceeding with adjustment, be sure that the picture will sync vertically, as lack of both vertical and horizontal sync indicates sync circuit trouble. Lack of only horizontal sync generally indicates trouble in the horizontal sync (phase detector) circuit. Adjust as follows:

1. Remove cabinet back. Connect interlock cord.
2. Allow a few minutes for set to warm up. Tune in weakest station, set Brightness and Contrast controls for a normal picture. Important: Before proceeding, be sure that the AGC control has been adjusted according to instructions in this manual.
3. Using a piece of hook-up wire, short test point "R", junction of resistors R443 (680K) and R444 (1 meg.) to chassis ground. See Figure B for location.
4. Connect a .22 mf, 400 volt capacitor from test point "S" (junction of horizontal lock coil L401 and resistor R446, 12,000 ohms) to chassis ground. Caution: To avoid B+ shock, turn receiver off when making this connection.
5. With picture in vertical sync, set Horizontal Range control at point where picture is in horizontal sync and almost remains stationary with tendency to shift to left or right.
6. Remove the .22 mf capacitor from the horizontal lock coil. Set horizontal lock coil at point where picture is in horizontal sync and almost remains stationary with tendency to shift to left or right.
7. Remove wire short from test point "R".
8. Set Channel Selector to weakest station. Switch Channel Selector on and off channel, picture should remain in horizontal sync. If necessary, adjust horizontal lock coil slightly to bring picture in sync.

IMPROVING FOCUS

The picture tube of these receivers utilizes electrostatic focus in connection with a three position focus adjustment.

For obtaining best overall sharpness of pictures, focus adjustment should be checked at installation and when servicing. Once focus adjustment is properly made, no further need for readjustment is required.

From rear view of chassis on front page, note that there are three focus (pin) connections at top rear of the chassis board, points shown as "A", "B" and "C". To make adjustment, connect plug-in focus lead to either of the three focus pins, whichever provides best focus at central area of picture tube. Important: Focus adjustment should be made with controls set for picture with normal contrast and brightness.

ADMIRAL Chassis 19A3, 19UA3, etc., Alignment Information, Continued

IF AMPLIFIER ALIGNMENT

Connect negative of 6 volt bias supply to test point "T" (IF AGC), positive to chassis. See figure B.

Using needle nose alligator clip or looped end of hookup wire, connect signal generator high side to test point "G", low side directly to tuner, see figures D, E and F.

Connect VTVM high side to test point "V" through a decoupling filter, see figure A. Connect low side to chassis.

Set Channel Selector to channel 12. Connect jumper wire across antenna terminals.

Allow about 15 minutes for receiver and test equipment to warm up. Use a non-metallic alignment tool, part no. 98A30-12.

Important: Before proceeding check signal generator against frequency standard for calibration.

†1. Set generator at 47.25 MC and adjust A2 for minimum.

2. Connect wire jumper across resistor R304 (4.7K) at terminals of IF input coil L301.

‡3. Set generator at 44.3 MC and adjust A3 for maximum. Remove wire jumper from across resistor R304.

‡4. Set generator at 42.7 MC and adjust A4 for maximum.

‡5. Retouch trap adjustment A2 (step 1).

‡6. Set generator at 44.8 MC and adjust A5 for maximum.

‡7. Set generator at 42.7 MC and adjust A6 for maximum.

‡8. Set generator at 44.3 MC and adjust A7 for maximum.

9. To insure correct IF alignment, make "IF Response Curve Check".

† If necessary, increase generator output and/or reduce bias to —1½ volts to obtain a definite indication on VTVM.

‡ Use —6 volts bias. When adjusting, keep reducing generator output to prevent VTVM reading from exceeding 2 volts.

IF RESPONSE CURVE CHECK

1. Allow about 15 minutes for receiver and test equipment warm up.

2. Set VHF tuner on channel 12. Connect negative of 6 volt bias supply to test point "T" (IF AGC), positive to chassis. See figure B.

3. Using needle nose alligator clip or looped end of hookup wire, connect sweep generator high side to test point "G", low side directly to tuner, see figures D, E and F. Set sweep frequency to 43 MC, sweep width approximately 7 MC. If external marker generator is used, loosely couple high side to sweep generator lead, low side directly to tuner. Marker frequencies indicated on IF Response Curve.

4. Connect oscilloscope high side to test point "V" through a decoupling filter (figure A), low side to chassis.

5. Check curve obtained against ideal response curve, figure C. Keep marker and sweep outputs at very minimum to prevent over-loading. A reduction in sweep output should reduce curve amplitude without altering the shape of the response curve.

If curve is not within tolerance or markers not in proper location on curve, adjust A5 to position 45.75 MC Video Marker. Adjust A6 and A7 to correct shape of curve.

4.5 MC SOUND IF ALIGNMENT

1. Tune in normal picture on strongest TV station. Allow about 15 minutes for set to warm up. See figure B for adjustment locations.

*2. Using non-metallic alignment tool (part no. 98A30-12), slowly turn slug "A8" several turns to left until a buzz is heard in sound. Then slowly turn slug "A8" to the right for loudest and clearest sound. NOTE: There may be two points (approx. ½ turn apart) at which sound is loudest. The slug should be set at center of second point of loudest sound noted as slug is turned in (toward bottom of coil).

3. Reduce signal to antenna terminals until there is considerable hiss in sound. For best results, use a step attenuator, connected between antenna and antenna terminals. Signal can also be reduced by disconnecting antenna and placing it close to antenna terminals or leads.

4. Carefully adjust slug "A9" for loudest and clearest sound with minimum hiss. If hiss disappears during alignment, reduce signal to maintain hiss level. Readjust slug "A9". NOTE: Slug "A9" should be at end nearest bottom of coil.

5. Carefully adjust slug "A10" for loudest and clearest sound with minimum hiss. If hiss disappears during alignment, reduce signal to maintain hiss level. Readjust slug "A10". Caution: Slug "A10" is located nearest bottom of shield can. Use care so as not to disturb slug nearest top of shield can.

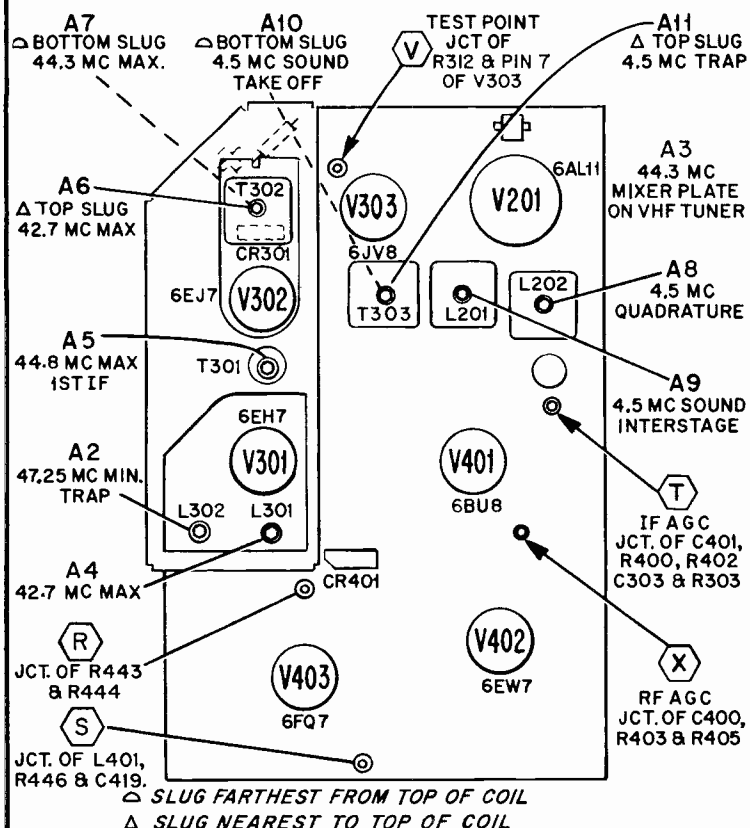


Figure B. View of Precision Wired System Showing Test Point and Alignment Locations.

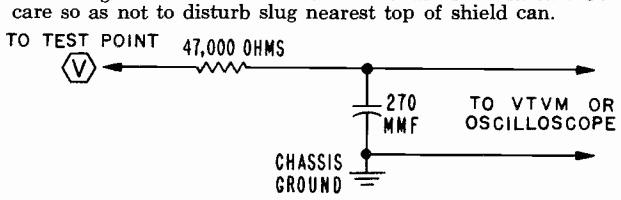


Figure A. Decoupling Filter.

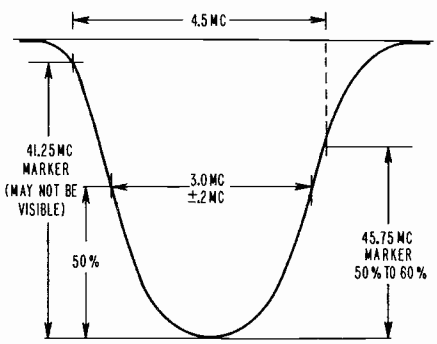


Figure C. Ideal IF Response Curve.

ADMIRAL®

Television Receiver Only Models

MODEL IDENTIFICATION CHART

Model	Chassis	Model	Chassis	Model	Chassis
†C3301C	21B5-11C	†TU3100C	21UA5-21C	§T3122D	21A5-71D
†C3301D	21B5-11D	†TU3100D	21UA5-21D	§TU3122C	21UA5-81C
†CU3301C	21UB5-21C	†T3101C	21A5-11C	§TU3122D	21UA5-81D
†CU3301D	21UB5-21D	†T3101D	21A5-11D	†T3600C	21A5-11C
†C3302C	21B5-11C	†TU3101C	21UA5-21C	†T3600D	21A5-11D
†C3302D	21B5-11D	†TU3101D	21UA5-21D	†TU3600C	21UA5-21C
†CU3302C	21UB5-21C	†T3104C	21A5-11C	†TU3600D	21UA5-21D
†CU3302D	21UB5-21D	†T3104D	21A5-11D	†T3601C	21A5-11C
†C3305C	21B5-11C	†TU3104C	21UA5-21C	†T3601D	21A5-11D
†C3305D	21B5-11D	†TU3104D	21UA5-21D	†TU3601C	21UA5-21C
†CU3305C	21UB5-21C	*T3111C	21A5-12C	†TU3601D	21UA5-21D
†CU3305D	21UB5-21D	*T3111D	21A5-12D	†T3604C	21A5-11C
‡C3311C	21B5-13C	*TU3111C	21UA5-22C	†T3604D	21A5-11D
‡C3311D	21B5-13D	*TU3111D	21UA5-22D	†TU3604C	21UA5-21C
‡CU3311C	21UB5-23C	*T3112C	21A5-12C	†TU3604D	21UA5-21D
‡CU3311D	21UB5-23D	*T3112D	21A5-12D	†T3611C	21A5-11C
‡C3312C	21B5-13C	*TU3112C	21UA5-22C	†T3611D	21A5-11D
‡C3312D	21B5-13D	*TU3112D	21UA5-22D	†TU3611C	21UA5-21C
‡CU3312C	21UB5-23C	§T3121C	21A5-71C	†TU3611D	21UA5-21D
‡CU3312D	21UB5-23D	§T3121D	21A5-71D	†T3612C	21A5-11C
‡C3313C	21B5-13C	§TU3121C	21UA5-81C	†T3612D	21A5-11D
‡C3313D	21B5-13D	§TU3121D	21UA5-81D	†TU3612C	21UA5-21C
‡CU3313C	21UB5-23C	§T3122C	21A5-71C	†TU3612D	21UA5-21D
‡CU3313D	21UB5-23D				
‡C3321C	21B5-13C				
‡C3321D	21B5-13D				
‡CU3321C	21UB5-23C				
‡CU3321D	21UB5-23D				
‡C3322C	21B5-13C				
‡C3322D	21B5-13D				
‡CU3322C	21UB5-23C				
‡CU3322D	21UB5-23D				
†C3601C	21A5-11C				
†C3601D	21A5-11D				
†CU3601C	21UA5-21C				
†CU3601D	21UA5-21D				
†C3602C	21A5-11C				
†C3602D	21A5-11D				
†CU3602C	21UA5-21C				
†CU3602D	21UA5-21D				
†C3605C	21A5-11C				
†C3605D	21A5-11D				
†CU3605C	21UA5-21C				
†CU3605D	21UA5-21D				
†L3301C	21C5-15C				
†L3301D	21C5-15D				
†LU3301C	21UC5-25C				
†LU3301D	21UC5-25D				
†L3302C	21C5-15C				
†L3302D	21C5-15D				
†LU3302C	21UC5-25C				
†LU3302D	21UC5-25D				
†L3309C	21C5-15C				
†L3309D	21C5-15D				
†LU3309C	21UC5-15C				
†LU3309D	21UC5-15D				
‡L3311C	21B5-13C				
‡L3311D	21B5-13D				
‡LU3311C	21UB5-23C				
‡LU3311D	21UB5-23D				
‡L3312C	21B5-13C				
‡L3312D	21B5-13D				
‡LU3312C	21UB5-23C				
‡LU3312D	21UB5-23D				
‡L3313C	21B5-13C				
‡L3313D	21B5-13D				
‡LU3313C	21UB5-23C				
‡LU3313D	21UB5-23D				
†T3100C	21A5-11C				
†T3100D	21A5-11D				

Models or Chassis with suffix letter "C" use VHF tuner 94E243-2.
Models or Chassis with suffix letter "D" use VHF tuner 94E202-27.
†Model has no dial light and no tone control.
*Model has dial light and tone control.
§Model with digital tuning (dialescent panel). Has tone control.
‡Model has dial light, but no tone control.

Radio-Television Combinations

MODEL IDENTIFICATION CHART

Model	Chassis	Model	Chassis	Model	Chassis
*SR3511C	21C5-14C	SMU3841C	21UC5-24C	SMU3921D	21UC5-24D
*SR3511D	21C5-14D	SMU3841D	21UC5-24D	SM3922C	21C5-14C
*SRU3511C	21UC5-24C	SM3842C	21C5-14C	SM3922D	21C5-14D
*SRU3511D	21UC5-24D	SM3842D	21C5-14D	SMU3922C	21UC5-24C
*SR3512C	21C5-14C	SMU3842C	21UC5-24C	SMU3922D	21UC5-24D
*SR3512D	21C5-14D	SMU3842D	21UC5-24D	SM3925C	21C5-14C
*SRU3512C	21UC5-24C	SM3843C	21C5-14C	SM3925D	21C5-14D
*SRU3512D	21UC5-24D	SM3843D	21C5-14D	SMU3925C	21UC5-24C
*SR3513C	21C5-14C	SMU3843C	21UC5-24C	SMU3925D	21UC5-24D
*SR3513D	21C5-14D	SMU3843D	21UC5-24D	SM3931C	21C5-14C
*SRU3513C	21UC5-24C	SM3911C	21C5-14C	SM3931D	21C5-14D
*SRU3513D	21UC5-24D	SM3911D	21C5-14D	SMU3931C	21UC5-24C
SM3641C	21C5-14C	SMU3911C	21UC5-24C	SMU3931D	21UC5-24D
SM3641D	21C5-14D	SMU3911D	21UC5-24D	SM3932C	21C5-14C
SMU3641C	21UC5-24C	SM3921C	21C5-14C	SM3932D	21C5-14D
SMU3641D	21UC5-24D	SM3921D	21C5-14D	SMU3932C	21UC5-24C
SM3841C	21C5-14C	SMU3921C	21UC5-24C	SMU3932D	21UC5-24D
SM3841D	21C5-14D				

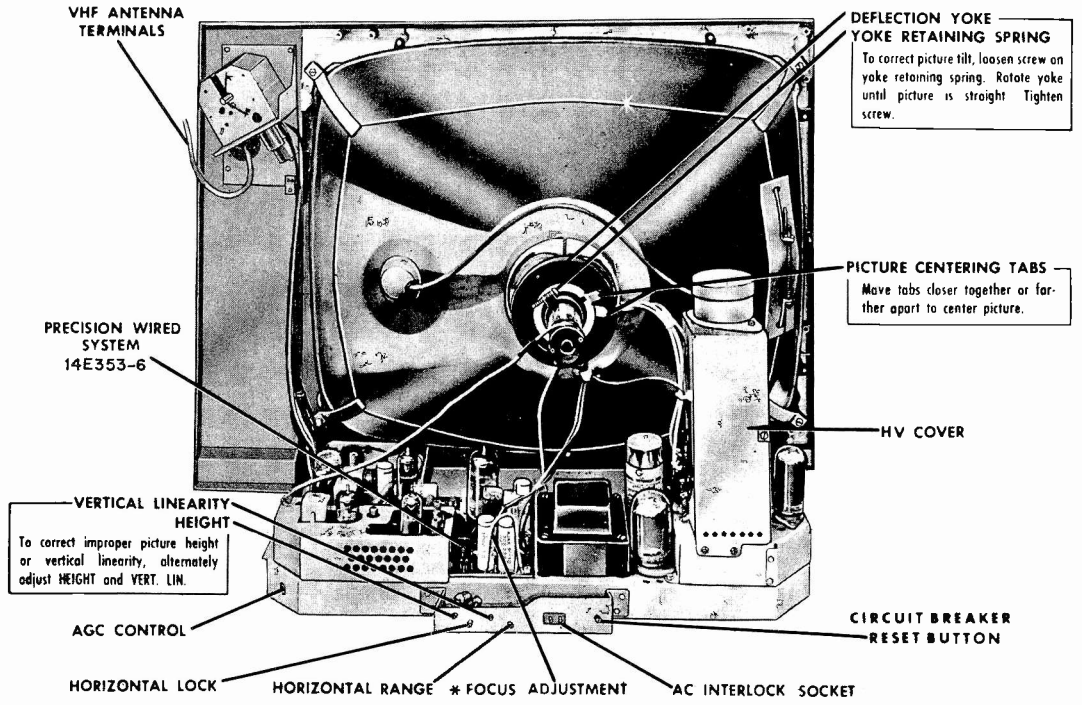
* Models without suffix letter "M" use 8T2 AM-FM Radio. Models with suffix letter "M" use 8T2A AM-FM Radio which has plug and socket connections for use of AMX102 FM Stereo Multiplex Adaptor. All other models use 9L2 AM-FM Radio with built-in Stereo Multiplex.

Remote Controlled Television Sets

MODEL IDENTIFICATION CHART

Model	Chassis	Model	Chassis	Model	Chassis
CS3301D	21B5-51D	CS3313D	21B5-54D	LS3313D	21B5-54D
CS3302D	21B5-51D	CS3321D	21B5-54D	TS3100D	21A5-51D
CS3305D	21B5-51D	CS3322D	21B5-54D	TS3101D	21A5-51D
CS3311D	21B5-54D	LS3311D	21B5-54D	TS3104D	21A5-51D
CS3312D	21B5-54D	LS3312D	21B5-54D	†TS3121D	21A5-91D
				†TS3122D	21A5-91D

† Model with digital tuning (dialescent panel). Has tone control.



Rear View of Chassis Showing Adjustment Locations (UHF Tuner in 21UC5-24C and D Chassis).

ADMIRAL Service Material for sets listed on page 20, Continued

VHF CHANNEL ADJUSTMENT

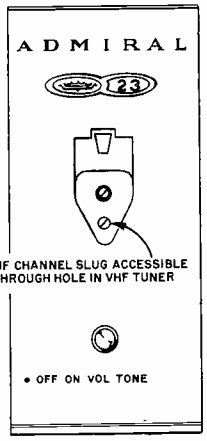
These sets are provided with a channel adjustment slug for each VHF channel. See control panel illustration at right. Adjust as follows:

1. Turn receiver on and allow 15 minutes warm up.

2. Set Channel Selector at highest channel to be adjusted. Set Fine Tuning control at center of tuning range, by rotating it one third turn counter-clockwise from full clockwise rotation. Set other tuning controls for normal picture and sound.

3. Remove Channel Selector and Fine Tuning knobs.

4. Using a non-metallic alignment tool with $\frac{3}{32}$" blade (part number 98B30-22), carefully adjust channel slug for best picture. Note: Sound may not be loudest at this point. Repeat procedure for each channel to be adjusted.



View of Escutcheon, Channel Selector and Fine Tuning Knob Removed.

AGC CONTROL ADJUSTMENT

The AGC control is an AGC threshold control which is used solely to adjust the receiver for optimum operation under all signal conditions.

Note: This control is set at the factory and will not normally require field readjustment.

Improper AGC control adjustment can result in picture bending, tearing (overloading) or buzz in the sound. However, these same conditions can also be caused by other troubles in the set.

If adjustment is required, it should be made exactly as instructed.

1. Turn set on and allow 15 minutes to warm up.

2. Turn Channel Selector to strongest station in the area.

3. Turn Contrast and Brightness controls fully to the right.

4. Very slowly turn AGC control to the left, just to the point where picture is weak (loses contrast).

5. Adjust Horizontal Lock (at rear of set) and Vertical Hold control for steady picture, without bending of vertical lines at top of picture.

6. Very slowly turn AGC control to the right, until picture just begins to bend, tear, shift, or buzz is heard in sound. Then very slowly turn the AGC control to the left, to the point at which picture bending, tearing, shifting and buzz is removed.

7. Make final adjustment by turning AGC control approximately 10 degrees to the left.

8. Recheck at maximum contrast on all channels. Picture should not overload and should reappear immediately after changing channels.

IMPORTANT: AGC adjustment should always be made on the strongest TV station received. If adjustment is made only on a weak station, AGC overload may occur when a strong TV station is tuned in.

HORIZONTAL LOCK ADJUSTMENT

Make adjustment if picture "slips sideways" or "tears" when switching channels. Adjustment is made by rotating flexible shaft extending from rear of set. Adjust as follows:

1. Allow a few minutes for set to warm up. Tune in weakest station, set Brightness and Contrast controls for normal Picture. Important: Before proceeding, be sure that AGC control has been adjusted according to instructions in this manual.

2. Reduce Contrast to minimum. Very slowly turn Horizontal Lock adjustment to the right or left until picture is in sync. Interrupt the television signal by switching Channel Selector off and on channel. Picture should remain in sync. If picture bends or loses sync, adjust the Horizontal Lock so that picture remains in sync and bending of vertical lines does not appear at top of picture. Check adjustment on all channels; if necessary, repeat procedure.

IMPORTANT: If adjustment cannot be made using the Horizontal Lock control, it will be necessary to make Horizontal Range adjustment as instructed below.

HORIZONTAL RANGE ADJUSTMENT

The Horizontal Range control is set at the factory and seldom requires readjustment. Adjustment need only be made if 6FQ7 tube (V403) has been replaced and the picture cannot be locked-in with the Horizontal Lock adjustment or if the Horizontal Lock adjustment has insufficient range (adjustment only possible at extreme end rotation).

Caution: Before proceeding with adjustment, be sure that the picture will sync vertically, as lack of both vertical and horizontal sync indicates sync circuit trouble. Lack of only horizontal sync generally indicates trouble in the horizontal sync (phase detector) circuit. Adjust as follows:

1. Remove cabinet back. Connect interlock cord.

2. Allow a few minutes for set to warm up. Tune in weakest station, set Brightness and Contrast controls for a normal picture. Important: Before proceeding, be sure that the AGC control has been adjusted according to instructions in this manual.

3. Using a piece of hook-up wire, short test point "R", junction of resistors R443 (680K) and R444 (1 meg.) to chassis ground. See Figure B for location.

4. Connect a .22 mf, 400 volt capacitor from test point "S" (junction of horizontal lock coil L401 and resistor R446, 12,000 ohms) to chassis ground. Caution: To avoid B+ shock, turn receiver off when making this connection.

5. With picture in vertical sync, set Horizontal Range control at point where picture is in horizontal sync and almost remains stationary with tendency to shift to left or right.

6. Remove the .22 mf capacitor from the horizontal lock coil. Set horizontal lock coil at point where picture is in horizontal sync and almost remains stationary with tendency to shift to left or right.

7. Remove wire short from test point "R".

8. Set Channel Selector to weakest station. Switch Channel Selector on and off channel, picture should remain in horizontal sync. If necessary, adjust horizontal lock coil slightly to bring picture in sync.

IMPROVING FOCUS

The picture tube of these receivers utilizes electrostatic focus in connection with a three position focus adjustment.

For obtaining best overall sharpness of pictures, focus adjustment should be checked at installation and when servicing. Once focus adjustment is properly made, no further need for readjustment is required.

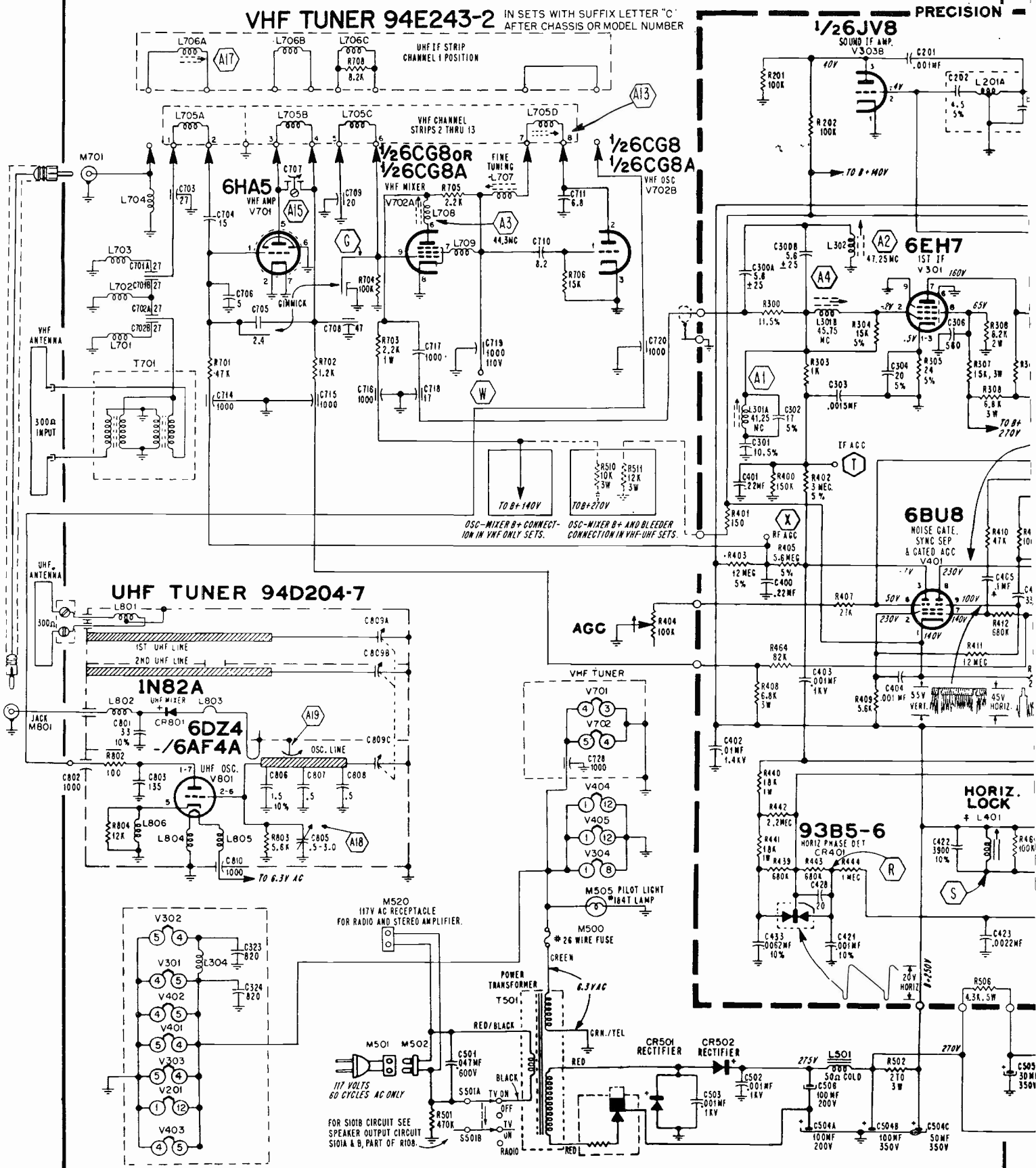
From rear view of chassis on front page, note that there are three focus (pin) connections at top rear of precision wired system, points shown at "A", "B" and "C". To make adjustment, connect plug-in focus lead to either of the three focus pins, whichever provides best focus at central area of picture tube. Important: Focus adjustment should be made with controls set for picture with normal contrast and brightness.

Caution: High B+ potential is present at focus terminals. To prevent electric shock, use care to avoid accidental contact with focus terminals.

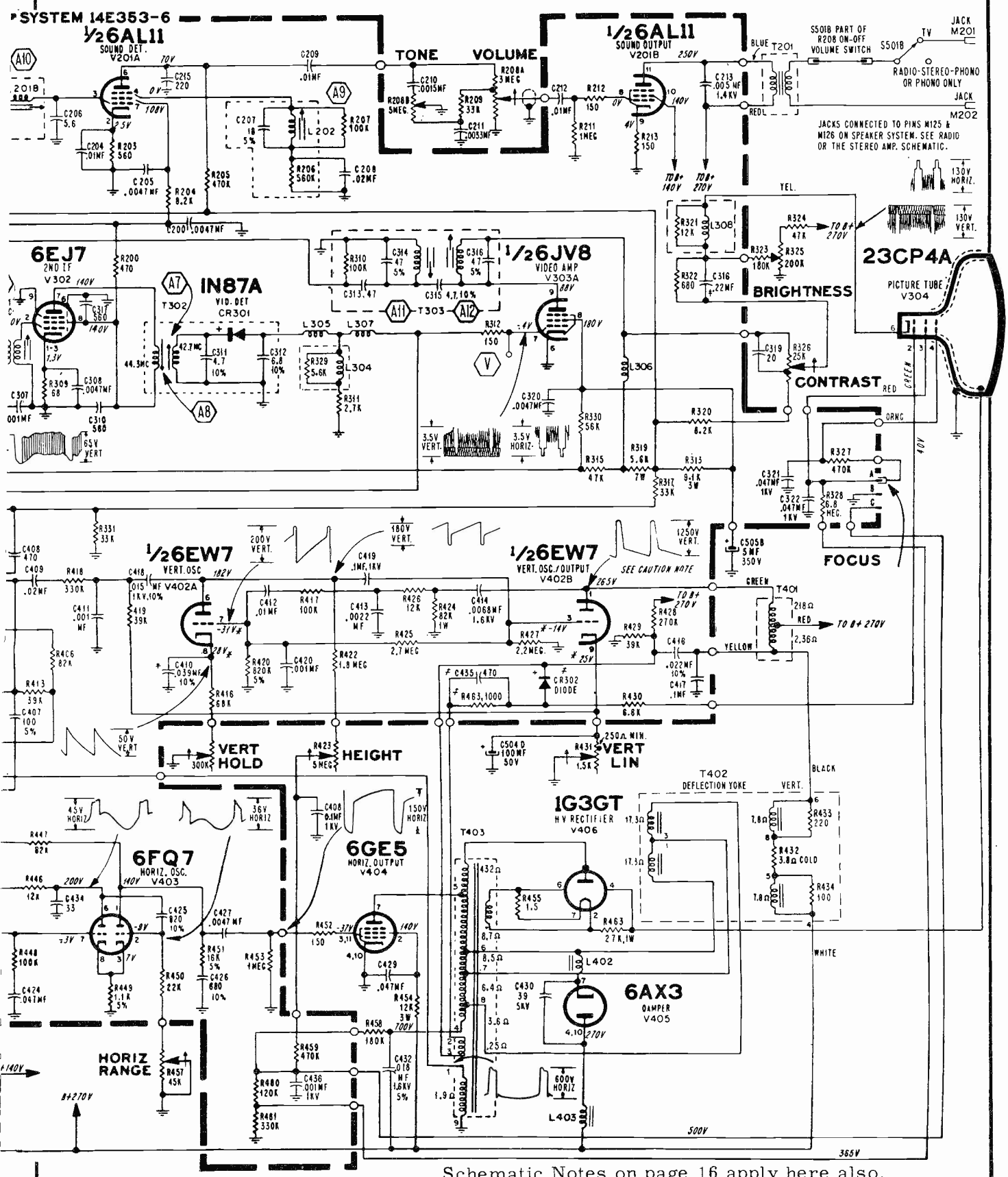
UHF CONVERSION KIT AVAILABLE

UHF conversion kit is available for conversion of VHF only models to receive all UHF channels. All necessary parts and complete instructions are included in the kit. No special tools or brackets are required.

ADMIRAL Schematic for 21C5-14D, 21UC5-24C, Continued

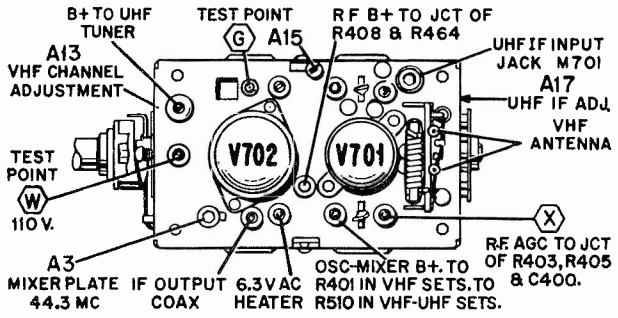


ADMIRAL

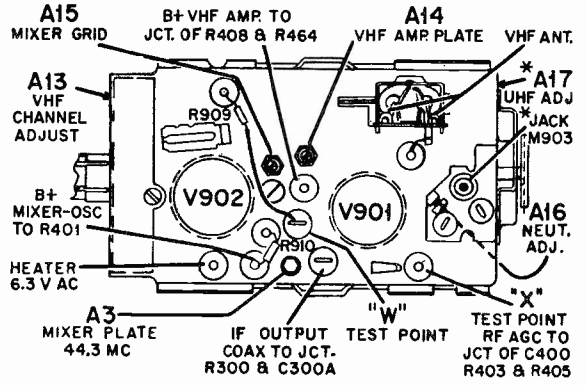


Schematic Notes on page 16 apply here also.

ADMIRAL Service Information, Continued



Top View of VHF Tuner 94E243-2.



Top View of VHF Tuner 94D202-27.

ALIGNMENT OF 4.5 MC TRAP

Alignment of 4.5 MC (beat interference) trap "A12" requires use of a hexagonal non-metallic alignment tool (part number 98A30-12).

To align 4.5 MC trap "A12", tune in television station with beat interference pattern in picture. While closely observing picture, adjust slug "A12" for minimum interference pattern.

Note that adjustment "A12" is top slug (slug farthest from bottom of coil). Use caution so as not to disturb bottom slug (slug nearest bottom of coil) as sound IF alignment will be affected.

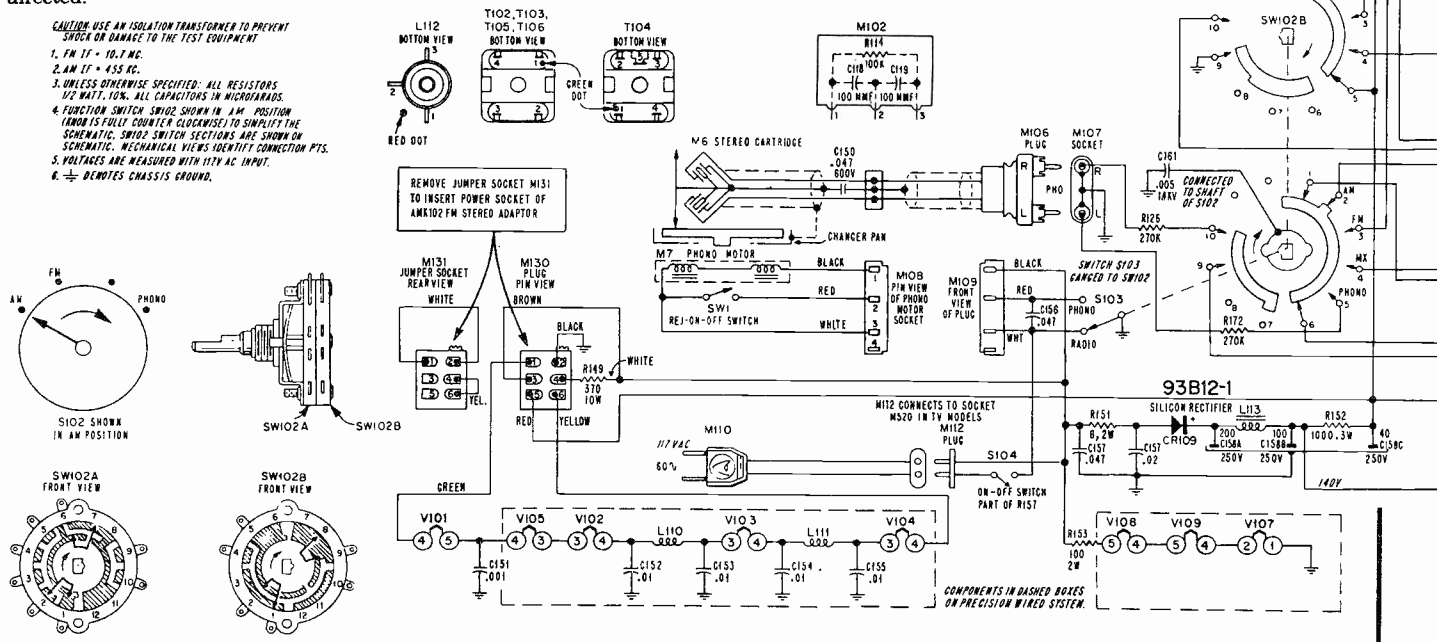
The 8T2, 8T2A or 9L2 AM- FM radio may be removed from the cabinet and serviced independently of the television set.

Although the same speaker system is used for both television and radio or phonograph, the two units operate independently of each other. The television and radio have separate, (independent) power supplies. However, the television should be turned off before operating the radio or phonograph. Likewise, turn the radio or phonograph off before operating the television.

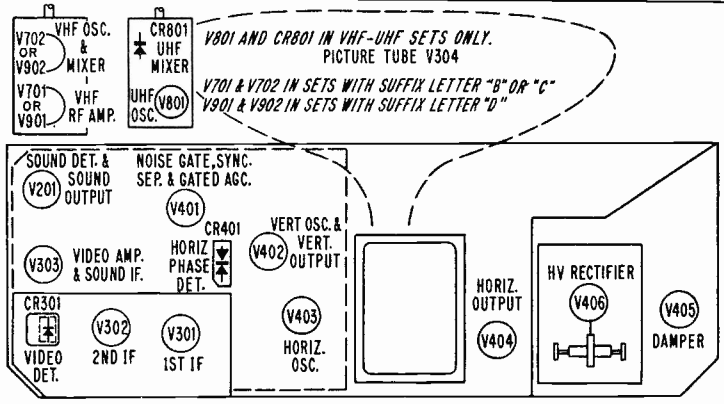
NOTE: The On-Off switch of the television chassis, has an additional switch section. When the television On-Off switch is in the off position, the voice coil winding of the television audio output transformer is disconnected from the speaker system.

DIAL STRINGING SHOWN WITH GANG CLOSED AND DIAL POINTER AT LOW END OF DIAL SCALE.

Dial Stringing Diagram



ADMIRAL 8T2A AM-FM Radio Diagram

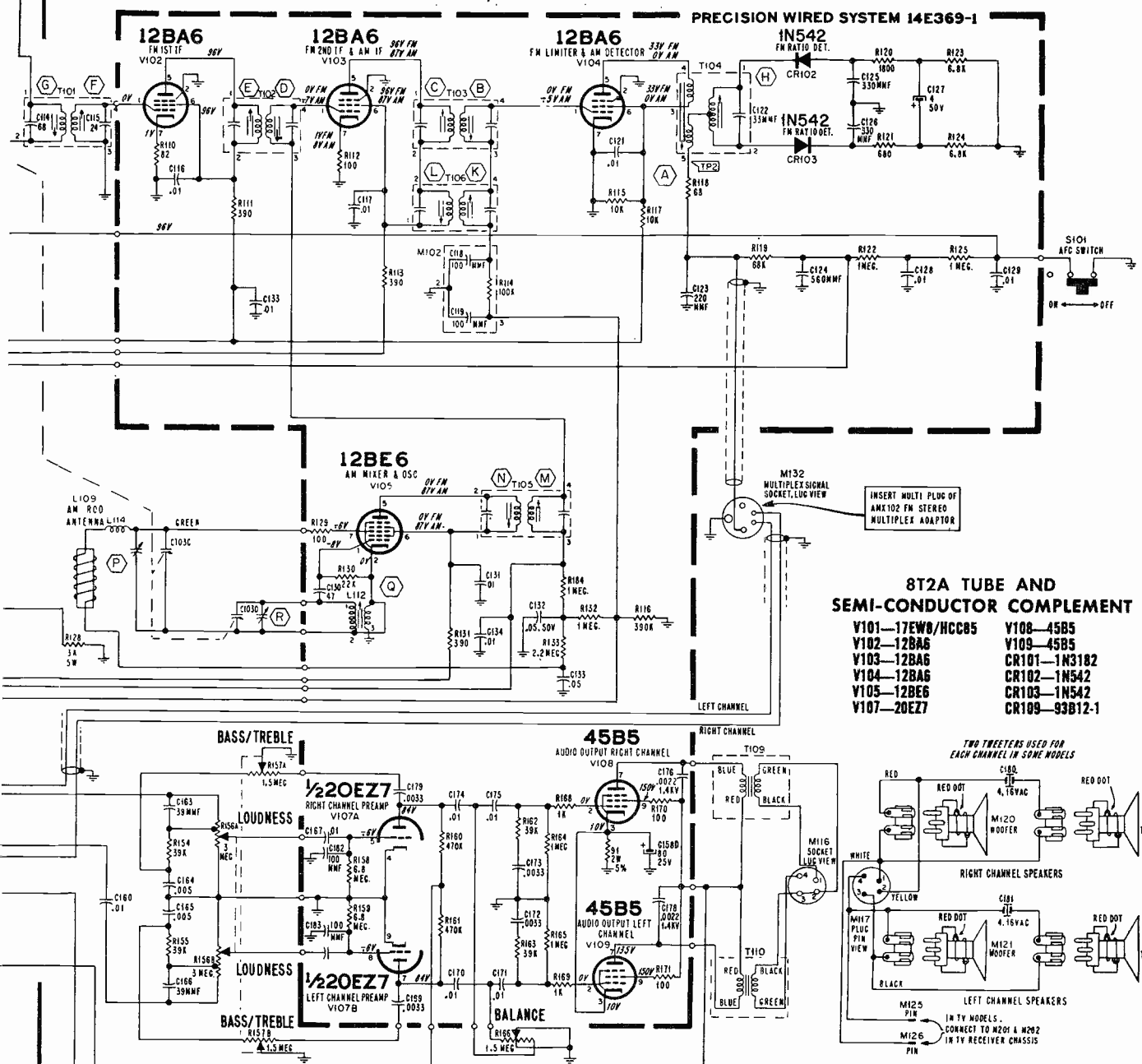


Television Tube Locations

TUBE COMPLEMENT

V201—6AL11	V403—6FQ7	V901—6HK5
V301—6EH7	V404—6GE5	V902—6CG8 or 6CG8A
V302—6EJ7	V405—6AX3	CR301—1N87A
V303—6JV8	V406—1G3GT	CR401—93B5-6
V304—23CP4A	V701—6HA5	CR501—93B12-1
V401—6BU8	V702—6CG8 or 6CG8A	CR502—93B12-1
V402—6EW7	V801—6DZ4 or 6AF4A	

Schematic of 8T2A AM-FM Radio, Used In Sets With Suffix Letter "M" After Model Number.



8T2A TUBE AND SEMI-CONDUCTOR COMPLEMENT

V101—17EW8/HCC85	V108—45B5
V102—12BA6	V109—45B5
V103—12BA6	CR101—1N3182
V104—12BA6	CR102—1N542
V105—12BE6	CR103—1N542
V107—20EZ7	CR109—93B12-1

ADMIRAL Alignment Information for sets listed on page 20, Continued

IF AMPLIFIER ALIGNMENT

Connect negative of 6 volt bias supply to test point "T" (IF AGC), positive to chassis. See figure B.

Using needle nose alligator clip or looped end of hookup wire, connect signal generator high side to test point "G", low side directly to tuner, see figures E and F.

Connect VTVM high side to test point "V" through a decoupling filter, see figure A. Connect low side to chassis.

Set Channel Selector to channel 12. Connect jumper wire across antenna terminals.

Allow about 15 minutes for receiver and test equipment to warm up. Use a non-metallic alignment tool, part no. 98A30-12.

Important: Before proceeding check signal generator against frequency standard for calibration.

†1. Set generator at 41.25 MC and adjust A1 for minimum.

†2. Set generator at 47.25 MC and adjust A2 for minimum.

3. Connect wire jumper across resistor R304 (15K) at terminals of IF input coil L301B.

‡4. Set generator at 44.3 MC and adjust A3 for maximum. Remove wire jumper from across resistor R304.

‡5. Set generator at 45.75 MC and adjust A4 for maximum.

‡6. Retouch trap adjustments A1 and A2 (steps 1 and 2).

‡7. Set generator at 43.5 MC. Connect a 300 to 500 ohm, ½ watt (loading) resistor across R302 (10 K ohms), located across primary of 1st IF transformer T301. Adjust A5 for maximum. Remove loading resistor.

‡8. With generator at 43.5 MC, connect 300 to 500 ohms, ½ watt (loading) resistor from pin 2 of V302 (2nd IF tube) to chassis ground. Adjust A6 for maximum. Remove loading resistor.

‡9. Set generator at 42.7 MC and adjust A7 for maximum.

‡10. Set generator at 44.3 MC and adjust A8 for maximum.

11. To insure correct IF alignment, make "IF Response Curve Check."

† If necessary, increase generator output and/or reduce bias to —1½ volts to obtain a definite indication on VTVM.

‡ Use —6 volts bias. When adjusting, keep reducing generator output to prevent VTVM reading from exceeding 2 volts.

IF RESPONSE CURVE CHECK

1. Allow about 15 minutes for receiver and test equipment warm up.

2. Set VHF tuner on channel 12. Connect negative of 6 volt bias supply to test point "T" (IF AGC), positive to chassis.

3. Using needle nose alligator clip or looped end of hookup wire, connect sweep generator high side to test point "G", low side directly to tuner, see figures E and F. Set sweep frequency to 43 MC. sweep width approximately 7MC. If external marker generator is used, loosely couple high side to sweep generator lead, low side directly to tuner. Marker frequencies indicated on IF Response Curve.

4. Connect oscilloscope high side to test point "V" through a decoupling filter (figure A), low side to chassis.

5. Check curve obtained against ideal response curve, figure C. Keep marker and sweep outputs at very minimum to prevent over-loading. A reduction in sweep output should reduce curve amplitude without altering the shape of the response curve.

If curve is not within tolerance or markers not in proper location on curve, adjust A3 to position 45.75 MC Video Marker. Adjust A7 and A8 to correct shape of curve.

4.5 MC SOUND IF ALIGNMENT

1. Tune in normal picture on strongest TV station. Allow about 15 minutes for set to warm up. See figure B for adjustment locations.

*2. Using non-metallic alignment tool (part no. 98A30-12), slowly turn slug "A9" several turns to left until a buzz is heard in sound. Then slowly turn slug "A9" to the right for loudest and clearest sound. NOTE: There may be two points (approx. ½ turn apart) at which sound is loudest. The slug should be set at center of second point of loudest sound noted as slug is turned in (toward bottom of coil).

3. Reduce signal to antenna terminals until there is considerable hiss in sound. For best results, use a step attenuator, connected between antenna and antenna terminals. Signal can also be reduced by disconnecting antenna and placing it close to antenna terminals or leads.

4. Carefully adjust slug "A10" for loudest and clearest sound with minimum hiss. If hiss disappears during alignment, reduce signal to maintain hiss level. Readjust slug "A10". NOTE: Slug "A10" should be at end of coil nearest bottom of coil.

5. Carefully adjust slug "A11" for loudest and clearest sound with minimum hiss. If hiss disappears during alignment, reduce signal to maintain hiss level. Readjust slug "A11". Caution: Slug "A11" is located nearest bottom of coil. Use care so as not to disturb slug nearest top of coil.

6. If above alignment is correctly made, no further adjustment is required. However, if sound remains distorted at normal volume level (when receiver is tuned for best sound), repeat entire procedure.

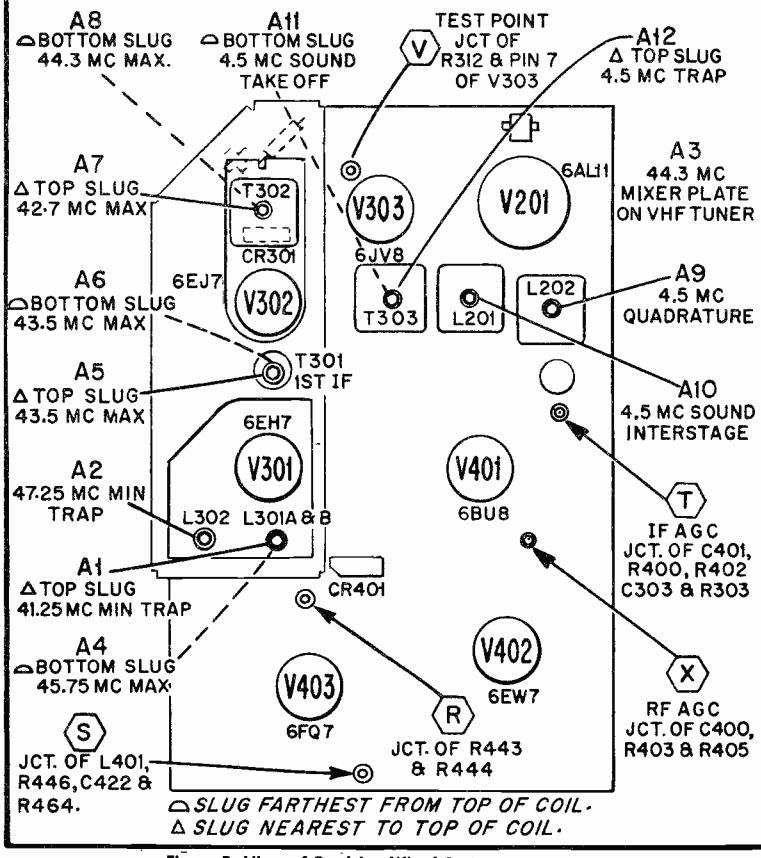


Figure B. View of Precision Wired System Showing Test Point and Alignment Locations.

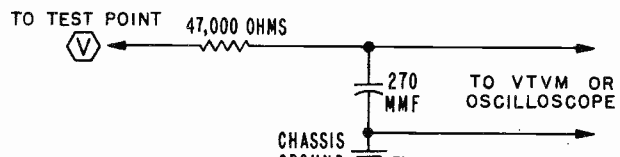


Figure A. Decoupling Filter.

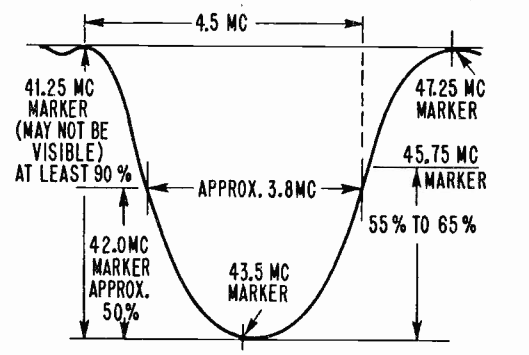


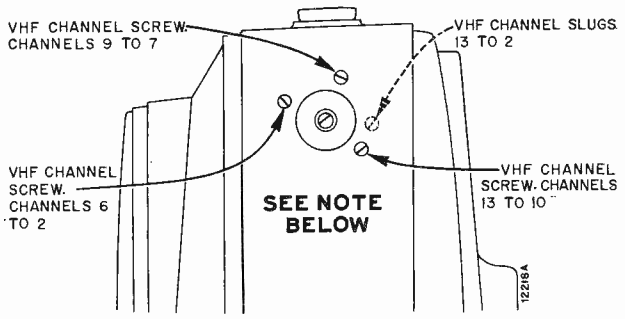
Figure C. Ideal IF Response Curve.

ADMIRAL®

C21A1-1A, C21A1-1E, C21A10-1C

(Service material on pages 27 through 33)

MODEL IDENTIFICATION CHART					
Model	Chassis	Model	Chassis	Model	Chassis
P1104A	C21A1-1A	UP1110C	C21A10-1C	P1113E	C21A1-1E
P1104E	C21A1-1E	P1112A	C21A1-1A	UP1113C	C21A10-1C
UP1104C	C21A10-1C	P1112E	C21A1-1E	P1119A	C21A1-1A
P1110A	C21A1-1A	UP1112C	C21A10-1C	P1119E	C21A1-1E
P1110E	C21A1-1E	P1113A	C21A1-1A	UP1119C	C21A10-1C



Side View of Cabinet, Channel Selector and Fine Tuning Knobs Removed. Use adjustments in solid lines for sets with suffix "E" after chassis and model number. Use adjustment in dashed lines for sets with suffix letter "A" or "C" after chassis and model number.

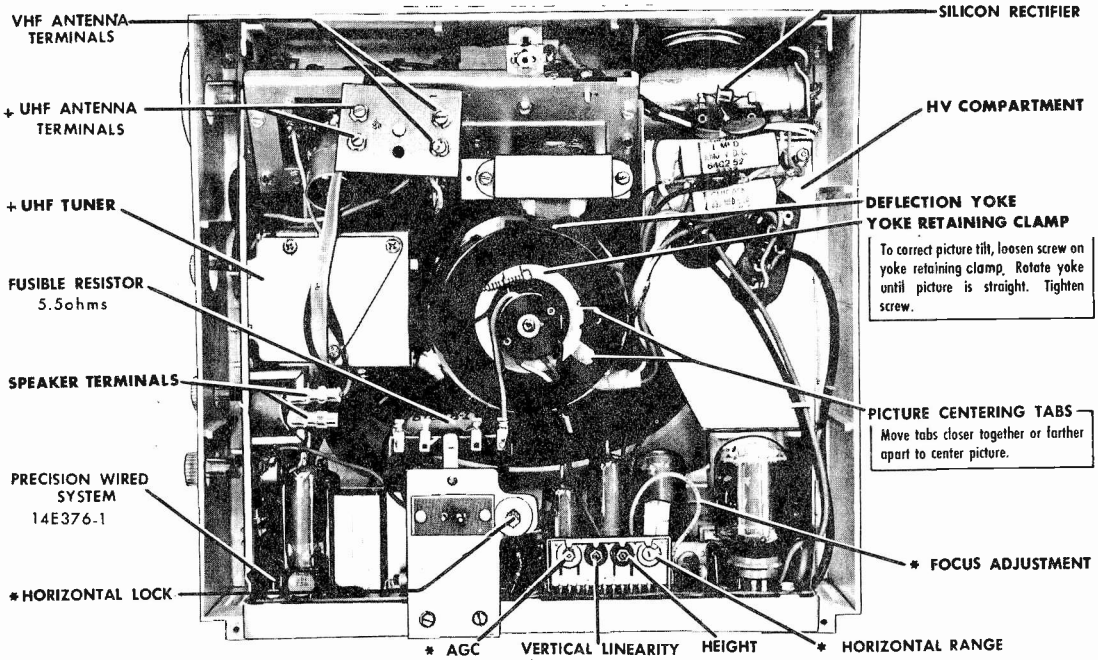
VHF CHANNEL ADJUSTMENT FOR SETS WITH SUFFIX LETTER "E" AFTER CHASSIS AND MODEL NUMBER

These sets are provided with three channel adjustment screws. A channel screw covering channels 13 through 10, one covering channels 9 through 7 and one covering channels 6 through 2. Since adjustment on a higher channel affects all lower channels, make adjustment starting with the highest operating channel, then on each lower channel. See illustration of channel screws. Adjust as follows:

1. Turn receiver on and allow 15 minutes warm up.
2. Set channel Selector at highest channel to be adjusted. Set Fine Tuning control at center of tuning range, by setting knob at mid-point between stops at extreme ends of rotation. Set other tuning controls for normal picture and sound.
3. Remove Channel Selector and Fine Tuning knobs.
4. Using a non-metallic adjustment screw-driver with metal tip blade, carefully adjust channel screw for best picture.

Note: Sound may not be loudest at this point.

5. Check adjustment on lower channels to be sure that good picture and sound can be tuned within range of the Fine Tuning control. If good picture and sound are not tunable on a lower channel, touch-up adjustment of the corresponding channel screw should be made on the lower channel, as a compromise adjustment to favor other channels.



*** ADJUSTMENT INFORMATION GIVEN ON OTHER PAGES**
+ Only in VHF-UHF MODELS

Rear View of Chassis Showing Adjustment Locations (UHF Tuner in C21A10-1C Chassis).

VHF CHANNEL ADJUSTMENT FOR SETS WITH SUFFIX LETTER "A" OR "C" AFTER CHASSIS AND MODEL NUMBER

These sets are provided with a channel adjustment slug for each channel, see illustration. Adjust as follows:

1. Turn receiver on and allow 15 minutes warm up.

2. Set Channel Selector at highest channel to be adjusted. Set Fine Tuning control at center of tuning range, by rotating it one third turn counter-clockwise from full clockwise rotation. Set other tuning controls for normal picture and sound.

3. Remove Channel Selector and Fine Tuning knobs.

4. Using a non-metallic alignment tool with a $\frac{1}{32}$" blade (part number 98B30-22), carefully adjust channel slug for best picture. Note: Sound may not be loudest at this point. Repeat procedure for each channel to be adjusted.

AGC CONTROL ADJUSTMENT

The AGC control is an AGC threshold control which is used solely to adjust the receiver for optimum operation under all signal conditions.

Note: This control is set at the factory and will not normally require field readjustment.

Improper AGC control adjustment can result in picture bending, tearing (overloading) or buzz in the sound. However, these same conditions can also be caused by other troubles in the set.

If adjustment is required, it should be made exactly as instructed.

1. Turn set on and allow 15 minutes to warm up.

2. Turn Channel Selector to strongest station in the area.

3. Turn Contrast and Brightness controls fully to the right.

4. Very slowly turn AGC control to the left, just to the point where picture is weak (loses contrast).

5. Adjust Horizontal Lock (at rear of set) and Vertical Hold control (at side of set) for steady picture, without bending of vertical lines at top of picture.

6. Very slowly turn AGC control to the right, until picture just begins to bend, shift, or buzz is heard in sound. Then very slowly turn the AGC control to the left, to the point at which picture bending, tearing, shifting and buzz is removed.

7. Make final adjustment by turning AGC control an approximate additional 10 degrees to the left.

8. Recheck at maximum contrast on all channels. Picture should not overload and should reappear immediately after changing channels.

IMPORTANT: AGC adjustment should always be made on the strongest TV station received. If adjustment is made only on a weak station, AGC overload may occur when a strong TV station is tuned in.

HORIZONTAL LOCK ADJUSTMENT

Make adjustment if picture "slips sideways" or "tears" when switching channels. Adjustment is made by rotating flexible shaft extending from rear of set. Adjust as follows:

1. Allow a few minutes for set to warm up. Tune in weakest station, set Brightness and Contrast controls for normal Picture. Important: Before proceeding, be sure that AGC control has been adjusted according to instructions in this manual.

2. Reduce Contrast to minimum. Very slowly turn Horizontal Lock adjustment to the right or left until picture is in sync. Interrupt the television signal by switching Channel Selector off and on channel. Picture should remain in sync. If picture bends or loses sync, adjust the Horizontal Lock so that picture remains in sync and bending of vertical lines does not appear at top of picture. Check adjustment on all channels; if necessary, repeat procedure.

IMPORTANT: If adjustment cannot be made using the Horizontal Lock control, it will be necessary to make Horizontal Range adjustment as instructed below.

HORIZONTAL RANGE ADJUSTMENT

The Horizontal Range control is set at the factory and seldom requires readjustment. Adjustment need only be made if 8FQ7 tube (V403) has been replaced and the picture cannot be locked-in with the Horizontal Lock adjustment or if the Horizontal Lock adjustment has insufficient range (adjustment only possible at extreme end rotation). Note: Horizontal Range adjustment is accessible after removing cabinet back.

Caution: Before proceeding with adjustment, be sure that the picture will sync vertically, as lack of both vertical and horizontal sync indicates sync circuit trouble. Lack of only horizontal sync generally indicates trouble in the horizontal sync (phase detector) circuit. Adjust as follows:

1. Remove cabinet back. Connect interlock cord.

2. Allow a few minutes for set to warm up. Tune in weakest station, set Brightness and Contrast controls for a normal picture. Important: Before proceeding, be sure that the AGC control has been adjusted according to instructions in this manual.

3. Using a piece of hook-up wire, short test point "R" (pin 2 of V403, 8FQ7 tube), to chassis ground. See figure B for test point locations.

4. Connect a .22 mf 400 volt capacitor from test point "S" (junction of horizontal lock coil L401 and resistor R446, 15,000 ohms) to chassis ground. Caution: To avoid B+ shock, turn receiver off when making this connection.

5. With picture in vertical sync, set Horizontal Range control at point where picture is in horizontal sync and almost remains stationary with tendency to shift to left or right.

6. Remove the .22 mf capacitor from the horizontal lock coil. Set horizontal lock coil at point where picture is in horizontal sync and almost remains stationary with tendency to shift to left or right.

7. Remove wire short from test point "R". Set Channel Selector to weakest station. Switch Channel Selector on and off channel, picture should remain in horizontal sync. If necessary, adjust horizontal lock coil slightly to bring picture in sync.

IMPROVING FOCUS

The picture tube of these receivers utilizes electrostatic focus in connection with a three position focus adjustment.

For obtaining best overall sharpness of pictures, focus adjustment should be checked at installation and when servicing. Once focus adjustment is properly made, no further need for readjustment is required.

From rear view of chassis on front page, note that there are three focus (pin) connections at bottom rear of chassis, points shown as "A", "B" and "C" on schematic. To make adjustment, connect plug-in focus lead to either of the three focus pins, whichever provides best focus at central area of picture tube. Important: Focus adjustment should be made with controls set for picture with normal contrast and brightness.

Caution: High B+ potential is present at focus terminals. To prevent electric shock, use care to avoid accidental contact with focus terminals.

ADMIRAL Chassis C21A1-1A, -1E, C21A10-1C, Alignment Data, Continued

IF AMPLIFIER ALIGNMENT

Connect isolation transformer between AC line and receiver. Connect negative of 6 volt bias supply to test point "T" (IF AGC), positive to chassis. See figure B.

Using needle nose alligator clip or looped end of hookup wire, connect signal generator high side to test point "G", low side directly to tuner, see figures E and F.

Connect VTVM high side to test point "V" through a decoupling filter, see figure A. Connect low side to chassis.

Set Channel Selector to channel 12. Connect jumper wire across antenna terminals.

Allow about 15 minutes for receiver and test equipment to warm up. Use a non-metallic alignment tool, part no. 98A30-12.

Important: Before proceeding check signal generator against frequency standard for calibration.

†1. Set generator at 42.7 MC and adjust A1 for maximum.
†2. Set generator at 44.2 MC and adjust A2 for maximum.
†3. Set generator at 44.3 MC and adjust A3 for maximum.
4. Connect wire jumper across IF input coil L302.
†5. Set generator at 44.8 MC and adjust A4 for maximum.
6. Remove wire jumper from across input coil L302.
†7. Set generator at 42.7 MC and adjust A5 for maximum.
*8. Set generator at 47.25 MC and adjust A6 for minimum.
9. To insure correct IF alignment, make "IF Response Curve Check".

*If necessary, increase generator output and/or reduce bias to — 1½ volts to obtain a definite indication on VTVM.

†Use —6 volts bias. When adjusting, keep reducing generator output to prevent VTVM reading from exceeding 2 volts.

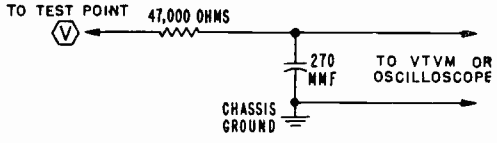


Figure A. Decoupling Filter.

IF RESPONSE CURVE CHECK

1. Connect isolation transformer between AC line and receiver. Allow about 15 minutes for receiver and test equipment to warm up.
2. Set VHF tuner on channel 12. Connect negative of 6 volt bias supply to test point "T" (IF AGC), positive to chassis. See figure B.
3. Using needle nose alligator clip or looped end of hookup wire, connect sweep generator high side to test point "G" low side directly to tuner, see figures E and F. Set sweep frequency to 43 MC, sweep width approximately 7 MC. If external marker generator is used, loosely couple high side to sweep generator lead, low side directly to tuner. Marker frequencies indicated on IF Response Curve.
4. Connect oscilloscope high side to test point "V" through a decoupling filter (figure A), low side to chassis.
5. Check curve obtained against ideal response curve, figure C. Keep marker and sweep outputs at very minimum to prevent over-loading. A reduction in sweep output should reduce curve amplitude without altering the shape of the response curve.

If curve is not within tolerance or markers not in proper location on curve, adjust A4 to position 45.75 MC Video Marker. Adjust A1 to correct shape of curve.

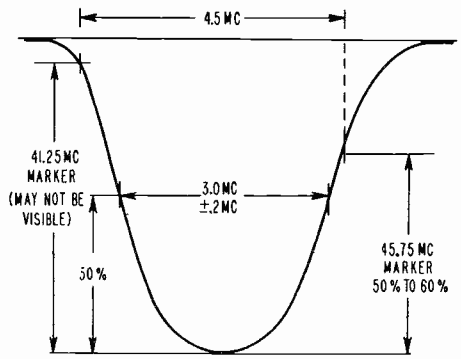


Figure C. Ideal IF Response Curve.

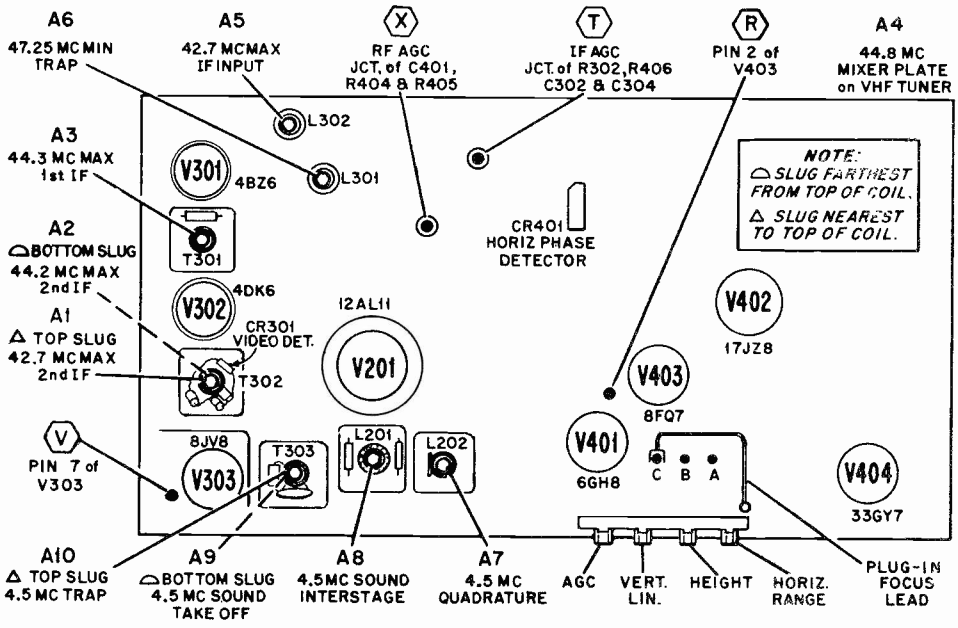
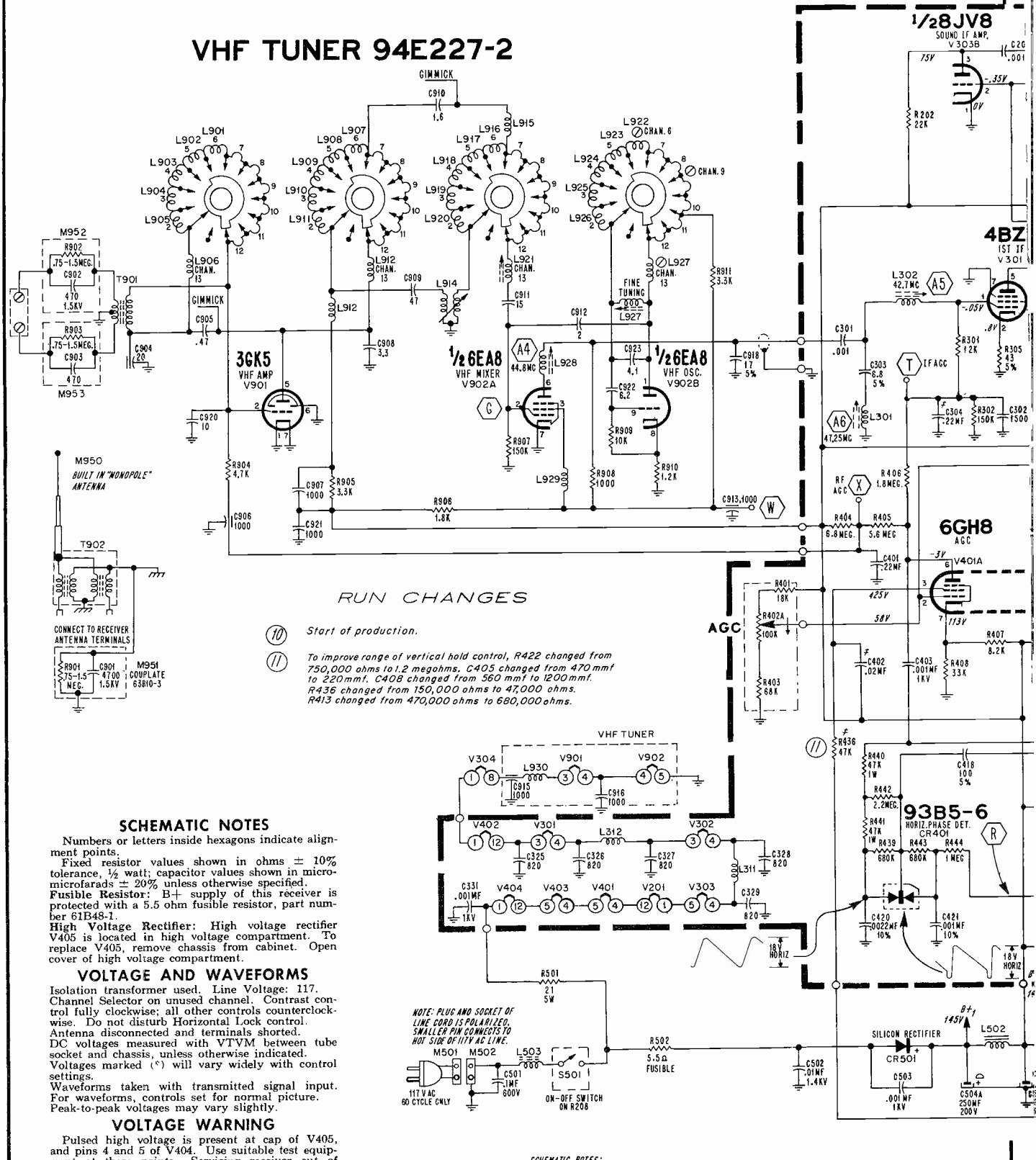


Figure B. View of Precision Wired System Showing Test Point and Alignment Locations.

ADMIRAL Chassis C21A1-1E Schematic Diagram (Diff. tuners in C21A1-1A, C21A10-1C)



RUN CHANGES

(10) *Start of production.*

(11) *To improve range of vertical hold control, R422 changed from 750,000 ohms to 1.2 megohms. C405 changed from 470 mmf to 220 mmf. C408 changed from 560 mmf to 1200 mmf. R436 changed from 150,000 ohms to 47,000 ohms. R413 changed from 470,000 ohms to 680,000 ohms.*

SCHEMATIC NOTES

Numbers or letters inside hexagons indicate alignment points.

Fixed resistor values shown in ohms ± 10% tolerance, ½ watt; capacitor values shown in microfarads ± 20% unless otherwise specified.

Fusible Resistor: B+ supply of this receiver is protected with a 5.5 ohm fusible resistor, part number 61B48-1.

High Voltage Rectifier: High voltage rectifier V405 is located in high voltage compartment. To replace V405, remove chassis from cabinet. Open cover of high voltage compartment.

VOLTAGE AND WAVEFORMS

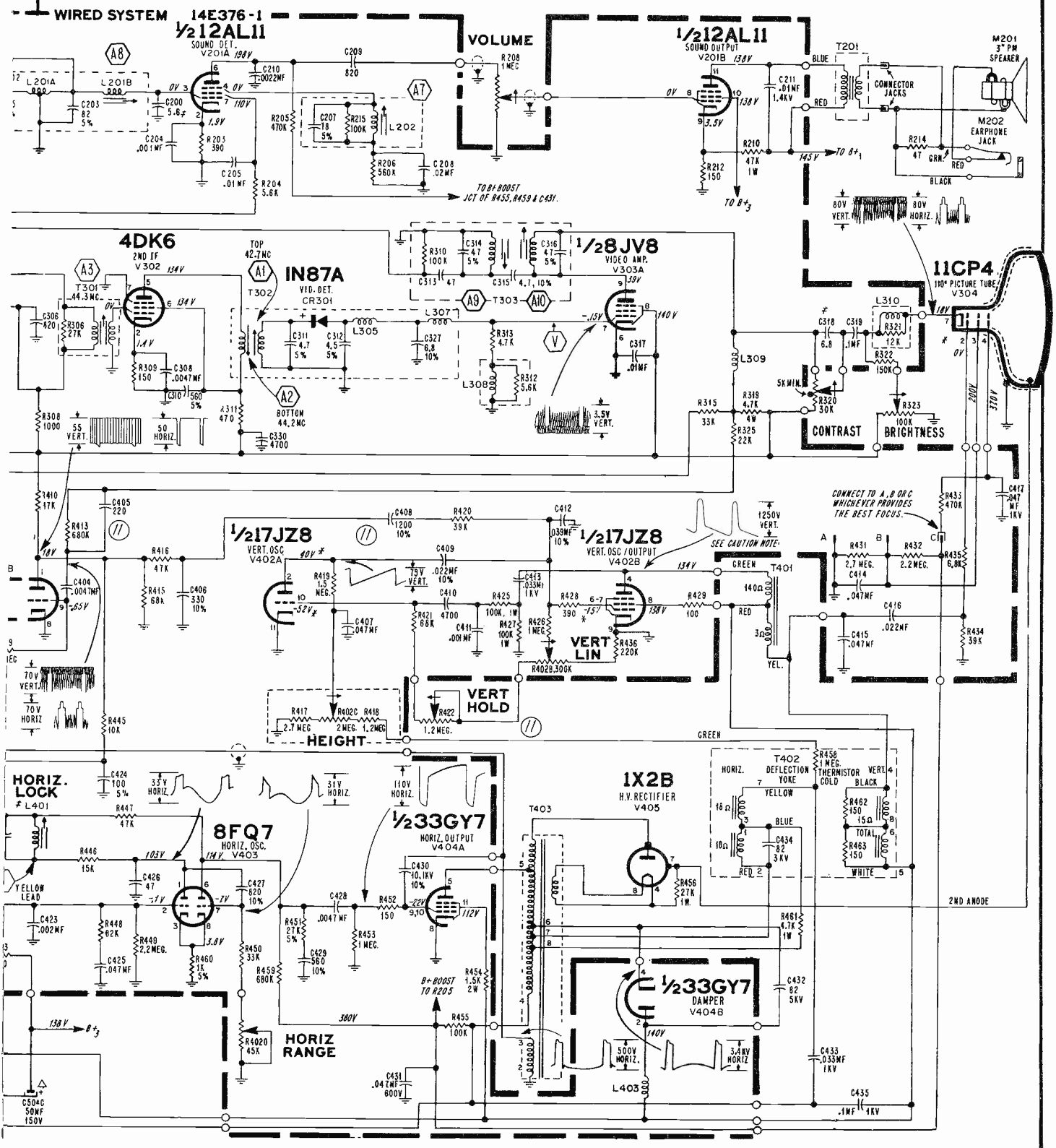
Isolation transformer used. Line Voltage: 117.
Channel Selector on unused channel. Contrast control fully clockwise; all other controls counterclockwise. Do not disturb Horizontal Lock control.
Antenna disconnected and terminals shorted.
DC voltages measured with VTVM between tube socket and chassis, unless otherwise indicated.
Voltages marked (*) will vary widely with control settings.
Waveforms taken with transmitted signal input. For waveforms, controls set for normal picture. Peak-to-peak voltages may vary slightly.

VOLTAGE WARNING

Pulsed high voltage is present at cap of V405, and pins 4 and 5 of V404. Use suitable test equipment at these points. Servicing receiver out of cabinet involves a shock hazard. Use polarized line (cheater) cord and plug, part number 89C 121-2.

SCHEMATIC NOTES:
⏚ CHASSIS GROUND.
≠ PART NOT MOUNTED ON CIRCUIT BOARD.
** VOLTAGE WILL VARY WITH SETTING OF CONTROLS.*
⏚ CABINET GROUND.

ADMIRAL Chassis C21A1-1A, -1E, C21A10-1C, Schematic Diagram, Continued



Schematic for Chassis Stamped Run 11, Showing VHF Tuner Used in Sets with C21A1-1E Chassis.

ADMIRAL Chassis C21A1-1A, -1E, C21A10-1C, Alignment Data, Continued

VHF AMPLIFIER AND MIXER ALIGNMENT

VHF tuners used in these receivers, feature high stability and trouble-free operation. In general, RF and mixer alignment is permanent. However, individual channel oscillator screws or slugs are provided, should oscillator adjustment be required after replacement of VHF oscillator tube. For tuner adjustment locations, see front page and figures below. If it is definitely determined that complete tuner alignment is required, return tuner to Admiral Distributor for repair or replacement. Note: VHF Channel Adjustment can be made from in front of set after removing VHF channel and fine tuning knobs.

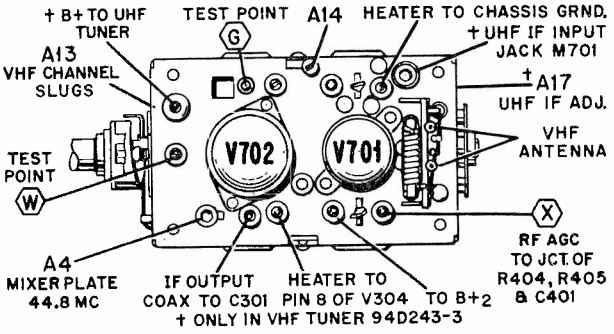


Figure E. Top View of VHF Tuners 94E243-3 and -7.

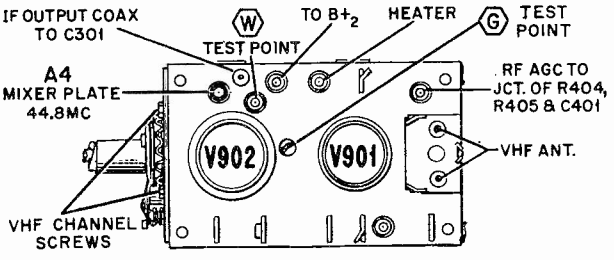


Figure F. Top View of VHF Tuner 94E227-2.

OVER-ALL VHF AND IF RESPONSE CURVE CHECK

Set AGC control fully to the left. Channel Selector on channel 12. Connect negative of 3V bias supply to test points "T" (IF AGC) and "X" (RF AGC), positive to chassis. See figure B.

Connect isolation transformer between AC line and receiver. Allow about 15 minutes for receiver and test equipment to warm up.

Connect sweep generator to antenna terminals. Set sweep to channel 12 with sweep output as low as possible. If an external marker generator is used, loosely couple high side to sweep generator lead.

Connect oscilloscope high side to test point "V" through decoupling filter, low side to chassis.

Compare response curve obtained against ideal curve shown in figure "G". If the curve is not within tolerance, adjust A4 to position video marker; adjust A1 to correct shape of curve. It should never be necessary to turn slugs more than one turn in either direction. If curve is satisfactory on channel checked, all other channels should be satisfactory. IMPORTANT: When sweep output is reduced, response curve amplitude on scope should also decrease, but curve shape should remain the same. If curve shape changes, reduce sweep output and/or scope gain until shape does not change.

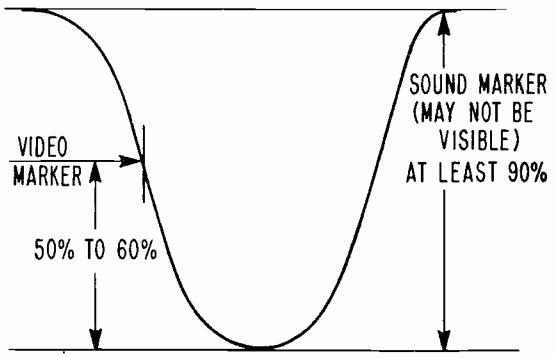


Figure G. Ideal Over-all VHF and IF Response Curve

ALIGNMENT OF UHF IF INPUT USING A TRANSMITTED SIGNAL

Alignment of UHF IF input coil (part of VHF tuner), should be made if UHF reception is poor and after usual causes of poor UHF reception have been checked.

To align UHF IF input coil, tune in UHF channel with normal picture and sound. Using non-metallic alignment tool very carefully adjust slug A17 for best picture, consistent with good sound. For VHF tuner adjustment locations, see figure E.

4.5 MC SOUND IF ALIGNMENT

1. Tune in normal picture on strongest TV station. Allow about 15 minutes for set to warm up. See figure B for adjustment locations.

*2. Using non-metallic alignment tool (part no. 98A30-12), slowly turn slug "A7" several turns to left until a buzz is heard in sound. Then slowly turn slug "A7" to the right for loudest and clearest sound. NOTE: There may be two points (approx. ½ turn apart) at which sound is loudest. The slug should be set at center of second point of loudest sound noted as slug is turned in (toward bottom of coil).

3. Reduce signal to antenna terminals until there is considerable hiss in sound. For best results, use a step attenuator, connected between antenna and antenna terminals. Signal can also be reduced by disconnecting antenna and placing it close to antenna terminals or leads.

4. Carefully adjust slug "A8" for loudest and clearest sound with minimum hiss. If hiss dissappears during alignment, reduce signal to maintain hiss level. Readjust slug "A8". NOTE: Slug "A8" should be at end nearest bottom of coil.

5. Carefully adjust slug "A9" for loudest and clearest sound with minimum hiss. If hiss disappears during alignment, reduce signal to maintain hiss level. Readjust slug "A9". Caution: Slug "A9" is located nearest bottom of coil. Use care so as not to disturb slug nearest top of coil.

6. If above alignment is correctly made, no further adjustment is required. However, if sound remains distorted at normal volume level (when receiver is tuned for best sound), repeat entire procedure.

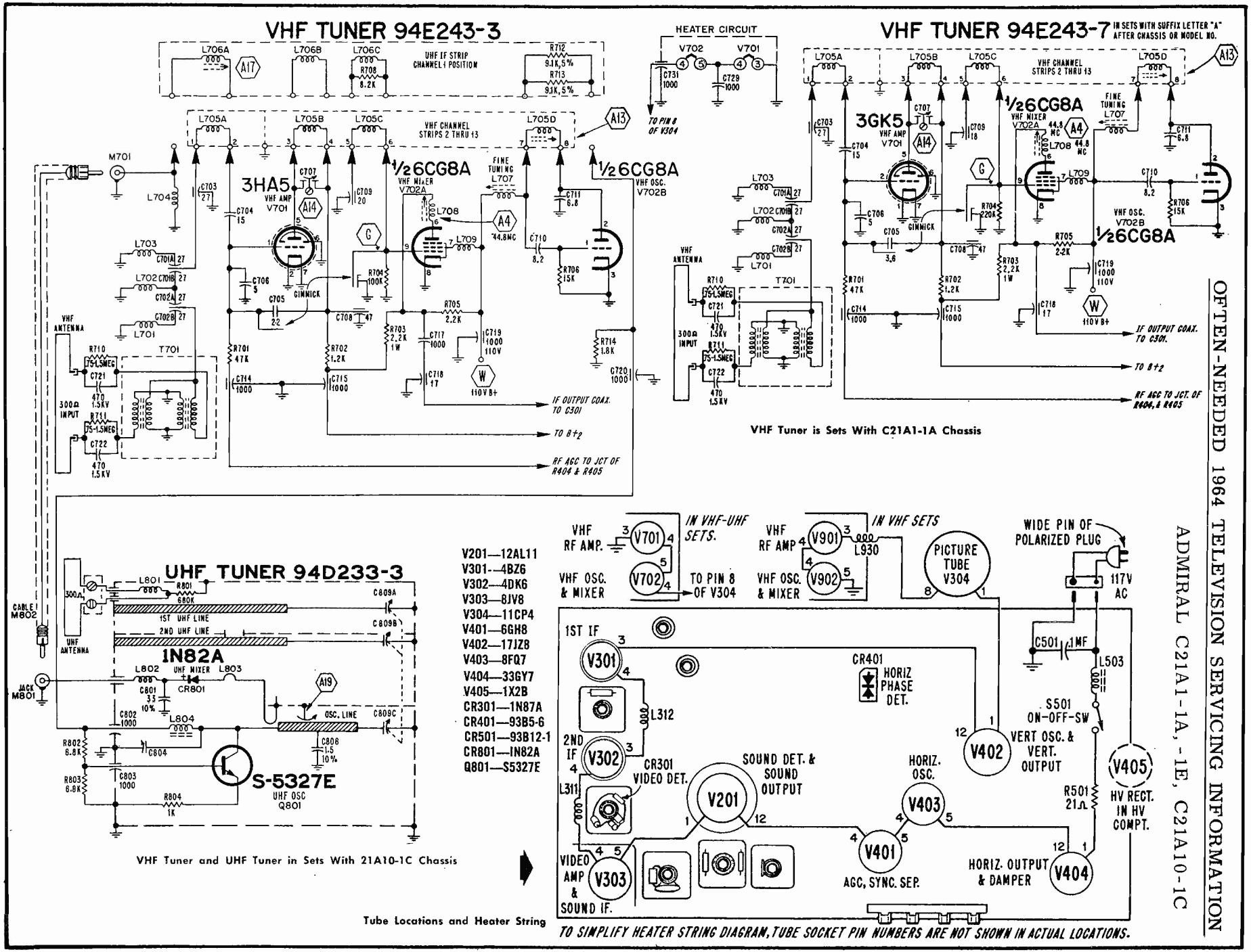
*CAUTION: Do not readjust slug "A7" unless sound is distorted. If "A7" is readjusted, all steps in alignment procedure should be repeated exactly as instructed.

ALIGNMENT OF 4.5 MC TRAP

Alignment of 4.5 MC (beat interference) trap "A10" requires use of a hexagonal non-metallic alignment tool (part number 98A30-12).

To align 4.5 MC trap "A10", tune in television station with beat interference pattern in picture. While closely observing picture, adjust slug "A10" for minimum interference pattern.

Note that adjustment "A10" is top slug (slug farthest from bottom of coil). Use caution so as not to disturb bottom slug (slug nearest bottom of coil) as sound IF alignment will be affected.


VHF TUNER 94E243-3
L706A
L706B
L706C
UHF IF STRIP CHANNEL 1 POSITION
R708 6.2K
R712 9.1K, 5%
R713 9.1K, 5%
A17
L705A
L705B
L705C
VHF CHANNEL STRIPS 2 THRU 13
L705D
A13
M701
L704
3HA5
VHF AMP V701
A14
C707
C709 20
½6CG8A
VHF MIXER V702A
FINE TUNING L707
A4 44.8MC
½6CG8A
VHF OSC. V702B
C703 27
C704 15
C706 5
GIMMICK
C705 22
C708 47
C710 8.2
C711 6.8
L703
L702
L701
C701A 27
C701B 27
C702A 27
C702B 27
VHF ANTENNA
300Ω INPUT
T701
R710 75-1.5MEG
R711 75-1.5MEG
C721 470 1.5KV
C722 470 1.5KV
R701 47K
R702 1.2K
R703 2.2K 1W
R704 100K
R705 2.2K
R706 15K
R714 1.8K
C714 1000
C715 1000
C717 1000
C718 17
C719 1000 110V
C720 1000
W 110V B+
G
IF OUTPUT COAX. TO C501
TO B+2
RF AGC TO JCT OF R404 & R405
HEATER CIRCUIT
V702
V701
C731 1000
C729 1000
TO PIN 8 OF V304
VHF TUNER 94E243-7 IN SETS WITH SUFFIX LETTER "A" AFTER CHASSIS OR MODEL NO.
L705A
L705B
L705C
VHF CHANNEL STRIPS 2 THRU 13
L705D
A13
3GK5
VHF AMP V701
A14
C707
½6CG8A
VHF MIXER V702A
A4 44.8 MC
L708 44.8 MC
FINE TUNING L707
C703 27
C704 15
C706 5
GIMMICK
C705 3.6
C708 47
C709 18
C710 8.2
C711 6.8
L703
L702
L701
C701A 27
C701B 27
C702A 27
C702B 27
VHF ANTENNA
300Ω INPUT
T701
R710 75-1.5MEG
R711 75-1.5MEG
C721 470 1.5KV
C722 470 1.5KV
R701 47K
R702 1.2K
R703 2.2K 1W
R704 220K
R705 2.2K
C714 1000
C715 1000
C718 17
C719 1000 110V
W 110V B+
G
VHF OSC. V702B
½6CG8A
IF OUTPUT COAX. TO C501
TO B+2
RF AGC TO JCT OF R404 & R405
VHF Tuner is Sets With C21A1-1A Chassis
UHF TUNER 94D233-3
CABLE M802
JACK M801
300Ω
UHF ANTENNA
L801
R801 680K
1ST UHF LINE
2ND UHF LINE
C809A
C809B
C809C
1N82A
L802
UHF MIXER
L803
CR801
C801 33 10%
C802 1000
L804
OSC. LINE
A19
R802 6.8K
R803 6.8K
C804
C803 1000
R804 1K
C808 1.5 10%
S-5327E
UHF OSC Q801
VHF Tuner and UHF Tuner in Sets With 21A10-1C Chassis
V201—12AL11
V301—4BZ6
V302—4DK6
V303—8JV8
V304—11CP4
V401—6GH8
V402—17JZ8
V403—8FQ7
V404—33GY7
V405—1X2B
CR301—1N87A
CR401—93B5-6
CR501—93B12-1
CR801—IN82A
Q801—S5327E
VHF RF AMP.
V701
V702
IN VHF-UHF SETS.
VHF OSC. & MIXER
TO PIN 8 OF V304
VHF RF AMP
V901
V902
L930
IN VHF SETS
VHF OSC. & MIXER
PICTURE TUBE V304
WIDE PIN OF POLARIZED PLUG
117V AC
C501 .1MF
L503
S501 ON-OFF-SW
1ST IF
V301
L312
2ND IF
V302
CR301 VIDEO DET.
L311
V201
SOUND DET. & SOUND OUTPUT
CR401 HORIZ PHASE DET.
HORIZ. OSC.
V403
V401
AGC, SYNC. SEP.
V402
VERT OSC. & VERT. OUTPUT
V405
HV RECT. IN HV COMPT.
R501 21Ω
V303
VIDEO AMP & SOUND IF.
V404
HORIZ. OUTPUT & DAMPER
Tube Locations and Heater String
TO SIMPLIFY HEATER STRING DIAGRAM, TUBE SOCKET PIN NUMBERS ARE NOT SHOWN IN ACTUAL LOCATIONS.

Emerson

MODEL AND CHASSIS CROSS-REFERENCE CHART

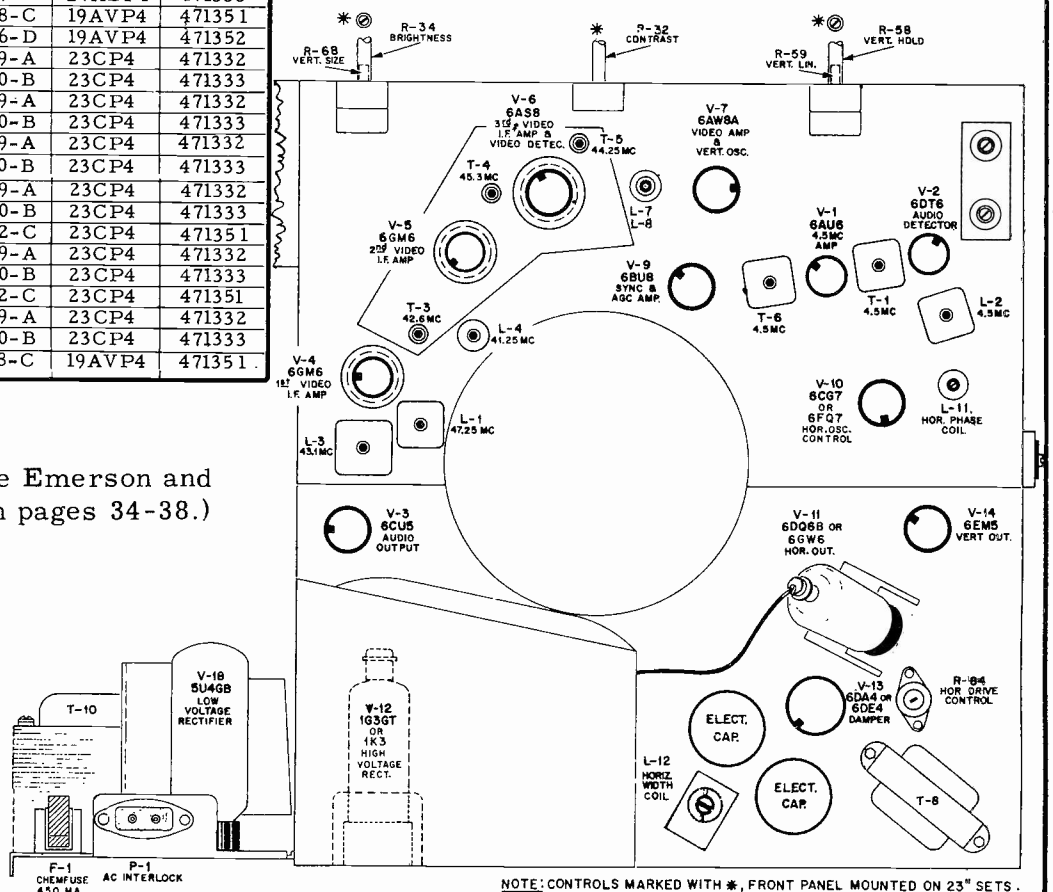
MODEL NO.	CABINET STYLE	CHASSIS NO.	CRT	VHF TUNER
T-1800B	Portable	120625-C	19AVP4	471351
T-1800G	Portable	120625-C	19AVP4	471351
T-1805G	Portable	120628-C	19AVP4	471351
U-1806A	Portable	120622-A	19AVP4	471338
T-1809	Console	120619A	23CP4	471332
U-1809	Console	120620-B	23CP4	471333
T-1814	Console	120619-A	23CP4	471332
U-1814	Console	120620-B	23CP4	471333
T-1816	Low Boy	120619-A	23CP4	471332
U-1816	Low Boy	120620-B	23CP4	471333
T-1817B	Portable	120628-C	17DKP4	471351
R-1819	Portable	120624-A	19AVP4	471338
T-1820B	Portable	120628-C	17DKP4	471351
U-1820B	Portable	120626-D	17DKP4	471352
T-1822	Console	120619-A	23CP4	471332
U-1822	Console	120620-B	23CP4	471333
T-1823	Low Boy	120619-A	23CP4	471332
U-1823	Low Boy	120620-B	23CP4	471333
T-1824	Console	120619-A	23CP4	471332
U-1824	Console	120620-B	23CP4	471333
T-1825	Portable	120628-C	19AVP4	471351
U-1825	Portable	120626-D	19AVP4	471352
T-1826	Portable	120625-C	19AVP4	471351
T-1827	Low Boy	120658-A	27ADP4	471332
U-1827	Low Boy	120659-B	27ADP4	471333
T-1828	Portable	120628-C	19AVP4	471351
U-1828	Portable	120626-D	19AVP4	471352
T-1829	Low Boy	120619-A	23CP4	471332
U-1829	Low Boy	120620-B	23CP4	471333
T-1830	Low Boy	120619-A	23CP4	471332
U-1830	Low Boy	120620-B	23CP4	471333
T-1831	Low Boy	120619-A	23CP4	471332
U-1831	Low Boy	120620-B	23CP4	471333
T-1832	Low Boy	120619-A	23CP4	471332
U-1832	Low Boy	120620-B	23CP4	471333
T-1833	T. M.	120662-C	23CP4	471351
T-1834	T. M.	120619-A	23CP4	471332
U-1834	T. M.	120620-B	23CP4	471333
T-1835	Console	120662-C	23CP4	471351
T-1836	Console	120619-A	23CP4	471332
U-1836	Console	120620-B	23CP4	471333
T-1837	T. M.	120628-C	19AVP4	471351

(Material on these Emerson and DuMont sets is on pages 34-38.)

DUMONT

MODEL NO.	CABINET STYLE	CHASSIS NO.	C.R.T.
B-148A	PORTABLE	120622-A	19AVP4
B-149A		120623-B	
B-158A		120644-A	17DKP4
B-159A		120623-B	
B-173		120644-A	19AVP4
B-174		120623-B	
B-176	CONSOLETTE	120688-A	23CP4
B-177			
B-178	CONSOLE		
B-179			

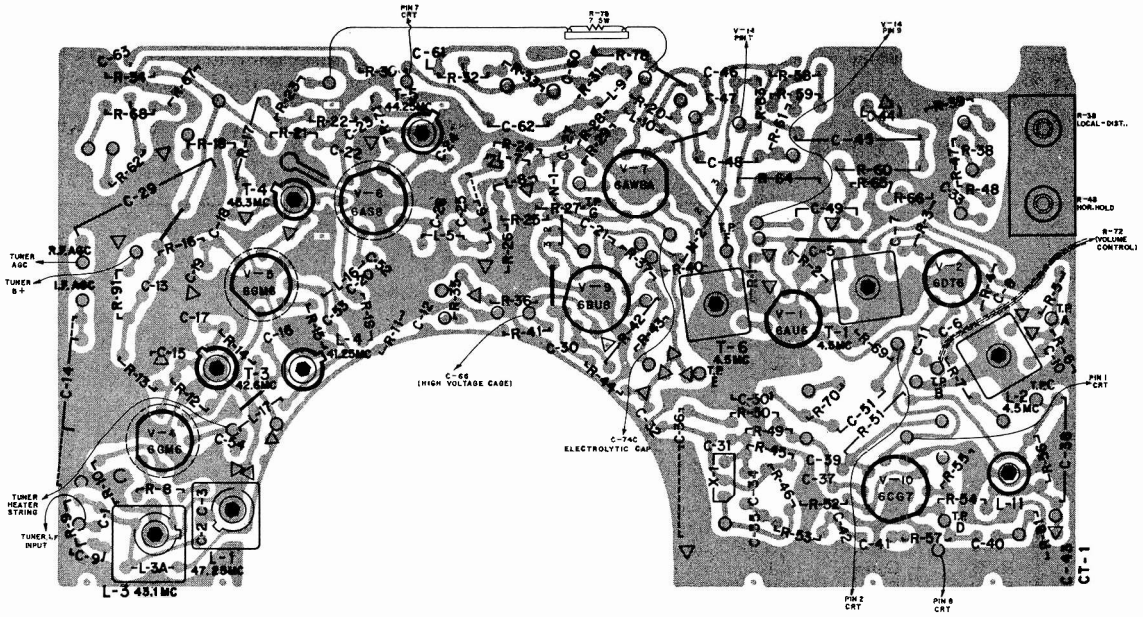
The television section of Emerson combination Models C-2003, C-2004, D-2004, C-2005, D-2005, using Chassis 120619A, 120620B, is similar to units covered.



NOTE: CONTROLS MARKED WITH ✱, FRONT PANEL MOUNTED ON 23" SETS.

TUBE LOCATION AND ALIGNMENT POINTS

EMERSON - DUMONT 120619A, 120620B, etc., Service Information, Continued



ETCHED PRINTED CIRCUIT BOARD, TOP VIEW

CONDITIONS FOR CHASSIS READINGS

VOLTAGES and WAVESHAPES were taken under actual operating conditions (normal picture and sound). AGC voltage developed at junction of C-12, C-14 and R-11 was minus six volts. Voltage and waveshape readings obtained may vary ± 10% in value due to component tolerances and strength of input signal to chassis under test. Frequencies indicated for waveshapes shown in schematic diagram are approximate sweep settings for oscilloscope used (one-half actual frequency of signal being measured).

RESISTANCE READINGS were taken with no power applied. Where readings are affected by control settings, both maximum and minimum values are given. All resistance readings may vary ±10% due to normal component tolerances.

ALL MEASUREMENTS were taken between points indicated and chassis (unless otherwise indicated), with line voltage maintained at 120 volts AC. A VTVM was used for all voltage and resistance measurements and a low capacity probe was used for all waveshapes shown.

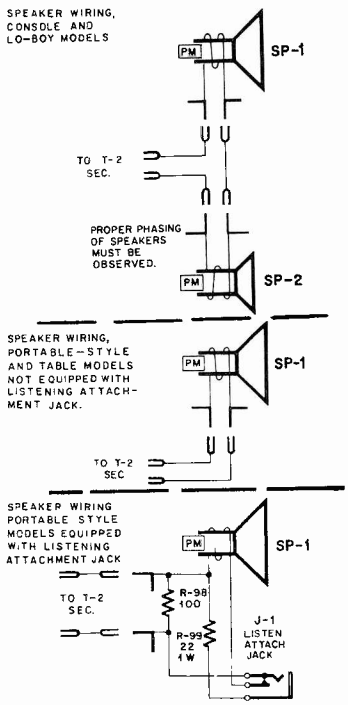
SYM.	TUBE TYPE	PIN 1	PIN 2	PIN 3	PIN 4	PIN 5	PIN 6	PIN 7	PIN 8	PIN 9
V-1	6AU6	1.2	0	0	.1	*540	*540	82	—	—
V-2	6DT6	3.4	390	0	.1	‡920K	*3.3K	560K	—	—
V-3	6CU5	140K	1.2M	.1	0	N.C.	‡470	‡630	—	—
V-4	6GM6	68K	47	0	.1	*540	*540	0	—	—
V-5	6GM6	69K	47	.1	0	‡7.5K	*540	0	—	—
V-6	6AS8	*540	0	180	.1	0	3.9K	0	0	2.2K
V-7	6AW8A	0	500K TO 2M	5.9M TO 8.4M	0	.1	15	3.9K	‡15.2K	‡4.6K
V-8	CRT	.1	22K	3.5M	0 TO 3.5M	—	—	100K TO 240K	0	—
V-9	6BU8	* 68	‡10.2K	300K	0	.1	51K	200K	75K	3.2M
V-10	6CG7 OR 6FQ7	‡50K	100K	1.2K	0	.1	‡15K	3M	1.2K	0
V-11	6DQ6B OR 6GW6	T.P.	0	T.P.	‡10K	680K	T.P.	.1	0 TO 30	—
V-12	1G3-GT	← INFINITE →								
V-13	6DE4 OR 6CQ4	N.C.	N.C.	‡380K	N.C	‡5	N.C.	.1	0	—
V-14	6EM5	‡220	T.P.	N.C.	.1	0	2.3M TO 2.8M	270	N.C.	‡310
V-15	6GK5	0	1.8M	0	.1	*1.5K	0	0	—	—
V-16	6CG8A	4.7K	*5.3K	0	0	.1	*1.4K	*280	0	210K
V-18	5U4	N.C.	40K	N.C.	20	N.C.	20	N.C.	40K	—

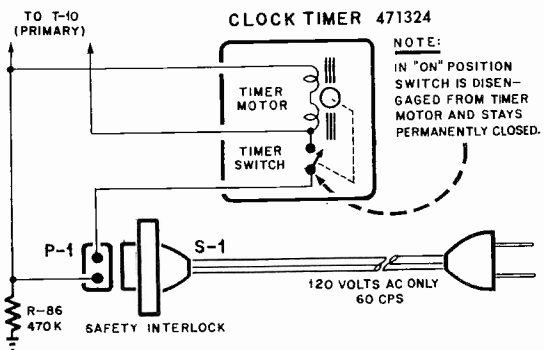
NOTES: ALL RESISTANCE READINGS ARE IN OHMS, UNLESS OTHERWISE SPECIFIED.
"K" DENOTES KILOHMS: "M" DENOTES MEGOHMS.
N. C. - DENOTES NO CONNECTION AT TERMINAL INDICATED.
T. P. - DENOTES TERMINAL INDICATED USED AS TIE POST.
* - MEASUREMENTS TAKEN WITH COMMON LEAD OF METER CONNECTED TO PIN 1 OF V-3 (6CU5).
‡ - MEASUREMENTS TAKEN WITH COMMON LEAD OF METER CONNECTED TO JUNCTION OF L-15 AND R-94 (B-PLUS 255 V).

EMERSON - DU MONT

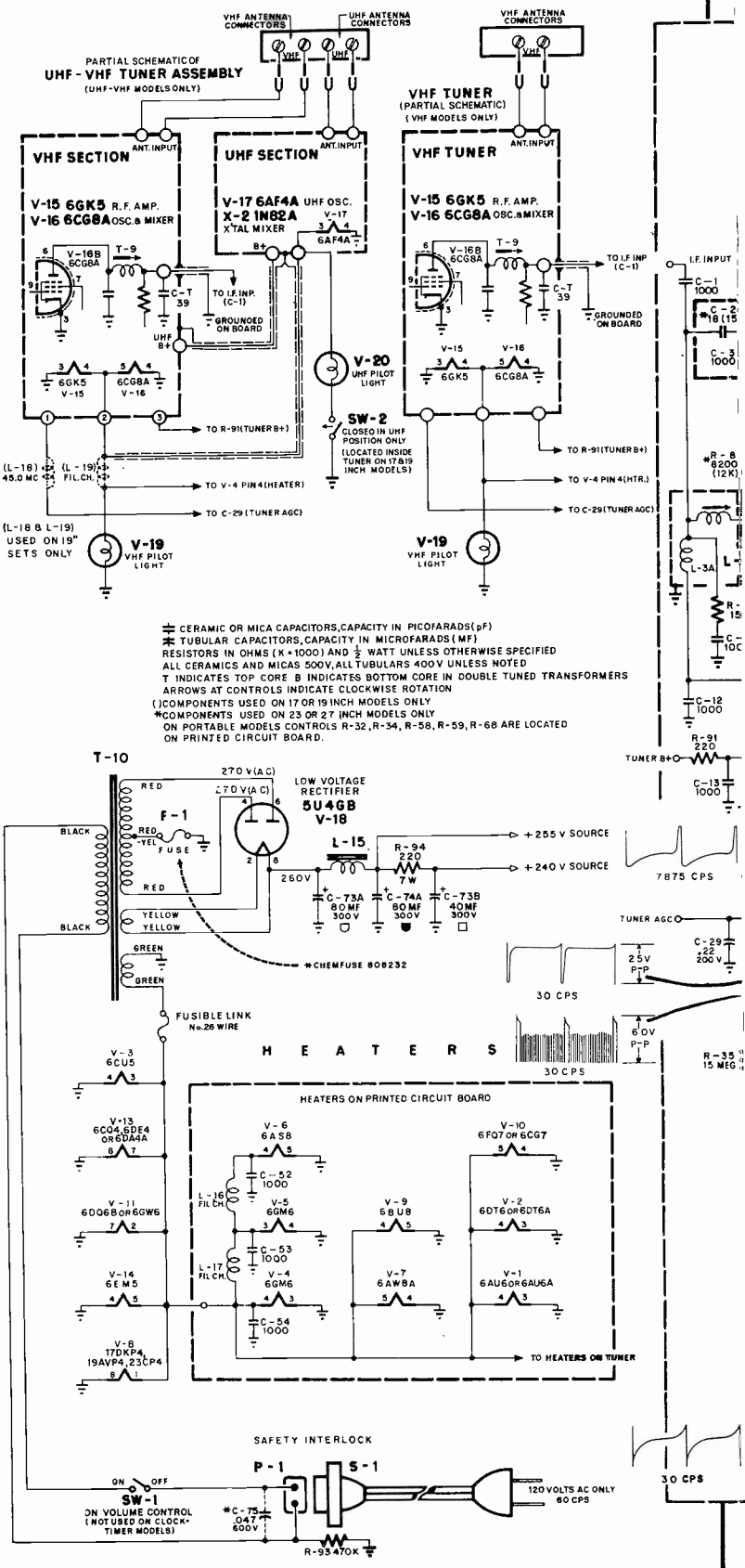
Schematic Diagram

Chassis 120619A, 120620B, 120622A, 120624A, 120625C, 120626D, 120628C, 120658A, 120659B, and 120662C.



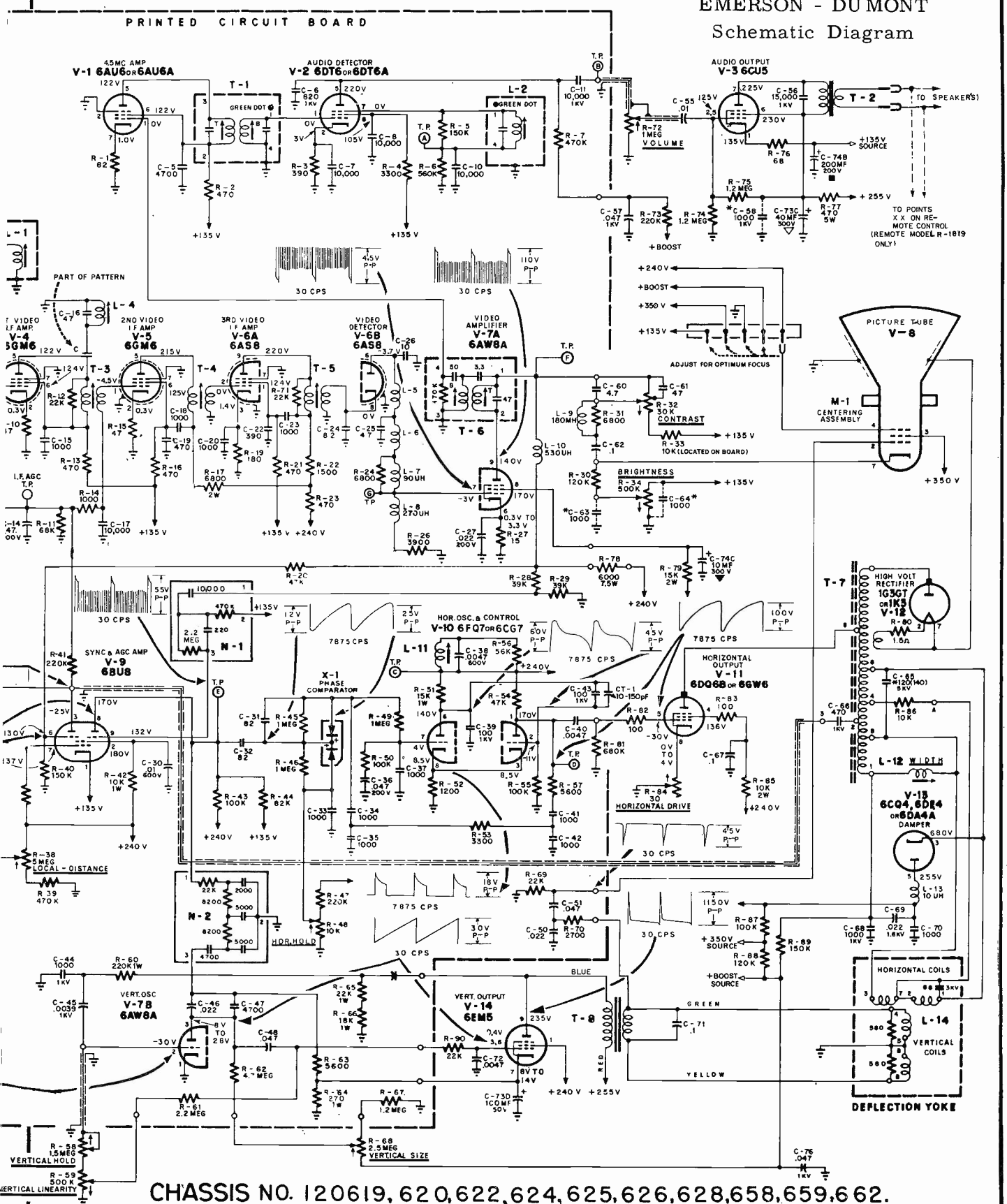


PARTIAL SCHEMATIC SHOWING WIRING CIRCUIT OF TIMER ASSEMBLY USED IN MODELS T-1800B, T-1800G, T-1806A, AND T-1826



EMERSON - DUMONT

Schematic Diagram



CHASSIS NO. 120619, 620, 622, 624, 625, 626, 628, 658, 659, 662.

EMERSON - DUMONT 120619A, 120620B, etc., Service Information, Continued

TV CHASSIS ALIGNMENT INFORMATION

GENERAL ALIGNMENT NOTES:

A. Set tuner to highest unused channel and allow both chassis and equipment to warm up for ten minutes or more.

B. Connect -3 volts bias through a 10K resistor to the AGC test point (junction of C-12, C-14 and R-11).

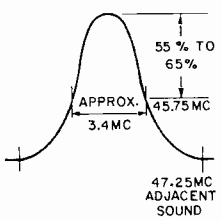
C. Maintain signal generator output no higher than necessary to produce a reading not to exceed two volts on VTVM and use insulated alignment tools for adjusting.

D. Video IF alignment requires the use of a shim for signal injection. This can be easily constructed by pasting a thin piece of metal foil, (approx. ½ x 2") on a slightly larger piece of heavy paper. Insert this shim between the tuner mixer tube and its shield in such a manner that the foil side faces the tube.

VIDEO IF ALIGNMENT

1. Connect high side of signal generator to metal foil on shim, low side to chassis through a .001 mfd. capacitor.
2. Place a VTVM (-5 volt range) at video detector test point (junction of L-7 and L-8), common lead to chassis.
3. Peak the following for MAXIMUM response at the frequencies specified:
   T-5 at 44.25 MC, T-4 at 45.3 MC, T-3 at 42.6 MC
4. Tune the following for MINIMUM response, increasing signal generator output as necessary:
   L-4 at 41.25 MC, L-1 at 47.25 MC, L-3 at 45.0 MC
5. Peak T-9 on tuner for MAXIMUM output at 45.0 MC.
6. Set generator at 43.1 MC and re-tune L-3 for MAXIMUM output.

To observe the IF response curve connect an oscilloscope, thru a 10,000 ohm isolation resistor, in place of the VTVM. Inject a sweep signal (40 to 50 MC) along with a loosely coupled marker generator at the mixer tube in the manner described above. Adjust the output of the sweep generator to produce about 2 volts peak to peak curve on the oscilloscope and reduce the marker signal so as not to upset the response curve. The 45.75 MC marker should appear between 55% and 65% down with respect to the peak.



OVERALL I.F. RESPONSE CURVE

SOUND IF ALIGNMENT

1. Using a strong T.V. transmitted signal, adjust T-6, sound take-off transformer, bottom, and T-1, sound interstage transformer, top and bottom, for the loudest sound.
2. Adjust L-2, quadrature coil, for clearest and loudest sound. If two peaks are encountered, use the position where the slug is closer to the circuit board.
3. With the antenna loosely coupled to the set, (simulating a weak signal) repeat step No. 1, tuning for maximum volume and minimum distortion.
4. If a VTVM is available, measure the voltage across R-6, 560K resistor. Voltages should be between -3 and -10 volts and not vary by more than 3 volts between a strong and weak signal.
5. Check sound on all channels and repeat entire procedure if necessary.

4.5 MC VIDEO TRAP ALIGNMENT

1. Tune in a local station and adjust the fine-tuning control until a 4.5 MC beat is visible in the picture.
2. Adjust T-6 (top) for minimum 4.5 MC beat on screen.

HORIZONTAL OSCILLATOR ALIGNMENT

The horizontal oscillator can be aligned without removing the chassis from the cabinet. To accomplish this, tune the receiver to a known "good" channel, set the LOCAL-DISTANCE control (R-38) fully counterclockwise (local position), and proceed as follows:

PROCEDURE:

1. Disable sync by shorting test point (E) to chassis.
2. Place a jumper across horizontal stabilizer coil L-11.
3. Set horizontal hold control to center of range.
4. Adjust frequency range trimmer CT-1 for momentary lock-in (picture will sway from side to side due to absence of sync).
5. Remove jumper from L-11.
6. Adjust L-11 for momentary lock-in (picture will sway from side to side due to absence of sync).
7. Remove short from test point (E).

The picture should now remain in sync when changing channels. Failure to do so indicates a defect in the horizontal oscillator, phase comparator or sync circuits.

ADJUSTMENT OF LOCAL-DISTANCE CONTROL (R-38)

Before adjusting, make sure the Horizontal Oscillator has been properly adjusted (see above).

Sets are shipped out from the factory with this control set to its "distant" position (maximum clockwise). This position provides best signal-to-noise ratio (minimum snow) and should not be changed unless overload (streaking in picture, poor sync stability, high distorted contrast, etc.) is noted on the stronger channels. If overload exists, set contrast control to max. clockwise and adjust "Local-Distance" control in a counter-clockwise direction to a point just under an overload condition.

HORIZONTAL SIZE ADJUSTMENT (L-12)

The chassis described in this Service Note have been designed to provide proper horizontal sweep under the normal variations usually encountered in line voltages. Should unusually low or high line voltages be encountered, it may be necessary to re-adjust the width control (L-12) for proper horizontal sweep. Turning the control clockwise (inward) will result in increased width, while turning the control counter-clockwise (outward) will reduce the width. When adjusting the width, the Horizontal Drive control setting should also be checked, as outlined below.

HORIZONTAL DRIVE ADJUSTMENT (R-84)

The horizontal drive control, located just below the horizontal output tube, should normally be in its most clockwise position (minimum resistance in circuit). If overdrive bars (indicated by white vertical lines in the raster) appear at this setting, slowly rotate R-84 in a counterclockwise direction until the lines just disappear.

VERTICAL SIZE (R-68) AND LINEARITY (R-59) ADJUSTMENTS

Vertical size and linearity may be adjusted by inserting a fiber alignment tool into the hollow shafts of the brightness and vertical hold controls, respectively. Insert alignment tool into the hollow brightness control shaft to adjust vertical size, and into the hollow vertical hold control shaft to adjust vertical linearity.

FOCUS ADJUSTMENT

Any one of four different voltages (available at the quadruple terminal strip mounted directly below the 6CG7 tube) may be utilized as a focus potential. Remove the insulated clip-lead connector (attached to one of the terminals on this strip) and alternately try connecting it to each possible terminal, leaving it connected to the one which gives the best overall focus.

Emerson

MODEL–CHASSIS CROSS-REFERENCE CHART

MODEL No.	CHASSIS No.	CABINET STYLE	C.R.T.
T–1865	120711–F	PORTABLE	23CP4
U–1865	120707-B or D		
T–1866	120711–F	CONSOLE	
U–1866	120707-B or D		
T–1867	120711–F	LOWBOY	
U–1867	120707-B or D		
T–1870	120710–F	PORTABLE	19DKP4
U–1870	120708-B or D		
T–1872	120710–F		
U–1872	120708-B or D		
T–1875	120710–F		
U–1875	120708-B or D		
T–1876	120721–F		
T–1880	120712–A	LOWBOY	23CP4
U–1880	120717–B		
T–1881	120712–A		
U–1881	120717–B		
T–1882	120712–A		
U–1882	120717–B		

(The service material for these various Emerson and DuMont sets is on pages 39 through 43.)

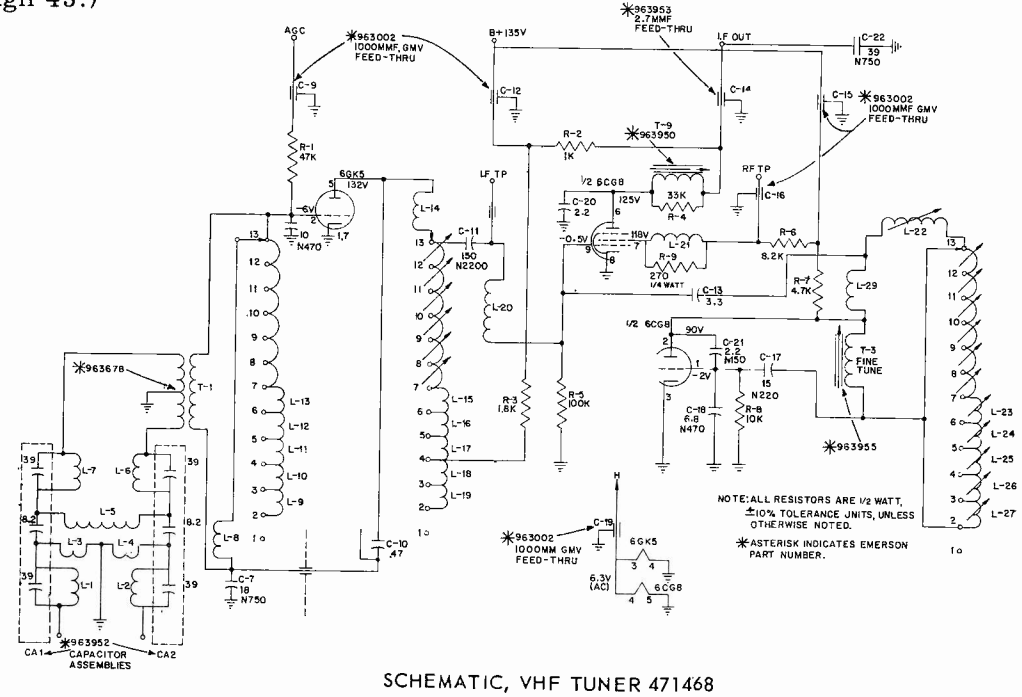
DUMONT

MODEL NO.	CABINET STYLE	CHASSIS	C.R.T.
B-148C	PORTABLE	120677-A	19AVP4
B-173C		120684-A	
B-174C		120678-B	
B-175C		120679-A	
B-176	CONSOLETTE	120689-A	23CP4
B-177			
B-178	CONSOLE		
B-179			
B-189	CONSOLETTE		

AUTOMATIC TIMER OPERATION – MODEL T–1876:
This receiver features an automatic timer unit, part number 471324, which can be set to turn the receiver off automatically after a pre-determined period of from one-half hour to three hours. For details, refer to the schematic diagram on pages and 4

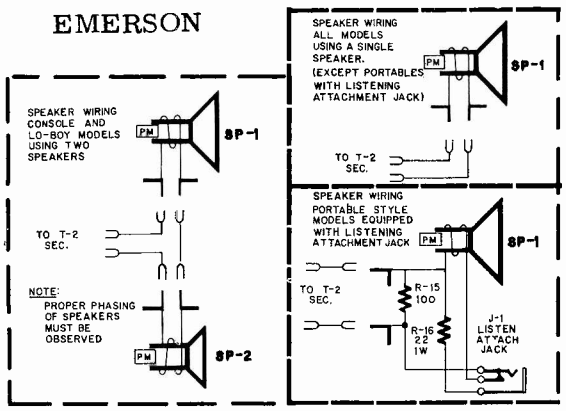
LEG ASSEMBLY KIT – MODELS T–1865 AND U–1865:
These receivers may be easily converted to consolette design by use of a special leg assembly kit, part no. 471430A (Mahogany), or part no. 471430D (Walnut).

UHF CONVERSION – MODELS USING VHF TUNER 471468:
The VHF receivers described in this Service Note which utilize VHF tuner 471468 are not adaptable to UHF reception by use of individual UHF channel strips. These receivers require the use of an external converter if UHF reception is desired.



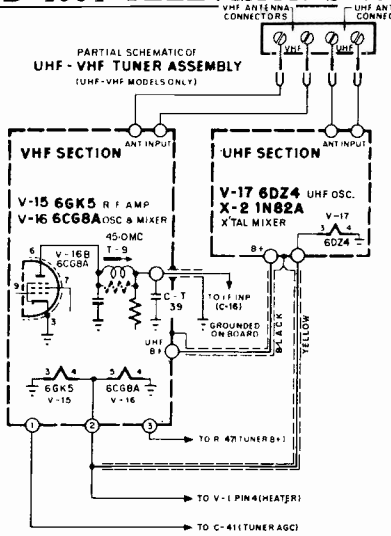
SCHEMATIC, VHF TUNER 471468

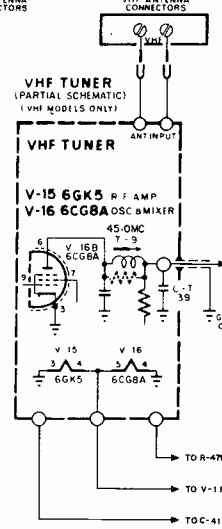
EMERSON

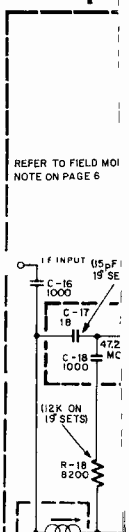


SYM.	TUBE TYPE	PIN 1	PIN 2	PIN 3	PIN 4	PIN 5	PIN 6	PIN 7	PIN 8	PIN 9
V-1	6GH8	51K	10K	✱540	.1	0	✱540	220	0	2.7M
V-2	6DT6	3.4	390	0	.1	‡920K	✱3.3K	560K	—	—
V-3	6CU5	140K	1.2M	.1	0	N.C.	‡470	‡630	—	—
V-4	6GM6	33K	47	0	.1	✱540	✱540	0	—	—
V-5	6GM6	34K	47	.1	0	✱540	✱540	0	—	—
V-6	6AS8	✱540	0	180	.1	0	4K	0	0	‡2.4K
V-7	6AW8	0	500K TO 2M	5.9M TO 8.4M	0	.1	15	4K	‡15.2 K	‡4.6K
V-8	C.R.T.	.1	22K	3.5M	0 TO 3.5M	—	—	120K TO 250K	0	—
V-9	12AZ7	30K	250K TO 1.2M	2.2K	0	0	180K	17K TO 60K	✱68	.1
V-10	6GH8	‡100K	100K	‡56K	0	.1	‡39K	120	0	1.8M
V-11	6DQ8/6GW8	T.P.	.1	T.P.	‡10.3K	450K	T.P.	0	0 TO 30	—
V-13	6CQ4/6DE4	N.C.	N.C.	‡380K	N.C.	‡5	N.C.	.1	0	—
V-14	6EM5	‡220	T.P.	N.C.	.1	0	2.3M TO 2.8M	270	N.C.	‡310
V-18	5U4	N.C.	40K	N.C.	20	N.C.	20	N.C.	40K	—

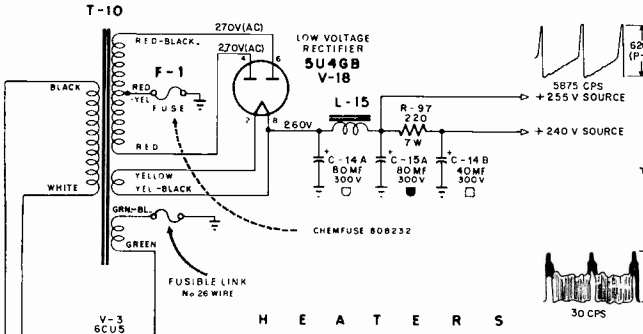
NOTES: ALL RESISTANCE READINGS ARE IN OHMS, UNLESS OTHERWISE SPECIFIED.
"K" DENOTES KILOHMS; "M" DENOTES MEGOHMS.
N.C. – DENOTES NO CONNECTION AT TERMINAL INDICATED.
T.P. – DENOTES TERMINAL INDICATED AS TIE POST.
✱ – MEASUREMENTS TAKEN WITH COMMON LEAD OF METER CONNECTED TO PIN 1 OF V-3 (6CU5).
‡ – MEASUREMENTS TAKEN WITH COMMON LEAD OF METER CONNECTED TO JUNCTION OF L-15 AND R-97 (B-PLUS 255 V).

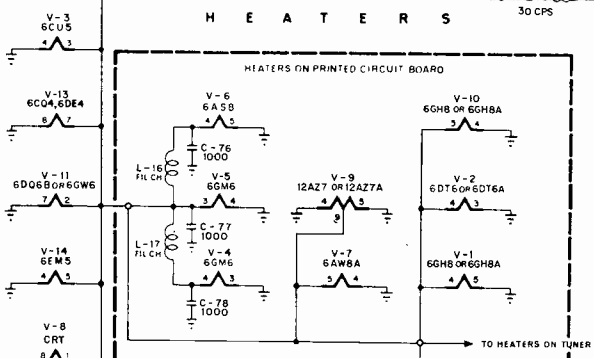


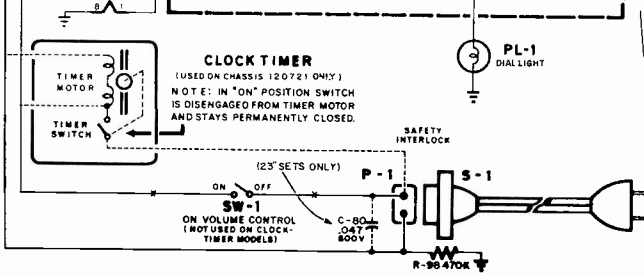




‡ CERAMIC OR MICA CAPACITORS, CAPACITY IN PICOFARADS (pF)
# TUBULAR CAPACITORS, CAPACITY IN MICROFARADS (MF)
RESISTORS IN OHMS (K = 1000) AND ½ WATT UNLESS OTHERWISE SPECIFIED
ALL CERAMICS AND MICAS 500V, ALL TUBULARS 400V UNLESS NOTED
T INDICATES TOP CORE & INDICATES BOTTOM CORE IN DOUBLE TUNED TRANSFORMERS
ARROWS AT CONTROLS INDICATE CLOCKWISE ROTATION







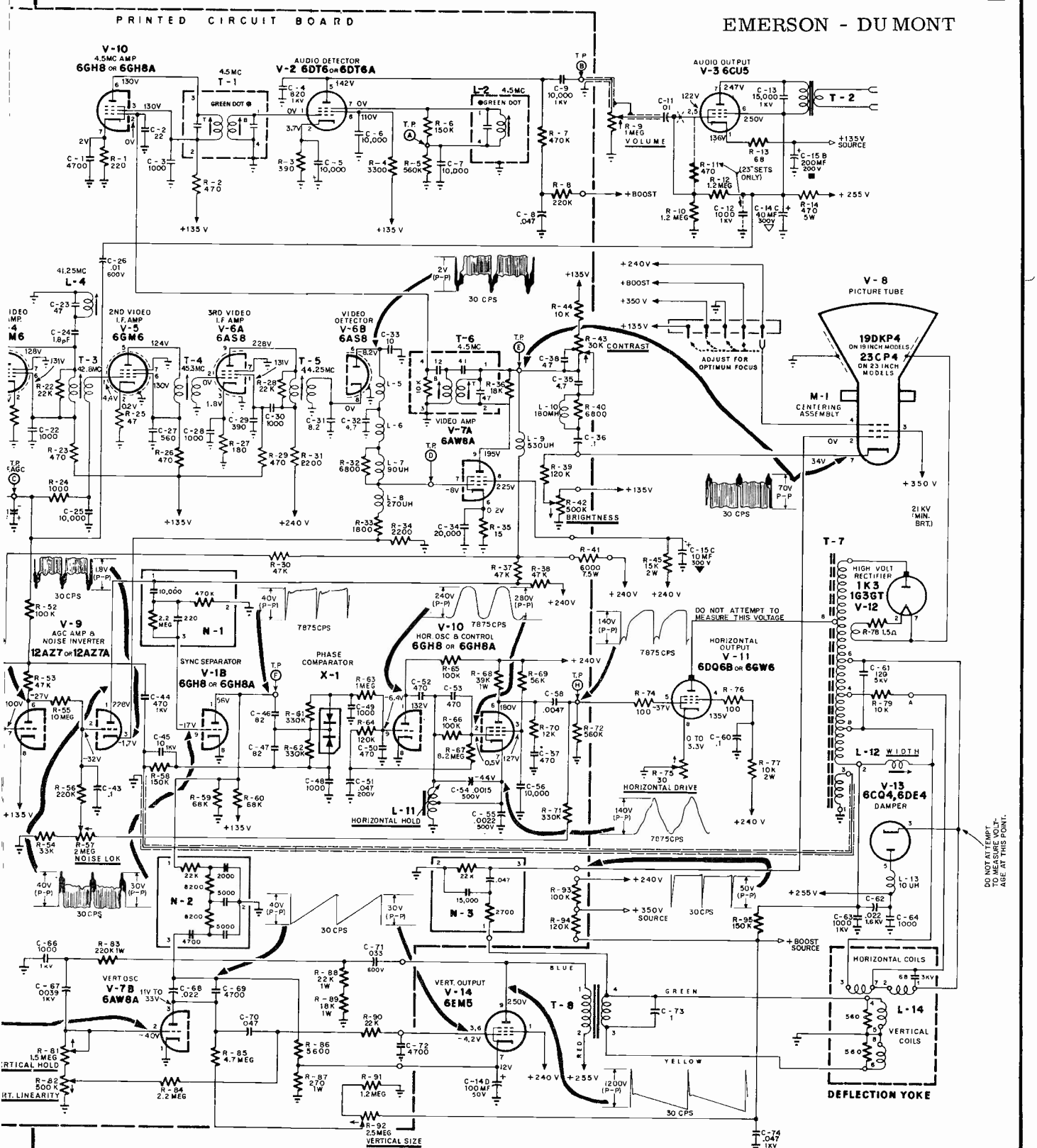
VOLTAGES and WAVESHAPES were taken under actual operating conditions (normal picture and sound). AGC voltage developed at junction of C-19, C-21 and R-20 was minus 4.6 volts. Voltage and waveshape readings obtained may vary ± 10% in value due to component tolerances and strength of input signal to chassis under test. Frequencies indicated for waveshapes shown in schematic diagram are approximate sweep settings for oscilloscope used (one-half actual frequency of signal being measured).

RESISTANCE READINGS were taken with no power applied. Where readings are affected by control settings, both maximum and minimum values are given. All resistance readings may vary ± 10% due to normal component tolerances.

ALL MEASUREMENTS were taken between points indicated and chassis (unless otherwise indicated), with line voltage maintained at 120 volts AC. A VTVM was used for all voltage and resistance measurements and a low capacity probe was used for all waveshapes shown.

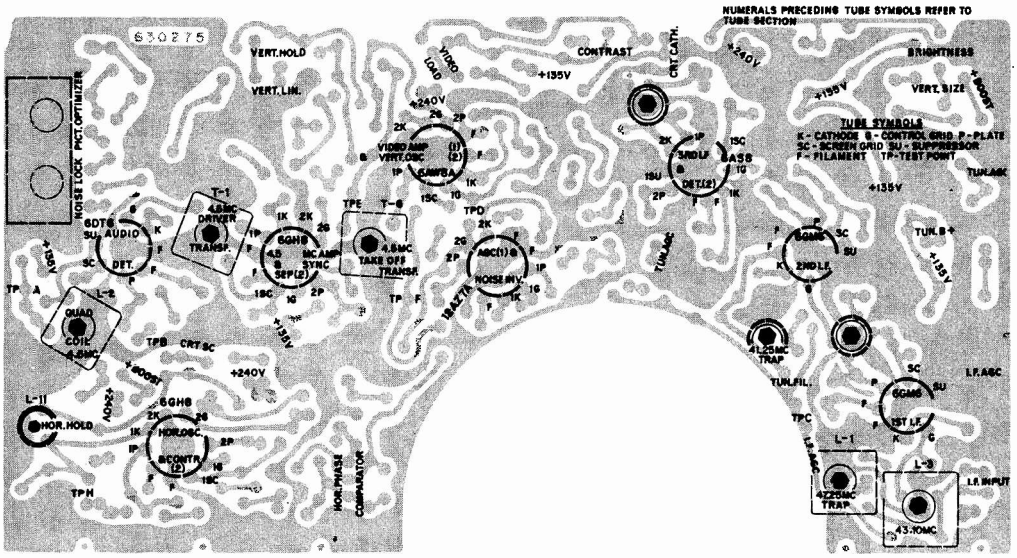
PRINTED CIRCUIT BOARD

EMERSON - DU MONT

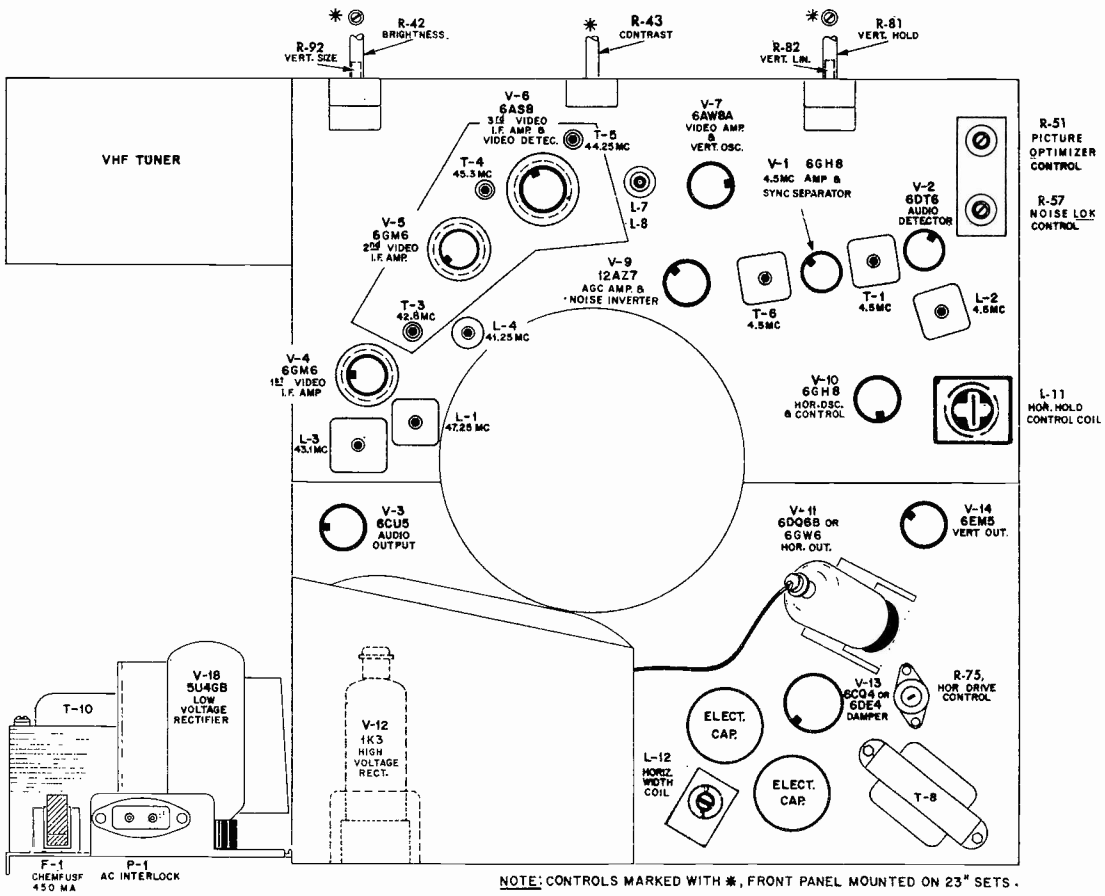


EMERSON CHASSIS No.120707, 708, 710, 711, 712, 717, 721.

EMERSON - DUMONT 120707B, 120708B, etc., Service Information, Continued



ETCHED PRINTED CIRCUIT BOARD (BOTTOM VIEW).



NOTE: CONTROLS MARKED WITH *, FRONT PANEL MOUNTED ON 23" SETS.

TUBE LOCATION AND ALIGNMENT POINTS

EMERSON - DUMONT 120707B, 120708B, etc., Service Information, Continued

TV CHASSIS ALIGNMENT INFORMATION

GENERAL ALIGNMENT NOTES:

A. Set tuner to highest unused channel and allow both chassis and equipment to warm up for ten minutes or more.

B. Connect -3 volts bias through a 10K resistor to the AGC test point (junction of C-19 C-21 and R-20).

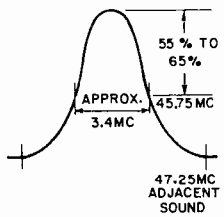
C. Maintain signal generator output no higher than necessary to produce a reading not to exceed two volts on VTVM and use insulated alignment tools for adjusting.

D. Video IF alignment requires the use of a shim for signal injection. This can be easily constructed by pasting a thin piece of metal foil, (approx. ½ x 2") on a slightly larger piece of heavy paper. Insert this shim between the tuner mixer tube and its shield in such a manner that the foil side faces the tube.

VIDEO IF ALIGNMENT

1. Connect high side of signal generator to metal foil on shim, low side to chassis through a .001 mfd. capacitor.
2. Place a VTVM (-5 volt range) at video detector test point (junction of L-7 and L-8), common lead to chassis.
3. Peak the following for MAXIMUM response at the frequencies specified:
   T-5 at 44.25 MC, T-4 at 45.3 MC, T-3 at 42.8 MC
4. Tune the following for MINIMUM response, increasing signal generator output as necessary:
   L-4 at 41.25 MC, L-1 at 47.25 MC, L-3 at 45.0 MC
5. Peak T-9 on tuner for MAXIMUM output at 45.0 MC.
6. Set generator at 43.1 MC and re-tune L-3 for MAXIMUM output.

To observe the IF response curve connect an oscilloscope, thru a 10,000 ohm isolation resistor, in place of the VTVM. Inject a sweep signal (40 to 50 MC) along with a loosely coupled marker generator at the mixer tube in the manner described above. Adjust the output of the sweep generator to produce about 2 volts peak to peak curve on the oscilloscope and reduce the marker signal so as not to upset the response curve. The 45.75 MC marker should appear between 55% and 65% down with respect to the peak.



OVERALL I.F. RESPONSE CURVE

SOUND IF ALIGNMENT

1. Using a strong T.V. transmitted signal, adjust T-6, sound take-off transformer, bottom, and T-1, sound interstage transformer, top and bottom, for the loudest sound.
2. Adjust L-2, quadrature coil, for clearest and loudest sound. If two peaks are encountered, use the position where the slug is closer to the circuit board.
3. With the antenna loosely coupled to the set, (simulating a weak signal) repeat step No. 1, tuning for maximum volume and minimum distortion.
4. If a VTVM is available, measure the voltage across R-5, 560K resistor. Voltages should be between -3 and -10 volts and not vary by more than 3 volts between a strong and weak signal.
5. Check sound on all channels and repeat entire procedure if necessary.

4.5 MC VIDEO TRAP ALIGNMENT

1. Tune in a local station and adjust the fine-tuning control until a 4.5 MC beat is visible in the picture.
2. Adjust T-6 (top) for minimum 4.5 MC beat on screen.

HORIZONTAL SIZE ADJUSTMENT

The chassis described in this Service Note have been designed to provide proper horizontal sweep under the normal variations usually encountered in line voltages. Should unusually low or high line voltages be encountered, it may be necessary to re-adjust the width control (L-12) for proper horizontal sweep. Turning the control clockwise (inward) will result in increased width, while turning the control counter-clockwise (outward) will reduce the width. When adjusting the width, the Horizontal Drive control setting should also be checked, as outlined below.

HORIZONTAL DRIVE ADJUSTMENT

The horizontal drive control, located just below the horizontal output tube, should normally be in its most clockwise position (minimum resistance in circuit). If overdrive bars (indicated by white vertical lines in the raster) appear at this setting, slowly rotate R-75 in a counterclockwise direction until the lines just disappear.

VERTICAL SIZE AND LINEARITY ADJUSTMENTS

Vertical size and linearity may be adjusted by inserting a fiber alignment tool into the hollow shafts of the brightness and vertical hold controls, respectively. Insert alignment tool into the hollow brightness control shaft to adjust vertical size, and into the hollow vertical hold control shaft to adjust vertical linearity.

FOCUS ADJUSTMENT

Any one of four different voltages (available at the quadruple terminal strip mounted directly below the 6CG7 tube) may be utilized as a focus potential. Remove the insulated clip-lead connector (attached to one of the terminals on this strip) and alternately try connecting it to each possible terminal, leaving it connected to the one which gives the best overall focus.

PICTURE OPTIMIZER AND NOISE-LOK ADJUSTMENTS

1. Rotate the Picture Optimizer and Noise Lok controls fully counterclockwise (as viewed from rear of cabinet).

2. Tune to the strongest channel and rotate the Picture Optimizer slowly clockwise until the receiver begins to overload (sync instability, sound buzz, kinks in picture), then back off slightly counterclockwise to eliminate overload, continuing an additional approximate ten degrees beyond this point to assure a proper safety factor. If the receiver does not overload when the control has been rotated fully, leave it in this position.

3. With the receiver still tuned to strongest channel, rotate the Noise Lok control slowly clockwise until the picture begins to overload (sync instability, sound buzz, kinks in picture), then back off slightly to eliminate this condition. With controls properly set, switch channels to verify setting for strongest signals. This optimizes operation of the Noise Lok for mixed signal conditions (strong and weak). However, in extreme fringe areas it is possible to improve the picture stability by further clockwise adjustment of the control.

FIELD MODIFICATION NOTE

All chassis described in this Service Note are equipped with an I-F input coil which has been designed to allow for the addition of a second adjacent channel sound trap without removing the chassis from the cabinet. This input coil, which is housed in a two-piece shield can with removable top, has been wound around a coil form which extends beyond the windings sufficiently to allow the added adjacent channel sound trap (part no. 720396) to be cemented in place around it. An additional tuning slug (part no. 404052) is then inserted into the open end of the coil form and tuned for minimum adjacent channel sound interference, and the removable metal top section of the coil shield replaced. Parts necessary for this modification may be ordered from DuMont distributors in such areas where the need for these items may exist.

GENERAL ELECTRIC

CHASSIS MY, list of Models below, service material on pages 44-50

SAM604YBN	SAM605YGL	R608YBG	M616YVY
SAM604YGL	SBM605YBG	R608YVY	M616YWD
SBM604YBG	SBM605YGN	M609YBG	M617YCL
SBM604YGN	M608YBG	M609YVY	M617YVY
SAM605YBN	M608YVY	M616YCL	M617YWD

SPECIFICATIONS

POWER INPUT RATING:	Frequency . . . . . 60 cycles Voltage . . . . . 110–128 volts Wattage (at 120 volts) . . . . . 185 watts
R-F FREQUENCY:	Channels . . . . . No. 2 through No. 13 Frequencies . . . . 54–88MC, 174–216MC For receivers with UHF tuners . . . . . UHF Channels 14 through 83 Frequencies 470–890MC
OPERATIONAL FREQUENCIES:	Picture I-F Carrier . . . . . 45.75MC Sound I-F Carrier . . . . . 41.25MC Intercarrier Sound Takeoff 4.5MC
AUDIO POWER OUTPUT:	Undistorted . . . . . 1.5 watts Maximum . . . . . 2 watts
LOUDSPEAKER:	3.2-Ohm PM (Single-Speaker Models)
ANTENNA INPUT:	VHF: Telescoping Monopole or Dipole External Antenna Terminals Impedance: 300 ohms balanced to ground UHF: Loop on UHF/VHF receivers
FUSES:	F401 (Plate Supply): 2 amp. Fast-Blo F402 (Filament): #26-Gauge Wire Link

FOCUS

The proper focus potential was determined at the time the receiver was manufactured, but subsequent changes in a given receiver may make a change of focus potential necessary to optimize focus. The proper potential is selected by connecting the jumper lead (including R184) from the picture tube socket either to chassis ground or the +278V or B+ boost terminals on the sweep circuit board.

PICTURE CENTERING

The picture centering device consists of two rings located on the yoke assembly. Each ring has tabs with punched holes through which insulated alignment tools may be inserted to provide easy rotation. The tabs should be moved toward or away from each other until the picture is properly centered on the tube face.

WIDTH

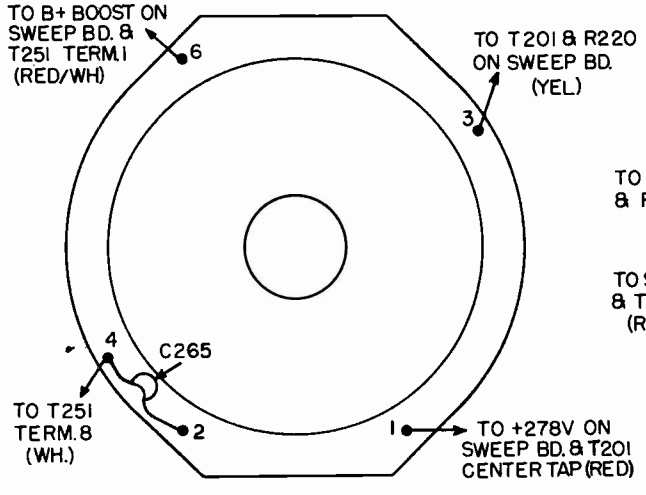
This control, projecting from the rear of the cabinet near the top, should be rotated to correct improper picture width. Clockwise rotation decreases width; counterclockwise rotation increases it.

HEIGHT AND VERTICAL LINEARITY

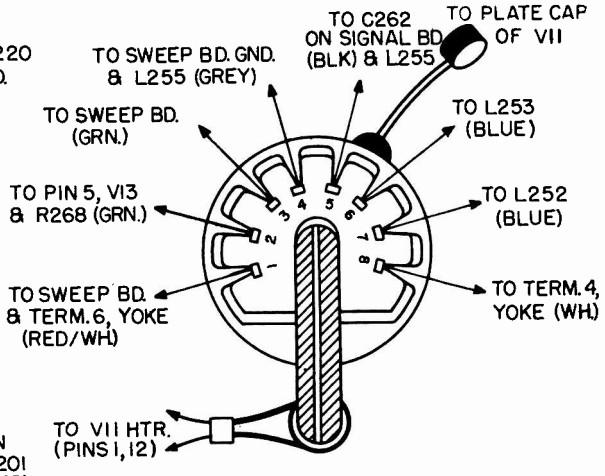
These controls should be adjusted simultaneously to give proper vertical size consistent with good vertical linearity. Adjustment should then be made to extend the picture limits approximately 1/8 inch beyond the top and bottom edges of the mask.

HORIZONTAL HOLD

1. Remove the cabinet back and supply 120VAC at the interlock.
2. Tune in a strong signal and adjust the receiver for normal operation.
3. Using a jumper wire, short Test Point VI to chassis.
4. Connect a 1000-ohm resistor between Test Points VIII and IX.
5. Adjust the horizontal hold control until the picture just "floats" back and forth across the screen.
6. Remove the resistor and adjust the core of the stabilizer coil (L251) inward until the picture again floats across the screen. Then remove the jumper at Test Point VI. Repeat the procedure if the picture does not "lock."



YOKE WIRING

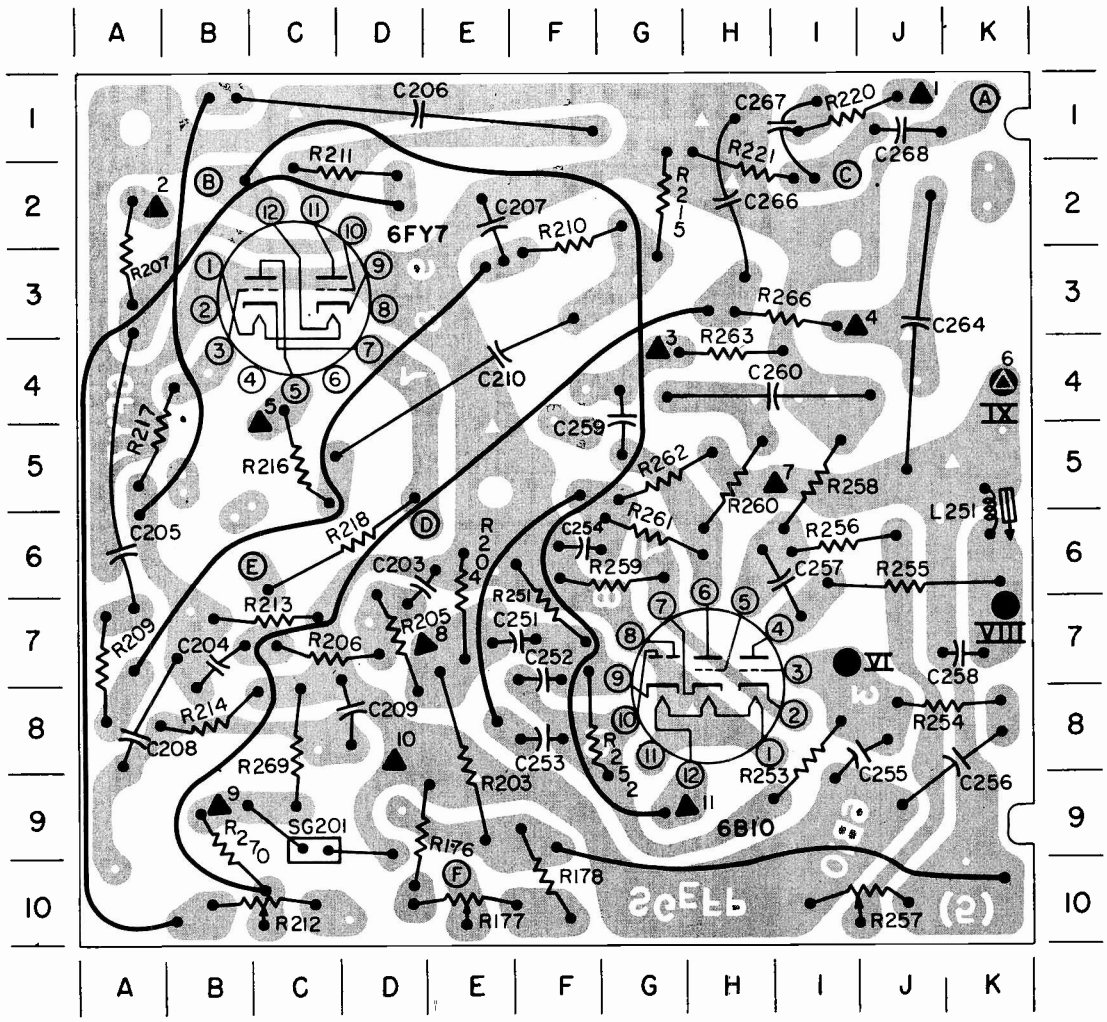


T251 WIRING

GENERAL ELECTRIC Chassis MY, Service Information, Continued

SWEEP BOARD

AS VIEWED FROM COMPONENT SIDE OF BOARD



NUMBERED (▲-O) TRIANGLES

REPRESENT WIREWRAP TERMINALS ON COMPONENT BOARD FOR CONNECTION TO THE POINTS INDICATED.

- ▲ 1 YELLOW LEADS TO YOKE (TERMINAL 3) & T201
- ▲ 2 GREY LEAD TO R208
- ▲ 3 BLACK SHIELDED LEAD TO R264 ON PIN 3 OF V10
- ▲ 4 RED & WHITE LEADS TO TERMINAL 1, T251 & TERMINAL 6 OF YOKE
- ▲ 5 BLUE LEAD TO T201
- ▲ 6 RED LEADS TO L256 & C406A
- ▲ 7 RED LEADS TO YOKE & T201; ORANGE LEAD TO R184 TO PIN 4, V13, FOR 278V FOCUS POTENTIAL.
- ▲ 8 GREEN LEAD TO Ⓓ ON SIGNAL BOARD
- ▲ 9 RED & GREEN LEAD TO PIN 3 OF PICTURE TUBE
- ▲ 10 BLACK LEAD TWISTED WITH LEAD FROM ▲ 9 (NO CONNECTION PICTURE TUBE END)
- ▲ 11 BROWN LEAD TO PIN 12 OF V10

CIRCLED Ⓐ LETTERS

REPRESENT INTERCONNECTING WIRES SOLDERED INTO BOARD

- Ⓐ GREY LEAD TO TERMINAL 4, T 251
- Ⓑ BROWN LEAD TO ▲ 13 ON SIGNAL BOARD
- Ⓒ GREEN LEAD TO T251 TERMINAL 3
- Ⓓ YELLOW LEAD TO C404B
- Ⓔ YELLOW LEAD TO R219 (HEIGHT CONTROL)
- Ⓕ YELLOW LEAD TO ▲ 14 ON SIGNAL BOARD

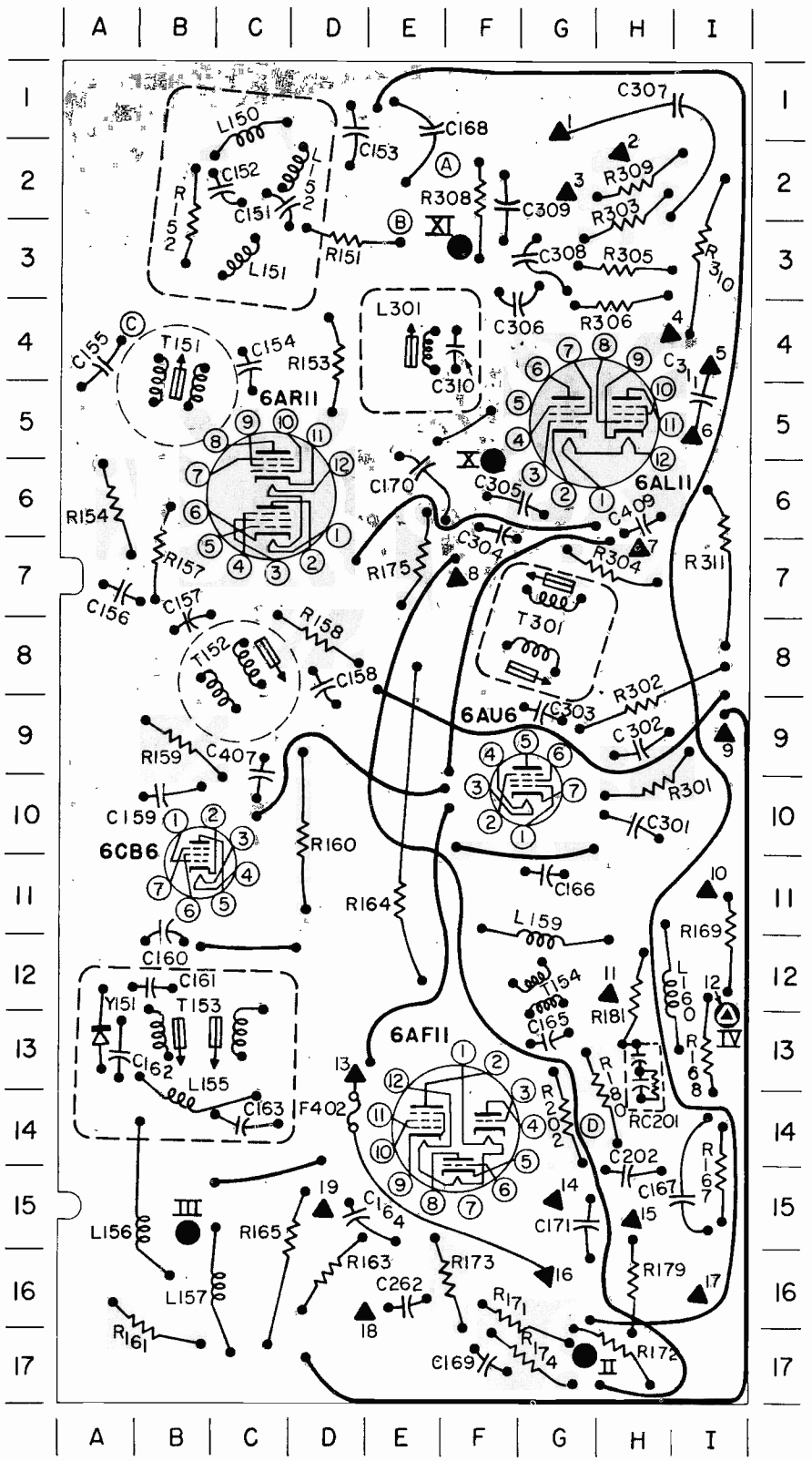
ROMAN (XI) NUMERALS

INDICATE TEST POINTS

GENERAL ELECTRIC Chassis MY, Service Information, Continued

IF BOARD

AS VIEWED FROM COMPONENT SIDE OF BOARD



LOCATIONS BY COORDINATES

WIRE CONNECTIONS

A–E2
B–E3
C–A4
D–G14
1–G1
2–H2
3–G2
4–H4
5–I4
6–I5
7–H7
8–F7
9–I9
10–I11
11–H12
12–I12
13–D13
14–G15
15–H15
16–G16
17–I16
18–E16
19–D15

RESISTORS

R151–D3
R152–B3
R153–D4
R154–A6
R157–B7
R158–D8
R159–B9
R160–D10
R161–B17
R163–D16
R164–E11
R165–D15
R167–I15
R168–I13
R169–I11
R171–F16
R172–H17
R173–F16
R174–G17
R175–E7
R179–H16
R180–G13
R181–H12
R202–G14
R301–H10
R302–H9
R303–H2
R304–H7
R305–H3
R306–H4
R308–F2
R309–H2
R310–I3
R311–I6

TUBES

6AF11–F14
6AL11–G5
6AR11–C6
6CB6–B11
6AU6–F10

TEST POINTS

II–G17
III–B15
IV–I12
X–F6
XI–F3

CAPACITORS

C151–C2
C152–C2
C153–D1
C154–C4
C155–A4
C156–A7
C157–B8
C158–D8
C159–B10
C160–B11
C161–B12
C162–A13
C163–C14
C164–D15
C165–G13
C166–G11
C167–I15
C168–E1
C169–F17
C170–E6
C171–G15
C202–H15
C262–E16
C301–H10
C302–H9
C303–G9
C304–F6
C305–G6
C306–F4
C307–I1
C308–G3
C309–F2
C310–F4
C311–I5
C407–C10
C409–H6

COILS & TRANSFORMERS

L150–C1
L151–C3
L152–D2
L155–B14
L156–B15
L157–C16
L159–G12
L160–I12
L301–E4
T151–B4
T152–C8
T153–B13
T154–G12
T301–G8

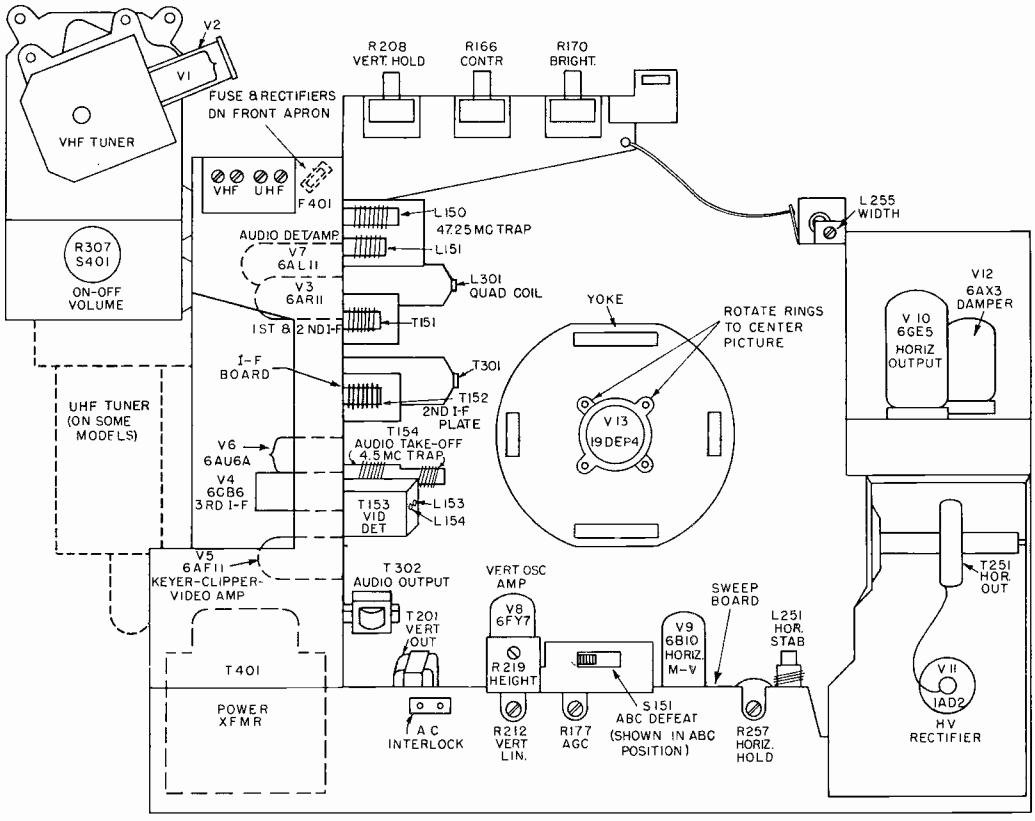
R-C NETWORK

RC201–H13

DIODE

Y151–A13

GENERAL ELECTRIC Chassis MY, Service Information, Continued



TUBE & ADJUSTMENT LOCATIONS

TRIANGLE (▲) NUMBERS

REPRESENT WIREWRAP TERMINALS ON COMPONENT BOARD FOR CONNECTION TO POINTS INDICATED

1. ▲ YELLOW LEAD (AUDIO CABLE) TO R307 VOLUME
2. ▲ BRAIDED SHIELD (AUDIO CABLE)
3. ▲ GREEN LEAD (AUDIO CABLE) R307 VOLUME (CENTER)
4. ▲ GRAY LEAD TO C406D
5. ▲ RED & BLACK LEAD C406B
6. ▲ BLUE LEAD TO T302
7. ▲ BROWN LEAD TO TUNER FILAMENTS
8. ▲ WHITE LEAD TO TUNER AGC
9. ▲ RED LEADS TO R156 & R170 (B+ 278V)
10. ▲ BLUE LEAD TO R170 (BRIGHTNESS CONTROL)
11. ▲ ORANGE & WHITE LEAD TO R166 (CONTRAST)
12. ▲ YELLOW LEAD TO L161 (ON PIX. TUBE SKT.)
13. ▲ BROWN LEAD TO Ⓑ ON SWEEP BD.
14. ▲ YELLOW LEAD TO Ⓕ ON SWEEP BD.
15. ▲ GREY LEAD TO R182 ON S151
16. ▲ GREEN LEAD TO T401
17. ▲ GREEN LEAD TO R166 CONTRAST (CENTER)
18. ▲ BLACK LEAD TO T251 TERMINAL 5
19. ▲ ORANGE & BLACK LEAD TO C406C

CIRCLED Ⓒ LETTERS

REPRESENT INTERCONNECTING WIRES SOLDERED INTO BOARD

Ⓐ BRAIDED SHIELD (LINK CABLE)
Ⓑ WHITE LEAD (LINK CABLE) TO TUNER
Ⓒ ORANGE LEAD TO R155 & R156 ON TERMINAL BD.
Ⓓ GREEN LEAD TO ▲-8 ON SWEEP BOARD

ROMAN (XI) NUMERALS

INDICATE TEST POINTS

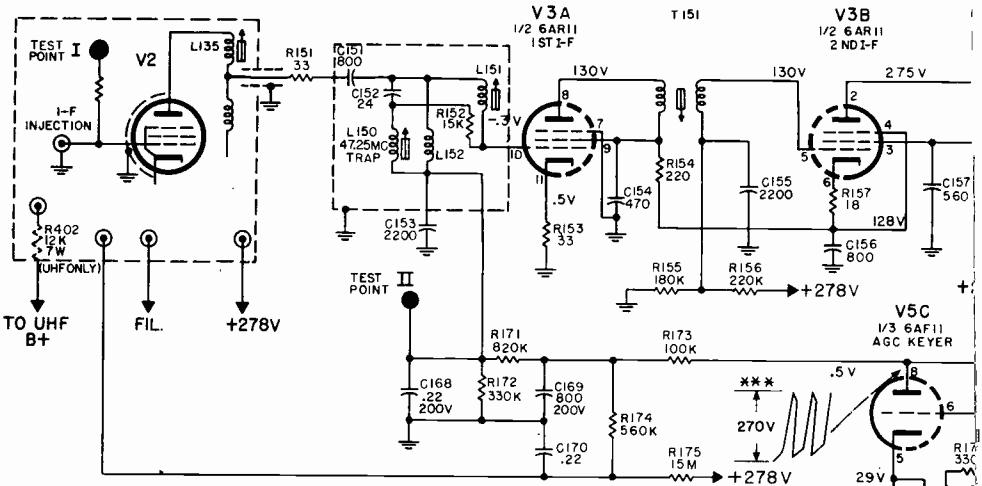
GENERAL ELECTRIC Chassis MY Schematic Diagram, Continued

AGC CONTROL

Field Adjustment: Tune in the strongest available signal and adjust R177 to the point where overloading is indicated by "tearing" of the picture. Then back off the AGC control to just beyond the point where the overload condition disappears.

Instrument Adjustment:

1. Tune in a broadcast signal, preferably a monoscope signal that is monitored to assure that the percentage of sync does not exceed 25 percent.
2. Connect an oscilloscope to Test Point IV. Synchronize the scope at a vertical rate and observe at least two vertical sync pulses.
3. Adjust the fine tuning for smear and the AGC control for the point where the sync pulses begin to compress. Then back off the AGC control slightly from this point.



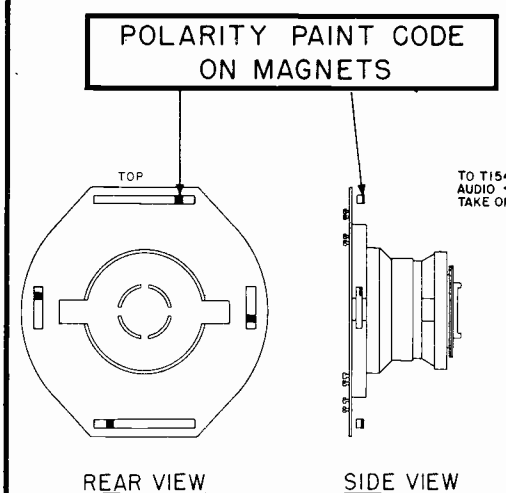
1 ALL VOLTAGE MEASUREMENTS MADE WITH A VACUUM TUBE VOLTMETER IN RESPECT TO CHASSIS GROUND WITH RECEIVER CONTROLS SET FOR NORMAL OPERATION

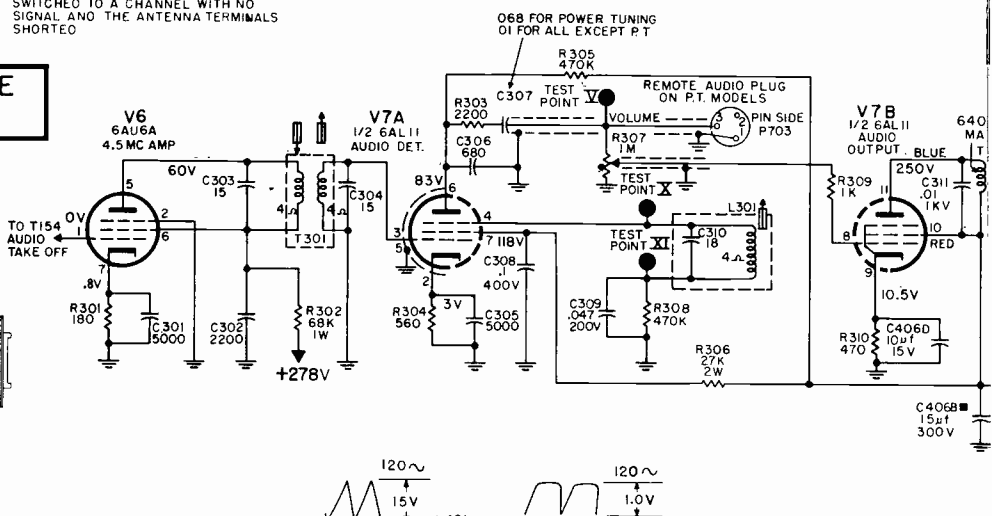
2. WITH LINE VOLTAGE MAINTAINED AT 120 VAC. MEASUREMENTS SHOWN MAY DEVIATE ±10%

3 VOLTAGES SHOWN MADE WITH THE THE SELECTOR KNOB SWITCHED TO A CHANNEL WITH NO SIGNAL AND THE ANTENNA TERMINALS SHORTED

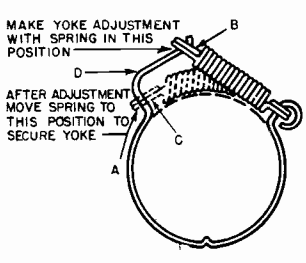
• VARIES WITH CONTROL SETTINGS

UNLESS OTHERWISE NOTED
K=1000 M=1,000,000
CAPACITORS MORE THAN 1= μμf(μμf=pf)
CAPACITORS LESS THAN 1= μf
RESISTORS ARE 1/2 WATT

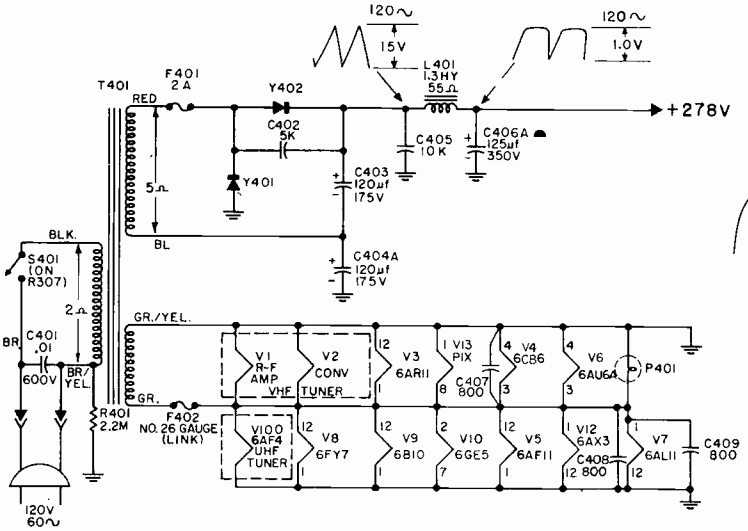


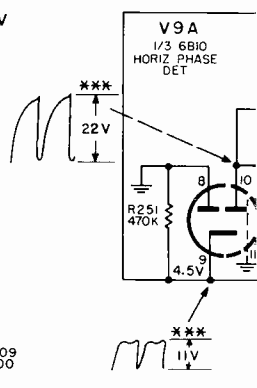


PINCUSHION MAGNET POLARITY



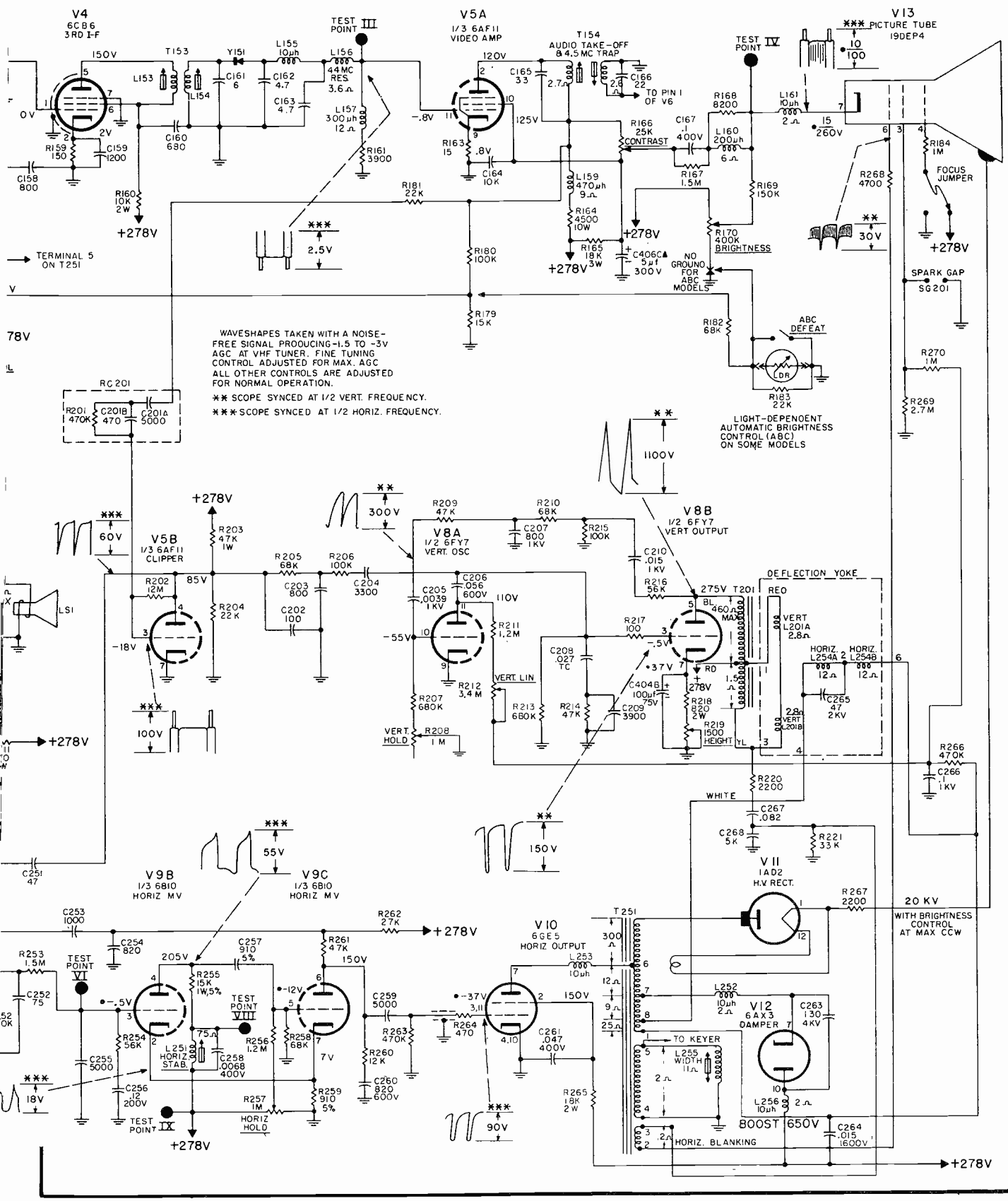
YOKE CLAMP





MY CHASSIS SCHEMATIC DIAGRAM

GENERAL ELECTRIC Chassis MY Schematic Diagram, Continued



GENERAL ELECTRIC Chassis MY Alignment Information, Continued

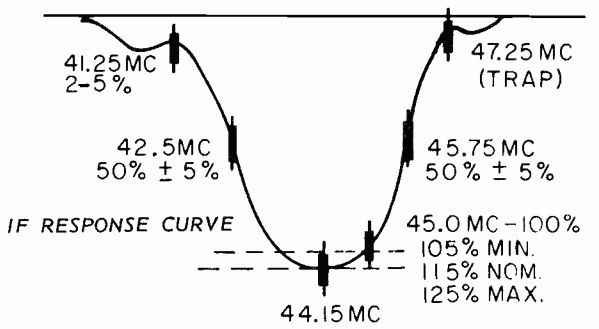
VIDEO IF SYSTEM

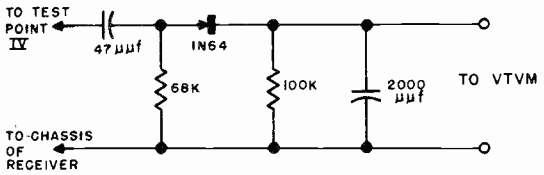
Note: Allow the receiver and test equipment at least 20 minutes to warm up. If the receiver is equipped with automatic brightness control, the ABC Defeat switch should be placed in the OFF position and left there during alignment procedure.

1. Set the channel selector to Channel 9, the fine tuning and volume to minimum positions (fully counterclockwise) and the contrast control to the clockwise extreme.
2. Short the VHF antenna terminals together and leave them shorted throughout video alignment.
3. Connect an oscilloscope to Test Point III through a 22,000-ohm resistor (which should not be more than 2-1/2 inches away from Test Point III) and short Test Point II to chassis.
4. Inject signals from a properly-terminated AM signal generator or sweep generator, through the network shown, to the I-F injection point on the tuner.
5. Align the receiver to produce the response curve illustrated.

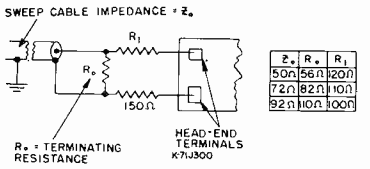
AM PRE-PEAKING FREQUENCIES

L150	Min. at 47.25MC
L135	Max. at 45.75MC
L151	Max. at 42.50MC
L153, L154	Max. at 44.15MC
T151	Max. at 43.00MC
T152	Max. at 45.20MC

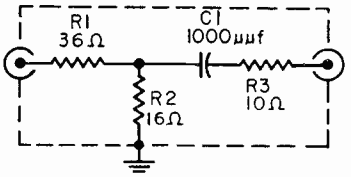




DETECTOR NETWORK



SWEEP EQUIPMENT TERMINATION



IF INJECTION NETWORK

VIDEO I-F ALIGNMENT CHART

STEP	SIGNAL FREQUENCY	ADJUST	REMARKS
1.	47.25 MC AM	Adjust L150 for minimum scope deflection.	Use maximum scope sensitivity and smallest possible signal for the 47.25 MC AM adjustments.
2.	44.15 MC AM	Adjust first L154, then L153 for maximum scope deflection.	Do not retouch these adjustments. (L153 core must be flush with top of coil when L154 is peaked.)
3.	38—48 MC sweep generator, with scope calibrated 3 volts peak to peak for 2 inch deflection; markers at 41.25, 42.5, 44.15, 45 & 45.75 MC	L135 (converter plate) for maximum deflection of the 45.75 MC marker.	
4.	SAME	L151 (1st I-F grid) for maximum deflection of the 42.5 MC marker and proper nose shaping.	Symmetry of the nose is important. No portion of the nose should be out of symmetry by more than 3%.
5.	SAME	T152 (2nd I-F Plate) to place 45.75 MC marker properly on the curve.	Repeat 4, 5 and 6 if necessary.
6.	SAME	T151 (1st I-F Plate) to place 42.5 MC marker properly on the curve.	
7.	SAME	L151 if necessary to shape the nose.	

4.5 MC TRAP ALIGNMENT

1. Connect a −10V bias to Test Point II, with the positive bias lead grounded to chassis.
2. .05μf capacitor between Test Point X and chassis.
3. Turn contrast control to maximum, volume to minimum.
4. Connect the DETECTOR NETWORK shown to Test Point IV and feed its output to an AC VTVM.
5. Apply a 4.5 MC AM signal through a 5μμf capacitor at Test Point III.
6. Adjust the top core of T154 for minimum reading on Test Point IV. Two core positions will give an apparent minimum indication, the correct one is nearer the top end of the coil form.

NOTE: Retouching of the trap adjustment may be necessary after alignment of the audio takeoff.

AUDIO ALIGNMENT WITH ON-THE-AIR SIGNALS

1. Tune in a strong local signal and set receiver volume to a low audible level.
2. Adjust L301 for maximum undistorted, buzz-free audio output. Start with the core at the outermost position away from the printed board and tune for the second "peak" encountered on the way into the coil form.
3. Connect a variable bias supply (3 to 15V) to the AGC test point with the positive lead to the chassis. Adjust bias until audio signal distorts on peaks slightly, then adjust core of L301 to curb distortion. Repeat this procedure several times at increased bias levels until maximum clarity of audio is obtained.
4. Adjust the bottom core of T154, repeating the bias advances in step 3, to achieve the optimum setting for noise-free performance at low signal levels.

GENERAL ELECTRIC

AY CHASSIS, For complete list of Models see page 52

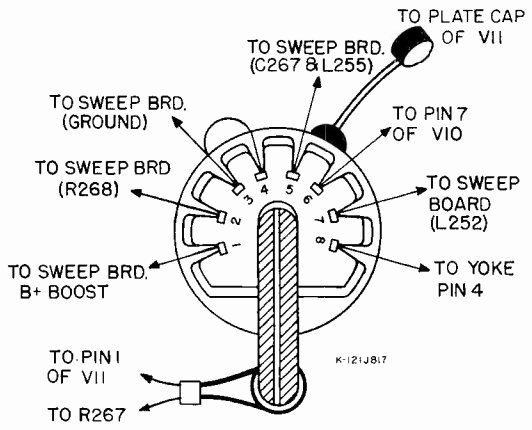
This service information covers the General Electric AY Chassis. Some receivers of the AY line are equipped with features such as power tuning, remote control, illuminated channel indication, multiple speakers and a separate tone control. This (chassis) section includes main-chassis service data.

PICTURE TUBE ADJUSTMENTS

FOCUS: The proper focus potential for the tube was chosen at the time the set was manufactured. If it becomes necessary to install a new picture tube or change the focus potential, any one of four potentials may be chosen for best focus. Connection points for the four potentials may be selected by referring to main schematic diagram.

PICTURE TILT: To correct picture tilt, loosen the YOKE CLAMP by squeezing spring over the bend in the clamp. Adjust yoke to correct tilt. Secure yoke with clamp.

PICTURE CENTERING: Rotate the two centering rings located at the rear of the yoke assembly until picture is properly centered.



T251 WIRING

ELECTRICAL ADJUSTMENTS

HEIGHT AND VERTICAL LINEARITY: Adjust R208 and R214 simultaneously for proper vertical size and linearity. Picture should extend 1/8-inch beyond top and bottom edges of mask.

HORIZONTAL HOLD:

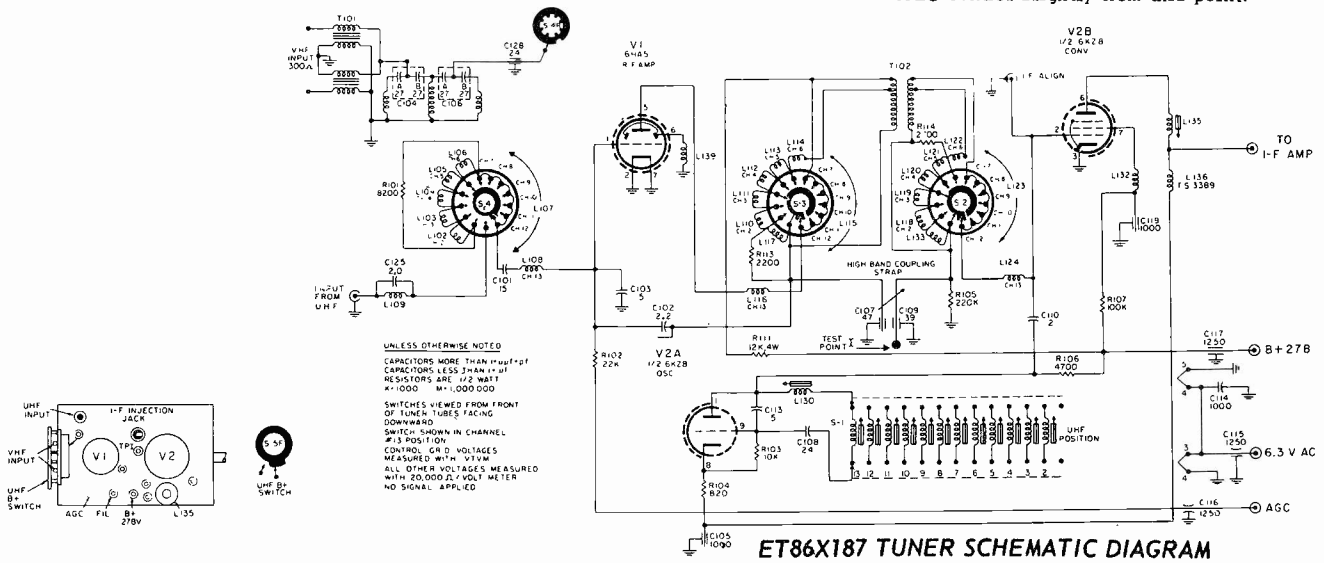
1. Remove the cabinet back.
2. Tune the receiver to a weak signal and adjust the controls for normal operation.
3. Short Test Point VI to the chassis with a jumper wire.
4. Connect a 1000 ohm resistor from Test Point VIII to Test Point IX (in parallel with L251.)
5. Adjust HORIZONTAL HOLD potentiometer, R257, until picture just "floats" back and forth across the screen. Leave R257 set in this position.
6. Remove the 1000 ohm resistor from Test Point VIII and Test Point IX. Adjust L251 (stabilizer coil) so that the picture again just "floats" across the screen, turning the core toward the printed board. Leave L251 set in this position.
7. Remove the chassis jumper from Test Point VI. Repeat adjustments if the picture does not "lock."

AGC CONTROL:

Field Adjustment: Tune in the strongest available signal and adjust R201 to the point where overloading is indicated by "tearing" of the picture. Then back off the AGC control to just beyond the point where the overload condition disappears. Before adjusting the AGC control, set the automatic brightness control defeat switch to the "defeat" position.

Instrument Adjustment:

1. Tune in a broadcast signal, preferably a monoscope signal that is monitored to assure that the percentage of sync does not exceed 25 percent.
2. Connect an oscilloscope to Test Point IV. Synchronize the scope at a vertical rate and observe at least two vertical sync pulses.
3. Adjust the fine tuning for smear and the AGC control for the point where the sync pulses begin to compress. Then back off the AGC control slightly from this point.

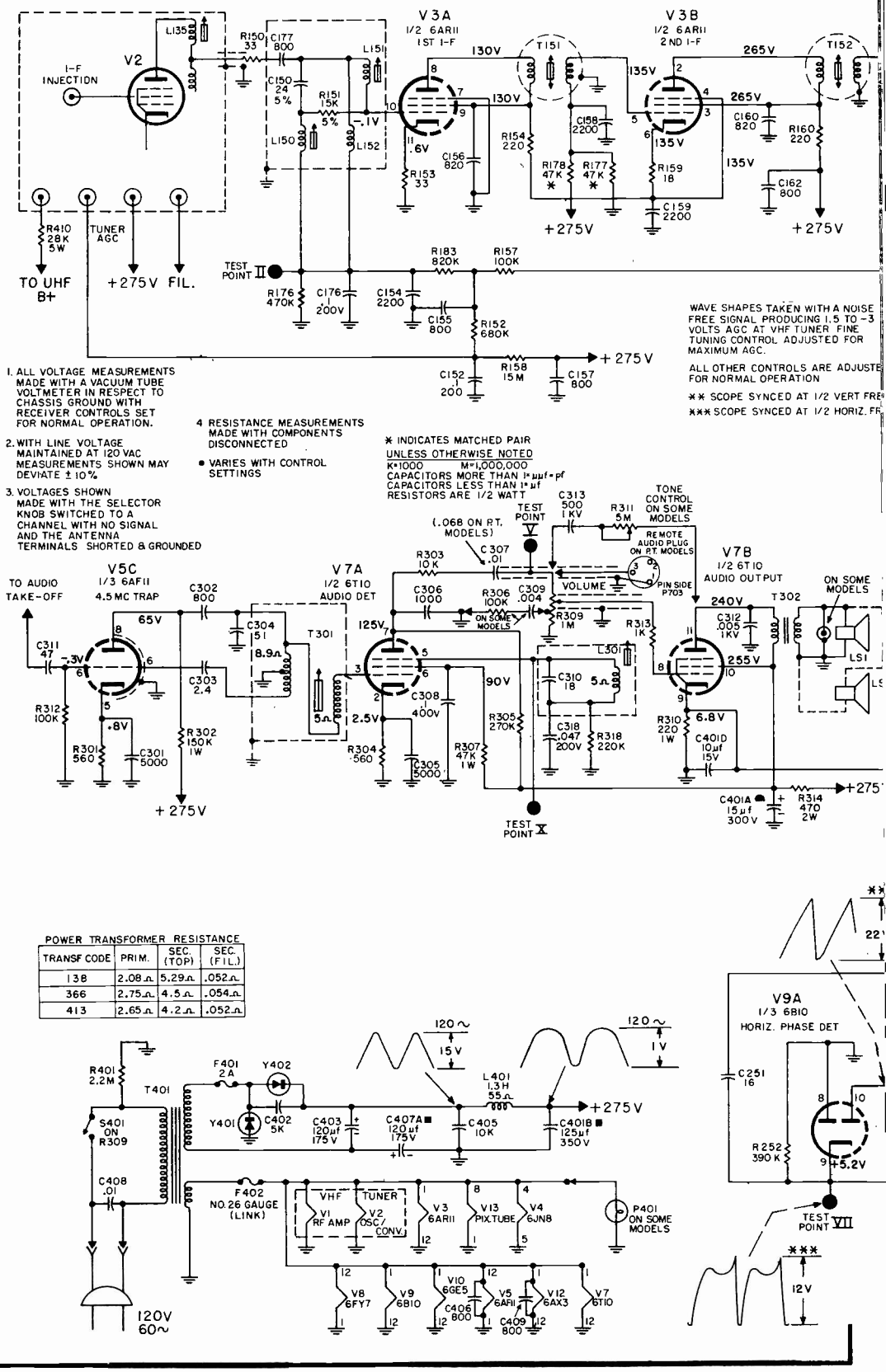


ET86X187 TUNER SCHEMATIC DIAGRAM

GENERAL ELECTRIC Chassis AY Schematic Diagram, Continued

AY CHASSIS MODELS

PAM718YBZ	M758YMD
PAM718YMD	M758YMP
PAM719YBZ	M758YWD
PAM719YMD	M759YMD
M720YEB	M759YMP
M721YEB	M759YWD
M722YMD	M760YMD
M722YOA	M760YOA
M722YWD	M760YWD
PAM722YWD	M761YMD
M723YMD	M761YOA
M723YOA	M761YWD
M723YWD	M762YMD
PAM723YWD	M762YMP
CAM722YBG	M762YWD
CAM722YEB	M763YMD
CAM723YBG	M763YMP
CAM723YEB	M763YWD
M730YMD	PAM762YMD
M730YWD	PAM762YMP
M731YMD	PAM763YMD
M731YWD	PAM763YMP
M732YMD	R762YMD
M732YMP	R762YWD
M732YOA	M766YMD
M732YWD	M766YMP
M733YMD	M766YWD
M733YMP	M767YMD
M733YOA	M767YMP
M733YWD	M767YWD
M734YMD	M782YMD
M734YMP	M782YMP
M734YWD	M782YWD
M735YMD	M783YMD
M735YMP	M783YMP
M735YWD	M783YWD
R734YMD	M784YMD
R734YWD	M784YMP
M736YVY	M784YWD
M736YWL	M785YMD
M737YVY	M785YMP
M737YWL	M785YWD
M742YBH	M786YMP
M742YMD	M786YWD
M742YMP	M787YMP
M742YWD	M787YWD
M742YWL	M788YMD
M743YBH	M788YWD
M743YMD	M788YCD
M743YMP	M789YMD
M743YWD	M789YWD
M743YWL	M789YCD



1. ALL VOLTAGE MEASUREMENTS MADE WITH A VACUUM TUBE VOLTMETER IN RESPECT TO CHASSIS GROUND WITH RECEIVER CONTROLS SET FOR NORMAL OPERATION.
2. WITH LINE VOLTAGE MAINTAINED AT 120 VAC MEASUREMENTS SHOWN MAY DEVIATE ± 10%
3. VOLTAGES SHOWN MADE WITH THE SELECTOR KNOB SWITCHED TO A CHANNEL WITH NO SIGNAL AND THE ANTENNA TERMINALS SHORTED & GROUNDED
4. RESISTANCE MEASUREMENTS MADE WITH COMPONENTS DISCONNECTED
- VARIES WITH CONTROL SETTINGS

* INDICATES MATCHED PAIR
UNLESS OTHERWISE NOTED
K=1000 M=1,000,000
CAPACITORS MORE THAN 1 = µµf = pf
CAPACITORS LESS THAN 1 = µf
RESISTORS ARE 1/2 WATT

WAVE SHAPES TAKEN WITH A NOISE FREE SIGNAL PRODUCING 1.5 TO -3 VOLTS AGC AT VHF TUNER FINE TUNING CONTROL ADJUSTED FOR MAXIMUM AGC.

ALL OTHER CONTROLS ARE ADJUSTED FOR NORMAL OPERATION

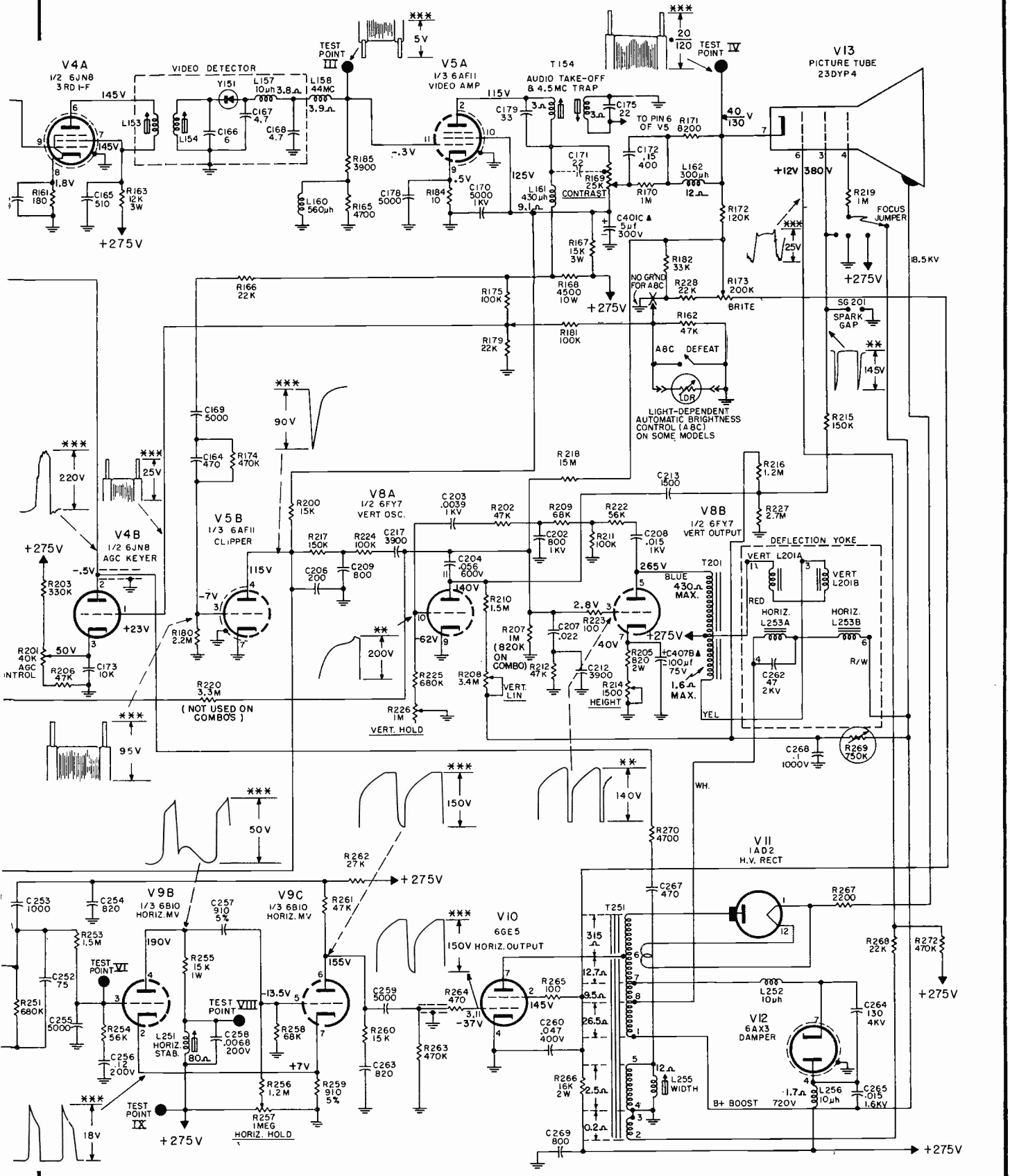
** SCOPE SYNCED AT 1/2 VERT FREQ

*** SCOPE SYNCED AT 1/2 HORIZ. FREQ

POWER TRANSFORMER RESISTANCE

TRANSF CODE	PRIM.	SEC. (TOP)	SEC. (FIL.)
138	2.08Ω	5.29Ω	.052Ω
366	2.75Ω	4.5Ω	.054Ω
413	2.65Ω	4.2Ω	.052Ω

GENERAL ELECTRIC Chassis AY Schematic Diagram, Continued



AY CHASSIS SCHEMATIC DIAGRAM

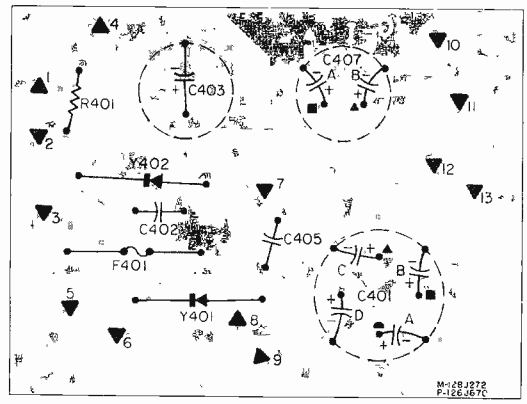
VOLUME TV-22, MOST-OFTEN-NEEDED 1964

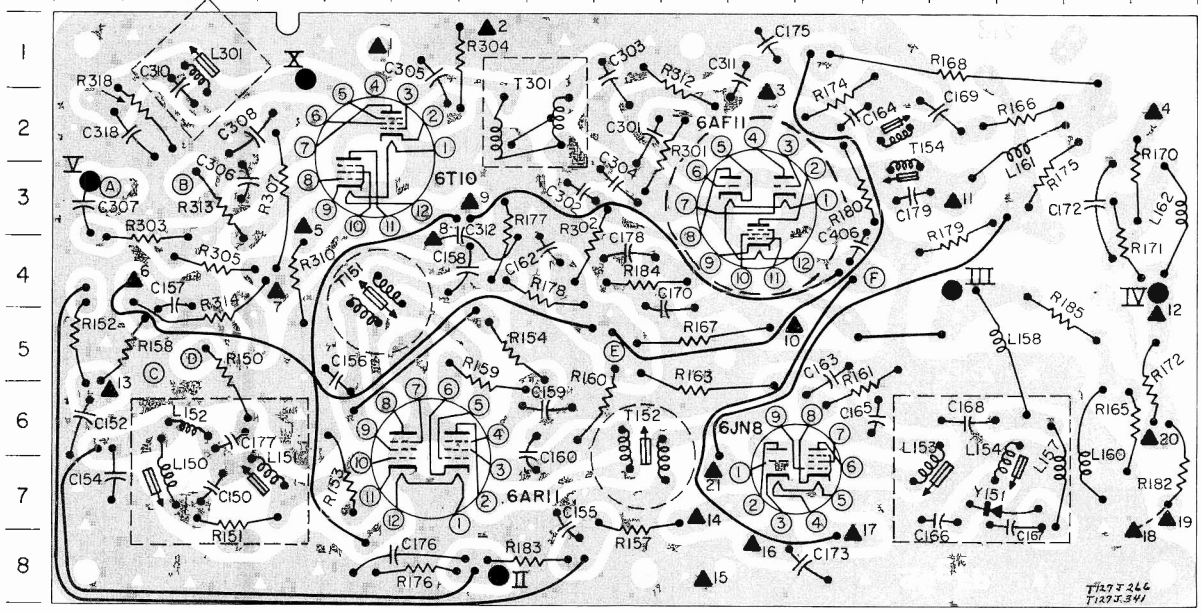
POWER SUPPLY CIRCUIT BOARD

TRIANGLE ▲7 NUMBERS

REPRESENT WIREWRAP TERMINALS ON COMPONENT BOARD FOR CONNECTION OF WIRES FROM POINTS INDICATED

- ▲1 YELLOW & GREEN LEAD TO T401
- ▲2 BLACK LEAD TO T401 BLACK LEAD TO ON OFF SWITCH
- ▲3 RED LEAD TO T401
- ▲4 BLUE LEAD TO T401
- ▲5 BROWN & YELLOW LEAD TO T401 & AC INTERLOCK
- ▲6 BROWN LEAD TO ON OFF SWITCH & AC INTERLOCK
- ▲7 GREEN LEAD TO L401
- ▲8 GREY LEAD TO ▲5 OF I-F BOARD & (G) OF SWEEP BD
- ▲9 RED AND BLACK LEAD TO ▲7 OF I-F BOARD
- ▲10 GREEN LEAD TO T401 AND F402 NO 26 GAUGE LINK TO ▲17 ON I-F BOARD
- ▲11 YELLOW LEAD TO (B) OF SWEEP BOARD
- ▲12 ORANGE LEAD TO ▲10 OF I-F BOARD AND (H) OF SWEEP BOARD
- ▲13 RED LEADS TO (E) OF I-F BOARD, (I) OF SWEEP BOARD AND L401





I-F BOARD COMPONENT LOCATION

NUMBERED (▲7) TRIANGLES
REPRESENT WIREWRAP TERMINALS ON COMPONENT BOARD FOR CONNECTION OF WIRES FROM POINTS INDICATED

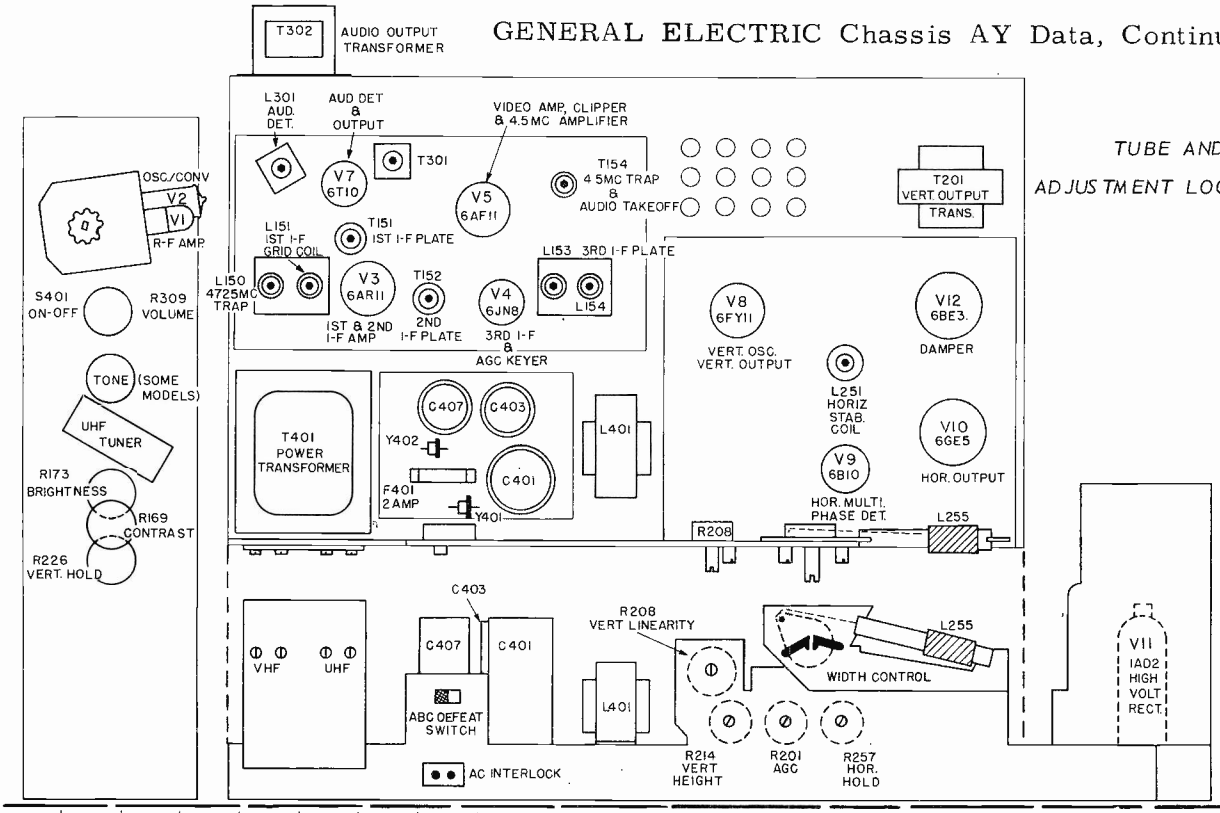
CIRCLED (A) LETTERS
REPRESENT BOARD MOUNTED WIRES CONNECTED TO POINTS INDICATED

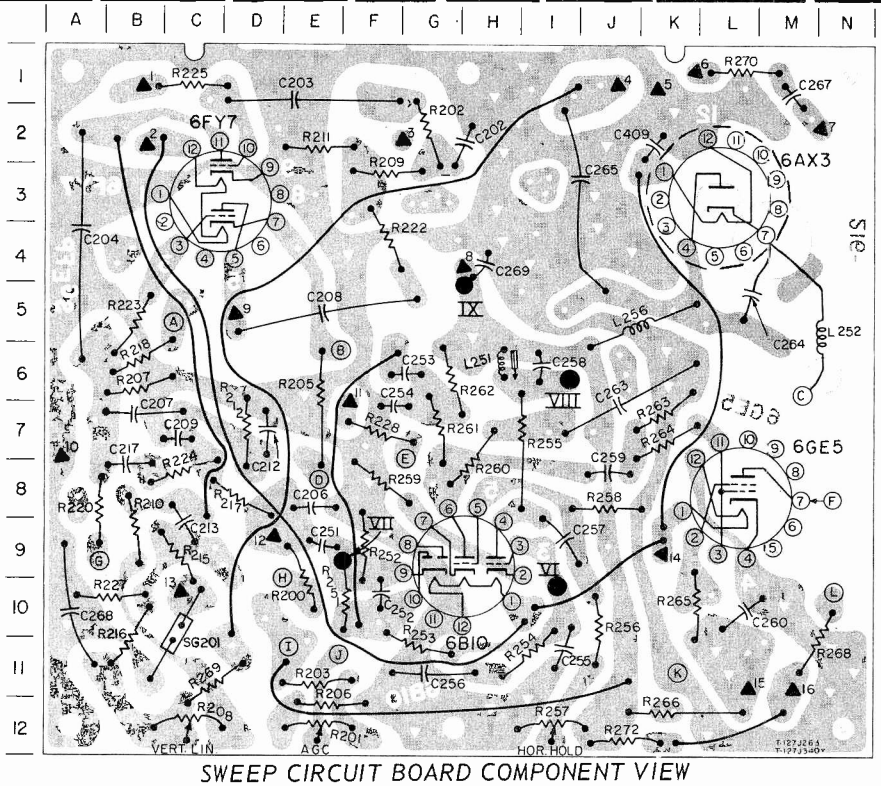
- ▲1 to T302 & Speaker, High Side
- ▲2 to T302 & Speaker, Low Side
- ▲3 to ▲12 on Sweep Board
- ▲4 to Contrast Control Arm
- ▲5 to ▲8 on Power Supply Board
- ▲6 to VHF Tuner B+ Terminal
- ▲7 to T302 Secondary & ▲9 on Power Supply Board
- ▲8 to T302 Secondary
- ▲9 to VHF Tuner Filament Terminal
- ▲10 to ▲12 on Power Supply Board & Contrast Control
- ▲11 to Contrast Control, High Side
- ▲12 to Picture Tube Pin 7
- ▲13 to VHF Tuner AGC Terminal
- ▲14 Shielded Lead to ▲6 on Sweep Board
- ▲15 Ground for ▲14 Shield
- ▲16 to (J) on Sweep Board
- ▲17 to F402
- ▲18 ABC Ground Lug Shorts to ▲19 for Non-ABC
- ▲19 to (E) on Sweep Board, ABC Connection Point
- ▲20 to (A) on Sweep Board & Arm of Brightness Control
- (A) Yellow Lead of Shielded Audio Cable to Vol. Control
- (B) Green Lead of Shielded Audio Cable to Vol. Control
- (C) Ground for Shield of Link Cable
- (D) Center Conductor of Shielded Link Cable
- (E) to ▲13 of Power Supply Board
- (F) to ▲12 of Power Supply Board

RESISTORS	RESISTORS	CAPACITORS	COILS
R150—C5	R302—H3	C172—P3	
R151—C7	R303—B3	C173—L8	L150—B7
R152—A5	R304—G1	C175—K1	L151—D7
R153—E7	R305—C4	C176—F8	L152—B6
R154—G5	R307—D3	C177—C6	L153—M6
R156—F8	R310—D4	C178—I4	L154—O6
R157—I7	R312—J1	C179—M3	L157—O6
R158—B5	R313—C3	C301—I2	L158—O5
R159—G5	R314—C4	C302—H3	L160—P6
R160—I5	R318—A1	C303—I1	L161—O2
R161—L5		C304—I3	L162—Q3
R163—J5	CAPACITORS	C305—F1	L301—C1
R165—P6	C150—C7	C306—C3	T151—E4
R166—O2	C152—A6	C307—R3	T152—I6
R167—J5	C154—A7	C308—C2	T154—M2
R168—N1	C155—H7	C310—B1	T301—H1
R170—Q2	C156—E5	C311—K1	
R171—P3	C157—B4	C312—G3	
R172—Q5	C158—F4	C318—A2	
R174—L2	C159—H6	C406—L4	
R175—O3	C160—H6		
R177—G3	C162—H4		
R178—H4	C163—L5		TEST POINTS
R179—N3	C164—M2	TUBES	
R180—L3	C165—M6		II—G8
R182—Q7	C166—N7	V3—F7	III—N4
R183—G8	C167—O7	V4—K6	IV—Q4
R184—I4	C168—N6	V5—J3	V—A3
R185—O4	C169—N2	V7—E2	X—D1
R301—J2	C170—J4		

GENERAL ELECTRIC Chassis AY Data, Continued

TUBE AND ADJUSTMENT LOCATION





SWEEP CIRCUIT BOARD COMPONENT VIEW

TRIANGLE (▲-0) NUMBERS

REPRESENT WIRE WRAP TERMINALS ON COMPONENT BOARD FOR CONNECTION OF WIRES TO POINTS INDICATED.

- ▲1 TO VERT HOLD CONTROL (END)
- ▲2 TO (F) ON I-F BOARD
- ▲3 TO T201 YELLOW LEAD & YOKE 3
- ▲4 TO YOKE 6 AND PIN 1 OF T251
- ▲5 SHIELD GROUND FOR ▲6
- ▲6 TO ▲14 ON I-F BOARD
- ▲7 TO T251 PIN 5 & L255
- ▲8 TO YOKE PIN 1 & T201 RED LEAD
- ▲9 TO T201 BLUE LEAD
- ▲10 TO PIN 1 OF CRT & SHIELD WIRE FOR CRT PIN 3
- ▲11 TO BRIGHTNESS CONTROL LOW SIDE
- ▲12 TO ▲3 ON I-F BOARD
- ▲13 TO PIN 3 OF CRT SOCKET
- ▲14 TO PIN 8 OF CRT SOCKET
- ▲15 TO BRIGHTNESS CONTROL HIGH SIDE
- ▲16 TO PIN 6 OF CRT SOCKET

CIRCLED (A) LETTERS

REPRESENT INTERCONNECTING WIRES SOLDERED INTO BOARD

- (A) TO ▲20 ON I-F BOARD
- (B) TO ▲11 ON POWER SUPPLY BOARD
- (C) TO PIN 7 OF T251
- (D) TO HEIGHT CONTROL HIGH SIDE
- (E) TO ▲19 ON I-F BOARD
- (F) TO PIN 6 ON T251
- (G) TO ▲8 ON POWER SUPPLY BOARD
- (H) TO ▲12 ON POWER SUPPLY BOARD
- (I) TO ▲13 ON POWER SUPPLY BOARD
- (J) TO ▲16 ON I-F BOARD
- (K) TO GROUND TO L255
- (L) TO PIN OF T251

COMPONENT LOCATION

RESISTORS

R200—E10	R207—B6	R217—C8	R228—F7	R258—J8	R266—K12
R201—F12	R208—C12	R218—B6	R251—E10	R259—G8	R268—N11
R202—G2	R209—F2	R220—A8	R252—F9	R260—H8	R269—C11
R203—E11	R210—B8	R222—G4	R253—G10	R261—H7	R270—L1
R205—E6	R211—E2	R223—B5	R254—I11	R262—H6	R272—J12
R206—E11	R212—D7	R224—C8	R255—I7	R263—K7	
	R215—C9	R225—C1	R256—J10	R264—K7	
	R216—B10	R227—B10	R257—I12	R265—K10	

CAPACITORS

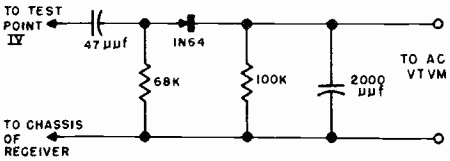
C202—H2	C255—I11
C203—E1	C256—G11
C204—A4	C257—J9
C206—E8	C258—I6
C207—B7	C259—J7
C208—E5	C260—M10
C209—C7	C263—J3
C212—D8	C264—M6
C213—C9	C265—J3
C217—B7	C267—M1
C251—E9	C268—A10
C252—F10	C269—H4
C253—G6	C409—J2
C254—F6	

GENERAL ELECTRIC Chassis AY Alignment Information, Continued

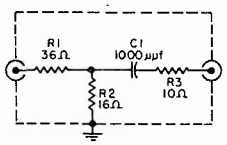
VIDEO I-F SYSTEM

AM PRE-PEAKING & TRAP FREQUENCIES

L150 . . . . . Min. 47.25 MC	T151 . . . . Max. 43.0 MC
L135 . . . . Max. 45.75 MC	T152 . . . . Max. 45.2 MC
L151 . . . . Max. 42.50 MC	L153, L154 Max. 44.15 MC



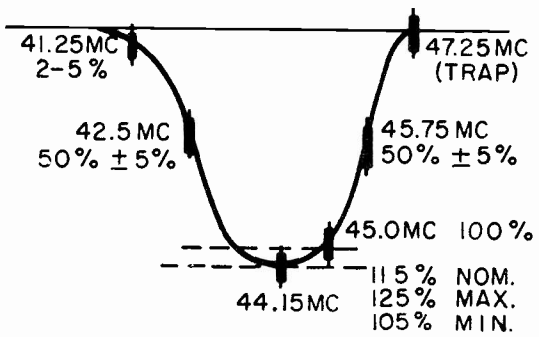
DETECTOR NETWORK



I-F INJECTION NETWORK

GENERAL: Allow receiver and test equipment at least 20 minutes warm-up.

1. Turn volume control to minimum and contrast control fully clockwise. Set channel selector to Channel 9 and fine tuning fully counterclockwise.
2. Short antenna terminals together.
3. Connect oscilloscope to Test Point III thru 22,000 ohms resistor not more than 2.5 inches away from Test Point III. Connect −4.5V bias between Test Point II and chassis.
4. Inject signals from a properly terminated AM signal generator or sweep generator, through the I-F INJECTION NETWORK shown, to the I-F injection point on the VHF tuner.
5. Align the receiver to produce the response curve illustrated.
6. All cores are positioned away from printed board.



I-F RESPONSE CURVE

VIDEO I-F ALIGNMENT CHART

STEP	SIGNAL FREQUENCY	ADJUST	REMARKS
1	47.25 MC AM	Adjust L150 for minimum scope deflection	Use maximum scope sensitivity and smallest possible signal. Do not retouch this adjustment.
2	38–48 MC sweep generator, with scope calibrated 3 volts peak to peak for 2 inch deflection.	Adjust L154 and L153 in the following sequence: A. Tune L153 core so top of core is flush w/top of coil. B. Tune L154 for max. deflection of 44.15 MC marker. (Do not re-adjust scope) C. Tune L153 for max. deflection of 44.15 MC marker.	Do not retouch these adjustments.
3		L135 (converter plate) for max. deflection of the 45.75 MC marker.	
4		L151 (1st I-F grid) for maximum deflection of the 42.5 MC marker and proper nose shaping.	Symmetry of the nose is important. No portion of the nose should be out of symmetry by more than 3%.
5		T151(2nd I-F Plate) to place 45.75 MC marker properly on the curve.	
6		T151 (1st I-F Plate) to place 42.5 MC marker properly on the curve.	Repeat 5, 6, and 7 if necessary.
7		L151 if necessary to shape the nose.	

4.5 MC TRAP ALIGNMENT

1. Connect a −7.5V bias to Test Point II, with the positive bias lead grounded to chassis.
2. Turn contrast control to maximum, volume to minimum.
3. Connect the DETECTOR NETWORK shown to Test Point IV and feed its output to an AC VTVM.
4. Apply a 4.5 MC AM signal through a 5μμf capacitor at Test Point III.
5. Adjust the top core of T154 for minimum reading on Test Point IV. Two core positions will give an apparent minimum indication, the correct one is the first reached while turning the core from the top end of the coil form toward the circuit board.

NOTE: Retouching of the trap adjustment may be necessary after alignment of the audio takeoff.

AUDIO ALIGNMENT WITH ON-THE-AIR SIGNALS

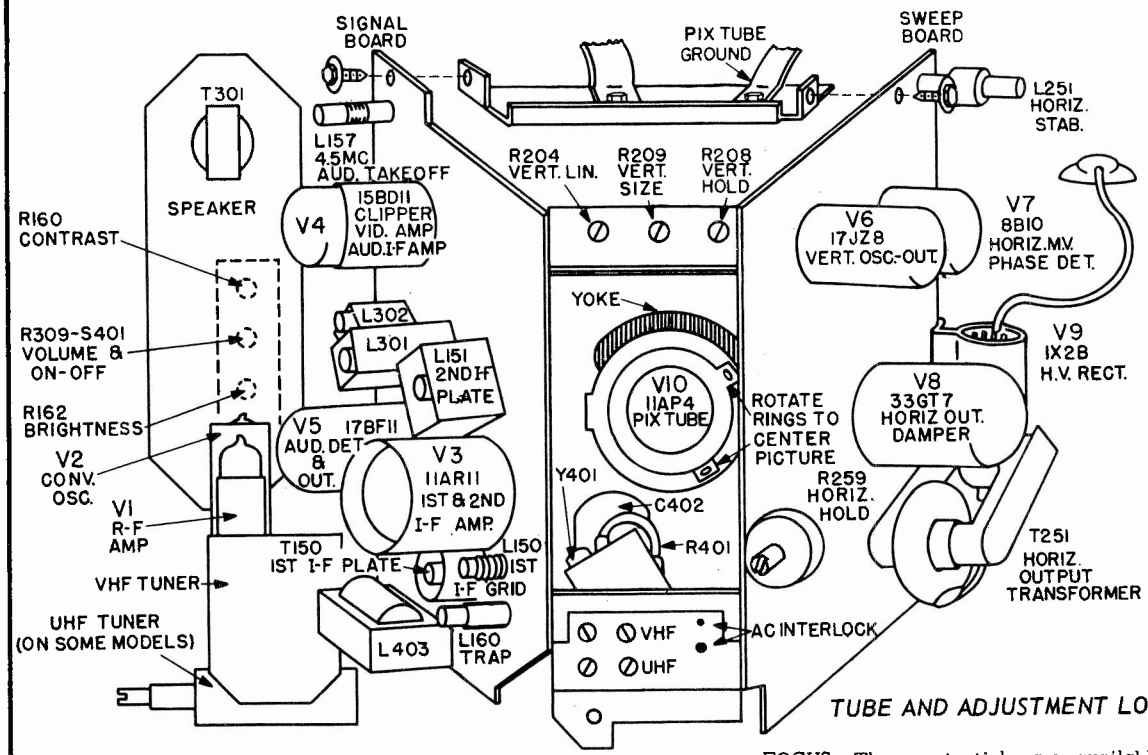
1. Tune in a strong local signal and set receiver volume to a low audible level.
2. Adjust L301 for maximum undistorted, buzz-free audio output. Start with the core at the outermost position away from the printed board and tune for the second "peak" encountered on the way into the coil form.
3. Connect a variable bias supply (3 to 15V) to the AGC test point with the positive lead to the chassis. Adjust bias until audio signal distorts on peaks slightly, then adjust core of T301 to curb distortion. Repeat this procedure several times at increased bias levels until maximum clarity of audio is obtained.
4. Adjust the bottom core of T154, repeating the bias advances in step 3, to achieve the optimum setting for noise-free performance at low signal levels.

GENERAL ELECTRIC

CHASSIS SY used in Models listed at right

SY CHASSIS MODELS

M110YBG
M111YBG
M112YVY
M112YBN
M112YRD
M113YVY
M113YBN
M113YRD
M116YWD
M116YVY
M117YWD
M117YVY
M180YWD
M180YVY
M181YWD
M181YVY



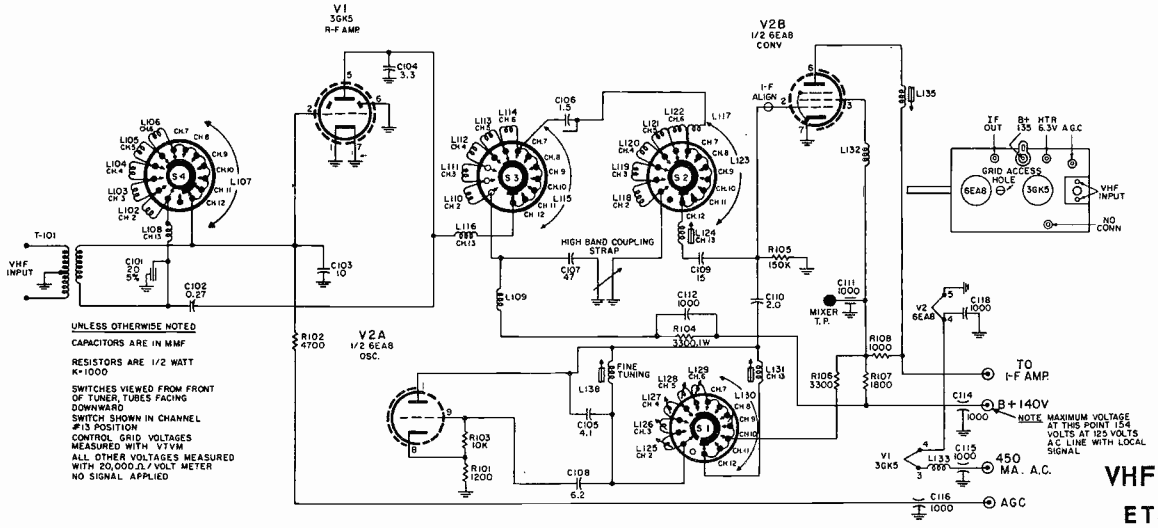
TUBE AND ADJUSTMENT LOCATIONS

PICTURE TILT: To correct picture tilt, loosen the YOKE CLAMP with long nose pliers by sliding the eye of the spring over the bend in the clamp. Adjust the yoke to correct picture tilt. Secure the yoke with the pliers by squeezing between the eye of the spring and a point below the bend in the clamp until the spring slips over the bend.

PICTURE CENTERING: Rotate the two centering rings located at the rear of the yoke assembly until picture is properly centered.

FOCUS: Three potentials are available in the receiver for focus adjustment—ground, +140 volts and B+ boost. Focus was correctly adjusted at the factory. If it becomes necessary to adjust focus, connect the orange lead from R165 and pin 4 of the picture tube base to the potential which produces best focus. Refer to the sweep circuit board diagram for the connection points.

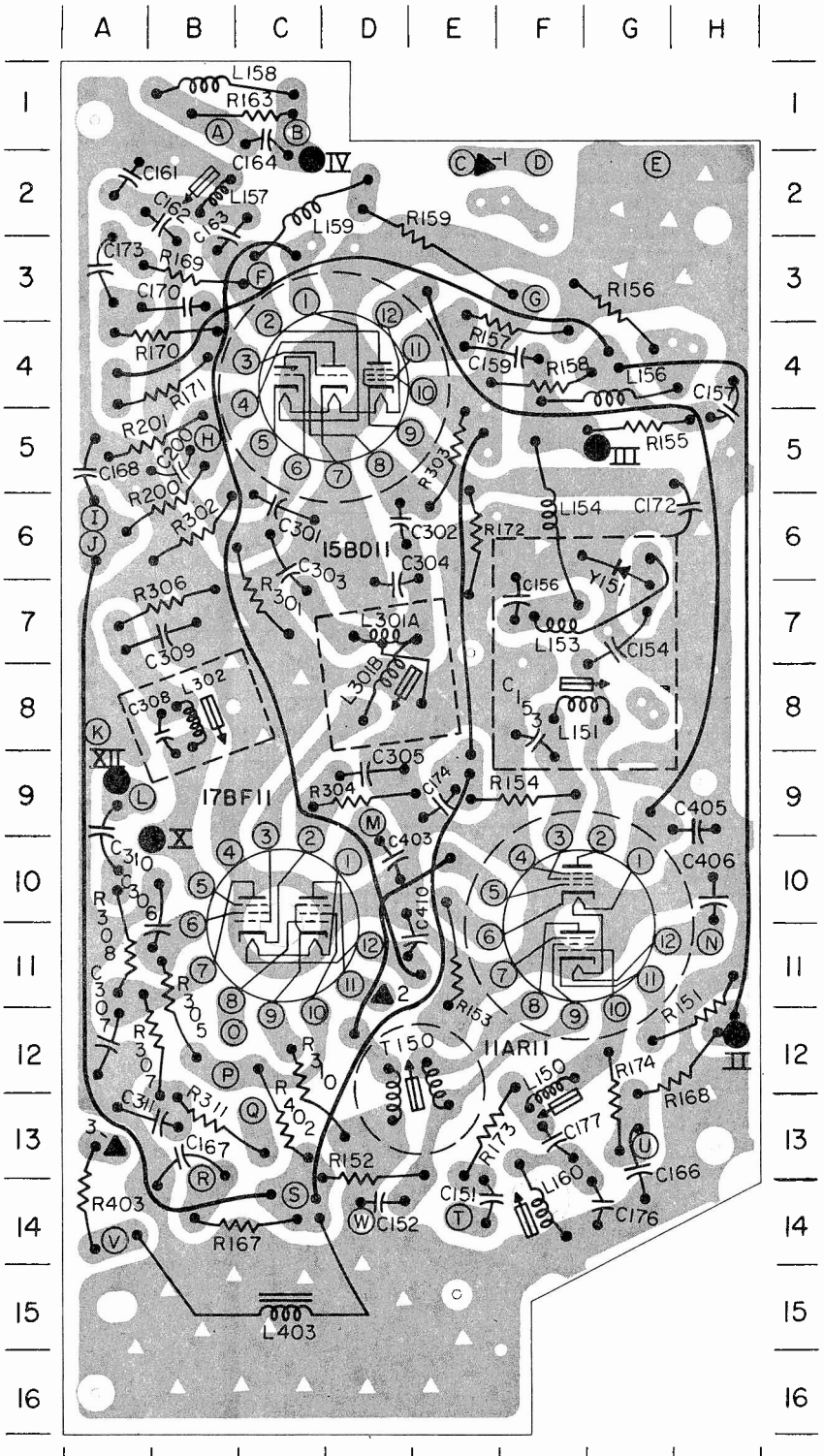
HEIGHT AND VERTICAL LINEARITY: Adjust R204 and R209 simultaneously for proper vertical size and linearity. Picture should extend 1/8-inch beyond top and bottom edges of mask.



VHF TUNER ET86X196

GENERAL ELECTRIC Chassis SY Service Material, Continued

I-F BOARD COMPONENT LOCATIONS



I-F BOARD VIEWED FROM COMPONENT SIDE

CAPACITORS	RESISTORS (CONT'D)
C151–E14	
C152–D14	
C153–F8	R168–H13
C154–G7	R169–B3
C156–F7	R170–B4
C157–H4	R171–B4
C159–F4	R172–E6
C161–B2	R173–E13
C162–B2	R174–G12
C163–C2	R200–A6
C164–C2	R201–A5
C166–G13	R301–C7
C167–B13	R302–B6
C168–A5	R303–E5
C170–B3	R304–D9
C172–G6	R305–B11
C173–A3	R306–B7
C174–E9	R307–A12
C176–G14	R308–A11
C177–F13	R310–C12
C200–B5	R311–B13
C301–C6	R402–C13
C302–D6	R403–A14
C303–C6	
C304–E6	**COILS & TRANSFORMERS**
C305–D9	
C306–A10	L150–F12
C307–A12	L151–F8
C308–B8	L153–F7
C309–B7	L154–F6
C310–A10	L156–G4
C311–A13	L157–C2
C403–D10	L158–C1
C405–H9	L159–D2
C406–H10	L160–F14
C410–E10	L301–D7
	L302–B8
RESISTORS	L403–C15
	T150–D12
R151–H11	
R152–D13	
R153–E11	**DIODE**
R154–F9	
R155–G5	Y151–G6
R156–G3	
R157–E4	**COMPACTRONS**
R158–F4	
R159–E2	11AR11–F12
R163–E1	15BD11–D6
R167–B14	17BF11–B9

CIRCLED Ⓐ LETTERS

REPRESENT INTERCONNECTING WIRES SOLDERED INTO BOARD

- Ⓐ YELLOW LEAD TO Ⓓ ON FRONT CONTROL BOARD
- Ⓑ YELLOW LEAD TO PIN 7 OF PICTURE TUBE
- Ⓒ YELLOW LEAD TO DEFLECTION YOKE
- Ⓓ RED LEAD TO PIN 3 OF PICTURE TUBE
- Ⓔ GREEN LEAD TO PIN 2 OF PICTURE TUBE
- Ⓕ BLUE & WHITE LEAD TO Ⓖ FRONT CONTROL BOARD
- Ⓖ RED LEAD TO Ⓙ ON SWEEP BOARD
- Ⓗ GREEN LEAD TO Ⓘ ON SWEEP BOARD
- Ⓘ RED LEAD TO DEFLECTION YOKE
- Ⓙ RED WIRE TO Ⓕ ON FRONT CONTROL BOARD
- Ⓚ AUDIO CABLE SHIELD CONDUCTOR TO Ⓔ ON FRONT CONTROL BOARD
- Ⓛ YELLOW AUDIO CABLE LEAD TO Ⓒ ON FRONT CONTROL BOARD
- Ⓜ BROWN LEAD Ⓑ ON SWEEP BOARD
- Ⓝ BROWN LEAD TO PIN 1 OF PICTURE TUBE
- Ⓞ GREEN AUDIO CABLE LEAD Ⓑ ON FRONT CONTROL BOARD
- Ⓟ ORANGE LEAD FROM Ⓐ ON POWER SUPPLY BOARD
- Ⓠ RED & WHITE LEAD TO Ⓛ ON SWEEP BOARD
- Ⓡ RED LEAD TO TUNER B+
- Ⓢ RED LEAD FROM Ⓔ ON POWER SUPPLY BOARD
- Ⓣ SHIELDED CABLE FROM TUNER I-F OUTPUT
- Ⓤ WHITE LEAD TO TUNER AGC
- Ⓥ BLUE LEAD TO 0 FROM POWER SUPPLY BOARD
- Ⓦ CABLE SHIELD FROM TUNER I-F OUTPUT

TRIANGLE (▲-0) NUMBERS

REPRESENT WIRE WRAP TERMINALS ON COMPONENT BOARD FOR CONNECTION OF WIRES TO POINTS INDICATED

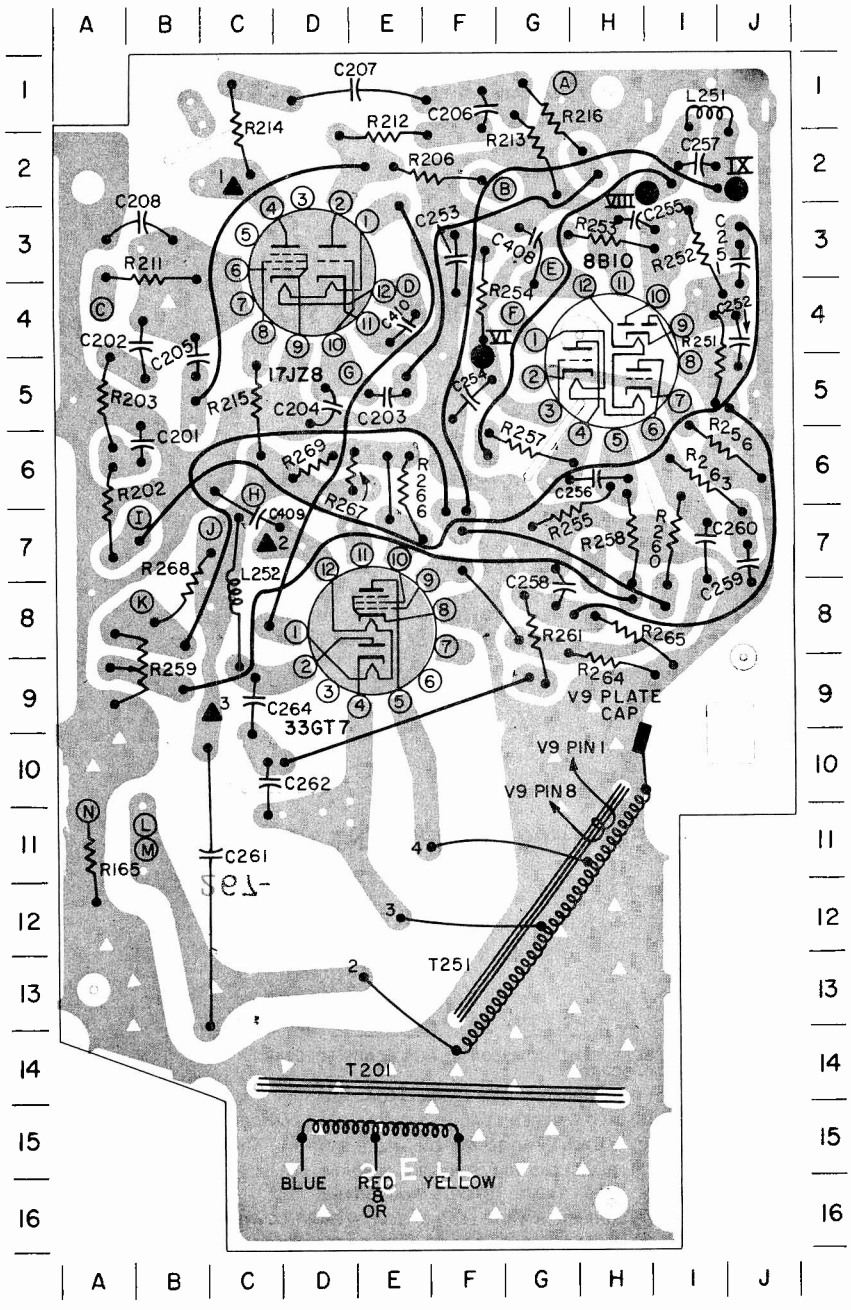
- ▲1 YELLOW LEAD TO T201
- ▲2 BLUE LEAD TO T301
- ▲3 RED LEAD TO T301

ROMAN (XI) NUMERALS

INDICATE TEST POINTS

GENERAL ELECTRIC Chassis SY Service Material, Continued

SWEEP BOARD COMPONENT LOCATIONS



SWEEP BOARD VIEWED FROM COMPONENT SIDE

CAPACITORS	RESISTORS
C201—B6	R165—A11
C202—A4	R202—A6
C203—E5	R203—A5
C204—D5	R206—F2
C205—B4	R211—B3
C206—F1	R212—E1
C207—E1	R213—G2
C208—B2	R214—C1
C251—J3	R215—C5
C252—J4	R216—H1
C253—F3	R251—I4
C254—F5	R252—I3
C255—I3	R253—H3
C256—H6	R254—G4
C257—I2	R255—G7
C258—G8	R256—J6
C259—J7	R257—G6
C260—I7	R258—H7
C261—C11	R259—B9
C262—D10	R260—I7
C264—C9	R261—G8
C408—G3	R263 -I6
C409—C7	R264—H3
C410—E4	R265—H8
	R266—E6
	R267—D6
	R268—B7
	R269—D6

COILS & TRANSFORMERS

L251—I1
L252—C7
T201—E14
T251—F13

COMPACTRONS

8B10—H3
17JZ8—D5
33GT7—D9

CIRCLED (A) LETTERS

REPRESENT INTERCONNECTING WIRES SOLDERED INTO BOARD

- (A) BLACK LEAD TO (D) ON REAR CONTROL BOARD
- (B) WHITE & BLUE LEAD TO (B) ON REAR CONTROL BOARD
- (C) ORANGE & GREEN LEAD TO (E) ON REAR CONTROL BOARD
- (D) BROWN LEAD FROM (M) ON SIGNAL BOARD
- (E) BROWN LEAD FROM TUNER FIL SUPPLY
- (F) BROWN LEAD FROM TO PIN 12 OF PICTURE TUBE
- (G) ORANGE AND BLUE LEAD TO (F) ON REAR CONTROL BOARD
- (H) RED LEAD TO (C) ON REAR CONTROL BOARD
- (I) GREEN LEAD FROM (H) ON SIGNAL BOARD
- (J) RED LEAD FROM (G) ON SIGNAL BOARD
- (K) ORANGE & RED LEAD FROM (G) ON POWER SUPPLY BOARD
- (L) RED & WHITE LEAD TO (A) ON REAR CONTROL BOARD
- (M) RED & WHITE LEAD FROM (D) ON SIGNAL BOARD
- (N) ORANGE & RED LEAD FROM (C) ON POWER SUPPLY BOARD

NUMBERED (▲-0) TRIANGLES

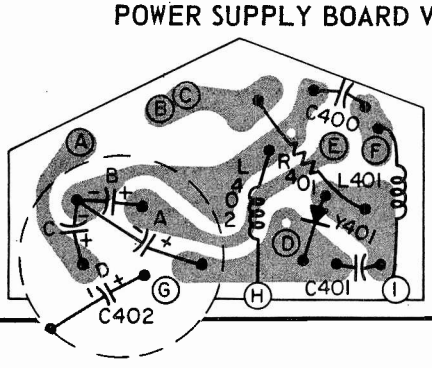
REPRESENT WIREWRAP TERMINALS ON COMPONENT BOARD FOR CONNECTION OF WIRES TO POINTS INDICATED

- ▲1 BLUE LEAD FROM T201
- ▲2 BROWN LEAD FROM (C) ON POWER SUPPLY BOARD
- ▲3 RED LEAD FROM T201 ON SWEEP BOARD

ROMAN (XI) NUMERALS

INDICATE TEST POINTS

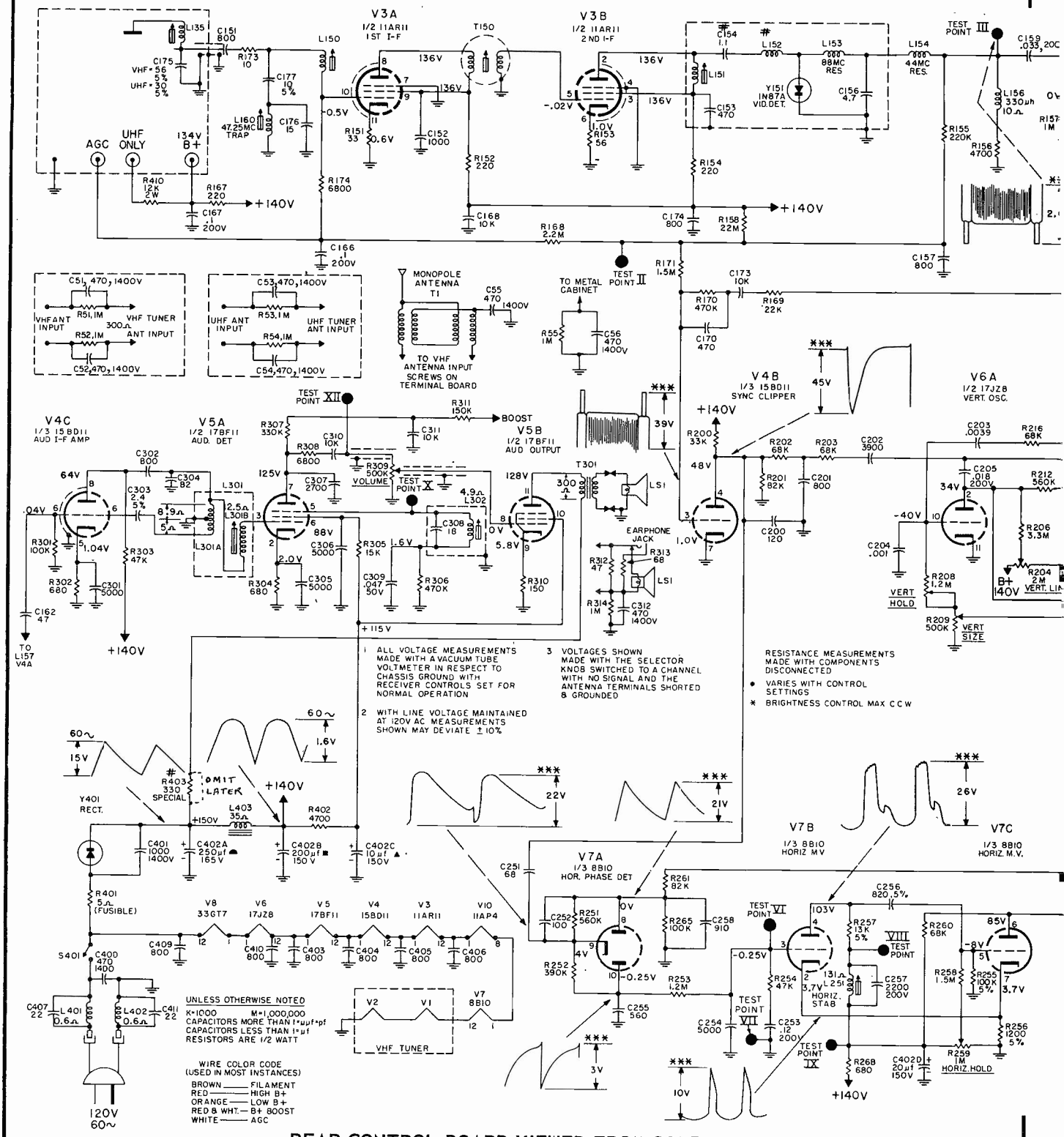
POWER SUPPLY BOARD VIEWED FROM COMPONENT SIDE



CIRCLED (A) LETTERS

- (A) ORANGE LEAD TO (P) ON SIGNAL BOARD
- (B) RED & GREEN LEAD TO S401 ON FRONT CONTROL BOARD
- (C) BROWN LEAD TO ▲2 ON SWEEP BOARD
- (D) BLUE LEAD TO (V) ON SIGNAL BOARD
- (E) RED LEAD TO (S) ON SIGNAL BOARD
- (F) ORANGE & WHITE LEAD TO S401 ON FRONT CONTROL BOARD
- (G) ORANGE & RED LEAD TO (K) ON SWEEP BOARD
- (H) END OF L401 TO AC INTERLOCK
- (I) END OF L402 TO AC INTERLOCK

GENERAL ELECTRIC Chassis SY Schematic Diagram, Continued



1 ALL VOLTAGE MEASUREMENTS MADE WITH A VACUUM TUBE VOLTMETER IN RESPECT TO CHASSIS GROUND WITH RECEIVER CONTROLS SET FOR NORMAL OPERATION

2 WITH LINE VOLTAGE MAINTAINED AT 120V AC MEASUREMENTS SHOWN MAY DEVIATE ±10%

3 VOLTAGES SHOWN MADE WITH THE SELECTOR KNOB SWITCHED TO A CHANNEL WITH NO SIGNAL AND THE ANTENNA TERMINALS SHORTED & GROUNDED

RESISTANCE MEASUREMENTS MADE WITH COMPONENTS DISCONNECTED

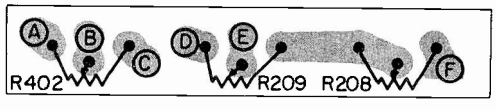
• VARIES WITH CONTROL SETTINGS

* BRIGHTNESS CONTROL MAX CCW

UNLESS OTHERWISE NOTED
K=1000 M=1,000,000
CAPACITORS MORE THAN 1=μμf+pf
CAPACITORS LESS THAN 1=μf
RESISTORS ARE 1/2 WATT

WIRE COLOR CODE (USED IN MOST INSTANCES)
BROWN — FILAMENT
RED — HIGH B+
ORANGE — LOW B+
RED & WHT. — B+ BOOST
WHITE — AGC

REAR CONTROL BOARD VIEWED FROM COMPONENT SIDE

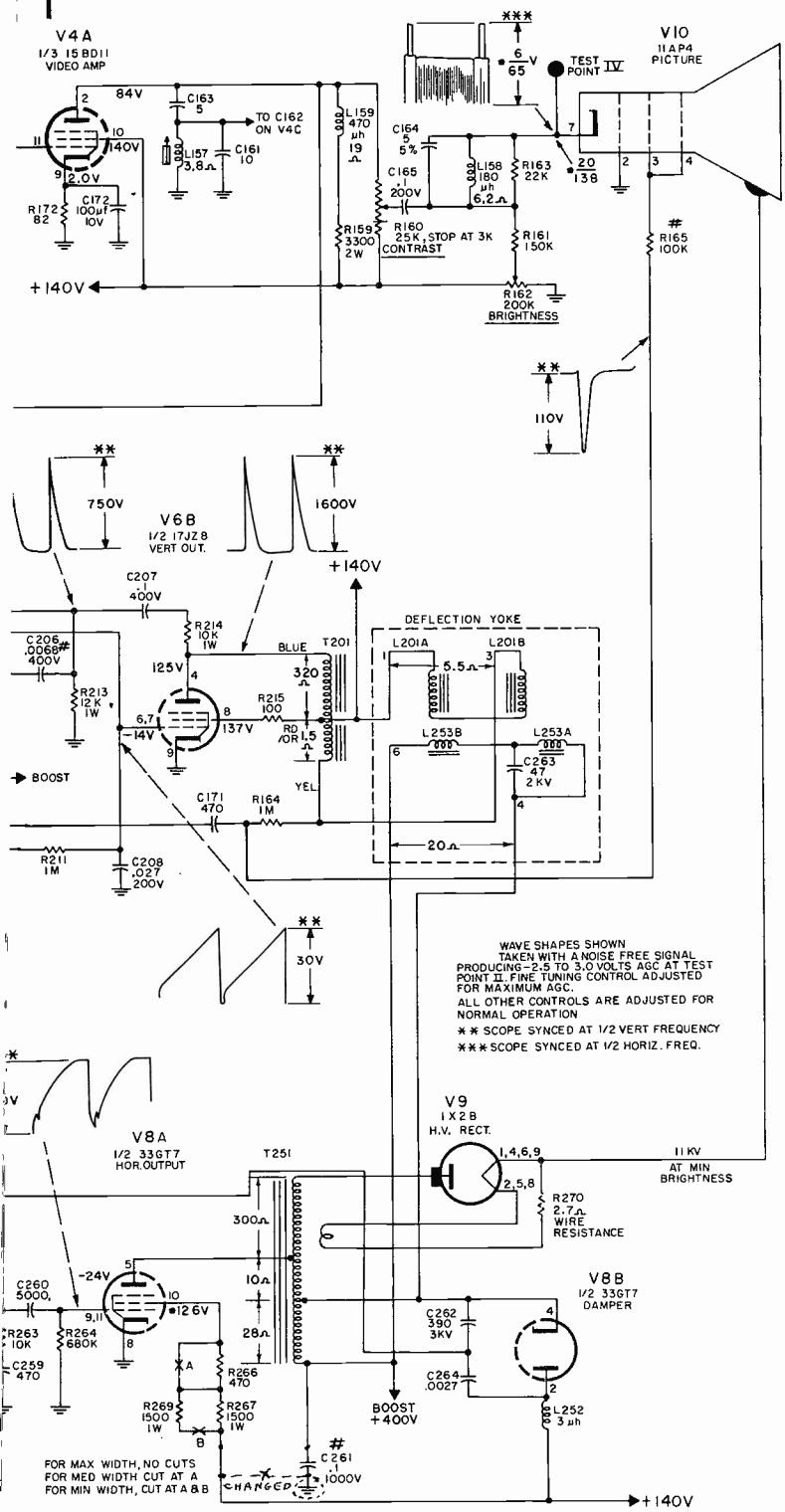


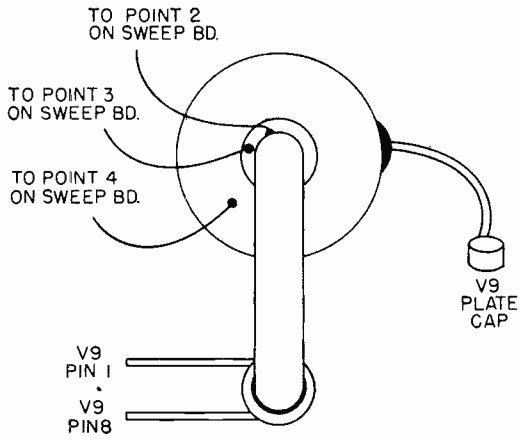
CIRCLED (A) LETTERS

REPRESENT INTERCONNECTING WIRES SOLDERED INTO BOARD

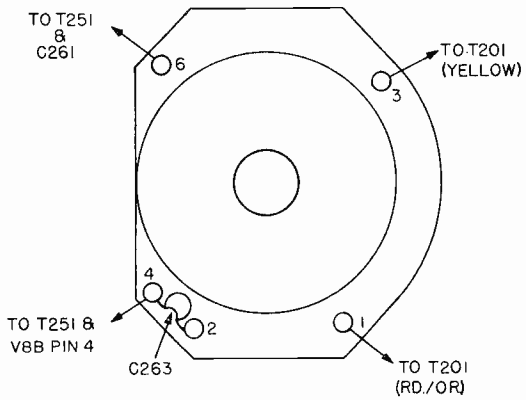
(A) RED & WHITE LEAD FROM (L) ON SWEEP BOARD
(B) WHITE & BLUE LEAD FROM (B) ON SWEEP BOARD
(C) RED LEAD FROM (4) ON SWEEP BOARD
(D) BLACK LEAD FROM (A) ON SWEEP BOARD
(E) ORANGE & GREEN LEAD FROM (C) ON SWEEP
(F) ORANGE & BLUE LEAD FROM (G) ON SWEEP

GENERAL ELECTRIC Chassis SY Schematic Diagram, Continued

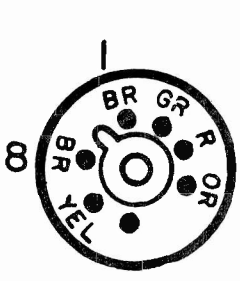




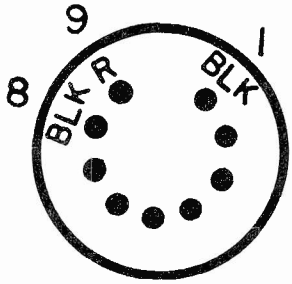
HORIZONTAL OUTPUT TRANSFORMER WIRING



YOKE WIRING



V10 PICTURE TUBE

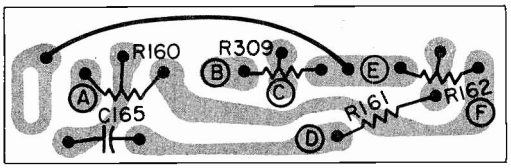


V9 H.V. RECTIFIER

TUBE PIN CONNECTIONS

WIRE COLOR CODE

FRONT CONTROL BOARD VIEWED FROM COMPONENT SIDE



- (A) BLUE & WHITE LEAD FROM (F) ON SIGNAL BOARD
- (B) GREEN AUDIO CABLE LEAD FROM (O) ON SIGNAL BOARD
- (C) YELLOW AUDIO CABLE LEAD FROM (L) ON SIGNAL BOARD
- (D) YELLOW LEAD FROM (A) ON SIGNAL BOARD
- (E) AUDIO CABLE SHIELD CONDUCTOR FROM (K) ON SIGNAL BOARD
- (F) RED LEAD FROM (J) ON SIGNAL BOARD

GENERAL ELECTRIC Chassis SY Alignment Information, Continued

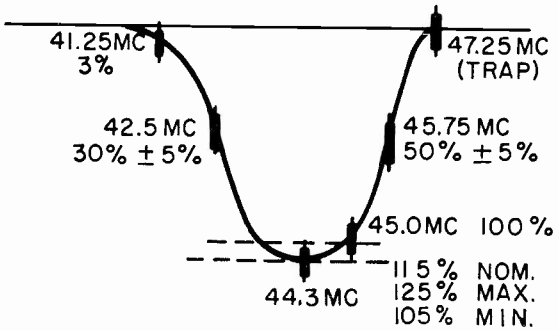
VIDEO I-F SYSTEM

AM PRE-PEAKING & TRAP FREQUENCIES

L160..... Min. 47.25MC	L150.....Max. 44.15MC
L135.....Max. 44.15MC	L151.....Max. 43.00MC
T150.....Max. 42.8MC	

GENERAL: Allow receiver and test equipment at least 20 minutes warm-up.

1. Turn volume control to minimum and contrast control fully clockwise. Set channel selector to Channel 9 and fine tuning fully counterclockwise.
2. Short antenna terminals together.
3. Connect oscilloscope to Test Point III through 22,000 ohm resistor not more than 2.5 inches away from Test Point III. Connect −3.5V bias between Test Point II and chassis.
4. Inject signals from a properly terminated AM signal generator or sweep generator, through the I-F INJECTION NETWORK shown, to the I-F injection point. This point is accessible through a hole in the tuner top deck at the base of the Oscillator V2.
5. Align the receiver to produce the response curve illustrated.
6. All cores are positioned away from printed board.



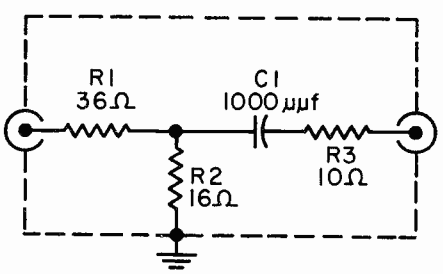
I-F RESPONSE CURVE

VIDEO I-F ALIGNMENT CHART

STEP	SIGNAL FREQUENCY	ADJUST	REMARKS
1	47.25 MC AM	Adjust L160 for minimum scope deflection	Use maximum scope sensitivity and smallest possible signal. Do not touch this adjustment.
2	38—48 MC sweep generator, with scope calibrated 3 volts peak to peak for 2-inch deflection.	Short across L150 and adjust L135 (converter plate) for maximum deflection at 44.15 MC. Remove short.	Do not retouch this adjustment.
3		L150 (1st I-F grid) for maximum amplitude of the 44.15 MC marker and for proper shaping of the nose.	Symmetry of the nose is important. No portion of the nose should be out of symmetry or tilted by more than 3%.
4		T150 (1st I-F plate) to set the 42.5 MC marker	
5		Readjust L150 only if necessary to shape the nose. Adjustment should "rock" the nose around a pivot of 44.3 MC.	Repeat 5, 6, and 7 if necessary.

AUDIO ALIGNMENT WITH ON-THE-AIR SIGNALS

1. Tune in a strong local signal and set receiver volume to a low audible level.
2. Adjust L301 for maximum undistorted, buzz-free audio output. Start with the core at the outermost position from the printed board and tune for the second "peak" encountered on the way into the coil form.
3. Connect a variable bias supply (3 to 15V) to the AGC test point with the positive lead to the chassis. Adjust bias until audio signal distorts on peaks slightly, then adjust core of L302 to curb distortion. Repeat this procedure several times at increased bias levels until maximum clarity of audio is obtained.
4. Adjust the core of L157, repeating the bias advances in step 3, to achieve the optimum setting for noise-free performance at low signal levels.



I-F INJECTION NETWORK

Magnavox

42 SERIES TELEVISION CHASSIS

(Material on pages 63 through 66)

The 42 Series is an AC/DC chassis utilizing printed-wiring construction. VHF versions of these chassis contain 14 tubes (VHF/UHF versions 15). Also, four germanium diodes are used; two in the horizontal AFC circuit and two in the Ratio Detector Audio circuit. Three silicon diodes are used; two as conventional L. V. rectifiers and one is used to supply a DC voltage to the tube filaments. These chassis may use either a 16AUP4 or a 19AVP4.

These chassis have a video bandpass of approximately 3.5MC at the 6db level and have a picture carrier frequency of 45.75MC. The video IF circuit employs a 3DK6, a 3BZ6 and the pentode section of a 5EA8. The first and second stages are AGC controlled and since a single-tuned input is used the first stage has its cathode resistor bypassed for increased gain. Traps are provided in the 2nd and 3rd IF transformer for 47.25MC and 41.25MC respectively.

ADJUSTMENTS

CENTERING--To center the raster properly rotate the two centering rings, on the rear of the deflection yoke, about the neck of the picture tube.

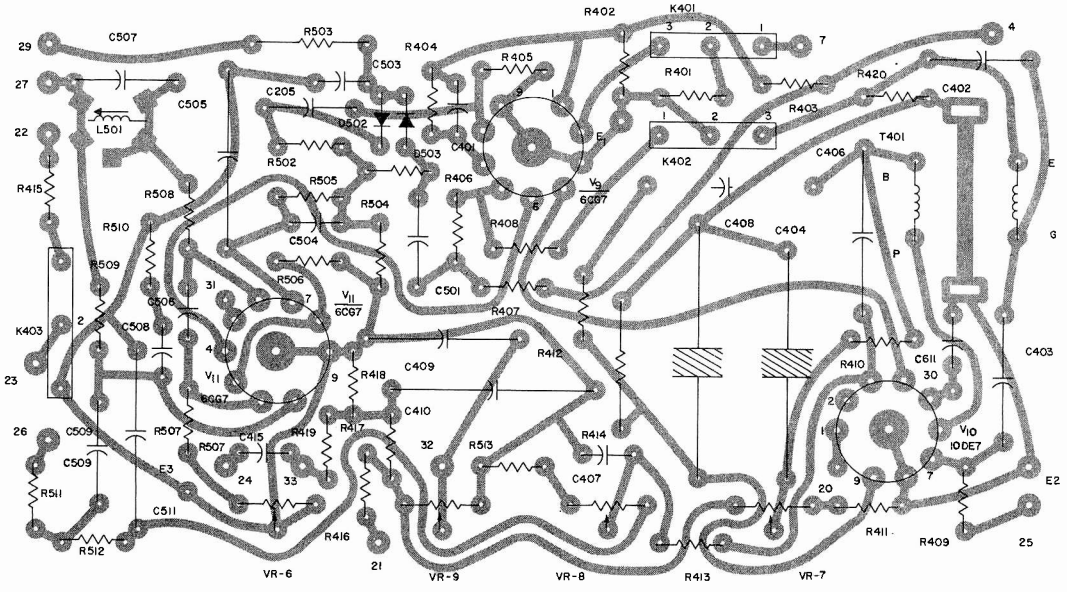
FOCUSING--These chassis employ electrostatic focus picture tubes. Proper focusing is accomplished by varying the amount of voltage applied to the focusing anode of the picture tube. A variable control is provided for the purpose.

VERTICAL HEIGHT & LINEARITY--Adjust the height and linearity controls so that the picture slightly overfills the mask with the linearity uniform from top to bottom. Adjustment of either of these controls will necessitate adjustment of the vertical hold control.

HORIZONTAL OSCILLATOR--Turn the horizontal hold control to its mid-range position. Adjust the horizontal coil until the picture falls out of sync. Now reverse the direction of adjustment until the picture just pulls into sync. Rotate the hold control to the extremes of rotation. The picture should stay in sync at both extremes or fall out by an equal number of bars. Repeat this procedure if necessary.

AGC ADJUST--This control should be used as a customer operated control. It should be adjusted in conjunction with the setting of the "Local-Distant" switch, to provide optimum performance without overload.

VHF OSCILLATOR--The VHF tuner is equipped with individual oscillator adjustment "slugs" for each channel. To adjust these "slugs" first remove the VHF Channel Selector and Fine Tuning knobs and rotate the Fine Tuning control to its mid-range position. Then, starting with the highest channel to be received and using a non-metallic adjustment tool, adjust the "slug" on the tuner marked with the same channel to which the tuner is set. Repeat this adjustment for all channels to be received without disturbing the setting of the Fine Tuning control.

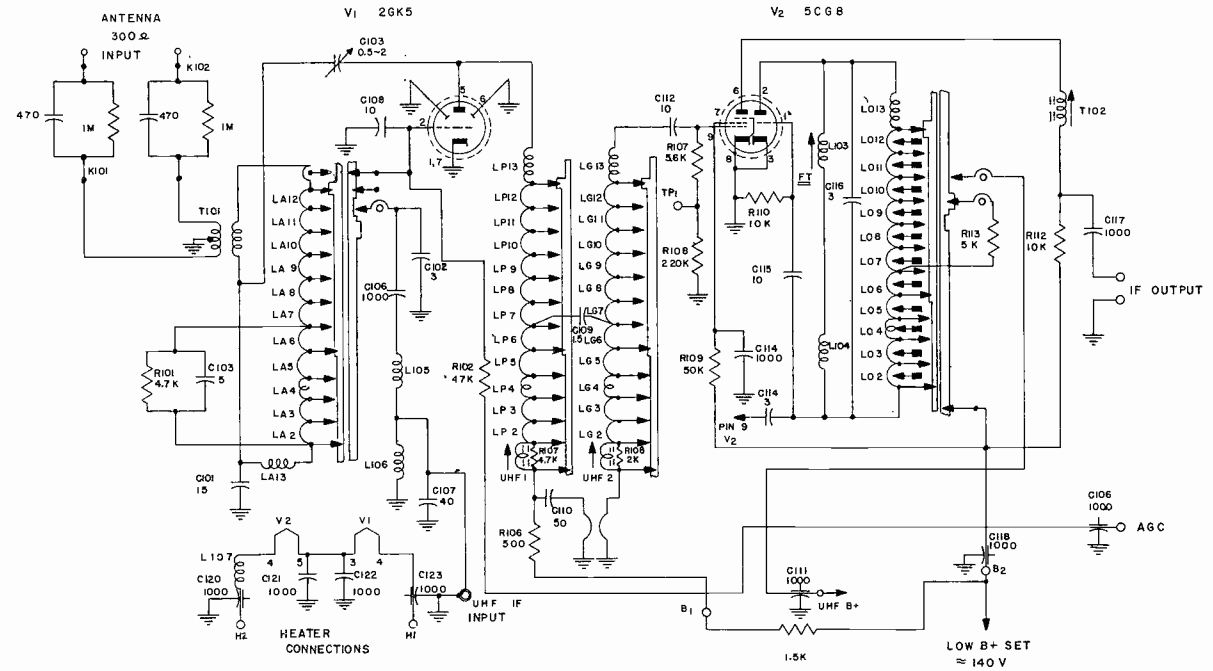


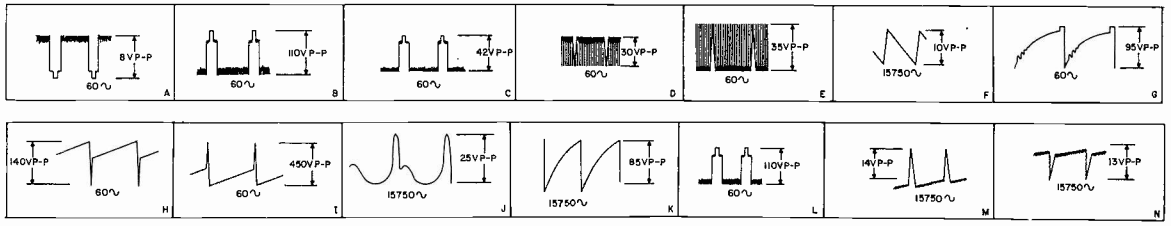
DEFLECTION BOARD

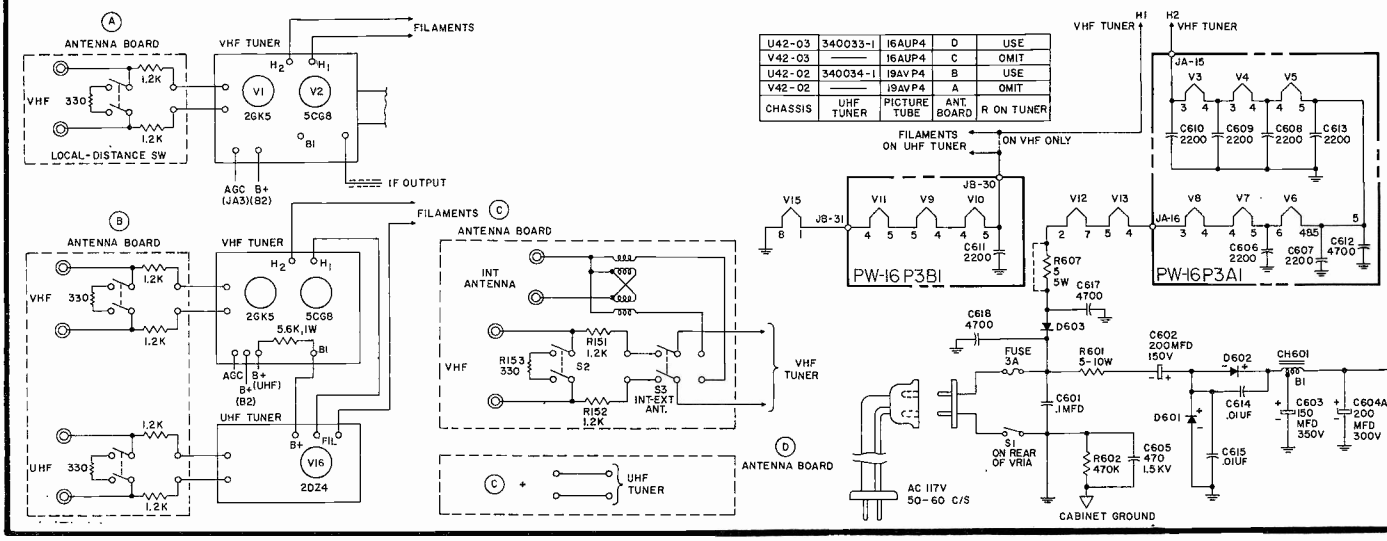
(VIEWED FROM COPPER PATTERN SIDE)

MAGNAVOX 42 Series Chassis, Service Material, Continued

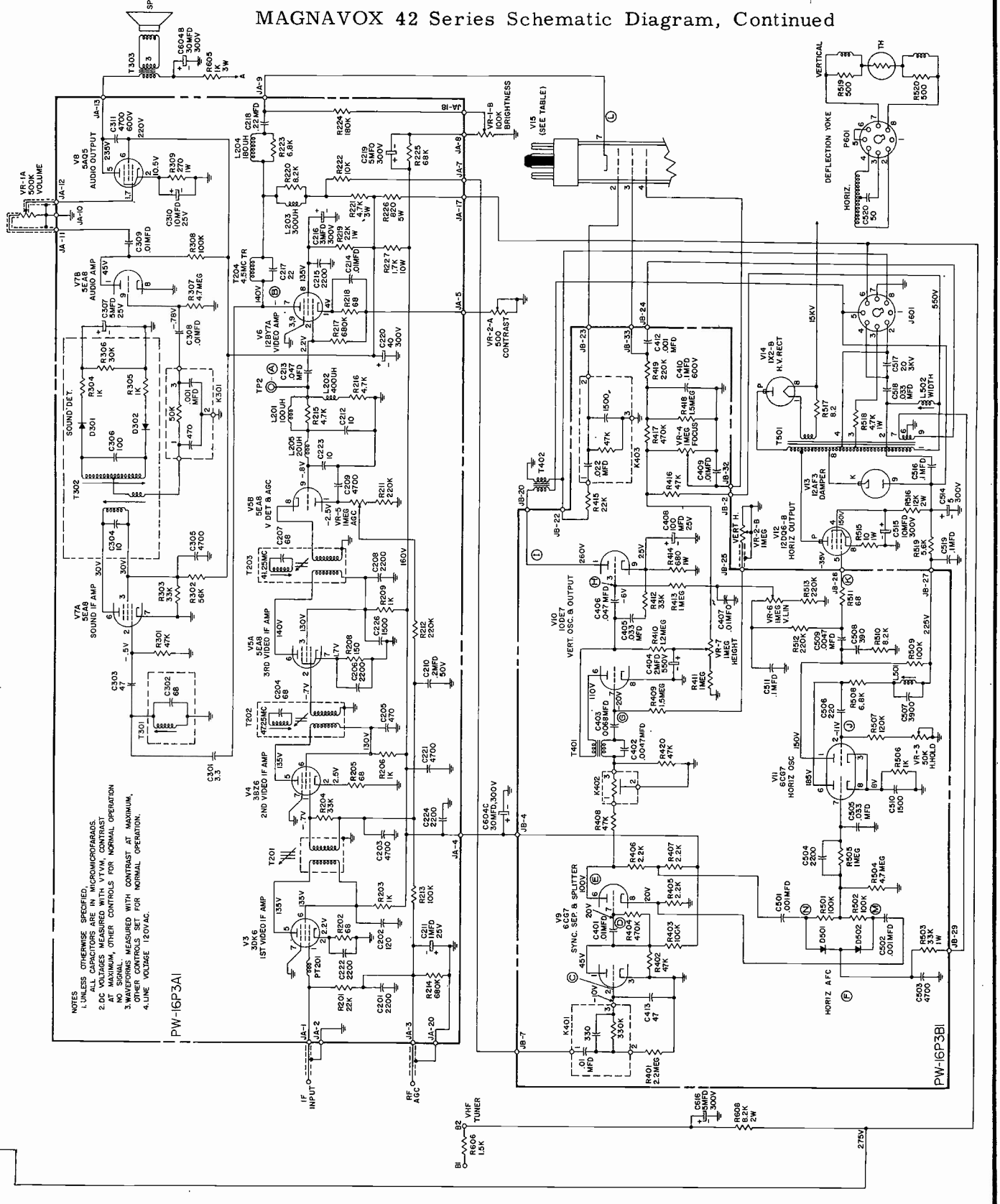
VHF TUNER SCHEMATIC DIAGRAM







MAGNAVOX 42 Series Schematic Diagram, Continued



MAGNAVOX 42 Series Chassis Schematic Diagram, Continued

MAGNAVOX 42 Series Chassis Alignment Information, Continued

VIDEO ALIGNMENT

1. Always use an isolation transformer when aligning and allow approximately 30 minutes warm-up time.
2. Using a low impedance bias supply, apply a -2.0 volts to point JA3.
3. Connect an oscilloscope thru a 10K isolation resistor to TP2. Set scope gain for 3V peak-to-peak.
4. Connect a 40MC IF Sweep Generator and Marker Generator to TP-1. Set the Sweep Generator for 10MC sweep.

MARKER FREQUENCIES	REMARKS
44.0MC	Adjust T102 (Mixer Plate) and T202 (Bottom) for maximum gain at 44.0MC.
47.5MC 47.25MC	Adjust T202 (bottom) for maximum gain at 47.5MC and T202 (top) for maximum attenuation of 47.25MC. See Figure 1.
41.0MC 41.25MC	Adjust T203 (bottom) for maximum gain at 41.0MC and T203 (top) for maximum attenuation of 41.25MC. See Figure 2.
45.8MC	Adjust T202 (bottom) for maximum gain at 45.8MC. See Figure 3.
43.3MC 45.75MC 42.75MC	Adjust T102 for maximum gain at 43.3MC. See Figure 4. Adjust T203 (bottom) and T201 to maintain 45.75MC and 42.75MC markers at 50% response. See Figure 5.
45.0MC 43.5MC 45.75MC 41.25MC 42.75MC 47.25MC	Recheck 47.25MC and 41.25MC Traps. Adjust T102 and T201 jointly to remove any tilt or peaks. If necessary adjust T203 (bottom) to maintain 45.75MC marker at 50% response. See Figure 5.

AUDIO ALIGNMENT

1. Loosely couple a 4.5MC (unmodulated) signal to the plate of the 12BY7 tube (Pin 7).
2. Connect a VTVM across C307 and adjust T301 and T302 (bottom) for maximum reading on the VTVM.
3. Connect two matched 100K resistors across C207 and connect the ground lead of the VTVM to the junction of these two resistors. Connect the probe to the pin 3 of K301.
4. Adjust T302 (Top) for zero reading on the VTVM.

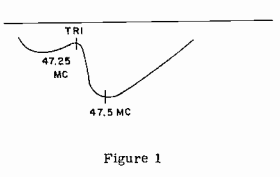


Figure 1

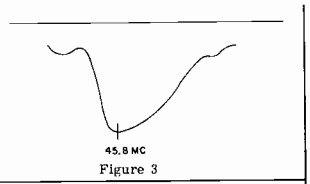


Figure 3

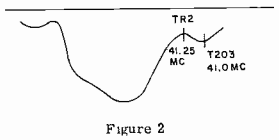


Figure 2

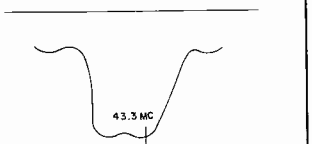


Figure 4

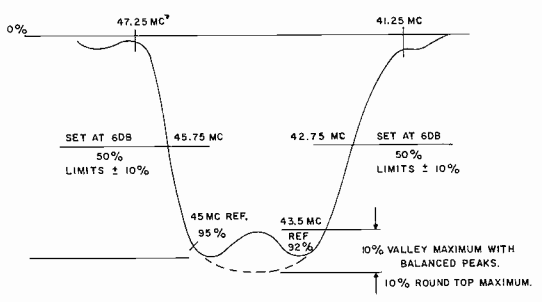
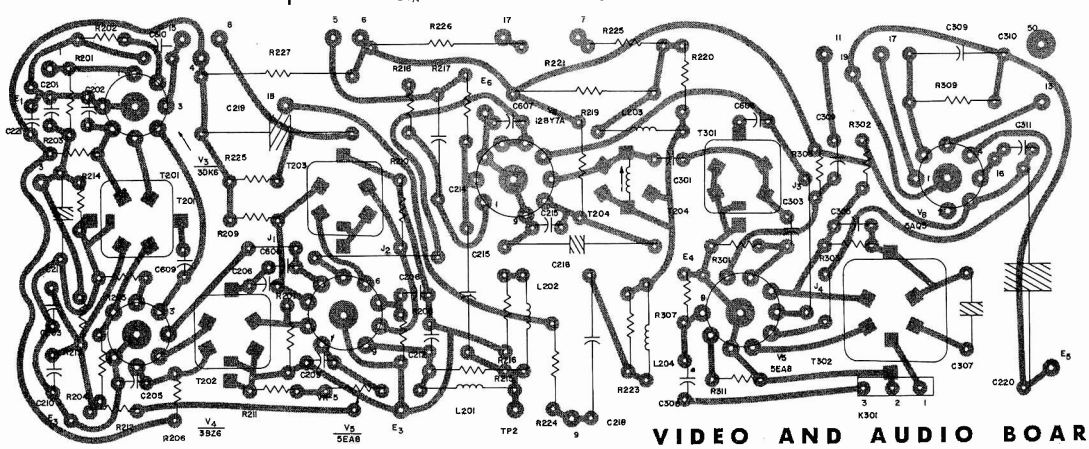
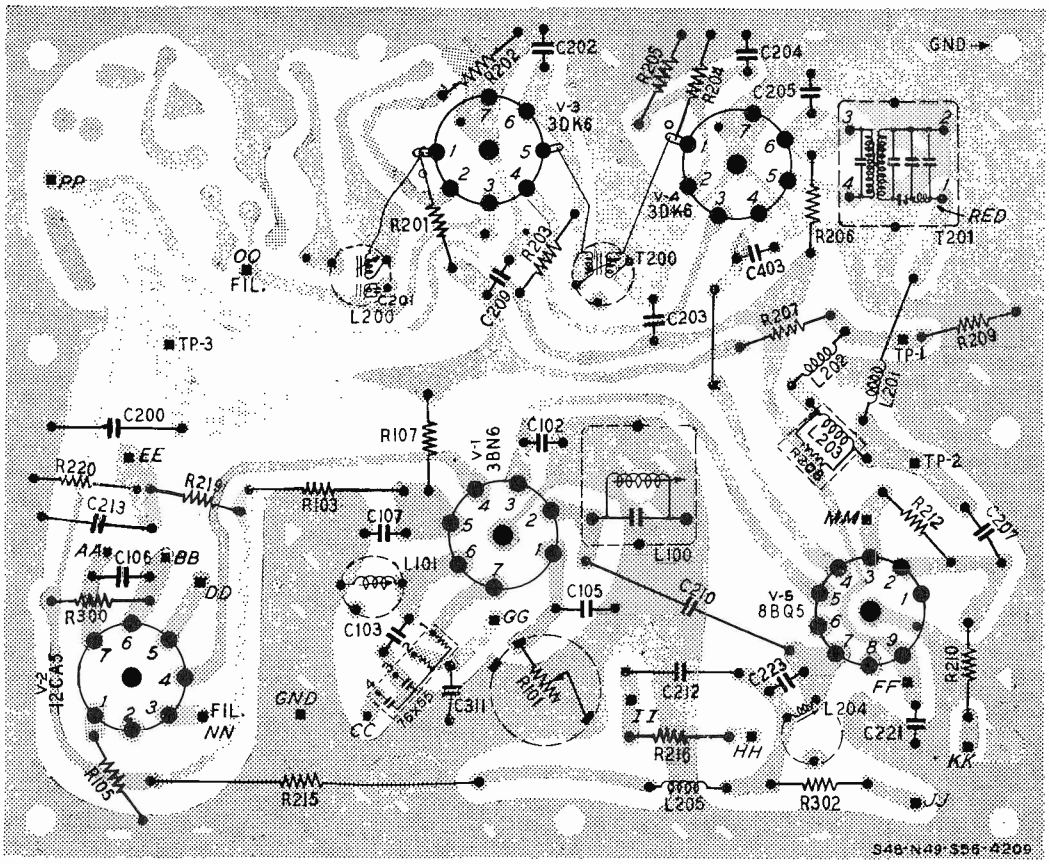


Figure 5



MONTGOMERY WARD



Airline

TELEVISION RECEIVER

MODELS

WG-3214A - WG-4214A
WG-3314A - WG-4314A
WG-3344A - WG-4344A
WG-3354A - WG-4354A

(Data on pages 67 through 70)

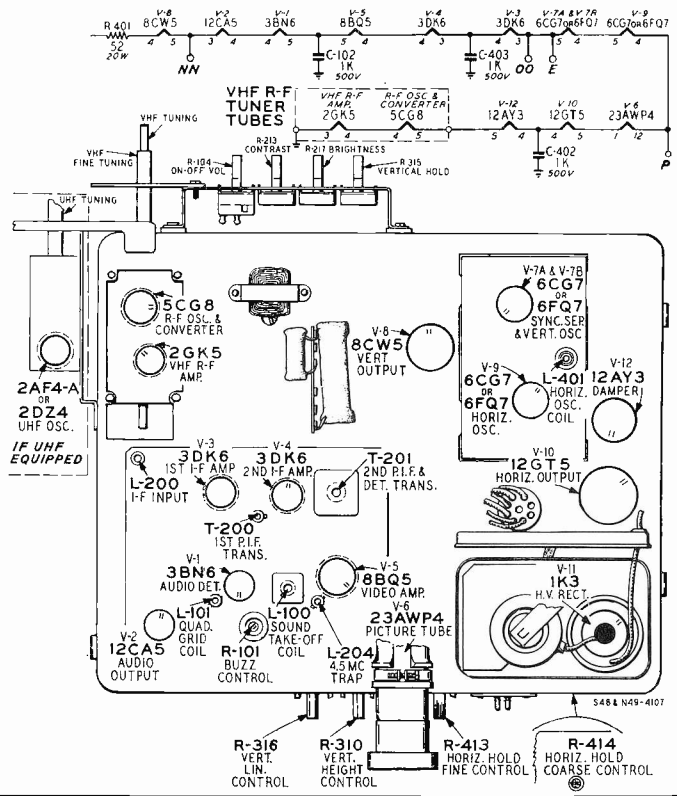
S-38A2725 PRINTED ASSEMBLY (I-F)

INSTRUCTIONS CHASSIS REMOVAL

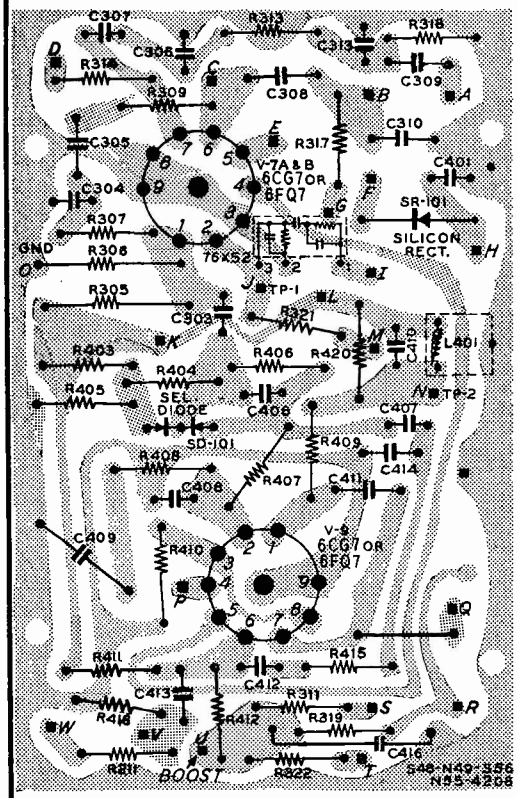
1. Remove all the knobs from front of cabinet.
2. Remove cabinet back and disconnect the yoke plug, pix tube socket, anode lead, beam aligner (if used) and lead from high voltage can to pix tube mounting ring screw.
3. Disconnect the speaker leads.
4. Disconnect the antenna leads from the tuner.
5. Four screws are used in mounting the chassis to the cabinet. One screw is located at the front (near the tuner), one screw at the rear, holding brace bracket to the cabinet and the other two screws are accessible through the holes in the perforated bottom panel. Remove the four screws and carefully remove the chassis from the cabinet.

DEFLECTION YOKE ADJUSTMENT — The deflection yoke should be positioned as far forward on the neck of the tube as the bell will allow. Then, if the lines of the raster are not horizontal or squared with the picture mask, rotate the deflection yoke until this condition is obtained. Upon completion of this adjustment, tighten the clamp at the rear of the deflection yoke.

CENTERING ADJUSTMENT — If horizontal or vertical centering is required this should be done at 105V line (if possible) to obtain normal setting. Adjust each ring in the centering device until proper centering is determined. If centering is not adjusted properly, focus may be poor.



MONTGOMERY WARD Models WG-3214A, WG-4214A, etc., Schematic Diagram

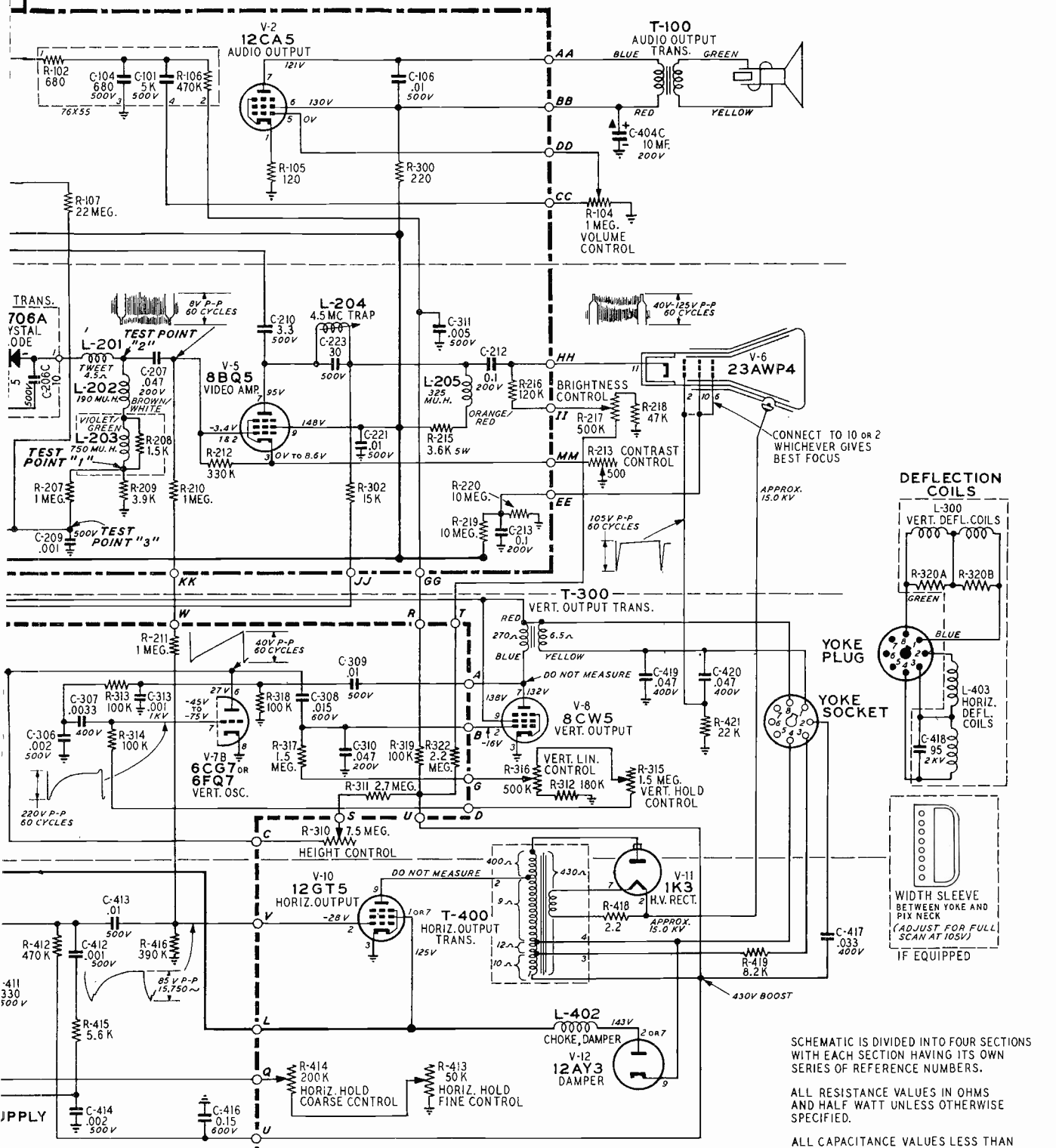


(S-38A2724) SWEEP PRINTED CIRCUIT BOARD ASSEMBLY

OSCILLOSCOPE WAVEFORM PATTERNS

The waveforms shown on the schematic diagram are as observed on a Tektronix type 524D wide band television oscilloscope with the receiver tuned to a reasonably strong signal and a normal picture. The voltages shown on each waveform are the approximate peak to peak amplitudes. The frequency accompanying each waveform indicates the repetition rate of the waveform not the sweep rate of the

MONTGOMERY WARD Models WG-3214A, WG-4214A, etc., Diagram, Continued



SCHEMATIC IS DIVIDED INTO FOUR SECTIONS WITH EACH SECTION HAVING ITS OWN SERIES OF REFERENCE NUMBERS.

ALL RESISTANCE VALUES IN OHMS AND HALF WATT UNLESS OTHERWISE SPECIFIED.

ALL CAPACITANCE VALUES LESS THAN 1.0 IN MF. AND ABOVE 1.0 IN PF. UNLESS OTHERWISE NOTED.

COIL RESISTANCE VALUES LESS THAN 1.0 OHM ARE NOT SHOWN.

K=1000

oscilloscope. If the waveforms are observed on the oscilloscope with a poor high frequency response, the corners of the pulses will tend to be more rounded than those shown on the schematic diagram and the amplitude of any high frequency pulse will tend to be less.

DC SOCKET VOLTAGES

All DC socket voltages shown on the schematic are measured with a high impedance VTVM and under zero signal conditions.

MONTGOMERY WARD Alignment Information for various models

TEST EQUIPMENT — To service this receiver properly, it is recommended that the following test equipment be available.

R-F SWEEP GENERATOR meeting the following requirements:

(a) Frequency ranges:
38 to 90 mc, 10 mc sweep width
170 to 225 mc, 10 mc sweep width
470 to 890 mc, 10 mc sweep width

(b) Output adjustable with at least .1 volt maximum.
(c) Output constant on all ranges.
(d) Flat output in all attenuator positions.
(e) A source of the following Markers:

45.75 mc	43.5 mc
44.5 mc	42.4 mc
	41.25 mc

CATHODE-RAY OSCILLOSCOPE with good low frequency response in vertical amplification and an input calibrating source.

BIAS SOURCE—1.5V to 10.0V.

DIODE DETECTOR

PROCEDURE

1. Connect sweep output to 2nd I-F grid (pin #1-V4), oscilloscope to Test Point "I". Set output of sweeper so that some ouput is indicated in oscilloscope. Adjust 2nd PIF transformer (T-201) primary (bottom) and secondary (top) simultaneously for maximum output and symmetry. Readjust sweeper output for 4.0V P-P on oscilloscope. Touch-up to give the waveform shown in figure 3.

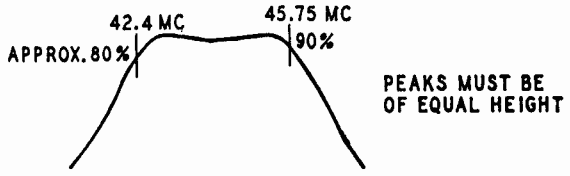


Fig. 3—2nd Pix I-F Response

2. With approximately —5.5V bias on AGC line (Test Point "3") connect sweeper to 1st I-F grid (Pin #1-V3.) Reduce sweeper output to compensate for additional gain of 1st stage (4.0V. P-P on oscilloscope). Adjust 1st I-F transformer primary (top) and secondary (bottom) for maximum gain and symmetry with 45.75 mc marker. (See Figure 4.)

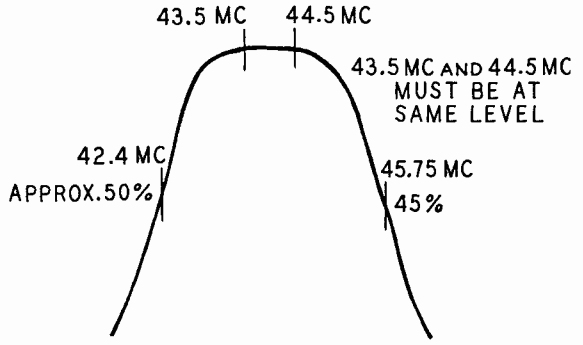


Fig. 4—Pix I-F Response From 1st Pix I-F Grid

3. Set channel selector to Channel 13. Connect sweeper with very short leads through a 10 K mmf disc ceramic capacitor to mixer grid (I-F test point — see figure 6). Readjust sweep output for 4.0V P-P, adjust 41.25 mc trap (bottom of L-200) so that notch is at marker, adjust mixer plate coil (L-2 primary) and input grid coil (top of L-200) for maximum gain and symmetry with 45.75 mc marker at 50%. (Figure 5.)

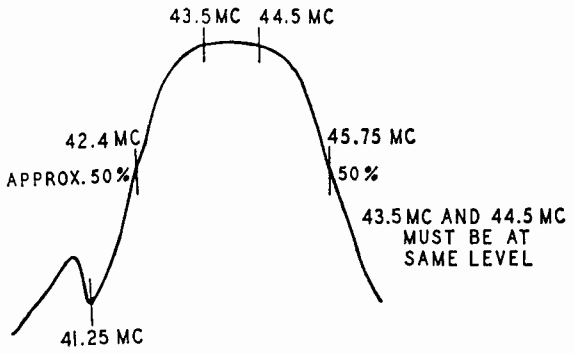


Fig. 5—Overall Pix I-F Response Curve

In all positions, final touch up should be made with 4.0V. P-P amplitude on oscilloscope. Once a stage has been adjusted, do not readjust with the sweeper connected to another stage. For instance, after adjusting the output stage and moving the sweeper to the 1st grid to adjust 1st I-F transformer, do not move the slugs in the output stage, etc.

In general, the position of the 45.75 mc marker should be set with the primary and the symmetry adjusted with the secondary. An approximate setting of the input grid coil may be obtained by adjusting for maximum amplitude of the 45.75 marker. This amplifier **cannot** be adjusted for bandwidth. It must be adjusted for maximum gain, symmetry and position of 45.75 marker.

VIDEO

With 4.5 Mc unmodulated signal into grid of the video amplifier tube (Test Point "2") and VTVM on picture tube cathode, tune 4.5 Mc trap for minimum response. VTVM on O-10 V AC scale. This adjustment can also be made while observing a picture from a station. Tune trap for least 4.5 Mc beat (grainy appearance) in picture.

AUDIO

1. Tune in a TV station and reduce signal strength at antenna terminals by use of an attenuator or similar device until a "hiss" accompanies the sound.
2. Adjust sound take-off coil (L-100) quadrature coil (L-101) and buzz control (R-101) for maximum undistorted sound and minimum buzz.
3. If "hiss" disappears during step 2, further reduce signal strength.

MOTOROLA CHASSIS TS-584C-00

(Service material on pages 71 through 76)

CHASSIS REMOVAL HINTS

19" & 23" Table Models

The chassis can be completely exposed by removing the back and bottom covers. Voltages and waveforms can be taken and all chassis components are accessable.

23" Consoles

Remove the chassis, tuner and control mounting bracket as a unit from the rear of the cabinet. Always replace grounding braids and/or clips and dress all leads properly (see receiver rear view photos) when re-installing chassis.

23K109 Only

The CRT and chassis are removed as a unit from the rear of the cabinet.

FINE TUNING ADJUSTMENTS

Prior to making any fine tuning adjustments, set the optimizer control to its mid-mechanical position (see "Optimizer Control" in this section).

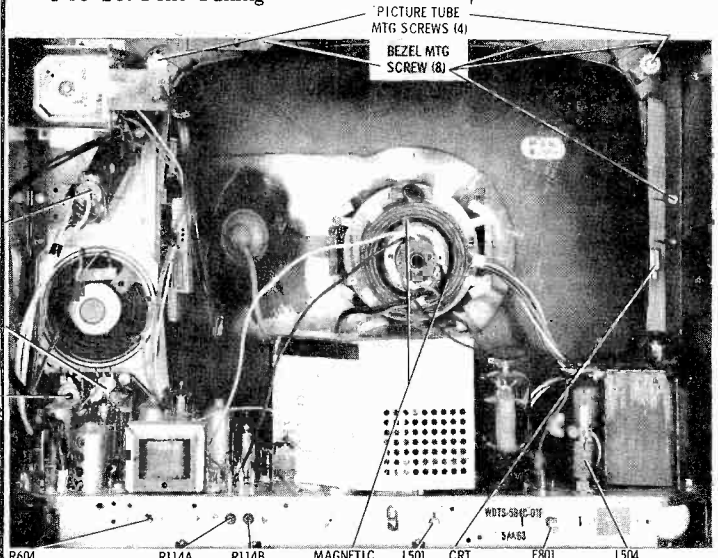
Switch Type Tuners With Continuously Variable Fine Tuning

Center the fine tuning control mechanically. Set tuner to the highest numbered available channel and with an insulated screwdriver, adjust the individual channel oscillator screw for best picture and sound. Adjust all other available channels in descending order. Only a slight adjustment should be necessary to bring in each channel.

Switch Type Tuners With Concentric Pre-Set Fine Tuning

Rotate the fine tuning knob in either direction for best picture and sound on all available channels. Turning the fine tuning shaft to the right or left engages the pre-set gears. The gears, in turn, change the position of the core in the oscillator coil. Individual coils are used for each channel.

MODEL 23K109 CRT MOUNTING



MODEL 19T38 – CRT MOUNTING

Combination models listed in chart below use TV chassis similar to other sets.

MODEL	CHASSIS
23FR25M,W	LSKTS-584
Y23FR25M,W	LSKTS-584Y
23FR26MP	LSKTS-584
Y23FR26MP	LSKTS-584Y
23FR27CW	LSKTS-584
Y23FR27CW	LSKTS-584Y
23FR30W	SKTS-584
Y23FR30W	SKTS-584Y
23FR31MB	SKTS-584
Y23FR31MB	SKTS-584Y

MODEL CHART

MODEL	CHASSIS
19T38BEF	WDTS-584
Y19T38BEF	WDTS-584Y
19T38BEFZ	WDTS-584
Y19T38BEFZ	WDTS-584Y
19T38CHF	WDTS-584
Y19T38CHF	WDTS-584Y
19T38CHFZ	WDTS-584
Y19T38CHFZ	WDTS-584Y
19T39AWF	NDTS-584
Y19T39AWF	NDTS-584Y
19T39AWFZ	NDTS-584
Y19T39AWFZ	NDTS-584Y
19T39CHF	NDTS-584
Y19T39CHF	NDTS-584Y
19T39CHFZ	NDTS-584
Y19T39CHFZ	NDTS-584Y
19T40MPGF	NDTS-584
Y19T40MPGF	NDTS-584Y
19T40MPGFZ	NDTS-584
Y19T40MPGFZ	NDTS-584Y
19T40WGF	NDTS-584
Y19T40WGF	NDTS-584Y
19T40WGFZ	NDTS-584
Y19T40WGFZ	NDTS-584Y
19T50GL	NDTS-584
Y19T50GL	NDTS-584Y
19T50GR	NDTS-584
Y19T50GR	NDTS-584Y
23K109CW	TDETS-584
Y23K109CW	TDETS-584Y
23K109M	TDETS-584
Y23K109M	TDETS-584Y
23K109W	TDETS-584
Y23K109W	TDETS-584Y
23K120M	WKTS-584
Y23K120M	WKTS-584Y
23K120W	WKTS-584
Y23K120W	WKTS-584Y
23K122B	WKTS-584
Y23K122B	WKTS-584Y
23K122M	WKTS-584
Y23K122M	WKTS-584Y
23K122W	WKTS-584
Y23K122W	WKTS-584Y
23K123MP	WKTS-584
Y23K123MP	WKTS-584Y
23K124CW	WKTS-584
Y23K124CW	WKTS-584Y
23K124WH	WKTS-584
Y23K124WH	WKTS-584Y
23K127M	PKTS-584
Y23K127M	PKTS-584Y
23K127W	PKTS-584
Y23K127W	PKTS-584Y
23K128CW	PKTS-584
Y23K128CW	PKTS-584Y
23K128WH	PKTS-584
Y23K128WH	PKTS-584Y
23K129M	PKTS-584
Y23K129M	PKTS-584Y
23K129W	PKTS-584
Y23K129W	PKTS-584Y
23K132M	PKTS-584
Y23K132M	PKTS-584Y
23K133CW	PKTS-584
Y23K133CW	PKTS-584Y
23K133MP	PKTS-584
Y23K133MP	PKTS-584Y
23K134W	PKTS-584
Y23K134W	PKTS-584Y

MOTOROLA Chassis TS-584C Alignment Information, Continued

CHASSIS ALIGNMENT PROCEDURE

PRE-ALIGNMENT INSTRUCTIONS

Before alignment of the video IF section is attempted, it is advisable to thoroughly check the system. If alignment is attempted on an IF section in which a faulty component exists, successful alignment will probably be impossible and the entire procedure will have to be repeated when the real cause of the trouble is corrected. Preliminary tests of the system should include voltage and resistance measurements, routine checks for bad soldering connections and visual inspection of the circuits for over-heated components as well as for obvious wiring defects.

VIDEO IF & MIXER ALIGNMENT

Pre-Alignment Steps

1. Maintain line voltage at 120 with variac.

2. Remove the deflection yoke plug to eliminate RF interference radiation.

3. Disable local oscillator. On turret type tuners, set tuner between channels. On switch type tuners, short out pins 8 and 9 of mixer - oscillator tube with a fine piece of bare wire, or short pin 9 to tube shield with a fine piece of wire.

4. Apply the negative lead of a 6.0 volt bias supply to I. F. AGC buss and positive lead to chassis ground.

5. Connect a 1500 ohm 60 watt voltage normalizing resistor from B+ to chassis.

6. Set the contrast control at minimum (extreme counter-clockwise position) and set optimizer control for maximum resistance (extreme counter-clockwise position).

7. Insert a 8200 ohm, 1/2 watt resistor from the top of the diode (grid of video output) load to ground.

8. Short across tuner input terminals.

9. Maintain 2 to 5 volts peak-to-peak at the grid of video amp except when specific values are given in the procedure chart.

10. Refer to Video I. F. and Sound Alignment Detail for component and test point locations.

NOTE: To reduce the possibility of inter-action between the two tuning cores in a double tuned transformer or coil, each core should be adjusted for optimum response in the tuning position nearest its respective end of the coil form.

4.5 MC TRAP ADJUSTMENT (L-110A)

1. Carefully tune receiver to local station and advance contrast control.

2. Adjust local oscillator (with fine tuning control) to bring 4.5 Mc interference strongly into the picture.

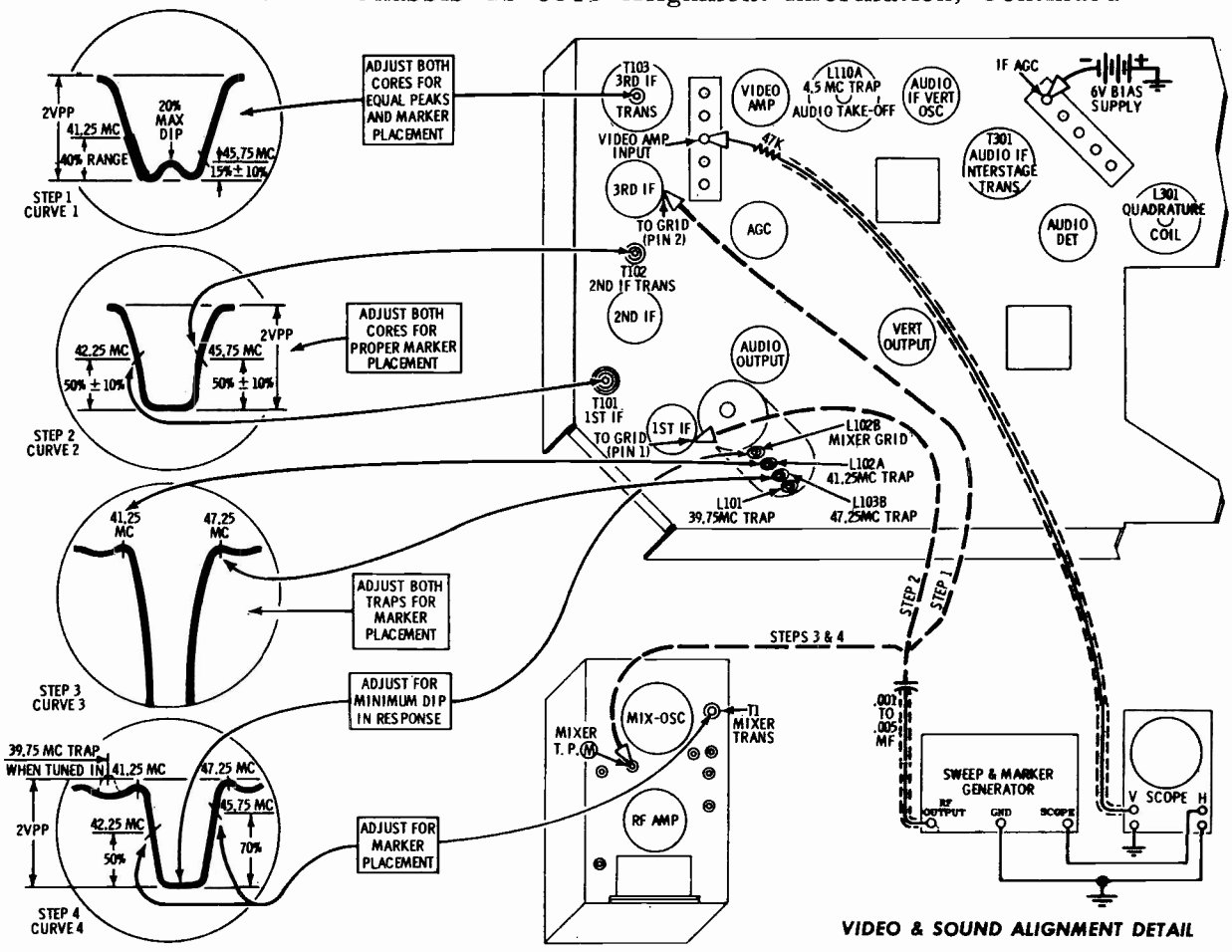
3. Adjust sound trap (L-110A) to find the two points of adjustment at which the sound beat is just noticeable on the picture tube screen. Rotate the core toward the center of the two points. Use minimum amount of inductance (core out of coil) that will result in no apparent beat interference.

VIDEO IF & MIXER ALIGNMENT PROCEDURE

STEP	SWEEP GEN. & MARKER	INDICATOR	ADJUST	ADJUST FOR AND/OR REMARKS
1.	To grid of 3rd IF thru .001mf cap. Set sweep to approx. 44Mc, markers as required.	Scope to grid of Video Amp thru 47K ohm resistor.	Both cores of 3rd IF trans (T-103)	Equal peaks and marker placement as shown in curve #1.
2.	To grid (pin 1) of 1st IF Amp thru .001mf cap. Wrap a wire around grid pin of tube and connect generator to wire. Set sweep to 44Mc, markers as required.	Same as step #1.	1st IF trans (T-101) 2nd IF trans (T-102)	Proper 42.25 Mc marker placement. See curve #2. Proper 45.75 Mc marker placement. See curve #3. NOTE: Mixer plate transformer (T-1) may cause suck-out in IF response. Detune transformer if desired.
3.	To mixer T.P. Ⓜ thru .001mf cap. Set sweep to 44Mc, markers as required.	Same as step #1.	47.25 Mc trap (L-103B) & 41.25Mc Trap (L-102A)	Minimum response at proper trap frequency. See curve #3. 39.75 Mc trap (L-101) core is turned fully into coil at a trap frequency of 36 Mc or lower. This trap is set at 39.75 Mc only when upper adjacent video interference is present.* NOTE: Temporary removal of bias and an increase of generator output may be required to see traps clearly.
4.	Same as step #2.	Same as step #1.	Mixer plate trans, (T-1 on tuner) & 1st IF grid coil (L-102B)	To obtain curve #4. The mixer transformer affects the center peak and the grid coil affects the two outside peaks. Tune coils simultaneously for proper tuning and bandwidth consistant with maximum gain. If necessary, the 1st and 2nd IF transformers can be touched-up to obtain proper response as shown in curve #4. If interference from an upper adjacent TV channel is present, L-101 should be adjusted for 39.75 Mc. If there is no interference from an upper adjacent channel, L-101 is adjusted out of the band pass or at 36 Mc.

*The 39.75 Mc trap (L-101) is factory adjusted to 36 Mc and is not tuned to 39.75 Mc unless adjacent video interference is present. Adjust trap by tuning core out of coil until adjacent video interference is visually no longer present on CRT.

MOTOROLA Chassis TS-584C Alignment Information, Continued



VIDEO & SOUND ALIGNMENT DETAIL

SOUND ALIGNMENT

(Station Signal Method)

The sound system used in this receiver consists of an audio I. F. amplifier stage, a quadrature grid detector and an output stage. Since this type of sound system is extremely sensitive, relatively small input signal voltage will cause grid current to flow in both the I. F. amplifier and the detector stages. Grid current through the tuned coils will load them down making the adjustment extremely broad and alignment impossible. For this reason, it is necessary to use a very weak signal when aligning the driver and the detector input coils. Actually, the signal should be well down into the noise level for proper tuning action.

Preliminary Steps

1. Tune in a strong TV station.

2. Adjust all controls for normal picture and sound.

3. Refer to Video I. F. & Mixer Alignment Detail for coil and test point locations.

STEP	STATION	INDICATOR	ADJUST	ADJUSTMENT FOR AND/OR REMARKS
1.	Strong signal	VTVM to point A on quad. coil L-301 (See schematic diagram)	L-301 (quad. coil)	Maximum deflection (coarse adjustment) of two possible maximum tuning points, use that giving largest voltage reading.*
2.	"	Listening test	"	Maximum sound with minimum distortion (fine adjustment).
3.	Weak signal	"	T-301 (inter-stage coil)	Maximum sound with minimum distortion (maintain hiss level).**
4.	"	"	L-110B (take off coil)	Maximum sound with minimum distortion.

If sound is not clear at this point, repeat the above procedure as necessary.

*The purpose of the top pre-set core is to enable the adjustable core to make the tuning range required while reducing the physical length. If the pre-set core should be misadjusted by previous service work, merely re-set near top end of coil and tune for maximum.

**The signal must be weakened considerably either by disconnecting one side of the antenna lead or connecting low value resistors across the antenna terminals until a pronounced hiss appears in the sound. The hiss level must be maintained for proper alignment.

MOTOROLA Chassis TS-584C-00 Schematic Diagram, Continued

NOTES:

VOLTAGE MEASUREMENTS
1. TAKEN FROM POINT INDICATED TO CHASSIS WITH A VTVM. ±20%
2. LINE VOLTAGE MAINTAINED AT 120V AC.
3. VOLTAGES INDICATED BY AN ASTERISK WILL VARY WITH ASSOCIATED CONTROL SETTINGS.
4. TAKEN WITH CONTRAST CONTROL AT MINIMUM AND ALL OTHER CONTROLS IN NORMAL OPERATING POSITION WITH NO SIGNAL INPUT.
5. TUNER ON CHANNEL 13 OR CHANNEL OF LEAST NOISE WITH ANTENNA TERMINALS SHORTED.

WAVEFORM MEASUREMENTS
1. TAKEN FROM POINT INDICATED TO CHASSIS WITH A WIDE-BAND OSCILLOSCOPE.
2. OSCILLOSCOPE SYNCED NEAR SWEEP RATE INDICATED.
3. TAKEN WITH STRONG SIGNAL, CONTRAST CONTROL AT MAXIMUM; ALL OTHER CONTROLS IN NORMAL OPERATING POSITION.

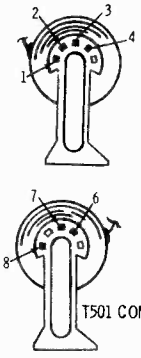
CAPACITORS: UNLESS OTHERWISE SPECIFIED, VALUES LESS THAN ONE IN MF; ALL OTHERS IN MMF.

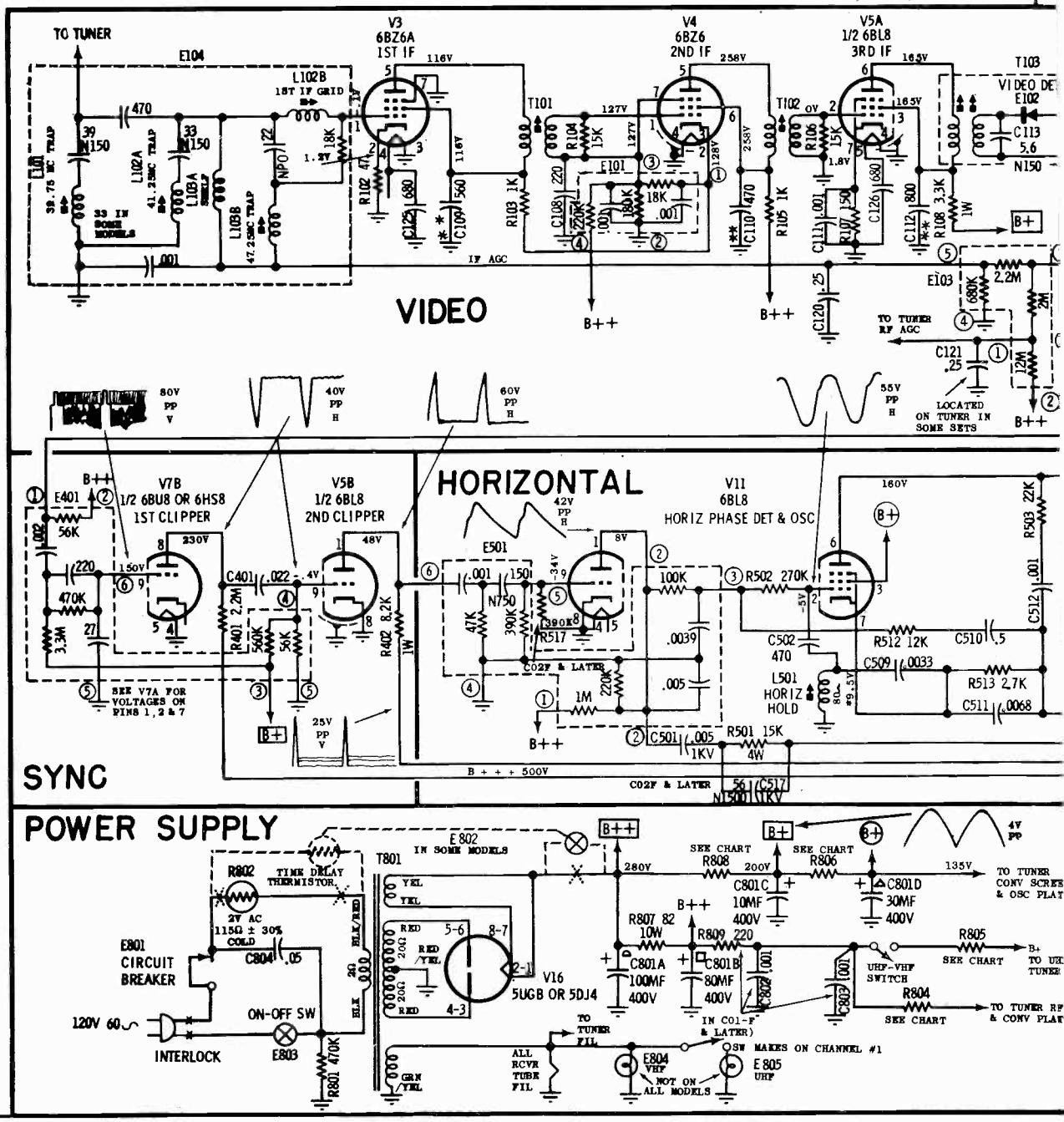
* INDICATES VOLTAGE VARIES WITH CONTROL SETTINGS.
** INDICATES SPECIAL COMPONENTS.
***
INDICATES CONTROLS MAY BE GANGED IN SOME CHASSIS.

TELEVISION CHASSIS TS-584C-00

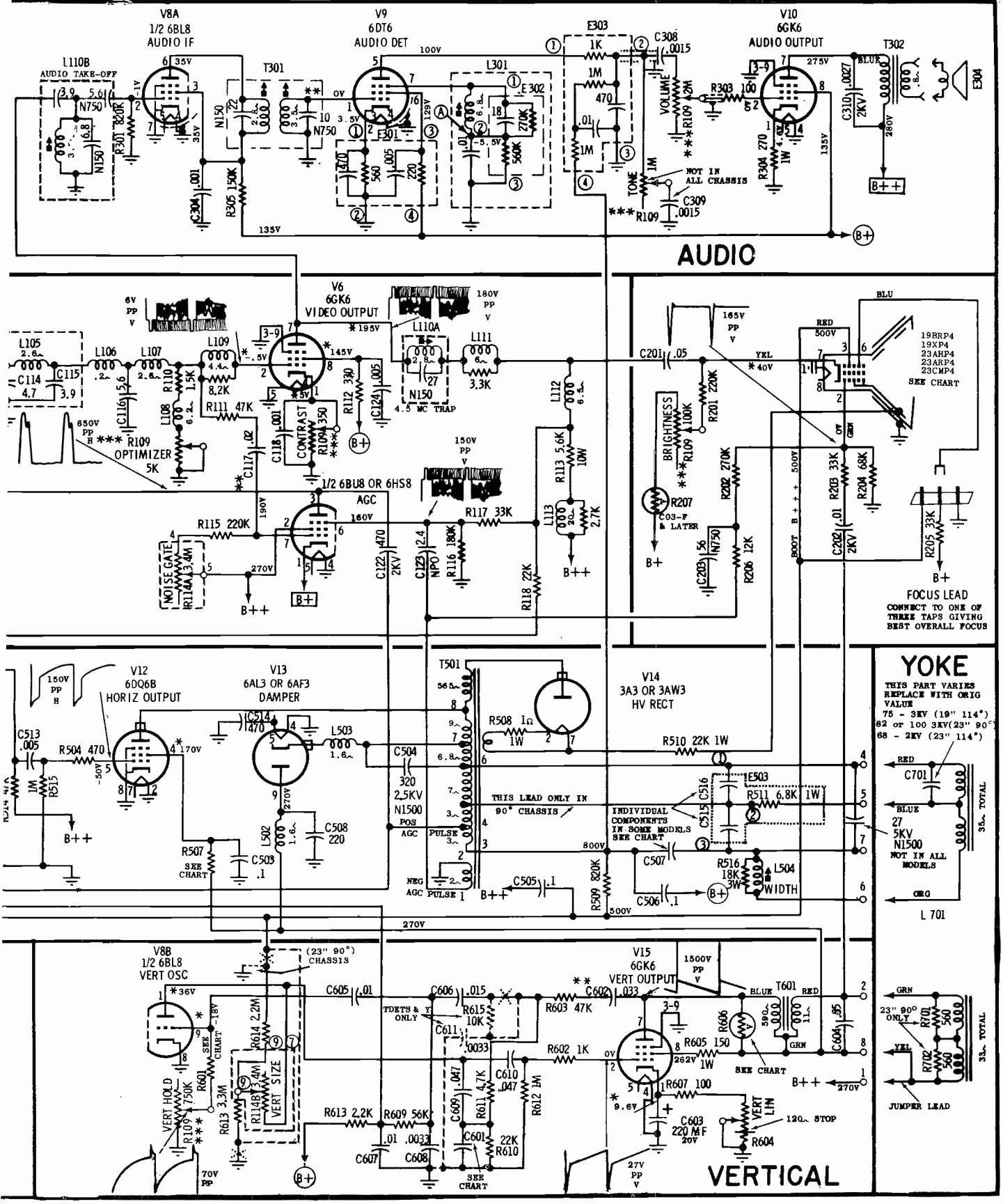
NOTE: TO IDENTIFY CHASSIS, USE THE LAST 3 LETTERS PRECEEDING THE CHASSIS NUMBER ONLY.

CHASSIS	CRT	C507	C515	C516	C601	R507	R601	R805	R806	R808	R606	R804
--DTS584	19XP4 OR 19BRP4 114° DEFL	.03	320 2.5KV N1500	320 2.5KV N1500	.5MF 50V	10K 2W	470K 1/2W	15K 3W	2K 3W	2.2K 4W	VDR	10K 3W
--KTS584	23CMP4 OR 23ARP4 110° DEFL	.03	150 2.5KV N1500	150 2.5KV N1500	.5MF 50V	6.8K 2W	470K 1/2W	15K 3W	2K 3W	2.2K 4W	VDR	10K 3W
--ETS584	23AHP4 90°	.05	-	--	.3MF 50V	6.8K 2W	560K 1/2W	15K 3W	2K 3W	2.2K 4W	NOT USED	10K 3W





MOTOROLA Chassis TS-584C-00 Schematic Diagram, Continued



MOTOROLA Chassis TS-584C Service Information, Continued

DEFLECTION YOKE ADJUSTMENT

The picture will be tilted if the deflection yoke is not correctly positioned. The picture may have raster distortions or neck shadows if the deflection yoke is not tight against the flare of the picture tube.

To adjust the yoke, loosen the yoke retainer clamp. Position the yoke as far froward as possible and rotate until the picture is straight. When satisfactory, tighten the yoke retainer clamp.

NOISE GATE CONTROL

The noise gate control is used to adjust the receiver for best hold stability under noise and different signal strength conditions.

To adjust, tune in a channel for best picture and sound. Turn the noise gate control counter-clockwise (when viewed from rear of receiver) until the picture becomes unstable (rolls down or slips, etc.). Then turn control clockwise until the picture returns to normal. Check all channels; if any are unstable, continue turning control clockwise until the picture is normal on all channels.

39.75MC TRAP ADJUSTMENT

(Adjacent Video)

The adjacent video trap coil (L-101) is set to approximately 36 Mc at the factory and must be adjusted if interference from an upper adjacent channel is present. See "Alignment Detail" for location.

FOCUSING ADJUSTMENT

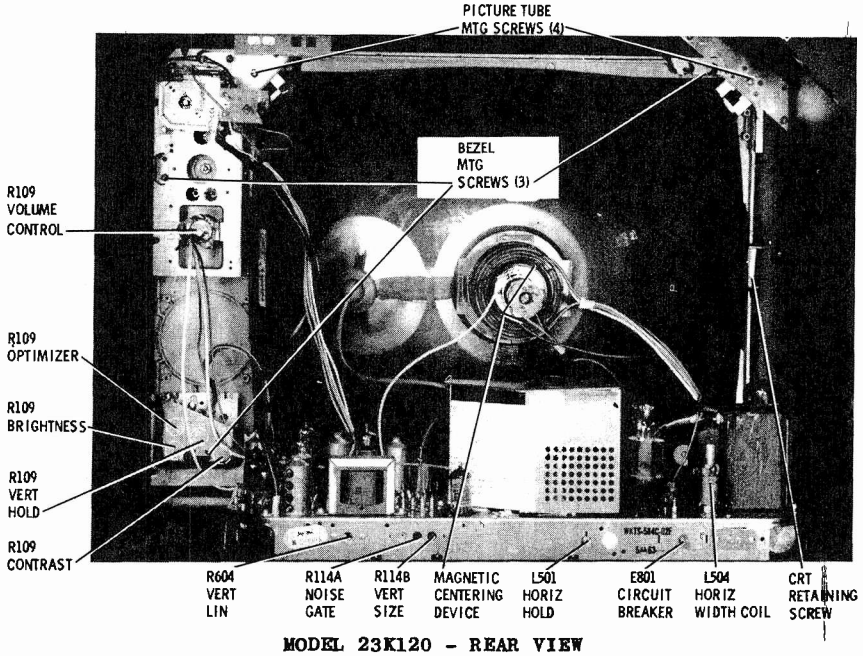
To provide for differences in the picture tube gun structure, a focus adjustment is provided by three (3) lugs located on the chassis. They provide a ground potential point, a B+ voltage point and a bootstrap voltage point. Connect the blue lead from the picture tube socket to the lug which provides the best over-all focus, center to edge of screen.

OPTIMIZER CONTROL

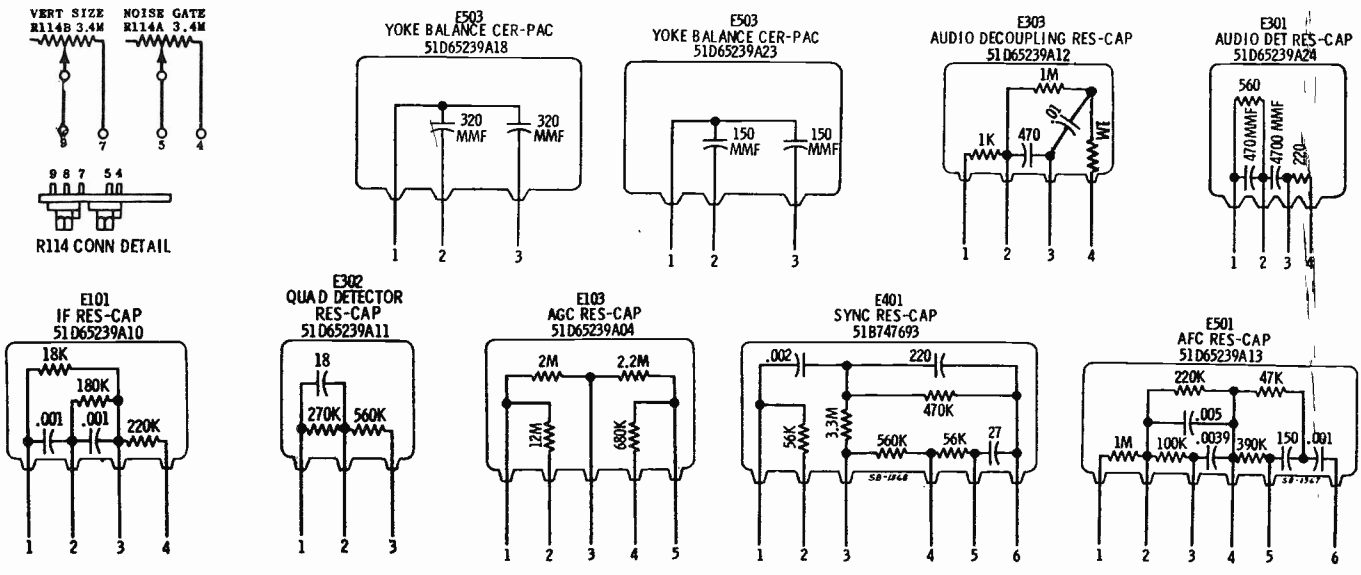
The optimizer control is connected in series with the video detector load which results in a variable load affecting the video response of the receiver.

The optimizer control is not a service adjustment. It should be used in conjunction with the fine tuning, contrast and brightness controls to reduce the "snow effect" in fringe areas or sharpen and crispen the picture in areas where the signal strength is high.

For optimum effect, set the optimizer control to its mid-mechanical position, then adjust the fine tuning control to the point where sound bars just disappear from the picture. Then adjust the optimizer control for desired picture quality.



MODEL 23K120 - REAR VIEW



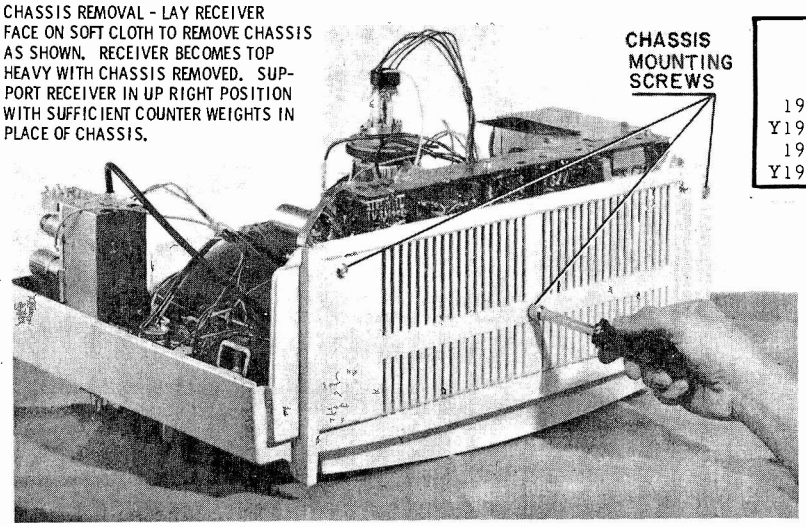
RES-CAP COMPONENT SCHEMATIC DIAGRAMS

MOTOROLA CHASSIS TS-586

MODEL BREAKDOWN CHART

MODEL	CHASSIS	VHF TUNER	UHF TUNER
19P35BRH	DTS-586	TT-312	
Y19P35BR	DTS-586(Y)	TT-349	TT-600
19P37BL,GR	NDTS-586	TT-348	
Y19P37BL,GR	DTS-586(Y)	TT-349	ZTT-600

CHASSIS REMOVAL - LAY RECEIVER FACE ON SOFT CLOTH TO REMOVE CHASSIS AS SHOWN. RECEIVER BECOMES TOP HEAVY WITH CHASSIS REMOVED. SUPPORT RECEIVER IN UP RIGHT POSITION WITH SUFFICIENT COUNTER WEIGHTS IN PLACE OF CHASSIS.



CHASSIS REMOVAL - 19P35, 19P37

Lay face of receiver on a soft cloth to remove chassis.

CAUTION: Receiver becomes top heavy when chassis is removed. To hold receiver up-right, use counter-balance weight as described in the "Chassis Removal" photo.

PICTURE TUBE REPLACEMENT

Use extreme care in handling the picture tube as rough handling may cause it to implode due to atmospheric pressure. Do not nick or scratch glass or subject it to any undue pressure in removal or installation. Use goggles and heavy gloves for protection.

Always place protective tape on the replacement tube in the same position as on the original tube.

Models 19P35, 19P37

Remove chassis from cabinet and yoke from CRT. Lay receiver on its face as shown in "Chassis Removal" photo. Remove the CRT strap mounting screw and the four (4) CRT mounting clamps shown in rear view photo. Lift CRT out of receiver.

HANDLE REMOVAL (19P35 AND 19P37)

Remove handle pins by pushing thru from front side with small bladed screwdriver.

TO REMOVE I F COILS FROM SHIELDS

The coils located in the shields are locked into position. In order to gain access to the coil and components located within the shield, grip one side of the coil form with long-nose pliers and carefully pull it out of the shield. If leads are too short to permit access to the coil, unsolder leads from chassis components, not from coil form. Heating the coil terminals may result in component damage or loss of wax protection against moisture.

When re-inserting coil assembly in shield, be sure coil form locks into position inside the shield.

Coils which are dipped in wax must be replaced as an assembly to maintain proper moisture protection in high humidity areas.

DEFLECTION YOKE ADJUSTMENT

The picture will be tilted if the deflection yoke is not correctly positioned. The picture may have raster distortions or neck shadows if the deflection yoke is not tight against the flare of the picture tube.

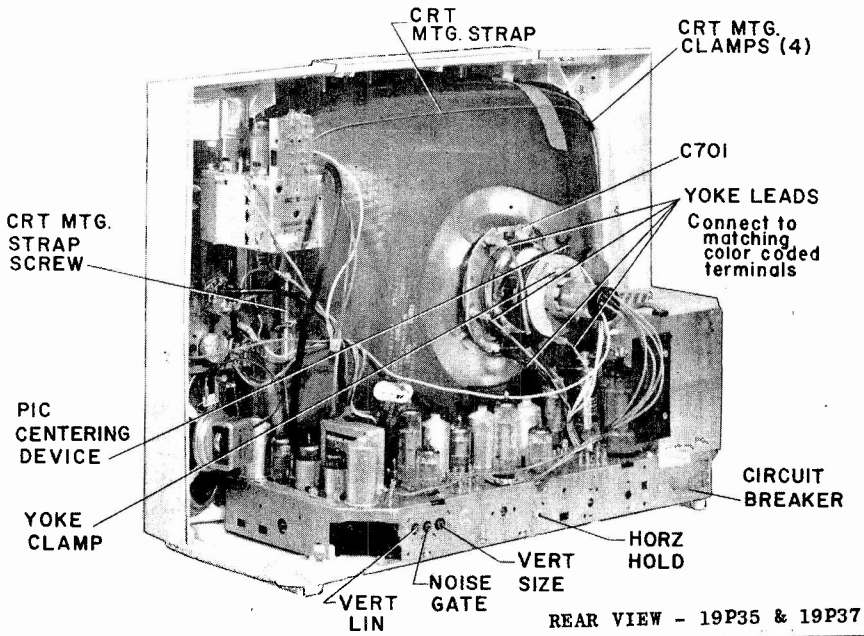
To adjust the yoke, loosen the yoke retainer clamp. Position the yoke as far forward as possible and rotate until the picture is straight. When satisfactory, tighten the yoke retainer clamp.

FOCUSING ADJUSTMENT

To provide for differences in the picture tube gun structure, a focus adjustment is provided by three (3) lugs located on the chassis. They provide a ground potential point, a B+ voltage point and a bootstrap voltage point. Connect the blue lead from the picture tube socket to the lug which provides the best over-all focus, center to edge of screen.

PICTURE CENTERING

Position the magnetic centering device arms 180° apart (minimum field strength) so they lie in a vertical plane. Rotate each arm to center the picture.



REAR VIEW - 19P35 & 19P37

MOTOROLA Chassis TS-586 Alignment Information, Continued

CHASSIS ALIGNMENT

Pre-Alignment Instructions

Before alignment of the video IF section is attempted, it is advisable to thoroughly check the system. If alignment is attempted on an IF section in which a faulty component exists, successful alignment will probably be impossible and the entire procedure will have to be repeated when the real cause of the trouble is corrected. Preliminary tests of the system should include voltage and resistance measurements, routine checks for bad soldering connections and visual inspection of the circuits for overheated components as well as for obvious wiring defects.

VIDEO IF & MIXER ALIGNMENT

Pre-Alignment Steps

1. Maintain line voltage at 120 with variac.

2. Remove the yellow lead from yoke to eliminate RF interference radiation.

3. Disable local oscillator. Ground oscillator grid of mixer-oscillator tube with a piece of bare wire to the tube shield.

4. Apply the negative lead of a 6.0 volt bias supply to IF AGC buss and positive lead to chassis ground. See Alignment detail.

5. Connect a 750 ohm, 60 watt voltage normalizing resistor from B+ to chassis.

6. Set the contrast control at minimum (extreme counter-clockwise position).

7. Short across tuner input terminals.

8. Maintain 2 volts peak-to-peak at the grid of video amp except when specific values are given in the procedure chart.

9. Refer to Video IF and Sound Alignment Detail for component and test point locations.

NOTE: To reduce the possibility of inter-action between the two tuning cores in a double tuned transformer or coil, each core should be adjusted for optimum response in the tuning position nearest its respective end of the coil form.

VIDEO IF & MIXER ALIGNMENT PROCEDURE

STEP	SWEEP GENERATOR AND MARKER	INDICATOR	ADJUST	ADJUST FOR AND/OR REMARKS
1.	To grid of 3rd IF thru .001mf capacitor. Set sweep to approximately 44Mc, markers as required.	Scope to grid of Video Amp thru 47K ohm resistor.	Both cores of 3rd IF transformer (T-103)	Equal peaks and marker placement as shown in curve #1.
2.	To grid (pin 1) of 1st IF amp thru .001mf capacitor. Wrap a wire around grid pin of tube and connect generator to wire. Set sweep to 44Mc, markers as required.	Same as Step #1.	1st IF transformer (T-101) 2nd IF transformer (T-102)	Proper 42.25Mc marker placement. See curve #2. Proper 45.75Mc marker placement. See curve #2. NOTE: Mixer plate coil (L-1) may cause suck-out in IF response. Detune transformer if desired.
3.	To mixer T. P. (M) thru .001mf capacitor. Set sweep to 44Mc, markers as required.	Same as Step #1.	47.25Mc trap (L-101 & 41.25Mc trap (L-102)	Minimum response at proper trap frequency. See curve #3. NOTE: Temporary removal of bias and an increase of generator output may be required to see traps clearly.
4.	Same as Step #3.	Same as Step #1.	Mixer plate coil (L-1 on tuner) and 1st IF grid coil (L-103B)	To obtain curve #4. The mixer coil affects the center peak and the grid coil affects the two outside peaks. Tune coils simultaneously for proper tuning and band-width consistent with maximum gain. If necessary, the 1st and 2nd IF transformers can be touched-up to obtain proper response as shown in curve #4.

SOUND ALIGNMENT (Station Signal Method)

SOUND ALIGNMENT (Station Signal Method)

The sound system used in this receiver consists of an audio IF amplifier stage, a quadrature grid detector and an output stage. Since this type of sound system is extremely sensitive, relatively small input signal voltage will cause grid current to flow in both the IF amplifier and the detector stages. Grid current through the tuned coils will load them down making the adjustment extremely broad and alignment impossible. For this reason, it is necessary to use a very weak signal when aligning the driver and the detector input coils. Actually, the signal should be well down into the noise level for proper tuning action.

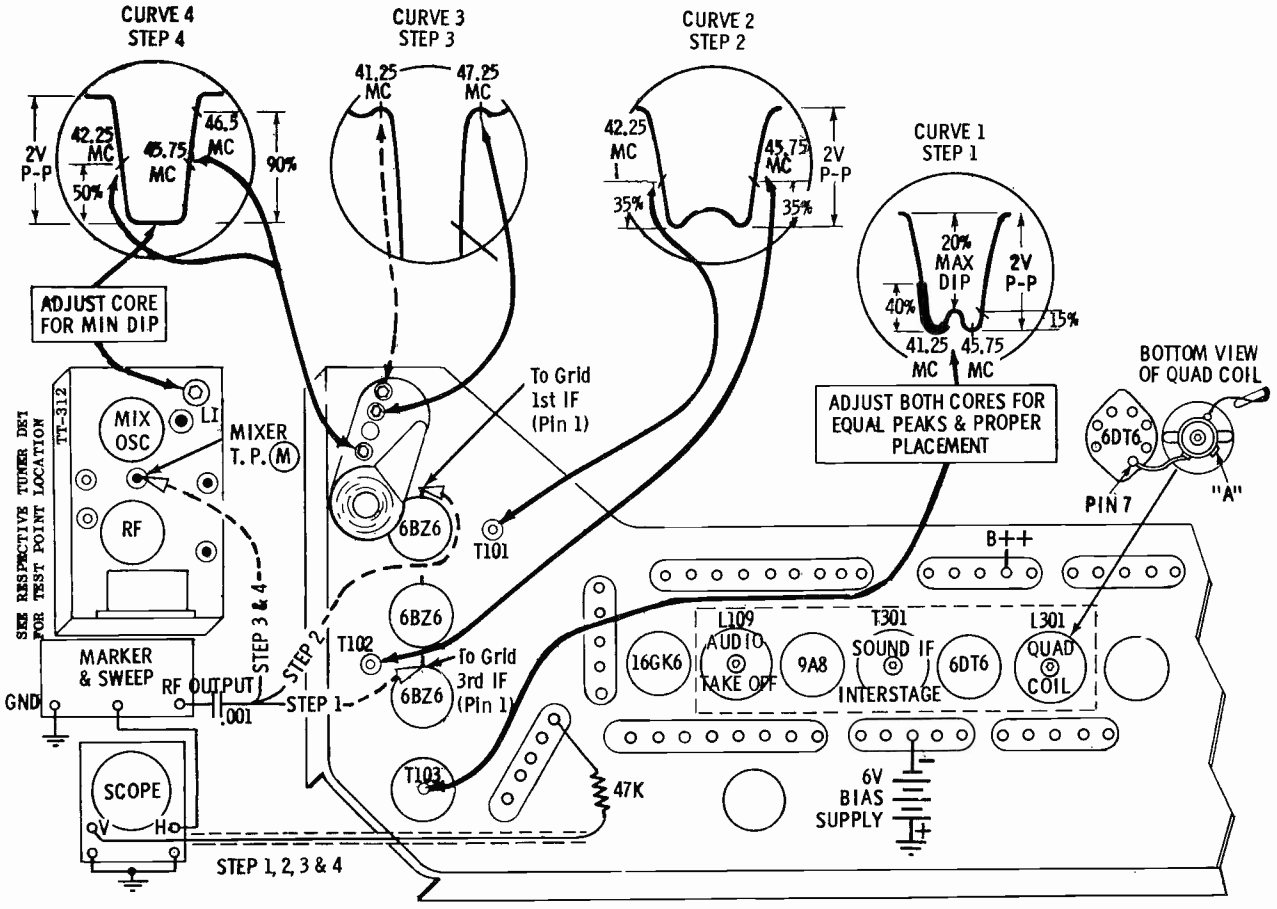
Preliminary Steps

1. Tune in a strong TV station.

2. Adjust all controls for normal picture and sound.

3. Refer to Video IF & Mixer Alignment Detail for coil and test point locations.

MOTOROLA Chassis TS-586 Alignment Information, Continued



VIDEO & SOUND ALIGNMENT DETAIL

SOUND ALIGNMENT PROCEDURE

STEP	STATION	INDICATOR	ADJUST	ADJUST FOR AND/OR REMARKS
1.	Strong signal	VTVM to point A on quad. coil L-301 (See schematic diagram)	L-301 (quad. coil)	Maximum deflection (coarse adjustment) of two possible maximum tuning points, use that giving largest voltage reading.*
2.	"	Listening test	"	Maximum sound with minimum distortion (fine adjustment).
3.	Weak signal	"	T-301 (inter-stage coil)	Maximum sound with minimum distortion (maintain hiss level).**
4.	"	"	L-109 (take off coil)	Maximum sound with minimum distortion.
	If sound is not clear at this point, repeat the above procedure as necessary.			

*The purpose of the top pre-set core is to enable the adjustable core to make the tuning range required while reducing the physical length. If the pre-set core should be misadjusted by previous service work, merely re-set near top end of coil and tune for maximum.

**The signal must be weakened considerably either by disconnecting one side of the antenna lead or connecting low value resistors across the antenna terminals until a pronounced hiss appears in the sound. The hiss level must be maintained for proper alignment.

MOTOROLA Chassis TS-586 Diagram

NOTES:

VOLTAGE MEASUREMENTS

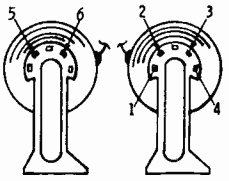
1. TAKEN FROM POINT INDICATED TO CHASSIS WITH A VTVM. ±20%
2. LINE VOLTAGE MAINTAINED AT 120V AC.
3. VOLTAGES INDICATED BY AN ASTERISK WILL VARY WITH ASSOCIATED CONTROL SETTINGS.
4. TAKEN WITH CONTRAST CONTROL AT MINIMUM AND ALL OTHER CONTROLS IN NORMAL OPERATING POSITION WITH NO SIGNAL INPUT.
5. TUNER ON CHANNEL 13 OR CHANNEL OF LEAST NOISE WITH ANTENNA TERMINALS SHORTED.

WAVEFORM MEASUREMENTS

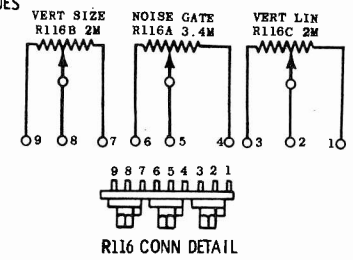
1. TAKEN FROM POINT INDICATED TO CHASSIS WITH A WIDE-BAND OSCILLOSCOPE.
2. OSCILLOSCOPE SYNCED NEAR SWEEP RATE INDICATED.
3. TAKEN WITH STRONG SIGNAL, CONTRAST CONTROL AT MAXIMUM; ALL OTHER CONTROLS IN NORMAL OPERATING POSITION.

CAPACITORS UNLESS OTHERWISE SPECIFIED, VALUES LESS THAN ONE IN MF; ALL OTHERS IN MMF.

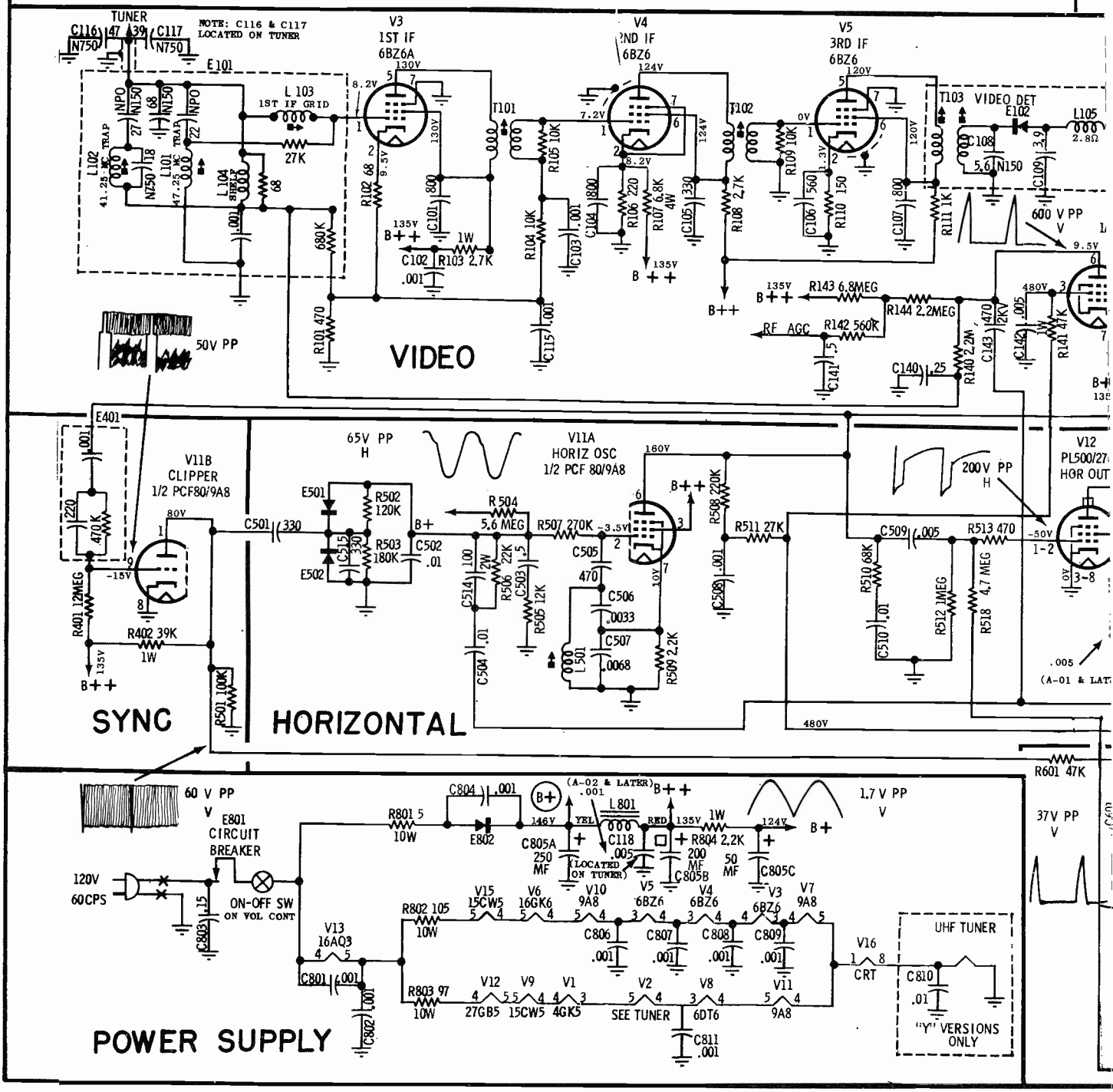
** INDICATES SPECIAL COMPONENTS.

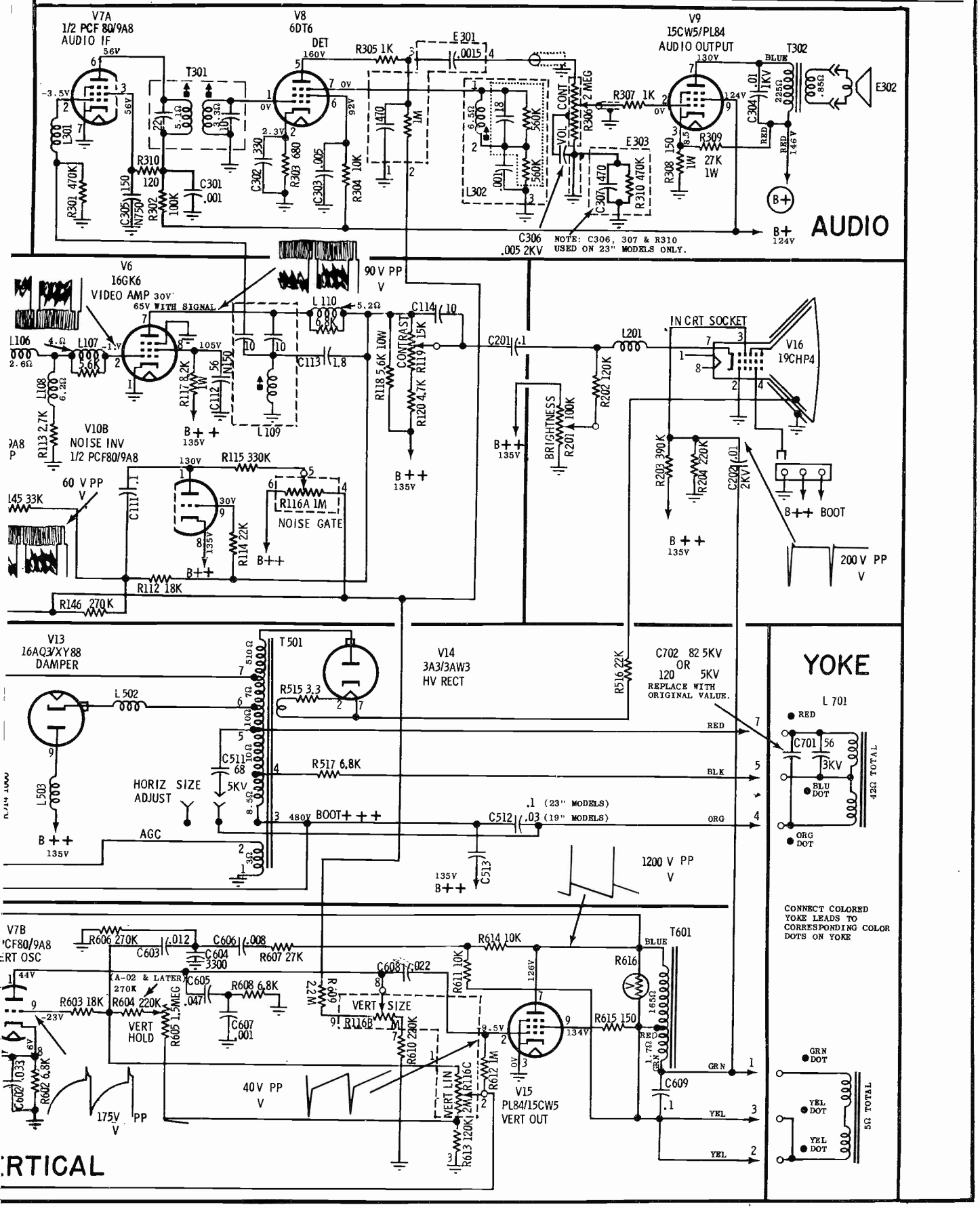


T501 CONN

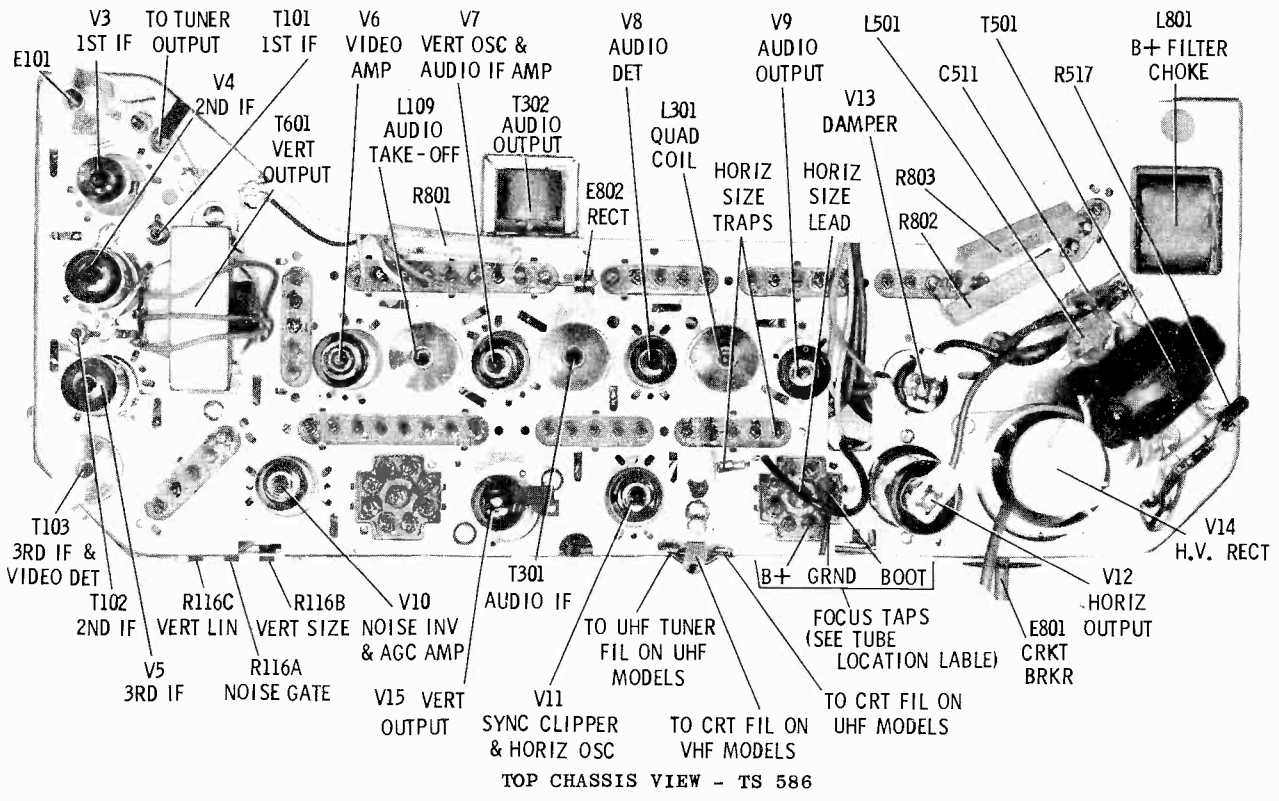


R116 CONN DETAIL

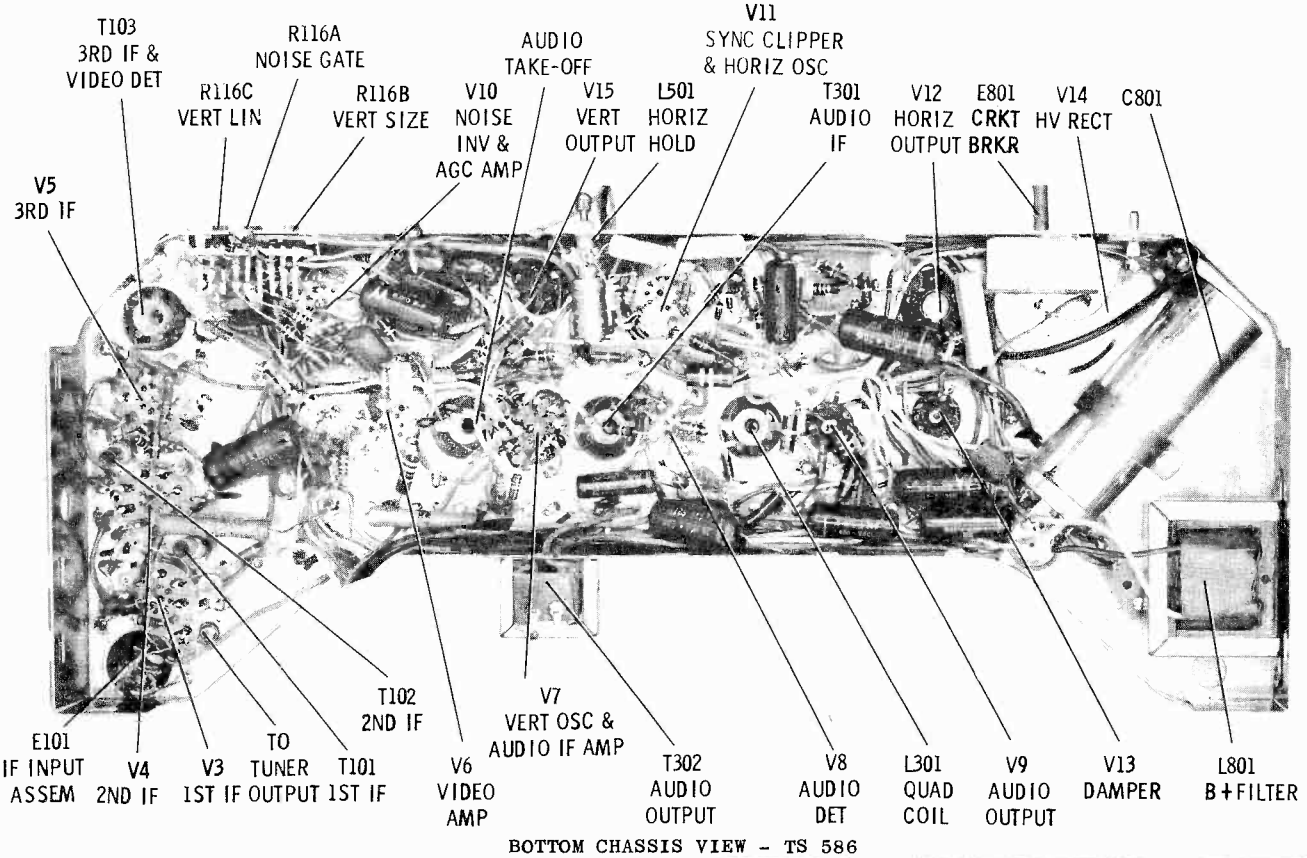



V7A
1/2 PCF 80/9A8
AUDIO IF
V8
6DT6
DET
V9
15CW5/PL84
AUDIO OUTPUT
T301
T302
E301
E302
E303
R305 1K
R306 2 MEG
R307 1K
R309 27K 1W
R310 120
C301 .001
C302 330
C303 .005
C304 .01 1KV
C305 150 N750
C306 .005 2KV
C307 470
R301 470K
R302 100K
R303 680
R304 10K
R308 150 1W
L301
L302
CONT
VOL
B+
124V
AUDIO
NOTE: C306, 307 & R310 USED ON 23" MODELS ONLY.
V6
16GK6
VIDEO AMP
65V WITH SIGNAL
90 V PP
L110
L106
L107
L108
L109
C112 56 N150
C113 1.8
C114 10
R117 8.2K 1W
R118 5.6K 10W
CONTRAST R119 15K
R120 4.7K
C201 .1
L201
IN CRT SOCKET
V16
19CHP4
R202 120K
BRIGHTNESS R201 100K
R203 390K
R204 220K
C202 .01 2KV
B++ BOOT
200 V PP
V10B
NOISE INV
1/2 PCF80/9A8
R115 330K
C111 .1
R116A 1M
NOISE GATE
R114 22K
R112 18K
R146 270K
60 V PP
B++
135V
V13
16AQ3/XY88
DAMPER
T501
L502
L503
R515 3.3
V14
3A3/3AW3
HV RECT
R516 22K
C702 82 5KV
OR
120 5KV
REPLACE WITH ORIGINAL VALUE.
YOKE
L 701
RED
BLK
ORG
BLU DOT
ORG DOT
42Ω TOTAL
R517 6.8K
C511 68 5KV
C512 .1 (23" MODELS) .03 (19" MODELS)
C513
HORIZ SIZE ADJUST
AGC
480V BOOT+++
1200 V PP
CONNECT COLORED YOKE LEADS TO CORRESPONDING COLOR DOTS ON YOKE
V7B
PCF80/9A8
VERT OSC
R606 270K
C603 .012
C604 3300
C606 .008
R607 27K
C605 .047
R608 6.8K
C607 .001
R603 18K
R604 220K
VERT HOLD
R605 1.5MEG
C608 .022
R609 2.2M
VERT SIZE R116B 1M
R610 220K
R611 10K
R612 1M
VERT LIN R116C 2M
R613 120K
R614 10K
R615 150
R616
T601
BLUE
RED
GRN
YEL
C609 .1
GRN DOT
YEL DOT
YEL DOT
5Ω TOTAL
V15
PL84/15CW5
VERT OUT
40 V PP
175V PP
VERTICAL

MOTOROLA Chassis TS-586 Service Information, Continued



TOP CHASSIS VIEW - TS 586



BOTTOM CHASSIS VIEW - TS 586

MOTOROLA CHASSIS TS-587

For list of models see chart below. Schematic diagram of TV unit is on pages 84-85; schematic diagram of stereo amplifiers RTHS - FTHS-1224 is on page 86. Alignment for TS-586, on pages 78-79, is also applicable to this chassis.

MODEL BREAKDOWN CHART

MODEL	CHASSIS	VHF TUNER	UHF TUNER	TK KIT	ADDITIONAL CHASSIS
23F20M,W	TS-587	VTT-349	-	TK-167	Record Changer VM100RC AF Pwr Amp FTHS-1224
Y23F20M,W	TS-587	VTT-349	RTT-600	-	Record Changer VM100RC AF Pwr Amp FTHS-1224
23FR20M,W	TS-587	VTT-349	-	TK-167	Record Changer VM100RC AF Pwr Amp RTHS-1224 FM-AM Tuner THS-4102
Y23FR20M,W	TS-587	VTT-349	RTT-600	-	Record Changer VM100RC AF Pwr Amp RTHS-1224 FM-AM Tuner THS-4102
23F21MP	TS-587	VTT-349	-	TK-167	Record Changer VM100RC AF Pwr Amp FTHS-1224
Y23F21MP	TS-587	VTT-349	RTT-600	-	Record Changer VM100RC AF Pwr Amp FTHS-1224
23FR21MP	TS-587	VTT-349	-	TK-167	Record Changer VM100RC AF Pwr Amp RTHS-1224 FM-AM Tuner THS-4102
Y23FR21MP	TS-587	VTT-349	RTT-600	-	Record Changer VM100RC AF Pwr Amp RTHS-1224 FM-AM Tuner THS-4102

CHASSIS DESCRIPTION

The TV receivers in this manual employ a horizontally mounted chassis containing 14 tubes plus picture tube. Four (4) diodes are used in the circuitry, a silicon power rectifier, a germanium video detector and two (2) silicon horizontal phase detector diodes.

With the three-position function switch in the TV position, the stereo amplifier is connected to the TV chassis. Therefore, no audio power amplifier is contained in the TV chassis.

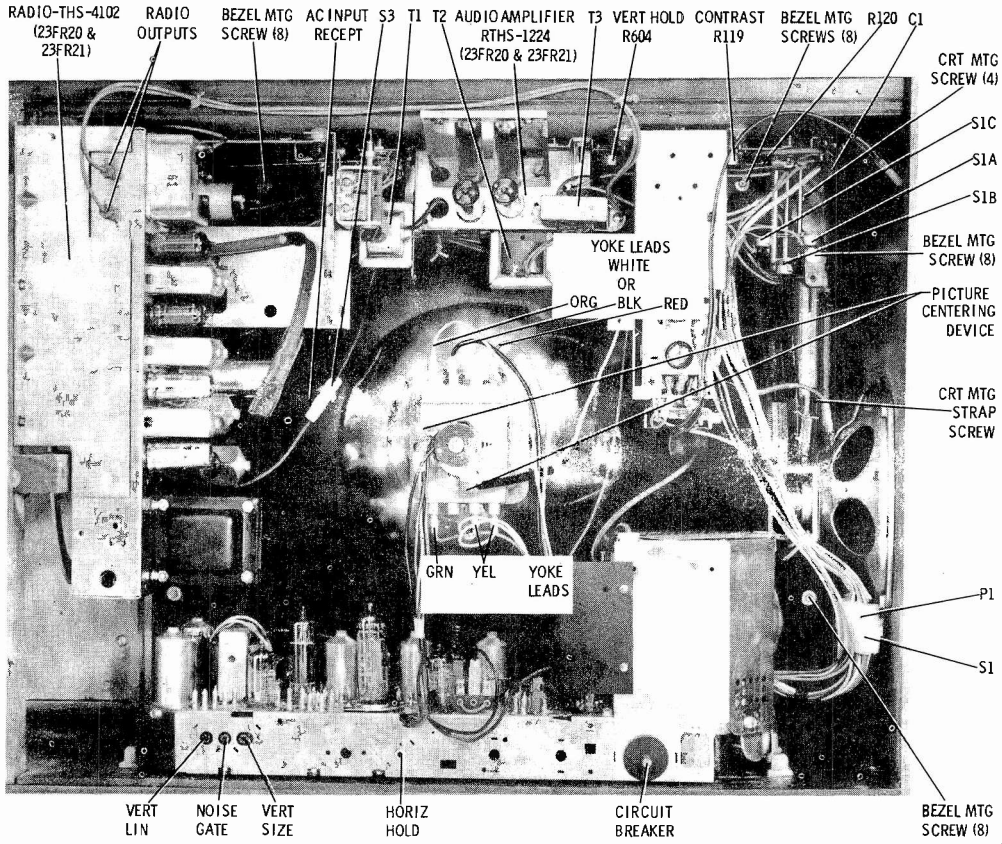
Chassis with the "Y" suffix contain a UHF tuner (RTT-600) which uses an additional tube.

HORIZONTAL HOLD ADJUSTMENT

Adjust the horizontal hold on the rear of the cabinet for most stable horizontal sync while switching from channel to channel.

PICTURE CENTERING

Position the magnetic centering device arms 180° apart (minimum field strength) so they lie in a vertical plane. Rotate each arm to center the picture. Best adjustment is usually with minimum field strength.



MOTOROLA Chassis TS-587 Schematic Diagram, Continued

NOTES:

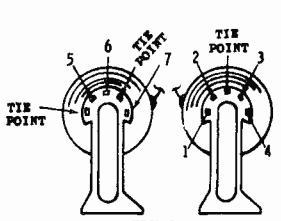
VOLTAGE MEASUREMENTS

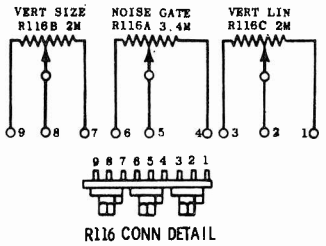
1. TAKEN FROM POINT INDICATED TO CHASSIS WITH A VTVM. ±20%
2. LINE VOLTAGE MAINTAINED AT 120V AC.
3. VOLTAGES INDICATED BY AN ASTERISK WILL VARY WITH ASSOCIATED CONTROL SETTINGS.
4. TAKEN WITH CONTRAST CONTROL AT MINIMUM AND ALL OTHER CONTROLS IN NORMAL OPERATING POSITION WITH NO SIGNAL INPUT.
5. TUNER ON CHANNEL 13 OR CHANNEL OF LEAST NOISE WITH ANTENNA TERMINALS SHORTED.

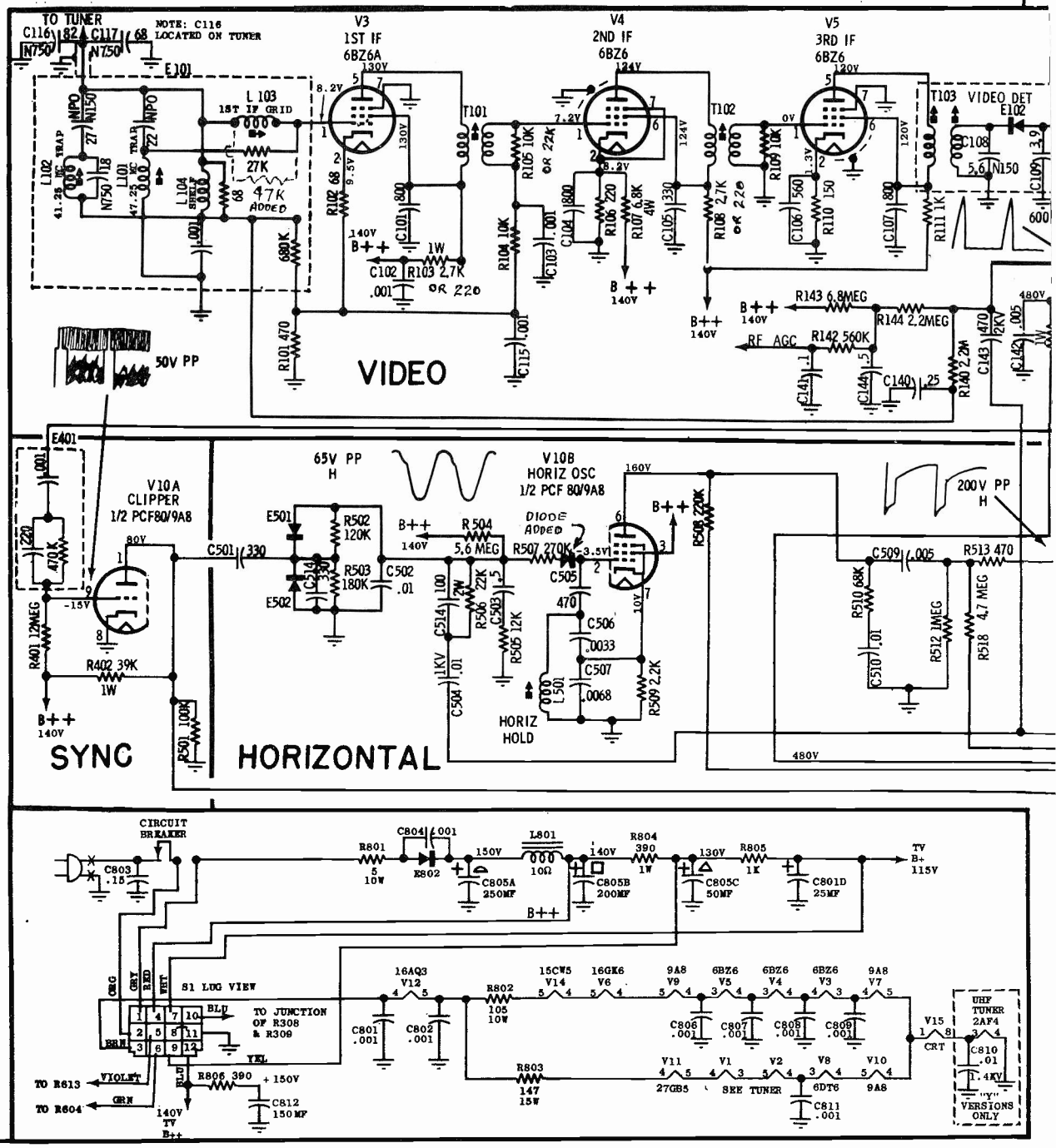
WAVEFORM MEASUREMENTS

1. TAKEN FROM POINT INDICATED TO CHASSIS WITH A WIDE-BAND OSCILLOSCOPE.
2. OSCILLOSCOPE SYNCED NEAR SWEEP RATE INDICATED.
3. TAKEN WITH STRONG SIGNAL, CONTRAST CONTROL AT MAXIMUM; ALL OTHER CONTROLS IN NORMAL OPERATING POSITION.

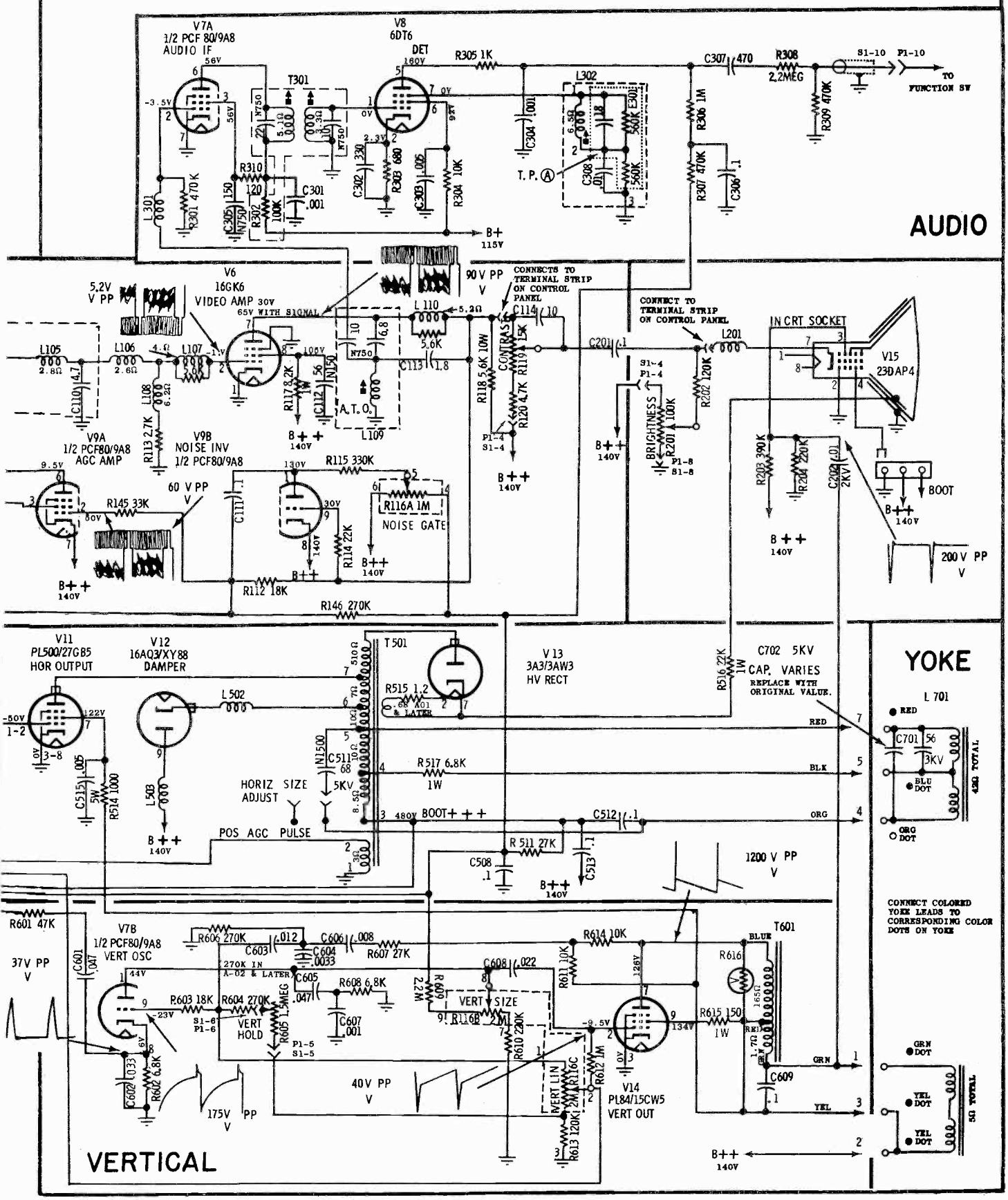
CAPACITORS UNLESS OTHERWISE SPECIFIED, VALUES LESS THAN ONE IN MF; ALL OTHERS IN MMF.







MOTOROLA Chassis TS-587 Schematic Diagram, Continued



MOTOROLA Chassis TS-587 Service Information, Continued

FOCUS ADJUSTMENT

To provide for differences in the picture tube gun structure, a focus adjustment is provided by three (3) lugs located on the chassis. They provide a ground potential point, a

HORIZONTAL SIZE CONTROL

To provide for differences in line voltages, either of the two end lugs of the terminal strip near the output tube may be selected to provide proper horizontal size. The lead must be connected to one of the lugs. Remove power before making adjustment.

DEFLECTION YOKE ADJUSTMENT

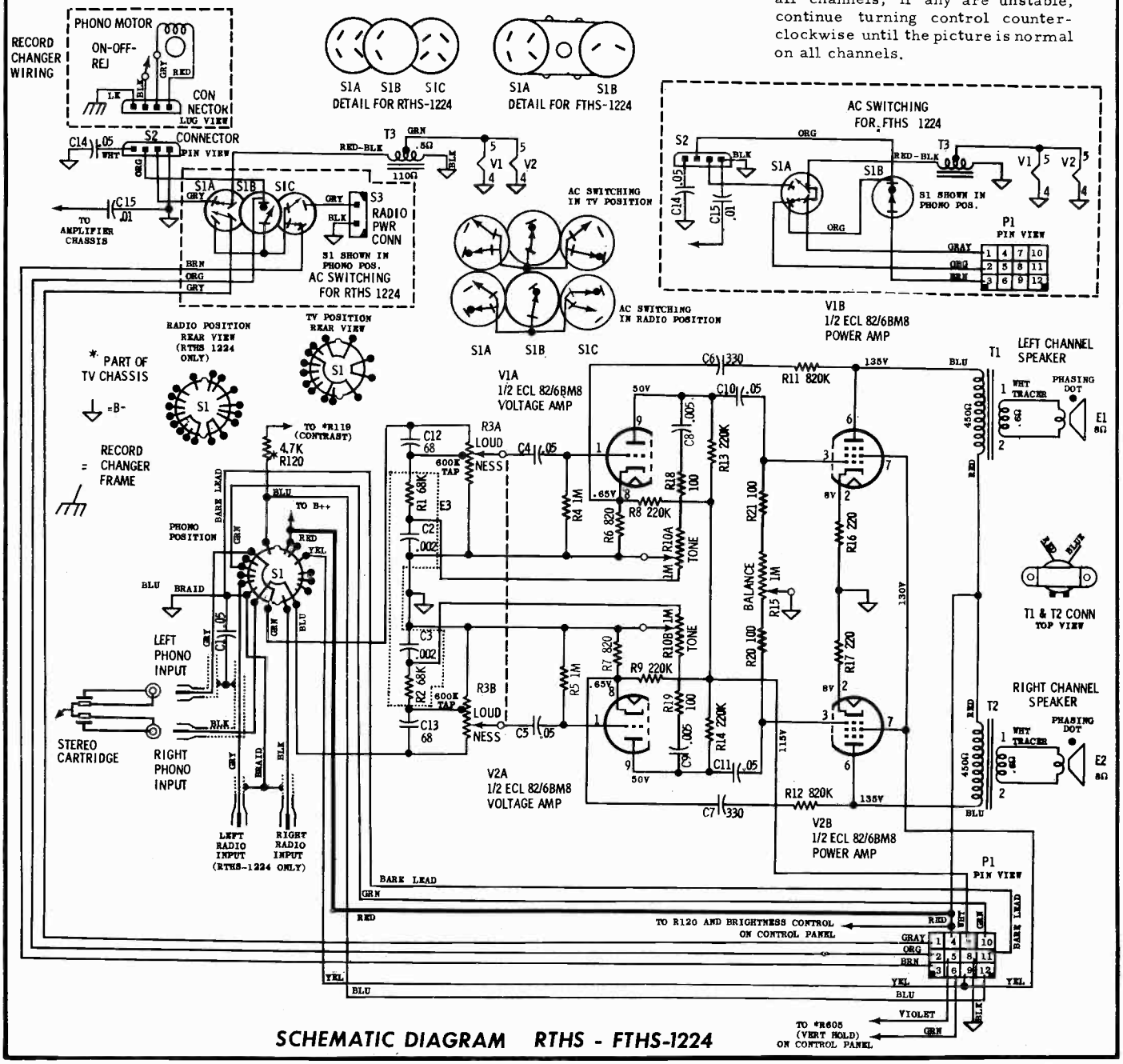
The picture will be tilted if the deflection yoke is not correctly positioned. The picture may have raster distortions or neck shadows if the deflection yoke is not tight against the flare of the picture tube.

To adjust the yoke, loosen the yoke retainer clamp. Position the yoke as far forward as possible and rotate until the picture is straight. When satisfactory, tighten the yoke retainer clamp.

NOISE GATE CONTROL

The noise gate control is used to adjust the receiver for best hold stability under noise and different signal strength conditions.

To adjust, tune in a channel for best picture and sound. Turn the noise gate control clockwise (when viewed from rear of receiver) until the picture becomes unstable (rolls down or slips, etc.). Then, turn control counter-clockwise until the picture returns to normal. Check all channels; if any are unstable, continue turning control counter-clockwise until the picture is normal on all channels.



SCHEMATIC DIAGRAM RTHS - FTHS-1224

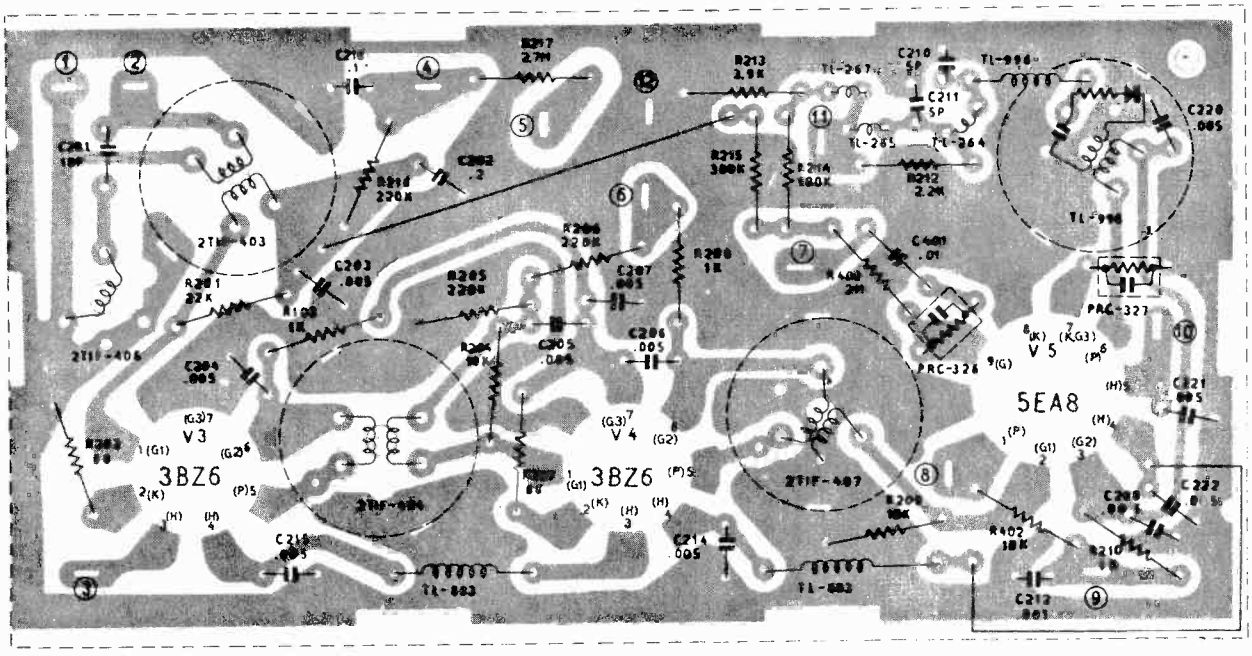
Olympic

OLYMPIC RADIO & TELEVISION

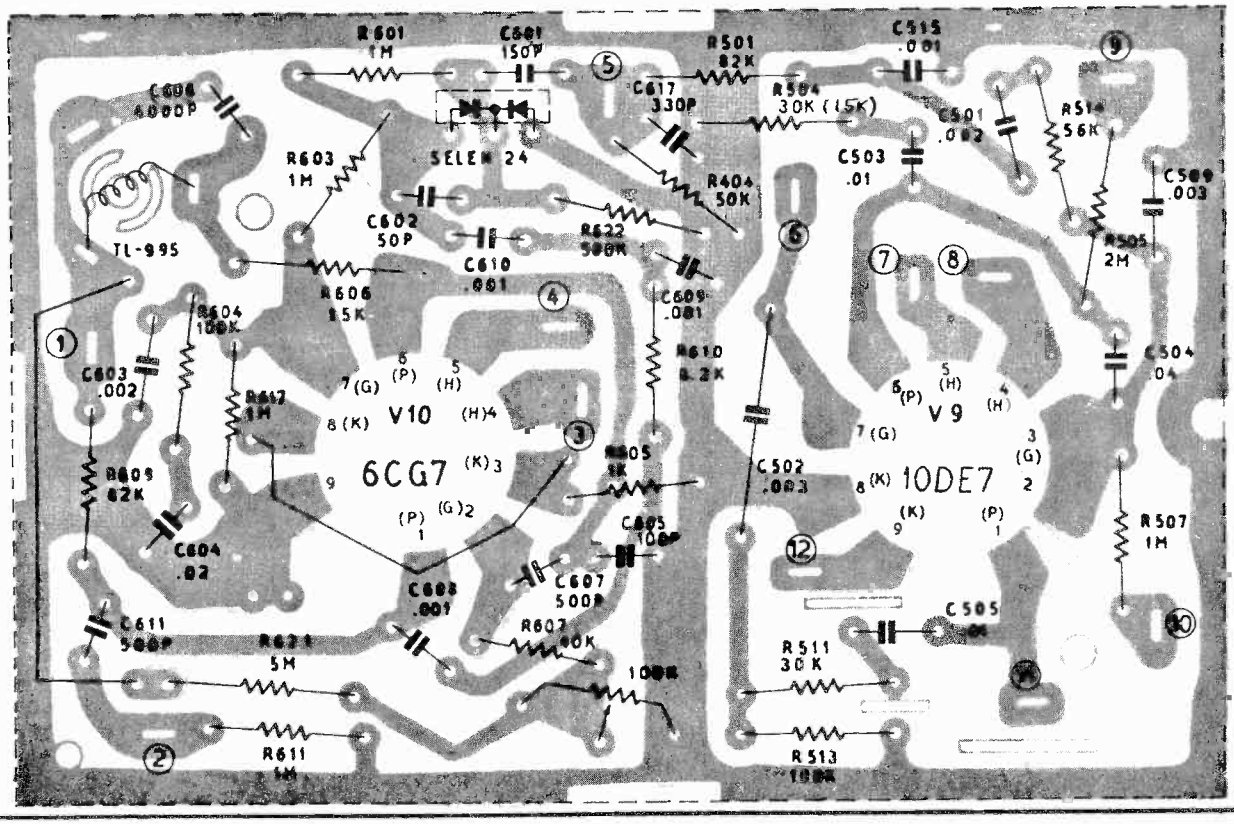
MODEL 6P25

(Pages 87 through 90)

PRINTED BOARD - PIF UNIT 1



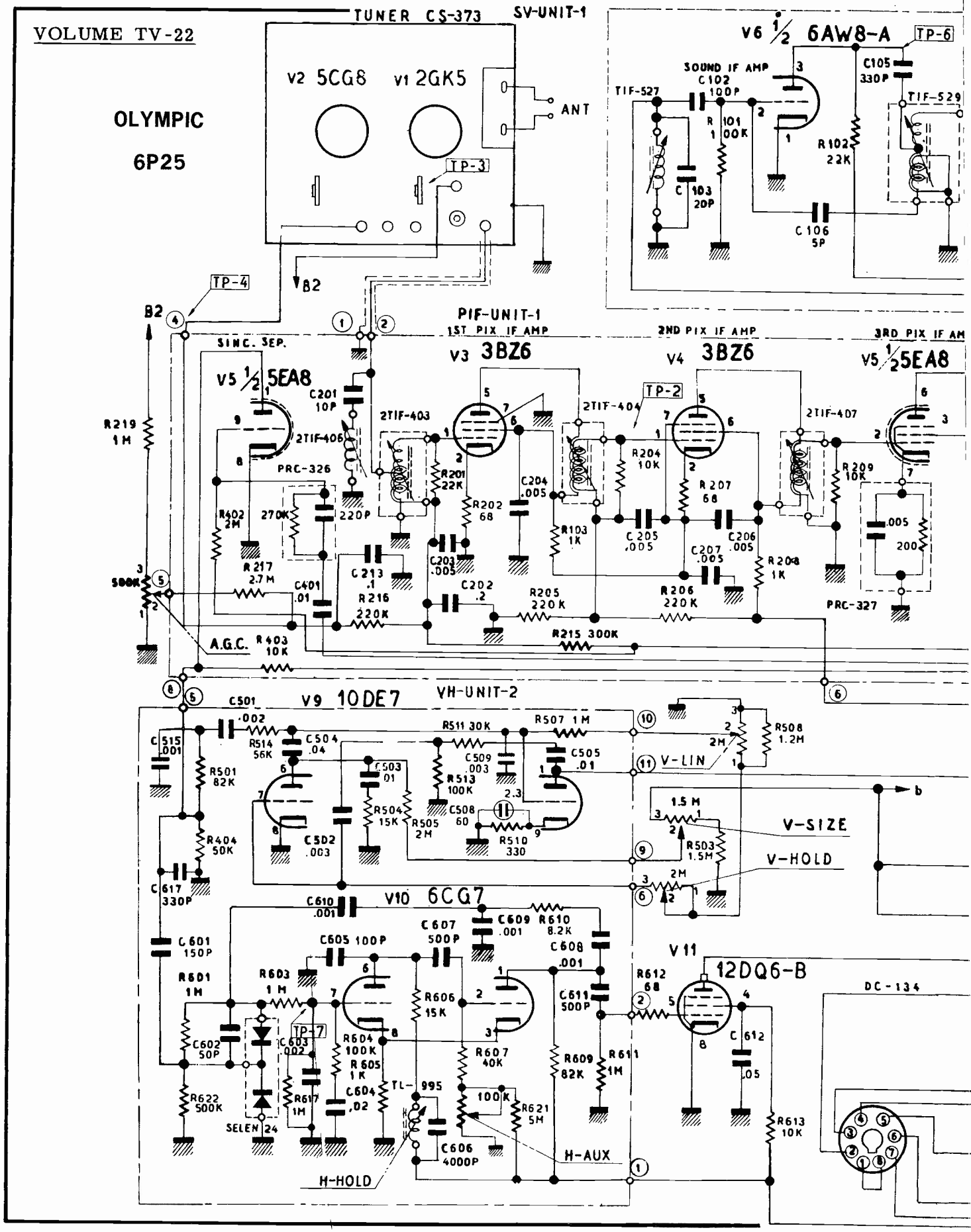
PRINTED BOARD - VH UNIT 4

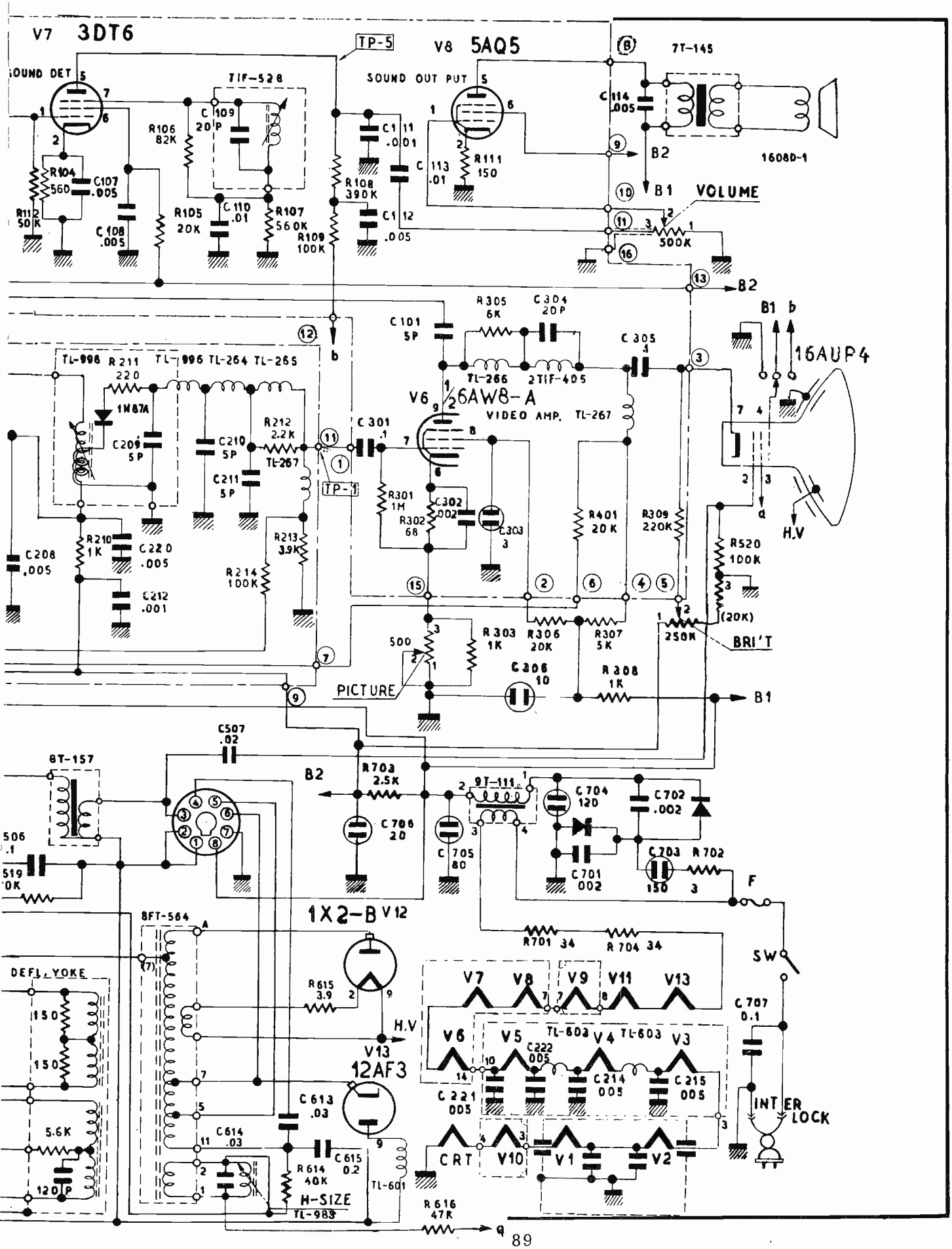


VOLUME TV-22

OLYMPIC

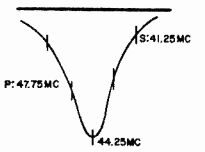
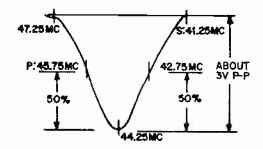
6P25




V7 3DT6
TP-5
V8 5AQ5
SOUND DET
SOUND OUT PUT
TIF-528
7T-145
16080-1
B2
B1
VOLUME
500K
R106 82K
R104 560
C107 .005
R112 50K
C108 .005
R105 20K
C109 20P
C110 .01
R107 560K
R109 100K
R108 390K
C111 .001
C112 .005
C113 .01
R111 150
C114 .005
R305 6K
C304 20P
C101 5P
C305 .1
TL-266
2TIF-405
V6 ½6AW8-A
VIDEO AMP. TL-267
16AUP4
H.V
TL-998 R211 220
1N87A
C209 5P
C210 5P
C211 5P
R212 2.2K
TL-267
C301 .1
TP-1
R301 1M
R302 68
C302 .002
C303 3
R401 20K
R309 220K
R520 100K
(20K)
BRI'T
C208 .005
R210 1K
C220 .005
C212 .001
R213 3.9K
R214 100K
500
R303 1K
R306 20K
R307 5K
250K
PICTURE
C306 10
R308 1K
C507 .02
BT-157
R703 2.5K
9T-111
C704 120
C702 .002
C706 20
C705 80
C701 002
C703 150
R702 3
F
1X2-B V12
8FT-564
R701 34
R704 34
SW
DEFL. YOKE
150
150
5.6K
120P
R615 3.9
V13 12AF3
C613 .03
C614 .03
C615 0.2
R614 40K
H-SIZE
TL-983
TL-601
R616 47K
V7 V8 V9 V11 V13
V6 V5 V4 V3
TL-602
TL-603
C222 005
C214 005
C215 005
C221 005
CRT V10 V1 V2
C707 0.1
INTER LOCK

OLYMPIC Model 6P25 Alignment Information, Continued

PICTURE IF ALIGNMENT

Step	Bias Source	Connect Sweep Gen.	Sweep Gen. Freq.	Marker Gen. Freq.	Scope Vert. Input	Adjust	Proper Response
1	Not used	TP2	44MC (10MC sweep)	44.25MC	TP1	TL998 2TIF407	
2	-3.5V at TP4	TP3	44MC (10MC sweep)	41.25MC 42.75MC 44.25MC 45.75MC 47.25MC	TP1	2TIF404 2TIF404 2TIF403 2TIF406 L1	

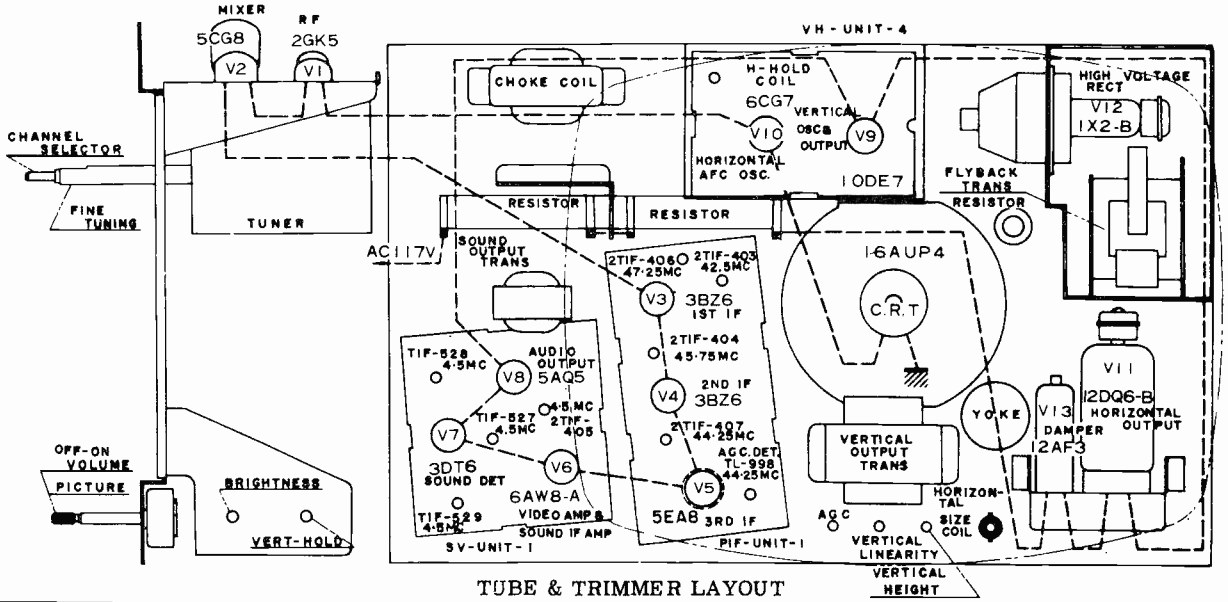
NOTE: When adjusting TIF406, 47.25MC trap in step 2, response near 47.25MC should be observed while putting the bias source at 0 volts and increasing the sweep generator output.

SOUND IF ALIGNMENT

1. Connect oscilloscope vertical input to TP5.
2. Connect marker generator to TP6 using a modulated 4.5MC signal with maximum output.
3. Observe waveform on oscilloscope and adjust the core of TIF528 for minimum.
4. Connect marker generator output to TP1.
5. Connect oscilloscope vertical input to TP6.
6. Observe waveform on oscilloscope and adjust TIF527 for maximum amplitude.
7. Disconnect oscilloscope from TP6.
8. Switch the marker generator output to an unmodulated signal, decrease output and put sound volume at maximum.
9. Adjust TIF529 for zero beat from the speaker.

HORIZONTAL SWEEP CIRCUIT ADJUSTMENT

1. Tune in a TV station.
2. Connect a jumper across the H-hold coil (TL995).
3. Connect a 0.5uf capacitor between TP7 and ground.
4. Adjust H-Aux control carefully until picture is almost stationary.
5. Remove jumper from across TL995.
6. Adjust the core of H-hold coil to make picture almost stationary.
7. Remove the 0.5uf capacitor connected between TP7 and ground.



TUBE & TRIMMER LAYOUT

Packard Bell

CHASSIS 88-14 ( )
( ) = K, L, M

ALIGNMENT

Equipment Required

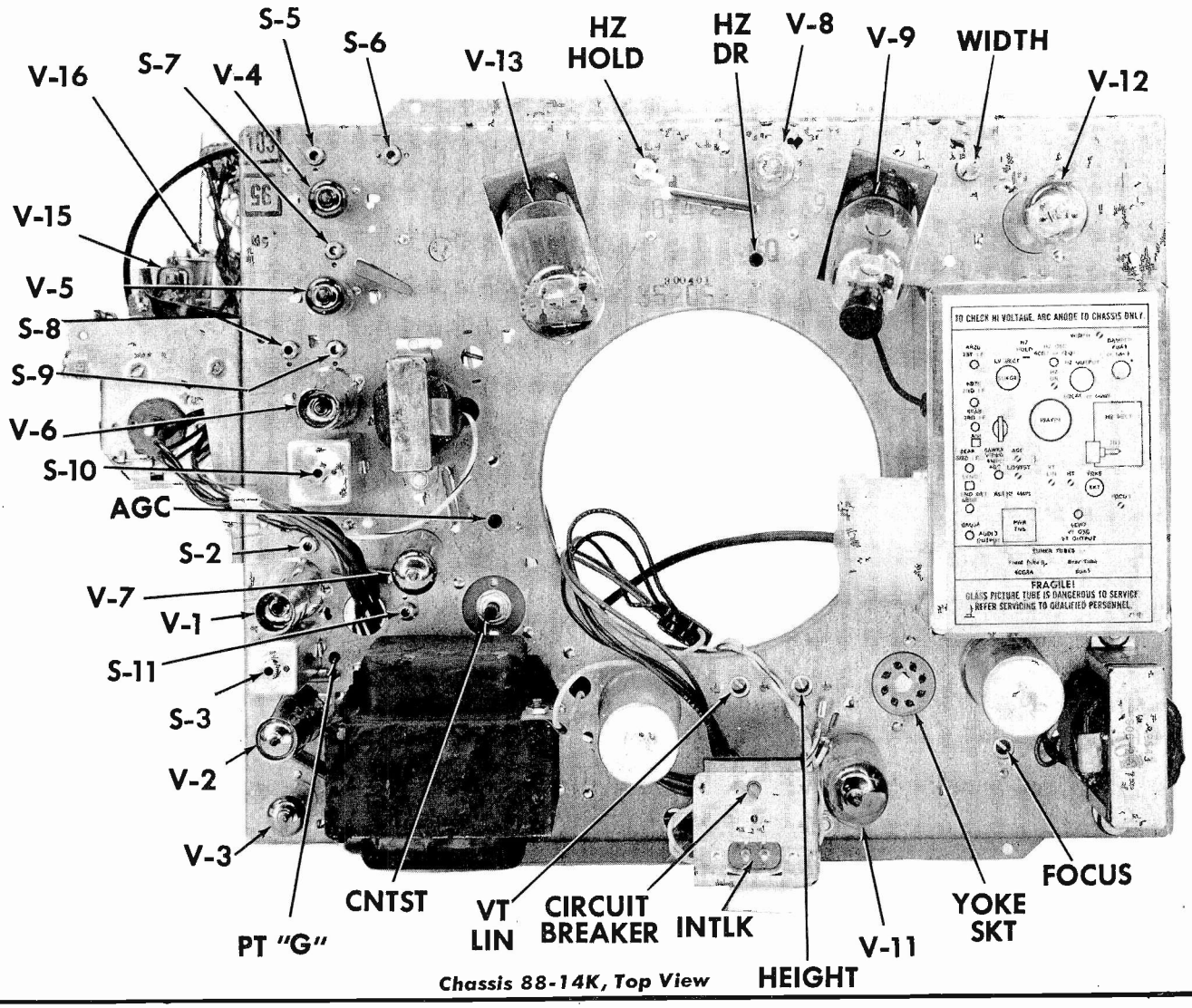
Signal generator, sweep generator, VTVM with RF probe, oscilloscope, matching network (sweep generator to antenna input), capacitor, .001 mfd, two 100,000 ohm resistors, one 22,000 ohm resistor, and two batteries, 6 v and 3 v.

Picture I-F Alignment

1. Connect point "J" to ground. "J" is terminal 5 of the horizontal oscillator PEC 24576A.
2. Connect the six volt battery between point "A" and ground, with the negative lead going to point "A".
3. Connect the three volt battery between point "D" and ground, with the negative lead to point "D".
4. Connect the VTVM between point "B" and ground.
5. Connect the signal generator to mixer grid in RF tuner through the .001 mfd capacitor. Connection may be made through the terminal next to the 6CG8A mixer tube.
6. Set generator output at maximum.

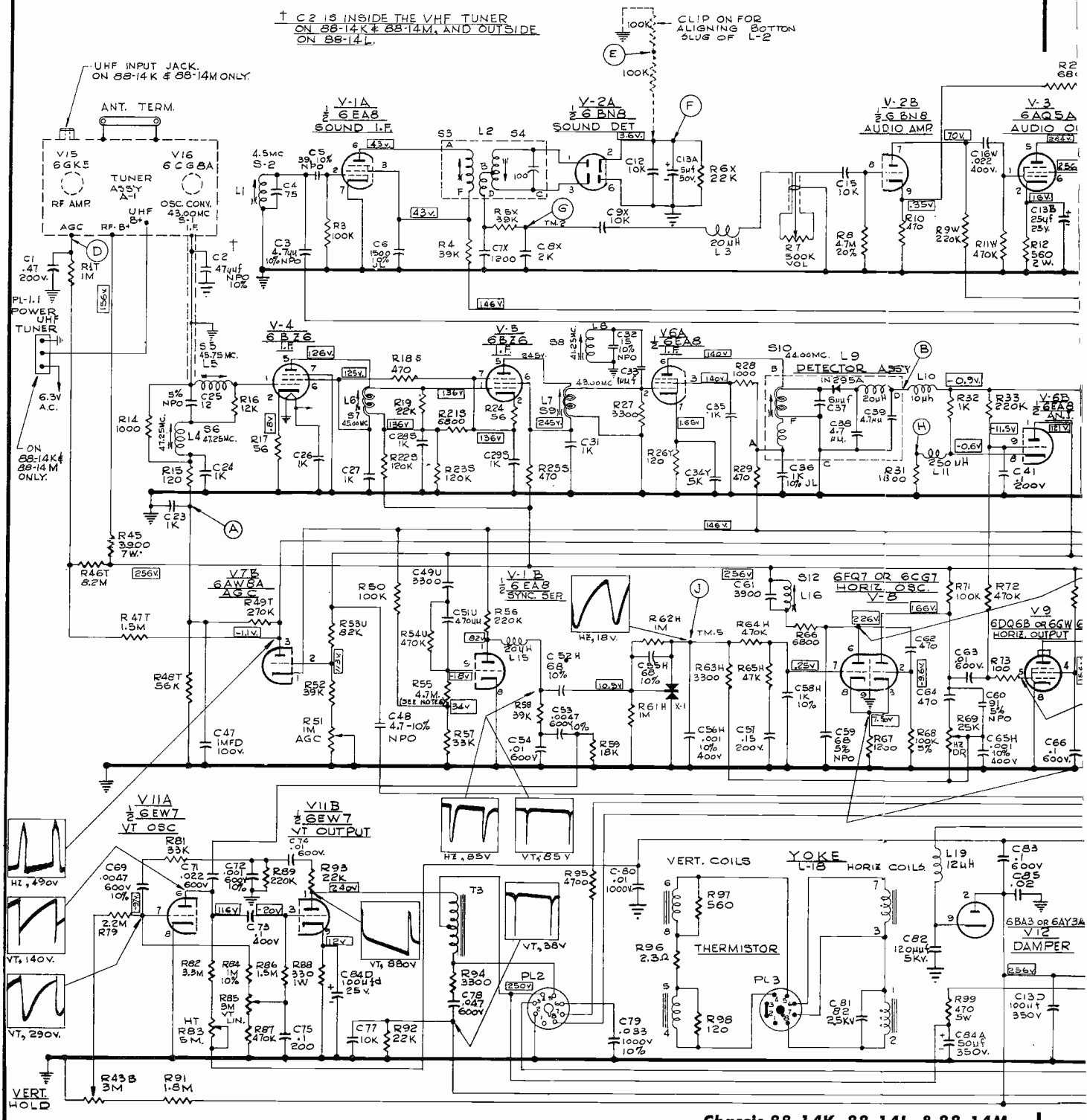
For the following steps, reduce the 6-volt bias at point "A" if necessary to obtain a definite reading on the VTVM.

(Continued on page 93)



Chassis 88-14K, Top View

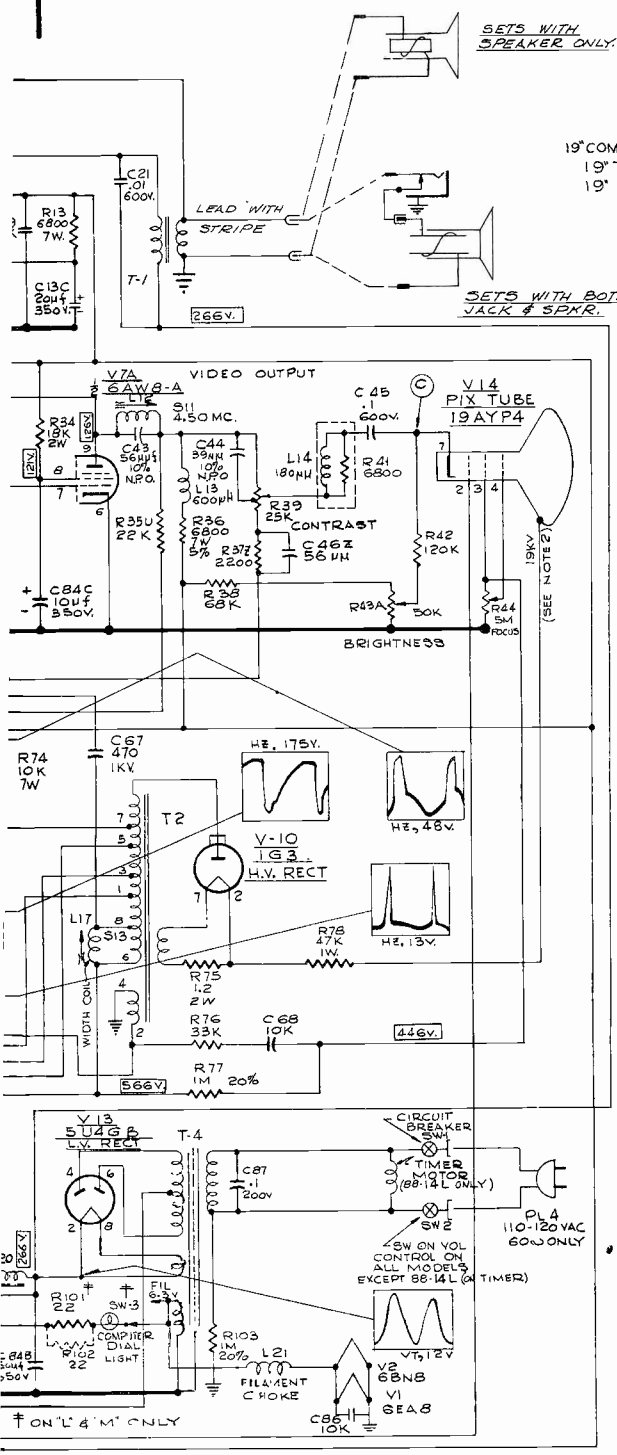
PACKARD BELL Chassis 88-14K, L, M, Schematic Diagram



NOTES

1. UNLESS NOTED TO THE CONTRARY, D-C VOLTAGES WERE MEASURED WITH NO SIGNAL. CONTROLS WERE SET FOR NORMAL PICTURE RECEPTION AND THEN SIGNAL WAS REMOVED. LINE VOLTAGE: 117V.
2. 19KV. MEASURED WITH 120 VOLT LINE, NORMAL SIGNAL, & ZERO BEAM CURRENT.
3. A LETTER AFTER THE REFERENCE SYMBOL (R9W) INDICATES THAT THE COMPONENT IS PART OF A P.E.C.
4. ALL RESISTORS ½ W & 10% UNLESS SPECIFIED. EXCEPTION: P.E.C. UNITS ARE ¼ W & 20%
5. SWEEP FREQUENCY, (HZ OR VT.) & PK. TO PK. VOLTAGE IS INDICATED BESIDE EACH WAVE FORM.
6. R-55 (4.7 MEG.) MAY OR MAY NOT BE PART OF THE P.E.C. WITH SUFFIX "U".

PACKARD BELL Chassis 88-14K, L, M



The **horizontal drive control** should be adjusted by turning it counterclockwise until drive bar appears, and then clockwise until drive bar just disappears. **This adjustment must be made with the AGC control fully clockwise** (maximum resistance).

Alignment, Continued

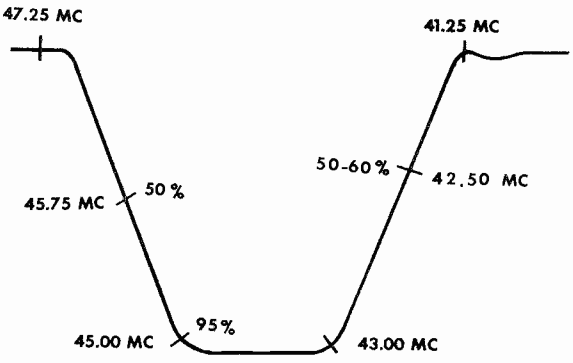
Step	Sig Gen Frqncy	Adjust	For
7.	41.25 mc	S-8	Minimum
8.	47.25 mc	S-6	Minimum

For the following steps, adjust signal generator output to obtain a reading of between two and three volts at point "B" with the six volt battery connected at point "A".

9.	44.00 mc	S-10	MAXIMUM
10.	43.00 mc	S-9	MAXIMUM
11.	45.00 mc	S-7	MAXIMUM
12.	45.75 mc	S-5	MAXIMUM
13.	43.00 mc	S-1 (on tuner)	MAXIMUM

REPEAT STEPS 7 THRU 13

14. Disconnect VTVM.
15. Connect scope between point "B" and ground thru the 22,000 ohm resistor.
16. Connect sweep generator to antenna terminals thru the impedance matching network.
17. Disconnect signal generator from mixer grid and connect hot lead to ground lead of I-F input cable. If this connection produces insufficient marker signal on the response curve, try connecting to other ground points in the vicinity of the 1st I-F stage.
18. Rotate selector to channel 3 and set sweep generator to center frequency of channel (63 mc). With a sweep width of 8mc, adjust generator output to develop not more than 3.5 volts peak to peak on the scope.



Response Curve

(Alignment continued on page 94)

PACKARD BELL Chassis 88-14K, L, M, Alignment Information, Continued

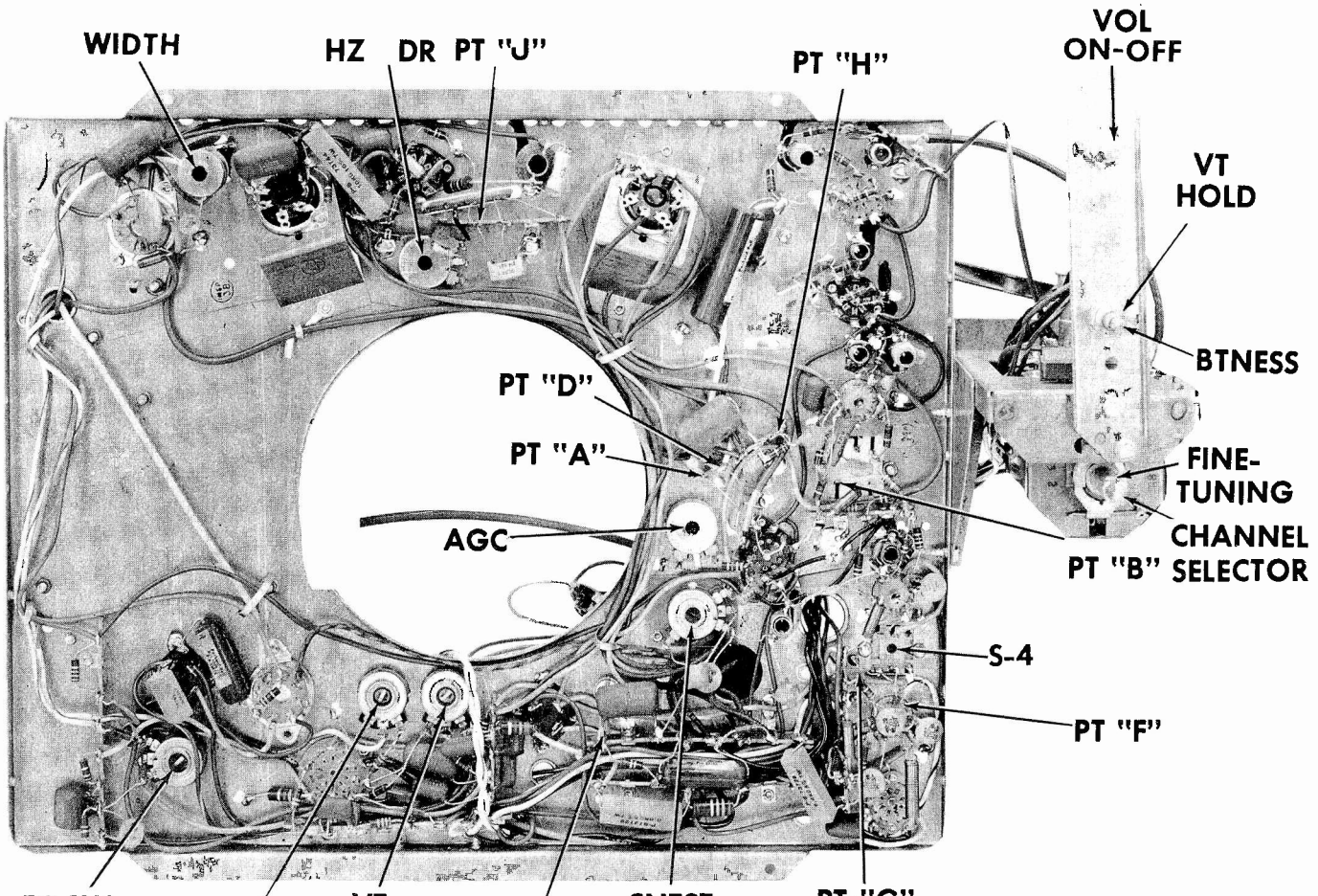
19. Adjust signal generator output to provide the markers shown on the illustrated response curve. Check positions of the markers one at a time. Some slight touching-up of the I-F adjustments may be needed to make the curve correspond to the illustration.
    In touching up the adjustments, use S-1 (tuner) to position 42.50 mc at 50% to 60% of response. Use S-5 to set 45.75 mc at 50%. Use S-10 to flatten or tilt response.
    Use S-7 to position 45.00 mc on corner of response.
    NOTE: Trap tuning may be rechecked by disconnecting the six volt battery from point "A". The response will be expanded sufficiently to show the trap settings.
20. Remove the ground connection from point "J". Remove all test equipment.

Alignment of 4.50 mc Trap:

1. Connect signal generator between point "B" and ground thru the .001 mfd capacitor.
2. Turn contrast control to maximum.
3. Connect RF probe of VTVM to point "C".
4. Set signal generator to 4.50 mc, with the output at one volt or more.
5. Adjust trap, S-11, for minimum VTVM reading. NOTE: If signal generator is not capable of a one volt output the trap may be adjusted visually. Observe the picture and detune the signal to accentuate the 4.50 mc beat. Then adjust S-11 for minimum beat in the picture.

Sound and Ratio Detector Alignment:

1. Connect signal generator between point "B" and ground thru the .001 mfd capacitor.
2. Connect VTVM between point "F" and ground.
3. With a generator frequency of 4.50 mc, adjust S-2 and S-3 for MAXIMUM reading on the VTVM. If a definite peak cannot be obtained, disconnect signal generator from point "B" (step 1), and connect to point "H".
4. Connect the two 100,000 ohm resistors in series between point "F" and ground. Their junction will be point "E" (see dotted resistor connections on schematic).
5. Connect VTVM between points "E" and "G", with ground lead to point "E". (Point "G" is terminal 2 of packaged circuit 24540.)
6. Adjust ratio detector secondary, S-4, for zero between positive and negative peaks.
7. Repeat steps 2 thru 6. Remove the two 100,000 ohm resistors and all test equipment.



Chassis 88-14K, Bottom View

PHILCO

The cross reference chart below and on the next page will tell you what chassis material is needed for any particular model. All chassis types and reference to pages for such material are listed directly below. Some general service information applicable to all chassis is on pages 96, 97, and 114.

Chassis 14G20 diagrams, service material, alignment, see pages 98-102;
Chassis 14J45 diagrams, service material, alignment, see pages 106-110;
Chassis 14N30 diagrams, service data, see pages 103-105, alignment on 101-102;
Chassis 14N50 diagrams, service data, see pages 112-114, alignment on 109-110.
Chassis 14J42, 14J43, used in first production of some models are practically the same as 13J42 covered in TV-21, 1963 TV manual.
Chassis 14N50A used in first production of some models is practically identical to material for 13N50 covered in TV-21, 1963 TV manual.

1964 "M" LINE TELEVISION MODEL-CHASSIS CROSS REFERENCE

MODEL	CHASSIS	13 POSITION TUNER	ALL CHANNEL UHF TUNER	CRT	NOTES
PORTABLE MODELS					
M2610BR	14G20	TT-127C 76-13163	TT-139B 76-12715-12	16ASP4	
M2612WH, GY	14G20	TT-127C 76-13163	TT-139B 76-12715-12	16ASP4	
M2614BU, GY	14G20	TT-127C 76-13163	TT-139B 76-12715-12	16ASP4	
M2616GD	14G20	TT-127C 76-13163	TT-139B 76-12715-12	16ASP4	
COMPACT MODELS					
M3822GD	14J43	TT-129 76-13027	TT-136A 76-12715-6	19BLP4	14J43 CHASSIS USED IN FIRST PRODUCTION
	14J45	TT-127B 76-13112	TT-136A 76-12715-6	19DFP4	
M3824BK, WH	14J43	TT-129 76-13027	TT-137A 76-12715-7	19BLP4	14J43 CHASSIS USED IN FIRST PRODUCTION
	14J45	TT-127B 76-13112	TT-137A 76-12715-7	19DFP4	
M3826CH, WA	14J43	TT-129 76-13027	TT-137A 76-12715-7	19BLP4	14J43 CHASSIS USED IN FIRST PRODUCTION
	14J45	TT-127B 76-13112	TT-137A 76-12715-7	19DFP4	
M3828RWH	14J42	TT-83 76-12718-2	STRIP* CONVERSION	19BLP4	RC-68 REMOTE CONTROL
TABLE AND CONSOLE MODELS					
M4350MR, WA	14N50	TT-127B 76-13112	TT-138C 76-12715-11	23DQP4	
M4500MR, MA, WA	14N50A	TT-127D 76-13155	TT-138C 76-12715-11	23BVP4	14N50A CHASSIS USED IN FIRST PRODUCTION
	14N50	TT-127B 76-13112	TT-138C 76-12715-11	23DQP4	
M4502WA, MR, MA	14N50A	TT-127D 76-13155	TT-138C 76-12715-11	23BVP4	14N50A CHASSIS USED IN FIRST PRODUCTION
	14N50	TT-127B 76-13112	TT-138C 76-12715-11	23DQP4	
M4504MR, BL, MA, WA	14N50A	TT-127D 76-13155	TT-138C 76-12715-11	23BVP4	14N50A CHASSIS USED IN FIRST PRODUCTION
	14N50	TT-127B 76-13112	TT-138C 76-1271S-11	23DQP4	
M4508MB, MA	14N50A	TT-127D 76-13155	TT-138C 76-12715-11	23BVP4	14N50A CHASSIS USED IN FIRST PRODUCTION
	14N50	TT-127B 76-13112	TT-138C 76-12715-11	23DQP4	
M4512MB, MA, WA	14N50A	TT-127D 76-13155	TT-138C 76-12715-11	23BVP4	14N50A CHASSIS USED IN FIRST PRODUCTION
	14N50	TT-127B 76-13112	TT-138C 76-12715-11	23DQP4	

PHILCO "M" Line Television Model-Chassis Cross Reference, Continued

MODEL	CHASSIS	13 POSITION TUNER	ALL CHANNEL UHF TUNER	CRT	NOTES
M4518WA, MA	14N50A	TT-127D 76-13155	TT-138C 76-12715-11	23BVP4	14N50A CHASSIS USED IN FIRST PRODUCTION
	14N50	TT-127B 76-13112	TT-138C 76-12715-11	23DQP4	
M4519GR, BK	14N50A	TT-127D 76-13155	TT-138C 76-12715-11	23BVP4	14N50A CHASSIS USED IN FIRST PRODUCTION
	14N50	TT-127B 76-13112	TT-138C 76-12715-11	23DQP4	
M4590MR, MA, WA	14N30	TT-127A 76-13064	TT-139A 76-12715-10	23DSP4	
M4591WA, MB, MA	14N30	TT-127A 76-13064	TT-139A 76-12715-10	23DSP4	
M4592SMB, SWA	14N30	TT-127A 76-13064	TT-139A 76-12715-10	23DSP4	
M9300MR, BK	14N30	TT-127A 76-13064	TT-139A 76-12715-10	23DSP4	
M9500WA	14N30	TT-127A 76-13064	TT-139A 76-12715-10	23DSP4	
M9502MR	14N30	TT-127A 76-13064	TT-139A 76-12715-10	23DSP4	
CONSOLE TELEVISION-PHONOGRAPH COMBINATIONS					
M4928MB	14N30	TT-127A 76-13064	TT-139A 76-12715-10	23DSP4	
M4930MB, WA	14N30	TT-127A 76-13064	TT-139A 76-12715-10	23DSP4	
M4934MA, WA	14N50A	TT-127D 76-13155	TT-138C 76-12715-11	23BVP4	

CLEANING PICTURE WINDOW:

CAUTION: When cleaning picture window always use a soft cloth with soap and warm water. Never use a detergent or abrasive material.

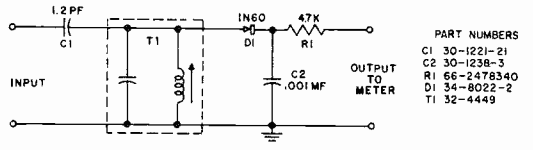
SPOT DECAY SWITCH S2 (14J25 & 14N30 CHASSIS)

When switch S2 is in open position (set turned off) it instantaneously removes external bias from the CRT cathode and prevents spot decay. Switch S2 is part of the volume control.

(Service Hint) - Should the brightness control become ineffective, check switch S2.

4.5MC DETECTOR JIG

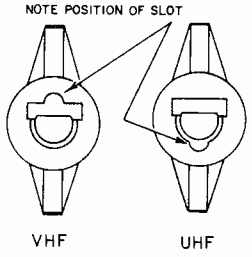
It is important that the jig be properly aligned to give proper results. Connect detector jig to an accurate source of 4.5MC signal and pad transformer (T1) for maximum D-C voltage output. Signal generator can be calibrated by zero beating with sound I-F developed from station signal.



4.5 MC Detector Jig Schematic

VHF AND UHF CHANNEL SELECTOR KNOBS (14N30 CHASSIS ONLY)

The physical appearance of the VHF and UHF knobs are identical except for the shaft slot (see illustration below). Should the knobs be interchanged, the channel indicator will point to the wrong channel.



NOISE CONTROL SETUP VR2

The noise control adjusts the bias of the noise inverter stage for optimum performance at all signal levels. The procedure for adjustment is as follows:

1. Adjustment should be made on weak signal.
2. Adjust fine tuning control until slight sound beat appears in picture.
3. Adjust noise control (clockwise) until the picture appears watery or shifts sideways. This condition is due to the noise inverter stage clipping sync.
4. Back off noise control (counterclockwise) until picture appears stable, then rotate approximately 30° in same direction for additional safety.

PHILCO

"M" Line Sets General Information

HORIZONTAL OSCILLATOR ADJUSTMENT

Allow set to warm up. Tune in a picture.

1. Short out horizontal ringing coil by placing jumper from lug marked "HOR. T.P." (left side of coil) to lug labeled "135V" (right side of coil).
2. Adjust horizontal hold control to correct horizontal line frequency (to stop picture) it will not be stable.
3. Remove shorting jumper and adjust ringing coil for stable picture sync.

LINE LEAKAGE MEASUREMENTS

All Philco television receivers are manufactured to equal or surpass Underwriters Laboratories Inc. specifications. It is possible, however, for the technician to inadvertently defeat one or more of the safety measures built into the receiver resulting in a receiver which is a potential shock hazard to the customer.

It is pertinent, therefore, that the technician carefully check each receiver, after it has been serviced, for excessive line leakage.

COLD CHECK

1. Remove A-C plug from wall outlet and place a jumper between the two plug prongs. Turn receiver A-C switch "on"

2. Connect one lead from an ohmmeter to the jumpered A-C plug and touch the other ohmmeter lead to the exposed metal parts of the cabinet and trim (including antenna). Limits which the reading should fall are between 1.5 meg and 3.5 meg.

HOT CHECK

1. Connect receiver to A-C outlet and turn set "on".

2. Connect a 1500 ohm, 10 watt, resistor across the terminals of a 1000 ohm/volt A-C voltmeter. Connect one lead of the meter to earth ground and touch the other lead to the exposed metal parts of the cabinet and trim (including the antenna). The voltage measured (on the 2.5V scale) should not exceed 0.4V RMS. Start check with meter on higher range to protect meter against overload.

3. If the "polarized plug" has been defeated in any way, such as by an adaptor plug for homes without polarized wiring, then reverse the A-C plug in the wall socket and check voltage reading again. NOTE: There shouldn't be any reading if the "polarized" plug has not been defeated, as the "polarized" plug automatically connects the metal parts of the receiver to earth ground thereby further eliminating any hazard.

TUNER OSCILLATOR ALIGNMENT

This procedure uses the traps of the video I-F channel, thus, proper oscillator adjustment is dependent upon an accurately aligned I-F strip.

1. Connect A-M generator to antenna input terminals (no matching network required). Use 30% modulated signal.

2. Connect oscilloscope to the video detector output lug.

3. Tuners Using Fine Tuning Control:

Set the fine tuning control in the middle of its range, then proceed with the padding of each channel oscillator adjustment for minimum scope indication (See chart below).

STEP	A-M GEN. FREQ.	TUNER POSITION	VIDEO CARRIER FREQ. (MC)	SOUND CARRIER FREQ. (MC)
1	209.75 MC	Channel 13	211.25	215.75
2	203.75 MC	Channel 12	205.25	209.75
3	197.75 MC	Channel 11	199.25	203.75
4	191.75 MC	Channel 10	193.25	197.75
5	185.75 MC	Channel 9	187.25	191.75
6	179.75 MC	Channel 8	181.25	185.75
7	173.75 MC	Channel 7	175.25	179.75
8	81.75 MC	Channel 6	83.25	87.75
9	75.75 MC	Channel 5	77.25	81.75
10	65.75 MC	Channel 4	67.25	71.75
11	59.75 MC	Channel 3	61.25	65.75
12	53.75 MC	Channel 2	55.25	59.75

CHECKING THE HORIZONTAL PHASE COMPARER SELENIUM (D1)

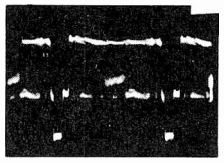
When servicing television receivers where the dual selenium diode is suspected, a fast and efficient method of checking them is this:

A 20,000 ohm/volt meter is employed. On the 10K scale the forward resistance (meter connected in the same polarity as the diode) should be a maximum of 6000 ohms. The ratio of the forward resistances of the two diodes should be less than 2 to 1. On the 100K scale the back resistance (meter connected in reverse polarity to the diode) should be a minimum of 2 megohms. The center of the phase comparer is the common negative.

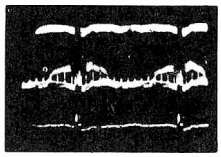
PHILCO

Chassis 14G20

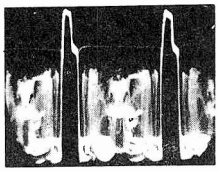
(Material on pages 98-102)



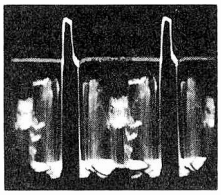
1 3.5 volts p/p, 15,750 c.p.s.



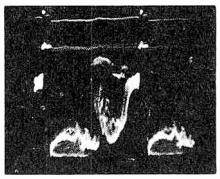
2 3.5 volts p/p, 60 c.p.s.



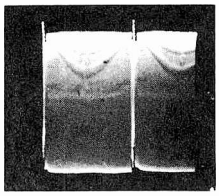
3 100 volts, p/p, 15,750 c.p.s.



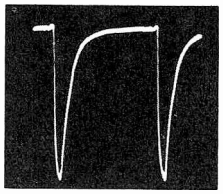
4 80 volts p/p, 15,750 c.p.s.



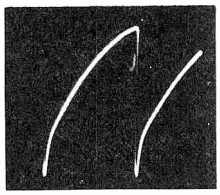
5 80 volts p/p, 60 c.p.s.



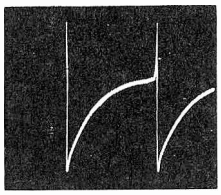
6 50 volts p/p, 60 c.p.s.



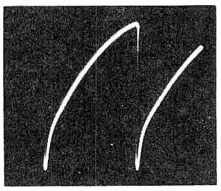
7 50 volts p/p, 15,750 c.p.s.



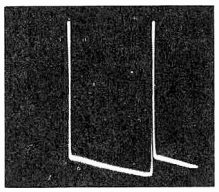
8 40 volts p/p, 60 c.p.s.



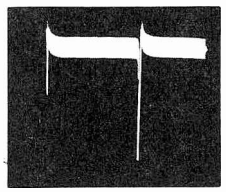
9 60 volts p/p, 60 c.p.s.



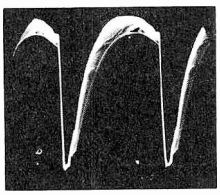
10 40 volts p/p, 60 c.p.s.



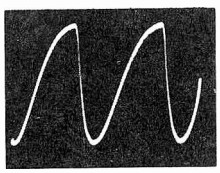
11 1150 volts p/p, 60 c.p.s.



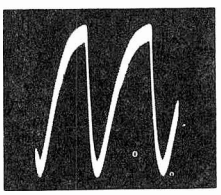
12 60 volts p/p, 60 c.p.s.



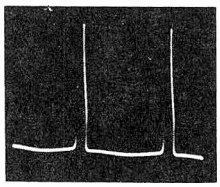
13 8 volts p/p, 15,750 c.p.s.



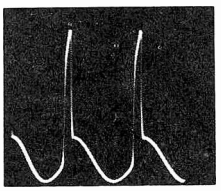
14 12 volts p/p, 15,750 c.p s.



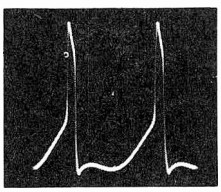
15 15 volts p/p, 15,750 c.p.s.



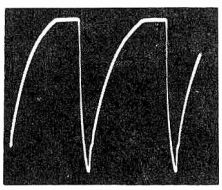
16 8 volts p/p, 15,750 c.p.s.



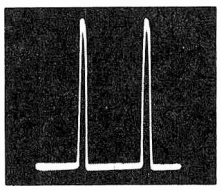
17 30 volts p/p, 15,750 c.p s.



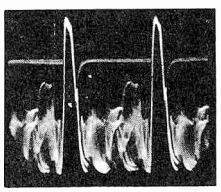
18 25 volts p/p, 15,750 c.p.s.



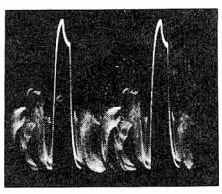
19 90 volts p/p, 15,750 c.p s.



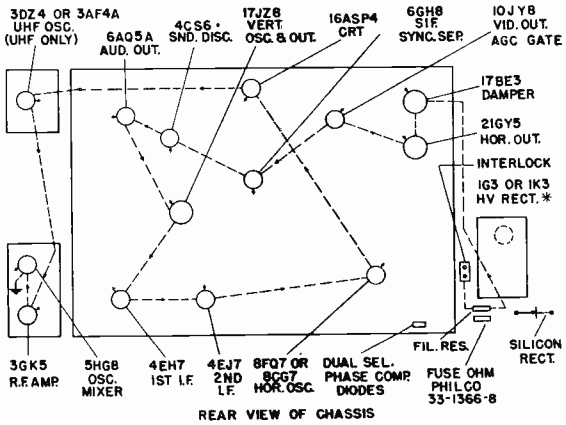
20 350 volts p/p, 15,750 c.p.s.



21 60 volts p/p, 15,750 c.p.s.



22 16 volts p/p, 15,750 c.p.s.



Dotted lines indicate filament string

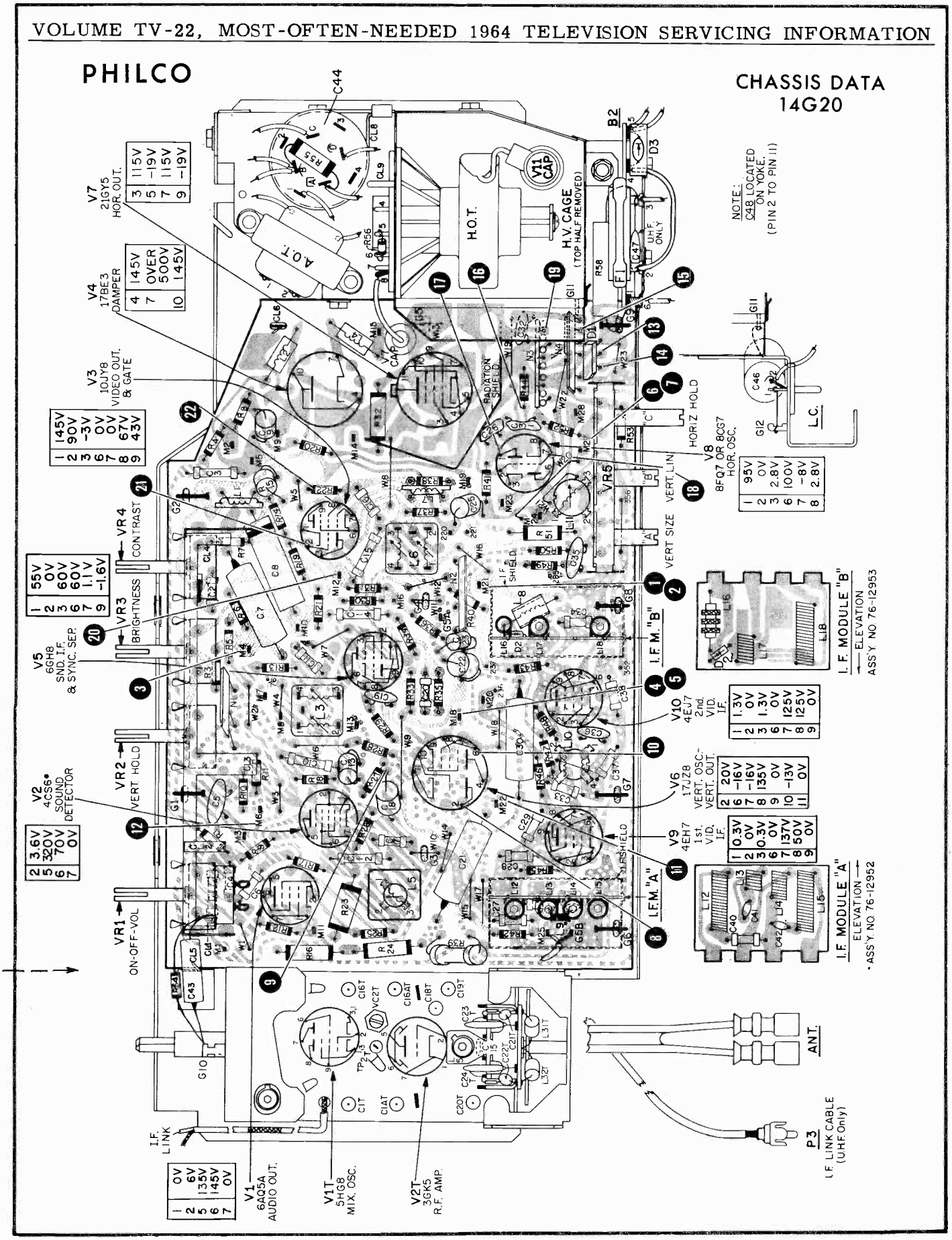
* This tube in high voltage cage

Series Filament Connections

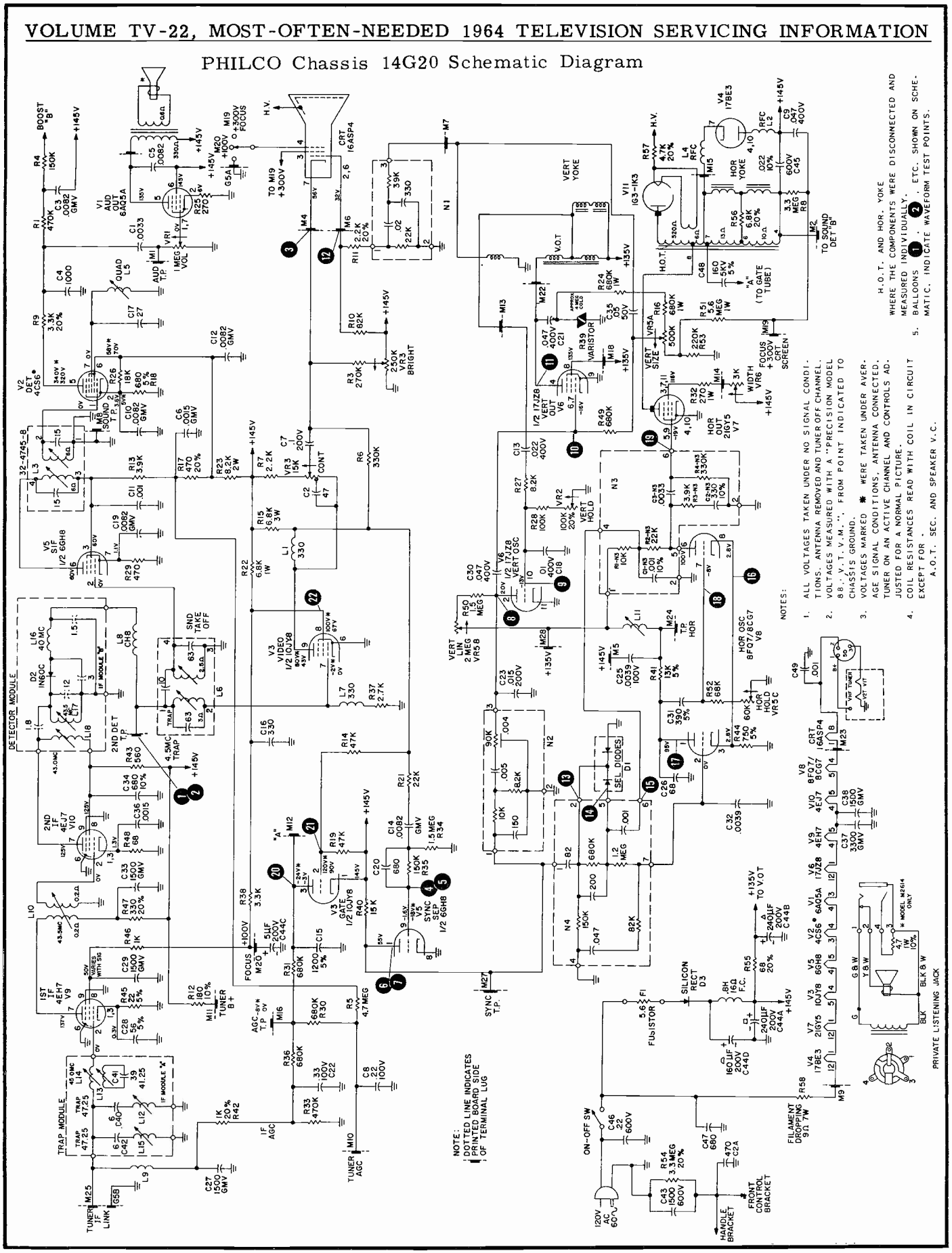
These waveforms were taken with the receiver adjusted for an approximate peak-to-peak output of 3.5 volts at the video detector. Voltage readings taken with raster just filling screen and all controls set for normal picture viewing. The voltages given are approximate peak-to-peak values. The frequencies shown are those of the waveforms—not the sweep rate of the oscilloscope. All readings were taken with a Model ES-550B Precision oscilloscope.

PANEL LUG CONNECTIONS

Lug	Connection
M1	Audio Test Point
M2	White Lead to B1-2
M3	Blue Lead to A. O. T.
M4	Video Output, Yellow/White lead to Pin 7 of C. R. T.
M5	Red/White Lead to B1-5, 145V B-plus
M6	Green/White Lead to Pin 6 of CRT
M7	Orange/White Lead to B1-3, vertical retrace suppression
M8	Sound Det. Test Point, Ground Link
M9	Brown/White Lead to B2-1, start of filament chain
M10	White Lead, Tuner AGC
M11	Yellow Lead, Tuner B-plus
M12	Blue/White Lead to Yoke, AGC Gate Pulse
M13	Red/White Lead of V. O. T., Vertical Feedback
M14	Blue/White Lead to VR6-1, Width Control
M15	Red Lead to H. O. T. Pin 7
M16	AGC Test Point
M18	Orange/White Leads to M28 and to C44B, 135V B-plus
M19	Orange/White Lead to Pin 4 of CRT, 300V, optional focus connection
M20	Green/White Lead to C44C, 100V B-plus, optional focus connection
M21	Video 2nd detector test point
M22	Blue/White Lead of V. O. T., vertical output plate
M23	Brown/White Lead to Pin 1 of CRT, filament
M24	Horizontal Oscillator Test Point
M25	I-F Input, center conductor of shielded tuner I-F link
M27	Sync Test Point
M28	Orange/White Lead to M18, 135V B-plus


PHILCO
CHASSIS DATA
14G20
NOTE:
G4B LOCATED ON YOKE. (PIN 2 TO PIN 11)
V7 21GY5 HOR. OUT.
3 115V
5 -19V
7 115V
9 -19V
V4 17BE3 DAMPER
4 145V
7 OVER 500V
10 145V
V3 10JY8 VIDEO OUT. & GATE
1 145V
2 90V
3 -3V
6 0V
7 0V
8 67V
9 43V
V5 6GH8 SND. I.F. & SYNC. SEP.
1 55V
2 0V
3 60V
6 60V
7 1.1V
9 -1.6V
V2 4CS6 SOUND DETECTOR
2 3.6V
5 320V
6 70V
7 0V
V1 6AQ5A AUDIO OUT.
1 0V
2 6V
5 135V
6 145V
7 0V
V1T 5HG8 MIX. OSC.
V2T 3GK5 R.F. AMP.
V8 8FQ7 OR 8CG7 HOR. OSC.
1 95V
2 0V
3 2.8V
6 100V
7 -8V
8 2.8V
V10 4EU7 2nd. VID. I.F.
1 1.3V
2 0V
3 1.3V
6 0V
7 125V
8 125V
9 0V
V6 17JZ8 VERT. OSC.-VERT. OUT.
2 20V
6 -16V
7 -16V
8 135V
9 0V
10 -13V
11 0V
V9 4EH7 1st. VID. I.F.
1 0.3V
2 0V
3 0.3V
6 0V
7 137V
8 50V
9 0V
I.F. MODULE "B" — ELEVATION — ASS'Y NO 76-12953
I.F. MODULE "A" — ELEVATION — ASS'Y NO 76-12952
I.F. LINK
P3 I.F. LINK CABLE (U.H.F. Only)
ANT.
H.O.T.
H.V. CAGE (TOP HALF REMOVED)
A.O.T.
RADIATION SHIELD
I.F. SHIELD
VR1 ON-OFF-VOL
VR2 VERT. HOLD
VR3 BRIGHTNESS
VR4 CONTRAST
VR5 HORIZ. HOLD
VERT. SIZE
VERT. LIN.
I.F.M. "A"
I.F.M. "B"
L.C.
UHF ONLY

PHILCO Chassis 14G20 Schematic Diagram



PHILCO

CHASSIS ALIGNMENT
14G20 & 14N30

VIDEO I-F AM AND SWEEP ALIGNMENT PROCEDURE

Preliminary Information

The following video I-F alignment procedure is based upon a tuner, with proper bandpass alignment, connected to the TV chassis.

1. Apply −10VDC to AGC test point, lug M16 on perma-circuit panel.
2. Calibrate oscilloscope for 2.0V p/p for 100% deflection.
3. Connect scope through 10K isolating resistor to 2nd detector T.P., lug M21. Connect .001 mfd from lug M21 to ground to sharpen sweep markers.
4. Connect AM and marker signal generators through test jig to mixer (C1T on tuner). Connect sweep generator, through a 72 ohm to 300 ohm matching network, to antenna terminals.
5. (a) Preset L-12, L-14, and L-18 so that top of cores are 1/8-inch out of coils.
   (b) Preset L-13, L-15, and L-17 so that top of cores are even with top of coils.

AM ALIGNMENT CHART

STEP	AM MOD. 400 AT 50%	ADJUST	REMARKS
1	43.5 MC	L17 - for max.	Adjust input level to prevent overloading.
2	43.0 MC	L18 - for max.	Same as Step #1.
3	43.5 MC 45.0 MC 42.7 MC	L10 - for max. L14 - for max. L1T (tuner I-F coil) - for max.	Same as Step #1.
4	41.25 MC 47.25 MC 47.25 MC	L-13 - for min. L-12 - for min. L-15 - for min.	Bias may be lowered to produce sufficient scope amplitude. Repeat adjustments of L12 and L15 until no further improvement is obtained.

NOTE: To properly position fine tuning for sweep alignment, set tuner to channel 4 and inject 65.75MC, modulated 30% at the antenna terminals. Adjust fine tuning control for minimum scope indication. Do not touch fine tuning control for channel selector for balance of alignment.

SWEEP ALIGNMENT CHART

STEP	SWEEP GEN. APPROX. 8 MC SWEEP WIDTH	MARKER GEN. UNMOD. R-F	ADJUST	REMARKS
5	69 MC	42.5 MC	L1T (tuner I-F coil)	Adjust L1T to place 42.5 MC marker between indicated limits on sound side of curve (Figure A). Adjust sweep generator level to limit scope to 2V p/p deflection. Keep response level with L10.
6	69 MC	45.75 MC	L14	Adjust L14 to place 45.75 MC marker between indicated limits on video side of curve (Figure A). Adjust sweep generator level to limit scope to 2V p/p deflection. Keep response level with L10.
7	69 MC	42.5 MC and 45.75 MC	L10	L10 tilts or levels curve.

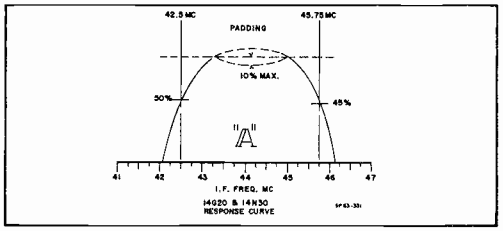


Fig. A

PHILCO

CHASSIS ALIGNMENT
14G20 & 14N30

4.5MC TRAP, SOUND TAKE-OFF AND INTERSTAGE ALIGNMENT

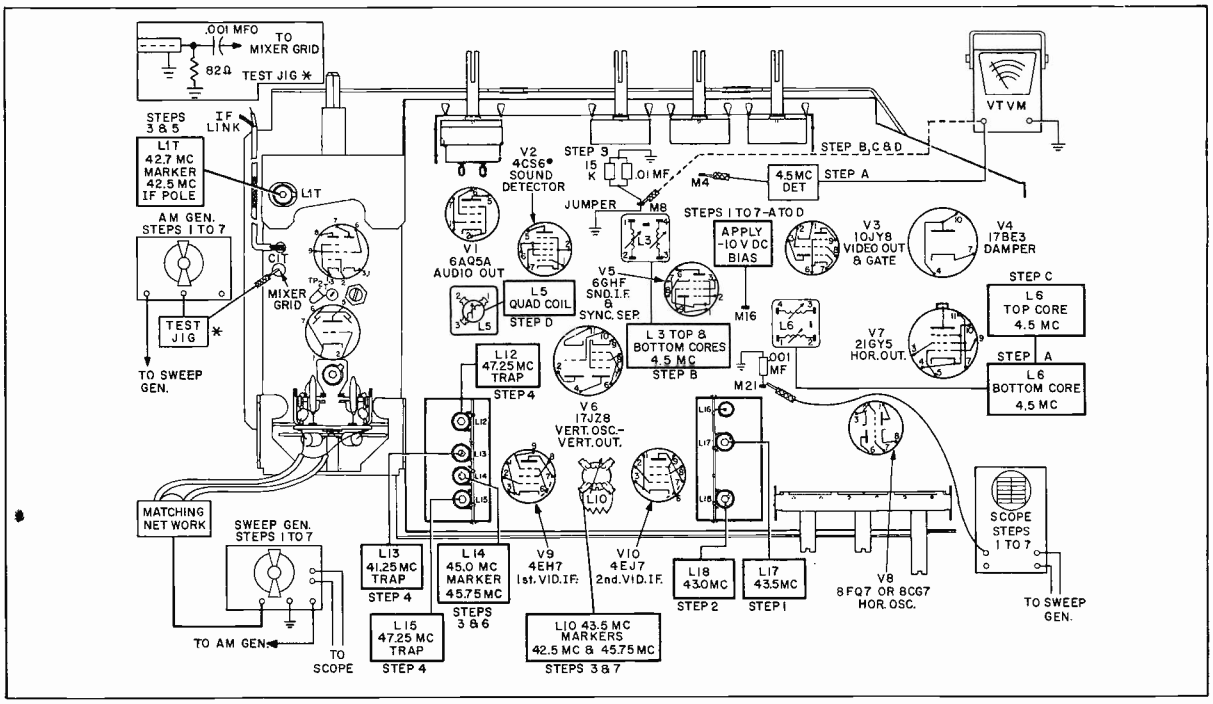
Preliminary:

1. Set contrast control to maximum
2. Set volume control to minimum
3. Apply −12V bias to lug M16

Equipment:

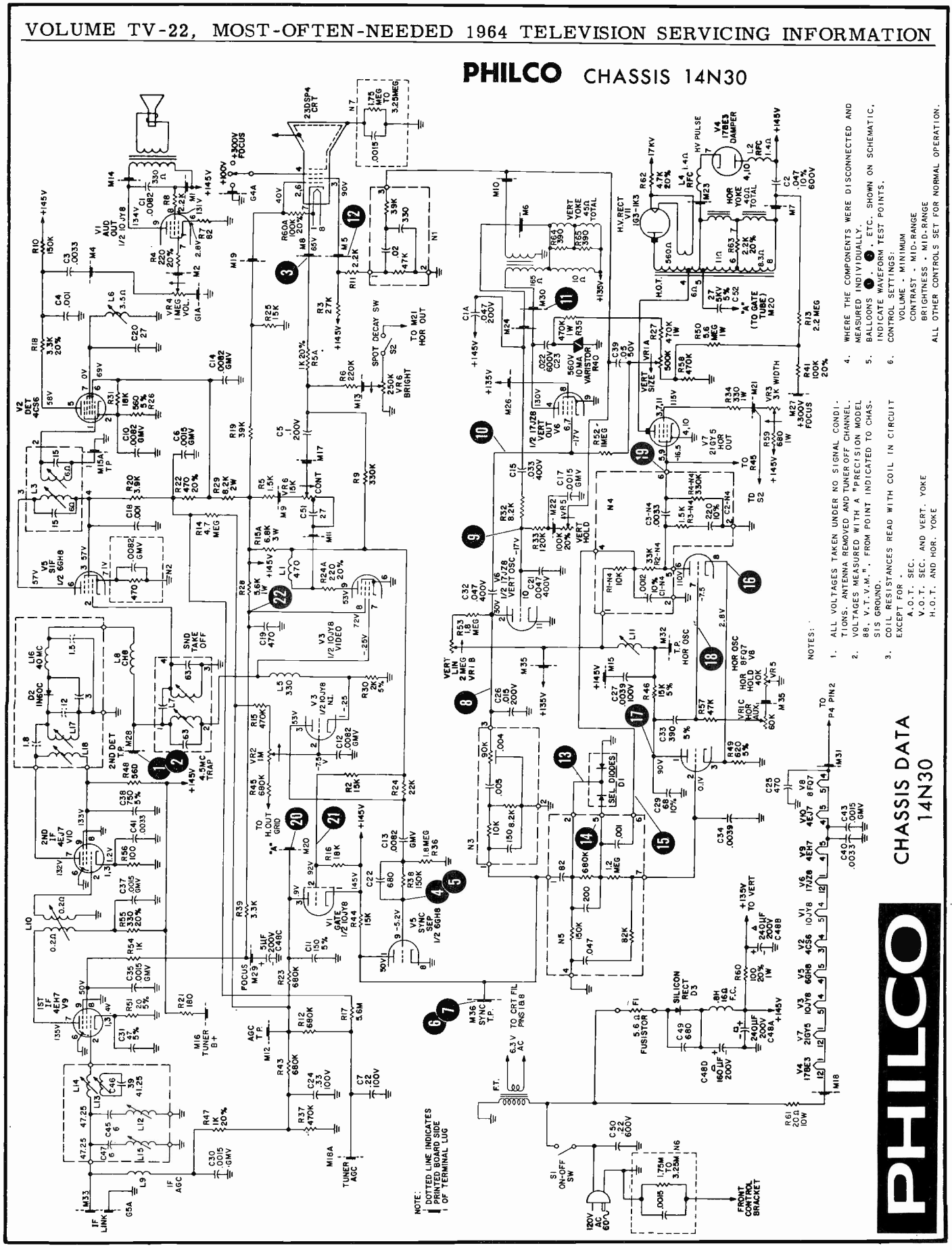
1. V.T.V.M.
2. AM Generator
3. RC Network (15K resistor and .01 mfd in parallel)
4. 4.5 MC Detector Probe (See page 96 for circuit diagram)

STEP	SIGNAL INPUT THROUGH 1500Ω RESISTOR TO LUG M21	OUTPUT	ADJUST	REMARKS
A	4.5MC AM or station signal	Connect 4.5MC detector probe to lug M4. Connect VTVM to 4.5MC probe. Set meter to 2.5V range.	L6 (bottom core) for minimum output indication on VTVM.	Increase signal input to give 1/4 scale deflection at null point (this step for 4.5MC trap adj. only).
B	4.5MC AM or station signal	Remove ground connection from Lug M8. Connect RC Network from M8 to ground. Place VTVM across network. Input should be adjusted to keep output between −1V and −2V.	L3 (top & bottom cores) for maximum indication on VTVM.	RC Network consists of a 15K resistor and a .01 mfd capacitor in parallel.
C	4.5MC AM or station signal	Same as Step B	L6 (top core) for maximum indication on VTVM.	
D	Use station signal	Remove RC Network and replace ground to Lug M8.	Quad coil L5 for maximum sound output.	The correct peak will be the second one when turning core into coil.



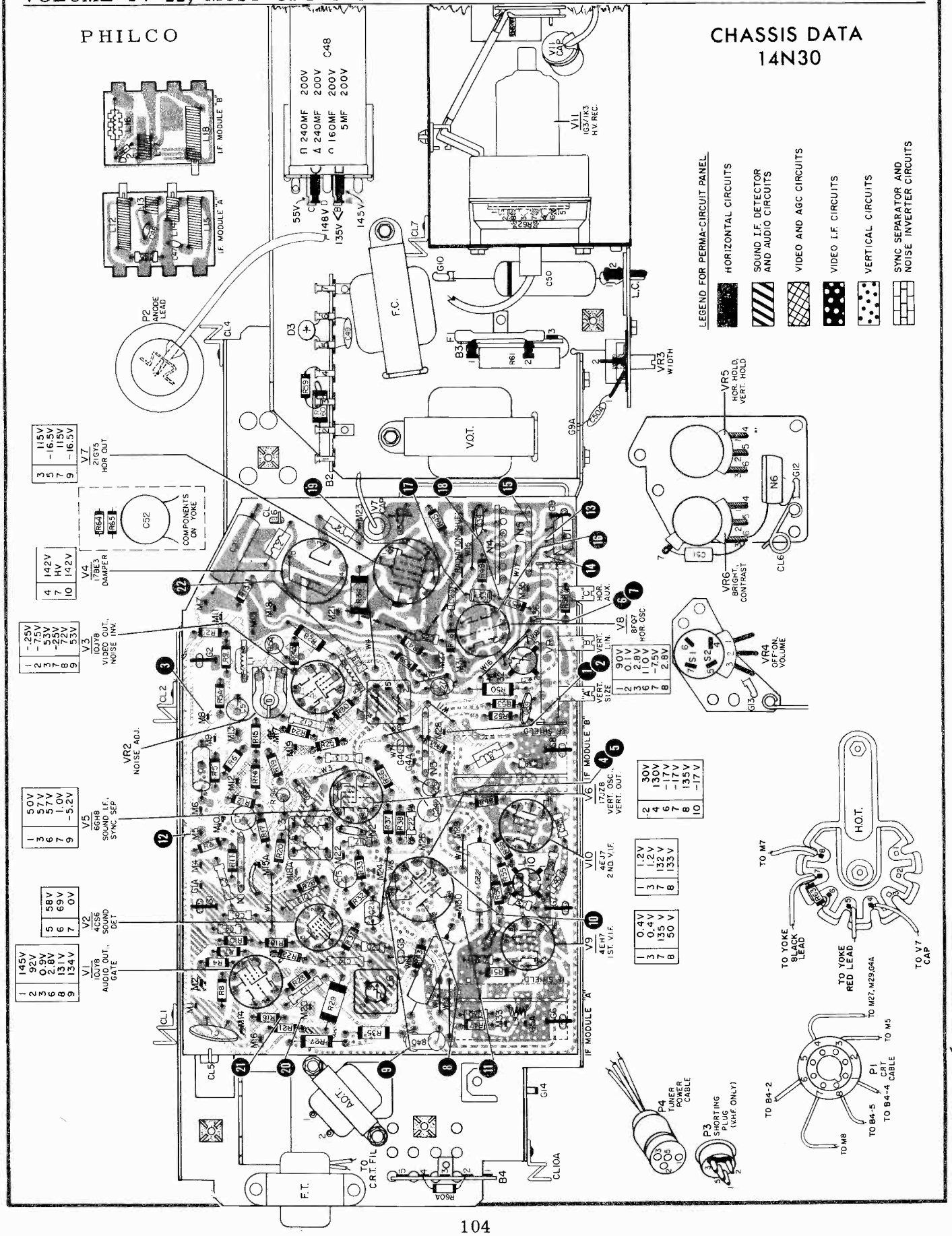
14G20 & 14N30 Equipment Setup & Alignment Points

PHILCO CHASSIS 14N30



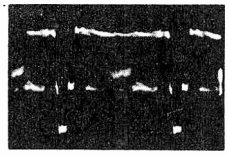
PHILCO

CHASSIS DATA
14N30

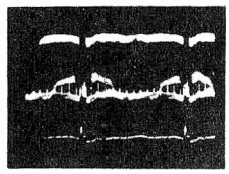


PHILCO

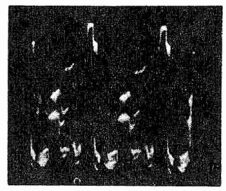
CHASSIS DATA
14N30



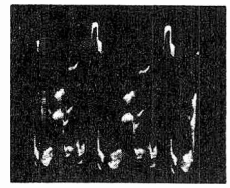
1 3.5 volts p/p, 15,750 cps (max. contrast)



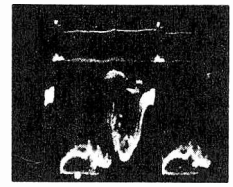
2 3.5 volts p/p, 60 cps (max. contrast)



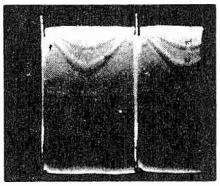
3 85 volts p/p, 15,750 cps (max. contrast)



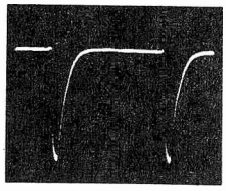
4 70 volts p/p, 15,750 cps



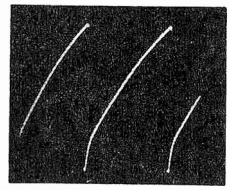
5 70 volts p/p, 60 cps



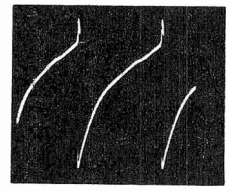
6 45 volts p/p, 60 cps



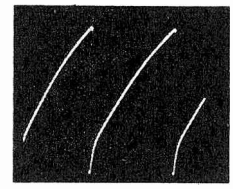
7 45 volts p/p, 15,750 cps



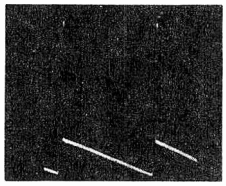
8 40 volts p/p, 60 cps



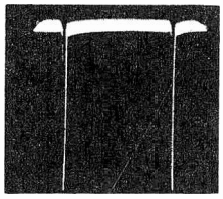
9 50 volts p/p, 60 cps



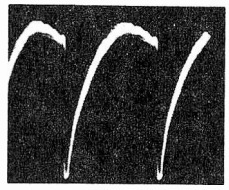
10 40 volts p/p, 60 cps



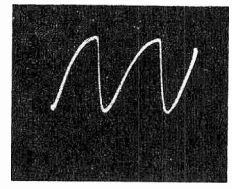
11 1000 volts p/p, sawtooth, 150 volts p/p, 60 cps



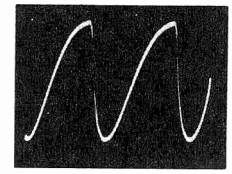
12 35 volts p/p, 60 cps



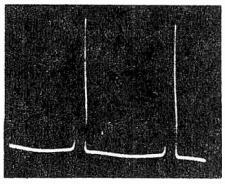
13 10 volts p/p, 15,750 cps



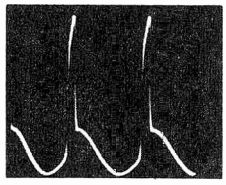
14 7 volts p/p, 15,750 cps



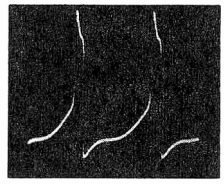
15 9 volts p/p, 15,750 cps



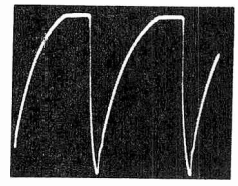
16 8 volts p/p, 15,750 cps



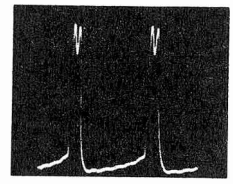
17 30 volts p/p, 15,750 cps



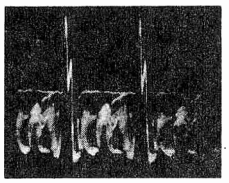
18 25 volts p/p, 15,750 cps



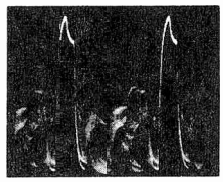
19 100 volts p/p, 15,750 cps



20 470 volts p/p, 15,750 cps

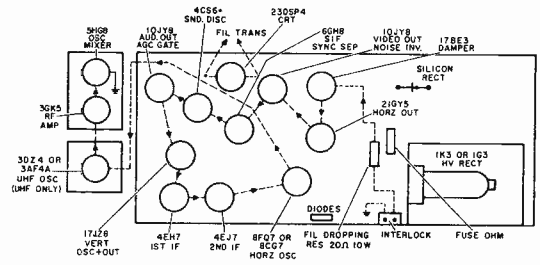


21 50 volts p/p, 15,750 cps



22 15 volts p/p, 15,750 cps

These waveforms were taken with the receiver adjusted for an approximate output of 3.5 volts p/p at the video detector. Voltage readings taken with raster just filling screen and all controls set for normal picture viewing. The voltages are given approximate peak-to-peak values. The frequencies shown are those of the waveforms—not the sweep rate of the oscilloscope. All readings taken with Model ES-550B "Precision Oscilloscope."



14N30 Filament String

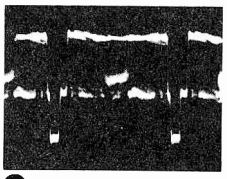
PANEL LUG CONNECTIONS

M1	LEAD TO A.O.T. (RED)
M2	LEAD TO VOL. CONT. C.T.
M4	LEAD TO VOL. CONT.
M5	LEAD TO CRT SCREEN GRID (PIN 3)
M6	LEAD TO VERT. YOKE AND M24
M7	LEAD TO HORZ. YOKE
M8	LEAD TO CRT CATHODE (PIN 7)
M9	LEAD TO CONTRAST CONT.
M10	LEAD TO VERT. OUT. TRANSFORMER
M11	LEAD TO CONTRAST CONTROL
M12	AGC TEST POINT
M13	LEAD TO BRIGHTNESS CONTROL
M14	LEAD TO A.O.T. (BLUE)
M15	LEAD TO B2-3
M15A	JUMPER TO GROUND
M16	LEAD TO TUNER B+
M17	LEAD TO CONTRAST CONTROL C.T.
M18	LEAD TO FILAMENT INPUT
M18A	LEAD TO TUNER AGC
M19	LEAD TO CRT GRID (PIN 2, 6)
M20	LEAD TO YOKE (GATE PULSE)
M21	LEADS TO WIDTH CONTROL AND S1-2
M22	LEAD TO VERT. HOLD CONTROL
M23	LEAD TO H.O.T. (PIN 5)
M24	LEADS TO V.O.T. AND M6
M26	LEAD TO B2-1
M27	FOCUS POINT
M28	SECOND DET. T.P.
M29	LEAD TO C48C
M30	LEAD TO V.O.T. PRIMARY
M31	LEAD TO CRT FILAMENT
M32	HORIZONTAL T.P.
M33	I.F INPUT CABLE
M35	LEAD TO M26
M36	SYNC TEST POINT

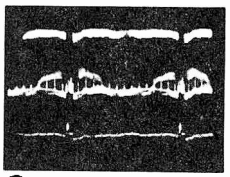
PHILCO CHASSIS DATA 14J45

OSCILLOSCOPE WAVEFORM PATTERNS

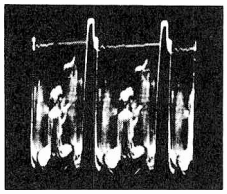
These waveforms were taken with the receiver adjusted for an approximate peak-to-peak out of 2.5 volts at the video detector. Voltage readings taken with the raster just filling screen and all controls set for normal picture viewing. The voltages given are approximate peak-to-peak values. The frequencies shown are those of the waveforms, not the sweep rate of the oscilloscope. All readings were taken with a Model ES-550B Precision Oscilloscope.



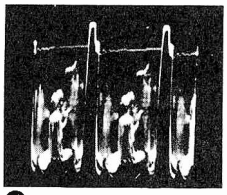
1 2.5 volts p/p, 15,750 c.p.s. (max. contrast)



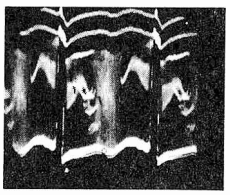
2 2.5 volts p/p, 60 c.p.s. (max. contrast)



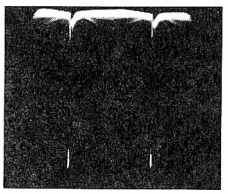
3 100 volts p/p, 15,750 c.p.s.



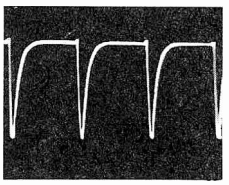
4 60 volts p/p, 15,750 c.p.s.



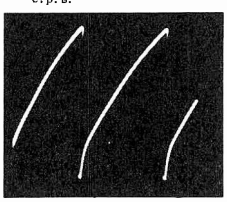
5 60 volts p/p, 60 c.p.s.



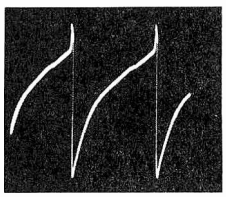
6 43 volts p/p, 60 c.p.s.



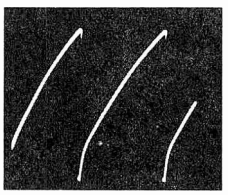
7 43 volts p/p, 15,750 c.p.s.



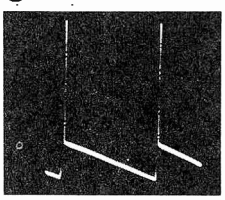
8 45 volts p/p, 60 c.p.s.



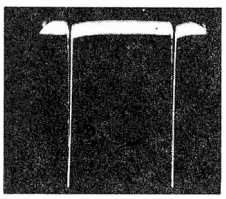
9 80 volts p/p, 60 c.p.s.



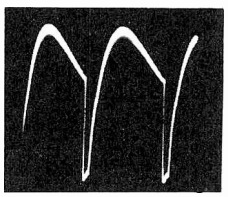
10 45 volts p/p, 60 c.p.s.



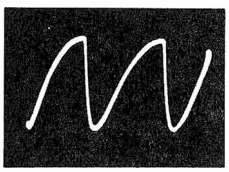
11 1000 volts p/p, 60 c.p.s. total - sawtooth 220 volts p/p



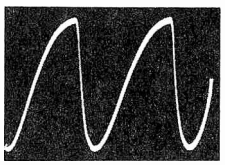
12 62 volts p/p, 60 c.p.s.



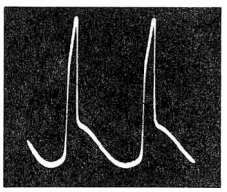
13 15 volts p/p, 15,750 c.p.s.



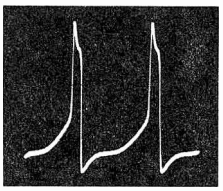
14 18 volts p/p, 15,750 c.p.s.



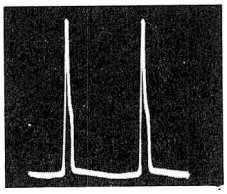
15 20 volts p/p, 15,750 c.p.s.



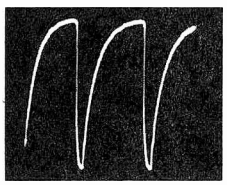
17 50 volts p/p, 15,750 c.p.s.



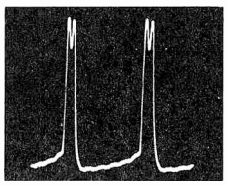
18 50 volts p/p, 15,750 c.p.s.



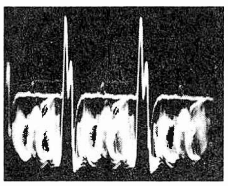
16 4.5 volts p/p, 15,750 c.p.s.



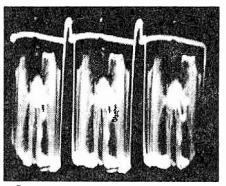
19 91 volts p/p, 15,750 c.p.s.



20 560 volts p/p, 15,750 c.p.s.



21 36 volts p/p, 15,750 c.p.s.



22 20 volts p/p, 15,750 c.p.s.

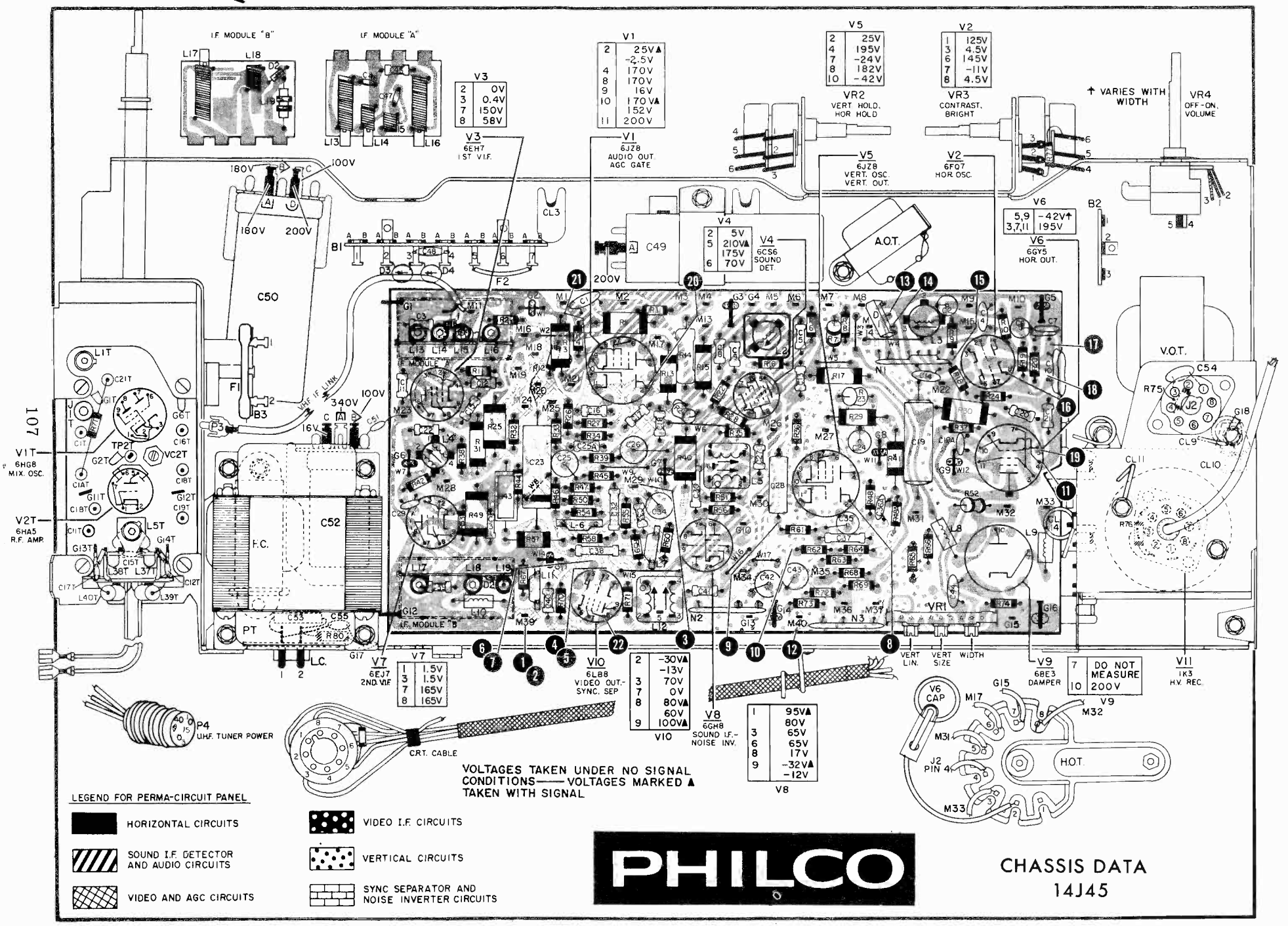
RESISTANCE CHART

TUBE	USE	PIN NUMBERS											
		1	2	3	4	5	6	7	8	9	10	11	12
V1 6JZ8	Aud. Out. AGC Gate	FIL	1.1 MEG Ω	10KΩ	11KΩ	11KΩ	200KΩ	200KΩ	14KΩ	390Ω	28KΩ	10KΩ	FIL
V2 6FQ7	Horz. Osc.	26KΩ	1.8MΩ	820Ω	FIL.	FIL.	39K	90K	820Ω				
V3 6EM7	1st VIF	24Ω	310KΩ	24Ω	FIL	FIL	GND.	11KΩ	30KΩ	GND			
V4 6CS6	Sound Disc	5.5Ω	560Ω	FIL	FIL.	800KΩ	11K	3.5Ω					
V5 6JZ8	Vert. Osc. Vert. Out.	0Ω	2.6 MEG Ω	INF	10KΩ	FIL.	1.3 MEG Ω	1.3 MEG Ω	11KΩ	GND.	250KΩ	GND.	FIL.

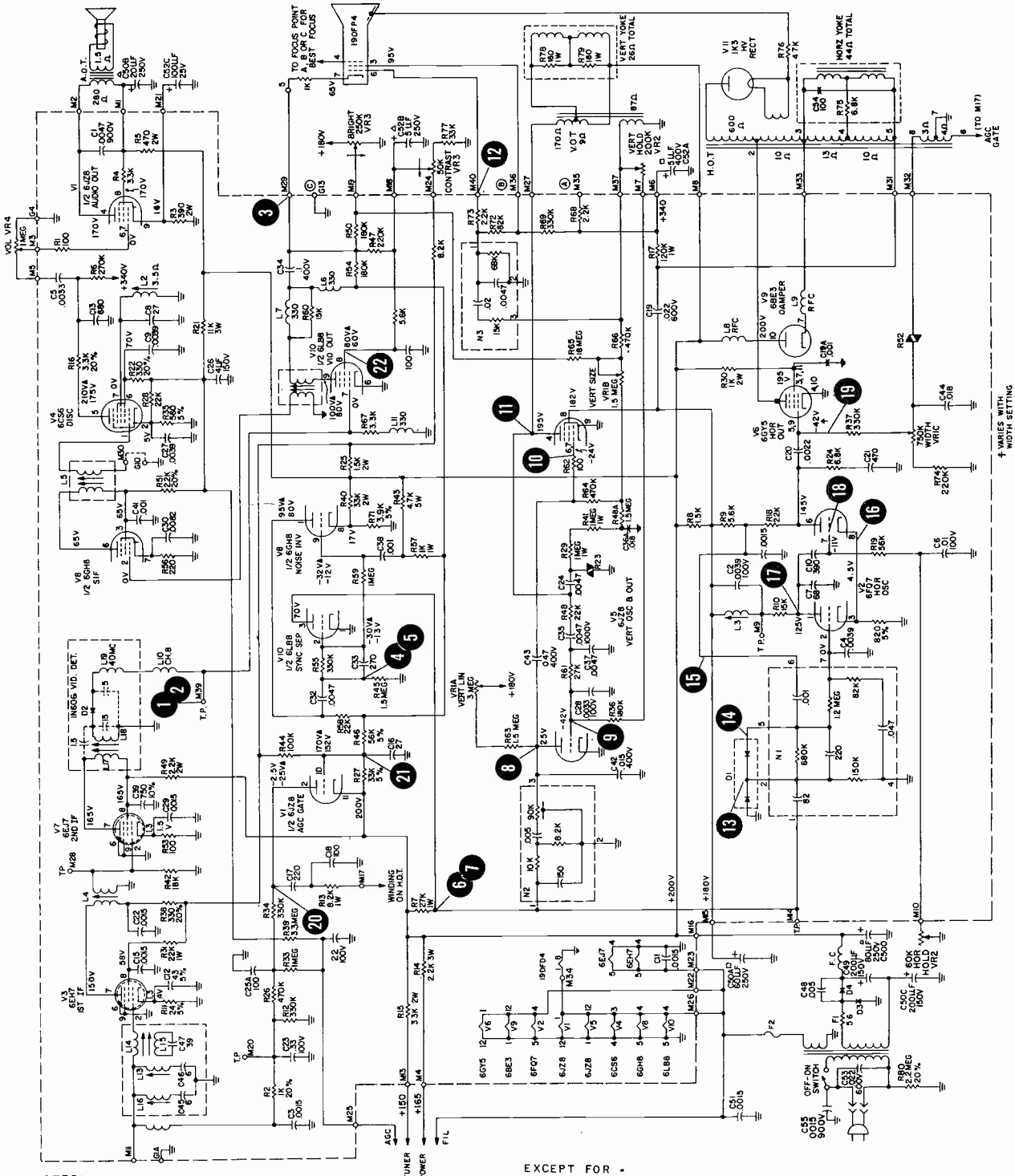
TUBE	USE	PIN NUMBERS											
		1	2	3	4	5	6	7	8	9	10	11	12
V6 6GY5	Horz. Out.	FIL	INF.	10.5KΩ	GND.	INF.	10.5KΩ	10.5KΩ	10.5KΩ	680KΩ	GND	10.5KΩ	FIL.
V7 6EJ7	2nd VIF	100Ω		100Ω	FIL	FIL.	GND			GND			
V8 6GH8	Sound IF & N.I.	37KΩ	0Ω	13KΩ	FIL.	FIL.	13KΩ	220Ω	3.9KΩ	2.6MΩ			
V9 6BE3	Damper	FIL		0Ω	10K	INF.				10K			FIL
V10 6LB8/ 6KR8	Vid. Out. Sync Sep.	GND.	1.7 MEG Ω	12KΩ	FIL.	FIL.	GND	90Ω	29KΩ	15KΩ			

PANEL LUG CONNECTIONS - 14J45

M1 RED LEAD TO A.O.T.
M2 BLUE LEAD TO A.O.T.
M3 GREEN LEAD TO VOL. CONT.
M4 LEAD TO TUNER (+165V) C12T
M5 BLUE LEAD TO VOL. CONT. END
M6 LEAD TO C52A
M7 LEAD TO VERT. HOLD CONT. END
M8 RED LEAD FROM V.O.T. - LEAD TO PIN 6 OF YOKE SOCKET
M9 HORZ. OSC. TEST POINT
M10 LEAD TO HORZ. HOLD CONT. END
M11 I-F INPUT CABLE
M13 LEAD TO TUNER (+150V)
M14 SYNC TEST POINT
M15 LEAD TO C50A
M16 LEAD TO C50D
M17 LEAD TO PIN 6 H.O.T.
M18 LEAD TO CONTRAST CON. TROL C.T. - LEAD TO C52B
M19 LEAD TO BRIGHTNESS CONTROL C.T.
M20 I-F TEST POINT
M21 LEAD TO C52C
M22 LEAD TO M26
M23 LEAD TO B1-7
M24 LEAD TO CONTRAST CONT. END
M25 LEAD TO TUNER (AGC) C19T
M26 LEAD TO M22 - LEAD TO B1-7
M27 BLUE LEAD FROM V.O.T.
M28 2ND VIF TEST POINT
M29 LEAD TO CRT CATHODE
M30 LEAD TO GND. G10
M31 LEAD TO PIN 5 H.O.T.
M32 LEAD TO PIN 8 H.O.T.
M33 LEAD TO PIN 3 H.O.T.
M34 LEAD TO CRT FILAMENT
M35 LEAD TO CRT FOCUS GRID
M36 LEAD TO CRT G2
M37 LEAD TO VERT. HOLD CONT. C.T.
M39 2ND DET. TEST POINT
M40 LEAD TO CRT G1


I.F. MODULE "B"
I.F. MODULE "A"
V3
2 0V
3 0.4V
7 150V
8 58V
V3 6EH7 1ST V.I.F.
V1
2 25V▲
-2.5V
4 170V
8 170V
9 16V
10 170V▲
152V
11 200V
V1 6JZ8 AUDIO OUT AGC GATE
V5
2 25V
4 195V
7 -24V
8 182V
10 -42V
VR2 VERT HOLD, HOR HOLD
V2
1 125V
3 4.5V
6 145V
7 -11V
8 4.5V
VR3 CONTRAST, BRIGHT
† VARIES WITH WIDTH
VR4 OFF-ON, VOLUME
V5 6JZ8 VERT. OSC. VERT. OUT.
V2 6FQ7 HOR. OSC.
V4
2 5V
5 210V▲
175V
6 70V
V4 6CS6 SOUND DET.
V6
5,9 -42V†
3,7,11 195V
V6 6GY5 HOR. OUT.
A.O.T.
V.O.T.
C50
C52
P.C.
PT
I.F. MODULE "B"
V1T 6HG8 MIX. OSC.
V2T 6HA5 R.F. AMP.
V7 6EJ7 2ND V.I.F.
V7
1 1.5V
3 1.5V
7 165V
8 165V
V10
2 -30V▲
-13V
3 70V
7 0V
8 80V▲
60V
9 100V▲
V10 6L8B VIDEO OUT.-SYNC. SEP.
V8 6GH8 SOUND I.F.-NOISE INV.
V8
1 95V▲
80V
3 65V
6 65V
8 17V
9 -32V▲
-12V
V9 6BE3 DAMPER
7 DO NOT MEASURE
10 200V
V11 1K3 H.V. REC.
VERT LIN.
VERT SIZE
WIDTH
V6 CAP
HOT.
P4 UHF. TUNER POWER
C.R.T. CABLE
VHF I.F. LINK
VOLTAGES TAKEN UNDER NO SIGNAL CONDITIONS—— VOLTAGES MARKED ▲ TAKEN WITH SIGNAL
LEGEND FOR PERMA-CIRCUIT PANEL
HORIZONTAL CIRCUITS
SOUND I.F. DETECTOR AND AUDIO CIRCUITS
VIDEO AND AGC CIRCUITS
VIDEO I.F. CIRCUITS
VERTICAL CIRCUITS
SYNC SEPARATOR AND NOISE INVERTER CIRCUITS
PHILCO
CHASSIS DATA
14J45

PHILCO Chassis 14J45 Schematic Diagram, Continued



NOTES:

1. ALL VOLTAGES TAKEN UNDER NO SIGNAL CONDITIONS. ANTENNA REMOVED AND TUNER OFF CHANNEL.
2. VOLTAGES MEASURED WITH A "PRECISION MODEL 88, V.T.V.M." FROM POINT INDICATED TO CHASSIS GROUND.
3. VOLTAGES MARKED ▲ WERE TAKEN UNDER AVERAGE SIGNAL CONDITIONS, ANTENNA CONNECTED, TUNER ON AN ACTIVE CHANNEL AND CONTROLS ADJUSTED FOR A NORMAL PICTURE.
4. COIL RESISTANCES READ WITH COIL IN CIRCUIT EXCEPT FOR -
   A.O.T. SEC.
   VERT. YOKE
   HOR. YOKE
   WHERE THE COMPONENTS WERE DISCONNECTED AND MEASURED INDIVIDUALLY.
5. BALLOONS ❶, ❷, ETC. SHOWN ON SCHEMATIC, INDICATE WAVEFORM TEST POINTS.
6. CONTROL SETTINGS:
   VOLUME - MINIMUM
   CONTRAST - MID-RANGE
   BRIGHTNESS - MID-RANGE
   ALL OTHER CONTROLS SET FOR NORMAL OPERATION.

PHILCO

CHASSIS ALIGNMENT
14J45 & 14N50

VIDEO I-F, AM, AND SWEEP ALIGNMENT PROCEDURE

Preliminary Information

The following video I-F alignment procedure is based upon a tuner, with proper bandpass alignment, connected to the TV chassis.

1. Connect yoke or dummy load to receiver so that normal B+ voltage is maintained.
2. Remove AGC gate tube 6JZ8 (V1), and turn contrast control to maximum.
3. Apply −2VDC bias to tuner AGC test point (M25).
   Apply −10VDC bias to I-F AGC test point (M20).
4. Connect scope through 10K resistor to 2nd detector test point (M39). Connect .001 mfd capacitor from lug (M39) to ground to sharpen sweep markers.
5. Connect AM and marker signal generators through test jig to mixer grid (TP2T on tuner). Connect sweep generator, through a 72Ω to 300Ω matching network, to antenna terminals.
6. (a) Preset five turns out from flush core position, L16, L13, L14 and L17.
   (b) Preset cores flush, L15 and L18.
   (c) Preset seven turns in from flush core position, L4.

AM ALIGNMENT CHART

STEP	AM MOD. 400 CPS AT 30%	ADJUST	REMARKS
1	44.84MC	L17 - FOR MAX.	ADJUST INPUT LEVEL TO PREVENT OVERLOADING.
2	42.75MC	L18 - FOR MAX.	ADJUST INPUT LEVEL TO PREVENT OVERLOADING.
3	43.5MC 42.5MC 45.25MC	L4 - FOR MAX. (CLOCKWISE) L1T - FOR MAX. L14 - FOR MAX.	ADJUST INPUT LEVEL TO PREVENT OVERLOADING.
4	41.25MC 47.25MC 47.25MC	L15 - FOR MIN. L13 - FOR MIN. L16 - FOR MIN.	BIAS MAY BE LOWERED TO PRODUCE SUFFICIENT SCOPE AMPLITUDE. REPEAT ADJUSTMENTS OF L13 AND L16 UNTIL NO FURTHER IMPROVEMENT IS OBTAINED.

SWEEP ALIGNMENT CHART

NOTE: 1. REMOVE JIG FROM GENERATOR CABLE.
2. REMOVE GENERATOR CABLE FROM MIXER GRID AND CONNECT CABLE TO (G6) ON VOS PANEL.
3. TO PROPERLY POSITION FINE TUNING FOR SWEEP ALIGNMENT, SET TUNER TO CHANNEL 4 AND INJECT 65.75MC MOD. 30% AT THE ANTENNA TERMINALS. ADJUST FINE TUNING CONTROL FOR MINIMUM SCOPE INDICATION. DO NOT TOUCH FINE TUNING CONTROL OR CHANNEL SELECTOR FOR BALANCE OF ALIGNMENT.

STEP	SWEEP GEN. APPROX. 8MC SWEEP WIDTH	MARKER GEN. UNMOD. RF	ADJUST	REMARKS
5	69MC	42.5MC	L1T (TUNER IF COIL)	ADJUST L1T TO PLACE 42.5MC MARKER BETWEEN INDICATED LIMITS ON SOUND SIDE OF CURVE (FIG. A). ADJUST SWEEP GENERATOR LEVEL TO LIMIT SCOPE TO 3V P/P DEFLECTION. KEEP RESPONSE LEVEL WITH L4.
6	69MC	45.75MC	L14	ADJUST L14 TO PLACE 45.75MC MARKER BETWEEN INDICATED LIMITS ON VIDEO SIDE OF CURVE (FIG. A). ADJUST SWEEP GENERATOR LEVEL TO LIMIT SCOPE TO 3V P/P DEFLECTION. KEEP RESPONSE LEVEL WITH L4.
7	69MC	42.5MC AND 45.75MC	L4	L4 TILTS OR LEVELS CURVE. ADJUST CURVE TO FALL WITHIN LIMITS (FIG. B).

Fig. A

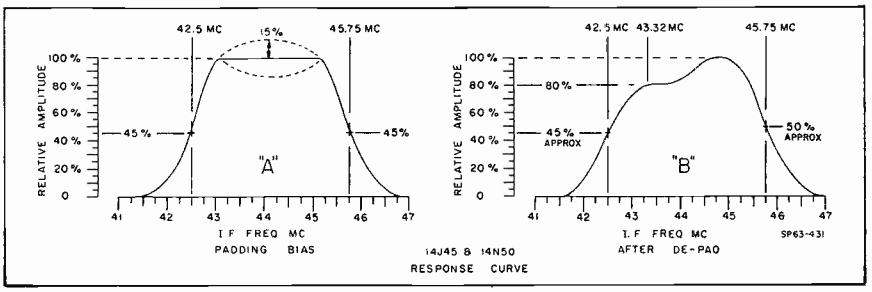


Fig. B

PHILCO Chassis 14J45 and 14N50 Alignment Information, Continued

4.5MC TRAP, SOUND TAKE-OFF AND INTERSTAGE ALIGNMENT

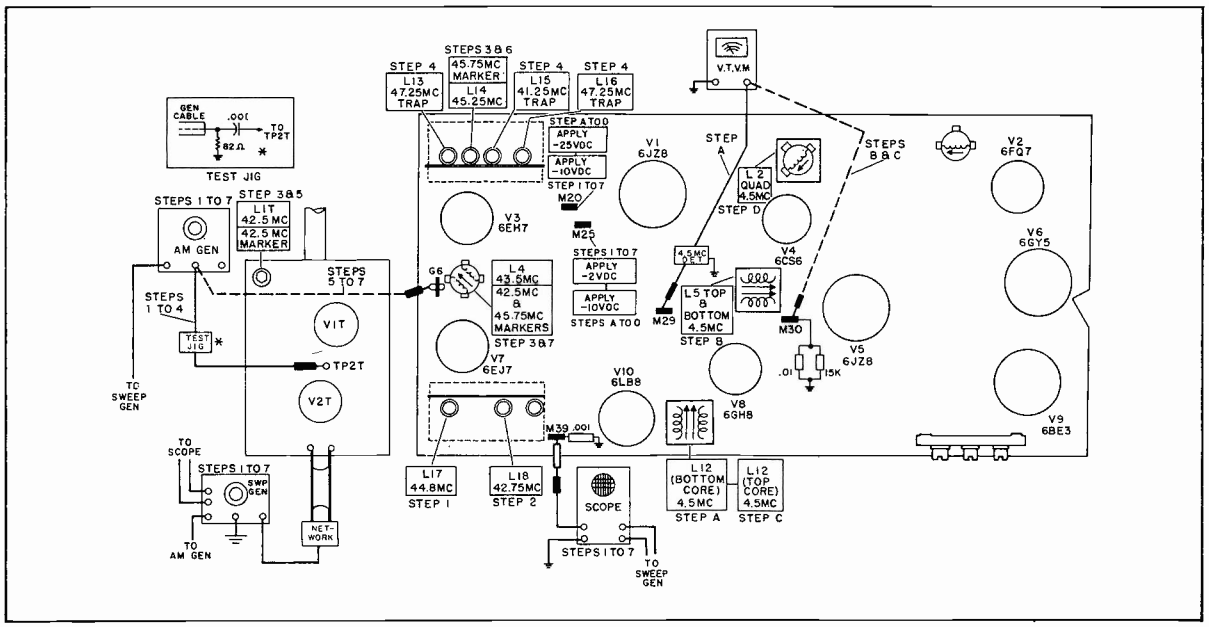
Preliminary:

1. Set contrast control to maximum
2. Set volume control to minimum
3. Apply -25V bias to lug M20
4. Apply -10V bias to lug M25

Equipment:

1. V.T.V.M.
2. AM Generator
3. RC Network (15K resistor and .01 mfd in parallel)
4. 4.5MC Detector Probe (See page 96).

STEP	SIGNAL INPUT THROUGH 1500Ω RESISTOR TO LUG M21	OUTPUT	ADJUST	REMARKS
A	4.5MC AM OR STATION SIGNAL	CONNECT 4.5MC DETECTOR PROBE TO LUG M29. CONNECT VTVM TO 4.5MC PROBE. SET METER TO 2.5V RANGE.	L12 (BOTTOM CORE) FOR MINIMUM OUTPUT INDICATION ON VTVM.	INCREASE SIGNAL INPUT TO GIVE 1/4 SCALE DEFLECTION AT NULL POINT (THIS STEP FOR 4.5MC TRAP ADJ. ONLY).
B	4.5MC AM OR STATION SIGNAL.	REMOVE GROUND CONNECTION FROM LUG M30. CONNECT RC NETWORK FROM M30 TO GROUND. PLACE VTVM ACROSS NETWORK. INPUT SHOULD BE ADJUSTED TO KEEP OUTPUT BETWEEN .1V AND .2V.	L5 (TOP & BOTTOM CORES) FOR MAXIMUM INDICATION ON VTVM.	RC NETWORK CONSISTS OF A 15K RESISTOR AND A .01 MFD CAPACITOR IN PARALLEL.
C	4.5MC AM OR STATION SIGNAL	SAME AS STEP B	L12 (TOP CORE) FOR MAXIMUM INDICATION ON VTVM.	
D	USE STATION SIGNAL	REMOVE RC NETWORK AND REPLACE GROUND TO LUG M30.	QUAD COIL L2 FOR MAXIMUM SOUND OUTPUT.	THE CORRECT PEAK WILL BE THE SECOND ONE WHEN TURNING CORE INTO COIL.



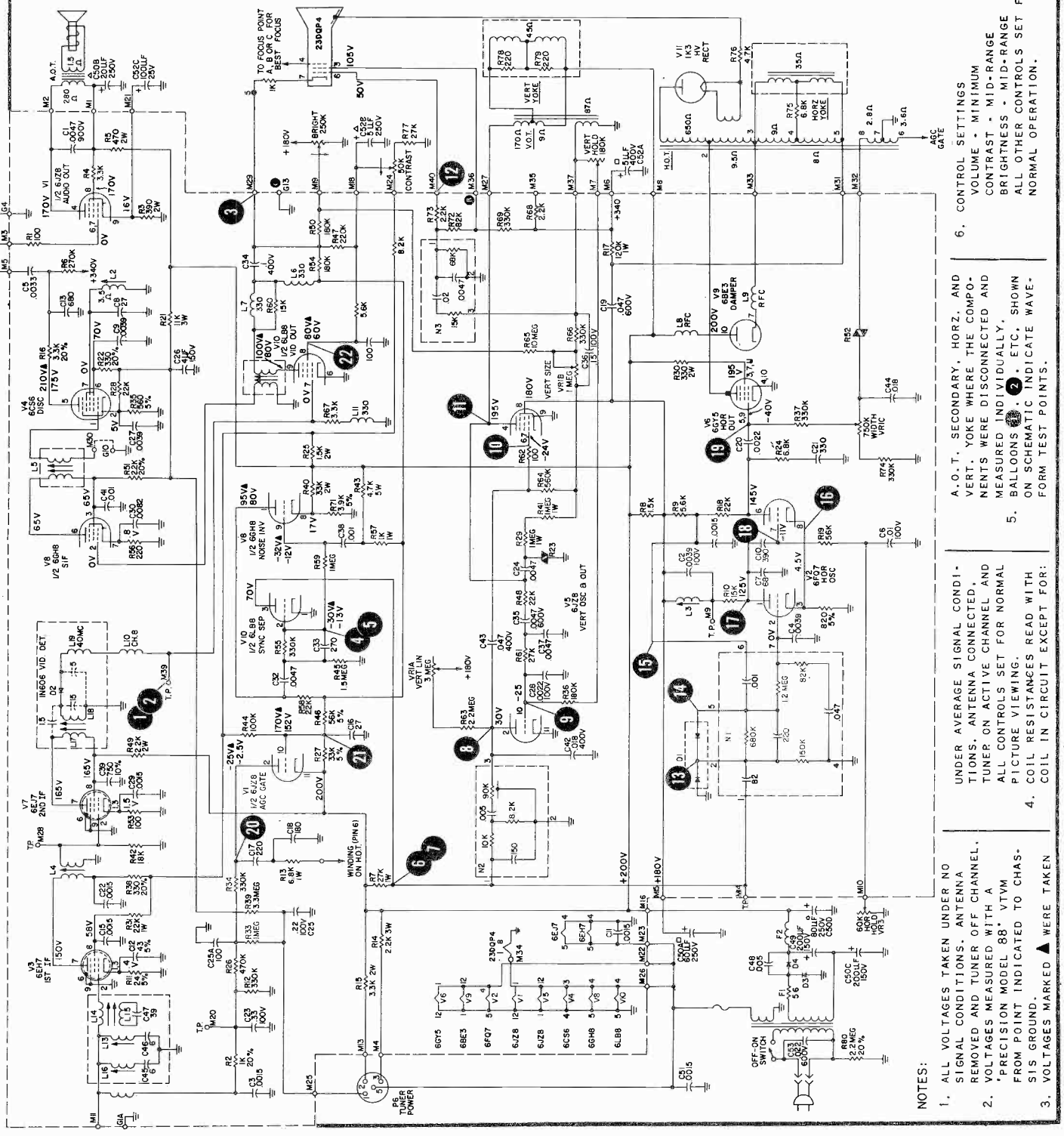
14J45 & 14N50 Equipment Setup & Alignment Points

PHILCO

CHASSIS 14N50

(Diagram below, other data pages 112-113, alignment pages 109-110)

14N50 Schematic Diagram



PHILCO Chassis 14N50 Service Data, Continued

PANEL LUG CONNECTIONS - 14N50

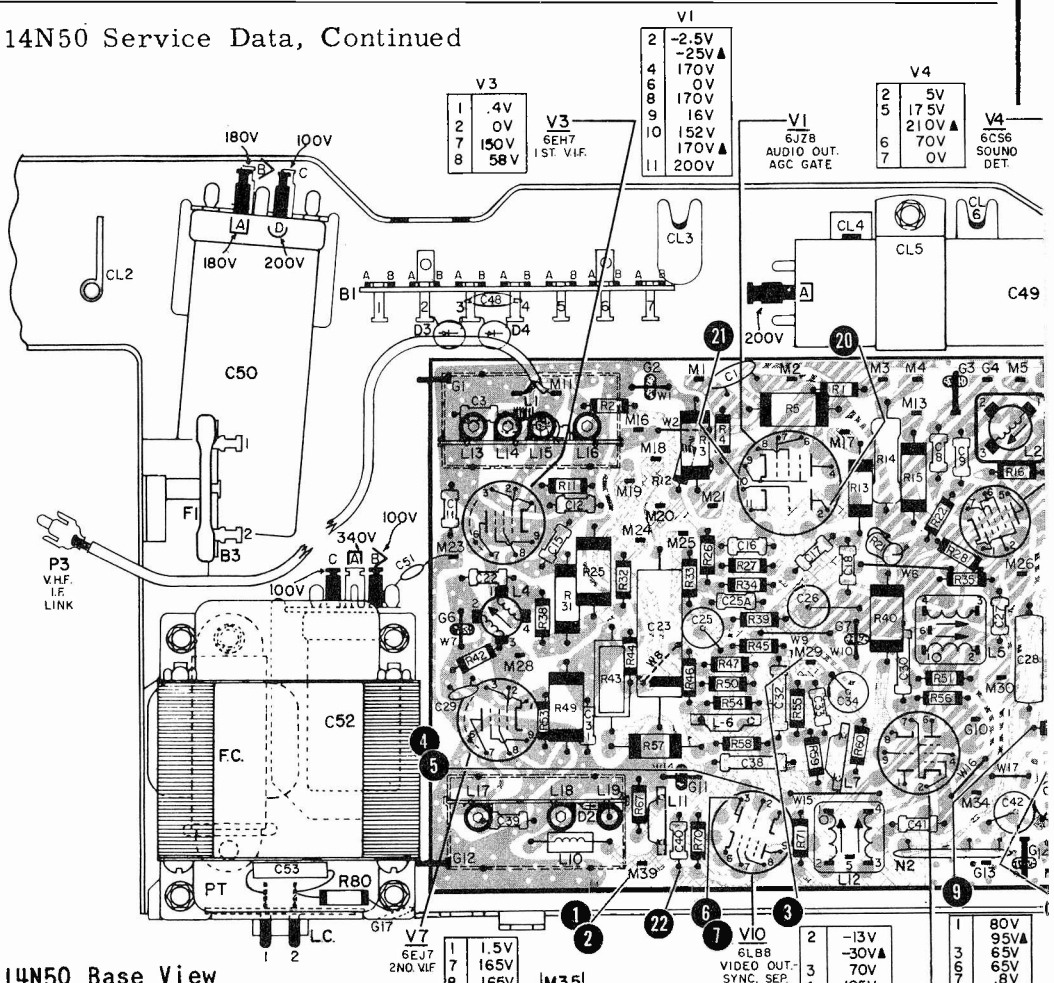
M1 RED LEAD TO A.O.T.
M2 BLUE LEAD TO A.O.T.
M3 GREEN LEAD TO VOL. CONT. C.T.
M4 LEAD TO TUNER PWR. PLUG
M5 BLUE LEAD TO VOL. CONT.
M6 LEAD TO C52A
M7 LEAD TO VERT. HOLD CONT.
M8 RED LEAD FROM V.O.T. - LEAD TO PIN 6 OF YOKE
M9 HORZ. OSC. TEST POINT
M10 LEAD TO HORZ. HOLD CONT.
M11 I-F INPUT CABLE
M13 LEAD TO TUNER PWR. PLUG
M14 SYNC TEST POINT
M15 LEAD TO C50A
M16 LEAD TO C50D
M17 LEAD TO PIN 6 H.O.T.
M18 LEAD TO CONTRAST CONTROL C.T. - LEAD TO C52B
M19 LEAD TO BRIGHTNESS CONTROL C.T.
M20 I-F TEST POINT
M21 LEAD TO C52C
M22 LEAD TO M26
M23 LEAD TO B1-7
M24 LEAD TO CONTRAST CONT.
M25 LEAD TO TUNER PWR. PLUG
M26 LEAD TO M22 - LEAD TO B1-7
M27 BLUE LEAD FROM V.O.T.
M28 2ND VIF TEST POINT
M29 LEAD TO CRT CATHODE
M30 LEAD TO GND. G10
M31 LEAD TO PIN 5 H.O.T.
M32 LEAD TO PIN 8 H.O.T.
M33 LEAD TO PIN 3 H.O.T.
M34 LEAD TO CRT FILAMENT
M35 LEAD TO CRT FOCUS GRID
M36 LEAD TO CRT G2
M37 LEAD TO VERT. HOLD CONT. C.T.
M39 2ND DET. TEST POINT
M40 LEAD TO CRT G1

LEADS PART OF PANEL

M19 TO R65
R41 TO VR1 (VERT. SIZE)
PIN 3 OF V10 TO N2

LEGEND FOR PERMA-CIRCUIT PANEL

- HORIZONTAL CIRCUITS
- SOUND I.F. DETECTOR AND AUDIO CIRCUITS
- VIDEO AND AGC CIRCUITS
- VIDEO I.F. CIRCUITS
- VERTICAL CIRCUITS
- SYNC SEPARATOR AND NOISE INVERTER CIRCUITS

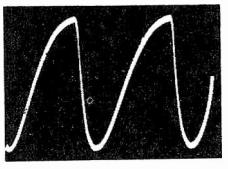


VOLTAGES TAKEN UNDER NO SIGNAL CONDITIONS

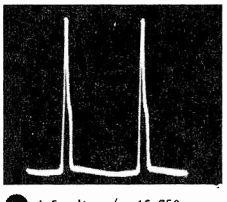
VOLTAGES MARKED ▲ TAKEN WITH SIGNAL

RESISTANCE CHART - 14N50

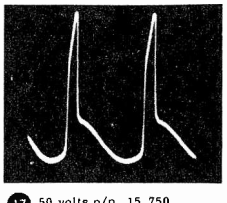
		PIN NUMBERS											
TUBE	USE	1	2	3	4	5	6	7	8	9	10	11	12
V1 6JZ8	Audio Out AGC Gate	FIL.	1.1 MEGΩ	10KΩ	11KΩ	11KΩ	200K	200K	14K	390Ω	28K	10K	FIL.
V2 6FQ7	Horz. Osc.	26KΩ	1.8MΩ	820Ω	FIL.	FIL	39K	90K	820Ω				
V3 6EH7	1st VIF	24Ω	310KΩ	24Ω	FIL	FIL.	GND.	11KΩ	30KΩ	GND.			
V4 6CS6	Sound Disc	5.5Ω	560Ω	FIL.	FIL.	800KΩ	11K	3.5Ω					
V5 6JZ8	Vert. Osc. Vert. Out.	0Ω	2.6 MEGΩ	INF.	10KΩ	FIL	1.3 MEGΩ	1.3 MEGΩ	11KΩ	GND	250KΩ	GND.	FIL.
V6 6GY5	Horz. Out.	FIL	INF	10.5KΩ	GND	INF	10.5KΩ	10.5KΩ	10.5KΩ	680KΩ	GND.	10.5KΩ	FIL.
V7 6EJ7	2nd VIF	100Ω		100Ω	FIL.	FIL	GND.			GND.			
V8 6GH8	Sound IF & N.I.	37KΩ	0Ω	13KΩ	FIL	FIL	13KΩ	220Ω	3.6KΩ	2.6MΩ			
V9 6BE3	Damper	FIL.		0Ω	10K	INF.				10K			FIL
V10 6LB8	Video Out. Sync Sep.	GND.	1.7 MEGΩ	12KΩ	FIL.	FIL.	GND	90Ω	29KΩ	15KΩ			



15 20 volts p/p, 15,750 c.p.s.

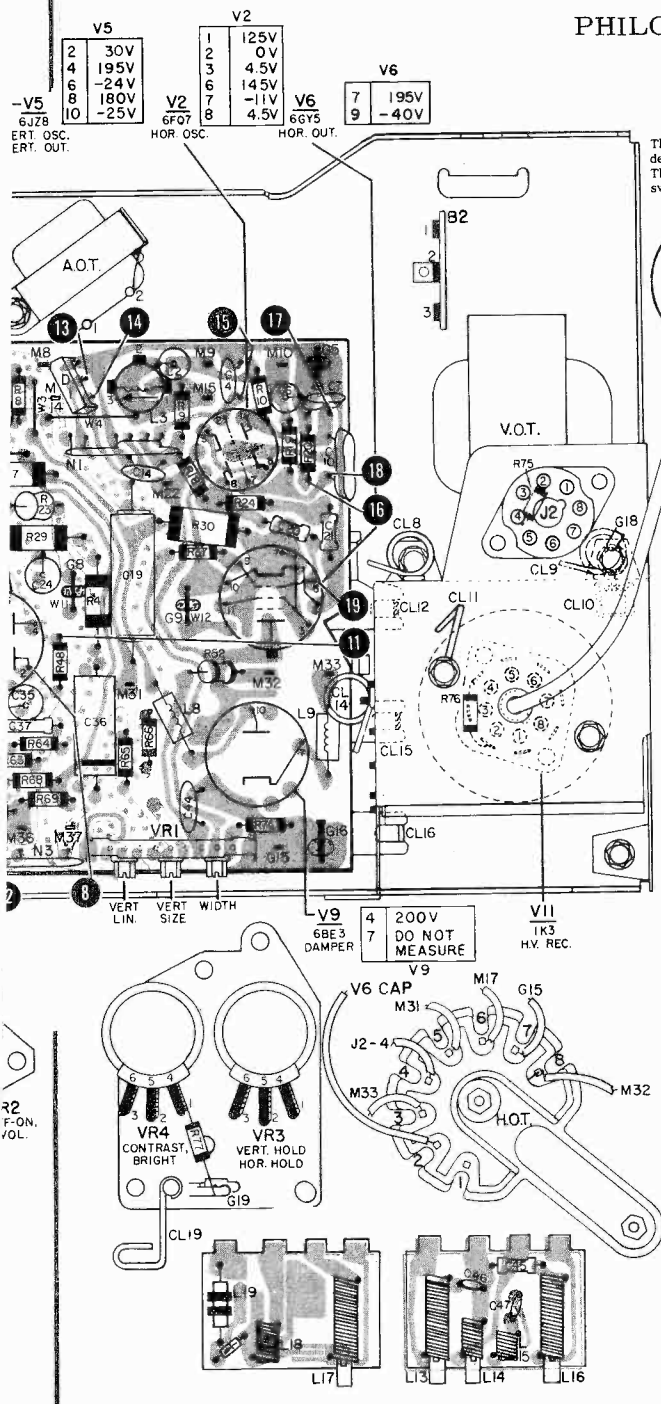


16 4.5 volts p/p, 15,750 c.p.s.



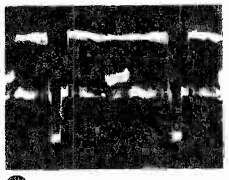
17 50 volts p/p, 15,750 c.p.s.

PHILCO Chassis 14N50 Service Data, Continued

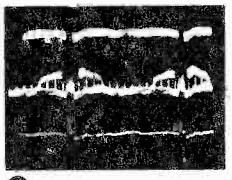


OSCILLOSCOPE WAVEFORM PATTERNS

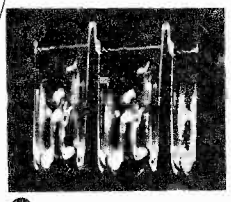
These waveforms were taken with the receiver adjusted for an approximate peak-to-peak out of 2.5 volts at the video detector. Voltage readings taken with the raster just filling screen and all controls set for normal picture viewing. The voltages given are approximate peak-to-peak values. The frequencies shown are those of the waveforms, not the sweep rate of the oscilloscope. All readings were taken with a Model ES-550B Precision Oscilloscope.



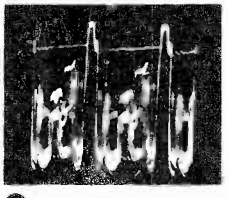
1 2.5 volts p/p, 15,750 c.p.s. (max. contrast)



2 2.5 volts p/p, 60 c.p.s. (max. contrast)

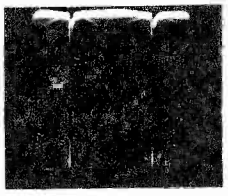


3 100 volts p/p, 15,750 c.p.s.

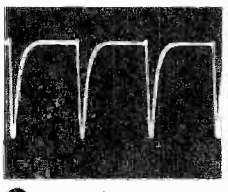


4 60 volts p/p, 15,750 c.p.s.

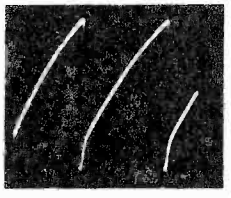
5 60 volts p/p, 60 c.p.s.



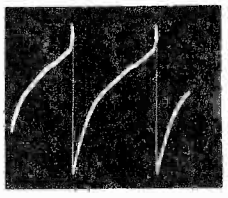
6 43 volts p/p, 60 c.p.s.



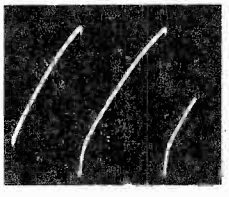
7 43 volts p/p, 15,750 c.p.s.



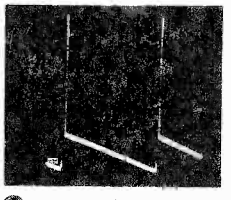
8 45 volts p/p, 60 c.p.s.



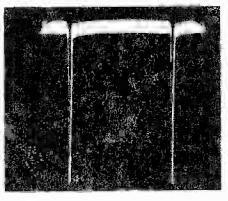
9 80 volts p/p, 60 c.p.s.



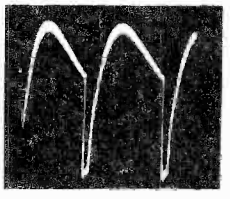
10 45 volts p/p, 60 c.p.s.



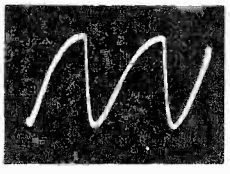
11 1000 volts p/p, 60 c.p.s. total - sawtooth 220 volts p/p



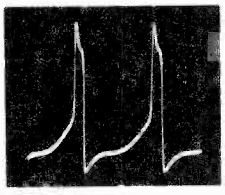
12 62 volts p/p, 60 c.p.s.



13 15 volts p/p, 15,750 c.p.s.

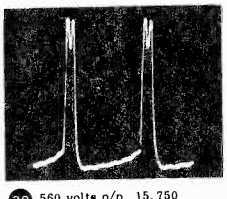


14 18 volts p/p, 15,750 c.p.s.

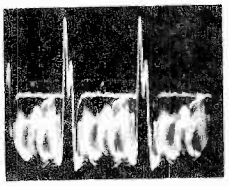


18 50 volts p/p, 15,750 c.p.s.

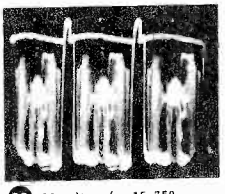
19 91 volts p/p, 15,750 c.p.s.



20 560 volts p/p, 15,750 c.p.s.



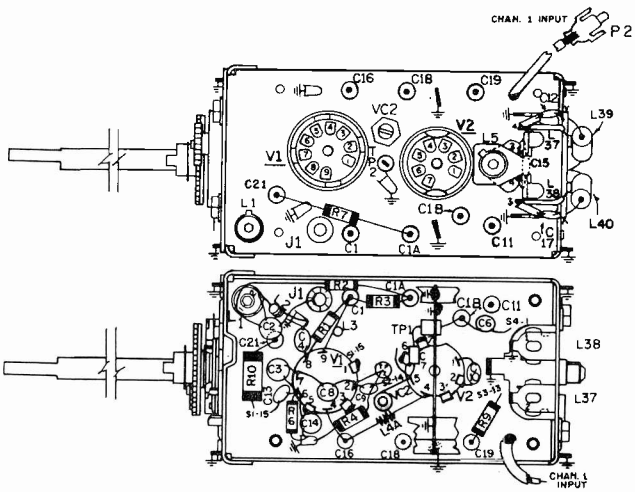
21 36 volts p/p, 15,750 c.p.s.

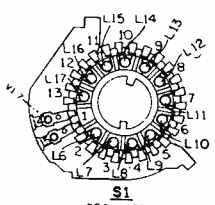


22 20 volts p/p, 15,750 c.p.s.

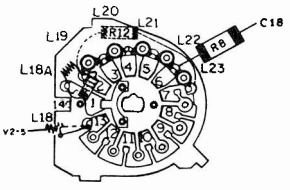
PHILCO

VHF TUNER DATA TT-127B

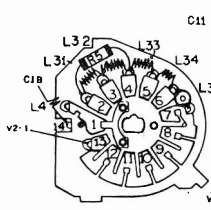




S1
OSC WAFER

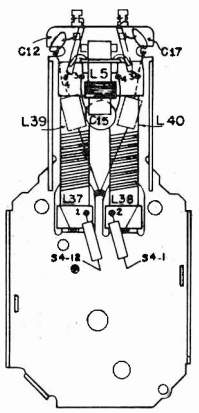


S2
INTERSTAGE WAFER

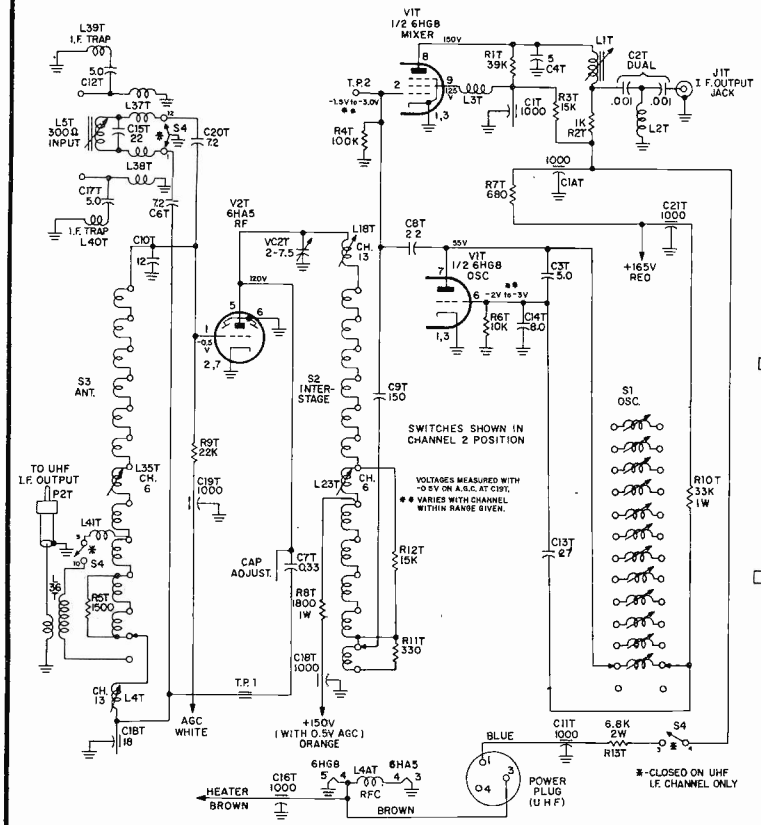


S3
ANT. WAFER

S4
AUX. ANT. WAFER



TT-127B Component Layout



TT-127D VHF Tuner Schematic

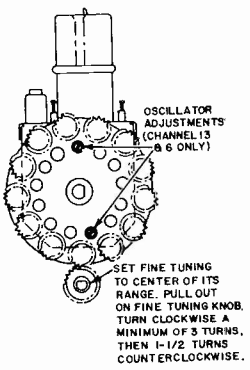
RCA VICTOR

MODEL AND CHASSIS INFORMATION

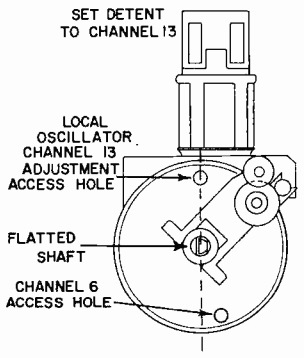
MODEL	CHASSIS	TUNER
34-B-222, 5, 6, 7MV	KCS136YA	KRK103C
34-B-222, 5, 6, 7MU	KCS136YJ	KRK104C/66AK
34-B-245, 6RS	KCS136ZN	KRK113F
34-C-275, 6, 7MV	KCS136YA	KRK103C
34-C-275, 6, 7MU	KCS136YJ	KRK104C/66AK
34-C-355, 6MV	KCS136YA	KRK103C
34-C-355, 6MU	KCS136YJ	KRK104C/66AK
34-C-376MV	KCS136ZK	KRK107B
34-C-376MU	KCS136ZL	KRK108B/66AM
34-C-394MV	KCS136ZK	KRK107B
34-C-394MU	KCS136ZL	KRK108B/66AM
34-C-425, 6, 7MV	KCS136ZK	KRK107B
34-C-425, 6, 7MU	KCS136ZL	KRK108B/66AM
34-C-446MV	KCS136ZK	KRK107B
34-C-446MU	KCS136ZL	KRK108B/66AM
34-C-450, 8, 9MV	KCS136ZK	KRK107B
34-C-450, 8, 9MU	KCS136ZL	KRK108B/66AM
34-C-465, 6, 7MV	KCS136ZA	KRK107C
34-C-465, 6, 7MU	KCS136ZB	KRK108C/66AM
34-C-475, 6MV	KCS136ZK	KRK107B
34-C-496MV	KCS136ZD	KRK107C
34-C-504MV	KCS136ZD	KRK107C
34-C-510, 8MV	KCS136ZD	KRK107C

INSTRUMENT MODEL AND CHASSIS INFORMATION

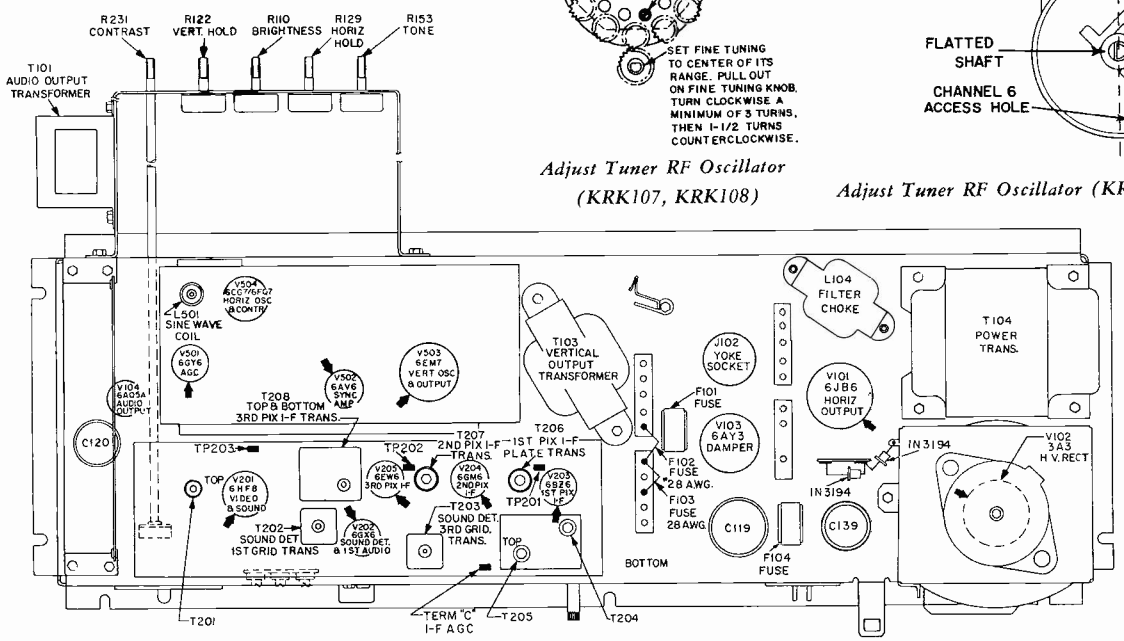
MODEL NO.	CHASSIS	TV TUNER	RADIO TUNER	AMPL. CHASSIS
34-D-535, 6 MV	KCS136ZR	KRK103C	RC1215A	RS203B
34-D-535, 6 MU	KCS136ZT	KRK104C/ 112C	RC1215A	RS203B
34-DX-535, 6 MV	KCS136ZR	KRK103C	RC1215B	RS203B
34-DX-535, 6 MU	KCS136ZT	KRK104C/ 112C	RC1215B	RS203B
34-D-555, 6 MV	KCS136ZAA	KRK107B	RC1206D RS200D	RS193J
34-D-555, 6 MU	KCS136ZAB	KRK108B/ 112C	RC1206D RS200D	RS193J
34-D-576 MV	KCS136ZU	KRK107C	RC1215C	RS203B
34-D-584 MV	KCS136ZU	KRK107C	RC1215C	RS203B



Adjust Tuner RF Oscillator (KRK107, KRK108)



Adjust Tuner RF Oscillator (KRK103, KRK104)



AGC AND SYNC STABILIZER

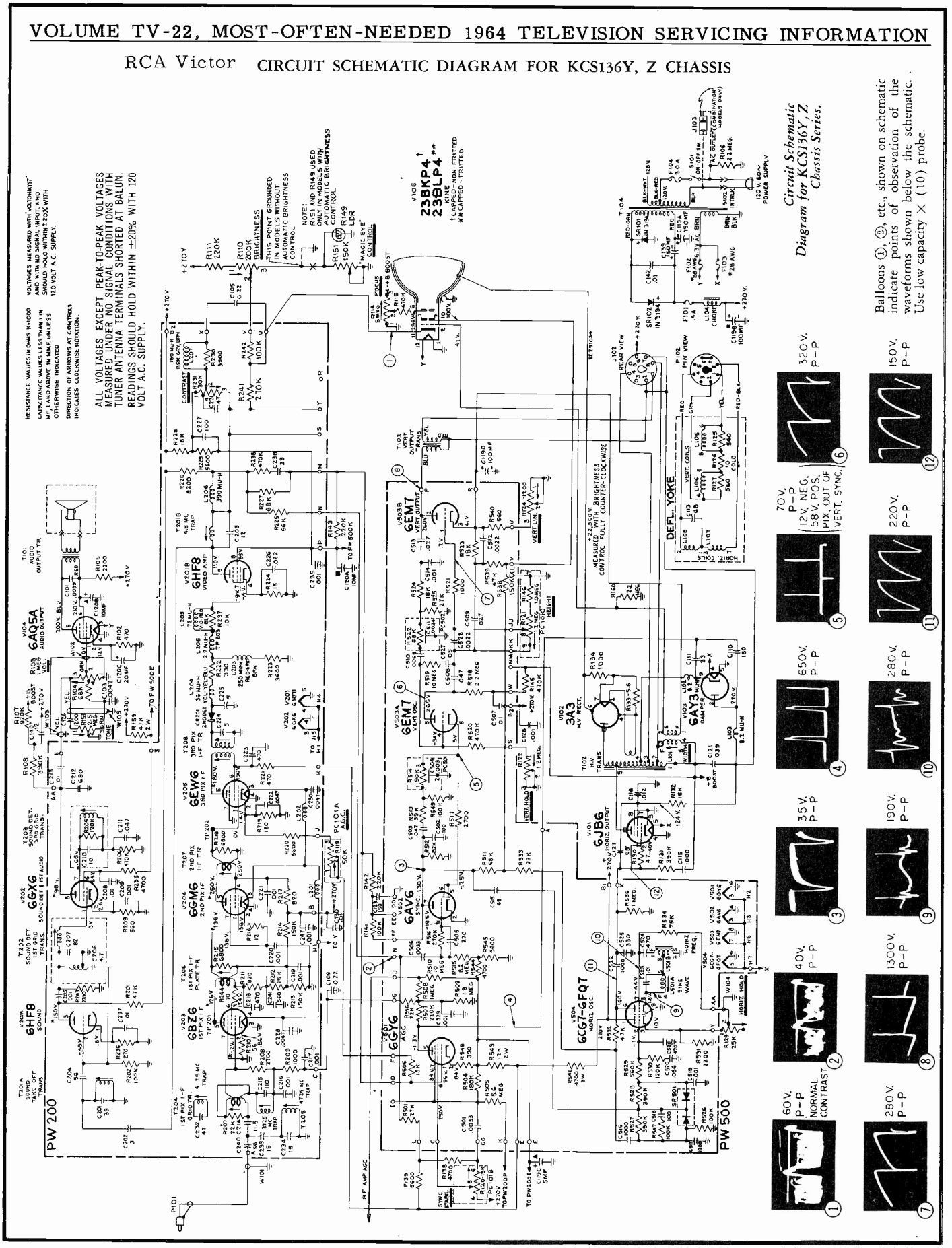
Turn the sync stabilizer control completely counterclockwise and adjust a.g.c. while tuned to a strong, local station. Turn the a.g.c. clockwise until picture begins to distort, and then counterclockwise slightly below the point where the distortion is eliminated. Advance the sync stabilizer fully clockwise and rotate the horizontal hold counterclockwise until horizontal sync is lost. Then slowly sync the picture again. If the picture tends to distort or "hang-up" before locking in, retard the sync stabilizer control until this condition is corrected.

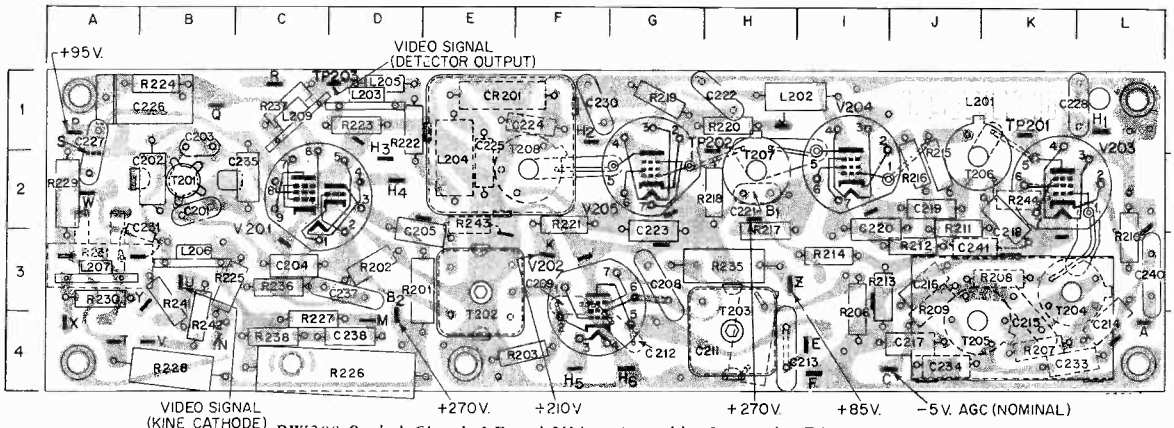
HORIZONTAL OSCILLATOR SINE COIL

With sync shorted (Pin 1 of V502 shorted to ground) connect jumper across terminals of L501A and adjust the horizontal hold control so that the sides of the picture are vertical. Remove jumper from L501A only, and adjust L501A slug, if necessary, to again bring the sides of the picture vertical. Remove jumper from Pin 1 of V502 to ground.

(Continued on pages 116-118)

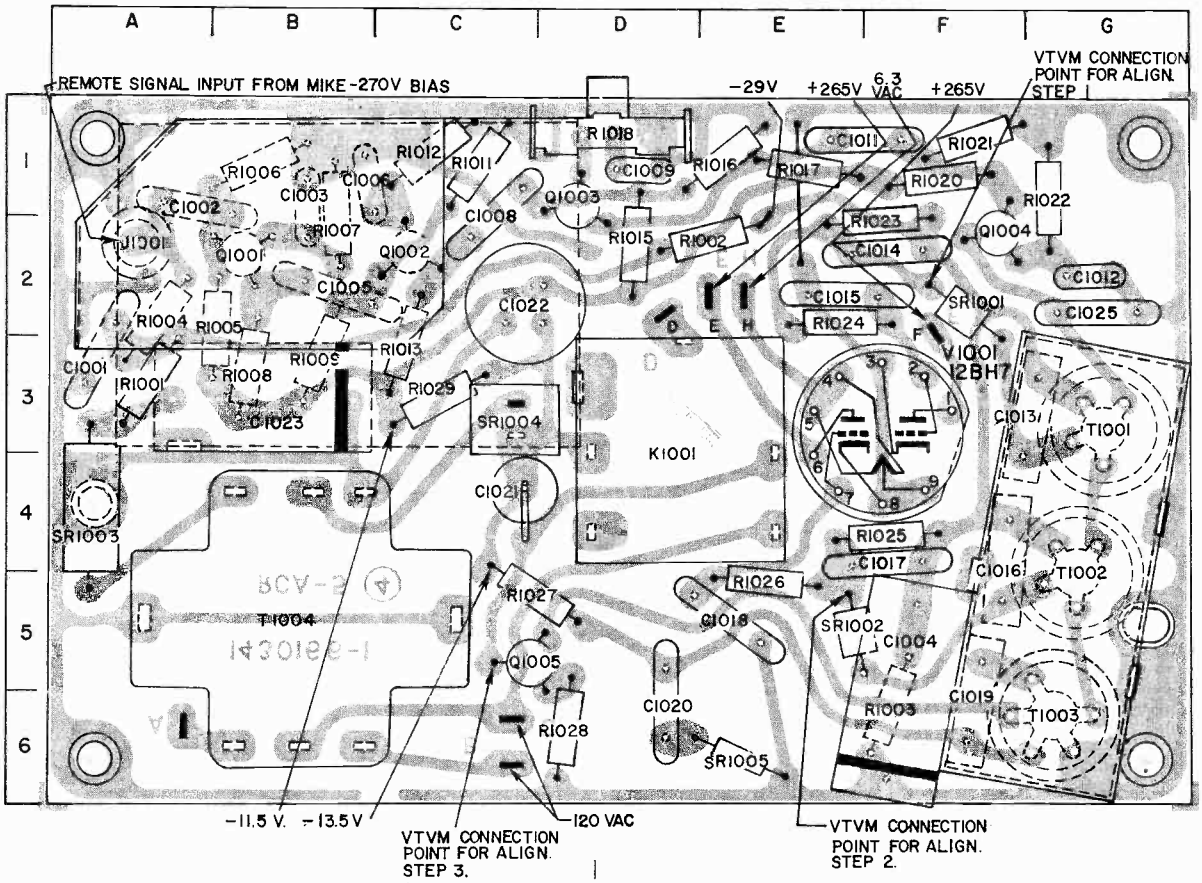
RCA Victor CIRCUIT SCHEMATIC DIAGRAM FOR KCS136Y, Z CHASSIS





PW200 Sealed Circuit I-F and Video Assembly Composite Diagram

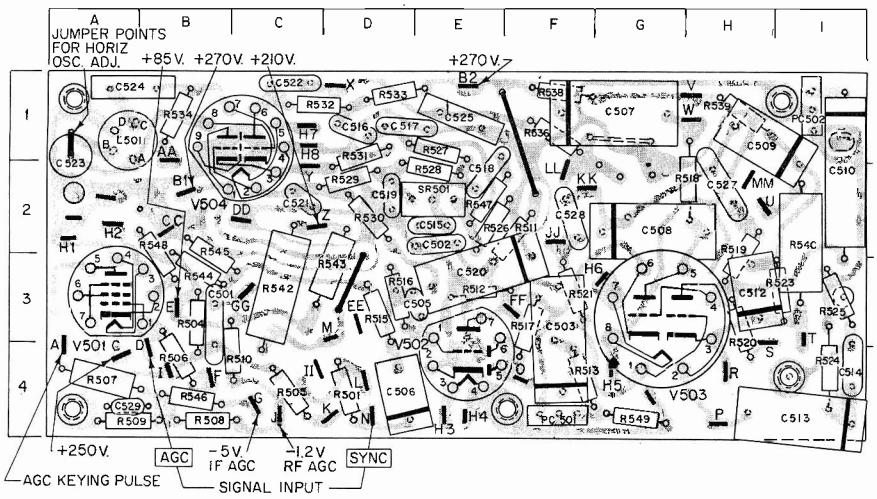
C201 ....B2	C216 ....J3	C228 ....L1	L201 ....J1	R207 ....K4	R218 ....H2	R230 ....A3	T201 ....B2
C202 ....B2	C217 ....J4	C230 ....F1	L202 ....I1	R208 ....K3	R219 ....G1	R231 ....A3	T202 ....E3
C203 ....B1	C218 ....K2	C231 ....B3	L203 ....D1	R209 ....J3	R220 ....H1	R235 ....H3	T203 ....H4
C204 ....C3	C219 ....J2	C233 ....L4	L204 ....E2	R210 ....L3	R221 ....F2	R236 ....C3	T204 ....K3
C205 ....D2	C220 ....I2	C234 ....J4	L205 ....D1	R211 ....J2	R222 ....D1	R237 ....C1	T205 ....K4
C208 ....G3	C221 ....H2	C235 ....C2	L206 ....B3	R212 ....J3	R223 ....D1	R238 ....C4	T206 ....K2
C209 ....F3	C222 ....H1	C237 ....D3	L207 ....A3	R213 ....I3	R224 ....B1	R241 ....B3	T207 ....H2
C211 ....H4	C223 ....G2	C238 ....D4	L209 ....C1		R225 ....B3	R242 ....B4	T208 ....F2
C212 ....G4	C224 ....F1	C240 ....L3	R201 ....E3	R214 ....I3	R226 ....D4	R243 ....E2	
C213 ....H4	C225 ....E2	C241 ....J3	R202 ....D3	R215 ....J2	R227 ....C4	R244 ....K2	
C214 ....L4	C226 ....B1		R203 ....F4	R216 ....J2	R228 ....B4		
C215 ....K4	C227 ....A1	CR201 ....E1	R206 ....I3	R217 ....H3	R229 ....A2		



PW900 Sealed Circuit Remote Control Amplifier Assembly Composite Diagram (Used with Remote Control Chassis Only)

C1001 ....A3	C1013 ....F3	C1023 ....B3	Q1004 ....F2	R1008 ....B3	R1021 ....F1	SR1001 ....F2
C1002 ....A2	C1014 ....F2	C1025 ....G2	Q1005 ....C5	R1009 ....B3	R1022 ....G1	SR1002 ....E5
C1003 ....B1	C1015 ....E2			R1011 ....C1	R1023 ....F1	SR1003 ....A4
C1004 ....F5	C1016 ....F4	J1001 ....A2	R1001 ....A3	R1012 ....C1	R1024 ....E2	SR1004 ....C3
C1005 ....B2	C1017 ....F5		R1002 ....D2	R1013 ....C3	R1025 ....F4	SR1005 ....E6
C1006 ....B1	C1018 ....D5	K1001 ....D4	R1003 ....F5	R1015 ....D2	R1026 ....E4	
C1008 ....C1	C1019 ....F5		R1004 ....A2	R1016 ....E1	R1027 ....C5	T1001 ....G3
C1009 ....D1	C1020 ....D6	Q1001 ....B2	R1005 ....A2	R1017 ....E1	R1028 ....D6	T1002 ....G4
C1011 ....E1	C1021 ....C4	Q1002 ....C2	R1006 ....B1	R1018 ....D1	R1029 ....C3	T1003 ....G6
C1012 ....G2	C1022 ....C2	Q1003 ....D1	R1007 ....B1	R1020 ....F1		T1004 ....B5

RCA Victor Chassis KCS-136Y+, KCS-136Z+, Service Information, Continued



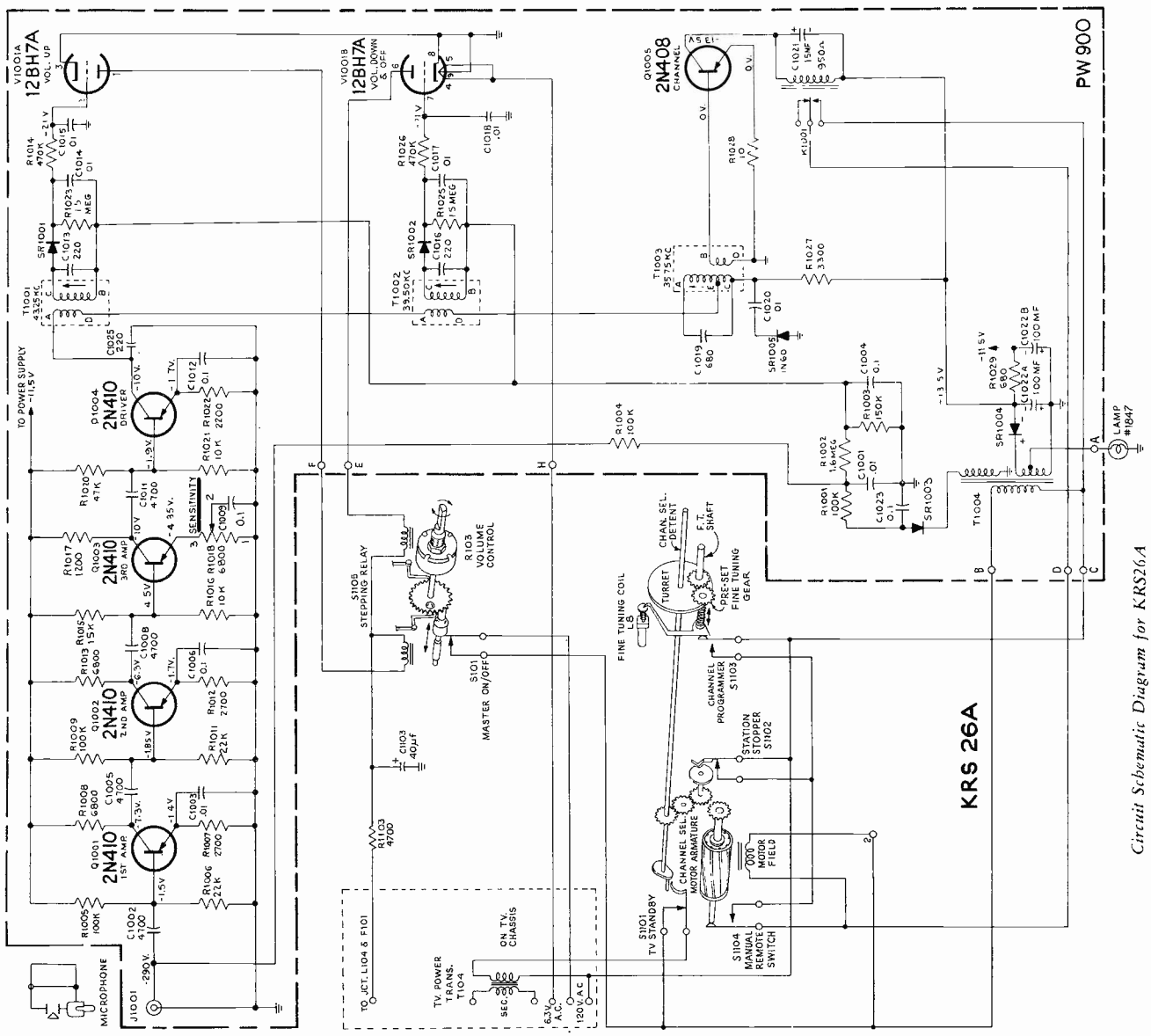
PW500 Sealed Circuit Deflection Assembly Composite Diagram

PW500 COMPONENT LOCATION GUIDE

C501	B3	PC501	F4	R530	D2
C502	E2	PC502	I1	R531	D1
C503	F3			R532	C1
C505	D3	R501	D4	R533	D1
C506	D4	R504	B3	R534	B1
C507	G1	R505	C4	R536	F1
C508	G2	R506	B4	R538	F1
C509	H1	R507	A4	R539	H1
C510	I2	R508	B4	R540	I2
C512	H3	R509	A4	R542	C3
C513	I4	R510	C4	R543	D3
C514	I4	R511	F2	R544	B3
C515	E2	R512	E3	R545	B2
C516	D1	R513	F4	R546	B4
C517	D1	R515	D3	R547	E2
C518	E2	R516	D3	R548	B2
C519	D2	R517	F3	R549	G4
C520	E3	R518	H2		
C521	C2	R519	H2	SR501	E2
C522	C1	R520	H3		
C523	A1	R521	F3		
C524	A1	R523	I3		
C525	E1	R524	I4		
C527	H2	R525	I3		
C528	F2	R526	E2		
C529	A4	R527	E1		
		R528	E2		
L501	A1	R529	D2		

CIRCUIT SCHEMATIC DIAGRAM KRS26A

(Used in KCS136Z Remote Models)



Circuit Schematic Diagram for KRS26A

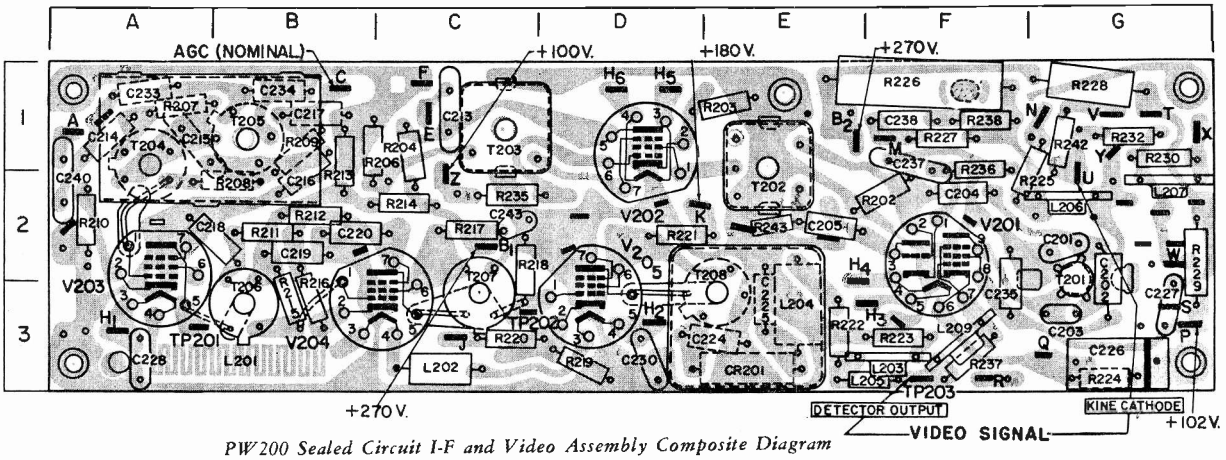
RCA Victor Chassis KCS-137P, Model 94-A-123-RS

HEIGHT & VERTICAL LINEARITY

If the blanking bar changed size while moving down, alternately adjust the height and vertical linearity controls until the condition is corrected. Final vertical size should allow the raster to overlap the mask about 5/8 inch at top and bottom.

WIDTH

The width adjustments is made with L101. The picture may be adjusted to fill the mask with a line voltage of 108 volts, and with normal line voltage, the raster should overscan the mask about 5/8 inch on each side. "Normal" line voltage is 120 volts.

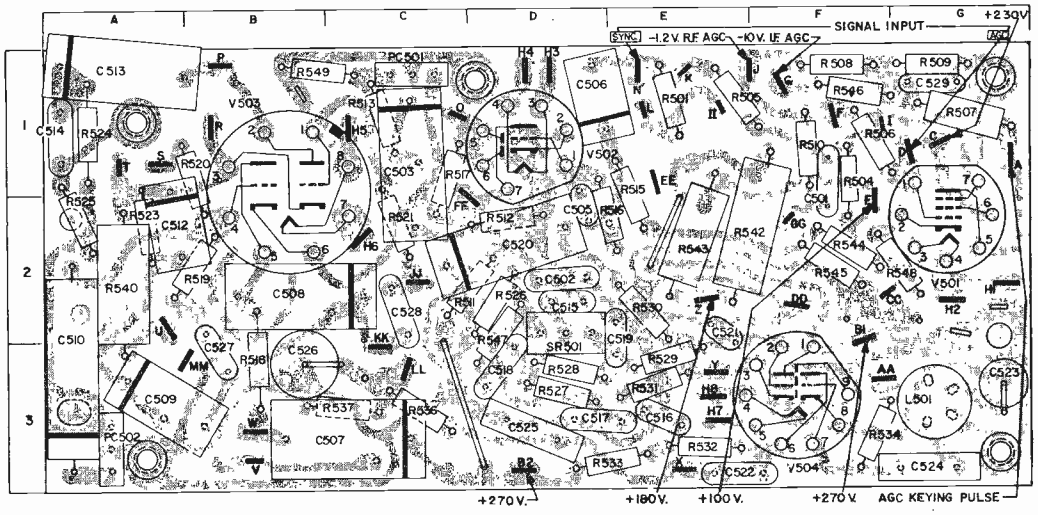


PW200 Sealed Circuit I-F and Video Assembly Composite Diagram

PW200 COMPONENT LOCATION GUIDE

C201 .....G2
C202 .....G2
C203 .....G3
C204 .....F2
C205 .....E2
C208 .....D2
C209 .....E1
C211 .....C1
C212 .....D1
C213 .....C1
C214 .....A1
C215 .....A1
C216 .....B1
C217 .....B1
C218 .....B2
C219 .....B2
C220 .....B2
C221 .....C2
C222 .....C3
C223 .....D2
C224 .....D3
C225 .....E3
C226 .....G3
C227 .....G3
C228 .....A3
C230 .....D3
C233 .....A1
C234 .....B1
C235 .....F3
C237 .....F1
C238 .....F1
C240 .....A2
*C241 .....B2
*C242 .....D1
C243 .....C2
CR201 ....E3
†L201 .....B3
L202 .....C3
L203 .....F3
L204 .....E3
L205 .....E3
L206 .....G2
L207 .....G2
L209 .....F3
R201 .....E1
R202 .....F2
R203 .....E1
R204 .....C1
R206 .....B1
R207 .....A1
R208 .....B2
R209 .....B1
R210 .....A2
R211 .....B2
R212 .....B2
R213 .....B1
R214 .....C2
R215 .....B3
R216 .....B3
R217 .....C2
R218 .....C2
R219 .....D3
R220 .....C3
R221 .....D2
R222 .....E3
R223 .....F3
R224 .....G3
R225 .....F2
R226 .....F1
R227 .....F1
R228 .....G1
R229 .....G2
R230 .....G1
R232 .....G1
R235 .....C2
R236 .....F1
R237 .....F3
R238 .....F1
R242 .....G1
R243 .....E2
*R244 .....B2
T201 .....G2
T202 .....E1
T203 .....C1
T204 .....A1
T205 .....B1
T206 .....B3
T207 .....C3
T208 .....E3

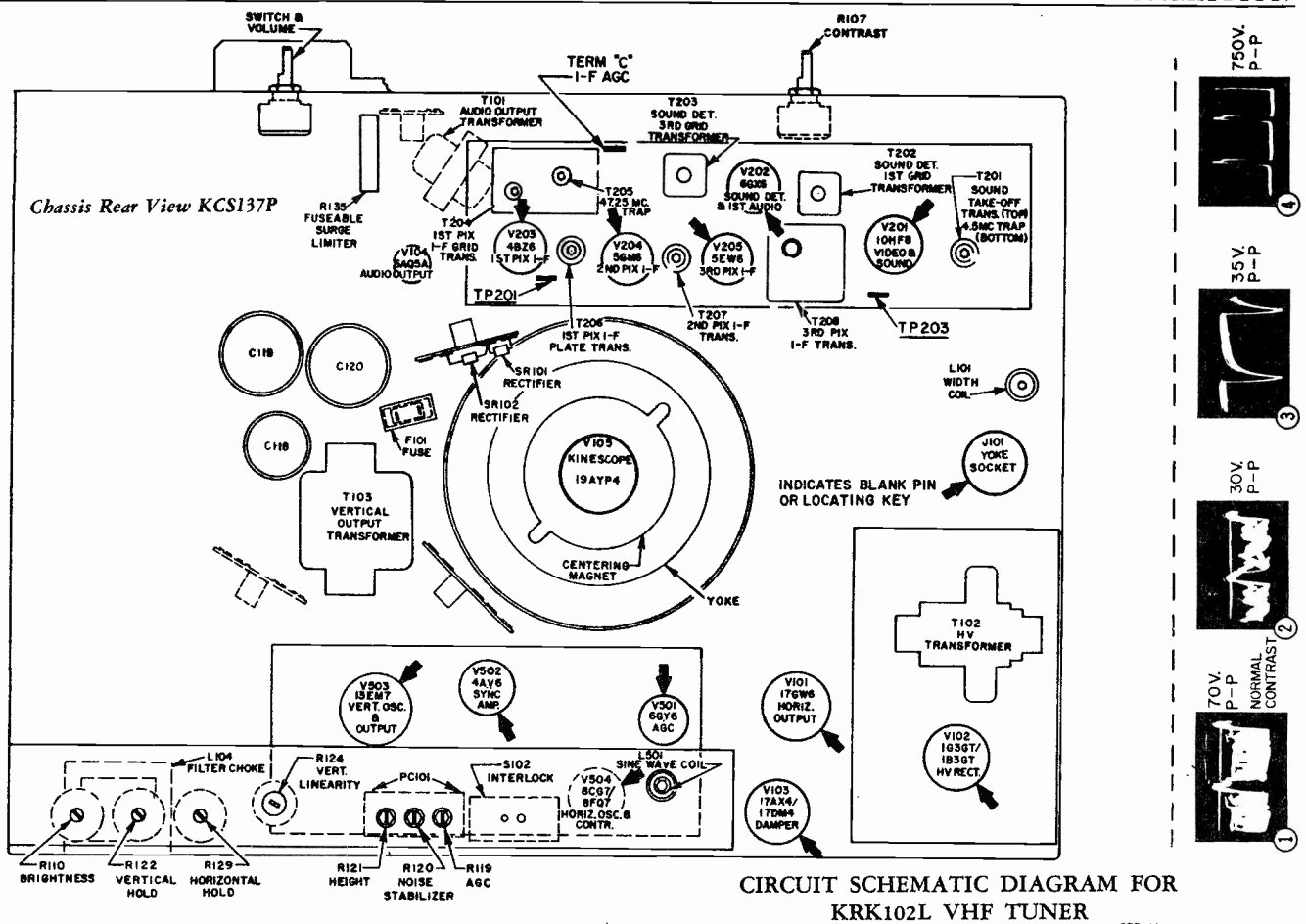
*Under Board
†Printed



PW500 Sealed Circuit Deflection Assembly Composite Diagram

PW500 COMPONENT LOCATION GUIDE

C501 .....F1
C502 .....D2
C503 .....C1
C505 .....D2
C506 .....D1
C507 .....C3
C508 .....B2
C509 .....A3
C510 .....A3
C512 .....A2
C513 .....A1
C514 .....A1
C515 .....D2
C516 .....E3
C517 .....D3
C518 .....D3
C519 .....E2
C520 .....D2
C521 .....E2
C522 .....E3
C523 .....G3
C524 .....G3
C525 .....D3
C526 .....B3
C527 .....B3
C528 .....C2
C529 .....G1
L501 .....G3
PC501 .....C1
PC502 .....A3
R501 .....E1
R504 .....F1
R505 .....E1
R506 .....F1
R507 .....G1
R508 .....F1
R509 .....G1
R510 .....F1
R511 .....D2
R512 .....D2
R513 .....C1
R515 .....E2
R516 .....E2
R517 .....C1
R518 .....B3
R519 .....B2
R521 .....C2
R523 .....A2
R524 .....A1
R525 .....A2
R526 .....D2
R527 .....D3
R528 .....D3
R529 .....E3
R530 .....E2
R531 .....E3
R532 .....E3
R533 .....E3
R534 .....F3
R536 .....C3
R537 .....C3
R540 .....A2
R542 .....F2
R543 .....E2
R544 .....F2
R545 .....F2
R546 .....F1
R547 .....D2
R548 .....G2
R549 .....B1
SR501 .....D2



AGC CONTROL ADJUSTMENT

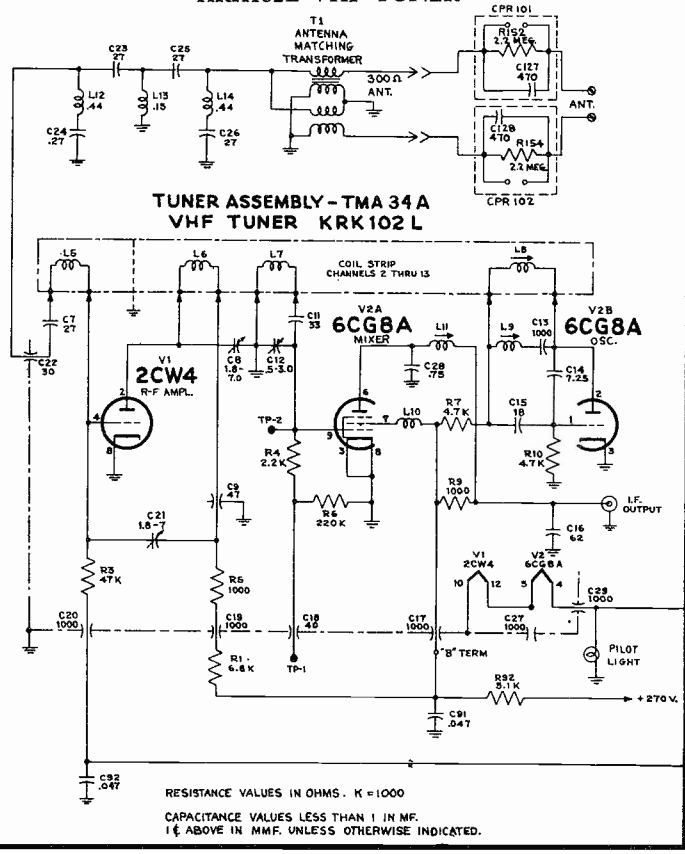
Perform the following routine test: Adjust the receiver and antenna to obtain the best picture from a strong, local station. Quickly switch off channel and back, and if the picture distorts and bends, or does not reappear immediately, rotate the AGC control R119, counterclockwise and then clockwise until picture bend occurs. Then slowly retard the control until the bend is gone. The noise control should be turned counterclockwise to the end of rotation before adjusting AGC.

HORIZONTAL OSCILLATOR ADJUSTMENT

Turn the horizontal hold control R129 clockwise until the picture falls out of sync, then slowly counterclockwise. The number of diagonal black bars sloping downward to the left will be gradually reduced, and when only 1 to 3 bars are obtained, slight additional counterclockwise rotation of the control should pull the picture into sync. The picture should remain in sync for approximately ½ turn of additional counterclockwise rotation. Continue counterclockwise rotation until the picture again falls out of sync, then rotate the control slowly clockwise. The number of diagonal black bars sloping down to the right will be gradually reduced, and when only 1 to 3 bars are obtained, slight additional clockwise rotation should pull the picture into sync.

If above conditions are not obtained, adjustment of the sine wave coil may be required (L501A on PW500 deflection board). Remove cabinet back as shown in Figure 2. Attach short jumpers across L501A and from pin 1 of V502 to ground. Adjust horizontal hold control to obtain a picture with sides vertical (picture may drift slowly). Momentarily remove and re-attach L501A jumper while adjusting sine coil slug (use nonmetallic tool) until the alternate shorting and unshorting of the coil causes not more than a slight sideways shift of the picture. Remove all jumpers.

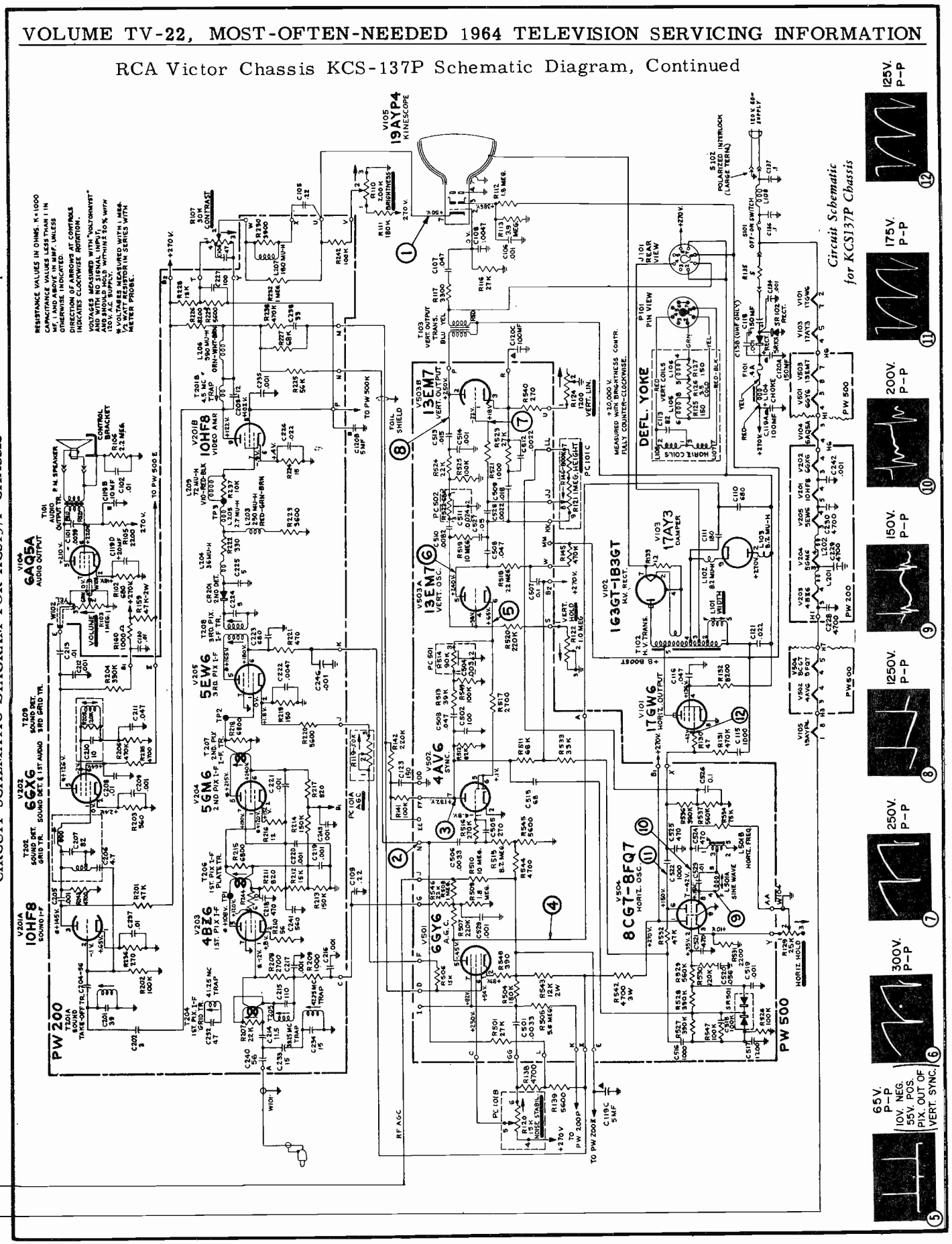
CIRCUIT SCHEMATIC DIAGRAM FOR KRK102L VHF TUNER



RCA Victor Chassis KCS-137P Schematic Diagram, Continued

CIRCUIT SCHEMATIC DIAGRAM FOR KCS137P CHASSIS

indicate points of observation



RCA VICTOR

Chassis KCS 141 A, K & L

Material on pages 122-124. PW200 circuit board same as illustrated on page 119. Remote control KRS-26A circuit and board PW900 same as data on pages 117 and 118. Alignment material on pages 131-133.

MODEL	CHASSIS	NAME
94-A-171-MV	KCS141A	"HERALDER"
94-A-171-MU	KCS141K	
94-A-172-MV	KCS141A	
94-A-172-MU	KCS141K	
94-A-176-MV	KCS141A	
94-A-176-MU	KCS141K	
94-A-183-MV	KCS141A	"CAMPAIGNER"
94-A-183-MU	KCS141K	
94-A-186-MV	KCS141A	
94-A-186-MU	KCS141K	
*94-A-182-RS	KCS141L	
*94-A-183-RS	KCS141L	

*These models incorporate a KRT4B (3 button) Remote Control Transmitter and a KRS26A Remote Control Amplifier.

WIDTH

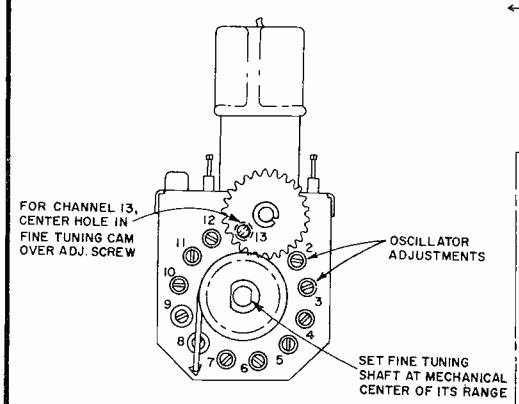
The width adjustments is made with L101. The picture may be adjusted to fill the mask with a line voltage of 108 volts, and with normal line voltage, the raster should overscan the mask about 5/8 inch on each side. "Normal" line voltage is 120 volts.

DEFLECTION YOKE

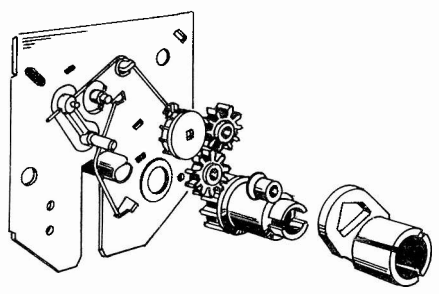
If the picture is tilted, loosen the yoke clamp screw and rotate the yoke to level the picture. Retighten the yoke clamp.

HEIGHT AND VERTICAL LINEARITY

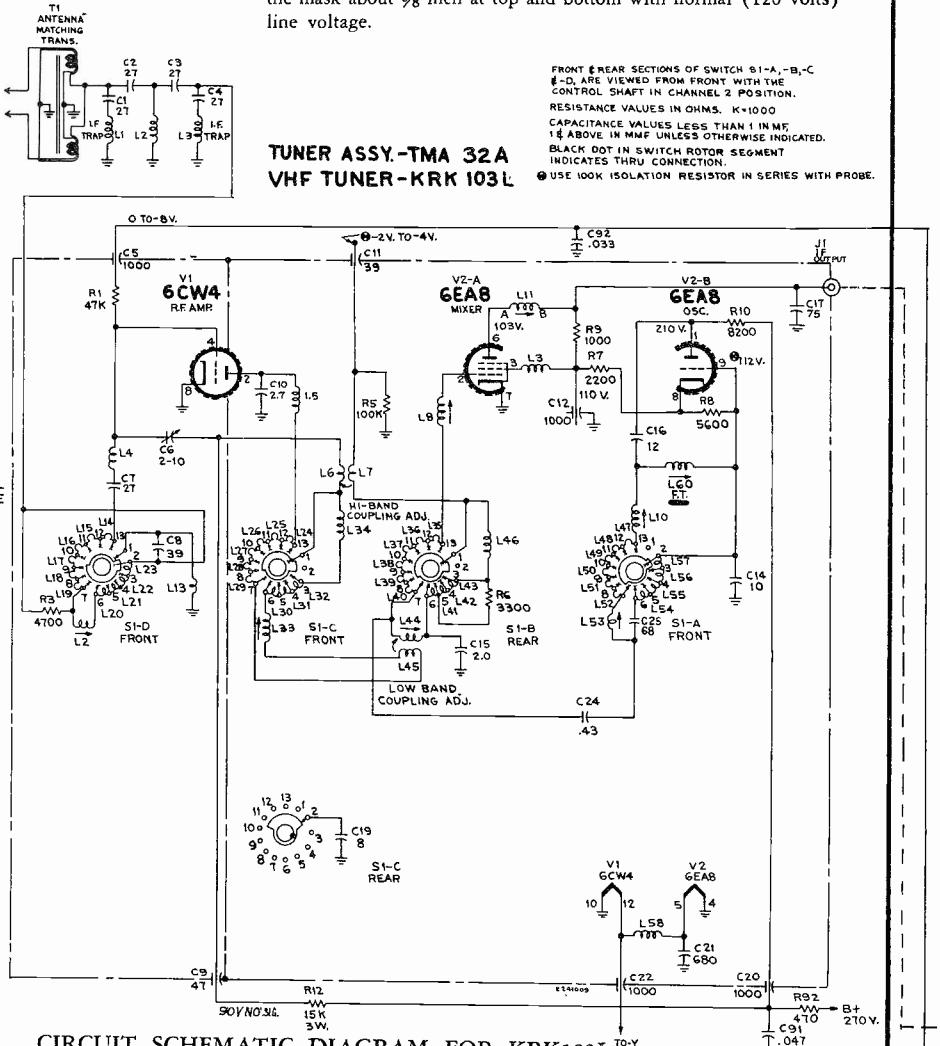
If the blanking bar changed size while moving down, alternately adjust the height and vertical linearity controls for best vertical proportions. Final vertical size should allow the raster to overlap the mask about 5/8 inch at top and bottom with normal (120 volts) line voltage.



Concentric Fine Tuning—Manual



One-Set Fine Tuning—Remote

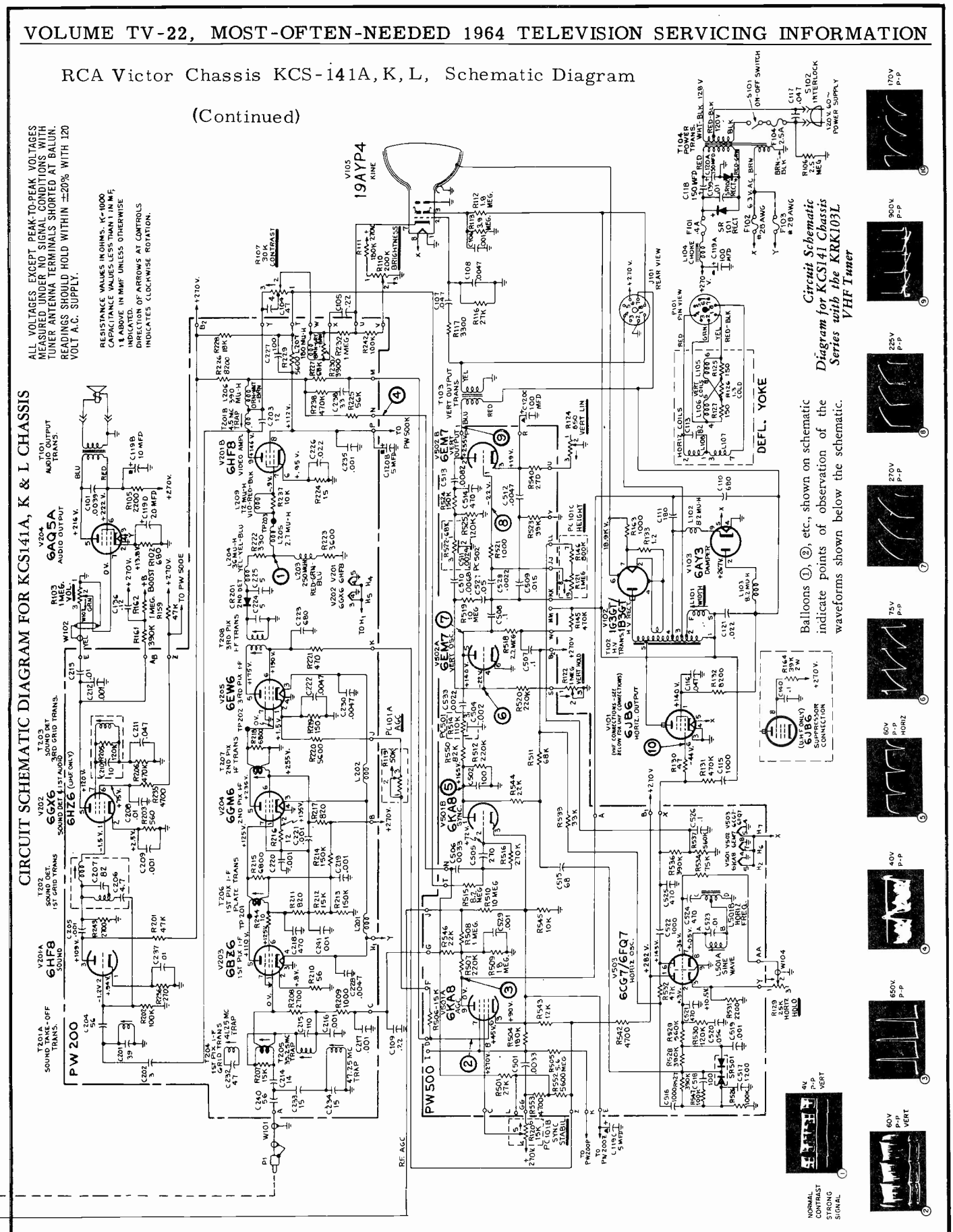


CIRCUIT SCHEMATIC DIAGRAM FOR KRK103L

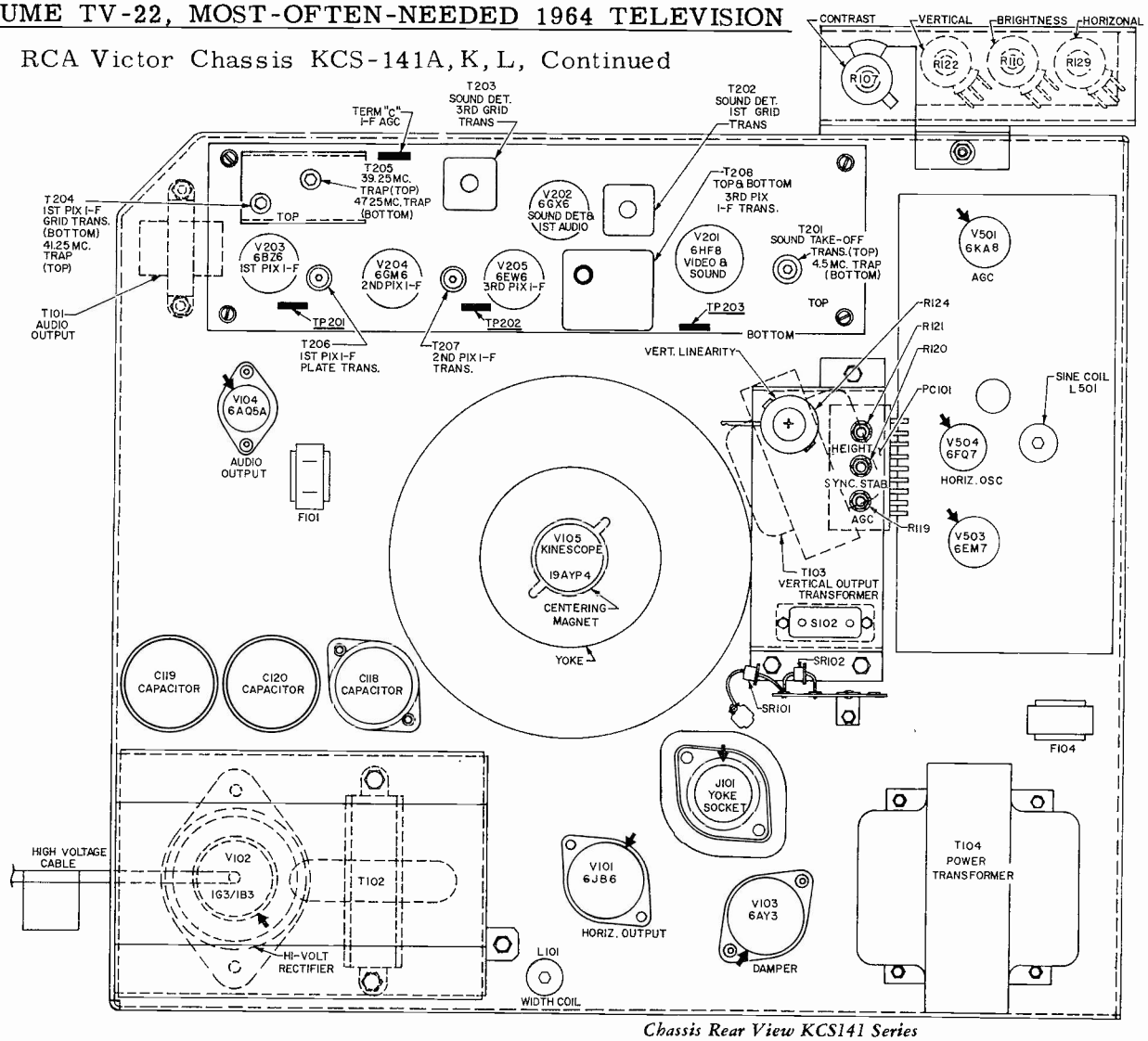
(Used in VHF Models)

RCA Victor Chassis KCS-141A,K,L, Schematic Diagram

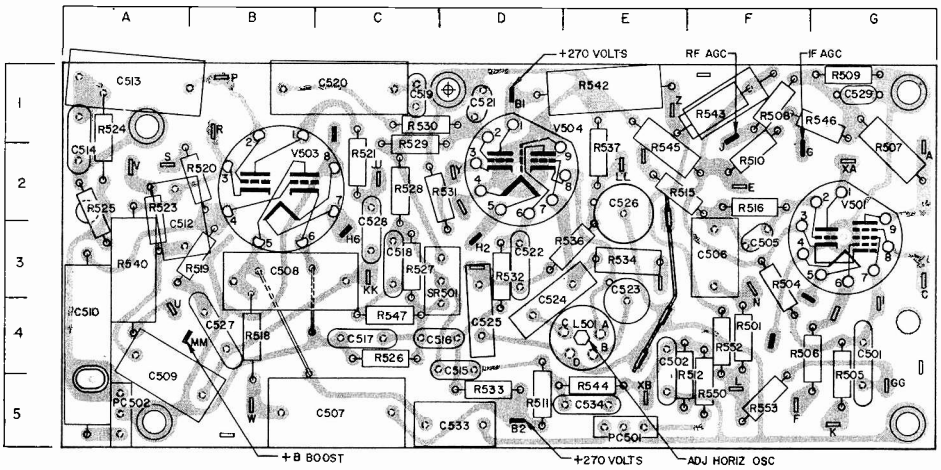
(Continued)



RCA Victor Chassis KCS-141A, K, L, Continued



Chassis Rear View KCS141 Series



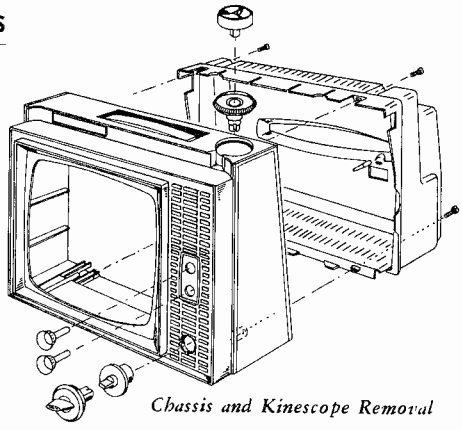
C501 ....G4	C514 ....A2	C524 ....D4	PC501 ....E5	R510 ....F2	R524 ....A1	R534 ....E3	R550 ....F5		
C502 ....E4	C515 ....D4	C525 ....D4	PC502 ....A5	R511 ....D5	R525 ....A2	R536 ....D3	R552 ....F4		
C505 ....F3	C516 ....D4	C526 ....E2		R512 ....F5	R526 ....C4	R537 ....E2	R553 ....F5		
C506 ....F3	C517 ....C4	C527 ....B4	R501 ....F4	R515 ....E2	R527 ....C3	R540 ....A3			
C507 ....C5	C518 ....C3	C528 ....C2	R504 ....F3	R516 ....F2	R528 ....C2	R542 ....E1	SR501 ....D3		
C508 ....B3	C519 ....C1	C529 ....G1	R505 ....G5	R518 ....B4	R529 ....C2	R543 ....F1			
C509 ....A5	C520 ....C1	C533 ....D5	R506 ....F4	R519 ....B3	R530 ....C1	R544 ....E5			
C510 ....A4	C521 ....D1	C534 ....E5	R507 ....G1	R520 ....B2	R531 ....D2	R545 ....E2			
C512 ....A3	D522 ....D3		R508 ....F1	R521 ....C2	R532 ....D3	R546 ....G1			
C513 ....A1	C523 ....E3	L501 ....E4	R509 ....G1	R522 ....A2	R533 ....D5	R547 ....C4			

PW500 Sealed Circuit Deflection Assembly Composite Diagram

RCA VICTOR

Chassis KCS-144 A & B

MODEL	CHASSIS
94-A-132-MV	KCS144A
94-A-132-MU	KCS144B
94-A-136-MV	KCS144A
94-A-136-MU	KCS144B
94-A-137-MV	KCS144A
94-A-137-MU	KCS144B

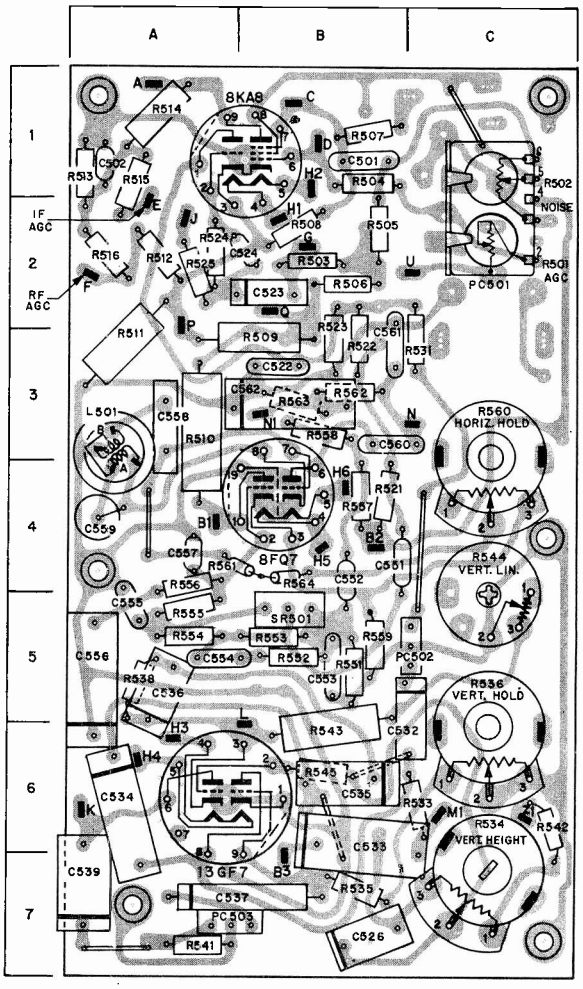


Chassis and Kinescope Removal

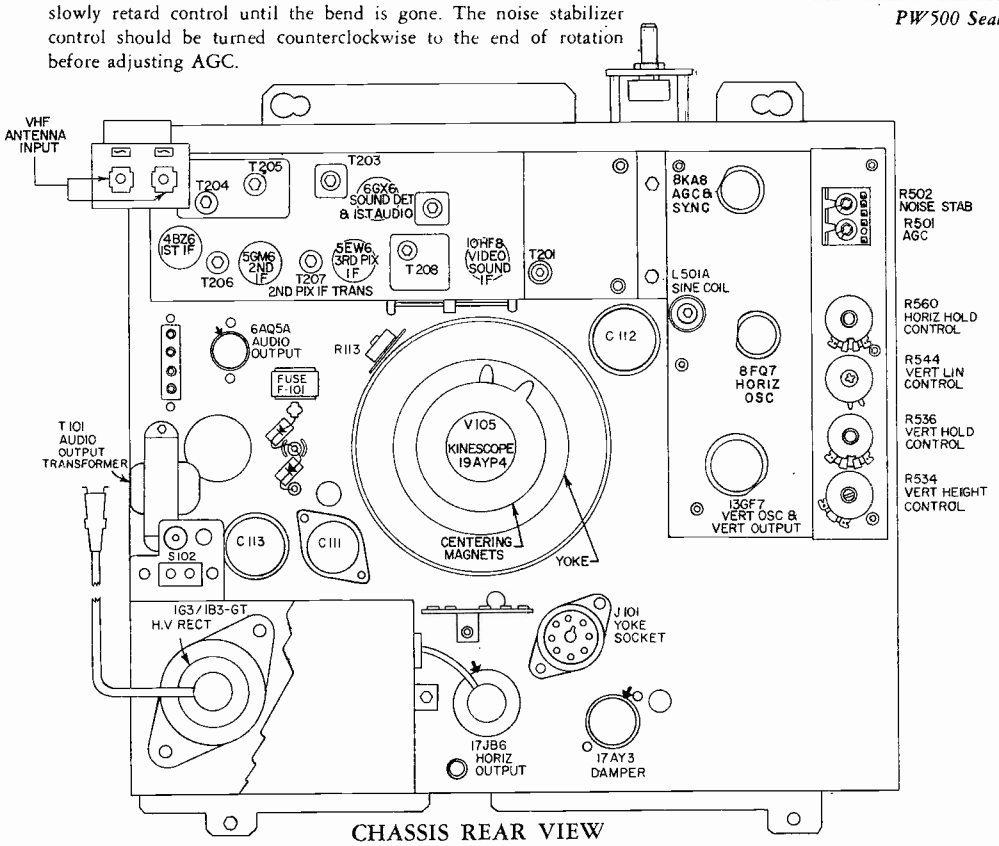
For details on PW200 circuit assembly used in these sets, see such data in another section on page 119; for alignment, pages 131-133.

AGC CONTROL ADJUSTMENT

Perform the following routine test: Adjust the receiver and antenna to obtain the best picture from a strong, local station. Quickly switch off channel and back, and if the picture distorts and bends, or does not reappear immediately, rotate the AGC control R501, counterclockwise and then clockwise until picture bend occurs. Then slowly retard control until the bend is gone. The noise stabilizer control should be turned counterclockwise to the end of rotation before adjusting AGC.



PW500 Sealed Circuit Assembly (Defl.)

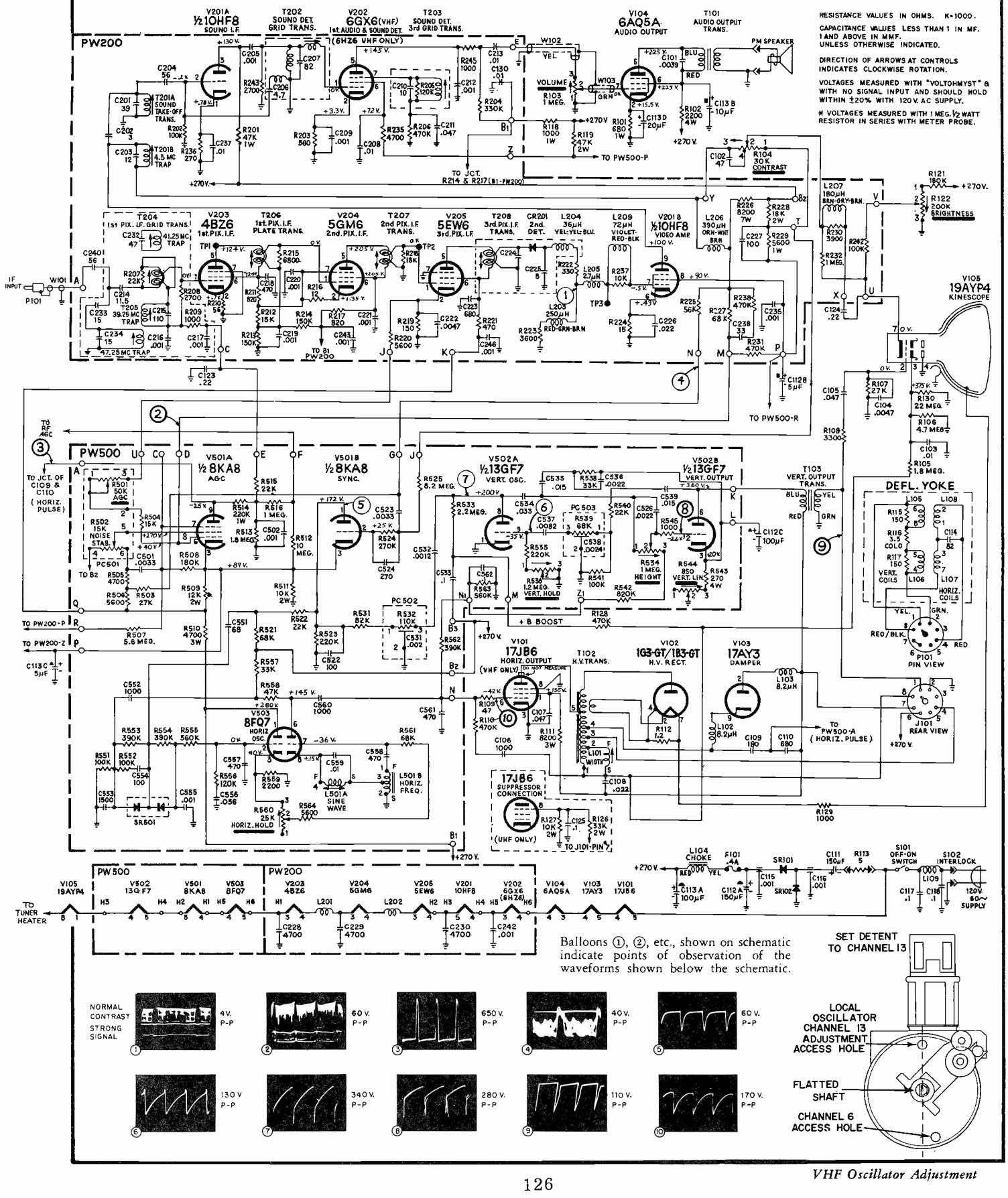


CHASSIS REAR VIEW

C501	B1	R510	A3
C502	A1	R511	A3
C522	B3	R512	A2
C523	B2	R513	A1
C524	B2	R514	A1
C526	B7	R515	A1
C532	C5	R516	A2
C533	B6	R521	B4
C534	A6	R522	B3
C535	B6	R523	B3
C536	A5	R524	A2
C537	B7	R525	A2
C539	A7	R531	C3
C551	B4	R533	C6
C552	B4	R534	C6
C553	B5	R535	B7
C554	A5	R536	C5
C555	A5	R538	A5
C556	A5	R540	A7
C557	A4	R541	A7
C558	A3	R542	C6
C559	A4	R543	B6
C560	B3	R544	C4
C561	B3	R545	B6
C562	B3	R551	B5
L501	A3	R553	B5
PC501	C2	R554	A5
PC502	C5	R555	A5
PC503	A7	R556	A4
R501	C2	R557	B4
R502	C1	R558	B3
R503	B2	R559	B5
R504	B1	R560	C3
R505	B2	R561	B4
R506	B2	R562	B3
R507	B1	R563	B3
R508	B2	R564	B4
R509	B3	SR501	B5

PW500 LOCATION GUIDE

RCA Victor CIRCUIT SCHEMATIC DIAGRAM FOR KCS144A & B CHASSIS



Balloons ①, ②, etc., shown on schematic indicate points of observation of the waveforms shown below the schematic.

VHF Oscillator Adjustment

RCA VICTOR

MODEL	CHASSIS
94-A-083, 4 MV	KCS143A
94-A-083, 4 MU	KCS143B
94-A-102, 7, 9 MV	KCS143A
94-A-102, 7, 9 MU	KCS143B

(For sound alignment see page 131; for PW500 deflection board view see page 136.)

CENTERING

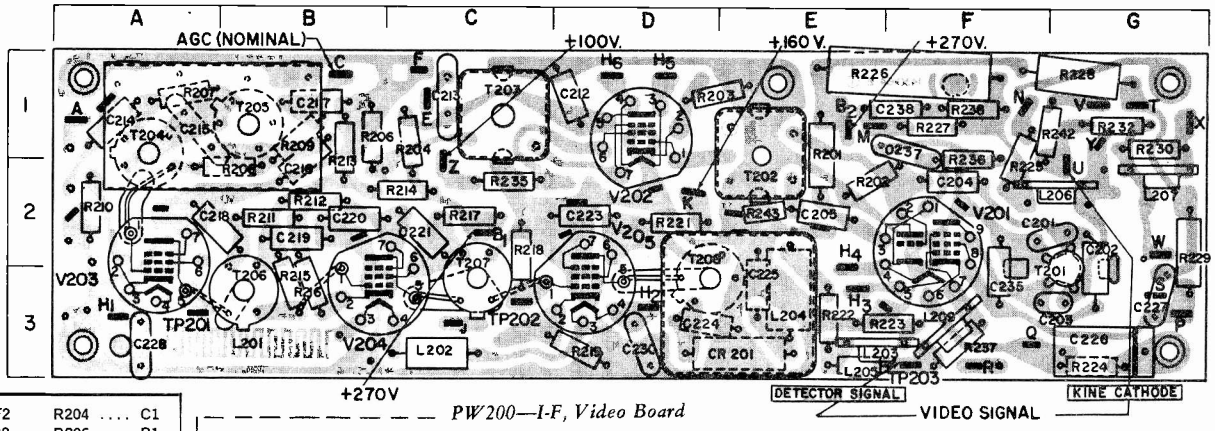
If the picture does not fill the screen, it may be necessary to center the picture with the 2 disc magnets mounted behind the yoke cover. Both horizontal and vertical centering are accomplished at once by rotating the discs together or separately. Perform this adjustment along with vertical height, vertical linearity, and width, as they are all interdependent.

HORIZONTAL OSCILLATOR

The horizontal sine wave coil is adjusted by temporarily attaching a short jumper across the coil (L501A) and another jumper from Pin 2 of 8KA8 to ground. Carefully adjust the horizontal hold for least sideways drift of the picture and remove the coil jumper. Again stop the sideways drift (if any) by adjusting the sine wave coil slug with nonmetallic tool. Remove all jumpers.

WIDTH

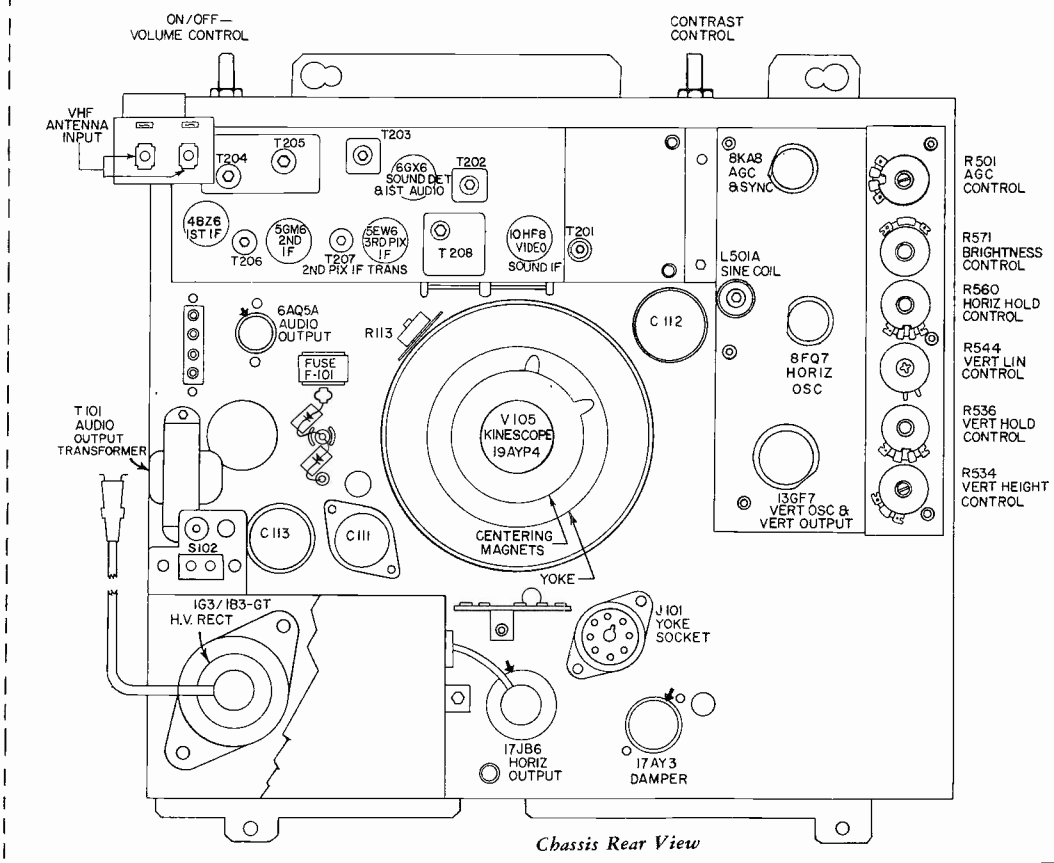
The width adjustments is made with L101. The picture may be adjusted to fill the mask with a line voltage of 108 volts, and with normal line voltage, the raster should overscan the mask about 5/8 inch on each side. "Normal" line voltage is 120 volts.



C201	F2	R204	C1
C202	G2	R206	B1
C203	F3	R207	A1
C204	F2	R208	B2
C205	E2	R209	B1
*C208	D2	R210	A2
*C209	E1	R211	B2
C212	D1	R212	B2
C213	C1	R213	B1
C214	A1	R214	C2
C215	A1	R215	B3
C216	B2	R216	B3
C217	B1	R217	C2
C218	B2	R218	C2
C219	B2	R219	D3
C220	B2	R221	D2
C221	C2	R222	E3
C223	D2	R223	F3
C224	D3	R224	G3
C225	E3	R225	F1
C226	G3	R226	F1
C227	G3	R227	F1
C228	A3	R228	G1
*C229	B3	R229	G2
*C230	D3	R230	G1
C235	F2	R232	G1
C237	F1	R235	C2
C238	F1	R236	F1
*C242	D1	R237	F3
*C245	E2	R238	F1
*C246	D2	R242	G1
CR201	E3	R243	E2
L202	C3	*R245	D1
L203	E3	T201	G2
L204	E3		
L205	E3	T202	E1
L206	G2	T203	C1
L207	G2	T204	A1
L209	F3	T205	B1
		T206	B3
R201	E1	T207	C3
R202	E2	T208	D3
R203	E1		

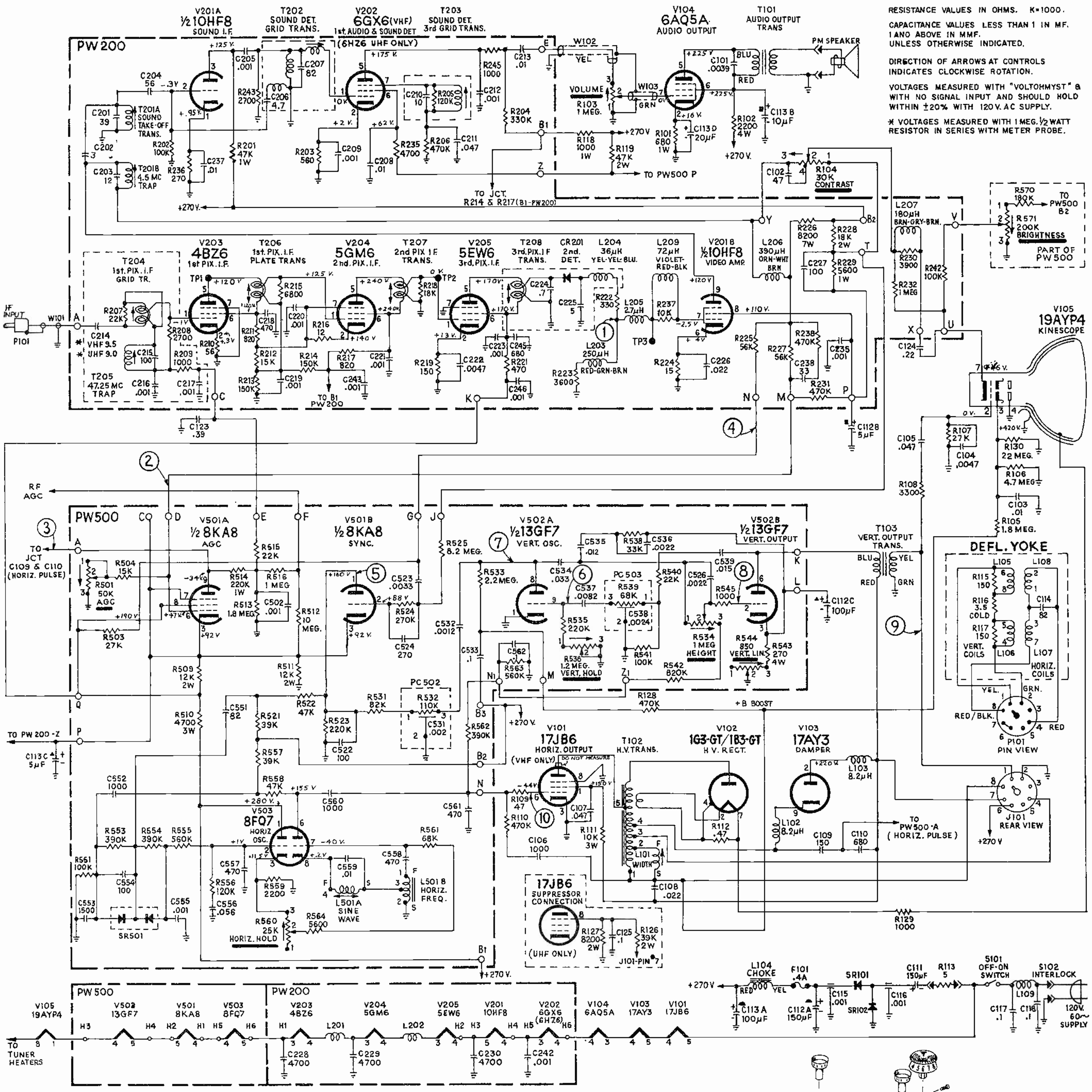
* Under Board

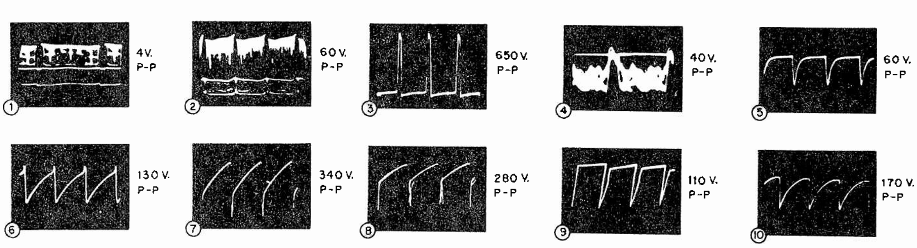
PW200 LOCATION GUIDE



RCA Victor CIRCUIT SCHEMATIC DIAGRAM FOR KCS143A & B CHASSIS

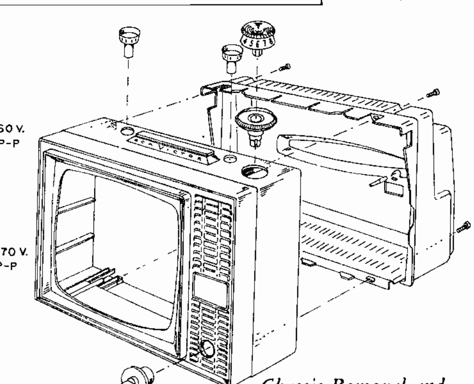
RESISTANCE VALUES IN OHMS. K=1000.
CAPACITANCE VALUES LESS THAN 1 IN MF. 1 AND ABOVE IN MMF. UNLESS OTHERWISE INDICATED.
DIRECTION OF ARROWS AT CONTROLS INDICATES CLOCKWISE ROTATION.
VOLTAGES MEASURED WITH "VOLTOHMYST" & WITH NO SIGNAL INPUT AND SHOULD HOLD WITHIN ±20% WITH 120V. AC SUPPLY.
✱ VOLTAGES MEASURED WITH 1 MEG. ½ WATT RESISTOR IN SERIES WITH METER PROBE.





NORMAL CONTRAST
STRONG SIGNAL

Balloons ①, ②, etc., shown on schematic indicate points of observation of the waveforms shown below the schematic.



Chassis Removal and Safety Glass Cleaning

RCA VICTOR

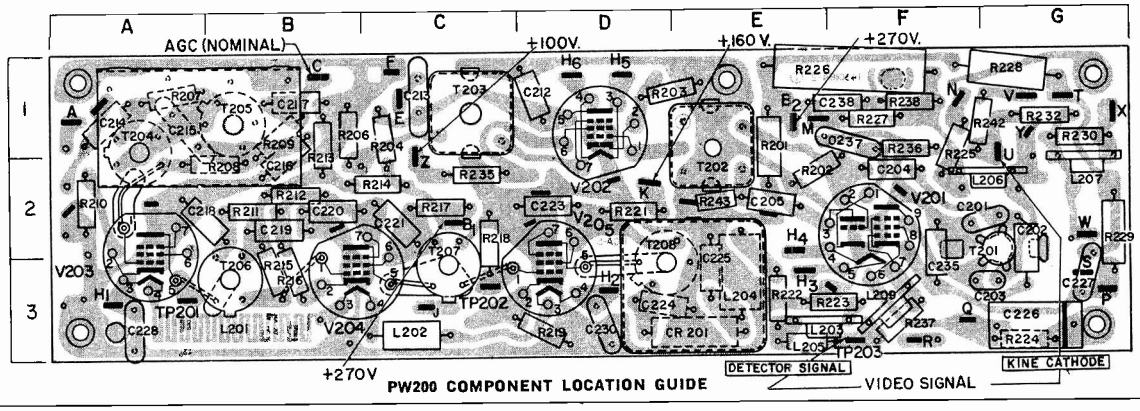
MODEL	CHASSIS
94-A-160-MV	KCS147A
94-A-160-MU	KCS147B

HORIZONTAL OSCILLATOR

The horizontal sine wave coil is adjusted by temporarily attaching a short jumper across the coil (L501A) and another jumper from Pin 2 of 6KA8 to ground. Carefully adjust the horizontal hold for least sideways drift of the picture and remove the coil jumper. Again stop the sideways drift (if any) by adjusting the sine wave coil slug with nonmetallic tool. Remove all jumpers.

CENTERING

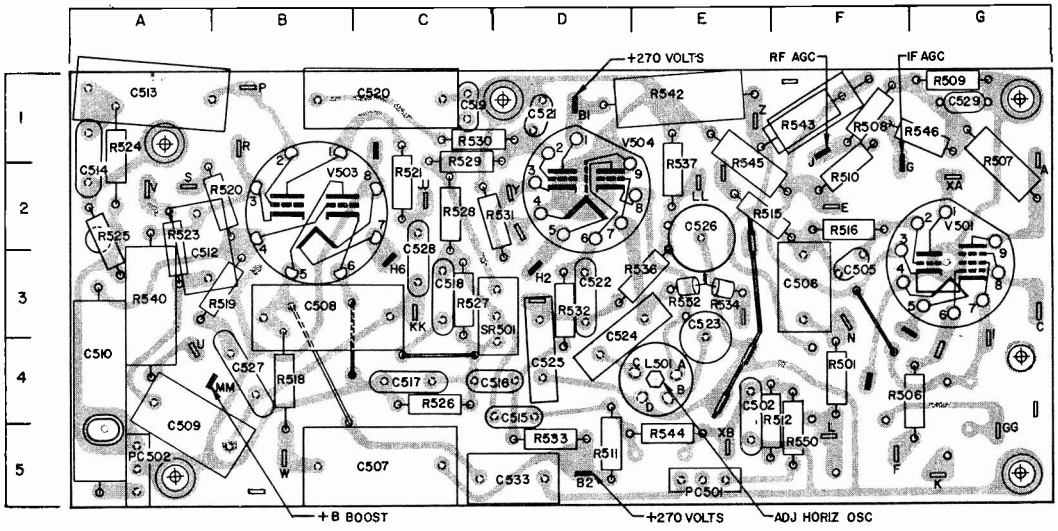
If the picture does not fill the screen, it may be necessary to center the picture with the 2 disc magnets mounted behind the yoke cover. Both horizontal and vertical centering are accomplished at once by rotating the discs together or separately. Perform this adjustment along with vertical height, vertical linearity, and width, as they are all interdependent.



PW200 COMPONENT LOCATION GUIDE

C201 .....F2	C217 .....B1	C230 .....D3	L204 .....E3	R208 .....B2	R221 .....D2	R236 .....F1	T207 .....C3
C202 .....G2	C218 .....B2	C235 .....F2	L205 .....E3	R209 .....B1	R222 .....E3	R237 .....F3	T208 .....D3
C203 .....F3	C219 .....B2	C237 .....F1	L206 .....G2	R210 .....A2	R223 .....F3	R238 .....F1	
C204 .....F2	C220 .....B2	C238 .....F1	L207 .....G2	R211 .....B2	R224 .....G3	R242 .....G1	*Under Board
C205 .....E2	C221 .....C2	*C245 .....E2	L209 .....F3	R212 .....B2	R225 .....F1	R243 .....E2	†Printed
*C208 .....D2	C222 .....C3	*C246 .....D2		R213 .....B1	R226 .....F1	*R245 .....D1	
*C209 .....E1	C223 .....D2		R201 .....E1	R214 .....C2	R227 .....F1	T201 .....G2	
C212 .....D1	C224 .....D3	CR201 ....E3	R202 .....E2	R215 .....B3	R228 .....G1	T202 .....E1	
C213 .....C1	C225 .....E3		R203 .....E1	R216 .....B3	R229 .....G2	T203 .....C1	
C214 .....A1	C226 .....G3	†L201 .....B3	R204 .....C1	R217 .....C2	R230 .....G1	T204 .....A1	
C215 .....A1	C227 .....G3	L202 .....C3	R206 .....B1	R218 .....C2	R232 .....G1	T205 .....B1	
C216 .....B2	C228 .....A3	L203 .....F3	R207 .....A1	R219 .....D3	R235 .....C2	T206 .....B3	

PW200 Sealed Circuit I-F and Video Assembly Composite Diagram



PW500 Sealed Circuit Deflection Assembly Composite Diagram

C502 .....E4	C514 .....A2	C523 .....E3	L501 .....E4	R509 .....G1	R521 .....C2	R532 .....D3	R545 .....E2
C505 .....F3	C515 .....D4	C524 .....D4		R510 .....F2	R524 .....A1	R533 .....D5	R546 .....G1
C506 .....F3	C516 .....D4	C525 .....D4	PC501 ....E5	R511 .....D5	R525 .....A2	R534 .....E3	R550 .....F5
C507 .....C5	C517 .....C4	C526 .....E2	PC502 ....A5	R512 .....F5	R526 .....C4	R536 .....D3	
C508 .....B3	C518 .....C3	C527 .....B4		R515 .....E2	R527 .....C3	R537 .....E2	SR501 ....D3
C509 .....A5	C519 .....C1	C528 .....C2	R501 .....F4	R516 .....F2	R528 .....C2	R540 .....A3	
C510 .....A4	C520 .....C1	C529 .....G1	R506 .....F4	R518 .....B4	R529 .....C2	R542 .....E1	
C512 .....A3	C521 .....D1	C533 .....D5	R507 .....G1	R519 .....B3	R530 .....C1	R543 .....F1	
C513 .....A1	C522 .....D3	C534 .....E5	R508 .....F1	R520 .....B2	R531 .....D2	R544 .....E5	

RCA Victor CIRCUIT SCHEMATIC DIAGRAM FOR KCS147A & B CHASSIS

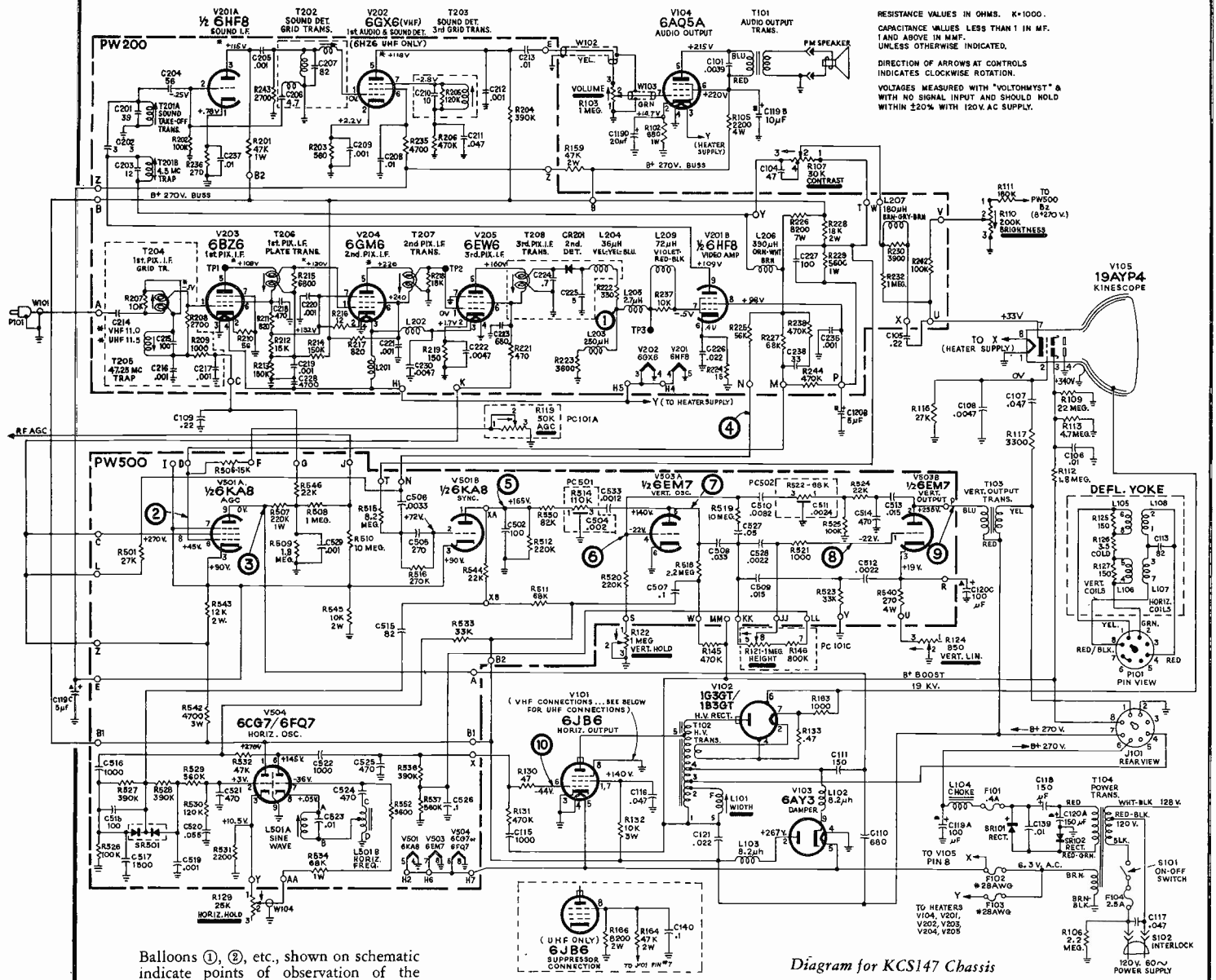
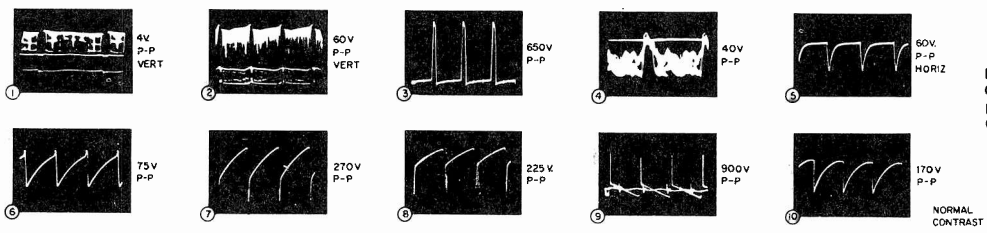


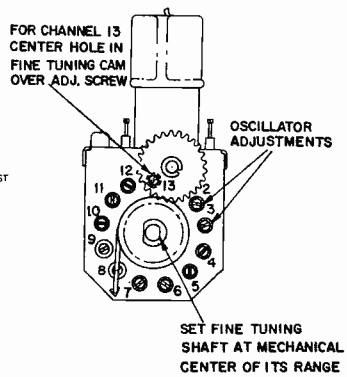
Diagram for KCS147 Chassis

Balloons ①, ②, etc., shown on schematic indicate points of observation of the waveforms shown below the schematic.



AGC CONTROL ADJUSTMENT

Perform the following, routine test: Adjust the receiver and antenna to obtain the best picture from a strong, local station. Quickly switch off channel and back, and if the picture distorts and bends, or does not reappear at once, rotate the AGC control (R119) counterclockwise and then clockwise until slight picture bend occurs. Then slowly retard the control until the bend is gone. Check again by switching off and on strong signal.



VHF Oscillator Adjustment

RCA Victor Sound Alignment for sets as listed

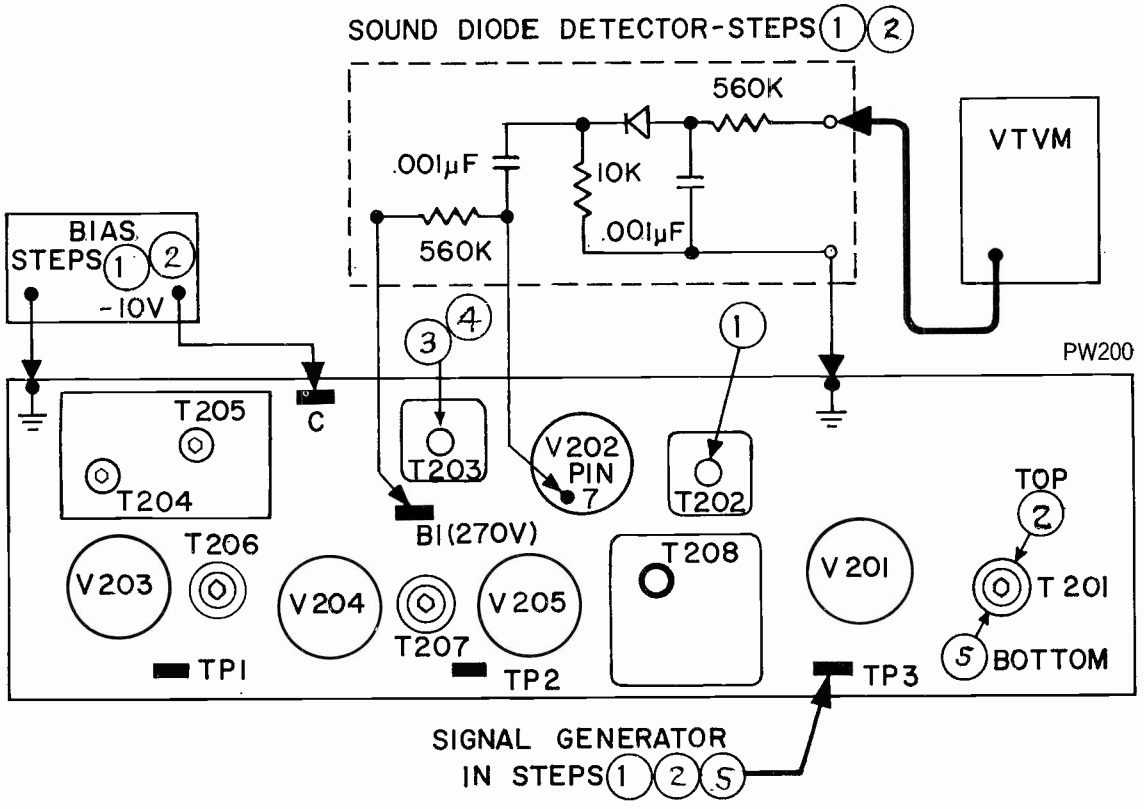
SOUND ALIGNMENT OF KCS136, KCS137, KCS141, KCS143, KCS144, KCS147

SOUND I-F, SOUND DETECTOR AND 4.5 MC. TRAP ALIGNMENT

TEST EQUIPMENT CONNECTIONS:

BIAS SUPPLY ..... Apply —10 volts to the I-F AGC bus at terminal "C" on PW200.
OSCILLOSCOPE ..... Connect to kinescope cathode lead through diode probe.
SIGNAL GENERATOR ..... Connect to test point TP3 on PW200.
VACUUM TUBE VOLTMETER... Connect to output of diode detector shown below. Set meter for negative voltage readings.
MISCELLANEOUS..... Connect test diode detector to pin 7 of V202. See below for adjustment locations.

	STEP	SIGNAL GENERATOR	ADJUST	REMARKS
1	Adjust detector grid transformer	4.5 mc.	T202	Adjust for maximum negative d.c. on meter. Set generator for 1.0 to 1.5 volts when peaked. T201A top core and T202 core should penetrate the coil from top of can when finally peaked.
2	Adjust sound take-off transformer	4.5 mc.	T201A (top)	
3	Disconnect the diode test detector. Turn off signal generator and tune in strongest signal in area, adjusting volume control for normal volume. Turn core of T203 flush with top of coil form. Disconnect bias supply.			
4	Adjust sound detector transformer		T201B (bottom)	Turn core clockwise to 2nd peak adjusting for max. volume.
5	Adjust 4.5 mc. trap	4.5 mc., 400 cycle, AM mod.	T201B (bottom)	Adjust for minimum 4.5 mc. indication on oscilloscope. The core should penetrate the coil from the bottom of the can when finally adjusted.

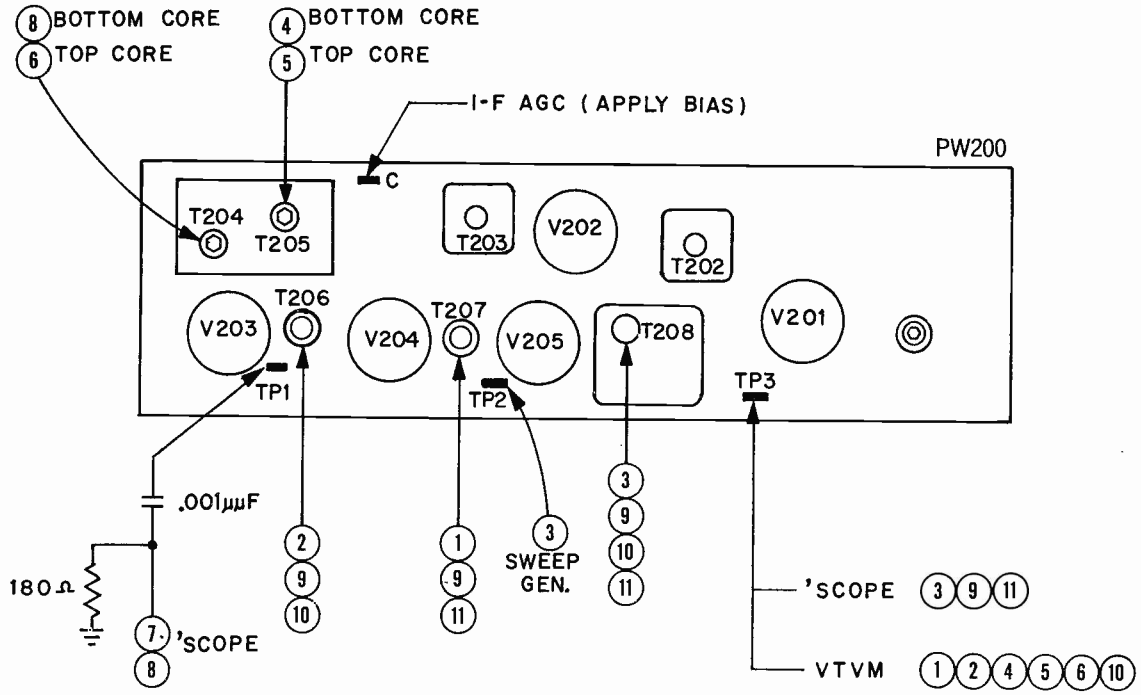


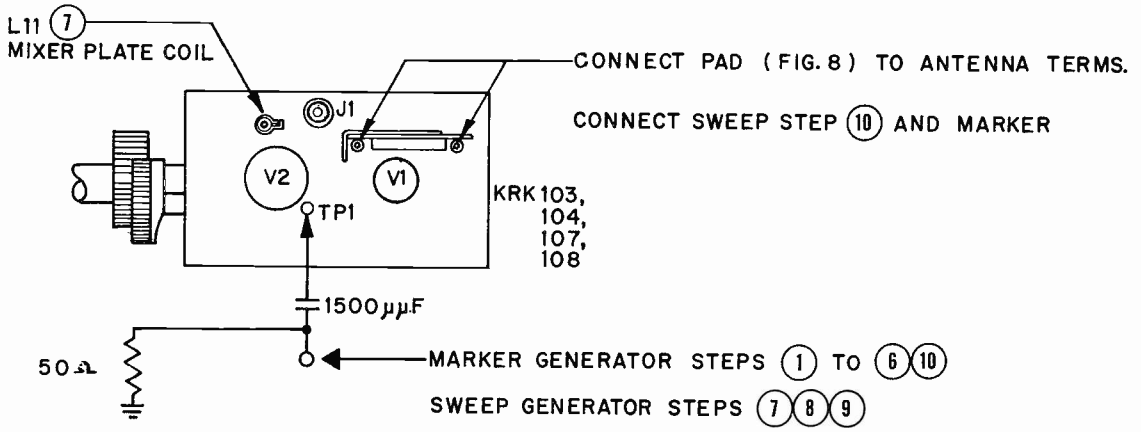
Sound Alignment of KCS136, KCS137, KCS141, KCS143, KCS144, KCS147

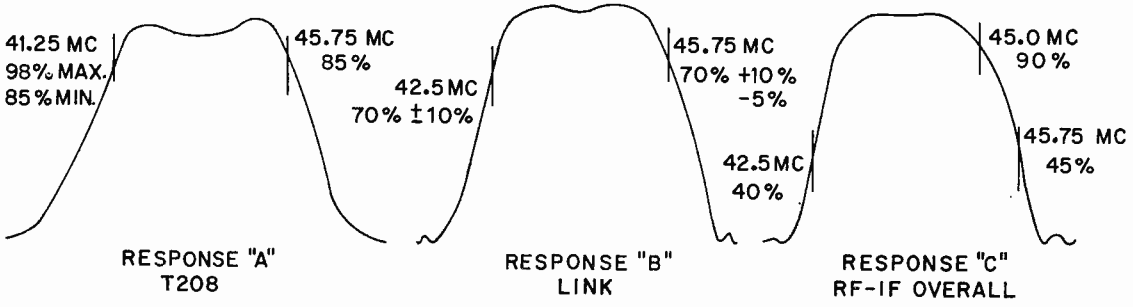
RCA Victor Picture I. F. Alignment for sets as listed

PICTURE I-F ALIGNMENT — KCS136, KCS137, KCS141, KCS144 CHASSIS

PICTURE I-F TRANSFORMER AND TRAP ADJUSTMENTS







Picture I-F Alignment—KCS136, KCS137, KCS141, KCS144 Chassis

RCA Victor Picture I. F. Alignment for sets as listed, Continued

PICTURE I-F ALIGNMENT — KCS136, KCS137, KCS141, KCS144 CHASSIS

PICTURE I-F TRANSFORMER AND TRAP ADJUSTMENTS

TEST EQUIPMENT CONNECTIONS:

BIAS ..... Connect —6 volts from I-F AGC terminal "C" of PW200 to ground.
OSCILLOSCOPE ..... Connect to 2nd Detector at test point TP3. Set "scope" for 5 volts Peak to Peak.
MARKER GENERATOR ..... Connect to mixer grid test point through mixer pad shown.
SWEEP GENERATOR ..... Connect to the grid of 3rd picture I-F, pin 1, V205, test point TP2. Use shortest leads possible.
VACUUM TUBE VOLTMETER ... Connect to 2nd Detector output at test point TP3. Use DC probe.
MISCELLANEOUS ..... Refer to facing page for adjustment locations and responses.

	STEP	SWEEP GENERATOR	MARKER GENERATOR	ADJUST	REMARKS
1	Peak 2nd pix. I-F transformer	————	45.5 mc.	T207	Peak T207 and T206 on frequency for max. output on meter. Adjust generator for 3 volts on meter when finally peaked.
2	Peak 1st pix. I-F Plate transformer	————	43.0 mc.	T206	
3	Adjust 3rd pix. I-F transformer	40-50 mc. (I-F)	41.25 mc. 45.75 mc.	T208 (top & bottom cores)	Adjust for maximum with response shown in "A". Use 5 v. p-p on "scope".
4	Adjust 47.25 mc. trap	————	47.25 mc.	T205B (bottom)	Adjust for minimum output indication on meter.
5	Adjust 39.25 mc. trap	————	39.25 mc.	T205A (top)	Adjust for minimum output indication on meter.
6	Adjust 41.25 mc. trap	————	41.25 mc.	T204A (top)	Adjust for minimum output indication on meter.

PICTURE I-F SWEEP ALIGNMENT

TEST EQUIPMENT CONNECTIONS:

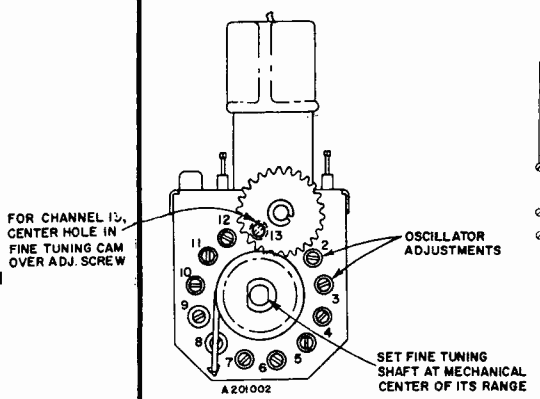
BIAS SUPPLY ..... Connect —6 volts from I-F AGC terminal "C" on PW200 to ground.
OSCILLOSCOPE ..... Connect oscilloscope to 180 Ω detector, using diode probe to TP1.
SWEEP GENERATOR ..... Connect in series with mixer pad into mixer grid test point TP1. Use shortest leads possible.
MARKER GENERATOR ..... Couple loosely to sweep output cable to provide markers.
VACUUM TUBE VOLTMETER ... Connect to 2nd Detector output at test point TP3. Use DC probe.
MISCELLANEOUS ..... Refer to facing page for adjustment locations and responses.

	STEP	SWEEP GENERATOR	MARKER GENERATOR	ADJUST	REMARKS
	Set Channel Selector to Channel 4.				
7	Adjust mixer plate coil	40-50 mc. (I-F)	42.5 mc. 45.75 mc.	L11	Sweep output set for 0.5 v. p-p on "scope". Adjust for max. gain and response "B". Max. allow. tilt 20%.
8	Adjust 1st I-F grid trans.	40-50 mc. (I-F)	42.5 mc. 45.75 mc.	T204B (bottom)	
	Repeat step 4 above, if necessary, for minimum output at 47.25 mc. Remove 180 ohm detector and "scope" from TP1. Connect "scope" to test point TP3, using direct probe. Set bias to —10 volts at terminal "C" on PW200.				
9	Retouch I-F transformers	40-50 mc. (I-F)	42.5 mc. 45.0 mc. 45.75 mc.	T208 T207 T206	Adjust for response "C". Use 5 v. p-p on "scope".
	Remove sweep from mixer pad and couple marker generator to mixer pad. Set generator to 45.75 mc. and adjust output for exactly one and one-half (1½) volts on "VoltOhmyst." Remove the pad and connect generator directly to mixer grid. Do not change generator output in step 10.				
10	Set 41.25 mc. attenuation	————	41.25 mc.	T206 & T208	Adjust for 1.2 to 1.5 volts on VTVM.
	Connect sweep generator to antenna terminals using attenuator pad shown in Figure 8.				
11	Check overall	Channels 13 to 2	42.5 mc. 45.0 mc. 45.75 mc.	T207 & T208B	Retouch slightly to correct overall tilt. Maintain response "C".

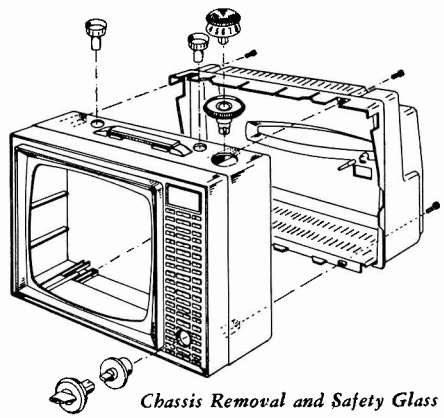
RCA VICTOR

Chassis KCS 142 D & E

MODEL	CHASSIS
94-A-064-MV	KCS142D
94-A-064-MU	KCS142E

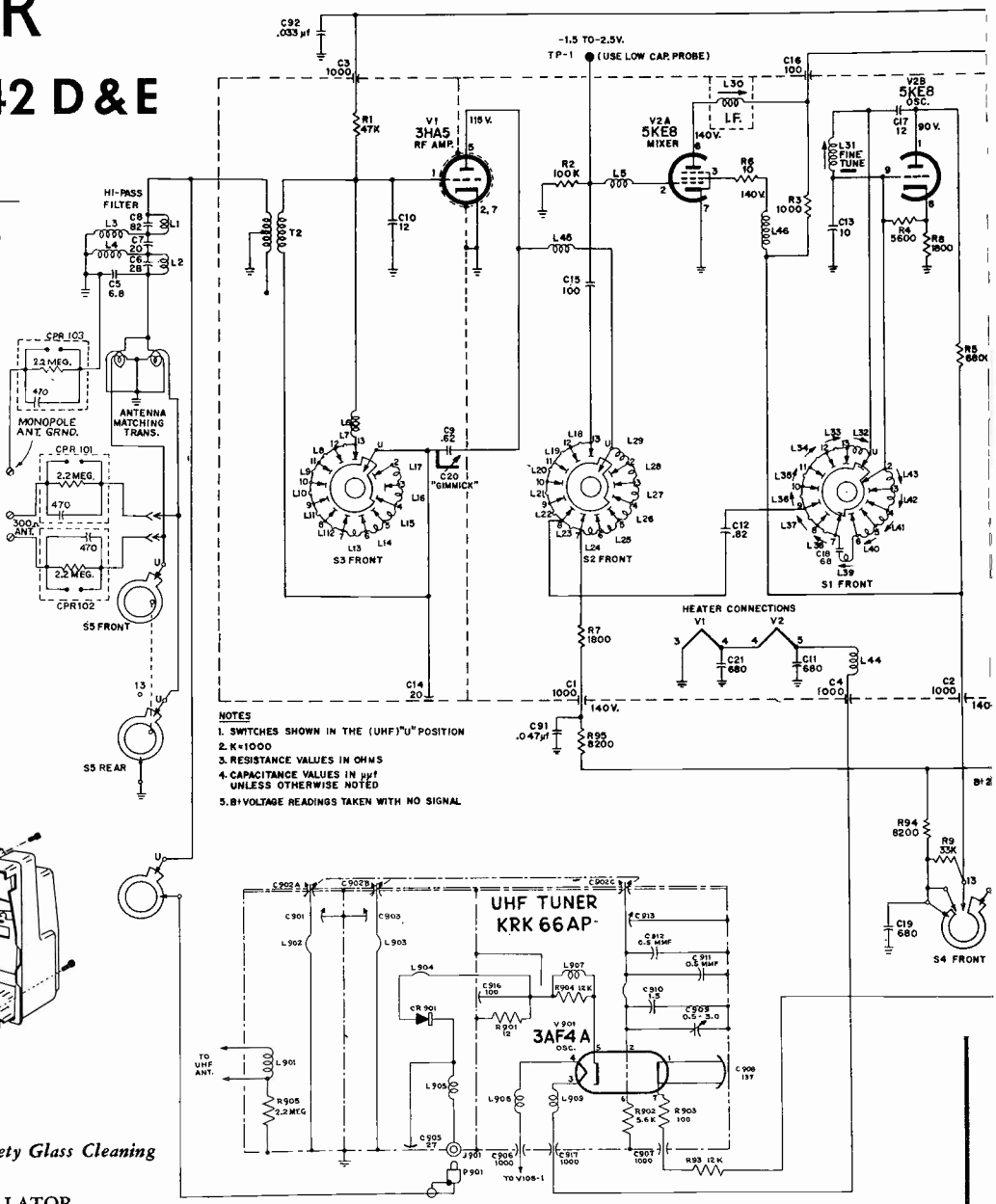


VHF Oscillator Adjustment



Chassis Removal and Safety Glass Cleaning

CIRCUIT SCHEMATIC DIAGRAM FOR KRK105A & KRK66AR UHF/VHF TUNER



Circuit Schematic Diagram of UHF/VHF Tuner Assembly

HORIZONTAL OSCILLATOR

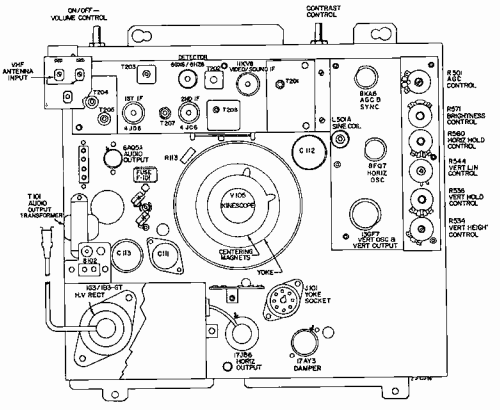
The horizontal sine wave coil is adjusted by temporarily attaching a short jumper across the coil (L501A) and another jumper from Pin 2 of 8KA8 to ground. Carefully adjust the horizontal hold for least sideways drift of the picture and remove the coil jumper. Again stop the sideways drift (if any) by adjusting the sine wave coil slug with nonmetallic tool. Remove all jumpers.

CENTERING

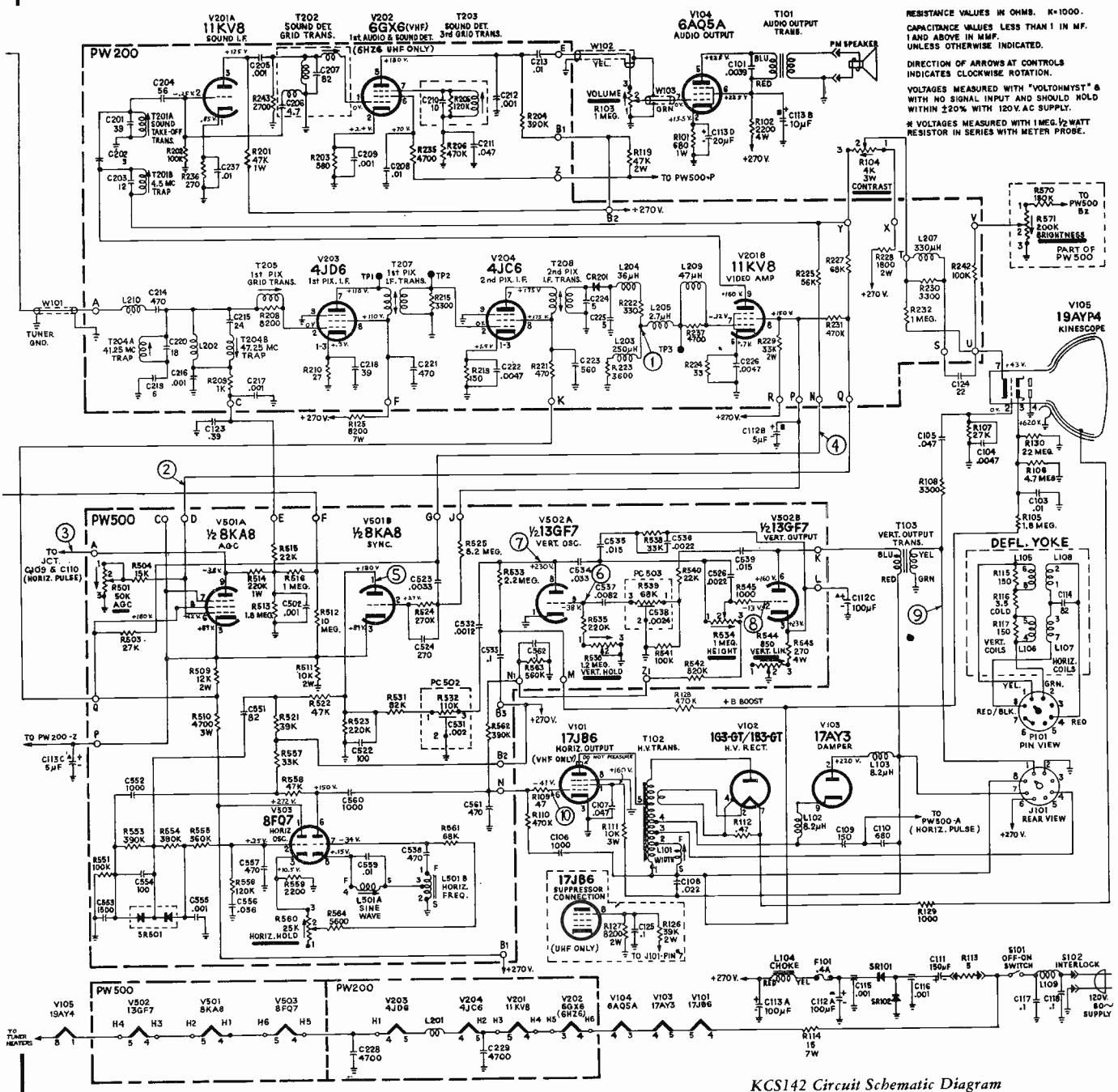
If the picture does not fill the screen, it may be necessary to center the picture with the 2 disc-magnets mounted behind the yoke cover. Both horizontal and vertical centering are accomplished at once by rotating the discs together or separately. Perform this adjustment along with vertical height, vertical linearity, and width, as they are all interdependent.

TESTING PICTURE PROPORTIONS

Rotate the vertical hold control to roll picture slowly downward and study the blanking bar. If it is not level, or if the bar varies in thickness as it moves down the screen, make adjustments as prescribed in the next two paragraphs.

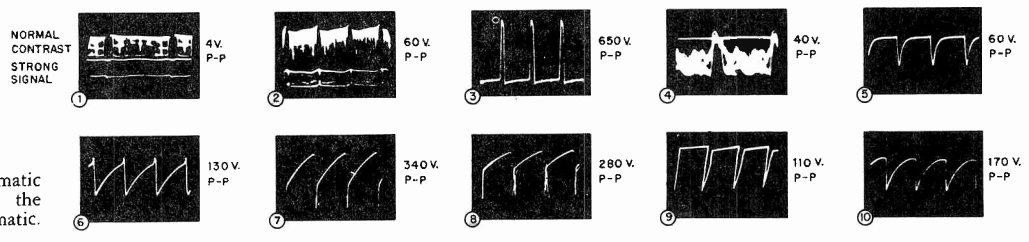


RCA Victor CIRCUIT SCHEMATIC DIAGRAM FOR KCS142D & E CHASSIS



KCS142 Circuit Schematic Diagram

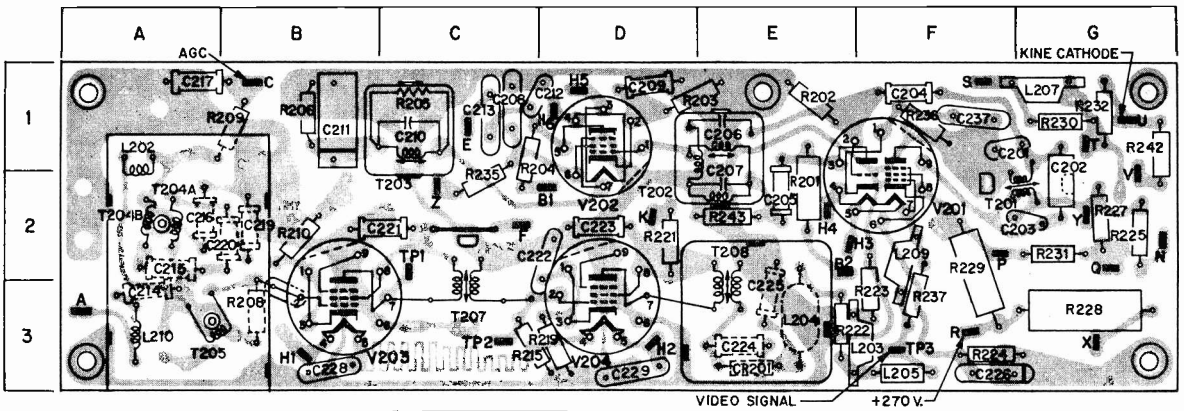
For alignment data see pages 140-142.



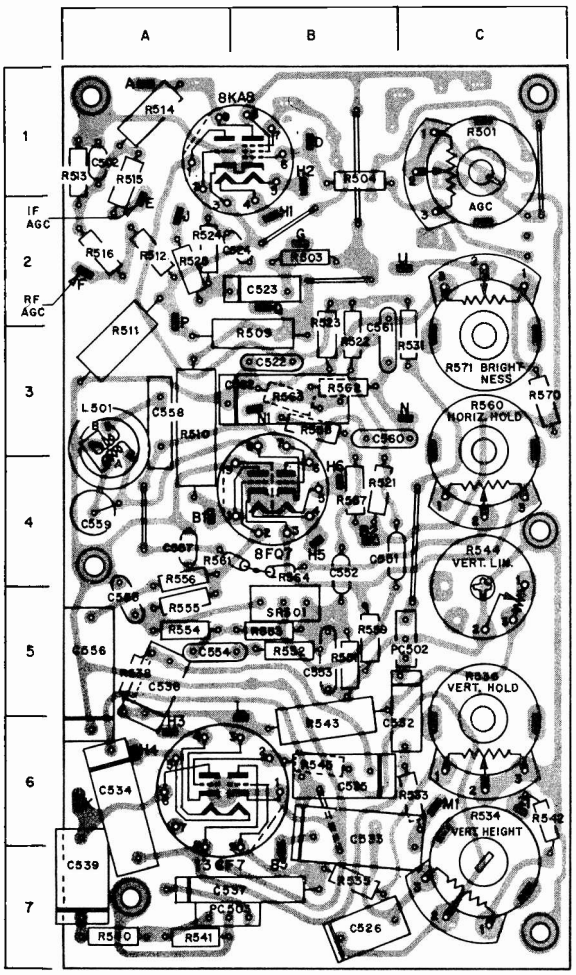
Balloons ①, ②, etc., shown on schematic indicate points of observation of the waveforms shown below the schematic.

RCA Victor Chassis KCS-142D, E, Service Information, Continued

SECURITY SEALED CIRCUIT ASSEMBLIES



PW200—I-F, Video Board



PW500 Deflection Board

C502	A1	R515	A1
C522	B3	R516	A2
C523	B3	R521	B4
C524	B2	R522	B2
C526	B7	R523	B2
C532	C6	R524	A2
C533	B6	R525	A2
C534	A6	R531	C3
C535	B6	R533	C6
C536	A5	R534	C6
C537	A7	R535	B7
C539	A7	R536	C5
C551	B4	R538	A5
C552	B4	R540	A7
C553	B5	R541	A7
C554	A5	R542	C6
C555	A5	R543	B6
C556	A5	R544	C4
C557	A4	R545	B6
C558	A3	R551	B5
C559	A4	R552	B5
C560	B3	R553	B5
C561	B3	R554	A5
C562	B3	R555	A5
		R556	A4
L501	A3	R557	B4
PC502	C5	R558	B3
PC503	B7	R559	B5
R501	C1	R560	C3
R503	B2	R561	B4
R504	B1	R562	B3
R509	B3	R563	B3
R510	A3	R564	B4
R511	A3	R570	C3
R512	A2	R571	C3
R513	A1		
R514	A1	SR501	B5

PW500 LOCATION GUIDE

C201	F1	L210	A3
C202	G2		
C203	G2	R201	E2
C204	F1	R202	E1
C205	E2	R203	D1
C206	E1	R204	C1
C207	E2	R205	C1
C208	C1	R206	B1
C209	D1	R208	B3
C210	C1	R209	B1
C211	B1	R210	B2
C212	C1	R215	C3
C213	C1	R219	D3
C214	A3	R221	D2
C215	A2	R222	E3
C216	A2	R223	F3
C217	A1	R224	F3
*C218	B3	R225	G2
C219	B2	R227	G2
C220	B2	R228	G3
C221	B2	R229	F2
C222	D2	R230	G1
C223	D2	R231	G2
C224	E3	R232	G1
C225	E3	R235	C2
C226	F3	R236	F1
C228	B3	R237	F3
C229	D3	R242	G1
C237	F1	R243	E2
CR201	E3		
		T201	G2
L202	A1	T202	
L203	E3	T203	C1
L204	E3	T204	A2
L205	F3	T205	A3
L207	G1	T207	C3
L209	F2	T208	E3

* Under Board — Not Shown

PW200 LOCATION GUIDE

SERVICING PRECAUTIONS

When the receiver must be operated directly from the AC supply, the power plug should always be inserted in the proper direction to connect the chassis to the ground side of the AC line. Check with an AC voltmeter to see if a potential exists between the chassis and the power source ground. No reading should be obtained. If a reading is obtained, reverse the power plug and recheck for zero meter reading.

When replacing a chassis in the cabinet, always be certain that all the protective devices are put back in place, such as: non-metallic control knobs, insulating "fishpapers," adjustment and compartment covers or shields, isolation resistor—capacitor networks, etc.

MODEL	CHASSIS	NAME
64-A-026-MV	KCS146D	*"PETITE"*
64-A-026-MU	KCS146E	
64-A-030-MV	KCS146A	*"DEBUTANTE"*
64-A-030-MU	KCS146B	
64-A-033-MV	KCS146A	
64-A-033-MU	KCS146B	
64-A-037-MV	KCS146A	
64-A-037-MU	KCS146B	
64-A-038-MV	KCS146A	
64-A-038-MU	KCS146B	

RCA VICTOR

Chassis KCS 146 A, B, D, E

AGC CONTROL ADJUSTMENT

Perform the following, routine test: Adjust the receiver and antenna to obtain the best picture from a strong, local station. Quickly switch off channel and back, and if the picture distorts and bends, or does not reappear at once, rotate the AGC control (R233) counterclockwise and then clockwise until slight picture bend occurs. Then slowly retard the control until the bend is gone. Check again by switching off and on strong signal.

HORIZONTAL OSCILLATOR

The horizontal sine wave coil can be adjusted by temporarily attaching a short jumper across the coil (L207A) and another jumper from Pin 9 of 6GH8 to ground. Carefully adjust the horizontal hold for least sideways drift of the picture and remove the coil jumper. Again stop the sideways drift (if any) by adjusting the sine wave coil slug with nonmetallic tool. Remove all jumpers.

CENTERING

If the picture does not fill the screen, it may be necessary to center the picture with the 2 disc magnets mounted behind the yoke cover. Both horizontal and vertical centering are accomplished at once by rotating the discs together or separately. Perform this adjustment along with vertical height, vertical linearity, and width, as they are all interdependent.

TESTING PICTURE PROPORTIONS

Rotate the vertical hold control to roll picture slowly downward and study the blanking bar. If it is not level, or if the bar varies in thickness as it moves down the screen, make adjustments as prescribed in the next two paragraphs.

DEFLECTION YOKE

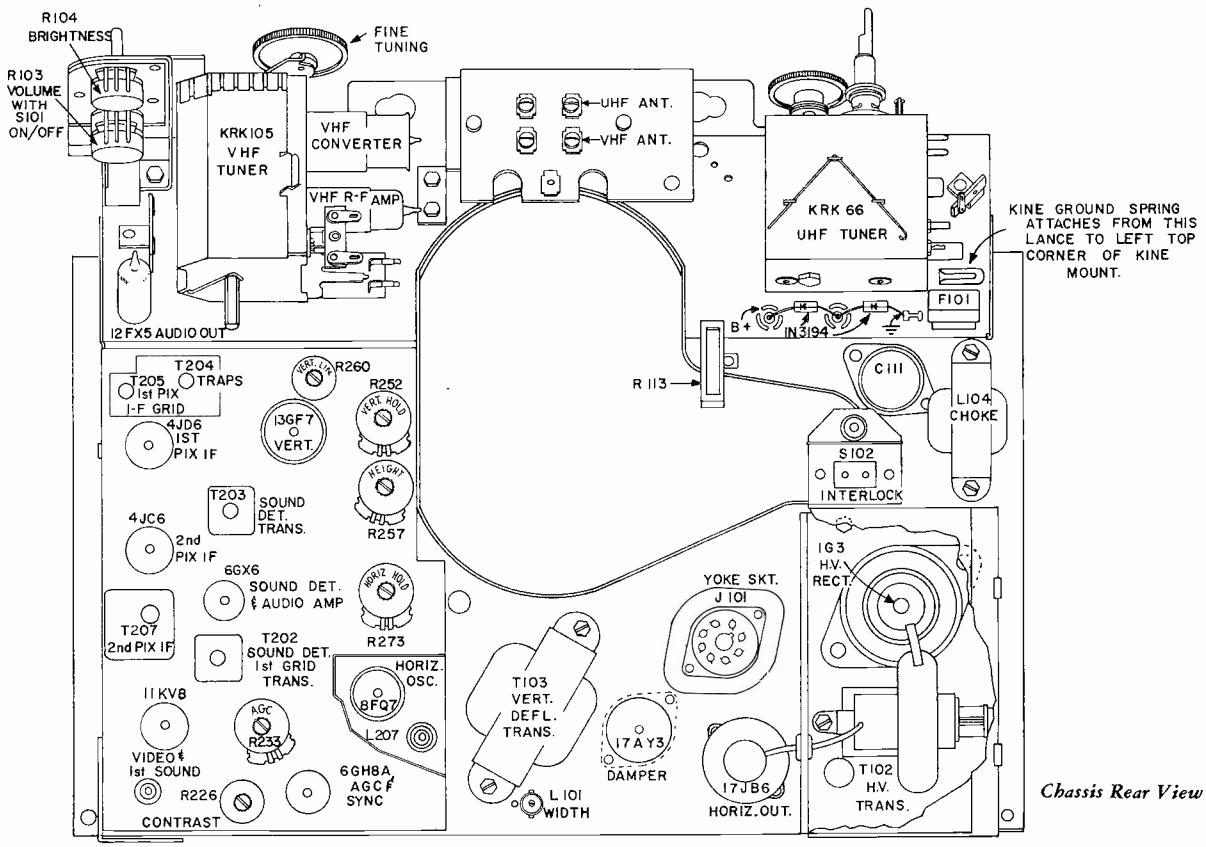
If the picture is tilted, loosen the yoke clamp screw and rotate the yoke to level the picture. Retighten the yoke clamp.

HEIGHT AND VERTICAL LINEARITY

If the blanking bar changed size while moving down, alternately adjust the height and vertical linearity controls for best vertical proportions. Final vertical size should allow the raster to overlap the mask about 3/8 inch at top and bottom with normal (120 volts) line voltage.

WIDTH

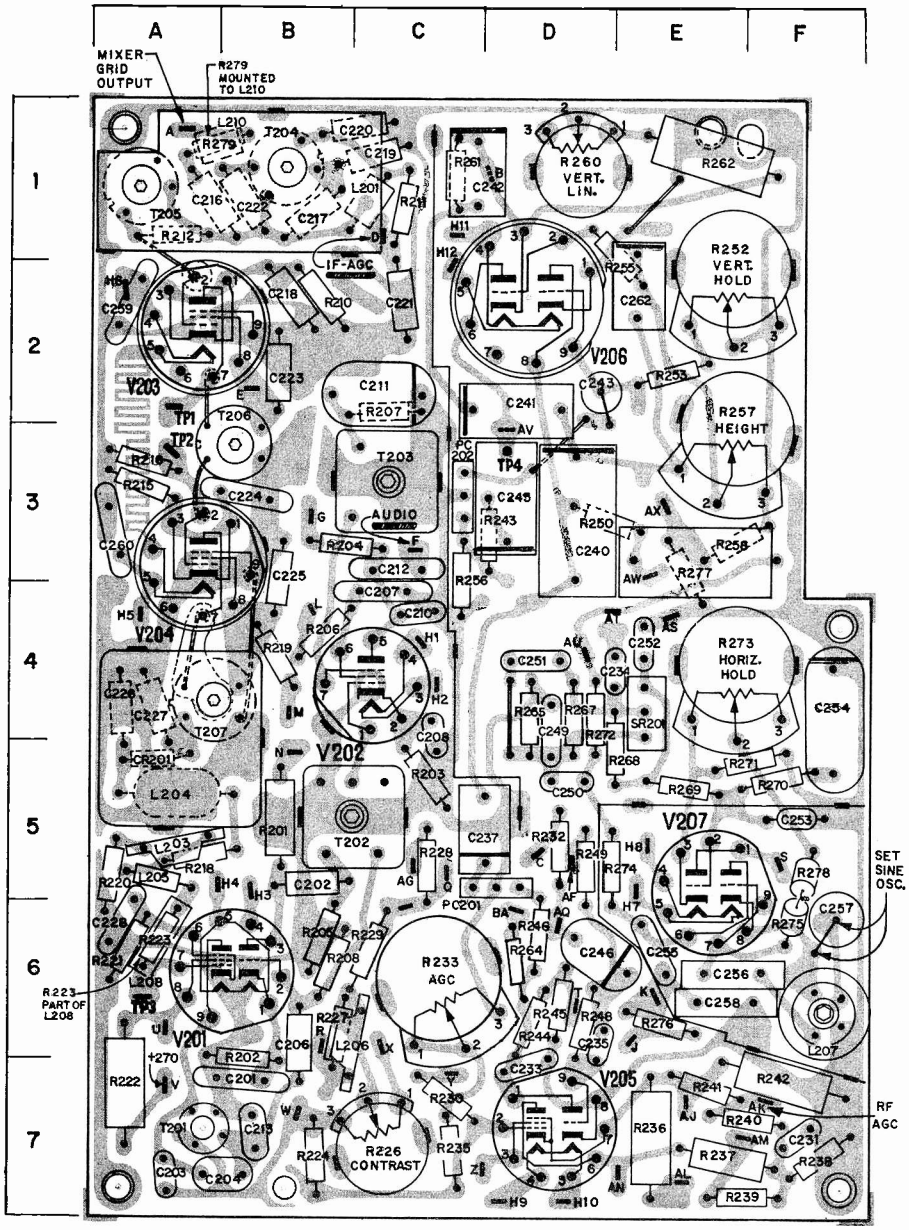
The width adjustments is made with L101. The picture may be adjusted to fill the mask with a line voltage of 108 volts, and with normal line voltage, the raster should overscan the mask about 5/8 inch on each side. "Normal" line voltage is 120 volts.



Chassis Rear View

RCA Victor Chassis KCS-146A, B, D, E, Service Information, Continued

SECURITY SEALED CIRCUIT ASSEMBLY

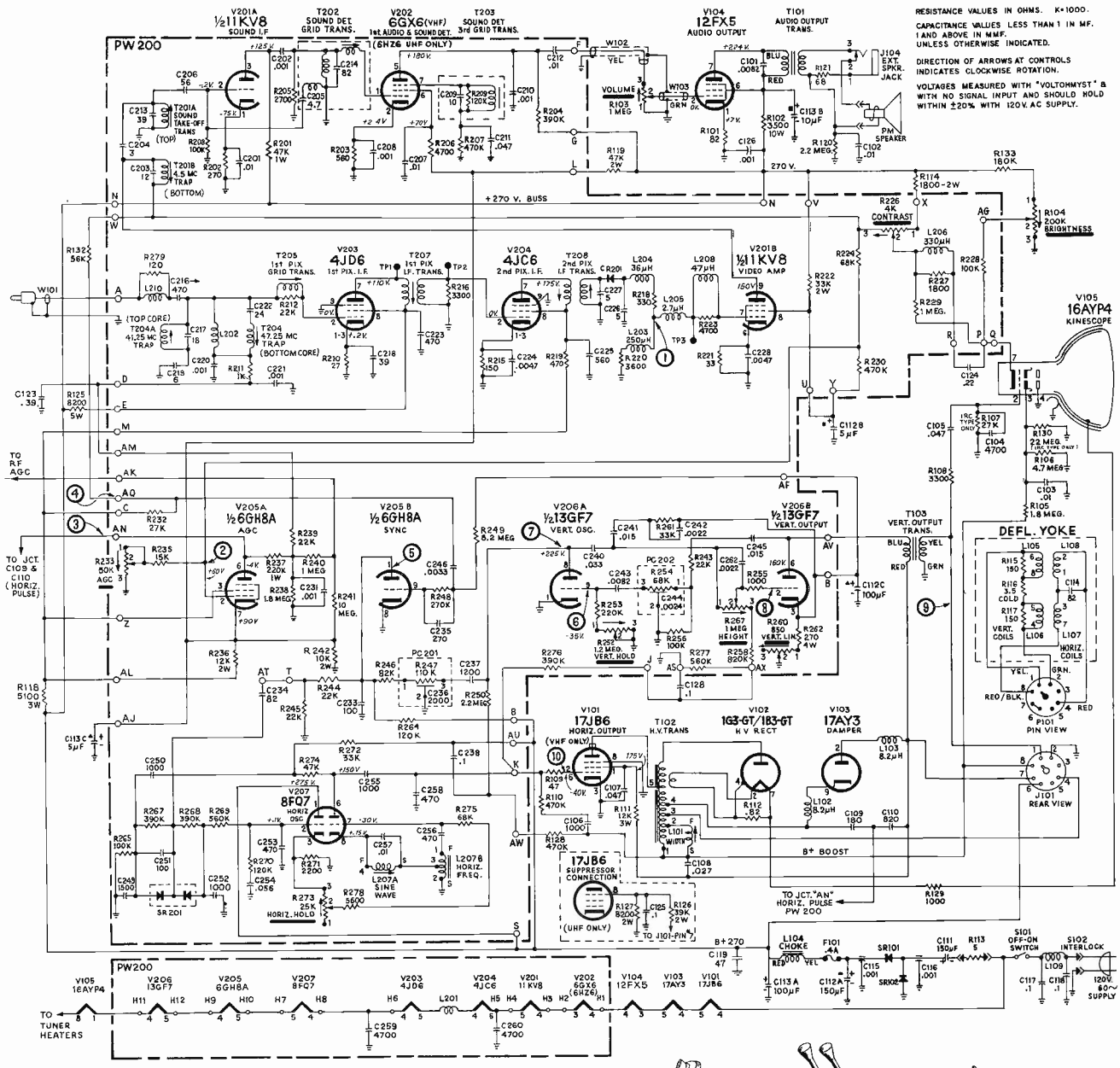


PW200 COMPONENT LOCATION GUIDE

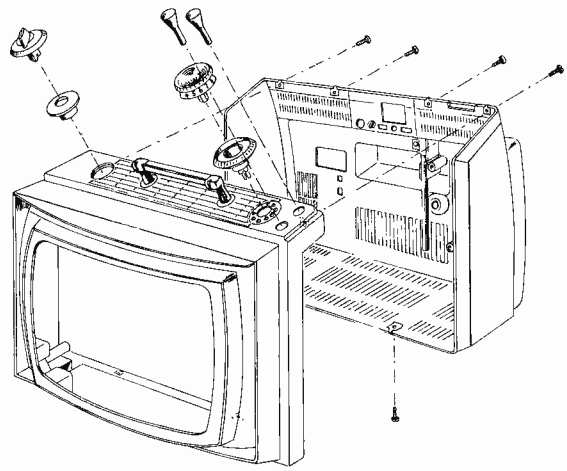
C201 ....B7	C223 ....B2	C250 ....D5	L205 ....A5	R216 ....A3	R238 ....F7	R260 ....D1	SR201 ....E4	
C202 ....B5	C224 ....B3	C251 ....D4	L206 ....C6	R218 ....A5	R239 ....E7	R261 ....C1		
C203 ....A7	C225 ....B3	C252 ....E4	L207 ....F6	R219 ....B4	R240 ....F7	R262 ....E1	T201 ....A7	
C204 ....B7	C226 ....A4	C253 ....F5	L208 ....A6	R220 ....A5	R241 ....E7	R264 ....D6	T202 ....C5	
C206 ....B6	C227 ....A4	C254 ....F4	L210 ....A1	R221 ....A6	R242 ....F7	R265 ....D4	T203 ....C3	
C207 ....C4	C228 ....A6	C255 ....E6		R222 ....A7	R243 ....D3	R267 ....D4	T204 ....B1	
C208 ....C4	C231 ....F7	C256 ....E6	R201 ....B5	R223 ....A6	R244 ....D6	R268 ....E5	T205 ....A1	
C210 ....C4	C233 ....D7	C257 ....F6	R202 ....B7	R224 ....B7	R245 ....D6	R269 ....E5	T206 ....B3	
C211 ....C2	C234 ....E4	C258 ....E6	R203 ....C5	R226 ....C7	R246 ....D6	R270 ....F5	T207 ....A4	
C212 ....C3	C235 ....D6	C259 ....A2	R204 ....B3	R227 ....B6	R248 ....D6	R271 ....F5		
C213 ....B7	C237 ....D5	C260 ....A3	R205 ....B6	R228 ....C5	R249 ....D5	R272 ....D4		
C216 ....A1	C240 ....D3	C262 ....E2	R206 ....B4	R229 ....C6	R250 ....D3	R273 ....E4		
C217 ....B1	C241 ....D2		R207 ....C2	R230 ....C7	R252 ....E2	R274 ....D5		
C218 ....B2	C242 ....C1	CR201 ....A5	R208 ....B6	R232 ....D5	R253 ....E2	R275 ....F6		
C219 ....C1	C243 ....D2		R210 ....B2	R233 ....C6	R255 ....E2	R276 ....E6		
C220 ....C1	C245 ....D3	L201 ....C1	R211 ....C1	R235 ....C7	R256 ....C3	R277 ....E3		
C221 ....C2	C246 ....D6	L203 ....A5	R212 ....A1	R236 ....E7	R257 ....E3	R278 ....F5		
C222 ....B1	C249 ....D4	L204 ....A5	R215 ....A3	R237 ....E7	R258 ....E3	R279 ....A1		

PW200 Board (I-F, Video, and Deflection)

RCA Victor CIRCUIT SCHEMATIC DIAGRAM FOR KCS146A, B, D, E CHASSIS



Balloons ①, ②, etc., shown on schematic indicate points of observation of the waveforms shown below the schematic.

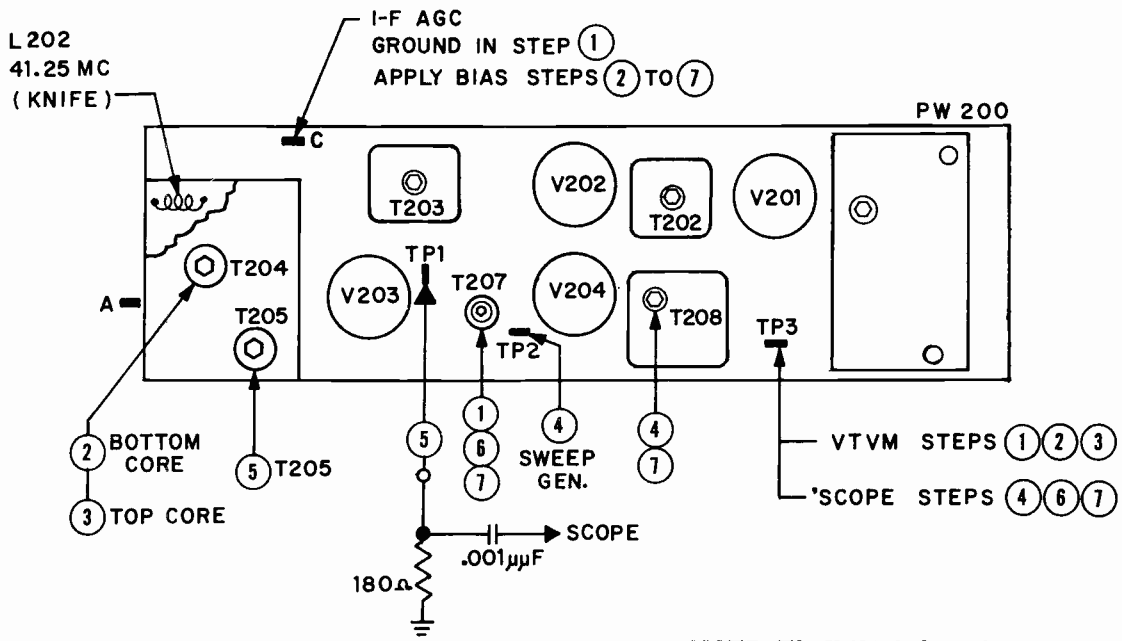


Chassis Removal and Safety Glass Cleaning

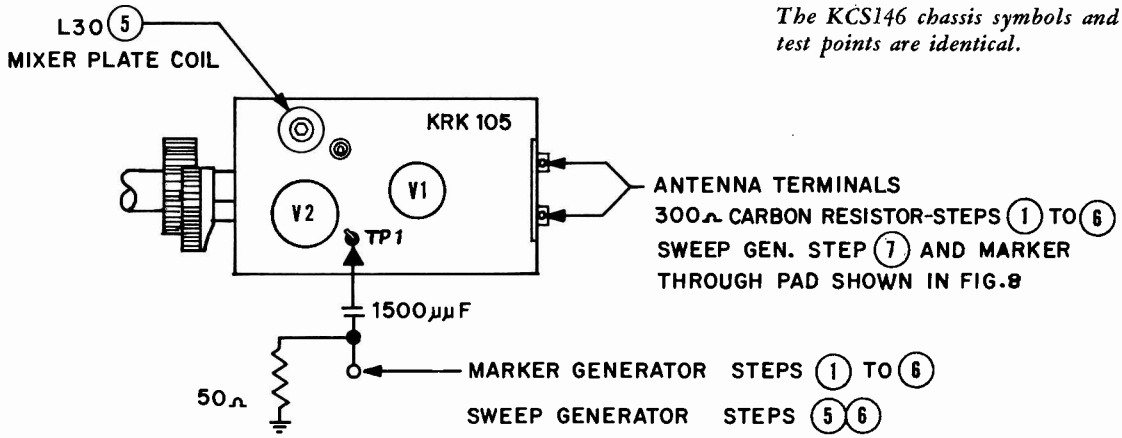
RCA Victor Picture I. F. Alignment for KCS-142 and KCS-146 Chassis

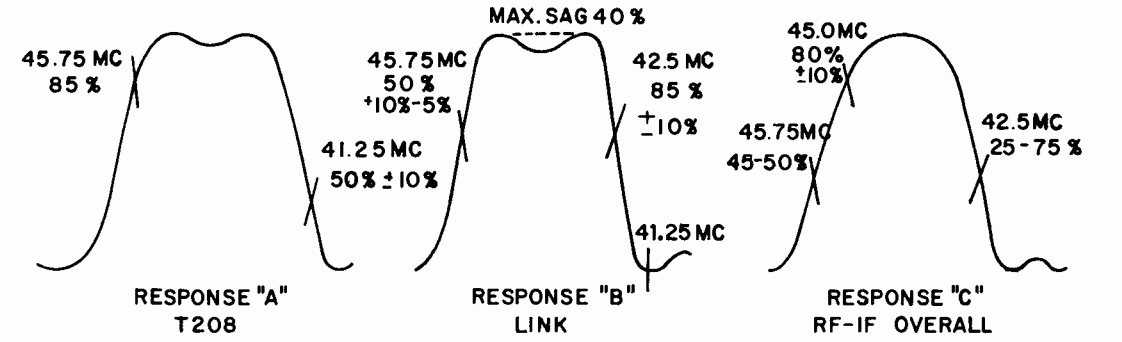
PICTURE I-F ALIGNMENT — KCS142 AND KCS146 CHASSIS

PICTURE I-F TRANSFORMER AND TRAP ADJUSTMENTS



NOTE: The KCS142 chassis layout is illustrated above.
The KCS146 chassis symbols and test points are identical.





Picture I-F Alignment—KCS142, KCS146 Chassis

RCA Victor Picture I. F. Alignment for KCS-142 and KCS-146, Continued

PICTURE I-F ALIGNMENT — KCS142 AND KCS146 CHASSIS

PICTURE I-F TRANSFORMER AND TRAP ADJUSTMENTS

TEST EQUIPMENT CONNECTIONS:

BIAS SUPPLY .....NONE IN STEP 1 (Ground I-F AGC term. "C" of PW200). Bias I-F AGC terminal "C" at —6 to —8 volts when adjusting traps in steps 2 and 3.

MARKER GENERATOR .....Connect to Mixer Grid test point (TP1) of KRK105 in series with mixer pad shown.

VTVM .....Attach through DC probe at test point TP3 (2nd Dectector).

MISCELLANEOUS .....Attach a 300 Ω dummy load across the antenna terminals. Refer to facing page for all adjustment locations and responses.

PEAK ALIGNMENT

	STEP	SWEEP GENERATOR	MARKER GENERATOR	ADJUST	REMARKS
1	PEAK 1st Pix IF Plate Trans. (T207)	NOT USED	44.25 mc.	T207	PEAK T207 and adjust generator output to maintain approx. 3 volts on VTVM when finally peaked.
2	Adjust 47.25 mc. Trap		47.25 mc.	T204B (Bottom Core)	Adjust for min. on VTVM. Readjust 47.25 mc. trap, if necessary, after step 5.
3	Adjust 41.25 mc. Trap		41.25 mc.	T204A (Top Core)	

PICTURE I-F SWEEP ALIGNMENT

TEST EQUIPMENT CONNECTIONS:

BIAS SUPPLY .....Adjust to —8 volts. Same connection as above.

OSCILLOSCOPE .....Attach through direct probe to test point TP3. Calibrate to 5 volts peak to peak.

MARKER GENERATOR .....Maintain connected to Mixer Grid test point TP1 of KRK105.

SWEEP GENERATOR .....Connect to test point TP2 (pin 2 of 4JC6). Use short leads.

	STEP	SWEEP GENERATOR	MARKER GENERATOR	ADJUST	REMARKS
4	Adjust 2nd Pix IF plate trans.	40-50 mc.	41.25 mc. 45.75 mc.	T208 (Top & Bottom Cores)	Adjust for max. gain and response curve "A". Reduce sweep gain to maintain 5 V. P. to P.
Move the OSCILLOSCOPE to the test point TP1 using the diode probe and 180 Ω detector. Calibrate the OSCILLOSCOPE for 0.5 volts Peak to Peak. Sweep Generator to Mixer Grid TPI. Lightly couple Marker to sweep cable. Channel selector to 4.					
5	Adjust tuner IF (L30) and 1st IF grid (T205)	40-50 mc.	42.5 mc. 45.75 mc.	L30 T205	Adjust for response "A". Use inner peak of L30 coil slug (bottom of winding).
Change OSCILLOSCOPE probe to DC probe and attach to test point TP3. Calibrate to 5 Volts Peak to Peak. Remove 180 Ω detector.					
6	Check IF Overall	40-50 mc.	42.5 mc. 45.0 mc. 45.75 mc.	T207	Retouch T207 slightly to maintain response "C".
Remove dummy antenna load and substitute the sweep attenuator pad (Fig. 8). Attach the sweep generator to the attenuator pad. The Marker Generator remains lightly coupled to the sweep generator input cable.					
7	Check RF Overall	40-50 mc.	42.5 mc. 45.0 mc. 45.75 mc.	T207 & T208 Top Core only	Make slight adjustments only. Observe response "A". Do not disturb T208 bottom core.

NOTE the position of the 41.25 mc. marker in response "C". If this marker is difficult to position within limits on the IF overall step 6, it may be necessary to knife the turns of coil L202 slightly. The acceptable position of the 42.5 mc. marker may be 75% ± 10% from the base of the overall response curve. No adjustment of L202 should be attempted before checking the condition of the 4JD6, 1st I-F Amplifier tube.

RCA Victor Sound I. F. Alignment for KCS-142 and KCS-146, Continued

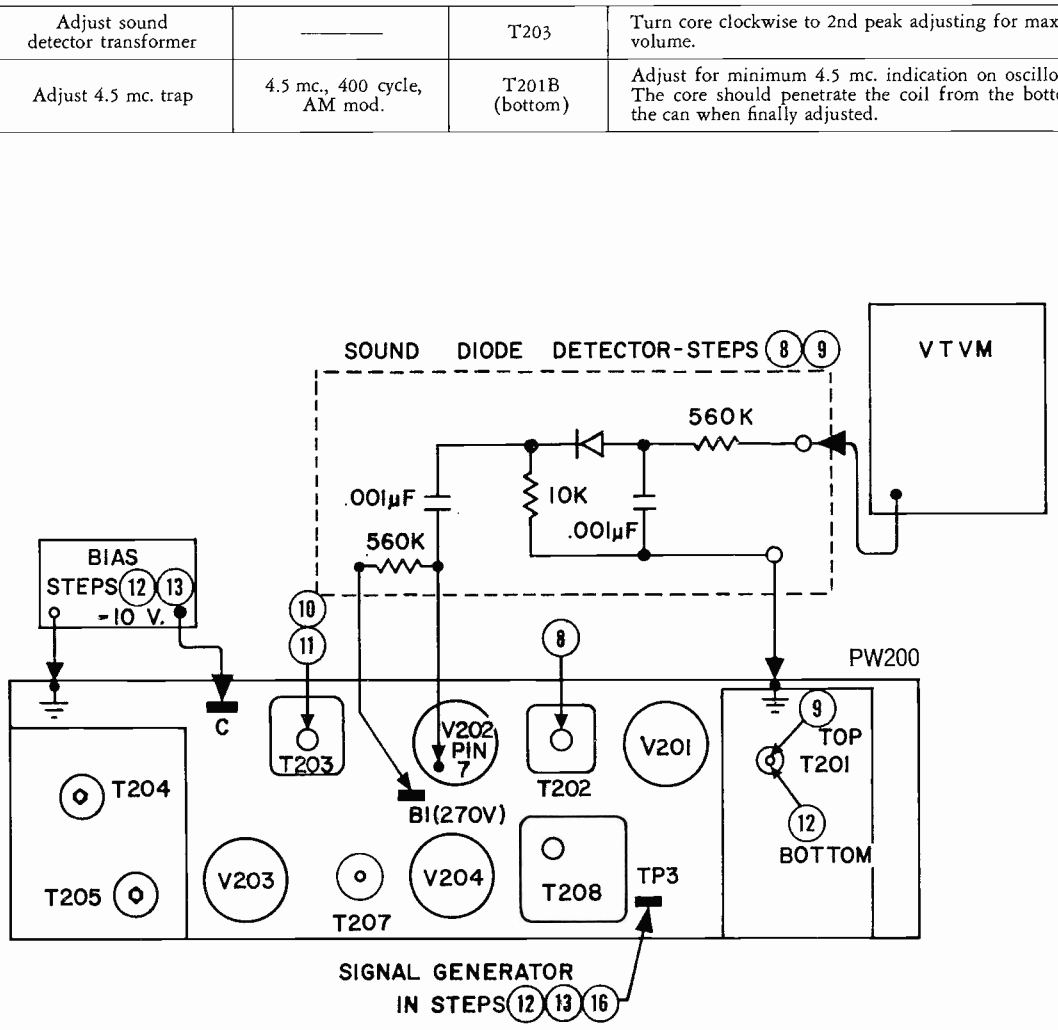
SOUND I-F ALIGNMENT OF KCS142 AND KCS146 CHASSIS

SOUND I-F, SOUND DETECTOR AND 4.5 MC. TRAP ALIGNMENT

TEST EQUIPMENT CONNECTIONS:

BIAS SUPPLY ..... Apply —10 volts to the I-F AGC bus at terminal "C" on PW200.
OSCILLOSCOPE ..... Connect to kinescope cathode lead through diode detector.
SIGNAL GENERATOR..... Connect to test point TP3 on PW200.
VACUUM TUBE VOLTMETER... Connect to output of diode detector shown. Set meter for negative voltage readings.
MISCELLANEOUS ..... Connect test diode detector to pin 7 of V202. See below for adjustment locations.

	STEP	SIGNAL GENERATOR	ADJUST	REMARKS
8	Adjust detector grid transformer	4.5 mc.	T202	Adjust for maximum negative DC on meter. Set generator for 1.0 to 1.5 volts when peaked. T201A top core and T202 core should penetrate the coil from top of can when finally peaked.
9	Adjust sound take-off transformer	4.5 mc.	T201A (top)	
10	Disconnect the diode test detector. Turn off signal generator and tune in strongest signal in area, adjusting volume control for normal volume (approx. ¼ turn from C.C.W.). Turn core of T203 flush with top of coil form. Remove bias.			
11	Adjust sound detector transformer	———	T203	Turn core clockwise to 2nd peak adjusting for maximum volume.
12	Adjust 4.5 mc. trap	4.5 mc., 400 cycle, AM mod.	T201B (bottom)	Adjust for minimum 4.5 mc. indication on oscilloscope. The core should penetrate the coil from the bottom of the can when finally adjusted.



Sound I-F Alignment of KCS142

SYLVANIA

Chassis 575-1 thru -6, used in Models 23T78, 23T82, 23C84, 23L86, 23L87, 23L89, and 23V90, are covered by service material on pages 143 through 150. Television section of Chassis 575-9, -0, Models 23H110 and 23H100, are electrically similar to the group of sets described.

—CHASSIS REMOVAL—

1. Disconnect AC power cord and antenna connections. Remove interlock cover.
2. Disconnect the following plug and socket connections:
   A. Yoke - at chassis
   B. Tuner cluster - at chassis
   C. Halo-Light (on some models) - at chassis
   D. Picture tube cable - at picture tube
   E. High voltage lead - at picture tube
   F. IF input - at chassis
   G. Speaker leads - at speaker
3. Remove screw securing braided cable grounding tuner assembly to main chassis.
4. Remove chassis mounting screw.
5. Slide chassis to the left until clear of slots and then to the rear until clear of cabinet. NOTE: Lower front control knobs will automatically disconnect while chassis is being removed.

NOTE: To remove yoke loosen screw on deflection yoke retaining ring. Slide yoke back on neck of picture tube until clear from tube.

6. Remove tuner cluster knobs by pulling straight outward.
7. Remove screws securing antenna board to cabinet.
8. Remove tuner mounting screws securing tuner cluster to cabinet. (On some models remove screw securing tuner to mounting bracket.)
9. Lift tuner cluster upward slightly and then back. Remove tuner cluster.
10. To replace chassis, reverse the above procedure, engaging lower front controls by pressing ends of shaft assemblies over control shafts. Reconnect all plug and socket connections.

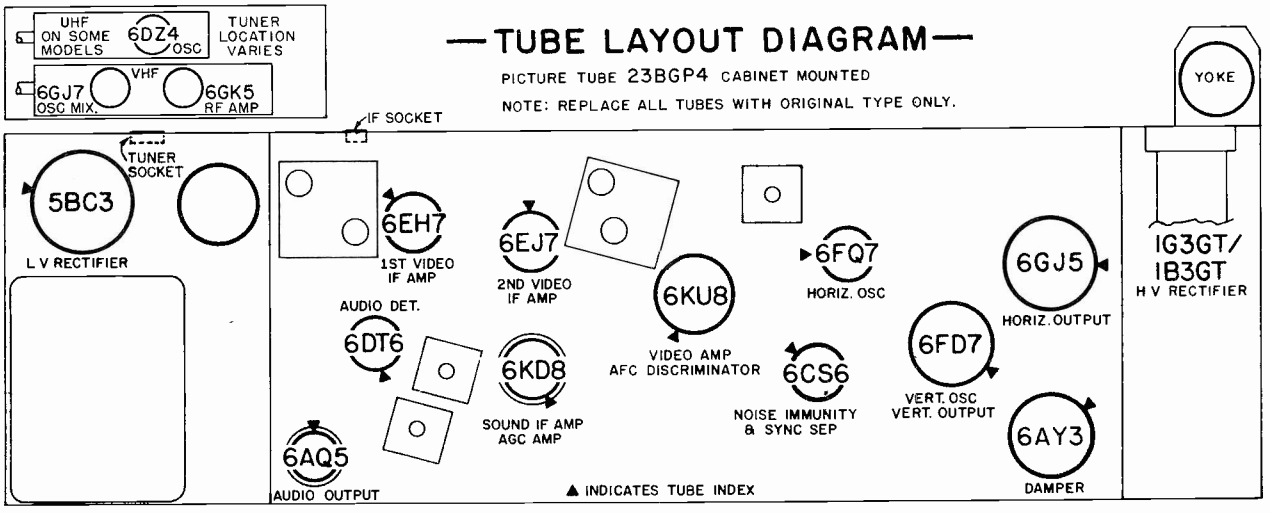
—PICTURE TUBE REMOVAL—

1. Remove chassis and tuner assembly as outlined under "Chassis Removal" procedure.
2. Lay cabinet face down on a soft material so as not to scratch or mar the face of the picture tube or finish on cabinet.
3. Remove the four brackets and screws securing picture tube to cabinet.
4. USING GOGGLES AND GLOVES, reach under face of tube and lift from cabinet, DO NOT GRASP NECK OF PICTURE TUBE AT ANY TIME.
5. To install picture tube, reverse the preceding steps. Exercise caution not to scratch face of picture tube.

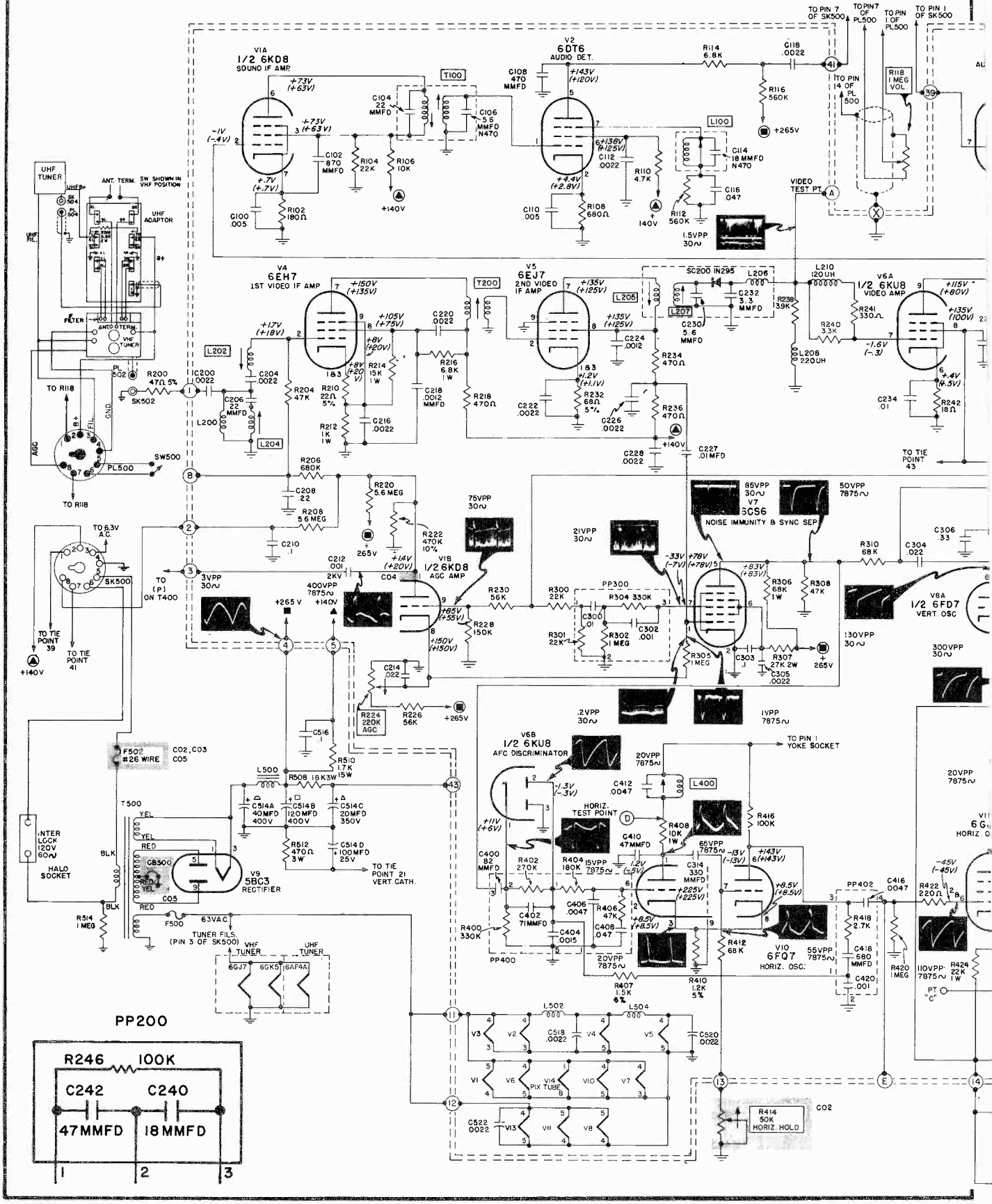
—TUBE LAYOUT DIAGRAM—

PICTURE TUBE 23BGP4 CABINET MOUNTED

NOTE: REPLACE ALL TUBES WITH ORIGINAL TYPE ONLY.



SYLVANIA Chassis 575-1 thru -6, Schematic Diagram, Continued



SYLVANIA Chassis 575-1 thru -6, Schematic Diagram, Continued

GENERAL SCHEMATIC NOTES

1. Voltage sources are indicated by encircled symbols, corresponding symbols without circles indicate voltage tie points.
2. Average resistances of coils and transformers are shown and are measured with component connected in circuit.
3. Encircled numbers on edge of printed circuit indicate tie points, corresponding with those shown on parts layout of printed board.
4. All capacitors are in microfarads unless otherwise specified.
5. Coils, transformers, plugs and sockets are shown as viewed from the bottom.
6. Arrows on controls indicate direction of clockwise rotation.
7. Shaded areas indicate code changes.

WAVEFORM MEASUREMENT CONDITIONS

1. Channel selector set to strong channel.
2. Contrast control set for signal of 65 volt peak to peak at yellow lead of picture tube.
3. Waveforms measured with respect to chassis using a wide band oscilloscope. (Other type oscilloscopes may alter waveform shapes or amplitudes.)
4. The terms "30~" or "7875~" refer to scope frequency used.

VOLTAGE MEASUREMENT CONDITIONS UNLESS OTHERWISE SPECIFIED.

1. Voltages measured to chassis using VTVM.
2. AC power source 120 volt 60 cycle line.
3. Voltage readings in brackets taken with no input; channel selector set to a free channel, antenna disconnected, antenna terminals shorted together and grounded to chassis.
4. Voltage readings not in brackets taken with a strong signal input; tuner set to a strong local station developing approximately -7 volt on AGC Buss. NOTE: AGC VOLTAGE AT TEST POINT Ⓑ WILL VARY FROM -7 VOLT ON A VERY STRONG SIGNAL TO A +20 VOLT ON A VERY WEAK SIGNAL.
5. Contrast control set to maximum. Brightness control set to minimum.
6. Voltage values shown are average readings. Variations may be observed due to normal production tolerances.

SPECIAL VOLTAGE MEASUREMENT CONDITIONS

Ⓟ Picture tube anode voltage measured with VTVM high voltage probe at line voltage of 120 volts under conditions of normal signal, no brightness and correct scan size.

◀ High peak voltage of short duration may damage meter used for this measurement.

SYLVANIA Chassis 575-1 thru -6, Service Information, Continued

CENTERING ADJUSTMENT

1. Position deflection yoke as far forward as possible on the neck (against the flare) of the picture tube.
2. Rotate centering adjustment rings (located on yoke cover) individually or together, until picture is centered. Turn brightness control to a low level and check that no corner cutting exists in the picture.

FOCUS

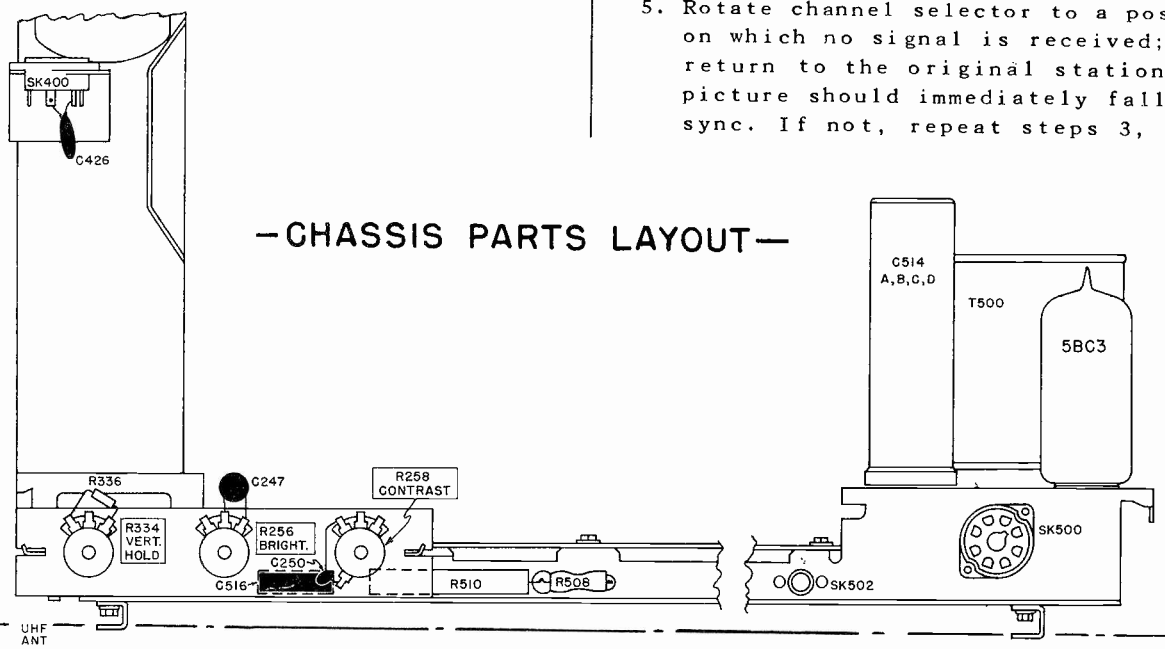
With contrast and brightness at normal settings connect focus jumper to either tie point X, Y, Z whichever gives maximum sharpness and clarity of fine detail in center and edges of picture.

HORIZONTAL AFC ADJUSTMENT

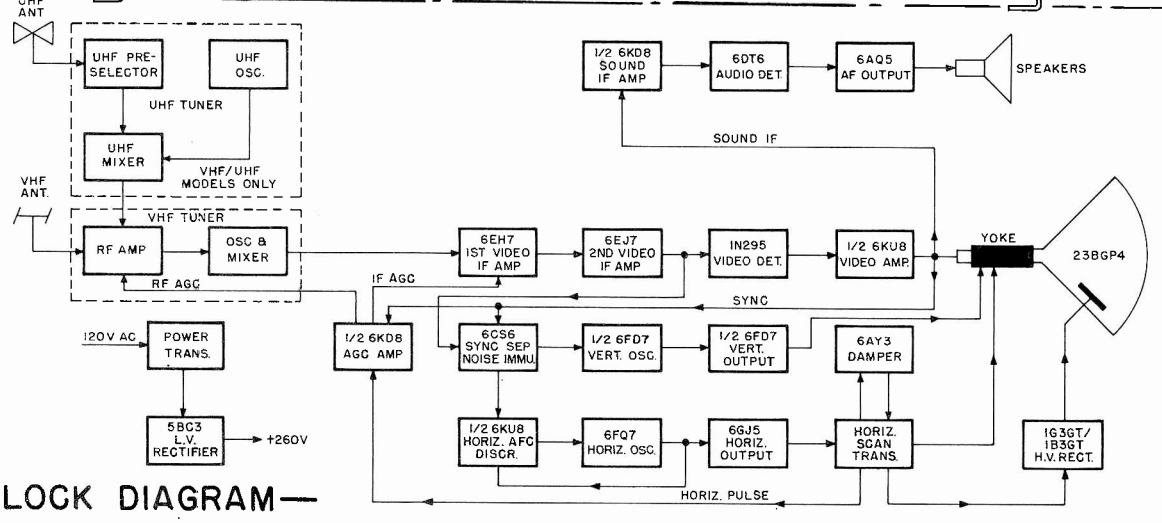
Before performing the following procedure, check AGC adjustment as described.

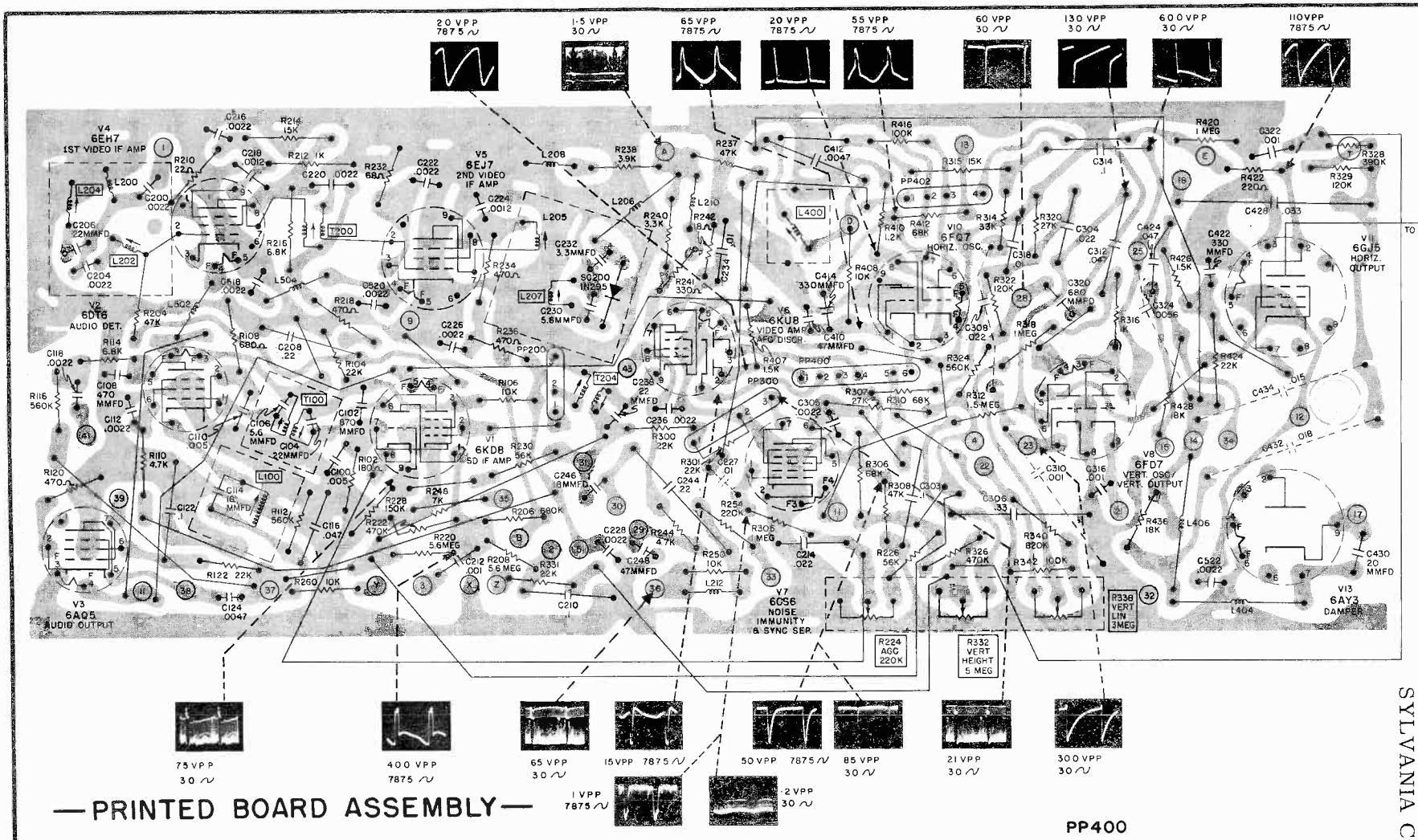
1. Set channel selector to strongest channel in area and adjust fine tuning control to correct tuning point.
2. Adjust vertical height, vertical linearity, and width control for normal picture.
3. Short pin 7 of V7 (6CS6) to ground and adjust R414 Horiz. Hold Control until the picture becomes as stable as possible.
4. Remove short from pin 7 of V7 and adjust L400 Horiz. Frequency for 9 Volts AC with hot lead of probe at horiz. test point (D), ground lead to chassis.
5. Rotate channel selector to a position on which no signal is received; then return to the original station. The picture should immediately fall into sync. If not, repeat steps 3, 4, 5.

—CHASSIS PARTS LAYOUT—



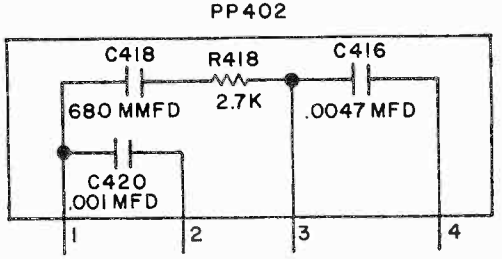
—BLOCK DIAGRAM—



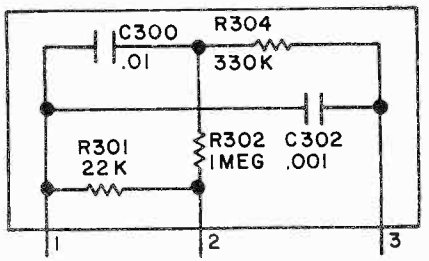


—PRINTED BOARD ASSEMBLY—

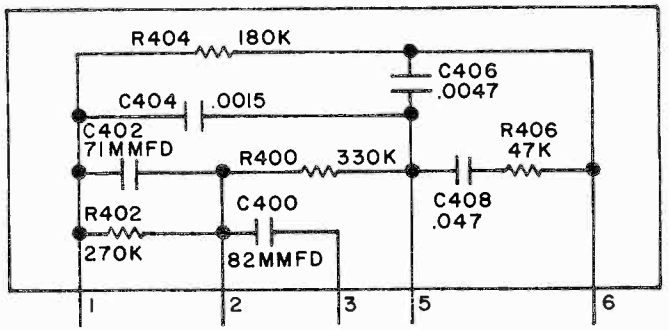
PP402



PP300

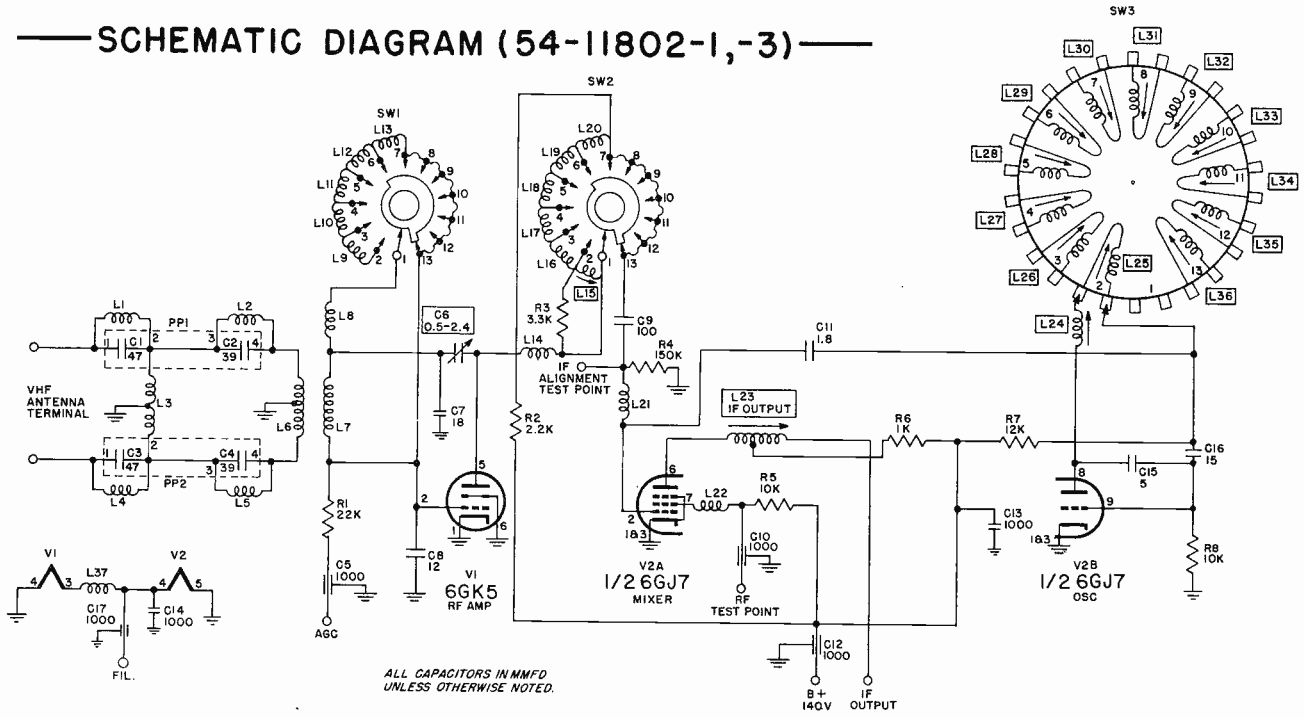


PP400

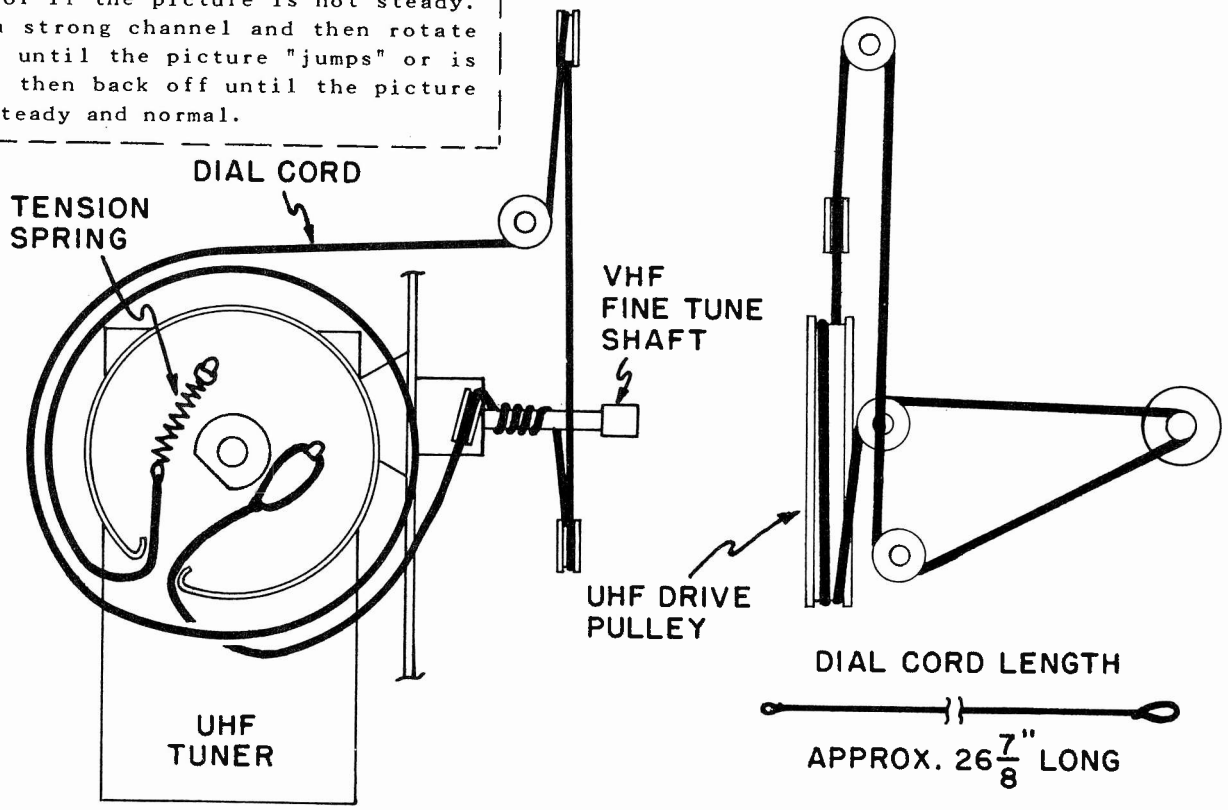


SYLVANIA Chassis 575-1 thru -6, Service Information, Continued

SCHEMATIC DIAGRAM (54-11802-1,-3)



AGC - Use this control only if normal contrast cannot be obtained with CONTRAST Control, or if the picture is not steady. Tune in a strong channel and then rotate clockwise until the picture "jumps" or is unsteady, then back off until the picture becomes steady and normal.



DIAL CORD STRINGING (-6 CH. ONLY)

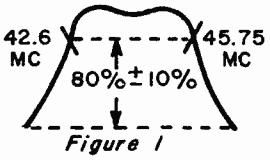
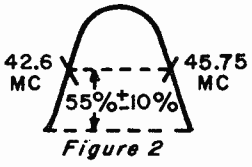
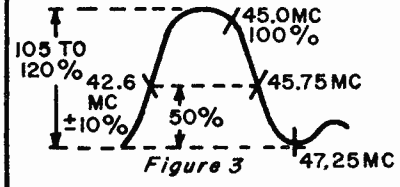
SYLVANIA Alignment Information for Chassis 575-1, 571-1, 573-1, etc., Continued

VIDEO IF, SOUND IF AND 4.5MC TRAP ALIGNMENT PROCEDURES

PRELIMINARY INSTRUCTIONS

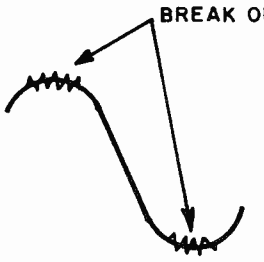
1. Connect an isolation transformer and a variable transformer between chassis and power line. Line voltage should be maintained at 120 volts.
2. Keep marker generator coupling at a minimum to avoid distortion of the response curve.
3. Do not use tubular capacitors for coupling sweep into receiver. Disc ceramics are best.
4. For best results, solder the sweep generator ground to chassis, do not use clips.
5. Sweep generator "hot" lead must make good electrical contact at all points given under TEST EQUIPMENT HOOK-UP.
6. Adjust sweep generator output for a 3V peak to peak response curve on the scope.
7. Receiver and test equipment should warm up for approximately 15 minutes before alignment.

VIDEO IF ALIGNMENT

STEP	ALIGNMENT SET - UP NOTES	TEST EQUIPMENT HOOK - UP	ADJUST
1	Set VHF tuner to a free channel that does not disturb the response curve. Short point (B) to ground and connect a -10V DC source to tie point (2) Connect - 30 volt DC source (-) terminal to pin 2 of V10 (+) terminal to chassis.	SWEEP GENERATOR - Through a .002 MFD capacitor to pin 2 of V5. Set generator to 43.5 MC with 10 MC sweep. SIGNAL GENERATOR - Loosely coupled as a marker to sweep generator lead. OSCILLOSCOPE - Through a 10K resistor connected to test point (A)	L205 and L207 so that the 42.6 MC marker and the 45.75 MC marker are of equal amplitude. See Figure 1.  *Figure 1* L205 Positions marker amplitude. L207 Adjusts for tilt.
2	Same as Step 1.  *Figure 2*	SWEEP GENERATOR - Through a .002 MFD capacitor to pin 2 of V4. Set generator to 43.5 MC with 10 MC sweep. SIGNAL GENERATOR - Same as Step 1. OSCILLOSCOPE - Same as Step 1.	T200 so that both the 42.6 MC and 45.75 MC markers are of equal amplitude and at 55% of response curve. See Figure 2.
3	Same as Step 1.  *Figure 3*	SWEEP GENERATOR - Same as Step 2. SIGNAL GENERATOR - Same as Step 1. OSCILLOSCOPE - Same as Step 1.	L204 for maximum dip at 47.25 MC. TUNER MIXER COIL - To position 45.75 MC marker at 50% of response curve while 45 MC marker is maintained at 100%. L202 To obtain response as shown in Figure 3. Top of response curve should be smooth and rounded and should rise from 105% to 120%.

SYLVANIA Alignment Information for Chassis 575-1, 571-1, 573-1, etc., Continued

4.5 MC TRAP AND SOUND IF ALIGNMENT

STEP	ALIGNMENT SET - UP NOTES	TEST EQUIPMENT HOOK - UP	ADJUST
1	Set contrast control to maximum. Connect - 30 volts DC source (-) terminal to test point (B) and pin 2 of V10. (+) terminal to chassis.	SIGNAL GENERATOR - Through a .0047 MFD capacitor to test point (A) Set signal generator to 4.5 MC, preferably crystal calibrated or controlled, with at least 100 millivolts output. VTVM - Through detector network shown in Figure 1, to cathode of picture tube - tie point (36)	Separate cores of [T204] Then Adjust top core of [T204] for minimum reading on meter.
2	Same as Step 1.	SIGNAL GENERATOR - Same as Step 1. VTVM - Through detector network shown in Figure 2.to pin 7 of 4DT6.	[T100] Bottom core [T100] Top core [T204] Bottom core For maximum meter reading using weakest possible signal.
3	Same as Step 1.  *Figure 3*	SIGNAL GENERATOR - Same as Step 1. OSCILLOSCOPE - Through .0047 MFD capacitor to tie point (41)	With core of [L100] at the top of coil form, rotate core inward (clockwise). (NOTE: Coil has two (2) peaks of resonance). Tune through the first peak and adjust the core for maximum amplitude on the second peak. Decrease signal strength until break out occurs, then readjust top core of [T100] until break out occurs simultaneously on both peaks. See Figure 3.
4	Remove all test equipment leads etc. Connect antenna and check receiver on a strong local station.		

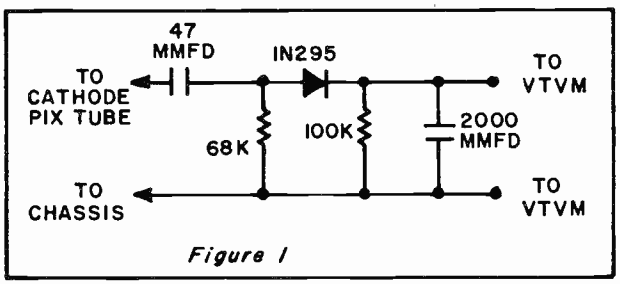


Figure 1

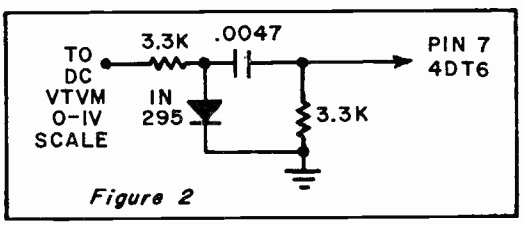


Figure 2

ALTERNATE SOUND ALIGNMENT USING TRANSMITTED SIGNAL

Tune in strongest available channel and adjust for best picture. Turn AGC control clockwise until picture begins to distort and adjust [L100] for best sound and minimum buzz. (Use tuning point where core is closest to chassis board).

Turn AGC counterclockwise until sound gets weak and noisy. Adjust [T100] top and bottom core and [T204] bottom core for loudest and clearest sound and minimum hiss.

SYLVANIA

Chassis 571-1, -2, -3, -4, Models 19P35 and 19P36, exact service data pages 151-156; Chassis 573-1, -2, used in Models 19P09, 19P12, 19P14, and Chassis 574-3, -4, used in Models of 19T21 Series, are very similar electrically and this material is applicable. Alignment information on pages 149-150 is also applicable to this group of sets.

CHASSIS AND PICTURE TUBE REMOVAL

CHASSIS REMOVAL

1. Disconnect AC power cord and antenna connections.
2. Remove screws securing backcover to cabinet. Remove backcover.
3. Disengage contrast, brightness and vertical hold knob from their respective shafts by pulling straight out.

NOTE: These knobs are captive to the cabinet DO NOT TRY TO FORCE OUT OF THE CABINET.

4. Remove the two (2) screws securing chassis to cabinet.

NOTE: One (1) screw is located behind the the protective barrier covering the width and horizontal hold controls.

5. Remove the one (1) screw securing tuner cluster to mounting bracket on chassis.
6. Carefully push on mounting bracket until it swings down and is clear of tuner cluster.
7. Slide chassis to the rear until clear of cabinet. Lead lengths permit removal of chassis from cabinet with components connected in circuit. If complete disassembly becomes necessary disconnect the following plug and socket connections:
   A. Picture tube socket - at picture tube.
   B. High voltage lead - at picture tube.
   C. Yoke - at chassis.
   D. IF input - at chassis.
   E. Tuner cluster - at chassis.
   F. Speaker leads - at speaker.
8. Remove chassis.

TUNER CLUSTER REMOVAL

1. Disconnect AC power cord and antenna connections. Remove backcover.
2. Remove VHF channel selector, VHF fine tune and volume/on/off knobs by pulling straight up.
3. Remove the nut securing volume/on/off control to cabinet, (made visible when knob is removed).
4. Unsolder the single lead from the antenna to terminal strip. (Unsolder lead at the terminal strip.)
5. Remove the one (1) screw securing the tuner cluster to brace.
6. Remove the one (1) screw securing tuner cluster to top of cabinet.
7. While supporting tuner cluster remove the two (2) screws securing cluster to mounting bracket on cabinet, lower cluster carefully until clear from cabinet.

PICTURE TUBE REMOVAL

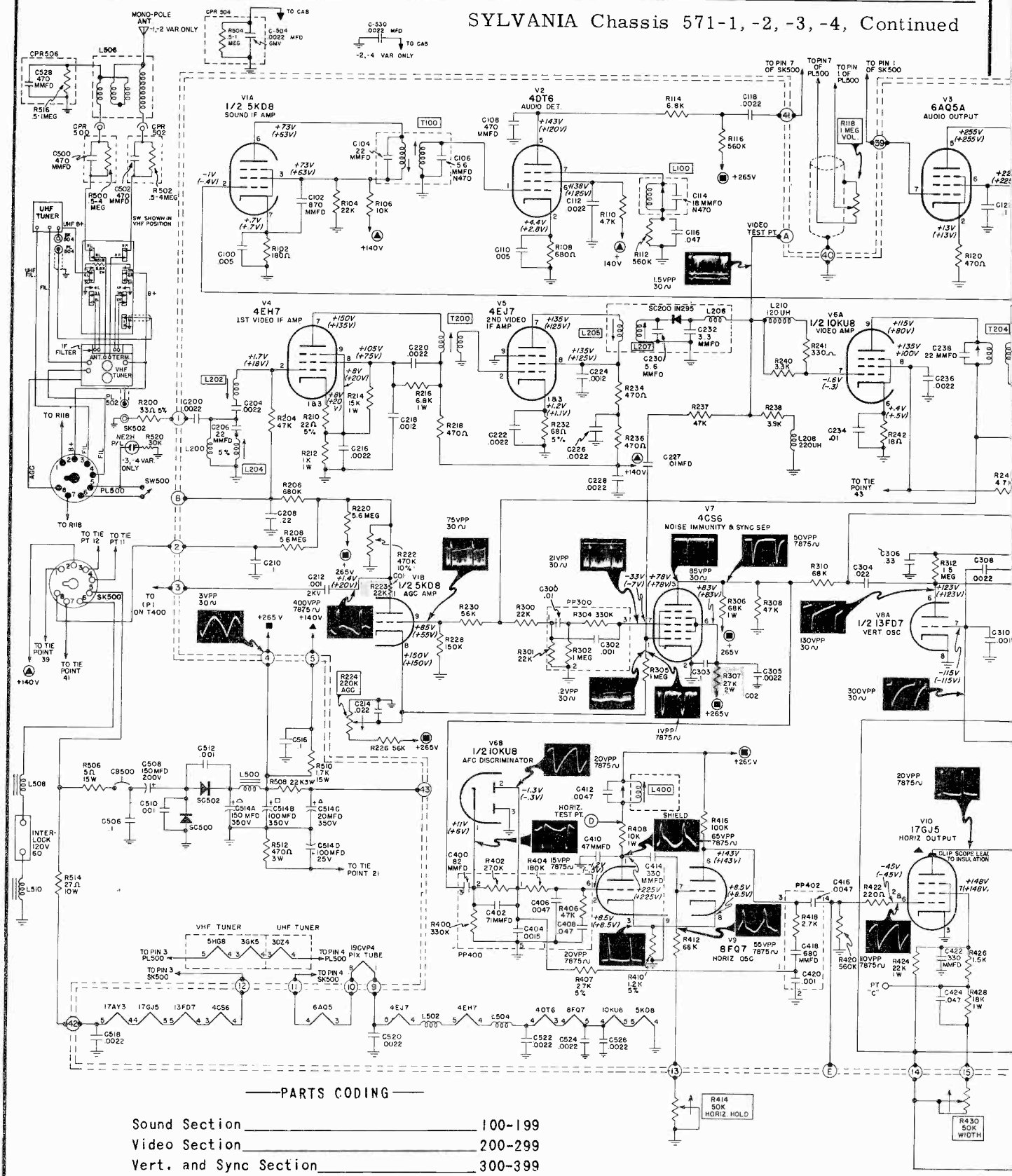
1. Remove chassis and tuner assembly as outlined under "Chassis Removal" procedure.
2. Lay cabinet face down on a soft material so as not to scratch or mar the face of the picture tube or finish on cabinet.
3. Remove the four brackets and screws securing picture tube to cabinet.
4. USING GOGGLES AND GLOVES, reach under face of tube and lift from cabinet, DO NOT GRASP NECK OF PICTURE TUBE AT ANY TIME.
5. To install picture tube, reverse the preceding steps. Exercise caution not to scratch face of picture tube.

YOKE REMOVAL

Loosen screw on deflection yoke retaining ring. Slide yoke back on neck of picture tube until clear from tube.

To replace chassis, tuner cluster and yoke reverse the preceding procedures.

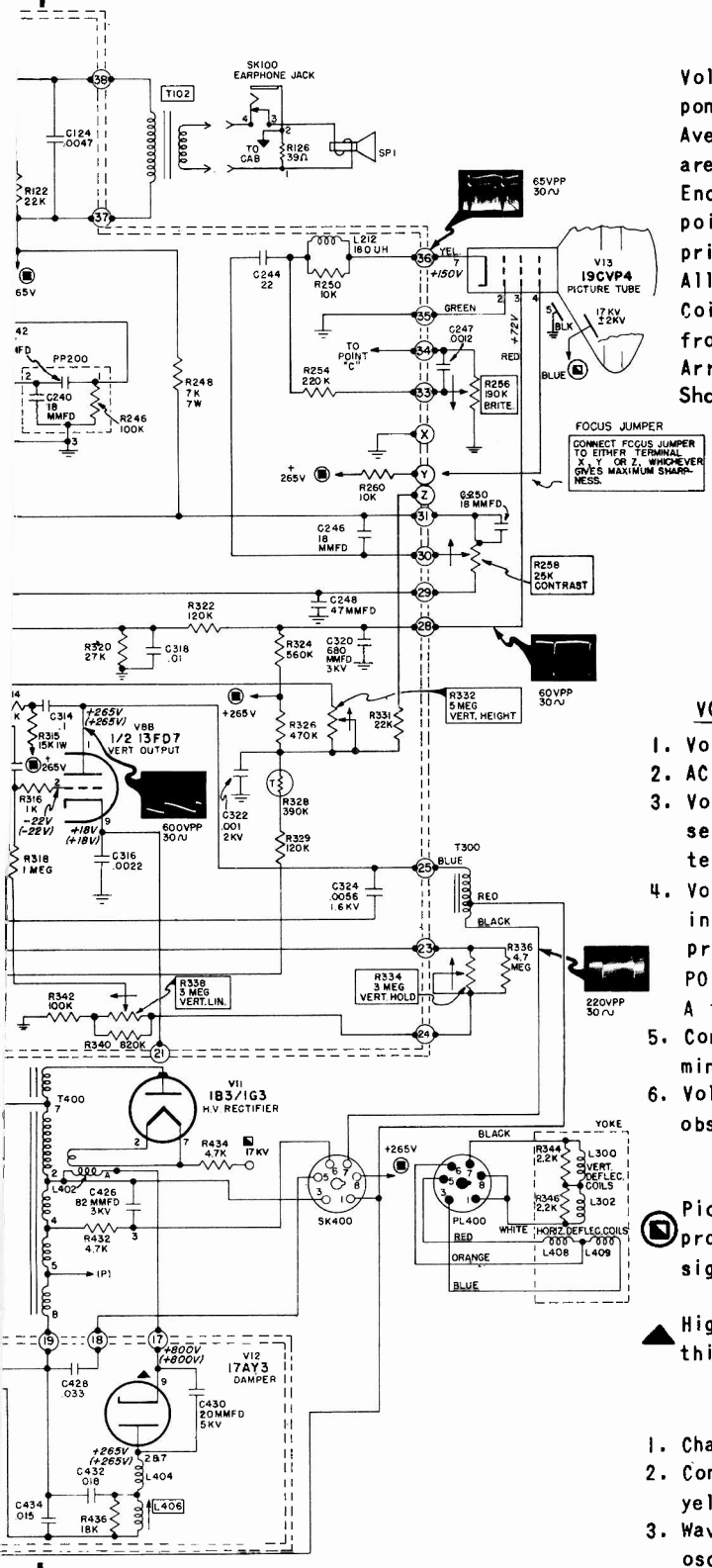
SYLVANIA Chassis 571-1, -2, -3, -4, Continued



PARTS CODING

Sound Section	100-199
Video Section	200-299
Vert. and Sync Section	300-399
Horiz. and H.V. Section	400-499
L.V. Supply, Fil., Misc.	500-599

SYLVANIA Chassis 571-1, -2, -3, -4, Schematic Diagram, Continued



—GENERAL SCHEMATIC NOTES—

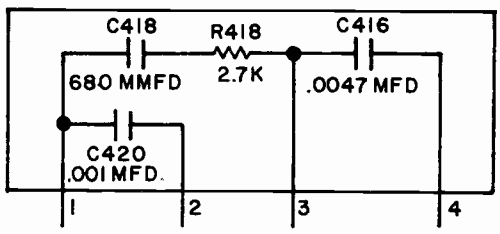
Voltage sources are indicated by encircled symbols, corresponding symbols without circles indicate voltage tie points. Average resistances of coils and transformers are shown and are measured with component connected in circuit.

Encircled numbers on edge of printed circuit indicate tie points, corresponding with those shown on parts layout of printed board.

All capacitors are in microfarads unless otherwise specified. Coils, transformers, plugs and sockets are shown as viewed from the bottom.

Arrows on controls indicate direction of clockwise rotation. Shaded areas indicate code changes.

PP402



VOLTAGE MEASUREMENT CONDITIONS UNLESS OTHERWISE SPECIFIED

1. Voltages measured to chassis using VTVM.
2. AC power source 120 volt 60 cycle line.
3. Voltage readings in brackets taken with no input; channel selector set to a free channel, antenna disconnected, antenna terminals shorted together and grounded to chassis.
4. Voltage readings not in brackets taken with a strong signal input; tuner set to a strong local station developing approximately -7 volt on AGC Buss. NOTE: AGC VOLTAGE AT TEST POINT (B) WILL VARY FROM -7 VOLT ON A VERY STRONG SIGNAL TO A +20 VOLT ON A VERY WEAK SIGNAL.
5. Contrast control set to maximum. Brightness control set to minimum.
6. Voltage values shown are average readings. Variations may be observed due to normal production tolerances.

SPECIAL VOLTAGE MEASUREMENT CONDITIONS

(B) Picture tube anode voltage measured with VTVM high voltage probe at line voltage of 120 volts under conditions of normal signal, no brightness and correct scan size.

▲ High peak voltage of short duration may damage meter used for this measurement.

WAVEFORM MEASUREMENT CONDITIONS

1. Channel selector set to strong channel.
2. Contrast control set for signal of 65 volt peak to peak at yellow lead of picture tube.
3. Waveforms measured with respect to chassis using a wide band oscilloscope. (Other type oscilloscopes may alter waveform shapes or amplitudes.)
4. The terms "30∿" or "7875∿" refer to scope frequency used.

SYLVANIA Chassis 571-1, -2, -3, -4, Service Information, Continued

CENTERING ADJUSTMENT

1. Position deflection yoke as far forward as possible on the neck (against the flare) of the picture tube.
2. Rotate centering adjustment rings (located on yoke cover) individually or together, until picture is centered. Turn brightness control to a low level and check that no corner cutting exists in the picture.

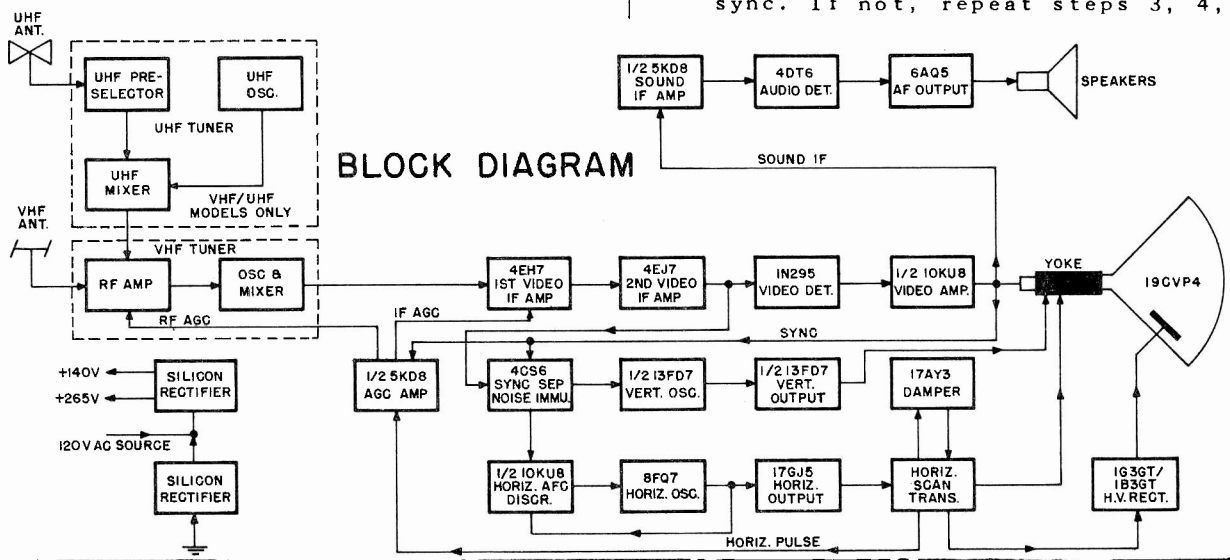
FOCUS

With contrast and brightness at normal settings connect focus jumper to either tie point X, Y, Z whichever gives maximum sharpness and clarity of fine detail in center and edges of picture.

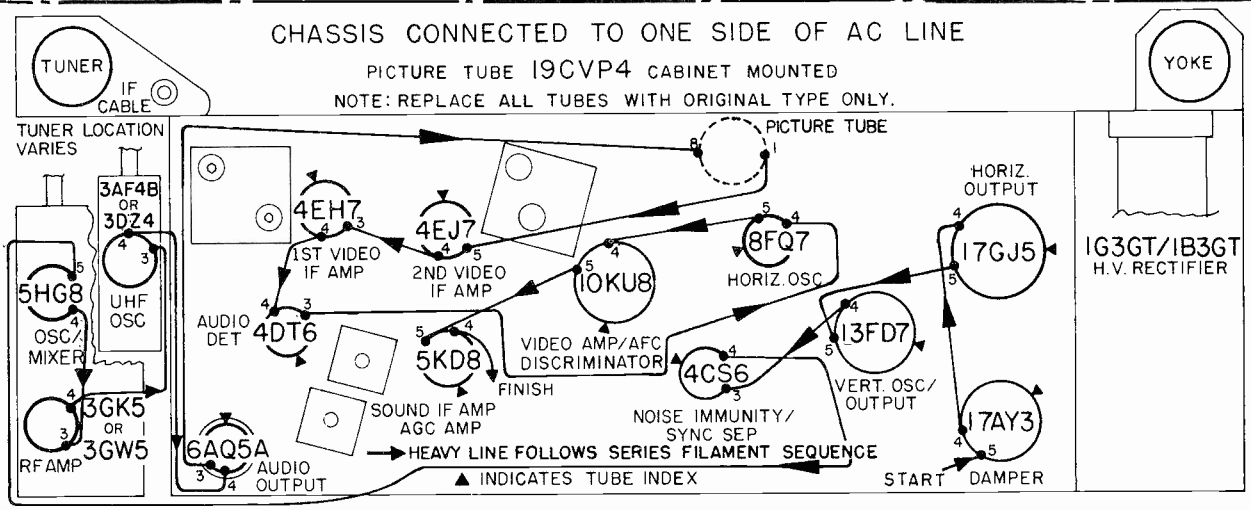
HORIZONTAL AFC ADJUSTMENT

Before performing the following procedure, check AGC adjustment as described.

1. Set channel selector to strongest channel in area and adjust fine tuning control to correct tuning point.
2. Adjust vertical height, vertical linearity, and width control for normal picture.
3. Short pin 7 of V7 (4CS6) to ground and adjust R414 Horiz. Hold Control until the picture becomes as stable as possible.
4. Remove short from pin 7 of V7 and adjust L400 Horiz. Frequency for 9 Volts AC with hot lead of probe at horiz. test point (D), ground lead to chassis.
5. Rotate channel selector to a position on which no signal is received; then return to the original station. The picture should immediately fall into sync. If not, repeat steps 3, 4, 5.

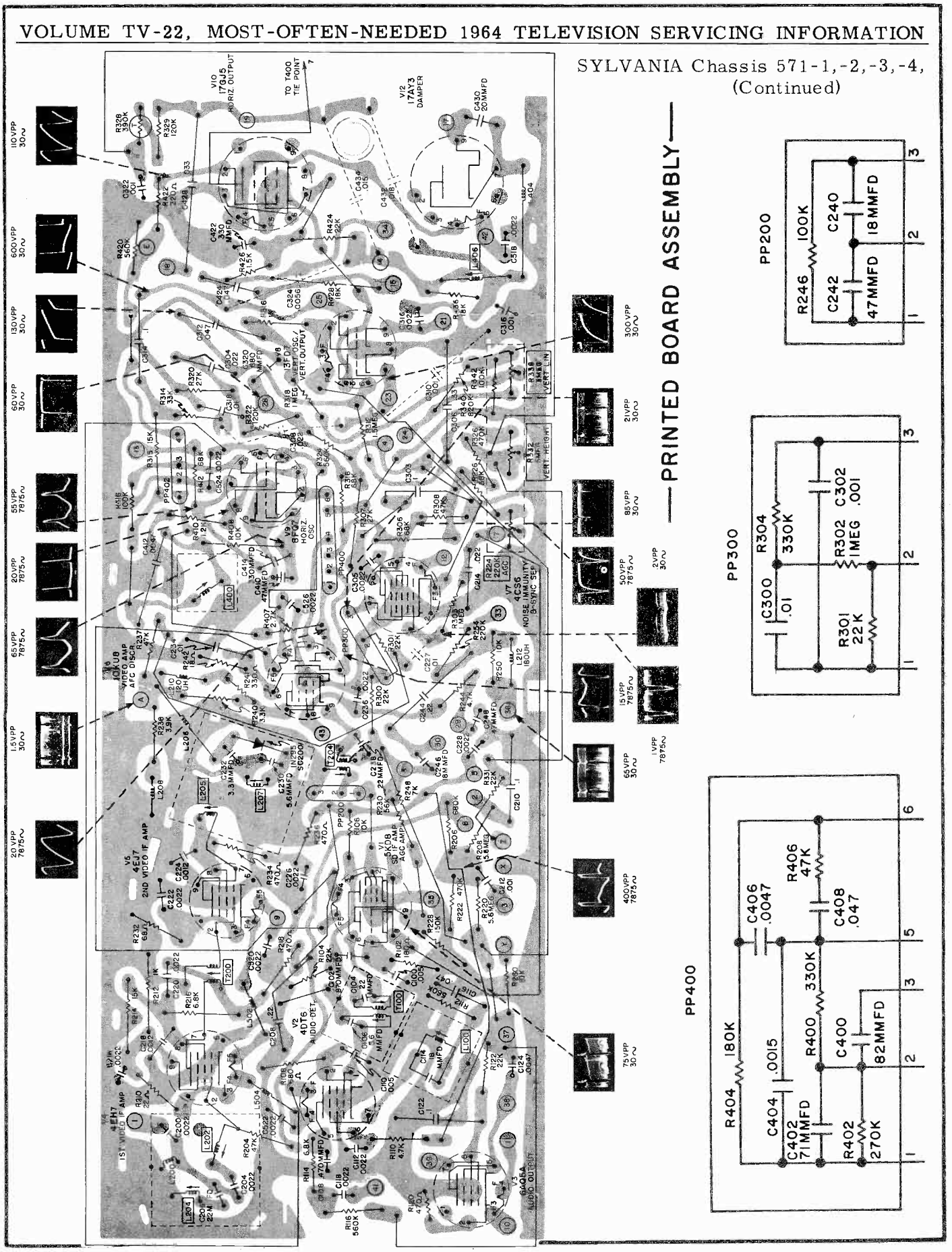


BLOCK DIAGRAM

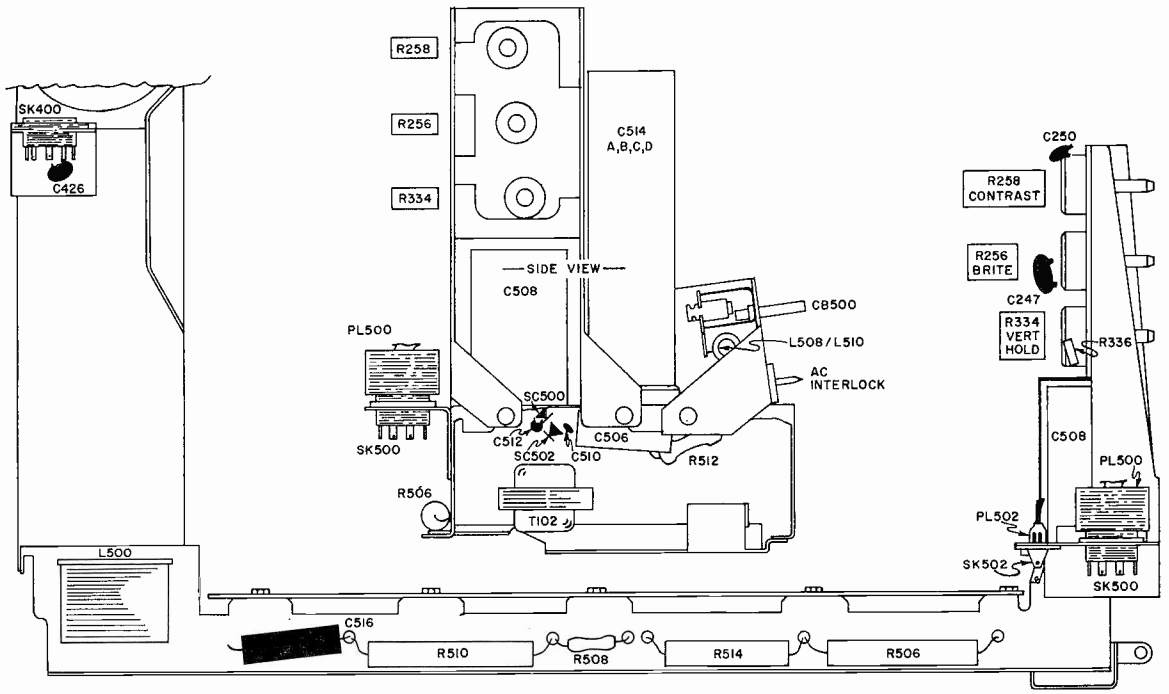


TUBE LAYOUT DIAGRAM

SYLVANIA Chassis 571-1,-2,-3,-4, (Continued)

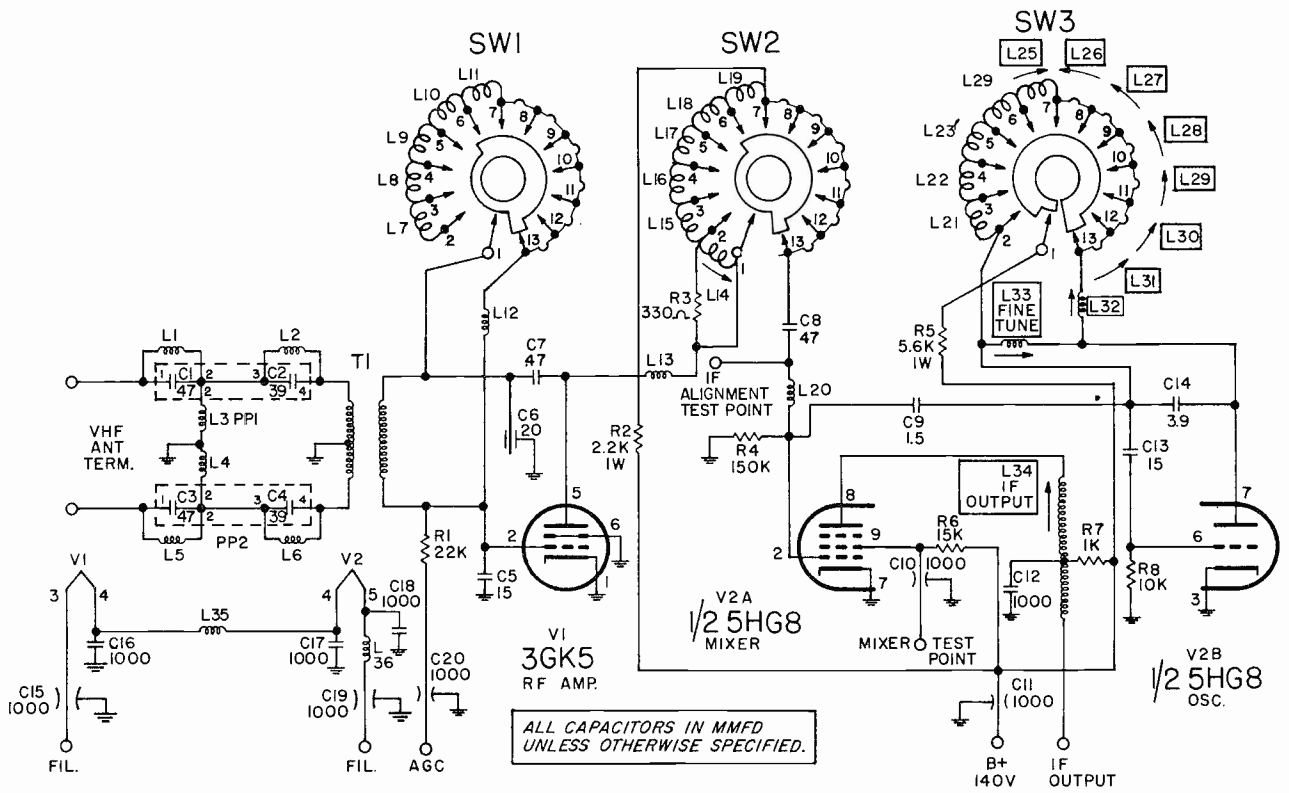


SYLVANIA Chassis 571-1, -2, -3, -4, Service Information, Continued



CHASSIS PARTS LAYOUT

SCHEMATIC DIAGRAM (54-11644-5)

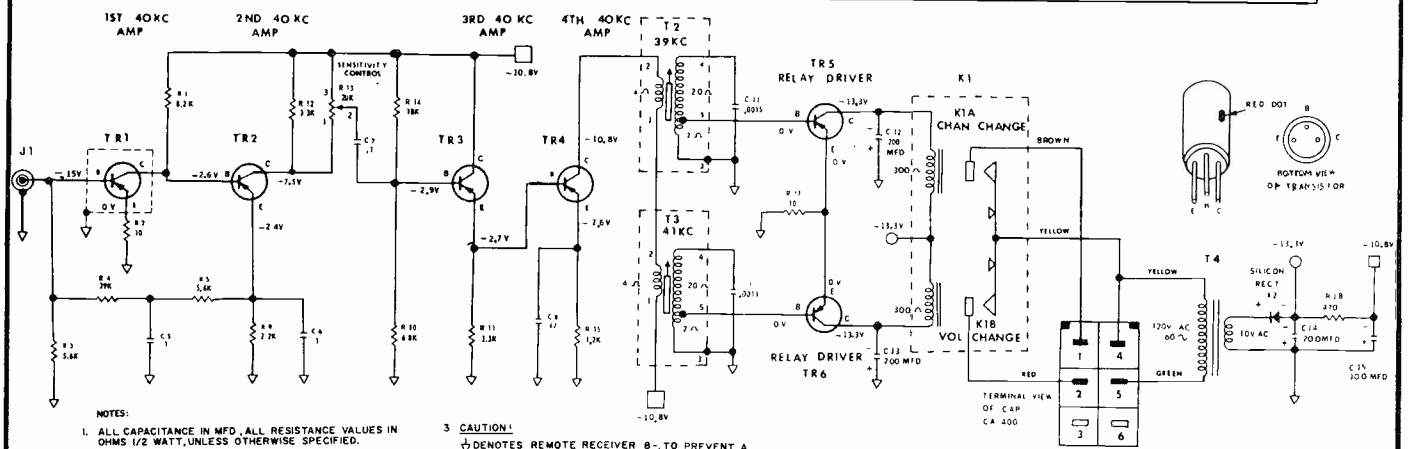


Westinghouse

CHASSIS V-2443-1, -2, -3, -4

MODEL AND CHASSIS CHART

MODEL	CHASSIS	TUNERS	UHF ADAPTABILITY	FEATURES
H-P3430	V-2443-1	470V132H02 470V133H01 (ALTERNATE) 470V119H01 (ALTERNATE)	EXTERNAL CONVERTER REQUIRED UHF STRIPS (Four Maximum)	VHF INSTANT ON
H-P3430U	V-2443-2	470V136H01 470V133H01 (ALTERNATE) 470V119H01 (ALTERNATE) 472V038H02 UHF	FACTORY EQUIPPED FOR ALL CHANNELS	VHF/UHF INSTANT ON
H-P3433	V-2443-3 (Television) V-2418-4 (Remote Rec) 559V087H02 (Remote Transmitter)	470V111H02	UHF STRIPS (Four Maximum)	VHF INSTANT ON REMOTE OPERATION MEMORY FINE TUNING
H-P3478	V-2443-4 (Television) V-2418-4 (Remote Rec) 559V087H02 (Remote Transmitter) V-2430-3 (Mobil Sound)	470V111H02	UHF STRIPS (Four Maximum)	VHF INSTANT ON REMOTE OPERATION MOBIL SOUND MEMORY FINE TUNING



NOTES:

1. ALL CAPACITANCE IN MFD., ALL RESISTANCE VALUES IN OHMS 1/2 WATT, UNLESS OTHERWISE SPECIFIED.
2. D.C. VOLTAGES MEASURED FROM POINT INDICATED TO B-. USING A V.T.V.M. LINE VOLTAGE AT 120V 60 ~ NO APPLIED SIGNAL.
3. CAUTION! ⏚ DENOTES REMOTE RECEIVER B-. TO PREVENT A SHOCK HAZARD, THE T.V. AND REMOTE RECEIVER B- MUST NEVER BE CONNECTED TO EACH OTHER UNDER ANY CIRCUMSTANCES.

Remote Receiver Chassis V-2418-4.

WESTINGHOUSE Chassis V-2443-1, -2, -3, -4, Disassembly Procedures, Continued

PC BOARD ACCESSIBILITY & SERVICING (Refer to Fig. 1)

Screw Location for Chassis Removal

(1) and (2) . . . . Screws, chassis retaining, to cabinet top.
(4) . . . . . Hinge, chassis support, right side.
(3) and (5) . . . . Screws, chassis retaining, vertical position.
(6) . . . . . Hinge, chassis support, left side.
(7) . . . . . Slots for front control panel mounting.
(9) and (11) . . . Screws, retaining, front control panel.
(8) and (10) . . . Studs, front control panel mounting to chassis at (7).

All chassis are designed for tilting down on support hinges, (4) and (6), for servicing and accessibility of parts.

Removing the two screws, (1) and (2), in the upper corner of the chassis and the two screws, (3) and (5), from the chassis support hinges, will permit tilting the chassis into a horizontal position for ease in servicing the PC board.

To keep the chassis in an upright or vertical position, replace the two screws, (3) and (5), into the chassis support hinges.

When the front control panel is disconnected, two studs, (8) and (10), on the side of the panel can hook into the slots (7) located on the left side of the PC board chassis for ease in handling and servicing.

DISASSEMBLY PROCEDURES

Chassis Removal – V-2443-1, -2

1. Remove back cover.
2. Remove front control knobs.
3. Disconnect ant. bkt.
4. Remove screws (1) and (2) from upper corners of chassis, and screws (3) and (5) from chassis support hinges.
5. Disconnect CRT cap and high voltage lead, and CRT dag contact spring ground connector; loosen yoke clamp screw and remove yoke and yoke width insert from CRT.
6. Disconnect spkr. leads.
7. Remove screws (9) and (11) holding front control panel and tuner.
8. Lift up chassis from plastic chassis-support hinges, and remove carefully with tuner and front control panel assy. Two studs, (8) and (10), on the side of the panel can hook into slot (7) for ease in handling.

Chassis Removal – Remote Models (V-2443-3, -4)

1. Remove back cover screws, disconnect interlock, pull out back cover slightly and disconnect amp-lok cap and plugs before removing back cover.
2. Remove front control knobs.
3. Disconnect ant. bkt.
4. Remove screw from remote to main chassis-support bracket (remote chassis side).
5. Remove screws (1), (2), (3), (5) and tilt down chassis.
6. Disconnect CRT cap, high voltage lead and CRT dag contact spring ground connector; loosen yoke clamp screw and remove yoke width insert and yoke from CRT.
7. Disconnect transducer plug from remote receiver.
8. Remove two remote receiver retaining bolts from bottom of cabinet.
9. Disconnect remote receiver amp-lok cap and plug and remove remote receiver.
10. Disconnect spkr leads.
11. Remove screws (9) and (11) holding front control panel.
12. Lift up chassis from support hinges and remove carefully with tuner and front control panel assembly.

CRT Removal

See chassis removal, and perform steps 1 thru 5. (Use shatterproof goggles for eye protection).

1. Lift chassis up from support hinges and swing chassis to left. CRT can be removed without tuner, remote or chassis removal.
2. Remove four corner CRT mounting screws.
3. Carefully remove CRT with strap assy from cabinet.
4. Disconnect dag contact spring and loosen bolt in CRT strap rivet assy. Carefully remove CRT (use heavy gloves).

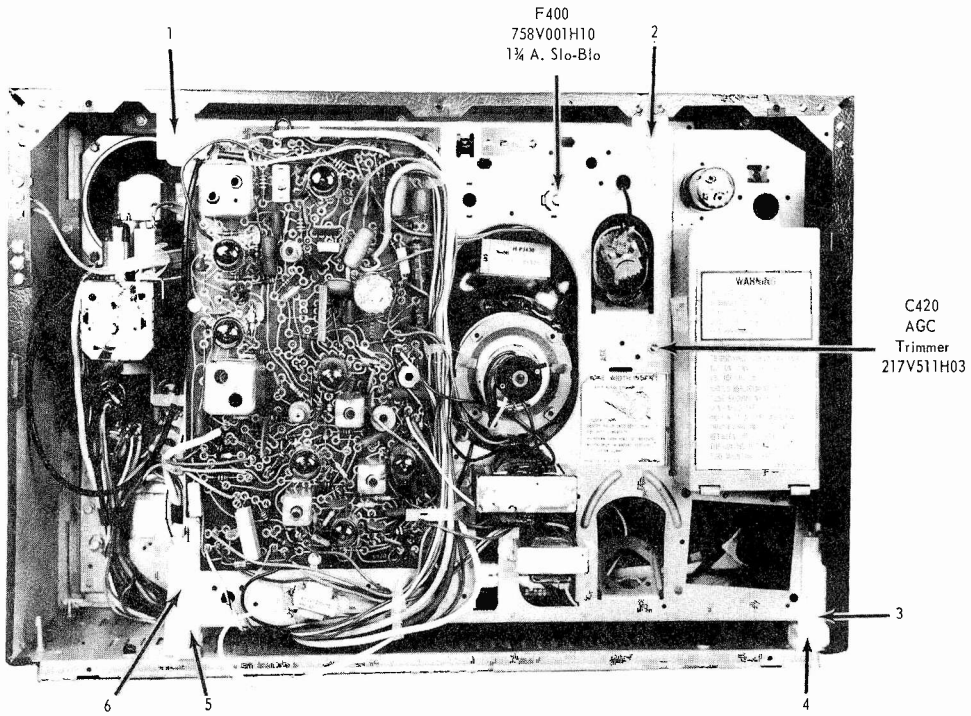


Figure 1 – Rear View of Chassis, showing location of screws for chassis removal.

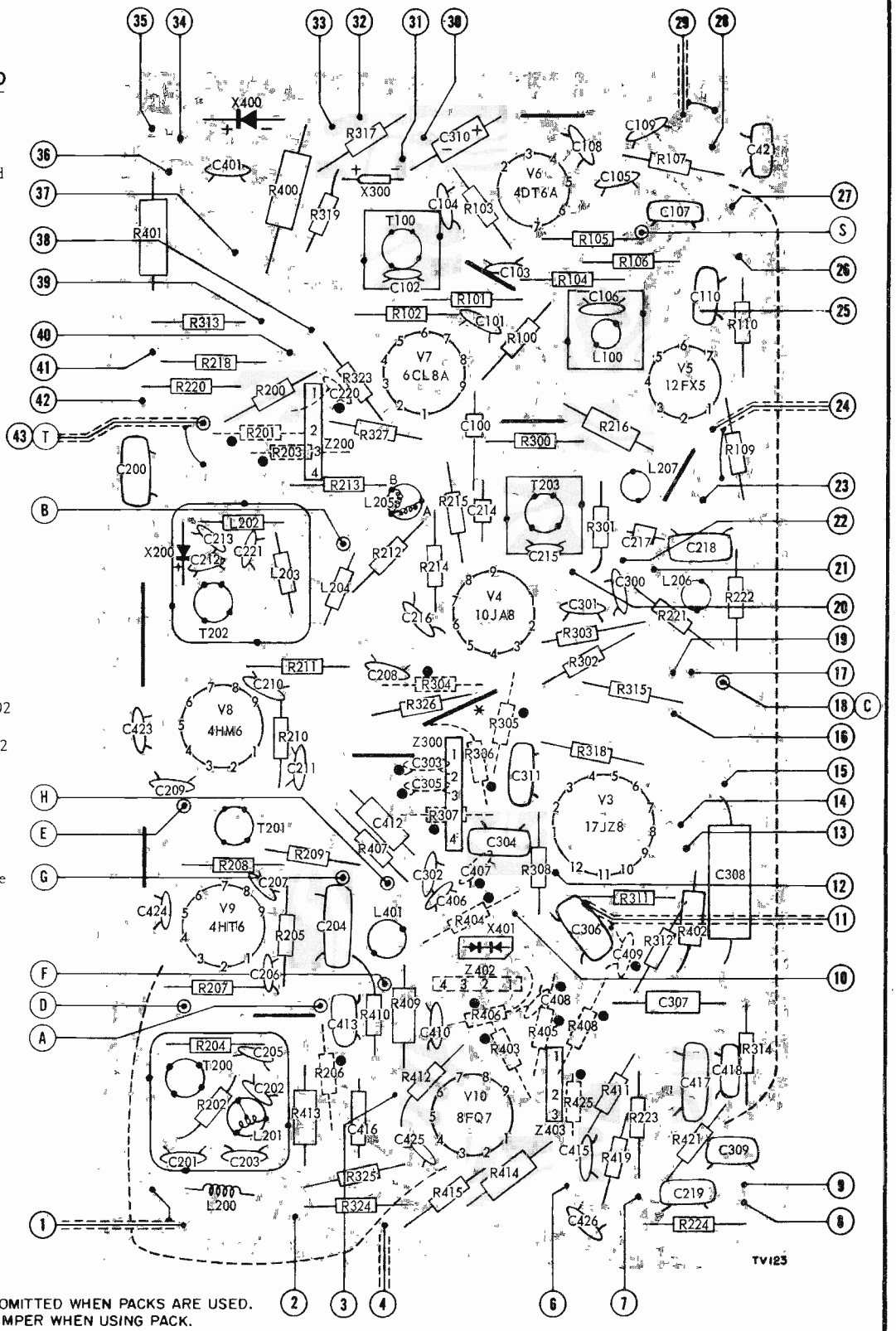
WESTINGHOUSE Chassis V-2443-1, -2, -3, -4, PC Board Information, Continued

V-2443 PC BOARD LEGEND

1. IF input
2. Height control, low end
3. Tuner fil.
4. Horiz Hold control, high end
6. V2 pin 2
7. CRT pin 3
8. T300, orange wire
9. Yoke, orange wire
10. Height control, arm
11. Vert Hold control, high side
12. V2, pin 12
13. T300, red wire
14. C405A
15. T300, blue wire
16. Vert Lin control, arm
17. Tuner fil
18. CRT, pin 7
19. CRT, pin 8
20. Contrast control, low side
21. Contrast control, arm
22. Brightness control, arm
23. C402A
24. Volume control, arm
25. T101, blue wire
26. T101, red wire
27. T400, lug 1
28. Yoke, black wire
29. Volume control, high side
30. C403A
31. Vert Lin control, high side
32. To F400
33. SW400, negative side of X402
34. V1, pin 8
35. SW400, positive side of X402
36. C404A
37. SW400
38. T400, lug #7
39. Vert Lin control, low side
40. Height control, high side
41. Contrast control, high side
42. Brightness control, high side
43. Tuner AGC

TEST POINTS

(A) AGC for IF
(B) Video detector
(C) CRT cathode
(D) 1st IF input
(E) 2nd IF grid
(F) Horizontal MV
(G) Ringing coil
(H) Ringing coil
(S) Quad coil
(T) AGC for tuner



● PARTS OMITTED WHEN PACKS ARE USED.
✱ ADD JUMPER WHEN USING PACK.

Bottom View of PC Board, showing top components in solid outline.
Tube pin numbering is for bottom of socket.

WESTINGHOUSE Chassis V-2443-1, -2, -3, -4, Schematic Diagram, Continued

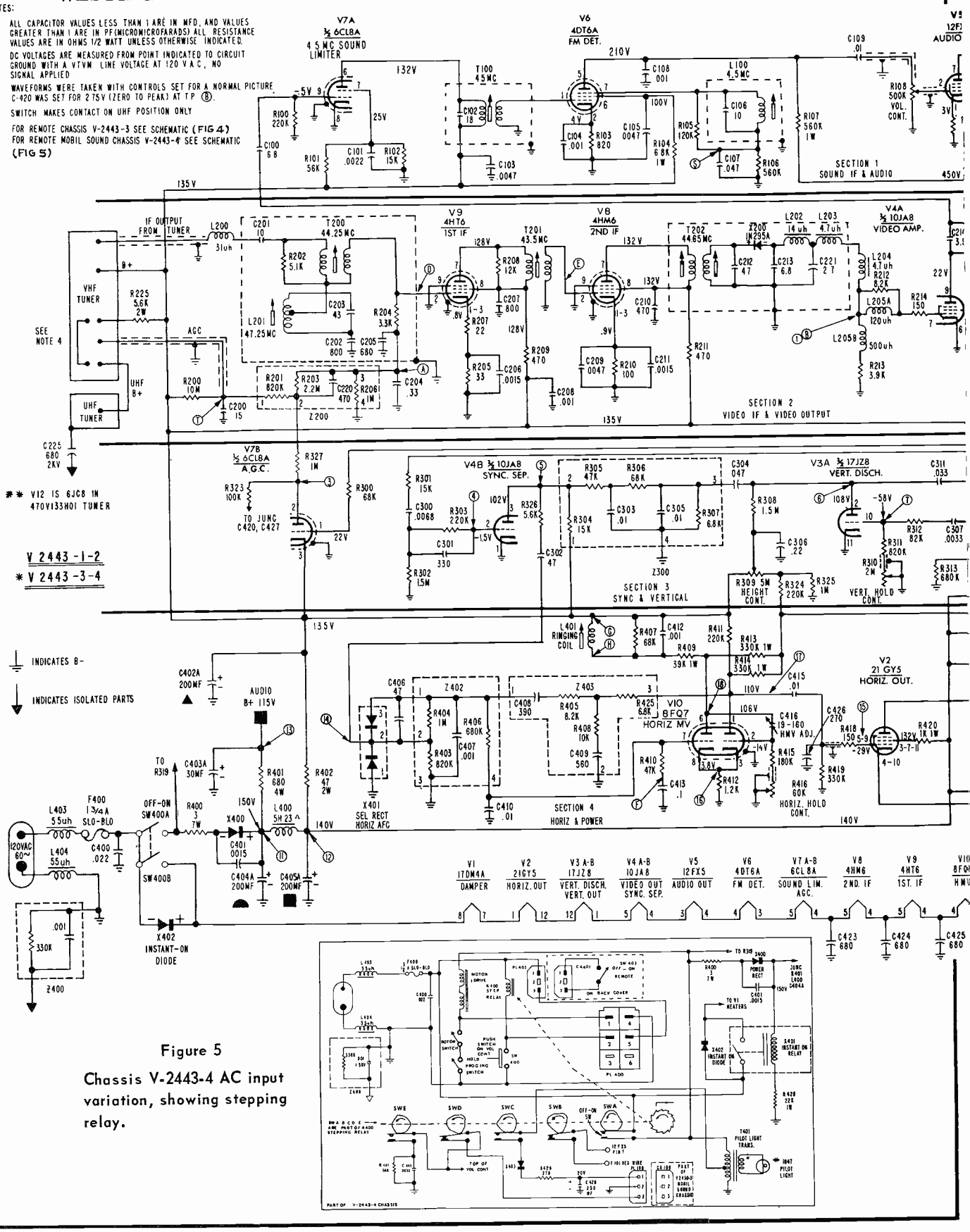


Figure 5

Chassis V-2443-4 AC input variation, showing stepping relay.

WESTINGHOUSE Chassis V-2443-1, -2, -3, -4, Service Information, Continued

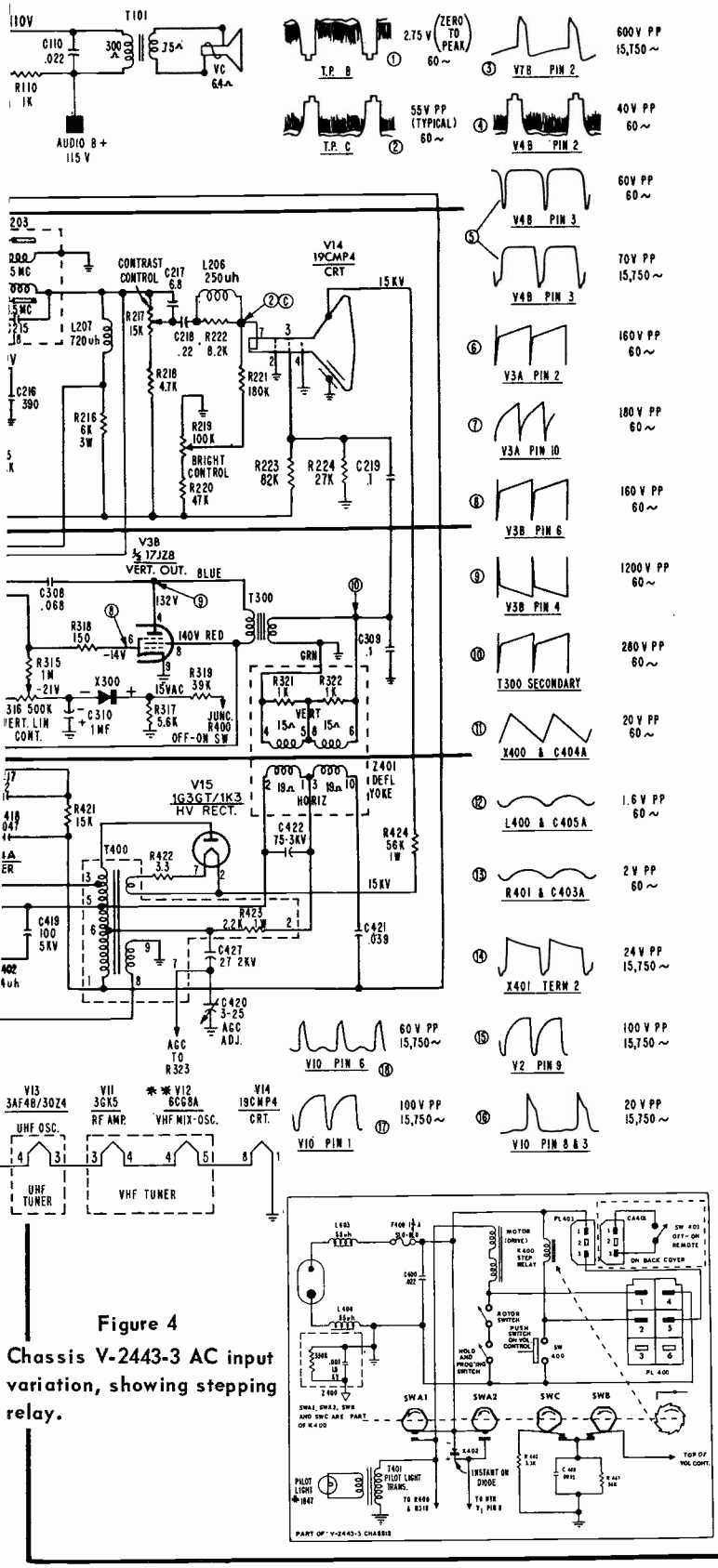


Figure 4
Chassis V-2443-3 AC input variation, showing stepping relay.

ADJUSTMENTS

WIDTH ADJUSTMENT

This adjustment is a plastic tab with a copper rectangle bonded to one side. It protrudes from between the yoke and the bottom of the neck of the picture tube. The shiny side of the copper rectangle goes down against the picture tube, and the clamp opening goes to the top. The rectangle must be centered at the bottom of the CRT neck.

To adjust the width, loosen the yoke clamp. Pushing the tab into the yoke decreases width. Pulling the tab out of the yoke increases width. Best linearity, however, is obtained with the width tab pushed all the way in. If insufficient width occurs, pull out the tab for just enough scan without causing poor linearity.

HEIGHT AND VERTICAL LINEARITY

The height and vertical linearity controls are accessible by removing the horizontal and vertical hold knobs and exposing the hollow shafts through which the adjustments are made. The height control is adjusted through the hollow horizontal hold control shaft while the linearity control is at the rear of the vertical hold control.

Adjust the height and vertical linearity controls to get a picture of proper height and proportion.

CENTERING

The centering rings, located at the rear of the deflection yoke, should be rotated to center the raster.

DEFLECTION YOKE

The deflection yoke should be as far forward as possible (touching the bell of the CRT). Rotation of the deflection yoke is used to level the raster.

AGC ADJUSTMENT (C420)

Connect a scope to TB (B). Tune in the strongest station and adjust C420 for a zero-to-peak reading of 2.75V. If a scope is not available, tune in the strongest station in the area. Adjust C420 until the picture bends at the top, then turn the screw back slightly until the bend disappears.

C420 is located adjacent to the left side of the high-voltage transformer cage.

HORIZONTAL FREQUENCY AND RINGING COIL

1. Short out the ringing coil with a short jumper wire between TP (G) & (H).
2. Set the horizontal hold control to the center of its range. Do not change this setting during the steps that follow.
3. Connect a VTVM to TP Ⓕ for measuring the DC voltage between TP Ⓕ and B–. Set meter to center scale.
4. With the receiver tuned to a station of normal signal strength, adjust C416 to 0 volts DC on the meter.
5. Remove the jumper from the ringing coil.
6. With horizontal sync locked in, adjust the ringing coil for –0.5 volts DC on the meter. Check the adjustment by switching to another channel and back again. The receiver should pull into horizontal sync on all channels.

WESTINGHOUSE Chassis V-2443-1, -2, -3, -4, Service Information, Continued

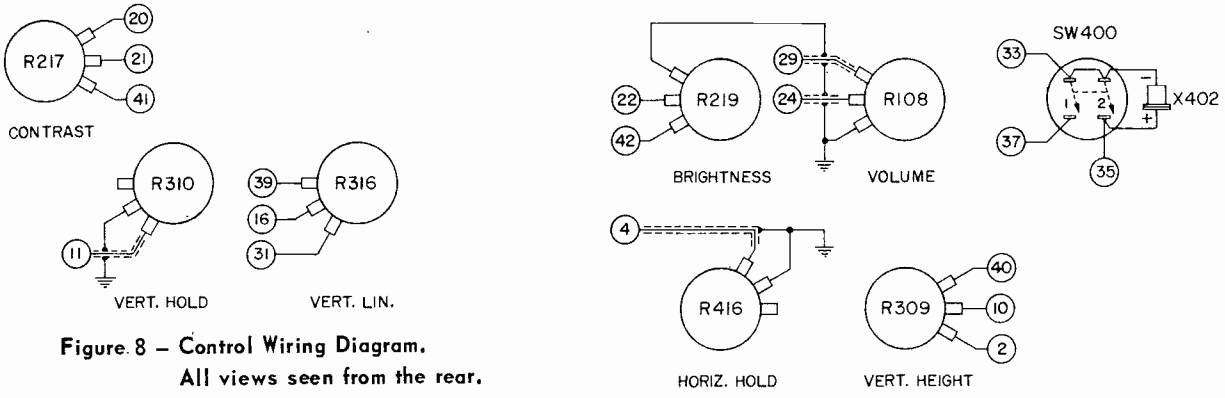


Figure 8 – Control Wiring Diagram. All views seen from the rear.

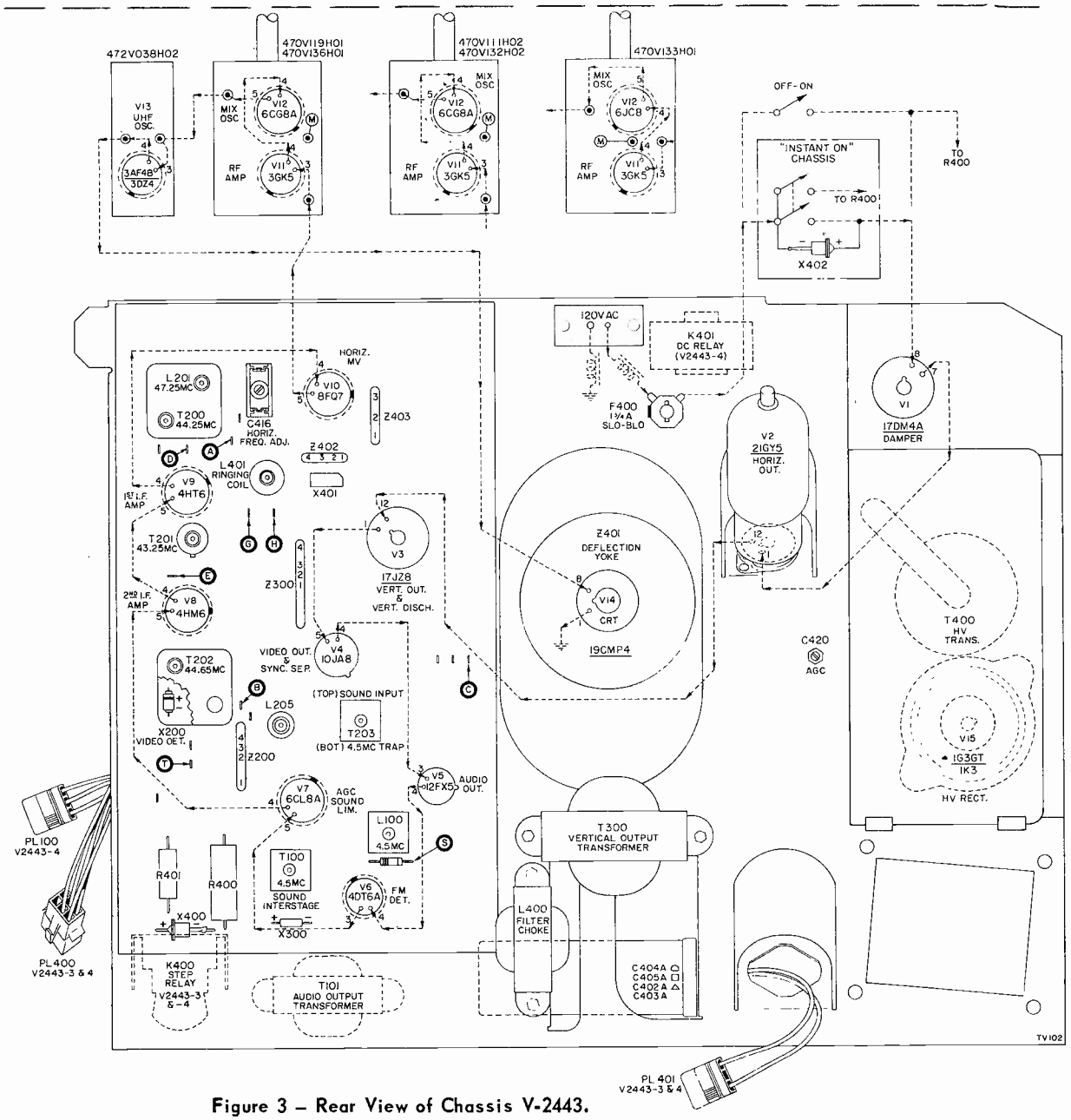


Figure 3 – Rear View of Chassis V-2443.

WESTINGHOUSE Chassis V-2443-1, -2, -3, -4, Alignment Information, Continued

ALIGNMENT

SOUND ALIGNMENT

EQUIPMENT: VTVM

PROCEDURE:

1. Select the strongest station available (preferably with test pattern and test tone) and adjust the FINE TUNING for best reception. Adjust the VOLUME control so that the station sound is audible.
2. Adjust the quad coil (L100) for maximum sound from the speaker.
3. Disconnect the antenna. Use a jumper wire to short TP Ⓑ to B—.
4. Connect the VTVM to TP Ⓢ.
5. Adjust interstage transformer T100 for maximum negative voltage on the VTVM.
6. Remove the jumper wire used to short TP Ⓑ to B—.
7. Place the antenna input close to the antenna terminals so that the signal is loosely coupled to the receiver and the picture is barely visible. A pronounced noisiness (hiss) should accompany the sound.
8. Adjust the limiter input coil (T203 top slug) for maximum negative voltage on the VTVM. If the VTVM indicates a broad response while making this adjustment, the receiver input signal is too strong. When the signal coupling described in step 7 is at the necessary low point, no limiting takes place and the VTVM will indicate a sharp response to the limiter input coil adjustment.

4.5 MC TRAP ALIGNMENT

Disconnect the antenna and turn contrast control to maximum clockwise. Inject a 4.5 MC CW signal through a .001mf capacitor to TP Ⓑ. Connect a .001mf capacitor to a demodulation probe tip. Connect the other end of the probe to a VTVM and the capacitor to TP Ⓒ. Set the VTVM to 1.5-2V DC range. Turn the set on and allow ten minutes for warmup. Then adjust T203 bottom slug for minimum on the VTVM.

IF ALIGNMENT

EQUIPMENT

1. ***Sweep Generator*** with a 10 MC wide sweep at center frequencies from 10 MC to 90 MC and 170 MC to 216 MC.
2. ***CW (Marker) Generator*** which accurately produces the IF and RF frequencies from 4.5 MC to 216 MC.
3. ***Oscilloscope*** with good low frequency response characteristics.
4. ***VTVM.***
5. ***Bias Supply*** of —2.5 volts and —3 volts.
6. ***Standard Alignment Tool*** with a 3/32" hexagonal tip (long enough to reach bottom slugs).

TERMINATION AND ADJUSTMENT OF EQUIPMENT

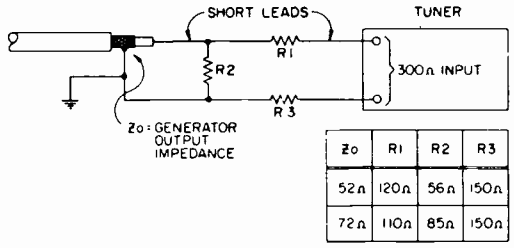
These instructions on termination and adjustment of equipment will apply throughout the IF Alignment procedure.

All test equipment cables and leads should be as short and direct as possible.

Oscilloscope and VTVM — Use a low-capacitance direct probe terminated with the decoupling network shown in Figure 13. Keep the oscilloscope calibrated for 2 volts peak to peak (P-P). Use a VTVM range suitable for measuring —1.5 volts.

Generators — Except where otherwise noted, all signal generating equipment should be terminated as shown in Figure 12. Connect the signal cable ground near the ground of the stage where the signal is injected.

Adjust the CW generator output so that: (1) When the VTVM is being used its reading remains near the —1 volt point. (2) When the oscilloscope is being used the marker frequencies do not distort the response curve.



Zo	R1	R2	R3
52Ω	120Ω	56Ω	150Ω
72Ω	110Ω	85Ω	150Ω

Figure 11 — Impedance Matching Network.

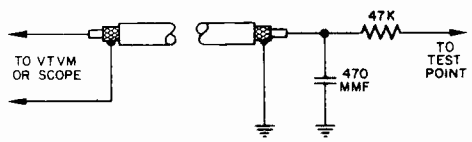


Figure 13 — VHF Decoupling Network.

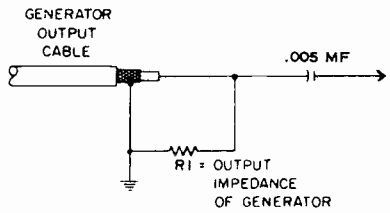


Figure 12 — Generator Cable Termination.

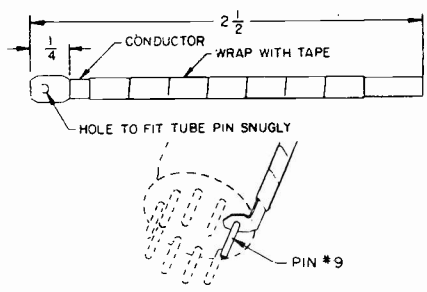


Figure 14 — Mixer Coupling Device.

WESTINGHOUSE Chassis V-2443-1, -2, -3, 4, Alignment Information, Continued

STEP	TEST EQUIPMENT AND CONNECTION	ADJUSTMENT
1.	−3V bias to TP Ⓐ and −2.5V bias to TP Ⓣ. Short antenna terminals. Channel selector to channel 10. Connect jumper from pin 2 of V7B to B− to disable the AGC pulse.	
2.	Oscilloscope and VTVM to TP Ⓑ. IF sweep generator with CW marker to TP Ⓔ. a. 44.65 MC. b. 45.75 MC.	a. T202 primary (top slug): Maximum amplitude on VTVM. T202 secondary (bottom slug): Rocking symmetrical response at 44.65 MC. b. Place 45.75 MC marker at 70% of peak response (see Figure 15) for waveshape and marker placement.
3.	CW generator to TP Ⓓ at: a. 43.25 MC.	a. T201: Maximum amplitude on VTVM (see Figure 16).
4.	CW generator to TP Ⓜ. Use mixer coupling device shown in Figure 14 for tuner 470V119H01: a. 44.25 MC. b. 44.25 MC. c. 47.25 MC. It may be necessary to increase generator output and/or decrease bias.	a. Tuner mixer output coil: Maximum on VTVM. b. T200: Maximum on VTVM. c. L201: Minimum on VTVM.
5.	Connect sweep generator to TP Ⓜ at 44.25 MC. Couple CW generator with marker at 44.25 MC to sweep generator cable. Keep marker amplitude low to avoid distorting response. Adjust scope for 2V PP.	Mixer output coil for maximum amplitude. T200 for "rocking symmetrical response with waveshape and markers" as shown in Figure 17.
6.	CW generator to TP Ⓜ at 47.25 MC.	Repeat step 4c.
7.	Oscilloscope, 2V PP. Sweep generator thru impedance matching network (see Figure 11)to antenna terminals. Set pix marker at 211.25 MC, channel 13. Inject 45.75 MC marker into IF section by connecting CW output cable to outer shield of IF link cable.	Fine tuning to center of range. Channel selector to channel 13. Oscillator slug setting: Picture carrier should fall at 45.75 MC (± 300 KC) marker on scope. (See Figure 18).
8.	Repeat step 7 for all channels in descending order.	

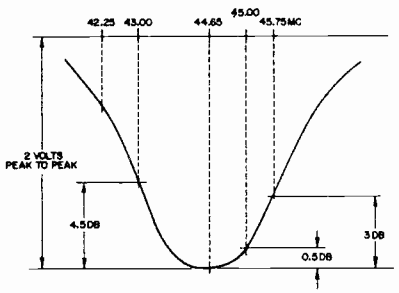


Figure 15 – Typical IF Response, 2nd IF Amp Grid to 2nd Det.

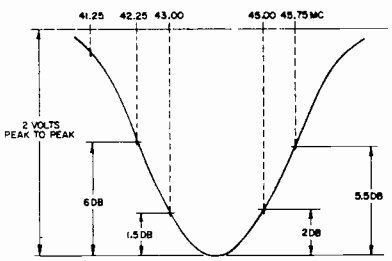


Figure 16 – Typical IF response, 1st IF Amp Grid to 2nd Det.

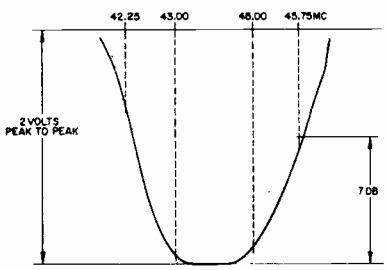


Figure 17 – Typical IF response, Mixer Amp grid to 2nd Det.

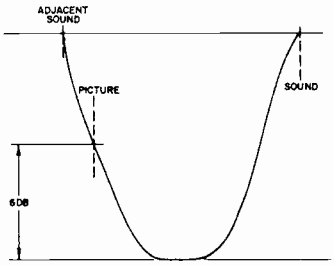


Figure 18 – Typical RF-IF response.

Westinghouse

CHASSIS V-2444

-1, -2, -3, -5, -6, -9, -10

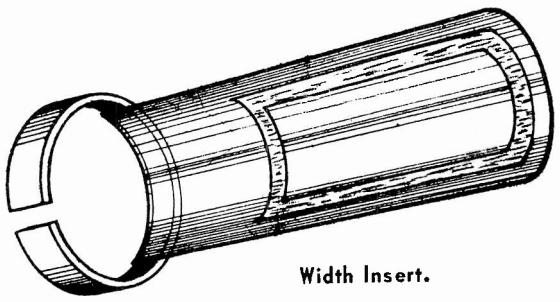
MODEL AND CHASSIS CHART (Chassis V-2444-7, -8, are similar)

MODELS	CHASSIS	TUNERS	UHF ADAPTABILITY	FEATURES
H-T3643 H-K3680 H-K3830 H-K3681 H-K3831 H-K3683 H-K3832 H-K4070 H-K4071 H-K4073	V-2444-1	470V132H01/02 470V133H01 (ALTERNATE) 470V119H01 (ALTERNATE)	EXTERNAL CONVERTER REQUIRED UHF STRIPS (4)	VHF
H-T3643U H-K3680U H-K3830U H-K3681U H-K3831U H-K3683U H-K3832U H-K4070U H-K4071U H-K4073U	V-2444-2	470V136H01 470V133H01 (ALTERNATE) 470V119H01 (ALTERNATE) 472V038H02 (UHF)	FACTORY EQUIPPED FOR ALL CHANNELS	VHF/UHF
H-K3685	V-2444-3 (TV) V-2418-4 (REMOTE RECEIVER) 559V087H02 (REMOTE TRANSMITTER)	470V111H02	UHF STRIPS (4)	VHF/REMOTE CONTROL/ INSTANT ON/MEMORY F.T.
H-C5230 H-C5231 H-C5233	V-2444-5 (TV) V-2515-9 (HI-FI)	470V132H01/02 470V133H01 (ALTERNATE) 476V009H01 (FM)	EXTERNAL CONVERTER REQUIRED	VHF TV/STEREO HI-FI/ AM-FM RADIO/4-SPEED RECORD CHANGER
H-C5230U H-C5231U H-C5233U	V-2444-6 (TV) V-2515-9 (HI-FI)	470V136H01 470V133H01 (ALTERNATE) 472V038H02 (UHF) 476V009H01 (FM)	FACTORY EQUIPPED FOR ALL CHANNELS	VHF-UHF TV/STEREO HI-FI/AM-FM RADIO/ 4-SPEED RECORD CHANGER
H-K3760 H-K3761 H-K3763	V-2444-9	470V132H01/02 470V133H01 (ALTERNATE) 470V119H01 (ALTERNATE)	EXTERNAL CONVERTER REQUIRED UHF STRIPS (4)	VHF/INSTANT ON
H-K3760U H-K3761U H-K3763U	V-2444-10	470V136H01 470V133H01 (ALTERNATE) 470V119H01 (ALTERNATE) 472V038H02 (UHF)	FACTORY EQUIPPED FOR ALL CHANNELS	VHF-UHF/INSTANT ON

WIDTH ADJUSTMENT (see Figure)

This adjustment is a plastic tab with a copper rectangle bonded to one side. It protrudes from between the yoke and the bottom of the neck of the picture tube. The shiny side of the copper rectangle goes down against the picture tube, and the clamp opening goes to the top. The rectangle must be centered at the bottom of the CRT neck.

To adjust the width, loosen the yoke clamp. Pushing the tab into the yoke decreases width. Pulling the tab out of the yoke increases width. Best linearity, however, is obtained with the width tab pushed all the way in. If insufficient width occurs, pull out the tab for just enough scan without causing poor linearity.



Width Insert.

HEIGHT AND VERTICAL LINEARITY

The height and vertical linearity controls are accessible by removing the horizontal and vertical hold knobs and exposing the hollow shafts through which the adjustments are made. The height control is adjusted through the hollow horizontal hold control shaft while the linearity control is at the rear of the vertical hold control.

Adjust the height and vertical linearity controls to get a picture of proper height and proportion.

CENTERING

The centering rings, located at the rear of the deflection yoke, should be rotated to center the raster.

DEFLECTION YOKE

The deflection yoke should be as far forward as possible (touching the bell of the CRT). Rotation of the deflection yoke is used to level the raster.

AGC ADJUSTMENT (C420)

Connect a scope to TB (B). Tune in the strongest station and adjust C420 for a zero-to-peak reading of 2.75V. If a scope is not available, tune in the strongest station in the area. Adjust C420 until the picture bends at the top, then turn the screw back slightly until the bend disappears.

C420 is located adjacent to the left side of the high-voltage transformer cage.

WESTINGHOUSE Chassis V-2444-1, etc., Disassembly Procedures, Continued

PILOT LAMP REPLACEMENT (V-2444-3)

1. Disconnect the AC line cord from its power source.
2. Remove the front control knobs.
3. Remove the back cover and tilt down the chassis (see "Chassis Removal").
4. Remove the wing nut holding the pilot lamp socket to the tuner. Swing the socket to the rear of the cabinet and remove the pilot lamp. This is a Ⓦ #1847 bayonet-base pilot lamp.

   When re-installing the pilot lamp socket on to the tuner, slight adjustments may be required to center the light over the channel indicating number.

PC BOARD ACCESSIBILITY AND SERVICING (see Figure 1)

All chassis are designed to tilt down on support hinges for ease in servicing.

Removing screws 1 and 2 from the upper corners of the chassis, 3 and 4 from the chassis support hinges, will permit tilting the chassis to the horizontal position for circuit tracing and access to the power and sweep circuits. All lead lengths are sufficiently long for this tilt-down position.

To hold the chassis upright, replace screws 3 and 4 into the chassis support hinges.

When the front panel is disconnected, two studs, 6 and 9, on the side of the panel can hook into the mounting slots, 5 and 10, for easier handling and servicing.

CHASSIS DISASSEMBLY

To tilt chassis down:
Remove screws 1, 2, 3, and 4.

For chassis and front panel removal:
Remove screws 1, 2, 3, 4, 7, 8, 11, and 12.

For mounting front control panel to chassis:
Place studs 6 and 9 into chassis mounting holes 5 and 10.

CHASSIS REMOVAL

The chassis can be removed with or without the CRT.

Chassis Removal With CRT

1. Remove back cover screws, disconnect interlock, and remove back cover.
2. Remove front control and tuner knobs.
3. Remove antenna connection bracket.
4. Disconnect speaker leads.
5. Remove screws 7, 8, 11, and 12, holding front control panel to cabinet front.
6. Remove chassis retaining screws 1, 2, 3, and 4, and tilt down chassis.
7. Remove two screws from top corners of CRT.
8. Return chassis to vertical position and replace screws 3 and 4.
9. Mount front control panel to chassis by hooking studs 6 and 9 into slots 5 and 10.
10. Remove cabinet bottom chassis retaining bolts.
11. Carefully remove chassis.

Chassis Removal Without CRT

1. Refer to "Chassis Removal With CRT", steps 1 through 6.
2. Mount front control panel to chassis by hooking studs 6 and 9 into slots 5 and 10.
3. Disconnect CRT cap, CRT high voltage connector, and dag spring ground wire. Loosen yoke clamp screw. Remove yoke and width insert from the neck of the CRT.
4. Lift up and pull out chassis from support hinges.

CRT REMOVAL

1. Remove chassis (See "Chassis Removal With CRT"). CAUTION: Use shatterproof goggles to protect your eyes.
2. Remove screws 3 and 4 from chassis support hinges and tilt down chassis.
3. Remove CRT cap and CRT high voltage connector, and loosen yoke clamp screw. Remove yoke and width insert from the neck of the CRT.
4. Disconnect CRT dag spring ground wire, then disconnect dag spring from CRT strap rivet assy.
5. Loosen bolt holding CRT in the strap rivet assy.
6. Carefully remove CRT (use heavy gloves).

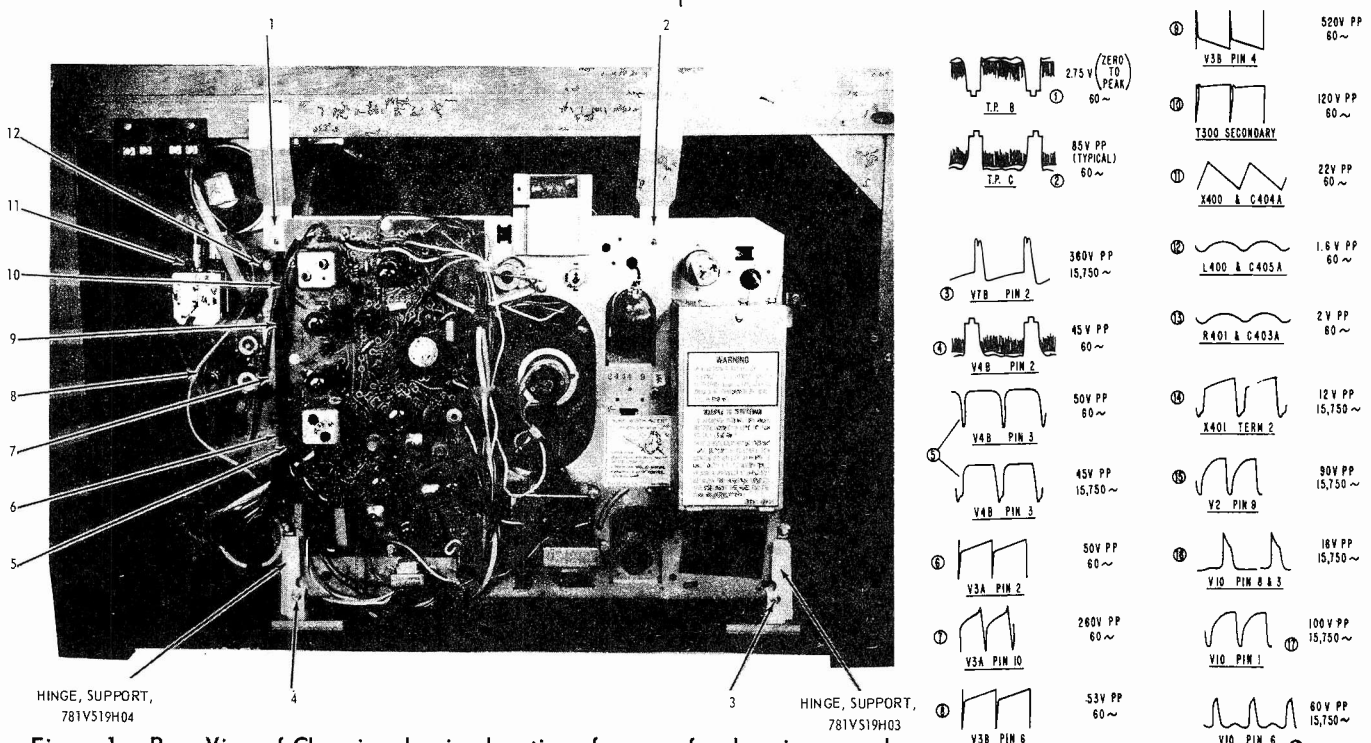
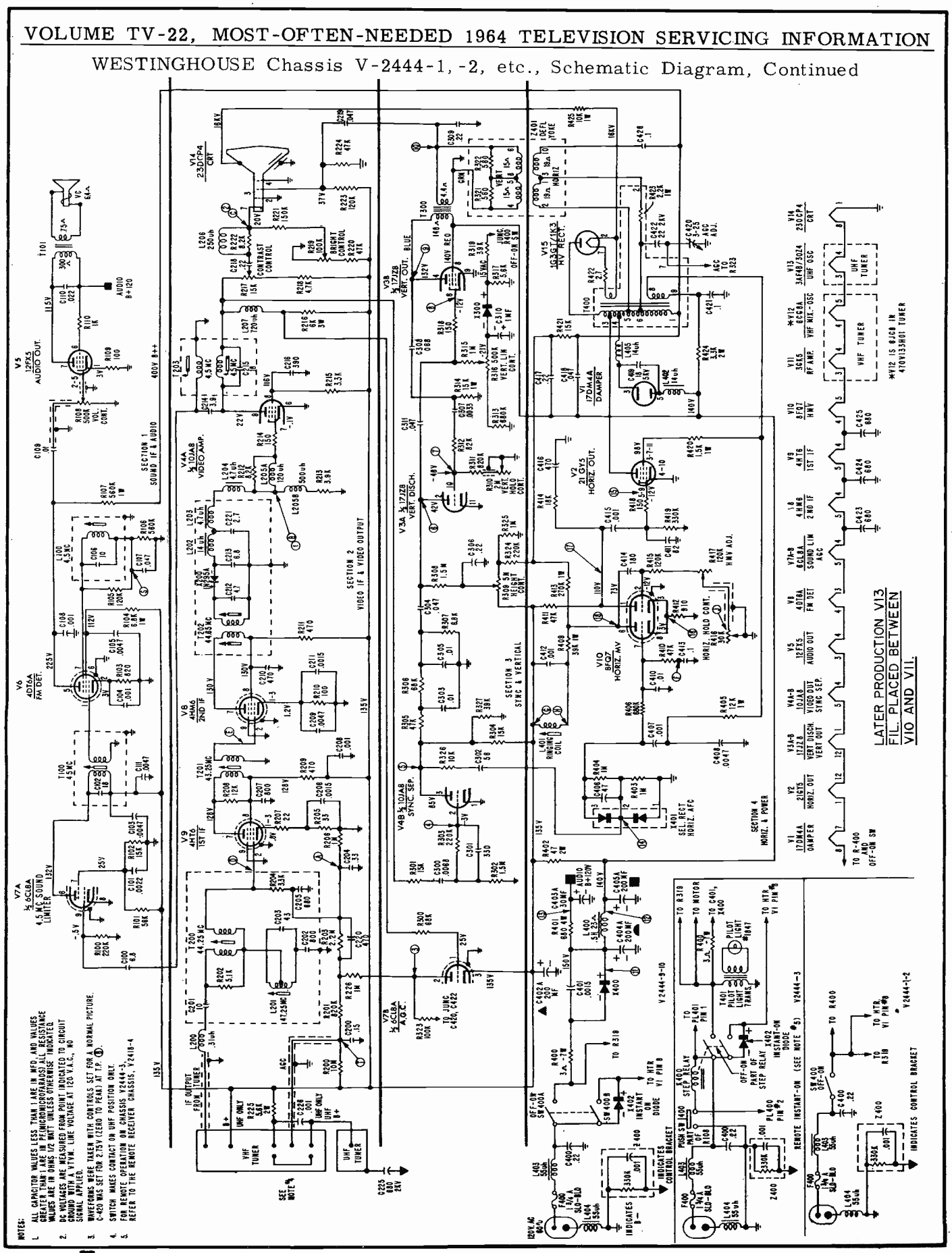


Figure 1 – Rear View of Chassis, showing location of screws for chassis removal.

WESTINGHOUSE Chassis V-2444-1, -2, etc., Schematic Diagram, Continued



WESTINGHOUSE Chassis V-2444-1, -2, etc., Service Information, Continued

INSTANT ON

"Instant On" provides immediate operation when the set is turned on, because no tube warm-up time is necessary.

Silicon diode X402 is connected in series with the AC line and the tube filament string. With the line cord plugged into an AC receptacle and the OFF-ON switch in the OFF position, the AC line voltage is rectified by silicon diode X402. This permits a pulsating direct current to flow thru the tube filament string to keep the tubes warm. No B+ is present when the OFF-ON switch is in the OFF position.

In chassis V-2444-5,-6,-9,-10, the OFF-ON and "Instant On" switch is a DPST switch.

In the ON position, one section of this switch places a short across diode X402 and the other side completes the AC input to R400 and R319.

Two relay contacts of K400, SWA1 and SWA2, form the OFF-ON and "Instant On" switch for chassis V-2444-3. When push switch SW400 is pressed momentarily, SWA1 and SWA2 contacts close; SWA2 shunts the "Instant On" diode X402 and completes the AC input to the filament string. SWA1 completes the AC input to R400 and R319.

PUSH SWITCH (SW400)

The remote-controlled chassis V-2444-3 uses a push switch in place of the conventional OFF-ON switch. Depressing this switch momentarily will give the same effect and in the same sequence as with the remote transmitter OFF-ON VOLUME button. Each momentary contact of the switch will turn the stepping relay K400 through one of its positions.

RINGING COIL AND HORIZONTAL FREQUENCY ADJUSTMENT

1. Short out the ringing coil (L401) with a short jumper wire between TP(G) and (H).
2. Set the horizontal hold control, R416, to the center of its electrical range. Place the VTVM probe to TP(J) and turn the control to measure one half the B+ voltage coming to the high end of the control. This is the electrical center. Do not change this setting during the steps that follow.
3. Calibrate a VTVM to 0V center scale on the 1.5V range and connect to test point (F) for measuring the DC voltage between (F) and ground.
4. With the receiver tuned to a station of normal signal strength, adjust R417, HMV adj, so that moving it one way causes the meter to swing to the left and moving it the other way causes it to swing to the right. Then carefully adjust R417 for center scale on this meter.
5. Remove the jumper from the ringing coil and bring into horizontal sync, if necessary, by adjusting L401.
6. With the set in horizontal sync, adjust the ringing coil for center scale on the VTVM. Check by switching to another channel and back again. The receiver should snap into horizontal sync on all channels.

NOTE: On some early production chassis, when R417, 270-V130H01, 120K control is used, and a greater resistance range is required to zero the HMV on the meter (as described above), a 33K resistor is added in series with R415 and R417

TUBE COMPLEMENT AND RESISTANCE CHART

TUBE	TYPE	FUNCTION	PIN 1	PIN 2	PIN 3	PIN 4	PIN 5	PIN 6	PIN 7	PIN 8	PIN 9	PIN 10	PIN 11	PIN 12	CAP
V1	17DM4A	Damper	23	NC	*300K	NC	23	NC	36	40					
V2	21GY5	Horiz. Output	36	330K	*3.7K or *4.8K	0	330K	NC	*3.7K or *4.8K	NC	330K	0	*3.7K or *4.8K	30	*280K
V3	17JZ8	Vert. Disch. & Outp.	24	*3M	NC	*180	NC	1.4M	1.4M	*23	0	1.5M	0	30	
V4	10JA8	Vid. Outp. & Sync. Sep.	0	1.7M	*12K	20	24	0	4K	*3.3K	*5K				
V5	12FX5	Audio Output	100	0 to 500K	20	16	0 to 500K	*1.7K	*1K						
V6	4DT6A	FM Detector	3	820	14	16	*900K	*6.8K	560K						
V7	6CL8A	Sound Lim. & AGC	*74K	3.4M	*70	12	14	*72	13K	0	220K				
V8	4HM6	2nd IF	100	.4	100	11	12	0	*540	*540	0				
V9	4HT6	1st IF	55	1M	55	10	11	0	*540	*540	0				
V10	8FQ7	Horiz. MV	*47K	170K	910	10	7	*39K	2.7M	910	0				
V11	●3GK5	RF Amp.	0	4M	7	6	*2.3K	0	0						
	⊕3GK5		0	4M	7	6	*1.3K	0	0						
	†3GK5		0	4M	7	6	*3.4K	0	0						
V12	●6CG8A	Mix./Osc.	10K	*5.8K	0	6	5	*1.1K	*1.1K	0	220K				
	⊕6CG8A		4.7K	*4.8K	0	6	5	*1.1K	*70	0	222K				
	†6JC8		0	218K	*4.8K	6	5	*1.1K	0	10K	*4.8K				
V13	3AF4B / 3DZ4	UHF Osc.	*5.8K	5.6K	5	3	.1	5.6K	*5.8K						
V14	23DCP4	CRT	0	0	36K	0	NC	NC	180K	3					
V15	1G3GT / 1K3	HV Rect.	INFINITE												*280K

RESISTANCES MEASURED FROM TUBE PIN INDICATED TO CIRCUIT GROUND.
* Resistances measured from tube pin indicated to junction of X400 and L400.
† Used with 470V133H01 tuner.
⊕ Used with 470V111H02 and 470V119H01 tuners.
● Used with 470V132H01/H02 and 470V136H01 tuners.

WESTINGHOUSE Chassis V-2444-1, -2, etc., Continued

V-2444 PC BOARD LEGEND

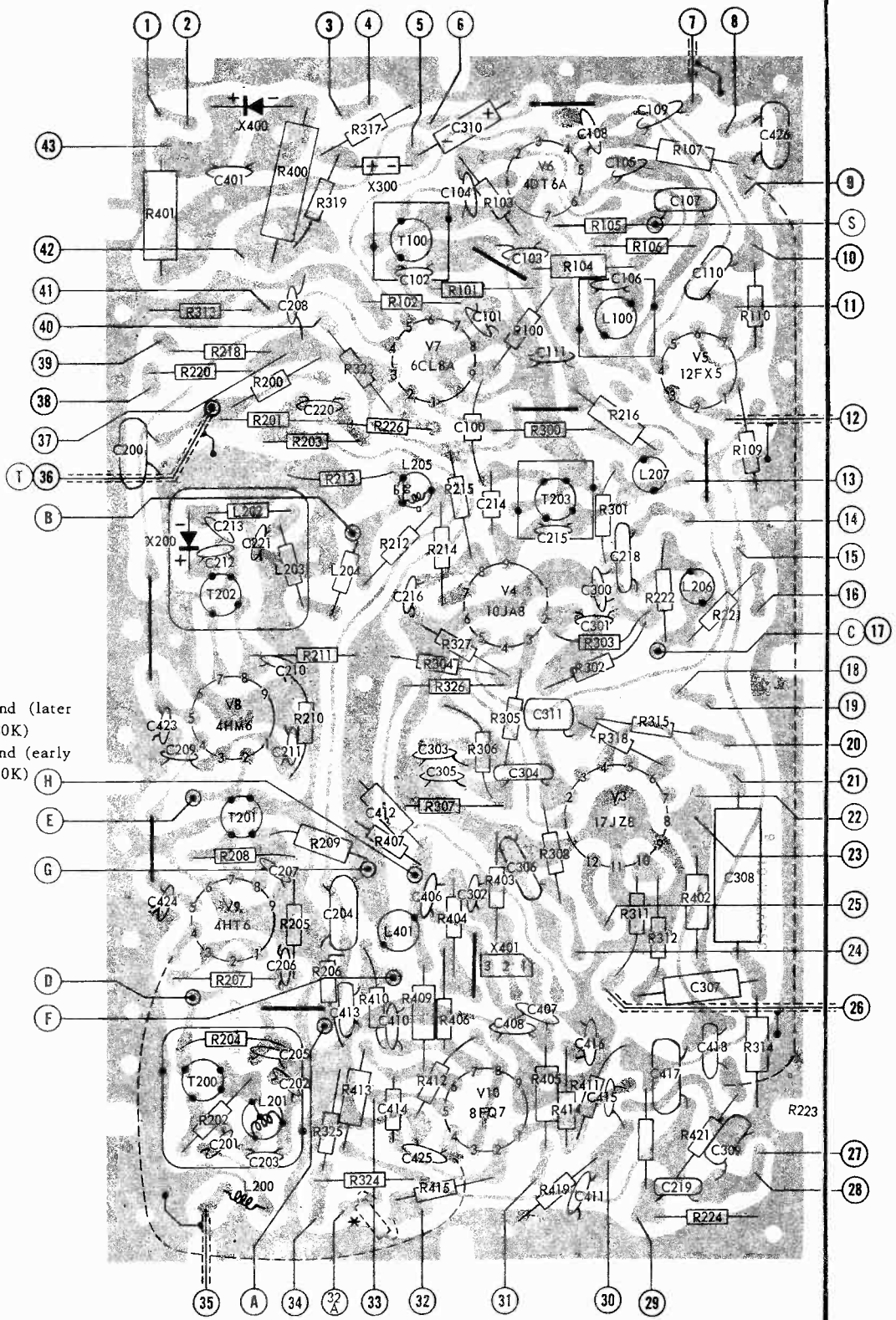
1. V1 pin 8
2. AC switch
3. AC switch
4. Junction C400, L403
5. Vert lin control, high end
6. C403A
7. Volume control, high end
8. Yoke, lug #10
9. T400, lug #1
10. T101, red wire
11. T101, blue wire
12. Volume control, arm
13. Contrast control, high end
14. Contrast control, arm
15. C402A
16. Brightness control, arm
17. CRT, pin 7
18. Tuner filament
19. CRT cap, pin 8
20. Vert lin control, arm
21. T300, blue wire
22. T300, red wire
23. C405A
24. Height control, arm
25. V2, pin 12
26. Vert hold control, high side
27. Yoke, orange wire
28. T300, orange wire
29. CRT cap, pin 3
30. V2, pin 2
31. T400, lug #8
32. Horiz MV adjust control, high end (later using 270V130H05 control R417, 180K)

32A. Horiz MV adjust control, high end (early using 270V130H01 control R417, 120K)

33. Tuner filament
34. Height control, low end
35. Tuner IF output
36. Tuner AGC cable
37. Height control, high end
38. Brightness control, high end
39. Contrast control, low end
40. T400, lug #7
41. Vertical lin control, low end
42. AC switch
43. C404A

TEST POINTS

A – IF AGC
B – Video detector
C – CRT cathode
D – 1st IF grid
E – 3rd IF grid
F – Horiz MV
G – Ringing coil
H – Ringing coil
J – Horiz hold control adj.
M – Tuner mixer grid
S – FM sound
T – Tuner AGC



* 33K RESISTOR = EARLY PRODUCTION USING R416 (270V130H01, CONTROL)

Figure 7 – Bottom View of PC Board, showing top components in solid outline. Tube pin numbering is for bottom of socket.

WESTINGHOUSE Chassis V-2444-1, -2, etc., Service Information, Continued

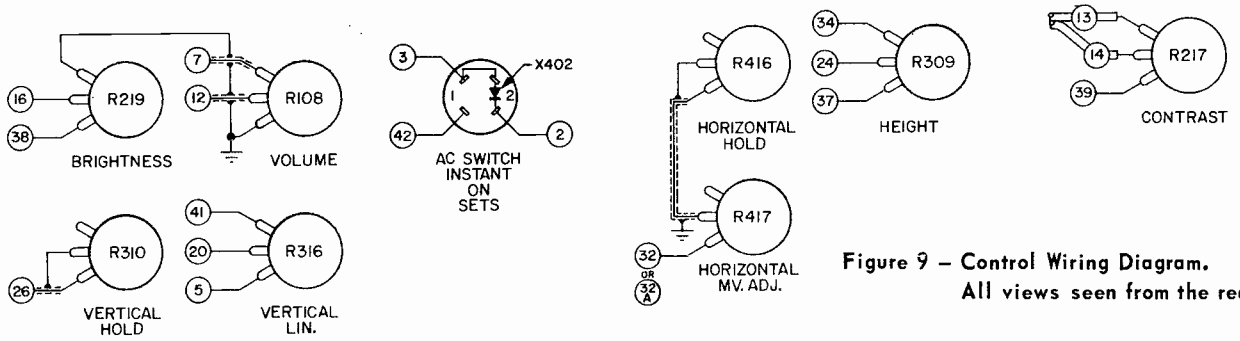


Figure 9 – Control Wiring Diagram. All views seen from the rear.

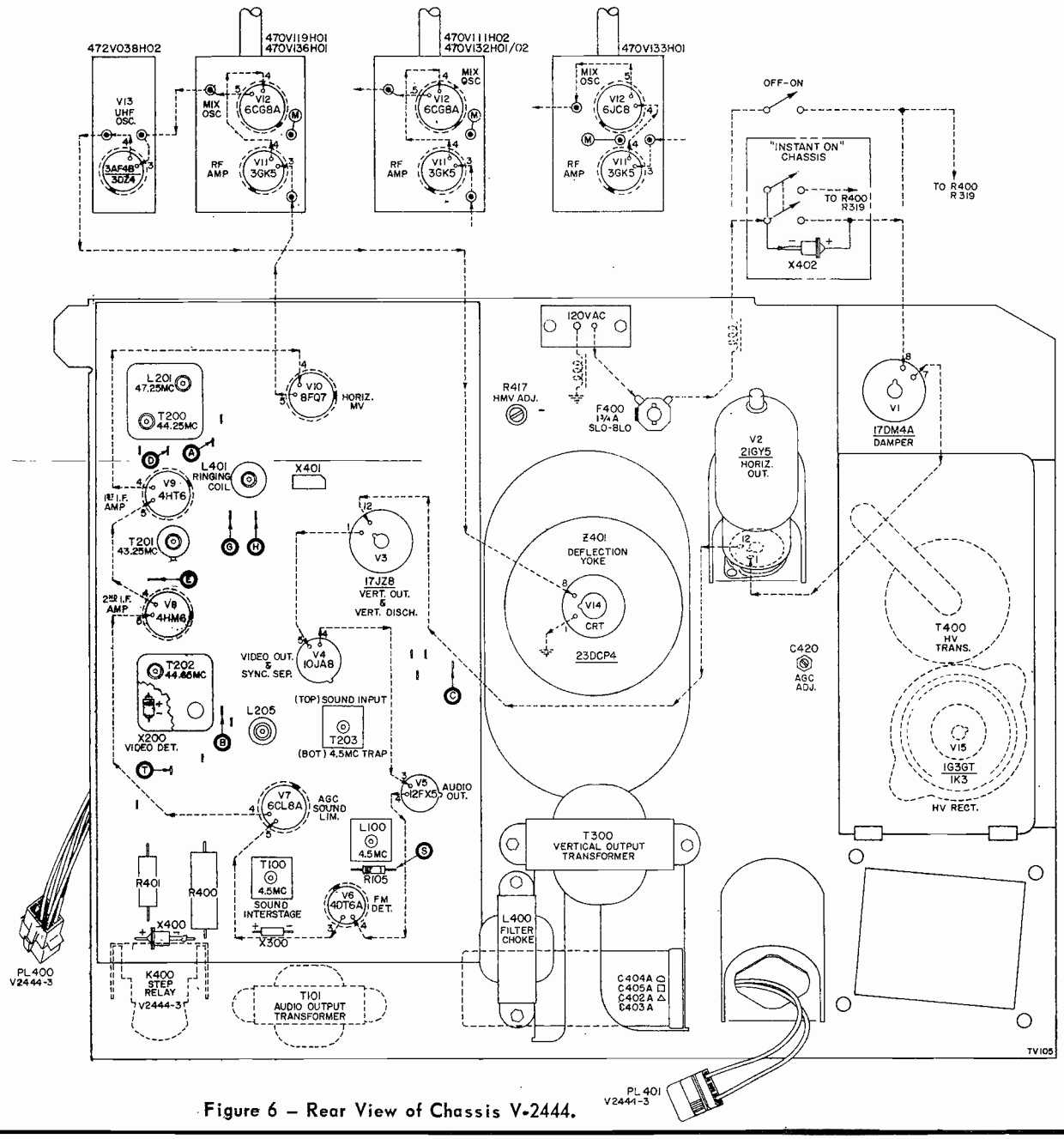


Figure 6 – Rear View of Chassis V-2444.

WESTINGHOUSE Chassis V-2444-1, -2, etc., Alignment Information, Continued

SOUND ALIGNMENT

EQUIPMENT: VTVM

PROCEDURE:

1. Select the strongest station available (preferably with test pattern and test tone) and adjust the FINE TUNING for best reception. Adjust the VOLUME control so that the station sound is audible.
2. Adjust the quad coil (L100) for maximum sound from the speaker.
3. Disconnect the antenna. Use a jumper wire to short TP Ⓑ to B—.
4. Connect the VTVM to TP Ⓢ.
5. Adjust interstage transformer T100 for maximum negative voltage on the VTVM.
6. Remove the jumper wire used to short TP Ⓑ to B—.
7. Place the antenna input close to the antenna terminals so that the signal is loosely coupled to the receiver and the picture is barely visible. A pronounced noisiness (hiss) should accompany the sound.
8. Adjust the limiter input coil (T203 top slug) for maximum negative voltage on the VTVM. If the VTVM indicates a broad response while making this adjustment, the receiver input signal is too strong. When the signal coupling described in step 7 is at the necessary low point, no limiting takes place and the VTVM will indicate a sharp response to the limiter input coil adjustment.

4.5 MC TRAP ALIGNMENT

Disconnect the antenna and turn contrast control to maximum clockwise. Inject a 4.5 MC CW signal through a .001mf capacitor to TP Ⓑ. Connect a .001mf capacitor to a demodulation probe tip. Connect the other end of the probe to a VTVM and the capacitor to TP Ⓒ. Set the VTVM to 1.5-2V DC range. Turn the set on and allow ten minutes for warmup. Then adjust T203 bottom slug for minimum on the VTVM.

IF ALIGNMENT

EQUIPMENT

1. ***Sweep Generator*** with a 10 MC wide sweep at center frequencies from 10 MC to 90 MC and 170 MC to 216 MC.
2. ***CW (Marker) Generator*** which accurately produces the IF and RF frequencies from 4.5 MC to 216 MC.
3. ***Oscilloscope*** with good low frequency response characteristics.
4. ***VTVM.***
5. ***Bias Supply*** of —2.5 volts and —3 volts.
6. ***Standard Alignment Tool*** with a 3/32" hexagonal tip (long enough to reach bottom slugs).

TERMINATION AND ADJUSTMENT OF EQUIPMENT

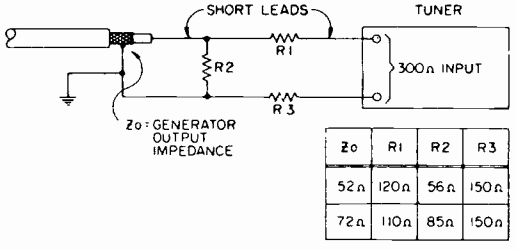
These instructions on termination and adjustment of equipment will apply throughout the IF Alignment procedure.

All test equipment cables and leads should be as short and direct as possible.

Oscilloscope and VTVM — Use a low-capacitance direct probe terminated with the decoupling network shown in Figure 13. Keep the oscilloscope calibrated for 2 volts peak to peak (P-P). Use a VTVM range suitable for measuring —1.5 volts.

Generators — Except where otherwise noted, all signal generating equipment should be terminated as shown in Figure 12. Connect the signal cable ground near the ground of the stage where the signal is injected.

Adjust the CW generator output so that: (1) When the VTVM is being used its reading remains near the —1 volt point. (2) When the oscilloscope is being used the marker frequencies do not distort the response curve.



Zo	R1	R2	R3
52Ω	120Ω	56Ω	150Ω
72Ω	110Ω	85Ω	150Ω

Figure 11 — Impedance Matching Network.

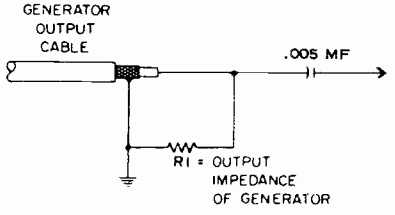


Figure 12 — Generator Cable Termination.

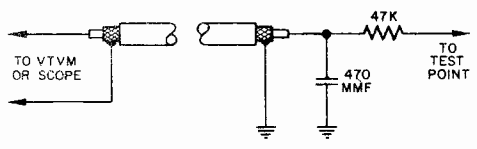


Figure 13 — VHF Decoupling Network.

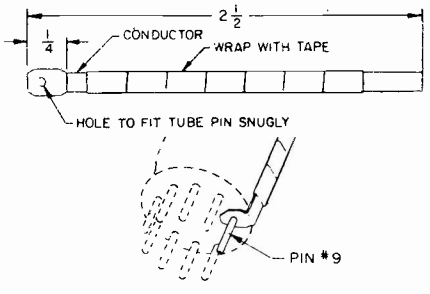


Figure 14 — Mixer Coupling Device.

WESTINGHOUSE Chassis V-2444-1, -2, etc., Alignment Information, Continued

STEP	TEST EQUIPMENT AND CONNECTION	ADJUSTMENT
1.	−3V bias to TP Ⓐ and −2.5V bias to TP Ⓣ. Short antenna terminals. Channel selector to channel 10. Connect jumper from pin 2 of V7B to B− to disable the AGC pulse.	
2.	Oscilloscope and VTVM to TP Ⓑ. IF sweep generator with CW marker to TP Ⓔ. a. 44.65 MC. b. 45.75 MC.	a. T202 primary (top slug): Maximum amplitude on VTVM. T202 secondary (bottom slug): Rocking symmetrical response at 44.65 MC. b. Place 45.75 MC marker at 70% of peak response (see Figure 15) for waveshape and marker placement.
3.	CW generator to TP Ⓓ at: a. 43.25 MC.	a. T201: Maximum amplitude on VTVM (see Figure 16).
4.	CW generator to TP Ⓜ. Use mixer coupling device shown in Figure 14 for tuner 470V119H01: a. 44.25 MC. b. 44.25 MC. c. 47.25 MC. It may be necessary to increase generator output and/or decrease bias.	a. Tuner mixer output coil: Maximum on VTVM. b. T200: Maximum on VTVM. c. L201: Minimum on VTVM.
5.	Connect sweep generator to TP Ⓜ at 44.25 MC. Couple CW generator with marker at 44.25 MC to sweep generator cable. Keep marker amplitude low to avoid distorting response. Adjust scope for 2V PP.	Mixer output coil for maximum amplitude. T200 for "rocking symmetrical response with waveshape and markers" as shown in Figure 17.
6.	CW generator to TP Ⓜ at 47.25 MC.	Repeat step 4c.
7.	Oscilloscope, 2V PP. Sweep generator thru impedance matching network (see Figure 11)to antenna terminals. Set pix marker at 211.25 MC, channel 13. Inject 45.75 MC marker into IF section by connecting CW output cable to outer shield of IF link cable.	Fine tuning to center of range. Channel selector to channel 13. Oscillator slug setting: Picture carrier should fall at 45.75 MC (± 300 KC) marker on scope. (See Figure 18).
8.	Repeat step 7 for all channels in descending order.	

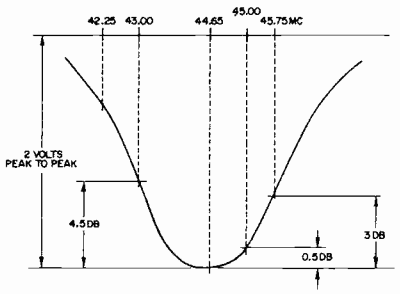


Figure 15 – Typical IF Response, 2nd IF Amp Grid to 2nd Det.

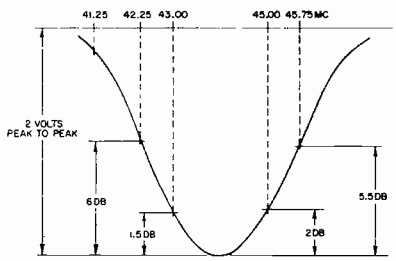


Figure 16 – Typical IF response, 1st IF Amp Grid to 2nd Det.

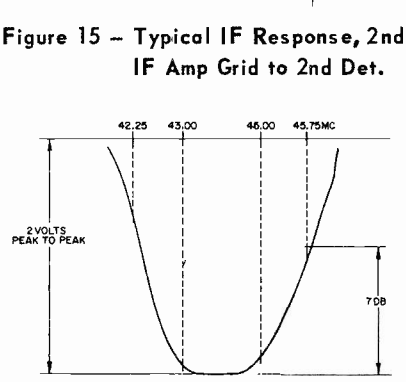


Figure 17 – Typical IF response, Mixer Amp grid to 2nd Det.

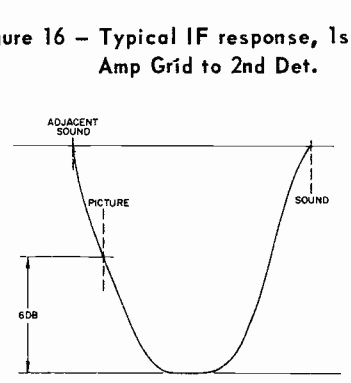


Figure 18 – Typical RF-IF response.

ZENITH RADIO CORPORATION

ZENITH

CHASSIS

14K20, 15K37, 15K37T, 15K37Q, 15K37QS, 15K37QT, 16K30, 16K30QS, 16K32, 16K32QS, 16K33, 16K33Q, 16K33QS, 16K34, 16K34Q, 16K34QS, 16K36, 16K36QS, 16K38QS

MODEL	SPACE COMMAND	TYPE	CHASSIS	TUNER	PICTURE TUBE
K1620B2		Luggage Portable	14K20	Super Bandswitch	16AVP4
K1620L2		Luggage Portable	14K20	Super Bandswitch	16AVP4
K1620Y2		Luggage Portable	14K20	Super Bandswitch	16AVP4
K2004C2		Table	16K30	Rotary Bandswitch	19CRP4
K2004F2		Table	16K30	Rotary Bandswitch	19CRP4
K2004C2B		Table	16K30	Bandswitch	19CRP4
K2004F2B		Table	16K30	Bandswitch	19CRP4
K2005C2		Table	16K30	Bandswitch	19CRP4
K2005F2		Table	16K30	Bandswitch	19CRP4
K2008R2		Table	16K30	Rotary Bandswitch	19CRP4
K2008R2B		Table	16K30	Bandswitch	19CRP4
K2008W2		Table	16K30	Rotary Bandswitch	19CRP4
K2008W2B		Table	16K30	Bandswitch	19CRP4
K2012G2		Table	16K36	Super Bandswitch	19CXP4
K2012L2		Table	16K36	Super Bandswitch	19CXP4
K2014F2		Table	16K36	Super Bandswitch	19CXP4
K2014L2		Table	16K36	Super Bandswitch	19CXP4
K2100G2		Table	16K30	Bandswitch	19CRP4
K2100L2		Table	16K30	Bandswitch	19CRP4
K2108B2		Table	15K37	Super Target Turret	19CXP4
K2108L2		Table	15K37	Super Target Turret	19CXP4
K2109J2		Table	15K37	Gold Video Guard Turret	19CXP4
K2110L2		Table	15K37	Gold Video Guard Turret	19CXP4
K2127L2		Table	15K37T	Gold Video Guard Turret	19CXP4
K2127R2		Table	15K37T	Gold Video Guard Turret	19CXP4
K2127W2		Table	15K37T	Gold Video Guard Turret	19CXP4
K2211J2	"300"	Table	16K30QS	Super Target Turret	19CRP4
K2213L2	"300"	Table	15K37QS	Super Target Turret	19CXP4
K2214F2	"300"	Table	15K37QS	Gold Video Guard Turret	19CXP4
K2214J2	"300"	Table	15K37QS	Gold Video Guard Turret	19CXP4
K2231L2	"300"	Table	15K37QT	Gold Video Guard Turret	19CXP4
K2231L2A	"300"	Table	16K27QT	Gold Video Guard Turret	19CXP4
K2231R2	"300"	Table	15K37QT	Gold Video Guard Turret	19CXP4
K2231R2A	"300"	Table	16K27QT	Gold Video Guard Turret	19CQP4
K2231W2	"300"	Table	15K37QT	Gold Video Guard Turret	19CXP4
K2231W2A	"300"	Table	16K27QT	Gold Video Guard Turret	19CQP4
K2700R2		Table	16K33	Super Bandswitch	23DNP4
K2705R2		Table	16K33	Super Bandswitch	23DNP4
K2705R2B		Table	16K34	Super Bandswitch	23ANP4
K2705Y2		Table	16K33	Super Bandswitch	23DNP4
K2705Y2B		Table	16K34	Super Bandswitch	23ANP4
K2708E2		Table	16K33	Super Bandswitch	23DNP4
K2708E2B		Table	16K34	Super Bandswitch	23ANP4
K2708R2		Table	16K33	Super Bandswitch	23DNP4
K2708R2B		Table	16K34	Super Bandswitch	23ANP4
K2708W2		Table	16K33	Super Bandswitch	23DNP4
K2708W2B		Table	16K34	Super Bandswitch	23ANP4
K2717E2		Table	16K32	Gold Video Guard Turret	23BTP4
K2717R2		Table	16K32	Gold Video Guard Turret	23BTP4
K2717W2		Table	16K32	Gold Video Guard Turret	23BTP4
K2735E2		Console	16K33	Super Target Turret	23DNP4
K2735E2B		Console	16K34	Super Target Turret	23ANP4
K2735L2		Console	16K33	Super Target Turret	23DNP4
K2735L2B		Console	16K34	Super Target Turret	23ANP4
K2735R2		Console	16K33	Super Target Turret	23DNP4
K2735R2B		Console	16K34	Super Target Turret	23ANP4
K2735W2		Console	16K33	Super Target Turret	23DNP4
K2735W2B		Console	16K34	Super Target Turret	23ANP4
K2736E2		Console	16K33	Super Target Turret	23DNP4

(Listing continued on pages 174-175 and 178; service material through page 190)

ZENITH Cross Index of Models and Chassis covered, Continued

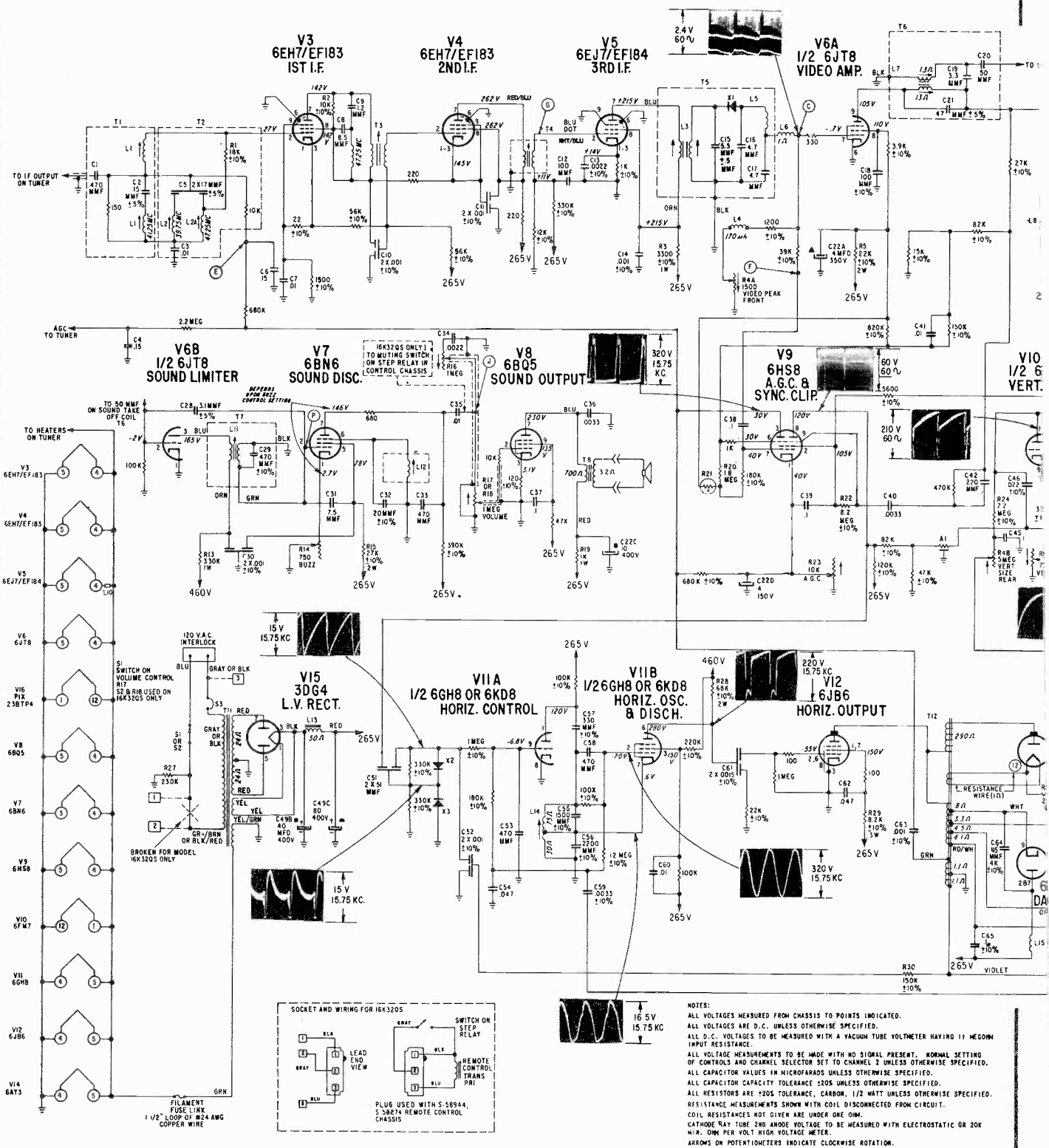
MODEL	SPACE COMMAND	TYPE	CHASSIS	TUNER	PICTURE TUBE
K2736E2B		Console	16K34	Super Target Turret	23ANP4
K2736M2		Console	16K33	Super Target Turret	23DNP4
K2736M2B		Console	16K34	Super Target Turret	23ANP4
K2736R2		Console	16K33	Super Target Turret	23DNP4
K2736R2B		Console	16K34	Super Target Turret	23ANP4
K2736W2		Console	16K33	Super Target Turret	23DNP4
K2736W2B		Console	16K34	Super Target Turret	23ANP4
K2737E2		Console	16K33	Super Target Turret	23DNP4
K2737E2B		Console	16K34	Super Target Turret	23ANP4
K2737R2		Console	16K33	Super Target Turret	23DNP4
K2737R2B		Console	16K34	Super Target Turret	23ANP4
K2737W2		Console	16K33	Super Target Turret	23DNP4
K2737W2B		Console	16K34	Super Target Turret	23ANP4
K2738E2		Console	16K33	Super Target Turret	23DNP4
K2738E2B		Console	16K34	Super Target Turret	23ANP4
K2738R2		Console	16K33	Super Target Turret	23DNP4
K2738R2B		Console	16K34	Super Target Turret	23ANP4
K2738W2		Console	16K33	Super Target Turret	23DNP4
K2738W2B		Console	16K34	Super Target Turret	23ANP4
K2742H2		Console	16K32	Gold Video Guard Turret	23BTP4
K2742M2		Console	16K32	Gold Video Guard Turret	23BTP4
K2742R2		Console	16K32	Gold Video Guard Turret	23BTP4
K2742W2		Console	16K32	Gold Video Guard Turret	23BTP4
K2748H2		Console	16K32	Gold Video Guard Turret	23BTP4
K2748M2		Console	16K32	Gold Video Guard Turret	23BTP4
K2748R2		Console	16K32	Gold Video Guard Turret	23BTP4
K2756L2		Console	16K32	Gold Video Guard Turret	23BTP4
K2756R2		Console	16K32	Gold Video Guard Turret	23BTP4
K2756W2		Console	16K32	Gold Video Guard Turret	23BTP4
K2756Y2		Console	16K32	Gold Video Guard Turret	23BTP4
K3300Y2	"400"	Table	16K38QS	Gold Video Guard Turret	23BTP4
K3308R2B	"300"	Table	16K34Q	Super Target Turret	23ANP4
K3308Y2	"300"	Table	16K33Q	Super Target Turret	23DNP4
K3308Y2B	"300"	Table	16K34Q	Super Target Turret	23ANP4
K3311R2	"400"	Table	16K32QS	Gold Video Guard Turret	23BTP4
K3311W2	"400"	Table	16K32QS	Gold Video Guard Turret	23BTP4
K3311Y2	"400"	Table	16K32QS	Gold Video Guard Turret	23BTP4
K3340E2	"300"	Console	16K33QS	Super Target Turret	23DNP4
K3340E2B	"300"	Console	16K34QS	Super Target Turret	23ANP4
K3340R2	"300"	Console	16K33QS	Super Target Turret	23DNP4
K3340R2B	"300"	Console	16K34QS	Super Target Turret	23ANP4
K3340W2	"300"	Console	16K33QS	Super Target Turret	23DNP4
K3340W2B	"300"	Console	16K34QS	Super Target Turret	23ANP4
K3341H2	"300"	Console	16K33QS	Super Target Turret	23DNP4
K3341H2B	"300"	Console	16K34QS	Super Target Turret	23ANP4
K3341M2	"300"	Console	16K33QS	Super Target Turret	23DNP4
K3341M2B	"300"	Console	16K34QS	Super Target Turret	23ANP4
K3341R2	"300"	Console	16K33QS	Super Target Turret	23DNP4
K3341R2B	"300"	Console	16K34QS	Super Target Turret	23ANP4
K3341W2	"300"	Console	16K33QS	Super Target Turret	23DNP4
K3341W2B	"300"	Console	16K34QS	Super Target Turret	23ANP4
K3342H2	"300"	Console	16K33QS	Super Target Turret	23DNP4
K3342H2B	"300"	Console	16K34QS	Super Target Turret	23ANP4
K3342M2	"300"	Console	16K33QS	Super Target Turret	23DNP4
K3342M2B	"300"	Console	16K34QS	Super Target Turret	23ANP4
K3342R2	"300"	Console	16K33QS	Super Target Turret	23DNP4
K3342R2B	"300"	Console	16K34QS	Super Target Turret	23ANP4
K3342W2	"300"	Console	16K33QS	Super Target Turret	23DNP4
K3342W2B	"300"	Console	16K34QS	Super Target Turret	23ANP4
K3350L2	"400"	Console	16K32QS	Gold Video Guard Turret	23BTP4
K3350R2	"400"	Console	16K32QS	Gold Video Guard Turret	23BTP4
K3350W2	"400"	Console	16K32QS	Gold Video Guard Turret	23BTP4
K3350Y2	"400"	Console	16K32QS	Gold Video Guard Turret	23BTP4
K3358W2	"400"	Console	16K38QS	Gold Video Guard Turret	23AFP4
K3358Y2	"400"	Console	16K38QS	Gold Video Guard Turret	23AFP4
K3385H2	"400"	Console	16K38QS	Gold Video Guard Turret	23AFP4
MK2785M2		Console	16K33	Super Target Turret	23DNP4
MK2785M2B		Console	16K34/4K22/9H20LZ4	Super Target Turret	23ANP4
MK2785R2		Console	16K33/4K22/7F20L	Super Target Turret	23DNP4
MK2785R2B		Console	16K34/4K22/9H20LZ4	Super Target Turret	23ANP4
MK2785W2		Console	16K33/4K22/9H20LZ4	Super Target Turret	23DNP4
MK2785W2B		Console	16K34/4K22/9H20LZ4	Super Target Turret	23ANP4
MK2786L2		Console	16K33/4K21/9H20LZ4	Super Target Turret	23DNP4

ZENITH Cross Index of Models and Chassis covered, Continued

MODEL	SPACE COMMAND	TYPE	CHASSIS	TUNER	PICTURE TUBE
MK2786L2B		Console	16K34/4K21/9H20LZ4	Super Target Turret	23ANP4
MK2786R2		Console	16K33/4K21/9H20LZ4	Super Target Turret	23DNP4
MK2786R2B		Console	16K34/4K21/9H20LZ4	Super Target Turret	23ANP4
MK2786W2		Console	16K33/4K21/9H20LZ4	Super Target Turret	23DNP4
MK2786W2B		Console	16K34/4K21/9H20LZ4	Super Target Turret	23ANP4
MK2787M2		Console	16K32/8K30/9H20LZ4	Gold Video Guard Turret	23BTP4
MK3388H2	"400"	Console	16K32QS/8K30/9H20LZ4	Gold Video Guard Turret	23BTP4
RK2785M2		Console	16K33/4K22/7F20L	Super Target Turret	23DNP4
RK2785M2B		Console	16K34	Super Target Turret	23ANP4
RK2785R2		Console	16K33/4K22/7F20L	Super Target Turret	23DNP4
RK2785R2B		Console	16K34/4K22/7F20L	Super Target Turret	23ANP4
RK2785W2		Console	16K33/4K22/7F20L	Super Target Turret	23DNP4
RK2785W2B		Console	16K34/4K22/7F20L	Super Target Turret	23ANP4
T1980C2		Table	16K30	Bandswitch	19CRP4
T1980G2		Table	16K30	Bandswitch	19CRP4
T1985C2		Table	16K36	Super Bandswitch	19CXP4
T1985J2		Table	16K36	Super Bandswitch	19CXP4
T1990G2		Table	16K36	Super Target Turret	19CXP4
T1995W2		Table	16K36	Super Bandswitch	19CXP4
T2025W2		Console	16K33	Super Target Turret	23DNP4
T2025W2B		Console	16K34	Super Target Turret	23ANP4
T2026H2		Console	16K33	Super Target Turret	23DNP4
T2026H2B		Console	16K34	Super Target Turret	23ANP4
T2026R2		Console	16K33	Super Target Turret	23DNP4
T2026R2B		Console	16K34	Super Target Turret	23ANP4
T2027M2		Console	16K33	Super Target Turret	23DNP4
T2027M2B		Console	16K34	Super Target Turret	23ANP4
T2040E2		Console	16K33	Super Target Turret	23DNP4
T2040E2B		Console	16K34	Super Target Turret	23ANP4
T2040R2		Console	16K33	Super Target Turret	23DNP4
T2040R2B		Console	16K34	Super Target Turret	23ANP4
T2040W2		Console	16K33	Super Target Turret	23DNP4
T2040W2B		Console	16K34	Super Target Turret	23ANP4
T2042E		Console	16K33	Super Target Turret	23DNP4
T2042R2		Console	16K33	Super Target Turret	23DNP4
T2042W2		Console	16K33	Super Target Turret	23DNP4
T2044E2B		Console	16K34	Super Target Turret	23ANP4
T2044R2		Console	16K33	Super Target Turret	23DNP4
T2044R2B		Console	16K34	Super Target Turret	23ANP4
T2044W2		Console	16K33	Super Target Turret	23DNP4
T2044W2B		Console	16K34	Super Target Turret	23ANP4
T2052M2		Console	16K33	Super Target Turret	23DNP4
T2052M2B		Console	16K34	Super Target Turret	23ANP4
T2052R2		Console	16K33	Super Target Turret	23DNP4
T2052R2B		Console	16K34	Super Target Turret	23ANP4
T2052W2		Console	16K33	Super Target Turret	23DNP4
T2052W2B		Console	16K34	Super Target Turret	23ANP4
T2055H2		Console	16K33	Super Target Turret	23DNP4
T2055H2B		Console	16K34	Super Target Turret	23ANP4
T2055M2		Console	16K33	Super Target Turret	23DNP4
T2055M2B		Console	16K34	Super Target Turret	23ANP4
T2055W2		Console	16K33	Super Target Turret	23DNP4
T2055W2B		Console	16K34	Super Target Turret	23ANP4
T2075L2B		Console	16K34	Super Target Turret	23ANP4
T2075W2B		Console	16K34	Super Target Turret	23ANP4
T2080E2		Console	16K33	Super Target Turret	23DNP4
T2080E2B		Console	16K34	Super Target Turret	23ANP4
T2080R2B		Console	16K34	Super Target Turret	23ANP4
T2080W2		Console	16K33	Super Target Turret	23DNP4
T2080W2B		Console	16K34	Super Target Turret	23ANP4
T2205G2	"300"	Table	16K36QS	Super Target Turret	19CXP4
T3025W2B	"300"	Console	16K34Q	Super Target Turret	23ANP4
T3026H2B	"300"	Console	16K34Q	Super Target Turret	23ANP4
T3026R2B	"300"	Console	16K34Q	Super Target Turret	23ANP4
T3027M2B	"300"	Console	16K34Q	Super Target Turret	23ANP4
T3042E2	"300"	Console	16K33Q	Super Target Turret	23DNP4
T3042H2	"300"	Console	16K33Q	Super Target Turret	23DNP4
T3042R2	"300"	Console	16K33Q	Super Target Turret	23DNP4
T3042W2	"300"	Console	16K33Q	Super Target Turret	23DNP4
T3075L2B	"300"	Console	16K34Q	Super Target Turret	23ANP4

(Model-Chassis listing continued on page 178)

ZENITH Chassis 16K32, 16K32QS, Schematic Diagram (Chassis 16K38QS is similar)

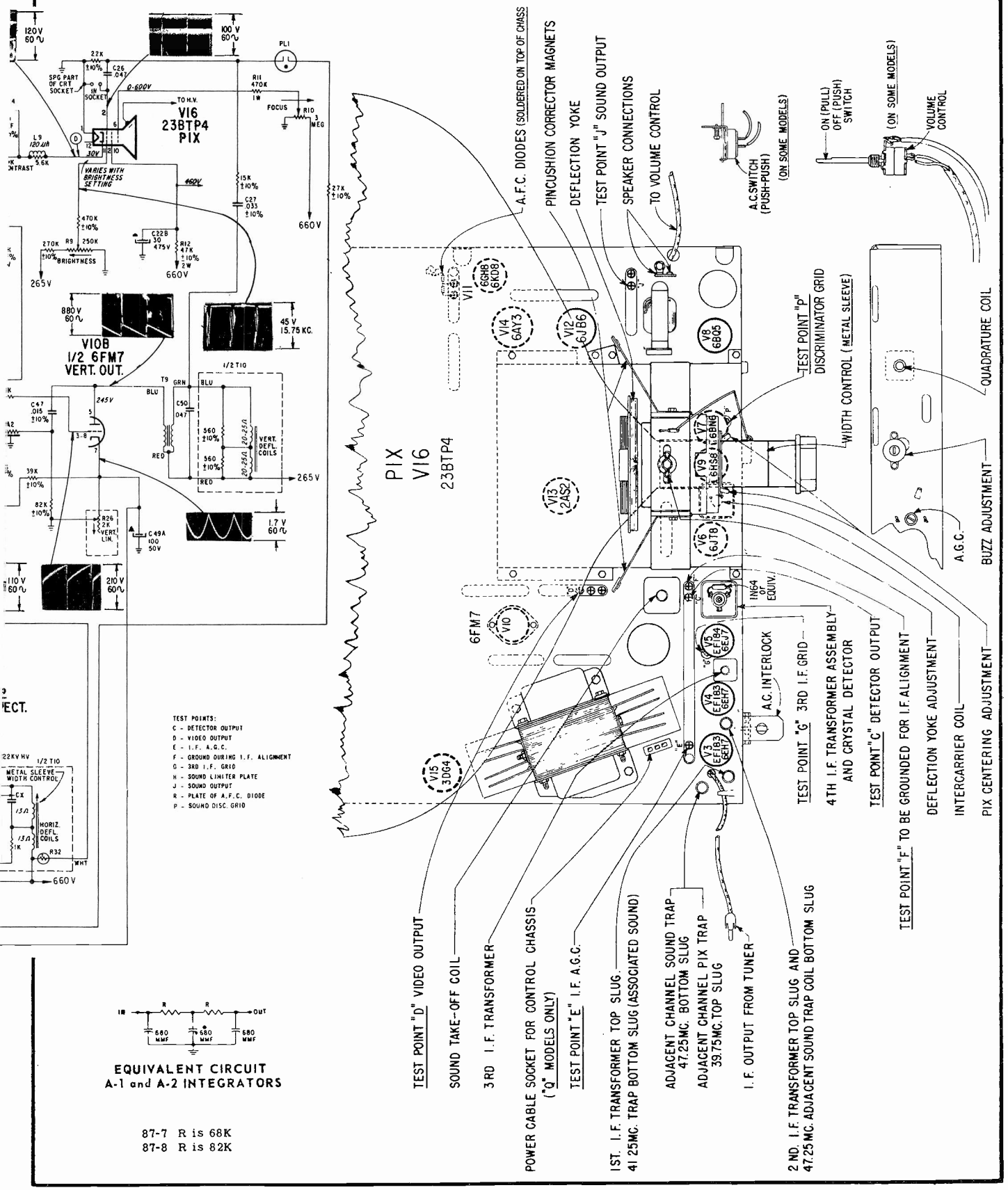


NOTES:
ALL VOLTAGES MEASURED FROM CHASSIS TO POINTS INDICATED.
ALL VOLTAGES ARE D.C. UNLESS OTHERWISE SPECIFIED.
ALL D.C. VOLTAGES TO BE MEASURED WITH A VACUUM TUBE VOLTMETER HAVING 11 MEGOHM INPUT RESISTANCE.
ALL VOLTAGE MEASUREMENTS TO BE MADE WITH NO SIGNAL PRESENT. NORMAL SETTING OF CONTROLS AND CHANNEL SELECTOR SET TO CHANNEL 2 UNLESS OTHERWISE SPECIFIED.
ALL CAPACITOR VALUES IN MICROFARADS UNLESS OTHERWISE SPECIFIED.
ALL CAPACITOR CAPACITY TOLERANCE ±20% UNLESS OTHERWISE SPECIFIED.
ALL RESISTORS ARE ±20% TOLERANCE, CARBON, 1/2 WATT UNLESS OTHERWISE SPECIFIED.
RESISTANCE MEASUREMENTS SHOWN WITH COIL DISCONNECTED FROM CIRCUIT.
COIL RESISTANCES NOT GIVEN ARE UNDER ONE OHM.
CATHODE RAY TUBE 2ND ANODE VOLTAGE TO BE MEASURED WITH ELECTROSTATIC OR 20K M.R. OHM PER VOLT HIGH VOLTAGE METER.
ARROWS ON POTENTIOMETERS INDICATE CLOCKWISE ROTATION.
ALIGNMENT POINTS:
CIRCLED LETTERS INDICATE ALIGNMENT AND TEST POINTS.
CHASSIS

PICTURE TUBE SECOND ANODE VOLTAGE TO BE MEASURED WITH ELECTROSTATIC KILOVOLTMETER WITH BRIGHTNESS AND CONTRAST CONTROLS FULL COUNTER-CLOCKWISE.
CX = CAPACITOR VALUE SELECTED FOR MINIMUM YOKE RINGING. VARIES WITHIN A RANGE OF 47 mmf TO 72 mmf (3 K.V., ±10%). WHEN NECESSARY, REPLACE WITH EXACT VALUE FOUND IN YOKE.

Schematic Diagram, Tube and Trimmer Layout 16K32 and 16K32QS (Waveforms Representative of Other "K" Chassis).

ZENITH Chassis 16K32, 16K32QS, Service Data (Chassis 16K38QS is similar)



EQUIVALENT CIRCUIT
A-1 and A-2 INTEGRATORS

87-7 R is 68K
87-8 R is 82K

ZENITH Service Material applicable to various chassis, Continued

MODEL	SPACE COMMAND	TYPE	CHASSIS	TUNER	PICTURE TUBE
T3075W2B	"300"	Console	16K34Q	Super Target Turret	23ANP4
T3080E2	"400"	Console	16K33Q	Super Target Turret	23DNP4
T3080E2B	"400"	Console	16K34Q	Super Target Turret	23ANP4
T3080R2	"400"	Console	16K33Q	Super Target Turret	23DNP4
T3080R2B	"400"	Console	16K34Q	Super Target Turret	23ANP4
T3080W2	"400"	Console	16K33Q	Super Target Turret	23DNP4
T3080W2B	"400"	Console	16K34Q	Super Target Turret	23ANP4

Suffix "Q" following the chassis number identifies a receiver with remote control; "QS" is used to identify such receivers having also an independent AC switch. Suffix "U" indicates set equipped with UHF continuous tuner. Chassis 4K21, 4K22, 7F20L, 9H20Lz4, (radio tuners and amplifiers) are covered in TV-21, 1963 Television volume.

OSCILLATOR ADJUSTMENTS

GOLD VIDEO GUARD TUNER
SUPER TARGET TUNER
SUPER BANDSWITCH TUNER
ROTARY BANDSWITCH TUNER

Each channel can be individually adjusted with the fine tuning knob at the front of the receiver. The tuning mechanism does not have a stop and several turns of the tuning knob is permissible, in either direction, to obtain proper adjustment.

The Super Target Tuner is equipped with an auxiliary oscillator adjustment to be used only if adjustment cannot be made with the fine tuning knob.

BANDSWITCH TUNER OSCILLATOR ADJUSTMENTS

1. Set the fine tuning control to the center of its mechanical range. Pull off the fine tuning and channel selector knobs.

2. Use a 68-33 alignment tool and adjust each operating channel to resonance starting with the highest channel following each lower channel in sequence.

The bandswitch tuner uses a series inductance in the oscillator circuit and if more than one turn of the screw is required to tune a particular channel or if adjustment cannot be made, it may be necessary to touch up the channel 13 screw to tune channels 7 thru 13 and the channel 6 screw for channels 2 thru 6.

FOCUS

A screwdriver type focus adjustment is provided in all chassis except 14K20, 15K37 and 16K36.

In the 15K37 chassis, the focus control is part of the picture tube socket. Adjustment is made by rotating the outer rim of the socket.

In the 14K20 and 16K36 chassis a 3 position tap is used.

WIDTH AND HORIZONTAL LINEARITY ADJUSTMENTS

Adjustment in most models is made by sliding the metal width sleeve along the neck of the picture tube until proper width and linearity is obtained.

In the 14K20 and 15K37 chassis the sleeve, which is installed with the slot facing the picture tube anode button, is used to control linearity and a screwdriver adjustment at the rear of the chassis is used to adjust width. The initial adjustment is made by turning the width control to its maximum counterclockwise position then sliding the sleeve to optimize linearity. The width control is then advanced to obtain correct width.

AGC ADJUSTMENT

Tune in a strong TV signal and slowly turn the delay control until a point is reached where the picture distorts and buzz is heard in the sound. The control should then be backed down from this position and set at a point comfortably below the level of intercarrier buzz, picture distortion and improper sync.

This setting will correspond to approximately 3 V. peak to peak output from the video detector.

CAUTION: Misadjustment of the AGC control can result in a washed-out picture, distorted picture, buzz in the sound or complete loss of picture and sound.

AFC ADJUSTMENT

The horizontal hold control is equipped with a stop which limits knob rotation to approximately 270 degrees. To adjust the AFC, remove the knob and turn the shaft to a position where it is virtually impossible to disrupt horizontal synchronization when switching from channel to channel. After adjustment, install the knob with its pointer centered between the stops.

ZENITH Service Material applicable to various chassis, Continued

CENTERING ADJUSTMENT

The centering assembly is built into the yoke housing. This assembly is made of two magnetic rings which can be rotated by means of tabs. Centering is accomplished by gradually rotating the tabs with respect to each other, then rotating both tabs simultaneously until the picture is centered.

CORRECTOR MAGNET ADJUSTMENT

Two corrector magnets are used in all 23 and some 19 inch models to obtain straight, sharply focused sweep lines across the face of the picture tube. The magnets are mounted on the deflection coil mounting brackets and can be moved in and out or up and down by bending the flexible arms which support them. Adjustment has been made at the factory and should not require readjustment unless the support brackets are accidentally bent out of position. If this occurs, proceed as follows:

1. With the vertical and horizontal size controls reduce the size of the picture to a point where the four corners and sides are visible. (In some receivers it may not be possible to reduce the picture size sufficiently to see all sides and it may be necessary to shift the picture with the centering control to view one side at a time.)
2. Bend the corrector magnet arms until the corners become right angles and the top of the raster is parallel with the bottom and the left side is parallel with the right side. After adjustment, the picture should be restored to normal size.

NOTE: Misadjustment of the corrector magnets may cause pincushioning, barreling, keystoning, poor linearity, etc.

PEAK PICTURE CONTROL

ALL 23" MODELS

This is a front panel control. It is part of the video detector load and has a decided effect on the video response of the receiver. The response can be changed from a slight smear at the extreme counterclockwise position of the control to an exaggerated overshoot in the maximum clockwise position.

The control is adjusted at the factory for best picture detail under normal signal conditions, however, it can be changed in the field to suit a particular signal or program condition. As an example, an old movie can be "crispened" or the texture of "snow" in a fringe area can be changed for a more pleasing picture.

ADJACENT CHANNEL REJECT SWITCH 16K38QS CHASSIS

This switch is located at the rear of the chassis and is used to switch the 47.25 Mc adjacent channel sound trap in or out of the circuit as required.

When the trap is switched out of the circuit a slight improvement in IF band pass occurs for better picture detail. The receiver is shipped from the factory with the trap in the "out" position.

If adjacent channel sound interference is experienced, switch the trap to the "in" position.

G2 ADJUSTMENT 16K38QS CHASSIS

1. Connect the negative lead of a variable bias supply (0-6V) to the grid (Pin 7) of the 6JT8 video amplifier and the positive lead to chassis. Switch the tuner to a blank channel.

2. Connect a VTVM to the cathode of the picture tube (pin 11) and adjust the bias supply until this voltage reads 150V.

3. Connect the VTVM to grid 1 (pin 2) and adjust the brightness control for 95 volts indication on the meter.

4. Leave the meter connected to grid 1 and adjust G2 until the raster is just extinguished.

NOTE: An alternate and reasonably accurate method of adjustment is to tune in a TV signal and adjust the G2 control for 450 volts on grid 2 (pin 10)

SOUND ADJUSTMENT

Proper alignment of the 4.5 Mc intercarrier sound channel can only be made if the signal to the receiver antenna terminals is reduced to a level below the limiting point of the 6BN6 Gated Beam Detector. This level can be easily identified by the "hiss" which then accompanies the sound. Various methods may be used to reduce the signal level; however, a step attenuator is recommended for most satisfactory results.

1. Connect the step attenuator between the antenna and the receiver antenna terminals.

2. Tune in a tone modulated TV signal. Adjust the step attenuator until the signal is reduced to a level where a "hiss" is heard in the sound.

3. Adjust the sound take-off coil (top and bottom cores), intercarrier transformer, quadrature coil and buzz control for the best quality sound and minimum buzz. It must be remembered that any of these adjustments may cause the "hiss" to disappear and further reduction of the signal will be necessary to prevent the "hiss" from disappearing during alignment.

ALIGNMENT

A suitable VHF and UHF sweep generator in conjunction with an accurate marker must be used for alignment work. It is extremely important to terminate the output cable properly and to check if the attenuator is reactive. If the attenuator is reactive or if the output cable is improperly terminated, correct alignment cannot be made since the degree of attenuation may change the shape as well as the amplitude of the response curve. The attenuator should only vary the amplitude and not the shape of the response curve.

ZENITH Alignment Information for sets covered, Continued

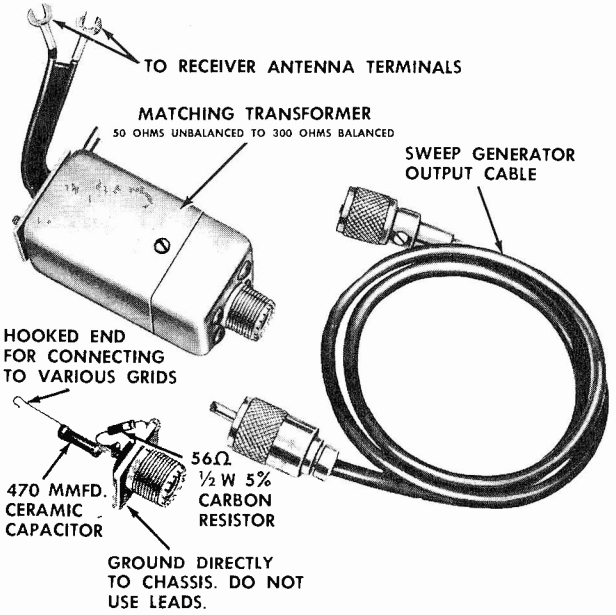


Fig. 4 IF-RF Alignment Fixtures

VIDEO IF ALIGNMENT
(15K37,16K32,16K33,16K34 & 16K38 CHASSIS)

1. Slowly turn the channel selector until the tuner rotor is made to rest between two channels. This will prevent an erroneous response.

2. Connect an oscilloscope through a 10,000 ohm isolation resistor to terminal "C" (detector). Connect the ground lead to chassis. In 23" models turn the Peak Picture Control to the extreme counter-clockwise position.

3. Feed the sweep generator through the special terminating network shown in Fig. 4 to point "G" (Pin 2 of the 3rd IF). Adjust generator to obtain a response similar to Fig. 5 with a detector output of 3 volts peak to peak. Do not exceed this level during any of the adjustments.

4. Set the marker generator to 45.75 Mc and alternately adjust the top and bottom cores of the 4th IF for maximum gain and symmetry with the 45.75 Mc marker positioned as shown in Fig. 5. The two peaks must be equal in height and the high frequency

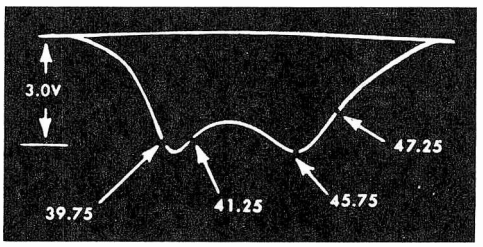


Fig. 5 4th IF Response

peak at 45.75 Mc. If the correct response cannot be obtained, check the position of the cores to see that they are not butted but are entering their respecti ve windings from the opposite ends of the coils.

5. Connect the sweep generator to terminal "A". Connect terminal "F" to chassis and connect a jumper between terminal "E" and chassis. Adjust sweep to obtain a 3V.P.P. response somewhat similar to Fig. 8. Switch oscilloscope to 10X gain to "blow up" the traps, (Fig. 6).

6. Refer to Fig. 6 and adjust the 39.75 Mc and the 41.25 Mc traps for minimum marker amplitude. Disconnect the jumper between "E" and chassis. Connect this jumper between "E" and the junction of the 22 (68 in the 15K37 chassis) and 1500 ohm resistors in the cathode of the first IF. This provides an additional "blow up" of the 47.25 Mc traps (Fig. 7). In the 16K38 chassis the receiver is shipped from the factory with the adjacent channel reject switch (at the rear of the chassis) in the "out" position. For alignment, the switch should be in the "in" position. Adjust the 47.25 Mc traps (the 15K37,16K33 and 16K34 chassis have one 47.25 Mc trap) for minimum marker amplitude.

7. Disconnect the jumper between "E" and the 22 and 1500 ohm cathode resistors. Connect this

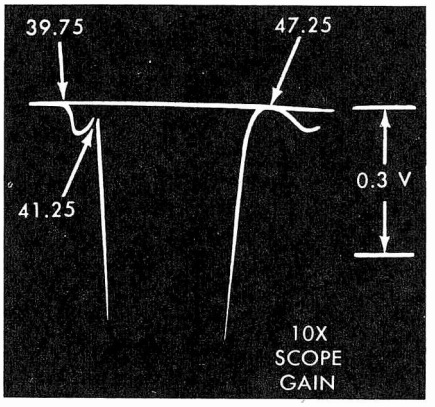


Fig. 6 Expanded View of Traps

jumper between "E" and chassis. In the 16K38 chassis switch the adjacent channel reject switch to the "out" position. Adjust sweep generator for 3 volts peak to peak output. Alternately adjust the 2nd, 3rd, 1st IF and the converter plate coil until an overall response similar to Fig. 8 (Fig. 9 for the 15K37 chassis) is obtained. It will be found that the 2nd IF affects the low side (42.75 Mc) and the 3rd IF the high side of the response.

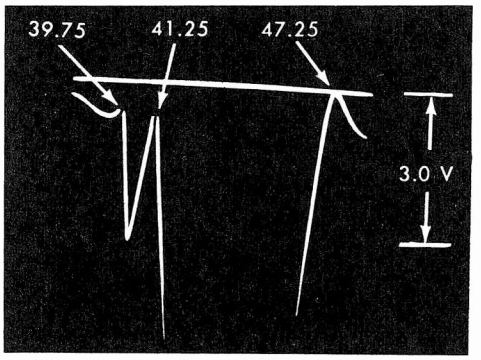


Fig. 7 Further Expansion of Fig. 6 for Detail View of the 39.75 and 47.25 Mc Traps.

ZENITH Alignment Information for sets covered, Continued

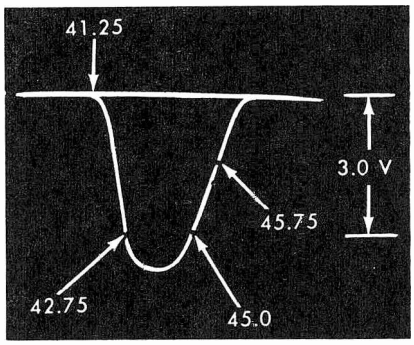


Fig. 8 Overall IF Response

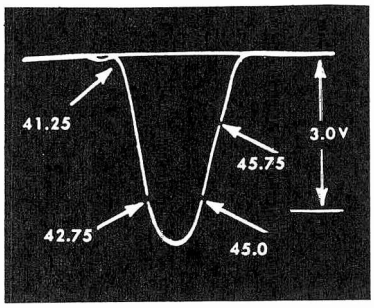


Fig. 9 Overall IF Response
15K37 CHASSIS

VIDEO IF ALIGNMENT

(14K20, 16K30 & 16K36 CHASSIS)

1. Slowly turn the channel selector until the tuner rotor is made to rest between two channels. This will prevent an erroneous response.

2. Connect an oscilloscope through a 10,000 ohm isolation resistor to terminal "C" (detector). Connect the ground lead to chassis.

3. Feed the sweep generator through the special terminating network as shown in Fig. 4 to point "G" (Pin 1 of the 3rd IF). Adjust generator to obtain a response similar to Fig. 12. Do not exceed the 3 volt peak to peak detector output during any of the following adjustments.

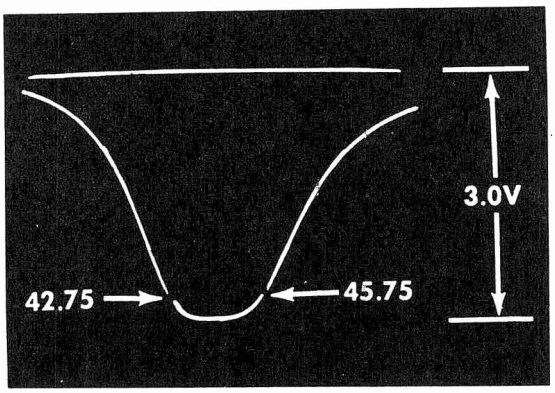


Fig. 10 4th IF Response
14K20, 16K30 & 16K36 CHASSIS

4. Set the marker generator to 45.75 Mc and alternately adjust the top and bottom cores of the 4th IF for maximum gain and symmetry with the 45.75 Mc and the 42.75 Mc markers positioned as shown in Fig. 10. If the correct response cannot be obtained, check the position of the cores to see that they are not butted but are entering their respective windings from the opposite ends of the coils.

5. Connect the sweep generator to terminal "A" (converter grid, Fig. 1 or 2 depending on tuner). Connect terminal "F" to chassis and connect a jumper between terminal "E" and the junction of the 68 and 1500 ohm resistors in the cathode of the first IF. This provides a "Blow Up" of the 47.25 Mc trap (Fig. 11). Adjust the 47.25 Mc trap for minimum marker amplitude.

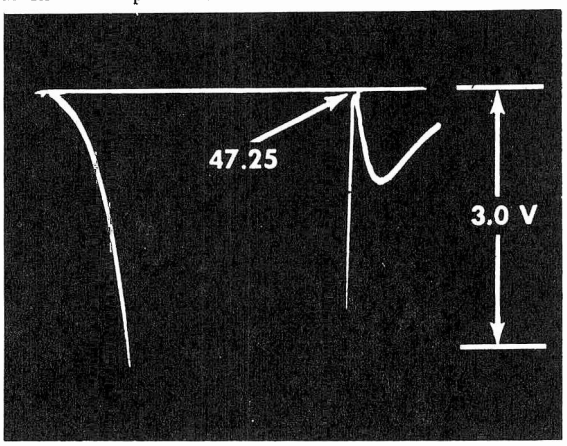


Fig. 11 Expanded View of the 47.25 Mc Trap,
14K20, 16K30 & 16K36 Chassis

6. Disconnect the jumper between "E" and the 68 and 1500 ohm cathode resistors. Connect this jumper between "E" and chassis. Adjust sweep generator for 3 volts peak to peak output. Alternately adjust the 2nd, 3rd, 1st IF and the converter plate coil until an overall response similar to Fig. 12 is

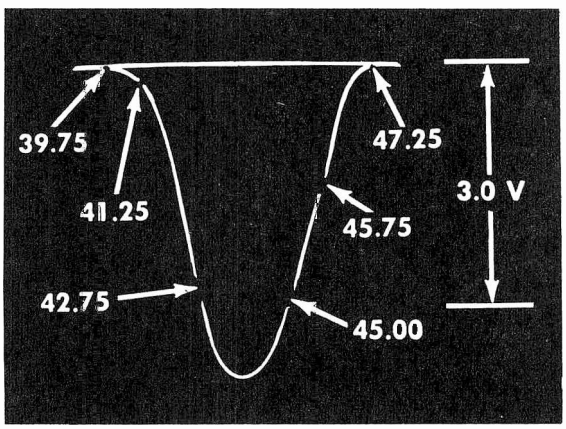
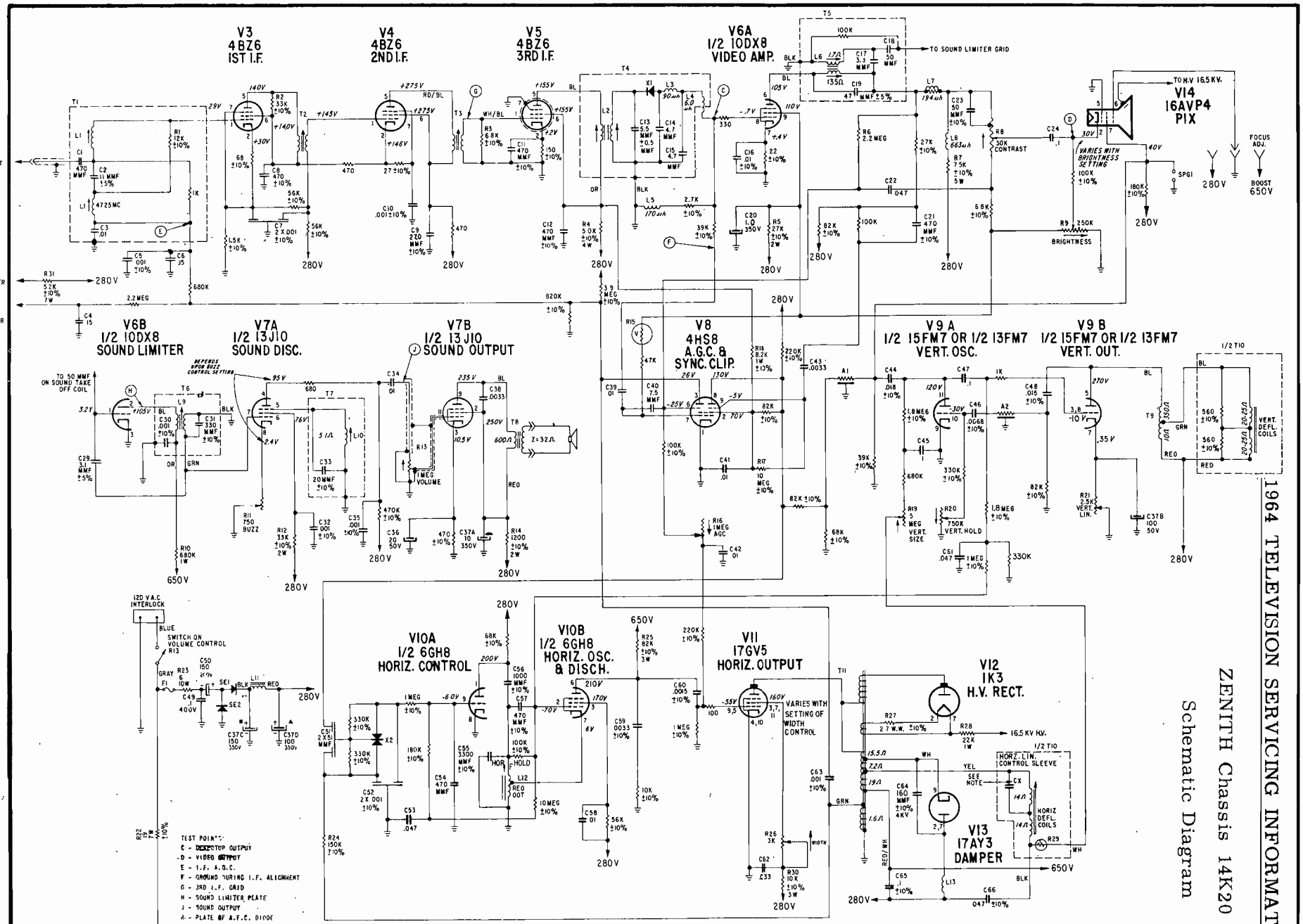


Fig. 12 Overall IF Response
14K20, 16K30 & 16K36 Chassis

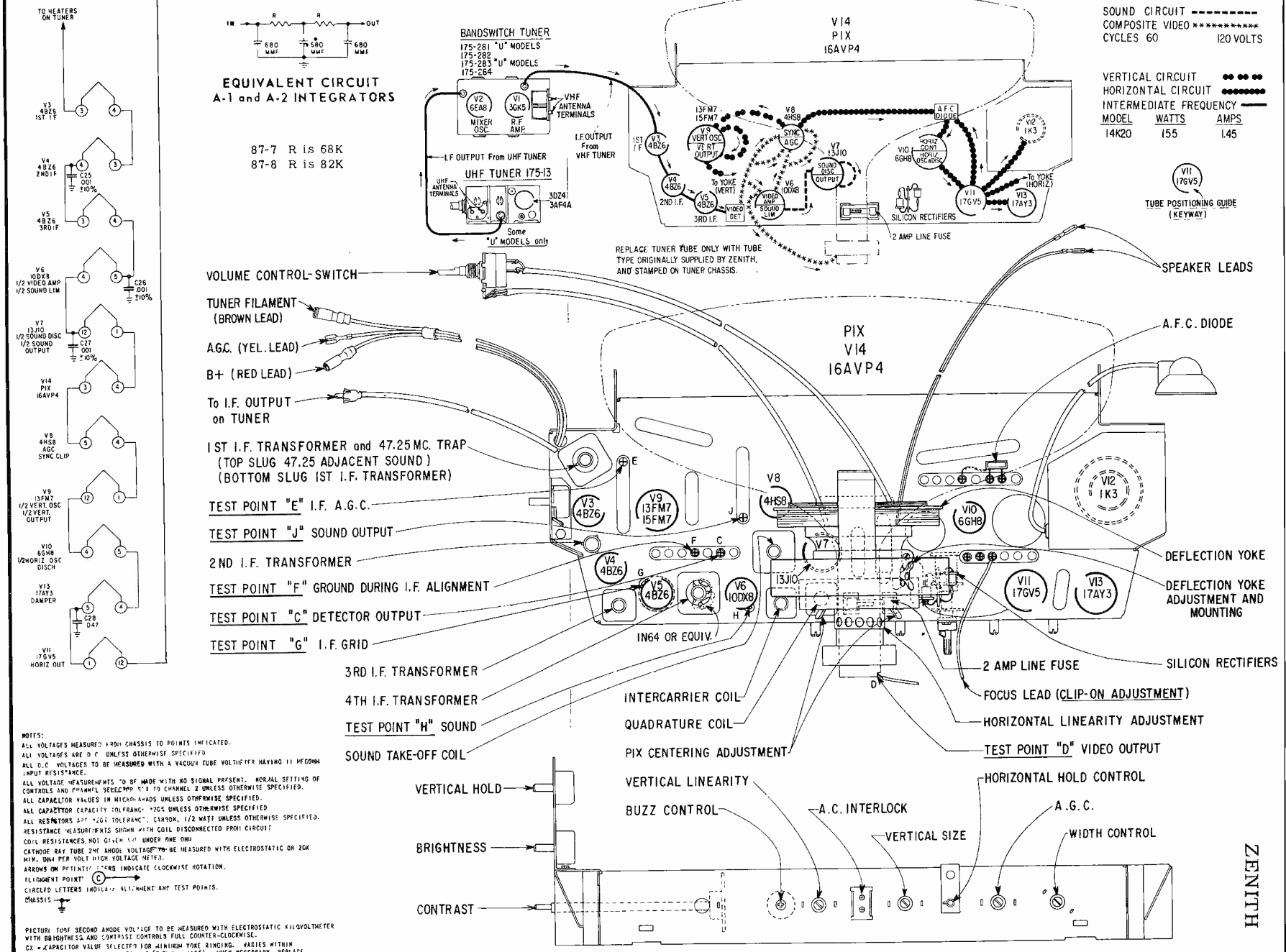
obtained. It will be found that the 2nd IF affects the low side (42.75 Mc) and the 3rd IF the high side of the response. Remove jumpers after alignment.



Schematic Diagram, Tube and Trimmer Layout and Signal Path Chart 14K20 Chassis.

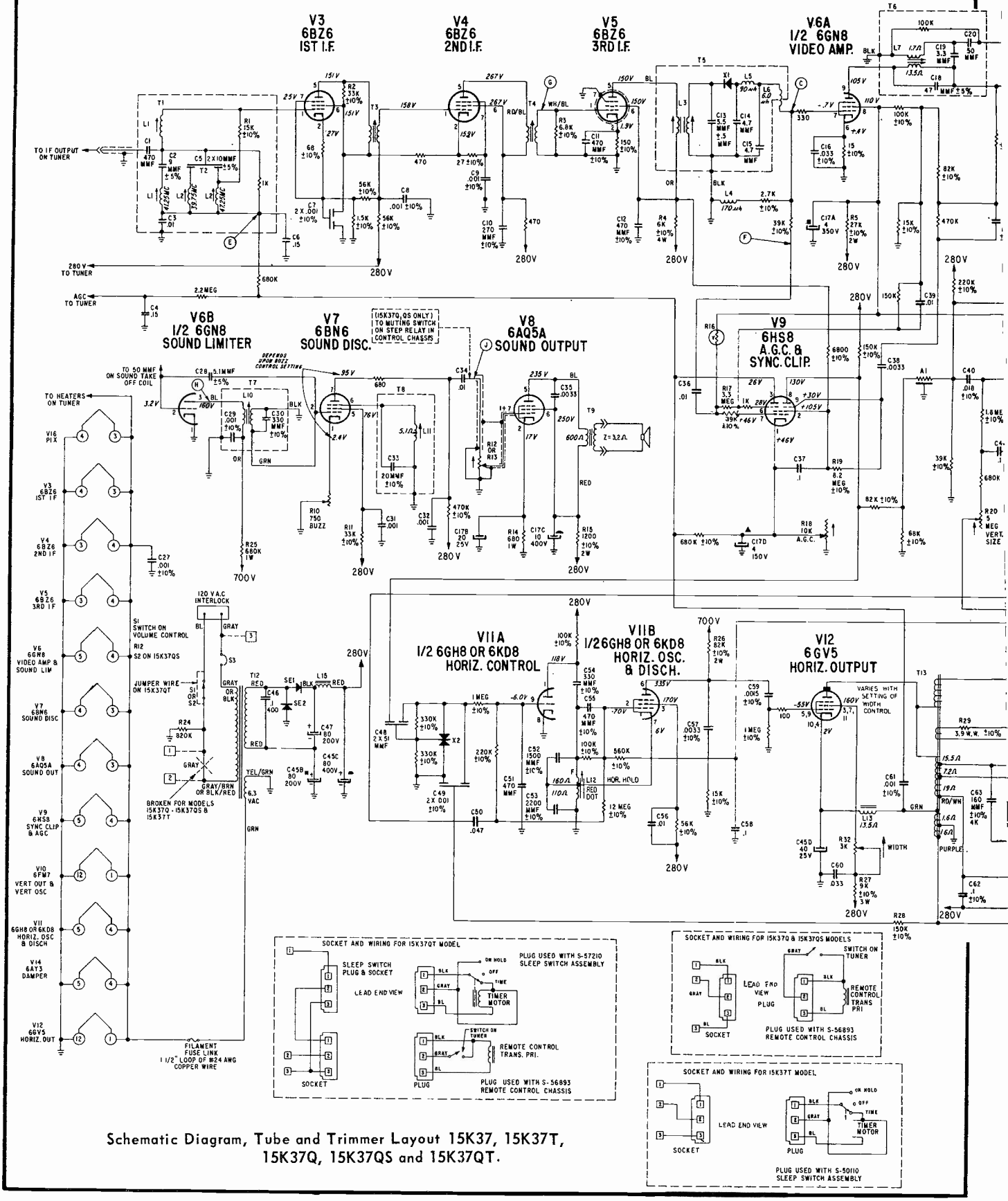
ZENITH Chassis 14K20

Schematic Diagram



Schematic Diagram, Tube and Trimmer Layout and Signal Path Chart 14K20 Chassis.

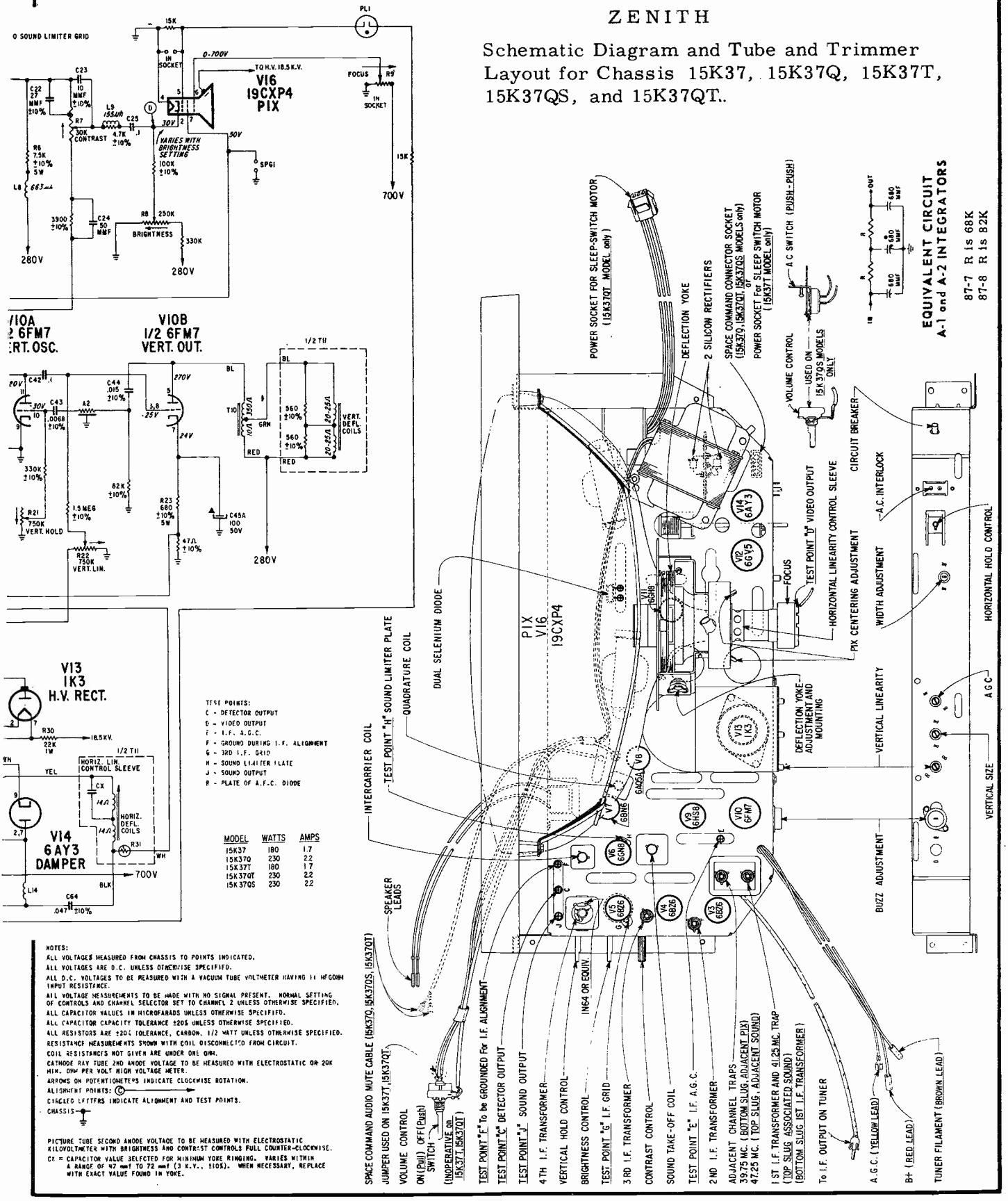
ZENITH Chassis 15K37, 15K37Q, 15K37QS, 15K37QT, 15K37T

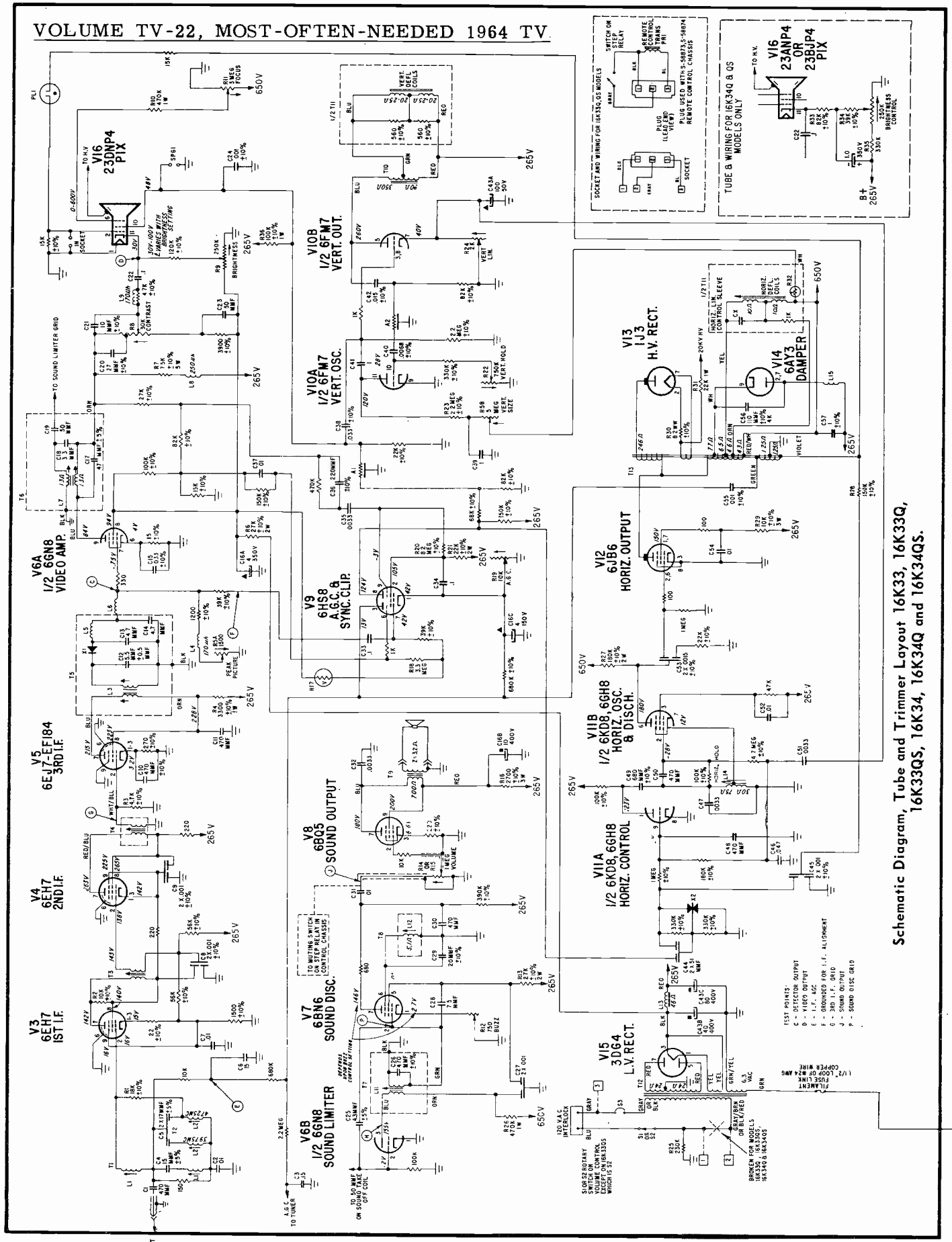


Schematic Diagram, Tube and Trimmer Layout 15K37, 15K37T, 15K37Q, 15K37QS and 15K37QT.

ZENITH

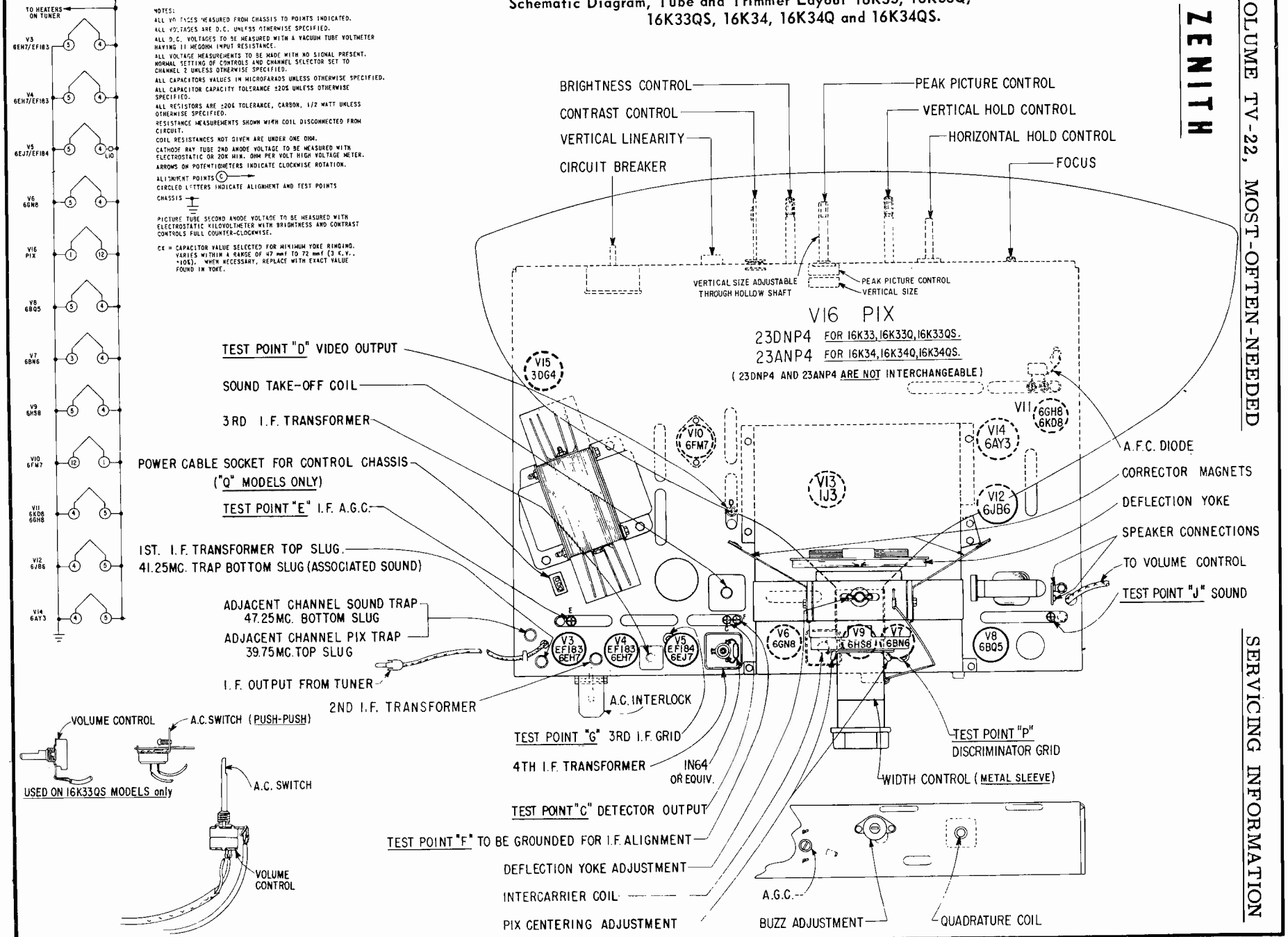
Schematic Diagram and Tube and Trimmer Layout for Chassis 15K37, 15K37Q, 15K37T, 15K37QS, and 15K37QT..

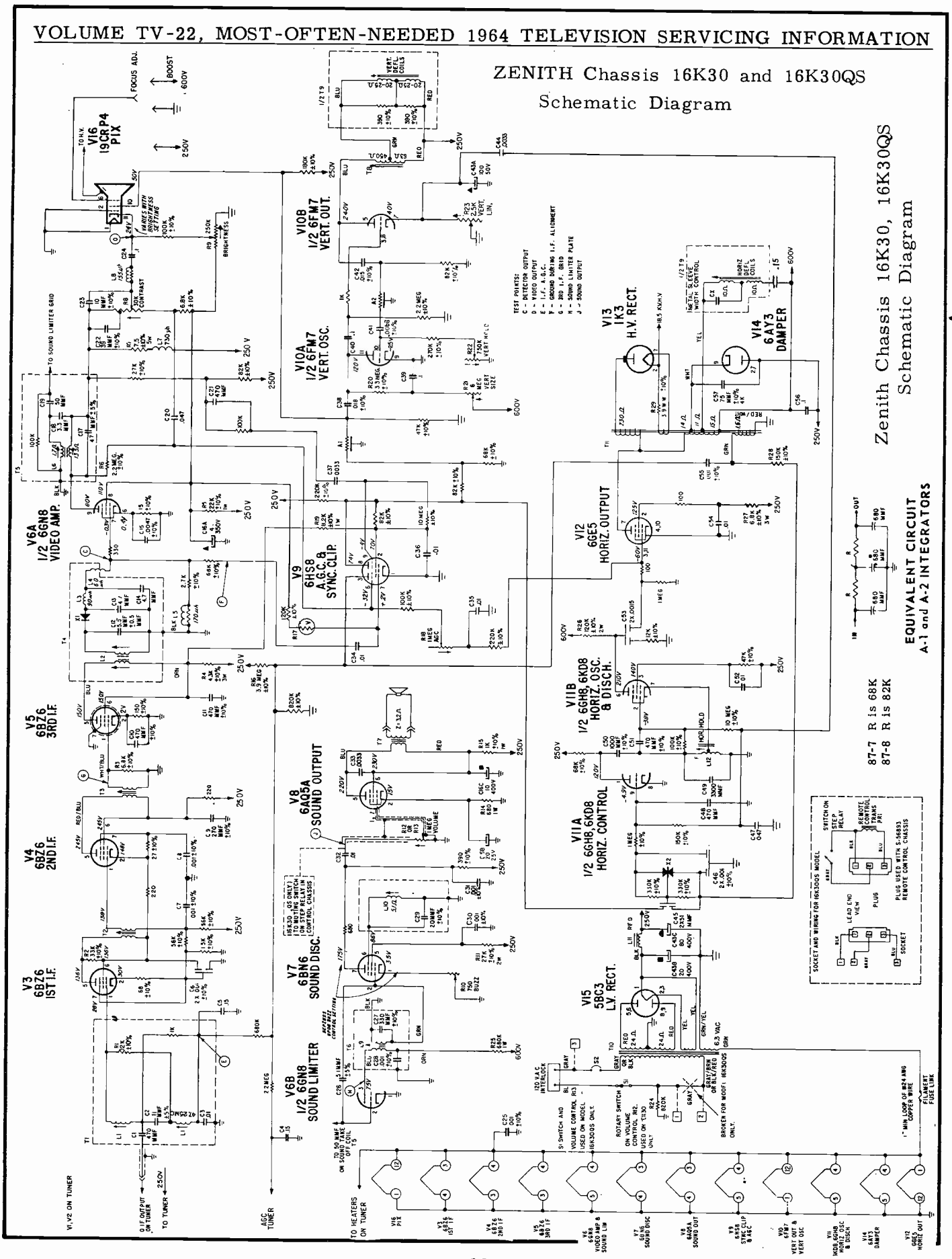




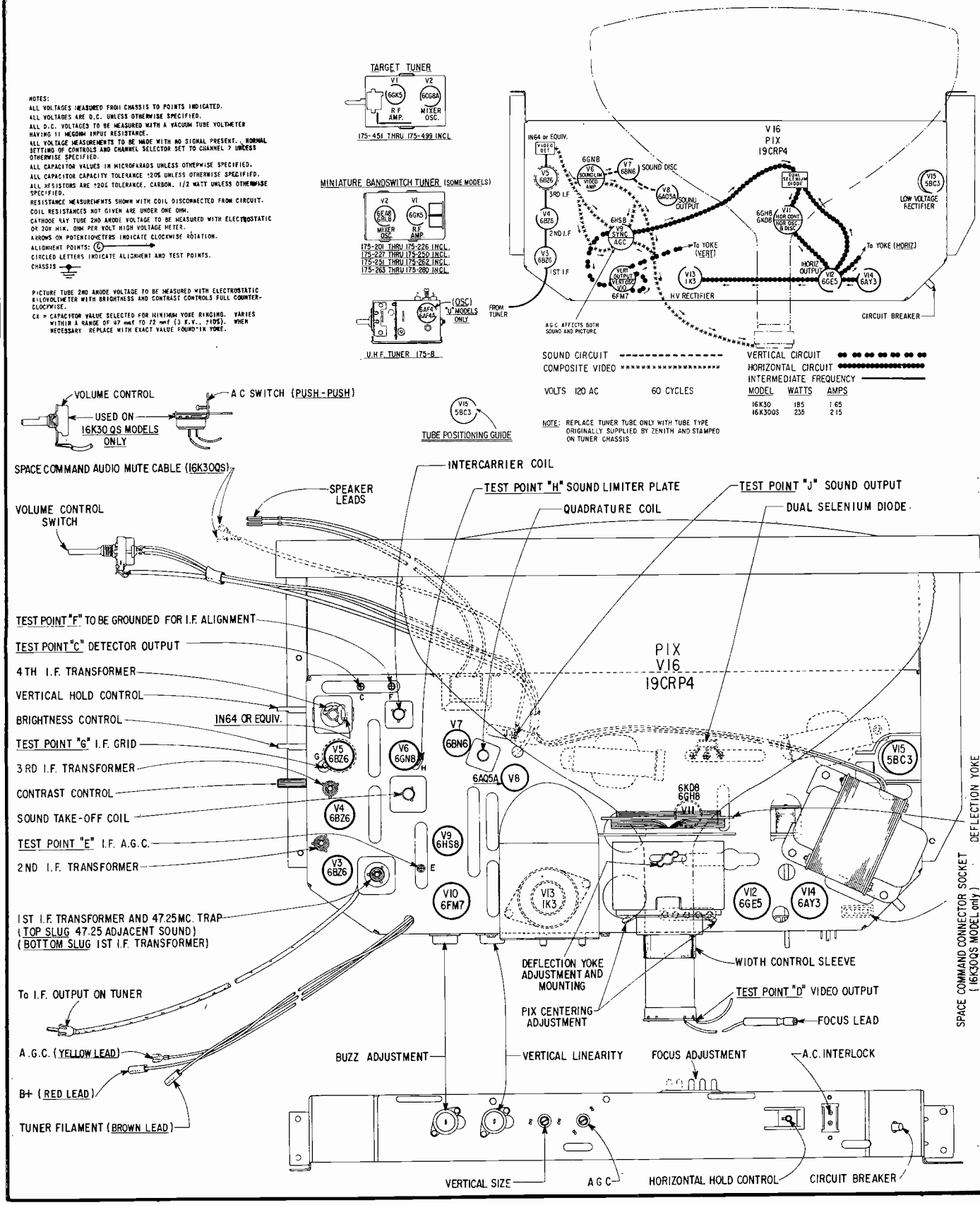
Schematic Diagram, Tube and Trimmer Layout 16K33, 16K33Q, 16K33QS, 16K34, 16K34Q and 16K34QS.

Schematic Diagram, Tube and Trimmer Layout 16K33, 16K33Q, 16K33QS, 16K34, 16K34Q and 16K34QS.




ZENITH Chassis 16K30 and 16K30QS
Schematic Diagram
Zenith Chassis 16K30, 16K30QS
Schematic Diagram
V1 19CRP4 PIX
V2 6FM7 VERT. OUT.
V3 6BZ6 1ST I.F.
V4 6BZ6 2ND I.F.
V5 6BZ6 3RD I.F.
V6A 1/2 6GN8 VIDEO AMP.
V6B 1/2 6GN8 SOUND LIMITER
V7 6BN6 SOUND DISC.
V8 6AQ5A SOUND OUTPUT
V9 6HS8 A.G.C. & SYNC. CLIP.
V10A 1/2 6FM7 VERT. OSC.
V10B 1/2 6FM7 VERT. OUT.
V11A 1/2 6GH8, 6KD8 HORIZ. CONTROL
V11B 1/2 6GH8, 6KD8 HORIZ. OSC. & DISCH.
V12 6GE5 HORIZ. OUTPUT
V13 1K3 H.V. RECT.
V14 6AY3 DAMPER
V15 5BC3 L.V. RECT.
V16 6GH8 VIDEO AMP & SOUND LIM
TEST POINTS:
C - DETECTION OUTPUT
D - TUNED OUTPUT
E - I.F. GROUND DURING I.F. ALIGNMENT
G - RED GRID
H - SOUND LIMITER PLATE
J - SOUND OUTPUT
EQUIVALENT CIRCUIT
A-1 and A-2 INTEGRATORS
87-7 R is 68K
87-8 R is 82K
TO TUNER
AGC
TO HEATERS ON TUNER

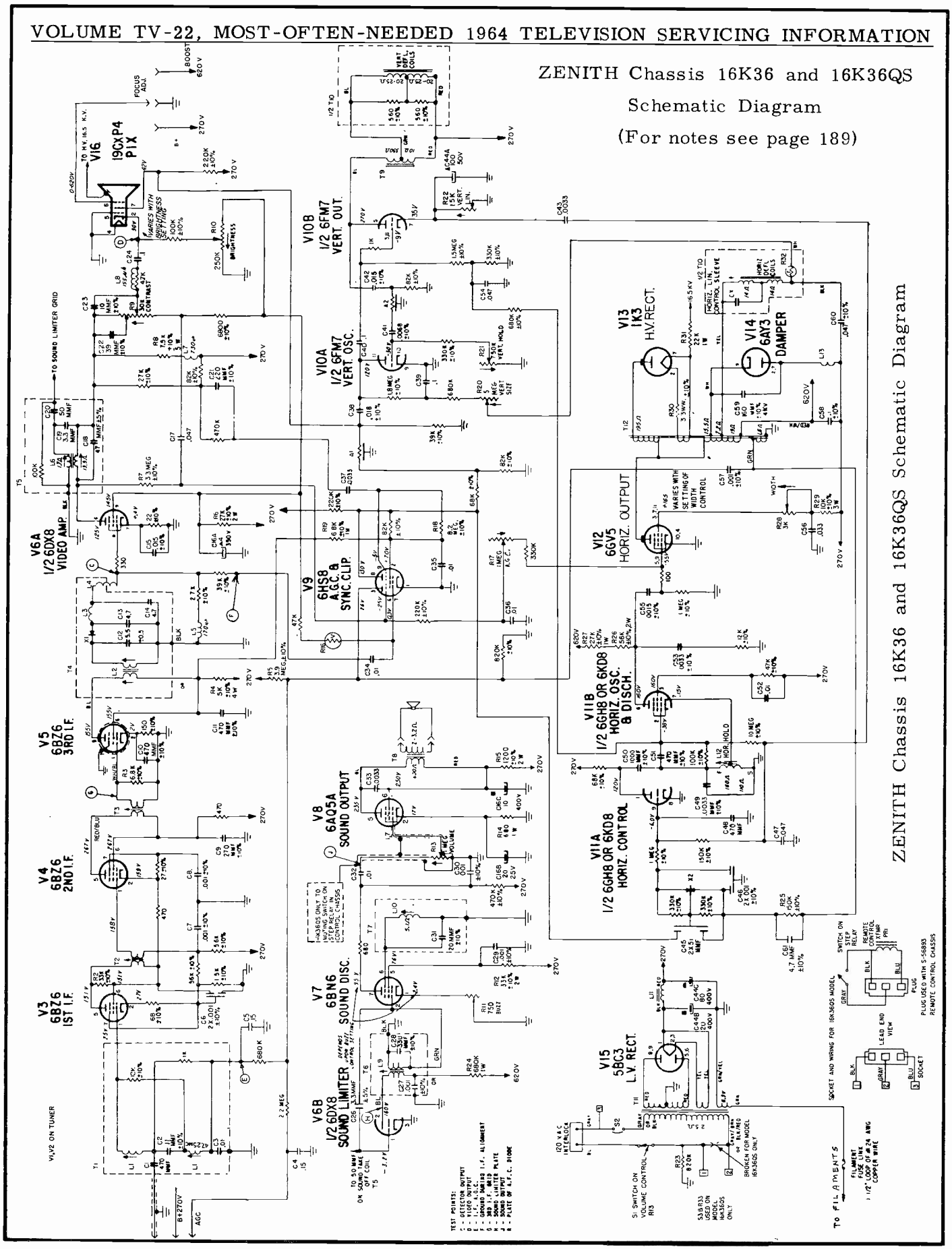
ZENITH Chassis 16K30 and 16K30QS Tube and Trimmer Layout & Signal Path Chart



ZENITH Chassis 16K36 and 16K36QS

Schematic Diagram

(For notes see page 189)



ZENITH Chassis 16K36 and 16K36QS Schematic Diagram

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Under each manufacturer's name, at left there are listed that make chassis and models in numerical order. The corresponding page number at right of each listing refers to the first page of the section dealing with such material.

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