

ADMIRAL®

TV Installation, Alignment & Service Data

FOR MODELS USING

16G9B

16UG9B

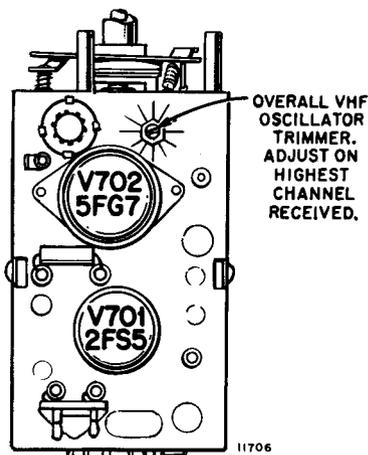
CHASSIS STAMPED
RUN 10

ST888-1G

CHANNEL ADJUSTMENT FOR VHF ONLY SETS

These sets are provided with an over-all channel adjustment screw, see illustration. Adjust 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 to be adjusted. Set Fine Tuning control at center of tuning range, by rotating it one third turn clockwise from full counter-clockwise rotation. Set other tuning controls for normal picture and sound.
3. Using a non-metallic alignment tool with metal tip blade, carefully adjust channel screw for best picture. Note: Sound may not be loudest at this point.
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.

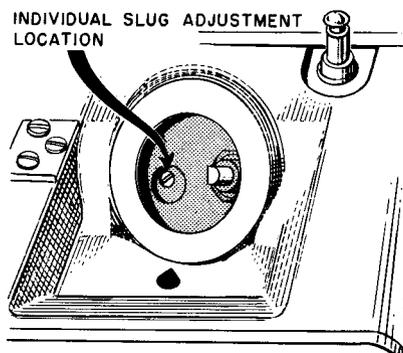


Channel Adjustment Location for VHF Only Sets.

CHANNEL ADJUSTMENT FOR VHF-UHF SETS

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

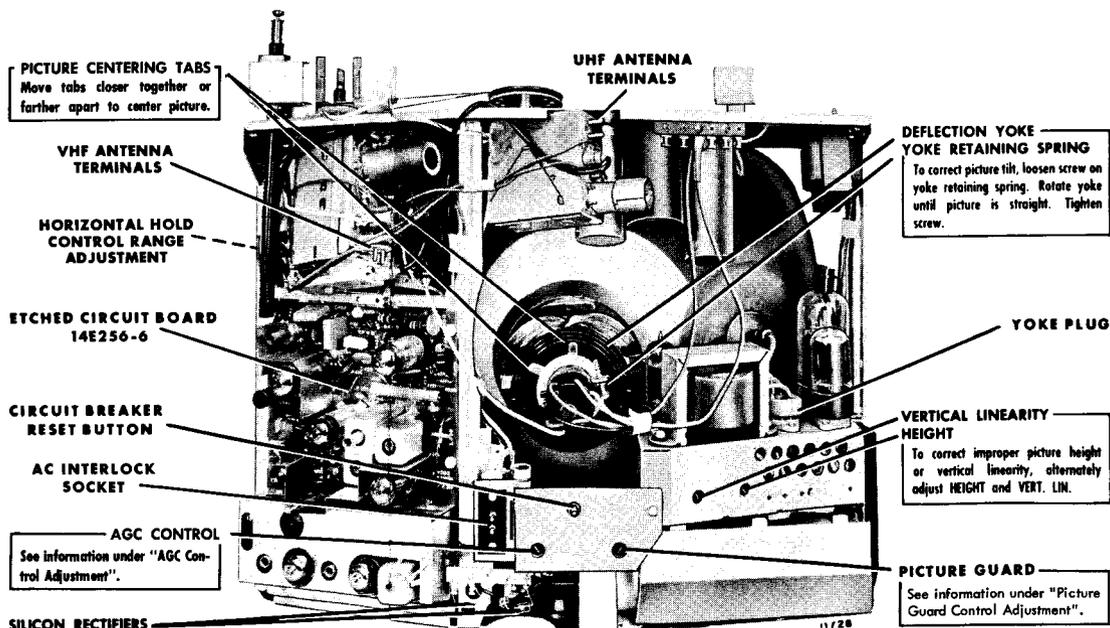
1. Turn receiver on and allow 15 minutes warm up.
2. Set Channel Selector at channel to be adjusted. Set other tuning controls for normal picture and sound.
3. Remove Channel Selector knob, Fine Tuning knob and plastic cup below knobs.
4. Rotate fine tuning shaft so that adjustment screw is visible through hole at front of VHF tuner.
5. Using a non-metallic alignment tool with 1/8" blade (part number 98A30-13), carefully adjust channel screw for best picture. Note: Sound may not be loudest at this point. Repeat procedure for each channel to be adjusted.



Channel Adjustment Location for VHF-UHF Sets.

MODEL CHART

Model	Chassis
P901	16G9B
UP901	16UG9B
P909	16G9B
UP909	16UG9B



Rear View of Chassis Showing Adjustment Locations (UHF Tuner in 16UG9B Chassis).

TELEVISION ALIGNMENT

IF AMPLIFIER ALIGNMENT

Connect isolation transformer between AC line and receiver. Connect negative of 3 volt bias supply through 10K resistor to test points "T" (IF AGC) and "X" (RF AGC). Connect negative of 9 volt bias supply to center terminal of picture guard control, positive to chassis. See figure B.

Connect signal generator high side to insulated tube shield over 5CG8 tube, low side to chassis near tube shield.

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 a jumper wire across the antenna terminals. Set Contrast control fully to the right. Set AGC control fully to the left.

Allow about 15 minutes for receiver and test equipment to warm up. Use a non-metallic alignment tool, part no. 98A30-13.

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

- *1 Set generator at 42.7 MC and adjust A2 for maximum.
- *2 Set generator at 44.2 MC and adjust A1 for maximum.
3. Repeat adjustment of Step 1.
- †4. Set generator at 44.3 MC and adjust A3 for maximum.
5. Connect wire jumper across IF input coil L301.
- †6. Set generator at 44.8 MC and adjust A5 for maximum.
7. Remove wire jumper from across IF input coil L301.
- †8. Set generator at 42.7 MC and adjust A4 for maximum.
9. Set generator at 47.25 and adjust A14 for minimum.
10. To insure correct IF alignment, make "IF Response Curve Check" given below.

*If necessary, increase generator output and/or reduce bias to $-1\frac{1}{2}$ volts to obtain a definite indication on VTVM.

†If necessary, keep reducing generator output so that VTVM reading will be 1.5 to 2.5 volts above no signal voltage reading.

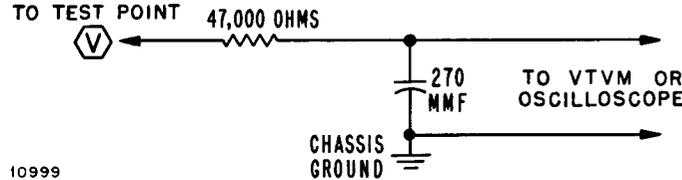


Figure A. Decoupling Filter.

10999

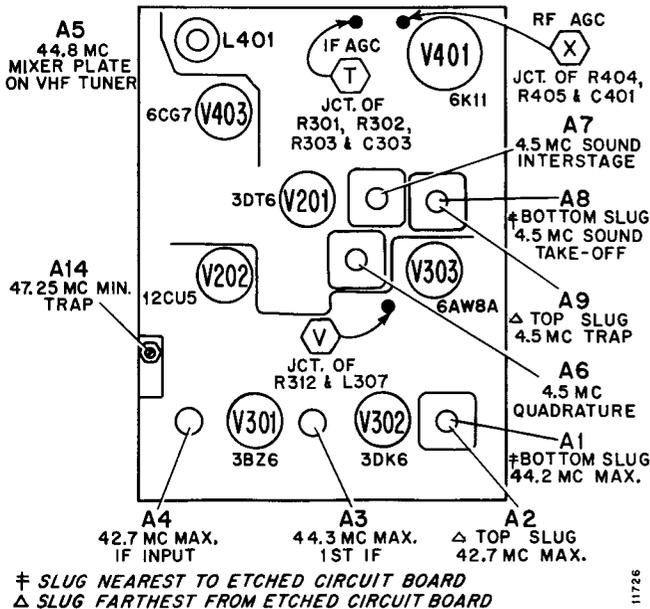


Figure B. View of Etched Circuit Board Showing Test Point Locations and IF Alignment Data.

IF RESPONSE CURVE CHECK AND IF TRAP ALIGNMENT

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. Contrast control full to left. Connect negative of 3 volt bias supply to test points "T" (IF AGC) and "X" (RF AGC), positive to chassis ground. See figure B.
3. Connect sweep generator high side to insulated tube shield over 5CG8 tube, low side to chassis near tube shield. Set sweep frequency to 43 MC, sweep width approximately 7MC. If external marker generator is used, loosely couple high side to sweep generator lead on tube shield, low side to chassis. 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 response curve amplitude without altering the shape of the response curve.

If video IF carrier marker (45.75 MC) does not fall at the 50 to 60% point on curve, position it with adjustment of A5. If curve is not symmetrical, adjust A3.

For sets with 16UG9B VHF-UHF chassis, set VHF tuner to UHF position. Feed IF sweep generator to VHF antenna terminals through 300 ohm matching pad. Adjust A13 for minimum overall response, see figures D and F. NOTE: More than two peaks may appear on response curve.

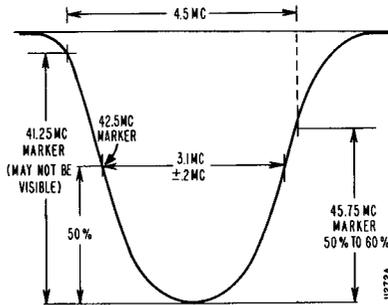


Figure C. Ideal IF Response Curve.

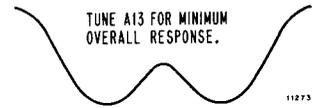


Figure D. Over-all Response for 41 MC IF Trap Adjustment.

VHF AMPLIFIER AND MIXER ALIGNMENT FOR VHF TUNER 94E163-10

Connect isolation transformer between AC line and receiver. Allow about 15 minutes for receiver and test equipment to warm up. See figure F for adjustment locations.

Connect negative of 3.0 volt bias supply to test point "X" (RF AGC), positive to chassis, see figure B.

Connect sweep generator 300 ohm output to antenna terminals. If sweep generator does not have a built-in marker generator, loosely couple a marker generator to the antenna terminals. To avoid distortion of the response curve, keep sweep generator output at a minimum, marker pips just barely visible.

Connect oscilloscope high side through 15,000 ohm resistor to test point "W" on tuner, low side to chassis. Keep scope leads away from chassis.

Do not remove VHF Tuner bottom shield during alignment.

1. Set sweep generator sweeping channel 10. Video marker at 193.25 MC; sound marker at 197.75 MC. Set Channel Selector to channel 10. Check response obtained with VHF response curve shown in figure E. Alternately adjust A10 and A11 as required to obtain curve having maximum amplitude, symmetry and flat top appearance consistent with proper bandwidth and correct marker location.
2. Set sweep generator sweeping channel 6. Video marker at 83.25 MC; sound marker at 87.75 MC. Set Channel Selector to channel 6. Check response obtained with VHF response curve. If curve is not within limits, compromise adjustment is required. Alternately adjust A10 and A11 as required to obtain curve having maximum amplitude, symmetry and flat top appearance consistent with proper bandwidth and correct marker location. After adjustment, recheck adjustment of step 1.

3. Set the sweep generator to sweep the channel to be checked. Set the marker generator for the corresponding video carrier frequency and sound carrier frequency. Use 3 volts bias. Check each channel operating in the service area for curve shape. In general, adjustment performed in steps 1 and 2 are sufficient to give satisfactory response curves on all channels. However, if reasonable alignment is not obtained on an operating channel, repeat steps 1 and 2 as a compromise adjustment to favor the particular channel. If a compromise adjustment is made, other channels operating in the service area should be checked to make certain that they have not been appreciably affected.

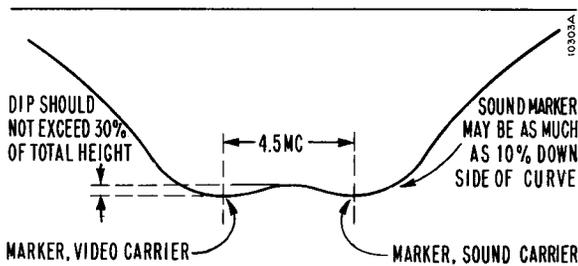


Figure E. Ideal VHF Response Curve.

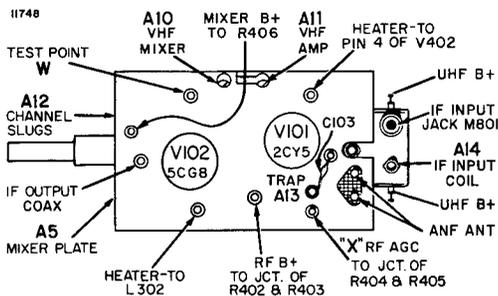


Figure F. Top View of VHF Tuner 94E163-10.

VHF AMPLIFIER AND MIXER ALIGNMENT FOR VHF TUNER 94E203-1

Tuner 94E203-1 is a switch type VHF tuner featuring high stability and trouble-free operation. The inductors of this tuner are an integral part of the channel switch and in general, alignment is permanent. However, an over-all oscillator adjustment screw A12 is provided at top of tuner, should channel oscillator adjustment be required after replacement of VHF oscillator tube. See figure G. If it is definitely determined that complete tuner alignment is required, return tuner to Admiral Distributor for repair or replacement.

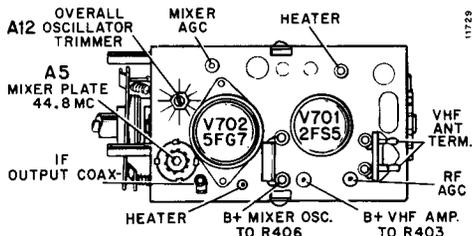


Figure G. Top View of VHF Tuner 94E203-1.

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 to test points "T" (IF AGC) and "X" (RF AGC), positive to chassis, see figure B.

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 H. If curve is not within tolerance, touch up the IF slugs, as instructed. 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.

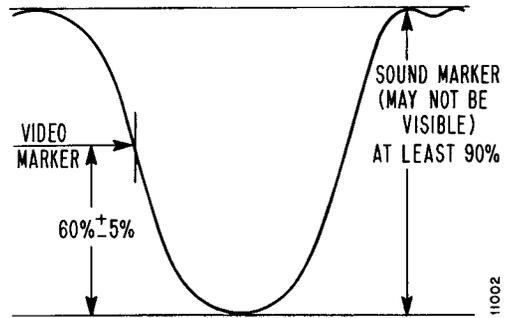


Figure H. Ideal Over-all VHF and IF Response Curve.

ALIGNMENT OF 4.5 MC TRAP

Alignment of 4.5 MC (beat interference) trap A9 requires use of a hexagonal non-metallic alignment tool (part number 98A30-12).

To align 4.5 MC trap A9, tune in television station with beat interference pattern in picture. While closely observing picture, adjust slug A9 for minimum interference pattern.

Note that adjustment A9 is top slug (slug farthest from etched circuit board). Use caution so as not to disturb bottom slug (slug nearest etched circuit board) as sound IF alignment will be affected.

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 "A6" several turns to left until a buzz is heard in sound. Then slowly turn slug "A6" to the right for loudest and clearest sound. NOTE: There may be two points (approx. 1/2 turn apart) at which sound is loudest. The slug should be set at center of first point of loudest sound noted as slug is turned in (toward etched circuit board).

3. Set Contrast control fully to the left. 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 "A7" for loudest and clearest sound with minimum hiss. If hiss disappears during alignment, reduce signal to maintain hiss level. Readjust slug "A7".

5. 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". Caution: Slug "A8" is located nearest bottom of shield can. Use care so as not to disturb slug nearest top of shield can.

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 "A6" unless sound is distorted. If "A6" is readjusted, all steps in alignment procedure should be repeated exactly as instructed.

ALIGNMENT OF UHF IF INPUT COIL USING A TRANSMITTED SIGNAL

Alignment of UHF IF input coil L807 (VHF Tuner 94E163-10) 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 L807; tune in UHF channel with normal picture and sound. Using non-metallic alignment tool (Admiral part number 98A30-14) very carefully adjust slug A14 for best picture, consistent with good sound. For VHF tuner adjustment locations, see figure F.

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 to maximum (fully to 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 further 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 only on the strongest TV station received. If adjustment is made on a weak station, AGC overload may occur when a strong TV station is tuned in.

Note: For Picture Guard Adjustment see following paragraph.

PICTURE GUARD ADJUSTMENT

The Picture Guard control cannot be set properly if the Horizontal Lock, Vertical Hold or AGC controls are out of adjustment. Before attempting to adjust the AGC control, see information under "AGC Control Adjustment".

The Picture Guard control is used to improve sync stability in areas (especially fringe areas) where interference caused by ignition systems, switches, motors, etc. results in an unstable picture. **NOTE:** This control has been adjusted at the factory. It should only be turned from its original position if picture is unstable (jitters or loses sync) due to noise.

To adjust, turn Picture Guard control (at rear of set) to the right until picture becomes stable. A compromise setting of the control may be required in areas having both strong and weak signals. If the control is set too far right, picture may overload on strong signals.

IMPORTANT: Keep Picture Guard control as far to the left as possible while still maintaining good sync stability on all channels. If control is turned too far to the right in a strong signal area, picture instability may result.

HORIZONTAL SWEEP ADJUSTMENT

Make adjustment if picture "slips sideways" or "tears" when switching channels. If the Horizontal Oscillator tube V403 (6CG7) is replaced, the Horizontal Hold control may require adjustment.

1. Allow a few minutes for set to warm up. Tune in weakest station, set Brightness and Contrast controls for normal picture.
2. Adjust Horizontal Hold control to sync the horizontal sweep circuit. If the picture cannot be locked-in at approximately the mid-rotation setting of the Horizontal Hold control, perform the following steps for complete horizontal sweep circuit alignment.
3. Connect a jumper wire from junction of R452 (680K) and R453 (1 Meg) to ground to short out oscillator control voltage from Horizontal Phase Detector, CR401. Connect a jumper wire across C452 (.0039 MF) on Etched Circuit Board. This effectively shorts out the Horizontal Lock coil L401.

Adjust Horizontal Hold control until one horizontal blanking bar (from top to bottom of picture) appears on the screen. This bar may waver back and forth slightly which is normal. If this condition is not reached when Horizontal Hold control is at approximately mid-rotation, change the position of the built-in jumper that is connected between R458 and R469. Short R458 or R469 with jumper or leave both unshortened to obtain one horizontal blanking bar when Horizontal Hold control is set to approximately mid-rotation.

4. Remove jumper from C452 (.0039 MF). Adjust Horizontal Lock coil, L401, until the horizontal blanking bar appears on the screen. Remove remaining jumper wire. Picture will lock into sync. If picture does not lock-in, trouble shooting of horizontal circuitry is necessary to find source of trouble.

PARTS LIST

Only special parts are listed below. Order by part number and description from Admiral Distributor.

RESISTORS

Sym.	Description	Part No.
R208	3 megohms, Volume	75C 2-27
R320	25,000 ohms, Contrast	75D 20-122
R322	200,000 ohms, Brightness	75D 13-113
R401	200,000 ohms, AGC	75D 20-143
R419	300,000 ohms, Vert. Hold	75D 20-120
R421	5 megohms, Height	75D 20-119
R432	3.8 ohms (measured when cold) thermistor	61A 27
R435	750 ohms, Vert. Lin.	75D 20-124
R466	1 ohm, 1/2 watt	60B 28-63
R470	15,000 ohms, Horiz. Hold	75D 20-130
R473	100,000 ohms, Picture Guard	75D 20-145
R501	51 ohms, 20 watts in 16G9	61B 3-34
R504	46 ohms, 20 watts in 16UG9	61B 3-35
	10 ohms, 15 watts	61B 1-58

CAPACITORS

C202	4.5 mmf, 450 volts, 5% comp.	65B 40-045
C203	82 mmf, 500 volts, 5%, cer. disc, NPO temp. coeff.	65D 10-98
C207	18 mmf, 500 volts, 5%, cer. disc, NPO temp. coeff.	65D 10-140
C208	.047 mf, 200 volts, molded, 4%, drift, mylar dielec.	64C 16-55
C211	.01 mf, 1.4KV, cer. disc.	65D 10-65
C212	40 mf, 200 volts, electrolytic	67A 4-21
C301	39 mmf, 500 volts, 5%, ceramic	65D 10-120
C314	47 mmf, 500 volts, 5%, cer. disc, NPO temp. coeff.	65D 10-92
C316	47 mmf, 500 volts, 5%, cer. disc, NPO temp. coeff.	65D 10-92
C320	6.8 mmf, 500 volts, 5%, cer. disc, NPO temp. coeff.	65B 27-068
C403	.001 mf, 1KV, cer. disc.	65D 10-47
C407	100 mmf, 500 volts, 5%, cer. disc, NPO temp. coeff.	65D 10-105
C410	.022 mf, 1KV, 10%, mylar dielec, 2% drift.	64C 2-51
C411	.039 mf, 200 volts, 10%, mylar dielec, 2% drift.	64C 26-25

CAPACITORS (Cont.)

Sym.	Description	Part No.
C415	.1 mf, 1KV, molded	64C 2-52
C416	.0068 mf, 1.6 KV, molded	64C 2-58
C421	.047 mf, 1KV, molded	64B 2-30
C422	.047 mf, 1KV, molded	64B 2-30
C423	.1 mf, 1KV, molded	64C 2-52
C452	.0039 mf, 300 volts, mica	65B 21-392
C455	820 mmf, 300 volts, mica	65B 21-821
C457	680 mmf, 500 volts, mica	65B 21-681
C461	100 mmf, 4KV, 10%, cer.	65D 10-212
C501	.047 mf, 1KV, molded	63B 12-1
C502	150 mf, 200 volts, electrolytic	67D 15-234
C503	.001 mf, 1KV, cer. disc.	65D 10-147
C504A	100 mf, 350 volts	electro-lytic 67D 15-331
C504B	100 mf, 350 volts	
C505A	50 mf, 350 volts	electro-lytic 67D 15-333
C505B	60 mf, 200 volts	
C505C	5 mf, 200 volts	
C505D	100 mf, 50 volts	

COILS AND TRANSFORMERS

L201	Phase Shift and Sound IF	72B 208-1
L202	Quadrature Coil	72B 132-37
L301	IF Input Coil	72C 132-41
L305	RF Choke Coil (Orange Dot)	73B 31-1
L306	Video Peaking Coil	73B 5-20
L307	Resonant Choke Coil	73B 31-3
L308	Video Peaking Coil	73B 5-39
L309	Video Peaking Coil	73B 5-34
L310	Trap Coil	73B 37-3
L311	Coupling Coil	73B 37-6
L401	Horizontal Lock Coil	94D 17-14
L501	RF Choke Coil	73B 31-1
L502	Filter Choke (1.1 henry)	74C 18-33
T201	Audio Output Transformer	79D 33-28
T301	1st IF Transformer	72C 132-42
T302	2nd IF Transformer	72B 207-2
T303	Sound Take-Off Transformer	72C 185-2
T401	Vertical Output Transformer	79B 43-20
T402	Deflection Yoke	94D 189-4
T403	Horizontal Output Trans.	79D 83-8

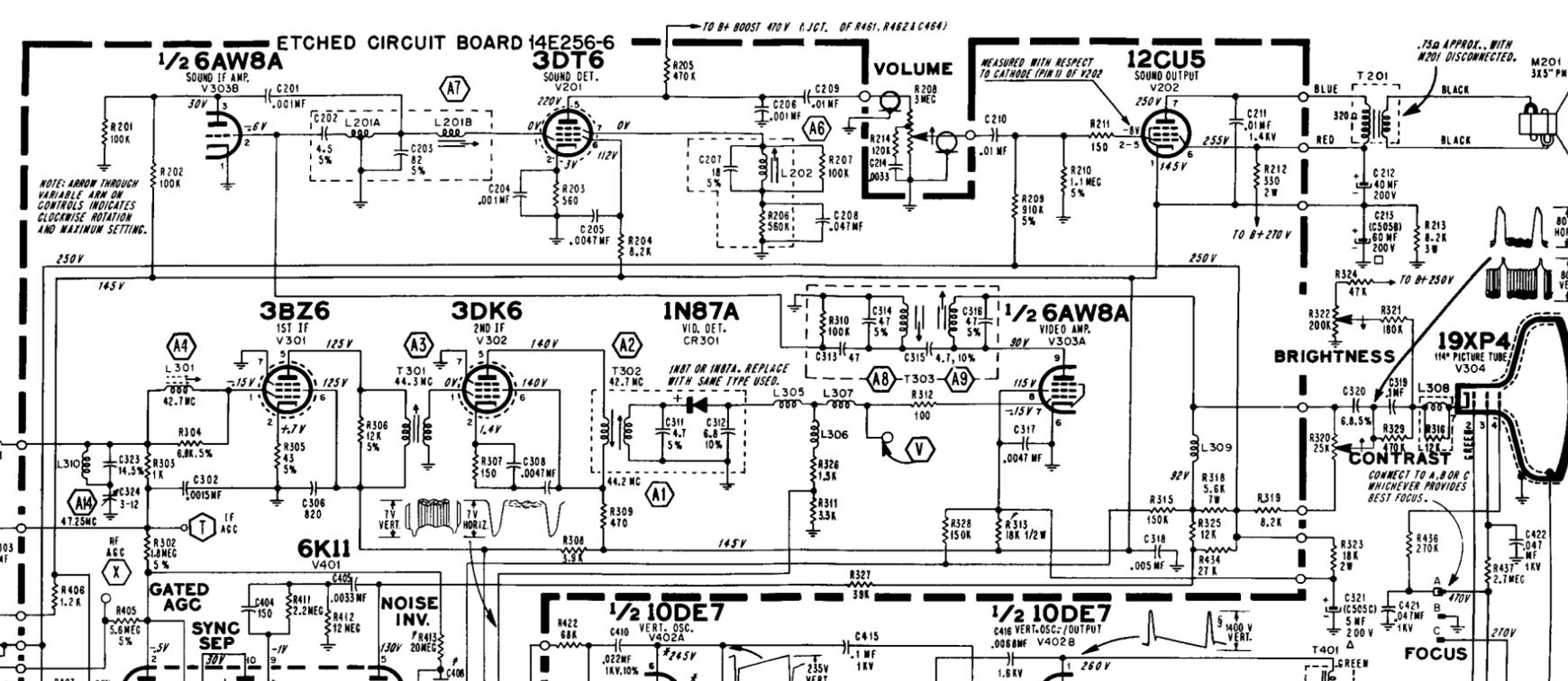
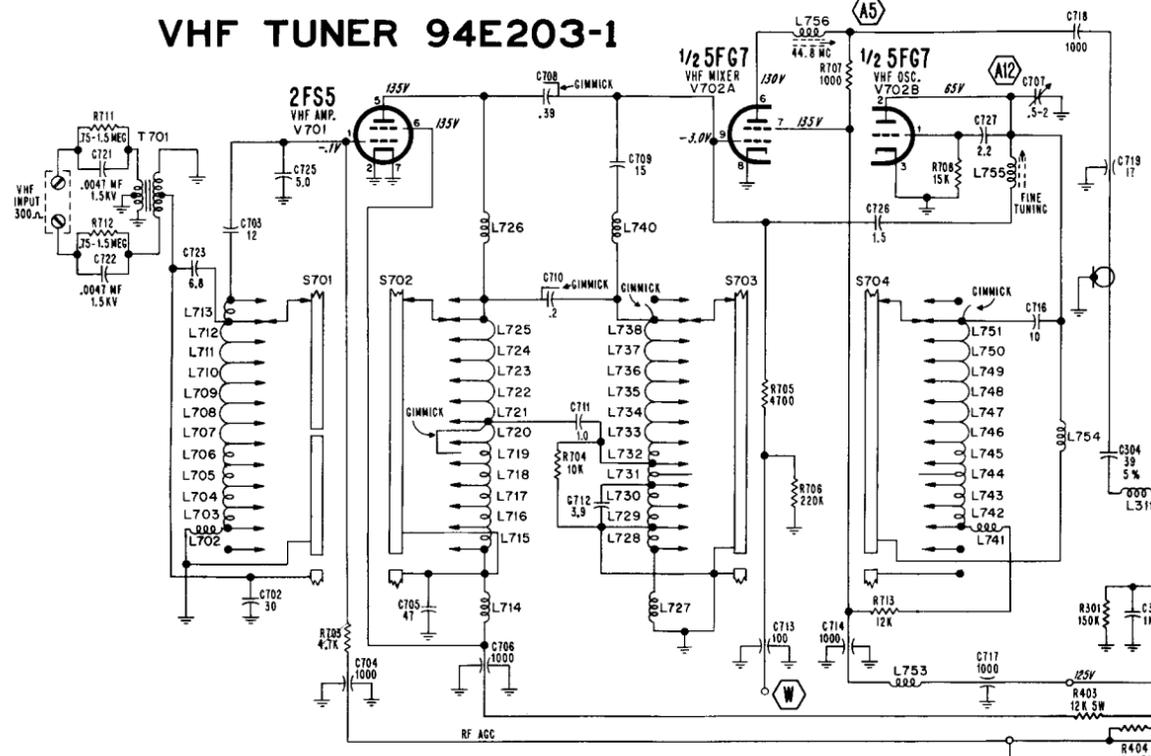
MISCELLANEOUS CHASSIS PARTS

Sym.	Description	Part No.
CR301	Video Detector	1N87 or 1N87A
CR401	Diode, Dual Selenium	93B 5-6
CR501	Rectifier, Silicon (500MA)	93B 12-1
CR502	Rectifier, Silicon (500MA)	93B 12-1
CR501	Diode, UHF	1N82A
M151	Couplate	63B 10-3
M152	Couplate	63B 10-3
M201	Speaker, 3"x5" PM	78C 158-3
M501	Interlock Line Cord	89B 90-2
M503	Circuit Breaker	84A 17-4
	Picture Centering Device	94C 152-3

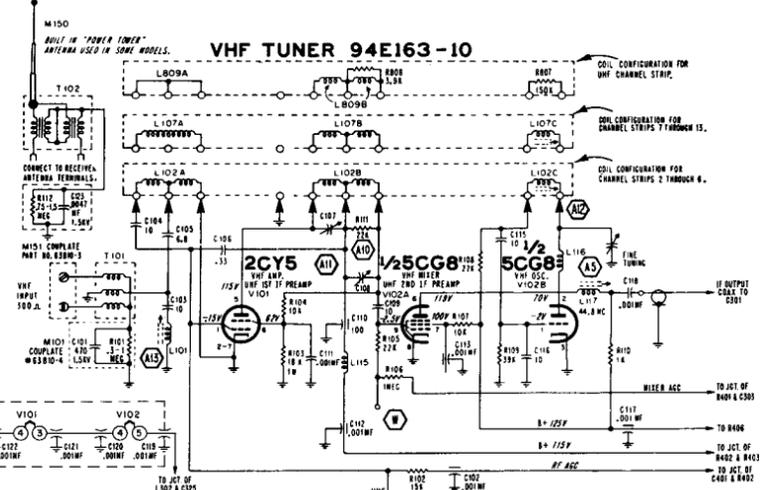
CABINET PARTS LIST

Description	Part No.
Antenna, "Power Tower"	69C 238-1
Back, Cabinet	33E 337-5
Cabinet, Wrap-around (incl. bottom plate)	
Brown for P901, PU901	750D 256-11
White for P909, PU909	750D 256-10
Cap, Cover, Brass (fits over handle mtg. plate)	37C 196-3
Escutcheon, Front	23E 400-3
Escutcheon, Speaker	
Brown	20D 29-12
White	20D 29-5
Handle, Carrying (with mtg. plate and rings)	37D 196-22
Insert, Monogram	23B 416-1
Knob, Control	
Brightness and ON-OFF Volume	20C 50-2
Channel Selector, VHF	
VHF Sets	33C 391-1
VHF-UHF Sets	33C 391-3
Fine Tuning	
VHF Sets	33D 340-5
UHF Sets	33D 340-12
Indicator Disc, UHF	33D 340-12
Vertical, Contrast, or Horizontal	33B 345-4
Line Cord and Interlock Socket	89B 90-2
Shield, Plastic, Gray (cup-shaped)	33B 351-1
Speaker, 3"x5" PM, 3.2 ohms	78C 158-3
Window Glass	21D 141-1

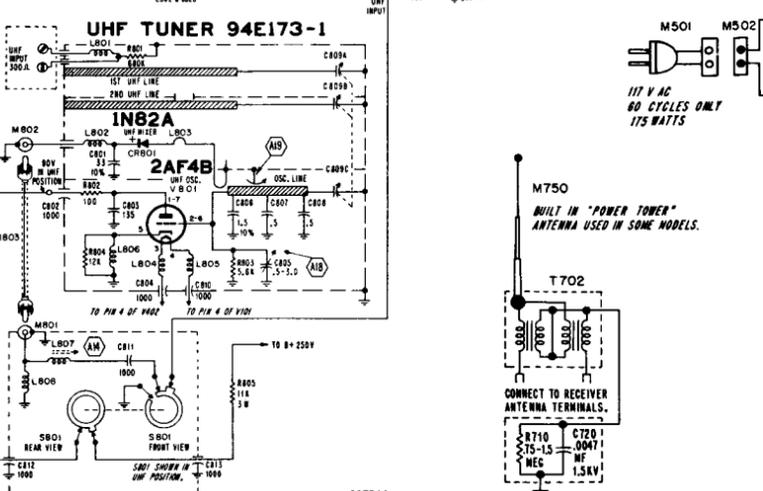
VHF TUNER 94E203-1



VHF TUNER 94E163-10



UHF TUNER 94E173-1

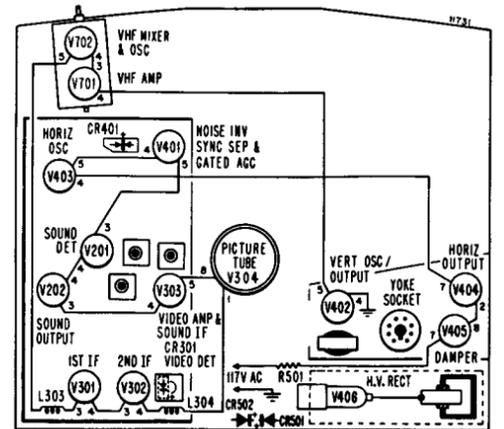


SCHEMATIC NOTES

Numbers or letters inside hexagons indicate alignment points.
 Fixed resistor values shown in ohms $\pm 10\%$ tolerance, $\frac{1}{2}$ watt; capacitor values shown in micromicrofarads $\pm 20\%$ unless otherwise specified.

VOLTAGES AND WAVEFORMS

Isolation transformer used. Line Voltage: 117.
 Channel Selector on unused channel. Contrast control fully clockwise; all other controls counterclockwise. Do not disturb Picture Guard or Horizontal Hold controls.
 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.



16G9B

- V701—2F55
- V702—5F6G
- V201—3D76
- V202—12CU5
- V301—3BZ6
- V302—3DK6
- V303—6AW8A
- V304—19XP4
- V401—6K11
- V402—10DE7
- V403—6CG7
- V404—12DQ6A
- V405—12AX4GTA/B
- V406—1G3GT/1K3
- CR301—1N87A
- CR401—93B5-6
- CR501—93B12-1
- CR502—93B12-1

16UG9B

- V101—2CY5
- V102—5CG8
- V201—3D76
- V202—12CU5
- V301—3BZ6
- V302—3DK6
- V303—6AW8A
- V304—19XP4
- V401—6K11
- V402—10DE7
- V403—6CG7
- V404—12DQ6A
- V405—12AX4GTA/B
- V406—1G3GT/1K3
- V801—2AF4B
- CR301—1N87A
- CR401—93B5-6
- CR501—93B12-1
- CR502—93B12-1
- CR801—1N82A