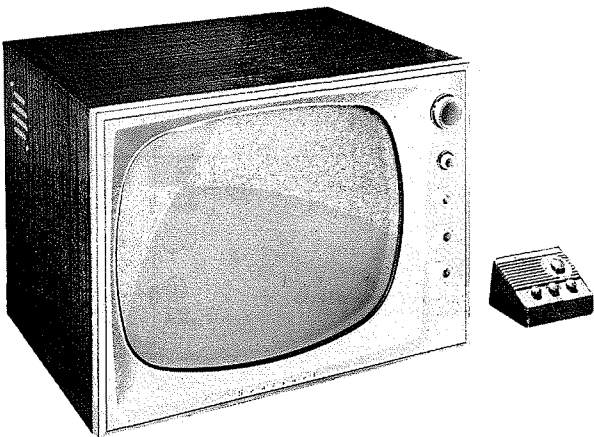




DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

- 1. Remove 7 push-on type control knobs from front panel of cabinet.
- 2. Remove 6 metal screws. Remove rear cover.
- 3. Remove 2 metal screws from antenna terminal bracket.
- 4. Disconnect speaker leads, yoke leads, picture tube socket and H. V. lead.
- 5. Remove 2 chassis bolts. Slide chassis out of guides at the top of cabinet.
- 6. Remove 2 speaker nuts. Remove speaker.



MODELS

1U-1101, 1U-1111, 1U-1121, 1U-1124, 1U-1126, 1U-1127, 1U-1131, 1U-1134, 1U-1136, 1U-1137, 1U-1145, 1U-1147, 1U-1155, 1U-1157, 1U-1161, 1U-1164, 1U-1165, 1U-1171, 1U-1174, 1U-1175, 1U-21161, 1U-21164, 1U-21165, 21101, 21121, 21145

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF tuner oscillator circuit may be accomplished by removal of the channel selector and fine tuning knobs. The adjustments are accessible, one at a time, thru the small hole in the cabinet above and slightly to the left of the channel selector shaft.

PICTURE TUBE SAFETY GLASS CLEANING

For picture tube safety glass cleaning, it is necessary to remove chassis. (See disassembly instructions).

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions).

SERVICE ADJUSTMENT LOCATION

See tube placement chart on page 5.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Turn the set on and tune in a TV station. Turn the horizontal hold control until the picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, it is necessary to remove the rear cover and supply power to the set. Adjust the buzz control (R9) for maximum volume and minimum buzz.

CENTERING

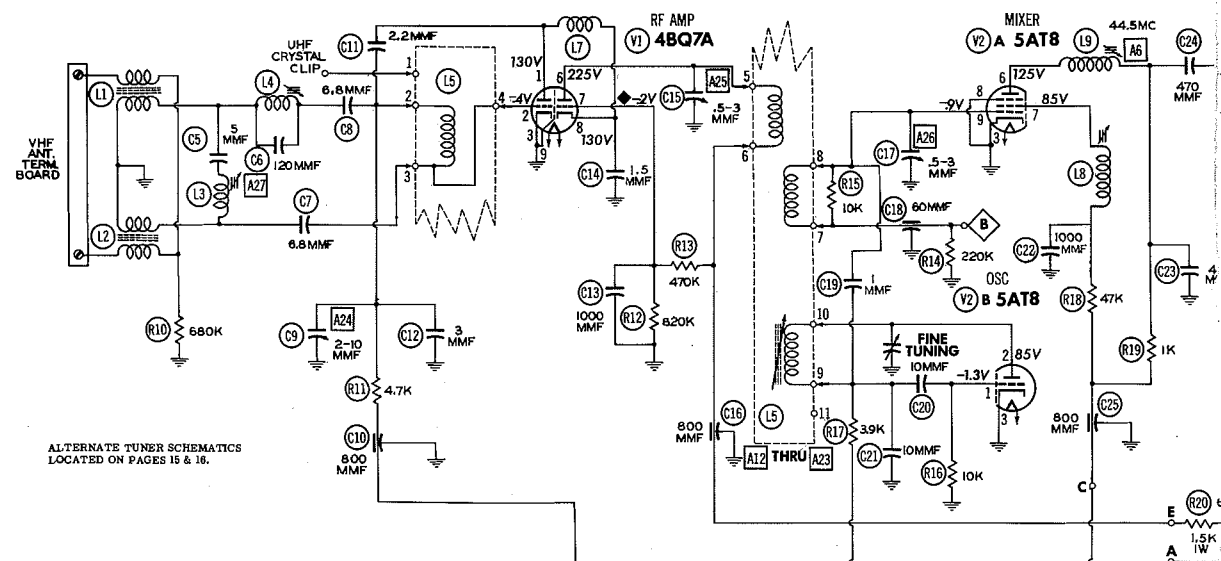
Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube, located flush against the deflection yoke. Rotate the two rings around the neck of the tube until the picture is properly centered.

SENTINEL MODELS 1U-1101, 1U-1111, 1U-1121, 1U-1124, 1U-1126, 1U-1127, 1U-1131, 1U-1134, 1U-1136, 1U-1137, 1U-1145, 1U-1147, 1U-1155, 1U-1157, 21101, 21121, 21145

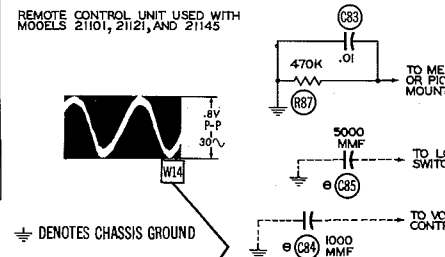
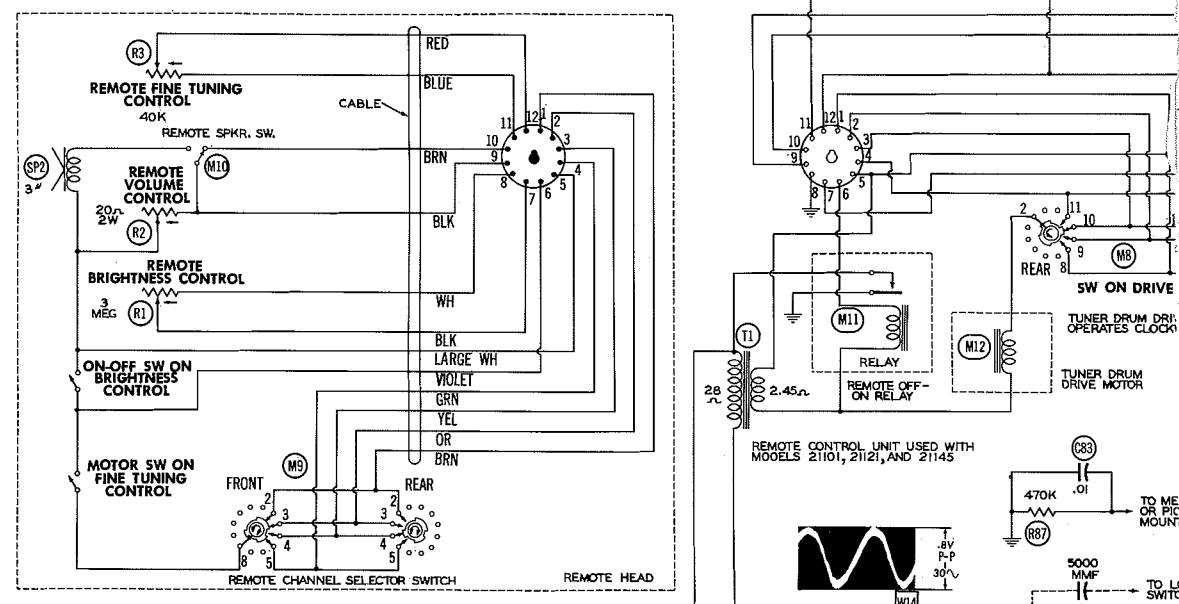
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ALTERNATE TUNER SCHEMATICS
LOCATED ON PAGES 15 & 16.



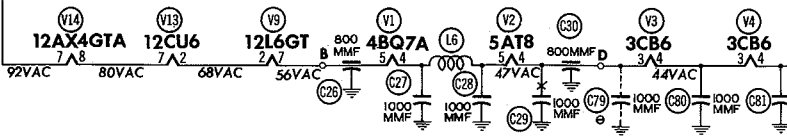
- ◆ MEASURED FROM PIN 6 OF V1.
- MEASURED FROM 155V LINE.
- ⊕ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION.

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM. (SEE PARTS LIST)

ARROWS ON CONTROLS INDICATE COUNTERCLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

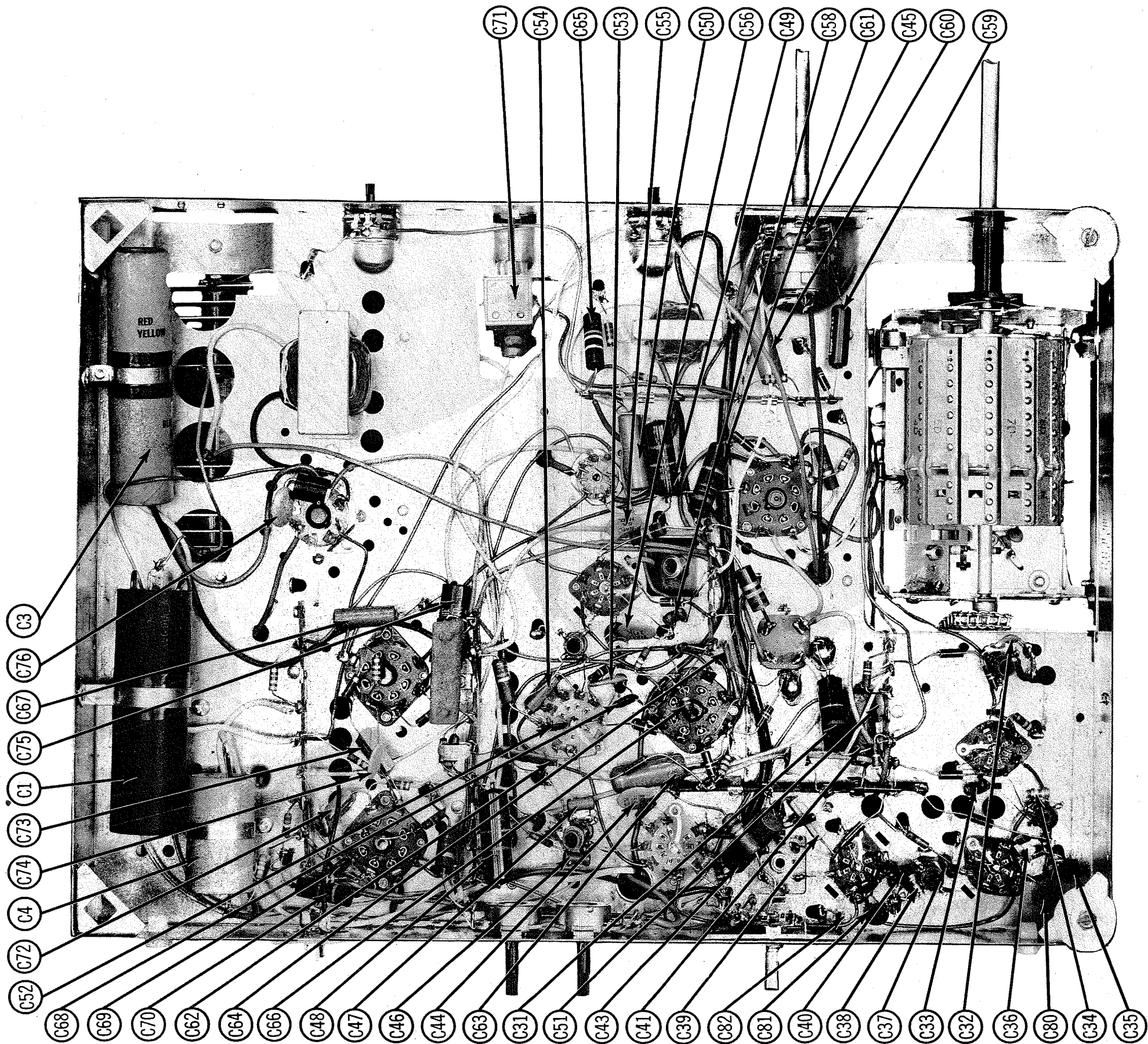
WAVE FORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE

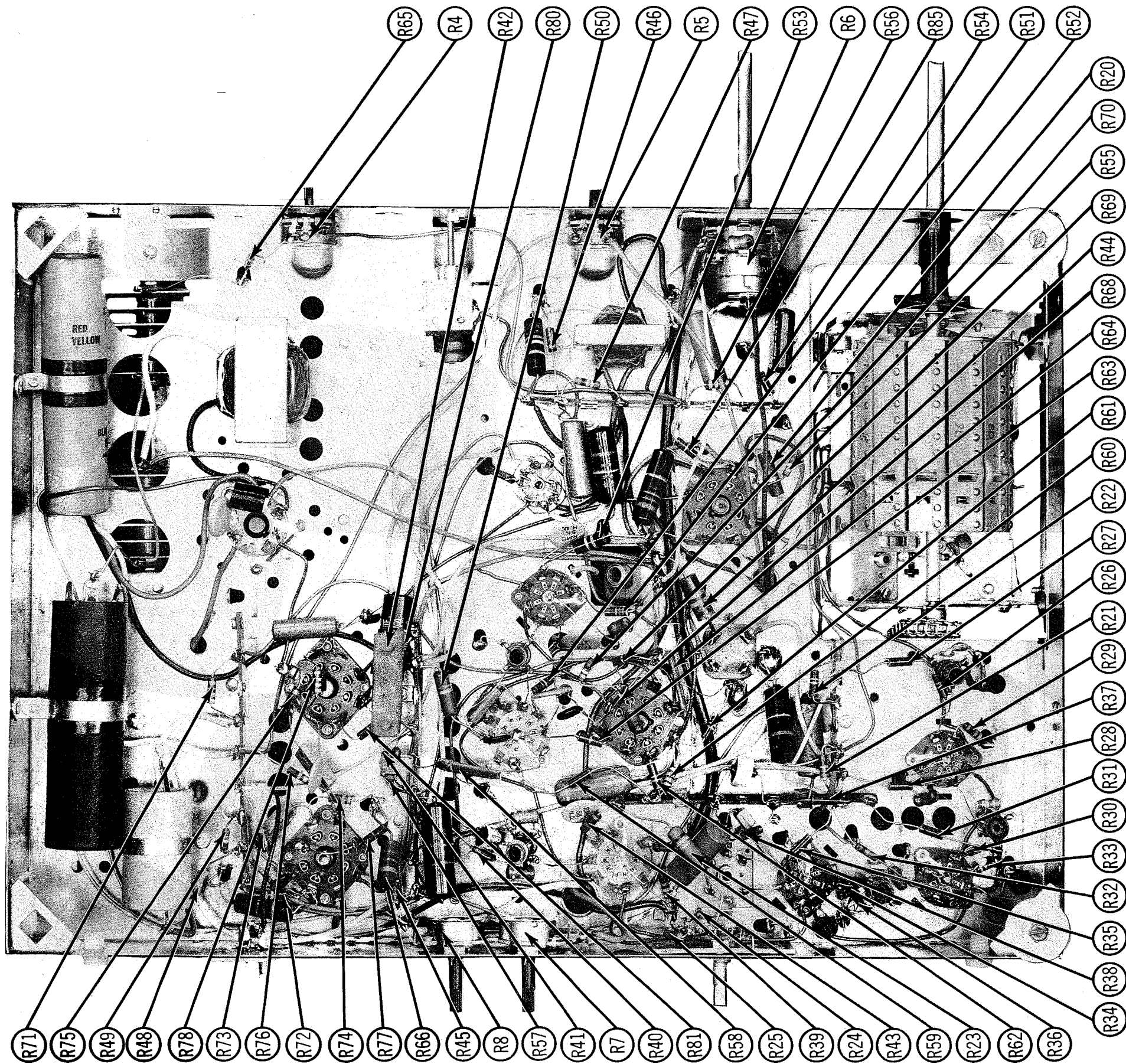
1. DC voltage measurements taken with vacuum tube voltmeter; AC voltage measured at 1,000 ohms per volt.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation; no signal applied.



A PHOTOFACT STANDARD NOTATION SCHEMATIC
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SENTINEL MODELS 1U-1101, 1U-1111, 1U-1121, 1U-1124, 1U-1126, 1U-1127, 1U-1131,
 1U-1134, 1U-1136, 1U-1137, 1U-1145, 1U-1147, 1U-1155, 1U-1157, 21101, 21121, 21145
 NOTIFICATION BOTTOM VIEW-CAPACITOR IDENTIFICATION



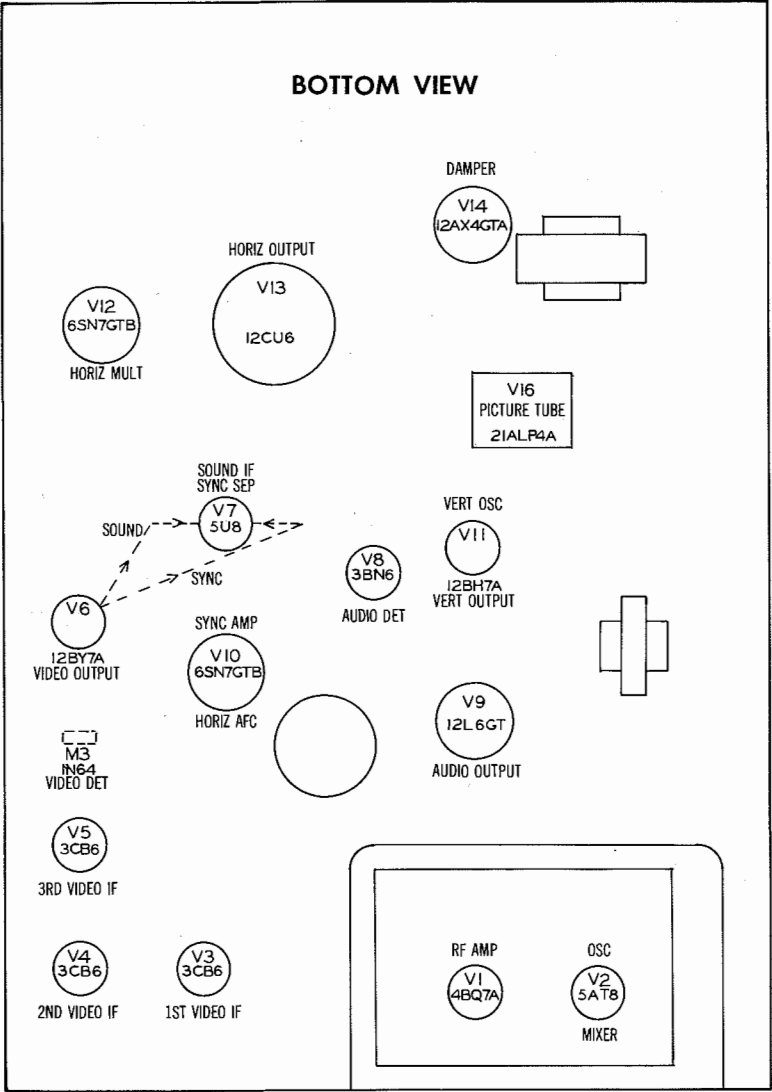


SENTINEL MODELS 1U-1101, 1U-1111, 1U-1121, 1U-1124, 1U-1126, 1U-1127, 1U-1131,
1U-1134, 1U-1136, 1U-1137, 1U-1145, 1U-1147, 1U-1155, 1U-1157, 21101, 21121, 21145
CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

RESISTANCE MEASUREMENTS

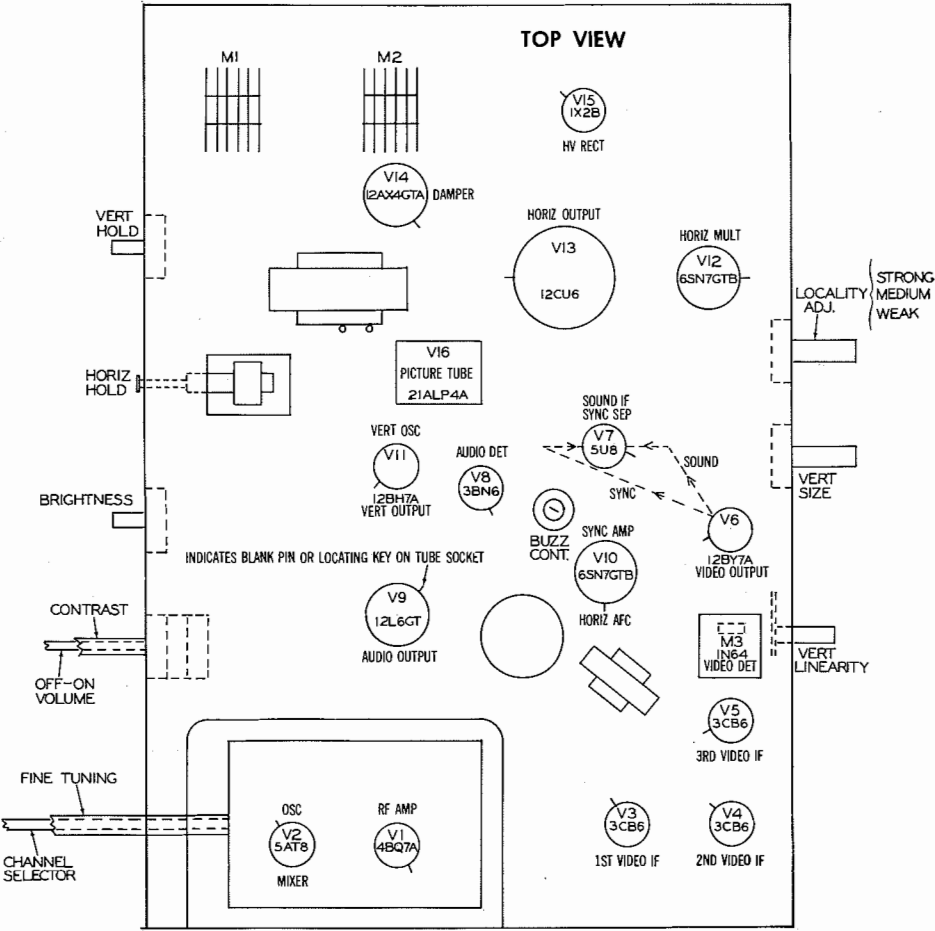
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	4BQ7A	INF	4Meg	0Ω	12Ω	13Ω	↑ 1.5KΩ	300KΩ	INF	0Ω
V 2	5AT8	10KΩ	■ 5.4KΩ	0Ω	11Ω	12Ω	■ 1.5KΩ	■ 47KΩ	0Ω	220KΩ
V 3	3CB6	1.5Meg	47Ω	11Ω	10Ω	■ 1KΩ	■ 1KΩ	0Ω		
V 4	3CB6	1.5Meg	47Ω	10Ω	9Ω	■ 1KΩ	■ 1KΩ	0Ω		
V 5	3CB6	.1Ω	120Ω	9Ω	8Ω	■ 1KΩ	■ 1KΩ	0Ω		
V 6	12BY7A	150Ω	470KΩ	0Ω	8Ω	8Ω	7Ω	↑ 4KΩ	↑ 18KΩ	0Ω
V 7	5U8	■ 1.5Meg	.8Ω	■ 5.6KΩ	7Ω	6Ω	■ 5.6KΩ	120Ω	0Ω	2.2Meg
V 8	3BN6	300Ω	.6Ω	5Ω	4Ω	■ 10KΩ	4.8Ω	↑ 300KΩ		
V 9	12L6GT	NC	16Ω	↑ 270Ω	↑ 52Ω	250KΩ	TP	18Ω	150KΩ	
V 10	6SN7GTB	22KΩ	■ 10KΩ	2.2KΩ	350KΩ	33KΩ	100KΩ	6Ω	5Ω	
V 11	12BH7A	■ 2.5Meg	450KΩ	210Ω	4Ω	4Ω	■ 800Ω	■ 2.5Meg	6KΩ	3Ω
V 12	6SN7GTB	5Meg	↑ 8KΩ	1.3KΩ	150KΩ	↑ 100KΩ	1.3KΩ	3Ω	1Ω	
V 13	12CU6	NC	16Ω	TP	↑ 18KΩ	470KΩ	TP	18Ω	0Ω	TOP CAP ■ 14Ω
V 14	12AX4GTA	NC	NC	300KΩ	NC	↑ 52Ω	TP	20Ω	18Ω	
V 15	1X2B		PINS	1 - 9	HAVE	INF	RESISTANCE			TOP CAP ■ 274Ω
V 16	21ALP4A	0Ω	16KΩ	PIN 6 ■ 330KΩ	PIN 10 ■ 330KΩ	PIN 11 ■ 300KΩ	PIN 12 1Ω			

↑ MEASURED FROM OUTPUT OF M1.
■ MEASURED FROM 135V LINE.
● MEASURED FROM PIN 3 OF V14.
TP-TIE POINT.
NC-NO CONNECTION.



TUBE PLACEMENT CHART

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

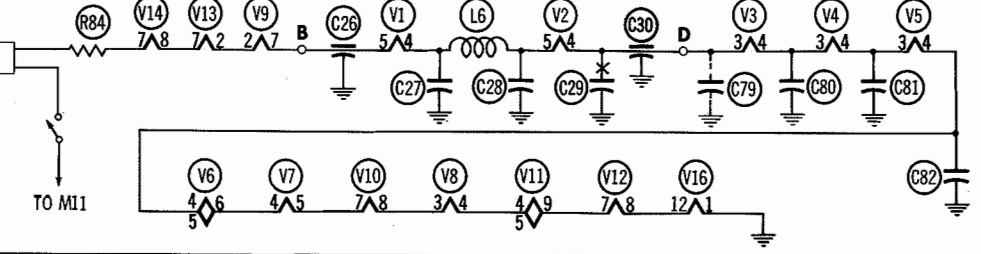
POWER SUPPLY FAILURE
No raster, no sound - Selenium Rectifiers (M1 & M2)

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V2, V3, V4, V5, V6, V9
No pic, no sound, has snow - V1, V2, V3
No pic, has sound, has raster - V6, V16
Has pic, no sound - V7, V8, V9

SYNC FAILURE
No vert, sync - V10, V11
No horiz, sync - V10, V12
No vert, or horiz, sync - V7, V10

SWEEP FAILURE
No raster, has sound - V12, V13, V14, V15
No vertical deflection - V11
Poor vert. linearity or foldover - V11
Poor horiz. linearity or foldover - V12, V13, V14
Narrow picture - V12, V15, V14, V15, M1, M2
Vert. off freq. - V10, V11
Horiz. off freq. - V10, V12

Note: Since this receiver employs tubes used in a series-parallel filament network, an open filament in any tube in series may cause the set to be inoperative. (See circuit below).



SENTINEL MODELS 1U-1101, 1U-1111, 1U-1121, 1U-1124, 1U-1126, 1U-1127, 1U-1131, 1U-1134, 1U-1136, 1U-1137, 1U-1145, 1U-1147, 1U-1155, 1U-1157, 21101, 21121, 21145

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped away from the chassis. Do not remove the horizontal multivibrator tube to disable the high voltage.

Allow a fifteen minute warm-up period for receiver and test equipment.

Use an isolation transformer to protect the test equipment.

VIDEO IF ALIGNMENT

Connect the negative lead of a 3 volt bias battery to the ungrounded side of C41. Connect the positive lead to chassis. Use only enough signal generator output to provide useable indication on the VTVM. Set locality switch (Rear panel) to "strong" position.

DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1. Direct	High side to an ungrounded tube shield floating over converter tube (V2). Low side to chassis.	44.0MC	3	DC probe thru 47KΩ to point (A). Common to chassis.	A1	Adjust for maximum deflection.
2. "	"	42.8MC	"	"	A2	"
3. "	"	41.25MC	"	"	A3	Adjust for MINIMUM deflection. Repeat steps 1 and 2.
4. "	"	45.75MC	"	"	A4	Adjust for maximum deflection.
5. "	"	47.25MC	"	"	A5	Adjust for MINIMUM deflection. Repeat steps 4 and 5.
6. "	"	44.5MC	"	"	A6	Detune A7 by adjusting fully counter clockwise. Adjust A6 for maximum deflection.
7. "	"	45.75MC	"	"	A7	Adjust for maximum deflection.

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection. Use only enough sweep generator output to provide useable pattern on scope.

DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8. Direct	High side to an ungrounded tube shield floating over converter tube (V2). Low side to chassis.	44MC (10MC Swp.)	41.25MC 42.75MC 45.75MC 47.25MC	3	Vert. Amp. thru 47KΩ to point (A). Low side to chassis.		Check for response curve similar to Fig. 1. If necessary, SLIGHTLY retouch A1, A2, A4, A6 and A7 to obtain desired response. To view 41.25 and 47.25MC markers, temporarily remove bias battery and increase scope gain and marker generator output. Markers should fall in trap notches as in Fig. 1.

4.5MC TRAP ALIGNMENT

Set contrast control to maximum. Connect clip lead from pin 1 of 3CB6/V5 to ground.

DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
9. 1KΩ Carbon Resistor	High side thru 1KΩ resistor to pin 2 of 12BY7 (V6). Low side to chassis.	4.5MC Unmod.	Any	DC probe thru crystal diode to pin 11 of picture tube. Common to chassis.	A8	Adjust for MINIMUM reading. Remove short from V5.

SOUND IF ALIGNMENT USING ON THE AIR SIGNAL

Turn the set on and tune in a strong TV signal. Turn the buzz control (R9) 90° from maximum clockwise rotation. Adjust A9 for maximum volume. Reduce signal strength. (Remove the antenna from antenna strip and stray feed the signal by placing the antenna lead near the antenna terminals). Adjust A10 and A11 for maximum volume. Adjust R9 for minimum noise. Reconnect antenna and readjust A9 for maximum volume. If necessary, reduce volume so this peak can be heard.

ALTERNATE SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection. Set volume control at a low level.

DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
11. .01MFD	High side to pin 2 (grid) of 12BY7 (V6). Low side to chassis.	4.5MC (400% Mod.) (50KC Swp.)	4.5MC	Any non-interfering channel	Across secondary of T6.	A9	Set buzz control (R9) 90° from maximum clockwise rotation. Adjust A8 for maximum 400% indication scope.
12. "	"	"	"	"	"	A11, A10	Attenuate generator output so that signal is below the limiting level of the 3BN6 as evidenced by background hiss and noise. Adjust A11 and A10 for maximum 400% response on scope.
13. "	"	"	4.5MC (400% Mod.)	"	"	R9	Use a high generator output and adjust R9 for MINIMUM 400% indication on scope.
14. "	"	"	4.5MC	"	"	A9	With volume control at low level, retouch A9 for maximum 400% indication on scope.

ALIGNMENT INSTRUCTIONS (cont)

OSCILLATOR ALIGNMENT FOR ALL TUNERS

Leave bias connected as under "Video IF Alignment". Restore tube shield on converter tube (V2) to its normal position. The channel oscillator adjustment screws are reached through a hole to the left and just below the channel switch shaft. The correct adjustment screw is accessible through this hole as the channel switch is turned to each channel.

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection. The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms. Set the fine tuning control to the mid-position of its range.

DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
15. Two 120Ω Carbon Resistors	Across antenna terminal with 120Ω in each lead.	213MC (10MC Swp.) 207MC (10MC Swp.) 201MC (10MC Swp.) 195MC (10MC Swp.) 189MC (10MC Swp.) 183MC (10MC Swp.) 177MC (10MC Swp.) 171MC (10MC Swp.) 165MC (10MC Swp.) 159MC (10MC Swp.) 153MC (10MC Swp.) 147MC (10MC Swp.) 141MC (10MC Swp.) 135MC (10MC Swp.) 129MC (10MC Swp.) 123MC (10MC Swp.) 117MC (10MC Swp.) 111MC (10MC Swp.) 105MC (10MC Swp.) 99MC (10MC Swp.) 93MC (10MC Swp.) 87MC (10MC Swp.) 81MC (10MC Swp.) 75MC (10MC Swp.) 69MC (10MC Swp.) 63MC (10MC Swp.) 57MC (10MC Swp.)	211.25MC 215.75MC 205.25MC 209.75MC 199.25MC 203.75MC 193.25MC 197.75MC 187.25MC 191.75MC 181.25MC 185.75MC 175.25MC 179.75MC 169.25MC 173.75MC 163.25MC 167.75MC 157.25MC 161.75MC 151.25MC 155.75MC 145.25MC 149.75MC 139.25MC 143.75MC 133.25MC 137.75MC 127.25MC 131.75MC 121.25MC 125.75MC 115.25MC 119.75MC 109.25MC 113.75MC 103.25MC 107.75MC 97.25MC 101.75MC 87.25MC 91.75MC 81.25MC 85.75MC 75.25MC 79.75MC 69.25MC 73.75MC 63.25MC 67.75MC 57.25MC 61.75MC 51.25MC 55.75MC 45.25MC 49.75MC	13 12 11 10 9 8 7 6 5 4 3 2	Vert. Amp. thru 47KΩ to point (A). Low side to chassis.	A12 A13 A14 A15 A16 A17 A18 A19 A20 A21 A22 A23	Adjust to place sound marker in sound trap as in Fig. 2. Video marker should fall at 55%.

VHF RF AND MIXER ALIGNMENT FOR ALL TUNERS

Set the locality switch to the "strong" position.,
Leave the bias battery connected as under "Video IF Alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
16. Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	207MC (10MC Swp.)	205.25MC 209.75MC	12	Vert. Amp. thru 10KΩ to point (B). Low side to chassis.	A24, A25, A26	Adjust for response curve similar to Fig. 3 with markers above 90%.
17. "	"	213MC (10MC Swp.) 207MC (10MC Swp.) 201MC (10MC Swp.) 195MC (10MC Swp.) 189MC (10MC Swp.) 183MC (10MC Swp.) 177MC (10MC Swp.) 171MC (10MC Swp.) 165MC (10MC Swp.) 159MC (10MC Swp.) 153MC (10MC Swp.) 147MC (10MC Swp.) 141MC (10MC Swp.) 135MC (10MC Swp.) 129MC (10MC Swp.) 123MC (10MC Swp.) 117MC (10MC Swp.) 111MC (10MC Swp.) 105MC (10MC Swp.) 99MC (10MC Swp.) 93MC (10MC Swp.) 87MC (10MC Swp.) 81MC (10MC Swp.) 75MC (10MC Swp.) 69MC (10MC Swp.) 63MC (10MC Swp.) 57MC (10MC Swp.)	211.25MC 215.75MC 205.25MC 209.75MC 199.25MC 203.75MC 193.25MC 197.75MC 187.25MC 191.75MC 181.25MC 185.75MC 175.25MC 179.75MC 169.25MC 173.75MC 163.25MC 167.75MC 157.25MC 161.75MC 151.25MC 155.75MC 145.25MC 149.75MC 139.25MC 143.75MC 133.25MC 137.75MC 127.25MC 131.75MC 121.25MC 125.75MC 115.25MC 119.75MC 109.25MC 113.75MC 103.25MC 107.75MC 97.25MC 101.75MC 87.25MC 91.75MC 81.25MC 85.75MC 75.25MC 79.75MC 69.25MC 73.75MC 63.25MC 67.75MC 57.25MC 61.75MC 51.25MC 55.75MC 45.25MC 49.75MC	13 11 10 9 8 7 6 5 4 3 2	"	Check for response similar to Fig. 3. If markers fall below 70% on any channel, make compromise adjustments of A24, A25, and A26 with channel switch set to that channel. Check all other channels to see that they have not been seriously affected.	

40MC TRAP ALIGNMENT

The 40MC trap (A27) will require adjustment only where a local interfering signal from 40MC thru 45MC affects the picture. In such cases A27 should be adjusted for minimum 40MC beat interference in the picture.

UHF TUNER ALIGNMENT

The UHF portion of this receiver has been properly aligned at the factory and is very stable. Alignment of the UHF portion of this receiver is not recommended in the field.

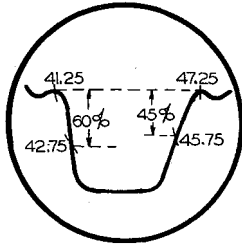


FIG. 1

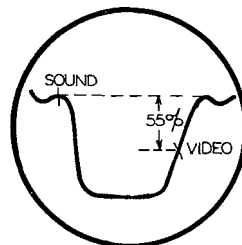


FIG. 2

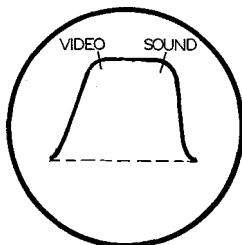


FIG. 3

SENTINEL MODELS 1U-1101, 1U-1111, 1U-1121, 1U-1124, 1U-1126, 1U-1127, 1U-1131, 1U-1134, 1U-1136, 1U-1137, 1U-1145, 1U-1147, 1U-1155, 1U-1157, 21101, 21121, 21145