

TELEVISION Service Manual

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GORDON OLIVER TELEVISION

T. V. RADIO SERVICE

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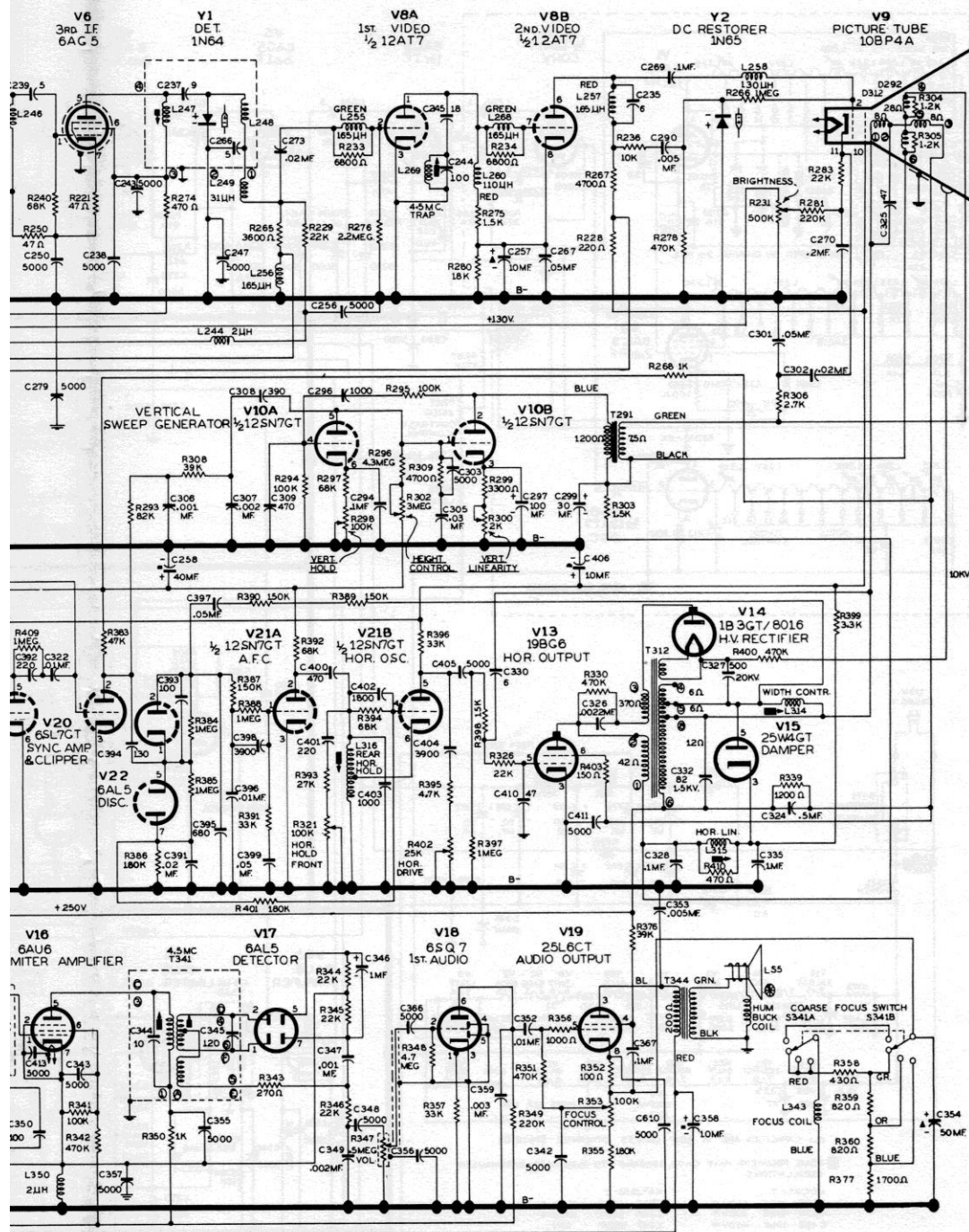
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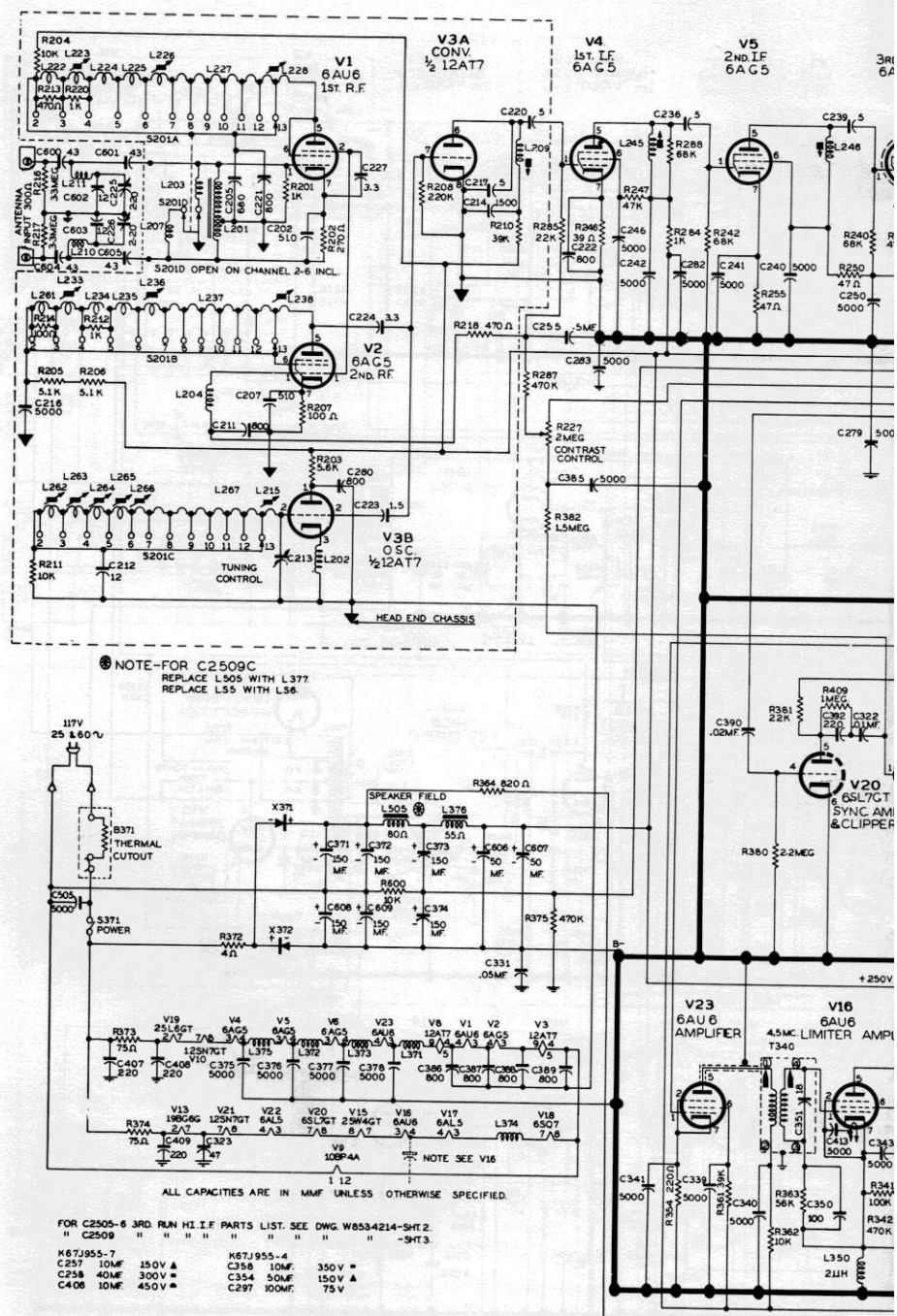
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NOTE: RE INDEXING

Since most TV circuits require fold pages for clear reproduction, it is necessary to bind them as a group in the middle of the book. As a result, related data such as alignment, voltages etc., may be widely separated in some cases. To avoid confusion, use your index to locate ALL data.

RCC
TELEVISION
Supplement
No.1







This trap is used to remove 4.5 mc audio 1-f from the video amplifier which shows up in the picture as an interference pattern. This trap will very rarely require adjustment. Adjustment is as follows:

1. The trap (L269, C244, C245) is adjusted for minimum amplitude of the 4.5 mc signal. Use a detector network as shown in Figure 12 connected from junction of L258 and C269 to B- to detect the signal.
2. Adjust the vertical hold control to remove the vertical pull from the picture.
3. Short horizontal oscillator coil L316 to remove horizontal oscillator interference in the response curve.

Step	Marker Generator Frequency	Sweep Generator Frequency	Oscilloscope	Adjust	See Notes
37	4.5 MC	4.5 MC ± 1 MC	Across 100K resistor as shown in Fig. 12 (See Note 1.)	L269 for min. amplitude of 4.5 mc marker. Increase scope gain.	1,2,3

* Late Production receivers used a Type 6BC5 tube in place of the high gm type 6AG5 tube. Use a Type 6BC5 tube as replacement for the type 6AG5 tube in these receivers. When this substitution is made it is necessary to realign the receiver.

itude of 4.5 mc	
one gain	1

The adjustment of the trap can be made by means of a signal generator and an oscilloscope or an a-c meter as the indicating device. The signal generator must be terminated to match 300 ohms impedance accurately by the sweep generator termination as shown in Fig. 23. The signal generator must cover the 1-f band and amplitude modulated approximately 30% with a fixed audio frequency signal.

Set channel selector switch to Channel 4.

Feed the r-f signal at the frequency of the interfering signal to the antenna terminals of the receiver through the correct termination.

Connect oscilloscope or VTVM to picture tube grid.

Tune the trap trimmers C225 and C226 for minimum signal indication on the picture tube grid. Keep the capacities of the individual trimmers at approximately equal values and continue the adjustment of each until maximum rejection is obtained.

CANADIAN GENERAL ELECTRIC

C2505C Etc., C2517C, COT1 Etc.

ALIGNMENT

GENERAL--

A complete alignment of the receiver tuned circuits is given in the following charts. Read all alignment notes prior to making an alignment. The procedure shown in the charts is based upon the use of the G-E test equipment specified and if other equipment is used which has different characteristics, the charts may have to be modified slightly. A diagram showing the location of adjustments used in alignment is shown in Figure 15. Use the alignment service diagram Page 19 with the charts.

It is necessary to connect the low side of the test equipment to the B- bus of the receiver keeping the lead as short as possible.

Always permit a 15 minute warm-up period for the receiver and test equipment prior to attempting alignment. To align the receiver with the picture tube removed, a Type 6SN7 tube with all pins clipped off except pins #7 and #8 may be used to complete the filament circuit. Plug pins #7 and #8 of the 6SN7 into pins #1 and #2 of the picture tube socket.

To protect the test equipment, always use an isolation transformer between the power line and the TV receiver. TEST EQUIPMENT--The following test equipment is necessary.

1. R-F Sweep Generator (G-E Type ST-4A or Equivalent).

- Frequency Requirements.
 - 4.5 MC with 500 KC and 2 MC sweep width.
 - 40-50 MC with approximately 10 MC sweep width.
 - 50-90 MC, 170-220 MC with 15 MC sweep width.
- Constant output in the sweep range.
- At least 0.1 volt output.

2. Marker Generator (G-E Type ST-5A or Equivalent).

The marker generator must have good frequency stability must be accurately calibrated and must cover the following frequencies.

- 41.25 MC for video I-F
- 42.50 MC for video I-F
- 44.50 MC for video I-F
- 45.00 MC for video I-F
- 45.75 MC for video I-F
- 47.25 MC for video I-F
- 4.5 MC for sound I-F and trap alignment

Picture and sound carrier frequencies for Channels #2 through #13.

3. Balanced Output Adapter (G-E ST-8A or Equivalent (See RF Note 1). See Fig. 23.

4. Oscilloscope (G-E Type ST-2A or Equivalent)--The oscilloscope should have good sensitivity and preferably a 1-inch screen with a good wide-band frequency response on the vertical deflection circuits. Although the high frequency response is not necessary for alignment, it is necessary when making waveform measurements.

5. Vacuum Tube Voltmeter--A vacuum tube voltmeter is necessary to measure the bias of 4 volts required for video and r-f alignments.

6. Detector Network--A crystal detector network as shown in Figure 12 is necessary to detect the response when aligning L269, the 4.5 mc trap.

7. Miscellaneous

- One 10,000 ohm resistor to isolate the scope as noted in the charts.
- One .01 mfd. capacitor to isolate the sweep generator as noted in the chart.
- Impedance matching pad for r-f alignment as shown in Figure 23.
- Bias battery to supply -4 volts as noted for video and r-f alignment.

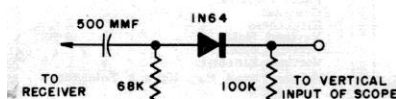


Fig. 12 Detector Network

VIDEO I-F ALIGNMENT NOTES.

1. Connect a bias battery from junction of C365, R382 and the Contrast control to B-. Connect positive of battery to B-. Adjust contrast control to give a -4 volts bias at the grid pin #1 of V4 measured with a VTVM. Disconnect VTVM leads during alignment.

2. The sweep generator should be properly terminated in its characteristic impedance. Couple the signal to the point of input through a .01 mf. capacitor. Keep leads as short as possible.

3. Before attempting i-f alignment, detune L205 if used for steps 1 through 5 by turning core of this coil all the way out of the coil. Retune this trap to 47.25 mc as in step 6. Increase the scope gain so L205 if used may be adjusted as in step 6 to give maximum attenuation at the 47.25 mc marker.

4. The 41.25 mc audio I-F marker should be approximately 4% of the total amplitude of the curve. See Final Alignment Curve, Figure 13-E.

5. Set the Channel switch to Channel #12 or #13. When aligning the 1st video I-F, check for oscillator influence by turning the tuning control. If the shape of the response curve changes, switch to another channel where oscillator influence is not noted.

6. In most cases it is only necessary to perform an overall alignment of the video i-f, as in step 7 of the Video Alignment Chart, to obtain i-f response curve of Figure 13-E. When aligning the i-f coils, L245 will adjust the audio or low frequency side of the i-f response curve, while L246 will adjust the video or high frequency side of the i-f response curve. L209 and L247 should be adjusted simultaneously to reduce the saddleback at the peak of the curve and to give maximum gain and retain 45.75 and 42.50 mc markers at the 50K mark.

7. Short L246, L245 and L209 during alignment of coils L247, L246 and L245, respectively, to prevent the coil preceding the signal input point from influencing the shape of the response curve.

8. The 45.75 mc marker should fall at the 50K point to give proper sideband response.

9. Adjust the signal input to give a video response curve of 3/4 volts, as shown in Figure 13.

VIDEO I-F ALIGNMENT CHART

Step	Marker Generator Frequency	Sweep Generator Frequency	Signal Input Points Between	Connect Oscilloscope Between	Adjust	See Note No.
1	---	---	---	---	Detune L205 by turning core out of coil.	3
2	44.5 MC	40-50 MC	V6 grid (pin 1) through .01 mf. cap. and B- on head-end shield. Short L246.	Junction of L249, R255, C273 through 10K ohms and B- on V8 socket.	Core of L247 for curve on Fig. 13-A. Place 44.5 marker at peak of curve.	
3	45.75 MC		V5 grid (pin 1) through .01 mf. cap. and B- on head-end shield. Short L245. Remove short on L246.		Core of L246 for curve of Fig. 13-B, to place 45.75 mc marker at peak of curve.	
4	42.50 MC, 45.75 MC		V4 grid (pin 1) through .01 mf. cap. and B- on head-end shield. Short L245. Remove short on L245.		Core of L243 for curve of Fig. 13-C. 42.5 mc marker should be at approx. 65% point and 45.75 should fall near hi-frequency knee of curve.	1,2,7,9
5	44.2 MC				Cores of L209 and L247 for curve of Fig. 13-D. Adjust L209 for max. amplitude and L247 to flatten top of curve.	1,2,5,9
6	47.25 MC		Through .01 mf. to junction of L236 and L237 on second r-f switch wafer, and B- on head-end shield. Remove short on L209.		Core of L205 for max. attenuation of 47.25 mc marker. See Fig. 13-E.	1,2,3,5,9
7	41.25 MC, 42.50 MC, 45.00 MC, 45.75 MC, 47.25 MC				Cores of L245, L246, L247 and L209 simultaneously for flat curve and position 45.00 mc marker as in Fig. 13-E. If necessary readjust L245 and L246 to place 42.5 and 45.75 mc markers at 50K as shown in Fig. 13-E.	1,2,4,5,6,8,9

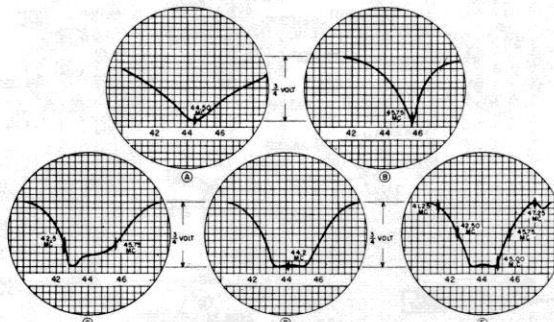


Fig. 13. Video I-F Curves

AUDIO I-F ALIGNMENT NOTES:

1. Audio i-f alignment is performed by putting in a 4.5 mc 2500 kc sweep and viewing the response curve as noted in the audio i-f chart. The primary and secondary of T341 should be aligned to give equal amplitude of the positive and negative peaks of the response curve with as straight a trace as possible connecting the peaks. The 4.5 mc marker zero beat point should be placed at the cross-over point of the base line and the curve.

2. As a final check, step 12 the secondary of T341 adjustment should be checked on a television signal if possible. Try several operating television stations and if buzz in the audio is heard, the secondary of T341 should be readjusted as follows.

Tune in the station and adjust the contrast control for a weak sound output. Readjust the secondary of T341 until the buzz is a minimum or disappears and the best quality audio is obtained.

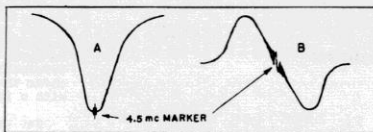


Fig. 14. Audio I-F Curves

3. Keep the input of the sweep generator low enough so that limiting does not take place, otherwise the response curve will broaden out permitting slight misadjustment. Check by increasing the output of the sweep generator, the response curve should increase in amplitude.

4. The secondary of T341 is adjusted for the curve of Figure 14-B. This adjustment should give as straight a slope as possible between the positive and negative peaks of the curve with the center of the 4.5 mc marker falling midway between the peaks.

5. The primary of T341 is adjusted for maximum of the positive and negative peaks with as straight a trace as possible between the peaks. If necessary, readjust the secondary of T341 so that the marker falls midway between the peaks.

6. An alternate method to the visual alignment is the sound output method using an operating television station, preferably when transmitting tone modulation during the test pattern.

(a) Tune the receiver for optimum detail.

(b) Keep the input below limiting level by reducing the contrast control or by using a resistor pad in the antenna circuit.

(c) Adjust primary and secondary of T340 for maximum sound output. Adjust primary of T341 for maximum audio output.

(d) Adjust the secondary of T341 for best quality audio (low distortion, least noise) and for minimum buzz in the output.

AUDIO I-F ALIGNMENT CHART

Step	Marker Generator Frequency	Sweep Generator Frequency	Signal Input Points Between	Connect Oscilloscope Between	Adjust	See Note No.
8			Pin 1 of T23 through .01 mfd. cap. and B-.	Junction of T340 (3), R363 and C250 through 10K and B-.	Primary and Secondary of T340 for max. amplitude and symmetry of curve. See Figure 14-A.	1,3
9					Secondary of T341 to place zero beat of 4.5 mc marker and sweep at the cross-over of the curve and base line.	
10	4.5 MC	4.5 MC 2500 KC keep signal below limiting level of receiver.	Pin 1 of V16 through .01 mfd. cap. and B-.	Junction of R343, C347 and R346 through 10K and B-.	Primary of T341 for equal amplitude of the positive and negative peaks with a straight line connecting these peaks. See Figure 14-B.	1,3,4,5
11					Secondary of T341 to place zero beat of 4.5 mc marker at cross-over and sweep point of curve and the base line. See Figure 14-B.	
12	Recheck alignment of step 11 on operating station as in note 2.					

CANADIAN GENERAL ELECTRIC

C2505C Etc., C2517C, COTI Etc.

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R-F ALIGNMENT NOTES.

1. Disconnect the transmission line to the antenna terminals from the head-end terminals.
Couple the output of the I-F sweep generator to the head-end terminals through a balanced output adapter, G-8 SP-3A. Couple the adapter to the head-end terminals through a 300-ohm transmission line and a resistor pad, as shown in Figure 23-4.
If a balanced output for the sweep generator is not available, a resistor matching network as shown in Figure 23-8 may be used.
On some sweep output generators, the terminating resistor is added, while on others it is necessary to add the terminating resistor as shown in Figure 23-8.
2. It is necessary to connect a bias battery to B-
Junction of the contrast control, C385, and R382 to B-
Connect plus of bias battery to B-. Adjust the contrast control to give a -4 volts bias measured from pin 1 of V2 to the head-end chassis B-.
3. Shunt L209 with a 680-ohm, 1/2-watt resistor during r-f alignment to prevent the oscillator from influencing the response curve. Connect approximately 400 mfd. of electrolytic capacitors, 350 volt, from the head-end B+ supply to B- to reduce the effect of hum on the response curves.
4. On all channels, the picture carrier marker should not be less than 67% of the peak of the r-f response curve. The sound carrier marker should ride up nearer to the top of the curve provided the sound carrier marker does not go below 50%. On the low channels the picture carrier marker should ride as high up on the curve as possible and still keep the sound carrier marker above 50%.
5. Coils for Channels #12 through #7 are fixed inductances. Check the alignment on these channels as in steps 14 through 19 for proper curve. Readjust L238 and L236 for proper curve if necessary.
6. Coils for Channels #5 and #4 are fixed inductance. Check the alignment on these channels for proper curve. Readjust coils L226 and L235 to give proper curve on Channels #5 and #4.
7. The coil for Channel #2 is a fixed inductance. Check the alignment on this channel for proper curve. Readjust L223 and L233 to give proper curve on Channels #3 and #2.

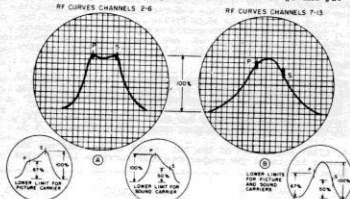


Fig. 16. R-F Alignment Curves

OSCILLATOR ALIGNMENT NOTES.

- Before attempting this oscillator alignment, it must be certain that the video I-F stages and r-f stages are properly aligned as outlined previously.
1. Disconnect the 300-ohm line from the r-f head-end terminals and connect sweep generator to head-end properly. See note 1 of r-f alignment.
 2. Alignment is made by viewing the response curve at the output of the video I-F detector.
 3. Use a video carrier marker as shown in each step of the Alignment Chart.
 4. The oscillator inductance for channels #12 through #7 are fixed. The alignment on these channels should be checked to see that the tuning control C213 will move the video carrier marker up and down the entire high frequency side of the response curve. Readjust L215 if necessary.
 5. On Channel #6 through #2 set the tuning control C213 at the center of its rotation and make the indicated adjustment so that the video carrier marker falls at the 50% mark on the high frequency slope of the response curve.

OSCILLATOR ALIGNMENT CHART

Step No.	Marker Generator Frequency	Sweep Generator Frequency for Channel	Signal Input Point	Connect Oscilloscope Between	Channel Switch Setting	Adjust	See Note
25	211.25 MC	No. 13 with 15 MC sweep	Antenna Terminals at head-end. See note 1.	Junction of L249, R265, C273 through 10K ohm and B- at V8 Socket (pin 3).	No. 13	L215 by squeezing or spreading turns slightly.	1,2,3,4
26	205.25 MC	No. 12 with 15 MC sweep			No. 12	---	
27	199.25 MC	No. 11 with 15 MC sweep			No. 11	---	
28	193.25 MC	No. 10 with 15 MC sweep			No. 10	---	
29	187.25 MC	No. 9 with 15 MC sweep			No. 9	---	
30	181.25 MC	No. 8 with 15 MC sweep			No. 8	---	1,2,3,5
31	175.25 MC	No. 7 with 15 MC sweep			No. 7	---	
32	83.25 MC	No. 6 with 15 MC sweep			No. 6	Screw of L266.	
33	77.25 MC	No. 5 with 15 MC sweep			No. 5	Screw of L265.	
34	67.25 MC	No. 4 with 15 MC sweep			No. 4	Screw of L264.	
35	61.25 MC	No. 3 with 15 MC sweep			No. 3	Screw of L263.	
36	55.25 MC	No. 2 with 15 MC sweep			No. 2	Screw of L262.	

R-F ALIGNMENT CHART

Step No.	Marker Generator Frequency	Sweep Generator Frequency for Channel	Signal Input Point	Connect Oscilloscope Between	Channel Switch Setting	Adjust	See Note
13	211.25 MC and 715.75 MC	No. 13 with 15 MC sweep	Antenna terminals at head-end. See note 1.	Junction of L209, C224, R210 through 10K and B- at head-end chassis	No. 13	Screw of L228, screw of L238 for Fig. 16-B.	1,2,3,4,5
14	205.25 MC and 709.75 MC	No. 12 with 15 MC sweep			No. 12	---	
15	199.25 MC and 703.75 MC	No. 11 with 15 MC sweep			No. 11	---	
16	193.25 MC and 697.75 MC	No. 10 with 15 MC sweep			No. 10	---	
17	187.25 MC and 691.75 MC	No. 9 with 15 MC sweep			No. 9	---	
18	181.25 MC and 685.75 MC	No. 8 with 15 MC sweep			No. 8	---	1,2,3,4,6
19	175.25 MC and 679.75 MC	No. 7 with 15 MC sweep			No. 7	---	
20	83.25 MC and 673.75 MC	No. 6 with 15 MC sweep			No. 6	Screw of L226 to place 83.25 MC marker and screw of L236 to place 87.75 MC marker as shown in Fig. 16-A.	
21	77.25 MC and 667.75 MC	No. 5 with 15 MC sweep			No. 5	---	
22	67.25 MC and 661.75 MC	No. 4 with 15 MC sweep			No. 4	---	
23	61.25 MC and 655.75 MC	No. 3 with 15 MC sweep			No. 3	Screw of L223 to place 61.25 MC marker and screw of L233 to place 65.75 MC marker as shown in Fig. 16-A.	1,2,3,4,7
24	55.25 MC and 649.75 MC	No. 2 with 15 MC sweep			No. 2	---	

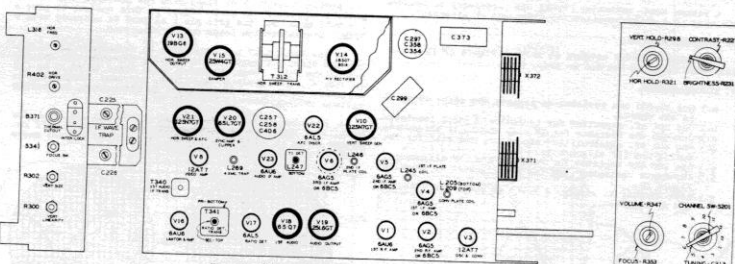


Fig. 15. Tube and Trimmer Location T8534605-3

NOTE: Use a Type 6BC5 tube as a replacement for the Type 6A05 tube used in these receivers. See Production Change.

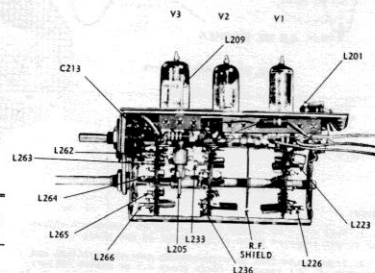


Fig. 17. R-F Head End

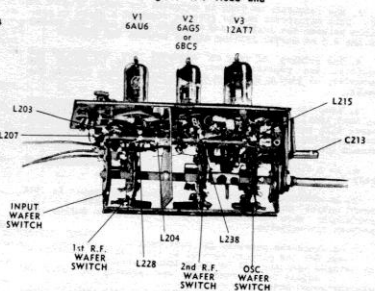


Fig. 18. R-F Head End