

# R.C.C. Service Manual

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## 1955 Supplement No. 14

GORDON OLIVER TELEVISION

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RCC  
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## "J" coded F, G, H

### "H" CHASSIS:

- Chassis coded "H" incorporate the following modifications:
1. Amplified AGC system; sync is removed from video detector.
  2. A new type of Cascode Tuner is used.  
Cat.# R2091 for 17" Models, R2092 for 21".

Tuner schematic - see below.

### Main schematic -

- deviations;
- (a) Local-Distant Switch S201 is omitted.
  - (b) R216 Resistor (10K) is omitted.

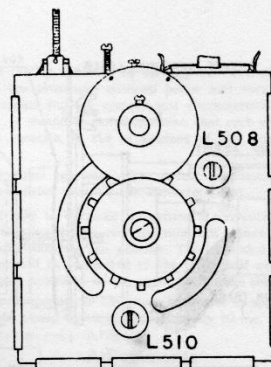
### "G" CHASSIS:

- Chassis coded "G" incorporate the following modifications:
1. Amplified AGC system; sync is removed from video detector.
  2. The new type Cascode Tuners, Cat.# R2091 for 17" Models & Cat.# R2092 for 21" Models, are used.
  3. Local-Distant Switch is added; its action is to remove AGC bias from the tuner when in the "Distant" position and to insert noise limiting action by V10, the sync amplifier stage.

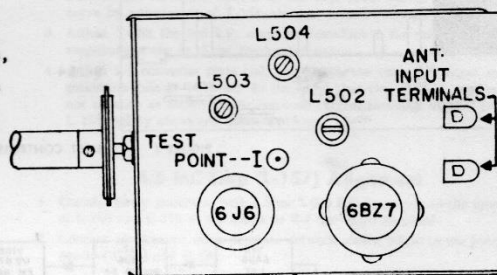
Tuner schematic - see below.

### "F" CHASSIS:

Chassis coded "F" are identical to chassis coded "G" except that the Cascode Tuners Cat.# R1735 for 17" Models & Cat.# R1747 for 21" Models are used.

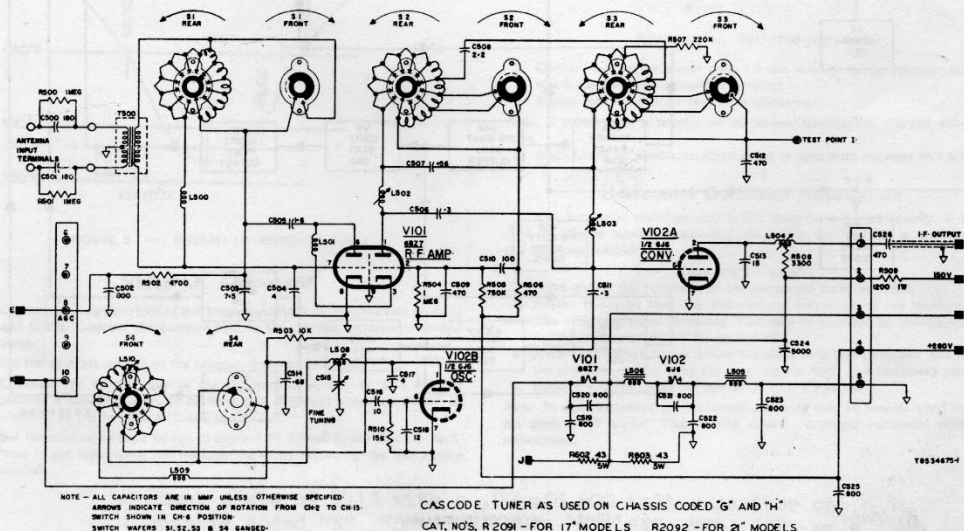


FRONT VIEW



TOP VIEW

New Type Cascode Tuners  
Cat.#'s R2091 & R2092.



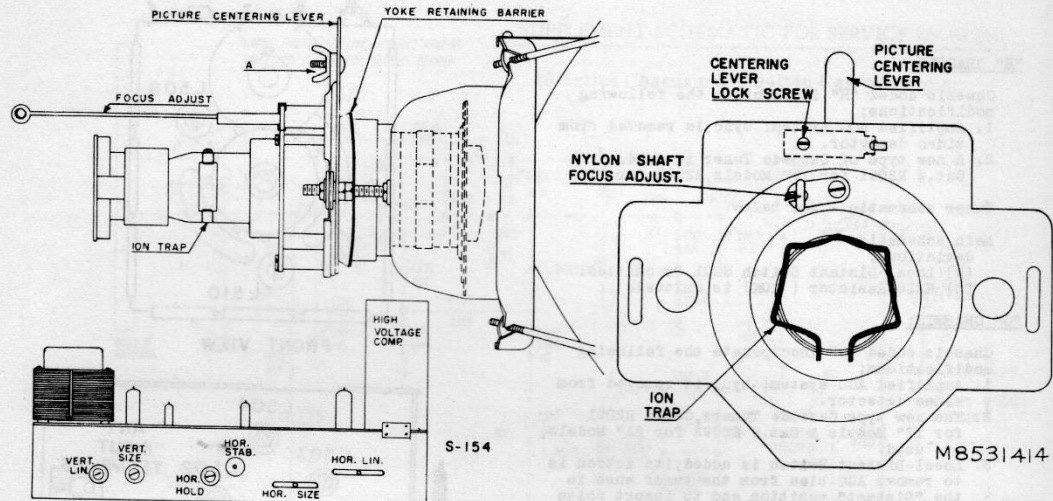


FIGURE 2 — PRESET CONTROLS AND FOCUS ADJUSTMENT.

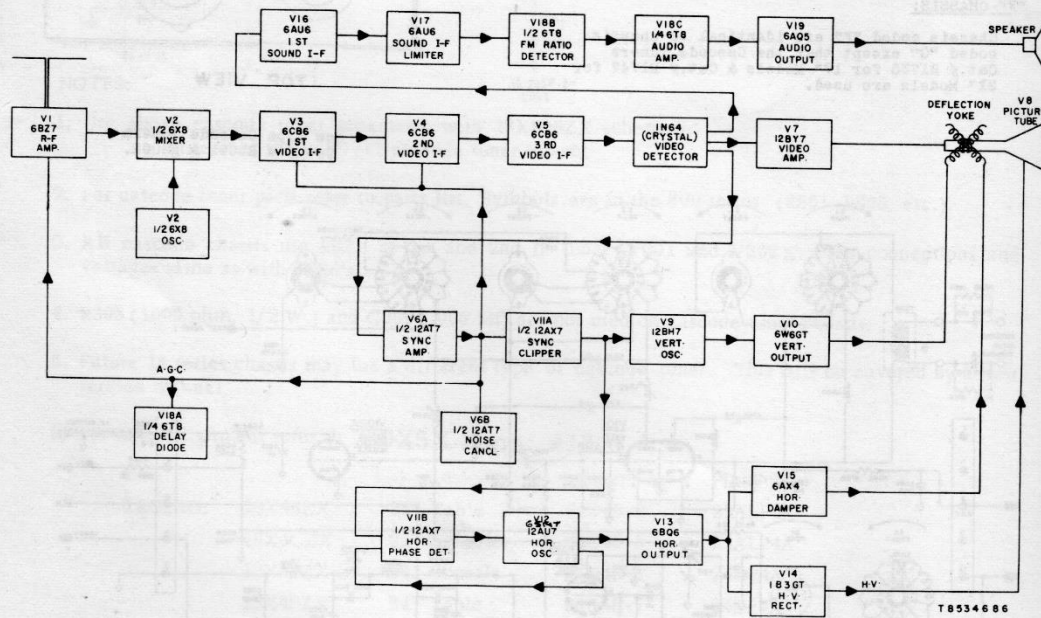


FIGURE 1 — BLOCK DIAGRAM



### Alignment - General

The following procedure covers the complete receiver alignment. It is based on the use of General Electric test equipment and if other equipment is used the procedure may have to be modified slightly.

Before proceeding with the alignment, read all the instructions carefully and allow the receiver and the test equipment to warm up for at least 15 minutes.

*Note:* Always use an isolation transformer to protect test equipment.

### Test Equipment

The following test equipment is necessary in order to effect alignment of the receiver:

1. R-F Sweep Generator; GE Type ST-4A or equivalent.
  - (a) Frequency requirements:
    - 4.5 mc. with approximately 2 mc. sweep width. 40-50 mc. with approximately 10 mc. sweep width. 50-90 mc., 170-220 mc., with approximately 15 mc. sweep width.
  - (b) Constant output in the sweep range.
  - (c) Minimum output of 0.1 volt.
2. Marker Generator; GE Type ST-5A or equivalent. The marker generator must have good frequency stability, accurate calibration and must cover the following frequencies:
  - (a) 42.5 mc.                      44.15 mc.                      45.0 mc.                      45.75 mc.
  - (b) 4.5 mc. for video amplifier trap alignment.
  - (c) Picture and sound carrier frequencies for channels 2-13 inclusive.
3. Balanced Output Adaptor; GE ST-8A or equivalent.
4. Oscilloscope; GE ST 2-A or equivalent. The oscilloscope should have good sensitivity and preferably a 5 inch screen and wide-band frequency response in the vertical deflection circuits. Although the high frequency response is not necessary for alignment, it is imperative when observing video waveforms.
5. A crystal detector network as shown is necessary when aligning the 4.5 mc. video amplifier trap.
6. For reduction of noise and spurious responses appearing on the oscilloscope while doing alignment, insert a 0.2 mf. capacitor across the vertical amplifier terminals of the oscilloscope.

*Note:* A special alignment tool is required for alignment purposes. This is available under part No. R-2166

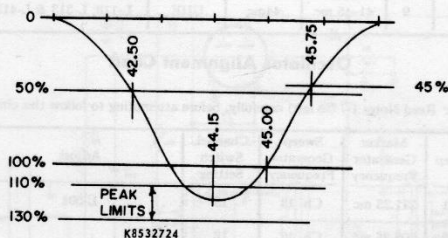


FIGURE 3 — OVERALL I.F. RESPONSE CURVE

### Video I.F. Alignment

1. Connect the negative lead of a 3 volt bias battery to the junction of R111 and C-105. Connect the positive lead to the nearest top chassis ground point.
2. Set the contrast control to the counter-clockwise position.
3. Calibrate the vertical gain of the oscilloscope so that  $\frac{3}{4}$  volt AC will provide a desirable amount of deflection. Receiver response should be observed at the junction of L-156 and C-118.
4. Set the channel selector switch to channel 11. Check to see that the oscilloscope is not influencing the response curve by adjusting the fine tuning control.

\* Shunt plate of V11A with a .02 mfd 600 volt capacitor on chassis coded "R", "S", "U", "V", "W", "X", "Y", "Z", or a .047 mfd 600 volts capacitor on chassis coded "P".

5. Alignment is readily achieved by viewing the "overall" I.F. response as indicated in the procedure outlined below and varying the individual stage adjustments for the symmetrical characteristics of the response curve shown. It should be noted however, that each stage has a separate and distinct function in the attainment of the symmetrical response curve.
6. Connect the signal generator after correct termination to a split tube shield which is fitted over V2 the converter stage.

*Note:* This shield may be obtained by cutting a conventional tube shield in half and fitting the two halves over the tube but separating them so as to prevent them from touching one another. The grounded side of the signal generator cable should be connected to the lower half and the ungrounded lead from the signal generator to the upper half of the shield.

7. Set the centre frequency of the sweep generator to approximately 44 mc. and adjust the sweep width to approximately 10 mc.

*Remove V13 during Align.*

### Adjustments

1. Position the 42.5 mc. marker at the 50% point on the response curve by adjustment of T-152, the 2nd video I.F. amplifier transformer.
2. Position the 45.75 mc. marker at the 45% point shown on the response curve by adjustment of T-151, the 1st video I.F. amplifier transformer.
3. Adjust T-153 the 3rd I.F. amplifier transformer for maximum gain or amplitude at the 44.15 mc. marker frequency.
4. Adjust L-2 converter plate coil, and L-153, the video I.F. input coil for maximum gain at 44.15 mc. In the event that the 45.0 mc. marker does not coincide as shown on the response curve illustrated, stagger L-2 and L-153 slightly above and below 44.15 mc.

### 4.5 MC Trap (L-157) Alignment

1. Connect sweep generator with 4.5 mc.  $\pm$  500 KC frequency to the junction of L-156 and C-118 at the input to V-7 the video amplifier.
2. Connect oscilloscope using detector network shown below to the junction point of C-121 and R-134.

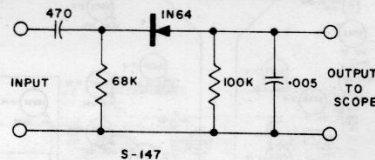


FIGURE 4 — DETECTOR NETWORK

3. Connect marker generator with 4.5 mc. marker to the junction point at which the sweep generator is connected.
4. Adjust contrast control maximum clockwise.

*Note:* If interference is present on the screen, remove V-5, the 3rd video I.F. tube.

5. Align L-157 for maximum attenuation or minimum response to 4.5 mc.

### Horizontal Oscillator Adjustment

The horizontal stabilizer coil L-351 must be adjusted exactly to 15,750 CPS to achieve maximum stability and pull-in ability. This is performed in the following manner:

1. Tune in a TV signal.
2. Short circuit the terminals of the horizontal stabilizing coil.
3. Adjust R-311 so that the free-running frequency of the multivibrator coincides with sync pulse frequency. This may be observed by holding the horizontal bar stationary for an instant.
4. Remove the short circuit across the stabilizing coil terminals, and adjust the stabilizer coil to bring the blanking bar back to a stationary position.
5. Replace V-6 and check the operation on a TV signal.

*Note:* In some instances, the horizontal oscillator may be audible when switching from a TV signal. This usually denotes improper horizontal oscillator adjustment.

## R-F Alignment

## General:

1. Disconnect the transmission line from the antenna terminals at the head-end. Couple the output of the sweep generator to the balanced output adaptor GE ST-8A, or equivalent, for the particular type sweep generator used. Couple the adaptor to the head-end terminals through a piece of 300 ohm transmission line. If a balanced output adaptor is not available for the sweep generator, a matching network should be used. A balanced output is recommended, since the matching network may introduce frequency shift and cause a misleading tilt to the response curve.
2. Connect the oscilloscope to the test point on top of the tuner assembly.

## Procedure:

1. The oscillator influences the R-F response curve. It is necessary to "kill" the oscillator by placing a 0.01 mfd. capacitor between the insulated terminal of the fine tuning capacitor and ground.
2. Coils for channels 12 through 7 are fixed inductances. Check the alignment of these channels for proper response curves. If necessary, re-adjust channel 13 for a compromise on channels 13 through 7.
3. Coils for channels 6 through 2 may be adjusted by squeezing or spreading turns. Use care in this process.

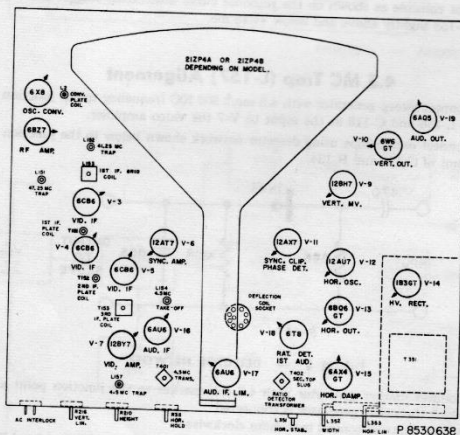


FIGURE 5 — TUBE AND TRIMMER LOCATION

## Oscillator Alignment

## Procedure:

1. R-F and video I-F alignment must be correct before attempting oscillator alignment.
2. Apply the signal to antenna terminals using matching network and proper termination as outlined in "General" under R-F alignment.
3. Adjust the Contrast Control to its minimum setting, and the Fine Tuning Control to mid-range position.
4. Calibrate the vertical gain of the oscilloscope so that  $\frac{3}{4}$  volt AC will provide a desirable amount of deflection. Connect the oscilloscope between the junction of L-156 and C-118 and B- on top chassis plate.
5. Set sweep generator for sweep width of 15 mc.
6. Adjust output of sweep generator for a  $\frac{3}{4}$  volt response curve on the calibrated oscilloscope.
7. Make the indicated adjustments so that the picture carrier for the channel falls at 50% on the high frequency side of the response curve.

## R-F Alignment Chart

Note: The R-F section of the tuner will very seldom require realignment. It is not recommended that R-F adjustments be made unless absolutely necessary.

Step	SW. Pos'n	Marker Generator Frequency	Sweep Generator Frequency	Channel Switch Setting	Adjust for Maximum Response
1	7	211.25 mc 215.75 mc	Ch. 13	13	L-101, L-301 & L-401
2	6	205.25 mc 209.75 mc	Ch. 12	12	No Adjustment
3	5	199.25 mc 203.75 mc	Ch. 11	11	
4	4	193.25 mc 197.75 mc	Ch. 10	10	
5	3	187.25 mc 191.75 mc	Ch. 9	9	
6	2	181.25 mc 187.75 mc	Ch. 8	8	
7	1	175.25 mc 179.75 mc	Ch. 7	7	
8	15	83.25 mc 87.75 mc	Ch. 6	6	L-108, L-308 & L-408
9	14	77.25 mc 81.75 mc	Ch. 5	5	L-109, L-309 & L-409
10	13	67.25 mc 71.75 mc	Ch. 4	4	L-110, L-310 & L-410
11	12	61.25 mc 65.75 mc	Ch. 3	3	L-111, L-311 & L-411
12	11	55.25 mc 59.75 mc	Ch. 2	2	L-112, L-312 & L-412
13	9	UHF 41-45 mc	44mc	UHF	L-113, L-313 & L-413

## Oscillator Alignment Chart

Note: Read Notes 1-7 (to left) carefully, before attempting to follow this chart.

Step	Marker Generator Frequency	Sweep Generator Frequency	Channel Switch Setting	Adjust
1	211.25 mc	Ch. 13	13	L-501
2	205.25 mc	Ch. 12	12	If insufficient tuning range is obtained, reset trimmer capacitor and re-adjust L-501 on Ch. 13.
3	199.25 mc	Ch. 11	11	
4	193.25 mc	Ch. 10	10	
5	187.25 mc	Ch. 9	9	
6	181.25 mc	Ch. 8	8	
7	175.25 mc	Ch. 7	7	
8	83.25 mc	Ch. 6	6	L-508
9	77.25 mc	Ch. 5	5	If insufficient tuning range is obtained, adjust remaining incremental inductances on S-5 to correct.
10	67.25 mc	Ch. 4	4	
11	61.25 mc	Ch. 3	3	
12	55.25 mc	Ch. 2	2	

## Audio I.F. Alignment

## General:

The preferred method of audio I.F. alignment involves the use of a station signal. The 4.5 mc. audio I.F. circuits are then tuned for proper indication on a DC voltmeter.

## Alignment on a TV Signal

1. Tune in a TV signal. This will provide a 4.5 mc. signal source for audio I.F. alignment. Keep the volume control turned down if the speaker is disconnected. Loosely couple the antenna to the tuner lead-in so that audio limiting is not excessive.
2. Connect VTVM, 20,000 ohm/voltmeter through a 100K resistor to the grid input of V-17 at the junction of R-403 and C-403 to T-401. Adjust L-154 and T-401 (top and bottom slugs) for maximum deflection or indication.
3. Connect VTVM, 20,000 ohm/voltmeter to pin 2 of V-18B and adjust T-402 (bottom adjustment) for maximum deflection or indication.
4. Place two 100K 5% tolerance resistors in series across pins 2 and 7 of V-18B the ratio detector, and connect a VTVM 20,000 ohms/voltmeter to the junction of the two 100K resistors. Adjust the secondary (top adjustment) of T-402 for zero indication.

## Service Data on Stratopower III Chassis

The printed schematic diagram dated Oct. 12, 1954 applies to "U" version chassis.

In chassis coded "Z" or "Y" the following changes in the schematic apply: V11 Sync clipper and Phase detector tube is type 12AT7.

C-418-.01 mfd. capacitor in the volume control circuit, not used. R-205 resistor located in the plate circuit of V11A is 180K.

To reduce curl encountered in "Z" chassis receivers, the horizontal width and linearity coils in Y, X, W, V and U chassis were physically interchanged to positions as shown in fig. 5. This change prevents cross coupling with the horizontal stabilizing coil.

In code "V" chassis C-418 .02 mfd. capacitor connected from junction of R-408 and C-411 to the top end of the volume control by means of a shielded lead is not used. C-417 .01 mfd. capacitor shown in the grid circuit of V-18C is relocated in position as shown in schematic for C-418.

## Coils and Transformers

Cat.#	Symbol	Description
R2136	T551 (60~R2269)	Filament Transformer
R2137	T403	Audio Output Transformer
R2138	T251	Vertical Output Transformer
R2139	T351	Horizontal Output Transformer
R2140	L551	Filter Reaction
R2141	L351	Coil—Horizontal Stabilizer
R2142	L155, L158	Compensating Coil 160 mh.
R2143	L156, R137	Compensating Coil 160 mh.
R2144	L159	Compensating Coil 68 mh.
R2145	L160	Compensating Coil 1.8 mh.
R1010	L354	Choke Coil 10mh.
R2146	L552, L553	Filament Choke Coil
R2147	T401, C404, C405	Audio I.F. Transformer 4.5 mc.
R2148	L157, C120	Coil, 4.5 mc. Trap
R2149	L153	Coil, 1st video I.F. Grid (shielded)
R2150	T152, T151	Coil, Video I.F. Plate
R2151	T153, C111, L161	Coil, 3rd Video I.F. Plate (shielded)
R2152	L152, C102	Coil—41.25 mc. trap
R2153	L151, C101	Coil—47.25 mc. trap
R2154	L154, C112, C113	Coil—4.5 mc. take-off
R2155	T402, C406, C407	Transformer—Ratio Detector
R2156	L353	Coil—Horizontal Linearity
R2157	L352	Coil—Horizontal Width.

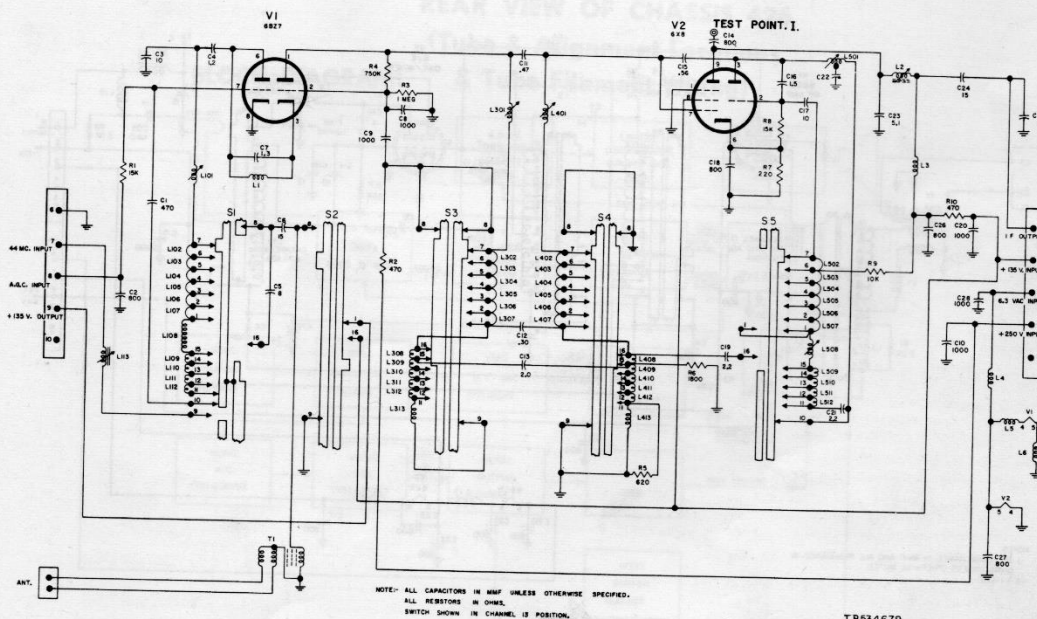


FIGURE 6 — TUNER UNIT

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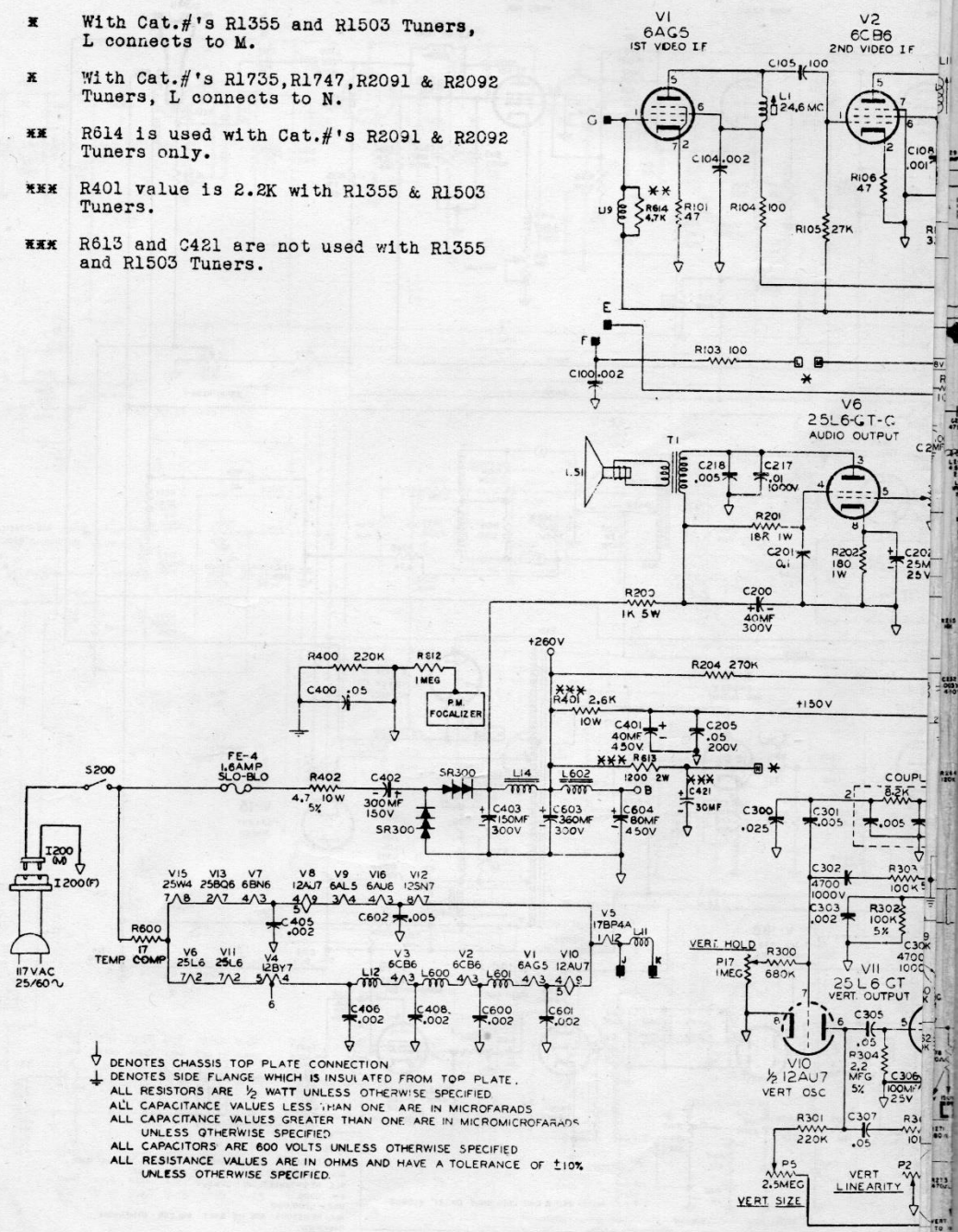


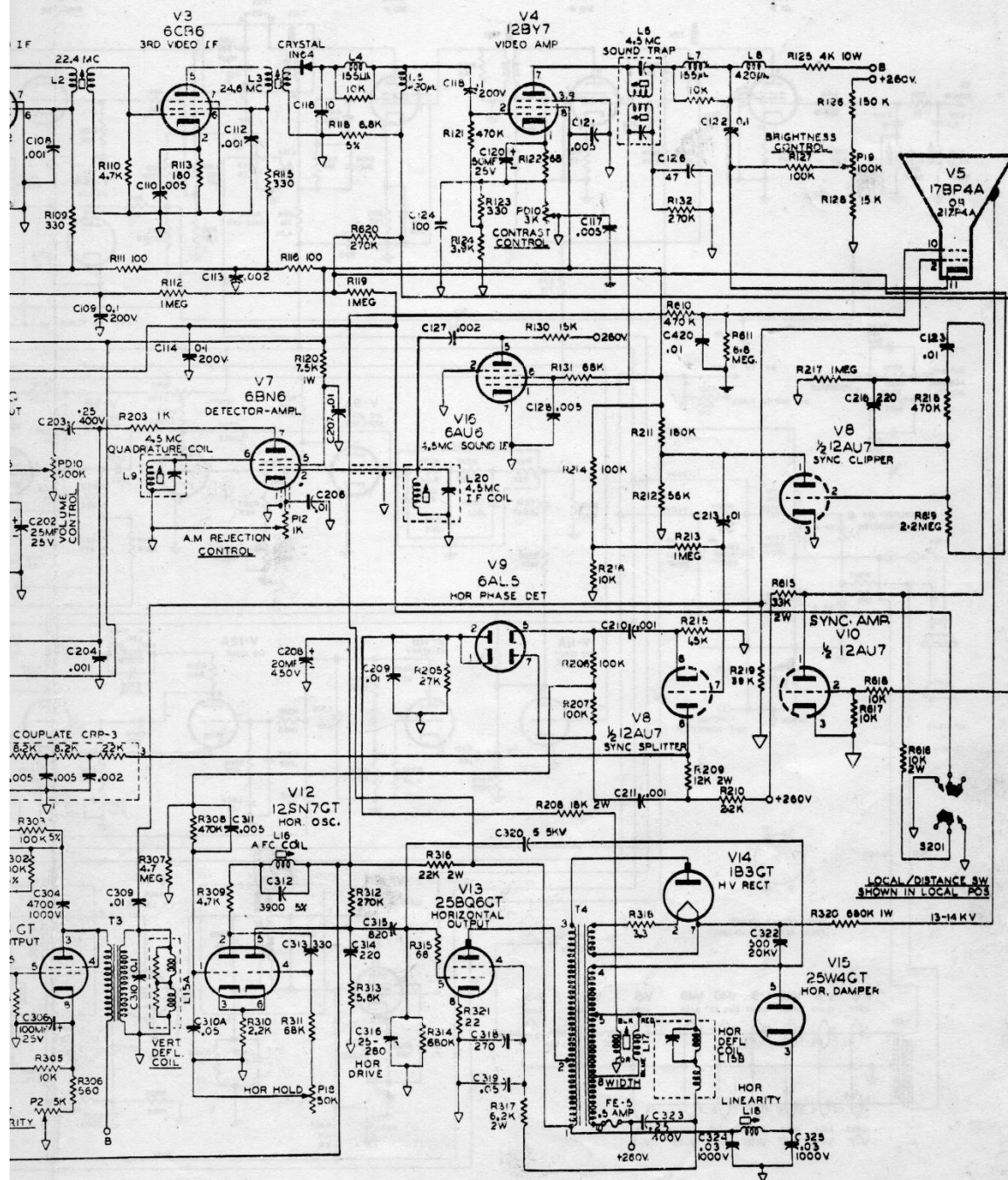
# CANADIAN GENERAL ELECTRIC

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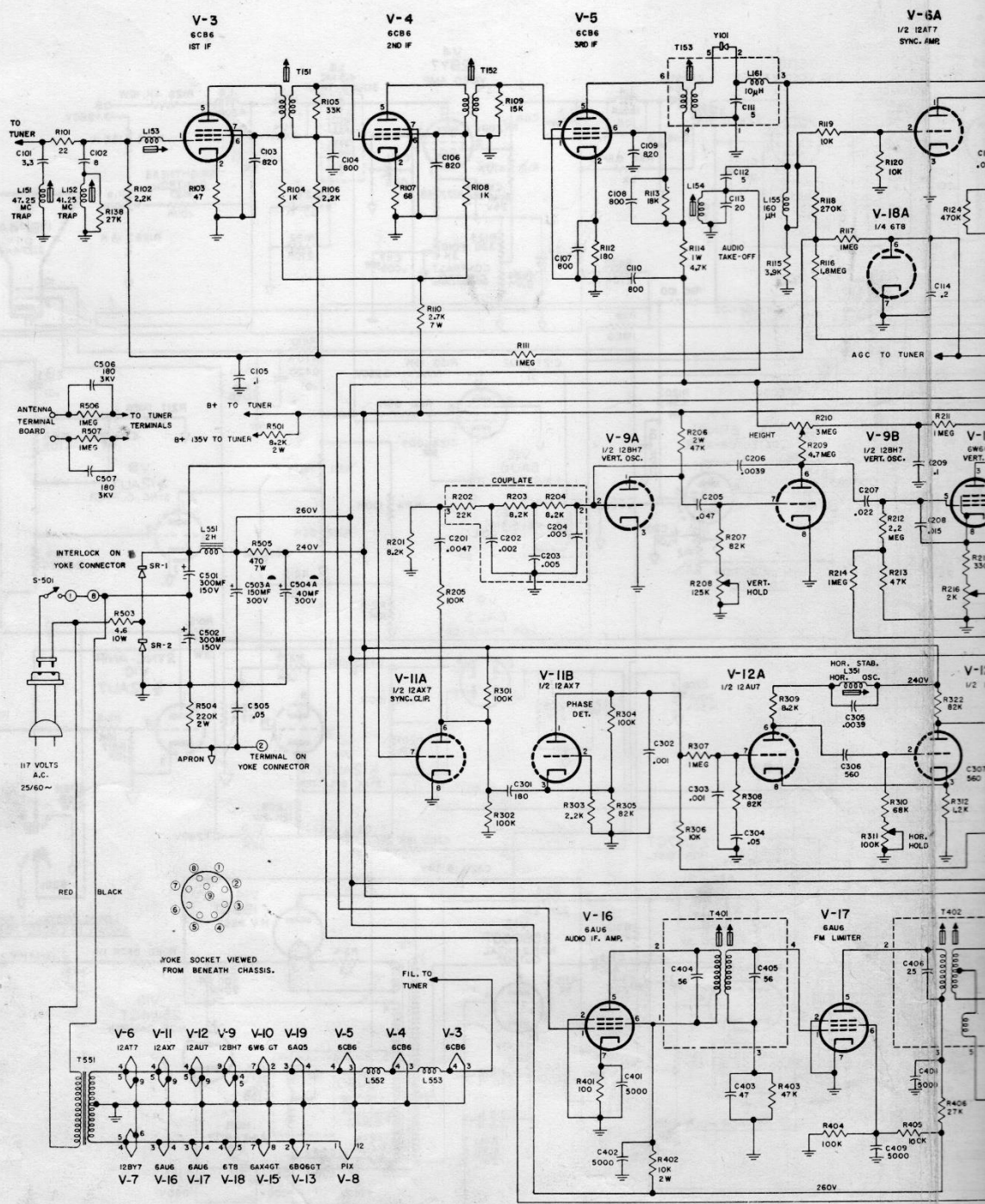
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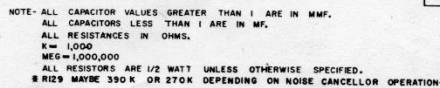
- \* With Cat.#'s R1355 and R1503 Tuners, L connects to M.
- \* With Cat.#'s R1735, R1747, R2091 & R2092 Tuners, L connects to N.
- \*\* R614 is used with Cat.#'s R2091 & R2092 Tuners only.
- \*\* R401 value is 2.2K with R1355 & R1503 Tuners.
- \*\* R613 and C421 are not used with R1355 and R1503 Tuners.











STRATOPOV

