

## MODELS 400TV, 405TVM, Revised

5. NO RASTER BUT SOUND NORMAL, CHECK FOR:
- Shorted or open picture tube - 7JP4.
  - Shorted or open 6Y6G high voltage oscillator tube located along the side of the high voltage shield compartment on picture chassis.
  - Open high voltage oscillator coil L1 located inside shield compartment in high voltage unit on picture chassis.
  - Shorted Herlac H.V. Filter Unit consisting of the 350 MMF condensers C-22A, C-22B and the 100,000 ohm resistor R-42 inside the high voltage shield compartment on the picture chassis.
  - Shorted .001 Mfd. 6000 volt coupling condenser C-1 or C-3 in 6SN7 horizontal amplifier plate circuit in picture chassis.
  - Defective 8013/1B3GT H.V. rectifier tube inside shield compartment on picture chassis.
  - High voltage breakdown between chassis and high voltage leads caused by wires being dressed too close to chassis.
6. NO RASTER BUT THIN VERTICAL LINE IS VISIBLE ON SCREEN, CHECK FOR:
- Shorted .001 Mfd. 600 Volt condenser C6 between pin #4 of the 6SN7 horizontal amplifier tube and the single tie lug on the picture chassis. ALWAYS REPLACE with .01 Mfd. 1200 Volt condenser, part number 23E1211.
  - Defective 6SN7 horizontal oscillator tube on picture chassis.
  - Defective 6SN7 horizontal amplifier tube on picture chassis.
7. NO RASTER BUT THIN HORIZONTAL LINE IS VISIBLE ON SCREEN, CHECK FOR:
- Improper setting of Vertical Size Control.
  - Defective 6SN7 vertical oscillator tube on picture chassis.
  - Defective 6SN7 vertical amplifier tube on picture chassis.
8. WHEN BOTH VERTICAL AND HORIZONTAL RASTER SIZE IS SMALL OR INTERMITTENTLY SO, TOP AND BOTTOM CURVE IN TOWARD MIDDLE, WILL NOT FOCUS AND RASTER APPEARS TO BE YELLOW IN COLOR, CHECK FOR:
- Shorted or intermittently shorted picture tube - 7JP4.
9. RASTER AND PICTURE NORMAL, BRILLIANCE VERY LOW, INCREASING BRIGHTNESS CONTROL PRODUCES NEGATIVE PICTURE, CHECK FOR:
- Weak picture tube - 7JP4.
10. RASTER STILL BRIGHT WITH BRIGHTNESS CONTROL AT MINIMUM POSITION (PICTURE MAY OR MAY NOT TURN NEGATIVE WITH BRIGHTNESS CONTROL ADVANCED TO MAXIMUM POSITION, CHECK FOR:
- Defective picture tube - 7JP4
11. NO PICTURE OR WEAK PICTURE, SOUND WEAK OR NO SOUND, CHECK FOR:
- Weak or dead 12AT7 oscillator tube on tuner chassis.
  - Weak or dead 6SH6 R.F. amplifier tube on tuner chassis.
  - Weak or dead 6AG5 modulator tube on tuner chassis.
  - Weak or dead 6AG5 video I.F. amplifier tube on tuner chassis.
  - Weak or dead 6AL5 video detector tube on tuner chassis.
  - Weak or dead 6AU6 video amplifier tube on tuner chassis.
  - Intermittent contact between eyellet holding switch contact to wafer and switch contact of channel switch assembly in R.F. tuner unit. NOTE: Caution should be used in soldering eyellet to contact - too much applied heat may damage switch assembly.
  - Open fuse in picture chassis.
1. WHEN VERTICAL RASTER IS TOO SMALL, CHECK FOR:
- Shorted 6SL7 vertical amplifier tube, located on picture chassis.  
CAUTION: Always turn receiver off before removal of this tube or damage to resistors and condensers in this circuit by high voltage may occur.
  - Weak 6SN7 vertical oscillator tube located on picture chassis.
2. WHEN VERTICAL RASTER IS TOO SMALL, WITH BRIGHT LINES OR BARS EITHER ON TOP OR BOTTOM, OR BOTH TOP AND BOTTOM OF RASTER (ALSO MAY OR MAY NOT FOCUS), CHECK FOR:
- 4.7 megohm resistors R23 and R24 in the plate circuits of the 6SL7 vertical amplifier tube on the picture chassis either open or higher than normal value. Replace with high voltage type resistor only - part number 27E1017.
  - See section 4 (a)
  - Shorted .1 Mfd. 600 Volt condenser C13 in plate circuit of the 6SL7 vertical amplifier tube on the picture chassis.
  - Defective 6SN7 vertical oscillator tube on picture chassis.
  - Defective 6SL7 vertical amplifier tube on picture chassis.
  - Shorted 20 Mfd. or 1.0 Mfd. condenser C-21 located on picture chassis. Always replace with 1.0 Mfd. 200 volt condenser - part number 23E226.
  - Shorted picture tube 7JP4.
3. WHEN HORIZONTAL RASTER IS TOO SMALL, CHECK FOR:
- Weak 6SN7 horizontal oscillator tube on picture chassis.
  - Weak 6SN7 horizontal amplifier tube on picture chassis.
  - 100,000 ohm resistors R2 and R5 in plate circuits of 6SN7 horizontal amplifier tube on picture chassis open or higher than normal in value. Replace with high voltage type resistor only - part number 27E104-5.
  - Add 10 MMF condenser in parallel with the 72 MMF condenser C24 which is across the medium high voltage winding located on the high voltage coil L1 inside shield can on picture chassis.
  - Open or shorted 10 MMF condenser in parallel with the 72 MMF condenser C-24 which is across the medium high voltage winding located on the High Voltage Coil L-1 inside the shield can on the picture chassis.
  - Open or high resistance 1 megohm resistor R10 in the plate circuit of the 6SN7 horizontal oscillator tube on picture chassis.
4. WHEN PICTURE CANNOT BE BROUGHT IN FOCUS WITH FOCUS CONTROL BUT RASTER, PICTURE AND SOUND APPEAR NORMAL, CHECK FOR:
- 4.7 megohm resistors R58 and R59, connected in series in the high voltage divider from the horizontal centering control to the focusing control on the picture chassis, either open or higher than normal in value. Always replace both resistors and use four 2.4 megohm resistors in series of the high voltage type resistor only - assembly part number A27E1017-2.
  - 4.7 megohm resistors R23 and R24 in the plate circuits of the 6SL7 vertical amplifier tube on the picture chassis either open or higher than normal in value. Replace with high voltage type resistor only - part number 27E1017.

12. NO PICTURE OR SOUND AND SET SMOKES, OR PICTURE AND SOUND INTERMITTENT, CHECK FOR:

- (a) Unused ground contact, at the third I.F. amplifier socket under the I.F. plate choke L8 on tuner chassis, cutting in to the choke.
- (b) Shorted .005 Mfd. condenser C26 in modulator tube plate circuit in tuner chassis.
- (c) Shorted tube in tuner or picture chassis.
- (d) Shorted .005 Mfd. or 680 MFD condenser in R.F. tuner unit.

13. WHEN PICTURE WILL NOT LOCK EITHER HORIZONTALLY OR VERTICALLY, OR LOCKING IS VERY CRITICAL, CHECK FOR:

- (a) Defective 6AU6 sync separator tube in tuner chassis.

14. WHEN PICTURE WILL NOT LOCK VERTICALLY; VERTICAL HOLD CONTROL LOCKS VERY BROADLY; PICTURE LOCKS VERTICALLY BUT TWO SEPARATE PICTURES ARE VISIBLE (LOOKING AT 120 CYCLES); OR TOP HALF OF PICTURE AND BOTTOM HALF OF PICTURE ARE SUPERIMPOSED UPON EACH OTHER (LOOKING AT 30 CYCLES), CHECK FOR:

- (a) Defective 6SN7 vertical oscillator tube in picture chassis.

15. BAND SWITCH STICKS ON ANY CHANNEL:

- (a) One of the oscillator trimmer adjustment screws on the channel selector switch in the tuner unit at the front of the tuner chassis may be out too far and may be hitting the stop arm on the channel switch.

16. RASTER AND PICTURE NORMAL, NO SOUND, CHECK FOR:

- (a) Defective 6AS5 audio output tube on tuner chassis.
- (b) Defective 6SQ7 audio amplifier tube on tuner chassis.
- (c) Defective 6AL5 sound detector tube on tuner chassis.
- (d) Defective 6AU6 sound I.F. amplifier tube on tuner chassis.
- (e) Defective component in sound section in tuner chassis.

The following changes have been made in Models 400TV and 405TVM, as shown in SENTINEL PAGES 2-1 through 2-13.

1. CIRCUIT DIFFERENCES

- (a) Resistor R7 in plate circuit of 12AT7 oscillator tube in tuner chassis section of circuit diagram marked 68,000 ohms should read 6,8000 ohms.

2. TO PREVENT PICTURE SMEARING WHEN BRIGHTNESS AND CONTRAST CONTROLS ARE ADVANCED TOO FAR:

- (a) The 2.2 megohm resistor R51 in the H.V. bleeder circuit in the picture chassis has been removed and a direct connection made between the two points in the set to which this resistor was connected.

3. TO INCREASE THE RANGE OF THE VERTICAL HOLD CONTROL

- (a) The part number 28E37, 500,000 ohm Vertical Hold Control R46 has been changed to a 1 megohm control in the picture chassis, and the new part number is 28E36.

4. TO IMPROVE PERFORMANCE FOR LOCKING ON BOTH HORIZONTAL AND VERTICAL:

- (a) The .25 Mfd. condenser C-43 by-pass in the A.G.C. circuit in the tuner chassis has been changed to a 1.0 Mfd. 200-volt condenser, part number 23E226.

5. TO IMPROVE THE VERTICAL LINEARITY, THE 6SN7GT VERTICAL OSCILLATOR CIRCUIT, SHOWN IN FIG. 1, HAS BEEN CHANGED AS SHOWN IN FIG. 2.

- (a) Note that condensers C15, .1 Mfd., C14, .15 Mfd., resistors R20 100,000 ohms, and R48 100,000 ohms were eliminated. Condenser C12 .1 Mfd. and R41 500,000 vertical size control are returned to ground, and a .03 Mfd. condenser C32, part number 23E114 has been added. THE VALUE OF THE VERTICAL LINEARITY CONTROL R21 has been changed to 500,000 ohms, part number 28E37.

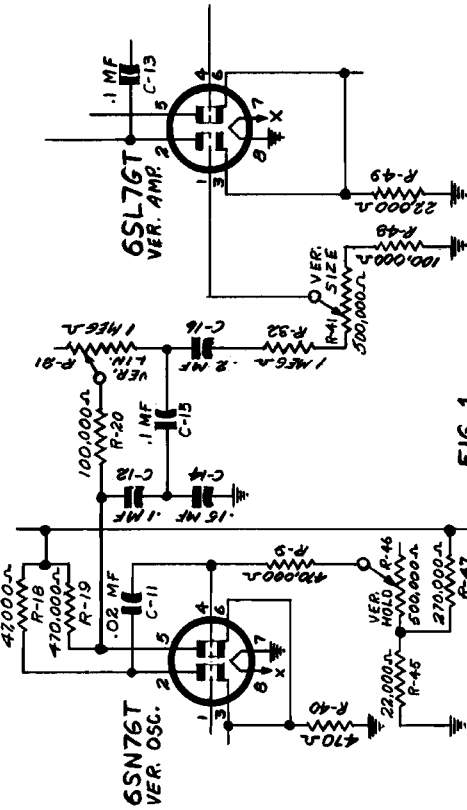


FIG. 1

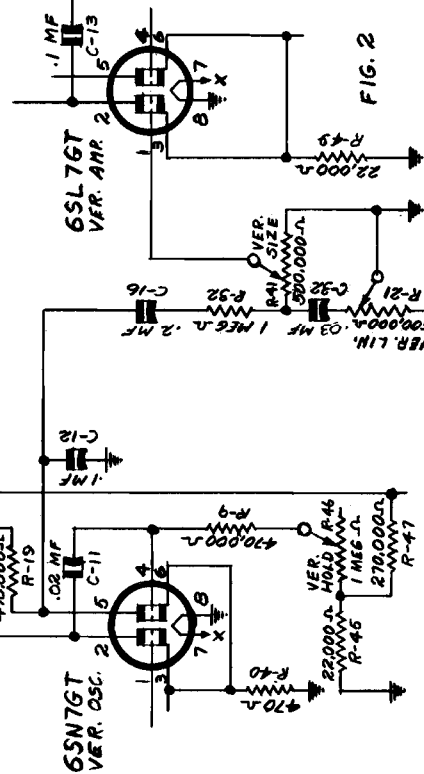


FIG. 2

MODELS 400TV, 405TVM, Revised

SERVICE BULLETIN TV-109

6. TO INCREASE THE AMOUNT OF VERTICAL SYNC VOLTAGE

- (a) The 4700 ohm resistor R24, located in the sync separator output circuit on the tuner chassis has been changed to a 10,000 ohm resistor, part number 27E103.

- 7. TO PREVENT TURNOVER OF EXTREME TOP OF PICTURE - (indicated by top portion of center vertical lines of test pattern curving to left.)
  - (a) The 470 ohm resistor R6 in the input circuit of the horizontal oscillator on the picture chassis has been replaced with a 820 ohm resistor, part number 27E821.

- (b) The .005 Mfd. mica coupling condenser C5 in the input circuit of the horizontal oscillator on the picture chassis has been replaced with a 200 MFD mica or ceramic, part number 23E141.

- (c) The 12,000 ohm resistor R7 in the input circuit of the horizontal oscillator on the picture chassis has been replaced with a 4700 ohm resistor, part number 27E472.

8. TO PREVENT PICTURE WIDTH CHANGING WITH AN INCREASE IN AMBIENT TEMPERATURE

- (a) The 1 megohm resistor R10 in series with the horizontal size control on the picture chassis has been replaced with a 1 megohm, 2 watt, resistor, part number 27E105-5.

- 9. TO ELIMINATE TOO BROAD PEAKS IN THE SOUND I.F. TRANSFORMER T5, in the tuner chassis, caused by variations in 6AU6 tube in the sound I.F. amplifier circuit.

- (a) The 68 ohm resistor R51 in the cathode circuit of the 6AU6 sound I.F. amplifier tube on the tuner chassis has been changed to a 180 ohm, 1/3 watt, resistor, part number 27E181.

SERVICE BULLETIN TV 110

1. TO PREVENT PICTURE TEARING AT THE TOP AND TO INCREASE THE STABILITY OF THE HORIZONTAL OSCILLATOR CIRCUIT, THE FOLLOWING CHANGES HAVE BEEN MADE IN CURRENT MODELS 400 TV AND 405 TVM.

- (a) The .001 MFD ceramic condenser C-2 in the Horizontal Oscillator Circuit connected across the socket to pins 2 and 5 in the picture chassis has been changed to a special .001 MFD ceramic +5% 500V. Zero temperature coefficient condenser, part number 23E3.
- (b) The 229,000 ohm resistor R-3 in the Horizontal Oscillator Circuit connected between pin 1 on the tube socket and the center lug of the Horizontal Hold Control in the picture chassis has been changed to a special 220,000 ohm ±5% 1/3 W. resistor, part number 27-E1009-17.
- (c) The 680,000 ohm resistor R-15 in the Horizontal Oscillator Circuit connected between the electrolytic C-27 and the lug on the Horizontal Hold Control in the picture chassis has been changed to a special 680,000 ohm ±10% 1/3 W. resistor, part number 27E1009-16.
- (d) The 33,000 ohm resistor R-16 in the Horizontal Oscillator Circuit connected between the lug on the Horizontal Hold Control and ground in the picture chassis has been changed to a special 33,000 ±5% 1/3W. resistor, part number 27E1009-18.

2. ALSO AS AN AID AND TO PREVENT PICTURE SMEARING

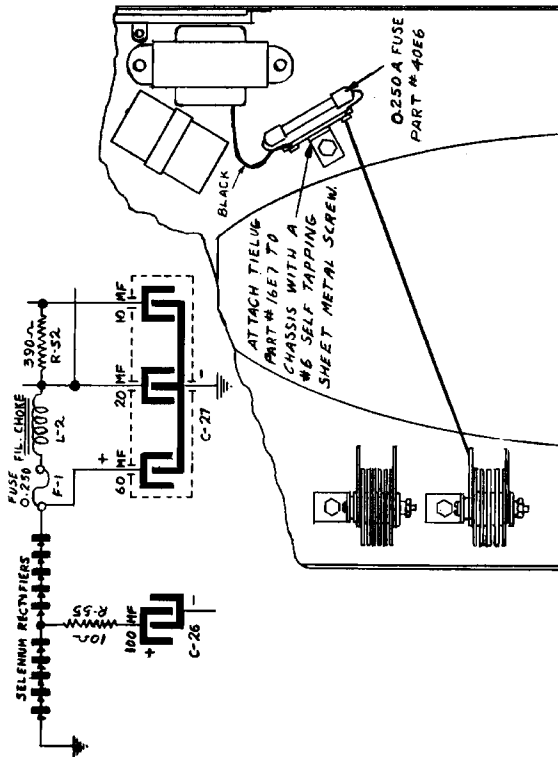
- (a) The 470,000 ohm resistor R-34 in the A.G.C. Circuit, which is connected to the R.F. tuner unit and the second lug (ground lug) on the tie lug strip in the center of the tuner chassis, has been removed.
- (b) The .25MFD condenser C-43 by-pass in the A.G.C. Circuit and connected to the tie lug strip near the 6AL5 Video Detector Tube in the tuner chassis has been changed to a 1.0 MFD 200 V. condenser part number 23E226.

SERVICE BULLETIN TV-105

To prevent component damage should a "P" short develop in the 400 TV or 405TVM receivers, a 1/4 ampere 250 volt fuse is being used in series with the filter choke, in present production of these models.

To provide this protection in those receivers that were shipped from the factory without the fuse, we recommend that you add the fuse whenever such a receiver is serviced. Diagram below shows where to locate and how to connect the fuse assembly.

A fuse assembly kit consisting of the fuse, terminal strip and self-tapping mounting screw is available directly from Sentinel Radio Corporation's Service Department.



MODELS 400TV, 405TVM, Revised

TUNER CHASSIS AND MISC. PARTS LIST

(For Revised Circuit Diagram)

R.F. TUNER UNIT

CAPACITORS

Table of R.F. Tuner Unit Capacitors with columns for Part No., Description, and Illustration No.

RESISTORS

Table of R.F. Tuner Unit Resistors with columns for Part No., Description, and Illustration No.

COILS and TRANSFORMERS

Table of R.F. Tuner Unit Coils and Transformers with columns for Part No., Description, and Illustration No.

TUNER CHASSIS

CAPACITORS

Table of Tuner Chassis Capacitors with columns for Part No., Description, and Illustration No.

COILS and TRANSFORMERS

Table of Tuner Chassis Coils and Transformers with columns for Part No., Description, and Illustration No.

MISCELLANEOUS PARTS

Table of Miscellaneous Parts with columns for Part No., Description, and Illustration No.

PICTURE CHASSIS AND CABINET MISC. PARTS LIST

(For Revised Circuit Diagram)

CAPACITORS

Table of Picture Chassis and Cabinet Capacitors with columns for Part No., Description, and Illustration No.

RESISTORS

Table of Picture Chassis and Cabinet Resistors with columns for Part No., Description, and Illustration No.

COILS and TRANSFORMERS

Table of Picture Chassis and Cabinet Coils and Transformers with columns for Part No., Description, and Illustration No.

MISCELLANEOUS PARTS

Table of Miscellaneous Parts (continued) with columns for Part No., Description, and Illustration No.

COILS and TRANSFORMERS

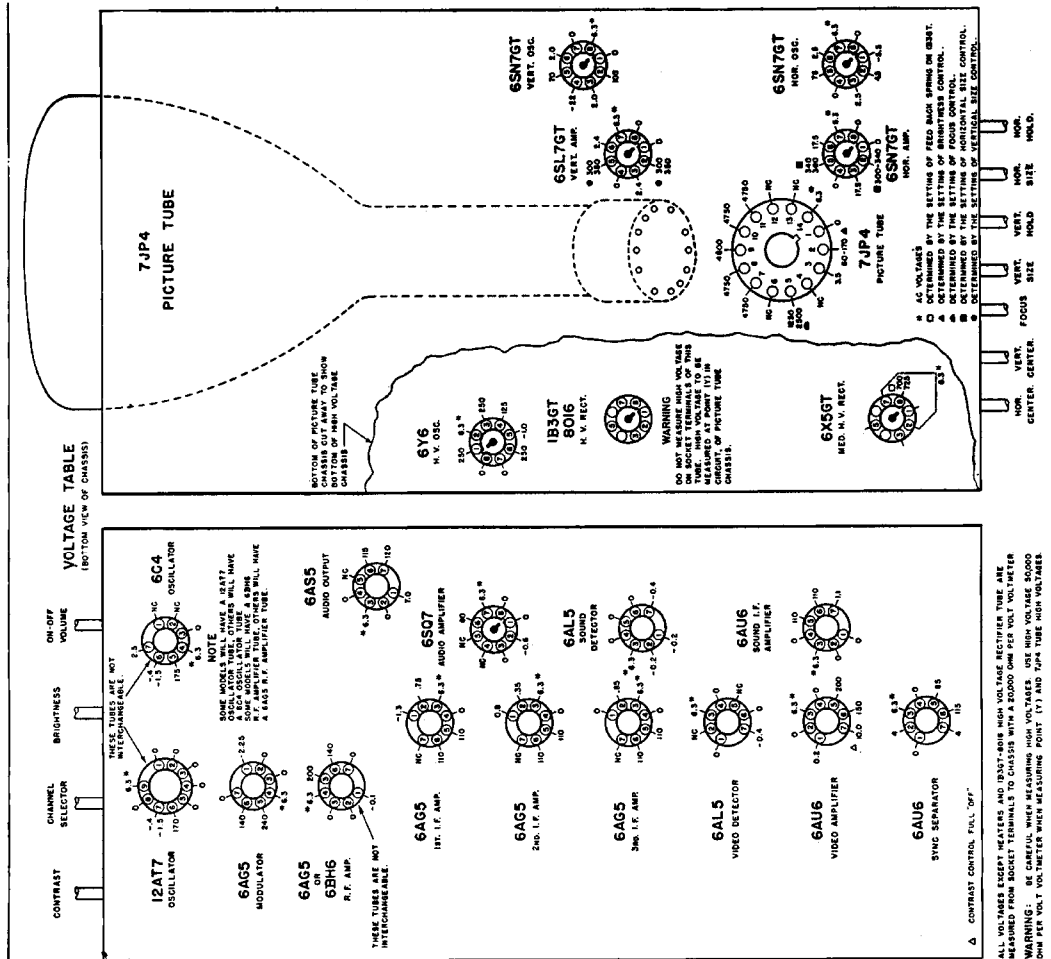
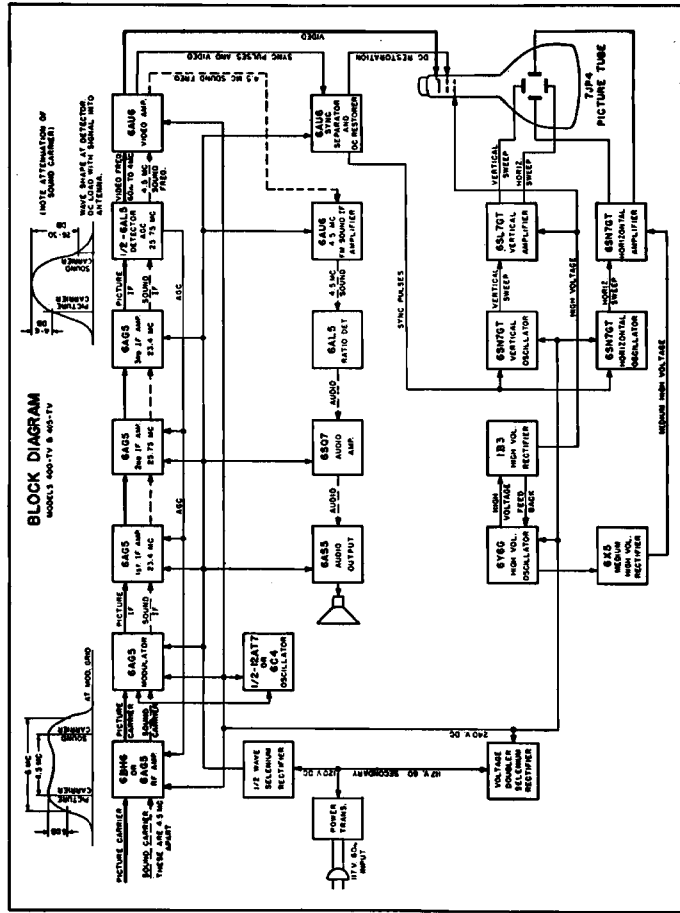
Table of Miscellaneous Parts (continued) with columns for Part No., Description, and Illustration No.

CABINET MISCELLANEOUS

Table of Cabinet Miscellaneous Parts with columns for Part No., Description, and Illustration No.

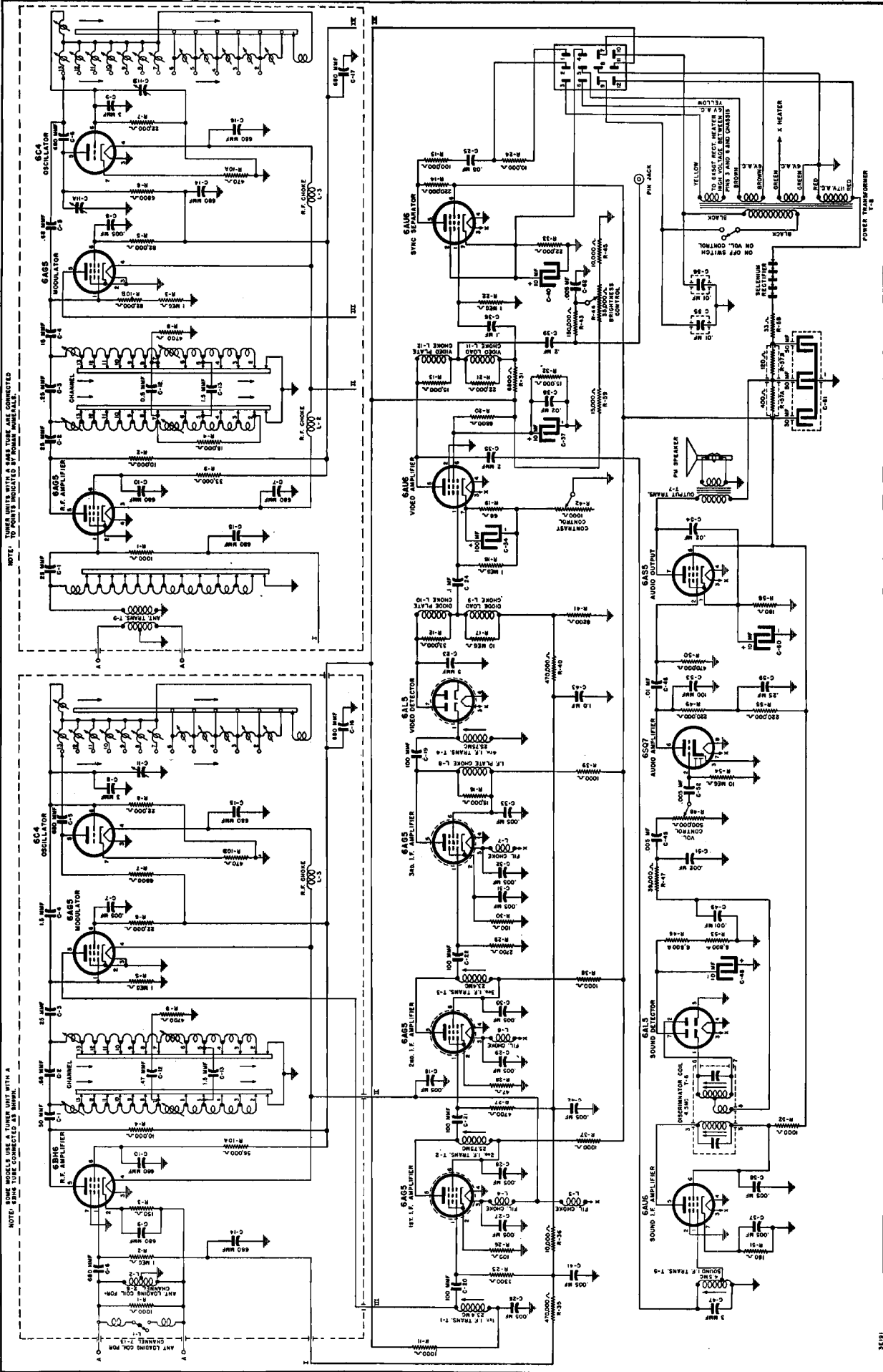
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MODELS 400TV, 405TVM, Revised



MODELS 400TV, 405TVM, Revised

MODELS 400 AND 405 REVISED CIRCUIT DIAGRAM AND VOLTAGE TABLE



NOTE: TUBE UNITS WITH 9 PINS MUST BE CONNECTED TO PINS 1 INDICATED BY SMALL SQUARE.

NOTE: SOME MODELS USE A TUBE UNIT WITH A 9 PIN TUBE CONNECTED AS SHOWN.

MODELS 400TV, 405TVM, Revised

