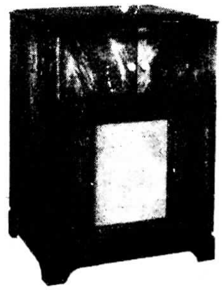
MODEL 801 Early, Late

GENERAL ELECTRIC CO.



ELECTRICAL RATING:

Frequency	50 60 cps	60 cps
Voltage	105-125 v.	105 125 v.
Wattage (Radio)	85	85
Wattage (Television)	215	215

R-F FREQUENCY RANGE:

Selector Switch Position	Freq. Range	Picture Carrier	Sound Carrier
Radio	540 1600 kc	....	....
No. 1	44- 50 mc	45.25	49.75
No. 2	54- 60 mc	55.25	59.75
No. 3	60- 66 mc	61.25	65.75
No. 4	66- 72 mc	67.25	71.75
No. 5	76- 82 mc	77.25	81.75
No. 6	82- 88 mc	83.25	87.75
No. 7	174- 180 mc	175.25	179.75
No. 8	180- 186 mc	181.25	185.75
No. 9	186- 192 mc	187.25	191.75
No. 10	192- 198 mc	193.25	197.75
No. 11	198- 204 mc	199.25	203.75
No. 12	204- 210 mc	205.25	209.75
No. 13	210- 216 mc	211.25	215.75

INTERMEDIATE FREQUENCIES:

Television Video (carrier freq. equivalent) .... 26.4 mc
Television Audio .... 21.9 mc
Radio .... 455 kc

AUDIO POWER OUTPUT:

Undistorted .... 3 watts
Maximum .... 4.5 watts

PICTURE SIZE:

Height .... 6 inches
Width .... 8 inches

ANTENNA REQUIREMENTS:

Type .... Folded Dipole
Impedance .... 300 ohms

TUBES: (24 including rectifiers)

Symbol	Purpose	Type
(V 1)	Television R-F Amplifier	6AU6
(V 2)	Television Converter-Oscillator	7F8
(V 3)	1st Video I-F Amplifier	6AC7
(V 4)	2nd Video I-F Amplifier	6AC7
(V 5)	3rd Video I-F Amplifier	6AC7
(V 6)	Video Detector—Bias Rectifier	6H6
(V 7)	Video Amplifier	6AC7
(V 8)	Picture Tube	10BP4
(V 9)	Clipper-Horizontal Sync. Ampli.	6SN7GT
(V10)	Horizontal Discr.—D-C Amplifier	6SL7GT
(V11)	Horizontal Multivibrator	6SN7GT
(V12)	Horizontal Output	807
(V13)	High Voltage Rectifier	8016
(V14)	Horizontal Damping	6AS7G
(V15)	Horiz. Discrim.—Vert. Sync. Amplifier	6SL7GT
(V16)	Vertical Multivibrator	6SN7GT
(V17)	Vertical Output	6V6GT
(V18)	Radio Converter	6SA7
(V19)	1st Audio I-F Amplifier	6SG7
(V20)	2nd Audio I-F Amplifier	6SV7
(V21)	Audio Discrim.—Audio Amplifier	6AQ7GT
(V22)	Audio Output	6V6GT
(V23)	Low Voltage Rectifier	5V4G*
(V24)	Low Voltage Rectifier	5U4G

* Changed to a Type 5Y3GT in late production receivers, at approximately serial No. 2000.

Model 801 LATE PRODUCTION

The Model 801 receivers above Serial No. 4550 (approximate) are known as "late production" receivers. These receivers differ electrically from the early production receivers, as follows: (NOTE - Some early production receivers below Serial No. 4550 may incorporate some of these changes.)

(1) Tube V12 changed from a Type 807 to a Type 6BG6G. This improved the horizontal size at low line voltage conditions. The 6BG6G tube is very similar to the Type 807 except for the basing.

(2) The r-f head-end unit was changed to provide better detail, as follows: The r-f coils were more heavily loaded by reducing the r-f plate resistor. The converter grid coils on Channels #3 through #5 were loaded with resistance. A 10 mmf. capacitor, C110, was connected from converter plate to ground in conjunction with 1st i-f transformer change to permit better frequency characteristics after alignment of head-end unit. The heavier loading of r-f and converter coils reduces the available sensitivity somewhat.

(3) The 1st video i-f transformer, T1, was changed so that the primary is inductively tuned instead of by capacity, as in the early production. This permits the converter grid circuit to work at a higher input impedance which is not affected by plate tuning, as in early production transformer. The 27.9 mc wave trap also changes from an absorption shunt trap, to a series tuned trap in the late production transformer.

(4) The video amplifier tube (V7) plate chokes L3 and L4 were increased in value to improve detail.

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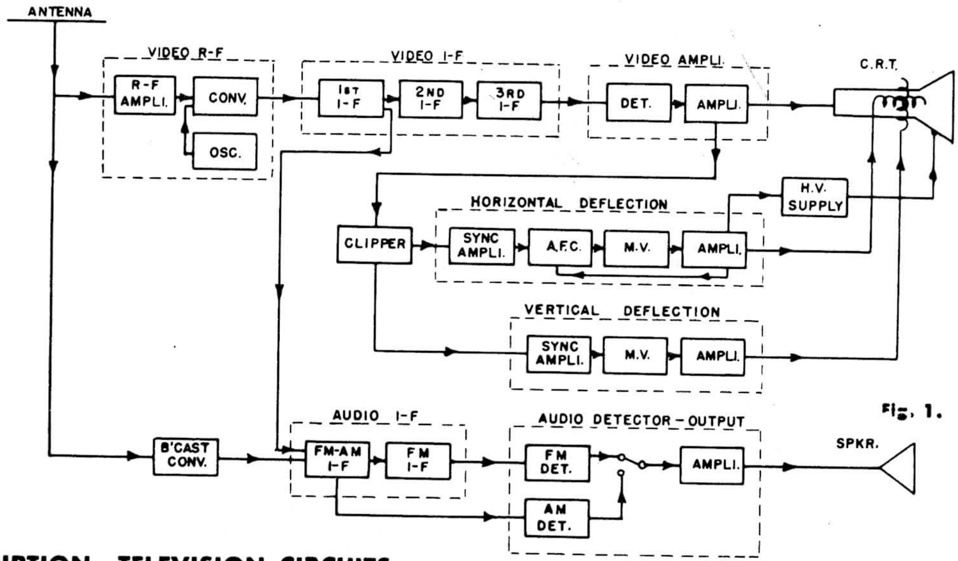

Fig. 1. Block Diagram

DESCRIPTION—TELEVISION CIRCUITS

The television receiver circuits are divided into the following sections:

1. R-f amplifier, converter and oscillator
2. Video and audio i-f amplifier
3. Video detector and amplifier
4. Sync pulse clipper-amplifier
5. Horizontal multivibrator and AFC sync.
6. Horizontal sweep output
7. Vertical multivibrator and sweep output
8. High voltage power supply (H.V. supply)
9. Low voltage power supply (L.V. supply)

A brief description of the operation of each section is described in the following paragraphs. This is supplemented by a comprehensive television training course in the publication, RSM-4-TV.

A block diagram of the complete receiver is shown in Figure 1 to assist in signal tracing and to better visualize the operation of the receiver as a whole.

1. R-F AMPLIFIER, CONVERTER & OSCILLATOR (See Figure 2)—The r-f amplifier makes use of a Type 6AU6 tube connected as a triode grounded-grid amplifier. The antenna is connected into the cathode circuit so as to provide a substantially constant input impedance of 300 ohms to the antenna at all frequencies. With a 300-ohm antenna and transmission line system, this coupling arrangement permits optimum transfer of signal from antenna to r-f amplifier for all 13 channels. R101 is the normal bias resistor. A choke, L_K, is placed in series with this cathode resistor to prevent the input impedance from being lowered by the shunting effect of the total stray capacity to ground of the cathode of the tube. The choke value is changed with frequency.

The r-f amplifier is coupled to the converter tube by a wide band transformer consisting of windings L_p and L_s. The windings are self-tuned by the distributed and tube capacities to provide optimum gain. On channels No. 1 and No. 2 the transformer is triple tuned to prevent the image frequencies of the 88-108 mc FM band from interfering with these two channels. The triode converter is one section of a Type 7F8 dual triode, V2A. Bias for this tube is provided by the oscillator voltage appearing in the grid of V2A causing grid rectification charging the grid resistor-condenser combination, R104 and C104.

The oscillator makes use of the remaining half of the Type 7F8 tube, V2B, and is inductively coupled to the converter grid by locating the oscillator grid coil, T22, on the same coil form as the converter grid coil, L_s. The oscillator is a modified Colpits oscillator, oscillation being produced by the cathode-to-grid, C_g, and cathode-to-plate, C_k, interelectrode capacities of the oscillator tube. The choke L_f provides a d-c ground to the cathode of the oscillator but maintains the cathode off-ground at the r-f frequencies. The oscillator operates on the high frequency side of the r-f signal on all bands.

The r-f amplifier, converter and oscillator is constructed as a complete unit sub-assembly which can readily be demounted from the main chassis.

2. VIDEO AND AUDIO I-F AMPLIFIERS (See Figure 3)—The video i-f amplifier makes use of a three-stage band-pass amplifier using three Type 6AC7 tubes. The transformers, T1, T2, T3, and T4, are overcoupled and then loaded with resistance, R_L, to give an adequate (approx. 4 mc) band-pass frequency characteristic. A third winding is added to each video transformer and tuned to trap out the adjacent audio and associated audio interference. The trap on T1 is tuned to 27.9 mc to provide rejection of the adjacent channel audio i-f, while the traps at T2, T3, and T4 are tuned to 21.9 mc to provide rejection of the same channel audio.

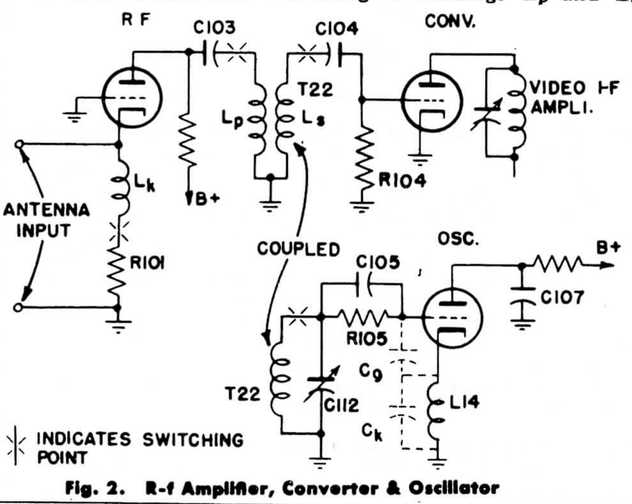

Fig. 2. R-f Amplifier, Converter & Oscillator

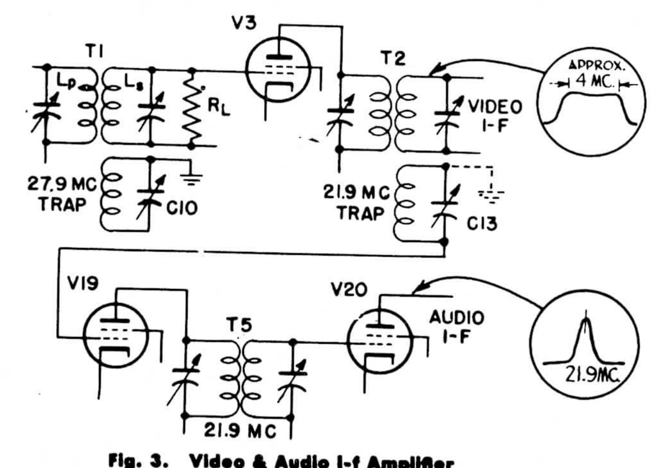

Fig. 3. Video & Audio I-f Amplifier

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The audio i-f frequency is developed by taking the 21.9 mc signal from across the trap on T2 and applying it to the grid of the audio i-f amplifier tube V19. The ground return side of the trap is effectively connected to ground at 21.9 mc through the low impedance circuit offered by the capacitors C74 and C42. Since the audio channel of the television is frequency-modulated, the transformer T6 functions with the diode sections of V21 as the discriminator.

Bias voltage, derived by rectifying 6.3 volts a-c through the diode V6B, is applied to the grid circuits of the video i-f amplifier tubes, V3 and V4. A variable potentiometer contrast control, permits this voltage to be changed so as to vary the gain of the i-f amplifier.

3. VIDEO DETECTOR AND AMPLIFIER (See Figure 4)—The video i-f amplifier output is applied to a diode rectifier, V6, and the diode load, R14, is connected so as to develop a negative-going signal voltage at this point. The signal is amplified by tube V7 and then applied directly to the cathode of the picture tube, V8. This provides direct coupling so that d-c reinsertion is unnecessary. The chokes L5 and L3 are series peaking chokes, while L4 is a shunt peaking choke. These are used to obtain good high frequency response. L5 also prevents harmonics of the i-f frequency from being passed through the video amplifier. R16 is the V7 tube plate load resistor.

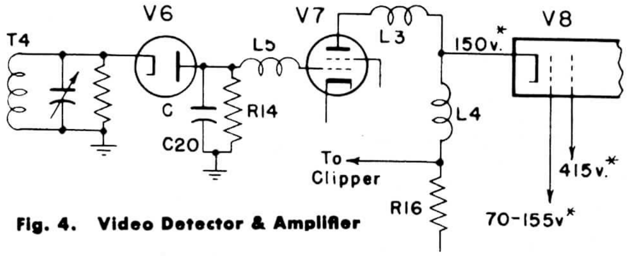

Fig. 4. Video Detector & Amplifier

*VOLTAGE VALUES ARE APPROX FOR NO SIGNAL INPUT

With the cathode of V8 coupled directly into the plate circuit of V7, it is necessary to apply a variable positive voltage to the control grid of the picture tube in order to control the beam current and, therefore, the brightness of the picture. In late production receivers where the rectifier V23 is a Type 5Y3G tube, the cathode and control grid voltages of V8 will be approximately 25 volts less.

4. CLIPPER AND SYNC AMPLIFIER—The triode section, V9A, of a Type 6SN7GT tube is used to separate the sync pulses from the video signal taken off at the load resistor, R16, see Figure 4. This is accomplished by applying very low plate voltage to V9A, then the resulting grid rectification causes negative bias to be developed at the grid of V9A so that conduction occurs only during the sync pulse intervals which are the most positive component of the video signal.

Tube V9B is a horizontal synchronizing amplifier which rejects the vertical pulse at the transformer, T7, by virtue of its low inductance to the vertical synchronizing pulse. The cathode impedance is required to raise the control grid to a positive voltage with respect to chassis for proper operation of V15B. The tube V15B is operated as a cathode follower vertical synchronizing amplifier. Integration of the vertical signal is provided in both the grid and cathode circuits.

5. HORIZONTAL MULTIVIBRATOR AND AFC SYNC (See Figure 5)—The horizontal sawtooth oscillator makes use of a Type 6SN7GT tube, V11, in a conventional cathode-coupled multivibrator circuit. Instead of its frequency being controlled directly by the horizontal sync pulses, it is controlled by a d-c voltage on its grid, which is the resultant of the phase error between the incoming sync signal and a sawtooth voltage derived from the output of the horizontal sweep amplifier. This voltage is called an automatic frequency control (AFC) voltage.

The AFC voltage is developed by the diode-connected triodes V10A and V15A by mixing the horizontal sync pulse at the secondary of transformer T7 with a sawtooth waveform derived at the output of the sweep amplifier. When the sync pulse occurs at the time "a" shown in the sawtooth waveform drawing in Figure 5, no voltage will be developed at the output of the filter. However if the multivibrator runs faster or slower so that the pulse falls at a point other than at "a," a positive or negative voltage will appear at the filter, which will be amplified by the d-c amplifier V10B and then

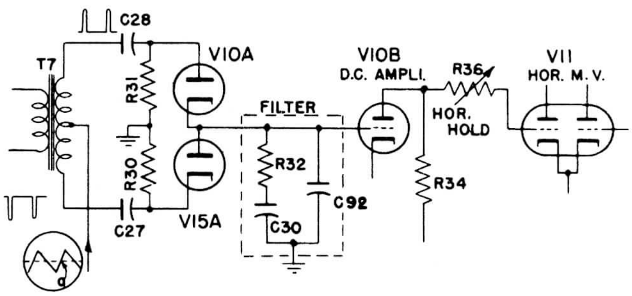

Fig. 5. Horizontal M.V. & Sync Circuit

applied to the grid of the multivibrator. This change in d-c voltage on the grid of the multivibrator will cause it to speed up or slow down so as to cause the sawtooth wave to combine with the incoming sync pulses until the correction voltage becomes zero. With the filter, consisting of C92, R32, and C30, the change is relatively slow in controlling the speed, permitting a synchronizing system which is relatively free from random noise triggering. The Horizontal Hold control, R36, controls the speed of the multivibrator, permitting the free-running speed of it to be set near the correct frequency during the time when no sync pulses are available.

6. HORIZONTAL SWEEP OUTPUT (See Figure 6)—The horizontal sawtooth voltage generated by the multivibrator, V11, is shaped and then amplified by a Type 807 tube, V12. The output of this tube is coupled to the horizontal deflection yoke through an impedance matching transformer, T9. An oscillatory voltage, as shown in the dotted line in the wave shape at the upper left of Figure 6, which results from the rapid retrace in transformer T9, is removed by the damping tube, V14. This tube is a triode Type 6AS7 and by its use the transient may be dampened, linearity controlled and the positive overshoot voltage retained for use in the high voltage supply. The linearity of the horizontal trace is controlled by varying the voltage wave shape applied to the grid of V14 by potentiometer R49. The horizontal size is varied by the adjustable iron core inductance, L7, which is in series with the output to the yoke.

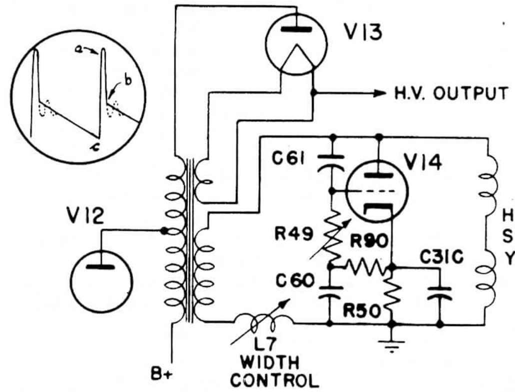

Fig. 6. Horizontal Sweep Output

7. VERTICAL MULTIVIBRATOR AND SWEEP OUTPUT (See Figure 7)—The vertical sawtooth voltage is generated by a Type 6SN7-GT tube, V16, connected as a multivibrator. This voltage is coupled directly to a Type 6V6G vertical sweep output tube, V17, and then to the vertical sweep yoke through the impedance matching transformer, T8. Vertical speed is controlled by changing the time constant of the multivibrator grid circuit by the potentiometer, R62. Sweep size is changed by the potentiometer, R61, which changes the B+ voltage applied to the charging network of tube V16 simultaneously with the screen voltage on tube V17. Vertical linearity is controlled by feeding back voltage through C37 from the cathode to grid of the output tube. The amount of the voltage is varied by the variable cathode resistor, R58.

8. HIGH VOLTAGE SUPPLY (See Figure 6)—The high voltage is derived by making use of the inductive "kick" voltage produced during retrace in the horizontal output transformer.

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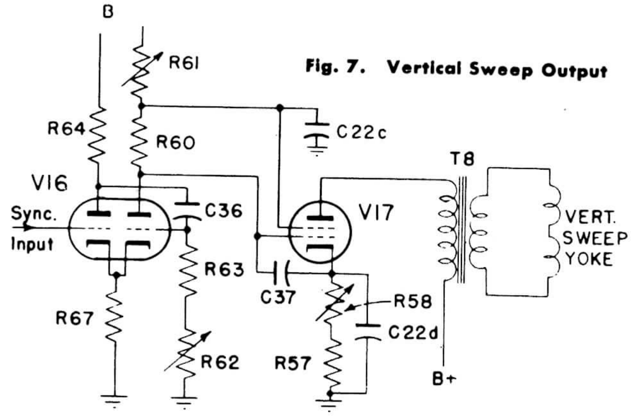


Fig. 7. Vertical Sweep Output

This "kick" voltage is shown in the wave shape shown as a-b in Figure 6. This voltage is generated in the primary winding and is further increased by an additional winding added to the transformer which connects to the rectifier tube plate of V13. The rectifier tube, V13, is a Type 8016 which derives its filament voltage from the horizontal sweep transformer T9 by a single turn around the transformer. Because of the high frequency which is rectified, a 500 mmf capacitor is more than sufficient for filtering purposes.

9. LOW VOLTAGE POWER SUPPLY—Two rectifiers are used to supply the required plate current for the television and radio receiver. A Type 5U4G tube, V24, supplies the bulk of the current and makes use of combination inductive and resistance type filter. A Type 5V4G or 5Y3G tube, V23, is used to supply higher voltage to the horizontal output, horizontal multivibrator, and the cathode ray tube 1st anode. This is followed by a choke filter. All filament supply leads except for tubes V19, V20, V21, V22 and the rectifier filaments pass through the band switch so that tubes may be switched ON or OFF when switching from radio to television.

CIRCUIT ALIGNMENT

GENERAL—A complete alignment of the Model 801 television receiver consists of the following individual alignment procedures. These are listed below in the correct sequence of alignment. However, any one alignment may be performed without the necessity of realignment of any one of the other sectional alignments.

1. Broadcast i-f amplifier
2. Broadcast r-f amplifier
3. Television i-f traps
4. Television sound i-f amplifier
5. Video i-f amplifier
6. Oscillator adjustments
7. Television r-f amplifier

TEST EQUIPMENT REQUIREMENTS—To provide the over-all alignment as outlined above, the following test equipment is required.

1. *Cathode Ray Oscilloscope*—This scope should preferably have a 5-inch screen and should preferably have good high frequency response, which will be useful in making waveform voltage measurements.

2. *Signal Generator*—This signal generator must have good frequency stability and be accurately calibrated. It should be capable of covering the following frequency ranges with tone modulation where desired.

(a) 455 kc for broadcast
(b) 550-1600 kc for broadcast
(c) 21.9 mc for video i-f trap
(d) 27.9 mc for video i-f trap
(e) 23.0 mc for video i-f marker
(f) 25.65 mc for video i-f marker
(g) 26.4 mc for video i-f marker
(h) 44-110 mc and 174-238 mc for oscillator adjustment and markers for the r-f channel bandwidth measurements.

3. *R-F Sweep Generator*—This should give approximately 0.1-volt output with adjustable attenuation of the output. The output should be flat over wide frequency variations. The frequency coverage should be:

(a) 20 to 30 mc, with 10 mc sweep width
(b) 40 to 90 mc, with 25 mc sweep width
(c) 170 to 220 mc, with 25 mc sweep width

4. *Output Meter*—An output meter with a voltage range 0-2.5 volts a-c.

ALIGNMENT SUGGESTIONS—With the exception of the broadcast i-f and r-f trimmers and the FM sound i-f discriminator trimmers, all alignment adjustments are performed from the underside of the chassis. Remove the chassis from the cabinet and turn it on its side with the power transformer down. This is the only safe position in which the chassis will rest and leave all adjustments accessible. The following suggestions apply to each individual alignment procedure.

1. *Broadcast I-F Alignment*—(a) Although the oscilloscope is recommended in the table for indicating the output voltage during alignment, an output meter may be connected across the speaker voice coil as an alternate output indicating device. When this is used, the volume control should be set for maximum volume and then attenuate the signal generator output so as not to cause audio overload.

(b) Use a 200 mmf mica capacitor or standard RMA dummy between the high side of the signal generator and the signal input point, as indicated in the Alignment Table.

2. *Broadcast R-F Alignment*—Apply signal generator input to one of dipole input terminals through a 200 mmf mica capacitor as in (1) above. An output meter may be used in place of the oscilloscope for indicating output. First adjust oscillator trimmer by tuning gang condenser to minimum capacity and aligning oscillator trimmer for maximum with a 1620 kc input signal. Next with 1500 kc input signal, tune in signal, set pointer to 1500 kc calibration then align r-f trimmer for maximum output.

3. *Video I-F Trap Alignment*—The video i-f traps are used to attenuate the sound i-f of the same and adjacent channels from being detected and reproduced as sound bar interference on the picture tube. Misalignment of these traps results in the interference pattern, as shown in Figure 31.

Set the contrast control about half-way up. Turn the Station Selector to channel 13. Connect the oscilloscope through a 10,000-ohm resistor, to the top of the 3300-ohm video load resistor, R16.

Connect the output of an accurately calibrated signal generator with tone modulation to the grid of the converter tube, V2A, through a 200 mmf mica capacitor. The alignment frequencies are:

T1 (C10)—27.9 mc
T2 (C13)—21.9 mc
T3 (C16)—21.9 mc
T4 (C19)—21.9 mc

The trimmers should be aligned for minimum output, care being taken to get the lowest possible indication at the output. The input signal should be attenuated below saturation of the i-f amplifier tubes at start, then raised as signal is attenuated during alignment.

4. *Television Sound I-F Alignment*—Since the television sound i-f amplifier transformer is slightly overcoupled, alignment by a sweep generator is recommended. Connect the generator through a 200 mmf capacitor to grid (4) of V3. For alignment, connect the oscilloscope through a 100,000 ohm isolating resistor across capacitor C49.

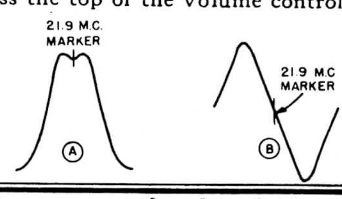
For step 1, insert a 21.9 mc marker signal from an unmodulated signal generator into the same point of input as the sweep generator. This input from the signal generator should be very loosely coupled by clipping the signal generator through insulation to the grid (4) of V3.

Keep the input of the sweep generator low enough so that the sound i-f amplifier does not overload. Check by increasing the output of the sweep; the response curve on the scope should increase in size proportionally. Set Contrast Control to half-advanced position.

The response curve of the amplifier at the grid return of V20 should appear as in Figure 8A.

For discriminator alignment the secondary trimmer, C78, of T6 is aligned by using a tone modulated 21.9 mc signal and listening to the tone at the loudspeaker. The trimmer is adjusted for minimum tone signal output. If the sweep is used for the secondary trimmer alignment, the cross-over should be symmetrical about a 21.9 mc marker and should be a straight line between the alternate peaks, as shown in Figure 8B. Reconnect oscilloscope across the top of the volume control.

Fig. 8. T-V Audio I-F Curves



For test patterns see back of Manual

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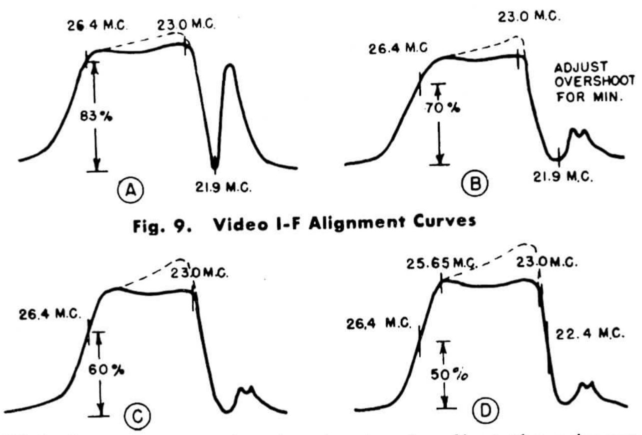

Fig. 9. Video I-F Alignment Curves

With the same sweep input as in step 1, adjust the primary trimmer, C84, of T6 for maximum peak-to-peak amplitude of the positive and negative peaks as shown in Figure 8B.

5. *Video I-F Alignment*—The video i-f amplifier uses transformers which are coupled and loaded to give the proper band-pass characteristic. Before attempting alignment of the video i-f, the sound i-f traps should be aligned as in (3), then do not touch these trimmers when making the video i-f alignment.

Stage-by-stage alignment should be performed so as to duplicate the curves, as shown in Figures 9A, B, C, and D. The markers are used to establish the correct bandwidth and frequency limits.

The trap formed by L20 and C89 in the cathode of V4 is used to reduce the overshoot of the 21.9 mc traps. Adjust the spacing of turns comprising L20 by either pushing them together or separating them so as to give a minimum amplitude to the overshoot.

Connect the sweep generator to the tube grid preceding the transformer to be aligned. Adjust the sweep width for a minimum of 10 mc about the center frequency of the video i-f. The marker frequencies are supplied by a signal generator and sufficient marker signal may be supplied in most cases by merely connecting the high side of the signal generator to the television chassis.

The primary of the transformer preceding the grid where the signal is applied will act as a trap putting a hole in the alignment curves as viewed on the scope unless it is short circuited or detuned. It may be detuned readily by connecting a 100 to 200 mmf capacitor across the primary trimmer or place a temporary short circuit across the primary trimmer. ***Be sure to remove this capacitor after the stage is aligned.***

Keep the input of the sweep generator low so as not to overload the video i-f amplifier.

The response curves shown are obtained on an oscilloscope at the junction of L4 and R16. Use a 10,000 resistor in series with the input lead to the oscilloscope.

The contrast control should be advanced approximately to its half-advanced position.

The Selector Switch should be turned to radio position and a temporary jumper put across filament switch wafer so as to keep the television tube filaments lit while in this radio position. If a television position is used, the i-f curve will be affected by the interaction from the r-f coil in the converter tube grid. NOTE—When jumper is used, remove B+ from r-f assembly by disconnecting external lead to terminal (2) of r-f assembly, see Fig. 12.

6. *Oscillator Adjustment*—The oscillator coil must be adjusted so that the Television Tuning Condenser, C112, will tune the sound carrier of the television signal at the middle of its range. Set the condenser, C112, to mid-position. Then adjust oscillator coil for channels No. 1 through No. 6 by spreading turns to raise frequency or compressing turns to lower frequency. For channels No. 7 through No. 13, the oscillator coil consists of a single turn. Adjust these coils by spreading the gap to lower frequency or closing the gap to raise frequency in the leads of the coil which run to the terminals.

Apply the signal generator with tone modulation to the antenna input terminals and set the generator to the sound carrier frequency for the channel under alignment. The signal generator must be very accurately calibrated. This can be done by beating its output against a known channel carrier or use a station operating on the channel and tune in the sound.

For output indication, advance the volume control about to mid-position so that the tone modulation or audio modulation on the channel station may be heard through the loudspeaker.

The oscillator coil is located on the coil form or assembly nearest to the front of the switch assembly and is wound of heavier wire than the other coils. This is shown in Figure 10.

7. *R-F Coil Alignment*—The r-f coil assembly is designed for stable, band-pass operation and under normal conditions will seldom require adjustment. In cases where it is definitely known that alignment is necessary (such as when the present coil is damaged and has been changed), do not attempt the adjustment unless suitable equipment is available. When tubes V1 or V2 are changed, alignment of r-f and oscillator may be necessary.

The minimum requirements for correct r-f alignment is to provide the correct band width, and for the response curve to be centered within the limit frequencies shown for each of the individual bands, as shown in Figure 11. It is also necessary that the curve be adjusted for maximum amplitude consistent with correct band width. To provide these minimum requirements, the r-f coils are overcoupled in a very similar manner to the video i-f transformers. However, instead of adjusting capacity to tune the coils, the inductance is varied by moving a few turns. Coupling is also adjustable by moving the entire coil either away from or toward the adjacent coil on the form.

The physical assembly of the coils in the band switch locates the r-f amplifier plate coil at the rear of the switch and the oscillator coil towards the front end. Two types of coils are used—the Channel No. 1 and No. 2 coils have an additional link circuit between the grid and plate coils to provide better image rejection of the FM band (88 to 108 mc) signals on these two channels. These links are tuned by means of two copper rings which are moved along the coil forms for adjustments.

The input sweep signal is applied to the antenna terminal board at the r-f unit. The 300-ohm cable between the antenna terminal board and r-f amplifier input must be disconnected at the r-f unit when making r-f alignment. The marker signal

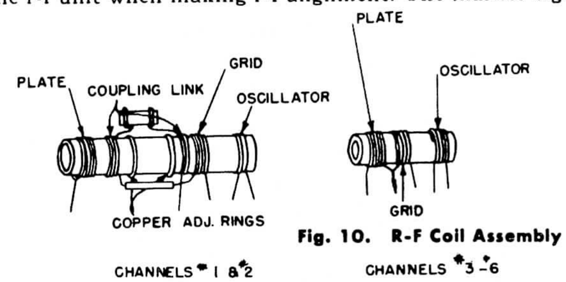

Fig. 10. R-F Coil Assembly

generator may be coupled loosely to the antenna input terminals.

The output r-f response curve is taken off at the junction of R1 and C1. The Contrast Control should be set for minimum for all r-f alignment.

For channels No. 1 and No. 2, the r-f coil should be aligned to give approximately the curve shown in Figure 11A. The high frequency end of curve (at S marker) may be peaked slightly higher than the low frequency end of curve, but the low frequency end should never be aligned with more amplitude than the high frequency end. The markers should be located on the inside of the humps of the curves, the video marker (P) preferably being inside slightly farther than the sound marker (S). Adjustment of the bandwidth is made by moving the plate coil closer to the grid coil or vice-versa. In most cases the sliding of the copper rings will give both the required bandwidth and frequency adjustment. Spread

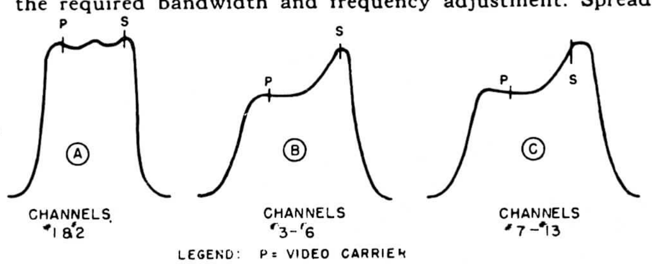

Fig. 11. R-F Alignment Curves

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or squeeze turns in plate and grid coils if the frequency cannot be obtained by sliding the rings. Spreading turns results in a raising of the frequency; while squeezing turns lowers the frequency.

For the remainder of the channels, the adjustment of the plate coil in relation to the grid coil changes the bandwidth while the spreading or squeezing of the plate and grid coil turns results in the raising or lowering of frequency. Only when the plate and grid coils are tuned to the same frequency will the amplitude be greatest with the correct bandwidth. The outside peaks of the r-f response curve should be aligned to the carrier markers. In general it is desirable to have a slight rise on the high frequency (sound carrier) side of the curve, however the rise should not exceed approximately 30 per cent of the low frequency side. A low frequency rise in the response curve is not desirable and must be avoided, as a picture with poor definition will result if this is done.

The upper channel coils (No. 11, No. 12, and No. 13) may have the plate winding reversed from the winding direction of the plate coil of the other transformers. If this is the case, the bandwidth will be increased by separating the plate and grid coils and vice-versa. This condition can be determined by inspection or by the effect on the curve when making the alignment.

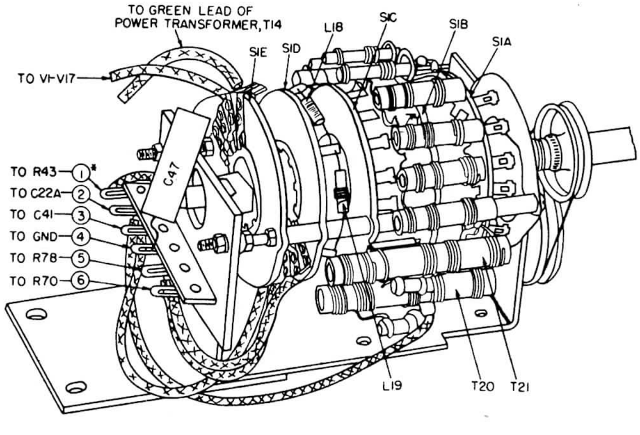

Fig. 12. R-F Coil & Switch Assembly

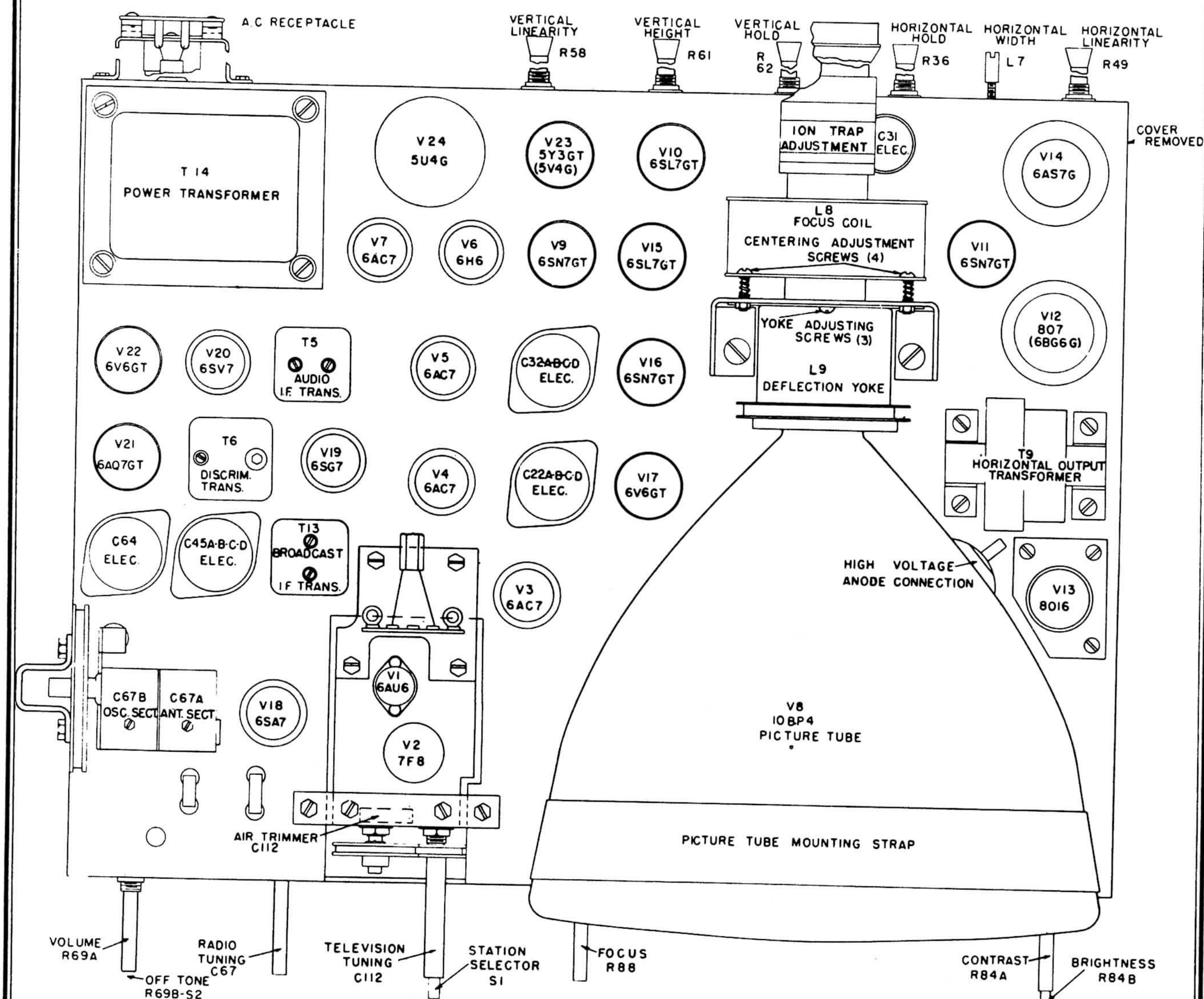

Fig. 13. Component Location, Top View of Chassis

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ALIGNMENT TABLE

Before attempting the following tabular alignment procedure, read the preceding section "ALIGNMENT SUGGESTIONS"

STEP NO.	SIGNAL GENERATOR FREQUENCY	SWEEP GENERATOR FREQUENCY	SIGNAL INPUT POINT	CONNECT OSCILLOSCOPE TO CHASSIS &	STATION SELECTOR SWITCH	DIAL SETTING	ADJUST	REMARKS
(1) BROADCAST I-F ALIGNMENT								
1	455 kc with tone modulation	Not Used	Grid (4) of V19 thru 200 mmf	Junction C41 & R69A	Radio	550 kc	C75 & C76 for max. output	
2	455 kc with tone modulation	Not Used	Grid (5) of V18 thru 200 mmf	Junction C41 & R69A	Radio	550 kc	C73 & C74 for max. output	
(2) BROADCAST R-F ALIGNMENT								
1	1500 kc with tone modulation	Not Used	Ant. terminal thru 200 mmf	Junction C41 & R69A	Radio	*	C67B osc. trimmer for maximum output	* Tune gang condenser to minimum capacity setting.
2	1500 kc with tone modulation	Not Used	Ant. terminals thru 200 mmf	Junction C41 & R69A	Radio	1500 kc**	C67A r-f trimmer for maximum output	** If pointer does not fall on the 1500 kc calibration when 1500 kc signal is tuned in, slip pointer drum on dial cord until it does.
(3) TELEVISION I-F TRAP ALIGNMENT								
1	21.9 mc with tone modulation	Not Used	Grid (8) of V2A thru 200 mmf	Junction L4 & R16	Channel #13	—	C19 on T4 for minimum output	Connect 10,000 ohms in series with oscilloscope input lead.
2	21.9 mc with tone modulation	Not Used	Grid (8) of V2A thru 200 mmf	Junction L4 & R16	Channel #13	—	C16 on T3 for minimum output	
3	21.9 mc with tone modulation	Not Used	Grid (8) of V2A thru 200 mmf	Junction L4 & R16	Channel #13	—	C13 on T2 for minimum output	
4	27.9 mc with tone modulation	Not Used	Grid (8) of V2A thru 200 mmf	Junction L4 & R16	Channel #13	—	C10 on T1 for minimum output	
(4) TELEVISION SOUND I-F AMPLIFIER ALIGNMENT								
1	21.9 mc unmodulated	21.9 mc with 2 mc sweep width	Grid (4) of V3	Junction of R77 & C49	Channel #13	—	C79 & C80 for max. amplitude and symmetry at 21.9 mc	Detune C84 on T6; then adjust trimmers C79 and C80. Adjust for max. amplitude and symmetry about 21.9 mc marker as shown in Fig. 8A.
2	21.9 mc with tone modulation	Not Used	Grid (4) of V3		Channel #13	—	C78 for minimum tone output	With volume control halfway up and speaker connected, adjust C78 for minimum tone output.
3	Not Used	21.9 mc with 2 mc sweep width	Grid (4) of V3	Junction of C41 and R69A.	Channel #13	—	C84 for max. peak to peak amplitude	Peak trimmer so that the positive and negative peaks have max. peak to peak amplitude. See Fig. 8B.
4	Repeat steps 2 and 3.							

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ALIGNMENT TABLE (CONT'D)

STEP NO.	SIGNAL GENERATOR FREQUENCY	SWEEP GENERATOR FREQUENCY	SIGNAL INPUT POINT	CONNECT OSCILLOSCOPE TO CHASSIS &	STATION SELECTOR SWITCH	DIAL SETTING	ADJUST	REMARKS
(5) VIDEO I-F AMPLIFIER ALIGNMENT								
1	23.0 mc & 26.4 mc marker	20-30 mc sweep	Grid (4) of V5	Junction of L4 and R16	Channel #13	—	C17 and C18 for max. amplitude, bandwidth, and correct positioning of markers.	Shunt C14, T3 primary trimmer with a 100 mmf capacitor. See Fig. 9A.
2	23.0 mc & 26.4 mc marker	20-30 mc sweep	Grid (4) of V4	Junction of L4 and R16	Channel #13	—	C14 and C15 for max. amplitude, bandwidth, and correct positioning of markers.	Remove 100 mmf capacitor from C14, and shunt C11, T2 primary trimmer, with it. See Fig. 9B.
3	23.0 mc & 26.4 mc marker	20-30 mc sweep	Grid (4) of V4	Junction of L4 and R16	Channel #13	—	Adjust L20 for minimum overshoot	See Fig. 9B. Either spread or squeeze turns together to give minimum amplitude of overshoot.
4	23.0 mc & 26.4 mc	20-30 mc sweep	Grid (4) of V3	Junction of L4 and R16	Channel #13	—	C11 and C12 for max. amplitude, bandwidth, and correct position of markers	Remove 100 mmf capacitor from C11 and shunt C8, T1 primary trimmer, with it. See Fig. 9C.
5	23.0 mc & 26.4 mc	20-30 mc sweep	Grid (4) of V3	Junction of L4 and R16	Channel #13	—	Readjust L20 for minimum overshoot	See Fig. 9 C. Repeat procedure as in step 3, except for point of signal input.
6	23.0 mc, 26.4 mc, & 25.65 mc	20-30 mc sweep	Grid (8) of V2A	Junction of L4 and R16	Radio*	—	C8 and C9 for max. amplitude, bandwidth, and correct position of markers	Remove 100 mmf. capacitor from C8. See Fig. 9D. * Jump filament wafer switch with clip lead so that tube filaments will be lit. Remove B+ from r-f assembly.
(6) OSCILLATOR COIL ADJUSTMENT								
1	49.75 mc with tone modulation	—	Antenna terminals	—	Channel #1	—	Turns of osc. coil, T20.	Make sure that C112 is at mid-position of travel. Use sound output as indicator.
2	59.75 mc with tone modulation	—	Antenna terminals	—	Channel #2	—	Turns of osc. coil, T21.	Same as for Step #1.
3	65.75 mc with tone modulation	—	Antenna terminals	—	Channel #3	—	Turns of osc. coil, T22.	Same as for Step #1.
4	71.75 mc with tone modulation	—	Antenna terminals	—	Channel #4	—	Turns of osc. coil, T23.	Same as for Step #1.
5	81.75 mc with tone modulation	—	Antenna terminals	—	Channel #5	—	Turns of osc. coil, T24.	Same as for Step #1.
6	87.75 mc with tone modulation	—	Antenna terminals	—	Channel #6	—	Turns of osc. coil, T25.	Same as for Step #1.
7	179.75 mc with tone modulation	—	Antenna terminals	—	Channel #7	—	Lead gap of oscillator coil, T26.	Same as for Step #1.

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ALIGNMENT TABLE (CONT'D)

STEP NO.	SIGNAL GENERATOR FREQUENCY	SWEEP GENERATOR FREQUENCY	SIGNAL INPUT POINT	CONNECT OSCILLOSCOPE TO CHASSIS &	STATION SELECTOR SWITCH	DIAL SETTING	ADJUST	REMARKS
(6) OSCILLATOR COIL ADJUSTMENT (Cont'd)								
8	185.75 mc with tone modulation	—	Antenna terminals	—	Channel #8	—	Lead gap of oscillator coil, T27.	Same as for Step #1.
9	191.75 mc with tone modulation	—	Antenna terminals	—	Channel #9	—	Lead gap of oscillator coil, T28.	Same as for Step #1.
10	197.75 mc with tone modulation	—	Antenna terminals	—	Channel #10	—	Lead gap of oscillator coil, T29.	Same as for Step #1.
11	203.75 mc with tone modulation	—	Antenna terminals	—	Channel #11	—	Lead gap of oscillator coil, T30	Same as for Step #1
12	209.75 mc with tone modulation	—	Antenna terminals	—	Channel #12	—	Lead gap of oscillator coil, T31.	Same as for Step #1
13	215.75 mc with tone modulation	—	Antenna terminals	—	Channel #13	—	Lead gap of oscillator coil, T32.	Same as for Step #1
(7) R-F-COIL ALIGNMENT								
1	Markers 45.25 mc & 49.75 mc	Channel #1 with 25 mc sweep	Antenna terminals at r-f amplifier	Junction R1 and C1	Channel #1	—	For max. amplitude and for recommended response	See Fig. 11A for resultant alignment curve.
2	Markers 55.25 mc & 59.75 mc	Channel #2 with 25 mc sweep	Antenna terminals at r-f amplifier	Junction R1 and C1	Channel #2	—	For max. amplitude and for recommended response	See Fig. 11A for resultant alignment curve.
3	Markers 61.25 mc & 65.75 mc	Channel #3 with 25 mc sweep	Antenna terminals at r-f amplifier	Junction R1 and C1	Channel #3	—	For max. amplitude and for recommended response	See Fig. 11B.
4	Markers 67.25 mc & 71.75 mc	Channel #4 with 25 mc sweep	Antenna terminals at r-f amplifier	Junction R1 and C1	Channel #4	—	For max. amplitude and for recommended response	See Fig. 11B for resultant alignment curve.
5	Markers 77.25 mc & 81.75 mc	Channel #5 with 25 mc sweep	Antenna terminals at r-f amplifier	Junction R1 and C1	Channel #5	—	For max. amplitude and for recommended response	See Fig. 11B for resultant alignment curve.
6	Markers 83.25 mc & 87.75 mc	Channel #6 with 25 mc sweep	Antenna terminals at r-f amplifier	Junction R1 and C1	Channel #6	—	For max. amplitude and for recommended response	See Fig. 11B for resultant alignment curve.
7	Markers 175.25 mc & 179.75 mc	Channel #7 with 25 mc sweep	Antenna terminals at r-f amplifier	Junction R1 and C1	Channel #7	—	For max. amplitude and for recommended response	See Fig. 11C for resultant alignment curve.

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ALIGNMENT TABLE (CONT'D)

STEP NO.	SIGNAL GENERATOR FREQUENCY	SWEEP GENERATOR FREQUENCY	SIGNAL INPUT POINT	CONNECT OSCILLOSCOPE TO CHASSIS &	STATION SELECTOR SWITCH	DIAL SETTING	ADJUST	REMARKS
(7) R-F COIL ALIGNMENT (Cont'd)								
8	Markers 181.25 mc & 185.75 mc	Channel #8 with 25 mc sweep	Antenna terminals at r-f amplifier	Junction R1 and C1	Channel #8	—	For max. amplitude and for recommended response	See Fig. 11C for resultant alignment curve.
9	Markers 187.25 mc & 191.75 mc	Channel #9 with 25 mc sweep	Antenna terminals at r-f amplifier	Junction R1 and C1	Channel #9	—	For max. amplitude and for recommended response	See Fig. 11C for resultant alignment curve.
10	Markers 193.25 mc & 197.75 mc	Channel #10 with 25 mc sweep	Antenna terminals at r-f amplifier	Junction R1 and C1	Channel #10	—	For max. amplitude and for recommended response	See Fig. 11C for resultant alignment curve.
11	Markers 199.25 mc & 203.75 mc	Channel #11 with 25 mc sweep	Antenna terminals at r-f amplifier	Junction R1 and C1	Channel #11	—	For max. amplitude and for recommended response	See Fig. 11C for resultant alignment curve.
12	Markers 205.25 mc & 209.75 mc	Channel #12 with 25 mc sweep	Antenna terminals at r-f amplifier	Junction R1 and C1	Channel #12	—	For max. amplitude and for recommended response	See Fig. 11C for resultant alignment curve.
13	Markers 211.25 mc & 215.75 mc	Channel #13 with 25 mc sweep	Antenna terminals at r-f amplifier	Junction R1 and C1	Channel #13	—	For max. amplitude and for recommended response	See Fig. 11C for resultant alignment curve.

MISCELLANEOUS INSTALLATION AND SERVICE ADJUSTMENTS

REPLACEMENT OF PICTURE TUBE

To remove the picture tube from the television chassis, remove the picture tube socket and then untape and slide off the ion trap adjustment assembly. The ion trap can be removed readily, if the gap in the assembly is pulled apart slightly with the fingers while attempting to slide it. Loosen the two set screws partially that clamp the left side of the picture tube mounting strap, then slide the strap backward from the top-front rim of the picture tube until the rim of the tube is free from the strap. Carefully pull the tube out through the focus and deflection coils.

To replace a picture tube the reverse procedure should be followed, being careful never to force the picture tube if it sticks or fails to slip into place readily. Investigate and remove the source of the trouble. The picture tube should be oriented so that the anode cap is adjacent to the H.V. rectifier, V13, and the high voltage lead.

Wipe the screen surface of the tube to remove finger marks and dust. ***PRECAUTION—Do not handle, remove, or install a picture tube unless shatterproof goggles and heavy gloves are worn.***

ION TRAP ADJUSTMENT

The ion trap may be approximately located as shown in Figure 17; however its final adjustment must be made with the television receiver operating.

The approximate adjustment requires that the gaps in the two magnets be lined up with the break in the rubber holder. NOTE—Some ion traps have been magnetized so that it is necessary to rotate the small magnet at 180 degrees to this normal position. Then slide the assembly onto the picture tube neck so that the ion trap assembly slit is at the bottom or top (dependent upon picture tube) and lines up with pin #12 or #6. Slide the assembly forward on the picture tube until it is about the position shown in the illustration. NOTE—The wider of the two magnets should be located at the rear or the base end of the picture tube. The final following steps should be taken with the television receiver operating:

1. With Brilliance control advanced, turn ion trap assembly so that gap in rubber holder is faced up or down and lines up with either pin #6 or pin #12. Whichever way gives some illumination, is the correct approximate orientation of assembly. If the tube V16 is removed, it will be found much easier to adjust for maximum illumination since the resultant thin line will illuminate even though the magnets are considerably out of adjustment.

2. Move assembly back and forth and rotating it while viewing screen, adjust for maximum brightness.

3. If illuminated area gets very bright, reduce brightness with control and repeat step 2. If tube V16 was removed as suggested in Step 1, replace it before proceeding with step 4.

4. If any shadowing of the tube neck is present after completing step 3, rotate the small (front) magnet to correct shadow and repeat step 2 and 3. NOTE—Badly out-of-line focus coils can also cause neck shadowing. The focus coil should be symmetrical and straight before starting the ion trap adjustment.

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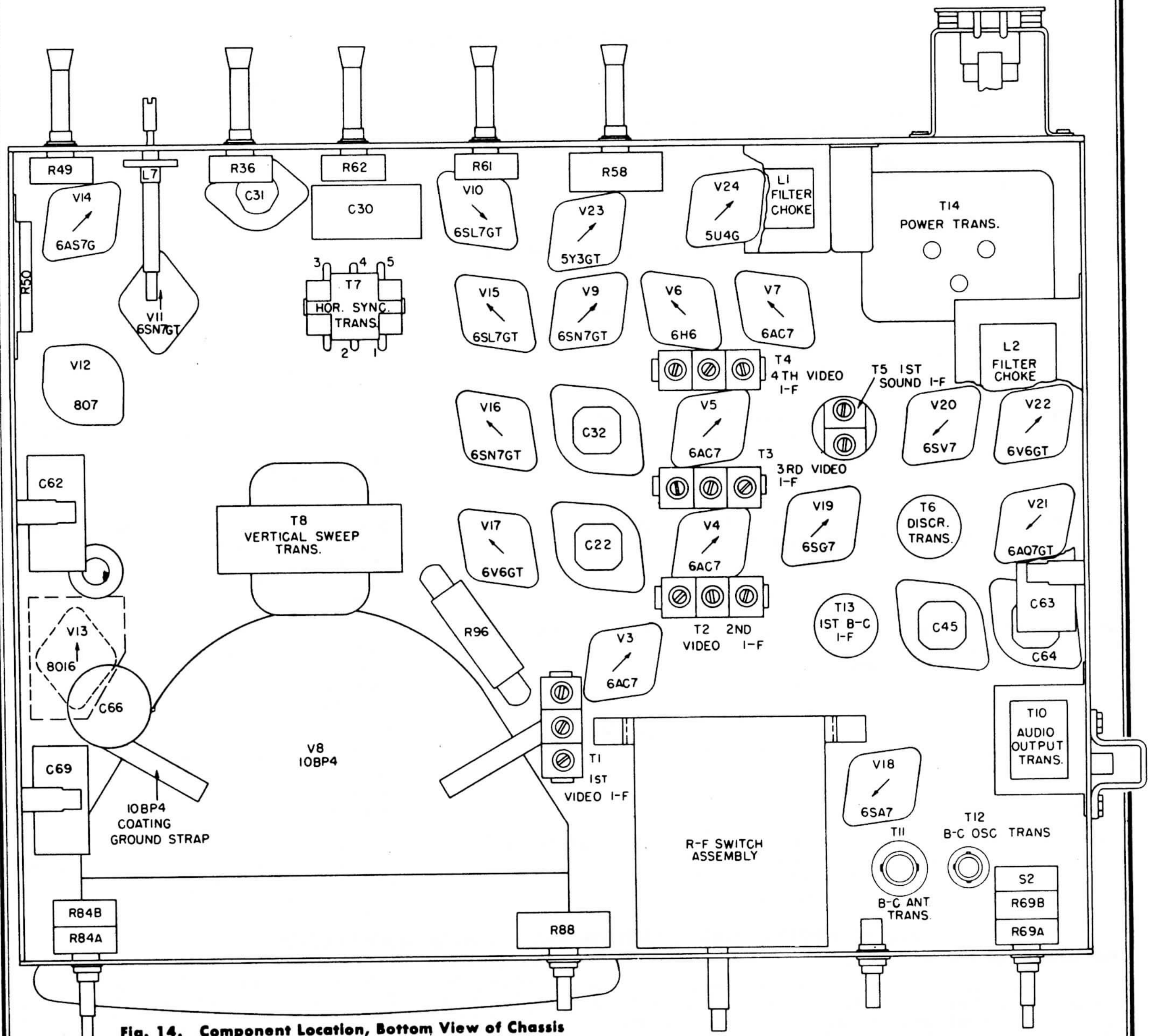


Fig. 14. Component Location, Bottom View of Chassis

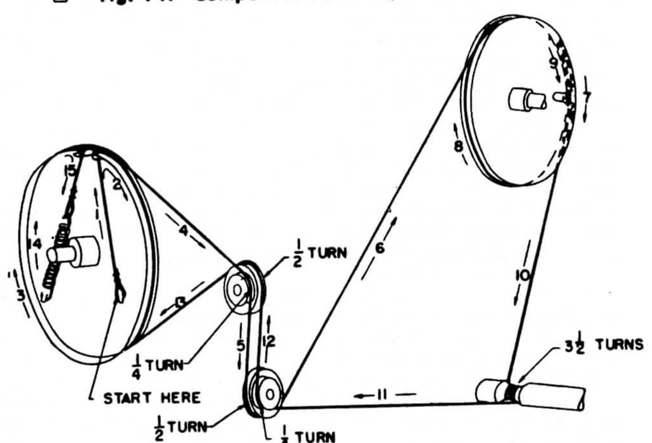
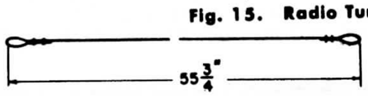


Fig. 15. Radio Tuning, Dial Drive Stringing



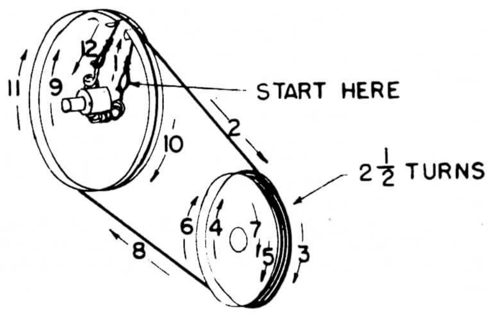
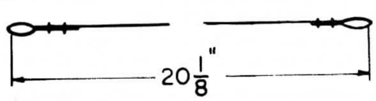


Fig. 16. Television Tuning, Drive Stringing



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SOCKET VOLTAGE CHART

NOTE—All d-c measurements taken by a 20,000 ohm/volt meter. Station selector switch at Channel No. 1 unless noted. Contrast control at maximum, Brilliance at minimum.

SYMBOL	TUBE TYPE	PLATE		SCREEN		CATHODE		GRID		PLATE M.A.	SCREEN M.A.	NOTES
		PIN	VOLTS	PIN	VOLTS	PIN	VOLTS	PIN	VOLTS			
V1	6AU6	5	140	6	140	7	1.3	1	0	7.2	—	
V2A	7F8	6	115	—	—	5	0	8	−4.5*	2.5	—	* Measured with V.T.V.M.
V2B		3	180	—	—	4	0	1	0	10	—	
V3	6AC7	8	150	6	150	5	0	4	−2*	14	3	* Measured on 50 v scale
V4	6AC7	8	160	6	160	5	0	4	−2*	15	3.2	* Measured on 50 v scale
V5	6AC7	8	170	6	170	5	2	4	0	14	3	
V6A	6H6	5	0	—	—	8	0	—	—	4	—	
V6B		3	−8.5	—	—	4	6.3AC	—	—	0	—	
V7	6AC7	8	150	6	125	5	0	4	0	15	3.7	
V8	10BP4	CAP	8300*	10	415	11	150	2	90	—	—	* Use multiplier with 1000 v scale
V9A	6SN7GT	2	12.5	—	—	3	0	1	−1	.2	—	
V9B		5	110	—	—	6	11	4	6	10	—	
V10A	6SL7GT	2	−95	—	—	3	0.5	1	−9.5	0	—	
V10B		5	42.5	—	—	6	0.5	4	0.5	1	—	
V11A	6SN7GT	5	170	—	—	6	6	4	−25	2.5	—	
V11B		2	135	—	—	3	6	1	0	2.9	—	
V12	807	CAP	415	2	345	4	22	3	−10	76	13	
V13	8016	CAP	—	—	—	2	8300*	—	—	—	—	* Use multiplier with 1000 v scale
V14	6AS7GT	2 & 5	0	—	—	3 & 6	10	1 & 4	−15	—	—	
V15A	6SL7GT	2	0.5	—	—	3	7.5	1	0.5	0	—	
V15B		5	105	—	—	6	10	4	4	1	—	
V16A	6SN7GT	2	30	—	—	3	1.5	1	0	.7	—	
V16B		5	14.5	—	—	6	1.5	4	4.5	.1	—	
V17	6V6GT	3	195	4	135	8	23.5	5	14.5	20	1.85	
V18*	6SA7	3	200	4	80	8	0	6	0	3	8.5	
V19	6SG7	8	200	6	110	5	1	4	0	10	4	
V20	6SV7	6	195	4	88	2	−0.5	3	0	9.7	1.7	
V21A	6AQ7GT	1 & 3	0	—	—	2	0	—	—	0	—	
V21B		5	75	—	—	6	0	4	0	1	—	
V22	6V6GT	3	230	4	200	8	10	5	0	41.5	4.5	
V23	5Y3GT	4 & 6	315AC	—	—	2	425	—	—	85*	—	* Cathode current
V24	5U4G	4 & 6	240AC	—	—	2	250	—	—	160*	—	* Cathode current.

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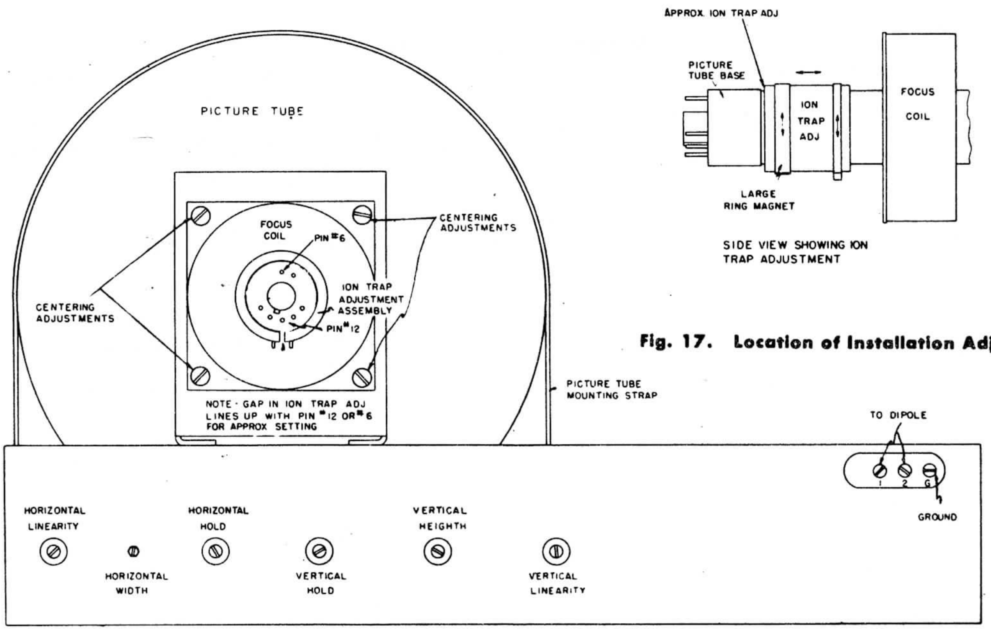

Fig. 17. Location of Installation Adjustment Controls

CENTERING (FOCUS COIL) ADJUSTMENT

The four focus coil adjustment screws should all be tightened sufficiently so that the springs are always under tension. Too loose pressure on the springs will result in the picture centering being unstable. These adjustments are not readily available with the back cover in place unless a long screwdriver is used. Since each screw adjustment reacts in both the horizontal and vertical directions, a maladjustment in the centering may have to be corrected by the adjustment of one to four screws.

DEFLECTION YOKE ADJUSTMENT

Three set screws permit the deflection yoke to be loosened, permitting limited turning in either direction. If the picture does not line up horizontally or square with the picture tube mask, rotate the yoke until this condition is remedied, then tighten the set screws.

HORIZONTAL (HOLD) OSCILLATOR SPEED ADJUSTMENT

The horizontal hold control is a preset adjustment on the rear of the chassis which is used to adjust the speed. In late production receivers, a tuned circuit consisting of L21 and C91 was added to the horizontal oscillator cathode circuit to stabilize the horizontal hold operation. For complete alignment both controls must be adjusted. Check operation first as follows:

Check on Alignment—With a normal television signal being received, free from excessive noise, turn the horizontal hold control to the position where the picture locks in horizontally and passes the following tests:

1. With a picture being received, switch the Station Selector to a channel having no program and then back to the desired channel. The picture should immediately lock into position.

2. With a picture being received, turn the television receiver power "off" for two or three seconds and then turn it back "on" again. The picture should come into synchronization within ten seconds after the picture tube has been illuminated.

3. Turn the Station Selector to the "radio" position and allow the television receiver to transfer for two or three minutes to Broadcast reception, and then return to the television channel transmitting a picture. The picture should synchronize within ten seconds after the picture tube becomes illuminated with receivers not equipped with L21. Receivers with L21 should sync immediately upon showing raster.

4. Turn power off for three or four minutes and then turn "ON." The picture should lock-in horizontally within ten seconds after the raster becomes illuminated.

Minor Adjustments—If the receiver does not have the tuned circuit consisting of L21 and C91 in the cathode of the horizontal multivibrator, V11, the horizontal hold control, R36, should be adjusted until the above checks can be satisfactorily accomplished. If attempted adjustment of the hold control will not permit all the above checks to be met when the tuned circuit is incorporated, then make the adjustment as outlined under "Complete Realignment."

Complete Realignment—Tune in a television signal for optimum sound and adjust for normal contrast.

1. Adjust the Horizontal Hold control to the center of its range.

2. Remove tube V9, and then adjust the iron core of L21 until the picture is approximately synchronized (held in frame) in the horizontal direction.

3. Replace tube V9 and then adjust the Horizontal Hold control until the picture passed all tests as outlined in "Check on Alignment."

VERTICAL (HOLD) OSCILLATOR SPEED ADJUSTMENT

This control, R62, is used to lock the picture in synchronism with the transmitted picture in the vertical direction. When the control is maladjusted the picture will slide vertically out-of-frame or lock out-of-frame, giving overlapping vertical images or even double images in the vertical direction. After the picture is locked in vertically on a normal picture, reduce the contrast control until the picture is barely visible, then readjust the control until the picture holds in frame.

HORIZONTAL LINEARITY AND WIDTH CONTROL

These controls react on each other so that when one control is adjusted the other may have to be. The adjustment of the linearity control should only be made on a test pattern signal. First, obtain the correct width by adjusting the width control, L7, until the picture extends approximately 1/8-inch outside the edge of the mask on both sides. Next, adjust the Horizontal Linearity control, R49, until the test pattern is symmetrical in the left and right direction. A slight readjustment of the Width control may now be necessary, as well as touching up of the centering adjusting screws.

VERTICAL LINEARITY AND HEIGHT CONTROL

The Height control, R61, is adjusted until the picture extends approximately 1/8 inch outside the edge of the mask on both top and bottom. Next, adjust the Vertical Linearity control, R58, until the test pattern is symmetrical from top to bottom. Readjustment of the Height and Vertical Hold controls as well as the centering adjustments may be necessary.

For test patterns see back of Manual

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50-CYCLE OPERATION

The supplement schematic diagram, Figure 18, shows the wiring of the power transformer, T14, through the special terminal board installed. Also, it shows the addition of capacitors C98 and C99 required for additional filtering. The changes involved in changing from 60-cycle to 50-cycle operation are listed below:

1. The 50-cycle power transformer, T14, is separated from the chassis and installed on a mounting plate at the base of the cabinet.

2. All filament and high voltage leads are extended on the transformer and terminated at the chassis proper in a terminal board. The connection of these leads through this terminal board is shown in Figure 18. All leads are twisted.

3. A 90 mfd. capacitor, C98, is shunted across C62. A 90 mfd. capacitor, C99, is shunted across C45-A.

4. The bias supply filter capacitor, C69, is changed to a 50 mfd. capacitor.

5. Filament leads to V6, V7, V9, V10, V11, V12, V14, V15, V16, and V17 are twisted. The ground connection is made at one point only for this series of tubes, and the high side is connected through the filament wafer of the band switch.

PRODUCTION CHANGES

The following production changes have taken place up to the time that this service data was compiled. In most cases the change can not be accurately identified with the serial number of the chassis. The order of listing below does not indicate the chronological order of the change.

1. Power Transformer, T14 and V23—The original transformer, T14, supplied, gave insufficient B+ voltage (385 volts) when using a Type 5Y3GT rectifier tube, V23. This resulted in a low anode voltage of 7500 volts for the picture tube. To increase this voltage, a Type 5V4G tube was substituted for the 5Y3G tube, V23. At approximately serial number 2500, a new transformer T14 having Stock No. RTP-040 was substituted, which gave the correct B+ voltage of 415 volts when a Type 5Y3G tube was used as V23. This B+ voltage gives an anode voltage to the picture tube of 8500 volts.

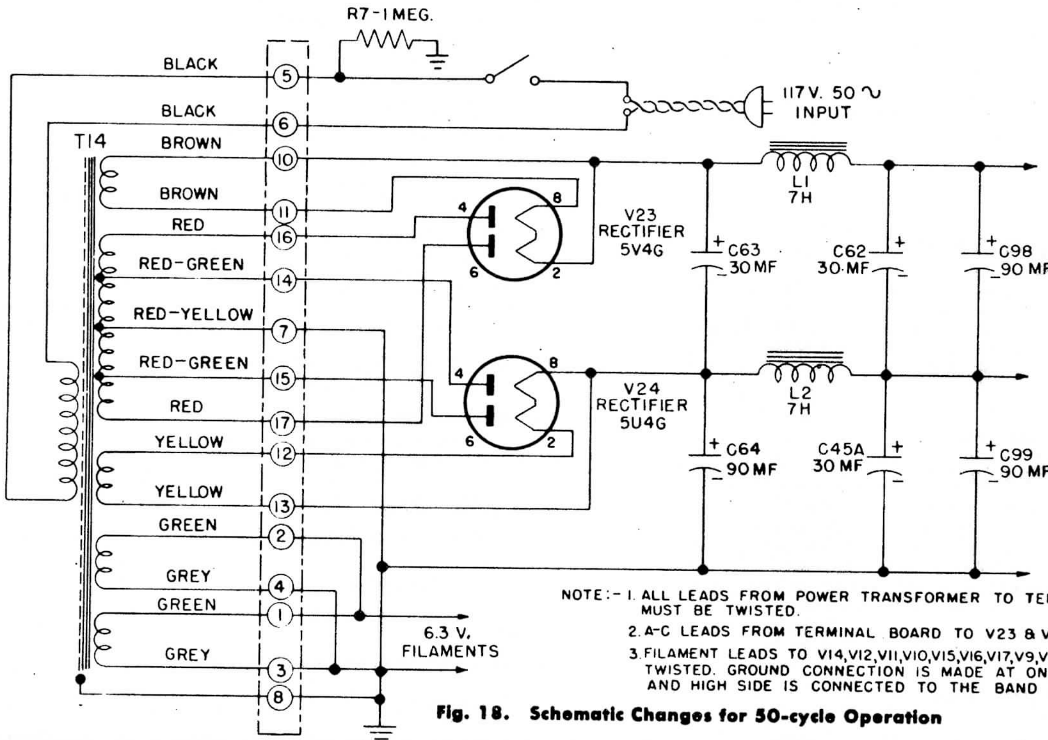
2. Television Tuning Trimmer C112—For approximately the first 2000 receivers, the tuning trimmer C112 did not quite have the correct tuning range, making it necessary to add a fixed 10 mmf. capacitor C114 in series with it. The shunt capacitor C102 had a value of 4.7 mmf. Later production trimmer, C114, has the correct range. With this new value of trimmer, the shunt capacitor C112 was changed to 6.0 mmf. This shunt capacitor in a few receivers was merely a 5.0 mmf., while in most it will consist of two capacitors; a 5 mmf. and a 1.0 mmf. capacitor in parallel. The early production trimmer has a ¼-in. O.D. shaft, while the late production trimmer is slightly larger and has a $\frac{3}{16}$-in. O.D. shaft.

3. Tone Control, R69B—The tone control R69B, on early production receivers was connected in series between the Volume Control R69A, movable arm, and C39. C72 was a 680 mmf. capacitor from C39 to ground. Hum in the audio dependent upon the tone control setting necessitated a revision as shown in the schematic.

4. Tuned Circuit, L20 and C89—The capacitor, C89, was originally 240 mmf. and the coil, L20, was fixed-tuned and wound on a resistor form. This was later changed to 1000 mmf. and the coil turns were reduced and made variable, resulting in a higher Q circuit. This change permitted adjustment of the trap as described in the alignment procedure.

5. Resistor, R87—This resistor was changed from 100,000 ohms to 330,000 ohms to prevent excessive beam current in the picture tube, V8. This excessive beam current caused the high voltage to be reduced when the Brilliance control was advanced to maximum with the result that the control reduced brightness at end of its clockwise travel instead of increasing brightness.

6. Resistor, R47—This resistor has been changed from ½-watt to a 1-watt size. In some cases, the original ½-watt resistor dissipation is exceeded, especially if the Width control iron core is nearly all the way in the coil, resulting in a reduction in the resistance value. This reduced resistance changes the waveshape across C29 so much that the horizontal multivibrator may lock in at half frequency or not lock at all. It may also result in the resistor burning out.



NOTE:- 1. ALL LEADS FROM POWER TRANSFORMER TO TERMINAL BOARD MUST BE TWISTED.
2. A-C LEADS FROM TERMINAL BOARD TO V23 & V24 ARE TWISTED.
3. FILAMENT LEADS TO V14, V12, V11, V10, V15, V16, V17, V9, V6, V7 ARE TWISTED. GROUND CONNECTION IS MADE AT ONE POINT ONLY, AND HIGH SIDE IS CONNECTED TO THE BAND SWITCH.

Fig. 18. Schematic Changes for 50-cycle Operation

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7. Change in Horizontal Output Transformer, T9—A new design horizontal output transformer, T9, was used in late production receivers. This may be identified by the fact that it has two windings instead of the single winding design, as characterized the early production receivers. When the late production transformer is used, a 3900-ohm, 1-watt resistor must be added in series to the existing 6800-ohm, 1-watt resistor, R47. *Do not use a single 1-watt resistor for this.* The capacitor, C66, should be returned to ground when the new type transformer is used.

8. Horizontal Multivibrator Cathode Switching—After the first 150 receivers were built, a shorting contact was added to the filament wafer of the Station Selector switch so as to stop the horizontal multivibrator as soon as the Station Selector was switched to "Radio" position. This connects the multivibrator cathode to ground through the filament circuit when switching to "Radio" so that "birdies" are not heard on the broadcast band as the television tubes cool off after switching from television to radio reception.

9. Screen Resistor, R79—This resistor was changed from an original 47,000 ohms to 33,000 ohms. This reduces the operating d-c voltage on the plate of V7, and gives greater brightness.

10. Addition of C21—A fixed 10 mmf. mica capacitor, C21, was added across C10 so that the trimmer C10 would peak at the center of its range.

11. Change in R63—The 330,000 ohm resistor, R63, was changed to 220,000 ohms so that the Vertical Hold control will operate near its mid-adjustment position.

12. Removal of R95—To correct a transient which appeared in the vertical retrace as a white line at the top of the picture, the 2200 ohm resistor, R95, in series with capacitor, C37, was removed. The potentiometer, R58, was reconnected as a variable resistance as shown on the schematic.

13. Value Change of C52—The original capacity of C52 was 47 mmf. To improve vertical interlace, this capacitor was changed to 240 mmf.

14. Addition of Tuned Circuit, L21 and C91—A 15.75 kc tuned circuit was added to the cathode of the horizontal multivibrator, V11. This stabilizes the horizontal AFC circuit to the extent that it prevents picture wiggles on noise pulses and echoes. With this addition, the 240 $\mu\mu f$ capacitor, C56, should be changed to 150 mmf. and the 150,000 ohm, resistor, R40, should be increased to 330,000 ohms. This prevents a white line at the left-center of the picture which may result with installation of L21-C91. With addition of L21, the capacitor, C30, was changed from a 40 mfd to a 1.0 mfd, and C92 was changed from 1.0 mfd to a .05 mfd.

15. Connection of Primary of T11—On early production receivers the primary of T11 was connected to a mid-tap on choke L10. This connection caused a resonant condition to develop which affected the lower television bands. This was corrected temporarily by shunting a 47 mmf. capacitor between the midtap of L10 and ground. Later the primary of T11 was connected to the junction of L10 and C101 as shown on the schematic.

TROUBLE SHOOTING

The following is a listing of possible troubles and their cures. This is not intended as a comprehensive coverage of all possible failures but serves to point out some of the more difficult troubles that may be experienced. From time to time this information will be expanded as information becomes available.

1. NO RASTER ON PICTURE TUBE

(a) Ion trap adjustment incorrectly made. Assembly on backward or improperly oriented. See ion trap adjustment under "Miscellaneous Preset and Service Adjustments."

(b) Check for waveform at output of T9. If present, the trouble is probably in the Type 8016 rectifier tube or filter circuit. Check for open in high voltage winding of T9. If the V13 tube filament glows yellow, high-voltage is being generated and the trouble will possibly exist in the picture tube, V8.

(c) If there is no waveform at output of T9, check operation of 807, V12, V7, and multivibrator V11 by oscilloscope waveform measurement.

(d) Check that high voltage anode cap is contacting the anode terminal of V8.

(e) Open Brightness control R84B, R87, or R85.

(f) No. B+ voltage at junction L4 and L3.

(g) If only two or three thousand volts are generated, check deflection yoke, L9, and Width control, L7, for continuity.

2. RASTER NORMAL, NO PICTURE OR SOUND

(a) Oscillator V2B defective, or oscillator coil resonates out of band.

(b) Defective antenna or lead-in.

(c) Converter, r-f amplifier, or first video i-f amplifier stage defective.

3. PICTURE NORMAL, NO SOUND

(a) 21.9 mc audio i-f amplifier, discriminator, or audio amplifier defective.

(b) Oscillator V2B off frequency.

(c) Defective speaker.

4. RASTER NORMAL, SOUND NORMAL, NO PICTURE

(a) Video i-f amplifier (after 1st i-f) inoperative.

(b) Resistor R83 in contrast control defective or open.

(c) Screen by-pass C32C open or shorted.

5. NORMAL PICTURE AND SOUND, NO HORIZONTAL OR VERTICAL SYNC.

(a) Check for signal input waveform at grid (1) of V9A.

(b) Defective V9A or plate circuit components.

(c) Operation of receiver with Contrast control advanced too far.

6. PICTURE NORMAL, NO VERTICAL SYNC.

(a) Check grid of V15B for normal waveform.

(b) Check speed of vertical multivibrator. Should be capable of free running speed less than 60 cps.

(c) Check V15B circuit components.

7. PICTURE NORMAL, NO HORIZONTAL SYNC.

(a) Check AFC transformer, T7.

(b) Check alignment of L21 and C91.

(c) Check socket voltages and waveforms of V10B and V11.

(d) Check resistor R47 for correct value.

8. NO VERTICAL OR NO HORIZONTAL DEFLECTION

(a) Check waveform and socket voltages of output and multivibrator tubes of respective sweep circuits.

(b) Check output transformer and yoke for continuity.

9. ONE OR MORE HORIZONTAL WHITE LINES AT TOP OF PICTURE

(a) Check for Production Change #12.

10. RIPPLE ON EDGE OF PICTURE

(a) Reflections on antenna lead-in.

(b) Instability of horizontal AFC circuit. See Production Change #14.

(c) Defective capacitor, C30.

11. RASTER EDGE NOT STRAIGHT—KEYSTONING

(a) Defective yoke.

(b) Defective sweep transformer.

(c) Improperly adjusted ion trap adjustment assembly.

12. PICTURE JUMPY

(a) Operation at too high contrast control setting.

(b) If picture moves at regular rate sideways, check capacitor C30, R32 and C92. Put in change #14.

(c) If left of picture jitters, change 807 sweep tube, V12.

(d) Noisy sweep or sync circuit tubes.

13. POOR INTERLACE OF VERTICAL SWEEP

(a) Check Production Change #13.

14. POOR PICTURE DETAIL

(a) Mismatch in antenna or lead-in.

(b) Misalignment of i-f or r-f circuits.

(c) Defective chokes L3, L4 or L5 in video amplifier.

(d) Make sure that focus control operates on both sides of proper focus point.

(e) Overload of video amplifier, check contrast control operation.

15. PICTURE CANNOT BE CENTERED

(a) Move focus coil back by loosening all four adjustment screws.

16. FOCUS CONTROL AT END OF TRAVEL

(a) Short out resistor R96.

(b) Check for correct B+ voltages.

WAVEFORM MEASUREMENTS

The waveforms shown in Figures 35 through 55 represent measurements on an average receiver wherein the controls have been adjusted for a normal picture with correct Contrast, Height, Width and Linearity. Most measurements must be made when a signal is being received.

An oscilloscope where the vertical deflection amplifier has been pre-calibrated is used to take measurements at the point indicated in the waveform boxes. The oscilloscope sweep frequency is indicated in the waveform title.

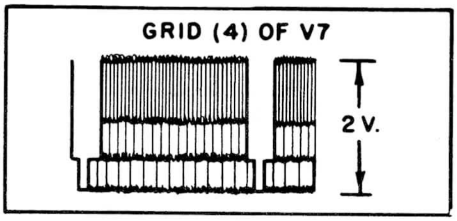

Fig. 35. Video Output of Detector (Osc. Synced at Half of Vert. Speed)

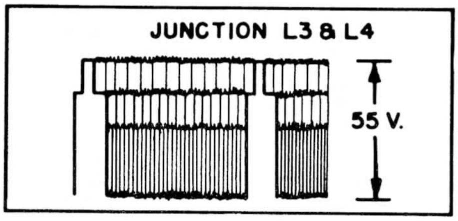

Fig. 36. Video Output of V7. (Osc. Synced at Half of Vert. Sweep Speed)

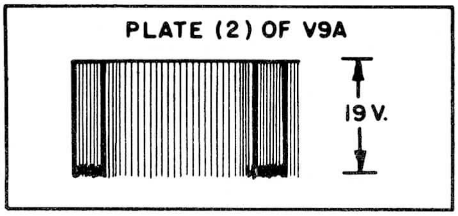

Fig. 37. Clipper Output (Osc. Synced at Half of Vert. Sweep Speed)

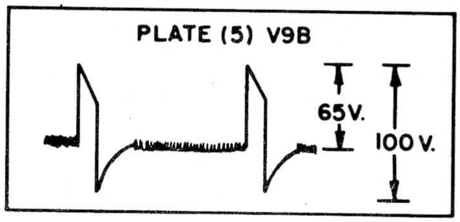

Fig. 38. Sync Amplifier Output (Osc. Synced at Half of Hor. Sweep Speed)

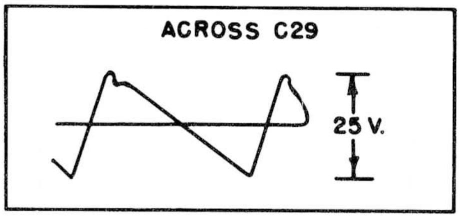

Fig. 39. A.F.C. Sawtooth (Osc. Synced at Half of Hor. Sweep Speed)

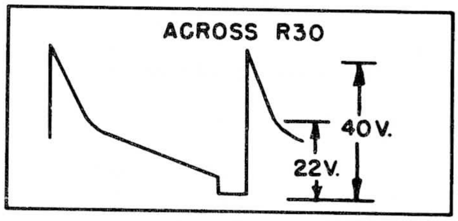

Fig. 40. Discriminator Voltage (Osc. Synced at Half of Hor. Sweep Speed)

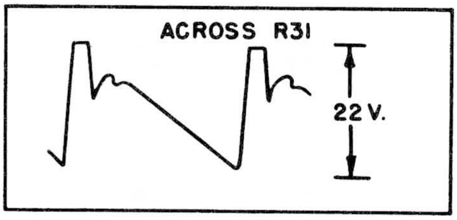

Fig. 41. Discriminator Voltage (Synced at Half of Hor. Sweep Speed)

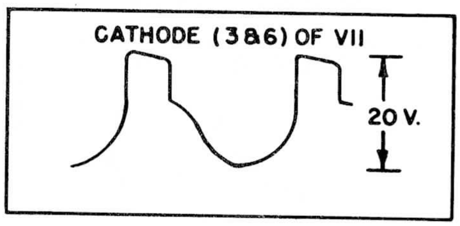

Fig. 42. Hor. M-V Cathode (Osc. Synced at Half of Hor. Sweep Speed)

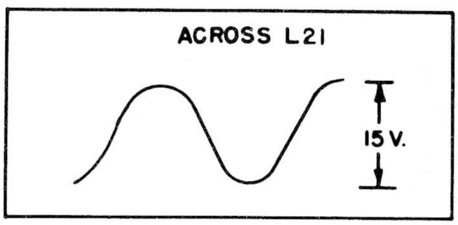

Fig. 43. Cathode Tuned Circuit (Synced at Half of Hor. Sweep Speed)

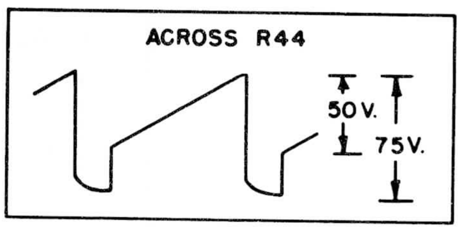

Fig. 44. Hor. M-V Output (Osc. Synced at Half of Hor. Sweep Speed)

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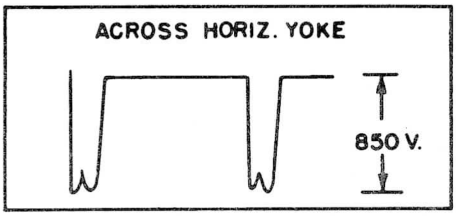

Fig. 45. Hor. Yoke Input (Osc. Synced at Half of Hor. Sweep Speed)

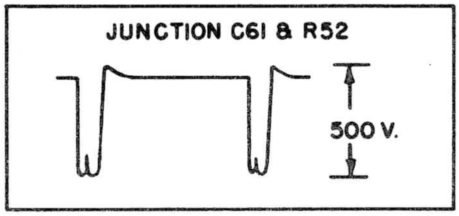

Fig. 46. V14 Control Voltage (Osc. Synced at Half of Hor. Sweep Speed)

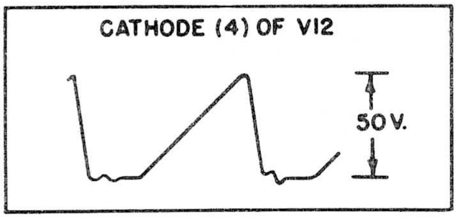

Fig. 47. 807 Cathode (Osc. Synced at Half of Hor. Sweep Speed)

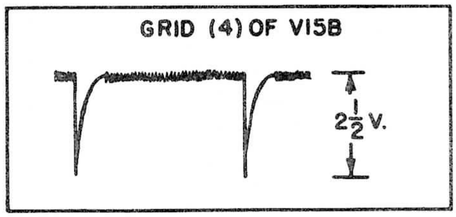

Fig. 48. Vert. Sync at V15B. (Osc. Synced at Half of Vert. Sweep Speed)

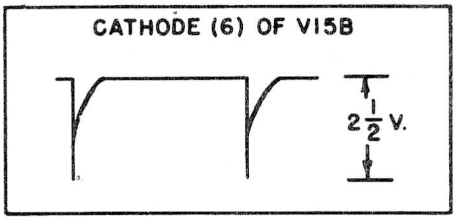

Fig. 49. Vertical Sync at Cathode V15B (Osc Synced at Half of Vert. Sweep Speed)

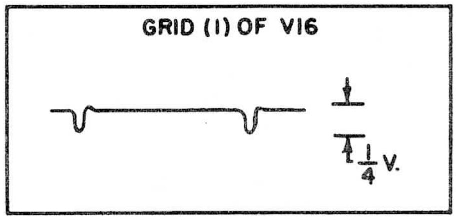

Fig. 50. Vert. Sync at Grid of M-V. (Osc. Synced at Half of Vert. Sweep Speed)

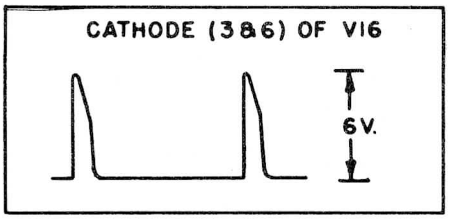

Fig. 51. Vert. M-V Cathode (Osc. Synced at Half of Vert. Sweep Speed)

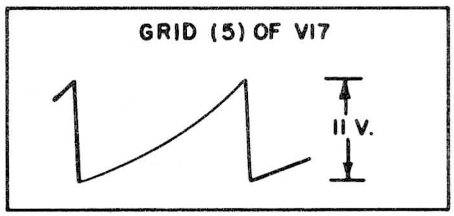

Fig. 52. Vert. M-V Output. (Osc. Synced at Half of Vert. Sweep Speed)

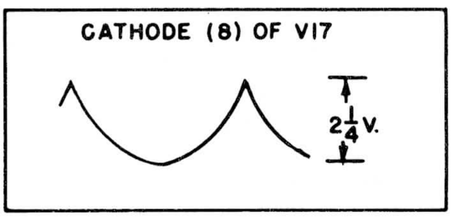

Fig. 53. Vert. Output Cathode (Osc. Synced at Half of Vert. Sweep Speed)

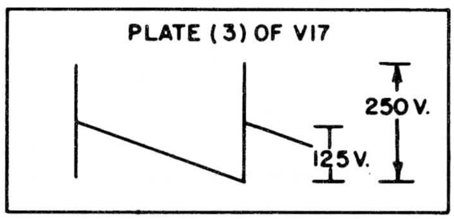

Fig. 54. Vert. Output of V17 (Osc. Synced at Half of Vert. Sweep Speed)

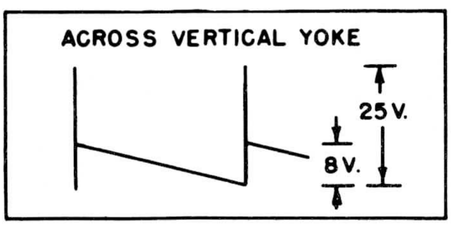

Fig. 55. Vert. Yoke Input (Osc. Synced at Half of Vert. Sweep Speed)

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Add the following to the parts list for the late production changes:

CAT. NO.	SYMBOL	DESCRIPTION
RJS-067		SOCKET - 6AU6 miniature socket
RJX-020	S1	SWITCH - R-F switch assembly completely wired and aligned (with tubes)
RRD-1073	R108,110	RESISTOR - 10,000 ohms, 1/2 w., carbon
RRD-1051	R103,113,114	RESISTOR - 3300 ohms, 1/2 w., carbon
RRD-1069	R109	RESISTOR - 6800 ohms, 1/2 w., carbon
RRE-1073	R102,106	RESISTOR - 10,000 ohms, 1 w., carbon
RTL-053	T1	TRANSFORMER - 1st video i-f transformer (late production)
RCW-2006	C105	CAPACITOR - 12 mmf., ceramic
RCW-023	C111	CAPACITOR - 6 mmf., ceramic
UCU-2004	C110	CAPACITOR - 10 mmf., ceramic
RCW-019	C102	CAPACITOR - 3 mmf., ceramic
UCU-1544	C107,109	CAPACITOR - 470 mmf., mica
REI-013		CORE - Powdered iron core for L21

EARLY

REI-012, Core - Powdered iron tuning core for L7, horizontal width control.

INTERCHANGEABILITY OF HEAD-END UNITS,
RJX-014 (EARLY PRODUCTION) AND RJX-020 (LATE PRODUCTION)

The early production r-f head-end unit is listed as RJX-014, while the late production r-f head-end unit is catalogued as RJX-020. As soon as the current stock of RJX-014 is depleted, the Cat. No. RJX-020 (late production) head-end unit will be shipped in lieu of it. When using Cat. No. RJX-020, either of the following procedures must be carried out to permit this unit to substitute for RJX-014 in the early production Model 801. Note - All late production Model 801 use the Cat. No. RJX-020 head-end unit and will not need to have any alteration made thereon.

1. Conversion of RJX-020 to Substitute for RJX-014 (In Model 801 Chassis Below Serial No. 4550):
   (a) Remove 10 mmf. capacitor (C110) that connects between plate (6) of 7F8 and ground.

2. Conversion of Early Production Chassis (Below Serial No. 4550) to Accommodate Head-End Unit RJX-020:
   (a) Remove 1st i-f transformer, T1, from receiver chassis.
   (b) Substitute late production i-f transformer, Cat. No. RTL-053.

NOTE - The second method is the preferred method since it eliminates the alignment of the 1st video i-f transformer affecting the r-f amplifier response curve. However, this method requires that the 1st video i-f transformer be aligned.

When aligning the new production 1st video i-f transformer, RTL-053, the primary is tuned by moving the shorted turn to change inductance in lieu of the primary trimmer as incorporated in the early production transformer, RTL-023.

MODEL 801

GENERAL ELECTRIC CO.

UNIVERSAL REPLACEMENT PARTS

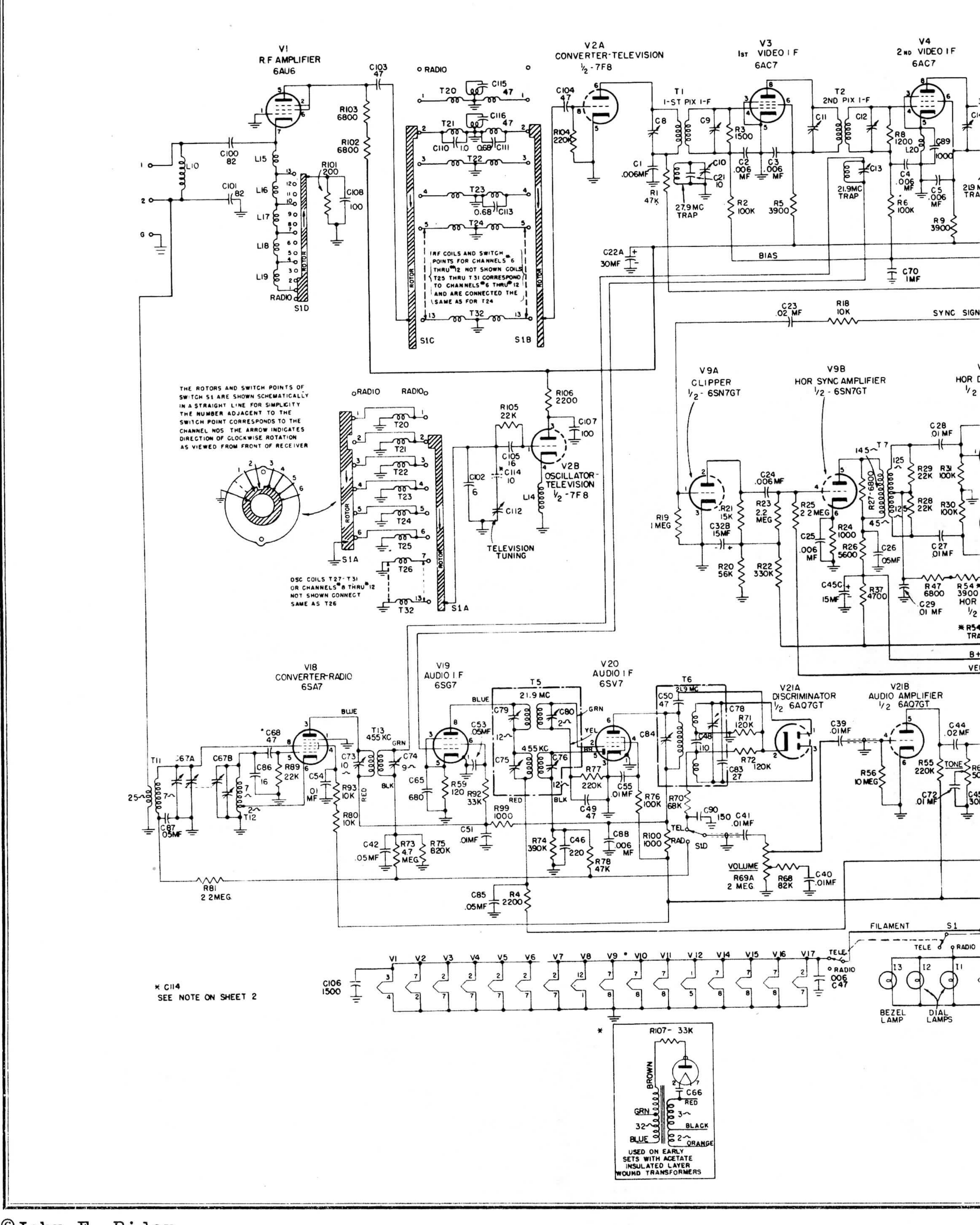
PART NO.	SYMBOL	DESCRIPTION
UCC-011	C42, 87	CAPACITOR—.05 mfd., 200 v., paper
UCC-017	C30, 69	CAPACITOR—1.0 mfd., 200 v., paper (C69 for 60-cycle receiver only)
UCC-025	C27, 28	CAPACITOR—.01 mfd., 400 v., paper
UCC-035	C43, 81	CAPACITOR—.001 mfd., 600 v., paper
UCC-040	C36, 39, 40, 41, 51, 54, 55, 60, 71, 29, 72	CAPACITOR—.01 mfd., 600 v., paper
UCC-041	C23, 34, 44	CAPACITOR—.02 mfd., 600 v., paper
UCC-045	C26, 33, 53, 58, 85, 92	CAPACITOR—.05 mfd., 600 v., paper
UCC-048	C37, 38, 59, 70, 77	CAPACITOR—.10 mfd., 600 v., paper
UCU-520	C50	CAPACITOR—47 mmf., mica
UCU-1014	C83	CAPACITOR—27 mmf., mica
UCU-1048	C35, 65	CAPACITOR—680 mmf., mica
UCU-1052	C57, 89	CAPACITOR—1000 mmf., mica
UCU-1504	C20, 21	CAPACITOR—10 mmf., mica
UCU-1520	C49, 61, 68	CAPACITOR—47 mmf., mica
UCU-1526	C100, 101	CAPACITOR—82 mmf., mica
UCU-1532	C90, 56	CAPACITOR—150 mmf., mica
UCU-1536	C46	CAPACITOR—220 mmf., mica
UCU-2538	C52	CAPACITOR—240 mmf., mica
UCW-1020	C103, 104	CAPACITOR—47 mmf., ceramic
UCW-2009	C86, 105	CAPACITOR—16 mmf., ceramic
UOP-1206	LS1	LOUDSPEAKER—12-inch PM speaker
UOX-005		CONE—Replacement speaker cone assembly
URD-027	R59	RESISTOR—120 ohms, ½ w., carbon
URD-029	R11	RESISTOR—150 ohms, ½ w., carbon
URD-049	R24, 43, 99, 100	RESISTOR—1000 ohms, ½ w., carbon
URD-057	R4, 51, 52, 67	RESISTOR—2200 ohms, ½ w., carbon
URD-073	R18, 42, 86	RESISTOR—10,000 ohms, ½ w., carbon
URD-077	R21	RESISTOR—15,000 ohms, ½ w., carbon
URD-081	R65, 89, 28, 29	RESISTOR—22,000 ohms, ½ w., carbon
URD-085	R92	RESISTOR—33,000 ohms, ½ w., carbon
URD-089	R78, 79	RESISTOR—47,000 ohms, ½ w., carbon
URD-091	R20	RESISTOR—56,000 ohms, ½ w., carbon
URD-093	R66, 70	RESISTOR—68,000 ohms, ½ w., carbon
URD-095	R68	RESISTOR—82,000 ohms, ½ w., carbon
URD-097	R2, 6, 94, 39, 41, 76	RESISTOR—100,000 ohms, ½ w., carbon
URD-099	R71, 72	RESISTOR—120,000 ohms, ½ w., carbon
URD-101	R83	RESISTOR—150,000 ohms, ½ w., carbon
URD-105	R55, 77, 63, 64	RESISTOR—220,000 ohms, ½ w., carbon
URD-109	R22, 87, 40	RESISTOR—330,000 ohms, ½ w., carbon
URD-111	R74	RESISTOR—390,000 ohms, ½ w., carbon
URD-113	R44, 97	RESISTOR—470,000 ohms, ½ w., carbon
URD-117	R85	RESISTOR—680,000 ohms, ½ w., carbon
URD-119	R75	RESISTOR—820,000 ohms, ½ w., carbon
URD-121	R7, 19	RESISTOR—1.0 meg., ½ w., carbon
URD-129	R23, 25, 81, 60	RESISTOR—2.2 meg., ½ w., carbon
URD-137	R73	RESISTOR—4.7 meg., ½ w., carbon
URD-145	R56	RESISTOR—10.0 meg., ½ w., carbon
URD-1041	R32, 57	RESISTOR—470 ohms, ½ w., carbon
URD-1051	R33, 8, 10	RESISTOR—1200 ohms, ½ w., carbon
URD-1053	R14, 3	RESISTOR—1500 ohms, ½ w., carbon
URD-1069	R15, 27	RESISTOR—6800 ohms, ½ w., carbon
URD-1097	R34, 35	RESISTOR—100,000 ohms, ½ w., carbon
URE-035	R53	RESISTOR—270 ohms, 1 w., carbon
URE-045	R38	RESISTOR—680 ohms, 1 w., carbon
URE-065	R37	RESISTOR—4700 ohms, 1 w., carbon
URE-067	R26	RESISTOR—5600 ohms, 1 w., carbon
URE-089	R1, 48	RESISTOR—47,000 ohms, 1 w., carbon
URE-097	R90	RESISTOR—100,000 ohms, 1 w., carbon
URE-1056	R17	RESISTOR—2000 ohms, 1 w., carbon
URE-1063	R5, 9, 12, 54	RESISTOR—3900 ohms, 1 w., carbon
URF-041	R13	RESISTOR—470 ohms, 2 w., carbon
URF-045	R82, 91	RESISTOR—680 ohms, 2 w., carbon
URF-071	R46	RESISTOR—8200 ohms, 2 w., carbon
URF-073	R80, 93	RESISTOR—10,000 ohms, 2 w., carbon
URF-1061	R16	RESISTOR—3300 ohms, 2 w., carbon

SPECIALIZED REPLACEMENT PARTS

PART NO.	SYMBOL	DESCRIPTION
RAB-040		BACK—Cabinet back cover
RAL-001		BEZEL—Pilot light bezel, bottom of cabinet

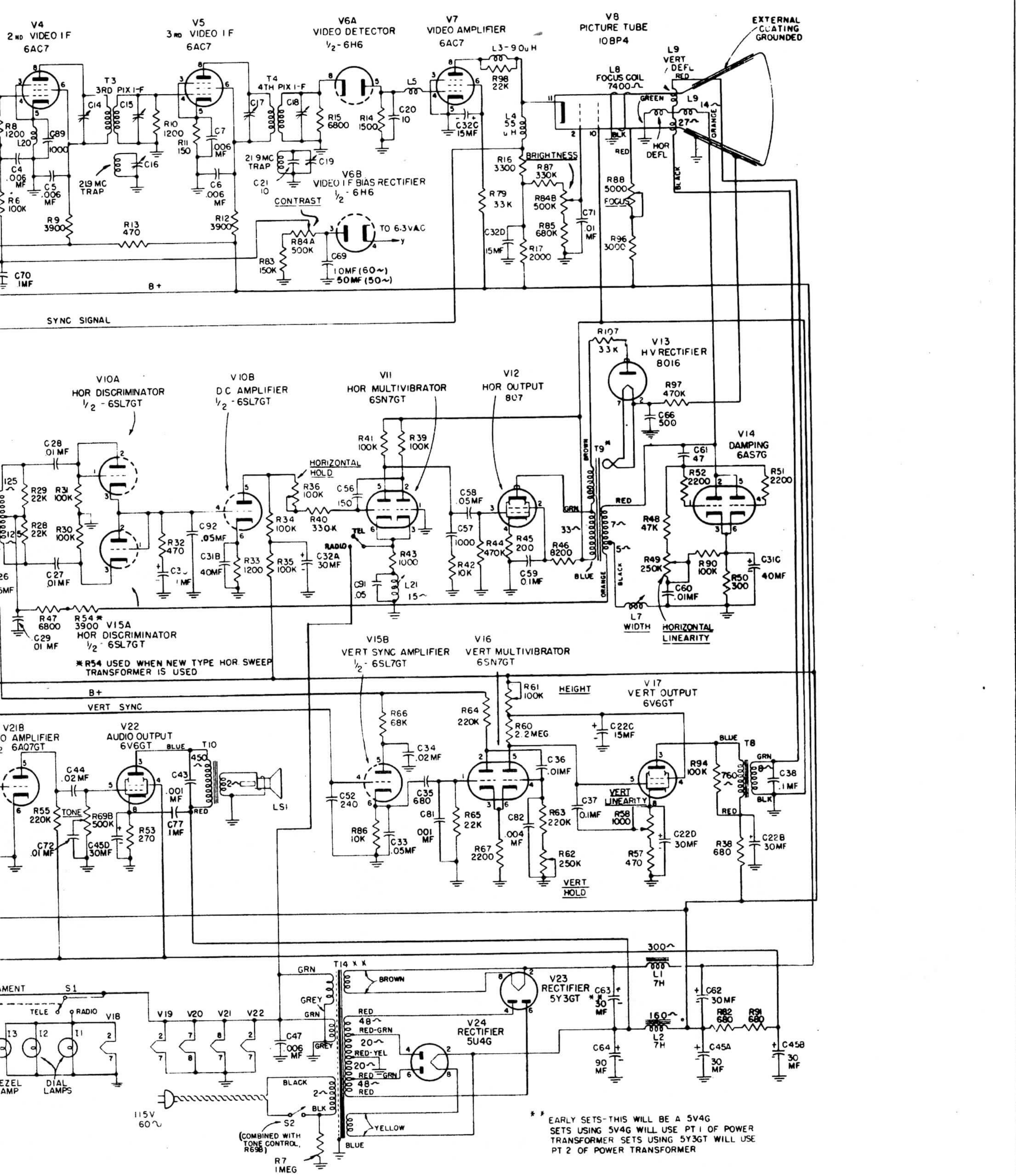
SPECIALIZED REPLACEMENT PARTS (Cont'd)

PART NO.	SYMBOL	DESCRIPTION
RAV-033		CABINET—Model 801 cabinet (less hardware)
RCC-002	C1, 2, 3, 4, 5, 6, 7, 24, 25, 47, 88	CAPACITOR—.006 mfd., 600 v., paper
RCC-038	C82	CAPACITOR—.004 mfd., 600 v., paper
RCE-017	C64	CAPACITOR—90 mfd., 450 v., electrolytic
RCE-018	C31A, B, C	CAPACITOR—40 mfd., 40 mfd., 40 mfd., 25 v., electrolytic
RCE-019	C45A, B, C, D; 22A, B, C, D	CAPACITOR—30 mfd., 30 mfd., 15 mfd., 450 v.; 30 mfd., 15 v., electrolytic
RCE-020	C32A, B, C, D	CAPACITOR—30 mfd., 15 mfd., 15 mfd., 15 mfd., 450 v., electrolytic
RCE-021	C62, 63	CAPACITOR—30 mfd., 300 v., electrolytic
RCE-048	C69	CAPACITOR—50 mfd., 25 v., electrolytic (used on 50-cycle receivers only)
RCN-001	C110	CAPACITOR—1 mmf., miniature
RCN-002	C111, 113	CAPACITOR—0.68 mmf., miniature
RCN-003	C66	CAPACITOR—500 mmf., lectrofilm
RCS-001	C91	CAPACITOR—.05 mfd., 200 v., paper
RCT-013	C67A, B	CONDENSER—2-section broadcast tuning condenser
RCW-2001	C102	CAPACITOR—5 mmf., ceramic
RCW-026	C106	CAPACITOR—1500 mmf., ceramic
RCW-1028	C107, 108	CAPACITOR—100 mmf., ceramic
RCY-015	C112	CONDENSER—Television tuning condenser
RDC-029		CORD—Television tuning drive cord
RDC-027		CORD—Broadcast dial cord
RDD-007		HUB AND DRUM ASSEMBLY—On Broadcast dial
RDD-008		DRUM AND SHAFT ASSEMBLY—For Broadcast dial
RDD-009		DRUM—Dial drive pointer drum and shaft assembly for B-C tuning
RDK-071		KNOB—Control knob for Radio Tuning or Focus
RKD-072		KNOB—Control knob for Television Tuning
RKD-073		KNOB—Control knob for Station Selector
RDK-074		KNOB—Control knob for Volume or Contrast
RDK-075		KNOB—Control knob Off-Tone or Brightness
RDL-002		LIGHT—Pilot light, Mazda No. 44, 6-8 v., 0.25 A., frosted for B-C tuning scale
RDM-006		MASK—Picture tube mask
RDP-023		POINTER—Broadcast dial pointer and hub assembly
RDS-034		GLASS—Broadcast dial glass
RDW-004		GLASS—Picture tube safety glass
RDX-028		SCALE—Broadcast dial scale assembly
RHC-008		CLIP—Clip for holding tubular capacitors
RHG-006		GROMMET—Power cord grommet
RHM-016		CLIP—B-C oscillator coil clip
RHM-028		CLIP—B.C. r-f coil clip
RHX-010		HARDWARE—Hardware for mounting gang condenser
RJC-001		PIN—Speaker lead contact pin
RJC-007		CONNECTOR—High voltage anode connector for picture tube
RJJ-005		RECEPTACLE—A-C receptacle (male) on chassis
RJP-015		PLUG—A-C plug (on back cover)
RJS-012		PLATE—Mounting plate for electrolytic capacitor (small size)
RJS-030		SOCKET—Octal base tube socket
RJS-037		PLATE—Mounting plate for electrolytic capacitor (large size)
RJS-041		SOCKET—Miniature tube socket for 6AU6
RJS-042		SOCKET—Loctal tube socket for 7F8
RJS-057		TUBE SOCKET—5-pin socket for 807
RJS-058		SOCKET—Tube socket for picture tube
RJS-059		SOCKET—Dial scale pilot lamp socket
RJS-064		SOCKET—Bezel pilot lamp socket
RJX-014	S1	SWITCH—R-f coil assembly completely wired and aligned (including tubes)
RLA-007	T11	TRANSFORMER—B-C antenna transformer
RLC-012	T12	TRANSFORMER—B-C oscillator transformer
RLD-001	L9	COIL—Deflection coil
RLF-005	L1	CHOKE—7 h., 75 ma. filter choke
RLF-006	L2	CHOKE—7 h., 140 ma. filter choke
RLF-008	L8	COIL—Focus coil
RLF-009	L10	CHOKE—Broadcast choke coil
RLI-003	L18	CHOKE—R-F amplifier cathode choke
RLI-006	L15, 19	CHOKE—R-F amplifier cathode choke
RLI-007	L3 and L98	CHOKE—90 uh. video choke
RLI-008	L4	CHOKE—55 uh. video choke
RLI-009	L5	CHOKE—Video detector choke
RLI-011	T26	COIL—R-F and oscillator coil (Band 7)
RLI-012	T27	COIL—R-F and oscillator coil (Band 8)
RLI-013	T28	COIL—R-F and oscillator coil (Band 9)
RLI-014	T29	COIL—R-F and oscillator coil (Band 10)
RLI-015	T30	COIL—R-F and oscillator coil (Band 11)
RLI-016	T31	COIL—R-F and oscillator coil (Band 12)
RLI-017	T32	COIL—R-F and oscillator coil (Band 13)
RLI-019	L14	CHOKE—Oscillator cathode choke
RLI-031	L21	CHOKE—Cathode choke assembly
RLM-003	T22	COIL—R-F and oscillator coil (Band 3)
RLM-004	T23	COIL—R-F and oscillator coil (Band 4)
RLM-005	T24	COIL—R-F and oscillator coil (Band 5)
RLM-006	T25	COIL—R-F and oscillator coil (Band 6)
RLM-008	T20	COIL—R-F and oscillator coil (Band 1)
RLM-009	T21	COIL—R-F and oscillator coil (Band 2)
RMB-009		BUSHING—B-C tuning shaft bushing
RMF-004		CLIP—Dial window clip
RMR-004		RUBBER—Channel rubber for dial
RMM-039		CUSHION—Picture tube cushion
RMM-040		TRAP—Ion trap assembly
RMM-041		SHIELD—Tube base shield for 7F8 tube
RMM-042		SHIELD—Tube base shield for television tube
RMS-004		SPRING—Television tuning drive cord tension spring
RMS-109		SPRING—For focus coil assembly
RMS-110		STRAP—Safety strap for picture tube
RMS-111		SPRING—B-C drive cord tension spring
RMW-027		PULLEY—Idler pulley for B-C drive cord, ½ in. O. D.
RMW-035		PULLEY—Idler pulley for B-C drive cord, 13/16 in. O. D.
RMX-100		SHAFT—B-C tuning shaft assembly and "C" washer
RMX-101		SHAFT—Television tuning shaft and pulley assembly
RRC-020	R36, 61	POTENTIOMETER—100,000 ohms, 2 w., (Hor. Hold and Height)
RRC-021	R49, 62	POTENTIOMETER—250,000 ohms, ½ w., (Hor. Linearity and Vertical Hold)
RRC-022	R69A, B	POTENTIOMETER—2 meg., ½ w., (Volume control); 500,000 ohms, ½ w., (Tone control)
RRC-023	R84A, B	POTENTIOMETER—500,000 ohms, ½ w., (Brightness control); 500,000 ohms, ½ w., (Contrast control)
RRC-024	R58	POTENTIOMETER—1000 ohms, 2 w., w.w., (Vertical Linearity)
RRC-025	R88	POTENTIOMETER—5000 ohms, 4 w., w.w., (Focus control)
RRC-034	L7	CHOKE—Variable choke (Horizontal size)
RRD-1032	R101	RESISTOR—200 ohms, ½ w., carbon
RRD-1057	R106	RESISTOR—2200 ohms, ½ w., carbon
RRD-1081	R105	RESISTOR—22,000 ohms, ½ w., carbon
RRD-1097	R30, 31	RESISTOR—100,000 ohms, ½ w., carbon
RRD-1105	R104	RESISTOR—220,000 ohms, ½ w., carbon
RRE-1069	R102, 103, 47	RESISTOR—6800 ohms, 1 w., carbon
RRW-011	R50	RESISTOR 300 ohms, 7.4 w., wirewound
RRW-012	R96	RESISTOR 3000 ohms, 7.4 w., wirewound
RTD-003	T6	TRANSFORMER FM i-f discriminator
RTL-023	T1	TRANSFORMER 1st video i-f transformer
RTL-024	T2	TRANSFORMER—2nd video i-f transformer
RTL-025	T3	TRANSFORMER—3rd video i-f transformer
RTL-027	T13	TRANSFORMER—455 kc i-f transformer
RTL-033	T4	TRANSFORMER—4th video i-f transformer
RTL-034	T5	TRANSFORMER—Composite 455 kc and 10.7 mc i-f transformer
RTM-001	T7	TRANSFORMER AFC synchronizing transformer
RTO-016	T8	TRANSFORMER Vertical sweep output
RTO-017	T10	TRANSFORMER Audio output transformer
RTO-032	T9	TRANSFORMER Horizontal sweep output
RTP-037	T14	TRANSFORMER Power transformer (50 cycles)
RTP-040	T14	TRANSFORMER Power transformer (60 cycles)
RWL-004		CORD—Power cord
RWL-010		CORD Power cord assembly, includes female plug


V1
R F AMPLIFIER
6AU6
V2A
CONVERTER-TELEVISION
1/2 - 7F8
V3
1st VIDEO I F
6AC7
V4
2nd VIDEO I F
6AC7
T1
1-ST PIX I-F
T2
2ND PIX I-F
27.9MC TRAP
21.9MC TRAP
BIAS
SYNC SIGN
S1D
S1C
S1B
RF COILS AND SWITCH POINTS FOR CHANNELS 6 THRU 12 NOT SHOWN COILS T25 THRU T31 CORRESPOND TO CHANNELS 6 THRU 12 AND ARE CONNECTED THE SAME AS FOR T24
THE ROTORS AND SWITCH POINTS OF SWITCH S1 ARE SHOWN SCHEMATICALLY IN A STRAIGHT LINE FOR SIMPLICITY THE NUMBER ADJACENT TO THE SWITCH POINT CORRESPONDS TO THE CHANNEL NOS THE ARROW INDICATES DIRECTION OF CLOCKWISE ROTATION AS VIEWED FROM FRONT OF RECEIVER
V2B
OSCILLATOR-TELEVISION
1/2 - 7F8
TELEVISION TUNING
S1A
OSC COILS T27-T31 OR CHANNELS 8 THRU 12 NOT SHOWN CONNECT SAME AS T26
V9A
CLIPPER
1/2 - 6SN7GT
V9B
HOR SYNC AMPLIFIER
1/2 - 6SN7GT
HOR D
V18
CONVERTER-RADIO
6SA7
V19
AUDIO I F
6SG7
V20
AUDIO I F
6SV7
V21A
DISCRIMINATOR
1/2 6AQ7GT
V21B
AUDIO AMPLIFIER
1/2 6AQ7GT
T13
455 KC
T5
21.9 MC
455 KC
T6
21.9 MC
VOLUME
TONE
FILAMENT
TELE
RADIO
BEZEL LAMP
DIAL LAMPS
* C114
SEE NOTE ON SHEET 2
R107- 33K
BROWN
GRN
BLUE
RED
BLACK
ORANGE
USED ON EARLY SETS WITH ACETATE INSULATED LAYER WOUND TRANSFORMERS

MODEL 801 Early

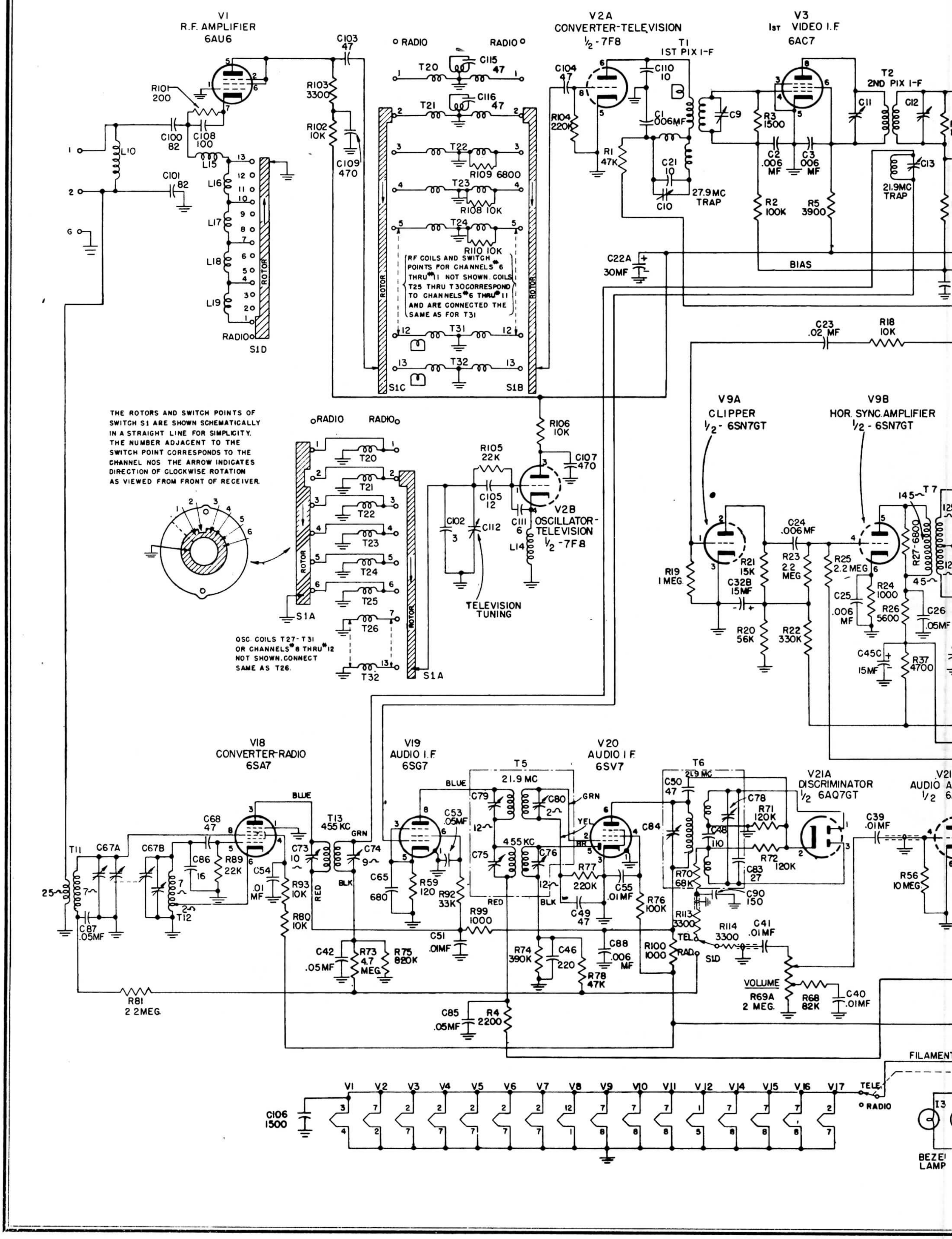
L ELECTRIC CO.



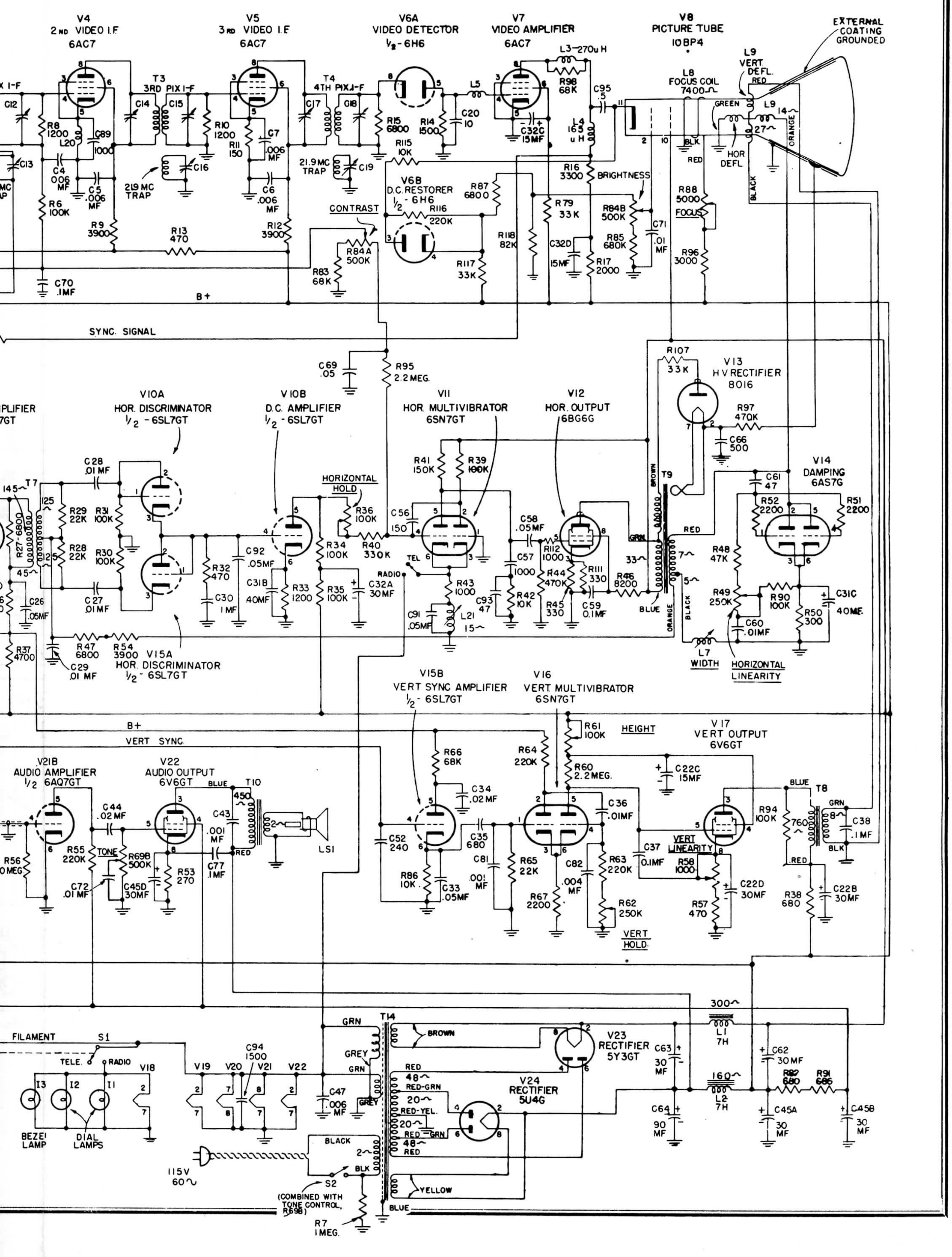
** EARLY SETS-THIS WILL BE A 5V4G
SETS USING 5V4G WILL USE PT 1 OF POWER
TRANSFORMER SETS USING 5Y3GT WILL USE
PT 2 OF POWER TRANSFORMER

MODEL 801 Late

GENERA



NERAL ELECTRIC CO.



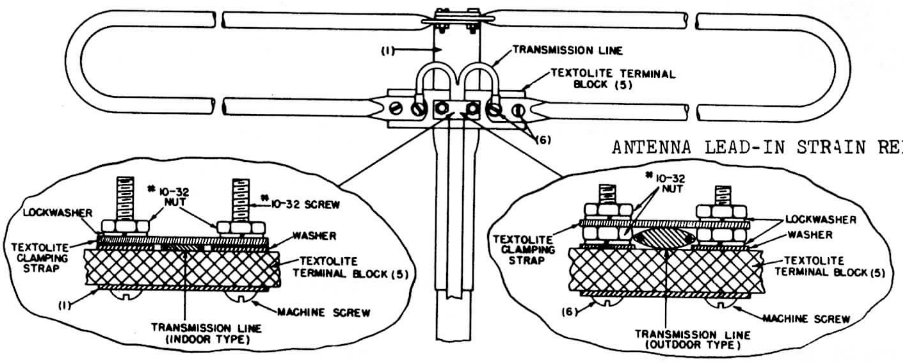
GENERAL ELECTRIC CO.

ANTENNA INSTALLATION NOTES

1. The illustration shows the installation details to provide strain relief on the lead-in where it is fastened to the dipole terminals. This is essential to prevent destruction of the line insulation at the point of lead separation and to prevent wind breakage of the multi-conductor leads at their point of connection to the dipole. The illustration shows the assembly of the spacers and clamping strap for both the indoor and outdoor line. The initial supply of antenna kits does not contain all the necessary hardware for this method of clamping the line. Consequently, extra nuts and washers should be procured.

2. Outdoor transmission line should be used in all runs where the transmission line is liable to be exposed to rain or snow. The indoor line may be used outdoors only for short runs where it is installed vertically under protecting eaves so that snow or rain will not collect on it. The outdoor line is characterized by a much heavier insulation and is ovular in shape so as to shed water readily. It is available in 500-foot coils from the Specialty Division, Syracuse, New York, as Cat. No. UWT-003. Failure to observe this precaution will result in the line changing impedance in bad weather, giving rise to echoes and smear as well as loss of signal.

3. Screw-eye spacers suitable for supporting the lead-in for the horizontal and vertical runs are available as Cat. No. S11-010 from the Specialty Division. Mast mounting brackets are also available.



ANTENNA LEAD-IN STRAIN RELIEF ASSEMBLY

4. Attic installations of the antenna are satisfactory in most cases in the primary service areas of the transmitters. Where conditions warrant it, and where the field strength is adequate (usually 1000 microvolts per meter or better), an attic installation is preferable since it is easier to install and service, the antenna is not subject to the weather, and the appearance of the house is not marred.

5. Suitable precautions should be observed in orienting the antenna so that "ghosts" are completely eliminated from the picture. Reflections not only spoil the picture detail but oftentimes make good, clean synchronization impossible.

6. Lockwashers must be used under all nuts. This is very important.

7. The transmission line should be firmly anchored at frequent intervals to prevent the wind from blowing it around. This may be accomplished by clamping it between two small blocks of wood or textolite or other suitable non-conducting materials, or as shown in the illustration below.

LEAD-IN SUPPORT DETAILS