TRANSVISION TELEVISION SERVICE NOTES

Table of Contents

Table of Contents (Cont'd.)

Page

III. Special Charts

IV. Oscillograms

SERVICE NOTES

TRANSVISION SEVEN INCH KIT

The following service notes are a compilation of considerable experience gained at the TRANSVISION Service Department and are intended to aid servicemen to locate the most prevalent troubles and reduce service time to a minimum. It must be noted that these notes deal only with the troubles that occur most frequently, and, as such, should not be misconstrued as a condensed television receiver servicing course.

Charts and special procedures will be found at the end of this manual. A brief description of the operation of the TRANSVISION set follows.

The R.F. plate (or tuner) selects the television signal, which is comprised of the video (picture) signal and the audio (sound) signal, also the synchronizing picture pulses, both horizontal and vertical. The received transmitter frequency is converted to the I.F. frequency (21.9 to 27.9 megacycles) by means of the action of the oscillator tube (6C4) and the mixer tube, which is the 6AC7 on the R.F. plate. (three channel).

This converted signal, composed of both audio and video, is thus fed to the first I.F. transformer (#174), which shapes the I.F. response curve on the high side of the band (27.9 mc.), thus trapping out unwanted higher frequencies. The signal then goes to the grid of tube X-6 (6AC7), which is pin #4, and is amplified and fed into the #175 I.F. transformer. This transformer traps out the sound I.F. frequency which is 21.9 mc. and then feeds it to the sound I.F. amplifier, which is a 6AC7 tube (X-3).

It is important to note that at this point the audio and video signals are separated, the sound signal appearing on the yellow terminal of transformer #175 and the picture signal appearing on the green terminal of the same I.F. transformer. The video signal is again amplified by a 6AC7 tube (X-5) and fed to another #174 transformer. It should be noticed at this point that the frequencies between 21.9 and 27.9 mc. are passed through the video channel.

The second #174 transformer further aids the shaping of the I.F. curve at the high side by means of its trapping action, after which the signal is again fed to another 6AC7 tube (X-4). There is another I.F. transformer, which is used to couple with the 6H6 (X-8) video detector. The video output amplifier 6AG7 (X-12) drives the control grid of the picture tube.

The synchronizing pulses, both vertical and horizontal, which have been accompanying the video signal from the start, are tapped off pin #4 (which is a cathode) of the 6H6 and are fed to the synchronization separator 6AC7 (X-9). This present discussion refers to the original seven inch TRANSVISION circuit.*

- -

* In the revised TRANSVISION synchronization circuit, the synchronizing pulses are tapped off a voltage divider in the plate circuit of the 6AG7 (X-12) video output tube and coupled to the grid (pin #4) of a 6SN7 tube which takes the place of the 6AC7 tube in the original circuit. The function of this 6SN7 tube is to act as a synchronization amplifier and separator.

The vertical and horizontal synchronizing pulses are then taken from pin #8 of the 6AC7 (X-9) and fed to their respective multivibrators, 6N7 (X-11) which is the horizontal oscillator, and 6N7 (X-10) which is the vertical oscillator. Separation of these pulses is accomplished by means of a filter network. (This refers to the early model seven inch kit.) The two synchronizing pulses are then amplified by their respective 6SN7 amplifiers and coupled to the deflection plates of the picture tube by means of blocking condensers AA and BB in the horizontal and CF-4 and CF-5 in the vertical. The first section of the twin triod amplifies the synchronizing signal, after which a .01 mmf. coupling condenser feeds it from the first section to the second section (from pin #5 to pin #1). At the second section the vertical pulse is found on the plate (pin #2) and the horizontal pulse on the cathode (pin #3). From these pins the pulses are fed to their respective multivibrator oscillators. Socket X-10 is the vertical oscillator and X-11 the horizontal. The final step is the amplification of these pulses by the 6SN7 tubes (For 7" kits with new sync.).

This completes a brief description of the video and synchronizing circuits. The audio circuit will now be traced. The sound takeoff is at the yellow terminal of the #175 I.F. transformer; the sound frequency at this point is 21.9 megacycles, which is passed through a three-tube audio amplifier consisting of a 6AC7 audio amplifier, the sound I.F. transformer (#177) tuned to 21.9 mc., a 6SQ7 detector and a 6V6 audio output tube.

SYMPTOMS AND THEIR CURE

Before referring to the symptoms described below or proceeding with any work, we advise that the wiring should first be carefully checked. Otherwise, you may arrive at a false diagnosis involving unnecessary labor.

Symptom	Cure
R.F. Plate	
Defective band switch	Improper locking or reception of stations between detents (positions) or other vague troubles difficult to trace, such as intermittent audio or video when using switch. Return the plate to the factory.
Noisy sound sensitivity control (air trimmer condenser)	One drop of machine oil on bearing.
Intermittent operation	Press 6C4 down firmly in socket, replace 6AC7, and inspect exposed wiring for shorts.
Dead or weak R.F. section	Check 2 meg. resistor for resistance; check resistance of both 2.2 K resistors from B+ of test set to R.F. plate; if resistance is low, replace. Check for open antenna coil. Check for shorting of 2 mmf. condenser on rear of switch.
Dead or weak oscillator	Check cathode resistor; it should be 39,000 ohms. Pin #1 of the 6C4 tube is at B+ potential; it is connected internally to pin #5; these two pins support the plate. Sound sensitivity trimmer plates may be touching.
Plate oscillates on R.F.	Choke coil turns too close.

Symptom	Cure
Low Voltage	
5U4G plates get red hot	Disconnect wires at terminal strip TS-F and check with ohmmeter. Quite often it will be found that excess solder is shorted to the chassis or that a tube pin is bent down, touching ground lug to socket.
Shorts or hum (condensers CF-1,CF-2)	Check to see that condensers are wired to proper connections.
High Voltage	
No raster (due to lack of high voltage)	Open high voltage transformer; incorrect wiring at terminal strip TS-V; or open circuit in cathode ray tube socket.
2X2 plate gets red hot	Incorrect wiring in filament circuit of 2X2.
2X2 is gassy (gets blue)	Tube may be defective and must be replaced. Check: a voltage reading of 2,700 d.c. should be found at red lead to the cathode ray tube.
High voltage transformer gets very hot	Be certain that mounting screw supporting centering strip is not shorted on the centering control. Be certain that anode lead to the high voltage grid cap has good insulation and is not shorted.
2X2 doesn't light up	Varnish on yellow (filament) leads should be thoroughly removed.
No raster (due to causes other than lack of high voltage)	Check cathode ray tube filament; check connections and voltages on terminal strip TS-V; check connections and voltages on centering controls; check for open peaking coil; check for open focus or brightness control.
Poor raster brightness	Poor cathode ray tube.
No sweep (bright dot on screen) NOTE: This will easily burn a mark on screen if left on!	Check B+ voltages to sweep circuits (vertical and horizontal), tubes X-10, X-13, X-11, X-14. Be certain that the cathode ray tube socket is firmly in place.
Thin vertical line (no horizontal sweep) (usually due to the horizontal oscillator tube not working)	Determine whether it is actually the horizontal or vertical that is not operating, by means of width controls. Check that control #36 (.1 meg.) and #37 (.5 meg.) are not reversed. Try another tube in X-11. Try another tube in X-14. Check voltages on tube pins.

Symptom	Cure
Thin horizontal line (no vertical sweep) (usually due to the vertical oscillator tube not working.)	Determine whether it is actually the horizontal or vertical that is not operating, by means of width controls. Check that control #31 (1 meg.) and control #37 (2 meg.) are not reversed. Try another tube in X-10. Try another tube in X-13.
Brightness control inoperative	See that pin #5 on X-12 (6AG7) is grounded. Be sure that lug #1 of P-4 goes to lug #2 of resistor #31.
No Picture	
Due to output circuit	On tube socket X-8 (6H6) short pin #7 to pin #8, for test to determine whether video output circuit is operating: wide black bars caused by 60 cycle should appear. If not, check for proper hookup; for open peaking coil; for voltages on 6AG7 (X-12).
Due to I.F.	Check three I.F. tube (6AC7) plate B+ voltages and screen voltages on pins #6 and #8. By use of signal generator feed modulated 24 meg. signal into grid (pin #4) of I.F. tubes X-4, X-5, and X-6, in this order, for bars on screen. If no bars are present, the stage preceding this is inoperative -- check tube or I.F. transformers.
Due to R.F. mixer	Check for B+ on mixer tube (6AC7). Feed 24 mc. into pin #4 (contrast full on) of 6AC7 which should produce horizontal bars across screen. If no bars are seen, first I.F. transformer or mixer tube may be defective.
Due to R.F. oscillator	Examine glass of 6C4 for cracks or white deposit inside, which mean tube leaks. Operating normally, this tube may have a bluish glow on the glass. This is normal.
Due to misalignment	See alignment instructions, Charts #7 and #8.
No Sound	
Due to output circuit	Check by putting finger on volume control lug under chassis when set is on. Response should be loud hum in speaker, which indicates that audio circuit is working properly, and sound I.F. should be checked as shown on next page.

Symptom	Cure
No Sound (continued)	
Due to output circuit (continued)	If there is no hum, inspect for short circuit due to braided shielding on volume control. Check to see that tone control is only grounded in one place. Measure voltages - refer to Voltage Chart, Chart #1 or #2. Check 6V6 and 6SQ7 tubes. If set has a ratio detector, check 6SN7.
Due to sound I.F.	Using a signal generator, feed 21.9 mc. into second I.F. (#175) at yellow terminal. Signal should be heard if #177 is aligned for this frequency. If no signal comes through, check #177 for continuity, check circuit and refer to voltage chart, Chart #1 or #2.
Due to misaligned #175 transformer	Feed 21.9 mc. into grid of 6AC7 (mixer) on R.F. plate. Tune #175 for maximum response.
Due to oscillator trimmer misalignment	Refer to alignment instructions, Charts #7 and #8.
Audio Distortion	
On original Transvision circuit	Align both #175 and #177 when sound is weakest. Also change these transformers if necessary.
On kits with F.M. sound	If ratio detector has weak sound, tune bandpass trimmer (under chassis) with switch set at highest frequency station. Tune for maximum voltmeter reading. Tune antenna trimmers for brightest picture. If F.M. hums, adjust bottom slug of ratio detector transformer and ground slug to chassis. Hum may also be caused by a defective 6AL5 tube.
Hum Modulation	See Chart #9.
New Synchronization Circuit	See Chart #10.
Linearity Adjustment	See Chart #11.
Focus Difficulties	If control P-5 does not go through focus point, measure five 1 meg. resistors between TS-U and TS-T for true value, or place additional 1 meg. resistor across #6 or #10 on Diagram D of instructions.

SERVICE NOTES
TRANSVISION TWELVE INCH KIT

CENTERING OF PICTURE

After the correct picture size has been set up (10" x 7½") it should be centered on the tube. To adjust vertical centering, tilt focus in a vertical plane. Normally, the rough horizontal centering is accomplished by resistor #69 and swinging the focus coil will give exact centering. If the picture is too far to the right, decrease resistor #69 and vice versa, i.e., increase resistor to move picture to the right. This is done only if the centering cannot be accomplished by focus coil #0-309 movement.

Sound I.F. and Audio Circuits

No sound or weak:

1. Defective tube X-15, X-16, X-17, X-18, X-14. Test either by substitution or with tube checker.
2. Shorted condenser, E,D,C,B,EE,FF,S.
3. Open resistor #43, #6, #15, #42, #27, #73, #11, #48, #49.
4. Open volume control P-1.
5. Shorted lead in shield leading to P-1.
6. I.F. transformers IF-D, IF-E, defective or improperly aligned. Check alignment instructions carefully.
7. Condensers DD, EE, FF, open. Test by bridging another condenser of same value across suspected part.
8. Defective #175, I.F. transformer. If the sound take-off trap in this coil assembly cannot be adjusted to exact frequency, it will be evident by low volume accompanied by hum. Replace unit.
9. Defective speaker, or speaker output transformer.
10. Shorted condenser (4mfd) XX.
11. Shorted condenser terminal #4 of condenser CF-3.
12. Shorted condenser (.002 mfd) Q.
13. Defective focus control P-6.

Distortion:

1. Caused by either defective tube X-14, X-18, X-17.
2. Leaky condenser FF, EE.
3. Open winding in IF transformer IF-E.
4. Open resistor #11 or P-6 (which will also affect focus of the cathode ray tube).
5. Open resistor #13, #50.
6. Leaky Condenser S (.005 mfd).

Inability to Focus:

1. Defective tube X-14.
2. Open resistor #11 or control P-6.
3. Focus coil set back too far on neck of cathode ray tube.

HORIZONTAL DEFLECTION AND HIGH VOLTAGE CIRCUITS.

As the horizontal oscillator 6SN7 (X-6) and horizontal amplifier 6BG6G (X-4) are a direct function of the high voltage developed for the cathode ray tube, a brief explanation of their operation is given below.

To obtain adequate scanning of the 12JP4 cathode ray tube, a 6BG6G type tube is utilized. This tube is identical to the 807 with the exception that the former tube has a higher peak inverse voltage rating, making it more applicable for pulsed operation. The plate of 6BG6G is connected to the primary of transformer O-308; and the sawtooth voltage applied to its grid is supplied from the discharge tube (X-6).

The negative pulse at the start of the sawtooth is produced by high peaking which prevents the discharge capacitor from being completely discharged by its associated tube. This negative pulse keeps the 6BG6G tube cut-off during the retrace period when the voltage on the plate rises to a high potential. The voltage on the grid produces a sawtooth of current in the plate. The plate load is inductive, so that a sudden change of current will produce a high inductive pulse. The energy stored in the magnetic yoke during the trace period is released rapidly, producing the high voltage pulse.

The B plus voltage to the 6BG6G tube is supplied through the 6X5 tube (X-3) which is the damping tube. The rectified voltage from the 6X5 tube is added to the normal B plus voltage, raising it by about 50 volts, thereby, providing more horizontal scanning and high voltage. The cathode ray tube anode voltage is obtained by stepping up the pulse from the primary of the transformer by auto-transformer action. This pulse in turn charges up the 1200 micromicrofarad condenser (AB) through the 8016 rectifier tube. The heater winding for the rectifier tube consists of two turns of polyethylene covered wire connected to pins #4 and #2 of socket X-A.

Another feature of this method of obtaining both horizontal scanning and high voltage is that in the event of failure in either the horizontal oscillator (6SN7) or 6BG6G tubes or circuits, the anode voltage ceases, thereby not permitting the burning of the cathode ray tube screen. In conventional circuits, i.e., using an A.C. power supply to produce the high voltage, failure of the sweep circuits completely would mean a brilliant spot on the screen which would damage it. The circuit used in the Transvision 12" Kit is such that only a horizontal line could exist if the vertical oscillator tube should fail to function.

Coupling condenser HH (.01 mfd) may be connected to pin #1 of socket X-6 instead of to pin #2 of X-6, thereby producing no grid drive for the 6BG6 tube. Also, this same lead may be grounded instead of being connected to pin #2 of X-6.

Lack of full horizontal scanning, accompanied by severe distortion in the left side of the raster, may be due to a decrease in value of resistor #74 (10,000 ohms). Replace with one of the correct value.

Lack of full horizontal scanning may be due to a defective 6X5G tube (socket X-3).

Inability to get full scanning and maximum anode voltage, accompanied by inability to focus, may be due to reversed cap leads of transformer #308, terminals #2 and #3 being reversed. It has also been found that the other connections to the same transformer were not wired in accordance with the instructions, causing difficulties in horizontal scanning circuits.

Inability to secure maximum horizontal scanning may be due to a shorted 50 mmf condenser (condenser A) connected between lugs #1 and #2 of deflection yoke #310.

A trapezoidal raster (keystone effect) is caused by a defective horizontal or vertical section of the deflection yoke #310. The part should be replaced.

Crackling noise accompanied by tears in the raster is due to the breaking down of condenser AB. To prove this, disconnect this condenser from the tube socket.

Hissing noise is usually caused by sharp points of solder on the wire on pins of socket X-A, causing corona. Be sure that the wire is bent around the pins and that the solder is smooth.

Inability to receive high voltage to the cathode ray tube: check resistor #67 for correct value. In some sets it has been found that a 3.3 meg resistor was erroneously put in the place of a 3.3 ohm resistor.

Poor High Voltage Regulation

This is evident by varying either the contrast or brightness control, which causes the screen to become very dim or to be extinguished entirely rather than to increase in brightness. Check for defective 1B3 tube or high value 3.3 ohm resistor.

It has sometimes been found that the filament winding on the horizontal output transformer was not one full turn, thereby not permitting the 1B3 filament to be properly heated.

Inability to secure horizontal linearity adjustment is due to the fact that condenser NN (150 mmf) was omitted from socket X-4, pins #5 and #6.

Poor Horizontal Linearity, Distortion and no Horizontal Scanning:

1. Linearity control P-7, improperly set.
   This controls mostly the left side of raster.
2. Horizontal drive control P-9, improperly set.
   This control can shift either or both sides of pattern. Adjust for optimum linearity.
3. Defective 6X5 tube (X-4).
   Open cathode pin #8 results in practically no damping of horizontal scanning pulses, resulting in folded-over picture and bright lines, small scanning and low anode voltage to cathode ray tube.
4. Defective 6BG6G tube
   Results in low anode voltage and insufficient scanning.
5. Open .05 mfd. condenser (BB)
   Causes insufficient scanning plus extreme distortion on left side of pattern.
6. Linearity Control P-7, improperly set.
   This slug tuned coil adjusts the right hand side or center of the picture set for optimum linearity.

7. Open .035 mfd. condenser, YY.
This shortens the right leg of the test pattern, resulting in crowded picture on that side.
8. Resistor #74 off value
An increase in value tends to improve linearity particularly on left hand side of pattern. A decrease in this resistor value will increase horizontal scanning but produce distortion on left hand side of pattern. This resistor value must be kept within plus or minus 10% of rated value.
9. Condenser NN (.001 mfd) or control P-9 (100,000) off value.
These two components comprise the horizontal drive circuit and an open or off value part causes improper setting of horizontal size.
10. Open or defective coupling condenser HH.
Results in either no horizontal scanning if open or bad linearity in the event that the capacitor is leaky.
11. Defective or open condenser NN (150 mmfd), resistor #41 (56K) or linearity control P-7.
Failure of the resistor, condenser, or control results in no peaking of horizontal voltage applied to 6BG6G grid and inability to adjust linearity of right hand side of picture. This also results in reduced anode voltage. Shorted Condenser —NN (150 mmf) will cause complete failure of the horizontal scanning and anode voltage.
12. Shorted cathode condenser of 6BG6G UU, (0.1 mfd)
Results in elongating right hand side of test pattern and shifting of center part.
13. Open cathode condenser UU (0.1 mfd)
This affects overall linearity of pattern besides reducing size. Do not replace a defective condenser with another larger than .25 mfd. An extremely high value such as 20 mfd. will have the same affect as an open 0.1 condenser.
14. Open or shorted 50 mmf. condenser A in yoke.
An open condenser will produce bright white lines on left side of raster. A shorted condenser will produce insufficient scanning and distortion.
15. Open or shorted 150 mmfd. condenser (MM)
An open condenser will cause improper linearity adjustment of left side of pattern. A shorted condenser will prevent the 6BG6G from operating.
16. Open linearity coil PC-1 -- No B Plus to terminal #1 of #0-308.

Lack of, or Unstable Vertical or Horizontal Synchronization.

1. Defective tube X-8 or X-9.
2. Leaky .05 mfd. condenser Y from pin #2 of X-8 to pin #1 of X-9, or leaky .01 condenser GG from pin #1 to #5 of X-8.
3. Leaky condenser .002 mfd. R from pin #2 to pin #4 of X-9.
4. Either vertical hold P-4 or horizontal hold P-5, improperly set or erratic.
5. Defective oscillator tube (6SN7) X-2 or X-6.
6. Resistor #28, 22K too low in value. Be sure resistor is approximately the correct value.
7. Open plate, grid or cathode resistors #30, #31, #38, #17 #55, #53, #34, #14, #20, #16.
8. Defective condenser, 150 mmf. LL or resistor #18, 2,200 (horizontal sync).
9. Defective condenser T (.005) (vertical sync.).
10. Open resistors #40, #22, #23, #24, (Vertical sync).
11. Shorted or leaky condensers, U,V and W (.005 mmfd) (vertical sync).
12. Defective 6AL5 tube - X-10.

Due to errors in wiring, condenser QQ (.1 mfd) may have ground end connected to #1 of terminal strip TS-M instead of to lug #2 of TS-M.

Condenser SS, terminated at lug #1 on TS-X instead of continuing on to pin #1 of tube socket X-10 as shown on Diagram E, will make the horizontal hold unstable; however, the picture will synchronize with this condition.

Condenser SS (.1 mfd) may be leaky, thereby saturating 6AL5 tube X-10.

Inability to hold picture vertically or hit frequency is due to resistor #61 (1 meg) being too high in value. A resistor of the correct value should be substituted.

THE RATIO -DETECTOR SYSTEM (AUDIO CIRCUIT)

As this method of obtaining F.M. signals differs so greatly, a brief resume is in order. The references listed should be obtained as a complete description is contained therein.

This circuit requires no additional limiter or I.F. stages since the ratio detector will provide appreciable amplitude rejection with as little as ten millivolts of input signal to the grid of ratio detector driver tube (X-16).

The rectified output voltage of the 6AL5 (X-17) impressed on its load circuit, automatically adjusts itself to the input signal level (due to long time constant load which is set for 0.1 to 0.2 second). There is no fixed threshold and the AF voltage output is proportional to the input signal. The stabilizing voltage also obtained is used for AVC controlling tube X-15. The use of AVC maintains the selectivity of the television se for either strong or weak signals.

Reference: Tele-Tech, July, 1947
pp. 46-49

After the preliminary test of checking the D.C. resistance from pin #8 of socket X-5 to ground (minimum of 10,000 ohms on a newly constructed kit) and the set should possibly not function properly, the following service data is offered as a means of obtaining best results.

For further information pertaining to television systems, it is suggested that the following publications be obtained:

"R.C.A. Practical Television"; "Television Engineering" by Donald Fink,
"Television Simplified", by Kiver, and also, most trade magazines.

The following assumes that the B plus voltage arrives to terminal strip TS-H, terminal #1. If not, then check for defective choke, open focus coil, or defective condenser CF-2.

Picture Tube - No Light

1. No filament voltage - check for open lead to cathode ray tube socket.
2. No high voltage - This can be due to either lack of B plus voltage; defective 6BG6G tube, or 6SN7 horizontal oscillator tube; defective 1B3GT tube; shorted condenser AB; defective transformer O-308; horizontal oscillator not working; open linearity coil; open deflection yoke Y-1 (check terminals #1, #2, and #3 of Y-1); shorted condenser (.1 mfd) PP; open resistor (100,000 ohm resistor) #44.
3. Brightness control improperly set - Be sure to advance control clockwise; set approximately half way.

Picture tube lights dimly:

1. Lack of grid #2 voltage (pin #10 of cathode ray tube).
2. Low anode voltage, due to weak 6BG6G.
3. Horizontal hold control improperly set.
4. Weak 6SN7 oscillator tube or low B plus voltage.
5. Brightness control improperly set.
6. Horizontal drive control improperly set.
7. Defective cathode ray tube.

Insufficient Horizontal Scanning:

1. Weak 6BG6G or 6SN7 horizontal oscillator tube.
2. Horizontal drive control or linearity control improperly set.
3. Low B plus voltage
4. Screen voltage on 6BG6G (pin #8) too high.
5. Resistor #66 increased in value.
6. Defective transformer #O-308.
7. Resistor #74 too low in value.
8. Condenser BB (.05) leaky.
9. Open condenser UU (0.1) in cathode of 6BG6G.

Vertical scanning circuit:

No Sweep - just a horizontal line.

1. Defective 6SN7 tube X-2 or X-1.
2. Open vertical output transformer.
3. Defective winding in yoke Y-1.
4. Open coupling condenser VV - no sweep.
5. Open vertical size control P-8 - no sweep.
6. Defective plate resistor #63, 1 Meg - no sweep.
7. Shorted condenser VV, no sweep.
8. Open resistor #61, 1 Meg - no sweep
9. Shorted..05 condenser CC, (Shorts out yoke) no sweep
10. Open condenser ZZ.

An increase in the vertical size of the raster after a few minutes of operation may be due to the omission of resistor #63 (1 meg).

Foldover on the bottom of the raster is due to a gassy 6SN7 vertical amplifier tube X-1.

Inability to reach vertical frequency is due to the 6SN7 oscillator tube X-2 having varied internal capacities. The tube must be replaced.

Poor Vertical Linearity:

1. Defective 6SN7 tube.
2. Open linearity control (P-10) or improperly set.
3. Size control advanced too far (P-8).

Adjust size control P-8 and linearity control P-10 together. Improper setting of linearity control will either expand or collapse top of raster.

No Picture: (Refer to Video circuits also)

1. Defective 6AC7 tube X-11, X-12, X-13. A shorted tube will usually destory resistor #8, #9 or #10, depending upon which 6AC7 should short. Also, check screen voltages (see voltage chart).
2. Open cathode, plate, screen resistor. A continuity test here will immediately disclose defect. Check resistors #2, #9, #36, #10, #37, #3, #35, #7, #8, #52, #53, D-3, D-2.
3. Open I.F. transformer IF-A, IF-B, IF-C, IF-AA, or shorted terminal lugs.
4. Shorted or open bypass condenser (.001 mmf) F,G,SA,H,J,K, L, M, N, O, C-3, C-2.
5. Defective tube in tuner units (See that all tubes light).
6. Open 2 mmf. condenser (red band) (Standard Model)
7. Open contrast control P-2.

Video Defects

Horizontal white and black bars on the picture are due to the reversal of the connections of terminal strip TS-G, lugs #2 and #3. This error superimposes a potential of 6.3 volts a.c. on the cathode. This same effect may also be due either to the connection of condenser TT (.1 mfd) to the wrong lug of TS-G or to the complete omission of this condenser.

Inability to secure a picture, accompanied by extreme oscillation on the picture tube screen, may be caused by any of the following errors:

1. Condenser RR being placed over socket X-10 instead of resting in the corner of the chassis (intersection of back skirt and top).

2. Condenser SS returning to lug #2 on TS-X instead of to lug #1 on TS-X.

3. Green lead (grid lead) of the picture tube extending too far below the chassis. After the picture tube socket is mounted on the tube, trim off the excess wire. As a matter of fact, all excess wire from the focus coil, deflection yoke, and picture tube socket should be eliminated.

4. Wrong values of condensers F, G, J, K, M, N. To test, substitute; bridge known good condensers across each of these doubtful condensers until the defective condenser is detected.

The ground wire from the black lug on IF-C, which connects to pin #2 of socket X-13, should also be grounded directly to the chassis at the edge of the hole nearest to the black lug of IF-C.

Poor picture quality (smeary picture), together with low level contrast, may be the result of:

1. An open peaking coil H-2.

2. Wrong value of resistor #19.

3. Improper setting of the traps on IF transformer IF-A-A (de luxe model) and IF-B (both models).

If the de luxe model is used in the New York area with three hundred ohm lead-in not properly matched, interference will be encountered on Channel 4, in the form of parallel lines travelling across the screen. This is due to a beat frequency between the Channel 4 frequency and that of an AM station in the immediate vicinity. The same phenomenon may occur in other areas, due to the same condition. The following remedy is suggested: take a 1,000 ohm one-half watt resistor, wind over it fifteen turns of #32 E wire, and solder this trap across the antenna input strip.

VIDEO CIRCUITS

1. Defective 6AG7 - producing weak or no picture.
2. Open peaking coil, H-1, H-2, H-3, H-4.
3. Open shunt resistors (22K) #29 and #33. Produces bubbling effect about lettering, etc., in test pattern. (This is actually H.F. oscillation taking place).
4. Weak picture and smeary or no picture.
   Test all peaking coils, #1, #2, #3, and #4 for high resistance or open; open condenser (.1) X, defective load resistor #72 (3,500 ohms, 10 W); open or leaky condenser (.1) SS and RR. Check resistor #19, (3,300 ohms) particularly, (in event of smeared picture, although strong), being sure resistor is not higher in value than approximately 3,900 ohms. Always replace this resistor and also, any peaking coil that should ever be defective, with exact value or approximately so. Deviation plus or minus 10% maximum.

5. Defective screen resistor #68 (47 K).
6. Defective 6AL5 detector tube (X-10). Weak or no picture.
7. Open lead to cathode ray tube grid or defective contact in cathode ray tube socket, pin #2. Produces weak or no picture.
8. 60 cycle hum modulation in picture. Caused by either open 0.1 mfd. condenser TT, reversed leads to terminals #2 and #3 of TS-G; shorted or cathode to filament leakage in 6AG7 (X-7) or 6AL5 tube (X-10).

Audio Oscillation

Check condenser A, socket X-16, for true value if strong audio oscillation occurs.

Be certain that grounds, as indicated on Diagram B, are followed exactly.

Sound blooping accompanied by hum when changing from one channel to another may be due to a defective 6AL5 tube.

Microphonics

This condition may be attributed to a loose slug in the first or second IF transformer, or to a defective 6AL5 and/or 6SL7.

Miscellaneous

When a round pattern appears on the face of the picture tube, it usually indicates that the focus coil is too far back on the neck of the tube, or the tube is not pushed fully into the deflection yoke.

Inability to focus: measure the d.c. resistance of the focus coil, which should be approximately 260 ohms. If the coil is shorted, it does not permit enough voltage drop.

When there is no horizontal sweep beyond approximately five inches, and operating the horizontal hold control causes the right side of the raster to fold over, the condition may be caused by a shorted 150 mmf condenser (NN), thus placing the positive potential on the 6BG6 grid.

Inability to peak the sound takeoff trap #175 is due to an open cathode condenser (.001) of the first video IF (X-13), pin #5 to ground.

When the centering resistor is open, the horizontal linearity potentiometer gets hot.

CHART #1

Voltage and Resistance Readings for TRANSVISION Television Kit

(These readings were taken on a 20,000 ohm per volt voltmeter)

Tube	Pin Numbers 1	2	3	4	5	6	7	8	
6AC7(X-15) Mixer	0 0	0 0	0 0	-1¼ 2 megs	0 0	125 110,000	6AC 0	375 30,000	volts ohms
6AC7 (X-6) 1st I.F. amp. & aud.	0 Q	0 0	0 0	0 0	7 100	310 80,000	6AC 0	375 50,000	volts ohms
6AC7 (X-5) 2d video amp.	0 0	0 0	0 0	0 3,500	2.2 100	175 90,000	6AC 0	375 30,000	volts ohms
6AC7 (X-4) 3d video amp.	0 0	0 0	0 0	0 0	2.5 150	175 80,000	6AC 0	350 30,000	volts ohms
6H6 (X-8) video detector	0 0	0 0	-3 1 meg	.2 10,000	0 0	NC NC	6AC 0	7½ 4,000	volts ohms
6AG7 (X-12) video amp. output	0 0	0 0	0 0	-1 1.25 megs	0 0	140 80,000	6AC 0	260 30,000	volts ohms
6AC7 (X-9) sync separator	0 0	0 0	0 0	-1.2 2.2 megs	0 0	21 20,000	6AC 0	22 12,000	volts ohms
6N7 (X-10) vert. sweep osc.	0 0	0 0	100 750,000	-15 600,000	0 100,000	60 280,000	6AC 0	1.7 500	volts ohms
6SN7 (X-13) vert. sweep amp.	-1 2 megs	175 60,000	4¼ 1,000	0 1.4 megs	225 90,000	9 3,500	6AC 0	0 0	volts ohms
6N7 (X-11) hor. sweep osc.	0 0	0 0	16 600,000	-.7 120,000	0 2,000	75 160,000	6AC 0	1.3 500	volts ohms
6SN7 (X-14) hor. sweep amp.	-3 2 megs	210 90,000	4 1,100	-6 2 megs	220 90,000	0 0	6AC 0	0 0	volts ohms
6C4 oscillator	NC NC	150 50,000	NC NC	0 0	6AC 0	150 50,000	-.9 40,000	0 0	volts ohms
5U4G (X-7) rectifier	NC 0	410 40,000	NC NC	400 AC 50	400 40,000	400 AC 50	NC NC	410 40,000	volts ohms
2X2 (X-A) H. V. rectifier	10 megs	NC	NC	10 megs					volts ohms
6AC7 (X-3) audio	0 0	0 0	0 0	0 5 megs	1¼ 100	200 90,000	6AC 0	350 40,000	volts ohms
6SQ7 (X-2) detector	0 0	0 2 megs	.7 3,000	.2 500,000	.2 500,000	100 500,000	6AC 0	0 0	volts ohms
6V6 (X-1) audio output	0 0	0 0	220 40,000	230 42,000	0 1meg	NC NC	6AC 0	12 300	volts ohms

All readings are positive (+) unless otherwise specified.

All readings are taken between pin socket and chassis (ground) with all tubes in sockets and volume and contrast controls turned fully on.

ALL READINGS MAY VARY BY PLUS OR MINUS 10%.

Voltage and Resistance Readings for TRANSVISION Television Kit (7")

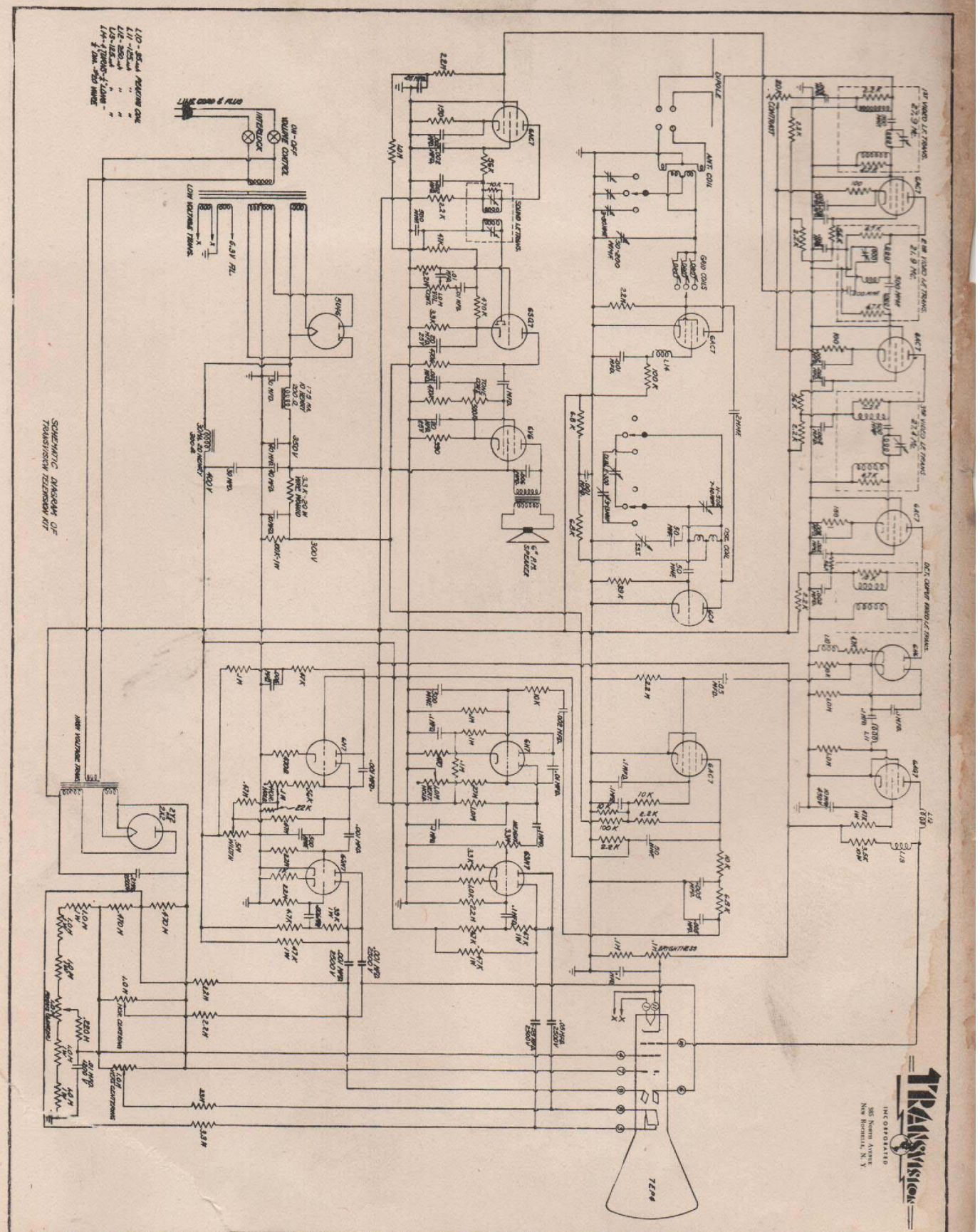
These readings were taken on a 20,000 ohm per volt voltmeter.
Using six 6SN7 tubes in all sweep circuits, also a ratio detector.

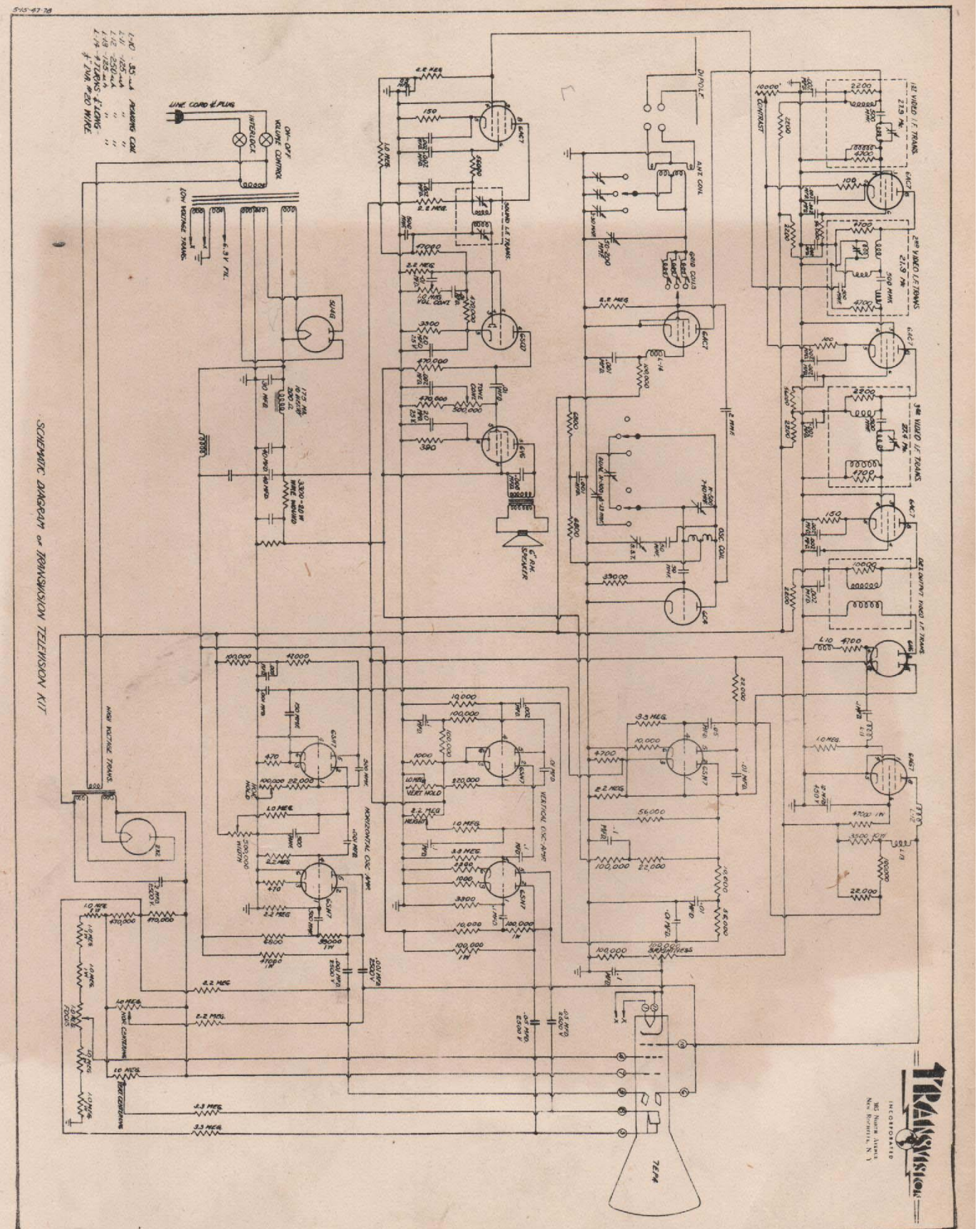
Tube	1	2	3	4	5	6	7	8	
6AC7 (X-15)	0	0	0	-1¼	0	125	6AC	375	volts
Mixer	0	0	0	2 meg.	0	110,000	0	30,000	ohms
6AC7 (X-6)	0	0	0	0	7	310	6AC	375	volts
1st IF amp. & aud.	0	0	0	0	100	80,000	0	50,000	ohms
6AC7 (X-5)	0	0	0	0	2.2	175	6AC	375	volts
2d video amp.	0	0	0	3,500	100	90,000	0	30,000	ohms
6AC7 (X-4)	0	0	0	0	2.5	175	6AC	350	volts
3d video amp.	0	0	0	0	150	80,000	0	30,000	ohms
6H6 (X-8)	0	0	-1	.2	0	NC	6AC	1	volts
video detector	0	0	2 meg.	0	0	NC	0	4,000	ohms
6AG7 (X-12)	0	0	0	-1	0	140	6AC	260	volts
video amp. output	0	0	0	1.25 meg.	0	80,000	0	30,000	ohms
6SN7 (X-9)	-½	60	-½	360	15	25	6AC	0	volts
sync separator	2 meg.	50,000	42,000	3 meg.	70,000	10,000	0	0	ohms
6SN7 (X-10)	-5	25	2	0	45	2	6AC	0	volts
vort. sweep oscillator	450,000	2 meg.	900	10,000	220,000	1,000	0	0	ohms
6SN7 (X-13)	-1½	160	160	.1	150	5	6AC	0	volts
vert. sweep amp.	2 meg.	150,000	150,000	2.2 meg.	150,000	2,200	0	0	ohms
6SN7 (X-11)	-1½	18	1½	0	50	1½	6AC	0	volts
hor. sweep oscillator	60,000	1½ meg.	500	0	200,000	500	0	0	ohms
6SN7 (X-14)	6½	250	1½	-5	200	0	6AC	0	volts
hor. sweep amp.	2 meg.	90,000	400	2 meg.	90,000	0	0	0	ohms
6C4	NC	150	NC	0	6AC	150	-.9	0	volts
oscillator	NC	50,000	NC	0	0	50,000	40,000	0	ohms
5U4G (X-7)	NC	410	NC	400 AC	400	400 AC	NC	410	volts
rectifier	0	40,000	NC	50	40,000	50	NC	40,000	ohms
2X2 (X-A)									volts
h. v. rectifier	10 meg.	NC	NC	10 meg.					ohms
6AC7 (X-3)	0	0	0	0	1¼	200	6AC	350	volts
audio	0	0	0	5 meg.	100	90,000	0	40,000	ohms
6SN7 (X-2)	-½	25	0	.1	30	1	6AC	0	volts
1st audio	2 meg.	270,000	0	50	250,000	1,000	0	0	ohms
6V6 (X-1)	0	0	220	230	0	NC	6AC	12	volts
audio output	0	0	40,000	42,000	1 meg.	NC	0	300	ohms
6AL5 ratio		.25	.25	6AC	0	0	-variable with signal		volts
detector		1 meg.	1 meg.	0	0	0	50,000		ohms

All readings are positive (+) unless otherwise specified.

All readings are taken between pin socket and chassis (ground) with all tubes in sockets and volume and contrast controls turned fully on.

ALL READINGS MAY VARY BY PLUS OR MINUS TEN PER CENT.


SCHEMATIC DIAGRAM OF TRANSVISION TELEVISION KIT
TRANSVISION
INCORPORATED
385 North Avenue
New Rochelle, N. Y.


SCHEMATIC DIAGRAM OF TRANSVISION TELEVISION KIT
TRANSVISION
INCORPORATED
New Rochelle, N. Y.
7EM4

PARTS LIST OF TRANSVISION KIT

(Original 7" Kit)

Cathode ray tube 7EP4
RF unit pretuned
Instruction sheets
Antenna
Lead-in wire

No.	Description	Quantity
1	6AC7 tube	5
3	6H6 "	1
4	6AG7 "	1
6	6SQ7 "	1
7	6V6 "	1
8	6N7 "	2
9	6SN7 "	2
10	5U4G "	1
11	2X2 or 2Y2 tube	1
16	Peaking Coil for 6AG7, 250 microhenrys	1
17	Peaking coil for 6AG7 and 6H6, 125 microhenrys	2
19	Peaking coil for 6H6, 35 Microhenrys	1
21	Output transformer for P.M. speaker	1
22	Filter choke, 20 henrys, 300 ohms, 30 ma.	1
23	Filter Choke, 10 henrys, 200 ohms, 175 ma.	1
24	Power Transformer, low voltage	1
25	Power transformer, high voltage	1
26	Interlock switch	1
28	Volume control, 1 meg., logarithmic taper, lg. shaft with switch	1
29	Tone control, .5 meg., logarithmic taper, lg, shaft	1
30	Brightness control, 100,000 ohms, linear taper, lg. shft	1
31	Vertical hold control, 1 meg. short shaft, scr. dr. slot	1
32	Contrast control, 5,000 ohms linear taper, long shaft	1
33	Horiz. posit. control, 1 meg. linear taper, ¼" shaft	1
34	Vert. posit. control, 1 meg. linear taper, ¼" shaft	1
35	Focus control, 1 meg, linear taper, ¼" shaft	1
36	Horiz. sync. control, .1 meg. linear taper, short shaft with screw driver slot	1
37	Vert. Height control, 2 meg. linear taper, short shaft with screw driver slot	1
38.	Width cont..5 meg, linear taper, short shaft with screw driver slot	1
39	P.M. speaker, 6"	1
40	High voltage condenser holder, all sizes	6
41	Resistor, 100 ohms, ½ Watt	2
42	Resistor, 150 ohms, ½ watt	2
43	Resistor, 390 ohms, ½ watt	1
44	Resistor, 470 ohms, ½ watt	2
45	Resistor, 1000 ohms, ½ watt	2
46	Resistor, 2200 ohms, ½ watt	7
47	Resistor, 3300 ohms, ½ watt	2
48	Resistor, 4700 ohms, ½ watt	3
49	Resistor, 6800 ohms, ½ watt	1
50	Resistor, 10,000 " ½ "	5
51	Resistor, 22,000 " ½ "	1
53	Resistor, 47,000 " ½ "	2
54	Resistor, 56,000 " ½ "	5
56	Resistor, 100,000" ½ "	6
57	Resistor, 220,000" ½ "	1
58	Resistor, 270,000" ½ "	1
59	Resistor, 470,000" ½ "	7
60	Resistor, 1 meg ½ "	4
61	Resistor, 2.2 meg ½ "	8
62	Resistor, 3.3 meg ½ "	2
63	Resistor, 39,000 ohm 1 "	1
64	Resistor, 47,000 " 1 "	4
66	Resistor, 100,000 " 1 "	1
67	Resistor, 1 meg. 1 "	5
68	Resistor, 3500 ohms 10 "	1
69	Resistor, 3300 ohms 20 "	1
71	Capacitor, 50 mmf. 500 vlts, ceramic	1
73	Capacitor, 500 mmf. 500 vlts, mica or ceramic	3
74	Capacitor, .05mfd, 600 vlts paper	2
76	Capacitor, .002mfd, 600 vlts, paper	15
77	Capacitor, .005mfd, 600 vlts paper	2
78	Capacitor, .006mfd, 600 vlts paper	3
79	Capacitor, .01mfd, 600 vlts paper	3
80	Capacitor, .1 mfd, 600 vlts paper	10
81	Capacitor, .01 mfd, 1200 or 1700 volts, paper	1
82	Capacitor, .001 mfd, 2500 volts, mica	2

No.	Description	Quantity
83	Capacitor, .05 mfd, 2500 volts, H.V. can	2
84	Capacitor, .2 mfd, 2500 volts, H.V. can	1
85	Capacitor, .001 mfd, 500 volts, ceramic or mica	2
90	Electrolytic condenser 40/30/20 10 mfd. 450/25 vlts	2
91	Tube Socket, octal, bakelite	14
93	Tube socket, cathode ray tube	1
95	Tube socket, 4 prong	1
96	Line cord	1
97	Panel bracket (Y-1009 CB)	2
98	CRT legs	2
99	CRT clamps (Y-1006 CB)	1
100	Cellulose acetate window	1
101	Rubber grommet for 7/8" hole	1
102	Rubber grommet for 3/8" hole	4
103	Lockwasher #6	61
104	Lockwasher #8	12
105	Screw, self-tapping, #6	45
106	Wooden knob	7
107	Wing nut, #8-32	2
108	Hex nut, #8-32	12
109	Machine screw, #8-32x3/8"	10
110	Machine screw, #6-32x3/8"	49
111	Machine screw, #6-32x2⅛"	1
112	Hex nut, #6-32	69
113	Set screw for extension shft #6, 1/8" long	6
115	Ground lug, #6	8
116	Standard angle bracket	1
117	Grid cap, high vltge. porcelain	1
118	Extension shaft, bakelite, long	1
	" " " sht.	2
121	Spacer, aluminum, ½" long	2
122	A.C. warning tag	1
123	Machine screw, rosette head #6-32x3/4"	2
124	Machine screw, rosette head, #6-32x1-1/8"	2
125	Machine screw, #6-32x1-1/8"	6
127	Hex nut, #10-32	6
128	Machine screw, round head #8-32x3¼"	2
129	Terminal strip, 1R1 3/8"	1
130	Terminal strip, 1P1 1/2"	4
131	Terminal strip, 2P1 3/8"	1
132	Terminal strip, 1P2 ½"	2
133	Terminal strip, 3P2 ½"	2
134	Terminal strip, 2P ½"	1
135	Terminal strip, R2 ½"	1
136	Terminal strip, P1 ½"	1
137	Terminal strip, 2R2 ½"	1
138	Terminal strip, R4R ½"	1
139	Terminal strip, R3 ½"	1
140	Terminal strip, 1R 3/4"	3
141	Terminal strip, 1R1 ½"	4
142	Terminal strip, 1R2R1 ½"	2
144	Wood screw, #6x3/8"	4
145	Lockwasher, #10	6
146	Washer, fiber, #6x3/8"	2
147	Nut for volume control, 3/8"	13
148	Bakelite spacer, insulated, 3/4"	4
152	Front panel (Y-1007 M)	1
153	Speaker baffle (Z-1011 M)	1
155	Decal "TRANSVISION"	1
156	Grille cloth	1
157	Felt (approx. 1' x 1')	1
158	Chassis (V-1018 CB)	1
159	Bottom plate (W-1033 CB)	1
161	Audio shield (Y-1010 CB)	1
166	Insulating plate (Z-1013 M) bakelite 3-3/8" x 1"	1
167	Insulating plate (1 control) bakelite 2-3/4" x 1"	1
170	Mounting plate for low voltage condenser	2
171	Shielded braiding	6"
172	Solder	4'
173	Spaghetti	18"
174	I. F. Transformer, first and third stages	2
175	I. F. transformer, second stg	1
176	I. F. transformer, fourth stg	1
177	I.F. transformer, sound	1
178	Brads or tacks, 1/4"	20
179	Bare wire	18"
180	Wire, black #22	10'
181	Wire, yellow #22	14'
182	Wire, red #22	10'
183	Wire, blue #22	2'
184	Wire, green #22	8'
185	Wire, H.V. #22	10'
187	CRT saddle	1
188	CRT tube block	2
221	Wood screw, #6x3/4"	4

TRANSVISION 7" TELEVISION KIT

Part No.	Description	Quantity
1	6AC7 Tube	4
3	6H6 Tube	1
4	6AG7 Tube	1
6	6SQ7 Tube	1
7	6V6 Tube	1
9	6SN7 Tube	5
10	5U4G Tube	1
11	2X2 Tube	1
16	Peaking Coil for 6AG7, 250 microhenrys	1
17	Peaking coil for 6AG7 and 6H6, 125 microhenrys	2
19	Peaking coil for 6H6 35microhenrys	1
21	Output transformer for P.M. speaker	1
22	Filter choke, 20 henrys, 300 ohms, 30 ma.	1
23	Filter Choke, 10 henrys, 200 ohms, 175 ma.	1
24	Power Transformer, low voltage	1
25	Power transformer, high voltage	1
26	Interlock switch	1
28	Volume Control, 1 meg., logarithmic taper, lg. shaft with switch	1
29	Tone control, .5 meg., logarithmic taper, lg. shaft	1
30	Brightness control, 100,000 ohms, linear taper, lg. shft.	1
31	Vertical hold control, 1 meg. short shaft, scr. dr. slot	1
32	Contrast control, 5,000 ohms linear taper, long shaft	1
33	Horiz. posit. control, 1 meg. linear taper, ¼"shaft	1
34	Vert. posit. control, 1 meg. linear taper, ¼" shaft	1
35	Focus control, 1 meg. linear taper, ¼" shaft	1
36	Horiz. sync. control, .1 meg linear taper, short shaft with screw driver slot	1
37	Vert. Height control, 2 meg. linear taper, short shaft with screw driver slot	1
38	Width control .5 meg linear taper, short shaft with screw driver slot	1
39	P.M. speaker, 6"	1
40	High voltage condenser holder, all sizes	6
41	Resistor, 100 ohms, ½ Watt	2
42	Resistor, 150 ohms, ½ Watt	2
43	Resistor, 390 ohms, ½ Watt	1
44	Resistor, 470 ohms, ½ Watt	2
45	Resistor, 1000 ohms, ½ Watt	2
46	Resistor, 2200 ohms, ½ Watt	6
47	Resistor, 3300 ohms, ½ Watt	1
48	Resistor, 4700 ohms, ½ Watt	2
49	Resistor, 6800 ohms ½ Watt	1
50	Resistor, 10,000 " ½ "	4
51	Resistor, 22,000 " ½ "	4
53	Resistor, 47,000 " ½ "	2
54	Resistor, 56,000 " ½ "	6
56	Resistor, 100,000" ½ "	6
57	Resistor, 220,000" ½ "	1
59	Resistor, 470,000" ½ "	5
60	Resistor, 1 meg ½ "	4
61	Resistor, 2.2 meg ½ "	7
62	Resistor, 3.3 meg ½ "	5
63	Resistor, 39,000 ohm 1 Watt	1
64	Resistor, 47,000 " 1 "	2
66	Resistor, 100,000 " 1 "	3
67	Resistor, 1 meg 1 "	5
68	Resistor, 3500 ohms 10 "	1
69	Resistor, 3300 ohms 20 "	1
72	Capacitor, 150mmf. 500 Volts mica	1
73	Capacitor, 500 mmf 500 volts mica	4
74	Capacitor, .05 mfd 600 volts paper	2
76	Capacitor, .002mfd 600 volts paper	15
77	Capacitor, .005mfd 600 volts paper	2
79	Capacitor, .01 mfd 600 volts paper	7
80	Capacitor, .1 mfd 600 volts paper	7
82	Capacitor, .001mfd, 2500 volts mica	2
83	Capacitor, .05 mfd, 2500 volts, H.V. can	2
84	Capacitor, .2 mfd, 2500 volts, H.V. can	1
85	Capacitor, .001 mfd, 500 volts, ceramic or mica	2
90	Electrolytic condenser 40/30/20 10 mfd. 450/25 vlts	2
91	Tube socket, octal, bakelite	14
93	Tube socket, cathode ray tube	1
95	Tube socket, 4 prong	1
96	Line cord	1
97	Panel bracket	2
98	CRT legs	2

TRANSVISION 7" TELEVISION KIT

Part No.	Description	Quantity
99	CRT clamps	1
100	Cellulose acetate window	1
101	Rubber grommet for 7/8"hole	1
102	Rubber grommet for 3/8"hole	4
103	Lockwasher #6	61
104	Lockwasher #8	12
105	Screw, self-tapping, #6	45
106	Wooden knob	7
107	Wing nut, #8-32	2
108	Hex nut, #8-32	12
109	Machine screw, #8-32x3/8"	10
110	Machine screw #6-32x3/8"	49
111	Machine screw #6-32x2½"	1
112	Hex nut, #6-32	69
115	Ground Lug, #6	9
116	Standard angle bracket	1
117	Grid cap	1
118	Extension shaft (long)	1
	(short)	2
121	Spacer (½" long)	2
122	A.C. Warning tag	1
123	Machine screw, rosette head, #6-32 x 3/4"	2
124	Machine screw, rosette head, #6-32 x 1-1/8"	2
125	Machine screw, #6-32x1-1/8"	8
127	Hexagonal nut, #10-32	6
128	Machine screw, round head, #8-32 x 1½"	2
129	Terminal strip, 1R1, 3/8"	1
130	Terminal strip, 1P1, ½"	3
131	Terminal strip, 2P1, 3/8"	1
132	Terminal strip, 1P2, ½"	2
133	Terminal strip, 3P2, ½"	2
135	Terminal strip, R2, ½"	1
136	Terminal strip, P1, ½"	1
137	Terminal strip, 2R2, ½"	1
138	Terminal strip, R4R, ½"	1
139	Terminal strip, R3, ½"	1
140	Terminal strip, 1R 3/4"	3
141	Terminal strip, 1R1 ½"	4
142	Terminal strip, 1R2R1, ½"	2
144	Wood screw, #6x3/8"	4
145	Lockwasher, #10	6
146	Washer, fiber, #6x3/8"	2
147	Nut for volume control, 3/8"	13
148	Bakelite spacer, insulated 3/4"	4
152	Front panel	1
153	Speaker baffle	1
155	Decal "TRANSVISION"	1
156	Grille cloth	1
157	Felt (approx. 3"x1')	1
158	Chassis	1
159	Bottom plate	1

Part No.	Description	Quantity
161	Audio shield	1
166	Insulating plate bakelite 3-3/8" x 1"	1
167	Insulating plate (1 control) bakelite 2-3/4" x 1"	1
170	Mounting plate for low voltage condenser	2
171	Shielded braiding	6'
172	Solder	4'
173	Spaghetti	3'
174	I.F. Transformer, first and third stages	2
175	I.F. transformer, 2nd stage	1
176	I.F. transformer, 4th stage	1
177	I.F. transformer, sound	1
178	Brads or tacks, 1/4"	20
179	Bare wire	18"
180	Wire, black #22	10'
181	Wire, yellow #22	14'
182	Wire, red #22	20'
183	Wire, blue #22	1'
184	Wire, green #22	2'
185	Wire, H.V. #22	10'
187	CRT saddle	1
188	CRT tube block	2
221	Wood screw, #4x3/4"	4

7EP4 Cathode Ray Tube
Pretuned R.F. Unit
Instruction Sheets
Antenna and Lead-in Wire

SIGNAL GENERATOR ALIGNMENT

Remove the oscillator tube 6C4 from its socket and attach the signal generator to the antenna terminal. Under these conditions a rather large signal generator output will be necessary, in the order of a tenth of a volt, applying signal of 21.9 megacycles across the antenna terminals with enough signal strength to definitely form bars across the screen of the picture tube. Tune the sound trap trimmer screw which is on the top picture I.F. transformer #175 (#2) to give the least brightness or least output to the picture tube grid. This indicates that the sound trap is rejecting the sound frequencies from the picture I.F. circuits. Set the signal generator 27.9 megacycles and repeat as above, adjusting trimmer screw picture I.F. tramsformers #174, which are the first and third I.F. transformers. This procedure will adjust the traps at each end of the picture pass band. To set the sound I.F. frequency, return the signal generator to 21.9 megacycles and adjust both trimmer screws of sound I.F. transformer for maximum output in the loud speaker.

ADJUSTMENT OF THE R.F. UNIT: Replace oscillator tube; turn band switch to highest frequency band or full counter-clockwise rotation of band switch. Set signal generator to frequency of sound channel on highest frequency band, i.e., 81.75 megacycles for 76-82 megacycle band. This adjustment must be done with an accurately calibrated signal generator with a 300 ohm termination to the antenna terminals. If the signal generator's impedance is 50 ohms, connect to antenna terminals through 150 ohm resistor to each terminal. This will approximate antenna terminal impedance. Under these conditions tune main oscillator trimmer A to give sound output on the sound channel frequency. CAUTION: Be sure to start with silver half-moon on oscillator trimmer A nearest the oscillator tube. This corresponds to the highest frequency to which the oscillator can be tuned.

Set signal generator 1.5 megacycles inside the lower edge of the band, i.e., 77.5 megacycles on 76-82 megacycle band. Adjust antenna trimmer A and grid coil A for maximum output to picture tube, i.e., brightest bars if 400 cycle tone modulation is used. Use only enough signal for bars to become barely visible. Set signal generator to sound frequency of next lowest band and adjust oscillator trimmer B for maximum sound output. Repeat as above for antenna and grid coil alignment. Repeat above for band C. CAUTION: In all oscillator adjustments be sure the sound sensitivity trimmer is in the half open position.

ADJUSTMENT OF BAND PASS TRIMMER: Any adjustment of band pass trimmer should be made with a great deal of caution. Set band switch on highest frequency band. Set signal generator to sound channel. Carefully adjust band pass trimmer for maximum sound output after all other adjustments have been made. This completes signal generator alignment of set.

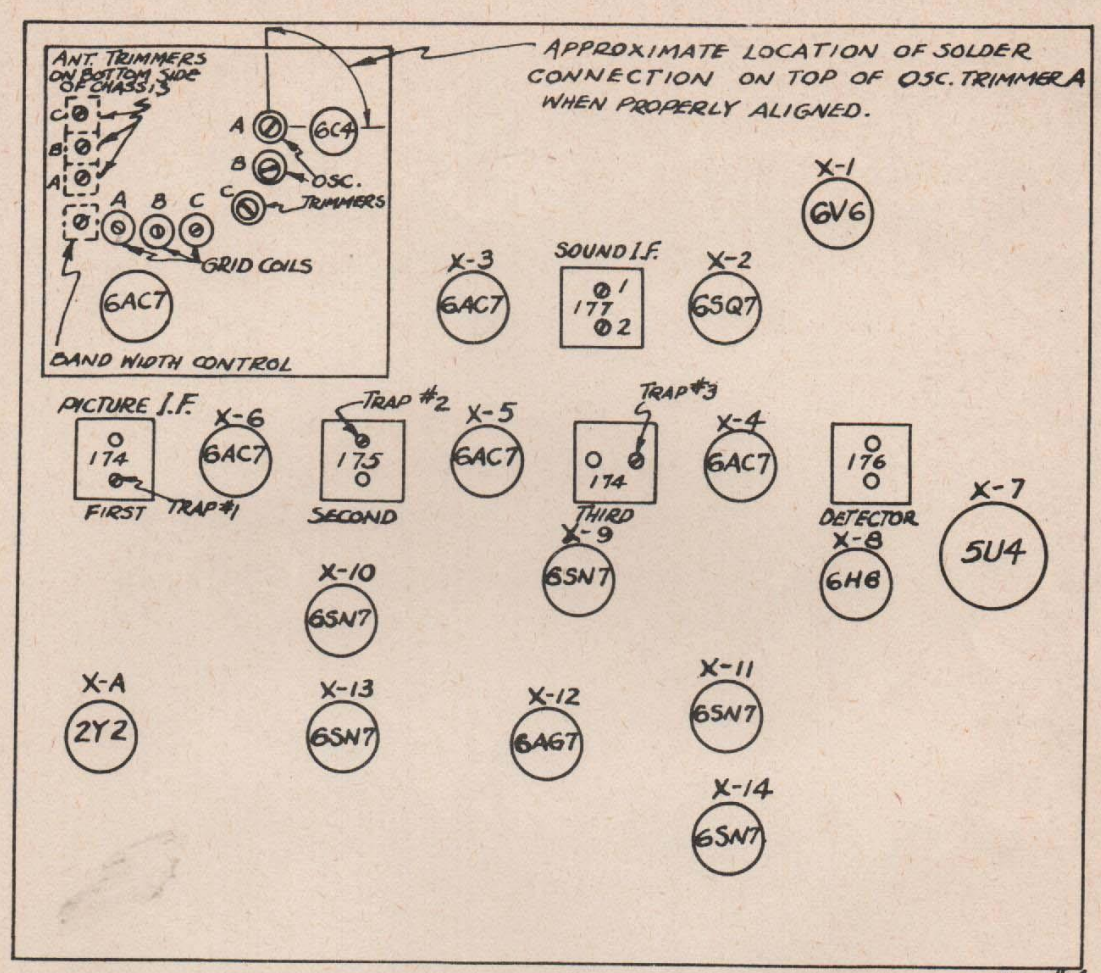


FIG. #1

TOP VIEW OF TUBES, I.F. TRANSFORMERS AND TRIMMERS

TROUBLE SHOOTING INFORMATION

All of the following information is given with the assumption that the circuit is correct and all components operative. Before any alignment is attempted, a logical analysis of the situation is extremely important in order that unnecessary adjustments with resultant mistakes, may be avoided.

The following important factors should be noted:

____ 1. Is the station in question transmitting signals (both sound and picture) at the time?

____ 2. Is television reception in your particular area satisfactory as indicated by owners of other television sets?

____ 3. Check your antenna system paying particular attention to see whether your television antenna is facing in the proper direction of the station that is transmitting.

Now, after having satisfied yourself on the above points we come to some of the possible conditions that might warrant alignment of some (or all) of the adjustments.

____ A. Picture is seen without sound.

____ B. Sound is heard without picture.

____ C. Pictureis seen unsatisfactorily (vertical wedges should be sharply defined).

____ D. Sound is distorted.

____ E. Signal is received weakly.

____ F. Neither sound nor picture is received.

COMPLETE VISUAL ALIGNMENT PROCEDURE FOR TRANSVISION KIT

WARNING: - All steps must be in the following sequence.

____ 1. All tuning and adjusting must be done when the station is transmitting a test pattern only.

____ 2. Loosen trimmer screws on picture I.F. traps #1 and #3, being careful not to loosen to the point where the screw may fall out. Tighten the trimmer screw on I.F. trap #2 until screwdriver tight. This provides maximum bandwidth for the picture circuit.

____ 3. Before making the following adjustment observe that the silver half-moon (with the solder connection on top of it) of the oscillator timmer A is on the side adjacent to the oscillator tube 6C4. See sketch. Now turn to the first position on the band switch, which is the one to the extreme left on the switch. NOTE: This corresponds to the highest frequency setting. Set the sound sensitivity trimmer to a half-way position. (Where the movable plates are half engaged with the fixed plates).

NOTE: In all of the following adjustments the contrast control should be set to the lowest point possible; just above the position where the picture begins to tear from lack of synchronization.

____ 4. Using the type of screw driver mentioned in step #15 of page of these instructions, tune oscillator trimmer A for maximum vertical detail. (This corresponds to the minimum capacity setting or highest frequency setting that will still admit the picture from the desired station). NOTE: This adjustment does not correspond to the brightest picture obtainable but does correspond to the clearest picture with the sharpest detail as shown on the vertical wedges of the test pattern. For close adjustment of this point the sound sensitivity trimmer is used.

____ 5. Now adjust antenna trimmer A and grid coil A for brightest picture, readjusting the oscillator trimmer for best detail, if necessary.

____ 6. Loosen trimmer screw on I.F. trap #2 and watch the picture carefully for the point where the detail begins to fade. The proper setting of this screw is just short of this point.

____ 7. Adjust both trimmers on the sound I.F. for maximum sound output.

____ 7a. Adjust both slugs on the sound I.F. for maximum sound output on FM models.

____ 8. Readjust trimmer on I.F. trap #2 for maximum sound output and if picture is affected adjust for the best compromise.

____ 9. Tighten trimmers on I.F. traps #1 and #3 to a point where the picture begins to get dim, then back off about one-eighth of a turn. to the point where the picture is the sharpest.

____ 10. This completes the alignment of the Transvision Set on the highest frequency setting.

In areas where there are several television stations in active use, the following procedure should be followed:

____ 1. For alignment of the second band turn to the second position of the band switch, which is second highest in frequency, or one position to the right from the extreme left. For alignment of the third and last band the same procedure is followed with the band switch on the third position while making the above adjustments on the oscillator C, grid coil C and antenna trimmer C. Be certain not to touch any of the previously adjusted trimmers. NOTE: In the adjusting of oscillator trimmer C, the silver half-moon (with the solder connection on top) need not be in any particular position. Do not, at any time, touch the band width trimmer.

____ 2. Do not touch any of the trimmers on the I.F. traps.

____ 3. Repeat the above steps #1 to #10, except those referring to I.F. traps, using only the "B" adjustments that is, oscillator B, grid coil B and antenna trimmer B. Be certain not to touch any of the previously adjusted trimmers. NOTE: In the adjusting of oscillator trimmer B, the silver half-moon (with the solder connection on top) need not be in any particular position.

SPECIAL NOTES

TUBE BRIGHTNESS

The normal life of a television picture tube is several thousand hours. However, a spot can be burned into the screen very quickly if the brightness control is set at a high level. This becomes especially true as the raster is reduced and approaches the size of a spot.

NORMAL LINE TRACES

When there is no program being televised the raster will show white horizontal lines widely spaced. This is a normal condition which will disappear when a television signal is transmitted.

VERTICAL HOLD

Do not adjust the vertical hold so that the picture moves downward. The proper setting of the vertical hold is that point where the picture moves slowly upward just before locking into position. The contrast setting should be set at a normal picture setting for your particular locality.

VERTICAL LINEARITY

Under certain conditions the vertical linearity can be improved by reversing the line plug of the television set. This should be done when there is a test pattern being televised in order that the vertical wedges may show any improvement.

INTERRUPTIONS

During the transmission of television programs there may, occasionally, be interruptions in either sound or picture. It is adviseable therefore, not to make any adjustments on your receiver until you are positive the station is not at fault.

CONTRAST CONTROL

The setting for the contrast control will usually be found near the upper end (right side) and normally affects the sound due to the type of circuit used.

HOLD CONTROLS

It has been found that, due to carelessness, the hold controls (located on rear skirt of chassis) are sometimes interchanged. If your set is troubled with poor synchronization or lack of height or width check these controls.

AUDIO DRIFT ON REGENERATION (SQUEAL)

In the event of sound drift or squeal, check the location of the 2.2 megohms grid resistor from pin #4 of 6AC7 to ground. In the instructions this is resistor #2 on Diagram D and must be placed exactly as shown and as closely as possible to the chassis.

INTERFERENCE:

A few words of explanation, at this point, regarding some types of intefference and how they show up on the screen of the picture tube may save considerable time and adjustments later. Diathermy interference which originates in hospitals and medical offices usually appears as a horizontal strip of herringbone effect across a portion of the picture. Interference due to other television receivers in the immediate vicinity results in a disturbance on the screen similar to that caused by amateur radio transmitters. This is characterized by white horizontal bars across the screen which become whiter and more brilliant as the interference becomes stronger. In some cases the screen appears silvery or completely white.

HUM MODULATION IN THE PICTURE OF THE 7" TRANSVISION KIT

Hum modulation in the picture which causes roll or wavering of the picture and irregular vertical lines, can be minimized by following these few suggestions.

MAGNETIC HUM:

First of all, determine if the difficulty is caused by magnetic or electrostatic pick up. This can be done by removing the picture tube from the set and operating the tube as far from the transformers as the picture tube cable will allow. If hum distortion disappears, then the difficulty will be of electromagnetic nature caused principally by radiated magnetic field from the low voltage transformer.

This condition can be minimized by reversal of the high voltage transformer primary leads. This places the field of one transformer in a position which will oppose the other and minimize the distortion in the picture tube.

In very early models, the low voltage transformer was mounted with laminations parallel to the back of the chassis rather than parallel to the side. If your kit has the transformer mounted in the old position, further benefits may be achieved by remounting the transformer with the laminations parallel to the side of chassis.

In very severe cases, it may be necessary to place a shield around the neck of the picture tube in order to minimize the magnetic pick-up. This shield should be made of soft iron or other magnetic material and formed as a loose fitting sleeve around the neck of the picture tube. A piece of 2" iron pipe, properly padded to prevent damage to the picture tube, will usually be adequate in very severe cases.

ELECTROSTATIC HUM:

In case the hum pick up is found to be electrostatic in nature rather than magnetic, it may be eliminated by one or several of the following expedients.

Place a .1 mfd condenser, 600 volt rating, from terminal #5 of terminal strip T to the high voltage terminal of the high voltage condenser. Try reversing the leads going from terminals #4 and #6 of terminal strip V. Check the values of resistors #44 and #45, which connect to terminals #4 and #5 of terminal strip V. These should be 2.2 megohms, plus or minus 10%. Severe unbalance of these two re-. sistors can cause hum distortion in the picture. Check also, the high voltage blocking condensers AA and BB for value. Very severe unbalance of these condensers will also cause difficulty.

Trouble can also be caused by unbalance of resistors in the vertical circuit which connect to terminals #3 and #1 of terminal strip V. These should be 3.3 megohms, plus or minus 10%.

TRANSVISION
INCORPORATED
385 North Avenue
New Rochelle, N. Y.

SERVICING INFORMATION FOR THE NEW SYNCHRONIZING CIRCUIT TRANSVISION SEVEN INCH TELEVISION KIT

In converting the early models of the seven inch TRANSVISION kit to the new synchronizing circuit, some difficulties have been encountered. These fall into two groups:

1. Failure to follow instructions by removing parts which should not be removed, such as: removing resistor #26, Diagram D, instead of resistor #26, Diagram C.
   MAKE SURE YOU REMOVE ONLY THE PARTS SPECIFIED FROM THE SPECIFIED DIAGRAM.
2. Very early models of the TRANSVISION kit did not provide lug #4 of terminal strip P used in steps #11, #12 and #13. In this case, resistors #5 and #6 on Figure 1 should be connected together, and the free end of resistor #5 connected to lug #2 of terminal strip P, and the free end of resistor #6 connected to lug #1 of H-2, Diagram D of early instructions.
   This, in effect, connects these resistors in parallel with the 3,500 ohm ten watt plate load resistor. The junction of resistors #5 and #6 should then form the terminal to which condenser B is attached.

Another point of difficulty is failure to remove all connections from terminals #1, #2 and #3 of socket 9.

Failure of the synchronizing circuit, when all wiring is correct, can be caused by:

1. Failure of 6SN7 tube, socket 9.
2. Failure of 6H6 tube, socket 8.
3. Leakage in condenser A (.01 mfd, 600 volts), which connects to pin #5, socket 9.
4. Leakage in condenser B (.05 mfd, 600 volts), which connects to pin #4, socket 9.

In some cases, failure of condenser B has also caused damage to resistor #1 (22,000 ohms, one-half watt), which connects lug #4 of terminal strip J to lug #5 of socket 9. In severe cases, resistor #2 has also been damaged; this is 10,000 ohms, one-half watt, connecting pin #6, socket 9 to ground.

If the color bands of these resistors are discolored, check with ohmmeter and replace if necessary.

Note: To improve the horizontal synchronization on the old synchronizing circuit, using 6AC7, condenser D on tube X-9, pin #8 to X-11, pin #5, should be changed from 50 mmf to 150 mmf.

LINEARITY ADJUSTMENTS
OF THE SEVEN INCH TRANSVISION KIT

Poor linearity can be caused by faulty oscillator or amplifier tubes in either the horizontal or vertical circuits. If a tube is suspected of being poor, change the tube with the corresponding tube type in the other circuit and see if the linearity has been affected.

Poor linearity will show up on the picture as distortion of the horizontal or vertical wedges, which is most noticeable on the test pattern. Small corrections can be made which will improve the overall performance of the set.

Vertical Linearity

Poor vertical linearity, as shown on the test pattern by a short bottom leg, can be corrected by the addition of a resistor of 2 to 3 megohms, connected between the discharge plate of the vertical oscillator and the second output plate of the vertical amplifier. These connections are as follows:

1. Lug #3 of socket 10 to lug #2 of socket 13, if your set uses a 6N7 oscillator and 6SN7 amplifier.
2. In case two 6SN7 tubes are in the vertical circuit, the connections will be from terminal #2 of socket 10 to terminal #2 of socket 13.

Remember, the lower the value of this resistor the greater will be its effect of lengthening the bottom leg.

Horizontal Linearity

Poor linearity can be caused by poor high frequency response of the horizontal 6SN7 tube, and may be corrected by the addition of a small condenser, .004 mfd, which connects from pin #3 of socket 14 to ground. This will lengthen the extreme left edge of the picture and will correct the foldover on this side.

The total length of the left hand leg of the picture will be affected by the value of the resistor connecting terminals #1 and #2 of terminal strip O. The value of this resistor, as specified, is 4,700 ohms if a 6N7 oscillator tube is used, and 6,800 ohms if a 6SN7 oscillator tube is used. Increasing this value will increase the length of the left wedge of the test pattern. NOTE: In some cases it has been found that damage to this resistor was caused by excessive heating of the unit during a soldering operation; in which case the heating of the resistor has resulted in a reduction in its value far below that specified.

Poor horizontal linearity can also be caused by any of the following:

1. A faulty discharge condenser (500 mmf) which connects the discharge plate of socket 11 to pin #3, if the 6N7 tube is used, and to pin #2 if a 6SN7 tube is used in socket 11.
2. Leakage in condenser ZZ which connects pin #1 of socket 14 to lug #2 of terminal strip O.
3. The leads going from #2 on condenser AA to #4 on TS-V and from #2 on condenser BB to #6 on TS-V are twisted in accordance with the instructions. In some cases these leads may be untwisted in order to correct a foldover condition.

PARTS LIST

TRANSVISION 12" TELEVISION KIT

Part No.	Description	Quantity
1	6AC7 tube	5
4	6AG7 tube	1
7	6V6-6V6GT tube	1
9	6SN7 tube	5
10	5U4 - 5V4 tube(alternate)	1
16	Peaking coil, 250 uh, pig-tail leads	1
17	Peaking coil, 125 uh, pig-tail leads	2
0- 21	Audio output transformer for loudspeaker	1
28	Potentiometer, 1.0 meg audio taper with switch, 1¼" shaft, (volume control)	1
0- 30	Potentiometer, 100,000 ohms linear, 1¼" shaft	1
32	Potentiometer, 5,000 ohms C bias taper, 1¼" shaft, (contrast control)	1
0- 36	Potentiometer, 100,000 ohms linear taper, screwdriver slot (Horizontal drive control)	1
0- 37	Potentiometer, 2.0 meg, linear taper, screwdriver slot, (vertical size control)	1
0- 41	Resistor 100 ohms, ½ watt	3
0- 42	Resistor, 150 ohms, ½ watt	7
0- 44	Resistor, 470 ohms, ½ watt	3
0- 45	Resistor, 1,000 ohms, ½ watt	2
0- 46	Resistor, 2,200 ohms, ½ watt	4
0- 47	Resistor, 3,300 ohms, ½ watt	1
0- 48	Resistor, 4,700 ohms, ½ watt	2
0- 50	Resistor, 10,000 ohms, ½ watt	3
0- 51	Resistor, 22,000 ohms, ½ watt	10
0- 54	Resistor, 56,000 ohms, ½ watt	7
0- 56	Resistor, 100,000 ohms, ½ watt	6
0- 57	Resistor, 220,000 ohms, ½ watt	2
0- 59	Resistor, 470,000 ohms, ½ watt	7
0- 60	Resistor, 1.0 meg, ½ watt	8
0- 62	Resistor, 3.3 meg, ½ watt	1
0- 64	Resistor, 47,000 ohms, 1 watt	1
68	Resistor, 3,500 ohms, 10 watt	1
0- 71	Capacitor, 50 mmf, 500 Volts ceramic	1
0- 72	Capacitor, 150 mmf, 500 Volts ceramic or mica	4
0- 73	Capacitor, 500 mmf, 500 Volts mica	1
0- 74	Capacitor, .05 mfd, 600 volts paper	6
0- 76	Capacitor, .002 mfd, 600 volts paper	2
0- 77	Capacitor, .005 mfd, 600 volts paper	6
0- 79	Capacitor, .01 mfd, 600 volts paper	5
0- 80	Capacitor, .1 mfd, 600 volts paper	8
0- 85	Capacitor, 1,000 mmf, 500 volts, ceramic	17
0- 90	Capacitor, 40-30-10/20 450/25 electrolytic capacitor (can, negative)	3
0- 91	Octal tube socket	17
0- 94	Miniature tube socket	2
96	Line cord (power)	1
0-101	Rubber grommet, 7/8"diameter	2
0-102	Rubber grommet, 3/8" diameter	6
0-103	6-32 lockwasher	95
0-104	8-32 lockwasher	11
0-105	#6 self tapping screw	60
0-106	Knob	6
0-107	8-32 wing nut	1
0-108	8-32 hex nut	11
0-109	8-32 x 3/8" machine screw	20
0-110	6-32 x 3/8" machine screw	75
0-112	6-32 hex nut	95
0-115	#6 ground lug	12
0-119	Antenna strip (3 terminal)	1
130	Terminal strip, 1P1	4
0-132	Terminal strip, 1P2	3
0-133	Terminal strip, 3P2	5
0-136	Terminal strip, P1	1
137	Terminal strip, 2R2	1
0-140	Terminal strip, 1R	1
0-141	Terminal strip, 1R1	2
0-147	Volume control nut	10
0-149	#4-40 x 3/8" machine screw	4
0-150	#4-40 hex nut	4
0-170	Mounting plate, electrolytic capacitor	3
0-172	Solder	15'
173	Spaghetti	18"
0-174	I.F. transformer (3rd)	1
0-175	I.F. transformer (2nd)	1
0-176	I.F. transformer (detector)	1
0-179	Bare wire, #22	3'
0-180	Black wire, #22	12'
181	Yellow wire, #22	14'
0-182	Red wire, #22	15'
0-183	Blue wire, #22	10'
0-184	Green wire, #22	10'
0-186	Cambric tubing	6"
0-230	Capacitor, 4 mfd, 50 volts electrolytic, pigtail leads	1
0-302	12JP4, cathode ray tube	1
0-303	Power transformer	1
0-304	Choke	1
0-305	Vertical output transformer	1

PARTS LIST

TRANSVISION 12" TELEVISION KIT

Part No.	Description	Quantity
0-306	Vertical blocking oscillator transformer	1
0-307	Horizontal oscillator transformer	1
0-308	Horizontal output transformer	1
0-309	Focus coil	1
0-310	Deflection yoke	1
0-311	Deflection yoke hood	1
0-312	Oval speaker, 4" x 6"	1
0-313	Cathode ray tube socket	1
0-314	High voltage anode cap (CRT)	1
0-317	Ratio detector transformer	1
0-318	Sound I.F. transformer	1
0-319	Peaking coil, 500 uh, pigtail leads	1
0-320-A	Cathode ray tube bracket	1
0-320-B	Cathode ray tube bracket	1
0-321	Focus coil stirrup	1
0-323	Speaker bracket	2
0-324	Horizontal transformer mounting plate	1
0-325-A	High voltage shield #1	1
0-325-B	High voltage shield #2	1
0-326	Potentiometer, 2,000 ohms linear taper, screw driver slot, (focus control)	1
0-330	Capacitor, .0012 mfd, 10,000 volt, ceramic	1
0-335	Resistor, 3.3 ohm, ½ watt	1
0-337	Resistor, 47 ohms, ½ watt	1
0-339	Resistor, 680,000 ohms, ½ watt	1
0-343	Resistor, 1,000 ohms, 10 watt	1
0-344	Resistor, 10,000 ohms, 10 watt	2
0-345	High voltage tube socket spacer, insulated	1
0-346	Bakelite spacer	6
0-347	Lead-in wire, cathode ray tube mounting strap	3'
0-349	Terminal strip 3R2	1
0-354	6AL5 tube	2
0-355	6SL7 tube	1
0-356	6X5GT tube	1
0-357	8016-1B3 tube	1
0-358	6BG6G tube	1
0-360	Terminal strip, 3R	1
0-361	Terminal strip, 2P1	1
0-362	Terminal strip, 3P1	1
0-363	Chassis	1
0-364	Bottom Plate	1
0-366	High voltage wire	12"
0-368	Capacitor, .035 mfd, 600 volts paper	1
0-370	Resistor, 10,000 ohms, 1 watt	2
0-371	Resistor; 10 ohms, 1 watt	1
0-372	Resistor, 190 ohms, 1 watt	2
0-373	Potentiometer, 5,000 ohms linear taper	2
0-374	1.0 meg potentiometer, linear taper, 1½" shaft, (vertical hold control).	1
0-375	Washer, 9/16", OD clearance, 6-32	12
0-377	Linearity control (inductance)	1
0-380	Terminal strip, 2R1	1
0-383	2 conductor shielded wire	20"
0-384	#6-32 x 1½" machine screw	6
0-388	Terminal strip, 1P	2
0-390	Felt, 2"x 12" approx.	1
0-400	Wire, (High voltage,- brown, red, green, white) 1' of each	1
0-401	#4-40 lockwasher	4

DE LUXE MODEL ALTERNATE
Packed with Tuner

Part No.	Description	Quantity
0- 50	Resistor, 10,000 ohms ½ watt	1
0- 85	Capacitor, 1,000 mmfd, 500 volts, ceramic	1
0-174	I.F. transformer (1st)	1
0-328	Potentiometer, 100,000 ohm linear taper with switch 1¼"shaft	1
0-334	Ceramic trimmer, 3-12 mmf	1
0-380	Terminal strip, 2R1	1
0-367	Tuner mounting plate	1
0-348	Pilot light bracket	1
0-348-A	Pilot light	1
0-300	Inductuner	1

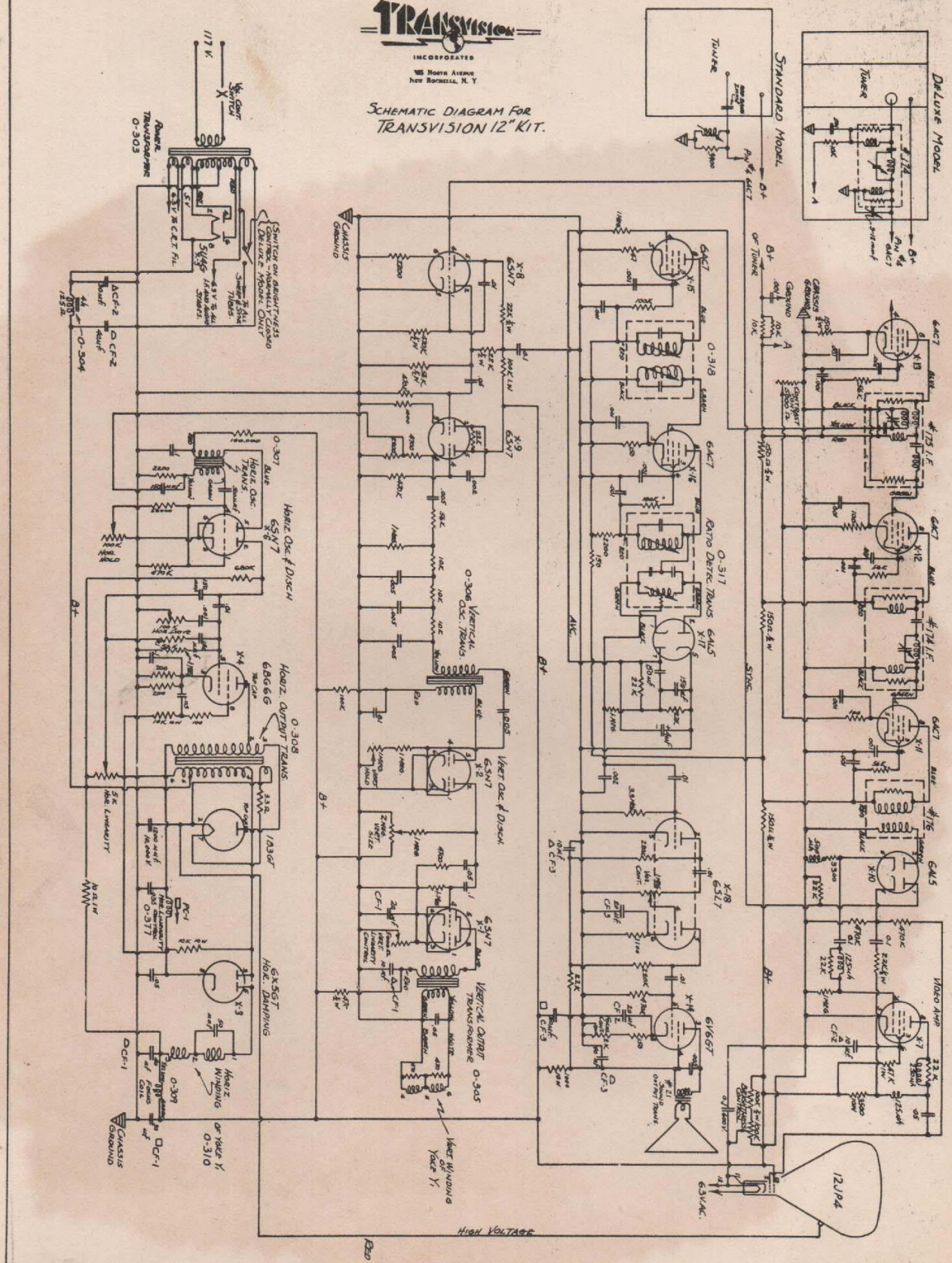
* * * * * * * * * * * * * * * *

STANDARD MODEL ALTERNATE
Packed with Tuner

30	Potentiometer, 100,000 ohm linear taper, 1¼" shaft	1
0-365	Slug coil (balance)	1
0- 52	Resistor, 3,900 ohm, ½ watt	1
0-382	Insulated shaft	1
0-381	Brass spacer	2
0-385	6-32 x 1½" machine screw	2
0-301	Standard tuner Knob	1

TRANSVISION
INCORPORATED
[illegible] NORTH AVENUE
NEW ROCHELLE, N. Y.

SCHEMATIC DIAGRAM FOR TRANSVISION 12" KIT.



TRANSVISION 12" TELEVISION KIT

RESISTANCE READINGS

* * * * * * * * *

Tube	Pin #1	Pin #2	Pin #3	Pin #4	Pin #5	Pin #6	Pin #7	Pin #8
V. Amp. 6SN7 (X-1)	1 Meg	50K**	*0-5000 ohm	1 meg	50 K**	0-5000 ohm*	-.1 ohm	0
V. Osc. 6SN7 (X-2)	2 Meg*	1.5 M *	0	2 meg	100 K**	0	-.1 ohm	0
Hor. Damp. 6X5 (X-3)	NC	0	50 K**	NC	50 K**	NC	-.1 ohm	50 K**
Hor. Amp. 6BG6G(X-4)	NC	0	100 ohm	20 K**	1 M	80 K**	-.1 ohm	30 K
L.V. Rect. 5U4G (X-5)	NC	30 K**	NC	365 ohm	NC	365 ohm	NC	30 K**
H. Osc. 6SN7 (X-6)	100 K*	600 K**	0	100 K	120 K**	0	-.1 ohm	0
Video Amp 6AG7 (X-7)	0	0	0	1 M	0	50 K**	-.1 ohm	50 K**
1st Syn Amp 6SN7 (X-8)	470 K	50 K	0	20 K	75 K	2.2 K	-.1 ohm	0
2nd Syn Amp 6SN7 (X-9)	470 K	50 K	1 K	470 K	40 K**	7 K	-.1 ohm	0
Det DC Rstr 6AL5 (X-10)	400 K	-.1 ohm	0	-.1 ohm	3.3 K	0	20 K	
3rd V. Amp 6AC7 (X-11)	0	0	0	-.1 ohm	100 K*	70 K**	-.1 ohm	30 K**
2nd V-IFamp 6AC7 (X-12)	0	0	0	4500 ohm	100 *	70 K**	-.1 ohm	30 K**
1st V.IFamp 6AC7 (X-13)	0	0	0	-.1 ohm	150	70 K**	-.1 ohm	30 K**
Audio Amp 6V6GT(X-14)	0	0	30 K**	30 K**	470 K**	NC	-.1 ohm	150-5000*
Sound IFamp 6AC7 (X-15)	0	0	0	1 Meg	47	70 K**	-.1 ohm	30 K**
Sound IF 6AC7 (X-16)	0	0	0	-.1 ohm	150	100 K**	-.1 ohm	30 K**
Sound Det 6AL5 (X-17)	100 K	100 K	0	-.1 ohm	0	0	30 K	
Audio Amp. 6SN7 (X-18)	3 Meg	270 K	0	0	270 K	1 K	-.1 ohm	0
H.V. Rect. 1B3GT(X-A)	0	More Than 20 M	0	0	0	More than 20 M	0	

K = 1,000
M = 1,000,000

** Actual value is higher due to charging condensers, but values should not be less than indicated

* Indicates variable value. (Dependant on control setting)

ALL FRONT PANEL CONTROLS TURNED TO EXTREME COUNTER-CLOCKWISE POSITION.

TRANSVISION 12" TELEVISION KIT

VOLTAGE CHART

* * * * * * *

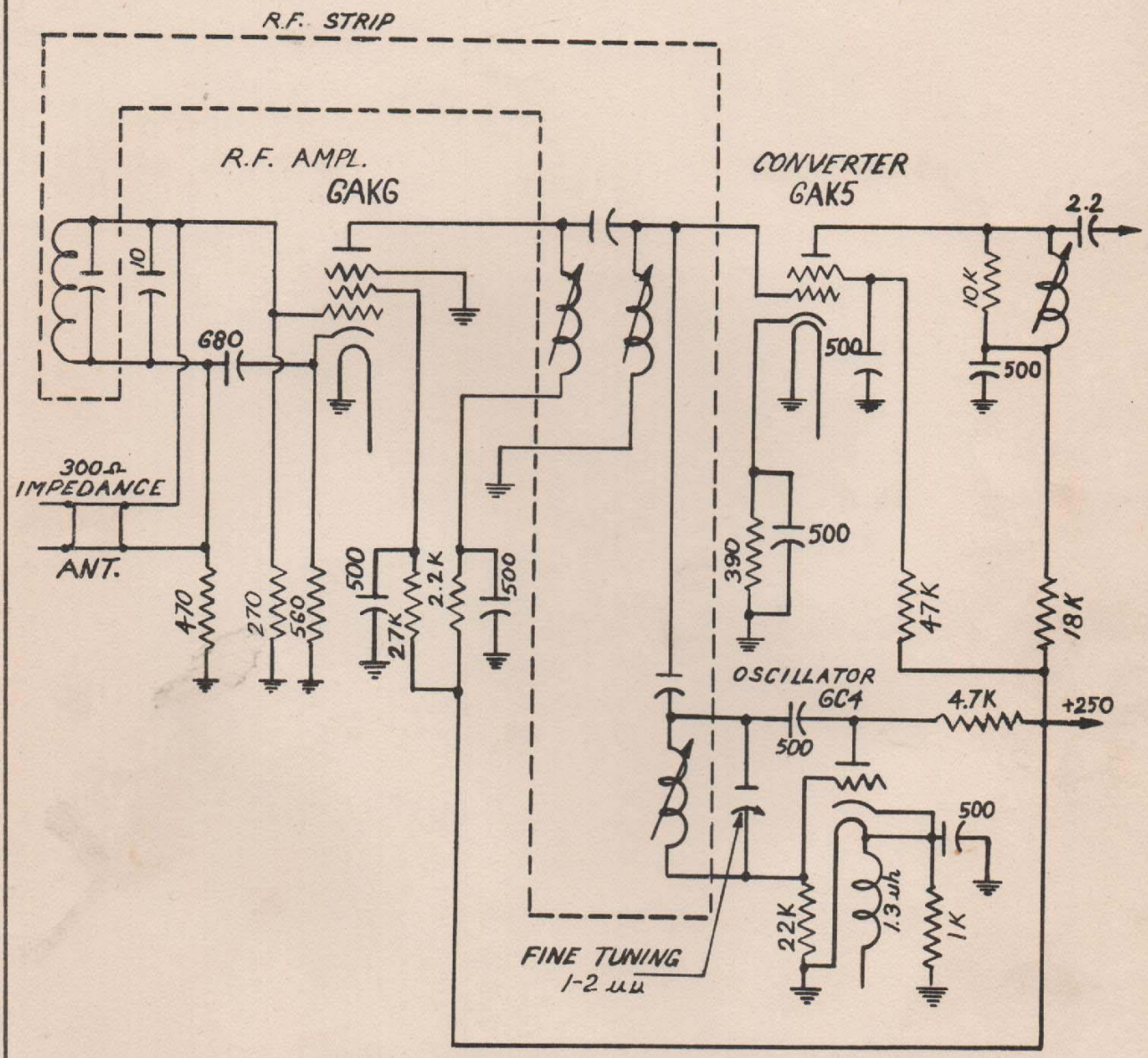
Tube	Pin #1	Pin #2	Pin #3	Pin #4	Pin #5	Pin #6	Pin #7	Pin #8
V. AmP 6SN7 (X-1)	0	280 V	15 V*	0	280 V	15 V*	6.3 V AC	0
V. Osc. 6SN7 (X-2)	-80*	40 V*	0	-80*	270 V	0	6.3 V AC	0
H. Damp. 6X5 (X-3)	0	0	360 V	0	360 V	0	6.3 V AC	410 V
H. Amp 6BG6G (X-4)	0	0	8.5 V*	360 V	-20 V*	360 V	6.3 AC	190
L.V. Rect. 5U4G (X-5)	0	400 V	0	0	375 V AC	0	375 V AC	400 V
H. Osc. 6SN7 (X-6)	-15V*	130 V	0	-20*	200 V	0	6.3 AC	0
Video Amp 6AG7 (X-7)	0	0	0	0	0	90 V	6.3 AC	220 V
Syn Amp 1st 6SN7 (X-8)	0	20 V	0	0	30 V	1.5 V	6.3 AC	0
Syn Amp 2nd 6SN7 (X-9)	0	180 V	4	0	360 V	15 V	6.3 AC	0
Det DC Rstr 6AL5 (X-10)	Not Readable	0	0	0	6.3 V AC	0	Not Readable	
Video IF 6AC7 (X-11)	0	0	0	0	10 V	320 V	6.3 V AC	360 V
Video IF 6AC7 (X-12)	0	0	0	0	10 V	320 V	6.3 V AC	360 V
Video IF 6AC7 (X-13)	0	0	0	0	2 V	160 V	6.3 V AC	350 V
Audio Amp 6V6GT (X-14)	0	0	300 V	300 V	0	0	6.3 V AC	20 V*
Sound IF 6AC7 (X-15)	0	0	0	Not Readable	1 V	100 V	6.3 V AC	280 V
Sound IF 6AC7 (X-16)	0	0	0	0	1.5 V	90 V	6.3 V AC	250 V
Det. 6AL5 (X-17)	0	0	0	6.3 V AC	0	0	0.4*	
Audio Amp. 6SN7 (X-18)	0	80 V	0	0	90 V	Not Readable	0	0
H.V. Rect. 1B3GT (X-A)		DO NOT ATTEMPT MEASUREMENTS ON THIS SOCKET						

20,000 ohms/v
All readings to ground

*Approximate Readings (No Signal)
Variable (Dependent on control setting)

ALL FRONT PANEL CONTROLS TURNED TO EXTREME COUNTER-CLOCKWISE POSITION. ALL REAR CONTROLS SET APPROXIMATELY HALF-WAY.

TRANSVISION STANDARD TELEVISION TUNER



TRANSVISION
INCORPORATED

385 North Avenue
New Rochelle, N. Y.

1-15-47-5T

SOME TECHNICAL INFORMATION

TRANSVISION TELEVISION KIT

THE TRANSVISION TELEVISION KIT was designed to supply a high quality television receiver at considerably lower cost than a completed set. It is, further, a boon to those who, deriving pleasure from creative activity, still want to keep costs down; is a practical aid to those who want to acquire basic training in television; opens the new, lucrative and intriguing field of television to interested technical men, as well as to the interested leymen.

Specific efforts were made, in designing the kit, to eliminate the alignment procedure usually required in the assembly of a kit, thus dispensing with the test equipment which the assembler may not possess. Most important, in this connection, is the RF plate, which is constructed and pretuned before shipment, owing to the critical alignment procedure it demands. The routine service of punching out the chassis is also furnished, but the installation of all remaining components is left exclusively to the constructor.

The assembler is supplied, furthermore, with every last item that an efficient television system requires for optimum performance, including a handsome front panel, a SEVEN INCH LECTROVISION PICTURE TUBE, and a sensitive single dipole antenna.

By following the plainly written instructions and clearly drawn diagrams, in which reference to the individually packaged and numbered parts is made by numbers, even the inexperienced builder finds himself smoothly guided, step by step and stage by stage, from rudimentary beginnings to the successful completion of an imposing, modern television receiver. And when finished, he possesses an attractive, efficient television instrument that measures 18 inches wide, 18 inches high, 15 inches long. For the technical man, the instructions include a schematic diagram of the set.

Electrically, the TRANSVISION TELEVISION SET has a bandpass of three and one half megacycles, rich audio reproduction, sensitivity that yields the maximum usable range of a given locality as determined by topographical conditions and a negligible image interference. The viewing area of 25 square inches will comfortably entertain fifteen or more people and the definition and clarity of the pictures have already won considerable praise.

The tube lineup in the RF section is a 6AC7 mixer and a 6C4 local oscillator. This stage has been carefully designed for flat response to the entire 6.5 megacycles of all channels and, despite compactness is also capable of surprising gain.

In the video IF section there are three stages, each using a 6AC7. The Audio Intelligence is picked off of the second IF transformer by a trap tuned to 21.9 megacycles and fed into a sound IF stage that uses another 6AC7. A 6SQ7 demodulator-amplifier and a 6V6 power amplifier comprise the audio section, while the video detection and amplification are achieved by a 6H6 and 6AG7 respectively.

The sync separator is still another 6AC7 and it fires 6N7 multivibrators in both the vertical and horizontal sweep circuits. The 6SN7's that follow are push-pull amplifiers. Low voltage rectification employs a 5U4G, while a 2X2 (or 2Y2) rectifies the high voltages. The picture tube is the type 7EP4.

Perhaps the most striking feature of the IF section is the system of fixed, double-tuned trap coupling. This method not only obviates the need for a signal generator but, in spite of the high IF frequency, it simultaneously affords satisfactory gain over a 3.5 megacycle bandpass that is obtained by heavy damping. The only tuning imposed upon the constructor at all involves trimmers in the trap circuits. In the second IF can, for example, the 21.9 megacycle trap is simply adjusted for maximum output (audio), while the two remaining trimmers are set for greatest brightness.

The selection of a relatively high intermediate frequency was dictated by image considerations. This choice fixes the various image frequencies in channels that for the present are inactive, thereby evading this problem despite the inherently poor image rejection power of television receivers in general. Measurements have indicated that at these high image frequencies convential tubes like the 6AC7 became inoperative and in this curious manner introduce acceptable rejection properties.

A noteworthy wiring precaution that preserves IF gain at its highest possible level concerns the use of a single ground for each IF stage. This common ground is a lug securely fastened to the appropriate socket under the #1 pin. In this manner, spurious voltages that frequently reduce gain are effectively eliminated. Excellent response in the video circuit is derived through the use of low resistance in the detector circuits and through a carefully designed series-shunt peaking arrangement in both the input and output of the section.

In the audio section, demodulation is accomplished by means of slope detection, while ample volume is provided by the two stages of amplification that follow. A tone control is also included. The salient feature of the sync separater is the exceedingly low voltages employed, a provision that affords maximum limiting.

Because of the latitude present in sweep design, it is always of interest to discuss what considerations have guided final circuit decisions. The primary one, of course, pertains to the selection of impulse generator. Greater flexibility is naturally permitted in the vertical section because of its lower frequency and, consequently, the advantages of a multivibrator can be utilized here without further ado.

The problem of stability, however, must be considered more cautiously in horizontal design. Initial plans, therefore, tentatively called for another multivibrator in the horonzital section. Surprisingly enough, the instability that actually materialized appeared to be closely connected with the interference problem, such as ignition disturbances, for example. Investigation soon focused attention upon the long time constant of the capacity grid leak arrangement originally coupling the differentiating network to the 6N7 multivibrator. At any rate, a direct connection from differentiator to frid, together with a further lowering of the differentiator time constant, succeeded in reducing the problem to such neglible proportions that the multivibrator proved completely acceptable.

A common expedient used in the rectifier circuits to provide the kinescope with an extra 350 volts deserves a word of comment. Generally, the low side of the high voltage rectifier is returned directly to ground. But since this procedure has the disadvantage of losing the potential available in the low voltage section, it appeared sensible to connect the two rectifier circuits in series. As a precaution against noise pickup, the low side of the high voltage supply was tied to a 350 volt terminal point safely distant from the RF unit. No ill effects developed and, because of the additional voltage, the kinescope performance was materially improved.

A final consideration that demands special attention in the kit field concerns adequate protection against the high voltages present. For the under surface of the chassis, an interlock switch and a bottom plate are provided, while for the top surface a ceramic cap insulates the connection to the anode of the 2X2. The last protective measure is the use of bakelite shafts, attached, of course, to all controls possessing high voltage connections.

Despite the simplicity of design employed to make the TRANSVISION TELEVISION KIT the ideal set for the inexperienced assembler to construct, no modern television technique was omitted. As a result, we have a television kit easy to construct into a set which, when complete, provides the user with a quality television receiver.

TRANSVISION 7" TELEVISION RECEIVER
OSCILLOGRAMS

To assist the serviceman in locating possible video defects quickly with the aid of an oscilloscope, a series of oscillograms has been incorporated into these notes. It is suggested that the indicated order of check points be maintained.

Note:
(1) All readings are approximate.
(2) All readings are made with Dumont 208 oscilloscope.
(3) All peak to peak readings are dependent on contrast control settings.

These oscillograms will appear on a properly functioning TRANSVISION 7" receiver.

The 6H6 tube is -- as in ordinary radio -- the detector, the function of which is to separate the desired intelligence (picture and necessary pulses) from the I.F. carrier. The oscillogram of figure 1 should appear when the oscilloscope is connected between pin # 8 of the 6H6 tube and ground. The polarity is plus in order to present to the single stage video a signal which, when amplified and inverted by the video amplifier tube, will have proper polarity for correct operation of the picture tube.

PIN 8 - 6H6 VIDEO DETECTOR
PIN 4 - 6AG7 VIDEO AMPLIFIER

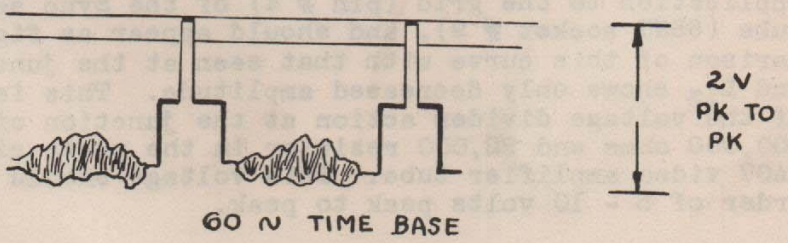
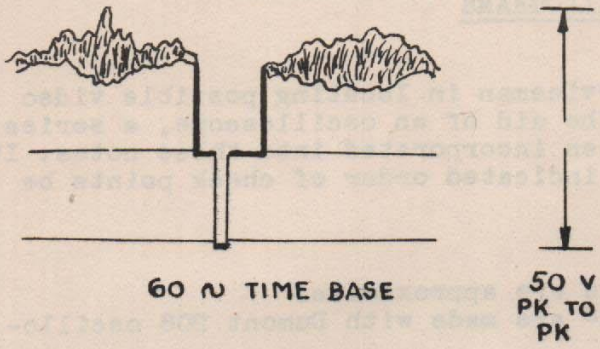


FIGURE 1

The inversion and amplification referred to above can be viewed when the oscilloscope is connected at the junction of the L_{12} and L_{13} peaking coils, and will appear as in figure 2.



JUNCTION OF L_{12}-L_{13}
PEAKING
COILS

FIGURE 2

PIN 4 6SN7 SYNC. SEP. TUBE

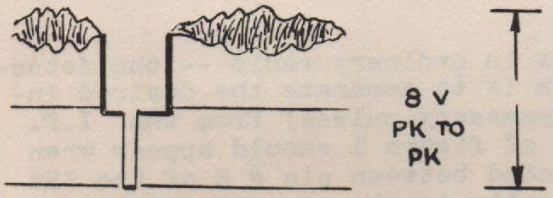
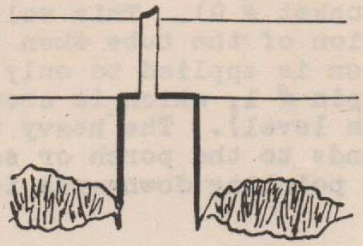


FIGURE 3

In order to synchronize the transmitter and receiver sweep circuits, certain pulses called "Sync pulses" are made a portion of the composite wave. These pulses have no "picture content" and, therefore, have no use at the picture tube. However, since they accompany the picture signal (not having been picked off at any intermediate point), they may be found in the output of the 6AG7 video amplifier. In order to separate the Sync pulses, a portion of this voltage is picked off at the junction of the 100,000 ohms and 22,000 ohms resistors for application to the grid (pin # 4) of the Sync separator tube (6SN7 socket # 9), and should appear as figure 3. Comparison of this curve with that seen at the junction of L_{12} and L_{13} shows only decreased amplitude. This is because of the voltage divider action at the junction of the 100,000 ohms and 22,000 resistor in the plate circuit of 6AG7 video amplifier tube. This voltage should be of the order of 5 - 10 volts peak to peak.

The voltage seen when the oscilloscope is connected to pin # 5 of the 6SN7 Sync separator (socket # 9) is that of figure 4. As is true of all amplifiers, the voltage at pin #4 has shifted through 180 degrees (inverted), and has been amplified to approximately 15 volts.



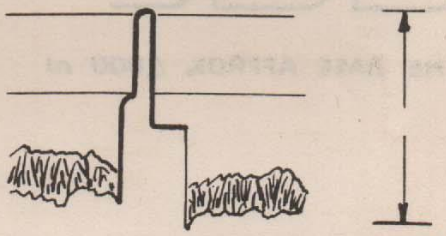
PIN 5
6SN7
SYNC. SEP. TUBE

60 ∿ TIME BASE

FIGURE 4

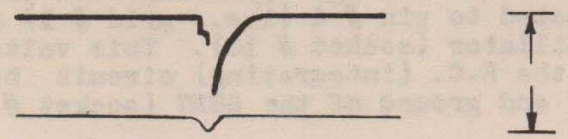
This amplified voltage is applied to the 2nd grid (pin # 1 of 6SN7 , socket # 9) through the .01 mfd. condenser.The output voltage at pin # 5 has been so coupled to the 2nd grid (pin # 1) that it is to be expected that it will appear there unchanged. If the oscilloscope be connected to the 6SN7 tube (socket # 9), such will be seen to hold. A slight change in the curve below the porch level may be noted due to the time constant of the R.C. coupling.

PIN 1 6SN7 SYNC. SEP. TUBE



60 ∿ TIME BASE

FIGURE 5

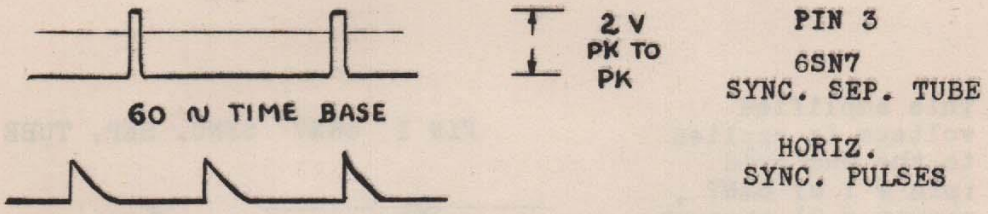


60 ∿ TIME BASE

PIN 2 6SN7
SYNC. SEP. TUBE
(LIMITER GRID)

FIGURE 6

We see at figure 6 the picture of the voltage at pin # 2 of the 6SN7 Sync separator (socket # 9). This voltage is that due to the "clipper" action of the tube when the tube is so biased that amplification is applied to only that part of the voltage, seen at pin # 1, which is above the black or blanking level (porch level). The heavy trace at the top of the curve corresponds to the porch or somewhat higher level, while the "pip" pointing downwards is the "pulse".



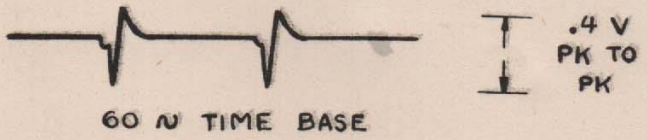
PIN 3
6SN7
SYNC. SEP. TUBE

HORIZ.
SYNC. PULSES

FIGURE 7

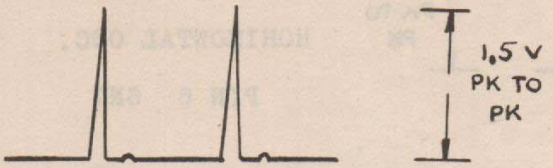
The higher frequency horizontal pulse voltage is developed at the cathode resistor at pin # 3 of 6SN7 (socket # 9) for application to the horizontal oscillator. This voltage is that shown in figure 7. Whether the curve appears as at 7A or 7B depends on whether the chosen time base of the oscilloscope is 60 CPS or higher. The "mush" accompanying the trace at 60 CPS will disappear as the frequency of the time base is increased, approaching the trace of a single pulse which should be seen when the time base becomes exactly 15,750 CPS.

Figure 8 is a picture of the voltage appearing when the oscilloscope is connected to pin # 4 (i.e., grid # 1) of the 6SN7 vertical oscillator (socket # 10). This voltage is that developed in the R.C. (integrating) circuit between plate (pin # 2) and ground of the 6SN7 (socket # 9) Sync separator.



SYNC. INPUT TO
VERT. OSC.
6SN7 PIN 4 (OR
6N7 PIN 4)

FIGURE 8



TIME BASE APPROX. 5,000 ∿
SYNC. INPUT TO HORIZONTAL OSC.
PINS 6 & 3 6SN7 (OR PIN 8 6N7)

FIGURE 9

When the oscilloscope is connected to pin # 6 of the 6SN7 horizontal multivibrator (socket # 11), the voltage seen at pin #3 of the 6SN7 at socket # 9 should be expected since it is "C" coupled to the horizontal oscillator. This is seen to be true from figure 9. When the natural frequency of this multivibrator (cathode coupled) is made slightly lower than the frequency of the pulses developed at pin #3 of 6SN7 in socket #9, the pulses take control of the multivibrator and thus synchronization is obtained.
Note: if pins number 6 and 3 were tied together, this would be the equivalent of a 6N7. In the case of a 6N7, the connecting point should be pin # 8.

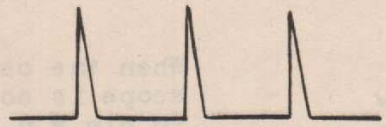
The voltage forms appearing when the oscilloscope is connected to pin # 5 of the 6SN7 in socket # 11 are seen in figure 10, and constitute a composite voltage. The slowly sloping part is due to the independent action of the multivibrator and the pip portion is due to the addition of the horizontal Sync pulse.

APPROX. 5,000 ∿ TIME BASE
PIN 5 6SN7 , PIN 4 (OR 6N7) HORIZ.OSC.

FIGURE 10

For explanation of the multivibrator, see Kiver, "Television Simplified", pp. 224-228.

The oscillogram in figure 11 is a representation of the voltage form appearing at pin # 1 of the 6SN7 tube (socket 11). It is a summation of the independent action of the multivibrator and the pulse appearing at pin # 5 of the same tube. This pulse, by causing the right half of the tube to conduct periodically, allows discharge of the saw tooth generating condenser.



60 ∿ TIME BASE

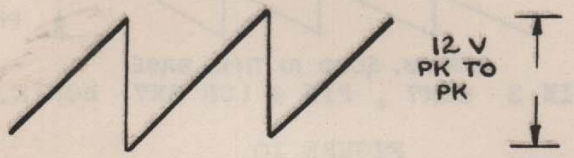
PIN 1 6SN7

HORIZONTAL OSC.

PIN 6 6N7

FIGURE 11

The controlled saw tooth voltage for which all previous work was done now can be found at pin # 4 of the 6SN7 horizontal amplifier tube in socket # 14. This is the voltage seen in figure 12, and is developed over the 500 mmf. condenser between pin # 2 of the 6SN7 in socket # 11 and ground or chassis. The 500,000 ohms potentiometer controls the amplitude through varying the time constant of the R.C. circuit composed of said potentiometer, the 1.0 meg. resister, and the 500 mmf. condenser. This voltage has not the amplitude with which to swing the electron beam and therefore must be amplified as shown at pin # 5 of 6SN7 in socket # 14: see figure 13. Note the phase inversion and increased amplitude.



60 ∿ TIME BASE

PIN 4 6SN7

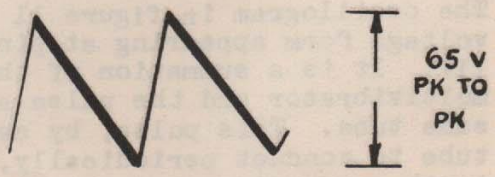
HORIZONTAL AMP.

FIGURE 12

PIN 5 6SN7

HORIZONTAL AMP.

FIGURE 13

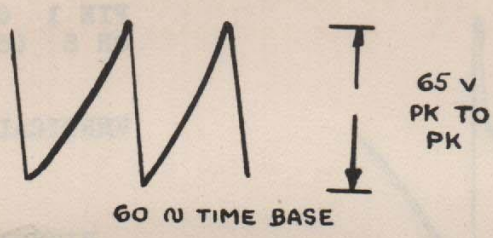


TIME BASE APPROX. 5,000 ∿ H

If a portion of the voltage appearing at pin # 5 of 6SN7 (socket # 14) be applied to grid # 2 (pin # 1 of same tube) figure 15, and be of the order of magnitude of that applied to grid # 1 (pin # 4), it will be amplified and inverted as in figure 14.

Figures 16, 17, 18, 19, 20, and 21 are patterns of the vertical section, which are similar to corresponding points in the horizontal section, the main differences being:

(1) the frequencies involved
(2) charge time relationship variations.



PIN 2
6SN7

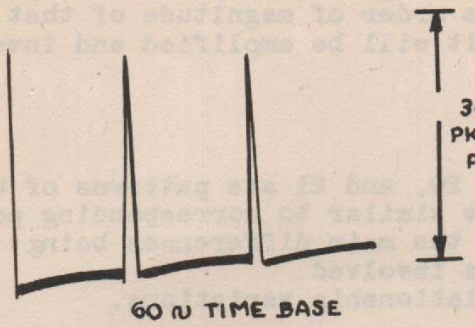
HORIZONTAL AMP.

FIGURE 14

PIN 1
6SN7

HORIZONTAL AMP.

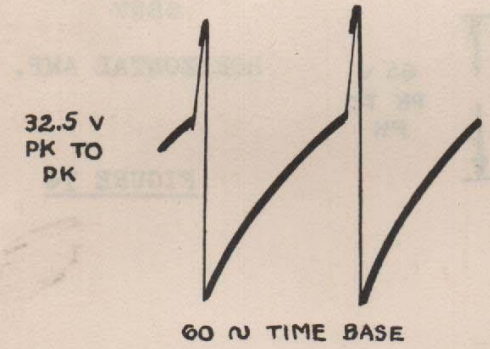
FIGURE 15



PIN 5
6SN7

VERTICAL OSC.

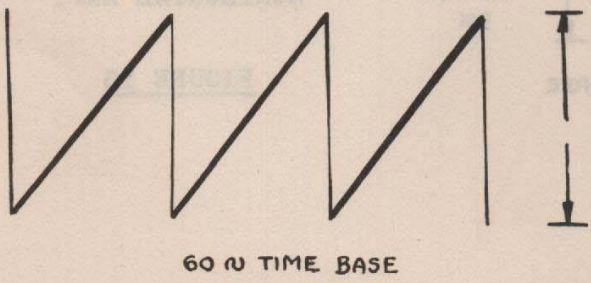
FIGURE 16



PIN 1 6SN7
OR 5 (6N7)

VERTICAL OSC.

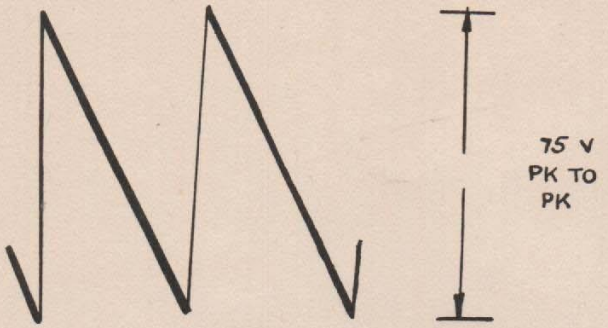
FIGURE 17



PIN 4
6SN7

VERTICAL AMP.

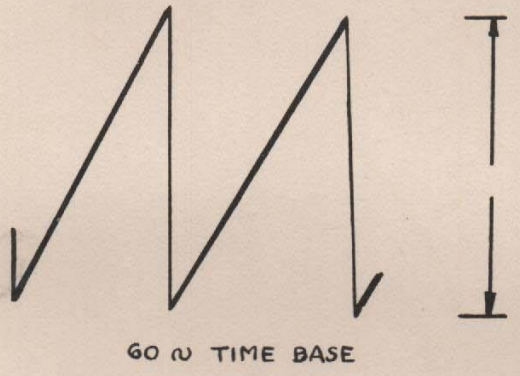
FIGURE 18



PIN 5
6SN7

VERTICAL AMP.

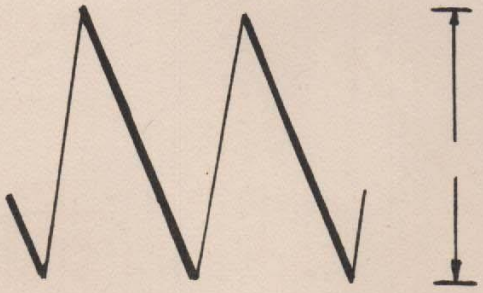
FIGURE 19



PIN 2
6SN7

VERTICAL AMP.

FIGURE 20



PIN 1
6SN7

VERTICAL AMP.

FIGURE 21

TRANSVISION 12" TELEVISION RECEIVER

Oscillograms

Figure 1

The wave form resulting after detection, or separation of picture and pulse information from the video I.F. carrier, appears as in Figure #1. The non-symmetrical waves at both right and left are picture information. The square wave surmounted by a pulse, seen in the center, is a composite blanking pulse and sync pulse. Thus, portions of two lines of picture with a blanking and a sync pulse are shown.

This voltage is R.C. coupled to the grid pin #4 of 6AG7, socket 7, and therefore must appear there also.

Figure 2

The second diode (pins #7 and #1 of the 6AL5, socket #10) is the D.C. restorer. An average voltage, proportional to the overall signal, is developed in its plate resistor and fed directly to the grid of the kinescope. Therefore the voltage form acting at the kinescope is proportional to that acting at pin #1 of the 6AL5 and appearing in Figure 2.

Figure 3

The A.C. picture signal applied to the D.C. restorer has such polarity that only the pulses cause the 6AL5 to conduct. If a resistor is inserted between the plate (pin #7) and ground, a voltage pulse is developed over it proportional to that applied to the cathode. In this way the sync pulses are "clipped" from the picture signal. Figure 3 shows the oscillogram of a clipped pulse found at pin #7 of the 6AL5 socket 10.

Figure 4

The oscillogram in Figure 4 (pin 5, 6SN7, socket 8) shows amplification and inversion of the sync pulse after one half of the 6SN7, socket 8 has acted on it.

Figure 5

The voltage at pin 5, 6SN7 socket 8 is R.C. coupled to pin #1 of same tube therefore a pulse of the same amplitude must appear there as shown in the Oscillogram of Figure 5.

Figure 6

The oscillogram gotten at pin #2 of 6SN7, socket 8, shows still further amplication of the pulse and another inversion.

Figure 7

Figure 7 shows the oscillogram picked off at pin #2 of socket 9 which is the plate of the third sync. amplifier. Amplification to the order of 70 volts appears here along with the attendant inversion of the pulse.

Figure 8

The voltage acting at pin #2 of socket 9 is coupled to the grid (pin #4 of 6SN7 socket 9) of the cathode follower section of socket 9. Figure 8 shows the pulse found at pin #4.

Figure 9

The voltage output of a cathode follower may equal, but cannot exceed, its imput and the polarity remains unchanged. Therefore the oscillogram taken at the cathode (pin #6, 6SN7, socket 9) as seen in Figure 9, is substantially the same as that of Figure 8.

Figure 10

The Horizontal pulses may be taken from the cathode follower output without further ado. Figure 10 is the Oscillogram of the horizontal pulse which may be tapped off at the junction of R16 and R20 as it appears on a time base of 60 c.p.s.

Figure 11

If the time base frequency is stepped up to the order of 5000 c.p.s. the horizontal pulse appears as in Figure 11.

Figure 12

When the horizontal pulse is fed the R.C. peaker or differentiator composed of Cmm and R18 the pulse is acted on so as to appear as in Figure 12. These are the pulses which trip the horizontal blocking oscillator synchronously with the transmitter counterpart.

Figure 13

The oscillogram of Figure 13 (pin #4, 6SN7, socket 6) shows the composite voltage acting at the grid of the horizontal blocking oscillator. The exponentially curved portion is due entirely to independent blocking oscillator action, always below cutoff, and the "pips" are the horizontal tripping pulses which drive the tube to conduction. Since pins #4 and #1 are tied together the same form of voltage acts at pin #1.

Figure 14

The oscillogram of Figure 14 shows the voltage found at pin #8 of the 6BG6G and results from supplying the screen voltage over the damping tube.

Figure 15

The varying voltage applied to the deflection coils is likely to set up oscillations due to the unavoidable capacity shunting the coils. Therefore, some "damping" is necessary. The 6X5GT and a parallel resistor are shunted across the coil thus providing an alternately high and low impedance shunt, thereby damping any oscillations that may occur. The oscillogram of Figure 15 (pin 3, 6S5GT, socket 3) showing the damping effect of this combination.

Figure 16

The rectifying action of the 6X5GT causes the pulsations seen in the oscillogram of Figure 16 to exist at pin #8 of the 6X5GT socket 3.

Figure 17

The voltage found at pin #3 of the 6BG6G is shown in the oscillogram of Figure 17. The pulsations at pin 3 of the 6X5GT are attenuated over the 10K resistor and thus appear as seen.

Figure 18

The vertical pulse component of the cathode follower output are low frequency pulses. The integrating network found across the cathode follower output discriminates in favor of these pulses and thus they are separated and found at lug 6-TS-C as shown in Figure 18.

Figure 19.

The voltage form at the grid (pin #4) of the blocking oscillator half of the 6SN7 socket #2 is shown in Figure 19. This is a composite wave form, the exponentially curved portion of which is due to the blocking oscillator action. The "pip" is due to the addition of the vertical sync pulse which trips the oscillator synchronously with its counterpart at the transmitter.

Figure 20

In order that the electron beam be deflected properly a sawtooth of current must be passed thru the deflecting coils. The voltage form required over the deflection coil, in order to produce such a current is that of Figure 20 which appears at pin #2 of the 6SN7, socket #2 in the vertical deflection circuit. Likewise a similar form will appear at the corresponding point in the Horizontal circuit.

Figure 21

The voltage of Figure 20 must be amplified in order to produce a current of sufficient magnitude to swing the beam of the kinescope. Therefore when acted upon by the amplifier, 6SN7, socket #1, it will be as seen in the oscillogram of Figure 21-inverted and amplified.

Pin 4-6AG7 Video Amplifier
Pin 5-6AL5 x-10
Video Detector

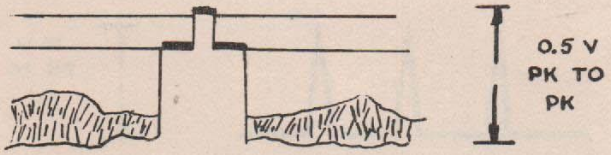


Fig. 1

60 ∿ TIME BASE

Pin 1-6AL5 D.C. Restorer

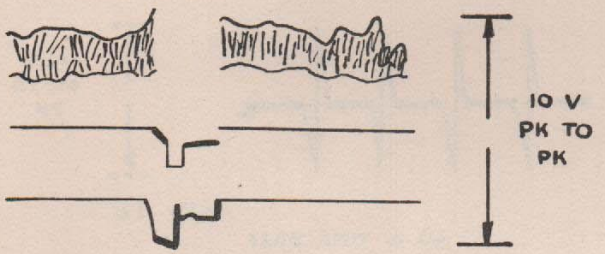


Fig. 2

60 ∿ TIME BASE

Pin 7-6AL5 X-10

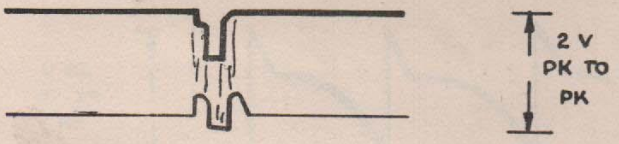


Fig. 3

60 ∿ TIME BASE

Pin 5-6SN7 X-8
Sync Amplifier

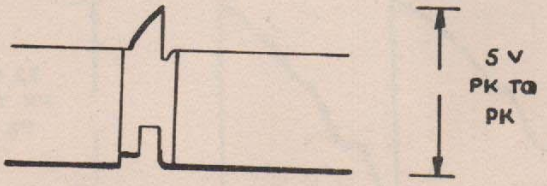


Fig. 4

60 ∿ TIME BASE

Pin 1-6SN7 X-8
Sync Amplifier

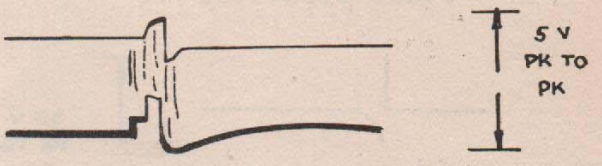


Fig. 5

60 ∿ TIME BASE

Pin 2-6SN7 X-8
Sync Amplifier

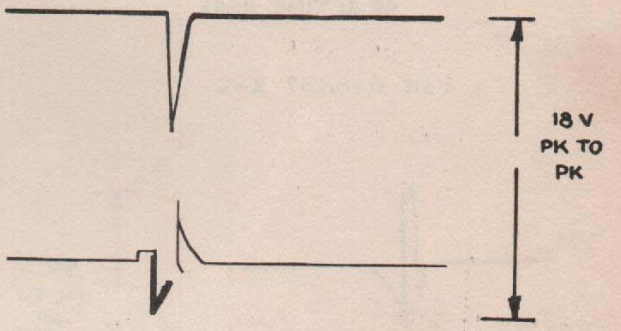


Fig. 6

60 ∿ TIME BASE

Pin 2-6SN7 X-9
Sync Amplifier

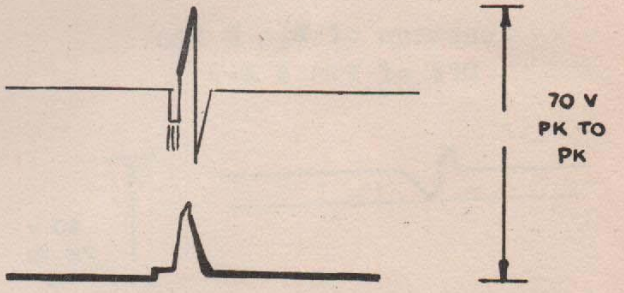


Fig. 7

60 ∿ TIME BASE

OSCILLOGRAMS

TRANSVISION 12"
TELEVISION KIT

Pin 4-6SN7 X-9
Cathode Follower
Pulse Separator

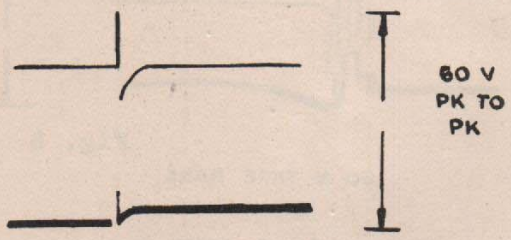


Fig. 8

60 ∿ TIME BASE

Pin 6-6SN7 X-9

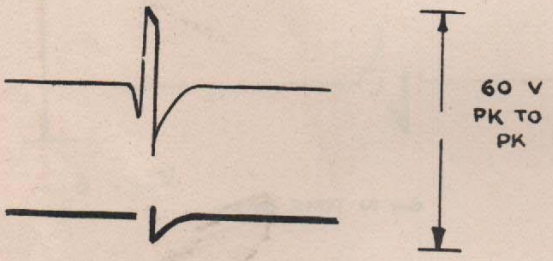


Fig. 9

60 ∿ TIME BASE

Junction of R_{16} & R_{20}
Off of Pin 6 X-9

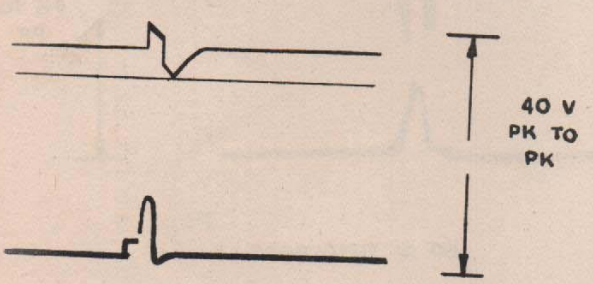


Fig. 10

60 ∿ TIME BASE

Horiz. Sync Pulse
at Junction of R_{16} & R_{20}
Off of Pin 6 X-9

Fig. 11

5000 ∿ TIME BASE

Horiz. Sync Pulse
at Junction of R_{18} & C_{mm}

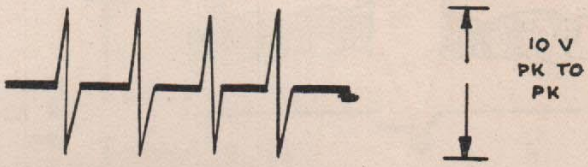


Fig. 12

60 ∿ TIME BASE

Pin 4-6SN7 X-6 Horiz. Osc.

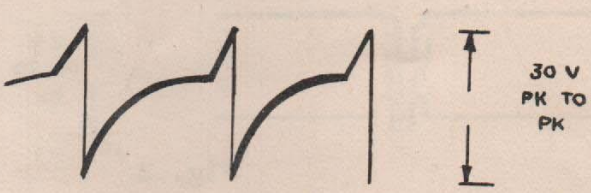


Fig. 13

60 ∿ TIME BASE

Pin 8-6BG6B X-4

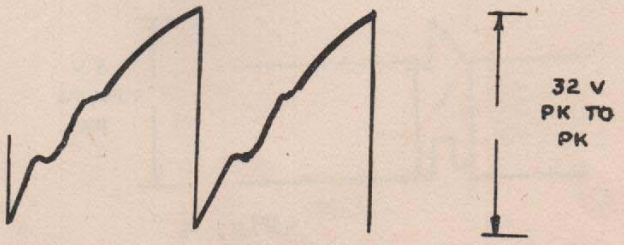


Fig. 14

60 ∿ TIME BASE

Pin 3-6X5GT X-3
Damping Tube

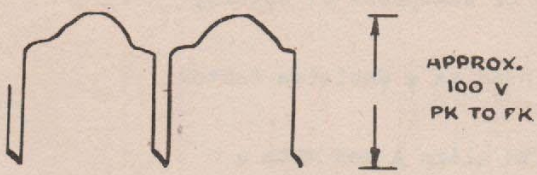


Fig. 15

60 ∿ TIME BASE

Pin 8-6X5GT X-3
Damping Tube

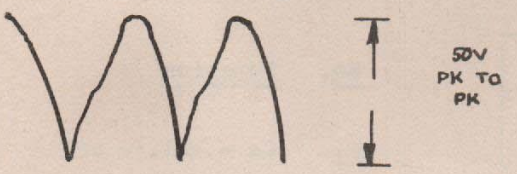


Fig. 16

60 ∿ TIME BASE

Pin 3-6BG6G
Horiz. Defl. Voltage Amp.

Fig. 17

60 ∿ TIME BASE

Vert. Sync Pulse at Lug 6 TS-C
Feeding into Yellow Lead
of Vert. Osc. Trans.

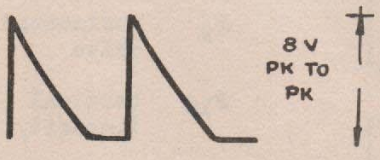


Fig. 18

60 ∿ TIME BASE

Pin 4-6SN7 X-2
Vert. Osc.

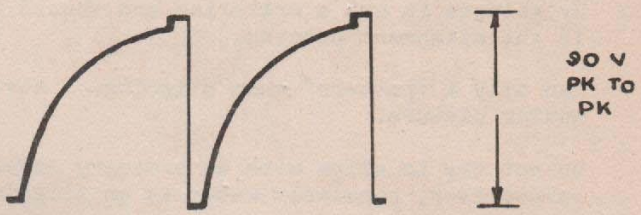


Fig. 19

60 ∿ TIME BASE

Pin 2-6SN7 X-2
Vert. Osc.

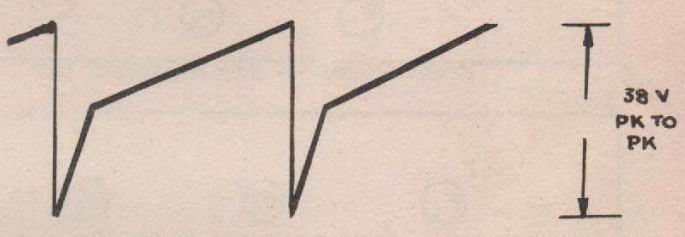


Fig. 20

60 ∿ TIME BASE

Pin 5-6SN7 X-1
Vert. Defl. Voltage Amp.

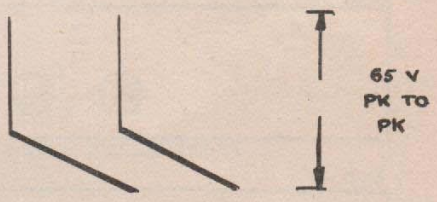


Fig. 21

60 ∿ TIME BASE

ALIGNMENT NOTES

Twelve Inch TRANSVISION Television Receiver

The criteria for a good picture are: definition or sharpness of detail, contrast and symmetry.

Brightness is not a criterion and should not be used as a decisive factor in the alignment process.

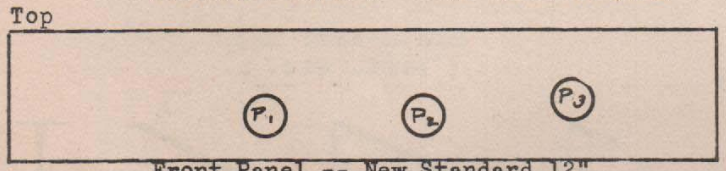
Use only a "pattern" when aligning. Never try to align a set with a moving picture.

Do not try to align with an ordinary screwdriver. Always use an insulated screwdriver, popularly known as an aligning tool.

If turning set on for first time, check all controls, to be sure none of them is advanced further than half-way.

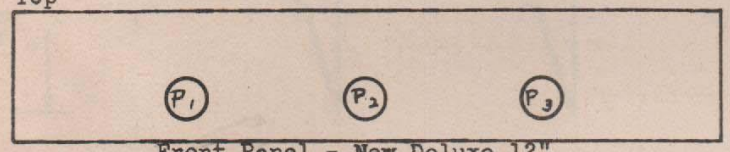
CONTROL LOCATION -- All views outside

Top



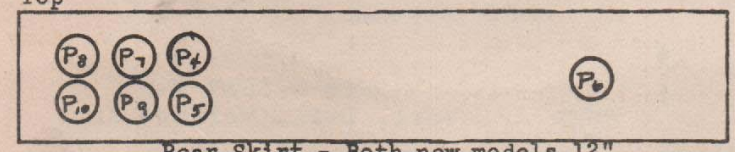
Front Panel -- New Standard 12"

Top



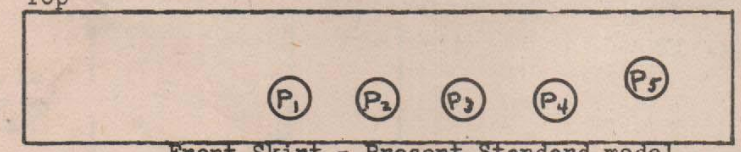
Front Panel - New Deluxe 12"

Top



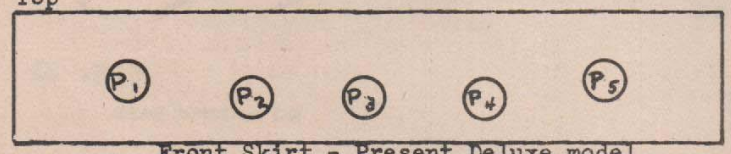
Rear Skirt - Both new models 12"

Top



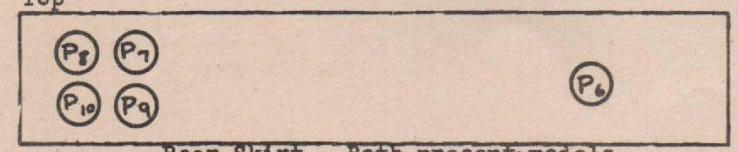
Front Skirt - Present Standard model

Top



Front Skirt - Present Deluxe model

Top



Rear Skirt - Both present models

No.	Function
P_1	On - vol. - off
P_2	Contrast
P_3	Brightness (sweep off deluxe model)
P_4	Vertical hold
P_5	Horizontal hold
P_6	Focus
P_7	Horizontal linearity
P_8	Vertical height
P_9	Horizontal drive
P_{10}	Vertical linearity

ALIGNMENT PROCEDURE

Twelve Inch TRANSVISION Television Kit

Visual Alignment

Caution: If turning set on for first time check all controls -- front and rear skirt -- to be sure they are not more than half advanced in the clockwise direction, with the exception of the volume control, which may be at "off", and the brightness control, which may be at minimum, counter-clockwise position.

Note: On the deluxe model, the brightness control also operates a switch at the maximum counter-clockwise end. Be sure that this is not at "off" for this step.

Turn set on and allow it to warm up for twenty to thirty seconds. If turning set on for first time let it warm fifteen or twenty minutes in order to insure "forming" of the electrolytic condensers. Focusing may be adversely affected otherwise.

Adjust brightness control (P_3) for a dim raster.

Set station selector to desired channel -- the strongest and most reliable station in your locality should be used.

Advance the contrast control (P_2) until a picture or horizontal streaks appear.

If picture frame is in motion or if it tears or shears, synchronize it by adjusting the horizontal hold (P_5) and/or vertical hold (P_4).

Adjust the focus control (P_6) for best focus.

Adjust the fine tuner (sound sensitivity control on standard model, or the "tuner" on deluxe model) for best picture.

After picture has been "locked", adjust the height control (P_8) -- this determines average height of picture -- for about $7\frac{1}{2}$", and the width control (P_9) -- which determines the average width of picture -- for about ten inches.

Note: For other picture sizes the height to width ratio - three to four - should be maintained.

The vertical linearity control (P_{10}) adjusts the upper vertical section of the picture. Adjust it until the top vertical wedge is as long as the bottom wedge.

The horizontal linearity control (P_7), on the rear skirt of the chassis, adjusts the left edge of the picture, and the horizontal linearity slug (if present it is in the right front corner of top of chassis) controls the right edge of picture.

Note: I. Some sets do not have the "variable slug" horizontal linearity control. Instead a fixed inductance is used which should not be touched.
II. If the slug is present its normal position is nearly all the way in.

Again check focus control (P_6) for best definition of the vertical wedges.

The adjustment now about to be made is very critical. The best performance of the set is highly dependent on it. Use extreme care in the observance of details.

If the brightness of the pattern has become high (through a strong signal or for any other reason), retard the brightness control (P_3) somewhat.

Now carefully tune the sound sensitivity trimmer (standard model) or tuner (deluxe model) for the brightest picture. In the case of the standard model, observe the position of the sound sensitivity trimmer plates and turn the control slowly in the direction of increased opening (decreasing capacity) to a position where the picture has become noticeably dimmer.

Observe carefully the resolution of the vertical wedges, and other fine detail. In the case of the deluxe model, rotate the tuner in the clockwise direction very slowly, meanwhile watching for a noticeable dimming of the picture accompanied by sharp resolution of the vertical wedge. In either case, when the sharpest detail has been achieved, desist from further tuning and do not again adjust either the sound sensitivity control or the tuner until all other adjustments have been made.

Alignment of Sound I.F. and Detector Transformers

Turn volume control full on. A slight hiss only may be heard. Adjust bottom slug of "can" #317 (sound detector transformer) for maximum sound output. A dip on either side of "peak" indicates proper operation.

Connect a high d.c. voltmeter (10,000 to 20,000 ohms per volt) between the automatic volume control (lug #2TS-R is easily accessible) and ground.

Adjust trap #2, top of "can" #175, for maximum deflection of meter.

Adjust first the top and secondly the bottom slug of "can" #318 for maximum deflection of meter.

Recheck adjustment of bottom slug of sound detection transformer "can" #317, at somewhat low audibility. This is a critical adjustment.

Tighten trimmer of video I.F. trap #3, "can" #174, and back off slowly for best picture. Look for a decrease, and final elimination, of sound bars, dark streaks and striations from the picture. This should be done at high contrast. Rock the contrast control during this operation.

To use a signal generator, set for the sound I.F. frequency, approximately 21.9 megacycles, and attach to grid of first sound I.F. amplifier tube (6AC7-socket X-13).

Adjust frequency for maximum sound automatic volume control voltage. Tune trap #3 "can" #174 for minimum bars on the screen.

Adjust trap #1 (new deluxe model only), loosen trap #1 trimmer all the way, then tighten slowly until picture begins to dim; back off slightly for best picture.

Balancing Coil Adjustment

On the standard model there is one balancing coil located near left front of the kinescope. Adjust this for best picture. This is a critical adjustment.

On the new deluxe model there are two balancing coils. One is at right center of the tuner plate and the other near left front of kinescope. Treat exactly as above.

After alignment of set is complete, the bottom cover should be installed, using the self-tapping screws.

TEST PATTERNS

As a further aid in diagnosing television receiver troubles, a series of photographs of NBC test patterns is included, with the permission of Radio Corporation of America.

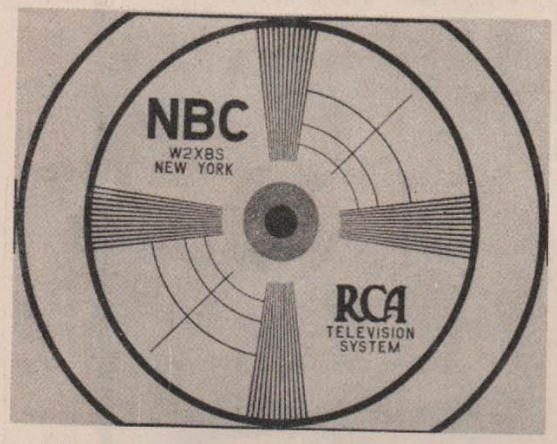


Fig. 1 - Normal Test Pattern

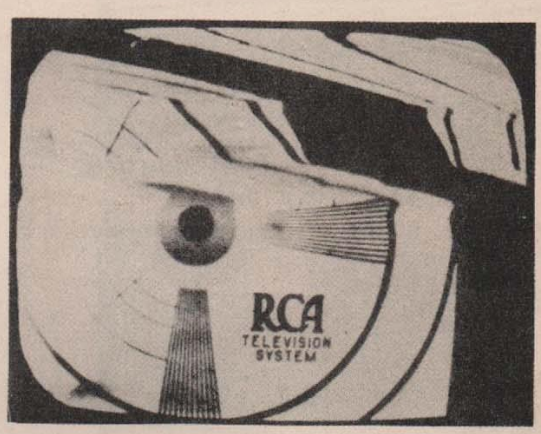


Fig. 2 - Horizontal Hold Control Incorrectly Set

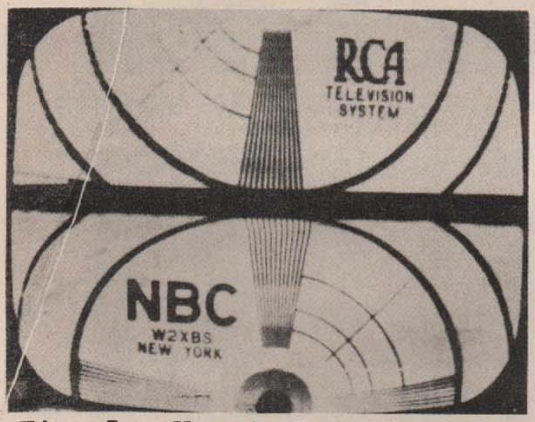


Fig. 3 - Vertical Hold Control Incorrectly Set

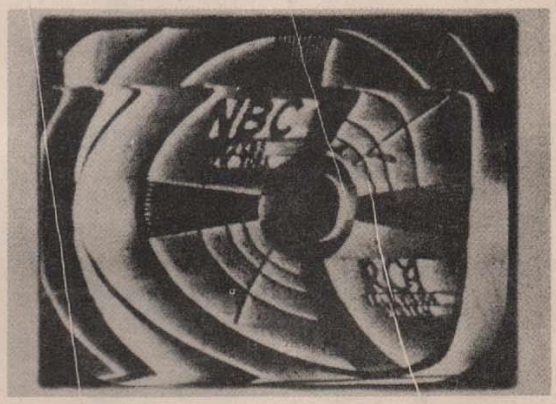


Fig. 4 - Input Signal Too Strong

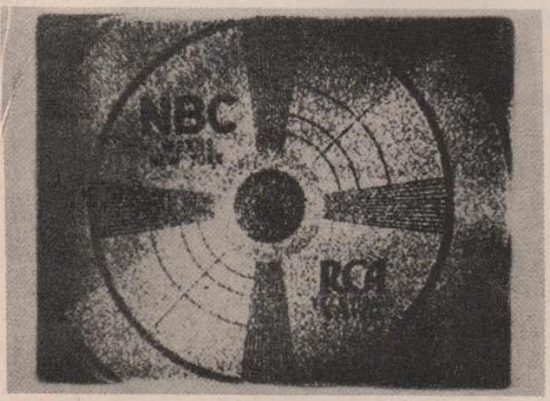


Fig. 5 - Input Signal Too Weak

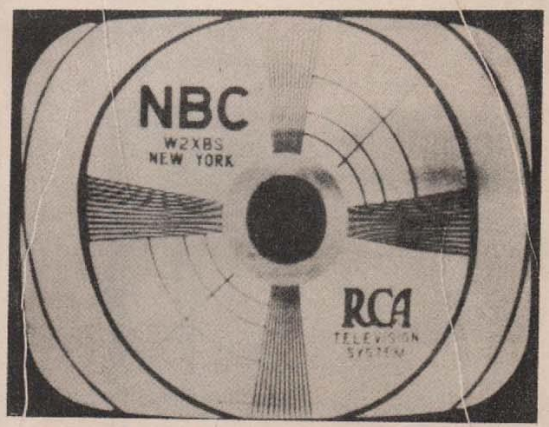


Fig. 6 - Improper Interlacing

By courtesy of RCA

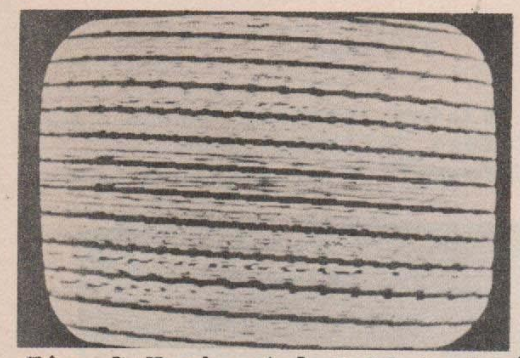


Fig. 7-Horizontal Hold Control Incorrectly Set

Fig. 8-Sound Modulation in Picture

Fig. 9-Vertical Linearity Control Incorrectly Set

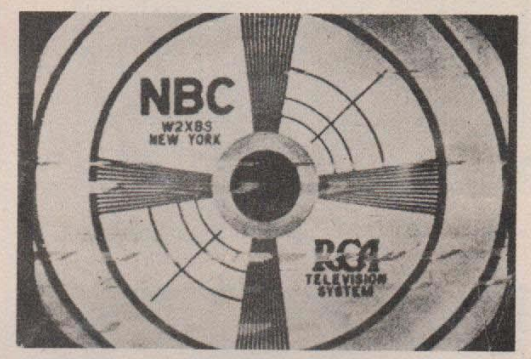


Fig. 10-Excessive Auto Ignition Interference

Fig. 11-Excessive Diathermy Interference

Fig. 12-Excessive Ripple in Horizontal Deflection

Fig. 13-Phase Shift and Loss of Low Video Frequencies

Fig. 14-Loss of High Video Frequencies

By Courtesy of RCA

ANTENNAS AND ANTENNA INSTALLATION

For the most effective performance of a television set, it is important that considerable attention be focused on the antenna and its installation.

The quasi-optical characteristics of the radio wave of television frequency result in reflection and interference problems which, in ordinary radio reception, are of little consequence. Large buildings or obstructions in the direct path of the wave may cast a radio "shadow" which makes reception difficult. Tall structures -- or sometimes even the surface of the earth -- may reflect the wave so that portions of it reach the receiving antenna via multiple paths. Each reflection is capable of producing a replica or "ghost" of the received image in positive or negative phase. In the proper installation of a television antenna we must devote our attention, therefore, to the reception of a maximum signal and to the elimination of ghosts.

Installation

1. Align the television set carefully before attempting to install or adjust the antenna. Misalignment of the I.F. transformers -- particularly trap #3 of the TRANSVISION set -- can cause the introduction of ghost images. Only by starting with a set capable of producing a satisfactory picture can an adequate criterion be established for proper installation.

2. Set the contrast control as low as compatible with an acceptable picture. Best results are obtainable from a test pattern rather than from a changing image.

3. Select the highest accessible site for the antenna. This will tend to:

   A. maximize signal strength, and
   B. minimize ignition interference from passing traffic.

4. If the antenna site is too remote for easy vocal communication, set up a portable, battery operated communication system between the technician at the controls of the set and the assistant at the antenna site.

5. Set up a portable antenna at the selected site, with lead-in attached to the antenna at one end and the antenna posts of the set at the other end, and have the assistant "probe" the location by walking around with the antenna until the best results are found at the set. Have him rotate the antenna slowly in a horizontal plane for optimum orientation. Normally this is broadside to a transmitting station. Where more than one transmitter is operative in a given area, a compromise orientation must be effected. The weakest station should be favored. Have the antenna rotated slowly in a vertical plane until the best picture appears at the set. This will insure optimum orientation in the event of polarization of the incoming wave. Where several widely separated stations are operating in a given area it may be best to install more than one antenna.

6. If the received signal is weak, as indicated by the appearance of "snow" in the picture, or if the picture is "tearing" due to excessive ignition or other outside interference, elevate the antenna still further. This may usually be done by adding lengths of pipe to the mast.

7. The addition of a reflector will further improve both signal strength and antenna directivity. The reflector is easily attachable to the antenna and is purchasable at low cost from TRANSVISION. It is suggested that a reflector be used in any area further than ten miles from the transmitter.

8. Install the antenna permanently. It is always advisable to reinforce it by the use of guy wires. Holes in the mast are provided for this purpose.

9. Do not allow the lead-in wire to rest against any metal surface. Use well insulated "stand-offs".

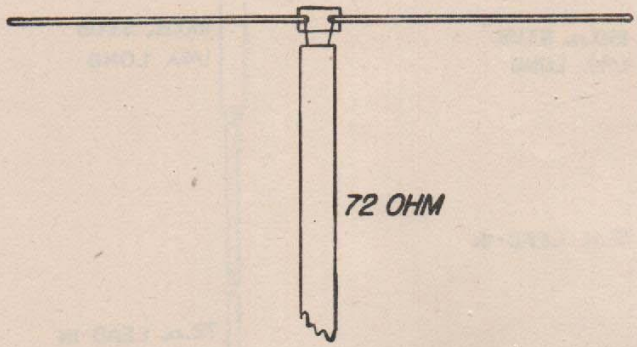
Antenna Matching

A problem of primary importance in television reception is that of matching the antenna to the input impedance of the first stage. This is required so that maximum energy may be passed on to the receiver where various factors, economic, technical and productional, demand that the input energy be as great as practicable.

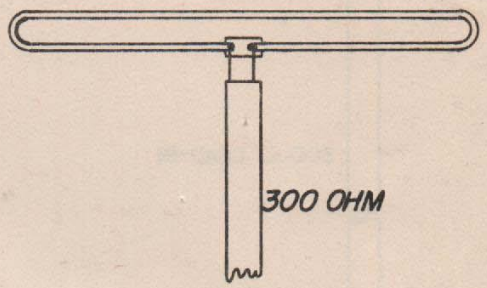
Antennas have been developed, as a result of considerable research, to present to the receiver an impedance of 72 or 300 ohms. Since some sort of connection must exist between the antenna and the receiver, parallel wire and coaxial transmission lines of 72 and 300 ohms have been designed. The input impedance of receivers has also been designed to be either 72 or 300 ohms. The TRANSVISION Deluxe 10", 12", or 15" kit has an input impedance of 72 ohms. The TRANSVISION Standard 7", 10", 12" or 15" kit has an input impedance of 300 ohms. It is now readily seen that various combinations of antenna, lead-in and receiver input impedance are possible. Any two of these elements may be matched by including between them a quarter wave-length matching section of 150 ohm impedance. Ordinary line cord forty inches long is satisfactory.

Naturally, where antenna, lead-in and receiver input impedances a re all equal, no matching problem exists.

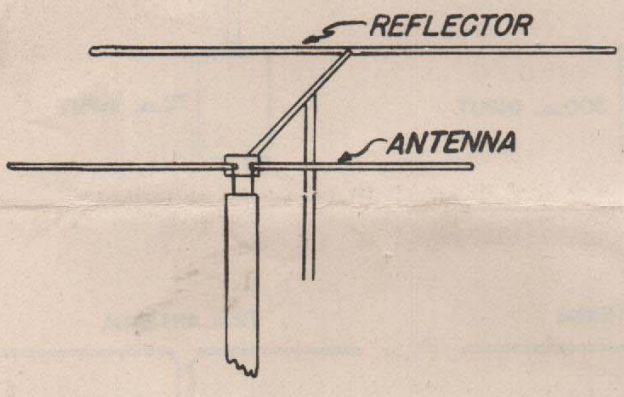
The accompanying diagrams indicate several of the possible combinations and show the proper manner of inserting the quarter wave-length matching sections. Where overly long lead-in is required, or interference problems are severe, coaxial cable may be used. For other applications parallel wire lead-in is quite satisfactory.



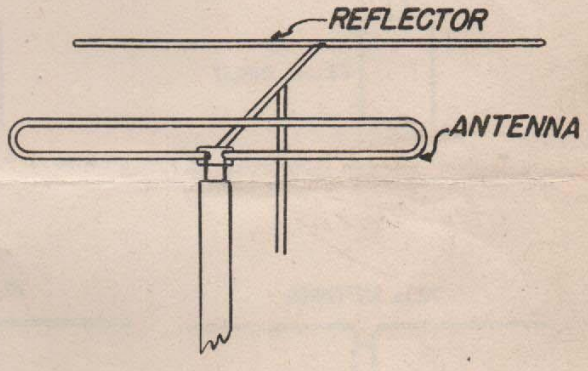
72 OHM SINGLE DIPOLE ANTENNA



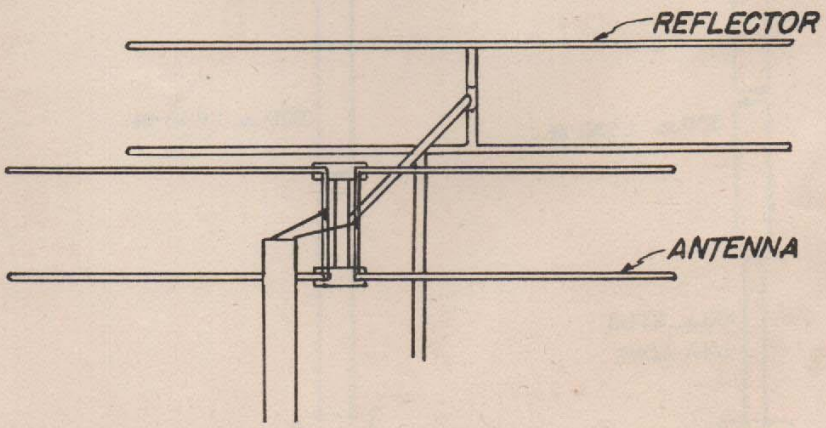
300 OHM FOLDED DIPOLE



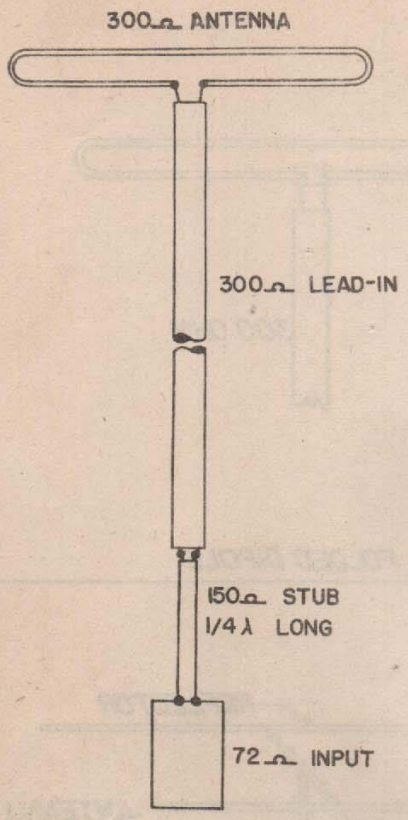
72 OHM SINGLE DIPOLE WITH REFLECTOR

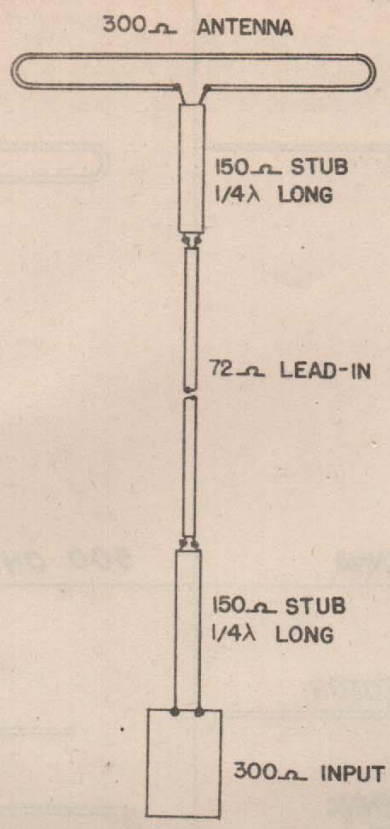


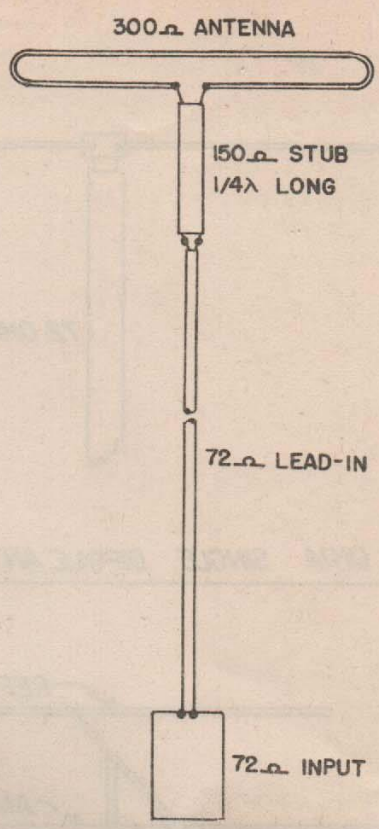
300 OHM FOLDED DIPOLE WITH REFLECTOR

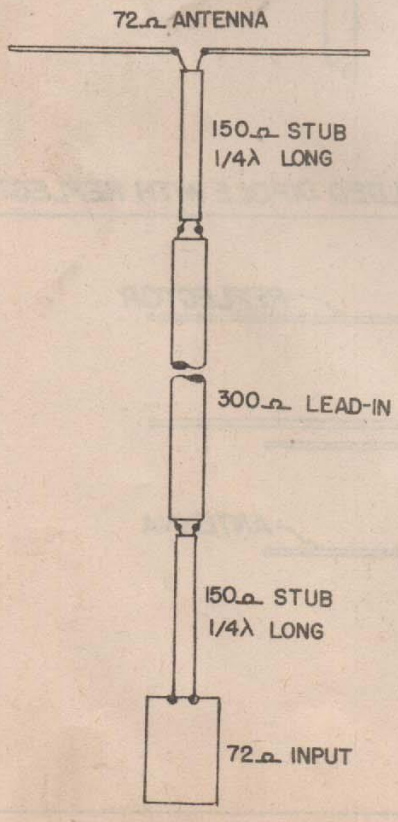


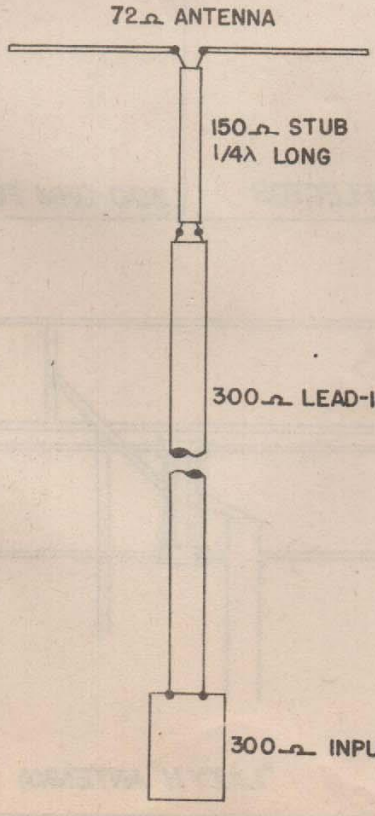
"LAZY H" ANTENNA

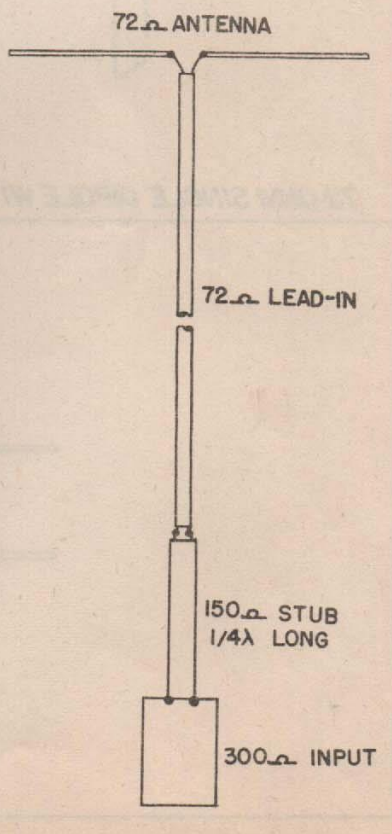

300Ω ANTENNA
300Ω LEAD-IN
150Ω STUB
1/4λ LONG
72Ω INPUT


300Ω ANTENNA
150Ω STUB
1/4λ LONG
72Ω LEAD-IN
150Ω STUB
1/4λ LONG
300Ω INPUT


300Ω ANTENNA
150Ω STUB
1/4λ LONG
72Ω LEAD-IN
72Ω INPUT


72Ω ANTENNA
150Ω STUB
1/4λ LONG
300Ω LEAD-IN
150Ω STUB
1/4λ LONG
72Ω INPUT


72Ω ANTENNA
150Ω STUB
1/4λ LONG
300Ω LEAD-IN
300Ω INPUT


72Ω ANTENNA
72Ω LEAD-IN
150Ω STUB
1/4λ LONG
300Ω INPUT