TRANSVISION, INC.

MODEL 7" KIT, EARLY, LATE

SERVICE NOTES

SEVEN INCH KIT

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 circuit.[1]

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

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[1] In the revised 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.

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 triode 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. Tube 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 seven inch 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 shorting of 2 mmf. condenser on rear of switch.

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Symptom	Cure
Dead or weak oscillator	Check cathode resistor; it should be 39 K. 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.
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 centering control. Be certain that anode lead to the high voltage grid cap has good insulation and is not shorted.
2X2 does not 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.

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Symptom	Cure
High Voltage (continued)	
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.
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 tests 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 on 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 glass. This is normal.
Due to misalignment	See alignment instructions, Charts 7 & 8.

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Sympton	Cure
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 below. 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, Chart #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 and#10 on Diagram D of instructions.

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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. transformers #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 a 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.

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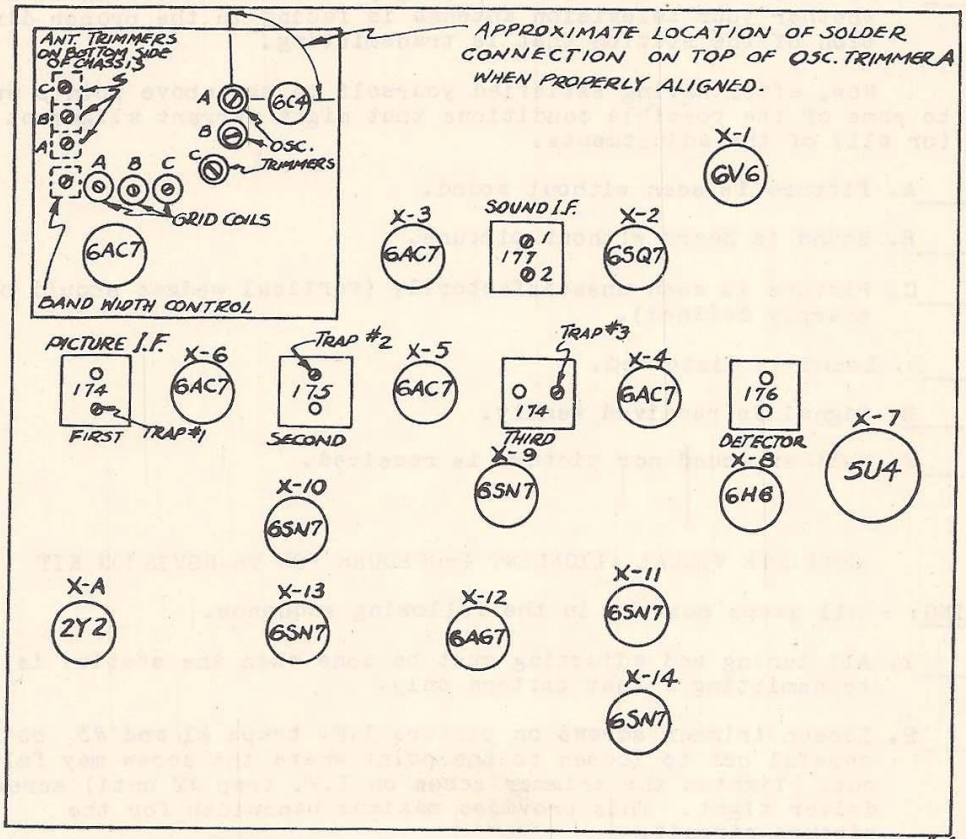

FIG. #1.

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. Picture is 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 trimmer 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 on 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

_____4. (cont.) 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 ofthe 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.

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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 interference 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.

For test patterns see back of Manual

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HUM MODULATION IN THE PICTURE

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 resistors 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%.

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SERVICING INFORMATION FOR THE NEW SYNCHRONIZING CIRCUIT

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.

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LINEARITY ADJUSTMENTS

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.

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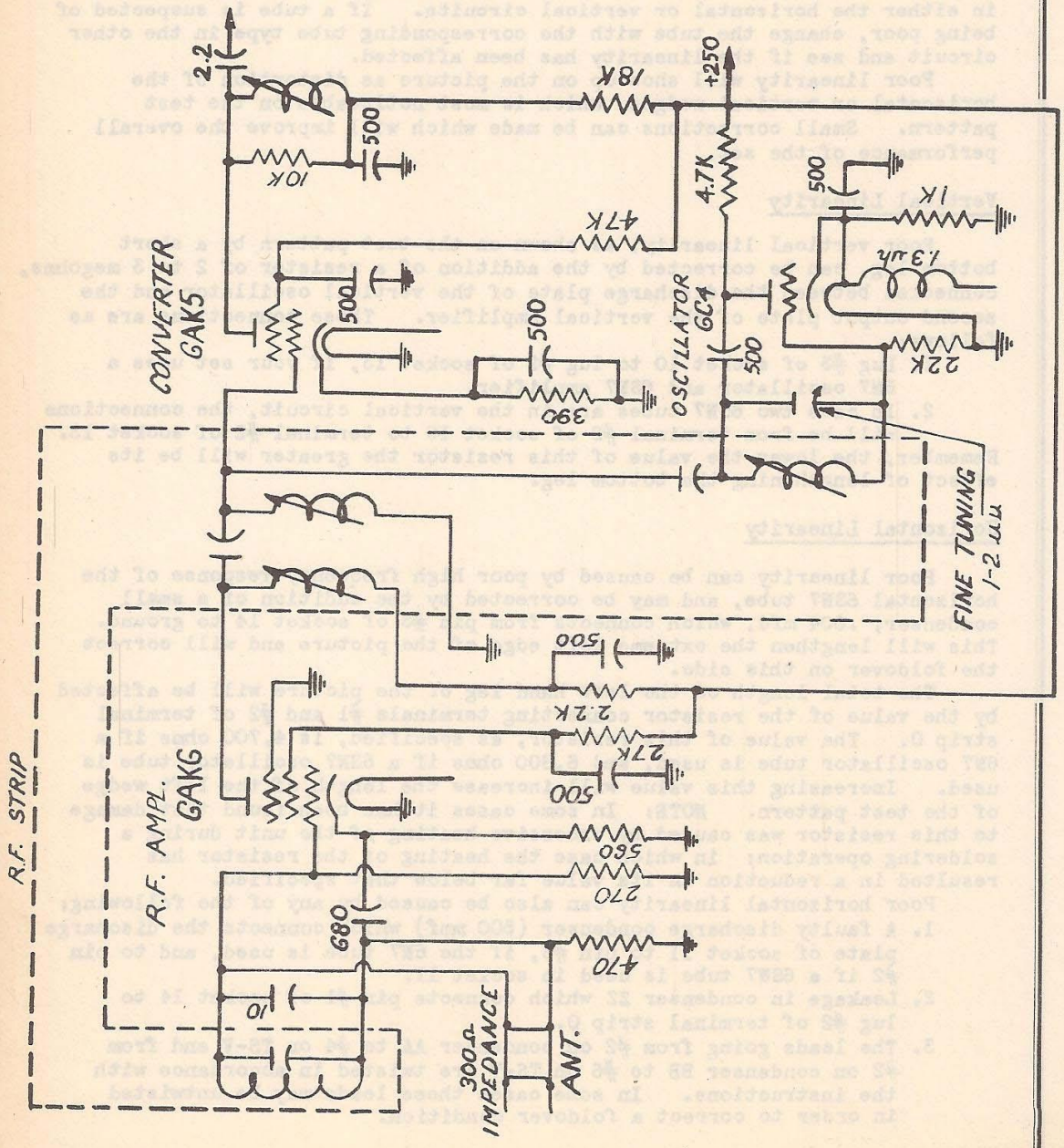


VOLTAGE AND RESISTANCE READINGS (THESE READINGS WERE TAKEN ON A 20,000-OHM PER VOLT VOLTMETER) ALL READINGS ARE POSITIVE (+) UNLESS OTHERWISE SPECIFIED. ALL READINGS ARE TAKEN BETWEEN PIN SOCKET AND CHASSIS (GROUND) WITH ALL TUBES IN SOCKETS AND VOLUME AND CONTRAST CONTROLS TURNED FULLY ON. ALL READINGS MAY VARY BY PLUS OR MINUS 10%.	Tube	Pin Numbers 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 megs	0	110,000	0	30,000	ohms
	6AC7 (X-6)	0	0	0	0	7	310	6AC	375	volts
	1st I.F. 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	-3	.2	0	NC	6AC	7½	volts
	video detector	0	0	1 meg	10,000	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 megs	0	80,000	0	30,000	ohms
	6AC7 (X-9)	0	0	0	-1.2	0	21	6AC	22	volts
	sync separator	0	0	0	2.2 megs	0	20,000	0	12,000	ohms
	6N7 (X-10)	0	0	100	-15	0	60	6AC	1.7	volts
	vert. sweep osc.	0	0	750,000	600,000	100,000	280,000	0	500	ohms
	6SN7 (X-13)	-1	175	4¼	0	225	9	6AC	0	volts
	vert. sweep amp.	2 megs	80,000	1,000	1.4 megs	90,000	3,500	0	0	ohms
	6N7 (X-11)	0	0	16	-.7	0	75	6AC	1.3	volts
	hor. sweep osc.	0	0	600,000	120,000	2,000	160,000	0	500	ohms
	6SN7 (X-14)	-3	210	4	-6	220	0	6AC	0	volts
	hor. sweep amp.	2 megs	90,000	1,100	2 megs	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) H.V. rectifier	10 megs	NC	NC	10 megs					volts
CHART #1	6AC7 (X-3)	0	0	0	0	1¼	200	6AC	350	volts
	audio detector	0	0	0	5 megs	100	90,000	0	40,000	ohms
	6SQ7 (X-2)	0	0	.7	.2	.2	100	6AC	0	volts
	detector	0	2 megs	3,000	500,000	500,000	500,000	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

VOLTAGE AND RESISTANCE READINGS

THESE READINGS WERE TAKEN ON A 20,000-OHM PER VOLT VOLTMETER, USING SIX 6SN7 TUBES IN ALL SWEEP CIRCUITS, ALSO A RATIO DETECTOR.

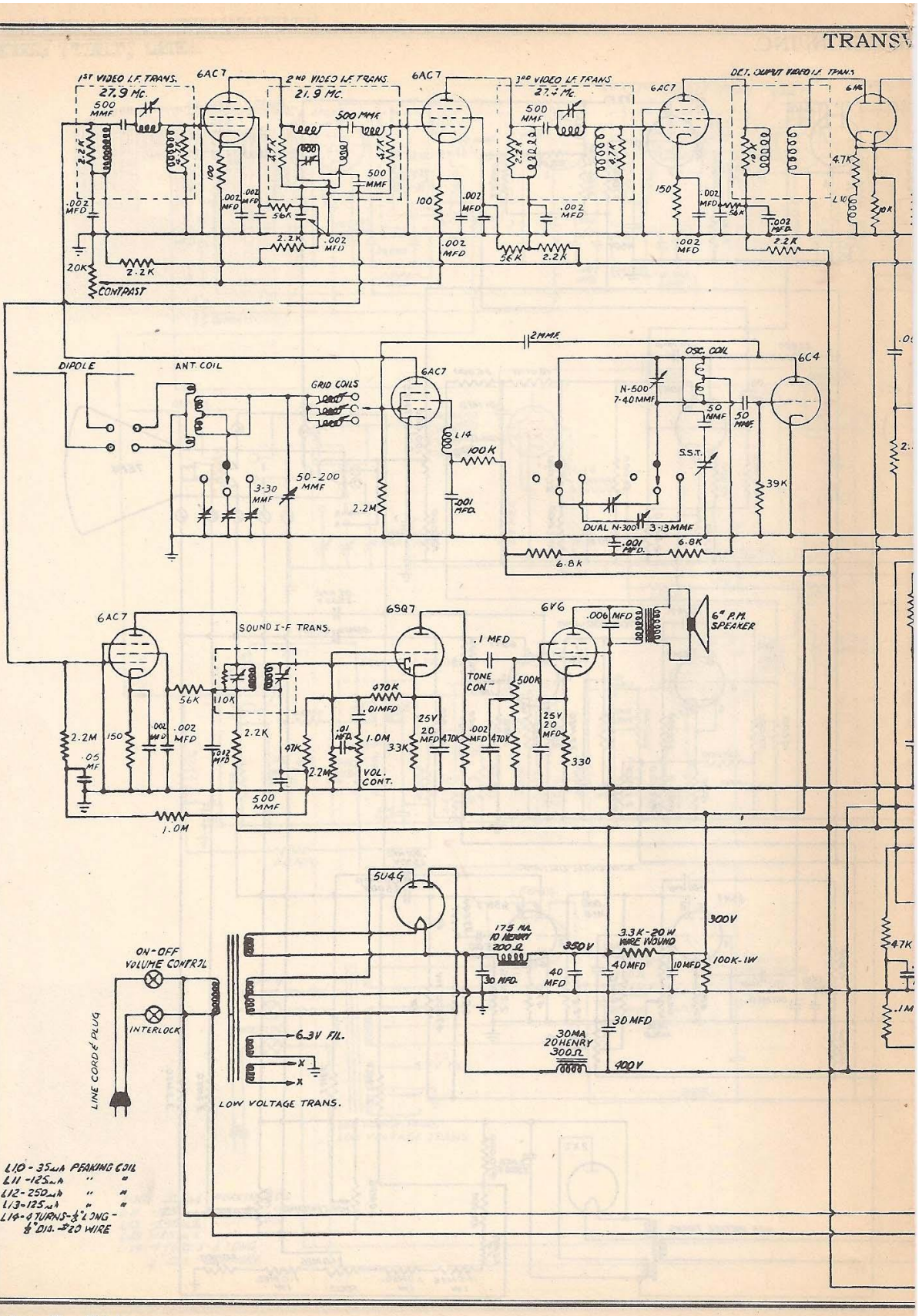
ALL READINGS ARE POSITIVE (+) UNLESS OTHERWISE SPECIFIED.

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.

CHART #2

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) sync	-½	60	-½	360	15	25	6AC	0	volts
separator	2 meg.	60,000	42,000	3 meg.	70,000	10,000	0	0	ohms
6SN7 (X-10) vert. sweep	-5	25	2	0	45	2	6AC	0	volts
oscillator	450,000	2 meg.	900	10,000	220,000	1,000	0	0	ohms
6SN7 (X-13) vert. sweep	-1½	160	160	.1	150	5	6AC	0	volts
amp.	2 meg.	150,000	150,000	2.2 meg.	150,000	2,200	0	0	ohms
6SN7 (X-11) hor.sweep	-1½	18	1½	0	50	1½	6AC	0	volts
oscillator	60,000	1½ meg.	500	0	200,000	500	0	0	ohms
6SN7 (X-14) hor. sweep	6½	250	1½	-5	200	0	6AC	0	volts
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	NC	NC	40,000	ohms
2X2 (X-A) h.v.									volts
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


TRANSV
1ST VIDEO I.F. TRANS.
27.9 MC.
6AC7
2ND VIDEO I.F. TRANS.
27.9 MC.
6AC7
3RD VIDEO I.F. TRANS.
27.9 MC.
6AC7
DET. OUTPUT VIDEO I.F. TRANS.
6H6
500 MMF
2.2K
4.7K
.002 MFD
56K
150
100
20K
CONTRAST
DIPOLE
ANT. COIL
GRID COILS
6AC7
2MMF.
OSC. COIL
6C4
N-500
7-40 MMF
50 MMF
S.S.T.
L14
100K
3-30 MMF
50-200 MMF
2.2M
.001 MFD.
39K
DUAL N-300
3-13 MMF
6.8K
6AC7
SOUND I-F TRANS.
6SQ7
6V6
.006 MFD
6" P.M. SPEAKER
.1 MFD
TONE CON-
500K
470K
.01MFD
25V 20 MFD
.05 MF
.01 MFD
1.0M
33K
VOL. CONT.
330
5U4G
175 MA.
10 HENRY
200Ω
350V
3.3K-20W WIRE WOUND
300V
40 MFD
10 MFD
100K-1W
30 MFD.
30MA
20HENRY
300Ω
400V
ON-OFF VOLUME CONTROL
INTERLOCK
LINE CORD & PLUG
6.3V FIL.
LOW VOLTAGE TRANS.
L10 - 35 uh PEAKING COIL
L11 - 125 uh " "
L12 - 250 uh " "
L13 - 125 uh " "
L14 - 4 TURNS - 3/4" LONG - 3/8" DIA. #20 WIRE

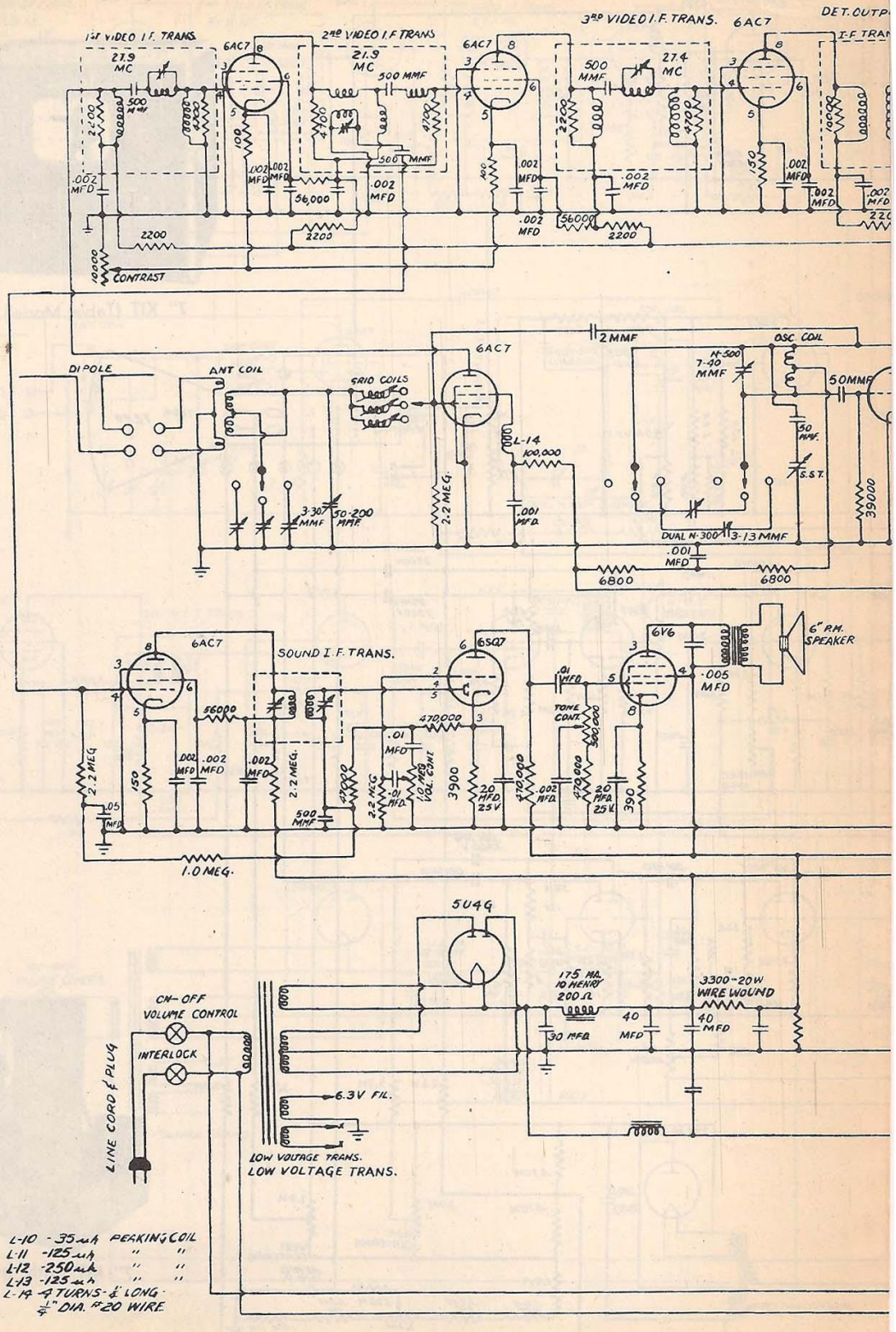
VISION, INC.

MODEL 7" KIT, EARLY

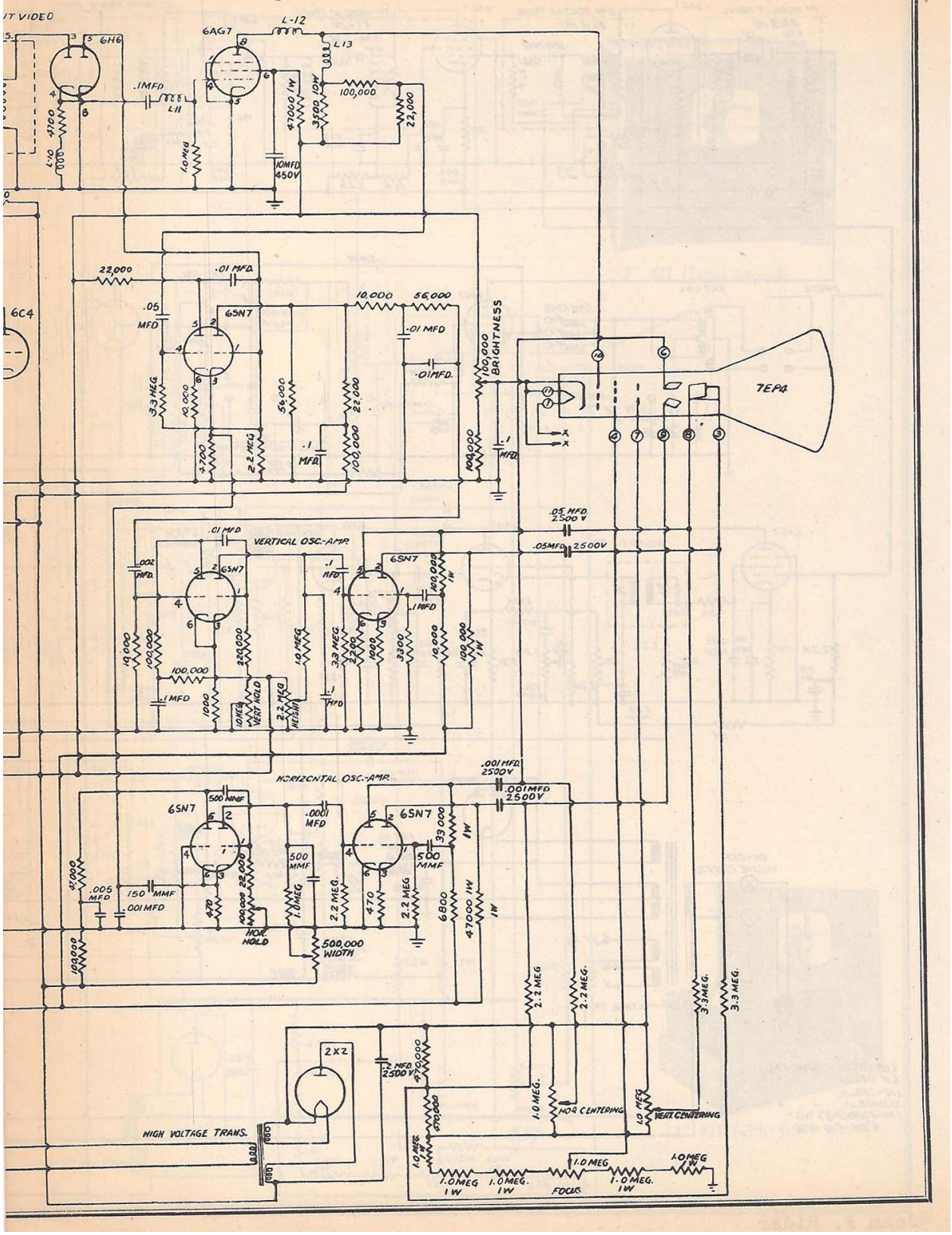
7" KIT (Table Model)

7" KIT (with front panel)

MODEL 7" KIT, LATE



L-10 - 35 mh PEAKING COIL
L-11 - 125 mh " "
L-12 - 250 mh " "
L-13 - 125 mh " "
L-14 - 4 TURNS - ¼" LONG - ¼" DIA. #20 WIRE


6H6
6AG7
L-12
L13
.1MFD
L11
47000 1W
3300 10W
100,000
22,000
10MFD 450V
22,000
.01 MFD
10,000
56,000
6SN7
.05 MFD
.01 MFD
.01MFD.
100,000 BRIGHTNESS
7EP4
.33MEG.
10,000
56,000
22,000
4700
2.2 MEG
.1 MFD
100,000
100,000
.1 MFD
.05 MFD 2500 V
.05MFD 2500V
.01 MFD
VERTICAL OSC.-AMP.
6SN7
.002 MFD.
.1 MFD
100,000 1W
.1 MFD
10,000
100,000
330,000
10 MEG.
33 MEG.
2200
1000
3300
10,000
100,000 1W
100,000
.1 MFD
1000
100,000 VERT HOLD
2.2 MEG HEIGHT
.1 MFD
.001 MFD 2500V
.001MFD 2500V
HORIZONTAL OSC.-AMP.
6SN7
500 MMF
.0001 MFD
6SN7
33,000 1W
500 MMF
47000
.005 MFD
150 MMF
.001 MFD
470
100,000
22,000
HOR. HOLD
1.0MEG.
2.2 MEG.
470
2.2 MEG.
6800
47000 1W
1W
100,000
500,000 WIDTH
2.2 MEG
2.2 MEG.
3.3 MEG.
3.3 MEG.
2X2
.2 MFD 2500V
470,000
1.0 MEG.
HOR CENTERING
1.0 MEG
VERT. CENTERING
470,000
1.0 MEG 1W
1.0 MEG 1W
1.0 MEG.
1.0 MEG 1W
FOCUS
1.0 MEG 1W
1.0 MEG 1W
HIGH VOLTAGE TRANS.
6300
6300

TRANSVISION, INC. MODEL 7" KIT, EARLY

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, .05 mfd,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

MODEL 7"KIT, EARLY — TRANSVISION, INC.

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	Celluiose 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
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, rosetts 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 #8-32x1¼"	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	Terrminal 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 (v-1010 CB)	1
166	Insulating plate (Z-1013M) 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 stage	1
176	I. F. transformer, 4th 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, INC. MODEL 7" KIT, LATE

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 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, 1meg. linear taper, $\frac{1}{4}$" shaft	1
34	Vert. posit. control, 1 meg. linear taper, $\frac{1}{4}$" shaft.	1
35	Focus control, 1 meg. linear taper, $\frac{1}{4}$" 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, $\frac{1}{2}$ Watt	2
42	Resistor,150 ohms, $\frac{1}{2}$ Watt	2
43	Resistor,390 ohms, $\frac{1}{2}$ Watt	1
44	Resistor,470 ohms, $\frac{1}{2}$ Watt	2
45	Resistor,1000 " $\frac{1}{2}$ Watt	2
46	Resistor,2200 " $\frac{1}{2}$ Watt	6
47	Resistor,3300 " $\frac{1}{2}$ Watt	1
48	Resistor,4700 " $\frac{1}{2}$ Watt	2
49	Resistor,6800 " $\frac{1}{2}$ Watt	1
50	Resistor,10,000" $\frac{1}{2}$ Watt	4
51	Resistor,22,000" $\frac{1}{2}$ Watt	4
53	Resistor,47,000" $\frac{1}{2}$ Watt	2
54	Resistor,56,000" $\frac{1}{2}$ Watt	6
56	Resistor,100,000 " $\frac{1}{2}$ Watt	6
57	Resistor,220,000 " $\frac{1}{2}$ "	1
59	Resistor,470,000 " $\frac{1}{2}$ "	5
60	Resistor, 1 meg $\frac{1}{2}$ "	4
61	Resistor, 2.2 meg $\frac{1}{2}$ "	7
62	Resistor, 3.3 meg $\frac{1}{2}$ "	5
63	Resistor,39,000ohm1 "	1
64	Resistor,47,000 " 1 "	2
66	Resistor,100,000" 1 "	3
67	Resistor, 1 meg 1 "	5
68	Resistor,3500 ohms10 "	1
69	Resistor,3300 ohms20 "	1
72	Capacitor,150mmf. 500 Volts mica	1
73	CCapacitor,500mmf. 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 vlt	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

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 1¼"	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, B2, 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
	7EP4 Cathode Ray Tube	
	Pretuned R.F. Unit	

Part No.	Description	Quantity
141	Terminal strip, 1R1 ½"	4
142	Terminal strip,1R2R1, ½"	2
144	Wood screw, #6 x 3/8"	4
145	Lockwasher, #10	6
146	Washer, fiber, #6 x 3/8"	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" x 1')	1
158	Chassis	1
159	Bottom plate	1
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
	Instruction Sheets	
	Antenna and Lead-in Wire	

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

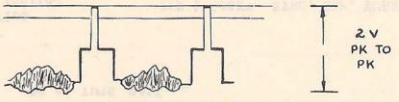
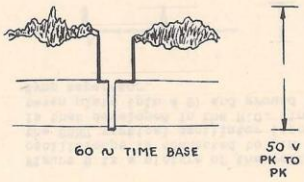


FIGURE 1

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

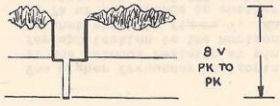
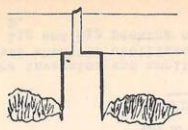


FIGURE 3

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.



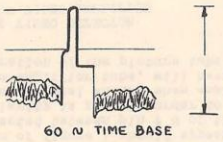
PIN 5
6SN7
SYNC. SEP. TUBE

FIGURE 4

60 ∿ TIME BASE

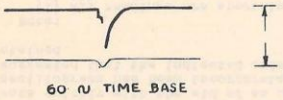
This amplified voltage is applied to the 2nd grid (pin # 1 of 6SN7 , socket # 9) through the .01 mfd. condenser. The output voltage at pin # 5 has been so coupled to the 2nd grid (pin # 1) that it is to be expected that it will appear there unchanged. If the oscilloscope be connected to the 6SN7 tube (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

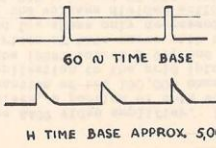


60 ∿ TIME BASE

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".



60 ∿ TIME BASE

H TIME BASE APPROX. 5,000 ∿

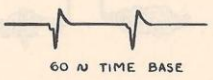
PIN 3
6SN7
SYNC. SEP. TUBE

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.

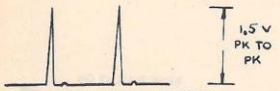
Figure 8 is a picture of the voltage appearing when the oscilloscope is connected to pin # 4 (i.e., grid # 1) of the 6SN7 vertical oscillator (socket # 10). This voltage is that developed in the R.C. (integrating) circuit between plate (pin # 2) and ground of the 6SN7 (socket # 9) Sync separator.



60 ∿ TIME BASE

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

FIGURE 8



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.

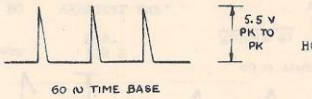
The voltage forms appearing when the oscilloscope is connected to pin # 5 of the 6SN7 in socket # 11 are seen in figure 10, and constitute a composite voltage. The slowly sloping part is due to the independent action of the multivibrator and the pip portion is due to the addition of the horizontal Sync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

PIN 5 6SN7 , PIN 4 (OR 6N7) HORIZ.OSC.

FIGURE 10

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

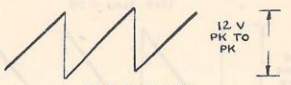
The oscillogram in figure 11 is a representation of the voltage form appearing at pin # 1 of the 6SN7 tube (socket 11). It is a summation of the independent action of the multivibrator and the pulse appearing at pin # 5 of the same tube. This pulse, by causing the right half of the tube to conduct periodically,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



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.



PIN 4 6SN7
HORIZONTAL AMP.

FIGURE 12

PIN 5 6SN7
HORIZONTAL AMP.

FIGURE 13

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.

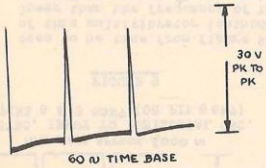
Figures 16, 17, 18, 19, 20, and 21 are patterns of the vertical section, which are similar to corresponding points in the horizontal section, the main differences being:
(1) the frequencies involved
(2) charge time relationship variations.

PIN 2
6SN7
HORIZONTAL AMP.

FIGURE 14

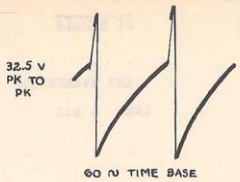
PIN 1
6SN7
HORIZONTAL AMP.

FIGURE 15



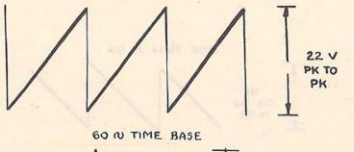
PIN 5
6SN7
VERTICAL OSC.

FIGURE 16



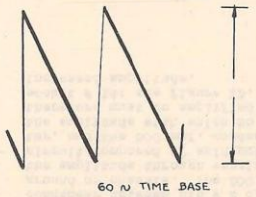
PIN 1 6SN7
OR 5 (6N7)
VERTICAL OSC.

FIGURE 17



PIN 4
6SN7
VERTICAL AMP.

FIGURE 18

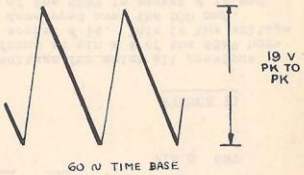


PIN 5
6SN7
VERTICAL AMP.

FIGURE 19

PIN 2
6SN7
VERTICAL AMP.

FIGURE 20

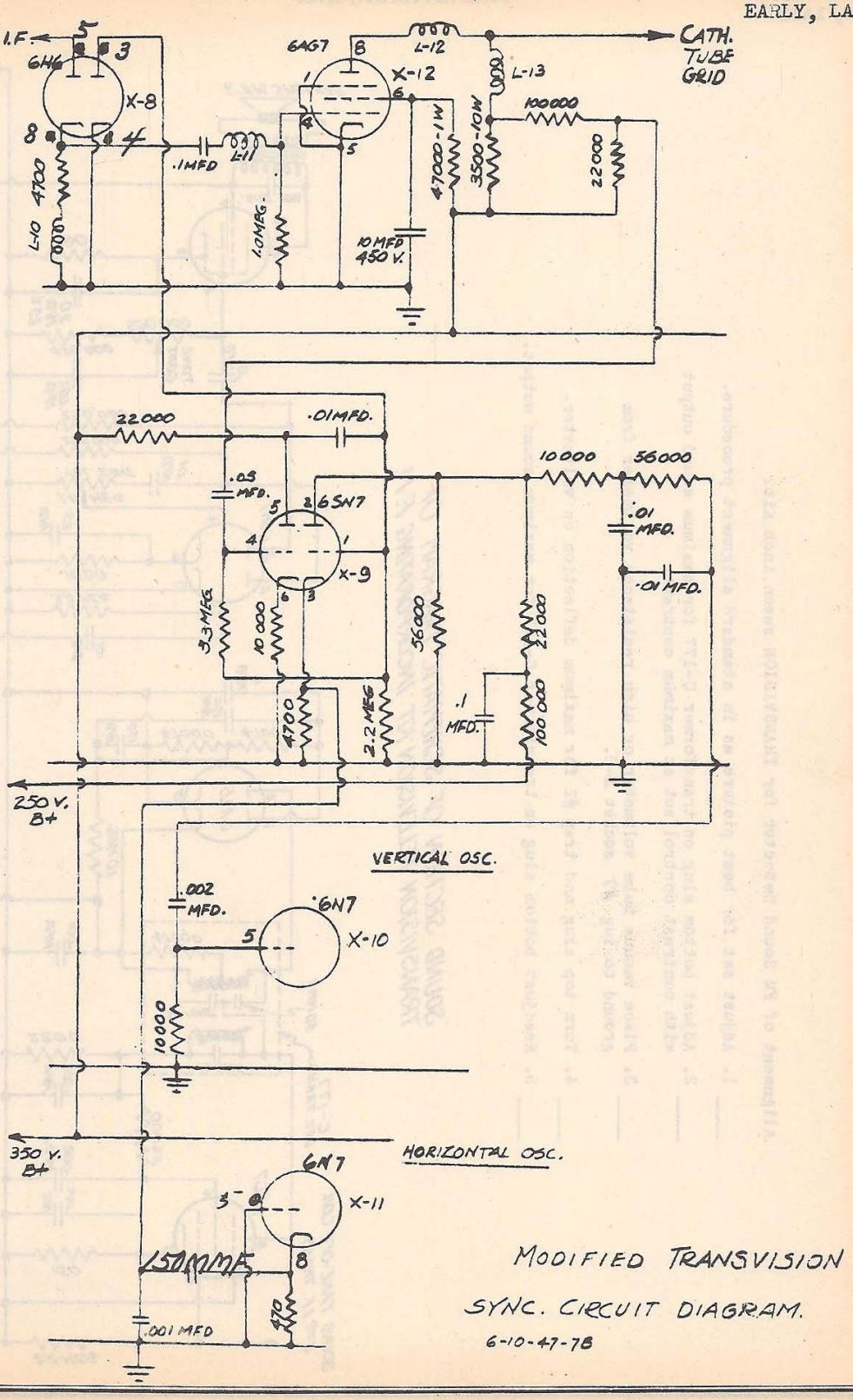


PIN 1
6SN7
VERTICAL AMP.

FIGURE 21

TRANSVISION, INC.

MODEL 7" KIT, EARLY, LATE



MODIFIED TRANSVISION SYNC. CIRCUIT DIAGRAM.

6-10-47-7B

Alignment of FM Sound Detector for TRANSVISION seven inch Kit.

____ 1. Adjust set for best picture as in standard alignment procedure.

____ 2. Adjust bottom slug on transformer C-177 for maximum sound output with contrast control set at maximum contrast.

____ 3. Place vacuum tube voltmeter or high resistance voltmeter from ground to lug #7 socket X-O.

____ 4. Turn top slug and trap #2 for maximum deflection on voltmeter.

____ 5. Readjust bottom slug on transformer C-177 for maximum sound output.

SOUND SECTION OF SCHEMATIC DIAGRAM OF TRANSVISION TELEVISION KIT INCORPORATING F.M.