



S E R V I C E H I N T S

F O R

M O D E L H T E L E V I S I O N

R E C E I V E R S

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Compiled by
Service Department

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920 WEST WASHINGTON BOULEVARD,
CHICAGO 7, ILLINOIS.

COMPLAINTSCAUSE OR CORRECTION

1. Erratic adjustment of vertical size and/or linearity.
("Touchy control")

A. Defective size or linearity potentiometer. Control should be replaced in order to avert call backs for vertical adjustments.

2. Vertical size low and non-linear, or vertical fold.

- A. Output tube must be Type 6SN7 G.T.A. Do not substitute Type 6SN7.
- B. Cathode by-pass of vertical output stage open. May show as jitter in lower half of pix.
- C. Plate dropping resistor in vertical output stage open. (R71 22H20 chassis only.)
- D. Plate dropping resistor in vertical output stage changing value.
- E. Defective yoke.

3. Poor vertical sync or loss of vertical sync.

- A. Grid to filament leakage in 6CB6 tubes or the 6AU6 tubes.
- B. Defective integrator. (Resistance reading of integrator can help to determine its condition. Average value of integrator to be 55K Ohm. This value will

range between 40K and 80K on average good units.)

- C. Defective crystal detector.
(Check front to back ratio)
See 11E.
- D. Check Type 6BN6 tube used as a sync clipper. It is best to test this tube by means of substitution.
- E. In early production receivers, the grid leak resistor for the 6BN6 sync clipper was 1 megohm. Better vertical hold stability can be obtained by the use of a 750K grid resistor on these sets.
- F. Improper setting of A.G.C. control will result in poor vertical hold.

4. Loss of vertical sweep.

- A. Defective vertical oscillator or output tube.
- B. Open vertical range, size, or linearity control.
- C. Shorted coupling condenser .015 MFD (C42) or .1 MFD (C51) in vertical oscillator circuit.

D. Open plate dropping resistor in vertical output stage. In replacing these resistors, it is recommended that the same resistance value be used; however, use a resistor with a 4- or 5-watt rating. In some cases, the plate dropping resistor may only change value and the complaint will be loss of vertical height or linearity.

5. Poor horizontal linearity.

A. In early production of the 23H22 chassis, the bootstrap resistor (R92 in later production) had a tendency to change in value. It is recommended that these resistors be replaced with a 10K Ohm resistor with a 10-watt rating.

B. Decreasing value of above resistor will result in a foldover on the right-hand side of the picture or a loss in width. If this resistor opens, the picture will have a "watery" appearance.

C. Shrinking or fold of raster on right-hand side after long

periods of operation may be corrected by changing 6BQ6 tubes. This applies to all chassis models.

6. Horizontal tearing or rubbery pix.

- A. Replace defective 12AU7 video amplifier.
- B. Trouble can be caused by a 12AT7 in 12AU7 socket.
- C. Leakage in condenser (C52) coupling plate of 6BN6 to cathodes of 6AL5 phase detector.
- D. Heater to grid leakage in 6CB6 RF tube may cause hum distortion in pix.

7. No high voltage.

- A. Shorted width coil. To test, remove center tap connection. If operation of H.V. is restored, the width coil is defective and must be replaced.
- B. Open screen grid resistor for horizontal output tube.
- C. Shorted or leaking high voltage condenser.
- D. Defective horizontal sweep transformer.

- E. Defective horizontal oscillator coil.
- F. Fuse open for one of the following reasons:
 - a. Shorted 6W4 tube. See 8C.
 - b. Poor lead dress, shorting pins No. 4 and 5 at 6W4 socket.
 - c. Intermittent short in deflection yoke.

8. High voltage arcing.

- A. Intermittent leakage in high voltage filter condenser (20 K.V. x 500 MMFD).

This arcing is worse when the brightness control is turned down and is most easily checked by removing the ground end of the filter condenser from the chassis.
- B. Arcing can be caused by poor lead dress of the wiring near pins 4 and 5 of the 6W4 socket. Arcing from this source may be reproduced as noise in the picture.
- C. Sometimes intermittent arcing will occur in the base of the 6W4 tube. This condition can be responsible for erratic

failure of the high voltage fuse, and it is recommended that the tube be replaced.

9. Premature failure of LX2 tube.

A. Chassis Type 23H22. Increase value of filament series resistor from 2.2 Ohms to 4.7 Ohms. When soldering at this point, care must be taken to prevent pin points of solder, which may result in flashover or arcing.

Careful soldering is important as thermo-plastic insulation is used on this high voltage wiring, and this insulation may be damaged by the application of excessive heat.

B. Improper setting of the horizontal drive and width controls can result in arcing and short life of the Type LX2 tube. It is recommended that the receiver be set up with the horizontal drive control backed down to a point just above horizontal foldover. Then adjust width control to give correct pix size.

10. Poor focus.

A. Open 4K resistor in bridge type focus circuit.

	<p>B. Defective focus coil.</p> <p>C. Poor focus can be caused by a weak 5U4 tube or other power supply components.</p>
<p>11. Automatic gain control.</p>	<p>A. When the picture overdrives and the A.G.C. potentiometer has no control, look for the following:</p> <p style="padding-left: 40px;">Shorted C57 coupling converter output to I.F. strip or C74 in plate circuit of horizontal oscillator. Leakage in either of these condensers will result in the application of a positive voltage which will "buck" the negative A.G.C. voltage and cause set to overload.</p> <p>B. Open 1.5 megohm resistor (R72) in the plate circuit of the A.G.C. amplifier tube.</p> <p>C. Open .1 MFD (C73) from plate of the A.G.C. amplifier.</p> <p>D. Gassey I.F. tube may result in overload condition, especially after the set has been in operation for a short period of time.</p> <p>E. Defective crystal detector. Front to back ratio should be at least 100:1. Both resistance measurements must be made on the same ohmmeter range, preferably R x 1000.</p>

	<p>F. Open 47K resistor (R5). Pin No. 6 of horizontal oscillator will result in failure of A.G.C. system.</p>
<p>12. No sound or distorted sound.</p>	<p>A. Open buzz potentiometer.</p> <p>B. Open screen grid resistor for 6BF5 tube. An open resistor at this point results in reduced volume with very distorted tone.</p> <p>C. Investigate for a shorted condenser across primary of audio output transformer.</p>
<p>13. Intercarrier buzz.</p>	<p>A. Make no attempt to adjust buzz until the A.G.C. and the bull's eye controls have been properly set. It is recommended that these A.G.C. adjustments be made, using the strongest signal in the area.</p> <p>Refer to the service manual for the proper adjustment of the sound input coil, the sound takeoff coil, the quadrature coil, and the buzz control. Intercarrier buzz can frequently be reduced by replacement of the Type 6BN6 tube and/or the 12AT7 tube.</p>

Do not interchange 12AU7 tube
for a 12AT7 tube.

- B. In strong signal areas, it may be necessary to attenuate the antenna input, as overloading can result in excessive buzz.

14. Poor sensitivity.

- A. Improper setting of A.G.C. control.
- B. Shorted silver mica disc ("spark plate") in tuner shelf; usually the 600 MMFD section used as a screen grid by-pass. When replacing these discs, examine chassis plate and separators for burrs before reassembling.
- C. Defective spark plates make it necessary to replace burnt 1500 Ohm (R3) in tuner shelf and 100 Ohm (R31) isolation resistor in main chassis assembly.

15. Weak video.

- A. Defective crystal detector.
(Refer to 11E)
- B. Improper setting of the A.G.C. control.
- C. To increase video gain in early production receivers, change series dropping resistor for

	<p>plate of 12AT7 noise limiter and inverter stage from 3300 to 68K and move from the 150 volt supply to the 360 volt line.</p> <p>D. It is possible to interpret loss of sensitivity as weak video. It is recommended that the silver mica condensers be examined. See 14B and 14C.</p>
<p>16. Picture overdriven and smeared. Unstable syncs.</p>	<p>A. This condition is caused by a defective 10 MFD electrolytic condenser used as a filter in the plate supply of the 12AT7 noise limiter stage (C24AA).</p>
<p>17. Drifting A.G.C. adjustment. Type 20H20 chassis only.</p>	<p>A. In early production of this type receiver, a 68K resistor to Pin No. 6 of the 6SN7 tube changed value and resulted in erratic A.G.C. action. Replace this resistor with 100K Ohm and move resistor from the 150-volt buss to the 350-volt buss.</p>
<p>18. Bunching of horizontal scan lines.</p>	<p>A. It is possible for a gassey picture tube to result in bunching of the horizontal scan lines. This bunching will follow the density of the picture</p>

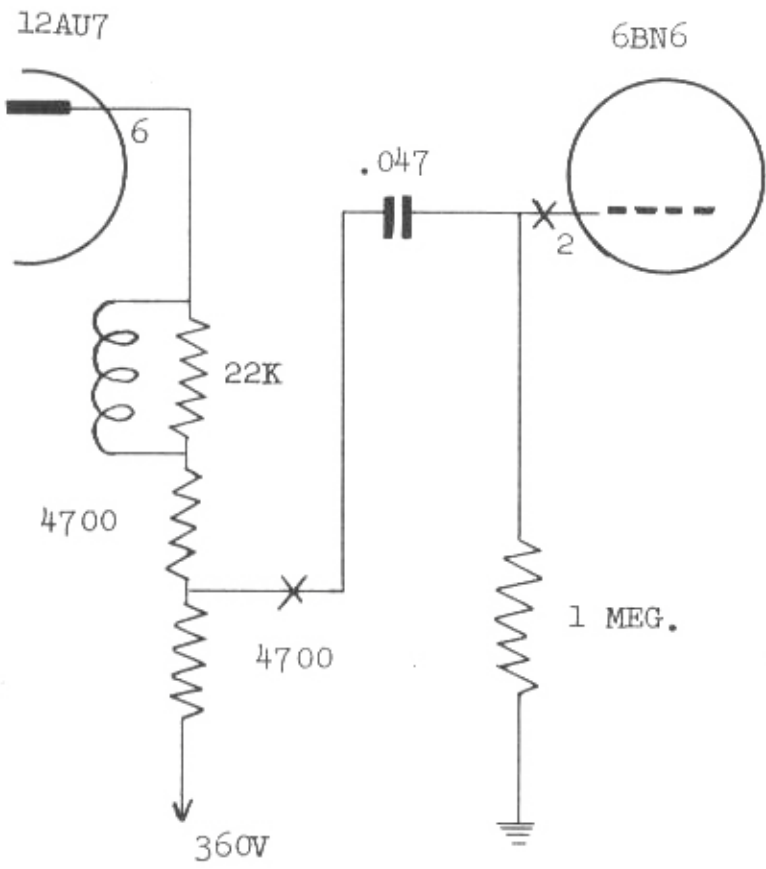
information on the tube and will become more obvious as the contrast is increased.

Under the above set of conditions, some of the picture information is transferred from the cathode to the grid in the picture tube and will return to the vertical oscillator circuit through the vertical blanking network. Before condemning a picture tube for this condition, be certain that the A.G.C. level is set correctly. It is possible for any picture tube to draw grid current when overdriven.

19. Circuit change for improving sync stability.
Fringe Area Only

A. In weak signal areas, it is possible for ignition noise to cause vertical jitter in the H model receivers. The circuit changes diagramed on the following page are recommended for improving this condition. Caution do not use this circuit in strong signal areas.

ORIGINAL



CHANGE

