

CONVERSIONS—630TS TO 20 INCH

This is the ninth of a series of articles on converting TV receivers to use larger picture tubes. In this issue an RCA Model 630TS was converted from a ten-inch round to a twenty-inch rectangular picture tube.

The following discussion is a description of the procedure followed which produced satisfactory results with respect to the particular model converted. If a conversion is attempted on a similar model of an earlier or later date or on a different model from the same manufacturer, then additional adjustments and steps may be necessary. The changes which were made have not been approved by the manufacturer and may therefore invalidate the manufacturer's warranty.

The RCA model 630TS shown in Figure 1 was originally a ten-inch receiver. This was converted to use a 20CP4 picture tube although sufficient sweep was available to use either a 21EP4 or a 24AP4 picture tube. Since the completed conversion could not be mounted in the original cabinet no cabinet information is given. This conversion would be particularly suitable for a custom installation or it could be mounted in a number of different cabinets which are available from radio supply houses.

The circuit used in this model has also been used in a considerable number of other receivers. Therefore the same circuit changes which were used on this model should also work on other receivers using the same type circuit. While making the conversion both horizontal and vertical retrace elimination circuits were added. The horizontal retrace elimination circuit consists of a piece of 75-ohm twin lead connected as shown in Figure 2. This eliminated a slight foldover which appeared at either side depending on the adjustment of the horizontal hold control. The vertical retrace elimination circuit consists of one .02 mfd and one .05 mfd 600-volt capacitors and one 2700-ohm and one 4700-ohm one-watt resistors connected as shown in Figure 3. This eliminated the vertical retrace lines which allowed the brightness control to be advanced beyond the point where these retrace lines normally appeared.

The following parts were used to make this conversion:

- 1—General Electric 20CP4 picture tube.



Figure 1. RCA ten-inch Model 630TS TV receiver before conversion.

- 1—General Electric RTO-085 horizontal sweep transformer.
- 1—General Electric RLD-025 deflection yoke.
- 1—General Electric RET-003 ion trap magnet.
- 1—General Electric 6V6-GT tube.
- 1—General Electric 6CD6-G tube.
- 1—General Electric RLD-014 width/linearity control
- 1—1000-ohm one-watt resistor.
- 1—1000-ohm two-watt resistor.
- 1—1200-ohm one-watt resistor.
- 1—2700-ohm one-watt resistor.
- 1—4700-ohm one-watt resistor.
- 1—10,000-ohm one-half-watt resistor.
- 2—500 mmd 20 KV capacitors.
- 1—.02 mfd 600-volt capacitor.
- 2—.05 mfd 600-volt capacitors.
- 1—Ten-inch piece of 72-ohm twin lead.
- 1—HV extension lead.

List prices of the foregoing parts, at date of publication, totaled \$94.60. However, allowance should be made for any local differences due to transportation costs, etc.

CHASSIS CHANGES

The center section of the cabinet top was removed by loosening the two screws at the rear top of the cabinet. The two flat-head wood screws which held the front in place were also removed. It was then possible to lift out the safety glass and front panel. These steps were necessary because the picture tube had to be removed from the front before the chassis could be taken out of the cabinet. The following circuit changes were then made:

1. The deflection yoke and focus coil mounting brackets were removed and discarded.
2. The leads to the picture tube socket with the exception of the lead going to pin 10 were lengthened. The wire going to pin 10 was cut and the receiver end taped. The socket end of this wire was connected as described in step 11 to the deflection yoke as part of the horizontal retrace elimination circuit. The focus coil leads were also lengthened and the length of the high voltage lead was increased by using

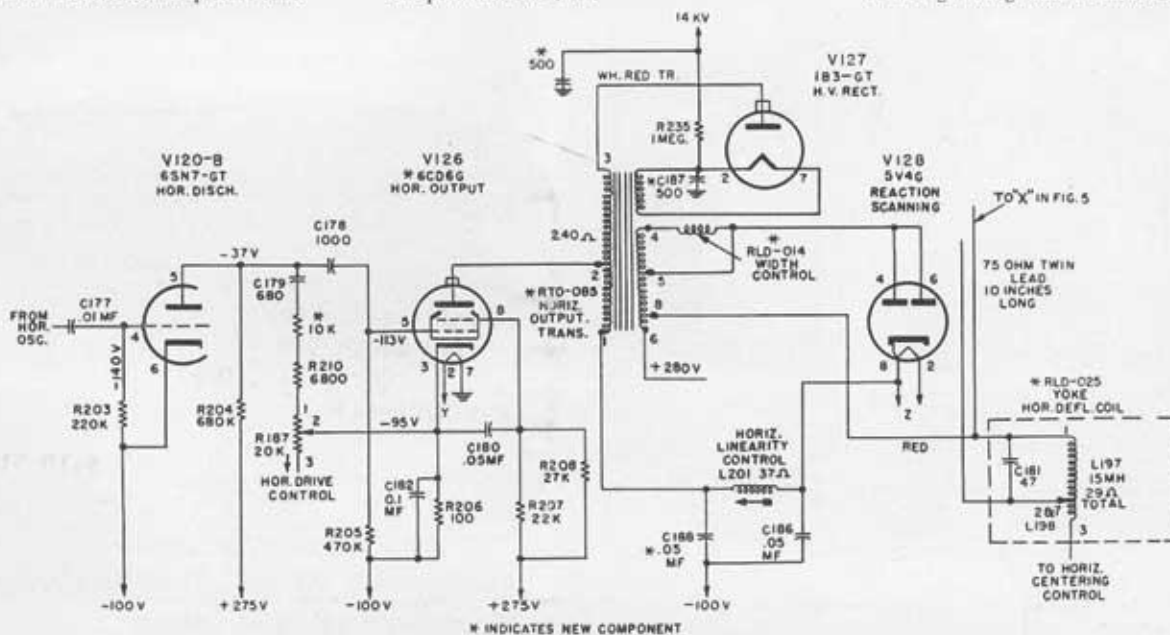


Figure 2. Horizontal output and HV section of RCA 630TS showing the changes made to use a General Electric 20CP4 picture tube.

one of the extension cables available at most General Electric tube and parts distributors.

3. The original deflection yoke was removed and replaced with a General Electric RLD-025 70° yoke. These leads were also lengthened when this replacement was made.
4. The original horizontal sweep transformer was removed and replaced with a General Electric RTO-085 and connected as shown in Figure 2. This was mounted to the side of the HV cage with an angle bracket bent and drilled as shown in Figure 3. If you do not have suitable material available to make this angle, the transformer can be mounted to the chassis with ordinary machine screws. If this method of mounting is used new holes will have to be drilled in both the transformer and the chassis. The 1B3-GT filament dropping resistor R233 was removed. A resistance check should be made of R235 in the HV lead, and if the resistance is off more than ten percent, it should be replaced.
5. The 500 mmfd capacitor was replaced with one having a 20 KV rating, and a second 500 mmfd 20 KV capacitor was connected between the chassis and the output end of R235 as shown in Figure 2. If a 20CP4-A or one of the twenty-one inch tubes having an external conductive coating is used, the second 500 mmfd filter capacitor can be omitted since this conductive coating acts as a filter capacitor when grounded.
6. Damping resistor R209 should be removed from the circuit and discarded.
7. The original width coil was removed and replaced with a General Electric RLD-014 which was connected as shown in Figure 2. This was mounted in an enlarged hole on the original mounting bracket.
8. The 6BG6-G horizontal output tube was replaced with a General Electric 6CD6-G tube.
9. Capacitor C188 was removed and replaced with a .05 mfd 600-volt capacitor. This capacitor is connected to one end of the horizontal linearity control.
10. A 10K two-watt resistor was inserted between R210 and R187 in the horizontal drive control circuit.

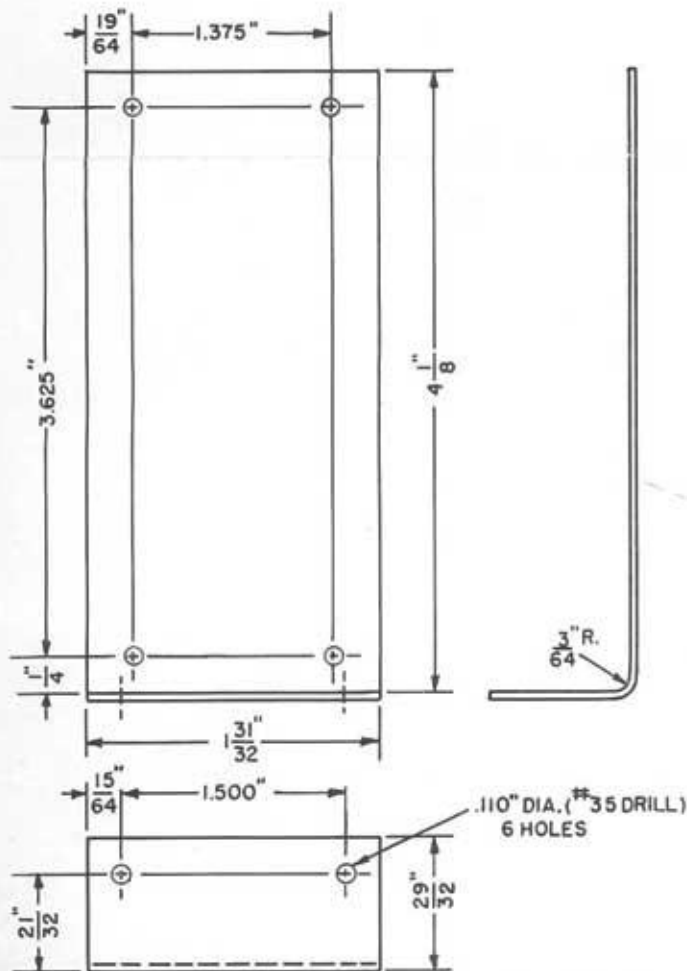


Figure 3. Dimensions of bracket used to mount General Electric RTO-085 horizontal sweep transformer to side of HV compartment.

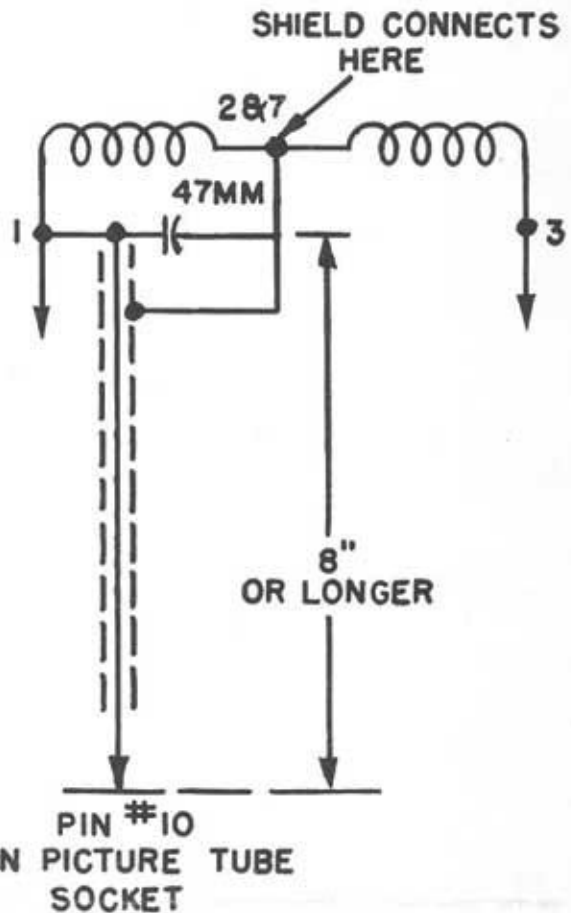


Figure 4. Horizontal retrace elimination circuit used when insulated shielded cable is used in place of 75 ohm twin lead.

11. A ten-inch piece of 75-ohm twin-lead was connected across capacitor C181 as shown in Figure 2. This capacitor is across a portion of the horizontal coils in the deflection yoke. If 75-ohm twin-lead is not available a piece of outside insulated shielded wire can be used. This type wire should be connected as shown in Figure 4. Be sure that the wire which originally supplied 275V to pin 10 on the picture tube is removed from the 275V source as described above in step No. 2.
12. The vertical output tube was changed from a 6K6-GT to a 6V6-GT tube.
13. The 2700-ohm resistor R177 in the cathode circuit of the vertical output tube was removed and replaced with a 1200-ohm one-watt resistor as shown in Figure 5.
14. The 10K ohm resistor R179 in the plate return lead of the vertical output tube was removed and replaced with a 1000-ohm two-watt resistor.
15. The vertical retrace elimination circuit which consists of two resistors, one 2700-ohm and one 4700-ohm, and two capacitors, one .02 mfd and one .05 mfd, was connected between the vertical output transformer and the cathode of the picture tube as shown in Figure 5. The cathode lead which was originally connected to the chassis was removed and the 4700-ohm resistor connected between this point and the chassis. The value of this resistor can be increased if any evidence of retrace lines remain.
16. The 1800-ohm resistor R183 across the focus coil was removed and a 1000-ohm resistor was inserted between the focus control R184 and R182 as shown in Figure 5.
17. The picture tube was placed in a Deity Tube Cradle, and the deflection yoke, focus coil and ion trap were placed on the neck of the tube as shown in Figure 6. The Deity Tube Cradle is very useful

**Tele-Clue Sheet Not Included
In This Issue**

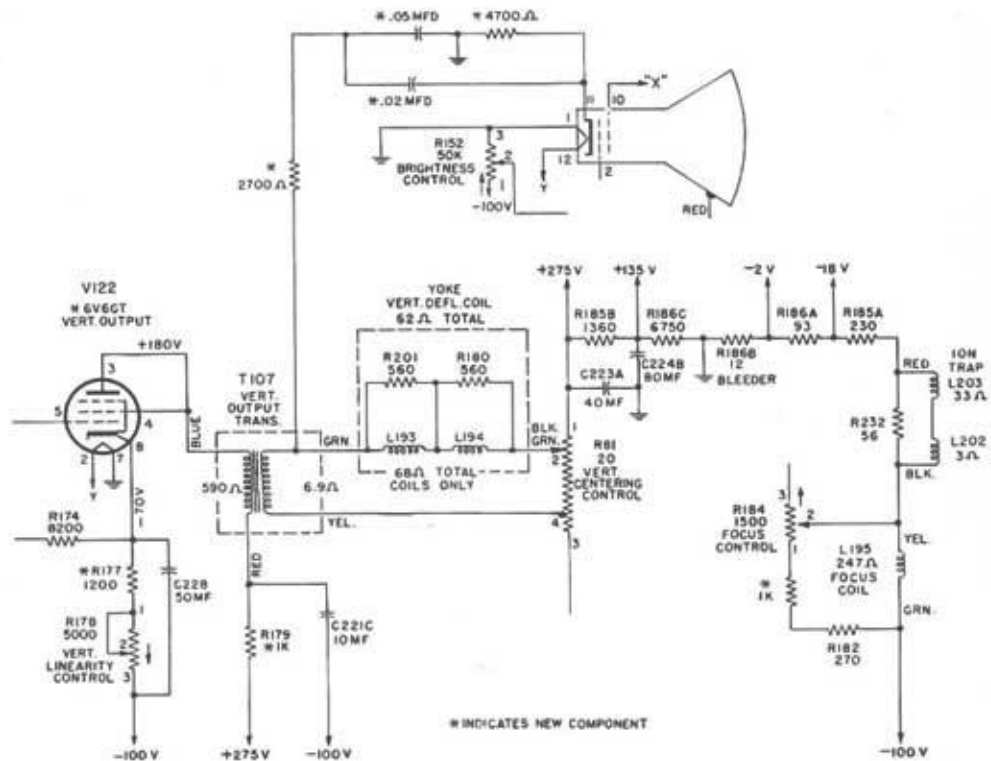


Figure 5. Vertical output circuit showing the conversion changes plus the vertical retrace elimination circuit.

when making conversions or when servicing receivers which do not have the picture tube mounted on the chassis. This cradle is manufactured by the Deity Miracle Lens Company, Passaic, New Jersey. 18. The width, horizontal drive, height and linearity controls were adjusted to produce a linear test pattern.

While these circuit modifications have been carefully tested, the General Electric Company can, of course, assume no responsibility

for the application of these suggestions to the conversion of any particular receiver. General Electric offers this article as a suggestion of one possible way of making the conversion, but it does not represent that this is the only way or the best way of accomplishing the conversion.

In forthcoming issues conversion information on other television receivers will be included.

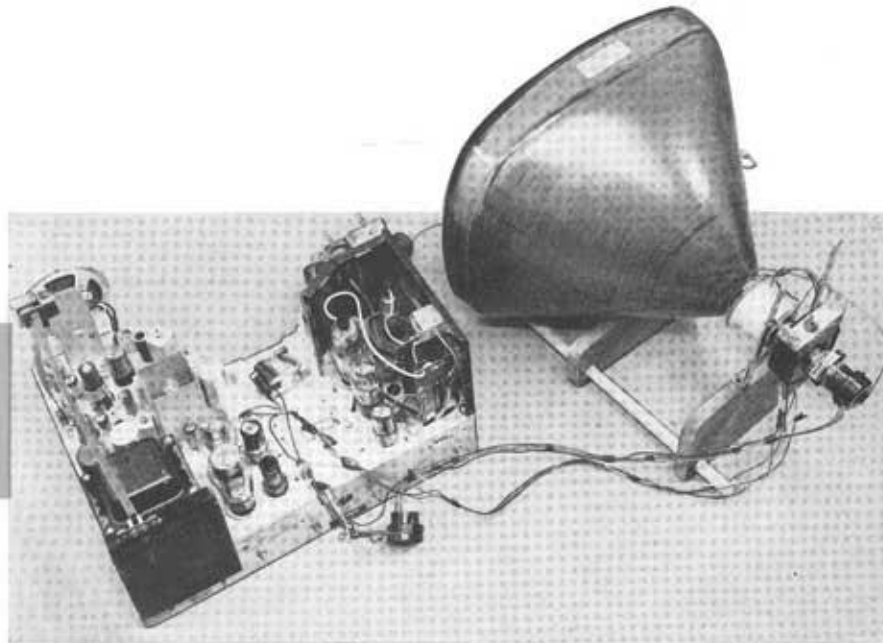


Figure 6. Completed conversion ready for installation in a new cabinet or wall.