Techni-talk

COMPLETE ELECTRONIC SERVICING INFORMATION

radio • tv • hi-fi

Vol 18, No. 3 Fall, 1966

G-E Porta-Color Television Picture Tube III

In the previous issue the convergence assembly and the location and effect of each element was discussed. In this issue the step-by step procedure for making purity and convergence adjustments will be described.

PURITY AND CONVERGENCE ADJUSTMENTS

With the receiver completely assembled in the cabinet, allow 10 minutes of warm up time. Tune the receiver to an active monochrome channel, adjust the contrast and front mounted controls for a normal black and white picture. Demagnetize the receiver and make necessary height, vertical linearity, and grey scale adjustments. Remove the cabinet body.

The electron guns in the neck of the picture tube are in line horizontally. The green gun is in the center requiring no convergence adjustments. For convergence register both the blue and red rasters on the green raster. The red and blue rasters are moved both horizontally and vertically to coincide with the green.

Connect the Dot-Crosshatch generator to the receiver and check Purity and Convergence. In the event the receiver exhibits considerable misconvergence and/or impurity, as might be the case where a picture tube is changed, perform the complete Purity and Convergence procedure as outlined below. If minor misconvergence is present, a slight touch-up of the static convergence magnets will generally suffice. Should this be the case, closely examine the raster to determine the color and direction of misconvergence. Make only slight adjustment to the appropriate horizontal or vertical convergence controls directly associated with the misregistered color. Keep in mind, green is fixed except for slight interaction from the red and blue controls (see Fig. 1).

The static convergence magnets are cemented in position at the factory. To turn the magnet, dissolve the cement with a few drops of lacquer thinner (nail polish remover), or in some instances a slight pressure will break the bond leaving the magnet free to be turned. When turning the magnets, keep a slight inward pressure to keep the magnet fully seated in the core. Upon completion of service, lock the magnets with a drop of Glyptal® cement.

Fig. 1 Dot movement pattern for blue and red dots. Green dots are fixed except for slight interaction from red and blue controls.

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If for any reason it is necessary to move the purity magnet or the static convergence magnets excessively, perform the complete Purity and Convergence procedure.

PURITY

1. Check for correct positioning of the convergence assembly and purity ring on the picture tube neck as shown in Figure 2.

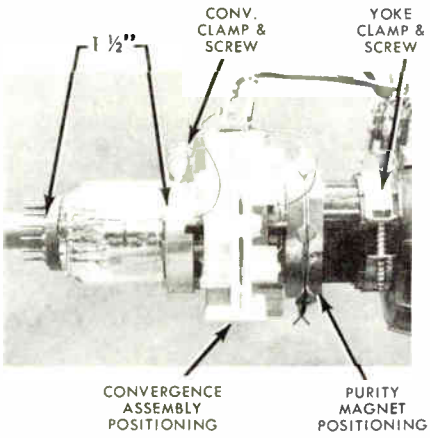

Fig. 2 Location of Convergence Assembly and Purity Magnet.

2. Loosen the screws on the horizontal convergence sliders and move each slider to place the core end ⅛" from the picture tube neck (*2, 3* and *4* in Fig. 3).

3. Position the purity rings for zero field by adjusting the rings so that the square tab on each ring is 180 degrees from the other and then position the assembly on the tube so that the square tabs are on a vertical plane.

4. Position the four static convergence magnets for zero field. For the vertical convergence magnets, this is achieved when the line marked on the end of the magnet is in a vertical plane, and for the horizontal magnets, the line is positioned on a horizontal plane.

5. Adjust the MASTER BRIGHTNESS control (on the front of the receiver) approximately ¼ to ⅜ turn clockwise from the maximum "off" position and turn the contrast control "off" (CCW).

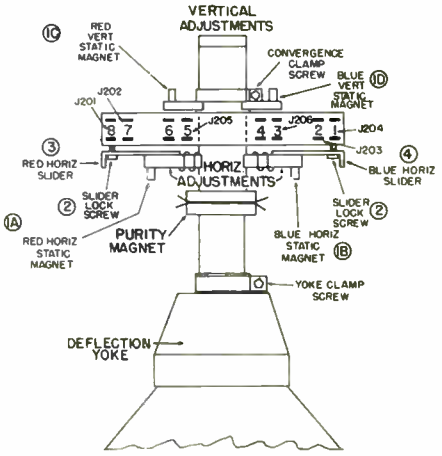

Fig. 3 Location of various purity and convergence adjustments.

6. Turn the picture tube screen controls (R546, R547 & R548) fully clockwise, then adjust the Green & Blue COLOR BRIGHTNESS controls (R539 & R545) for a semblance of grey scale tracking.

7. Using either a dot pattern or a crosshatch pattern, adjust the static convergence magnets (*1 A, B, C* and *D* in Fig. 3 and Fig. 5) to produce center convergence.

8. Turn the COLOR BRIGHTNESS controls (R539 & R545) "Off" and loosen the yoke clamp screw. Slide the Yoke back as far as possible. Tighten screw so Yoke will just slide and turn.

9. Adjust purity ring (Fig. 4): Rotate assembly around tube neck and/or spread tabs for uniform pure red field in center of raster.

10. CENTER CONVERGE:

A. Turn the GREEN COLOR BRIGHTNESS control "on" (CW)

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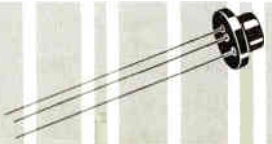

BENCH NOTES

NEW GRIP FOR OLD SOCKETS

Tube sockets sometimes become so worn from age and usage that arcing, interaction and even fallout may occur. Some new sets may even have a loose pin holder or two. Normally, socket replacement is the proper course of action or at least, chassis removal to tighten pin holder with pliers. Either way eats up precious time, so try this.

Simply insert receiving tubes in to the pin straightener sockets that are provided on most tube testers. Then, with a firm grip, slowly remove the tube while giving it a continuous clockwise twist. This procedure will insure you of the best possible contacts being made on any socket for all pins.

Don Barnett
Premiere TV
906 Port Republic
Beaufort, So. Car.

SHOCK HAZARD

To avoid shock hazard when replacing new high voltage rectifier tubes with compactron base pins — attach a wire with clip to ground, touch other end to 2nd anode of picture tube. Clip it on if possible.

The residual charge on the picture tube packs quite a wallop.

Bascom TV
875 Bette Ave.
San Jose, Calif. 95129

RCA CTC10 COLOR TV CHASSIS

Problem: Vertical sync in which the picture would lock in such a manner that about one-inch of the following picture 'frame' would appear below the normal picture 'frame' with retrace lines very strong. In addition the vertical hold was extremely touchy. Any slight variation would cause the picture to roll vertically.

Solution: This set was a real problem. The complete critical components in the vertical oscillator and amplifier were substituted but to no avail. The service literature did not show the vertical sync pulse information but based on scope tests of many other sets, the sync pulse appeared clipped. The problem was finally solved by the simple replacement of the video IF amplifier tubes 6BZ6 and 6GM6! It should be noted that the horizontal was perfect during the vertical sync problem time.

Leonard Chioma
Electronic Model Engineering
2020 Natalen Rd.
Winter Park, Fla.

DANGER

Cadmium-silver solder used in silver soldering emits dangerous fumes when heated and should not be used in closed rooms for more than a few minutes at a time, nor should the fumes be breathed in when silver soldering.

The U. S. Public Health grapevine has it that several "pneumonia" deaths have been traced to the use of this type of solder.

H. Mullen
9193 Manor Ave.
Cleveland, Ohio 44104

TV STETHOSCOPE

An 18-inch length of ⅜-inch diameter spaghetti tubing makes an excellent trouble-shooting "stethoscope" for locating the exact source of a sizzling or frying sound deep in the heart of a TV set, without inviting a burnt ear.

H. Miller
1919 Alice Drive
Vallejo, Calif. 94590

FOR THE BEGINNER

For people who are starting in radio and TV repairs, they will soon find out that it is expensive to purchase test equipment etc. . . I suggest that they do what I did. I looked in magazines and radio repair books and built a lot of my equipment by hand. They will find that it is less costly, very interesting and good experience.

Walter Zylka
721 Columbia St.
Utica, N. Y. 13502

BAD SOCKET

We had a RCA model C1L radio come in for repair. There was no sound and the tubes checked out good. The chassis was removed from the cabinet and voltages were checked on the various tube prongs. Everything at this point was OK. The audio section checked good with a signal injection tester but the last IF stage was dead. Again voltages were checked at this stage and they seemed to be fairly close. Upon examining the printed socket a little closer the small pin where the tube prong plugs in, was broken out. Upon installing a new socket the radio played again. The party had checked his own tubes and undoubtedly broke the pin when removing a stubborn tube from its socket.

Homer L. Davidson
2821 5th Ave., S.
Fort Dodge, Iowa

OLD FOCUS COIL MAKES HANDY DEMAGNETIZER

The focus coil from a discarded TV can be made to perform as a tool or general use demagnetizer. The coil is merely removed, and the leads connected to the a-c line. Most old focus coils will have sufficient reactance to prevent overheating, even when the current is kept on for much longer periods than normal use requires.

To demagnetize an object, the coil is energized with 60 cycle a-c, and the object passed through the center of the coil, slowly, back and forth, and then withdrawn slowly to a point perhaps a yard or so from the coil. Then the coil is de-energized. This procedure avoids remagnetizing the object inadvertently due to the sudden collapse of the a-c field at a current point: The tool or magnetized object is sufficiently out of the range or magnetic influence of the coil.

A. W. Edwards
222 Glenmore St.
Corpus Christi, Texas

PARTS HOLDER

I had a problem keeping knobs, screws etc., from disassembled sets together. Small boxes were not too good for they were always getting knocked over and parts spilled and lost.

I have found plastic sandwich bags ideal for keeping these small things together. I insert a slip of paper in the bag with the customer's name. I hang the bags up high over the bench on a board with nails. They are secure until needed. They are transparent, making ready identification possible. The bags are reusuable and inexpensive to use. I also carry them in the tube caddy.

Robert H. Cornish
Robert H. Cornish Telivision Ser.
324 Lowry Lane
Lexington, Ky.

EASY OPEN

A dab of petroleum jelly on the threads of a screwtype cap will keep it from freezing onto the can or bottle.

H. Muller
Box 6
Danboro, Pa.

HEAT SINK

Probably the most efficient heat sink is still a pair of long nose pliers, but it is a very difficult to hold them in place with one hand and make or break joints with the other.

Before using the pliers slip a rubber band over the handles, which makes them a self-holding device. The ridges inside the nose of the pliers assures no-slip, but best of all the hand is free to handle gun or solder.

Roy G. Hambrick
1750 Glendon Road
Salem, Virgnia 24153

TUBE TEST AID

In testing a tube in a tube tester it is sometimes at first difficult to observe whether the filament is lit due to the internal structure of the tube and dark envelop areas. I would suggest obtaining a small mirror about 1" square and glueing it to the top of the tester so that by looking down into the mirror, your view is directed up into the tube for observation. The mirror could be fastened by means of a double surface adhesive bonding tape or a suitable glue.

This saves a good deal of neck stretching and eye squinting to observe a tube.

Harold Jones
Harold's TV
810 College
Bowling Green, Ky.

NOTE:

Those desiring to have letters published in this column should write the Editor, Techni-Talk, Electronic Components Division, General Electric Company, Owensboro, Kentucky. For each such letter selected for publication you will receive $10.00 worth of General Electric tubes. In the event of duplicate or similar items, selection will be made by the Editor and his decision will be final. The Company shall have the unlimited right without obligation to publish or otherwise use any idea or suggestion sent to this column.

Caution: The ideas and suggestions expressed in this column are those of the individual writers. These ideas and suggestions have not been tried by the General Electric Company and therefore are not endorsed, sponsored or recommended.

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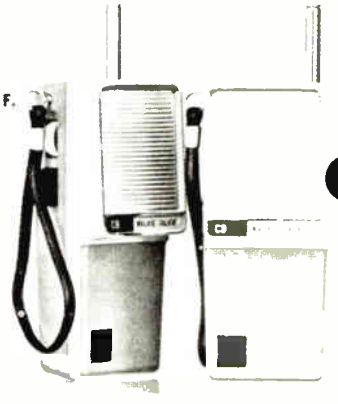
A.

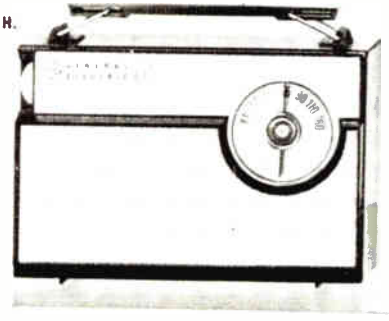
E.

F.



I.

H.



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What's new!

Porta-Color Television

Continued from page 1

to obtain a red and green pattern in the center of the raster and center converge the red on the green.

B. Turn the BLUE COLOR BRIGHTNESS control "on" and center converge the blue on the yellow.

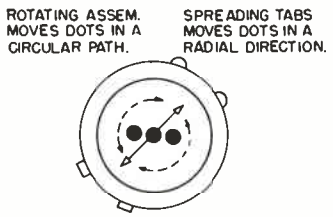

Fig. 4 Direction of dot movement caused by adjusting tabs on Purity Mognet.

11. PRELIMINARY PURITY: Turn the GREEN & BLUE COLOR BRIGHTNESS controls "Off" then slide the yoke forward for best overall pure red raster and proper leveling of the picture.

12. Repeat steps 8 thru 11 as necessary to obtain best center convergence consistant with best purity.

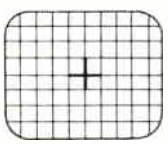

Fig. 5 Areo of center convergence.

13. HORIZONTAL SLIDER ADJUSTMENT:

A. Turn the GREEN COLOR BRIGHTNESS control "on" (CW) and check the relationship between the red and green vertical lines at both sides of the raster.

(a) Move slider (*2* and *3* in Fig. 3) close to tube if red appears inside of green (closer to raster center).

(b) Move slider away from tube if red appears outside of green (closer to raster edge).

B. Rotate red static convergence magnet to converge the red and green vertical lines at the center horizontal line.

C. Turn the BLUE COLOR BRIGHTNESS control "on" (CW) and in the same manner as outlined in A and B above, adjust the BLUE horizontal slider (*2* and *4* in Fig. 3) along with the BLUE static horizontal magnet to achieve blue convergence.

D. Repeat steps A thru C as necessary to obtain best center and edge convergence at the center horizontal line. Lock sliders in place by tightening the screws.

14. Repeat steps 8 thru 11 as necessary to obtain best "overall" convergence consistant with best "overall" purity. (see Fig. 6).

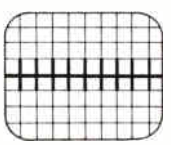

Fig. 6 Center horizontal convergence.

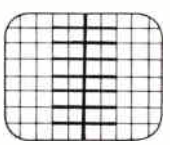

Fig. 7 Center vertical convergence.

15. Check convergence of the horizontal lines at the center vertical line (see Fig. 7). If additional adjustment is necessary, the connections to each vertical dynamic convergence coil may be changed to either reverse its polarity or remove it completely from the circuit. Clips and lugs are provided on the top of the assembly for ease of altering these connections.

16. FINAL OVER-ALL PURITY: Turn the GREEN & BLUE COLOR BRIGHTNESS controls "Off" and position the yoke on the neck of the picture tube for pure overall red raster and for proper leveling of the picture. Tighten the yoke clamp screw while supporting the yoke weight with one hand, check each color field and check overall convergence, then lock the convergence magnets in position with a drop of Glyptal cement.

NEW GENERAL ELECTRIC TUBES AND COMPACTRONS LISTED BY RECEIVER

Here is a list of *NEW* General Electric receiving tubes and compactrons and the manufacturers using these types in their receivers. Be ready to service the new model receivers by having at least one of each type on hand. They are now available from your General Electric tube distributor.

TYPE	SET MANUFACTURER	FUNCTION
*3AW2	Philco TV	High Voltage Rectifier
*6BZ3	Philco TV & Westinghouse TV	Damper
*6CJ3	Zenith TV	Damper
6JD6	RCA Color TV	IF Amp.
*6JZ6	Philco TV	Hor. Output
*8BA11	Zenith TV	Sync, AGC, Verticol Oscillotor
8CW5	Coronodo	Audio Output
*11BT11	GE 11" Color	Video Amp. 1st Video & AGC
17BS3A	RCA Monochrome	Damper
*17X10/17AB10	Zenith TV	Sound Detector & Output

*Compoctron Type

COLOR TEMPERATURE (Grey Scale) ADJUSTMENTS

Tune the receiver to an active monochrome channel. Check for proper adjustment of the height, vertical linearity, and the horizontal hold controls. Check convergence and purity. Make necessary adjustments and proceed as follows:

1. Turn the 3 picture tube screen controls fully clockwise.
2. Short the antenna terminals together and switch the channel selector to an unused VHF channel. Turn the contrast control counterclockwise.
3. Turn the master BRIGHTNESS control (on front of receiver) clockwise to a point just short of defocusing the raster.
4. Adjust either/or both of the two COLOR BRIGHTNESS (G_1) controls to eliminate color shading of the white raster.
5. Turn the master BRIGHTNESS control counterclockwise to a point where the raster is almost extinguished.
6. Adjust the appropriate color screen control to eliminate color shading of the dark grey raster.
7. Check the raster from highlights to low lights adjusting the controls as necessary to maintain gradations from grey to a white raster throughout the usable brightness range. Repeat steps 3 thru 6 if necessary to produce grey scale tracking.
8. Check the positioning, or setting, of the screen controls to make certain that at least one of these controls is set at maximum.

SERVICE NOTES

TELEVISION

9-INCH PICTURE TUBES — TRANSISTORIZED TA AND TB CHASSIS

The 9-inch picture tube, Cat. No. ET44X100, has now been registered by the General Electric Tube Department as a type 9VP4. The replacement type 9VP4 will not carry the "Lamilite®" faceplate protection. A separate 9-inch safety plate (similar to the one used with the 11-inch tube) will be packed with each 9VP4.

This safety plate must always be installed with the 9VP4. Failure to do this, leaves the picture tube unprotected and therefore hazardous.

®TM General Electric

CB CHASSIS — NEON BULB FAILURES

Recent reports indicate some cases of erratic or unusual color reception which have been traced to failure of the neon bulb N701 in the grid circuit of the burst gate.

This problem appears similar to a poor ground connection on the H. V. transformer pulse winding and may result in:

1. No Color
2. Intermittent Color
3. Incorrect Color

The neon bulb will fail to light or flicker and will usually appear black on the internal electrodes. Also, in some cases, color will not appear until the receiver has been operating for several minutes.

The original equipment is a type NE2 (ET41X6). Production has changed over to an improved type NE2H.

Your G. E. distributor's stock of (ET41X6) is being changed from NE2 to a more rugged type NE-83/5AH.

Until you are able to get NE-83/5AH from your distributor, we recommend that you purchase either NE2H or NE-83/5AH from local jobbers to meet your replacement needs.

DB CHASSIS TV CLOCK REPLACEMENT

Removal of the clock assembly from receivers of the DB Chassis 415 model series can be facilitated by following this procedure.

Carefully clip or break the two tabs by which the assembly is clip-mounted to the plastic back plate. Remove the mounting clips, and use them to fasten the assembly to the remaining pair of mounting tabs during reassembly.

(The plastic back-plate, which attaches to the die-cast front of the receiver, is equipped with a spare set of tabs for clock mounting — one tab at the top and another at the bottom diagonally opposite it.)

"DB" CHASSIS — TELEVISION UNSTABLE HORIZONTAL SYNC

An unusual problem has been reported on a few early production 19" DB receivers.

The problem is unstable horizontal sync on low channel UHF only. The picture appears ragged and jittery although it is OK on VHF.

Certain 8LT8 horizontal oscillator tubes exhibit a parasitic oscillation which falls in the low channel UHF spectrum. This parasitic oscillation is picked up by the tuner and upsets the horizontal sync.

The remedy is to replace the 8LT8. Since an occasional replacement tube may also exhibit this problem, try more than one if the trouble is not cured.

CONSOLE PHONO

CONSOLE PHONO G-E RECORD CHANGER BENT VELOCITY TRIP LEVER

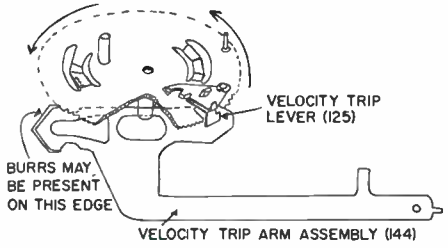

Fig. 1 Velocity trip arm assembly.

When servicing the General Electric record changer for a no center trip connection, it may be found that the velocity trip lever item #125 is bent for no obvious reason. Careful examination of the tip of the velocity trip arm assembly item #144 may reveal burrs on the right edge of the arrow head tip as shown in drawing.

During a normal cycling sequence the velocity trip lever does not contact the tip of the velocity trip arm after center trip has been accomplished because a stud on the underside of the main gear contacts and resets the velocity trip arm assembly before the velocity trip lever cycles to such a position. But if the Reject On-Off knob is held in either the manual off or reject position during cycling after this stud has passed by the arrow head tip of the velocity trip arm assembly, the velocity trip arm assembly is pushed into such a position that the velocity trip lever must contact and reset the arrow head tip of the velocity trip arm assembly. The velocity trip lever may catch and be damaged on this burred edge during this cycling sequence.

To properly repair such a defect the velocity trip arm assembly should be removed from the bottom of the mechanism assembly and the right hand edge of the arrow tip of the velocity trip arm assembly (see Fig. 1) should be dressed down with emery paper to remove all burrs or rough edges.

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Techni-talk

Vol. 18 No. 3 Fall 1966

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Techni-talk on AM, FM, TV Servicing, published quarterly by ELECTRONIC COMPONENTS DIVISION, GENERAL ELECTRIC COMPANY, OWENSBORO, KY. In Canada: Canadian General Electric Co., Ltd., 189 Dufferin St., Toronto 3, Ontario. R. G. Kempton, Editor.

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