

# PLAIN TALK

AND

# Technical Tips

RCA RCA VICTOR 

VOL. **6**

NO. **7**

JULY, 1963

a monthly publication for the service industry about products of: RCA VICTOR HOME INSTRUMENTS OPERATIONS  
RADIO CORPORATION OF AMERICA

## HIGH VOLTAGE SECTION—CTC 15

The high voltage section of the new CTC 15 includes several new features which contribute to reliability, serviceability and performance. The horizontal output tube is a type 6JE6, a novar base type with separate suppressor grid connection. This is a more efficient, cooler operating tube which features higher power sensitivity than previous horizontal output tubes. The socket for this tube is mounted on a raised portion of the chassis which provides for venting around three sides of the mount. This creates a "chimney" effect to the flow of air and the overall result of this new design is that the tube operates almost 40° C. below its maximum allowable operating temperature.

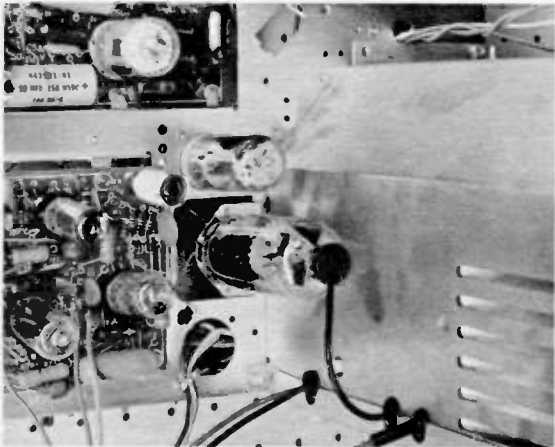


Figure 1—High Voltage Section—CTC 15

The high voltage compartment itself is of a new design with greater accessibility to the components in the compartment and an easily removed hinged cover. A barrier in the high voltage compartment restricts air flow in the lower portion where the horizontal output transformer is located combustion-proofing this area and permits full ventilation in the upper portion where the high voltage regulator is located. The upper section is lowered for air flow and at the same time an effective X-ray shield is maintained. The focus rectifier in the CTC 15 is a solid state device which features long life, low heat discharge and less loading to the high voltage transformer. A unique circuit is employed which produces, in addition to normal B boost, two additional boost voltages referred to as "A boosted boost" (1200 volts) and "B boosted boost" (1100 volts).

## THE NEW CTC 15 COLOR CHASSIS

The CTC 15 color chassis is a high performance receiver incorporating many time proven circuits as well as many new features. Improved performance, with high reliability and increased efficiency of operation, are the results achieved by new circuitry and advanced engineering design.

In addition to being a more reliable instrument, the CTC 15 is also easier to service. New, more legible and more complete, "roadmapping" has been printed on all the space-age sealed circuit boards to make circuit tracing an easier task for the technician. Color setup has been simplified by the addition of a three position bias switch which can accommodate wide variations of picture tube characteristics. Also the control placement on the convergence board has been changed to agree more nearly with the control function.

Many of the reliability items have to do with heat reduction and heat dissipation. Cooler operation of the horizontal output tube and high voltage regulator is accomplished by means of improved ventilation. Other heat reduction features include the use of novar tubes for the damper, horizontal output, and vertical oscillator and output. Also a special selenium rectifier is used as a focus rectifier and dark heater tubes in all high performance circuits help reduce the overall operating temperature of the receiver.

Further refinements in the CTC 15 contribute to higher definition of the picture. A smaller spot size is obtained with the use of higher screen voltages on the picture tube. To complement the sharper raster

(Continued on Page 4)

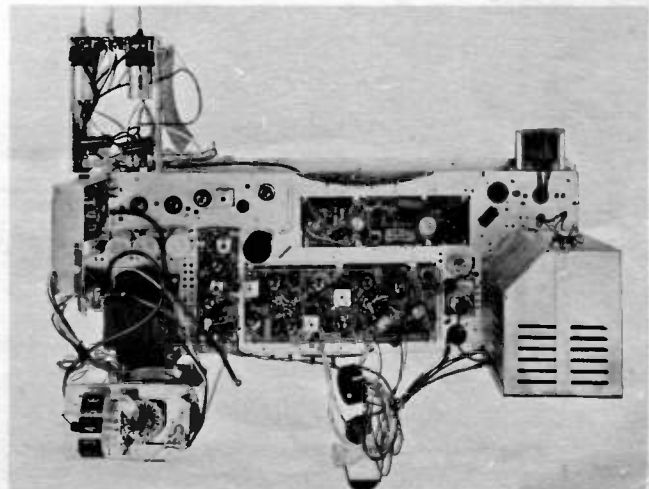


Figure 2—CTC 15 Color Chassis

## CTC 15 HIGH VOLTAGE REGULATION

The high voltage supply of the CTC 15 includes a regulating system which maintains a steady high voltage despite variations in picture tube loading. In addition to the normal regulator circuit, usually employed in color television chassis an extra feature is included in the CTC 15. This consists of a connection between the third video amplifier plate circuit and the shunt regulator grid. Normally, white areas of the picture tend to load the high voltage supply due to the additional beam current drawn by the picture tube. To compensate for this effect, video of the same polarity as appears at the picture tube cathodes is coupled to the shunt regulator grid through a 12 megohm resistor; this causes the high voltage to remain at the same level when large white areas are being displayed on the picture tube. The long time-constant formed by the 12 megohm resistor and the .01  $\mu$ f capacitor in the regulator grid circuit insure that only long term video variations are coupled to the shunt regulator.

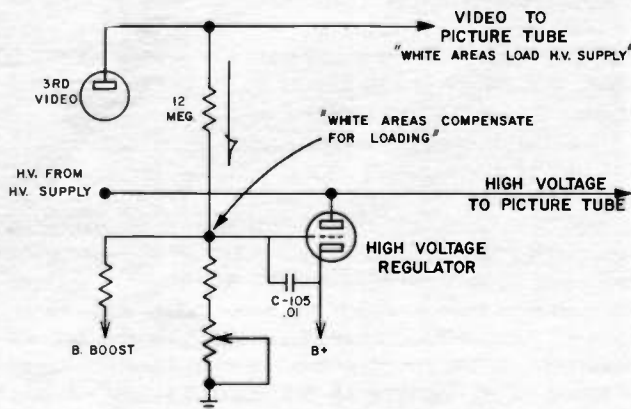


Figure 3—High Voltage Regulation

## CTC 15 BOOSTED BOOST

A unique adder circuit has been incorporated in the CTC 15 to supply the higher voltages for the screens of the picture tube. This higher voltage is required to accomplish the smaller spot size feature. The 500 volt pulse produced by the collapsing field of the horizontal output transformer during flyback time is applied to CR 101, the "boost diode adder," and is effectively added to the normal B boost of 800 volts. The higher boosted boost voltage of 1200 volts is utilized as a source voltage for the vertical oscillator. A voltage divider is used to derive the 1100 volts which is applied to the picture tube screens.

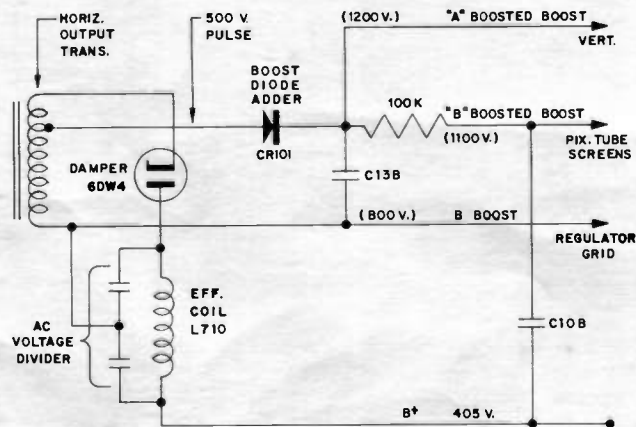


Figure 4—Boosted B Boost

## CTC 15 VIDEO PEAKING

An additional refinement in the CTC 15 color chassis is the inclusion of a video peaking switch which is mounted on the rear apron of the chassis. Three positions of the switch permit the selection of three degrees of video peaking; the upper position gives highest peaking while the lower positions select a lesser degree of peaking. The service technician can make use of this switch to satisfy the viewing requirements of any customer in any particular area.

The video peaking switch, S 103, is located in the contrast control circuit which is in the cathode of the third video amplifier. Maximum effect of this switch can be observed when the contrast control is nearest the  $\frac{3}{4}$  clockwise position. The peaking that is accomplished is actually phase peaking and results in better transient response thereby giving a sharper transition from black to white and vice versa.

When adjusting the peaking switch observe its action when tuned to a channel which is carrying fairly high definition program material.

## PICTURE TUBE BIAS SWITCH

The picture tube bias switch has been relocated in the circuitry and now affects the picture tube grids instead of the cathodes as in the previous CTC 12. This maintains a more constant load to the third video amplifier at any setting of the picture tube bias switch.

A three-position slide switch effectively selects three different values of plate load resistor for the blanking amplifier when the picture tube bias switch is operated. This changes the blanking pulse amplitude which is fed to the common cathodes of the R-Y, B-Y, and G-Y amplifiers. As a result, the average bias on these tubes will change with each position of the switch. A change in bias results in a plate voltage change, and since the picture tube control grids are DC coupled this change appears at the picture tube. With the three settings provided on the bias switch, it is possible to make adjustment for any variations in picture tube characteristics. A simplified schematic showing the operation of this circuit is given below.

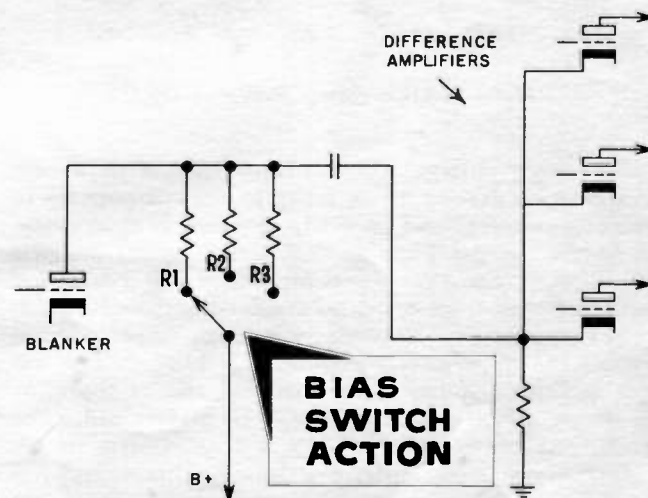


Figure 5—Picture Tube Bias Switch

## TUNERS USED IN 1964 LINE COLOR RECEIVERS

The tuners described below are used in some models of the CTC 15 and in some black and white receivers.

### KRK 103 Series

The KRK 103 is an improved super-powered New Vista tuner with concentric fine tuning. The signal-to-noise ratio figure has been improved over the previous models, which improves its performance in fringe area reception. The tubes used are a 6EA8 combined oscillator-mixer and a 6DV4 nuvistor RF amplifier. The remote cutoff characteristics of the RF amplifier nuvistor enable the tuner to handle large input signals without overload or cross modulation. The tuner can be field converted to UHF by the installation of the DK 154 or DK 155 UHF Conversion Kit. This tuner is used in some models of the CTC 15 chassis and some black and white instruments.

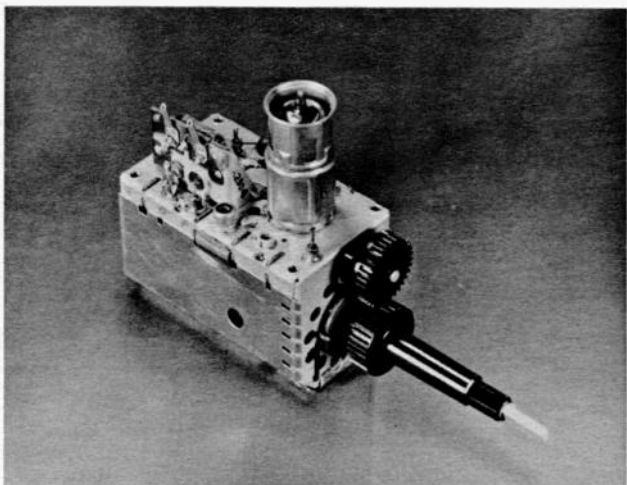


Figure 6—KRK 103 Tuner

### KRK 104 Series

This tuner is essentially the same as the KRK 103 with the exception of the input circuit and an extra UHF switch position. In the UHF position the tuner is connected as a two-stage IF amplifier using the RF amplifier and the mixer pentode tubes as IF amplifiers. The input circuit variations are minor and were made necessary by the added 40 Mc circuitry.

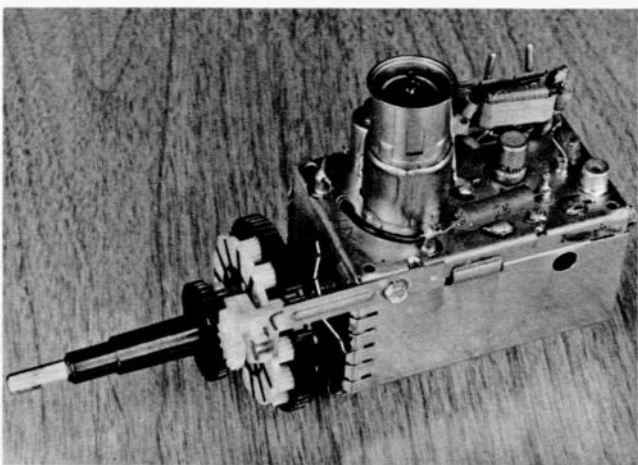


Figure 7—KRK 108 Tuner

### KRK 107 Series

This tuner is electrically the same as the KRK 103 but has concentric pre-set fine tuning. It is used in some black and white receivers and in all remote control color receivers. The tuner can be field converted for the CTC 15 receivers with die cast masks by using the DK 154 Conversion Kit; the DK 155 UHF Conversion Kit is used in color sets with floating single unit masks.

### KRK 108 Series

This tuner is the KRK 107 with added circuitry for UHF. In the UHF position the unit is connected as a two-stage IF amplifier using the nuvistor and the pentode section of the 6EA8 as amplifier tubes.

## CONVERGENCE—CTC15

The CTC 15 convergence controls operate in a manner very similar to the previous CTC 12; however two improvements have been incorporated in this area. One is the addition of a clamp diode which gives better action to the vertical RG controls, and the other consists of a change in the placement of the horizontal RG 3 and RG 4 controls. With this layout the entire

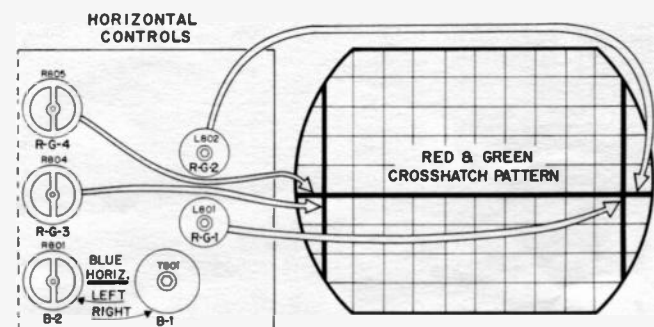
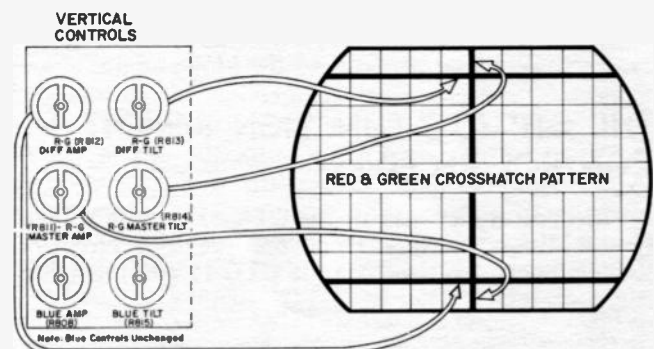


Figure 8—Convergence—CTC 15

top row of controls are adjusted on the basis of horizontal lines of a crosshatch pattern and the entire second row are adjusted on the basis of vertical lines on the crosshatch pattern. The effect of the other controls remain the same as in the previous CTC 12.



## THE CRK 6A COLOR REMOTE HAND UNIT

The transistorized 7-function hand unit used with the CTC 15 remote control system is improved over the previous hand unit. A new transducer, resistant to humidity effects, is used in a capacitive voltage divider circuit to give less loading of the oscillator circuit. A 9 volt battery is used instead of the 4.5 volt battery in the previous models. The output frequencies and the overall mechanical and electrical arrangement remain the same as the previous hand unit.

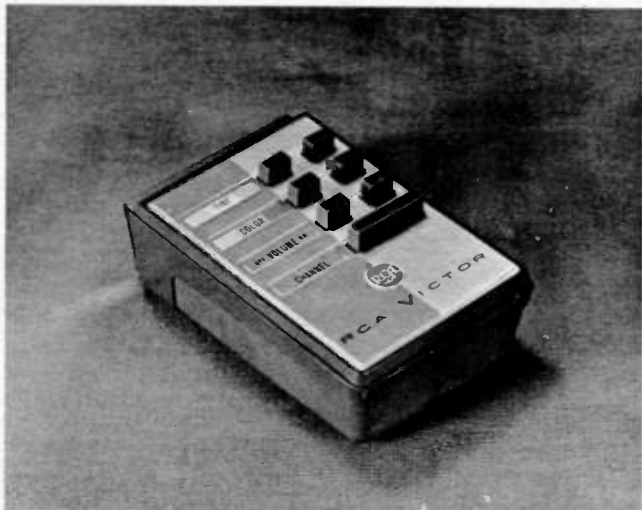


Figure 9—CRK 6A Hand Unit

## THE CTP 10 7-FUNCTION REMOTE CONTROL RECEIVER

The control circuitry of the CTC 15 remote control system differs slightly from the previous circuitry. Remote control versions of the CTC 15 employ a con-

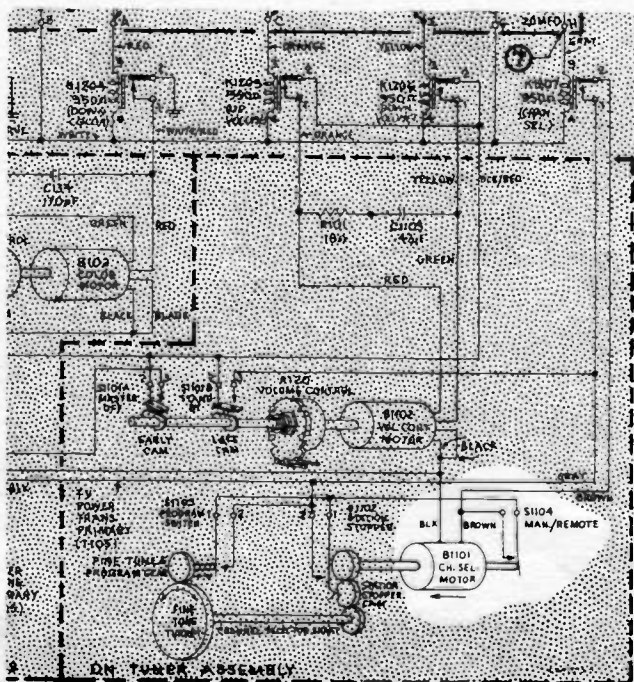


Figure 10—CTP10 Remote Control Receiver

ventional channel selector knob for manual operations. Provisions are made to disable the programming and station stopper switches when the channel selector knob is turned. A switch (S1104) operated by the end-play of the motor is in series with the program switch and station stopper. This prevents electrical rotation of the motor when the channel selector knob is turned manually. The relay contacts of K1207 (channel selector) will permit *remote* channel selection at any time.

To program the CTC 15 remote control each desired channel is pretuned by the fine tuning knob. To bypass a channel, stop at each undesired channel and rotate the fine tuning knob 3 turns clockwise. To add a channel previously by-passed, switch to that channel manually and adjust the fine tuning control approximately  $3\frac{1}{2}$  turns counterclockwise and tune for normal picture.

## THE NEW CTC15 COLOR CHASSIS

(Continued from Page 1)

produced by the small spot size, additional detail has been added to the black and white and color portions of the video circuits. Other improvements in the CTC 15 chassis include a more stable horizontal oscillator, an improved AGC characteristic and provisions for snivet suppression in the horizontal output circuit.

## RCA SALES CORPORATION

600 NORTH SHERMAN DRIVE

INDIANAPOLIS 1, INDIANA

A RADIO CORPORATION OF AMERICA SUBSIDIARY

Tmks. © Reg. U. S. Pat. Off.