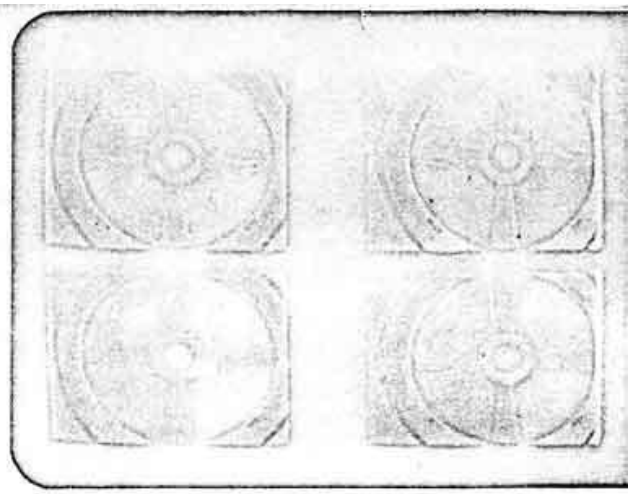
Your 7-Incher Can Catch Color Telecasts



Four tiny images like these will bob up on the screen of nearly every 7-inch TV set when it is tuned to a channel carrying CBS colors. Bigger conventional sets may just get a blur.

Adding two resistors will adapt a little set to the new standards, but you will need a wheel to enjoy the colors.

By Norman L. Chalfin

THE easiest sets to turn into color television receivers are the little 7-inchers.

- Adding two resistors will adapt these small sets to the CBS standards and enable you to see black-and-white versions of the color broadcasts.
- Adding two hold controls and a switch will then enable you to receive both standard black-and-white telecasts and black-and-white images of the CBS colorcasts on the same set.
- Placing a color wheel in front of the 7-inch screen of a set modified in these ways will enable you to see the broadcast in color.

Adapting a larger set to the color standards may entail much more work and possibly replacement of some major parts. The color wheel needed to obtain larger color pictures is also more cumbersome.

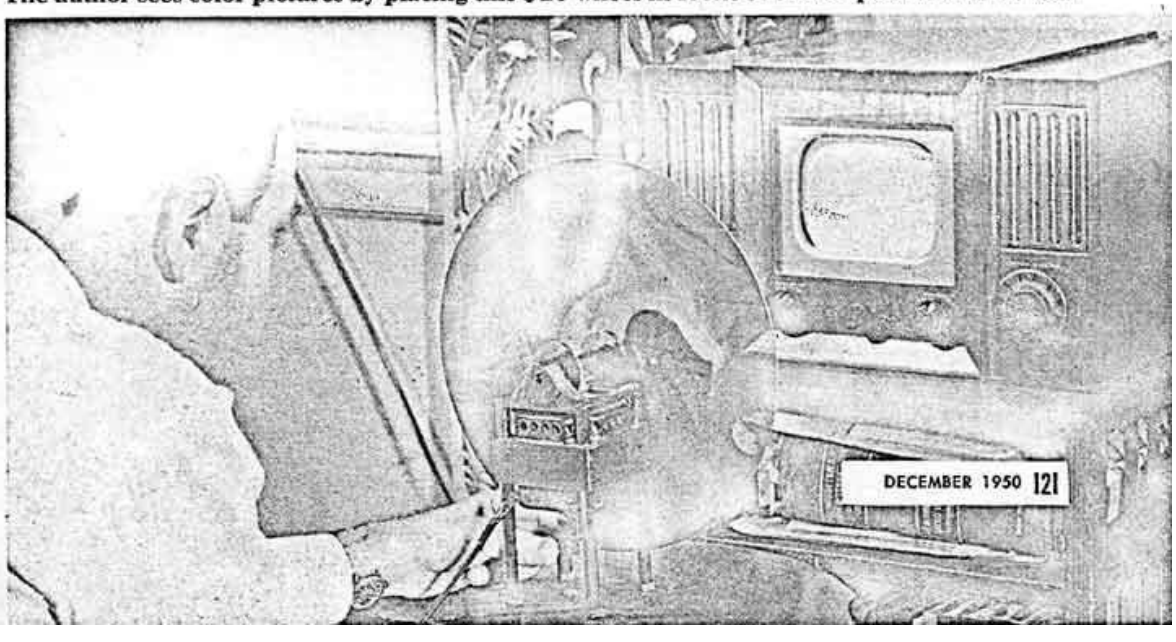
Many 7-inch sets have been shunted aside or traded in by purchasers of the more popular big-screen sets and are now available at much lower prices than the big sets. So this makes them the logical choice for anyone who would like to try his hand at turning a black-and-white receiver into a color set.

The Deflection Circuits

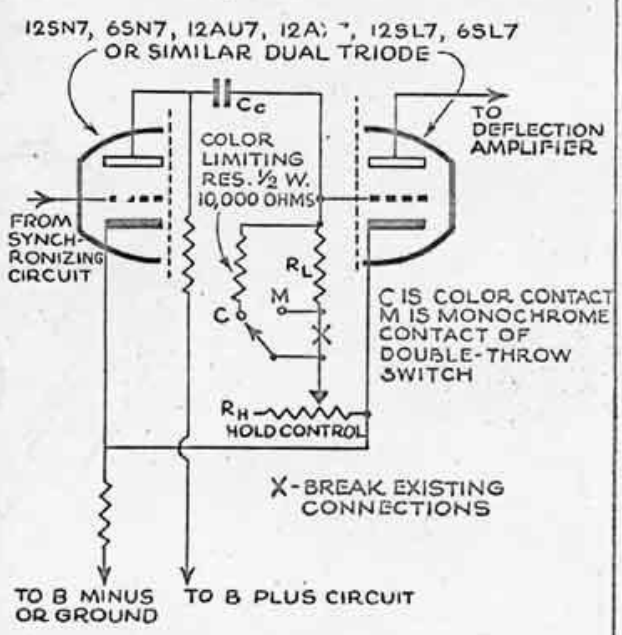
Every TV receiver contains two deflection oscillators—the circuits that move the electron beam horizontally and vertically. In all 7-inch sets, they are either multivibrators or blocking oscillators—although they often are referred to by other names, such as "sweep generators," "sweep oscillators," and "saw-tooth generators." Putting a new resistor that has a lower value into each oscillator will change the sweep frequencies to correspond with the color standards.

Identifying the deflection oscillators in

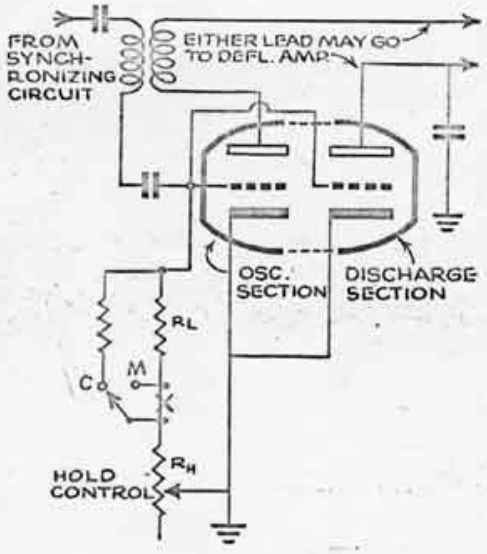
The author sees color pictures by placing this $20 wheel in front of his adapted 7-inch TV set.



DEFLECTION CIRCUITS LIKE THESE ARE USED IN 7-INCH SETS



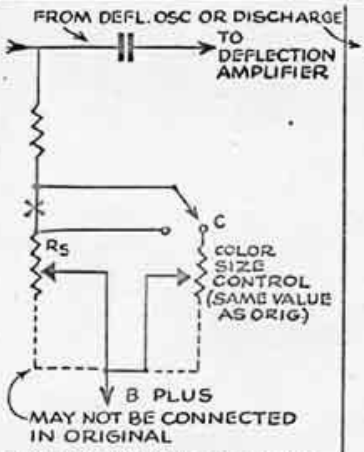
MULTIVIBRATOR
(HORIZONTAL OR VERTICAL)



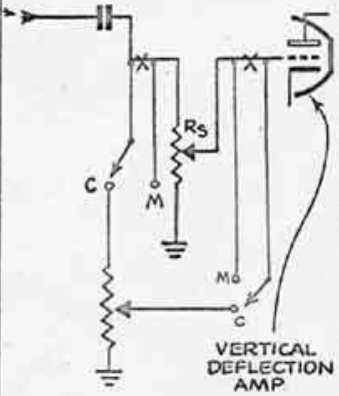
BLOCKING OSCILLATOR
(HORIZONTAL OR VERTICAL)

Colored lines show where resistors can be added, and switch cut in so set can be used to receive either monochrome or color telecasts. Every set has two deflection circuits. Both must be changed. One may be multivibrator and the other a blocking oscillator, or both may be the same. These are typical circuits; yours may differ in some respects. Consult your set diagram.

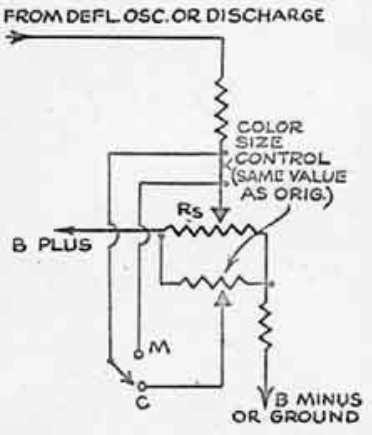
SIZE-CONTROL CIRCUITS LIKE THESE ARE USED IN 7-INCH SETS



HEIGHT OR WIDTH CONTROL
(B PLUS TO OSC PLATE)

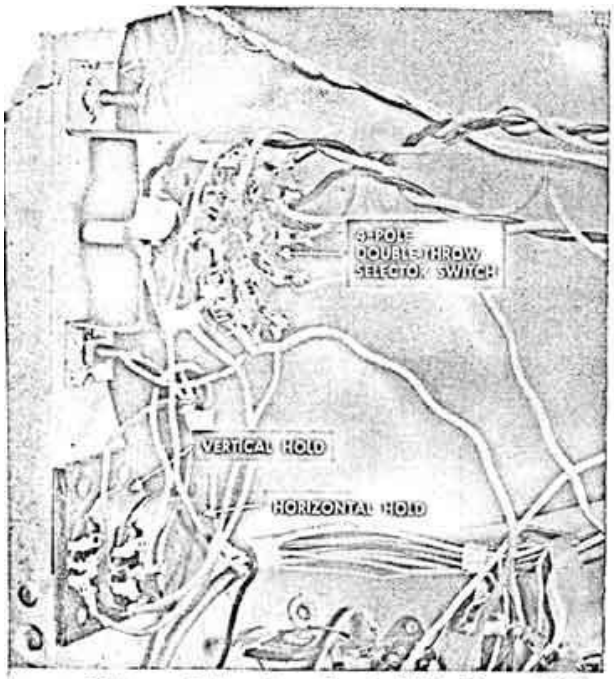


HEIGHT CONTROL IN GRID OF VERT. DEFL. AMP.

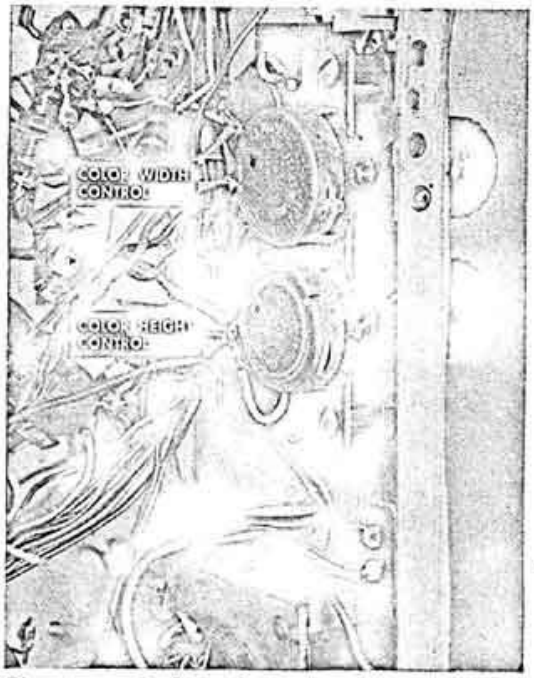


HEIGHT OR WIDTH CONTROL
IN B-PLUS BLEEDER

New controls must be added to avoid readjusting picture size whenever you switch from monochrome to color. Your height control may be any one of these three types; width control may be either of two so marked. Minor variations not indicated in drawings can be disregarded. If your set has height control shown in center you will need an extra switch pole.



Color switch put on front of Tele-Tone 149 by author is 4-pole, 2-position flat wafer. Its shaft goes through cabinet to a small knob centered directly beneath the 7-inch screen.



Size controls for color pictures are mounted on plastic strip, attached to rear apron with spacers, directly below monochrome controls. Once set right, they seldom need be changed.

some sets, however, is difficult. The best way to locate them is to consult a schematic wiring diagram—*but be sure it is the right one*. There are variations even among sets bearing the same model number. So, if you ask the manufacturer for a diagram, you should give him the serial number as well as the model number of the set for which you want it.

In most cases the central part of the oscillator circuit will be a dual-triode tube. Trace the connections, however, before you make any changes. It is dangerous to work on a TV set without being sure what you are doing.

Look For These Circuits

A basic multivibrator circuit is shown alongside a blocking oscillator circuit on page 122. In the multivibrator, both halves of a dual triode are used. Energy is exchanged between them through interconnected cathodes. The frequency of this oscillation depends on the capacity of the coupling condenser (C_C) and the combined resistance of the limiting resistor (R_L) and the variable resistor hold control (R_H).

A blocking oscillator requires a transformer. Opposite windings of this transformer are connected to the grid and plate of a triode. In most sets this is a dual triode, one half of which serves as the discharge section. The two grids then are tied together. The hold and limiting resistors are usually in the grid circuit, and the rate of oscillation depends on the values of the coupling condenser (C_C), the grid resistance (R_L plus R_H), and the impedance of the transformer.

Switch Is Helpful

To change the frequency of oscillation in either a multivibrator or blocking oscillator circuit, you have only to change the value of one of the parts that determine it. (You do this, incidentally, every time you adjus. your set's vertical or horizontal hold control.)

The simplest way of doing this to adapt a 7-incher to colorcasts is to reduce the resistance of the limiting resistor (R_L). This can be done by substituting a 10,000 ohm, ½-watt resistor for it. If you place a double-throw switch between the limiting resistor and the hold control, you can then throw this switch one way (M) and get monochrome pictures as usual and throw it the other way (C) and get color pictures—assuming you use a color wheel.

The picture-size controls will have to be readjusted whenever you switch from monochrome to color programs, however, unless you also put in a new set of size controls. The colored lines on the diagrams at the bottom of page 122 show how these can be put in. They should have the same resis-

tance as the size controls already in the set.

You may have to experiment a bit to find the control settings at which both color and monochrome images fill the picture frame properly. But once you've found them, no further adjustment of the size controls should be needed. I placed mine on the back of the set, and connected them to the color switch on the front, so that simply turning this switch gives me either monochrome or color images.

Color Requirements

The most difficult part of the job is likely to be identifying the parts accurately. After that, make sure that you connect all pairs of switch contacts so they operate in the same direction. Then one switch position will bring all color poles into the circuit and the other will close all monochrome contacts.

Once you have adapted your set in this way, you will probably want a color wheel. It should have six equal wedges of transparent colored material. Two wedges should be red, two blue, and two green. If you can synchronize such a disk so that each wedge is in front of the tube for 1/144 of a second, your eye will mix the three colors into every hue of the rainbow.

The simplest one I've seen is the $20 Celomat "Vue-Scope" shown in the photo on the first page of this article. It is simply a three-color wheel, a motor, and a speed regulator, which you can set in front of you and look through. You have to adjust the speed-control frequently, however, because it does not contain any device to keep it synchronized with the pictures.

More such "converters" will probably be available soon. END

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