Zenith 14N22 TV chassis – Dynamic-Contrast Discussion and Modification

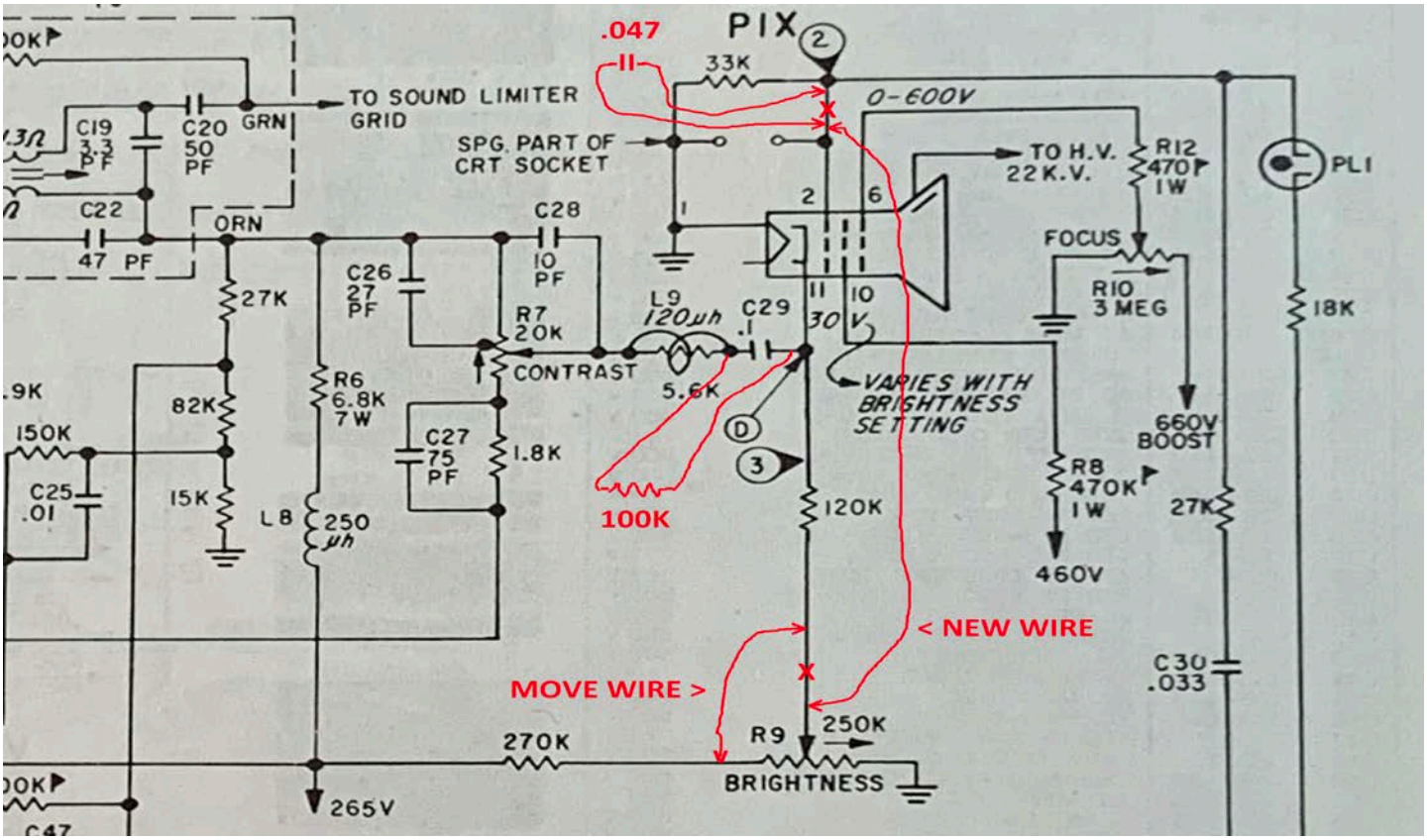
What is Dynamic-Contrast? It is the feature name Zenith assigned to Video DC Restoration in the early 1960's. Zenith included the feature with a small number of top-of-the-line 23" monochrome console models in the early 1960's. 1960 - 63 Zenith models which have this feature, include a "Normal-Contrast, Dynamic-Contrast" switch located on the secondary control panel. "Normal" is AC coupled (non-DC restored), "Dynamic" is DC coupled (DC restored).

What is Video DC Restoration? Also known as video clamping, DC restoration locks the black level (AKA: pedestal) of the video so that black remains black without drift from other video content or average picture level. The result is accurate reproduction of the source video. Most early television receivers do not employ the feature, so the black portions of the video appear variably from black to gray depending on average picture level. Night scenes appear as unnatural washed out gray instead of natural dark.

What happened to Video DC Restoration? After a few years Zenith discontinued the feature by the mid 1960's. It became standard (non-optional) with 1967 Zenith color sets, but not on monochrome sets. Other brands offered Video DC Restoration at various times. It eventually became standard on most color set brands. It is standard on professional video monitors used in production and broadcast.

I have owned a Zenith top-of-the-line 1961 17G28 set for several years which has the Dynamic-Contrast feature. It looks better than my other monochrome Zenith sets because dark scenes are dark instead of washed out gray. I studied several Zenith schematics and noted the differences in circuity between the sets with the Dynamic-Contrast feature and those without. The circuit differences between 16J28 and 14N22 are minor. The 14N22 is a nice 23-inch set, introduced in 1964 for the 1965 model year and in the early 70's. A real workhorse! But the 14N22 does not have Dynamic-Contrast. So, I decided the 14N22 chassis was a good candidate for modification. The results are excellent.

Here are the steps to perform the modification. First, the schematic below indicates the modifications in RED. Perform the steps which follow using the components: 1) 100K, ½ watt resistor, 1) .047uf, 200v capacitor, 1) 6 inch hookup wire. X indicates no continuity.



1. Connect the 100K, ½ watt resistor in parallel with C29. See figure 1.

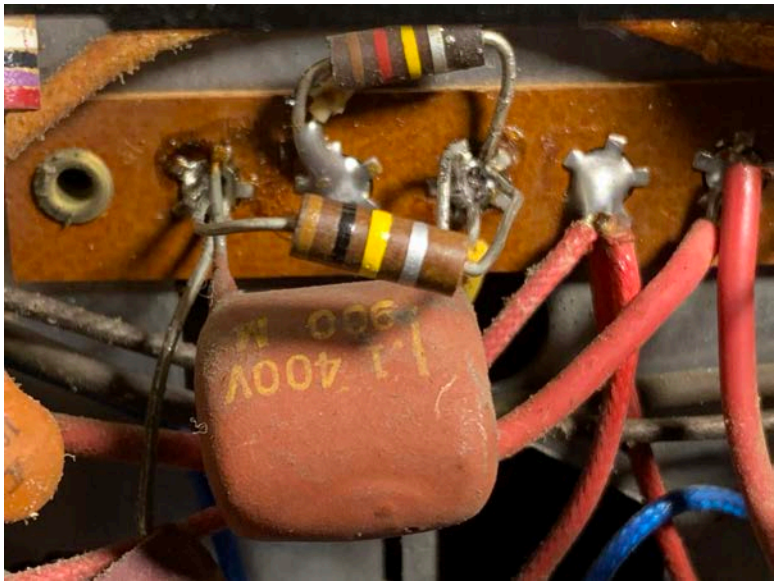


Figure 1 > 100K resistor added in parallel with C29

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2. Unsolder the yellow wire from the center terminal on R9 Brightness control, solder it to the CCW terminal with the orange wire on the same control (leaving the center terminal empty for the moment). See figure 2.

Figure 2 > Yellow wire moved from center term to CCW term

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3. Unsolder the Green G1 wire from its terminal on the chassis, move it to the adjacent unused terminal and insert it there. See figure 3.

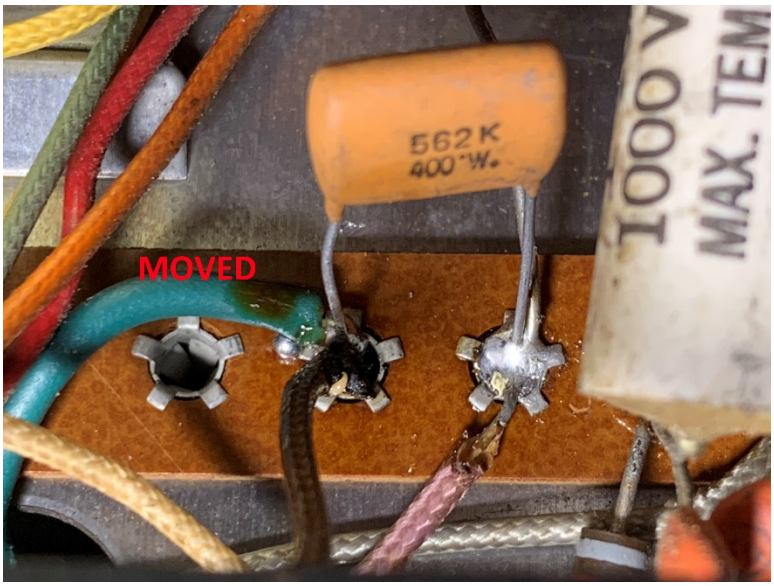

Figure 3 > Green G1 wire moved from violet wire term to empty adjacent unused terminal

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4. Connect the .047uf, 200v capacitor between the two terminals in step 3. See figure 4.

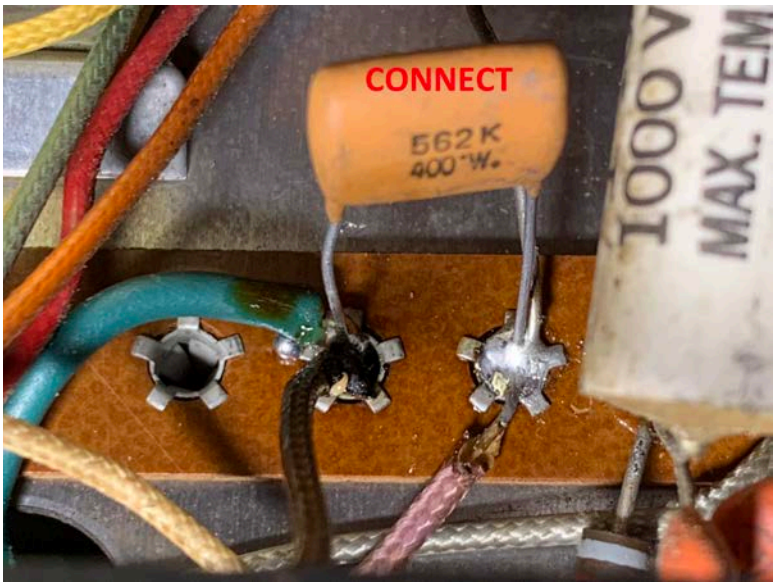

Figure 4 > Connect .047uf, 200v capacitor from violet wire term to GREEN G1 wire term

Note: I substituted an available .056 capacitor. Either .047 or .056 will work.

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5. Connect the 6 inch hookup wire from the center terminal on the brightness control to the GREEN G1 wire in its new terminal. See figure 5a and b.

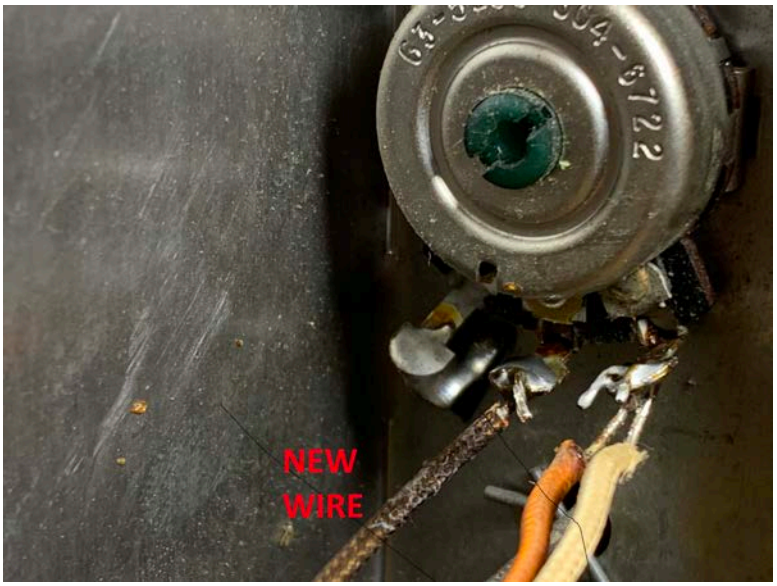

Figure 5a > New wire from brightness control center term

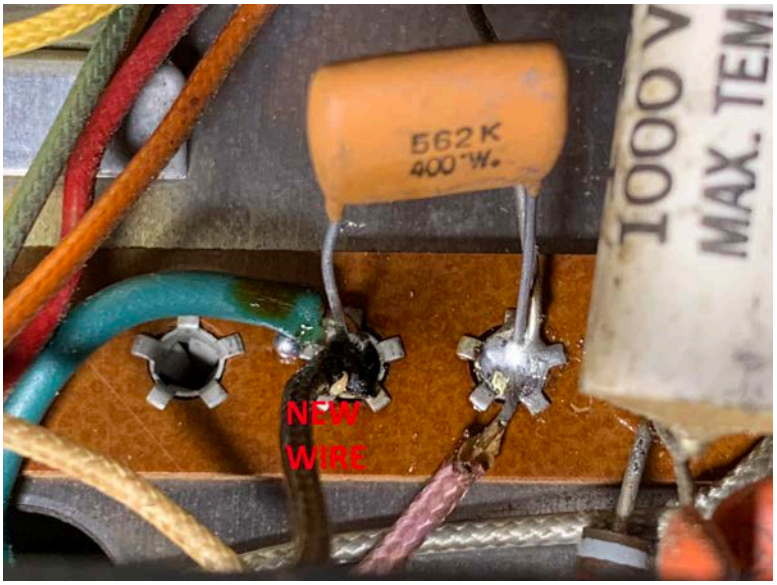

Figure 5b > New wire to GREEN G1 wire term

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6. Turn on the set and adjust for normal picture (the brightness control will now operate reverse direction).

7. Check the AGC level. It should be adjusted for 2.6V peak to peak with an oscilloscope connected to the grid (pin 8 - 6JT8) of the video amp.

Enjoy your favorite monochrome program!

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