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### Z-120 "All-in-one" Brightness Adjustment

One of our readers asked for help to adjust the brightness of the picture tube (Cathode Ray Tube or CRT) on his Z-120 All-In-One. It seems that, over time, the picture had been getting dimmer.

The following is a guide for others that may have been experiencing the same affect. As part for your Spring cleaning regimen, you may wish to tweak the inner workings somewhat to get a better picture again.

The first thing to check is the display itself, with the power off. If there is a residual shadow (darker blocks on the inside face of the CRT), you may wish to change out the CRT entirely. This situation is often called burn-in, where the phosphors of the inside face of the tube has literally been burned off, leaving the shadow affect. There is no fix for this condition, and it will only get worse.

This condition was often avoided by the use of screen savers that blanked the display after some length of time, but today's computer screens no longer suffer from this condition. The problem afflicted nearly all computers in the '80s and was caused by leaving the same display on the screen for lengthy periods at high brightness settings.

If there is no evidence of burn-in, then the CRT isn't probably the problem for your lack of brightness. Odds are a control was accidentally miss-set during some servicing, a resistor has

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drifted in value over time, or a capacitor may have gotten a bit leaky. It also probably isn't serious - the computer could run for many years yet without difficulty.

The first thing to check is the brightness control on the rear of the terminal. It might have been moved accidentally when moving the computer or when dusting.

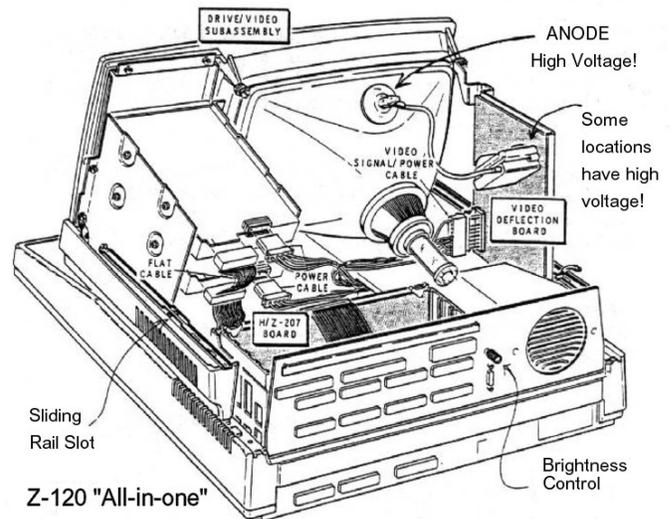


Figure 1.  
Z-120 "All-in-one" Computer

The best setting can be checked while using the {C} Color command (F12 function key for MTR-ROM v4 users) at the hand prompt. Adjust the control so that the second bar from the left is just visible. The first bar is black.

If this range is not sufficient, the next accessible control is on the video deflection board, mounted vertically behind the CRT on the left side. See Figure 2.

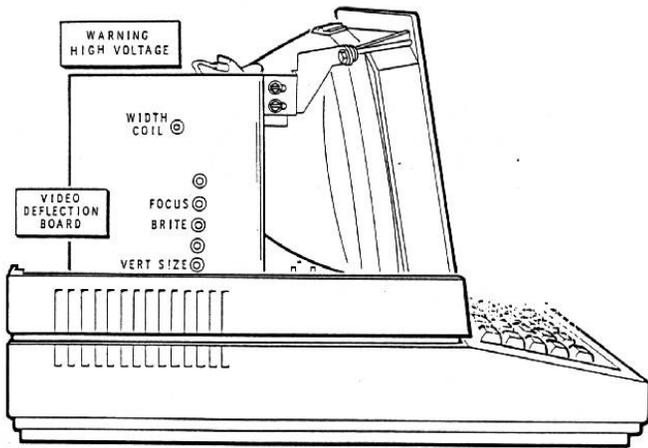


Figure 2.  
Z-120 "All-in-one" Interior

The control is accessible with just the cover removed.

Referring to Figure 1, the cover is removed by inserting a medium sized straight screwdriver into the slot on each side of the computer and moving the metal slide about 1/4" to the rear. It is tricky, but can be done by one very talented person. I recommend two persons, one to lift and hold the cover, while the second attacks each slide.

**Note:** Don't slide these rails too far back, because that was the old locking or storage position. A rubber pin was inserted in the hole at the slide's end so the slide could not be released! What a system!

Anyway, this control can be adjusted while the computer is on, but requires a very thin bladed screwdriver. An eyeglass screwdriver, with an insulated handle, would work fine.

**DANGER:** BE CAREFUL WHERE YOU STICK THE SCREWDRIVER. THERE ARE SOME HIGH VOLTAGES ON THIS BOARD AND AT THE ANODE OF THE CRT!

A thin wooden or plastic adjusting tool available in any radio/tv servicing kit would be better, but a metal screwdriver will work, if you carefully insert it only through each hole in the shield side to adjust the controls.

If in doubt, turn the computer off, pause a minute, adjust the control, and turn the computer back on to check how you did.

Brightness is the third hole down. Over adjust the control so you have a better range for adjusting the rear mounted control.

If this still does not give sufficient brightness, there are two more internal controls,

called Black Level and Contrast, mounted on the video logic board, Figure 3.

This board is mounted horizontally and upside down with three screws to standoffs on the motherboard. To adjust them requires removal of the entire picture tube and drive assembly. The procedure is explained in the Operations Manual, or on the "Repair and Modification" page on the "Z-100 LifeLine" Website.

Turn off the computer and unplug it before proceeding. Once the CRT assembly is removed, remove the middle cover section and lift out the keyboard to gain access to the entire video logic board.

If you wish to adjust these controls with power on, leave the keyboard set out to the front of the computer and place the CRT assembly back on top of the computer without the middle cover installed. It will rest comfortably on the two slide rails. Make all the power connections to the drives and video deflection board and power up.

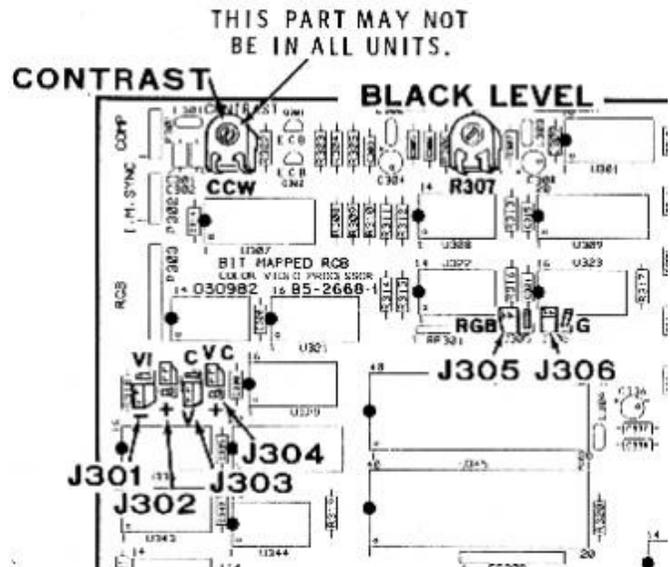


Figure 3.  
Video Logic Board

Figure 3 shows the component side of the Video Logic Board. In the computer, you will be looking at the solder side. You will see two holes in the front edge of the board and toward the left. The one closest to the left edge is the upside down Contrast Control. The other is the Black Level control.

Leaving the board mounted to the motherboard, we can still check the controls from the solder side of the board.

Using the thin bladed screwdriver again, check to ensure that the Contrast control is set fully clockwise (AS VIEWED FROM THE SOLDER SIDE). In spite of its name, it seems this control has the largest affect on brightness.

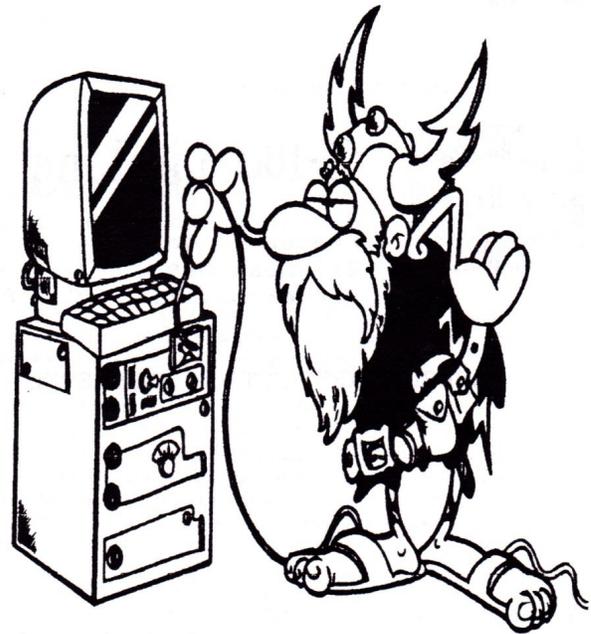
The Black Level control has a lesser affect but generally gets better as you turn counter-clockwise - to a point, then decreases the contrast if turned too far.

If the above adjustments have no affect, or you still can not get satisfactory brightness, then give me a call. It could still be the CRT, the deflection board, or the video board causing the problem. Before we try shipping the CRT and deflection board, I can ship you another video board to try.

I hope this helps.

Cheers,

Steven Vagts



"We can do this."