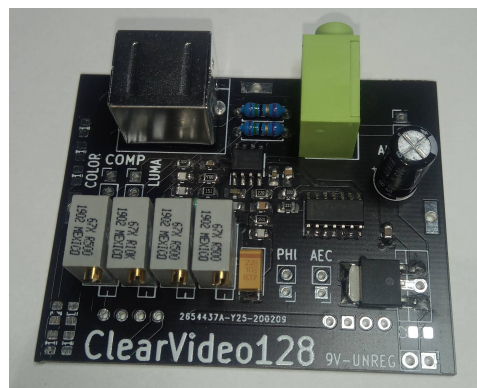


# ClearVideo128 Installation Instructions

For C64E (Assy 250469), C128, C128D, C128DCR  
Both NTSC & PAL compatible

## Tools Needed:

- Pliers
- Soldering Iron
- Solder and flux
- Desoldering iron or bulb or ribbon
- Wire strippers (16ga, 18ga, 22ga)
- Grounded anti-static work surface
- Flush cutters or side cutters
- Flux-remover (Isopropyl-99)
- DMM (continuity test)
- Various programs or games to help tune the video trimmers
- Patience. "Measure twice, solder once."



## Begin:

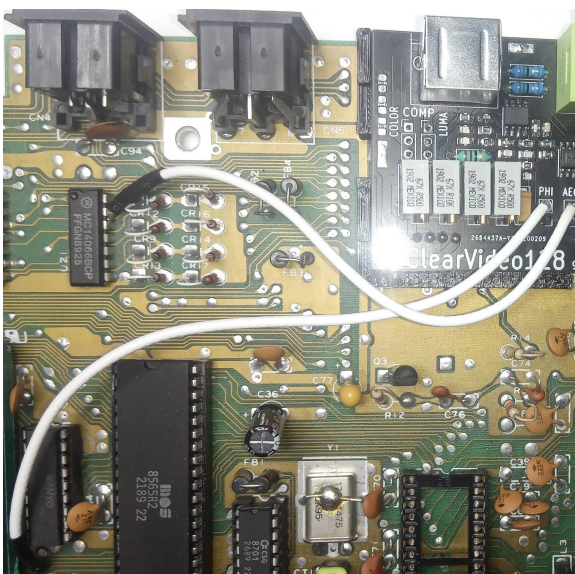
- 1) Read all instructions before proceeding.
- 2) Remove motherboard from computer case.
- 3) Remove the lid to the Video shielding. Clean the chips vigorously with alcohol... until clean. Peel the red tabs off the heat sinks and install in the center of each large video chip. They do not need to be perfectly centered, as the thermal tape is intentionally offset. Align and press. Enjoy your new heatsinks!
- 4) Desolder Mini-RFM box. This is the unit responsible for composite output mixed with audio. Remove the solder away from the tabs and bend them in so they are aligned with their holes. Desolder the 8 pins. Hopefully it wiggles free for you.
- 5) Install motherboard back into case with at least two screws, left and right of the RFM location. This is necessary to align the new plugs with your case exactly.
- 6) You may need to trim the plastic base to fit between the 80col DB9 and the standard Video Port DIN. Pre-fit the base by itself to see what sections to cut away near the existing connectors. If there is too little remaining of the base, the angle should still provide proper fitting. Reinforce base with your choice of filling (ie, hot glue) if you like, there will be no heat in this section to soften any of it, as long as the pins aren't obstructed.
- 7) Solder the power wires to the CV128. The front right corner is ground, next to it is "9V UNREG" which is typically connected across the largest internal capacitor. Just solder the wires to the CV128 for now. Then flush cut the leads from the underside, especially so 9vUNREG does not contact the motherboard.
- 8) Place the two large support pins in the motherboard holes in the rear and left side by the DB9. Do not solder.
- 9) Place the two 1x04 pinheaders in their holes for motherboard video connection. Do not solder.

- 10) Carefully lower the CV128 onto the two support pins through the aligned holes, and then the four pins on the left, and then onto the four on the right. The audio jack will interfere with the case and will need to be inserted first and then pushed down gently to hold it in place. It's a little tight but will fit. A little patience here.
- 11) Align the case holes with the CV128 S-Video and audio jacks. There are two lines along the top of the S-Video jack to help. Some very minor twisting may be necessary to perfectly fit your specific case. Hold in place with your finger on top of the trimmers, enough downward force to pin it in place. Use a S-Video cable plugged in to help align. If the support angle bracket doesn't fit your case well enough, you may omit this part and the following procedure should be sturdy enough without it.
- 12) Flush cut the left support pin, keeping the piece that is cut off. Set that aside briefly.
- 13) Verify you are aligned.
- 14) Solder the cut pin to the CV128.
- 15) Verify you are aligned.
- 16) Solder the left four video pins.
- 17) Flush cut the right four video pins and solder them.
- 18) By now it should be "fitted" but easily removable. Just keep it in there, you should no longer need to hold it so firmly.
- 19) Remove the motherboard screws and separate case from boards.
- 20) With pliers and your finger or harder surface, bend the cut pin you saved into an L or a J-hook, with just 1/8" or 3mm bent at the top. It should be just under a half-inch long. Insert this into the right-side support hole and solder it in place from the top, onto the CV128 pad.
- 21) Flush-cut the rear support pin, solder to CV128 pad.
- 22) Now flip over the motherboard, holding the video board against it. It should still be aligned and there shouldn't be any "play" or else you have missed a step.
- 23) While pinching the board to motherboard for tightest fit, tack-solder a video pin on each side so you can more comfortably solder the remaining pins. Try to keep these smooth and flowing, not crusty or cold-jointed. This is your primary video connection. **VERY IMPORTANT:** Clean the pads after with your alcohol solvent, since flux is conductive and will bleed the signals into each other if you do not.
- 24) Still pinching the two, place a great gob of solder on each of the support pins. Try to get the solder to cross the pad or at least a full corner. Not too much but not a hairline blob either.
- 25) Confirm with DMM (ohmmeter) you have mega-ohm resistance levels between the video pins, so that none are shorted together from too much solder. If any are, fix it now.
- 26) Trim excess pin lengths from bottom of motherboard.
- 27) Flip board over and pull the power wires over to the main capacitor. For each wire, find a suitable path and cut the wire giving an extra 1/4"-1/2" length. Trim 1/8" (2-3mm) of insulation and solder to each capacitor leg near the surface of the motherboard.
- 28) Locate through-holes on the motherboard for Pin 12 (AEC) and Pin 18 (PHI) of the VIC-IIe chip. On a C128, they are external of the shielded box for the video chips, to the right. The AEC hole is near Pin 2 of U28. Confirm with DMM. The PHI through-hole is just north of U28, left of the R48 north through-hole.
- 29) Locate the CV128 connection points for these two connections. The white square is the signal, the lower hole is to ground the shielding.
- 30) Using the shielded cabling provided, measure lengths that give a path for each connection with an extra inch. This is stiff cable and will need some pre-bending. You should have a sufficient length for each connection. On one end, strip 16ga and 3/8" of outer insulation (6-8mm), exposing the mesh shielding. Determine which way each wire is going to fold/lay so the shielded connection is below the signal, and unmesh the shielding starting from the top so you can twist it together "down" into a lead. Then strip 1/8" (2-3mm) of the exposed inner wire (22ga). On the other, strip 18/20ga 3/8" to cut through the shielding and expose the inner insulation. Strip 1/8". Do this all to the other wire as well. Flux&tin all six leads.

- 31) Bend each "paired end" like a fork with two prongs to fit the CV128 holes before trying to solder them. Starting with the closer hole on the CV128 (likely AEC) and the cable you prepared for it, pre-bend it so it lays to the right, then flux and solder to CV128. Bend it around the video chip shielding. Then holding it close to the through-hole you located for it, solder the two together so it inserts into the hole under the old solder.
- 32) Now solder the second cable in place.
- 33) If you would like to use the 2<sup>nd</sup> audio channel in the audio jack (2<sup>nd</sup> SID chip etc) solder the wires to their respective location. Differentiate which is ground before connecting.
- 34) Insert the motherboard back into its case, insert all screws, but do not button up the top case just yet! You still need to adjust the trim adjustments. Connect the keyboard so you can access your video color test programs etc.
- 35) Using the included trimmer knobs, turn all pots clockwise until no further visual change occurs. Some modern monitors try to "balance" the signals, so you will need to turn off your C128 and back on to re-initialize the signal processing in your digital monitor. This may only be necessary for the Color trim (#2, left-right). Best tuning will be done on a CRT monitor.
- 36) Now trim each pot counterclockwise until you ballpark a good setting. From one to another, make finer adjustments. At some point a WOW is in order, but you can still get closer to a perfect video output. Continue cycling between trimmers making adjustments, powercycling every so often on digital displays, until all jailbars have vanished and you have a crisp color-balanced video display.
- 37) Reconnect keyboard ground strap and LED cable. Close up your computer case and tighten all case screws.

Congratulations, you have completed installation.

C64E:



C128:

