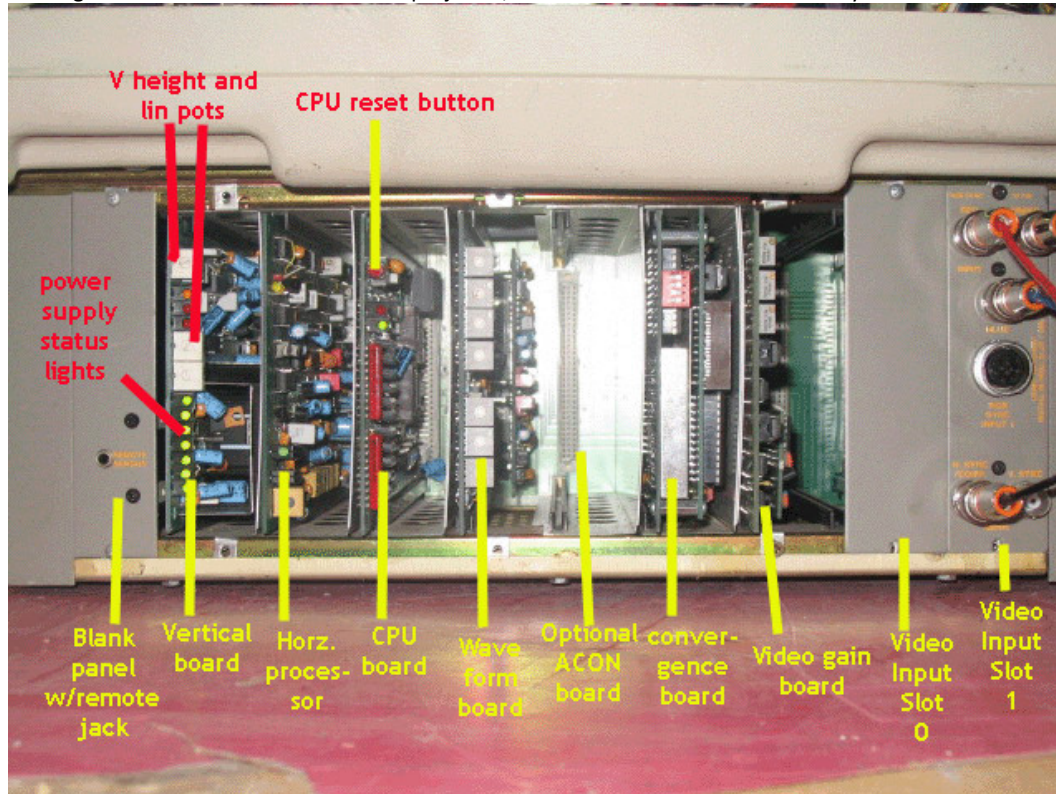


ECP setup stuff

Sunday, October 05, 2008
11:53 AM

Looking under the back cover of the ECP projector, all models used the same board layout as shown below.



Upon holding the power button down for 2 seconds, the set powers up and the green power supply lights should all come on, indicating that all power supply voltages are present. The red lights on the H and V boards may come on momentarily, but should go out after the set goes through a number of self checks. Once the self checks test OK, the high voltage will crackle up, and the tubes should light up if an input signal is present.

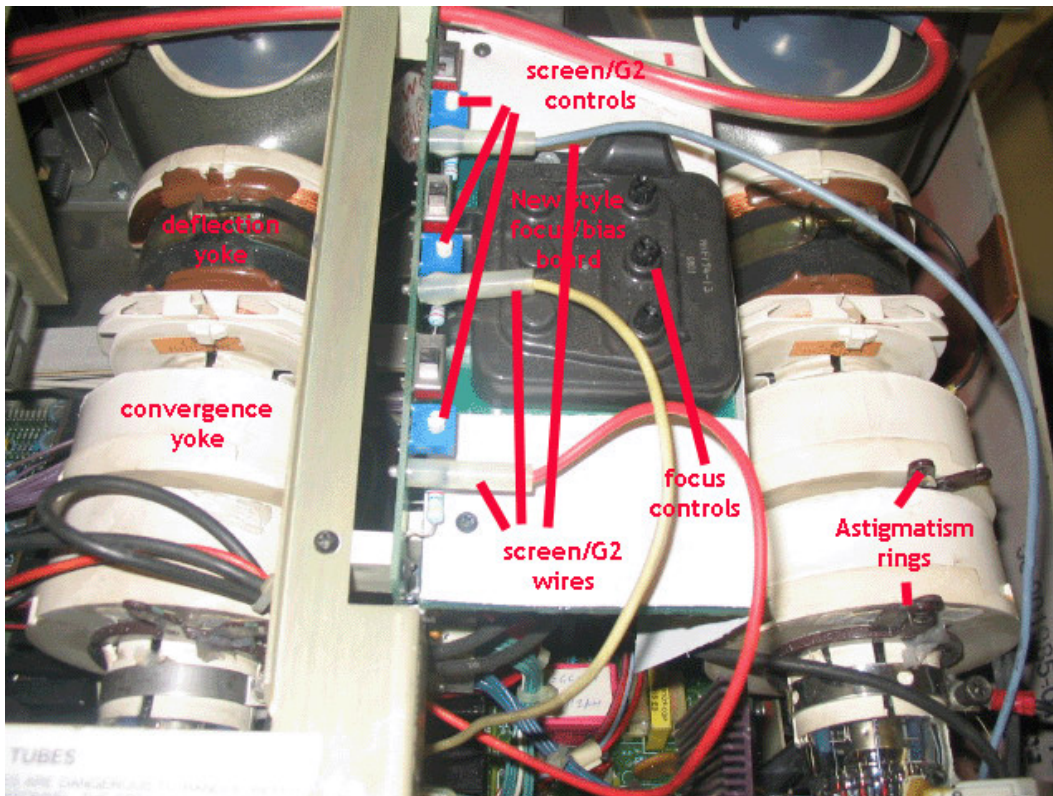
Starting from the left referring to the above image, the blank panel only houses an 1/8" mini jack so that a wired service remote may access the projector. This is useful for doing close screen convergence, when the projector is used in a rear projection mode or if the projector is far away from the screen.

- The first PC board with the green lights on it is the vertical output board. It provides the vertical sync and output, and has the master height and linearity controls on it. An H and V scan fail light are also on this board.
- The second board is the horizontal processor. This board has the horizontal driver and sync sections of the set on it, and those signals then drive the H deflection boards that are located under each tube.
- The third board is the CPU board that has the main microprocessor, the Dallas chip and the master reset button on it.
- The fourth board is the waveform board that generates the convergence waveforms for the convergence board on it.
- The 5th slot is usually empty, reserved for the ACON or automatic convergence board. If the ECP model is designated as an '01', ie. 4101, 3501, etc, then the set originally came from Electrohome with the ACON board and camera installed. Some people remove the ACON hardware, it's easy to install onto sets that did not come stock from the factory with it.
- The sixth board is the main convergence board. This board controls the convergence parameters for all three tubes.
- The seventh slot is the video gain board. This controls the amount of R G and B signals going to each video output board located on the back of each CRT.
- The eighth slot (shown here as a blank) is designated as Slot 0, the first video input board. Each ECP has the ability to accept two video input boards that came in a number of configurations, either video, S-video or RGB. Most boards were dual input, so with two input boards, you had available a total of 4 video inputs, eliminating the need for an external video switcher. Neat, huh?!?
- The ninth slot was the second video input card, designated as SLOT 1. When pressing the remote input selection, you select which slot you want to use, then which input on that particular slot. So 'Source' '0','1' selected the first input on slot 0. 'Source' '1','2' would select input 2 on slot 1. THE picture above shows a common dual RGB input board. Input 1 is a unique Electrohome 10 pin connector, and the matching plug is hard to find. Input 2 is a 5 BNC standard RGB input that accepts RGsB, RGSB or RGBHV signals.

Pasted from <http://www.curtpalme.com/ElectrohomeECP_Layout1.shtml>

Focus board

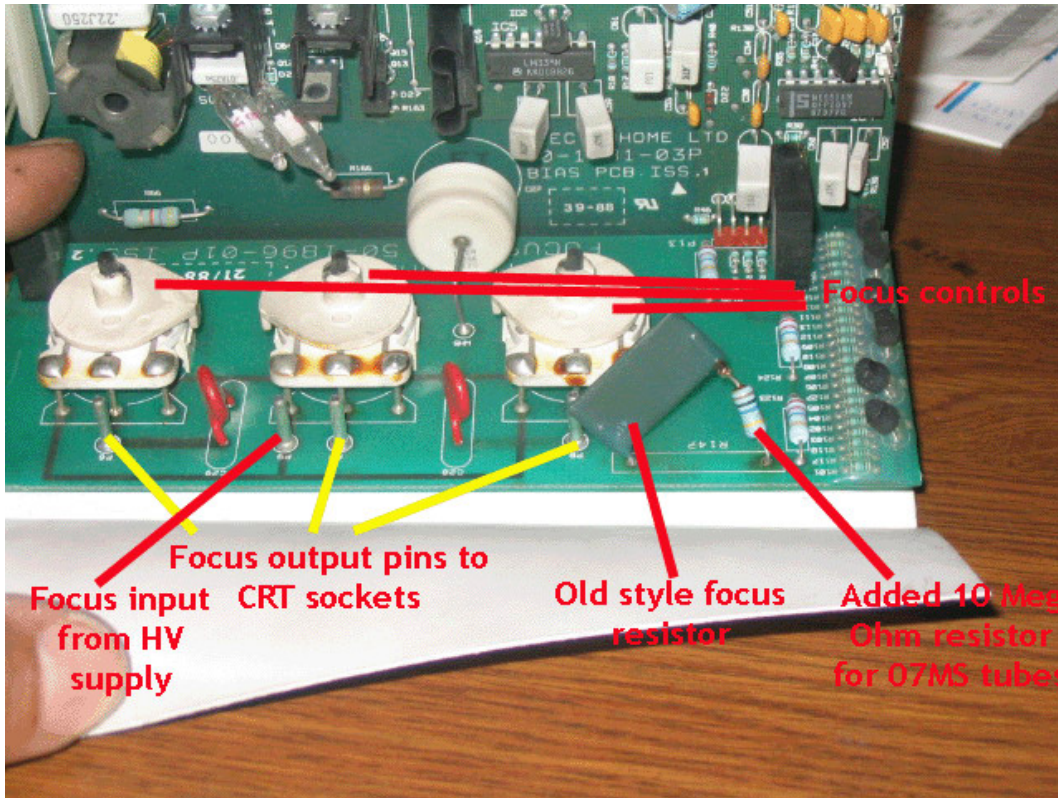
A partial view under the top cover shows the new style focus board, identifies the focus and G2 master brightness controls. The G2/screen control wires connect next to the G2 trimpots, and the small switches that I have not labeled below are the individual CRT cut-off switches that turn off each tube if the switch is set towards the front of the set. This is useful when setting focus and lens toe-in.



Located under the focus pots are the connectors for the thicker black focusing wires. Careful while poking around this area while the set is on, the focus leads carry 5000 volts! Let the set discharge for about 10 minutes with the AC plug pulled before you do any work in this area.

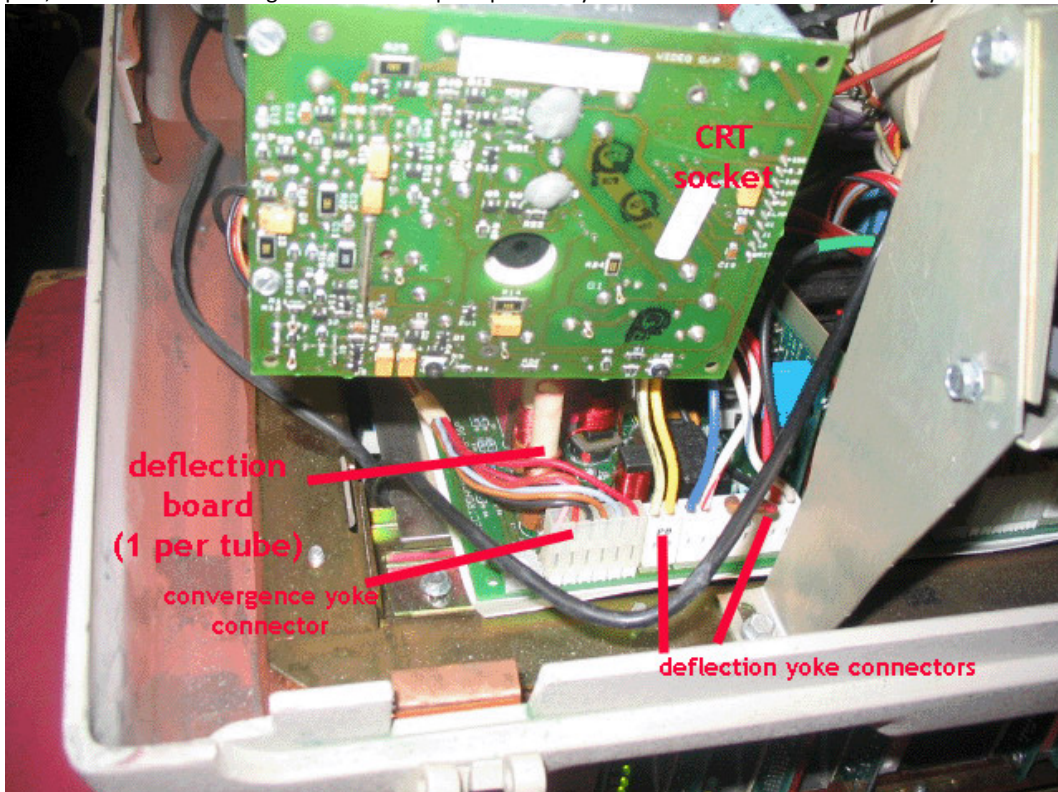
Pasted from <http://www.curtpalme.com/ElectrohomeECP_Layout2.shtm>

The below image shows the older style focusing board, and the problematic focus resistor that was underrated on the earlier ECP sets. This resistor would overheat and drift in value, causing the focus to drift and eventually drift out of range completely. The picture below shows the original focus resistor. Later models used a larger flat or round resistor that cured the overheating problems. The below image also shows an optional 10 Meg ohm resistor in series with the original 45 Meg Ohm resistor to accommodate the newer version 07MS tubes that needed a slightly different focus voltage to operate correctly. The main focus resistor is a 45 Meg Ohm resistor. These are hard to find, and I always use three 15 Meg ohm resistors, 2 watt flameproof ones soldered together in series to replace this older resistor. Once the resistor is replaced, the repair is good for the life of the set. Note that the top board of this two board bias/focusing board has a long connector with purple wires going to it. Make sure if you take this connector off that you insert it correctly. Installing it with one pin off will cause all sorts of havoc within the set. The last point of note on this focusing board is the focus connectors that go to each CRT. These leads have about 5000 volts on them. The black G2 lead coming to the focus board has about 12,000 volts on it, and goes to a separate pin on this focusing board. Use caution when working in this area with the power on!



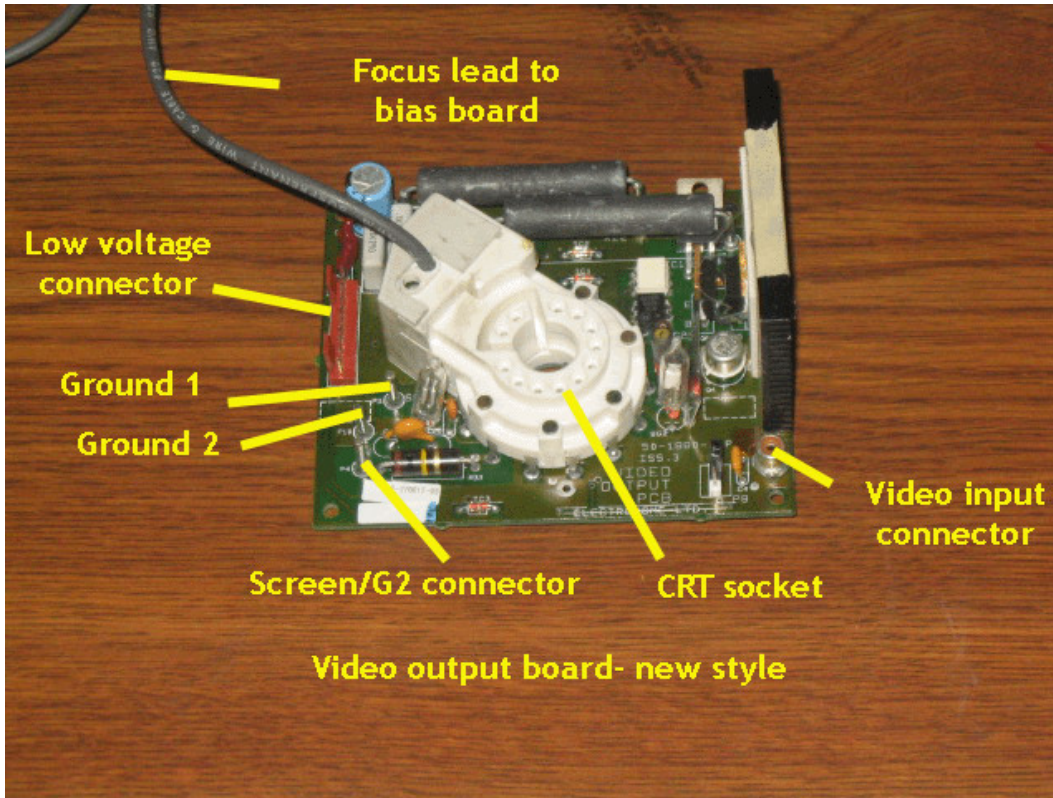
Pasted from <http://www.curtpalme.com/ElectrohomeECP_Layout3.shtm>

The below image shows one of the CRT output sockets. These pull right off the back of the tube, and all connectors pull off the board. Note that there are three single pin connectors right beside each other on the component side of the board with the exception of the focusing wire that pulls off the back of the focusing board. Ensure that the two black wires go back onto the right pins, and that the G2 wire goes to the third pin. Sparks may result if these wires are incorrectly installed.



All three CRT sockets are identical, so if problems occur with one color, these CRT boards may be swapped around to eliminate them as a source of the problem (or to confirm it.).

Here's a front view of the CRT socket.

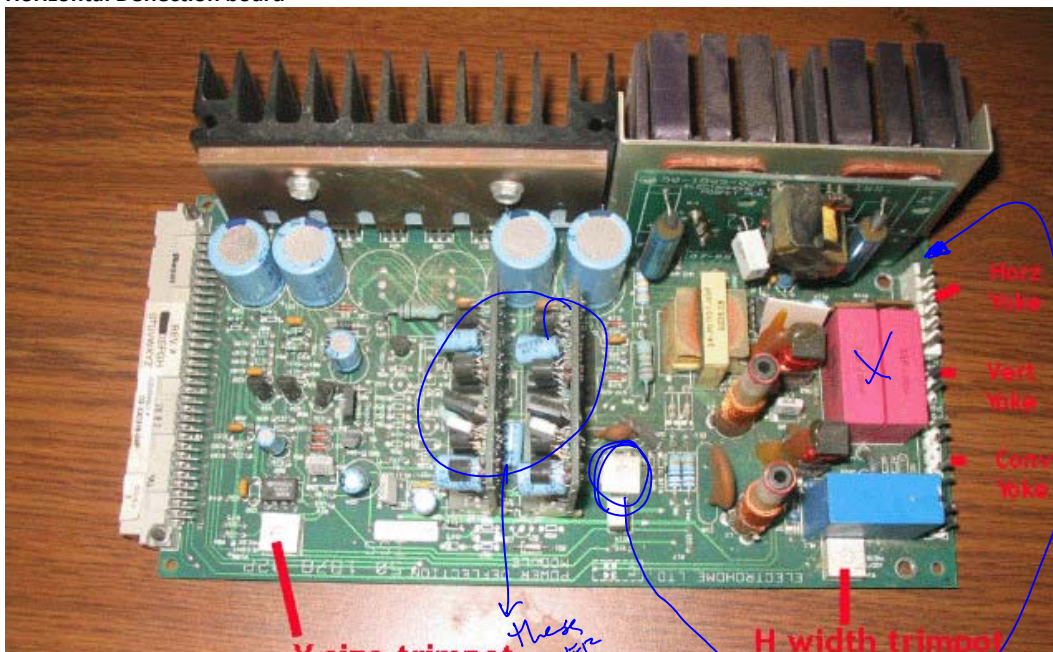


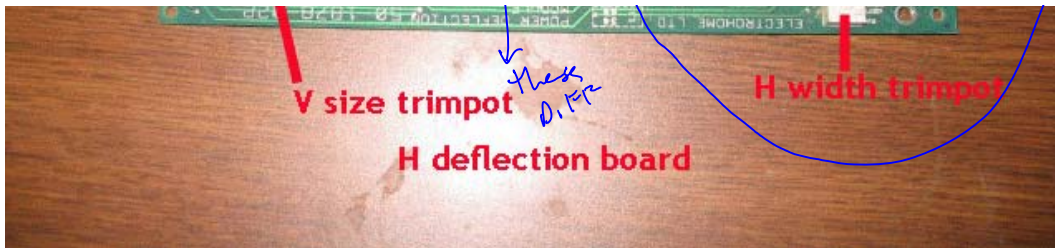
The front of the CRT sockets have several connectors that need to be unplugged if servicing or swapping boards. There are two ground connectors for two black ground wires. It does not matter which connector goes where. **The G2/screen connector should not be mixed up with the ground screws.** The above image shows the newer style of CRT output board, used in late model ECP 3100/4100's and the ECP 3500 and 4500. These use a mini RCA connector for the video input feed, the older style used a larger two pin connector.

Pasted from <http://www.curtpalme.com/ElectrohomeECP_Layout4.shtml>

Located below each CRT are the H deflection/convergence output board. Again, all three boards are identical, and you can swap these boards between tubes. Note however that a failure on one of these tubes usually shuts down the HV, and the H error light will light up on the back. Swapping the boards within the set will do nothing, you'd need to get a working deflection board and swap out these boards one at a time.

Horizontal Deflection board





The above picture shows the two main adjustments on the H deflection board. The master width pot works ONLY on the green board, the R and B width pots have no effect. This is normal. Set the width on the keypad to '5', and set this width pot so that a good amount of phosphor area is used. That allows some give and take adjustments via the width control on the keypad when changing resolutions.

The V size control works independently for each color. The idea of these controls is to match the height of all three CRT's without making massive use of convergence controls to shift the height of each color. This reduces convergence drift.

The convergence and H/V yoke plugs connect at the back edge of each deflection board. The H and V connectors pull out and reverse 180 degrees. This orients the image correctly whether floor or ceiling mounting. Both connectors need to be flipped on each H deflection board to properly orient the scanning of each tube.

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Vertical board

The below image shows the vertical/diagnostic board. This board is relatively reliable, and has the V height and linearity trimpots accessible while this board is installed in the set. There were various versions of this board throughout the various models, and all of these versions were interchangeable Not so for many other boards in these ECP sets.



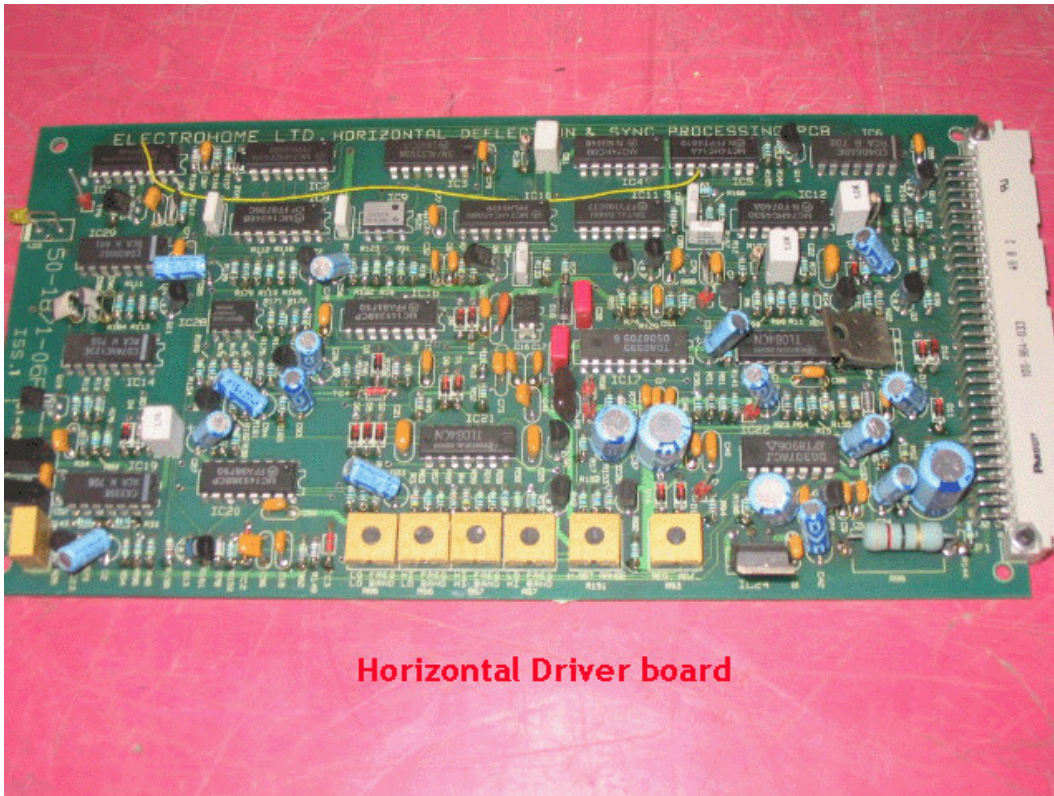
Vertical board

There are no other adjustments on the board that the user can set.

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Horizontal Driver board

Here is a shot of a typical H driver board from the ECP series of sets. The trimpots shown below are not accessible to the user without using special and expensive PC extender boards, and these pots do not need adjustment as a normal maintenance routine anyways. There are no real user adjustments on this board, and failures are rare. Various versions of this board are not interchangeable between models, so make sure you order the right board if you need one.

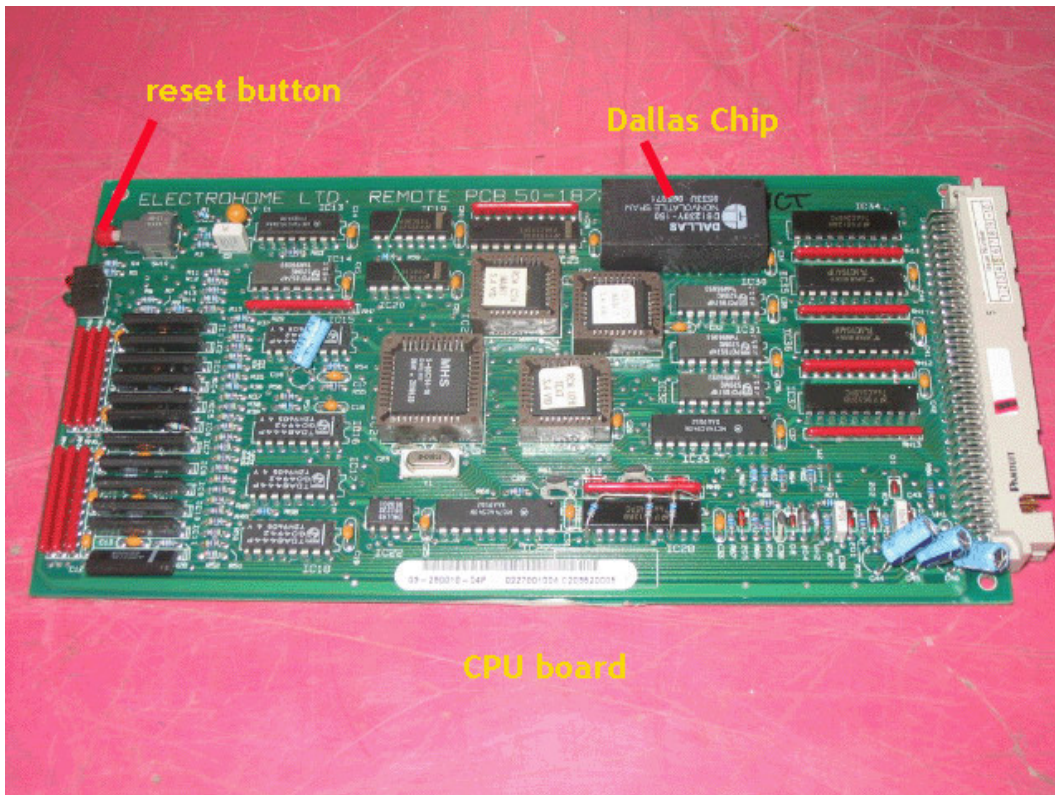


Horizontal Driver board

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CPU board

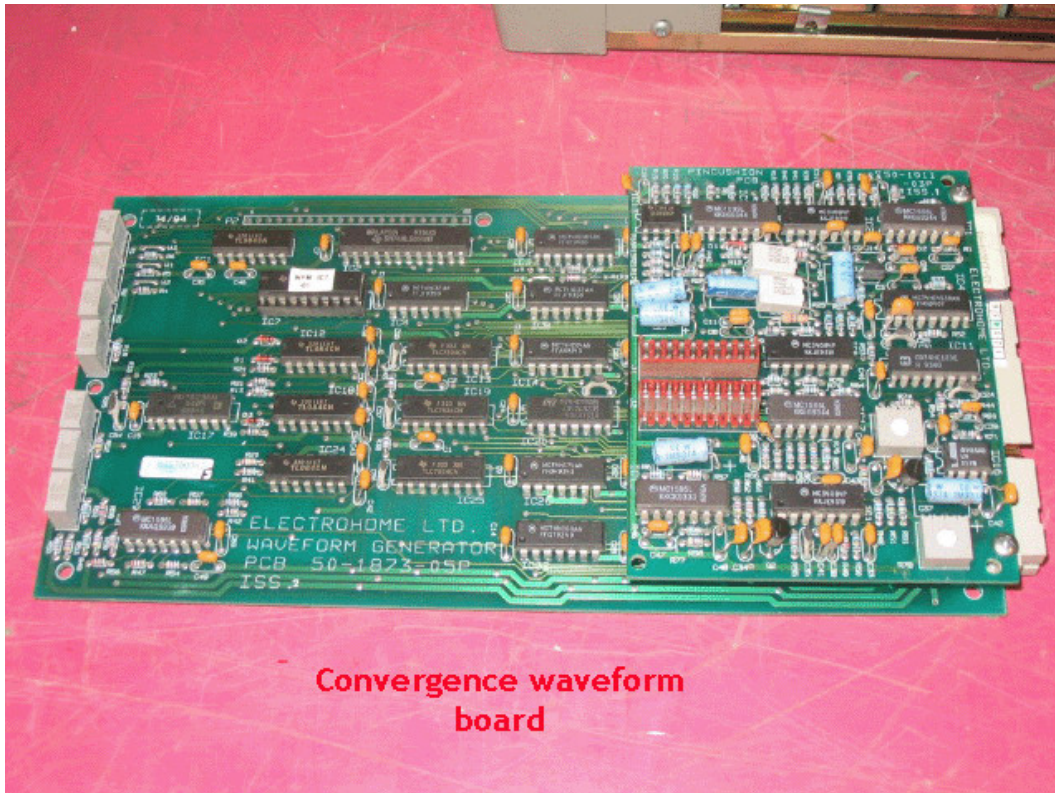
Here is the CPU board out of the ECP set. It came in various versions, and the location of the Dallas chip varied from revision to revision. The Dallas chip has an internal battery in the chip which cannot be measured at the chip pins. The battery is a lithium battery with a nominal rated life of 5 years, but 10-12 years is a more realistic life expectancy out of these chips. If you experience intermittent memory loss of the convergence settings, glitchy menus on the screen, etc. , the Dallas chip should be changed. There are a number of Dallas chip part numbers. The part numbers must match up exactly, or the CPU board will not work correctly.



The only other important part of the CPU board is the red reset switch. This switch is used in conjunction with the 'recall' or 'reset' button on the wired remote at the back of the set. To complete a full reset and memory wiping of the Dallas chip (recommended before each new installation), hold down either the 'recall' or 'reset' button on the keypad, then press the 'reset' button on this CPU board. If the reset has been done correctly, the set will shut off. Upon power-up, all convergence and other parameters on the on screen menu should be reset to '5'. That is, with the exception of the contrast control, which should now be set at '2'. Depending on the software installed in the projector, it will be either the 'reset' or 'recall' button that will activate the full resetting of this board. If you don't know which software you have, try both. You won't damage anything by pressing the wrong key on the keypad. The CPU simply won't do a full reset.

Pasted from <http://www.curtpalme.com/ElectrohomeECP_Layout8.shtm>

Waveform board



Convergence waveform board

As the title implies, the convergence waveform board generates the waveforms for the convergence board. I will be posted a separate tech tips section that describes how to tweak the trimpots on the front of this board, again under normal circumstances it's not required to turn these pots. The pincushion board is stacked as a daughterboard on the main board as shown above on some versions of this board. Some do not have this daughterboard.. It's common for the module contacts to go intermittent. The remedy is simple, take off the daughterboard and insert it back onto the motherboard several times. This cleans the contacts, and you're good to go for another few years.

ACON board

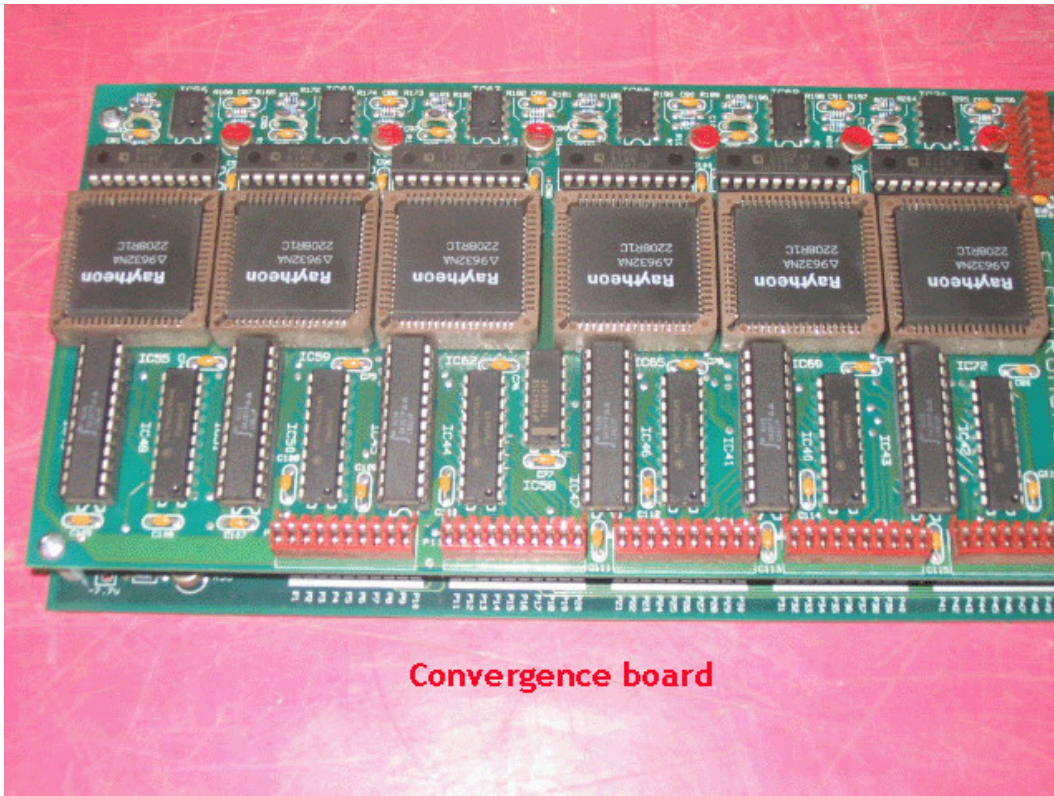
This board was an option on all models that ended in '00', and was standard equipment on the models ending in '01'. Of course, some ACON cameras were added after the fact and some were removed. The ACON consists of three parts: The PC board installed into the rear of the set, the camera on the front, and the 25 pin cable that plugs into the camera and snakes to the motherboard.

The ACON camera assists in the setup and convergence of the unit. When the ACON is installed and working properly, it will align the R and B tubes to the green grid that you need to set up manually. It's fun to watch, but you can always do a better job manually. When the ACON is installed, the ACON option will come up in the convergence menu. Select it, and the ACON will do it's job.

The ACON PC board is fairly reliable, but the mechanical servo controlled camera had it's issues. Most often, the camera got hit physically and sustained damage to the servos. Over time, the optics of the camera became dirty, and would show error messages. The optics are cheap and dirty in these ACON units, and it's not difficult to pull the camera open to clean them. Note that the ACON must be operated in complete darkness for the best results, any ambient light will throw the camera off.

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Convergence board



Convergence board

This is the main convergence board that controls the actions of the cursor as you converge. As with any Electrohome board, bad IC socket contacts are common on this board, and the connections between the top and bottom boards need to be cleaned if you experience intermittent convergence. As for the socketed chips, simply push down hard on them, that's always enough to clean and reseat the chip contacts.

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Video Gain board



Video gain board

This is a late model video gain board. The only adjustments on this board are the three gray trim pots as shown above, and they are

adjusted as follows:

Input a standard video signal so that you have an image on the screen. Turn the brightness control on the keypad to 10, set the contrast to 0. Look into each tube. If these pots are set correctly, all you will see is a blank screen. If the controls are misadjusted, you will see either a slight image or a slight negative of the image you're feeding to the projector. These pots are 10 turn pots, and you'll see a 'null' as the image goes from a negative one to a positive. Each pot/color should be set to that null position. Then return the brightness and contrast to 5 or whatever level you use.

Video Input boards

The various video input boards are very reliable and fail rarely on the ECP sets. The most common problem is a 5 volt regulator right on the edge of the older video/S-video boards, and it can catch the edge of the case when pulling the board out or when putting it in. The RGB inputs boards don't really fail from my experience.

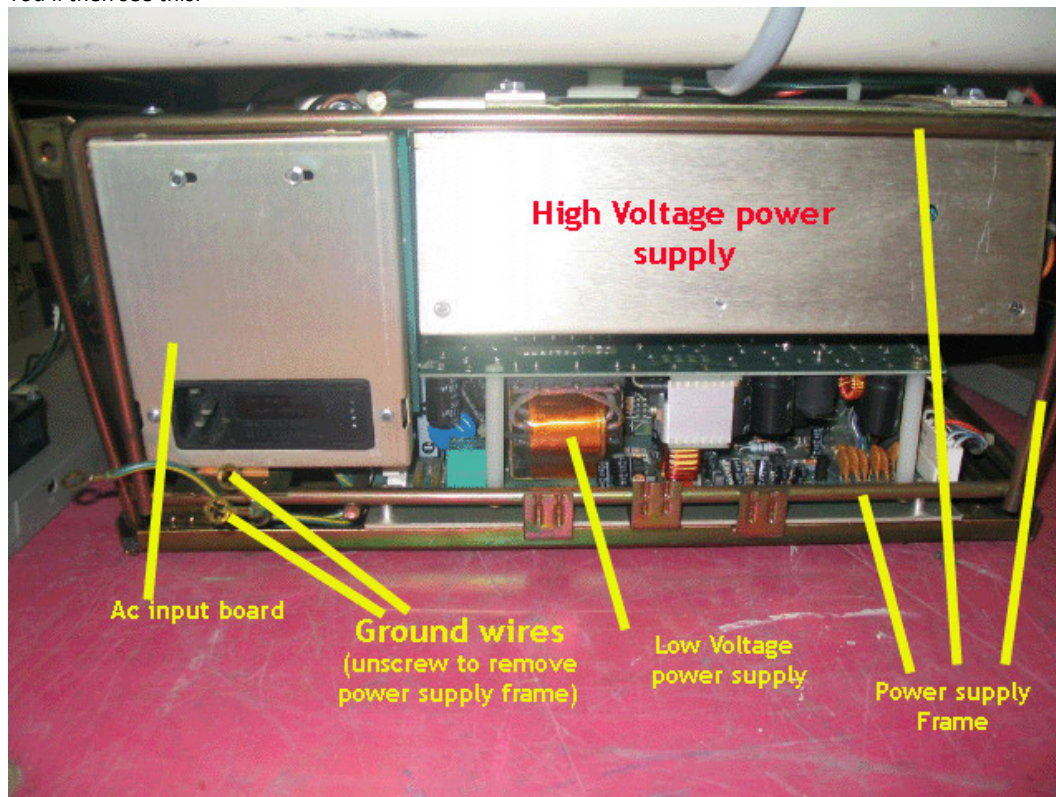
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Power Supply Cage

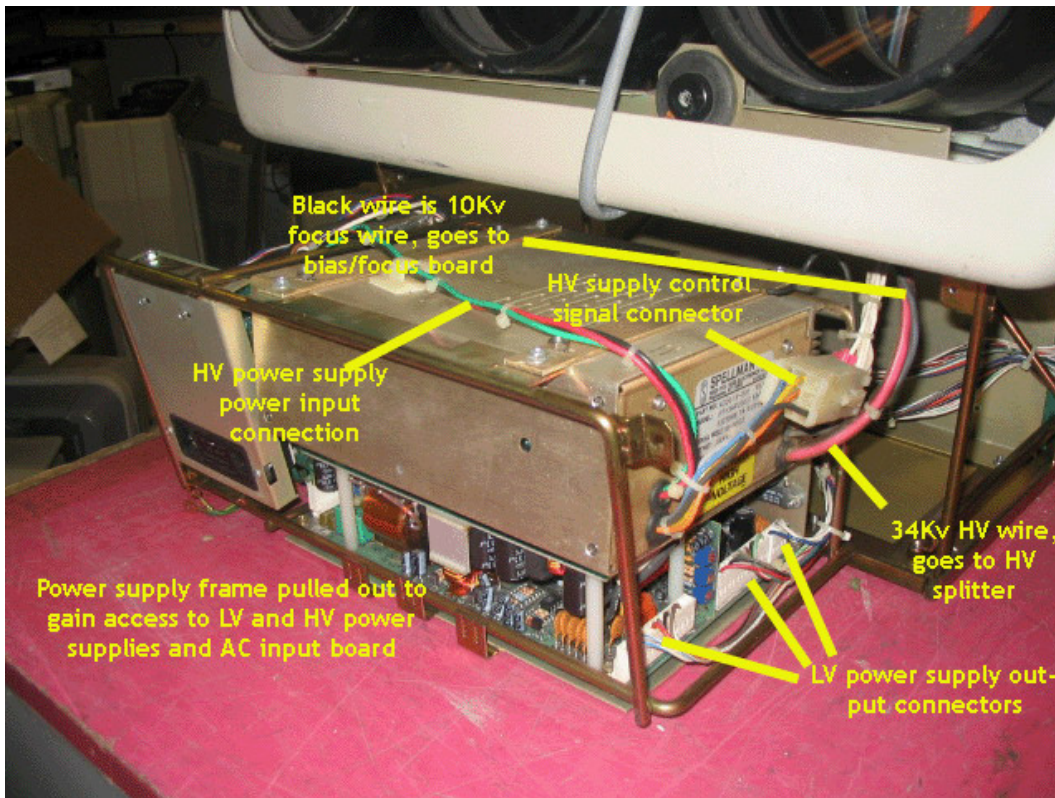
Some of the most common failures on the ECP are caused by bad HV or LV power supplies. There was no service information released for these supplies, so they should be considered a replacement device only. Most of the HV supply is sealed in silicone, and cannot be serviced. To access the power supplies, do the following:

Flip the projector on it's side and remove the side panels that the fans are mounted to. The side panels then slide down and out of position. You can disconnect the fan leads on the fans themselves, or leave the wiring in place. Then remove the front panel, also held on at the bottom of the set with either Philips or 1/4" hex bolts

You'll then see this:



The bottom exposed boards are the low voltage power supply. There are two versions of this board, and all LV supplies will interchange with each other. Above it is the HV supply. There were two makes of HV supplies. The early 3000 and 4000 used the Keltron brand, the later models used the Spellman supply that were supposed to be more reliable. I've had failures of both. The AC input board has the standby supply located on it that keeps the CPU and the remote sensors powered up. There is an AC fuse at the AC input under the black plastic cover, and there are one or two fuses on the AC input board depending on the version of ECP. Sometimes these fuses blow for no reason, and a dead set will come back to life once a fuse is replaced. Look around the frame that hold the power supply in place. There are two hex screws near the top that hold it in place, and two screws shown above that hold the ground screws in place. Take all four screws out, and the entire power supply frame slides out as below.



This now gives you access to the LC and HV supplies which remove relatively easily (more or less).

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LV power supply

Below shows a removed LV power supply. The connections are as shown. Again, there are no serviceable parts on this supply and the unit should be treated as a replacement only unit.



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