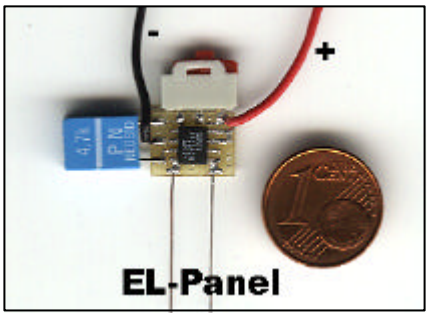
Partlist

1 inverter circuit incl. switch
1 EL-panel
1 current conducting gluepad of copper
1 alternative smt-capacitor (220pF)
1 alternative coil (10mH)



What more is needed

- some pieces of small insulated cable or insulated wire, 15cm
- soldering iron with needlelike tip, keep heat low
- a pair of fine scissors
- cross-screwdrivers, size 0 and 1
- sellotape, 20mm
- TESA-tex or electrical adhesive tape, ~20mm

Start-Up

The backlight-kit is readily prepared to start with the assembly. You can test it by applying 3 to 6 Volt DC to the batteryclip of the EL-driver circuit and contacting the 2 output pins to the 2 silvery contactlines of the EL-panel. Please do not start the EL-driver circuit WITHOUT load! The batteryclip is intended for batteryboxes, NEVER apply a 9 Volt DC battery! This will destroy the EL-driver circuit immediately.

How to open the display?

Remove the plastic frontside cover with the pink or red imprint: PORTFOLIO, 16 BIT PERSONAL COMPUTER. Try to lift from one edge and then tear powerful without bending the cover foil. The glue is strong and reusable. Place the removed frontside cover at a secure place with the glueside on top into the air. In any case avoid to place something on top of the glue, because its extremely adhesive.

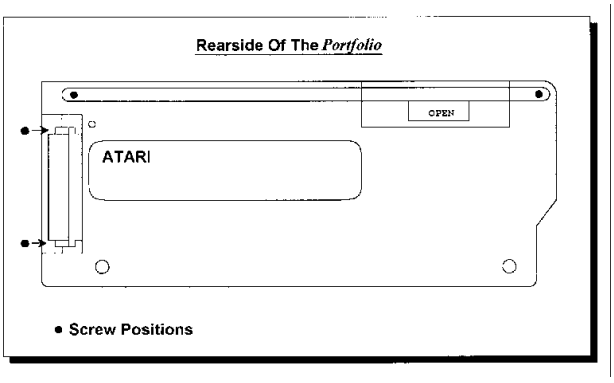
Below the frontside cover you'll find 2 black screws ready to be unscrewed.

Now you can carefully open the display housing beginning from the top into a 45° angle (but not more). The top- and bottom-part of the display housing should not be removed completely!

The display-pcb is fixed by 4 small screws in the edges. After you removed them you'll find that the display-pcb is connected now to the displaycable, only.

How to open the mainboard housing?

To unlock the displaycable you must open the mainboard housing first. Turn the Portfolio that way that you can see the bottom with its rubberfeet and batterydoor. See picture. Now remove the rubberfeet and you`ll find 2 black screws to unscrew. But there are 2 more and smaller black srews in the right and left side of the bus-connector. Remove them, too.



Preparation of the display-pcb

You can unlock the displaycable now from the mainboard connector and remove the display from the Portfoliohousing. Place the display-pcb in front of you with the displaycable looking down. On the right side of the mere display you will find a nice gap where the EL-panel completely fits into. Unfortunately there is more to do than simply pushing the EL-panel into the gap, because the backside of the display is covered with a silvern reflection foil.

Removing the reflection foil

Remove the golden metalframe by bending all fixing noses on the backside of the display-pcb into a straight position. Remove the glassbody of the display from the pink rubber BUT be careful NOT to tear the left contactcable from the pcb!

Start lifting the reflection from one edge. You may like to make use of a razorblade.

The reflection foil is as thin as an aluminium foil. Be careful NOT to remove the thicker polarisation foil, too, which is below the reflection foil. Keep the glassbody of the display strong into your hands and remove the reflection foil by a constant tearing without stopping.

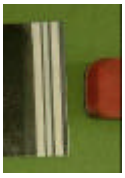
Reassembling the display

If the reflection foil has successfully been removed you can reassemble the display onto the pcb. Place the blassbody back onto the pink contact rubber and press the metalframe around the glassbody into the holes. Now, bend only the 2 noses on the right and left side, so that the display is not completely locked. Plug the displaycable into the mainboards connector and start your Portfolio. Probably you will notice that some of the pixels are not at their correct position.

You have to push the glassbody of the display below the frame slowly and carefully and only a few mikrometers to the right or left side so that the display content looks as perfect as usual. If thats O.K. you can bend all other noses of the metalframe and test the display again.

Contacting the EL-panel

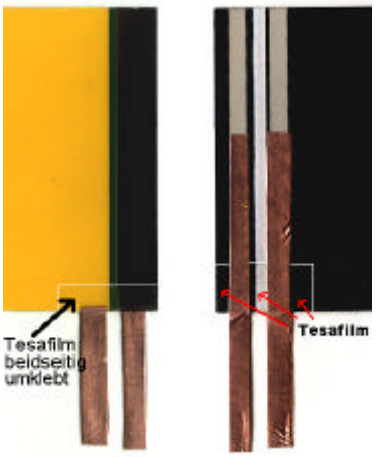
The EL-panel has 2 silvery stripes at one side which are its contact area. You can`t solder to them directly. A cold contacting is allowed, only.



Take a rubber and clean theses silvery stripes, carefully. Take the adhesive copper stripe and cut it into 2 pieces the LONG side!

Wrap 10mm sellotape at the end of the 2 silvery contact stripes of the EL-panel, so that front- and rear-side is covered with around 5mm clear sellotape. Watch pictures.

Then remove the backside protection layer from the adhesive copper stripes and press to the silvery stripes of the EL-panel.



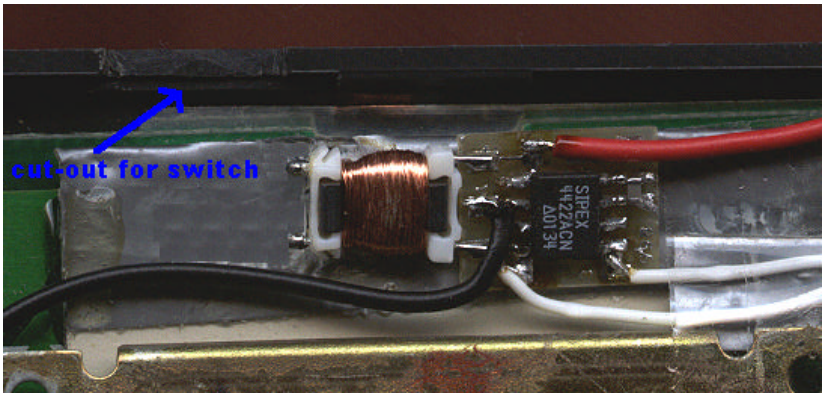
You may like to run a function test of proper contact between copper stripes and EL-panel with the inverter at batteries, now. If this test is successful for more than 5 min. we remommend to cover the contacting area with TESA-tex adhesive tape along the length of the silvery stripes for propper protection and insulation. When contacting the copper stripes of the EL-panel to the output cabling of the EL-inverter please guide the soldering heat away from the EL-panel that it may not be damaged by overheat. The copper stripes of course can be shortened as needed.

Position of the EL-panel

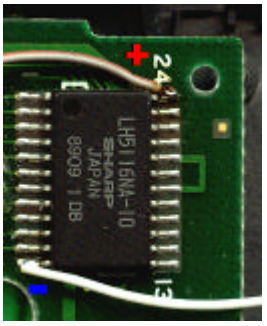
Push the EL-panel into the gap of the display that the screen is completely covered from the backside of the glassbody. You will notice that a kind of fixing would be good. We recommend to take a thin sheet of plactic in the same dimensions as the EL-panel. Not only to keep the EL-panel in its place but to protect the underlying pcb from the high voltage of the EL-panel.

Position of the driver circuit

You'll find the proper space between the golden displayframe and the end of the pcb at the right side. There is the best place for the switch, too. Remove the blue cap of the coil, carefully and cover the coil with nail varnish once or twice for protection.



The power supply (+ and -) can be taken from the LH5116NA chip nearby. Pin 24 has + and pin 12 - voltage. Or you can take it from the left and right side of the displaycable.



To enhance brightness if the Portfolio is connected to the power supply, you can route a + 6 Volt line from the power jacket to the EL-inverter input. But do not forget to place a (preferable Schottky) diode into the system supply line (pin 24 to backlight) to avoid running 6 Volt back directly into the system!

Why a manual switch?

Well, there was actually not even one documented free line which could have been used without the risk of a crash with other internal and external hardware and software. Otherwise we would have programmed a nice and small software switch for the Portfolio (for the HP200LX this has been realized). But there is another reason not to let the backlight be connected to the whole system all the time. The Portfolio has this 128s refresh function in sleep mode. This means the Portfolio wakes up all 128s for 1s and then goes back into sleep. But the Portfolio takes the full drain incl. backlight for this 1s and your batteries are dying faster WITH a backlight than without.

Position of the switch

The switch is already soldered to the inverter for a full function test at arrival. Now you can unsolder the switch carefully and place it as swhon in the picture. Carve a cut-out into the plastic frame by knife or else. Glue the switch with epoxy resin into the cut-out.

Alternatives

Instead of the prepared 4,7mH coil and a 120pF capacitor (about 35mA current drain) you can make use of the additional 10mH coil and the 220pF capacitor (about 25mA, only) with a certain decrease of brightness.

Reassembly

There is not much to say about the reassembly anymore. Perhaps this detail: 2 screws are enough at the 2 top holes instead of all the 4 small screws for the display-pcb.

This may be the time, too, to remove the black cylinder in the midst of the displaycable forever. This is a big destroyer of the displaycable and caused a big loss for ATARI with the Portfolio.