ZX81SCP – video out for Sinclair ZX81
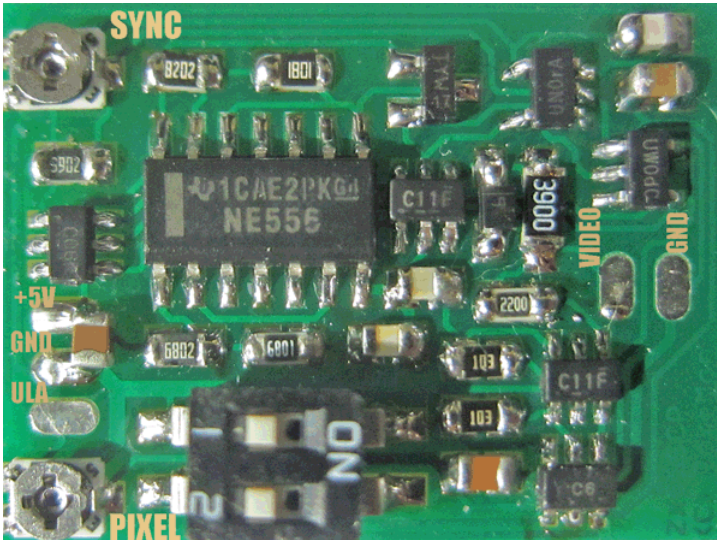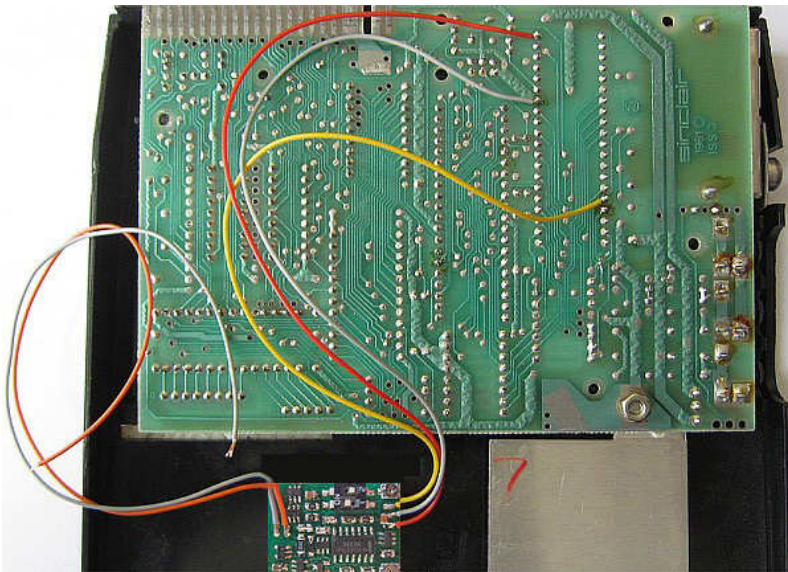

The board ZX81SCP work up the video signal from Sinclair ZX81 digital (ULA output) und is functioning with both ULA versions (184 or 210) or with the very first model of ZX81 (Issue One) and the following model (Issue 3, ISS3). Due to digital work up the noise in the video signal will be eliminated (nearly) fully. Additional the board adds a valid back porch in the signal regardless if ULA produce it or not. The result in conjunction with the very fast logic gates (74LVC series) is a very clear picture without any noise in the background and a very sharp and crispy picture. Additional the ZX81SCP has a standby sync generator for delivering a valid video signal during FAST mode (of course with an empty white screen) or during LOAD command (data transfer via audio interface using EAR plug) with the well known stripes in the picture. Via a DIP switch you can choose either normal video (black characters on a white background) or inverted picture (white characters on a black background). The circuit delivers 1Vss at any standard 75R video input. The output is safe against any shorts.

The SDM module has 29 x 21 x 5 mm (L x W x H) and fits into the modulator case (if you remove it's content) but could also be fixed with a adhesive tape inside the case of the ZX81. You only have to remove the back cover, not the main board itself. So the very sensitive keyboard foil will not be damaged. You will find it convenient and easy to integrate a small video jack (3.5mm) between the two cover parts.

connectors:

input:
red=+5V, ULA pin 40
grey=0V, ULA pin 34
yellow= video In, ULA pin 16

output:
orange= video out
grey= 0V / GND

DIP switch settings:

DIP 1 ON = normal picture
DIP 1 OFF = inverted picture

DIP 2 ON = standby sync off
DIP 2 OFF = standby sync active

Adjustment:
The modul is preadjusted to old ULA (184, Issue One). For new ULA (210, ISS3) it could be necessary to change the adjustment. But for optimal video quality it could be even better to adapt the adjustment on your own ZX81. You will find the meaning of the two trimmers in the picture above, one for SYNC and one for PIXEL.

For a complete readjustment you can turn the PIXEL trimmer full to the left (anticlockwise) which will result in a complete white picture with DIP1 on. Now you can adjust the SYNC trimmer for a valid picture on your TV without sync failures, it will be more easy if you choose 4:3 format on a widescreen TV. After you can adjust the PIXEL trimmer for finding the cursor "K" (inverted) on the white background. Maybe you try a command like PRINT for more easy adjustment. The SYNC trimmer has a wide possible adjustment area but can be adjusted more precise when you enter the LOAD "" command on the ZX81. You should adjust that you clearly have a steady picture of course with moving stripes but without sync failures. After try the normal video display and find the maybe best compromise.