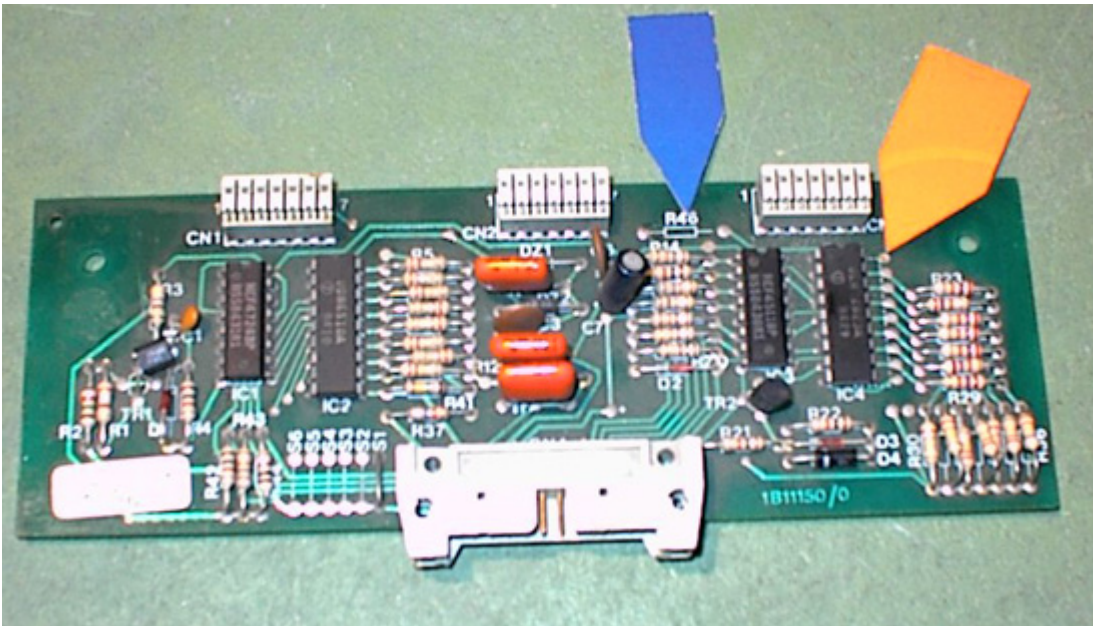


Zaccaria led display type 8 digits one single glass. board type = 1B1150

Thanks to David Gersic (USA) how provided me with a 8 digits display board to try this out.

Soon after i designed the led display for Bally i found out that it could be done for Zaccaria the same way. The schematic is almost identical .All we have to do to transform the Zaccaria display board to make it ready to steer the led display's , is to change 8 resistors, cut some away and change de digits driver 6510 ,who works on high tension, by a driver suited for 5 volts.

On the schematic is foreseen that IC4 can be a driver type 3491, or a ULN2823. The boards i have seen all had a ULN2823 for IC4, in any case we must have a ULN2823 in IC4, if not replace the existing IC by a ULN2823.



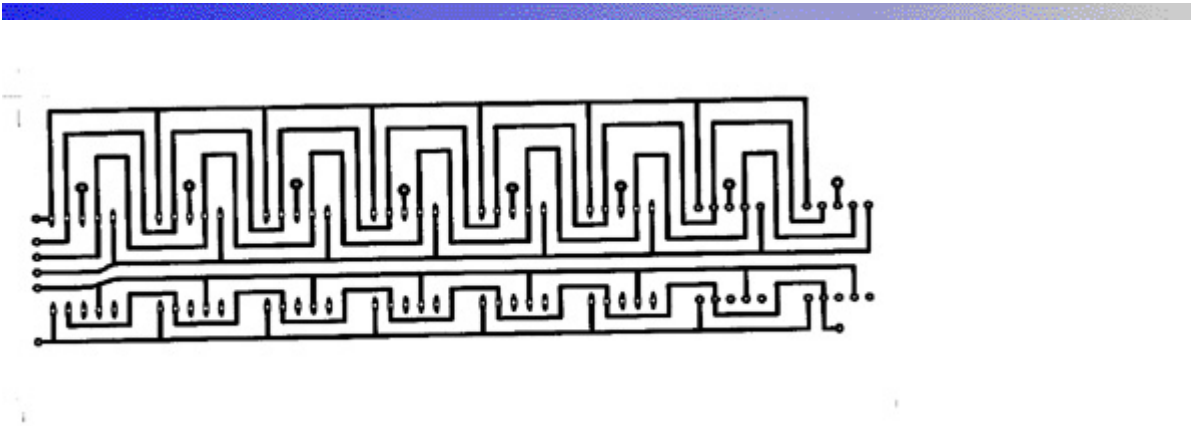
On the photo you seen the type board this article handles. If the board is for a 8 digits display and has another appearance look at the 2x4 digits article ..The yellow arrow indicates where the (larger) driver 3491 could be soldered, if there is no ULN2823. Because the ULN2823 works on 5 volts the resistor R46 is not present (blue arrow). This resistor could bring the high tension to the 3491 if they use such a type(never seen one..)

You find the complete schematic of the board here 

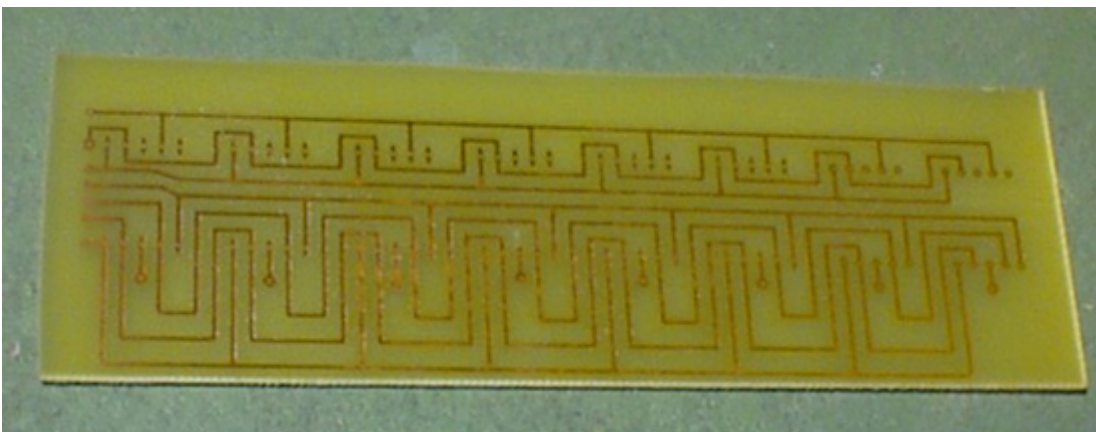
What we do is adapt the driver board and fix a print with the 8 led displays in place of the original glass display.



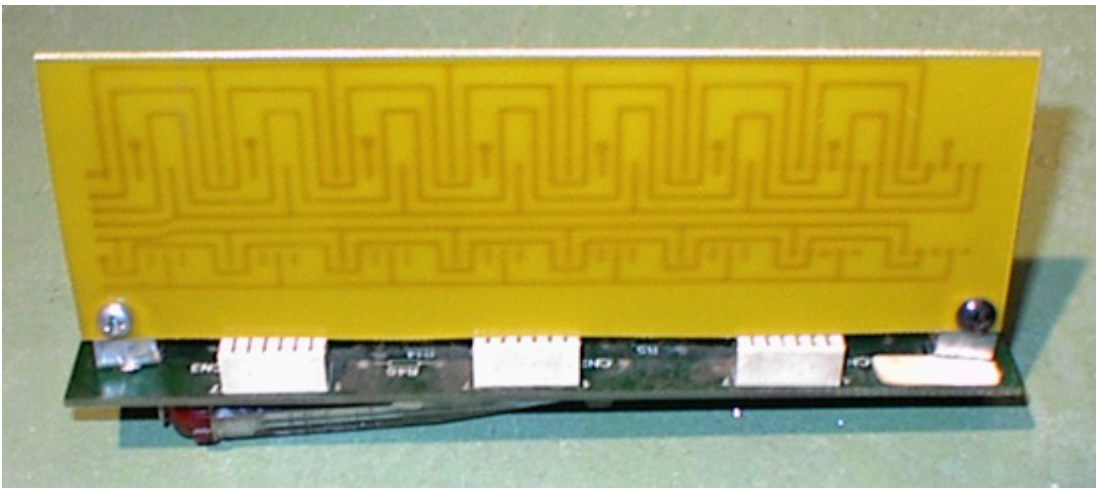
Something to fix the print



The print design.



The finished print.

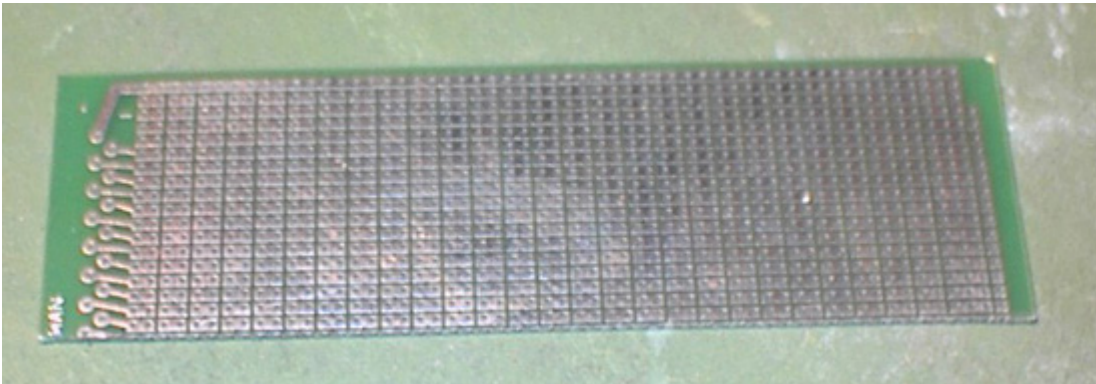


The print is 14,5 x 5 cm. We use the existing holes to fix the new print.

Second possibility , work on a universal print. Here an example executed for a 7 digits display.

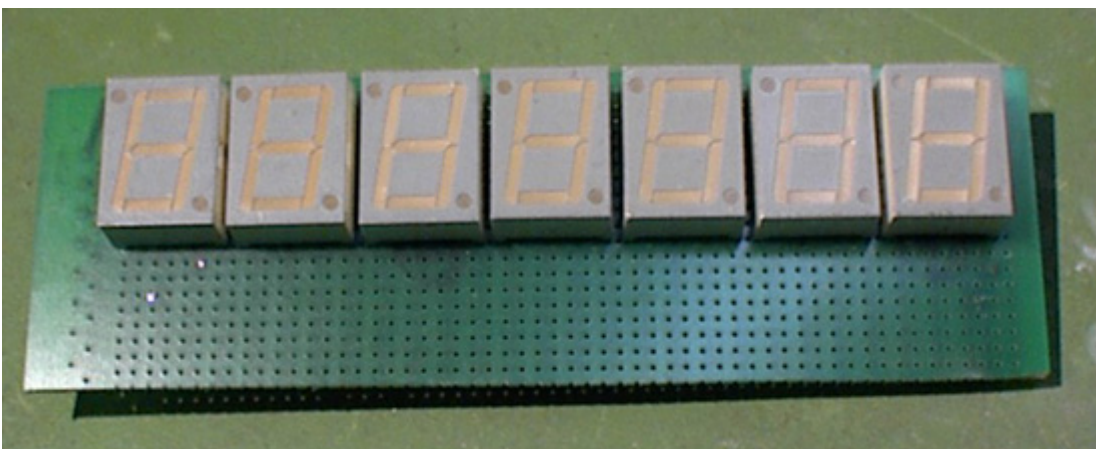
We use a piece of universal print, with two hole for every solder-island. The dimensions are 14x5cm. You can see a realisation of such a print on the pages for Bally 7 digits display, where i made such a board. The way how to make it is exactly the same for this 8 digts board, of course for the connections follow these pages..

,

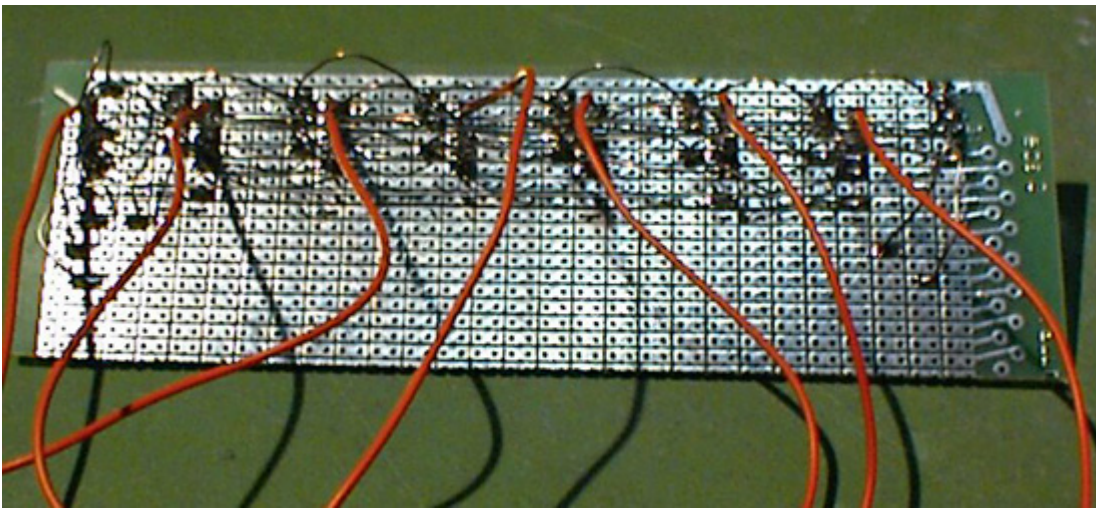


A piece of universal board ready to be made at te exact dimensions.

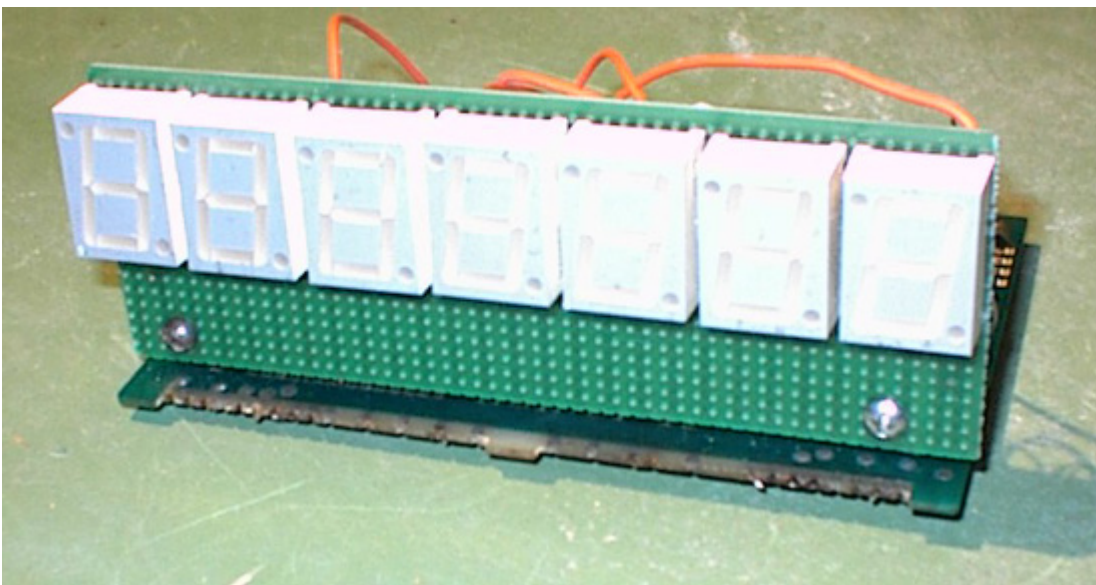
We mount the 7 displays and connect all 7 a, b, c, ..pins together, on the common anodes a short wire. Now it will be 8 display's.



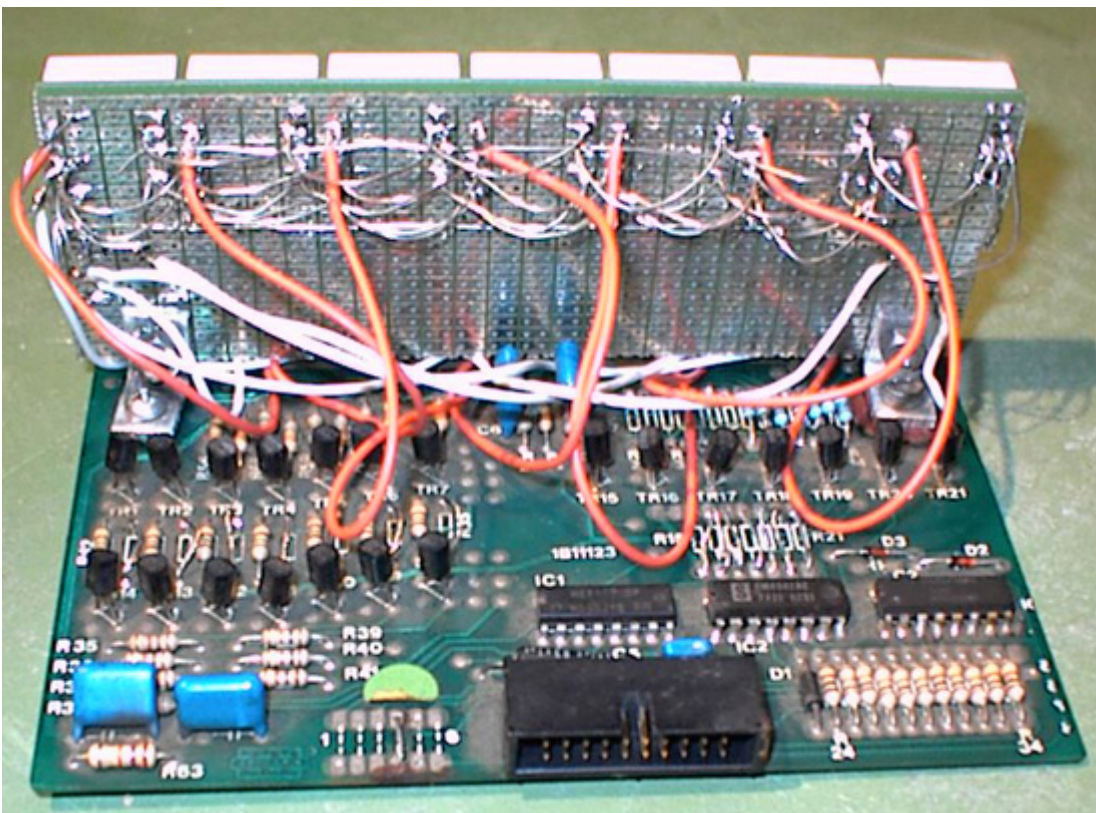
The 7 display mounted.



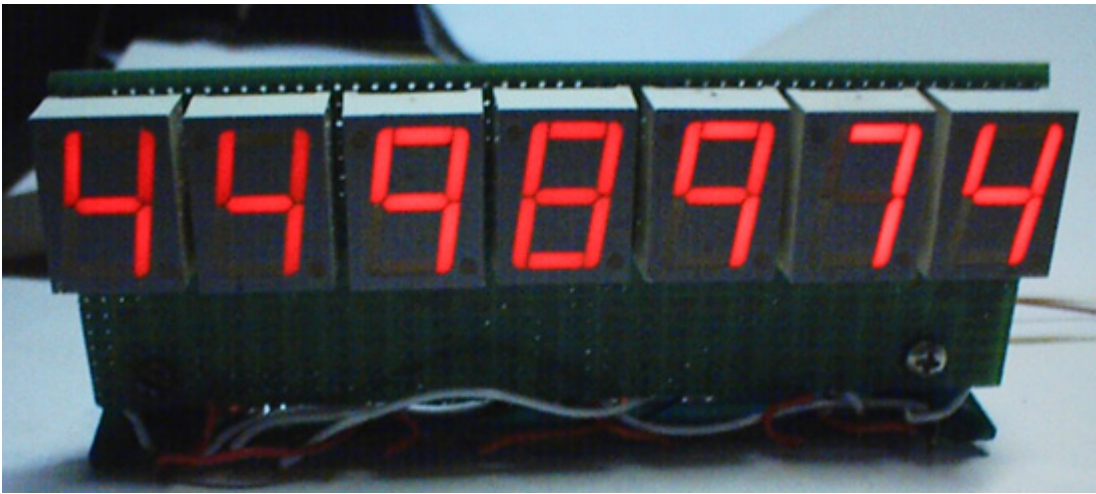
Back side the orange wires are the common anodes. The a,b,c. lines are all connected together.



Mounted with the led display's here type MAN8610. For the 8 digit Zaccaria use SA56-11HWA.




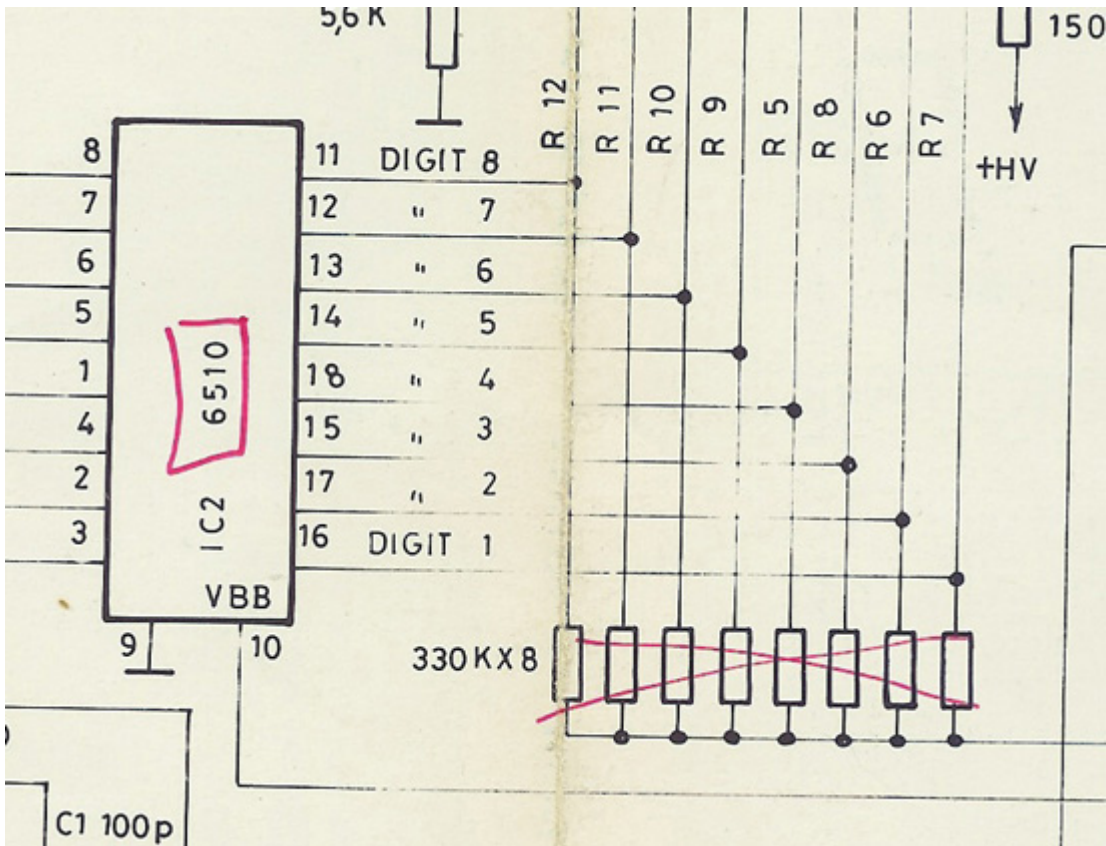
The backside, the red wires are the digit select, the white wire the connection to the a,b,c,d,e,f,g lines.
For the 8 digits Zaccaria see photo futher in the article.



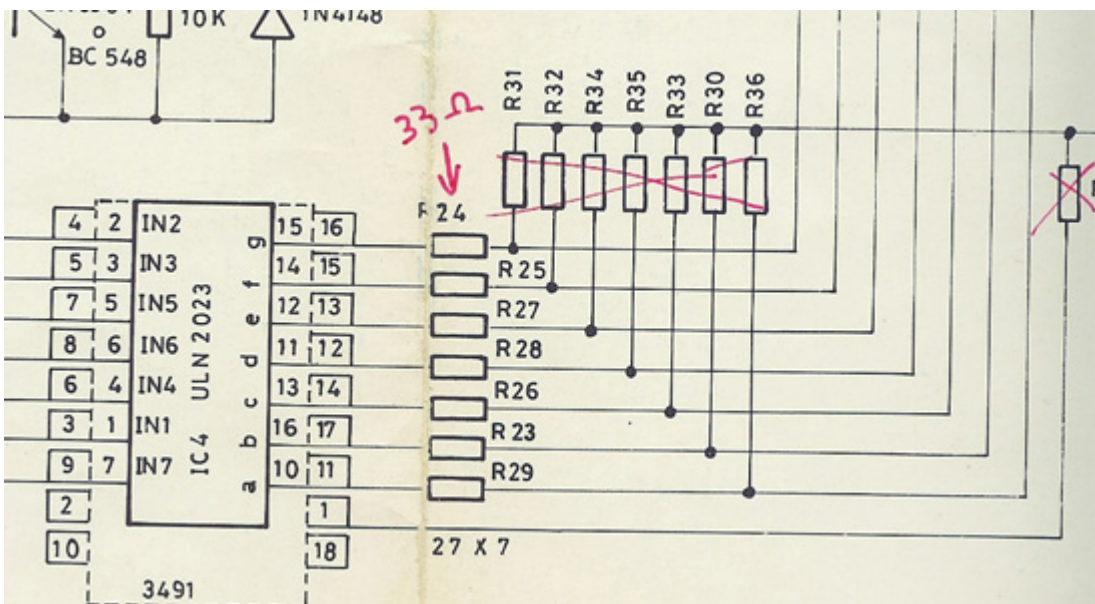
Een werkend model (7 digits). A working example (7 digits) .

The adaptations of the display board.

What do we change on the original board to make it ready to drive led displays? Here are the changes.
Use also the complete schematic to have an overview of the whole. You find it here 



Here we see the part where the digit selection is made . we change IC2 6510 by a UDN2981 and cut away 8 resistors R5 to R12. The tension arriving on the new UDN2981 will change, we need 5 volts on pin 9 and ground on pin 10.

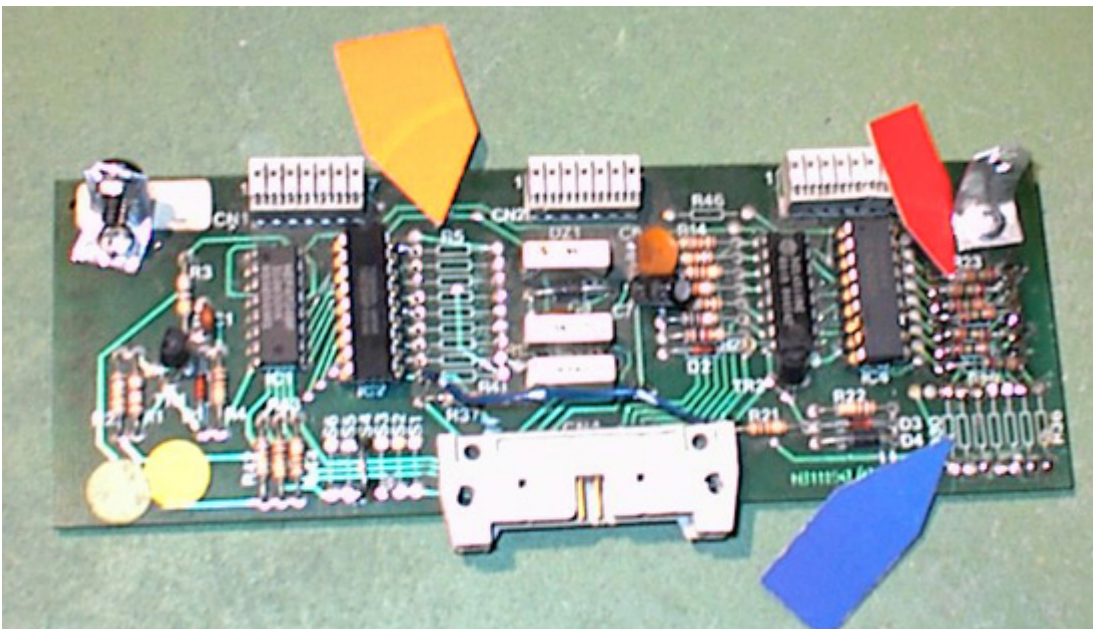


The figure on the led display is made up of 7 straight lines, here we see the steering of these lines. We eliminate resistors R23 to R29, and replace them by resistors of 33 ohm. We desolder and remove also resistors R30 to R36.

Practical realisation.

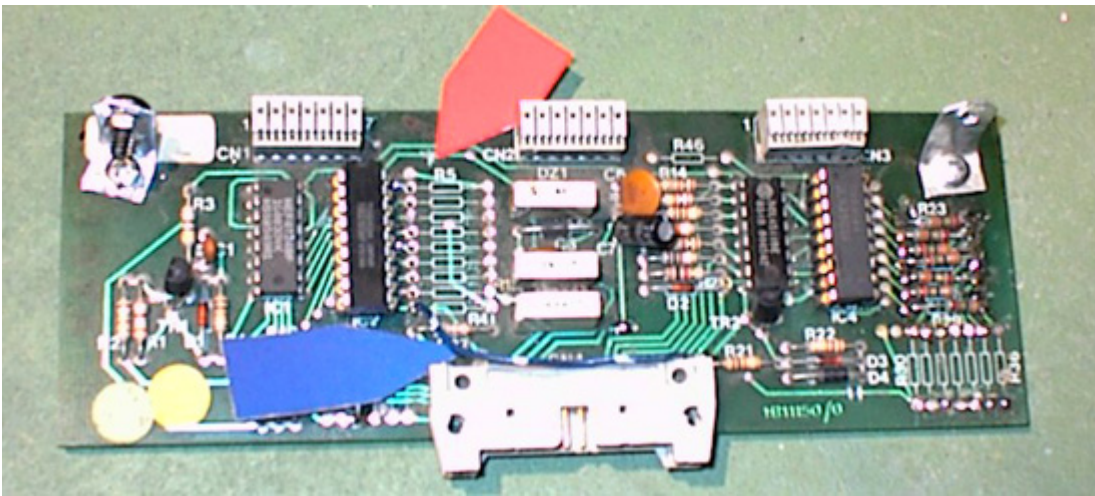
Check if IC4 is a ULN2823, if not remove the existing IC and place a ULN2823.

Replace IC2 (6510) by a UDN 2981.

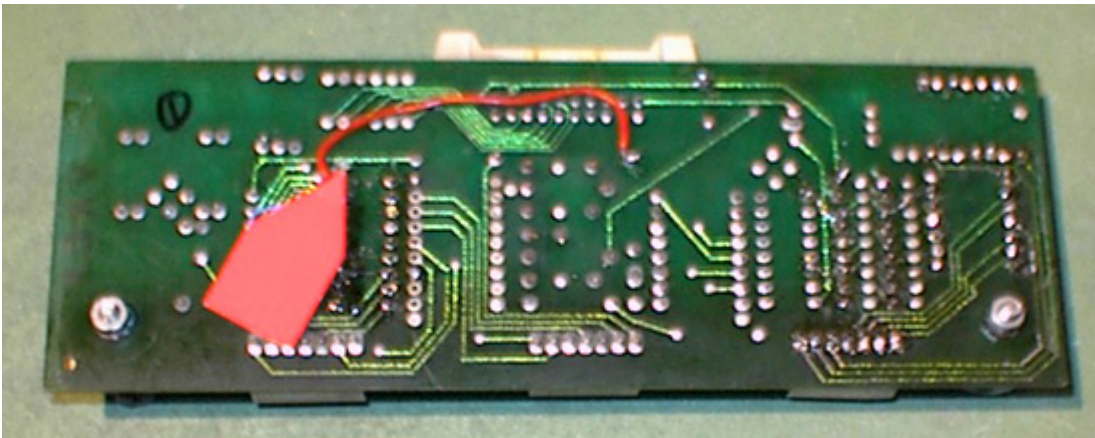


Remove the row resistors R5 to R12. (yellow arrow) Remove R23 tot R29 and replace them by 33ohm resistors (red arrow) .Finally remove R30 to R36 (blue arrow) .

The last thing to do is to cut off the arrival of the 140 volts. And adapt the tension coming on the new IC2 UDN2981. The 140 volts arrives at pin 19 of the input connector CN1, from there continues via two runs, (visible at the components side). The first going to R41= pin 10 of IC 6510 (blue arrow) the second to C5 . Only cut the run going to R41, and remove R141. Pin 10 of the new UDN2981 is free now, make a connection to ground , solder a short wire into the existing hole (where R141 was connected) and bring the other end to ground, you will find a ground point at R21 (left side) (See blue wire on photo) At the same time control if the resistor R46 is indeed not mounted.



What is left is to bring the + 5 volts to pin 9 . First we liberate this pin from his former connections. Cut the run going to DZ1 at the place of the red arrow. At the solder side the pin is also connected , cut that run to . The now liberated pin, is connected with a short wire (red on photo) to +5 volt, see photo below.

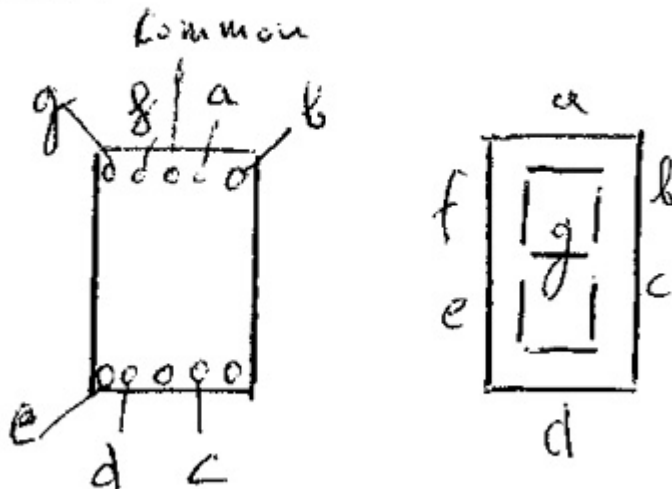


The connection point for the +5 volts is clearly marked + at the component side , in the middle of the board just behind CN4, use this point at the solderside to take the 5 volts for pin 9. Red wire on photo.

Connecting the display.

When using the print as presented in this article , i use the 16mm large display type SA56-11HWA.

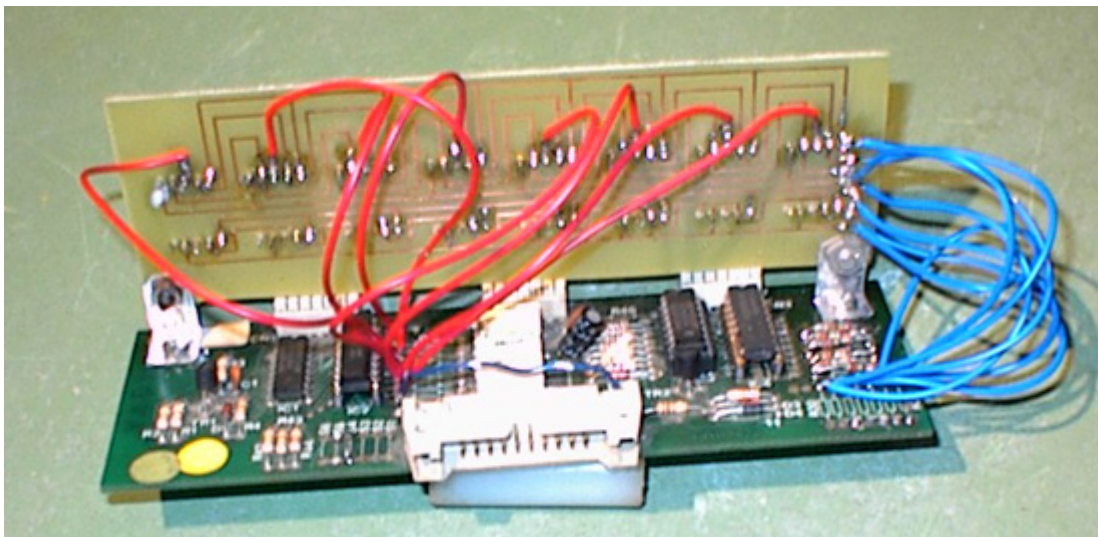
Front view



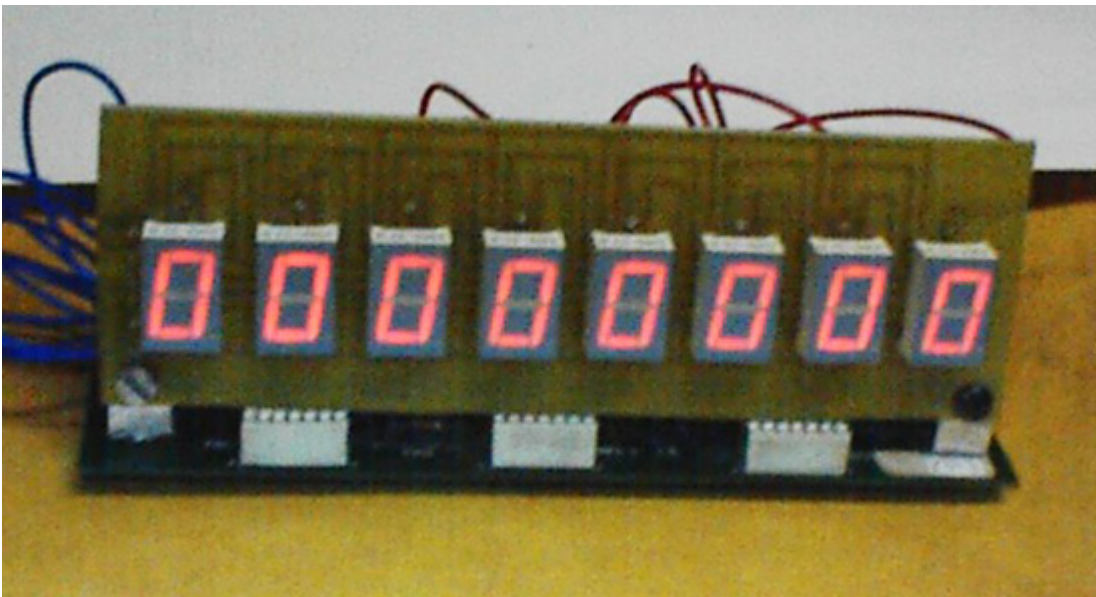
The connections of a SA56-11HWA type display.

The digits are connected at the former connection holes of R5 to R12. Digit 1 at R7 , 2 at R6 , 3 at R8 , 4 at R5 , 5 at R9 , 6 at R10 , 7 at R11 , 8 at R12 .

The segments are connected at the former holes of resistors R30 to R36, use the holes that are at the side of the new 33 ohm resistors, where segment a is R36, b = R 30, c =R33, d =R35, e = R34, f = R32 and g = r31.



The connections blue wires for the segments , red wires for the digits.



Mounted and connected to the machine.

Adapting the 5 volts regulator

When installing 5 or 6 extra Led display's the 5 volts regulator will be extra charged. The 78H05KC can deliver 5 amps. The Zaccaria pinball uses only 1,5 amps. So there is sufficient reserve to drive the 5/6 complete LED display's.
