

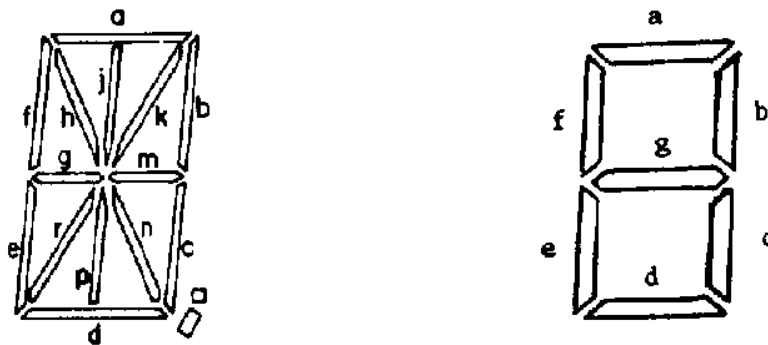
7 Digit Alphanumeric to 7 Digit Numeric Conversion

I had a bunch of dead 7 digit numeric displays and only NOS alphanumeric 7 digit glass. So here is my run down on the procedure and theory for putting the 7 digit alphanumeric glass onto a single glass 7-digit board as used in system 7 through early system 11 games.

7 digit numeric glass has 39 pins, 7 digit alphanumeric has 41 pins (1 extra pin added on each end)

For sake of avoiding confusion of matching the pins to each glass we are going to call the pins on the 7 digit numeric glass #1 through #39 and on the alphanumeric glass #0 through #40.

The pins that control the digits are identical between the 2 glasses (these are the yellow or orange lines you can see on the front of the glass) but most of the pins that control the segments are in different locations. This document will show you how to change the pinout to match the segments



Display Characters Segment Designations

Theory -What each jumper or cut trace accomplishes.

On the numeric glass the segments are controlled on the following pins

- A-1
- B-3
- C-5
- D-33
- E-35
- F-39
- G-37
- Commas- 9, 13

On the alphanumeric board the segments are as follows (counting pins 0-40)

- A-0
- B-3
- C-27
- D-9
- E-11
- F-39

G-35
 H-1 Not USED
 J-40 Not USED
 K-37 Not USED
 M-25 To be combined with G to form middle segment
 N-31 Not USED
 P-15 Not USED
 R-29 Not USED
 Dot-7 To be combined with comma
 Comma-13

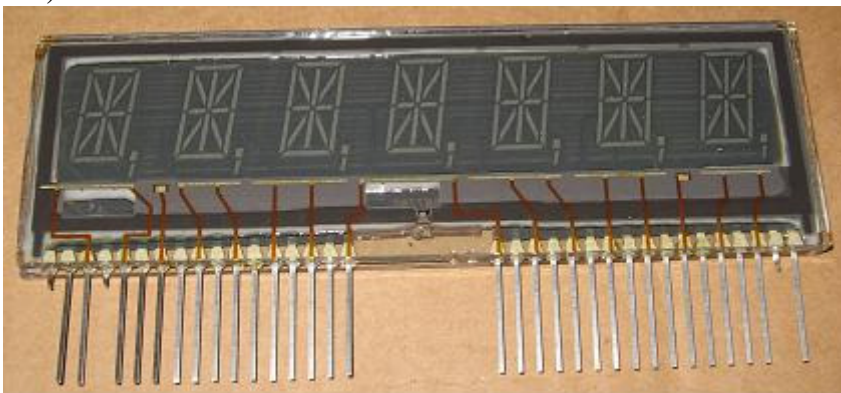
So to match the segments from the numeric to the segments on the alpha we will be connecting the alpha glass pins to the numeric board traces. Here is the theory on what we are doing.

Segment	Alpha Pin	Numeric Trace	Jumper Needed
A	0	1	No
B	3	3	No
C	27	5	Yes
D	9	33	Yes
E	11	35	Yes
F	39	39	No
G/M	35/25	37	Yes x2
Dot/Comma	7/13	9/13	Yes

The three trace cuts are to keep the following segments from shorting to each other
 Cut by Pin #9- separates segment D from the comma
 Cut by Pin #31- separates the Dot from segment N
 Cut by Pin #35- separates the Segment G from E

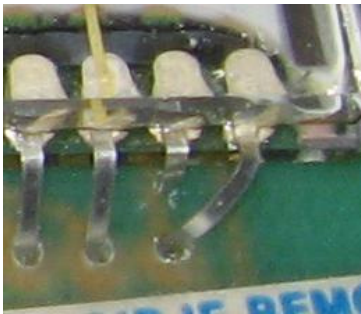
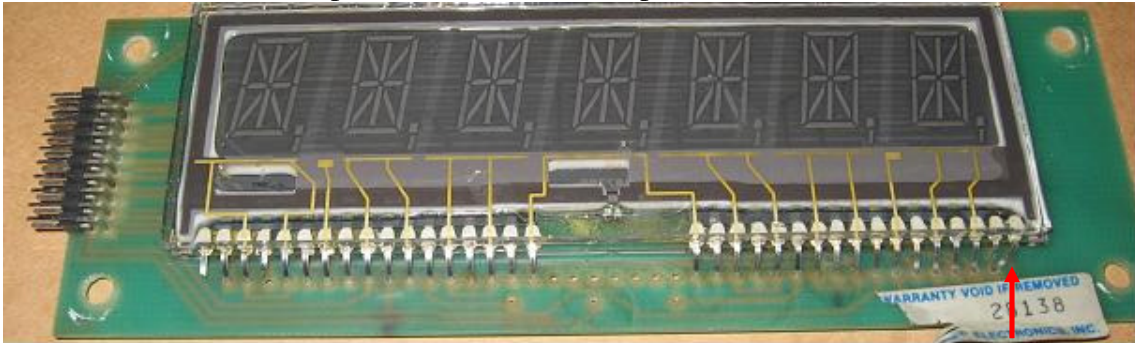
Application

Any and all of the 6 unused pins can be cut from the display glass, however it is only necessary to remove 3 of the pins #1, #37 and #40. Pins #15, 29 and 31 are optional. I leave a little bit leftover so that repairs can be made if the wrong one is accidentally cut.
 (note when looking at the glass from the front, pin # 0 is on the right side and pin #40 is on the left)



Install the glass into the board as normal but insert Pin #0 into Hole #1 and Pin #2 into hole #2... etc all the way down the line with pin #39 going into the last hole and what's left of pin #40 is not over a hole.

Make sure what is left of pin #1 does not short to pin #0

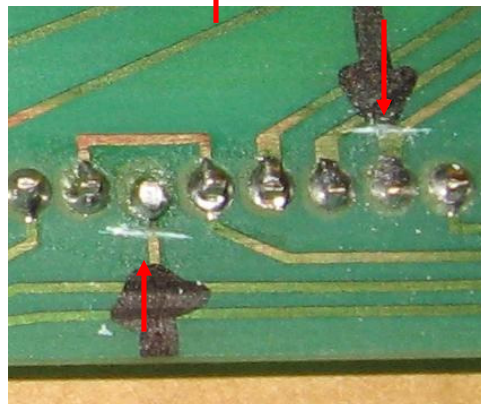
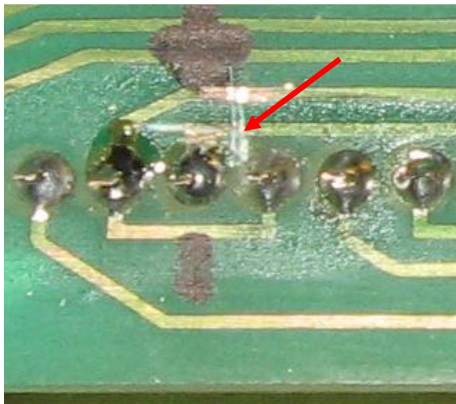
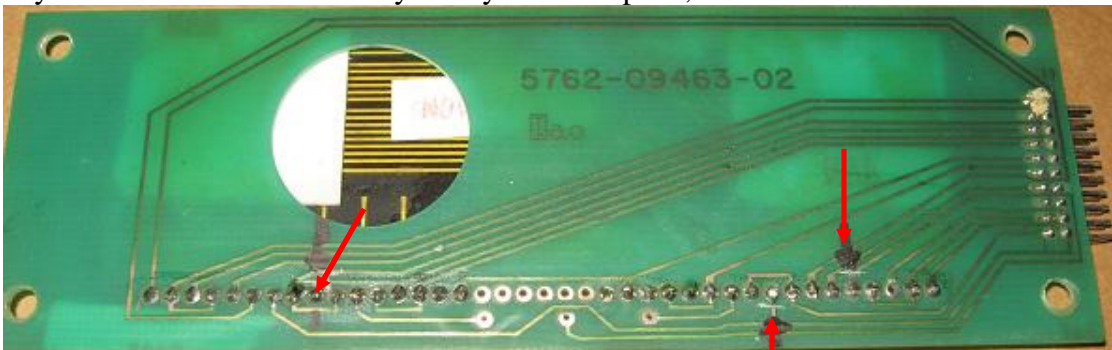


Now we need to cut 3 traces on the board

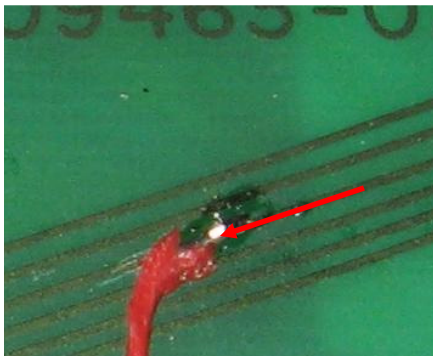
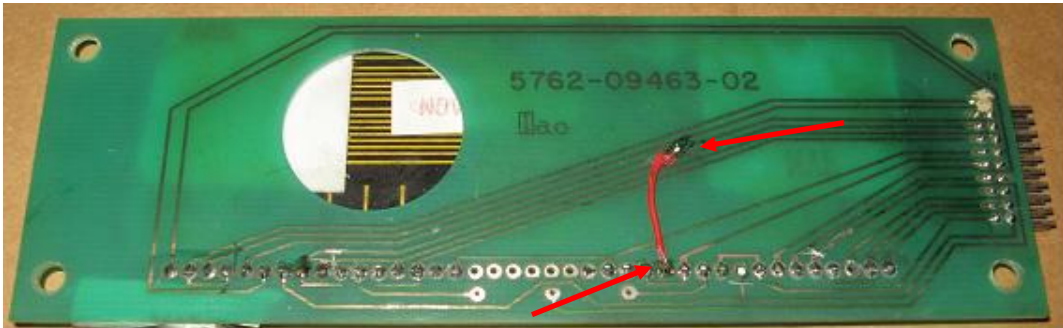
Cut the traces above pin's # 9 and #35

Cut the trace below pin #31.

Try to cut the traces a little ways away from the pins ,



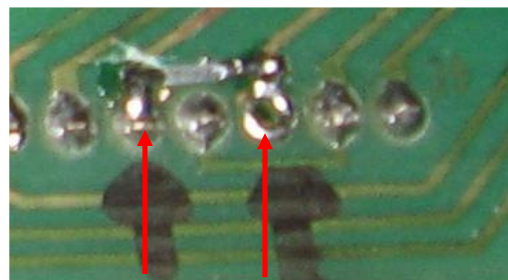
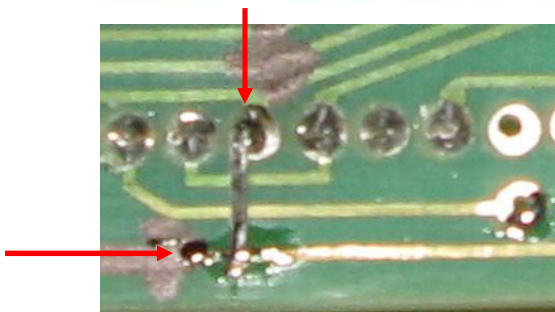
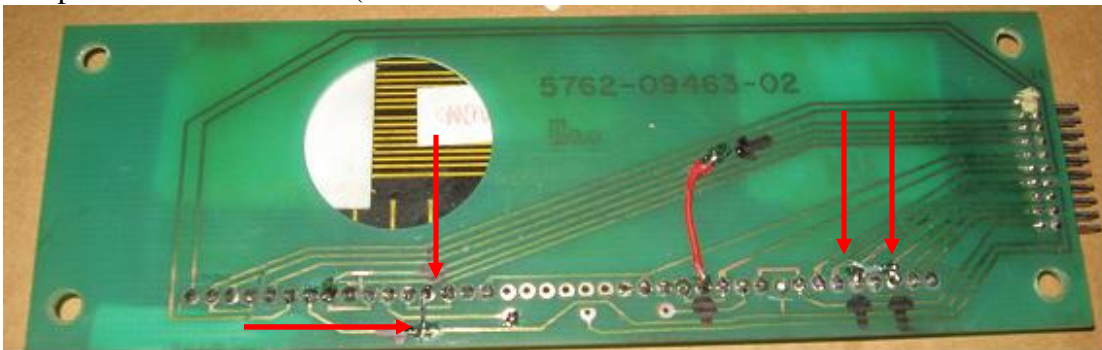
After the 3 traces are cut we will need to install 6 jumpers. 2 short ones and 4 long ones. The first jumper is from Pin #27 to the third trace underneath the part number in the picture (this is the third trace from the top in this group. This is the trace coming from pin #5 in case your board has a different layout) Just scrape off the green coating from over the trace and add some solder to it.



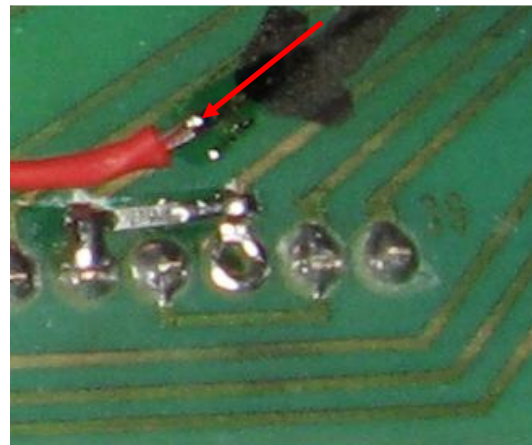
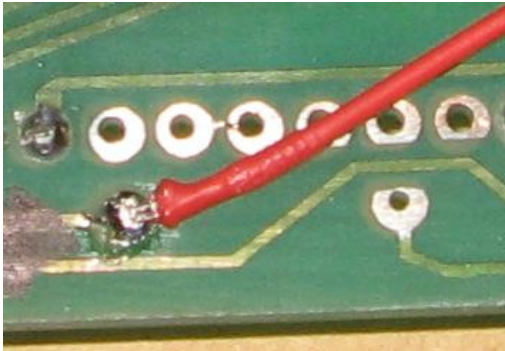
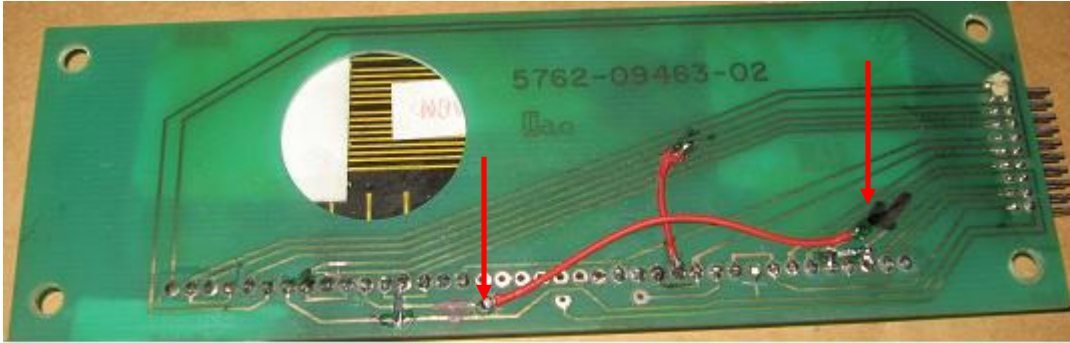
The next 2 jumpers are the short ones.

Jumper Pin #13 to the lowest trace directly underneath it (trace from pin #7)

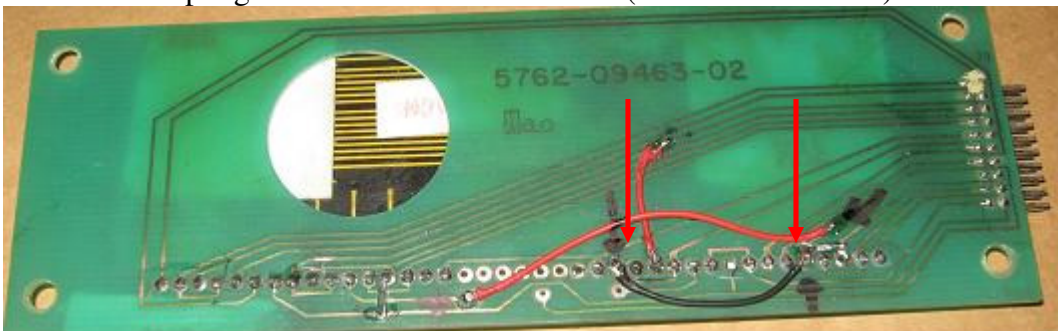
Jumper Pin #35 to Pin #37 (be careful not to reattach the cut trace on #35 or short to #36)



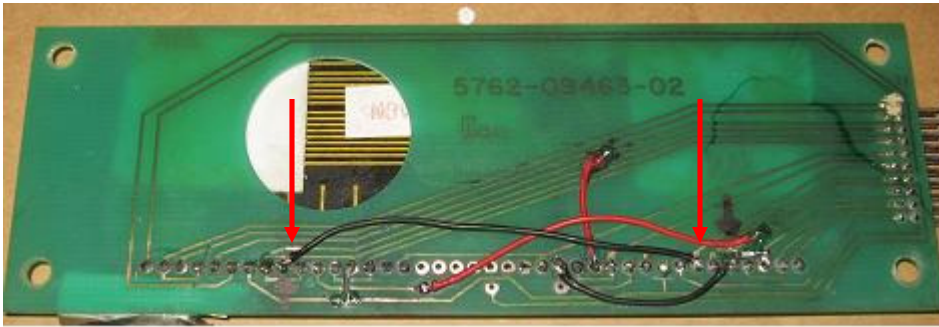
The fourth jumper is from Pin #11 to the cut trace from Pin #35. Scrape the green coating off of the trace above where it was cut. Also note that pin #11 goes to the empty via on the left side of the board so you can solder to that pad



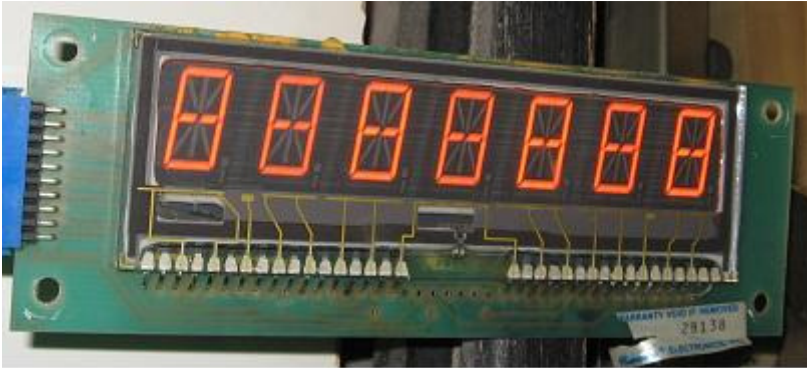
The Fifth Jumper goes from Pin #25 to Pin #35 (or #37 either is OK)



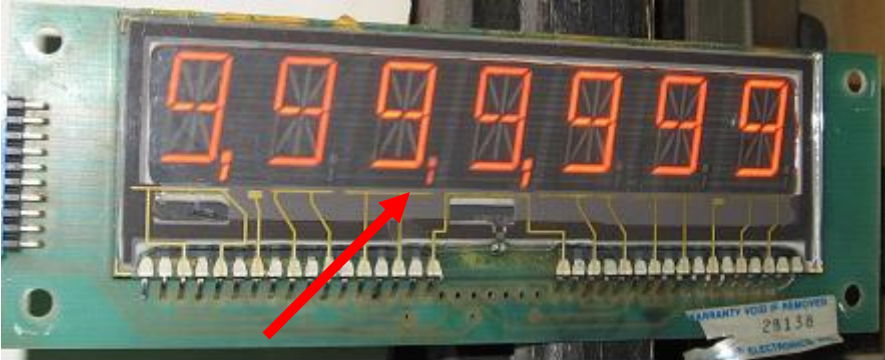
The last jumper goes from Pin #9 to Pin #33



Voila!!



One issue that I have not figured out is why the comma and dot faintly light in the ten-thousands digit whenever the thousands comma and dot are lit.



I separated the comma from the dot and it still happens

This might be a bug in the system 7 code that I tested these displays in.

I have done this conversion with 4 different glasses and boards and all 4 exhibited this same problem. I noticed there are a pair of contacts for the front of the display and a pair for the rear that don't control anything. The ones on the front match on the 2 different display glasses but the ones on the back do not. (pins 6 and 34 on front, 7 and 31/34 on the back). I cut more traces and added a jumper to get these to match up and it didn't make any difference. If anyone has a solution for this please let me know.

K Bliznick

8/21/09

Rev1.0