

W-30 LCD REPLACEMENT DIY v20211221

This hack was made out of desperation after my W-30 LCD started emitting a high shrill whining sound. The cause of this annoying sound is caused by a failing inverter circuit on the W-30 Main PCB supplying high voltage to the electroluminescent backlight. From reading other posts on the Internet, this appears to be a common problem with the W-30. The sound is so annoying that I had to wear headphones to use my sampler. Not including the minimal shipping costs for parts, the price to get everything working was under \$30 (USD). I say this is a hack because it's not a "drop-in" solution. However, it's a lot better than listening to the screaming cries of a banshee from Hell. The three issues which make this a hack are:

- ▶ The new LCD does not require high voltage levels from the inverter circuit so this section of the circuit needs to be disconnected. This requires removing one capacitor and one diode from the W-30 Main PCB. Both **Option #1** and **Option #2** require the removal of these two components
- ▶ The height of the new LCD is slightly taller so the bezel will sit above the surface about 2mm higher than the original LCD
- ▶ If you decide to go with **Option #2**, working with the specialized Hirose 20-pin connector and crimp connections is **extremely** difficult. The crimp connectors are very, VERY small. You will need a magnifying glass and the patience of a watchmaker. A lot of extra work is required. There is a special crimp tool but the price is an astronomical \$300! Obviously, I chose to assemble the crimp parts by hand without the special crimp tool. If you are easily frustrated, you need to avoid **OPTION #2** at all costs. Also, 2x11 IDC ribbon cables are nearly impossible to source these days so a 2x12 IDC ribbon cable is used instead. **The 24-pin IDC connector is wider than the 22-pin connector on the new LCD so plugging it the correct way is very important. Make sure you align Pin-1 on the IDC ribbon cable with Pin-1 on the new LCD**

OPTION #1 OR OPTION #2 ? ? ?

There are two options for connecting a cable to the new LCD. **Option #1** is the easiest way. It re-uses the existing 20-pin cable on the old LCD. Number all the wires then cut it off as close as possible to the old LCD PCB. Re-solder it onto the new LCD. Refer to Page 3 for a wiring chart of the new LCD. You **MUST** add the 100 Ohm 1W resistor plus extra wires into the circuit and remove a capacitor and diode as shown on Page 3. The only parts needed for **Option #1** are highlighted with a **green asterisk *** below. **Option #2** uses new parts (Hirose Connector, Crimps, Ribbon Cable, etc...) and a **LOT** of extra work is required. **All** parts listed below are needed for **Option #2**

PARTS

The LCD screen model I used for my W-30 is the first one on the list*. I have received eMails from people who report that the other three colors shown below will also work. The display quality of my Black/White model is extremely bright, crisp, clear & easy to read. My only complaint is the backlight LED is located on the left and it does not disperse the light evenly. The IDC ribbon cable, hookup wire and 100 Ohm 1W resistor are very common parts and can be found at Mouser or Tayda. If you can't find a 24-pin Female IDC connector, use a more common 26-pin IDC connector. The 20-Pin Hirose Connector and matching crimps are uncommon parts. However, a limited supply were still available at Mouser, DigiKey, Farnell and Newark as of December 2021

QUANTITY	PART NUMBER	DESCRIPTION	PRICE (USD)	VENDOR
1	ERM24064FS-1* *	Black/White 240x64 Character LCD	\$24.00	buydisplay.com
3	HOOKUP-WIRE *	50cm 24AWG Hookup Wire	\$ 0.25	eBay.com / Tayda
1	A-2271 *	100 Ohm 1W Metal Film Resistor	\$ 0.05	Tayda
1	24-PIN IDC CABLE	40cm Ribbon Cable w/IDC Connectors 2.54 Pitch	\$ 5.00	eBay.com
1	DF11-20DS-2C	Hirose 20-Slot Connector 2mm Pitch	\$ 0.30	mouser.com
30	DF11-2428SCF	Female Socket Crimp Connector (Tin)	\$ 0.05	mouser.com
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1	ERM24064SBS-1	White/Blue 240x64 Character LCD	\$23.00	buydisplay.com
1	ERM24064DNS-1	White/Black 240x64 Character LCD	\$26.00	buydisplay.com
1	ERM24064SYG-1	Black/YelGrn 240x64 Character LCD	\$23.00	buydisplay.com

* VERY IMPORTANT

If you are using **Option #1**, when placing your order for the LCD from buydisplay.com, **DO NOT** choose the 2 x 11 Pin Header option. If you are using **Option #2** and a new Hirose Connector, when placing your order for the LCD from buydisplay.com, choose the extra option with the 2 x 11 Pin Header (Soldered On Display). It's an extra 0.59¢ but it is required and is well worth the extra cost!

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OPTION #1

REMOVE CAPACITOR AND DIODE FROM W-30 MAIN PCB

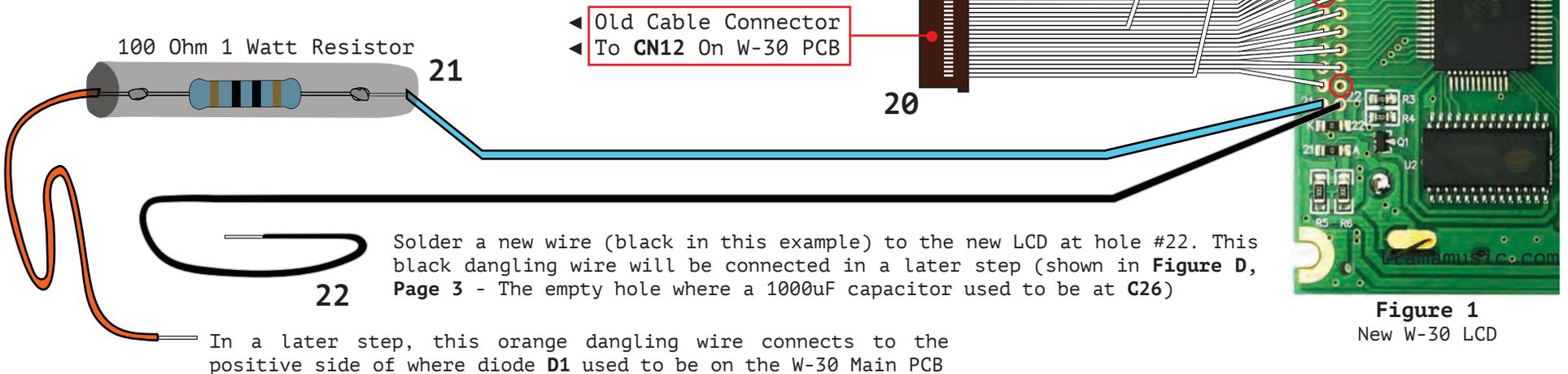
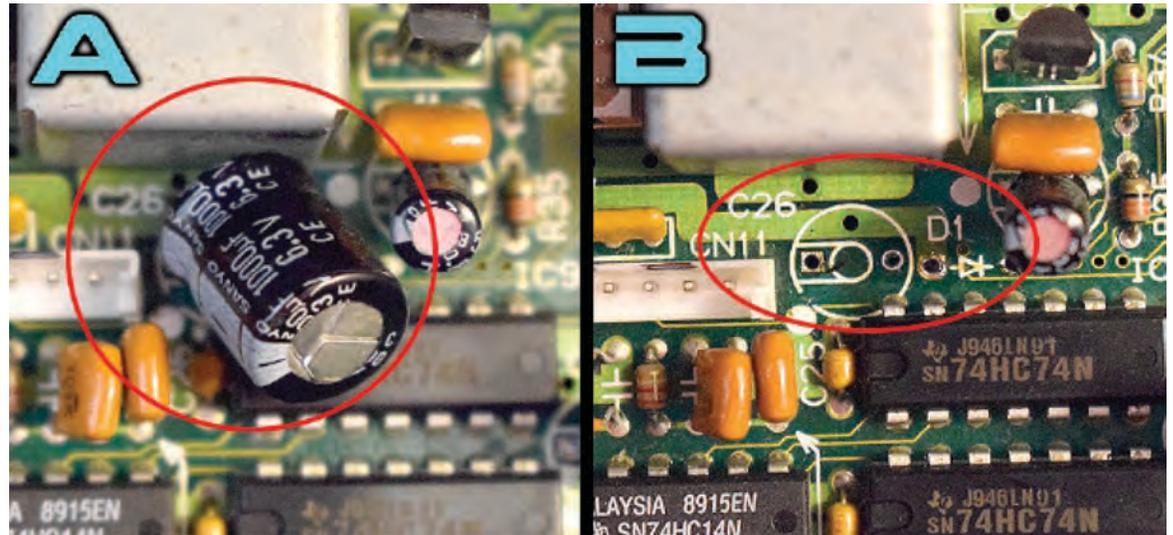
Ensure that you are using an anti-static wrist strap and also that you are working on a static-free workbench! Reference Figure A and note that the 1000uF capacitor at location C26 is covering diode D1 underneath. Unsolder and remove both of these components and any excess solder from the PCB holes. Figure B shows both components removed from the board

RE-USE THE ORIGINAL CABLE FROM THE OLD LCD

To connect power and data wires to the new LCD, you will need to cut the old cable off as close as possible from the old LCD PCB and re-solder it onto the new LCD. DO NOT connect wires #9 or #20 from the old cable to the new LCD. All of the other wire connections are straight-through connecting 2 to 2, 3 to 3, etc... ..18 to 18 and 19 to 19 (Note that

there is no cable on the old connector at pin #1 so start soldering at hole #2). Pin #9 and Pin #20 are not used so place heat shrink tubing or black electrical tape on the end of these exposed wires to insulate them. Solder a new wire (yellow in this example) at hole #1 on the new LCD. Attach the other end to CHASSIS GROUND on the W-30 (Previously attached with a bolt and lock washer)

Solder a new wire (blue in this example) to the LCD at hole #21 on the new LCD and solder the other end to the 100 Ohm 1W resistor. Solder another new wire (orange in this example) to the other end of the 100 Ohm 1W resistor. This dangling orange wire will be connected in a later step (Figure C, Page 3 - where diode D1 was previously connected to +5V on the Main PCB... the positive side of where diode D1 used to be). Insulate the resistor and any other exposed soldered cable connections with heat shrink tubing or black electrical tape

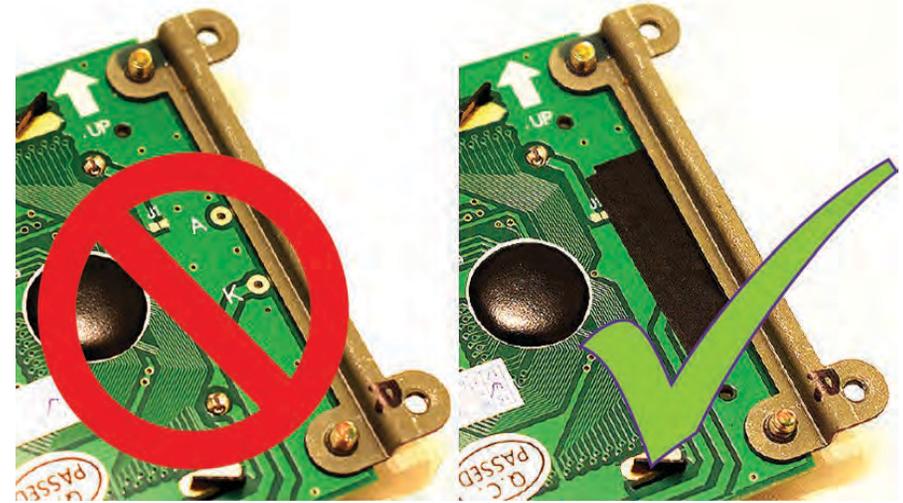
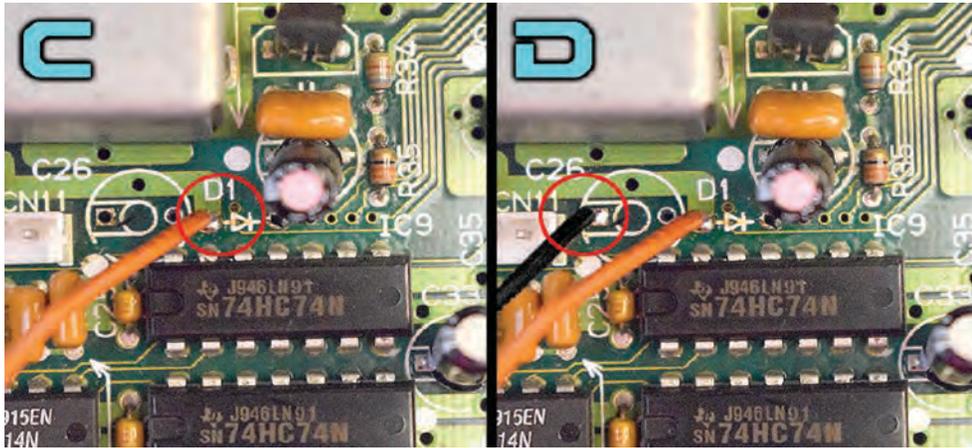


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OPTION #1 (continued)

Solder the orange wire dangling from the 100 Ohm 1W resistor to where diode **D1** was previously connected to **+5V** on the W-30 Main PCB (the positive side of where diode **D1** used to be, as shown in **Figure C**)

Solder the black wire dangling from Pin #22 on the new LCD to where the 1000uF capacitor at location **C26** (negative side) was previously connected to **GROUND** on the Main PCB as shown in Figure D



ATTACHING NEW LCD TO PANEL BOARD

The unused copper pads for the Anode (A) and the Cathode (K) on the new LCD circuit board are precariously close to the metal frame brackets. I recommended placing two strips of black electrical tape, one on top of the other, to cover pads A and K and prevent them from touching the metal bracket and shorting

Fit the new LCD back into the panel board frame. Remove the bezel from the old LCD. **Easier said than done!** Roland used an extremely strong double-sided tape to attach it. Use care not to scratch the black paint from the back surface. I used the back end of a clothespin covered with thick cloth and carefully pried it off in small steps. Since the new LCD is perfectly aligned in the panel frame now, simply use some double-sided tape and press the old bezel in place

This last step is critical!!! Double check that you get this part right or you could possibly damage the new LCD. Ensure that Pin #2 on the old cable matches up with Hole #2 on the back of the LCD PCB and that all other wires are connected to the correct holes. Double-check that no wires are connected to #9 and #20 on the new LCD. Ensure that Pin #1, Pin #21 and Pin #22 on the new LCD are connected to the right places. Power on the W-30 and test the display. If the screen is solid black or solid white, try adjusting the contrast knob on the back for best viewing results until text appears

LCD HOLE#	FUNCTION
1	Frame Ground
2	Ground
3	+5V
4	-8V to -5V For The 10K Ω Contrast Pot On Back
5	Write Signal
6	Read Signal
7	Chip Enable Signal
8	+5V - Sets The LCD Into "Data" Mode
9	N/C (NOT CONNECTED)
10	Reset Signal
11-18	Eight Data Bus Lines (D0 Through D7)
19	+5V - Sets The Font Selection To 6x8 Dots Rez
20	N/C (NOT CONNECTED)
21	+5V - For The LED Backlight (A - Anode)
22	Ground - For The LED Backlight (K - Cathode)

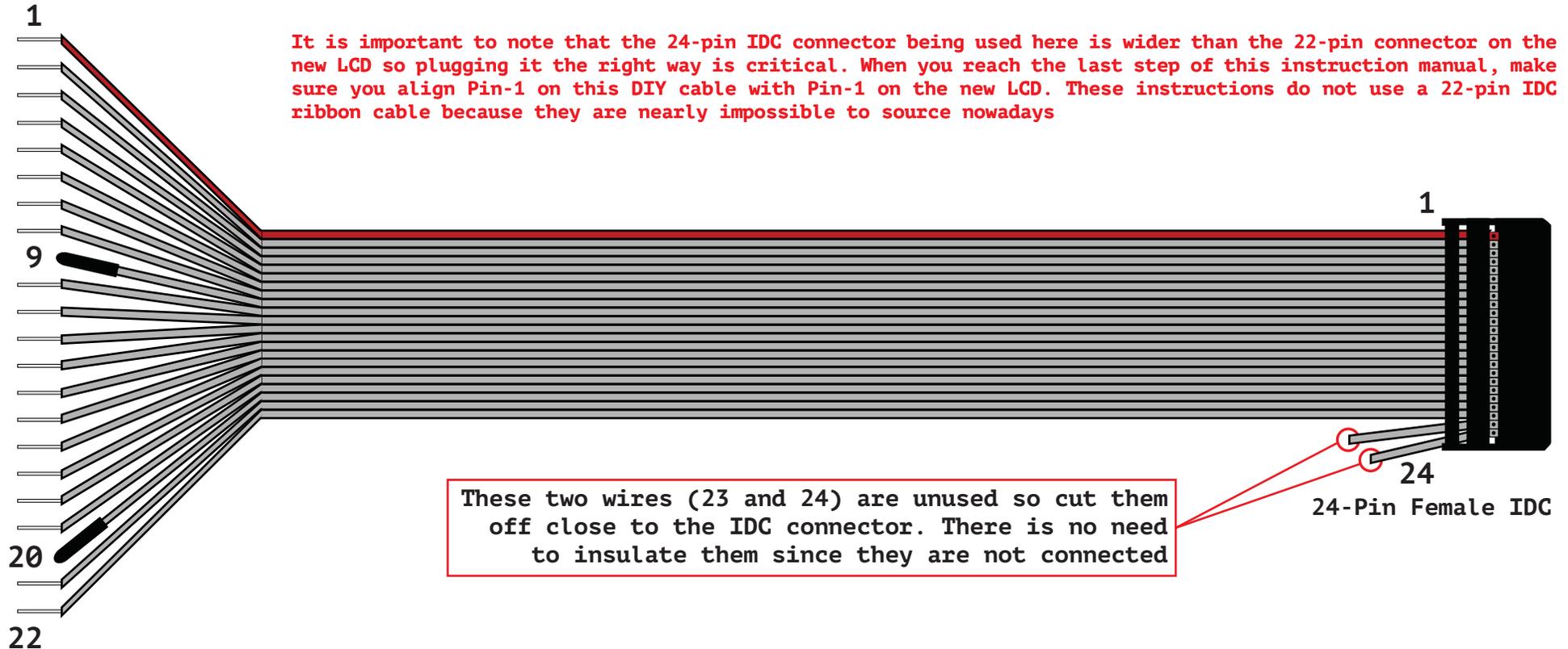
W-30 Wiring Chart For The **NEW** LCD from buydisplay.com

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OPTION #2 - ADD NEW HIROSE CONNECTOR, IDC RIBBON CABLE, WIRES AND 100 OHM RESISTOR

MODIFY THE IDC RIBBON CABLE

If your IDC ribbon cable does not have the wire for Pin #1 marked in red, use a sharpie and mark it yourself. Make it match the image below. Carefully use an X-Acto knife to cut a 10mm section along the border of each wire. Separate each wire section by hand to a length about 70mm long. Match it up to the image below. I find it easiest to tear the wires apart by hand rather than using an X-Acto knife. Strip a small 1mm length of insulation from each end as shown. Pin #9 and Pin #20 are not used so place heat shrink tubing or black electrical tape on the end to insulate the end of these two wires



ADD THE HIROSE CONNECTOR, WIRES AND 100 Ohm RESISTOR

Connecting the ribbon wire to the 20-pin Hirose Connector is the most difficult part of this DIY. The best method I have found is to use the end of a small paper-clip and bend the top crimp tabs to form a circle around the diameter of the paper-clip... just wide enough to insert a ribbon wire (I recommend using small pliers or hemostats for this step)

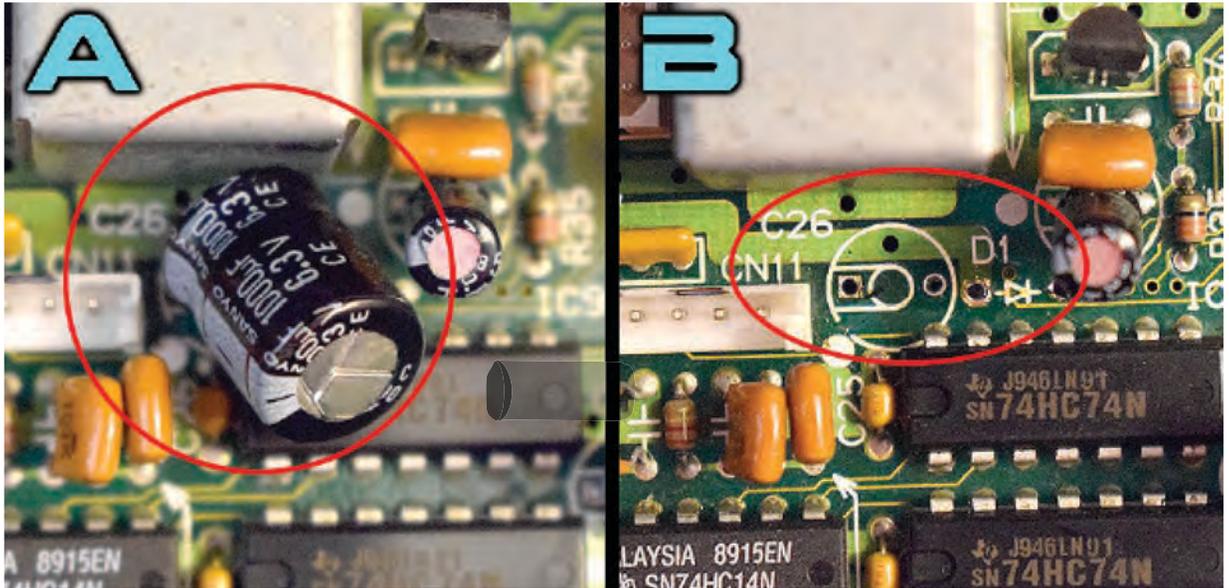
VERY CAREFULLY solder a 1mm section of wire at the very top section. Don't use too much solder or else the crimp piece won't fit into the Hirose connector (Figure 3, Page 6). Do not connect Pin #9 or Pin #20 because these wires are not used. After all the crimp pieces are pushed into the Hirose connector, solder a 100 Ohm 1 Watt resistor onto the end of the wire connector pin #21. Next, solder three 50cm 24AWG wires onto the end of ribbon wire connector pins #1, #22 and the other end of the 100 Ohm resistor (Figure 2, Page 5). Insulate all solder connections with heat shrink tubing or black electrical tape

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OPTION #2 (continued)

REMOVE CAPACITOR AND DIODE FROM MAIN PCB

Ensure that you are using an anti-static wrist strap and are working on a static-free workbench! Reference Figure A and note that the 1000uF capacitor at location C26 is covering diode D1 underneath. Unsolder and remove both of these components and any excess solder from the PCB holes. **Figure B** shows both components removed from the PCB



Connect this wire #1 from the ribbon cable to where the old LCD was connected at CHASSIS GROUND (Previously attached with a bolt and lock washer)

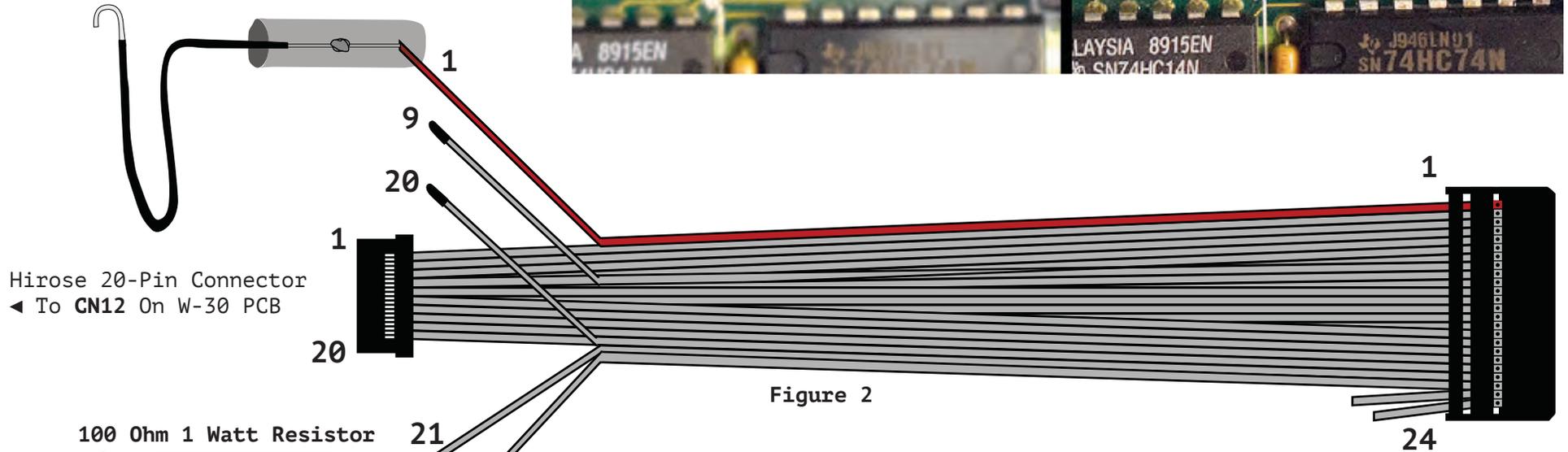


Figure 2

Solder this wire #22 from the ribbon cable to where the 1000uF capacitor at location C26 (negative side) used to connect to GROUND on the Main PCB (Figure D, Page 6)

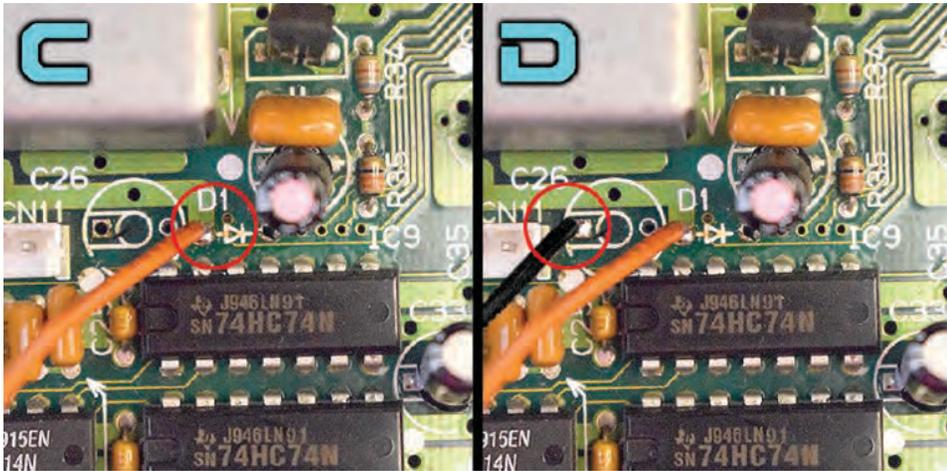
24-Pin IDC Connector
To New LCD PCB ▶

Insulate all exposed solder connections with heat shrink tubing or black electrical tape

Solder this orange wire from the end of the 100 Ohm 1W resistor to where diode D1 previously connected to +5V on the Main PCB, the positive side of where diode D1 used to be (Figure C, Page 6)

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OPTION #2 (continued)



LCD HOLE#	FUNCTION
1	Frame Ground
2	Ground
3	+5V
4	-8V to -5V For The 10K Ω Contrast Pot On Back
5	Write Signal
6	Read Signal
7	Chip Enable Signal
8	+5V - Sets The LCD Into "Data" Mode
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MAKING THE HIROSE CRIMP CONNECTORS

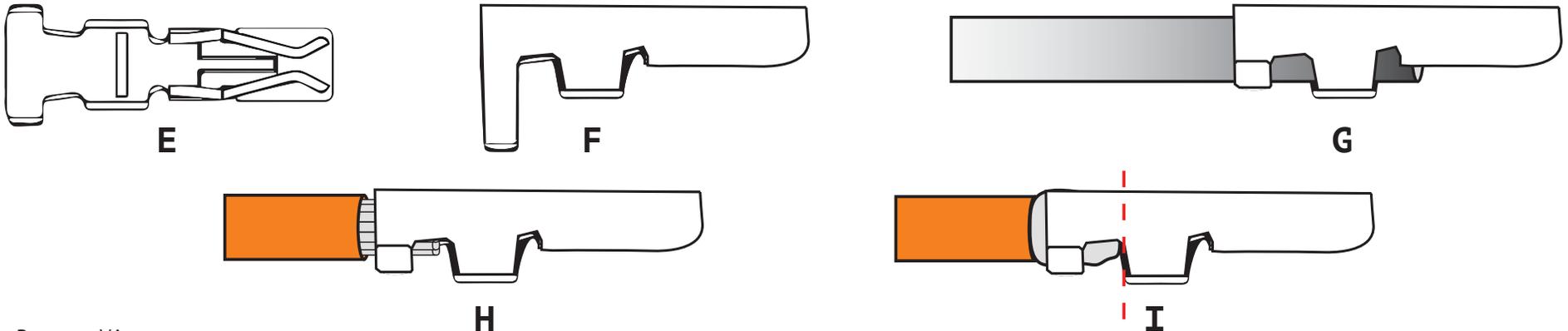


Figure 3 - Female Socket Crimp Connector - HIROSE P/N: DF11-2428SCF

E) Bottom View

F) Side View

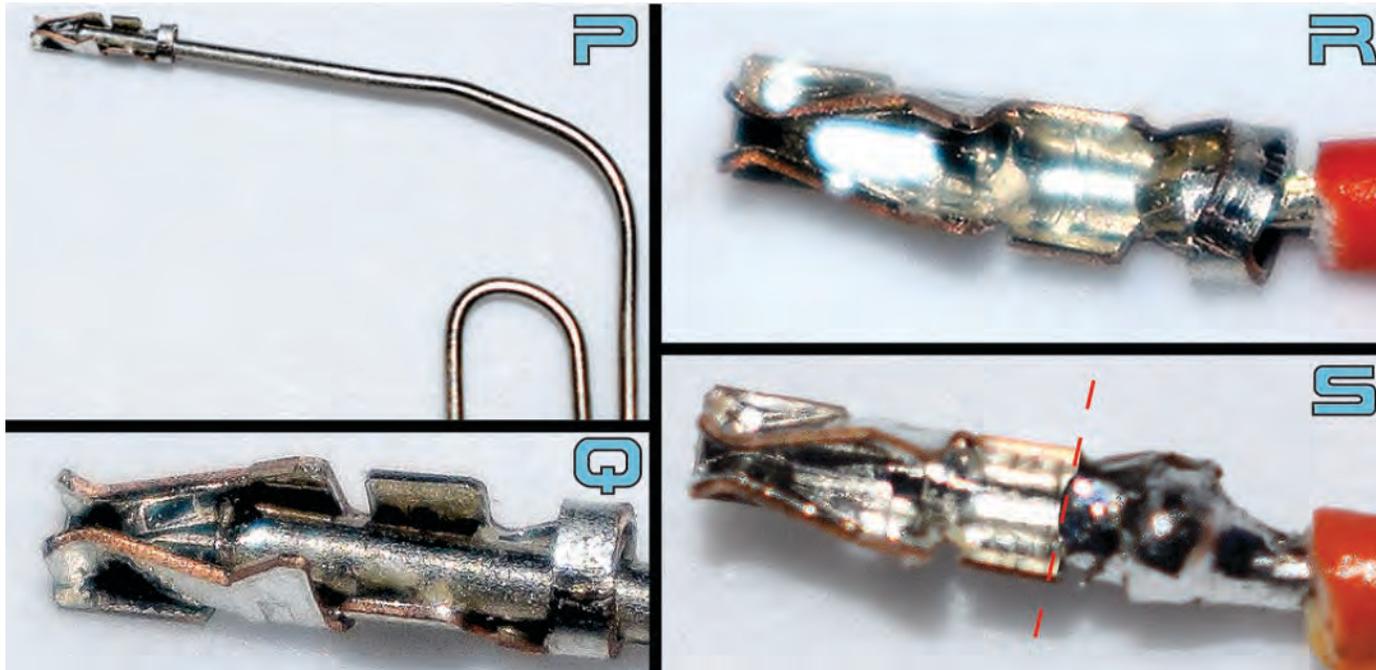
G) End of paper-clip inserted. Only the upper tabs are wrapped around to form a rounded slot
(I recommend using small pliers or hemostats for this step when bending the tabs over to form the rounded shape)

H) 24AWG wire inserted 1 cm into the newly formed slot

I) Solder wire in place. **USE AN EXTREMELY SMALL AMOUNT OF SOLDER** and don't let any flow beyond the red dotted line or else the crimp tab will not fit inside the Hirose connector

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OPTION #2 (continued)



P) End of paper-clip inserted

Q) Upper tabs are then wrapped around to form a rounded slot (I recommend using small pliers or hemostats for this step)

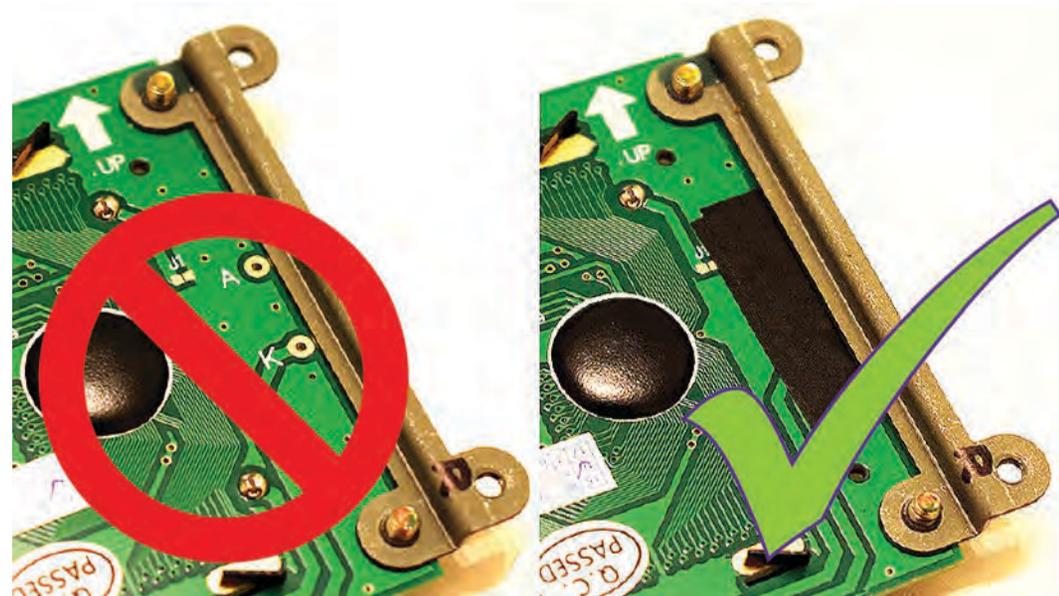
R) 24AWG wire inserted 1 cm into the newly formed slot

S) Solder wire in place. **USE AN EXTREMELY SMALL AMOUNT OF SOLDER** and don't let any flow beyond the dotted line or else the crimp tab will not fit inside the Hirose connector

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OPTION #2 (continued)

ATTACHING LCD TO PANEL BOARD (continued)

Power on the W-30 and test the display. If the screen is solid black or solid white, try adjusting the contrast knob on the back for best viewing results until text appears

EXTRA NOTES

Some people are reporting they are unable to find 24-pin Female IDC ribbon cables anywhere. As of December 2021, I'm having no problems finding these on eBay. If you are in a pinch, you can use the more common 26-pin Female IDC ribbon cable

DISCLAIMER

Modifications used here were performed on a W-30 manufactured February 1990 (early production model). If you find any errors because your sampler is a different production model, please send me an eMail so I can keep this document accurate. Thanks!

eMail: llamamusic@hotmail.com

Modifications made to factory stock samplers will always pose an element of risk. Sometimes mistakes are made which are irreversible. The author is not responsible for any damage or injury resulting from this DIY info. Use this DIY information at your own risk and be sure to wear an anti-static wrist strap when handling PCB's and components. Always wear eye protection when soldering. That stuff flies everywhere!!!

*As always, llamamusic.com strives to provide **free** info to keep our classic synth and sampler gear alive and kicking!*

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YOUR W-30 IS NO LONGER A SCREAMING BANSHEE FROM HELL! ENJOY!



P/N: ERM24064FS-1