U-220 LCD DIY v.20190203

I put this hack together after the LCD on my U-220 started fading slowly into solid black. Not including the minimal shipping costs for parts, the price to get everything working was under $7 (USD). Used U-220 LCD's seldom show up on eBay. When they do, they're costly and already in fair condition at 25+ years old. I didn't bother to see if Roland had any in stock. From past experiences, it's cheaper just to buy a whole synthesizer from eBay and cannibalize the parts, as opposed to buying any OEM parts from the Roland $ervice Department. I say this is a hack because it's nowhere near a perfect solution to replace the broken LCD. However, it's a lot better than having no LCD screen and a dead synth. The main issue which makes it buggy is this LCD model will not fit in the case without some minor modification to the steel frame inside

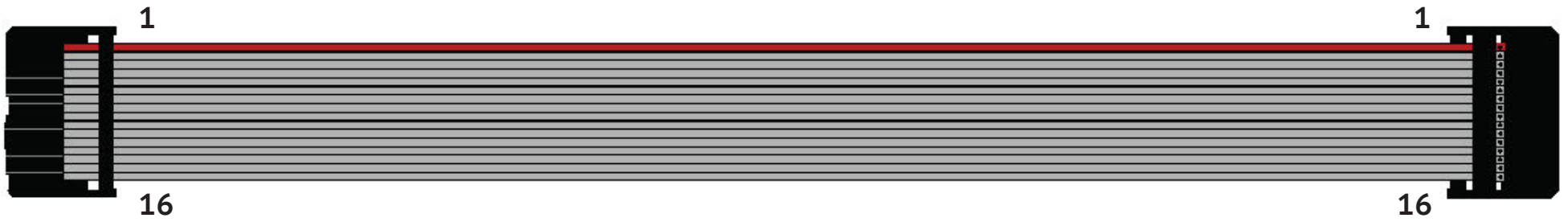
PARTS

The LCD screen model I used for this DIY is the first one on the parts list*. I've tested the White/Blue model and it's just OK. I've not tested the White/Black or the Black/Y-G but I'm 99.999% sure those two models will work just fine. From looking at their datasheets, the only differences I can see are the colors. I was very impressed with the LCD display quality of the Black/White ERM2402FS-1. Bright, crisp, clear & easy to read. My only complaint about this model and the White/Blue model is the right side is brighter than the rest of the screen because that's where the LED backlight is located. However, I can't be too picky for a $5 part! My experiences with White/Black and Black/Y-G on other model LCD's from the same company are mixed. The Black/Y-G is crisp and very bright but it's a horrendous monkey vomit green color. The White/Black and White/Blue both look a little washed out at the maximum contrast level because of the dark background mixed-in with the bright LED backlight

The 16-Pin ribbon cable is a common part found on eBay. Don't pay more than $2 for one. All parts shown below are available on eBay. However, I highly recommend buying the LCD direct from the buydisplay.com website instead. Their shipping charges are super cheap and the turn-around time is faster than their eBay storefront

QUAN	PART NUMBER	DESCRIPTION	PRICE(USD)	VENDOR
1	**ERM2402FS-1***	**BLACK/WHITE 24x2 CHARACTER LCD - CHOOSE 5V WITH A PRE-SOLDERED CONNECTOR**	**$5.30**	**buydisplay.com**
1	**16-PIN IDC CABLE**	**16-PIN IDC RIBBON CABLE 30cm LONG WITH FEMALE/FEMALE CONNECTORS**	**$1.00**	**eBay.com**
	ERM2402SBS-1	WHITE/BLUE 24x2 CHARACTERS LCD - CHOOSE 5V WITH A PRE-SOLDERED CONNECTOR	$4.72	buydisplay.com
	ERM2402SYG-1	BLACK/Y-G 24x2 CHARACTERS LCD - CHOOSE 5V WITH A PRE-SOLDERED CONNECTOR	$4.72	buydisplay.com
	ERM2402DNS-1	WHITE/BLACK 24x2 CHARACTERS LCD - CHOOSE 5V WITH A PRE-SOLDERED CONNECTOR	$4.72	buydisplay.com

If your ribbon cable does not have Pin #1 marked in red, Use a sharpie and mark it yourself. Make it match the image shown below

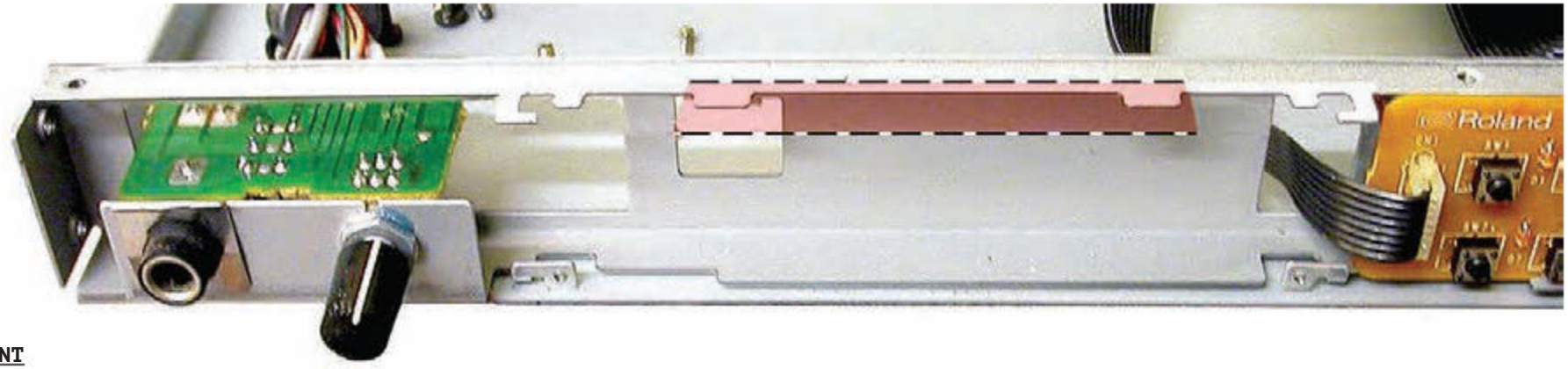


To LCD PCB

To Connector **CN6**
On The U-220 PCB

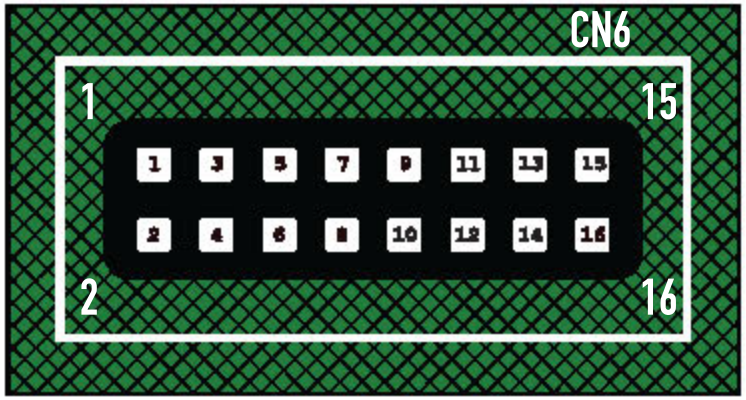
CASE MODIFICATION

Get your Anti-Static Wrist Strap and use proper grounding procedures before continuing. Finding a replacement U-220 PCB is uncommon if you zap any of those rare IC's! Unplug your synth from the electrical outlet and open the case. I cringe every time I make a change to original equipment. Unfortunately, for this mod I see no other way. The new LCD PCB won't fit into the case because there are two SMD resistors at the top of the PCB which are in the way. Two metal tabs (marked by the red outlined box) need to be bent downward. I used a strong pair of channel lock pliers and bent the metal tabs downward and as an extra precaution, insulated the back of the LCD board so the metal wouldn't make contact with any components



LCD PLACEMENT

Before fitting the new LCD in place, be sure the ribbon cable is already connected to the 16-pin connector on the back. You won't be able to plug it in place once the LCD has been screwed onto the frame. Take special care to match-up Pin-1 on the LCD ribbon cable connector with Pin-1 on the Main PCB at **CN6** because the connectors are not polarized. Triple-check your wiring connections because you only get one chance! Power on the synth and test that the LCD is working. You may need to adjust the contrast setting: **EDIT >> LEFT CURSOR x3 >> ENTER >> LEFT CURSOR x4 >> ENTER >> RIGHT CURSOR x2 >> ENTER >> VALUE UP x8 >> ENTER**



16-Pin Header On The Main PCB At CN6

If everything looks OK, unplug the synth from the electrical outlet. The last step is to remove the original Plexiglas bezel from the face of the old LCD. This is easier said than done. Roland used some **very** strong double-sided tape to attach this part. Use care not to scratch the black paint from the back surface. I used the back end of a clothespin covered with cloth and carefully pried it off in small steps. Take the black faceplate with buttons and place it back in it's original position. Do not put any of the screws in just yet. A few adjustments are needed before putting all the screws back in place. Take the Plexiglas and place it in position and press hard to affix it onto the new LCD. I was unable to reuse the same tape so I had to use my own. Since the faceplate section is partially assembled, it will be in perfect alignment with the new LCD. Note: I had to cover up small gaps on the left and right sides by placing black electrical tape on the inside because the bright LED backlight was shining through. This LCD is **really** bright! Put all the screws back in place and you're done. If for some reason you don't have the original Plexiglas bezel, I have no suggestions other than to try and fashion your own part using some Plexiglas from the hardware store. The Plexiglas thickness varies from synth to synth. Anywhere from 2.25mm to 3mm

LCD PLACEMENT (Continued)

Plexiglas Bezel Removal

The images below show a new White/Blue ERM2402SBS-1 LCD installed inside a U-220. As you can see in the first image, the right portion of the screen is extremely bright because of the LED position. This is why I prefer the White/Black ERM2402FS-1 LCD instead. The bright LED background contrast blends in better

One cool thing about the White/Blue model I do like is that when viewing it at an angle from either side, the text changes from white to black and is still quite legible

The next image shows a new White/Black ERM2402FS-1 LCD installed inside a U-220. Notice the right portion of the screen with more intense light as a result of the super bright LED backlight. Even so, it's not too shabby for only $5

That's it... your U-220 is no longer a brick. ENJOY!

THINGS TO CONSIDER

If for some reason you decide not to have buydisplay.com pre-solder the 16-pin connector on the LCD for you, DO NOT use a shrouded box header type because there is not enough clearance in the case. Use a regular 2x8 straight pin header such as this one from Tayda ► http://bit.ly/2RyKppM

DISCLAIMER

Modifications used here were performed on a U-220 manufactured February 1990 (early production model). If you find any errors because your synth is a different production model, please send me an eMail so I can keep this document accurate. Thanks!

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Modifications made to factory stock synths 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 always wear eye protection when soldering. That stuff flies everywhere!!!