KB/LCD Extension Build

Building the TRS-80 M100 KB/LCD Extension Set. Soigeneris (Hey Birt!)

User's Manual V1.0

Soigeneris
Your Resource for Hi-Tech Hobbies

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Introduction

One of the difficult parts of working on a TRS-80 Model 100 is trying to type on the keyboard or see the LCD while taking measurements on the board. The cables for both are short and you have to support the top case half from one side with one hand in a vertical position while trying to type with the other.

Dreaming about how nice it would be nice to be able to extend the cables for the KB and LCD this extension set of born. In addition to providing about 450mm of extra cable length it adds test points for all the signals to aid in troubleshooting.

The components are all through hole and assembly just requires a soldering iron and crimping tools for the ribbon cables and Molex MiniSpox connectors used on the keyboard connectors.

What's in the Kit?

LCD Extension BOM			
Qty	Part#	Source	Description
1	N/A	PCBWay	PCB
2	302-S301	DigiKey	2x15 Box Male Header
1	Generic	eBay	2x15 Male pin header
1	Generic	eBay	20" 30p ribbon cable
2	AWP 30-7240-T	DigiKey	2x15 female IDC

KB Extension BOM			
Qty	Part#	Source	Description
1	N/A	PCBWay	PCB
1	302-S201	DigiKey	2x10 Male Box Header
1	Generic	eBay	20" 20p ribbon cable
1	302-S201	DigiKey	2x10 Female IDC
2	Generic	eBay	1x10 boxed male pin header
2	50375103	DigiKey	10 pos Molex MiniSpox housing
20	8701039	DigiKey	Molex MiniSpox Terminal
2	22057105	DigiKey	10pos Molex MiniSpox Male PCB Mnt

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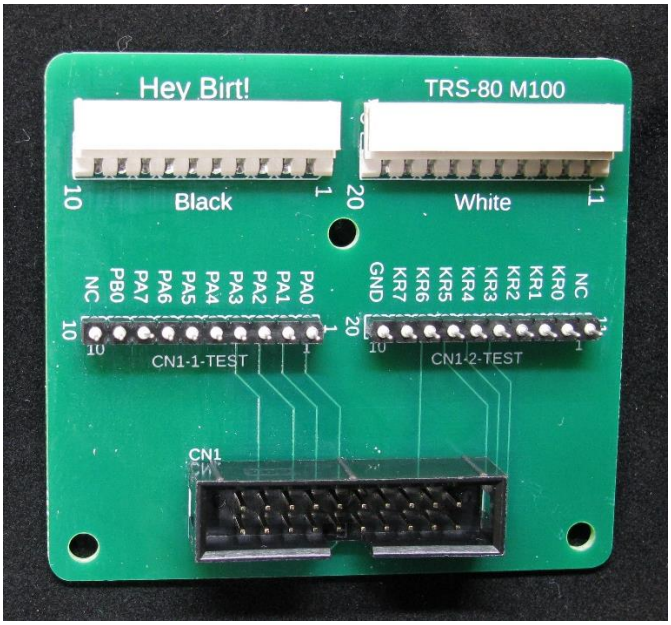
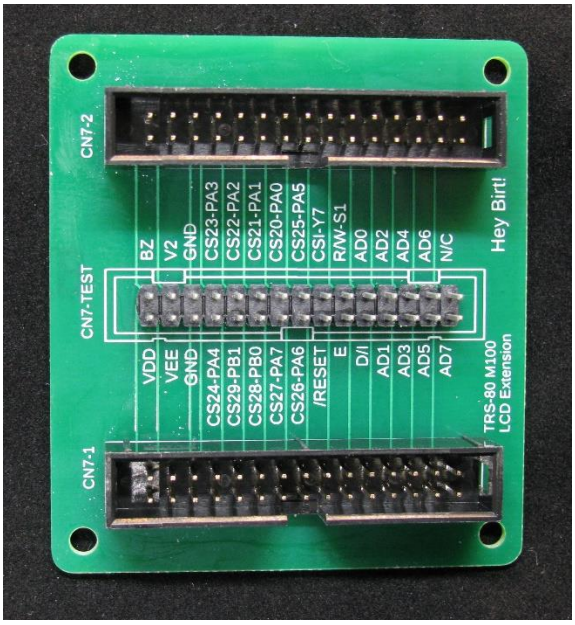
Building

Construction is straightforward, all parts are through hole and easily soldered. Refer to the following images for component placement. Please note the orientation of the boxed headers. The arrow on the left corner of the connector body denotes pin 1. The unboxed headers have no installation orientation.





The single row pin headers for the keyboard extension test points may come as two separate 10 pin headers or one 10 pin and one each of two smaller sizes that equal 10 pins. This was due to the odd number pins on the original header they were cut from.

The male PCB mount Molex MiniSpox connectors are in a seemingly odd orientation. This makes the connection to the keyboard easier as it does not require crossing the cables top to bottom. It also makes routing the PCB straightforward. The PCB silkscreen is marked with the color of the keyboard cable that plugs in there. See the photos below to see how the cables plug into the boards.

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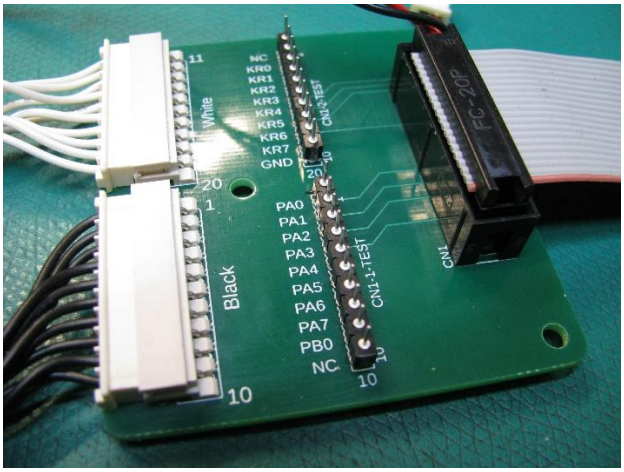
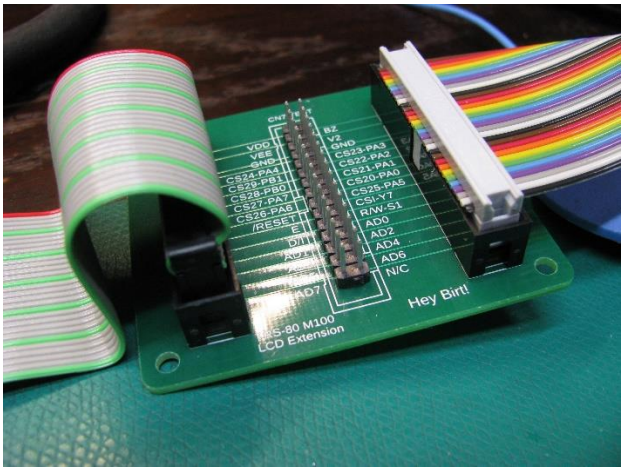
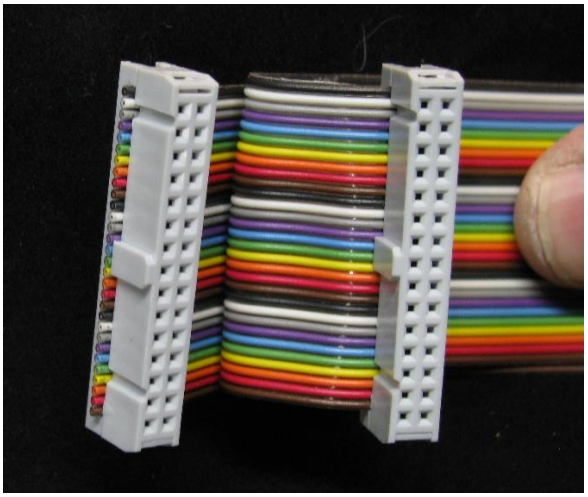
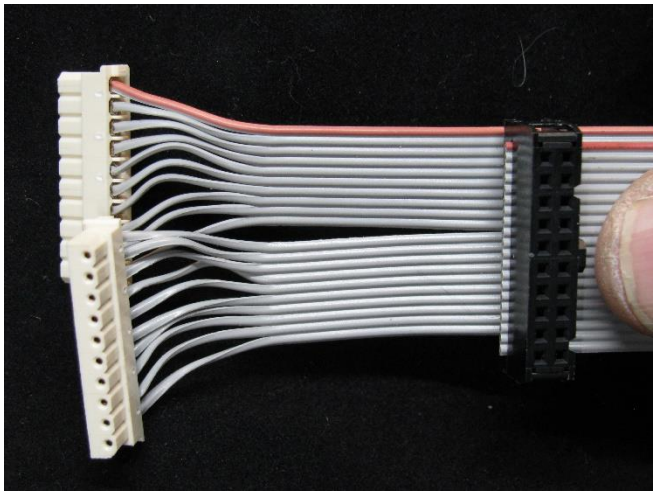




LCD Ribbon cable

The LCD ribbon cable is a 30 position striaght through cable. Crimp one of the 30 position female connectors to each side taking care to align Pin 1 of the connector to same color wire on both ends. In the photo below the brown wire on the ribbon is aligned to Pin 1. The cable was folded in half and then the right most end folded back over to reveal the connector in the photo below.





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Keyboard ribbon cable

The keyboard ribbon cable is the most complicated to make. This is a 20-position ribbon cable with a female connector crimped to one end. Note that in the picture above the red stripe is aligned to Pin 1 and the polarizing notch on the black connector is next to my thumb.

The other end of the cable connects to two 10 position female Molex MiniSpox connectors. The red stripe in the photo is Pin 1. Note that the connector housings are beveled on the bottom corners.

To make this cable split the ribbon cable into two 10 position cables about 2.5" back. Now split each wire about 1" back. This will give you two sets of ten wires. Strip about 2mm of insulation from each wire, crimp on the female terminal, insert terminal into housing. Take note of the connector orientation as shown in photo.

Information and links

The extension set is an open-source project created by Jeffrey T. Birt, a.k.a. 'Hey Birt!' Project files can be downloaded from the GitHub link below. The test harness files are also on GitHub.

Extension Set: https://github.com/Jeff-Birt/TASM_vsCode_Extension
Test Harness: https://github.com/Jeff-Birt/TRS-80-M100-M102-Test-Harness

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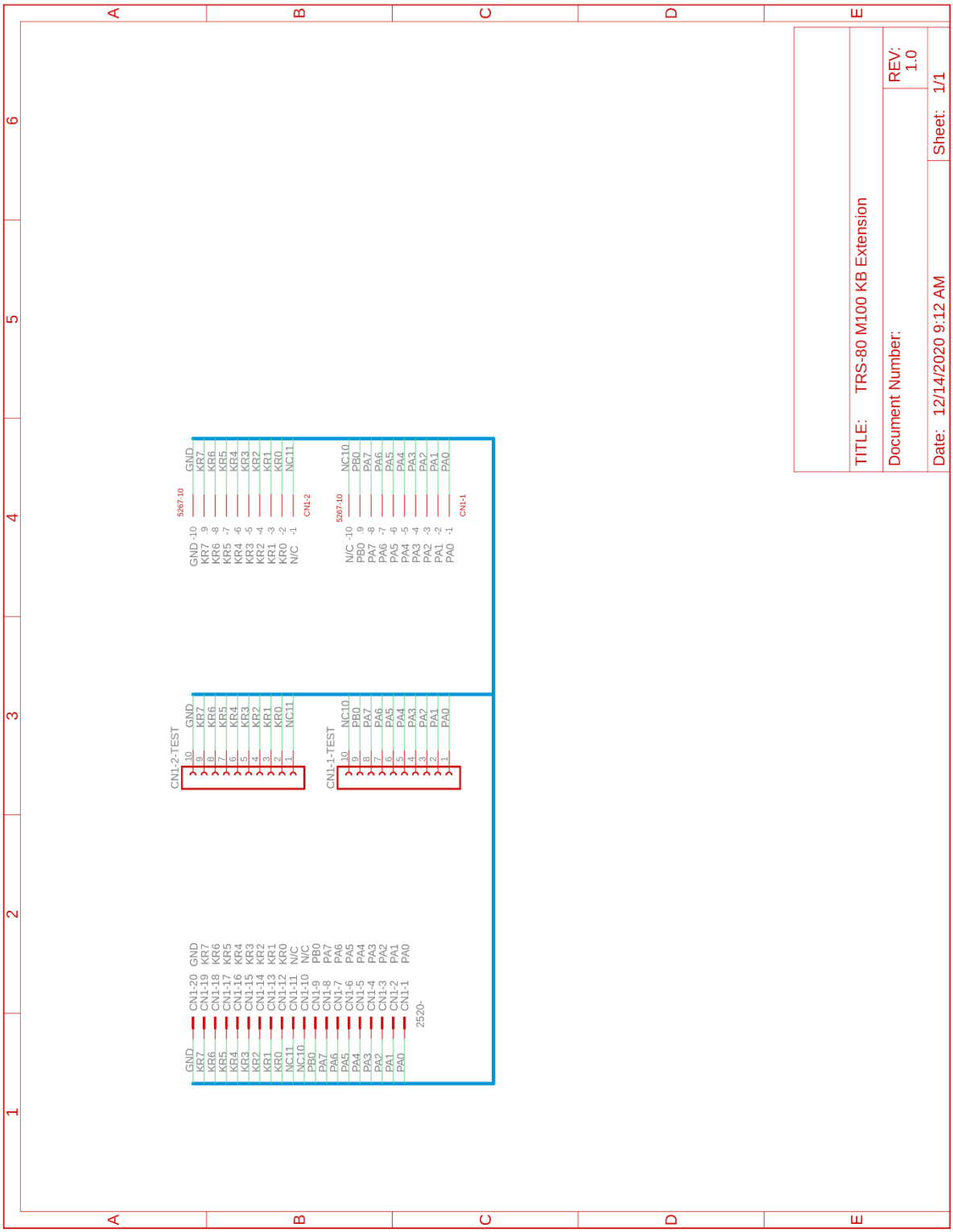

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