Manufacturing Run: r2 04/2019

Board Details

Please see Volpe USB Interface Board for all the details on this board except for the "Run-Specific Details" as outlined below.

Timeline

This manufacturing run is for boards marked r2 04/2019 on the back (the original mark still shows-- r1 02/2016).

The boards were ordered in April, 2019. After a few hiccups with the manufacturer, the boards were finally programmed and shipped in September, 2019.

At this time there are only a few boards left. If interested in ordering, please contact me.

Run-Specific Details

This board differs slightly from the original 2016 run of boards.

Slightly Differing Components

Some components were no longer available, so newer components were used, most notably the LH1540 optoisolator on the TX side. This optoisolator is an improvement in that it has a maximum current rating of 250mA max. However, the 6N139 limits the maximum current to 200mA. Still, this means the board is even more robust in case of overcurrent through the loop when put in half-duplex mode (the previous TX optoisolator was rated at only 100ma). This does not negate the recommendation for fuses on the current loop, however.

~200VDC max-- optoisolators report 350VDC maximum safe, but the transient voltage suppressor guarantees reverse standoff of 200VDC, starts breaking down at 224VDC, and clamps fully at 324VDC. This has proven plenty safe for regular current loop voltages including voltage spikes caused by high induction of the selector magnets. Most people are going to have very small current loops where you could probably get away with voltages under 100VDC if desired.

These boards also used the Atmega 16u2 chip instead of the 32u2 chip. The only real difference this causes is that the autoprint feature had to be disabled as it could not fit in the 16u2's memory. A future run of boards will use the 32u2.

Firmware Customizations

The firmware shipped with this board is also slightly improved. Older versions did not include the following functionalities (see main board page for details):

- Programmatically enter board configuration mode: Send ASCII character SYN (Synchonous Idle, or 0x16) to board from computer
- Issue FIGS from computer (with ITA2ASCII translation enabled): Send ASCII character RS (Record Sepatator, or 0x1E) to board from computer
- Issue LTRS from computer (with ITA2ASCII translation enabled): Send ASCII character US (Unit Separator, or 0x1F) to board from computer

Note that the above non-printable characters (SYN, RS, and US) were programmed purely with ITA2 ASCII translation in mind, but I did not think clearly enough to realize that even with ASCII translation disabled, sending the SYN (0x16) character for entering configuration mode conflicts with the ITA2 passthrough for the letter "P". This means that whenever a letter P is passed through to the board for printing with ASCII translation disabled, the board would enter configuration mode. This obviously is a big problem for those leveraging ITA2 in passthrough mode (I typically have been using the ASCII translation functionality and thus missed this when testing the boards). This can be remedied with updated firmware that can be flashed to the board if you know how to do it. That can be downloaded from here <need to add link>. If this kind of thing escapes you, I would be happy to reprogram the board for you and pay for shipping since this was my oversight. Contact me if you're in this pickle.

Gerbers, Eagle Files, BOM

Gerber files can be downloaded here: loopdapter-r2.3_usbfix_2019-05-31.zip

Eagle CAD files can be downloaded here: loopdapter-r2.3_cad.zip

Bill of materials (BOM), optimized for Seeed, can be downloaded here: loop-adapter-NEWBOM.csv