LAoE Keypad Board: Description

Contents

REV 0; May 22, 2018.

0.1 Keypad Functions

It provides an 8-bit output formed by the two most recent key presses. The keypad and display are hexadecimal. The display is a pair of 14-segment LED characters.

The board also provides control signals needed by the LAoE "Big Board" computer. Three slide switches and five pushbutton switches generate the six output signals. Pushbuttons are debounced. Debouncing and keypad scanning are implemented in a microcontroller (SiLabs C8051F62).

0.2 What it Looks Like

Here are two views of the current version.

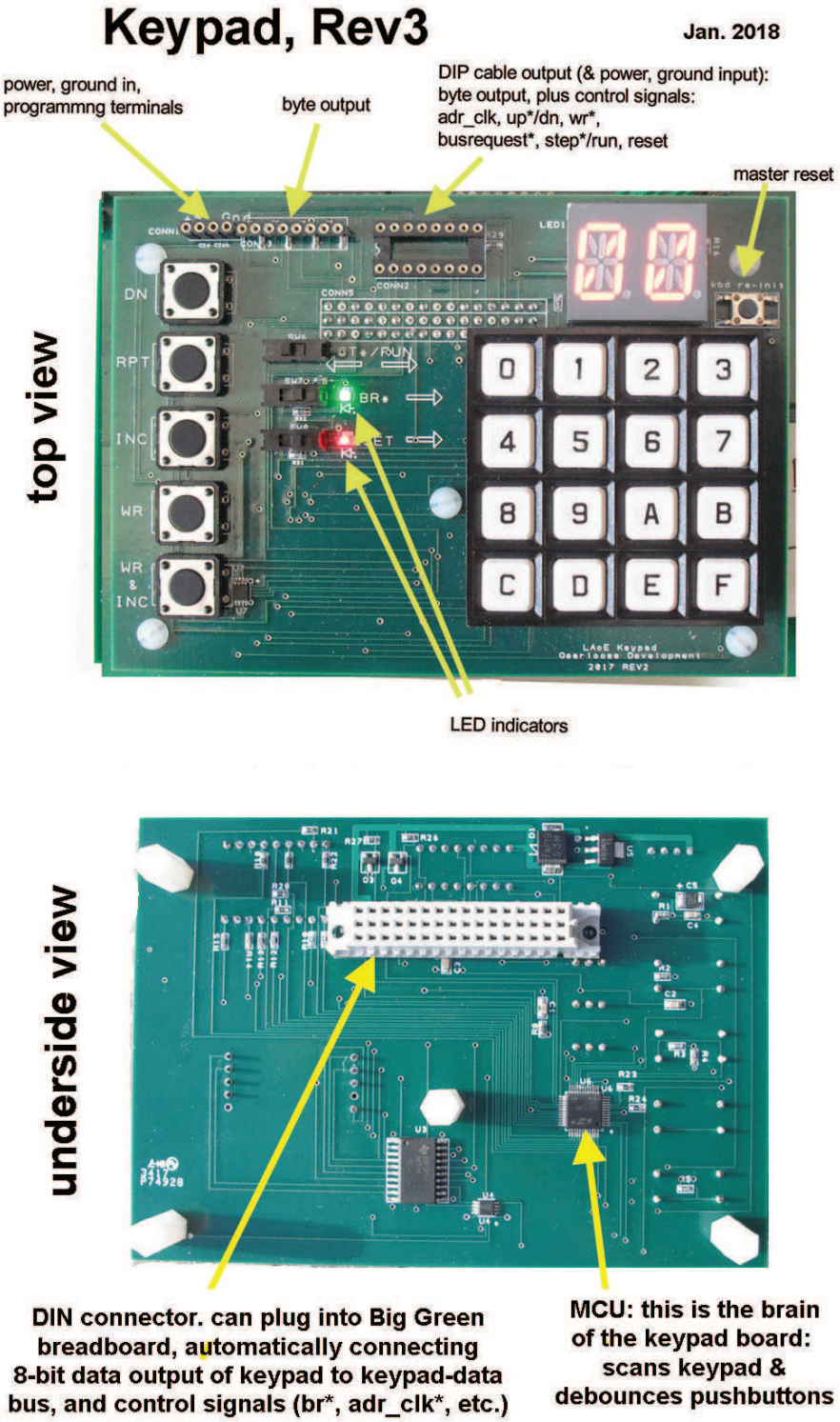

Figure 1: Keypad, top and underside views

0.2.1 How Keypad Connects to the Outside World

The keypad can be used stand-alone, linking to its target with a DIP cable that carries both the 8-bit key codes (two hex nybbles corresponding to the two most recent key presses) and the switch outputs.

Alternatively, when it is used with the printed circuit Big Green Board, it can be plugged directly into that board, and its DIN connector then internally connects to the Big Green's keypad data bus, and to a connector labelled with the five control signal names. The DIN connector appears in the *underside* view of fig.1.

0.3 Features and Quirks

0.3.1 An Inline Byte Output

We have provided an 8-bit in-line connector for the cases where the byte output is all that is wanted. We provide this in-line output because its wiring can be more convenient than for the DIP cable, where the byte is presented as a nybble on each side of the DIP connector.

When the inline output is used, power and ground must be provided separately, at the connector located at the top left corner of the board. When the DIP cable is used instead, or when the board is plugged into the Big Green's DIN connector, power and ground are connected internally.

0.3.2 A Quirk

The byte output becomes valid not on a key *press* but rather on a key *release*. This differs from the displayed value of key presses, which is updated on key *press*.

0.4 Schematics

On the next two pages we show the left side, then right side of the schematic. It's on two pages in the hope that this scale will make the design readable.

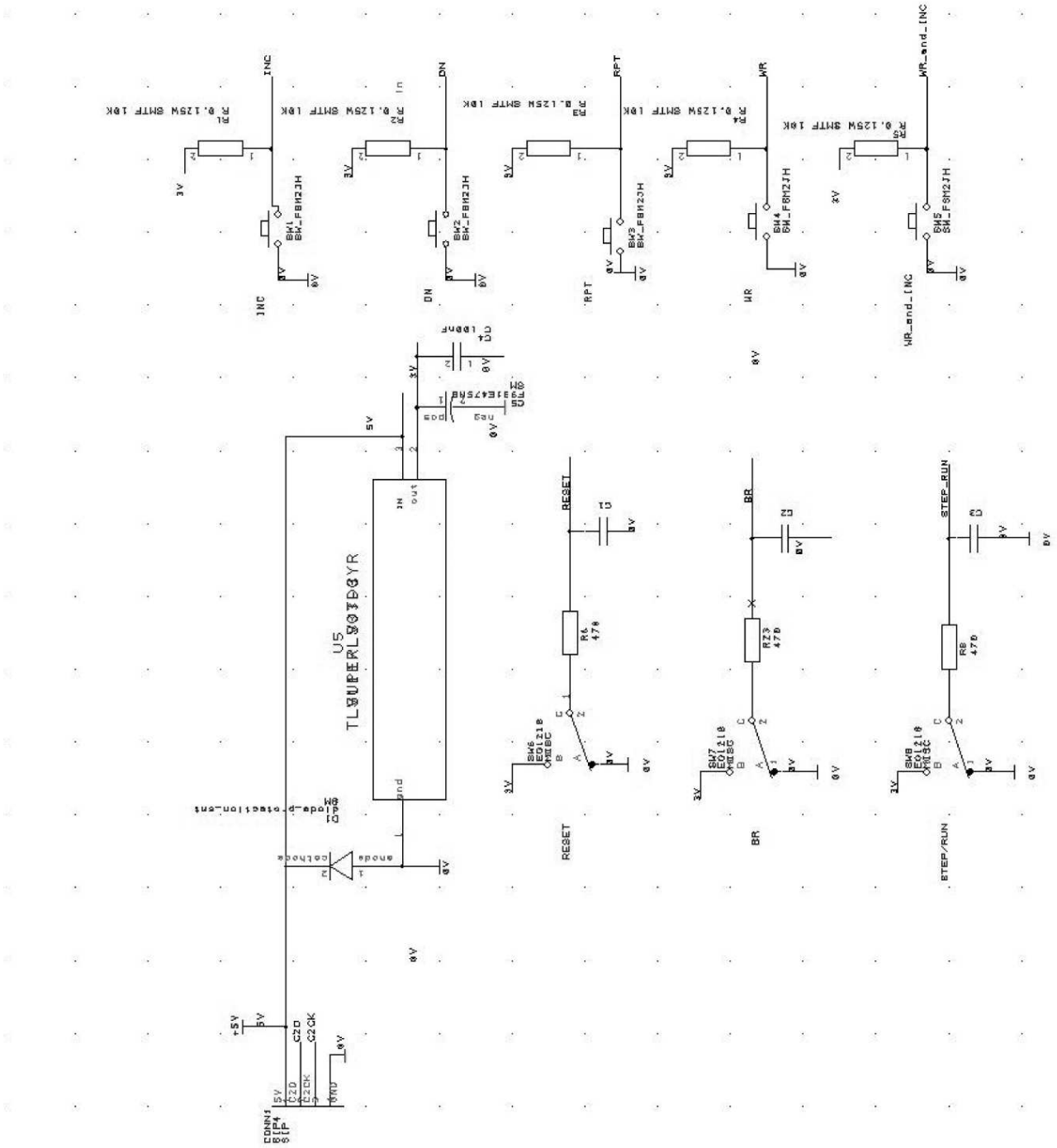

Figure 2: Left side of keypad schematic

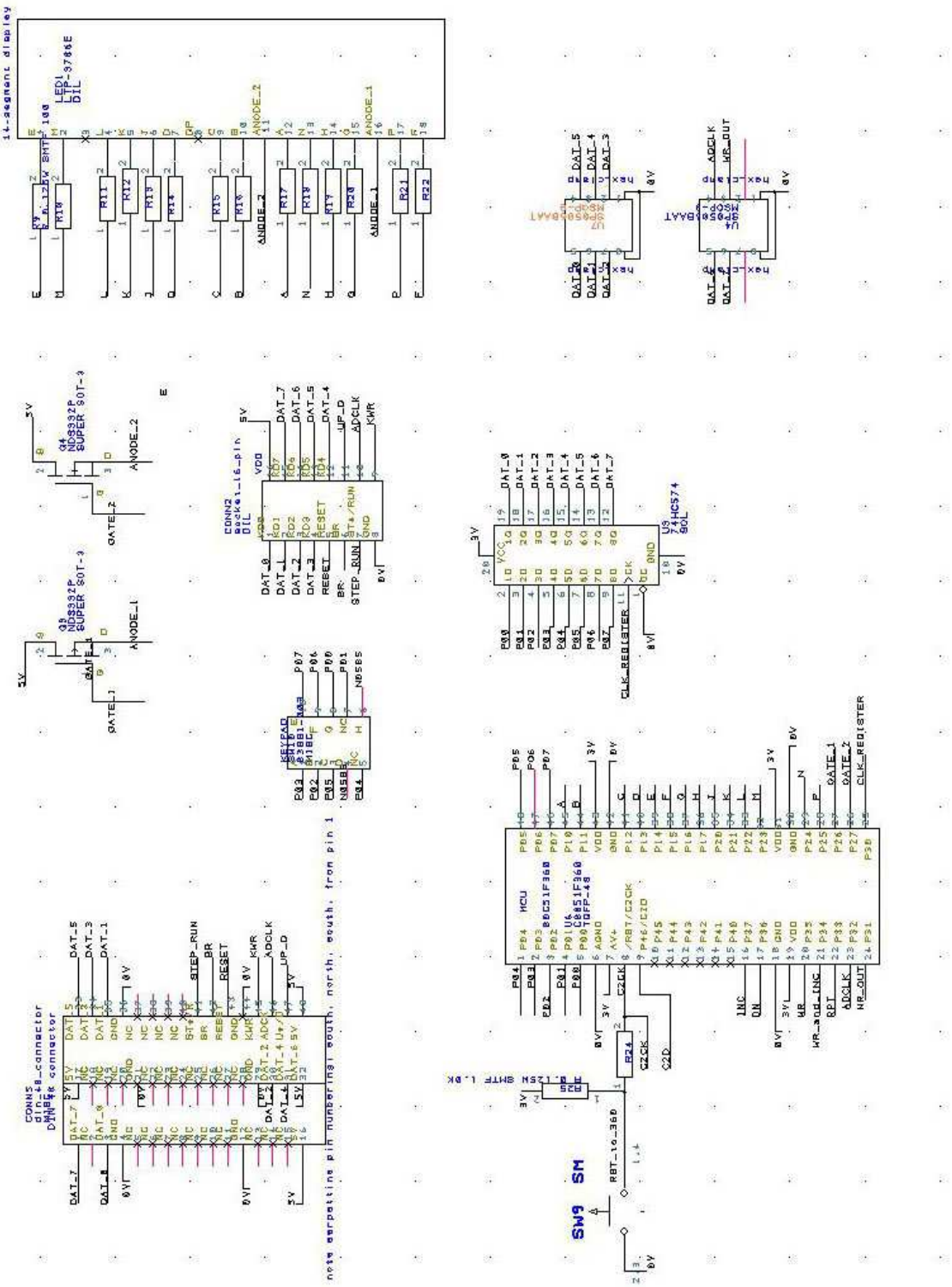

Figure 3: Right side of keypad schematic