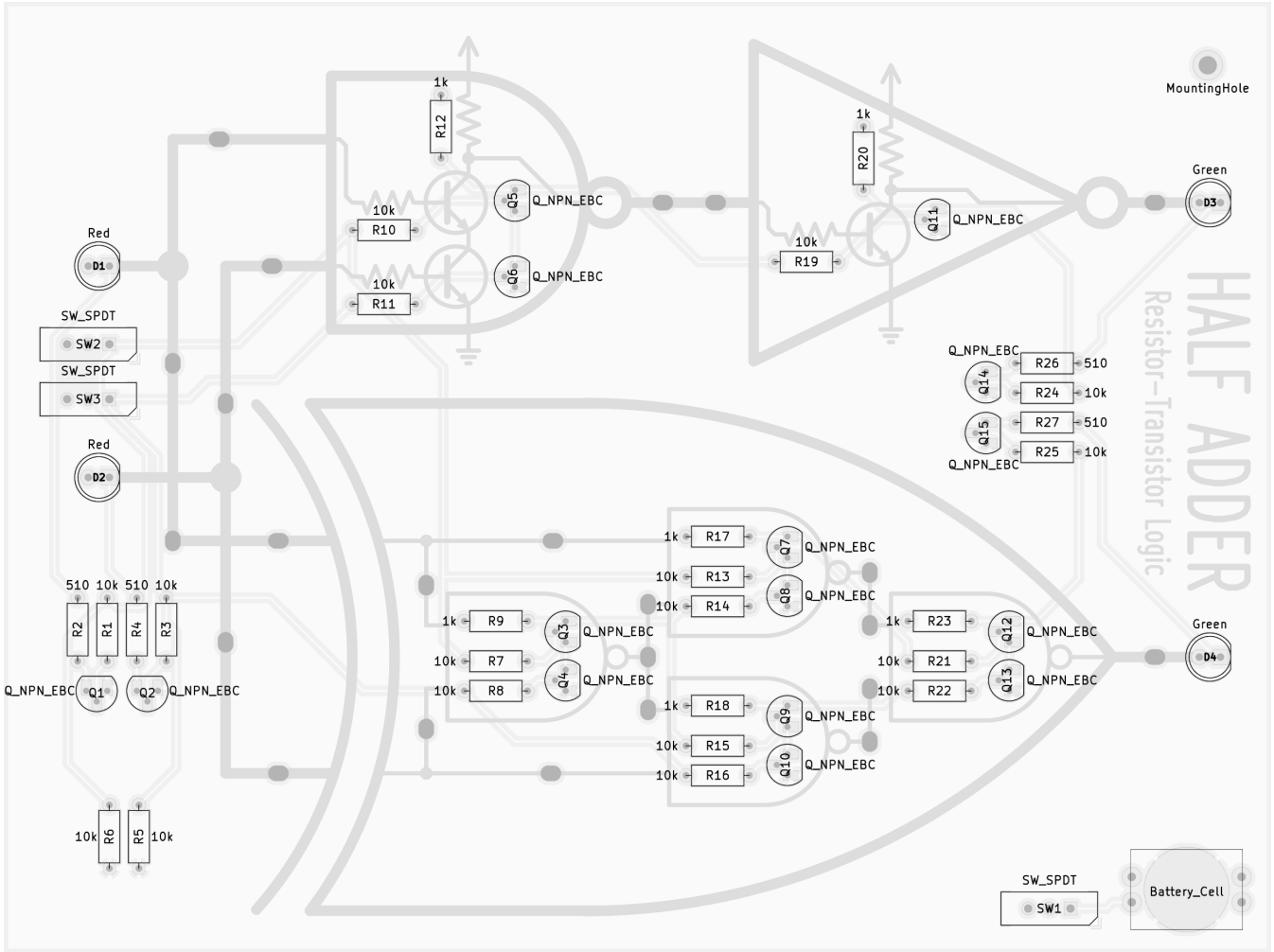
RTL Half Adder  v1  2019-06-12

Tobin Yehle  CC BY-NC-SA  github.com/tyehle/rtl-half-adder

All the RTL logic is on this side of the board using through hole components. All the surface mount components are optional and go on the other side of the board. The 510 ohm resistors control the brightness of the LEDs. If you prefer them brighter, replace the resistors with smaller ones.

| Reference | Value | Part Number | Quantity |
|---|---|---|---|
| BT1 | Battery_Cell | BAT-HLD-012-THM | 1 |
| D1 D2 | Red | LTL-4223 | 2 |
| D3 D4 | Green | LTL-4233 | 2 |
| Q1 - Q15 | Q_NPN_EBC | 2N3904BU | 15 |
| R2 R4 R26 R27 | 510 | CFR-25JR-52-510R | 4 |
| R1 R3 R5 - R8 R10 R11 R13 - R16 R19 R21 R22 R24 R25 | 10k | CFR-25JT-52-10K | 17 |
| R12 R17 R18 R20 R23 R9 | 1k | CFR-25JT-52-1K | 6 |
| SW1 SW2 SW3 | SW_SPDT | EG1218 | 3 |



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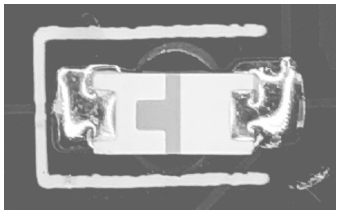
All these components are optional. The board should work with only the components on the front. I recommend starting with the resistors because it doesn't matter which way they go, there are many extras, and they are easiest to rework.

The surface mount LEDs have a green stripe with a box on one side on the back. The side with the box should point into the U on the board.



| Reference | Value | Part Number | Quantity |
|---|---|---|---|
| D5 - D27 | Yellow | LTST-C230KSKT | 23 |
| Q16 - Q19 | Q_NPN_BEC | MMBT3904,215 | 4 |
| R28 R31 R35 R38 | 10k | CR0805-FX-1002ELF | 4 |
| R29 R30 R32 R33 R34 R36 R37 R39 - R54 | 510 | CR0805-FX-5100ELF | 23 |