Model Railroad DCC accessory decoder high power Kato.
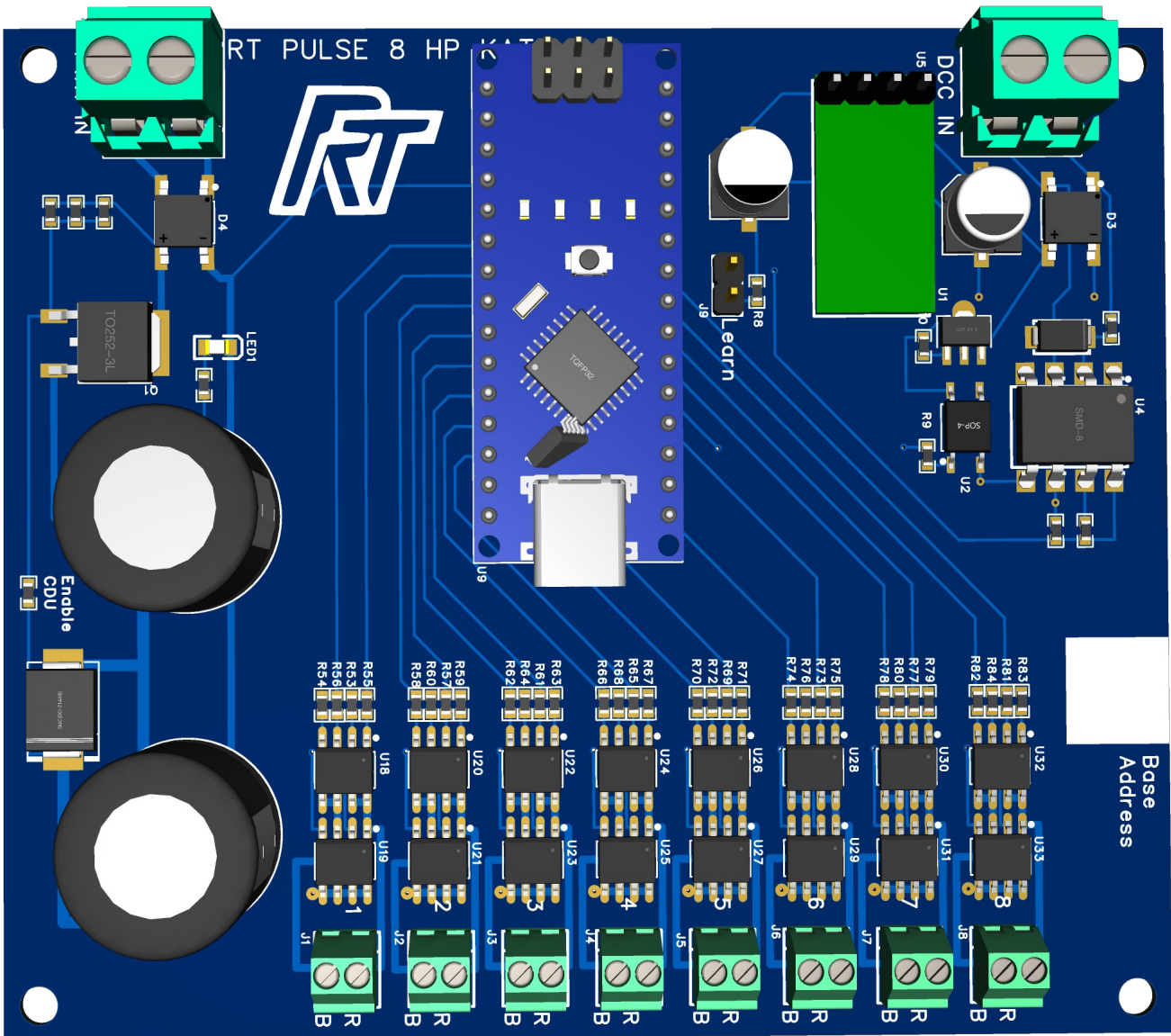
This board is a DCC accessory decoder. It is designed to control switch machines that require a changing polarity to move the solenoid or motor.

Brands that are like this but not limited to are Kato, Rokuhan, Circuitron Tortoise and Walthers.

This document describes the construction of the board.

The board can control turnouts with the firmware available here:

https://github.com/Rosscoetrain/DCC-Turnout-Decoder-Direct

The maximum current for any one solenoid is 5A, this is limited by the output mosfets.

Please read all this document before construction of the PCB.

Bill of Materials

PCB	RT PULSE 8 HP SMT
C2,C3	3000uF electrolytic capacitor*
J1,J2,J3,J4,J5,J6,J7,J8	2 way 2.54mm screw terminal
J10,J11	2 way 5.08mm screw terminal
J9	2 way 2.54mm male header
U9	Arduino Nano
	15 pin female headers x 2 for Arduino Nano *

* see Other Information section
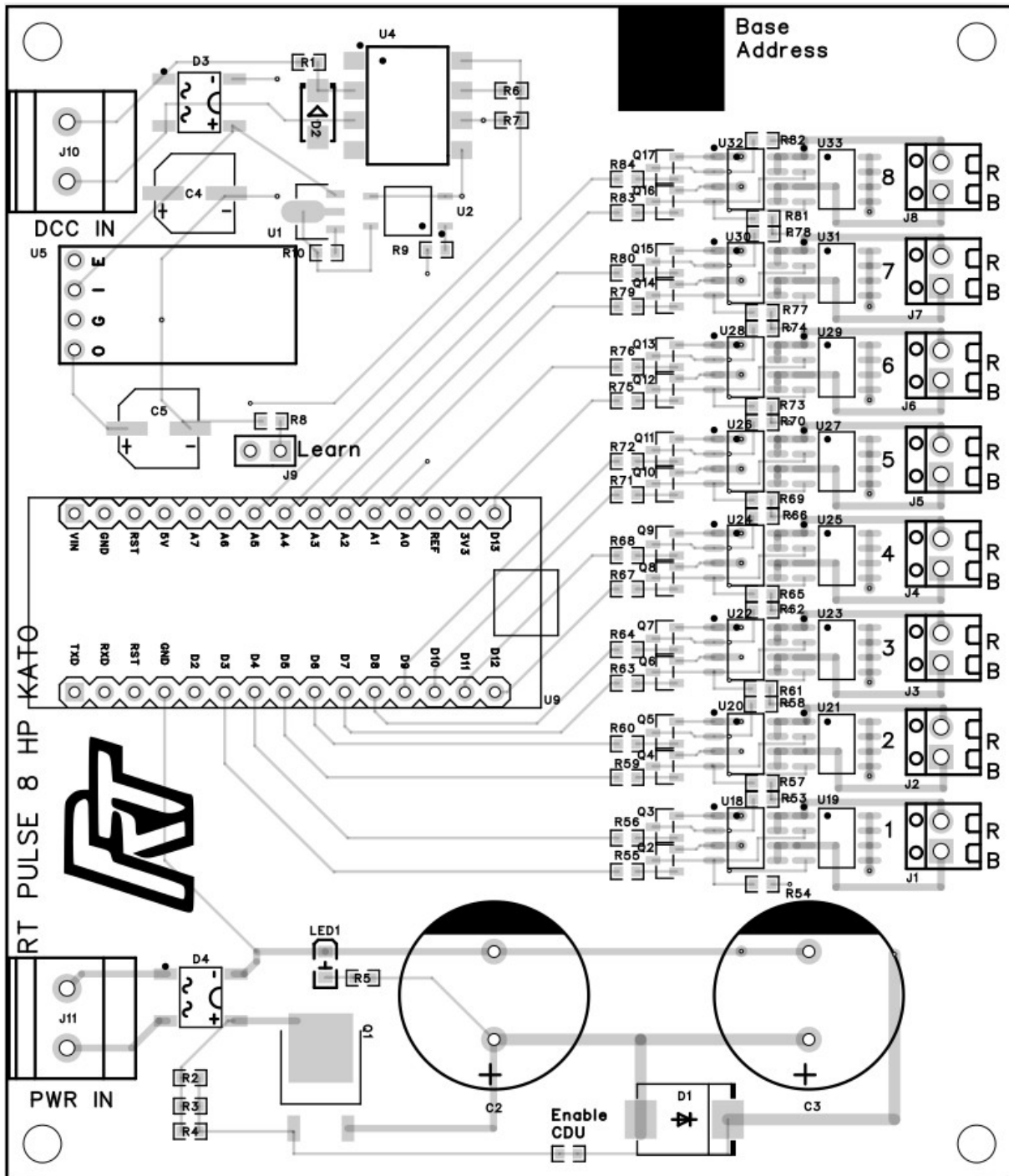
Construction of the board.

As with most PCB construction start with soldering in the lowest profile items first.

I suggest marking them of the list on the next page as you go.

Recommended soldering order:

Done

J1	2 way 2.54mm screw terminal	
J2	2 way 2.54mm screw terminal	
J3	2 way 2.54mm screw terminal	
J4	2 way 2.54mm screw terminal	
J5	2 way 2.54mm screw terminal	
J6	2 way 2.54mm screw terminal	
J7	2 way 2.54mm screw terminal	
J8	2 way 2.54mm screw terminal	
J9	2 way 2.54mm male header	
U9	2 x 15 pin female headers for Arduino Nano	
J10	2 way 5.08mm (0.2") screw terminal or pluggable terminal	
J11	2 way 5.08mm (0.2") screw terminal or pluggable terminal	
C2	3000uF 35V electrolytic capacitor (see Other Information section).	
C3	3000uF 35V electrolytic capacitor (see Other Information section).	

Other information.

The Arduino Nano should be mounted into 15 pin female headers. If your Nano does not have male headers already installed then you will need to solder them on the underside of that as well.

Optional components.

C2 and C3 can be replaced with any electrolytic capacitor that will fit. There are holes for 7.5mm pitch on the PCB. eg a 10000uF 25V electrolytic capacitor will fit the 7.5mm pitch holes. It's up to you to determine if the electrolytic capacitor will fit. The capacitor supplied in the kit will fit and is a 10000uF 25V if a single capacitor or 2 x 3300uF 25V.

Addendum

References.

PCB at Rosscoe Train store:

https://rosscoe.com/shop/index.php?main_page=product_info&cPath=1&products_id=7

Dual solenoid accessory decoder firmware:

https://github.com/Rosscoetrain/DCC-Turnout-Decoder-Direct