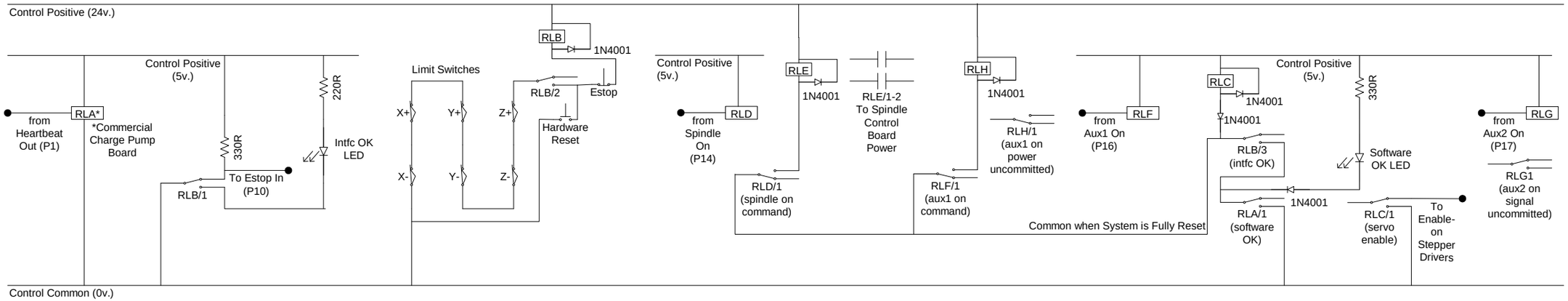



```
Mach3 Pin Utilization:
P1  - from cpu - Heartbeat
P2  - from cpu - X Pulse
P3  - from cpu - X Dir
P4  - from cpu - Y Pulse
P5  - from cpu - Y Dir
P6  - from cpu - Z Pulse
P7  - from cpu - Z Dir
P10 - to cpu   - Estop
P12 - to cpu   - Handwheel A
P13 - to cpu   - Handwheel B
P14 - from cpu - Spindle On
P16 - from cpu - Aux1 On
P17 - from cpu - Aux2 On

Notes:

1. System uses a commercial
UC100 USB to 25 pin parallel
port adapter.

2. Signals are carried from
the UC100 parallel side to
the main board through a
commercial DB25 1205 opto-
isolated breakout board.
```

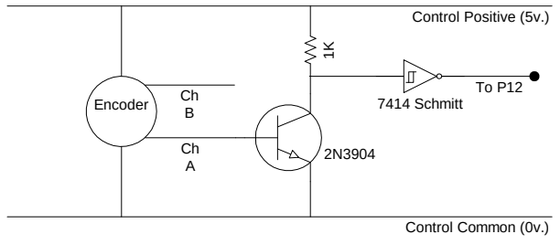
```
Relays:
RLA - 5v.  - Software OK
RLB - 24v. - Interface OK
RLC - 5v.  - Servo Enable
RLD - 5v.  - Spindle on Cmd.
RLE - 24v. - Spindle Power
RLF - 5v.  - Aux1 on Cmd.
RLG - 5v.  - Aux2 on Cmd.
RLH - 24v. - Aux1 Power

Notes:

1. RLA is a commercial charge
pump board designed to
respond to Mach3's heartbeat
signal.

2. Relays RLC, RLD, RLF and
RLG are located on an opto-
isolated commercial board
which accepts 5v. TTl inputs.

3. The 24v. relays are 'ice
cube' style on DIN-rail.
```



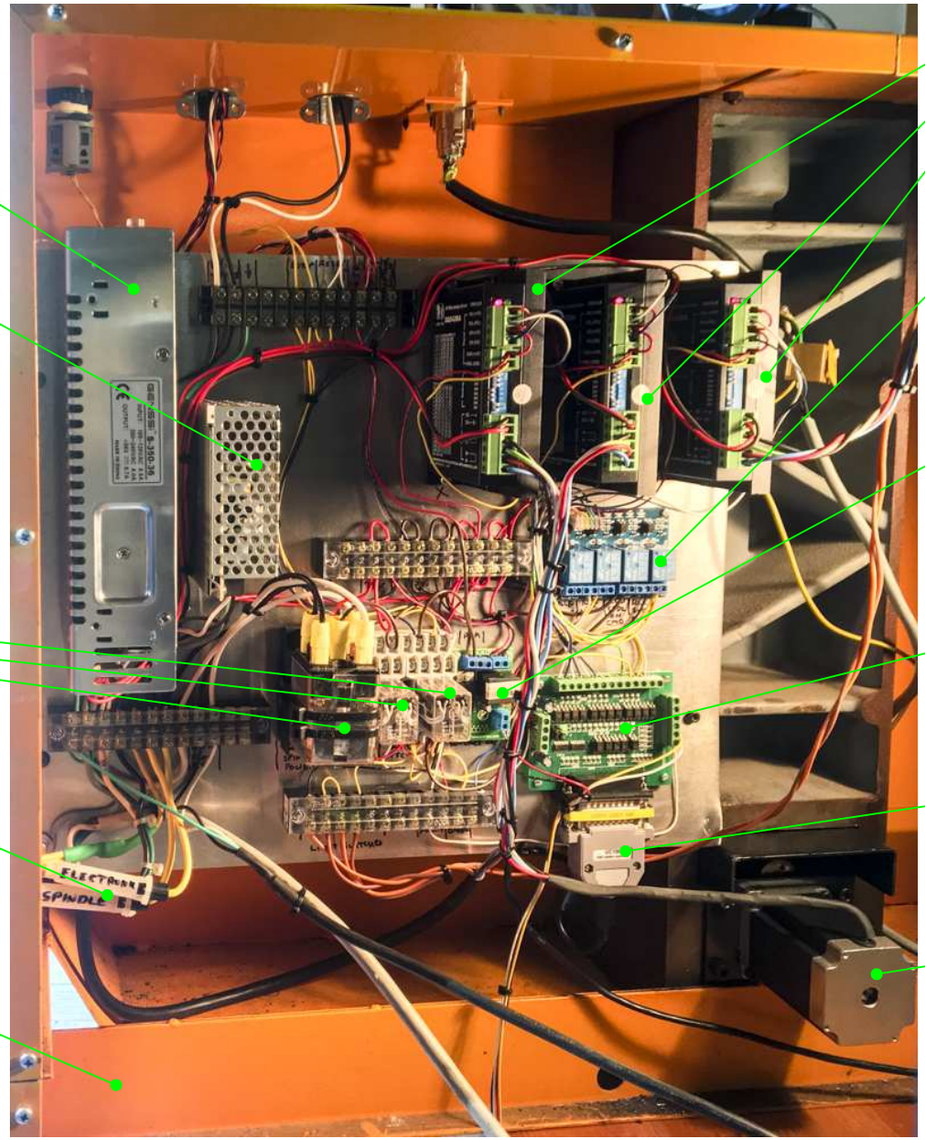

```
Pendant Encoder Signal
Conditioning Circuit

Notes:
1. Circuit shown for
channel A, only.  Both
channels are identical.
2. Circuit is packaged
within pendant.
```

Emco F1 Mill Stepper Upgrade

Safety and Control Logic Diagram

9/12/17 - Mark McDade - P1 of 2



36v. Stepper Power Supply

5v./24v. Control Power Supply

Ice Cube Relays

Line Fuses

Emco F1 Cabinet Rear

Wantai DQ-542MA Stepper Drivers

5v. TTL Input 4X Relay Board

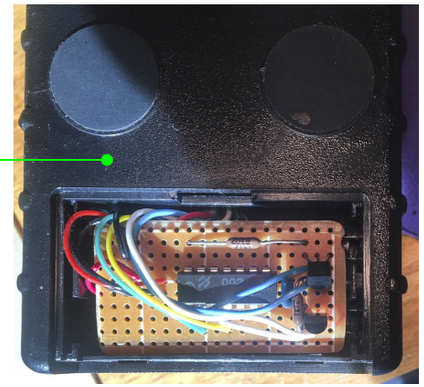
Commercial Mach3 Charge Pump Board

DB25-1205 Mach3 Breakout Board

UC100 USB to Parallel Adapter

Longs Motor 270 oz/in NEMA 23 Stepper (Y axis)

HB04 Pendant Front



HB04 Pendant Rear with Encoder Conditioning Board

Emco F1 Mill Stepper Upgrade

Safety and Control Circuit Layout

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