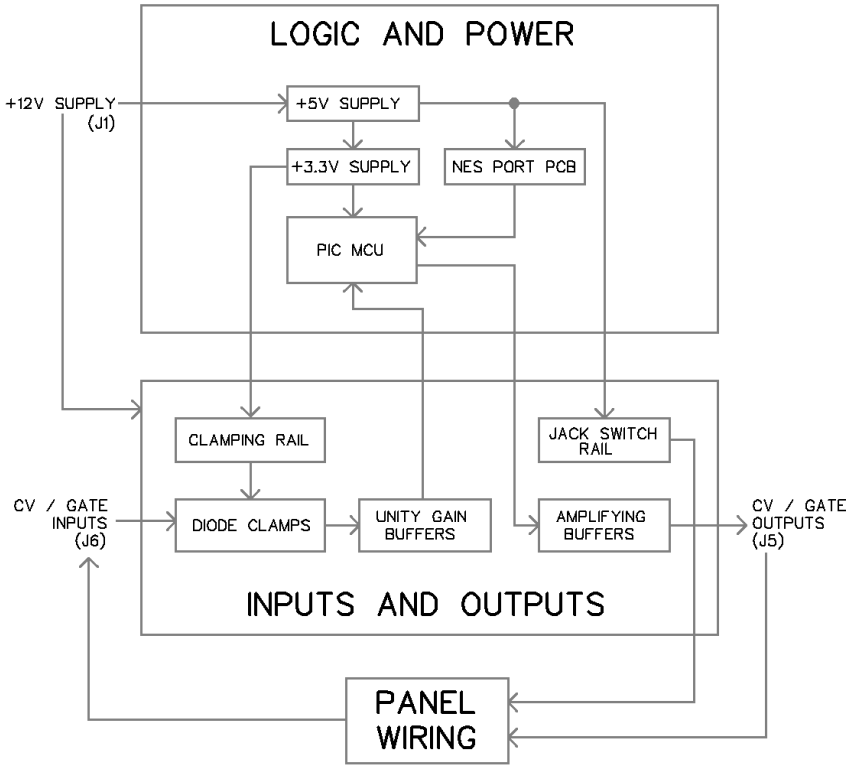
SSS-MM02-REV2

MING MECCA CONTROL CORE

DESIGNED BY JORDAN BARTEE IN PROVIDENCE, RI, SUMMER 2011
REVISED WINTER 2013

BLOCK DIAGRAM



PANEL WIRING

TOGGLE SWITCH S1 IS SPDT. SPST MAY BE SUBSTITUTED WITHOUT ISSUE.

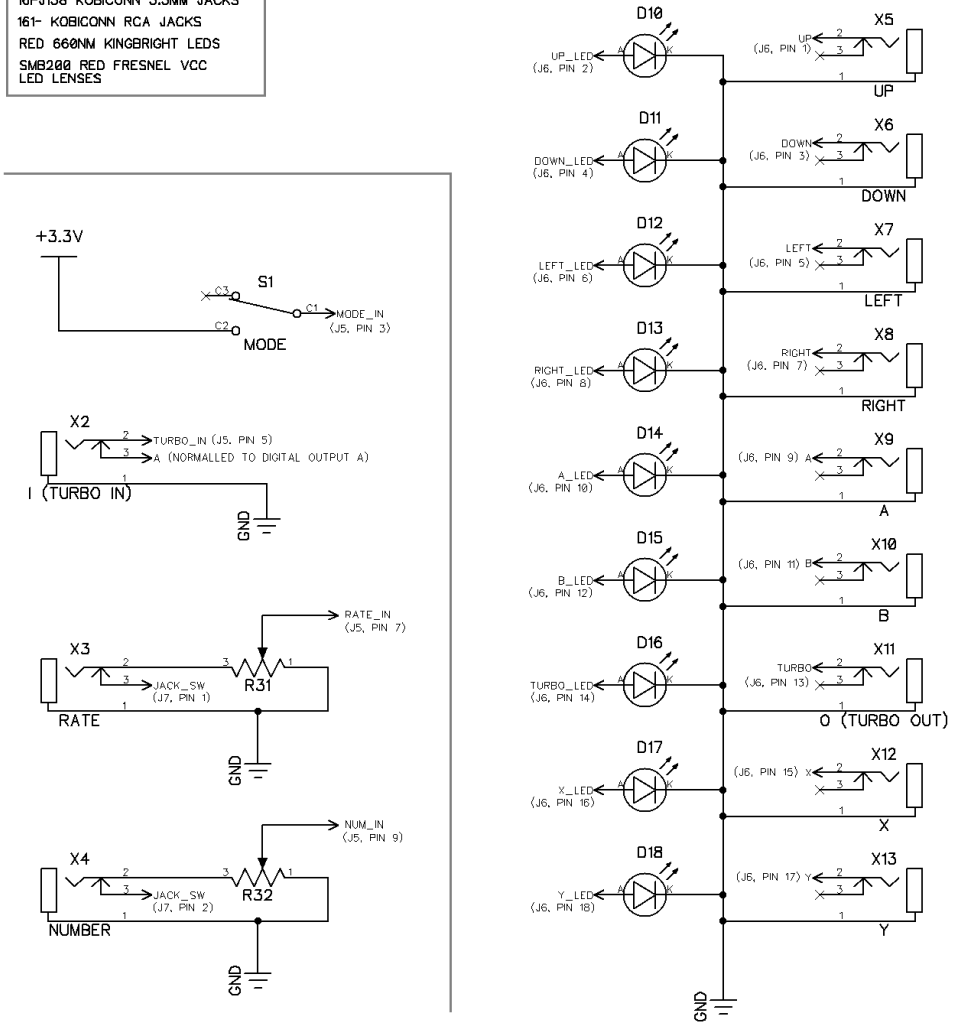
POTENTIOMETERS R31 AND R32 SHOULD BE INDIVIDUALLY GROUNDED TO THE PCB (STAR GROUNDING). THE DIGITAL OUTPUTS MAY SHARE A COMMON GROUND.

ALL POTENTIOMETERS ARE 10K LINEAR.

LEDS SHOULD BE SELECTED FOR A FORWARD VOLTAGE OF 2.5V AND A FORWARD CURRENT OF 20 mA (APPROXIMATE).

PREFERRED HARDWARE:

RV16AF 16MM ALPHA POTS
SERIES M NKK TOGGLE SWITCHES
16PJ138 KOBICONN 3.5MM JACKS
161- KOBICONN RCA JACKS
RED 660NM KINGBRIGHT LEDS
SMB200 RED FRESNEL VCC LED LENSES



special stage systems

LOGIC AND POWER

THIS DESIGN IS SPREAD ACROSS TWO PCBS JOINTED AT J3 / J4. THE MAIN PCB CONTAINS THE PIC MCU, POWER SUPPLY, AND CV PROCESSING (WHICH IS SHOWN ON THE "INPUTS AND OUTPUTS" SHEET). THE NES PORT PCB CONSISTS OF ONLY A PARALLAX NES CONTROLLER PORT CLONE AND A SCHMITT TRIGGER IC FOR SIGNAL INTEGRITY.

THE 7805 AND 7833 REGULATORS SHOULD BE HEATSUNK AND RATED FOR AT LEAST 130 mA EACH.

GROUND PINS 5 AND 6 ON POWER CONNECTOR J1 ARE INTENTIONALLY LEFT UNCONNECTED TO PREVENT DAMAGING SHORTS FROM OCCURING IF J1 IS CONNECTED BACKWARDS DUE TO USER ERROR. PINS 1, 2, AND 13 - 15 ARE ALSO LEFT UNCONNECTED.

FOR OP AMPS, THE ABSOLUTE MINIMUM DECOUPLING CONFIGURATION IS SHOWN, CONSISTING OF A SINGLE 100nF CERAMIC CAPACITOR PER IC AND A 6.8 uF TANTALUM CAPACITOR PER IC BLOCK. ALL ICS IN EACH BLOCK SHOULD BE GROUPED CLOSELY TOGETHER SINCE THEY SHARE THE TANTALUM CAPACITOR. ADDITIONAL DECOUPLING MAY BE NECESSARY DEPENDING ON PCB DESIGN.

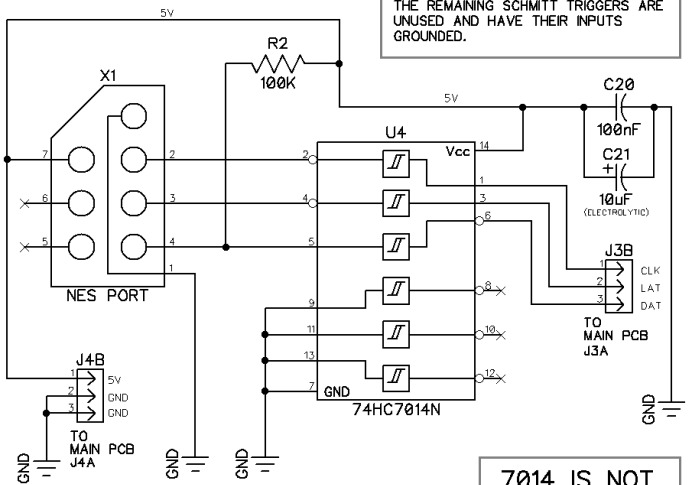
ALL RESISTORS ARE 5% TOLERANCE, EXCEPT FOR R27 AND R28, WHICH ARE 1% OR BETTER.

ALL CAPACITORS ARE CERAMIC EXCEPT WHERE NOTED.

NES PORT PCB

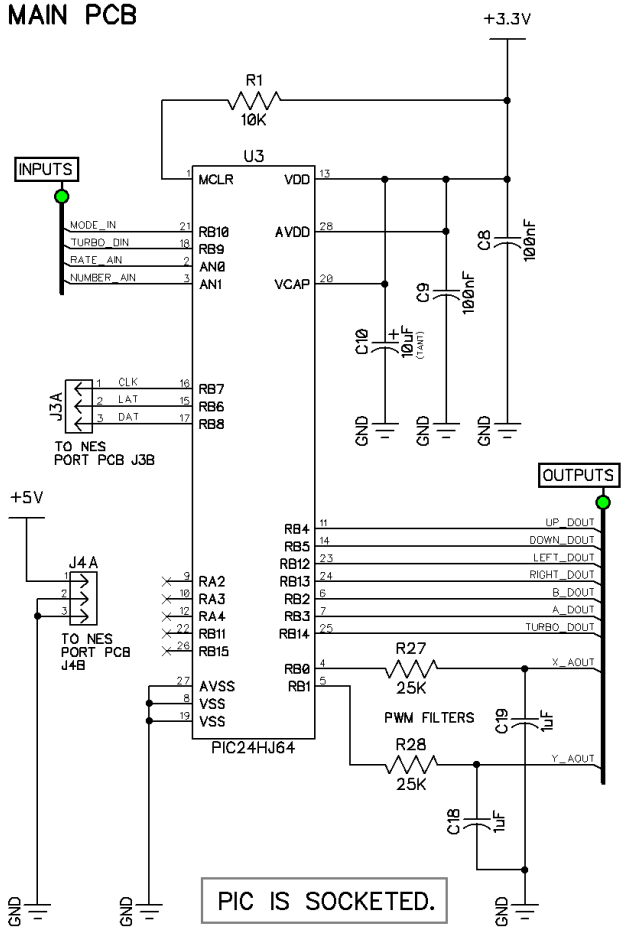
NOTE THE SIGNAL FLOW ON U4: THE SCHMITT TRIGGERS ON CLK AND LAT LINES ARE INVERTED RELATIVE TO THE DAT LINE.

THE REMAINING SCHMITT TRIGGERS ARE UNUSED AND HAVE THEIR INPUTS GROUNDED.



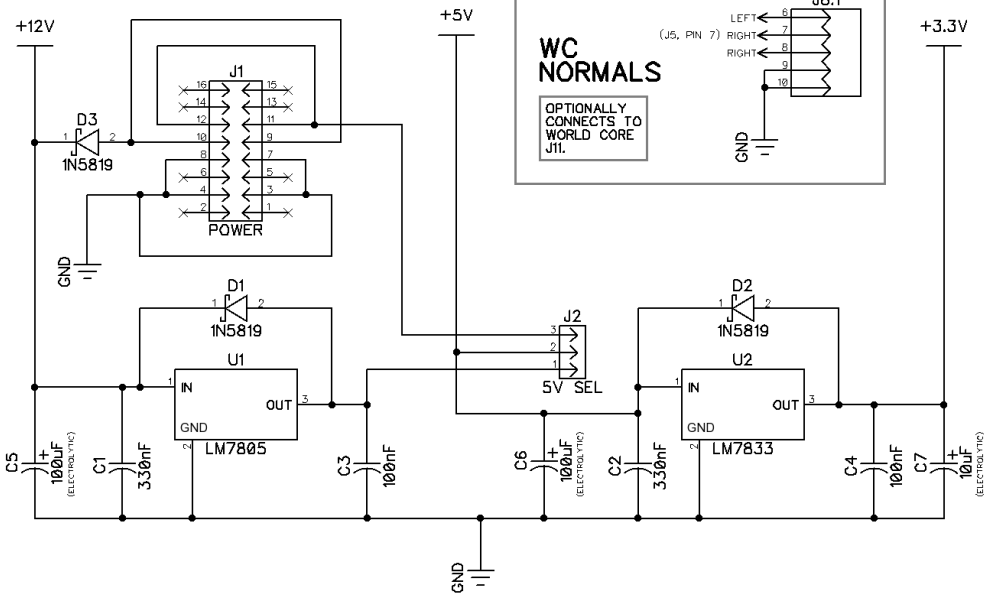
7014 IS NOT SOCKETED.

MAIN PCB



PIC IS SOCKETED.

POWER (MAIN PCB)



WC NORMALS

OPTIONALLY CONNECTS TO WORLD CORE J11.

12V SUPPLY

OP AMPS U5 - U8

5V SUPPLY

SCHMITT TRIGGER U4
NES PORT X1

3.3V SUPPLY

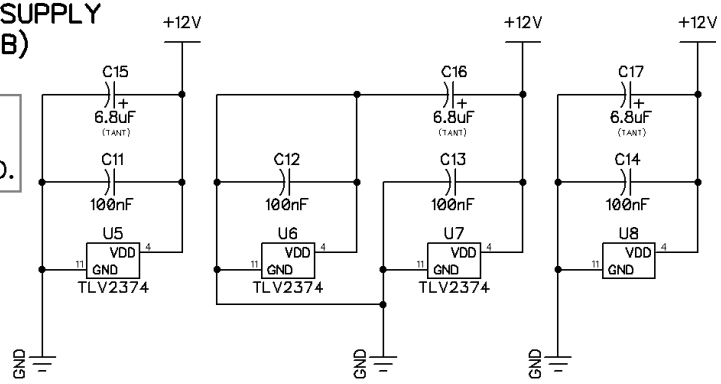
PIC MCU U3

TOTAL CURRENT CONSUMPTION

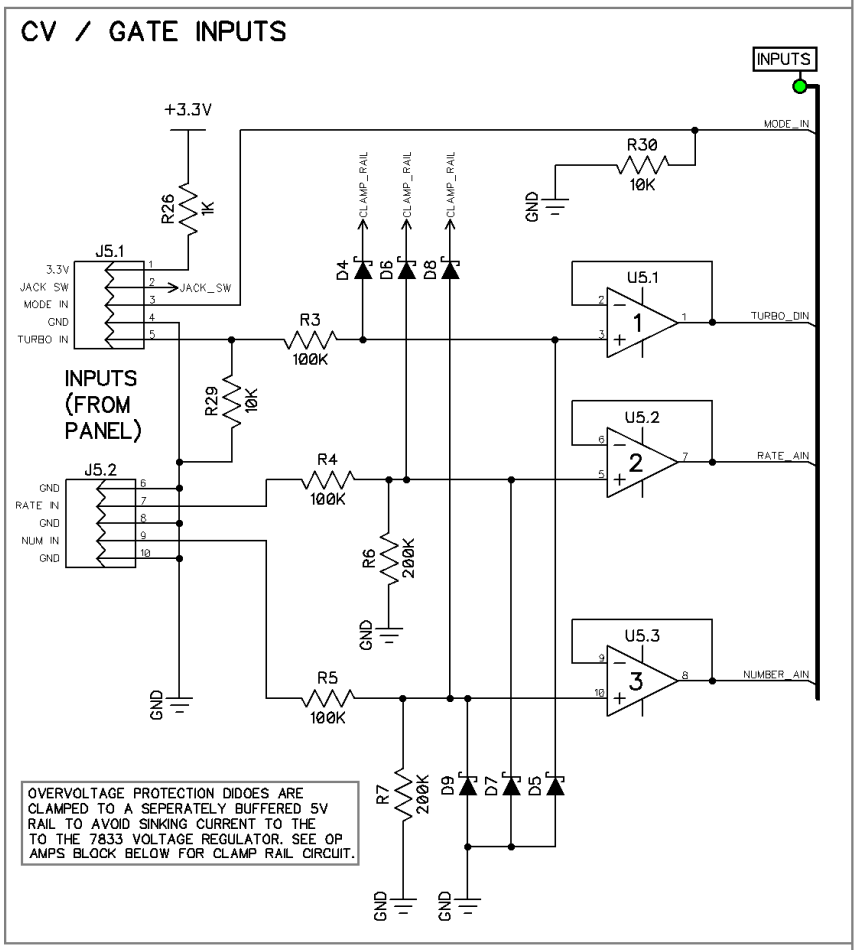
APPROX. 130 mA

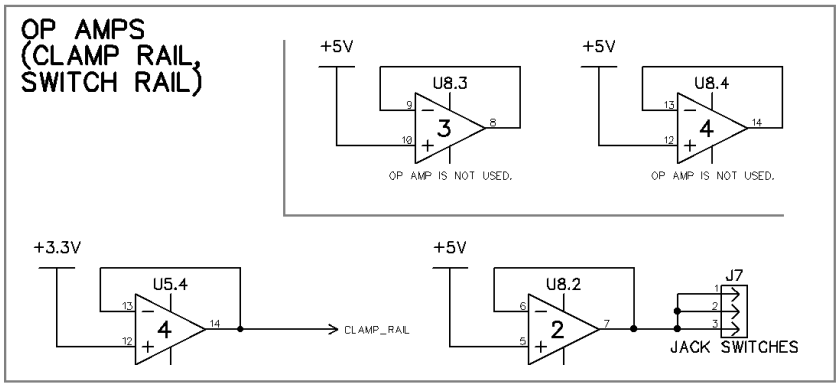
OP AMP SUPPLY (MAIN PCB)

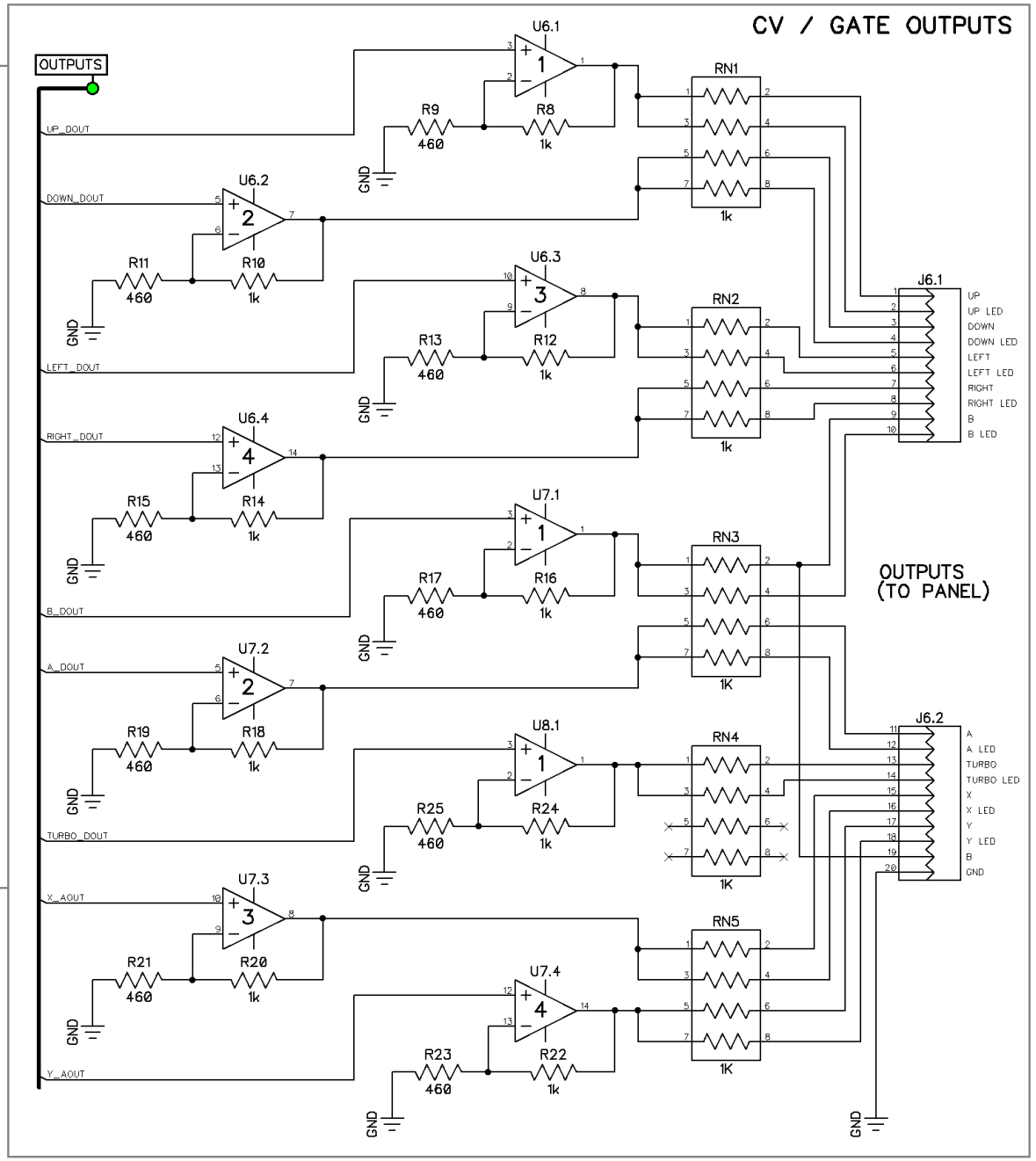
OP AMPS ARE SOCKETED.



INPUTS AND OUTPUTS (MAIN PCB)







ALL OP AMPS ARE TLV2374. SEE POWER SHEET FOR SUPPLY AND DECOUPLING INFORMATION. OP AMP GAIN IS CALIBRATED FOR 10.5V GATE OUTPUTS.
ALL RESISTOR NETWORKS ARE 5% TOLERANCE. R4 - R24 ARE 1% TOLERANCE OR BETTER. R3 AND R30 ARE 5% TOLERANCE. ALL DIODES ARE BAT85S.