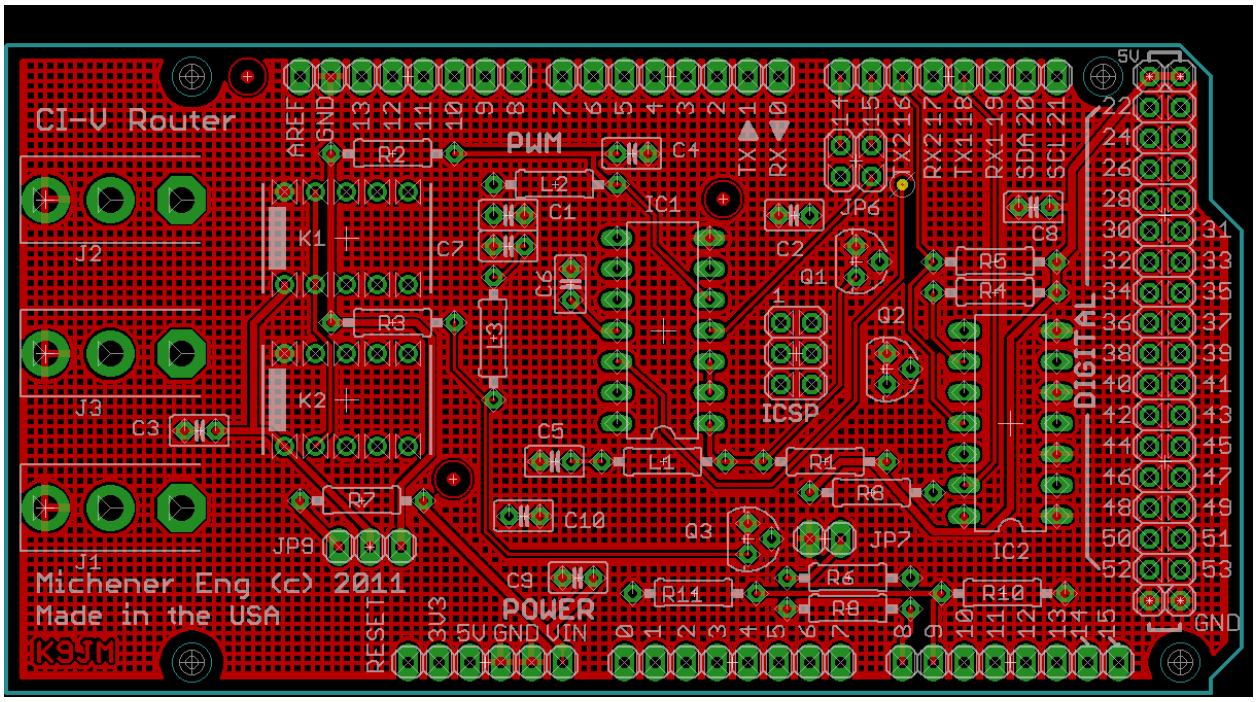
Icom CI-V Arduino Mega

Shield Board

Michener Engineering Deisgns (c) 2011
James Michener K9JM



The CI-V Router board is a "shield" that plugs into an Arduino Mega 2560 board that provides the following features:

1. Three isolated CI-V 3.5 mm jacks
2. Relay by-passing, connecting all CI-V connections together when power is not supplied.
3. Jumper configurable permitting connecting one port to a standard RS-232 interface (not supplied)
4. Full extension of all Arduino Mega bits if desired for further stacking.
5. Optional ability to measure analog voltages, Vin and one external supply voltage
6. Uses none of the Arduino Uno pins, permitting use of other Arduino shield in a stack.

The only pins that need to be extended to the Arduino board are the "POWER" row and pins 14 through 18.

Required jumpers:

JP6: Jumper pin 1 to 2 and pin 3 to 4 enables the third CI-V port (J1). If unconnected, an external RS-232 interface converter can be connected to provide a serial interface to other equipment.

JP9: Jumper pin 1-2 (normal operation) so the relays are energized through the Arduino 5 volt supply. This permits operation while powered off of USB. Jumper pins 2 to 3 when relays are to be powered off of Vin, through dropping resistor R7 (not supplied) . This provides relay power from Vin, reducing the

power dissipation on the on Arduino board regulator. When in this mode, the relays WILL NOT engage if powered via the USB.

Optional:

JP7 R6 and R9 - Plug in an external voltage to be measured by the Atmel processor A/D converter. Voltage range on the input is between 0 and 5volts. R6 and R9 are used as a voltage divider to bring the measured voltage within the safe conversion range. Not supplied. A/D Pin 8

R10 and R11 - Voltage divider to bring Vin to be within the safe conversion range. Not supplied. A/D Pin 9

Assembly Instructions:

Identify R1, R2 and R3. 4.7K 1/4w resistor (Yellow-Purple-Red) Insert, solder and cut leads. Keep leads as jumpers

Identify R4, R5 and R8. 47K 1/4w resistor (Yellow-Purple-Orange) Insert, solder and cut leads.

Resistors R6, R7, R9, R10 and R11 are not used

Identify C3, C8, C9 and C10 capacitors 0.1uF/50v (104) Insert, solder and cut leads.

Identify C1, C2, C4, C5, C6 and C7 capacitors 1000 pf or 0.001uF/50v (102) Insert, solder and cut leads.

Identify K1 and K2. Relay. Axicom Swiss FP2. Orient so the **thick** line on the PCB is below the thick line on the relay. Install solder and trim leads as needed.

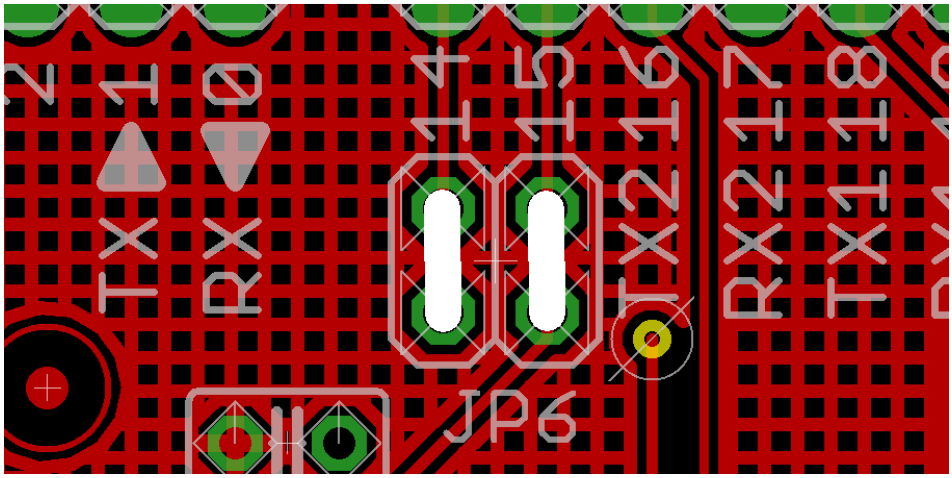
Identify L1, L2, L3 100uH inductor. Insert, solder and cut leads.

Identify Q1, Q2 and Q3. 2N7000 Pull back the center lead away from the flat edge of the TO-92 transistor. Install so the center lead is away from straight line. Permit the bottom of the transistors to be between .1 and .2 inches above the board. Solder and trim leads.

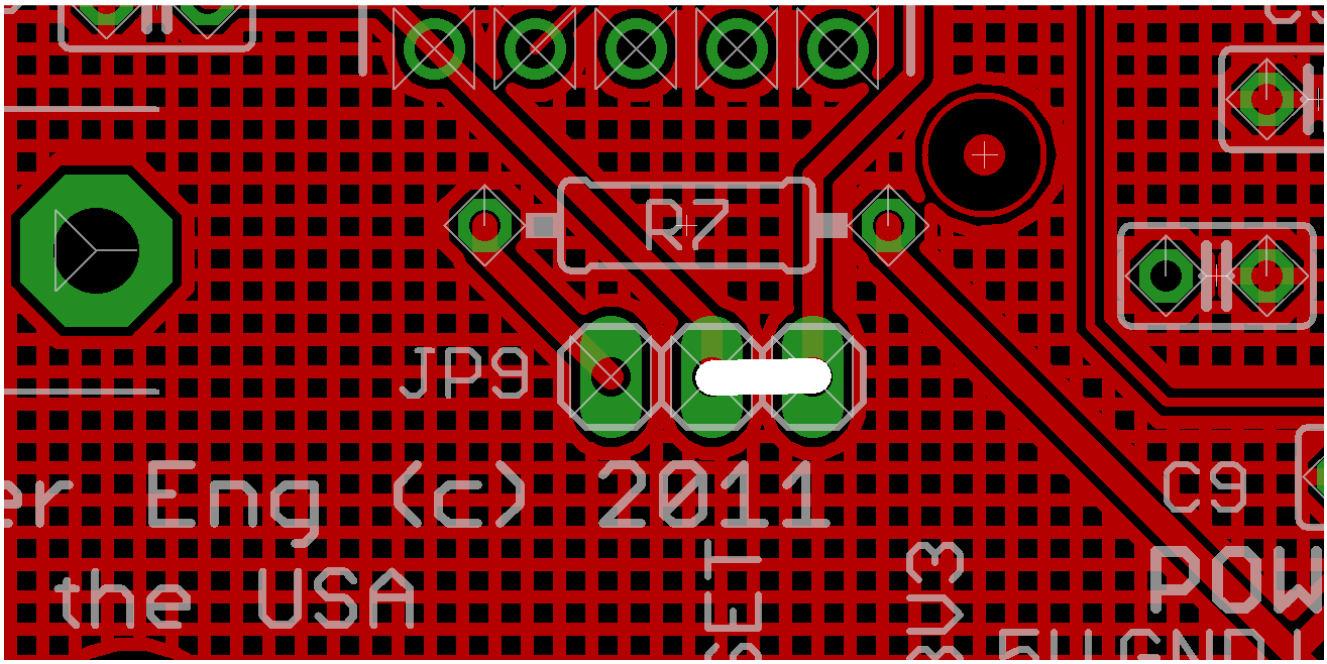
Identify IC1 and IC2 - MC14584 or CD40106 Identify the bump on the silk screen, this indicates the location of pin 1. (always towards bottom of the board... nearest to Arduino pins 1 through 14). Match with pin one markings. Solder and trim leads.

When installing jumper, make a loop of the wire and keep the top of the loop >0.1 inches from the board.

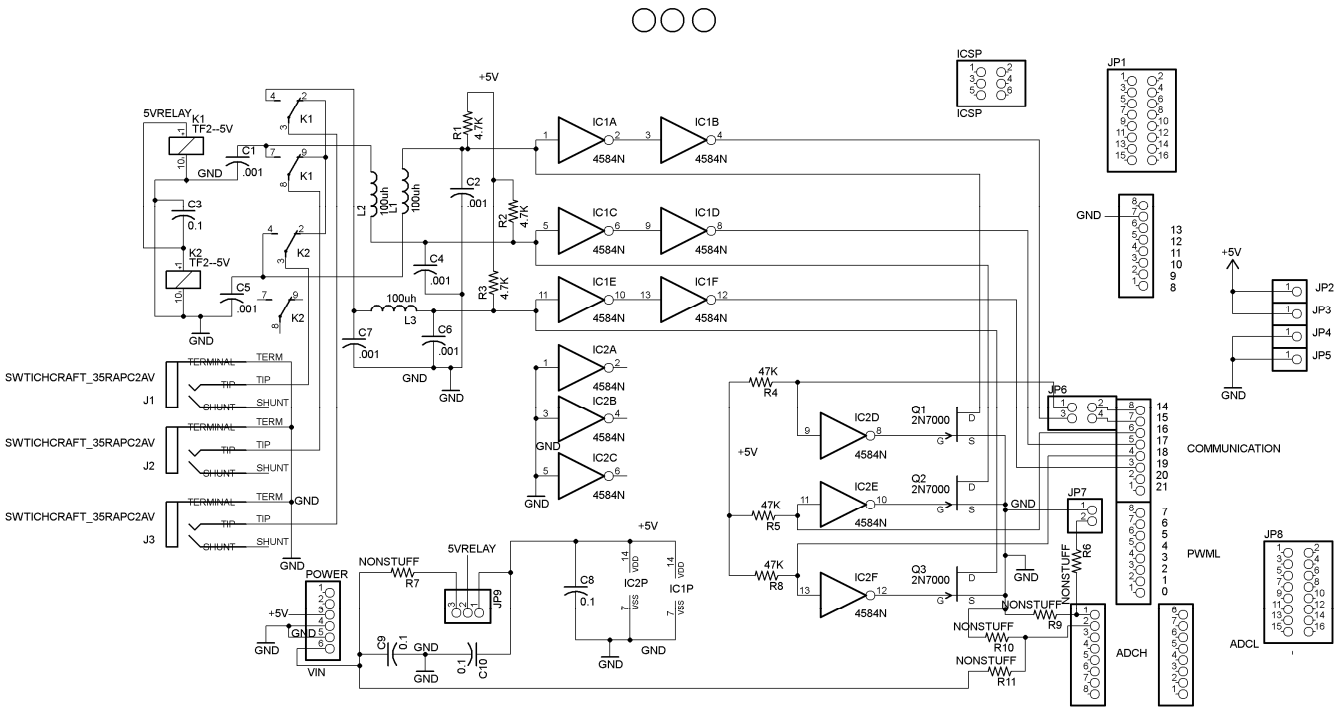
Install jumpers on JP6. Use cut leads from resistors. White lines represent jumpers.



Install jumper on JP9. Use cut leads from resistors. White lines represent jumpers.



Schematic:



Parts List:

QTY	Description	Ref Des	Mouser Part Number
2	MC14584	IC1 IC2	863-MC14584BCPG
2	Relay	K1 K2	655-D3023
3	2N7000	Q1 Q2 Q3	512-2N7000
3	4.7K	R1 R2 R3	291-4.7K-RC
3	47K	R4 R5 R8	291-47K-RC
3	1/8th inch mono jack	J1 J2 J3	502-35RAPC2AV
3	100uh	L1 L2 L3	434-23101
4	0.1 uf 50v	C3 C8 C9 C10	21RZ310-RC
6	1000pf 50v	C1 C2 C4 C5 C6 C7	140-50P2-102K-RC