

Sierra Radio Systems

# Multi-IO Backpack Board

Reference Manual

Version 1.0

# Contents

- Multi-IO backpack board

For more information, go to the Sierra Radio Systems web site at [www.sierraradio.net](http://www.sierraradio.net) or [www.hamstack.com](http://www.hamstack.com)

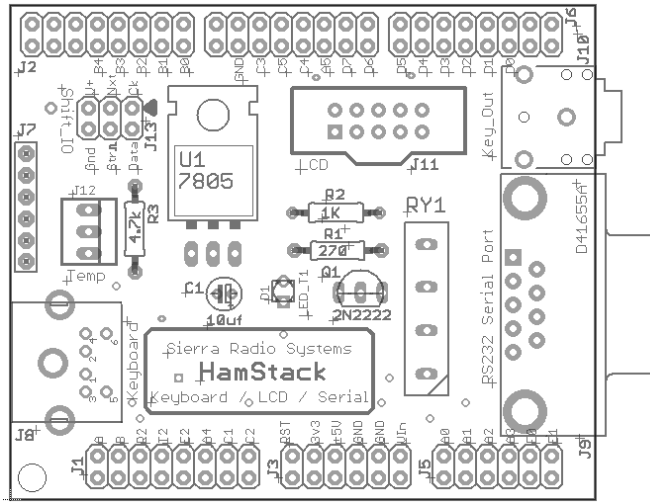
## Assembly

The HamStack and StationStack boards are easy to assemble. There is no particular assembly sequence required. Follow the parts placement diagram and insert the components and solder them in place. If there are special assembly instructions or configuration steps required, they are included in each section.

The HamStack Getting Started guide book provides more detailed suggestions for board assembly. While the instructions are written for the HamStack CPU board in particular, the sequence of assembly and tips to make the whole process go faster and smoother are generally applicable to all boards. Start with IC sockets, then resistors, then capacitors, etc...

The Getting Started guide can be downloaded from the HamStack web site.

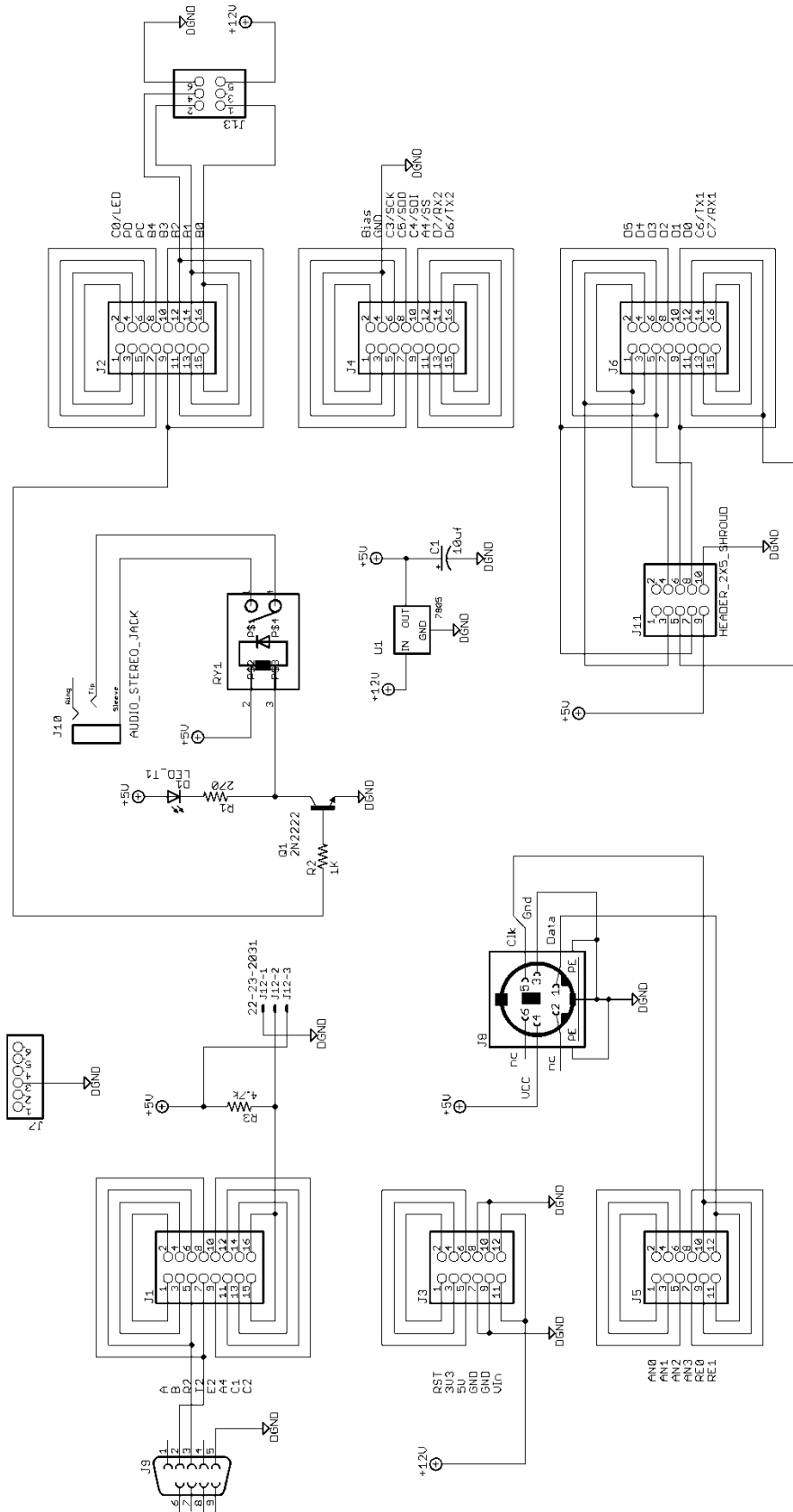
# Multi-IO Backpack Board



## Overview

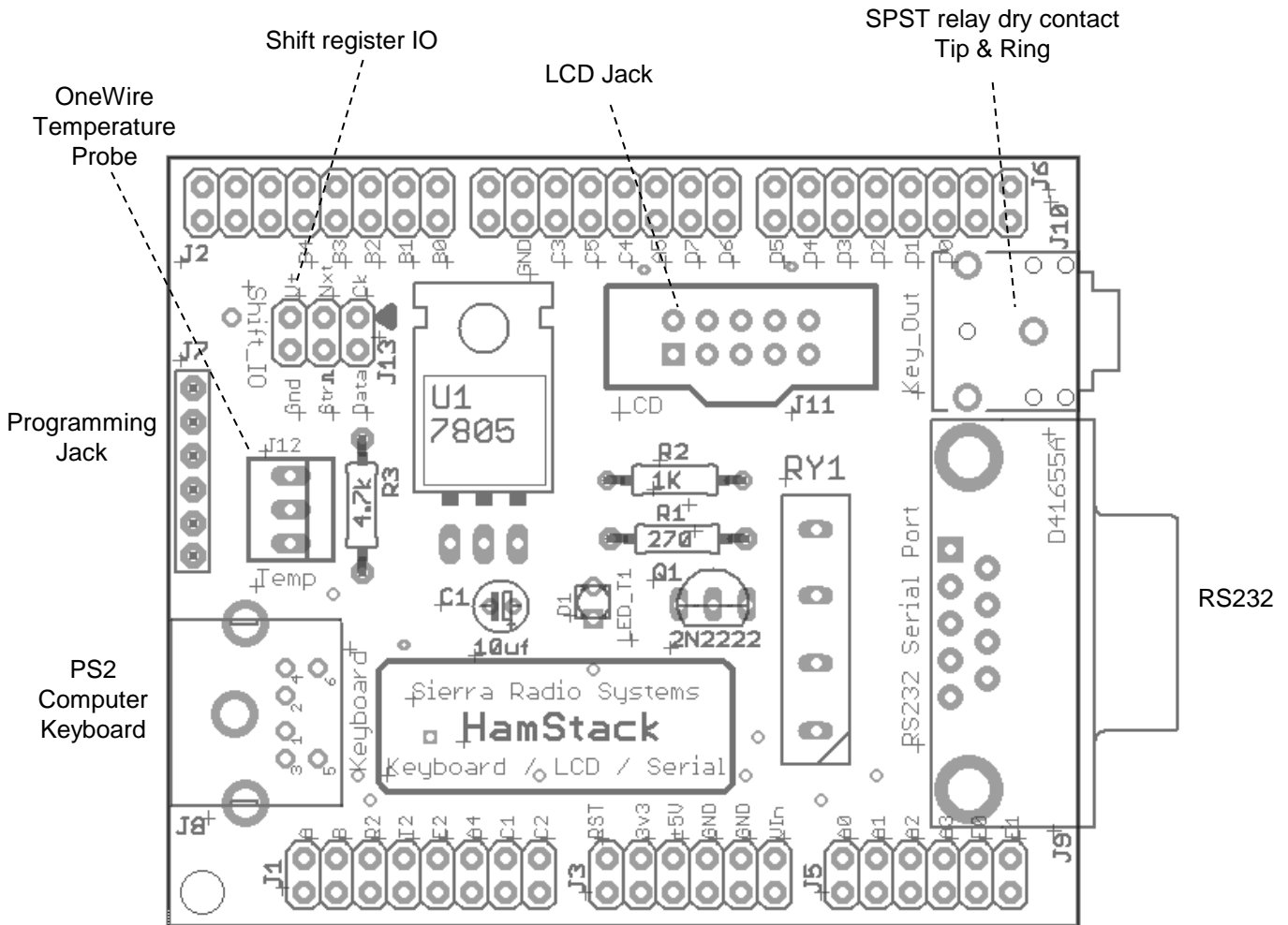
The multi-io board provides several popular IO connections to the HamStack CPU including a DB9 for RS232, mini-DIN connector for a PS/2 computer keyboard, 3 pin OneWire jack commonly used for temperature probes and other OneWire devices, 10 pin header for LCD display controllers, plus a high speed SPST reed relay dry contact pair on a 3.5mm stereo jack.

# Schematic



# Multi-IO Backpack Board

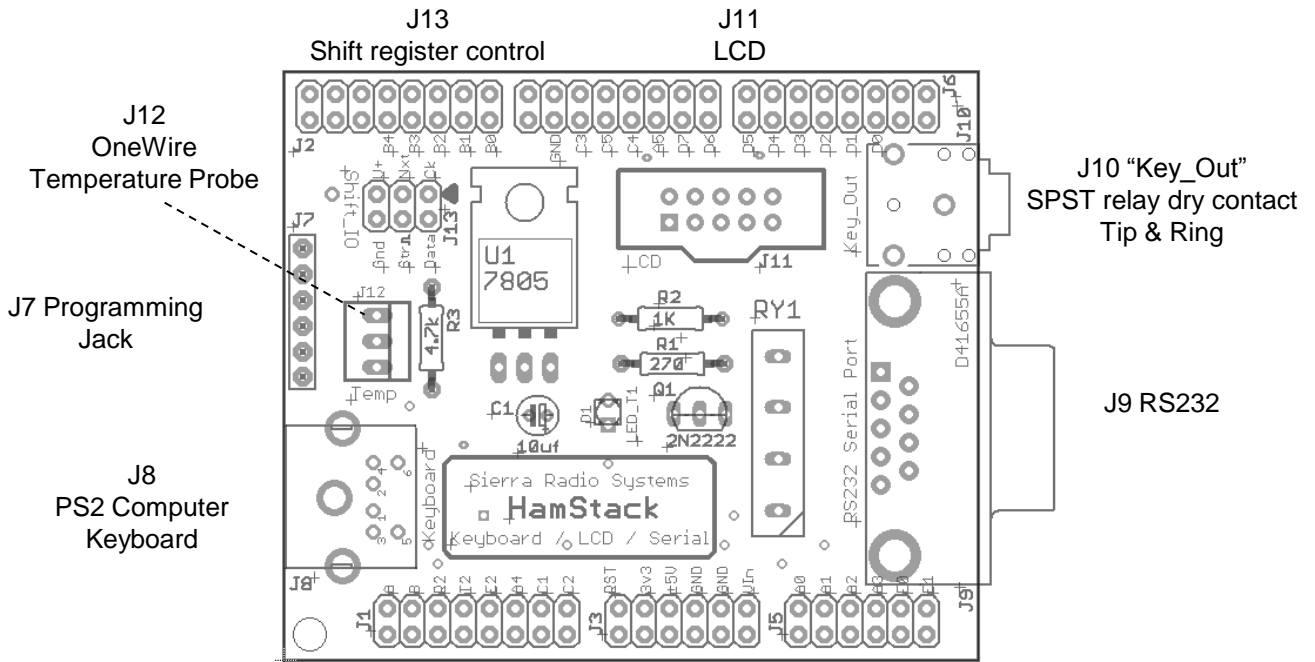
## Parts Placement



- C1 10 UF electrolytic capacitor
- D1 LED
- J1 2x8 Stacking header or male header pointing down
- J2 2x8 Stacking header or male header pointing down
- J3 2x6 Stacking header or male header pointing down
- J4 2x8 Stacking header or male header pointing down
- J5 2x7 Stacking header or male header pointing down
- J6 2x8 Stacking header or male header pointing down
- J7 2x6 Stacking header
- J8 6 pin mini-DIN connector for PS2 keyboard
- J9 DB9-F RS232 serial port
- J10 3.5mm stereo jack
- J11 2x5 pin header connector for LCD ribbon cable
- J12 3 pin connector for temperature probe
- J13 2x3 pin header
- Q1 2N2222
- RY1 SPST reed relay
- R1 270
- R2 1k
- R3 4.7k
- U1 7805

**Assembly Tip**  
 Before you begin to assemble this board, think about which features you need to install. Not installing parts you don't need for a project will leave the CPU pins available for connecting on other boards. *For example, if you don't need the reed relay / J10 feature, and you need to use CPU PORTB.3 to control something on another board, don't install the relay.*

# Multi-IO Backpack Board Connections



J8	PS/2 Keyboard	Mini-DIN Pin 5, keyboard clock, connects to PORTE.0 Mini-DIN Pin 1 keyboard data, connects to PORTE.1 Mini-DIN Pin 3 Ground Mini-DIN Pin 5 +5v out
J9	DB9 Female	RS232 IO. Pin 2 data out, pin 3 data in, pin 5 ground Requires MAX232 RS232 chip to be installed on the CPU board
J10	Relay output	Tip & ring are connected to the SPST reed relay
J11	LCD display	Header Pin 3 PORTD.4 Header Pin 4 PORTD.5 Header Pin 5 PORTD.0 Header Pin 6 PORTD.1 Header Pin 7 PORTD.2 Header Pin 8 PORTD.3
J12	OneWire	Pin 1 Ground Pin 2 Data, connects to PORTC.2 Pin 3 +5v out
J13	Shift_IO	Pin 1 PORTB.0, shift register clock out Pin 2 PORTB.1, data out to shift register chip Pin 3 no connection <reserved for data out of the next board> Pin 4 PORTB.2, shift register strobe out Pin 5 +12v out to power next board if necessary Pin 6 Ground
	Relay control	Connected to CPU PORTB.3