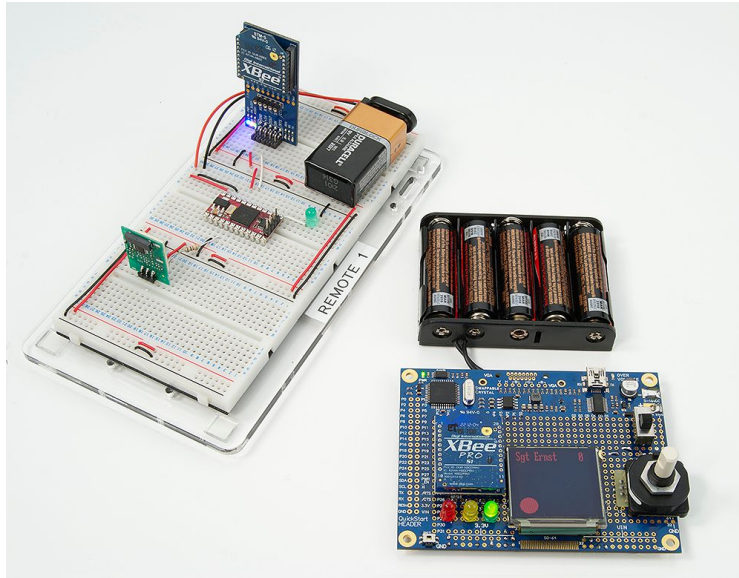


Spin Project: Corpsman Up Vitals Monitor

Level: Intermediate

Skills Required: Soldering, Programming, circuit building

Hours to Complete: 8



The Corpsman Up unit is a small, rugged device that provides real-time outputs of vital functions, in this case heart rate, when assessing a casualty. Multiple patients' vitals can be monitored by simply switching to their channel using the rotary encoder and observing the output on the OLED monitor.

The Base is designed around the Parallax Propeller microcontroller and is equipped with a uOLED information display, an A/D converter and three corresponding LEDs that indicate battery life of the unit. The module only uses 13 of the Propeller microcontroller's 32 I/O pins, which makes the incorporation of additional sensors, feedback devices and alarm indicators easy and achievable. The base uses an XBee wireless module to receive the data from the remote nodes, and an Incremental Rotary Encoder for selecting different Remote node's data to display. The whole package is powered off of a 5 AA power pack located under the control board, which should provide many hours of run-time before needing to be changed out.

What's Needed

Base Controller:

- (1) Propeller Project Board (#32810)

- (1) Xbee Wireless Module (various)
- (1) Xbee 5v/3.3v Adapter Board (#32403)
- (3) LED's (#751-00005)
- (1) uOLED Display (#27925, discontinued)
- (1) Incremental Rotary Encoder (#27805, discontinued)
- (1) Power Switch
- (1) MCP3204 8-channel 12-Bit A/D Converter (discontinued)
- (1) 5-AA Power Pack
- (2) 10k ohm Resistors (#751-00011)
- (1) 100 ohm Resistor (#751-00011)
- (1) 150 ohm Resistor
- (1) 5V LDO Regulator (#601-00506, discontinued)
- (1) 1000uF Electrolytic Capacitor
- Soldering Iron
- Solder
- Wire Cutters
- Wire Strippers
- Heat shrink tube or electrical tape
- Additional wire

Remote Node:

- (1) Propeller Spin Stamp (#SS1-IC, discontinued)
- (1) Xbee Wireless Module (various)
- (1) Xbee SIP Adapter (#32402)
- (1) Prop Plug (#32201)
- (1) Polar T34 Heart Rate Monitor (#28037, discontinued)
- (1) Polar Heart Rate Receiver Module (#28037, discontinued)
- (1) 9v Adapter
- (1) LED (#751-00005)
- (1) 1K ohm resistor (#751-00011)
- Additional wire

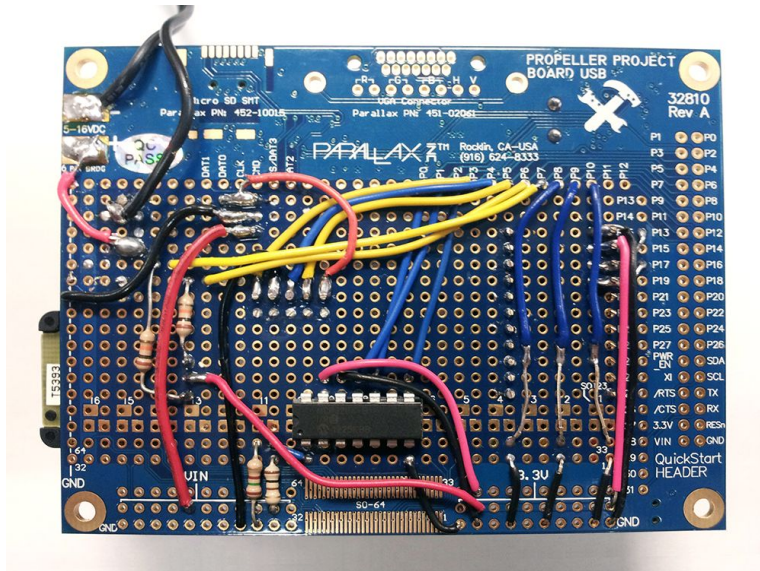
Note: Many of these parts are discontinued for sale or manufacture by Parallax, but may be found through other retailers, or have suitable replacements available through Parallax or other retailers.

Building the Base and Remote Units

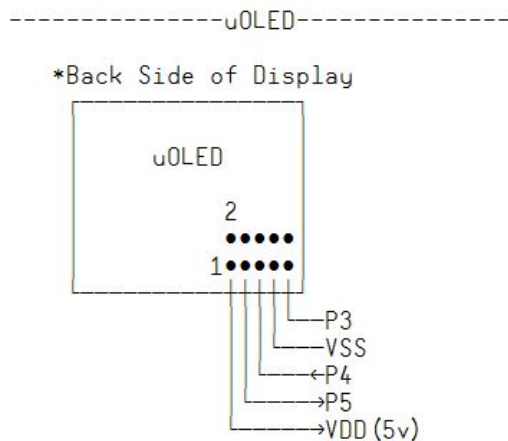
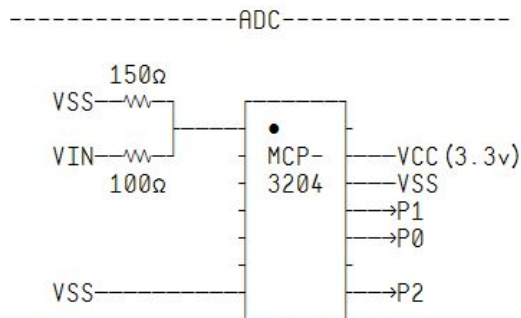
Build the Base Unit

Before you assemble and solder the components onto the board, it is best to take an extra few minutes and really brainstorm and look at how you want the components to be mounted. Once components are soldered, its very difficult to change them, so be sure you have your board the

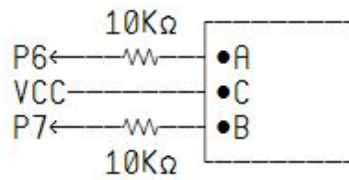
way you want it before soldering! My board is laid out in a way that I felt optimized the space on the board, but you may come up with a different layout that better suits your needs and style.



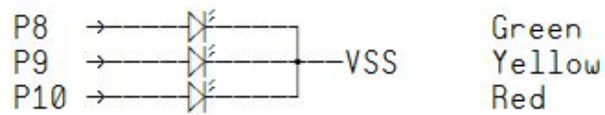
*****Complete Medic Base*****



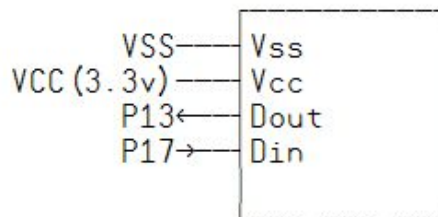
-----Rotary Encoder-----



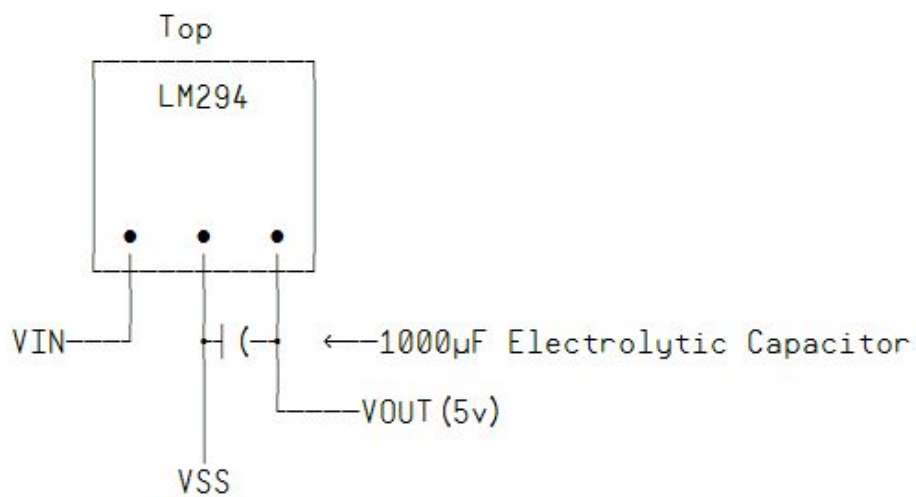
-----LED's-----



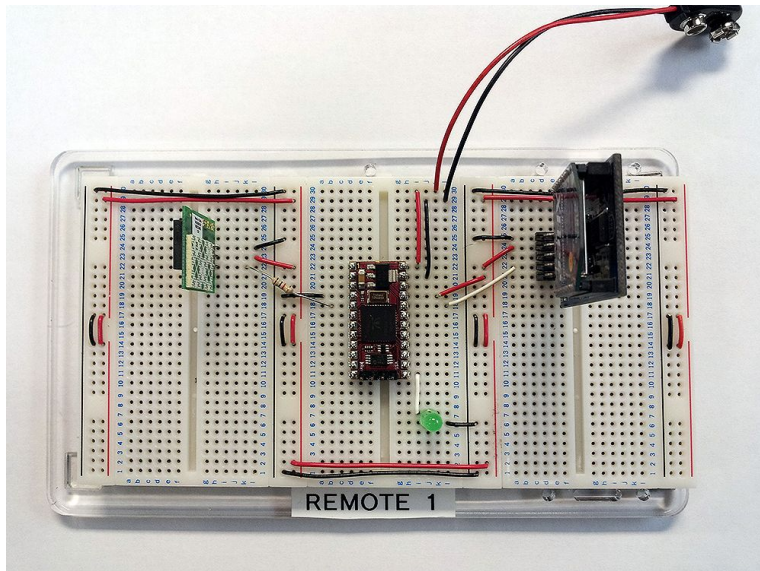
-----Xbee-----



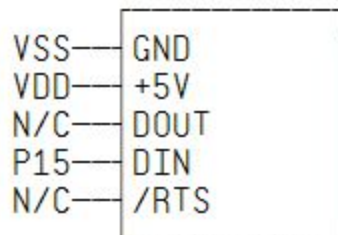
-----5V Regulator Circuit-----



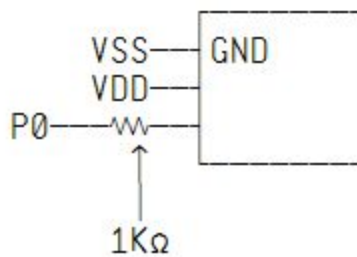
Build the Remote Unit



-----XBee SIP Adapter-----

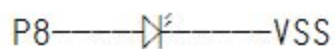


-----Heart Rate receiver-----



*No markings
other than
for GND

-----Green LED-----

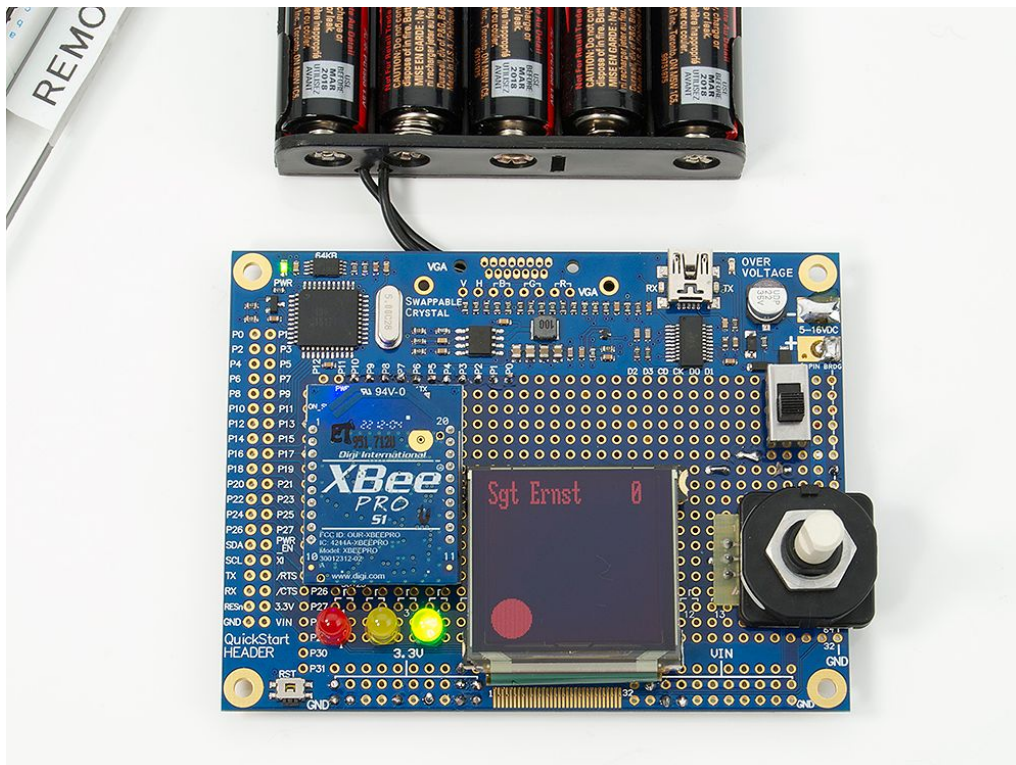


These schematics are also found in the Base.spin and Remote1.spin Propeller Code. If you prefer to make your own connections and use your own pin outs, you can do that as well.

Program and Run the Corpsman Up

- ✓ Open the Bas code folder and load Base.spin onto the Base Module.
- ✓ To load the program to the Propeller, press F11 in the Propeller Tool to load to EEPROM, or select Run → Compile Current → Load EEPROM.
- ✓ Repeat this process again for the Remote Node with Remote1.spin from the Remote code folder.

Once you have the code loaded, the remote will be ready to start sending data to the Base every time that it detects a heart beat. Upon power up, the green LED will flash five times to notify you that it is working. After this, the Remote will be ready to detect heart beats.



When you power on the Base Module, you will see the three LEDs that are used for the Voltage Monitor flash in a chaser sequence, this is to let you know that it is powering up and ready to go. After this, the uOLED will power on with the default “Corpsman Up” screen, and then go blank if no data has been received from a Remote Node. It is best to have the Remote powered up and transmitting before starting the Base. Once the Base has received its first signal from a Remote, it will go to the first Remote Node’s display menu. From here, you can toggle through the different users that you can program into the Base.