How to Build an IOS/QGC Ground Station

This document describes the design, construction and operation of a portable ground station that can be used to implement QGroundControl (QGC) on an IOS device. The cost of this ground station, excluding the IOS device, is reasonable and construction is straight-forward.

This portable ground station consists of the following components

(1) 915 mHz SiK telemetry radio

(2) MAVBridge

(3) 3S LiPo battery

(4) 5 volt DC USB power module

(5) Power distribution board (PDB) with 5 volt DC output

(6) Digital voltage monitor

(7) IOS device (iPhone or iPad)

(8) 10 inch square wooden plaque

The telemetry radio provides communication with a Unmanned Aerial Vehicle (UAV) carrying a second telemetry radio. The MAVBridge provides communication between the ground station telemetry radio and the QGroundStation software installed on the IOS device. The LiPo battery provides five volt power by way of the PDB to the telemetry radio and MAVBridge. The USB module can be used to recharge the IOS device. The LiPo voltage can be monitored using the digital display.

Additional information about MAVBridge can be found at http://imprimus.lv/mavbridge and https://imprimus.lv/pages/mavbridge.html. The device can be purchased on Tindie (https://www.tindie.com/products/festlv/mavbridge/) for a very reasonable price ($22 plus $4.50 shipping to the United States).

Here's a picture of the MAVBridge device and its electrical connections.
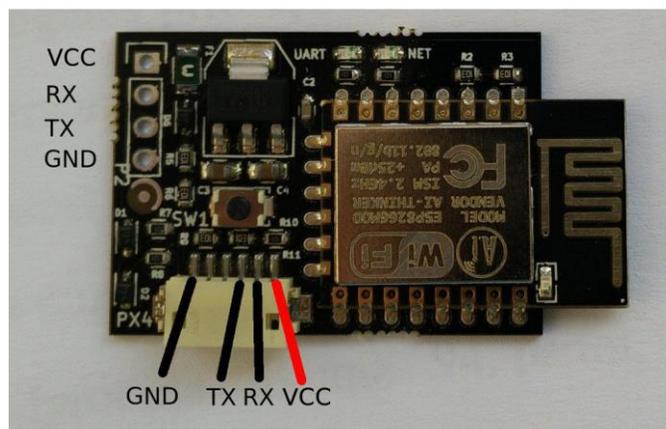
The following is a photograph of the front of the ground station using an iPad mini. There is a 3DR sunshade on the iPad mini. The iPad is mounted in a simple case which in turn is glued to the wood frame. This allows removal of the iPad from the ground station.
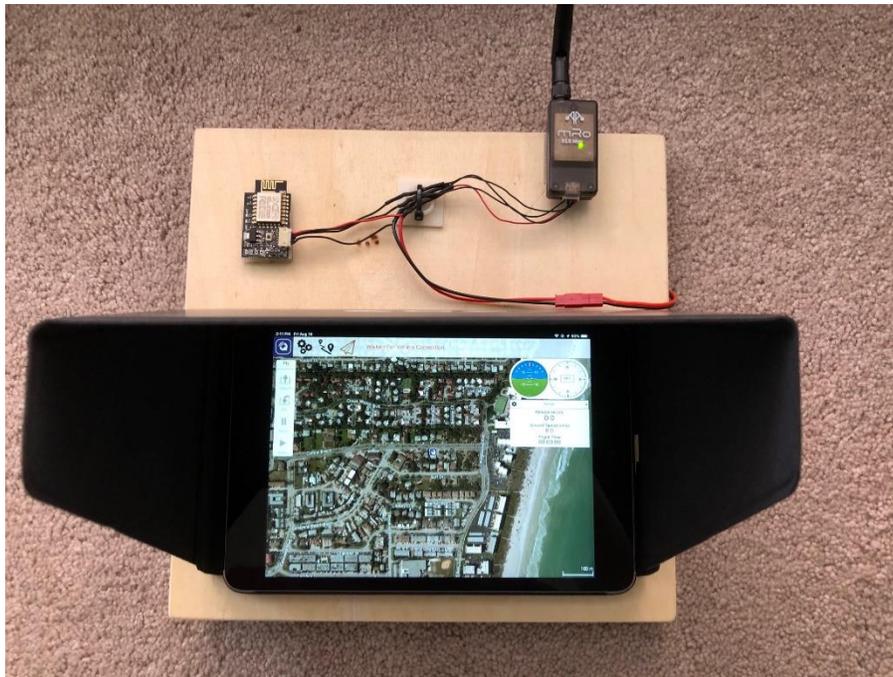
The following photograph is a close-up view of the telemetry radio and MAVBridge showing the five volt DC power supply and wiring connections between the MAVBridge and radio.
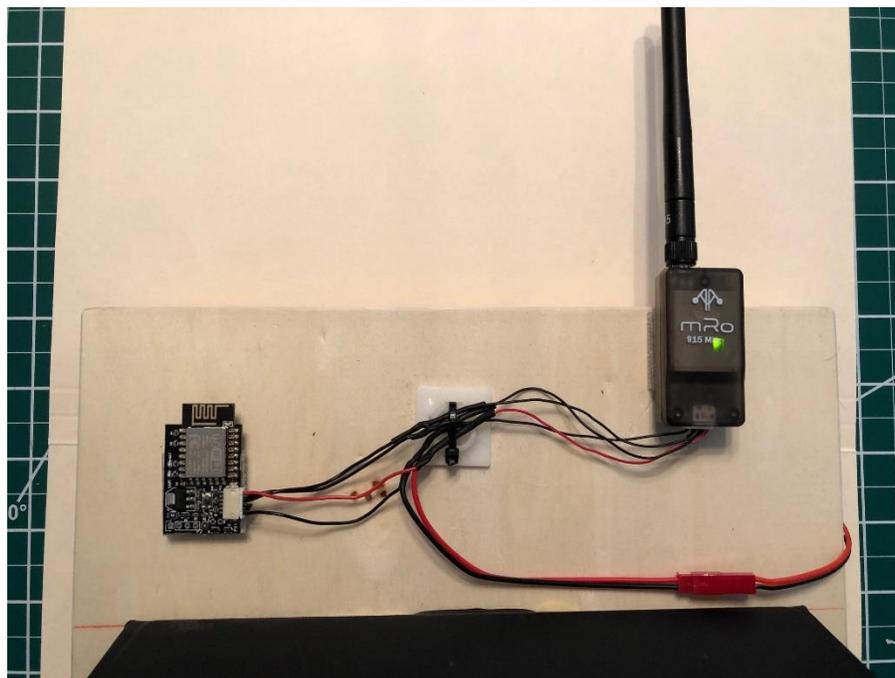
This final photo illustrates the layout of the components on the back of the ground station. The PDB device is an XT-60 device from Matek Systems.
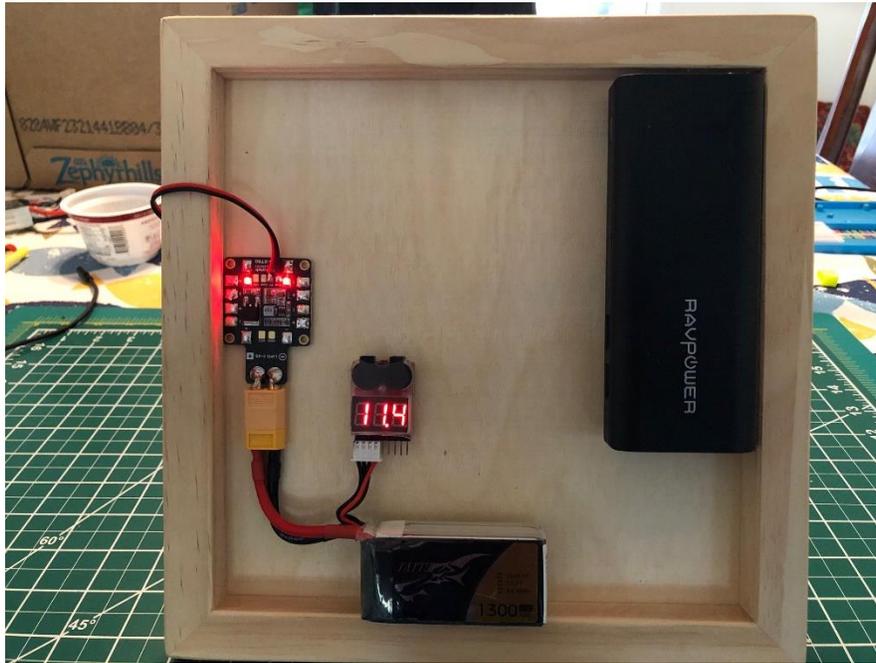
The wiring between the telemetry radio and the MAVBridge is as follows

	Telemetry Radio	**MAVBridge**
5 volts	pin 1	pin 1
Ground	pin 6	pin 6
TX/RX	pin 3 (TX)	pin 2 (RX)
RX/TX	pin 2 (RX)	pin 3 (TX)

Here are the steps to set up the ground station

(1) Configure the baud rate of the MAVBridge to 57600. The MAVBridge documentation explains how to do this.

(2) After powering up the ground station and IOS device, connect to the MAVBridge "hot spot" (MAVBridge-xxxx) using the IOS Settings/WiFi menu.

(3) Start QGroundControl on the IOS device. It should connect automatically.