Wire Specs
W1: USB cable
W2-3: 4wire cable
P1-4: 4pos MATE-N-LOK Plug
Digikay: A14282-ND

U1 Laptop:
J1: USB

A1 Station:
J1,2: 4pos MATE-N-LOK Cap
Digikay: A14283-ND
J4: USB cable out
J5: AC Main Jack

A2,3 Sensor:
J1: 4pos MATE-N-LOK Cap
Boat Hull
U9

Packaging
U19

Antenna
U9

Xbee
U8

Xbee Shield
U6

GPS
U3

Magneto meter
U5

RC Receiver / ESC Module
U2

Ardupilot
U4

IMU Shield
U7

ArduinoUno
A9

Power
A4

Motors
A5

Payload
A6

Beacon-Power PCB
A7

J1,2,3: RC Receiver interface (future)
J4: RC Receiver Power (future)
J5,6,7: Aduropilot RC interface (future)
J8: Aduropilot power jack (temporary)
J9: Aduropilot servo outputs
J10: Aduropilot I2C output
J11: Aduropilot top
J12: Aduropilot to audio control line
J13: Aduropilot to visual control line
J14: Aduropilot GPS Connection
J15: GPS board connection
J17: IMU RX/TX pins
J18: Magnetometer board
J19: Xbee shield connection
J21: Power to RC (future)
J22: Power to Aduropilot (temporary)
J23: Power to wall jack
J24: Power to visual beacon
J25: Power to audio beacon
J26: Motor power jack
J27: Power to payload
J28: Wall adapter
J29: Motor power
J30: Motor control line
J31: Payload power jack
J32: Payload control line
J33: Audio beacon control line
J34: Audio power jack
J35: Visual control line
J36: Visual power jack
Boat Ardupilot Assembly

Date: 5/1/2012
Revision: 1
Engineer: Sam Courtney

Ardupilot U4

GPS U3

Magneto meter U5

Xbee U8

Xbee Shield U6

IMU Shield U7

P1: Antenna connector
P2: Xbee Shield sockets
P3: IMU shield sockets
P4: Xbee Shield connector pins

W1: W2: W3:

A1: Station

Date: 5/1/2012
Revision: 5
Engineer: David Salter

<table>
<thead>
<tr>
<th>Ports:</th>
<th>U13 2-Port USB Hub:</th>
</tr>
</thead>
<tbody>
<tr>
<td>J1,2: 4pos MATE-N-LOK Cap</td>
<td>J1-2: USB Inputs</td>
</tr>
<tr>
<td>J4: USB cable out</td>
<td>U12 Xbee USB Adapter:</td>
</tr>
<tr>
<td>J5: AC Main jack</td>
<td>J1: USBmini jack</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Wire Specs:</th>
<th>U11 Xbee-Pro ZB:</th>
</tr>
</thead>
<tbody>
<tr>
<td>W1: USB_A to USBmini Wire</td>
<td>P1: 2 Row Pins</td>
</tr>
<tr>
<td>W2: USB_A to USB_B</td>
<td>J1: RPSMA Connector</td>
</tr>
<tr>
<td>W3,4: 1’ 6wire Ribbon Cable</td>
<td></td>
</tr>
<tr>
<td>W5,6: 1’ 4wire Ribbon Cable</td>
<td></td>
</tr>
<tr>
<td>P1,2: 6pos Micro-Match Connector</td>
<td></td>
</tr>
<tr>
<td>P3,4: 4pos 0.100” Connector</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>U10 Interface Board:</th>
</tr>
</thead>
<tbody>
<tr>
<td>J1-4: 4pin 0.100” Header</td>
</tr>
</tbody>
</table>

| U15 Packaging: Pelican Box |

Ports:
- J1,2: 4pos MATE-N-LOK Cap
- J4: USB cable out
- J5: AC Main jack

Wire Specs:
- W1: USB_A to USBmini Wire
- W2: USB_A to USB_B
- W3,4: 1’ 6wire Ribbon Cable
- W5,6: 1’ 4wire Ribbon Cable
- P1,2: 6pos Micro-Match Connector
- P3,4: 4pos 0.100” Connector

Packaging: Pelican Box
**A2,3: Sensor**

**Date:** 5/1/2012  
**Revision:** 4  
**Engineer:** David Salter

**Ports:**  
J1: 4pos MATE-N-LOK Cap

**Wire Specs:**  
W1: 4 line ribbon cable  
W3: 16 line ribbon cable  
P1: CONN 2.1mm Female Plug  
Digikey: CP3-1000-ND

**Sensor Back-end:**  
J1: 4 pin male header  
P1,2: 2x8 pin female header

**Sensor Front-end:**  
J1: 2x8 pin male header

---

**Sensor Ribbon**  
W2  
W1

---

**Packaging**  
U17

---

**Sensor Back-end**  
U18  
P1

**Interface A**  
P2

**Interface B**

**AZ/EL Positioner**  
U16

**Sensor Front-end**  
U19  
J1
Boat UltraSound Hardware

Date: 5/1/2012  
Revision: 3  
Engineer: Greg Busillo

W1: Basic Wire to Header  
W2: Basic Wire to Header  
W3: Basic Wire to Header  
W4: Basic Wire to Header (18v)  
W5: Basic Wire to Header  
W6: Basic Wire to Header (~9V)  
W7-8: Basic Wire to Header  
W9: Basic Wire to Header (5v)

J1: Receiver out to ArduinoUno Digital Input  
J2: 5V power supply  
J3: 18V power supply  
J4: Driver input from ArduinoUno Digital Output

Sensor 1  
Receiver

Sensor 2  
Transmitter

W1  
W2  
GND

W7  
W8

J1: Receiver out to ArduinUno Digital Input

J2: 5V power supply

J3: 18V power supply

J4: Driver input from ArduinoUno Digital Output

W3

Peak detected out to arduinoUno

J1

Drive Circuit

W4

Transmit Enable

W3

W1
IR Photodetector Assembly

Date: 5/1/2012
Revision: 5
Engineer: Andrew Ho

IR From Beacon

IR Pass Light Filter & Optics

Quad Photodiode Array

Analog Electrical Filters and Amplifiers

Peak Detector

Feedback Control Loop

AZ/EL angle position

Lock Status LED

Manual Position Joystick

Visual Flash to User

Physical User Input

User Adjustable

On AZ/EL

5V from AZ/EL

5V from AZ/EL

4x A to D

On Microcontroller

12V @ 1A

Calibration, Control Loop Mode, & SOS

To Shore Station

Azimuth Angle and Elevation Angle

Manual Position Joystick
IR Angle Boat

Date: 5/1/2012
Revision: 1
Engineer: Andrew Ho

![Diagram showing Ultrasound and Arduino Uno connected to Infrared LED Array, which then sends a flashing light to the shore station. The diagram includes a note: 1.8V @ 1A * 4. ]
J1: 2x8 pin jack