



# FlightBox Assembly Guide

Thank you very much for purchasing a FlightBox kit from Open Flight Solutions. We appreciate your business and hope you enjoy using your ADS-B receiver. Please review this guide and the assembly video prior to attempting to assemble your FlightBox. Please use standard safety precautions when working with tools.

## PLEASE WATCH THE ASSEMBLY VIDEO

**Before you begin assembling, please take a moment to watch our assembly tutorial video. You can find it at <https://www.openflightsolutions.com/flightbox/tutorial>**

## Tools

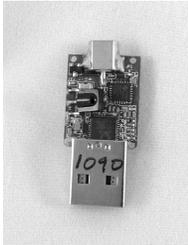
You will need a small phillips screwdriver and a pair of pliers. Magnetic screwdrivers help and will not damage the system. Optional tools include a 5/16" wrench or socket.

## Inventory

Each FlightBox kit should include:

1x - Raspberry Pi computer 1x - FlightBox case 1x - Cooling fan 1/2x - Pigtail cable <sup>1</sup> 1x - UAT antenna (taller)	1x - 1090-ES antenna (shorter) <sup>2</sup> 1x - 978 MHz radio module 1x - 1090-ES radio module <sup>2</sup> 1x - GPS module 1x - Wifi module <sup>3</sup>	1x - Data card 1x - Hardware kit 1x - USB power cable Assembly guide
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## Parts Identification

Wifi Module <sup>3</sup>	978 Radio Module	1090 Radio Module	GPS Module	Pigtail Cable	Data Card
					

*Note that many of the above parts are packed inside the FlightBox case for transport.*

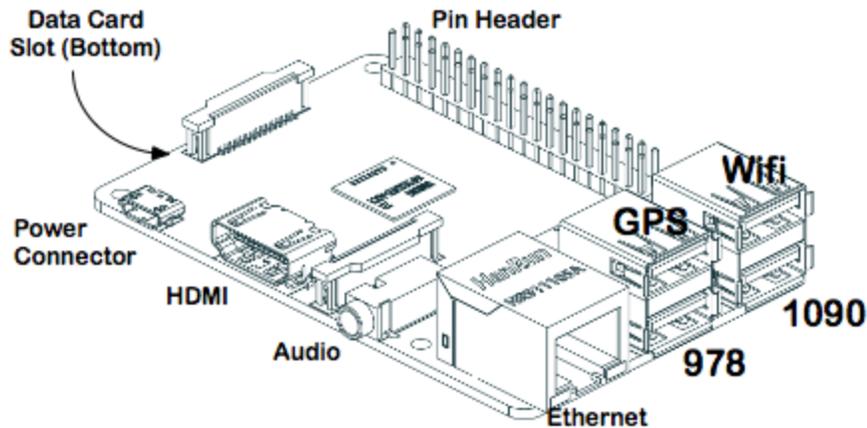
<sup>1</sup> Dual-Band kits include one, Single-Band kits include two.

<sup>2</sup> Not included in Single-Band kits.

<sup>3</sup> Not included with newer kits using the Raspberry Pi 3, which has built-in Wifi capabilities.

# Assembly

1. Remove the Raspberry Pi from the cardboard box and static bag.



2. Insert the USB radio module labeled “978” into the USB port at the bottom-center of the Raspberry Pi.

3. Insert the USB radio module labeled “1090” into the USB port at the bottom-right of the Raspberry Pi.

4. Insert the Wifi module into the USB port at the top-right of the Raspberry Pi. (Note: this component is not included or necessary if your FlightBox kit contains a Raspberry Pi 3 as the Raspberry Pi 3 has built-in wifi.)

5. Insert the GPS module into the USB port at the top-center of the Raspberry Pi.

6. Remove the data card from the static bag and insert it into the data card slot on the bottom of the Raspberry Pi. It only fits one way. Do not force the card. Make sure the card is securely seated.

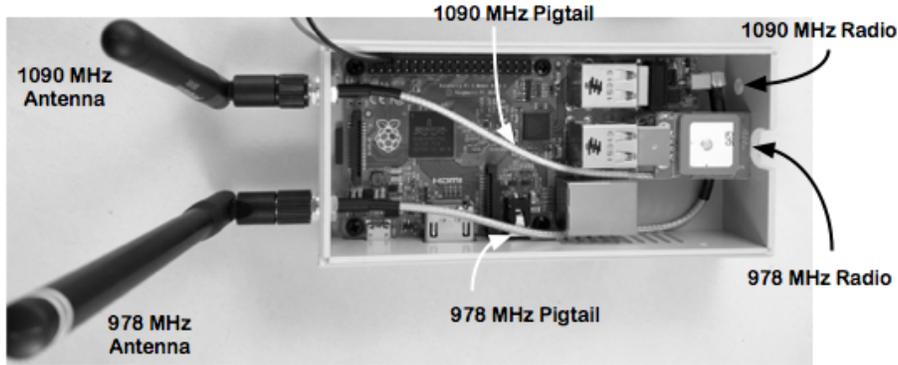
7. Connect a pigtail cable to the jack on the back of each of the radio modules, with the cables facing towards the Ethernet jack. The cables will overlap slightly.

8. Carefully insert the Raspberry Pi assembly into the case, making sure to align the power connector, HDMI connector and audio jack with the holes in the side of the case.

9. Lower the Raspberry Pi into place so that the four holes in the circuit board line up with the four connectors at the bottom of the case. Use the four ¼” black pan head screws to secure the Raspberry Pi. **Do not force the Raspberry Pi.** Check and adjust the alignment of audio / HDMI / power connectors if necessary.

10. Feed the pigtail cable from the 978 MHz radio module (under the GPS module) between the Ethernet jack and the wall of the case to the ¼” hole at the opposite end near the power input. (See picture below.)

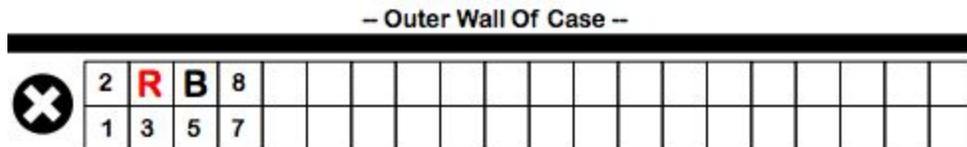
11. Feed the pigtail from the 1090 MHz radio (below the Wifi module) between the USB riser and the Ethernet jack to the ¼” hole at the opposite end near the pin header. (See picture below.)



12. Remove the nut and lock washer from each pigtail. Secure each pigtail to the case with the lock washer and nut. Use pliers and / or a 5/16" socket to gently snug the bulkhead connector.

13. Attach the fan to the case top using the four long (5/8") flat-head countersink screws and four nuts from the hardware kit. Optionally use LockTite® or superglue to secure the nuts. The fan should blow out through the top - the label on the fan will be facing the plastic on the top. Note the flow indication arrow etched into the plastic near the fan's power lead.

14. Connect the fan's power cable to pins 4 and 6 on the Raspberry Pi's pin connector. Both pins are on the row closest to the case wall. Connect + (Red) to pin 4, and - (Black) to pin 6. (See picture below.)



15. Place the top on the case and secure with the three short (1/4") flat-head screws.

16. Attach antennas. Connect the taller antenna with the yellow bands to the 978 MHz SMA bulkhead connector (closer to the side of the box with the power connector and vents). Connect the shorter antenna marked 1090 MHz to the other SMA bulkhead connector. (See image above.) *Optional: use a Sharpie to add marks on the bottom of the case indicating which antenna connects with which connector.*

17. Connect the USB cable to the power connector and power using a 2 amp or greater USB battery or adapter.

## Testing Your FlightBox

1. Apply power to the USB cable using a USB battery or power adapter **rated at 2 amps or greater**. 1 amp power supplies, including the ports on computers, will **not** provide enough power for FlightBox.

2. Check to see that the fan is running by looking through the grate on top / feeling for air blowing out. If the fan is not running, check the power connection to the FlightBox. If power is available, check the fan's connection to the pin header (see Step 15).

3. Using a mobile phone, tablet, or computer, check to see that a new Wifi network is available. The network will be named "FlightBox-XXXXXXXXXX" (where XXXXX is a unique identifier for your unit). The network should be available within 30 second of power-up. Connect to that network - there is no password required.

4. Open a web browser (Safari, Chrome, IE, etc.) and in the address bar type: <http://192.168.10.1> and press enter. This should open the status / configuration page for FlightBox. You should see that the system is active and attempting to receive ADS-B and GPS.

*Note that you may need to be outside to receive GPS and/or ADS-B signals. You generally will not see any UAT activity on the ground unless you are very near an ADS-B tower. Since weather data is transmitted over UAT, you will not receive weather updates until you are 500' - 2500' AGL depending on your location.*

5. Using any supported EFB application (i.e. ForeFlight, WingX Pro, iFly GPS, Droid EFB, etc.), enable the ADS-B features (if necessary - see the instructions from your EFB developer). Depending on the application, you should see an indication that it is receiving ADS-B and / or GPS data. (Please refer to your EFB application vendor's website for details on enabling and using ADS-B features.)

Congratulations - your FlightBox is now ready for use.

## FAQ / Troubleshooting

If you experience any issues with your FlightBox kit, please see the complete Troubleshooting Guide and Frequently Asked Questions (FAQ) page on the Open Flight Solutions website at:

<https://www.openflightsolutions.com/support>

**Power** - Use a 2 amp or greater power supply. FlightBox will not operate correctly if powered from a supply (battery, cigarette lighter adapter, or wall adapter) that not able to output at least 2 amps. It may appear to be working (lights come on, wifi network is visible in the list, etc.) but without an adequate power supply you **will** experience disconnects and other intermittent issues.

*Never try to power FlightBox from a USB port on a laptop or desktop computer.*

**Antennas** - If the taller 978 MHz antenna has a tendency to flop over, you may need to either tighten up the nut on the bulkhead connector or remove the lock washer and use only the nut. That will expose a bit of additional thread on the barrel, which will allow you to tighten up the antenna enough to remain upright.

**Weather** - You will not receive weather data on the ground unless you are very near (within 1 mile of) an ADS-B ground tower. In most areas you will pick up UAT towers 500' - 2500' AGL.

**Traffic** - ADS-B does not provide perfect traffic coverage. At this time (4/15/2016) the FAA only re-broadcasts traffic data to aircraft equipped with ADS-B out. Even with ADS-B Out the traffic view is limited, as there are aircraft operating below the effective altitude for ATC radar or without Mode C transponders.

**Updates** - The latest release is always available on the support page. Compare the version number on your Status page with the Current Release listed on the Support page. If an update is necessary, follow the instructions shown on the Update Tutorial page.

## Questions?

PLEASE watch the video, review this guide, and read check FAQ and Troubleshooting Guide on our website before contacting us. If you have questions, please email or call us:

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