



# Stratux Open Source ADS-B Receiver Equipment Supplement



Revision D  
02-May-2017

## Revision Notes

<b>Revision</b>	<b>Date</b>	<b>Change Description</b>
A	Thursday March 17 2016	Initial Release
B	Friday April 1, 2016	Miscellaneous spelling, grammatical and procedural corrections
C	10/6/2016	Noted software is compatible with Model 2 Hardware. Added wiring diagram.
D	5/2/2017	Updated links to software, added wiring diagram

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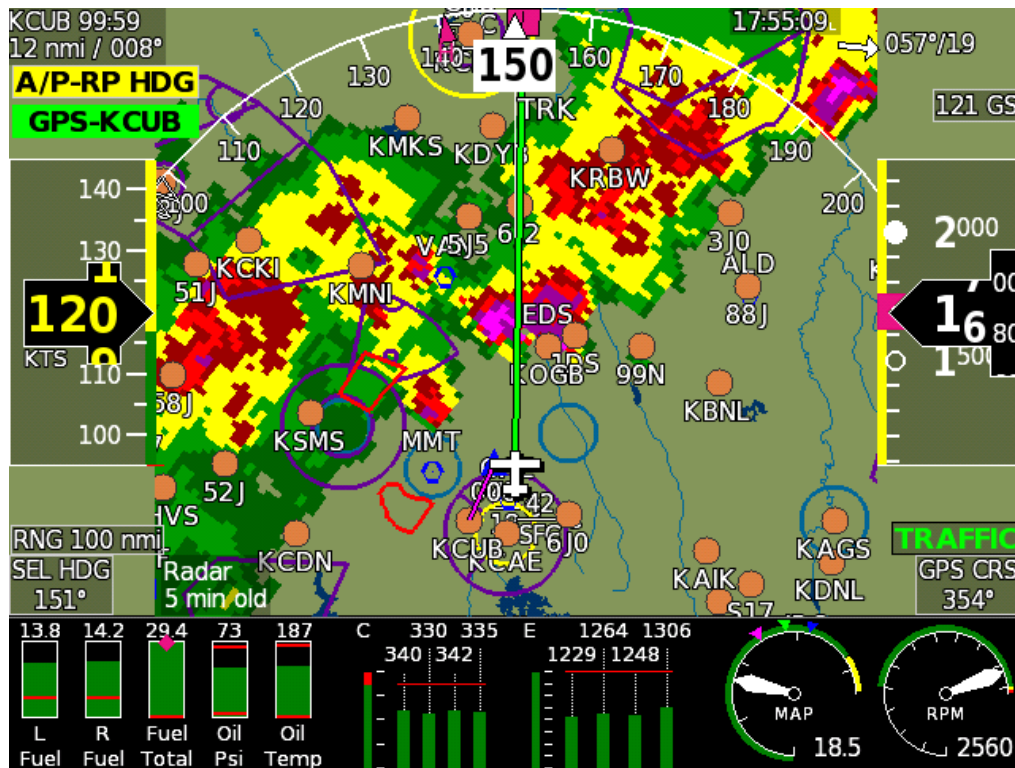
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Stratux Radar imagery on the Sport SX (courtesy of James Clark)

## Section 1: Introduction

### 1.1 About the Stratux Open Source ADS-B Receiver

Stratux is an "open source" system capable of receiving 978 MHz UAT and/or 1090 extended squitter data. When configured with a 978 MHz UAT function, Stratux can display FIS-B weather and TIS-B traffic data via a serial port connection on all GRT EFIS display units including: Horizon HX, Hxr, Sport SX, and Mini (versions with moving map), as well as the WS, HS, and Sport HS legacy display units. The Stratux receiver, when equipped with a Wi-Fi adapter, also transmits data to a large variety of tablet-based iPad and Android EFB (Electronic Flight Bag) devices.

See [www.Stratux.me](http://www.Stratux.me) for more information.

**WARNING:** Stratux is a receiver ONLY. **Do not expect or rely on any traffic information unless your aircraft is also participating in ADS-B OUT, and the output is verified to be functioning.**

GRT current recommendations for ADS-B out is available on the [ADS-B page](#) on the GRT website.

The Stratux open source ADS-B receiver may be purchased in kit form (approximately \$250 as of this writing for a dual band version), or via individual components purchased and assembled by the user. Again, please refer to [www.Stratux.me](http://www.Stratux.me) for more information.

This supplement is intended to support GRT users with information about Stratux connectivity and use with GRT EFIS systems.

Stratux Radar image on a Sport SX

*(Image courtesy of James Clark)*



The interface between Stratux and GRT display units allows for:

- FIS-B subscription-free weather information displayed on a GRT display unit while within ADS-B ground coverage;
- TIS-B traffic information displayed on a GRT display unit while within ADS-B ground coverage;
- Direct airplane-to-airplane traffic information displayed on a GRT display unit from nearby aircraft participating in ADS-B OUT on 978 MHz UAT frequencies.

## 1.2 Stratux Raspberry Pi Software

Software that supports the serial port is required in the Raspberry Pi is provided on the GRT website [here](#). Currently, serial data is not part of the main release of Stratux software, and we have encountered support issues with serial output compatibility. As a result, we have added known good software for both Raspberry Pi 2 and 3 hardware to our website. The versions we provide are may not be updated as frequently as the official Stratux software.

This software is configured for 38400 baud serial data output via a USB to serial adapter, and will not support a USB GPS with the Stratux. when used to send serial data to the EFIS. This will change in a future update.

After loading this software, the Raspberry Pi must be run with a keyboard and monitor connected. It will boot to a screen that asks about expanding the filesystem. Do this, re-boot, and it should re-boot to a prompt, at which point it will be working.

## 1.3 Serial Port and Hardware Requirements

A high-speed serial port is required on each GRT display unit that will be used to display weather. Traffic will transfer over the inter-display link, and weather will transfer over the Ethernet inter-display link.

**Antennas:** The use of an externally-mounted Stratux antenna is optional. GRT beta testers in Van's RV aircraft have reported good signal with the included antenna when the unit is within view of the sky (typically on the instrument panel glare shield). Signal reception may be improved by mounting an antenna on the belly of the aircraft. The included antenna may be removed and a dedicated passive transponder or DME antenna may be connected in its place.

More information re: antennas used with the Stratux project may be found at: [www.reddit.com/r/stratux](http://www.reddit.com/r/stratux). Search "antennas".

## Section 2: Installation & Wiring

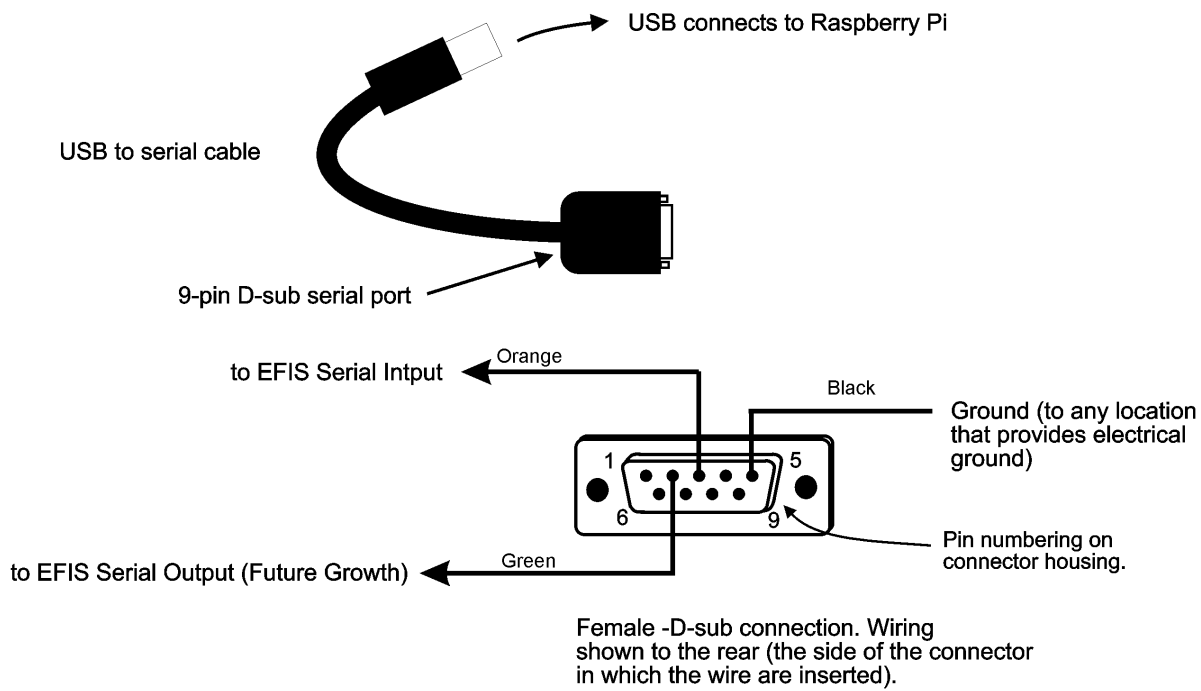
### 2.1 Electrical Connections

Wiring to the Stratux should be accomplished as follows:

USB-Serial Cable 9-pin d-sub pin	EFIS Connection	EFIS Setting
Serial Data Out - Pin 3	Any Unused high-speed serial input	Set baud to 38400 (115200 may be used in the future) Set Serial Port Function to "ADS-B" Requires a high-speed serial port. These are*: Hx, Hxr - All ports Sport SX - All ports WS/HS - Horizon - Ports 1 & 2 WS/HS - Sport Port 4 *Except when using the serial port pass-thru via an ARINC Module
Serial Data In - Pin 2	Serial output on the same port used for serial input	Set Function to "Stratux" (this setting may require a software update)
Serial Data Ground - Pin 5	None	Connect to ground.

Stratux - when equipped with Wi-Fi - can display ADS-B information on tablets running Electronic Flight Bag (EFB) apps such as: Avare, ForeFlight, Seattle Avionics FlyQ, WingX Pro7, Naviator, FlightPro, and more.

See [www.stratux.me](http://www.stratux.me) for more information.



Notes:

1. The serial input and ground connections are required. Serial output from the EFIS is not required, but may be used in the future.
2. The recommended USB to serial cable is Trendnet TU-S9.
3. Refer to the Stratux Supplement on GRTAvionics.com for configuring and testing this connection.

## Stratux Serial Wiring

Grand Rapids Technologies, Inc

Stratux serial port wiring.cdr  
03/2016

## Section 3: Setup & Programming

### 3.1 Display Unit Setup

Use the following procedure to program your GRT display unit to communicate with Stratux.

1. Power up the GRT EFIS system. Access the Setup Menu on the display unit that Stratux is connected to.
2. Under General Setup, scroll to just below the Serial Port setup options. Highlight **USB ADS-B** option and turn knob to select **ON**.
3. Stay on General Setup screen. Scroll down to Traffic Altitude Filter. This is used to filter out irrelevant traffic from the map beyond a certain reported altitude from your position.
4. Press **SAVE** softkey.
5. If your transponder is being used for ADS-B Out, and it has not already been programmed, set it up by using the transponder manufacturer's instructions and its GRT supplement, if applicable.  
**Note to Trig Users:** Answer "1090ES Receiver On Board?" with **NO**.

Setting	Value	Notes
Flight ID and Address*	–	Press to activate menu
Flight ID*	Enter actual value	Enter aircraft registration/N-number
Mode S Address*	Enter actual value	Mode S code (base 16-Hex). Find by looking up N-number on FAA website. <b>Note:</b> The 6-digit Mode S code is only listed for aircraft with an airworthiness certificate, and not for reserved N-numbers.
USB ADS-B	On	Tells display unit to expect ADS-B data through USB port.
Traffic Altitude Filter	Set to preference	Excludes traffic alerts outside of the selected altitude.
*Set this up to receive traffic data if you are transmitting ADS-B Out using an extended-squitter transponder.		

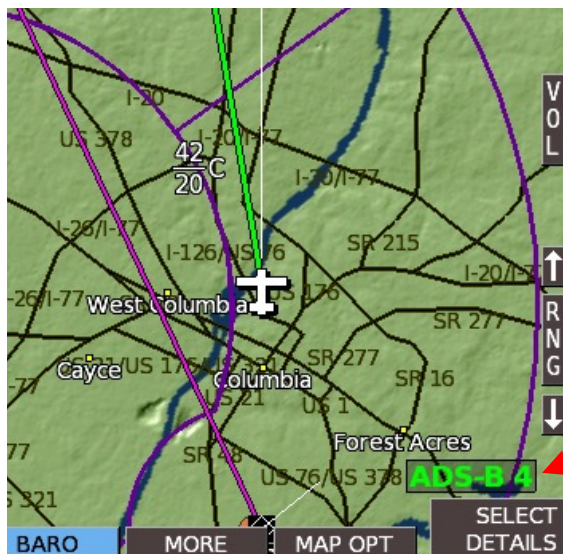


### 3.2 Post-Installation Checkout

1. Pull the aircraft outside and power up the GRT EFIS system.
2. Power up Stratux and verify connectivity on UI (192.168.10.1) and EFB.

Note: 978 MHz UAT data can not be received on the ground unless an ADS-B ground station tower is located nearby.

3. Go to Set Menu > Display Unit Maintenance. Scroll to ADS-B Status. If the Valid Frames counter is counting, data packets are being received.
4. When the receiver is within range of one or more ADS-B ground towers, a green **ADS-B x** icon will appear on the side of the moving map, with the "x" representing the number of towers received. See image below.



Receiver is communicating with 4 ADS-B ground towers.

## Section 4: Using the Stratux ADS-B Receiver

1. **WEATHER:** Bring up the GRT EFIS MAP screen. Under the SHOW softkey, there is a list of items to choose from: RADAR, SHADE, TERRAIN, WIND, METARS, etc. Note that only one map feature can be selected at a time. Also, RADAR information will replace TERRAIN because the color shading of both features together is confusing. (On HXR, access SHOW softkey by pressing SCREEN, then MAP OPTIONS softkeys.) When selected on the MAP screen, radar will also be displayed in the HXR map inset.
2. **METARS and TAFS**, if available, are shown on the WPT DETAILS page of the airport. Select METARS on the moving map SHOW menu to display color-coded METAR symbols.

Setting	Value	Notes
Traffic Alert Window	On or Off	Traffic inset automatically appears when traffic is a threat.
Show AIRMET	Choose to show on all MAP pages, on North-Up page only, or never.	
Color airports using METARS		
METAR Text	Choose to display weather report text in Raw or Translated (English) form	
TAF Text		

3. Go to the Moving Map Setup Menu for traffic alert and AIRMET, METAR, & TAF viewing options:
4. **TFRs** are currently not shown, but will be available with a future software update.
5. **Traffic** is shown as a black diamond icon with the altitude above or below you in hundreds of feet. An arrow indicates if climbing or descending, and a vector line shows the approximate direction of flight. In addition to the moving map and geo-referenced charts, traffic icons can also be displayed in 3D on the PFD. To turn PFD traffic on or off, go to Set Menu > Primary Flight Display and scroll to Traffic In View. Select ON or OFF.

