**STRATUX Setup**

**IMPORTANT MESSAGE:**

**When you download the Raspberry Pi image it will have the extension .docx This has been done so that it will be able to be downloaded easily. Once downloaded change the file extension to .img**

**The file should be called stratux-v0.8r2-db130aab176.img**

**Use a Raspberry Pi image writer to load that onto an SD card.**

**Making your Stratux ADSB Receiver**

**1. Components**

1. Wireless to iPad/Tablet EFB
   1. Raspberry Pi 3 Model B (this version has on-board Wifi and B-tooth
   2. Heat sink set to suit Raspberry Pi 3 B
   3. NooElec NESDR Nan0 2+ (this recent model has highest temp stability spec at 0.5ppm TCXO)
   4. Micro USB / regular USB 3ft cable (depending on your choice of power supply – you’ll use something like this “as is” if you intend to use a power supply with a USB outlet, or snip the regular USB connector off and connect to a custom power supply – aka DC-DC converter as Io did). I’d recommend a right angle micro USB cable – these come as “left” and “right”, so does depend on your installation, location and orientation - but the goal is to avoid stress on on the motherboard connector (I haven’t done this yet, but will do soon)
   5. If you don’t want to use the NooElec supplied antenna (I didn’t want to use this as I wanted a smaller / better antenna), you’ll need something like a right-angle Mini GSM/Cellular Quad-Band Antenna - 2dBi SMA Plug – I happened to have one anyway, but various available – you just need to make sure that you select something that is closest and best matched to 1090. Depending on how you want to install – i.e. remote, or “on box” - you’ll need to get an SMA connector when you snip the NooElec supplied antenna from the cable, and if mounting “on box” an SMA bulkhead connector; here you’d use the NooElec cable to make up an internal pigtail
   6. A 16GB good quality mini SD card
2. Wireless plus serial output to EFIS
   1. All items above plus Pluggable USB to RS232 Serial converter chip set with DB9 connector (I recommend Prolific PL2303HX Rev D chipset – this works for me, but apparently some others do not….)
3. Box – I used an Altronics box – something like from memory 110mm x 75mm x 30mm (see pics).  Everything fits really well. Adjust “holes” / “slots” depending on antenna config and/or whether serial output is required

**2. Software**

1. I have used the open access Stratux software
2. The latest version available through Reddit/Stratux works fine for “wireless”, but does not yet seem to work “out of the box" with an EFIS – although, some seem to have it working with GRT (see GRT website)
3. I have used a “serial output test version” - but this required some minor modification. It is set for an EFIS that required 115k baud. (MGL in my case.)
4. If “wireless” is all you need then this will still work.

**3. Other comments**

1. The DB9 connector on the serial converter is a pain - it has those fixed nuts on the connector – and so will likely not plug into the connector on back of an EFIS – which is also likely to have “nuts”. So – whilst there are other USB-Serial adapters out there with “screws” that would fit nicely on the back of the EFIS, a) their cable lengths are 5ft or 6ft and b) I don’t know if they will work.  I bought the one listed above (Prolific PL2303HX) as this is what was recommended by the creator of the Stratux code. Solution - “pop” the connector/chipset casing, mask off the electronics, grind off the fixings (Dremel or similar), use compressed air to clean, unmask, “pop” / “superglue” casing back together. As the device is non-critical, I’m not too worried about the connector not being screwed to EFIS connector.
2. Whilst all items are available from Amazon, they won’t ship some items to Oz. So – check out NooElec, Pluggable.com, Element14.com.au for electronics components – means shipping costs add to bottom line, but still can prob do the whole lot for about A$130, and about A$100 for just “wireless” solution.
3. You’ll also need some circuit board spacers (see pics) - I have some left (done 3 of these already!), so may have enough for yours – otherwise, Altronics!
4. Some feel a cooling fan (like 30mm x 7mm) is a good idea, but I have run my unit for 6 hours and no excessive temperatures – in fact, when located on the avionics shelf behind my panel, the max. processor temp I have seen is 52degC after several hours in flight, so I’m not worried – just make sure the cooling holes in the casing are not obscured. Nevertheless, there is enough room in the “box” to fit a fan – power can be supplied from the Pi I/O bar. Or – if you have an avionics fan with a spare port – use that!
5. Glenn Cousins tells me he has added an AHRS module to his unit – he says it works great!  So – as a back-up on your iPad/tablet running AvPlan or OzRunways this seems a no brainer for an extra few bucks. I will find details, and test myself soon.

**4.  Assembly / Hook it all up**

Should be self-explanatory. Note - you can, if you wish, hook this all up to a monitor, key board and mouse – but you’ll need the Pi out of the box unless you cut a hole bunch of other holes in the case – but unless you are programming the code – for example changing the serial baud rate, you shouldn’t need to do this

* + Once Pi is assembled with spacers etc, first slide in the SD card – it’ll only go one way, but be gentle
  + Now plug in the serial Adapter – right back / lower, and then the tuner alongside – now plug in the antenna to the end of the Tuner – of course, first cut / modify cable etc to suit a new antenna / config
  + Now locate the whole assembly into the box, and fit the four screws through the “box” to the spacers
  + Plug in the power connector into the Micro USB port and connect to your 5v power source
  + Red light should come on, and shortly after, the adjacent green light should start blinking randomly

**5.  Now see if its working**

* Test “wireless” first before worrying about EFIS – so Fire up your iPad, so you can see traffic on AvPlan
* Now connect your iPad to “Stratux” - go to Settings / WiFi and select it
* Now go to Safari and type in following address - [http://169.254.229.168](http://169.254.229.168/)/#/     This should be the same, but if not, you’ll see the address under the Wifi Setting for Stratux – check this if needs be
  + This should now allow you see what’s happening on the device – and you can change settings – just follow your nose
  + But make sure you select just 1090 and knock off the second receiver
  + And check the operating temperature  - after stabilising, I’ve seen typically 43/44degC and sometimes 52degC
* Now fire up AvPlan
  + Go to settings at bottom right, and then select “External Devices” and select ADSB-Pi Status”
  + You need to set
    - IP address as   192.168.10.1
    - Tap screen and away you go – back to Enroute / Map display
* Now fire up FlightRadar on your computer and see what’s out there for a positional check
* To give you an idea of range / altitude combinations etc – from home at City Beach, I can pick-up traffic in the circuit at Jandakot (and occasionally on the ground), or on approach to Perth – or traffic at FL390 ~60miles west of Rottnest
* Last very important step – go to fridge – withdraw a 6-pack, and celebrate – hopefully!
* Once absolutely sober, go flying and test. In my case, the antenna could be placed in baggage compartment; on the floor in cockpit; and is now behind panel – in all positions, I pick up targets, no issues (ATC verified). And – there is no issue picking up targets ahead and below