

PlaneGadget

Radars

PlaneGadget - Radar - V2.0 USB ADS-B Receiver

User Guide

15/3/10

This product has been tested and complies to the relevant standards for CE marking in the European Union



Safety Guidance – Please Read

Pointy end of antenna!

Although the antenna has a round end, please take care not to poke yourself with it! It's easy to place it on the window sill, then gaze out the window at the majestic aircraft sweeping by, the antenna below your chin and out of focus, out of sight, out of mind... A finger in the eye is not nice, so a slim antenna however blunt the end would be a bit worse I would imagine.

Take care where you use the receiver that you are doing so legally in the country and place of use. When you open the package you are asked to agree that you will not use the receiver in any way that is illegal within the country of use

Although most countries are very happy for aircraft enthusiasts to use equipment that relates to your hobby, in some countries you will be seen as breaking the law and may be arrested, especially if you are using your equipment in a sensitive place such as near an airport. This is not specifically about ADS-B virtual radar, but the use of air band receivers and even taking photos in the wrong place in the wrong country can land you in prison.

Recently we have seen aircraft enthusiasts get arrested in Greece for photographing aircraft and in India for listening on an air band radio to communications between the pilot and air traffic control.

So take care to ensure that your use of this equipment and other equipment you use is accepted and legal within the country and place of use.

Please read the Installation Guide first.

Section 1: Your antenna

The PlaneGadget-Radar is factory pre-set for the supplied antenna.

Unwrap the antenna from its packaging, extend the cable fully (leaving it tied up can impair the performance), and screw the antenna whip into the base unit.

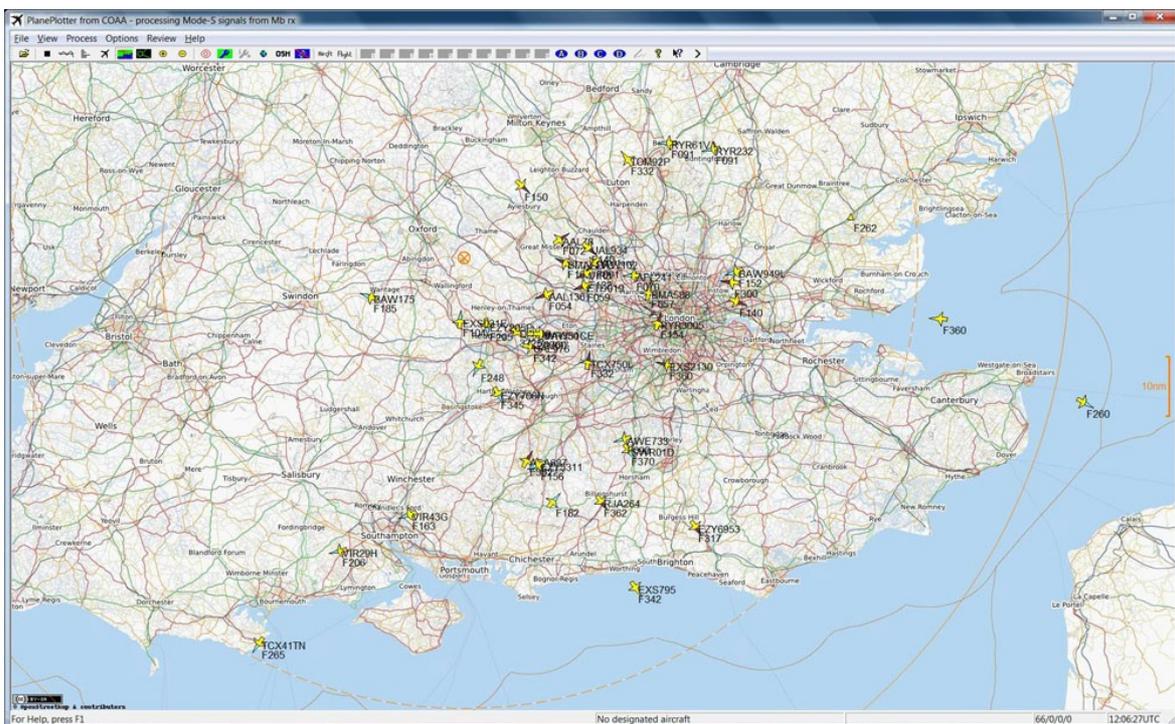
The antenna has a magnetic base and is intended for placing on a metallic surface. A large increase in performance is obtained by doing this, and typically this is achieved by simply placing the antenna in the centre of an upturned biscuit tin or biscuit tin lid. Any flat metallic surface which the magnetic base can adhere to is suitable. In practice its better to push the antenna as close to the window as possible, as the gain from being closer to the window is greater than the loss from being off centre on the tin.



The antenna is not weather proof and should not be placed outside. With the exception of temporary attended operation, for example on a car body (place something under the antenna to avoid scratching your car paintwork if you do this, like thin polythene).

As ADS-B transmissions are what is known as "line of sight" you need to place the antenna in a suitable position where it has a clear view of the sky. An upstairs window sill for example is a typical convenient position, where the view directly out of the window is clear of obstacles such as hills or adjacent buildings. However in this position you will see a clear pattern where aircraft on the other side of your house are either not seen or where the range of detection is lower.

The following picture shows PlanePlotter* with the receiving antenna is placed in a 1st floor window facing south east from oxford. You can clearly see that range is up to 110miles or so in that direction, but limited to around 30Nm in the north west. The north west is blocked by being the otherside of the building from the antenna, several walls of the building and the roof.



Section 2: Using PlaneplotterLite

Please note that this is a quick start guide.

The PlaneGadget-Radar is supplied with PlanePlotterLite software from COAA*. PlanePlotterLite is a cut down version of the popular full PlanePlotter software. For detailed information on PlanePlotter go to <http://www.coaa.co.uk/planeplotter.htm> you can also upgrade at anytime on this website to the full version of PlanePlotter that allows you to network and share data with other users.

There is an active Yahoo group here <http://groups.yahoo.com/group/planeplotter/> where you can ask questions and share your discoveries with other PlanePlotter users.

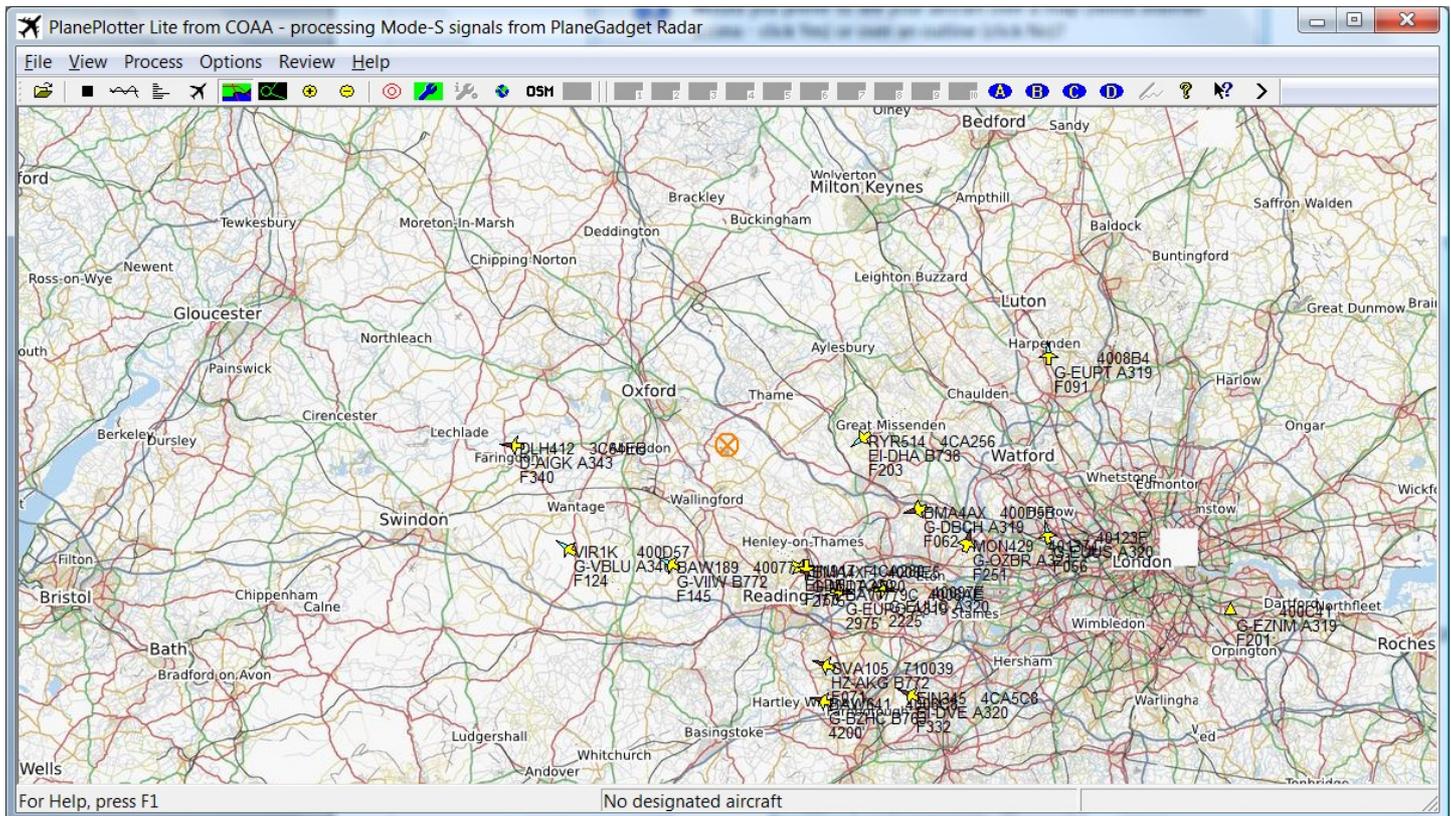
A full guide to using PlanePlotter is provided here <http://planeplotter.pbworks.com/>

The RadarGadgets website also has up to date links and the latest version of PlanePlotterLite if you need to upgrade. <http://www.radargadgets.com/planeplotter.htm>

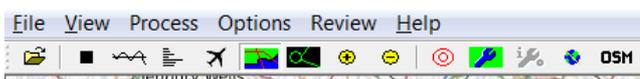
Now lets get on with the quick start guide to PlanePlotterLite

You have already installed PlanePlotterLite (if you have not you need to go to the Installation Guide first). If you do not already have it running run it now by selecting PlanePlotterLite either from the shortcut on your desk top or from the windows Start button.

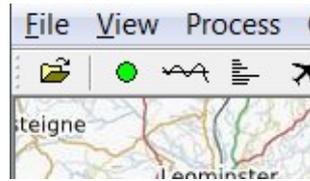
You will see the main screen with aircraft



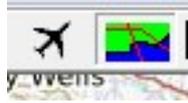
Lets have a quick look at the most useful functions in the tool bar.



Clicking on the black square stops PlanePlotterLite from processing the information from the PlaneGadget-Radar. If you click it you will notice it turns to a green button.



Clicking on the green button starts PlanePlotterLite processing information from the receiver. When you start the software you always have to click on the green start button to start processing data from the receiver.



Clicking on the aeroplane symbol changes the display to a list of aircraft “seen”. This list will include aircraft for which a position is not known. So you will usually see more aircraft here than on the chart display. Often you will see aircraft that do not have full ADS-B capability here, including some military aircraft. You may not know where they are, but they are around and within range.

Clicking on the map symbol to the right of the aeroplane returns the display to map view.

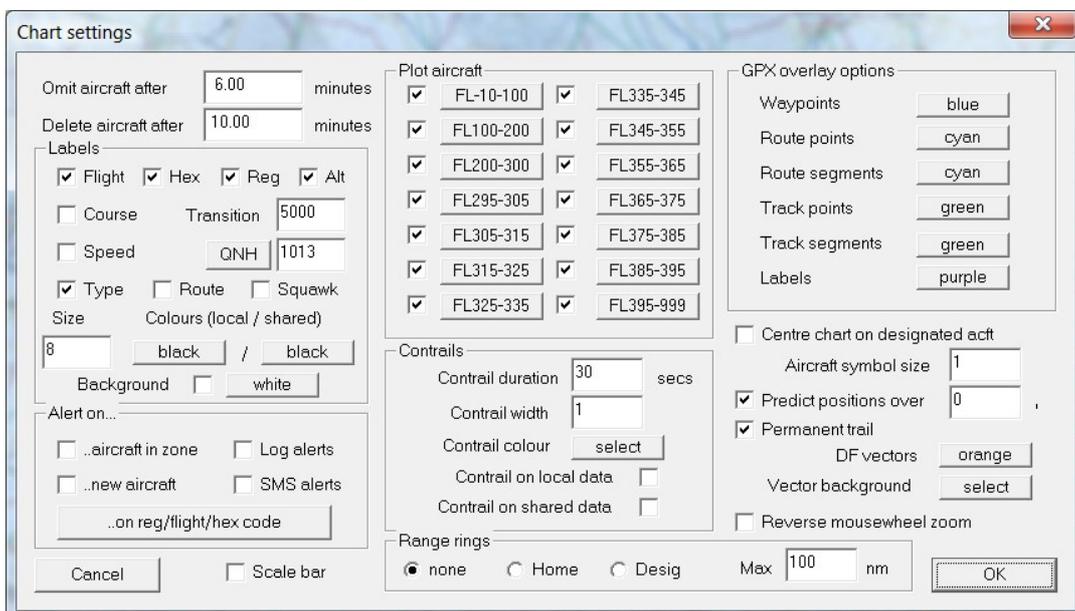
While in map view you will notice there are + and – buttons and a button marked OSM.



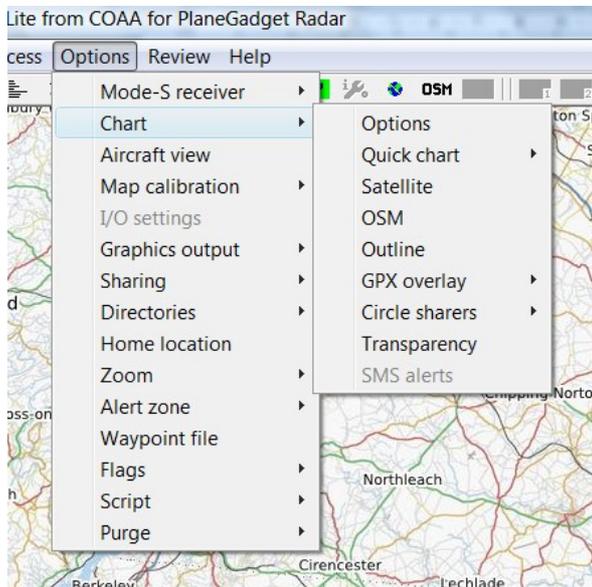
You can zoom into the map by clicking on the + and out by clicking on the -. However you will notice that when you zoom out the new area around the map is not updated automatically, and when you zoom in the map becomes pixelated (blurred). You need to manually update the map when you have the desired scale by clicking on OSM. You can pan the map by clicking and holding, while dragging your mouse around, this also requires you to click on the OSM button when you are happy with the position to update the map.

The red circles are range markers, clicking on creates rings around your position. The distance between the rings is set up on the chart settings menu, we'll look at that menu now.

Click on the spanner and you will see the chart settings menu



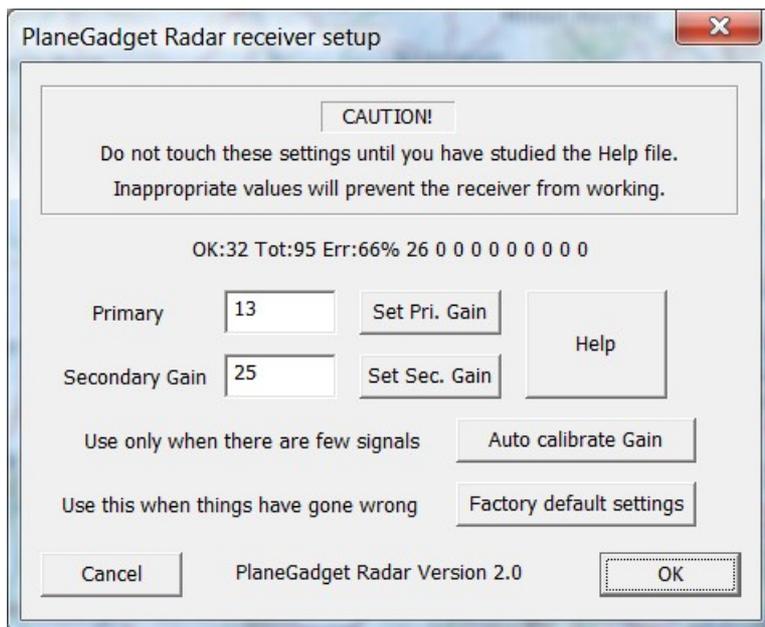
You can see the settings for the range rings previously mentioned bottom centre.



The options menu gives you many other advanced options. Under Chart you can see there are more options than the OSM chart we have looked at so far. You can use your own charts and use the Map Calibration to ensure aircraft are placed accurately. There is also a satellite map option.

Advanced Receiver Set Up

You may have noticed the menu above at the top has Mode-S receiver as an option. Hold the mouse over Mode-receiver, then over PlaneGadget radar, and select Set up Receiver. Your receiver is factory calibrated, you should not change these settings under normal conditions.



NOTE: YOUR RECEIVER HAS BEEN FACTORY CALIBRATED AND YOU SHOULD NOT HAVE TO CHANGE THESE SETTINGS. FOR MORE INFORMATION CLICK ON THE HELP BUTTON ON THIS PAGE. CHANGING THESE SETTINGS MAY STOP YOUR RECEIVER FROM OPERATING AND ARE LIKELY AT THE LEAST TO REDUCE PERFORMANCE.

Section 3: Specifications

- ADS-B (Automatic Dependent Surveillance Broadcast) Receiver
- USB 2.0 connection
- Powered over USB 5V – Typical 90mA, Max steady 150mA
- Antenna Connection – SMA Female 50 Ohm
- Antenna Included – magnetic base indoor whip antenna (SMA male)
- Range
 - Practical range with antenna included (placed on 1st floor window sill) 110Nm
 - Maximum range observed from hill top 210Nm
 - Theoretical range 240Nm
- Plotting Software – PlanePlotterLite* included, full version supported (requires upgrade)
- ADS-B messages supported
 - DF17 (sub types 1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,29)
 - DF0,DF4,DF5,DF11,DF16,DF20 (partial), DF21 (Partial)
- CE marking, tested and conforming to the requirements for sale within the EU

*PlanePlotterLite is a product produced by COAA see <http://www.coaa.co.uk/planeplotter.htm>