

ADS-B Receiver Board Mode-S Beast

AvionixTech

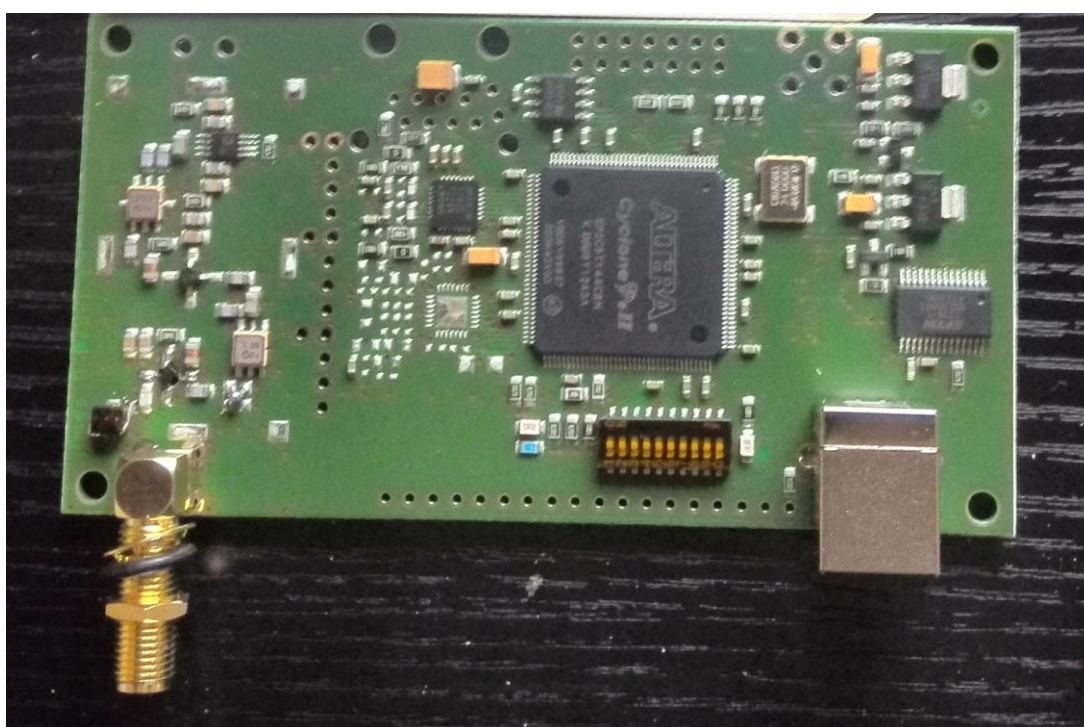
1. Introduction

Mode-S Beast is a high-performance ADS-B receiver board that can receive and decode ADS-B, Mode-S and Mode-A/C signals.

The Mode-S Beast allows you to receive the positions of the aircraft up to 400 km (220 nm) away. In addition, all you need is an antenna and a PC with freely available software for graphical representation.

The device is powered by USB.

The binary formats are supported by a variety of software, such as PlanePlotter and adsbscope.



Mode-S Beast includes:

Mode-S Beast ADS-B receiver board.

LED light.

USB cable, to connect Mode-S Beast with computer.



2. Specifications

- Output DF17 & DF18 data
- Output Mode A/C/S transponder data
- Provide data format for customer development
- Output data with timestamp. But please note that this timestamp is internal 12MHz clock, rather than GPS time. So not OK for MLAT.
- Can be customized for network data output.
- USB for power and data output.
- Physical size: 100 x 53 x 13 mm
- Weight: 40g

3. Driver Installation

When connected with computer, Mode-S Beast will automatically install drivers. If not, please download ftdi drivers here.

<http://www.ftdichip.com/Drivers/VCP.htm>

4. Data Format

The device can provide raw data in two different binary formats. Either in the so-called "AVR format" or the more efficient "beast binary format". There're 10 DIP at the bottom of the board and there're numbers indicate the DIP. Use a knife to tear open the protection and put DIP 3 to ON position, the output data would be binary format.

High-resolution timestamps are available in both formats. The "Beast Binary Format" also contains signal strength information.

AVR Data

```
*8D4B1621994420C18804887668F9;  
*02E1991058EF3100000000000000;  
*20000CB10D89FB000000000000000;  
*20001196553C25000000000000000;  
*02E198BF86760000000000000000;  
*02C18CB14E2D98000000000000000;  
*02E198BF86760000000000000000;  
*200015301CB296000000000000000;  
*20000F971E4582000000000000000;  
*200015B3EF4577000000000000000;  
*583E1BDABC2735000000000000000;  
*280008006C738F000000000000000;  
*200010142CC4CB000000000000000;  
*02E1941016FC9E000000000000000;  
*02E1919653E46F000000000000000;  
*200014101024D4000000000000000;  
*02C6081A5757E8000000000000000;  
*02E1941016FC9E000000000000000;  
*8D4CA27A608145305B0B09EAD8B5;  
*02E19838575F0A000000000000000;  
*A0001014BC900030A8000038ED68;  
*200015301CB296000000000000000;  
*8D400A6658AB0540C701D9CA672E;
```

binary format

```

1A 33 16 BF 00 8F 91 6B 34 8D 78 11 19 99 0C 17
16 78 40 88 AA 51 C9 1A 33 16 BF 02 39 9D 3A 1B
8D 78 04 CE 99 C4 14 14 48 3C 88 83 B1 00 1A 33
16 BF 02 69 C8 67 1C 8D 7B B0 FF 99 44 AE 84 28
08 86 14 A7 A7 1A 33 16 BF 02 7D 3B B6 23 8D 78
14 FB 99 09 CE 16 58 08 15 11 70 25 1A 33 16 BF
02 DE 34 F8 38 8D 78 01 0E 58 B5 42 BD 25 32 C8
6B 17 55 1A 33 16 BF 04 22 44 13 34 8D 39 65 B0
F8 21 00 02 00 49 B8 D9 77 83 1A 33 16 BF 06 A7
A3 78 2E 8D 78 00 69 20 0C 30 79 D7 0D A0 88 B4
26 1A 33 16 BF 08 77 11 68 29 8D 78 04 7F 60 67
42 91 E9 A7 A3 7F 34 1E 1A 33 16 BF 08 7D 88 7F
2A 8D 78 04 7F 99 90 81 B7 E0 40 07 02 0D 4A 1A
32 16 BF 09 FC D2 B1 3E 5D 78 04 90 27 55 69 1A
33 16 BF 0A FC CB 22 2D 8D 39 65 B0 58 67 C2 F4
12 FA 54 6E BF 36 1A 33 16 BF 0C 23 D2 1C 3F 8D
78 0B FB 99 C4 6A B4 20 2C 05 BA 5F 82 1A 33 16
BF 0D 59 F5 AE 22 8D 78 14 FB 58 A1 45 BA 85 40
F2 87 47 17 1A 33 16 BF 0F 75 F1 46 26 8D 78 11
19 58 15 46 2D 38 80 5E BE 8F E2 1A 33 16 BF 10
29 AD BA 2E 8D 78 00 69 99 44 16 15 A8 0C 85 97
01 C5 1A 33 16 BF 10 CE 5A F4 2E 8D 78 11 03 99
0C FA A3 B8 04 08 1B C6 65 1A 32 16 BF 12 26 33
CB 10 5D 7B B0 FF D3 71 1E 1A 32 16 BF 12 F8 AB

```

<esc> "1" : 6 byte MLAT timestamp, 1 byte signal level, 2 byte Mode-AC

<esc> "2" : 6 byte MLAT timestamp, 1 byte signal level, 7 byte Mode-S short frame

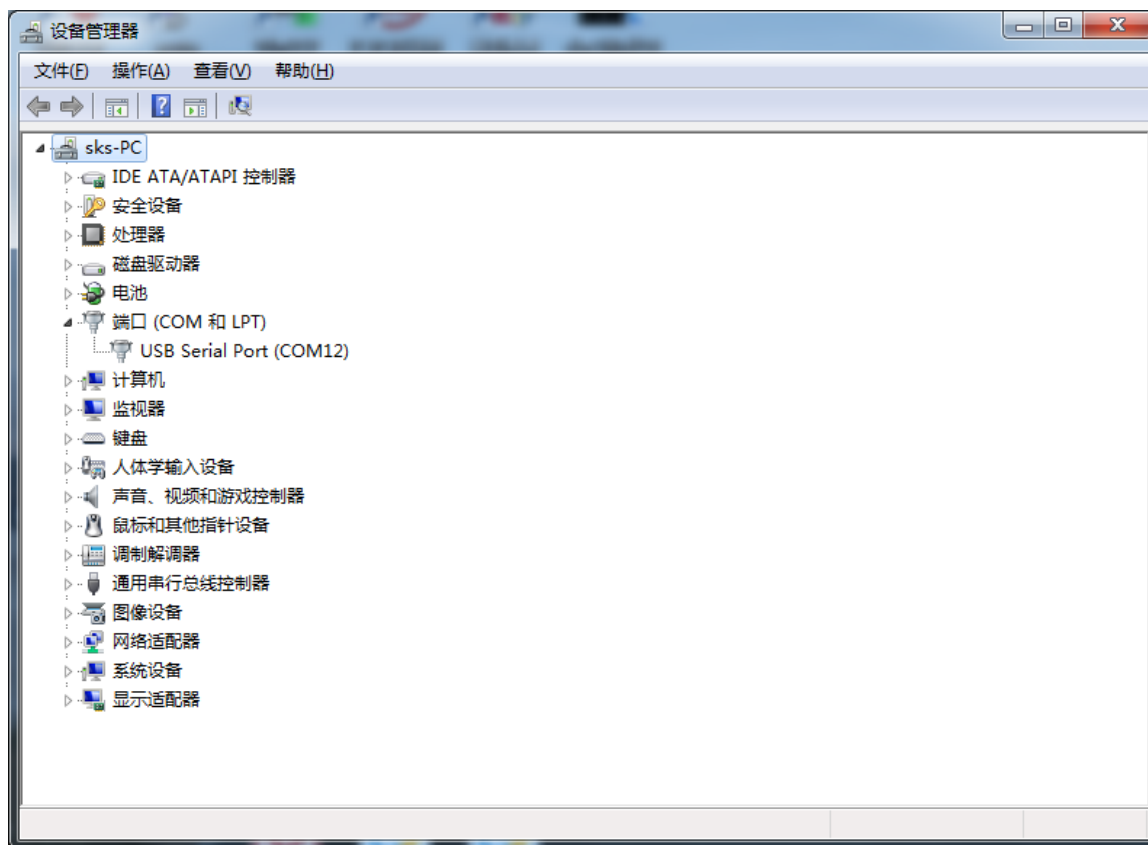
<esc> "3" : 6 byte MLAT timestamp, 1 byte signal level, 14 byte Mode-S long frame

<esc><esc>: true 0x1a

<esc> is 0x1a, and "1", "2" and "3" are 0x31, 0x32 and 0x33

5. Check the serial port

In this example it's COM12.

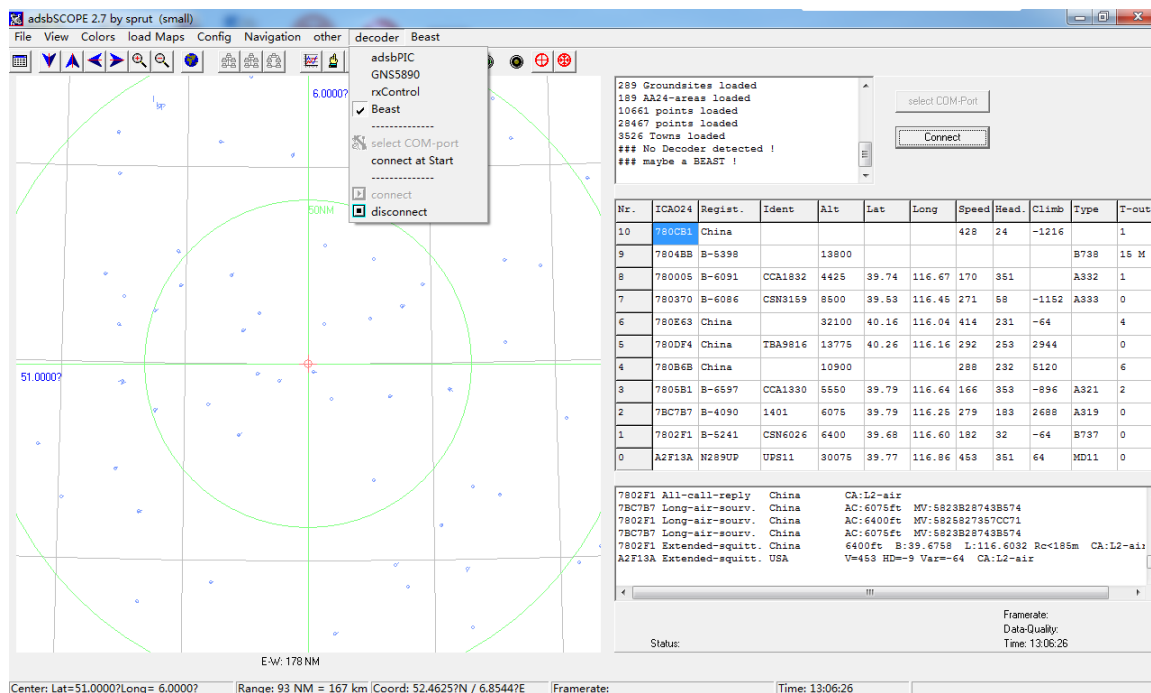


6. adsbscope ADS-B display software

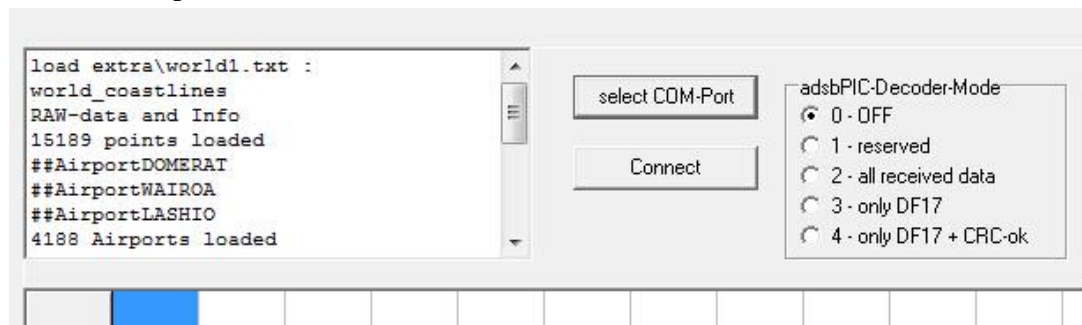
No need for installation, just double click the .exe file would be OK. The two .exe files are different in that the _256.exe program can display 256 aircrafts at most, while the _16384.exe program can display 16384 aircrafts at most.

ssb1	2014/12/16 星期...	文件夹	
adsbscope27_256.exe	2014/4/19 星期...	应用程序	1,756 KB
adsbscope27_16384.exe	2014/4/19 星期...	应用程序	1,756 KB
initfile.txt	2014/12/16 星期...	Text Document	4 KB

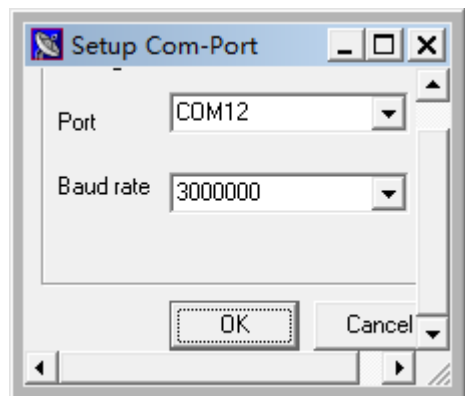
Choose decoder —> Beast



select COM-port

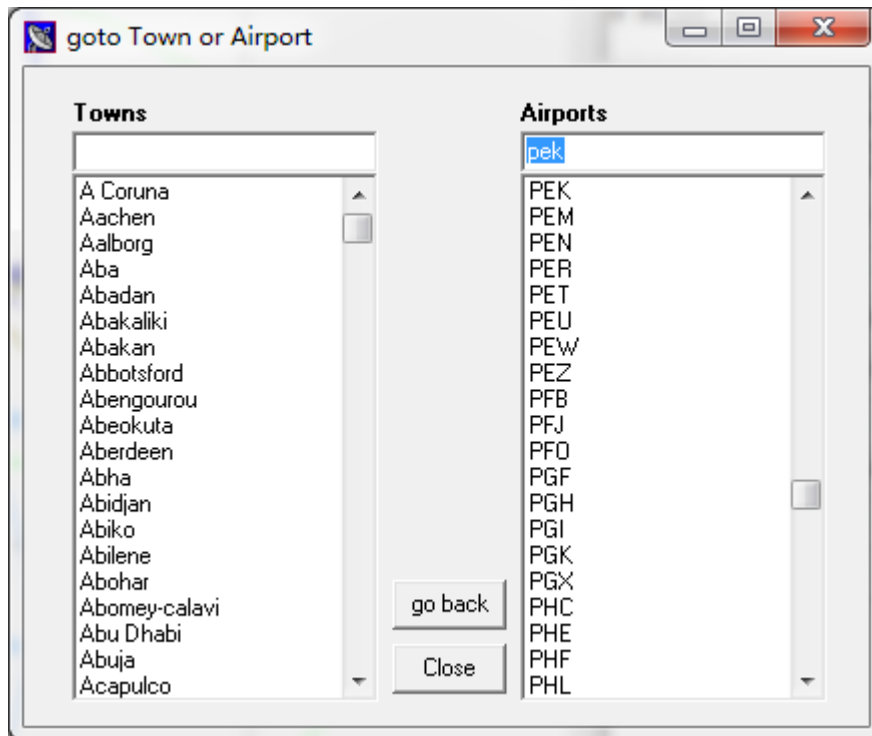


Input serial port and baud rate 3000000.



Then click Connect, it's connected.

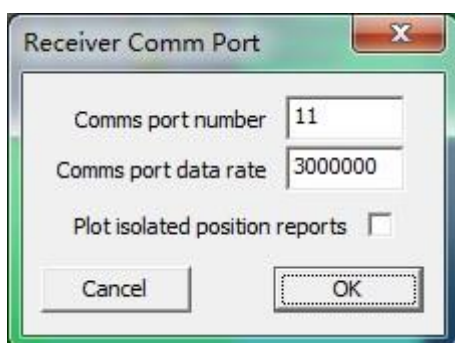
Set an airport nearby. In navigation—>goto town or airport.



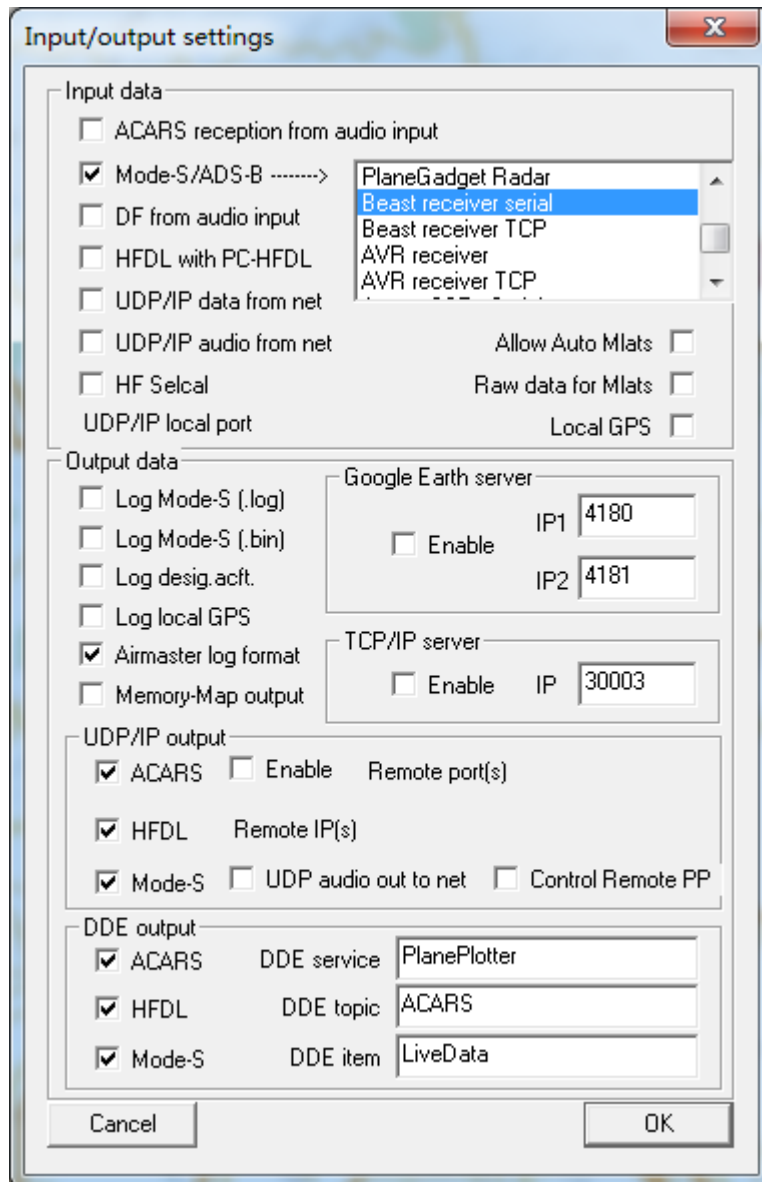
Done!

7. planeplotter ADS-B display software

In Options → Mode-S Receiver → Beast Receiver → set serial comms port. Set port number and data rate 3000000.



In Options → I/O setting
Set beast receiver serial as below



Process —>start. Done!