MyFlyDream

Automatic Antenna Tracker

Manual

V 3.0

www.MyFlyDream.com

Notes

Thank you for purchasing the MyFlyDream Automatic Antenna Tracker (hereinafter referred to as MFD AAT).

➢ Please follow this manual to get familiar with the tracker and to operate it correctly. The tracker is a precision mechanical and electronic device. Please read this manual carefully to avoid damaging the device or hurting yourself and others.

➢ The tracker is designed for use with RC-models only. Please use it in compliance with applicable local laws. The reliability and accuracy of the tracking system depend on a number of factors. A strong electromagnetic interference, bad GPS status and other reasons may cause a bad tracking result. Please consider the risk and take it yourself. Any loss or damage caused by the tracker system is not our responsibility.

➢ We reserve the right to continuously improve the product performance, so this document is not necessarily in full compliance with the tracker you purchased. The latest version of this document will be available at our website:

www.MyFlyDream.com

1.System Components

1. MyFlyDream Tracker
2. MyFlyDream TeleFlyOSD
3. MyFlyDream AATDriver
4. Cables connecting the AAT and your AV receiver
5. 7Pin Connector (for 12 channels version only)

6. USB Programmer (for firmware update)
7. Heat shrinkable tubes and M3x8mm stainless steel screws/nuts
8. Connector between the AAT and your AV receiver

2.Working Principle

In FPV flight, in order to get a better quality of video signal reception, we often wish to use high-gain antenna. But any high-gain antenna is accompanied by a narrow effective angle. MFD AAT is designed to solve the difficulty to keep the directional antenna pointed at the target to ensure the best possible reception and transmission during FPV flight.

To form a complete system, you need to mount the TeleFlyOSD module on the plane. The TeleFlyOSD reads data from the GPS on the plane, encodes and modulates the planes coordinates and height information and transmits them back via a wireless audio channel (usually the audio channel of the video transmission link is used).

The tracker forwards the audio signal received to the AATDriver. The AATDriver demodulates and decodes the signal to obtain the plane position information. After comparing with the original coordinates, it gets the current plane azimuth, distance and height, etc. relative to the tracker. Then the AATDriver transmits the information to the tracker that drives the internal servo to aim the directional antenna at the planes position.

3. Specifications

With a built-in high quality electrical slip ring, MFD AAT has a unrestrained, continuous panning capability. There is also a built-in electronic compass which makes it ~~as~~ a Plug-and-Play system without extra initialization.

➢ Tracker:

Weight	905g
Size	165*107*40mm (Length*Wide*Height)
Input voltage	12V
Current consume(empty load)	100mA
Loading capacity	1KG
Tilt range	0~90 Degrees
Pan range	Unlimited (0~∞ Degrees)
Tilt speed	100 Degrees/s
Pan speed	200 Degrees/s
Spare signal channels	1~7

➢ **TeleFlyOSD:**

Weight (Not including the harness）	9g
Size	45 * 25 mm
Input voltage	7~20V (7~13V if connected with an ExtensionBoard)
Current consume	100mA

➢ **AATDriver:**

Weight	58g
Size	78*44*23mm (Length*Wide*Height)
Input voltage	12V
Current consume	100mA
Virtual GPS Communication baud rate	1200bps *Virtual GPS：AATDriver can virtualize itself as a bluetooth GPS module. It outputs the location information of the plane with $GPGGA and $GPRMC command.

4. Connection and Set-up

1) Connecting TeleFlyOSD

➢ **Introduction to TeleFlyOSD**
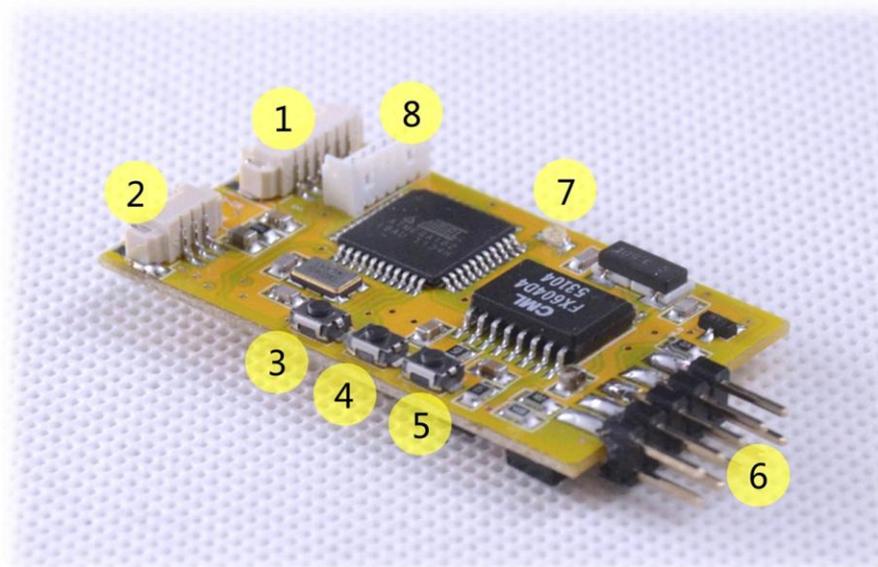
Part #	Name
1	Extension board port
2	OSD video signal port
3	UP button
4	SET button
5	DOWN button
6	Connecting pins
7	LED
8	Firmware upgrade socket

➤ Wires color and function
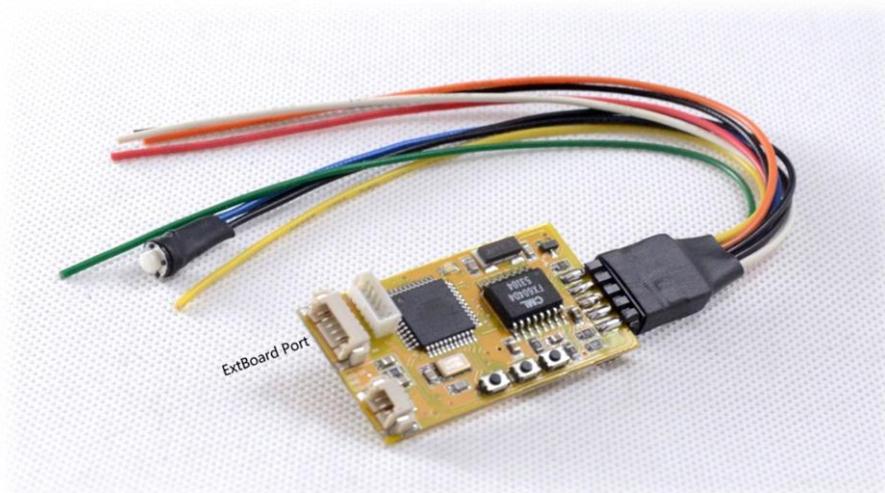
Colour	Name	Remard
Red	Power	Power input
Black(3 wires)	GND	Ground
Blue	SetHome	Set the tracker position
Green	GPS Data	GPS Data
Orange	GPS Power	GPS Power supply(3.3V) *
White	Audio Out	Audio output to transmitter
Yellow	Video Out	OSD video output to transmitter

* **Maximum current output: <200ma. Please make sure that your GPS current consumption does not exceed these limits.**

➤ Connecting TeleFlyOSD

The TeleFlyOSD can either use a separate GPS or share a GPS with another component (OSD, Autopilot).

Please refer to Connection Diagram A if a separate GPS is being used. In this

configuration, the TeleFlyOSD powers the GPS.

In the diagram, the operating voltage of GPS is assumed to be 3.3V. If your GPS needs an operating voltage of 5V, refer to Appendix A.

Please refer to Connection Diagram B if a GPS is shared with another component (OSD, Autopilot). In this example, the GPS and another OSD connect as usual for power supply.

See Chapter 7 "OSD Functions" for specific OSD functions of TeleFlyOSD.

Connection Diagram A (power the GPS by TeleFlyOSD)

TeleFlyOSD Connection Diagram A

http://www.MyFlyDream.com

Transmitter

VIDEO IN
AUDIO IN

SetHomeSwitch

GPS

TeleFlyOSD

WHITE
BLUE
BLACK
GREEN
ORANGE
RED

Video-IN
GND
Vide-OUT

6~9V Battery

Extension Board
(For additional features)

CAM

Optional

POWER	
GND	
GPS DATA	
GPS POWER	
VIDEO	
AUDIO	
SET HOME	
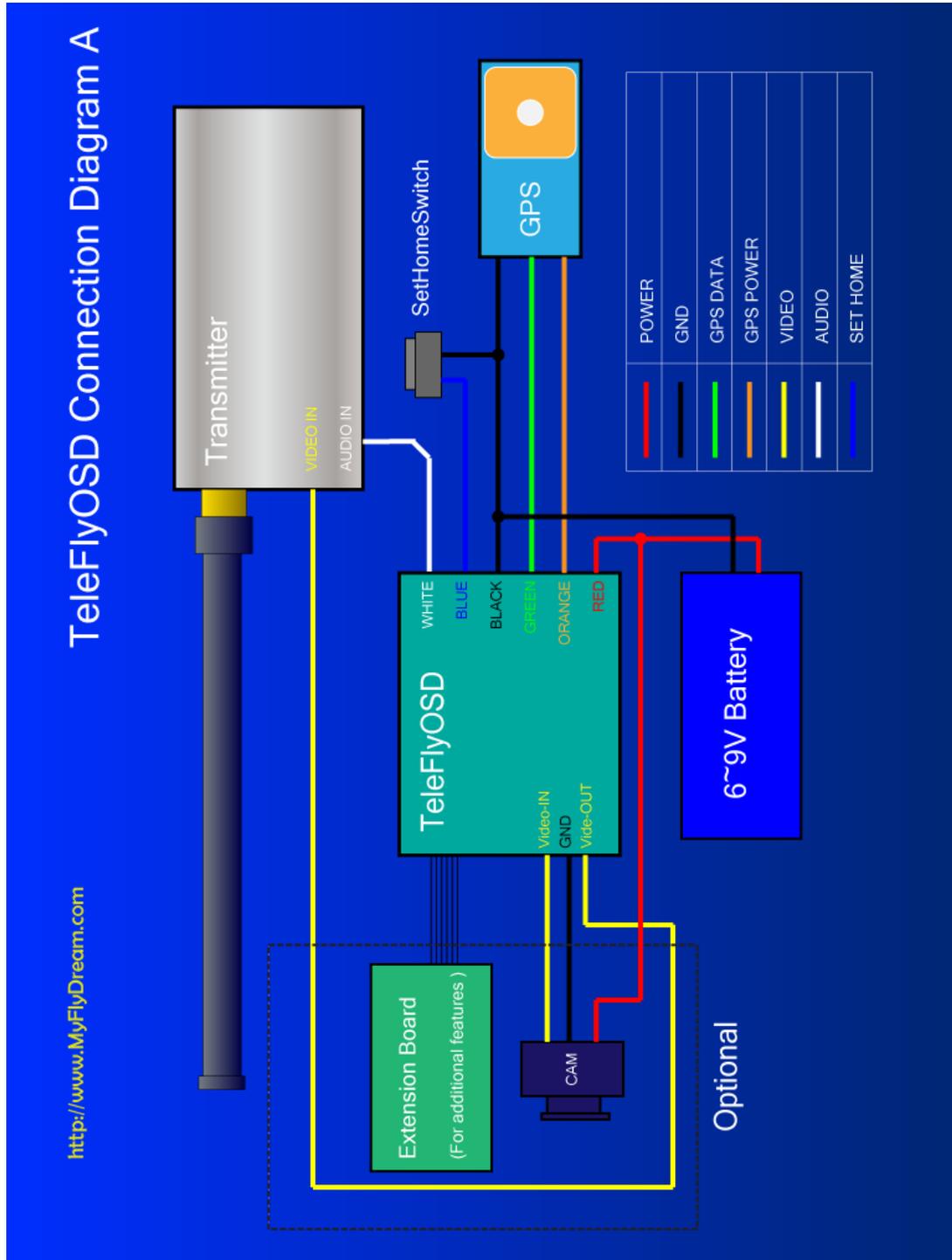
➢ **Connection Diagram B (share GPS with other OSD)**
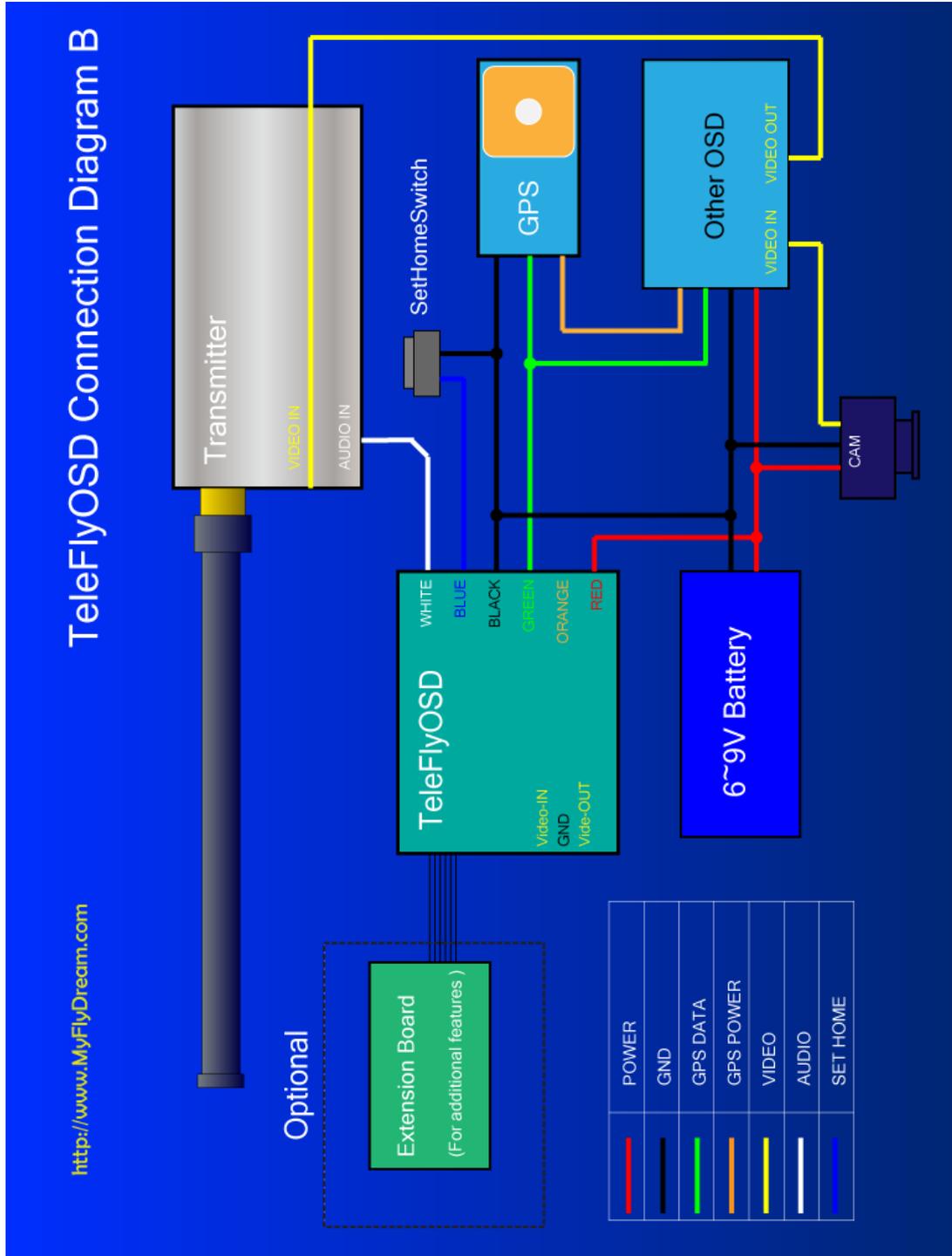
➢ Selecting appropriate baudrate for TeleFlyOSD

Since the output data rate of different GPS may be different, it is necessary to set the baudrate of the TeleFlyOSD communication port to match the GPS used. There is a two-way DIP switch on the backside of the TeleFlyOSD module which is used to select baudrates:

Select Baudrate
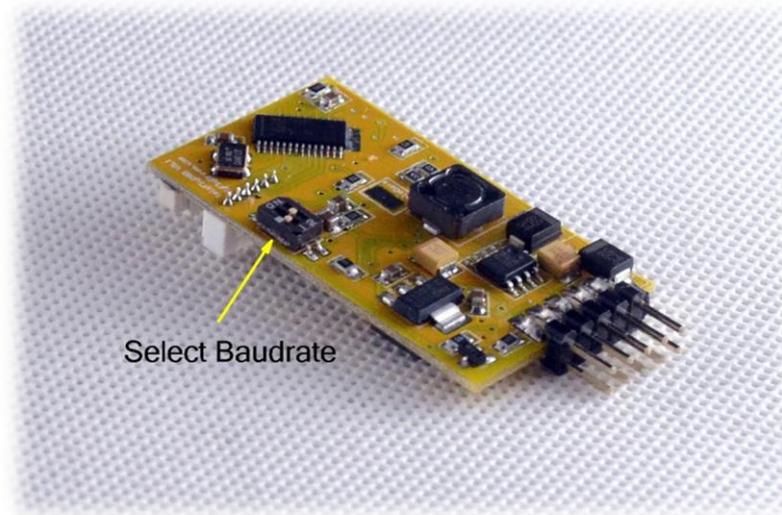
The arrow-indicated DIP switch in the figure has an ON mark above. There may be four different baudrate combinations via setting of this switch:

DIP Status(1-2)	Communication Bardrate(bps)
OFF-OFF	115200
OFF-ON	38400 (Default)
ON-OFF	57600
ON-ON	9600

Power on after checking correct connection. The TeleFlyOSD LED will turn on. After a few seconds, if the communication between TeleFlyOSD and GPS is working normally, the LED will flash at half the GPS data update frequency. If the LED is lit continually, check whether the GPS connection and baudrate setting are correct.

2). Mounting tracker and AATDriver

Please mount the antenna on the antenna handler of the tracker firmly. The image transmission receiver is suggested to be mounted on the antenna handler to avoid electronmagnetic interference. Antenna cables tend to be stiff, continual bending due to the movement of the tracker might damage it. Specific mounting methods should be designed according to the actual situation. The following picture is for reference only.

Connect the AATDriver to the tracker and mount the tracker on the tripod. Do not ever try to hold the tracker in hand to test it to avoid damage to the device and yourself. Three cables lead from the tracker: black 5.5mm power plug, yellow video plug and white audio plug. Connect the three cables to the corresponding jacks on your video transmission receiver. Please note that the 5.5mm power plug is directly connected to the power supply of the AATDriver. For example, if the power supply voltage for the AATDriver is 12V, the power plug output is 12V, too. If the interface specifications or power supply voltage do not match your image transmission receiver, you need some additional hardware like a step-up or step-down regulator to connect them.

Finally, connect your monitor to the yellow RCA terminal of the AATDriver to view the video signal.

3).Preliminary system test

➢ Power on the AATDriver with 12V DC. The red LED and yellow LED on the AATDriver will flash for several times and then go out. Flashing 5 times means the data output of the AATDriver is currently in MFD mode and flashing 2 times means it is in VGPS mode. The meaning of the two modes will be explained in the following chapter "Advanced Use".

➢ The tracker plays a "Beep" sound after power-on. The antenna handler turns to an elevation of 30 degrees, and the red LED (offline indicator) on the tracker flashes continually. That means the tracker is ready. The power indicator of the image transmission receiver on the tracker should also turn on.

➢ Press the TEST button on the AATDriver. The red LED on the AATDriver will turn on to indicate it is in TEST mode. If the tracker works normally, you will see the tracker turn as per the following parameters by pressing the TEST button in turn:

TEST sequence #	Azimuth	Tilt
1	0 (North)	0
2	90 (East)	30
3	180 (South)	0
4	270 (West)	60
5	(Quit test mode)	(Quit test mode)

It is recommended to conduct the above system test once before flight to ensure the tracker and driver hardware and software work properly. But remember to exit test mode before taking off, or the tracker will not start to track.

➢ Power on the TeleFlyOSD and image transmission transmitter. The red LED on the TeleFlyOSD should start to flash after turning on for a few seconds. If the video transmitter/receiver channels match with each other and the data link is good, the red RX LED on the AATDriver will flash continually. Every time a valid packet is received, the Red LED flashes.

➢ Press and hold the SetHome button on the TeleFlyOSD. If the communication is good, the tracker will play a "Beep..." continuous sound for as long as you hold the button, indicating that the "Home" position coordinates have been successfully set. On releasing the button, if the GPS does not lock more than three satellites at the moment, the tracker will play a rapid "Beep...Beep...Beep..." warning sound. If that happens, give the gps some time to acquire more satellites and try again.

➢ If the above test steps are passed through normally, it indicates the system connection and configuration are correct and you can start conducting flight tests outside.

5. How to use the AAT

➢ Power on all equipments and use the test button on the AAT Driver to check the tracker. Check to ensure the four pointing directions are basically correct and the red RX LED on the AATDriver flashes continually.

➢ It takes time for the GPS to search satellites. Wait for a while and check the GPS status according to the flashing frequency of the yellow LED on the AAT Driver. The higher the frequency, the better the GPS status. In the best condition, the yellow LED will stay lit. Check to ensure a good GPS positioning status before the next step.

➢ Place the plane as close as possible to the tracker and press the SetHome button on the TeleFlyOSD module for about three seconds. The tracker will play a "Beep..." sound, indicating the current position has been set as "Home". At the same time, the red LED on the tracker starts to flash, and the antenna should pitch up to a 30 degree angle. That means the tracker is in Stand-By for tracking.

➢ You can manually spin the tracker towards the take-off direction while it is in the standby mode to ensure the best angle of signal reception in the take-off phase, because the tracker won't start tracking unless the plane is 10 meters away.

➢ Take off your plane now. Once the plane leaves the tracker 10 meters away, the red LED on the tracker turns off and the tracker immediately starts tracking (the tracker will not stop tracking even if the plane flies back to within 10 meters).

Notes:
■ Before take-off make sure the AATDriver is not in test mode (the red RX LED on the AATDriver will stay lit in Test mode) and that the tracker is not in Offline mode (the red Off-Line LED on the tracker will stay lit in Offline mode). In both of these special conditions, the tracker will not track the target.

■ If the downlink is broken or the GPS is in a very bad status after SetHome, the tracker will play the "Beep...Beep..." sound and the red LED blinks, warning you that the tracking capability has been lost. In this situation, you can spin the tracker by hand towards the proper direction if necessary (pitch angle will maintain the angle before loss of signal). The system will automatically resume tracking as soon as there is a valid signal again.

6. Advanced Usage

➤ Setup and operation of the tracker

There are 3 LED indicators and buttons on the right side of the tracker. From left to right, the buttons (LEDs) are:

Off-Line (Red)	North (Yellow)	Cal. (Green)

Common functions and operations of the tracker:

Function	How to operate	Remark
Enter/Quit offline mode	Press the Off-Line button	In offline mode the tracker stops tracking. You can manually turn the tracker in the direction you need. You can press the "Off-Line" button to enter the offline mode. The red light will be on to indicate the tracker is in offline mode. Press the "Off-Line" button again to quit the offline mode.
Hard iron calibration	1.Enter offline mode 2.Then press the Cal. button, 3.Quit offline mode.	Enter Offline Mode, Press the "Cal." Button once, the green LED will light after 2 seconds. The tracker starts to rotate automatically to calibrate itself. Please wait until the green light is off, which means the calibration is done. The tracker will stay in a random direction after calibration.
Reset to factory default	1.Enter offline mode, 2.Press the Cal. Button 3. Then press the North button immediately within 2 seconds	The green light of the tracker will flash 5 times at the same time, which indicates that the tracker resets to the factory default settings and all the calibration data is cleared. CAUTION: If you don't press North button within 2 seconds after pressing CAL. button, the tracker will start to execute the hard iron calibration.

Description of the tracker LED indicators:

Indicator	Status	Meaning
Off-Line (Red Light)	Off	The tracker is tracking.
	On	The tracker is in off-line mode.
	Flashing	The tracker stands by. If you have set home position, the tracker will start to track once the target moves 10 meters away.
North (Yellow Light)	Flashing	The tracker is executing the North calibration.
CAL. (Green Light)	On	The tracker is executing the hard iron calibration.

➢ How to use the auxiliary channels of the tracker

There is 1 auxiliary channel available in a 6-channel tracker and 7 auxiliary channels are available in the 12-channel version. Users can use these auxiliary channels to transmit their own signals. For example, you put a data radio on the tracker, so maybe you need to connect the TX, RX, Power and GND from the data radio to your ground device. Use the auxiliary channels so that you can transmit the data without obstructing the tracker to rotate continuously.

To use these auxiliary channels you need to remove the left side panel. These pictures show how to remove the panel step by step:
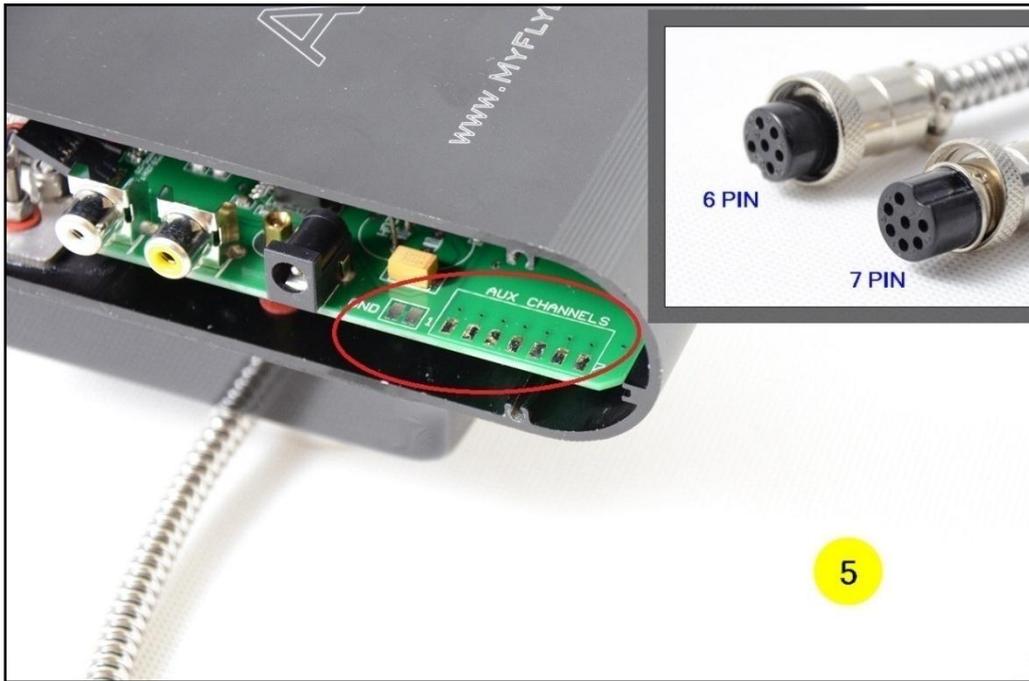
After removing the left panel you will see there are 7 soldering pad on the PCB. They are numbered from 1 to 7.

A 6 channels tracker has only a 6 pin plug. The Aux Channel 1 maps to PIN#3 of the plug.

A 12 channels tracker has two plugs, one 6Pin, one 7Pin. The 6Pin plug is used to connect to AATDriver. PIN#3 of the 6 pin plug is a null pin. The Aux Channel 1 to 7 map to PIN#1 to PIN#7 of the 7pin plug.

CAUTION: The maximum current allowed for each channel is 2A. Don't exceed this limit or the slip ring will be damaged.

➢ Setup and operation of the AATDriver

Common functions and operations of the AATDriver:

Function	How to operate	Remark
Toggle between MFD mode and VGPS mode	Hold down the HOME button to power on	After powering on, the yellow LED or the red LED of AATDriver will flash rapidly. The flashing of the yellow LED indicates that the current mode is VGPS mode, the flashing red one indicates the MFD mode. Power off and then power on again, AATDriver will start working in the new mode. Every time you power on while pressing the HOME button, AATDriver will toggle between the two modes Every time you power on without pressing

		the HOME button, the yellow and the red lights of AATDriver will blink several times. 2 times means the tracker is currently in VGPS mode, 5 times in MFD mode.
Set the origin coordinate for tracking	Press the Home button	The current location of the aircraft will be recorded as the home coordinates. The tracker needs a Home position set to track.

Description of the AATDriver LED indicators:

Data mode	LED Behaviour	Remark
RX (Red Light)	Off	No data received.
	On	It is currently in test mode.
	Flashing	Downlink data is received successfully .
GPS (Yellow Light)	Off	GPS lock has not been obtained.
	On	GPS is in a perfect status. (10 or more satellites are locked)
	Flashing	Indicating GPS status. The faster the LED is flashing, the more satellites are locked. The relationship between the frequency and the number of locked satellites is as follows: 0.5HZ: 1 ~ 3 satellites 1HZ: 4 ~ 5 satellites 2HZ: 6 ~ 7 satellites 5HZ: 8 ~ 9 satellites

➢ AAT Calibration procedure

If you are not satisfied with the tracking precision, please calibrate the tracker follow the next steps.

Step	How to operate
1. **Reset to factory default**	◆Power on the tracker. ◆Press Off-line button to enter off-line mode. ◆Press Cal. button, then press North button within 2 seconds. The tracker is reset to default now. ◆Press Off-line button to quit off-line mode.
2. **Calibrating the middle point of the PAN servo**	◆Press the "TEST" button on the AATDriver, The tracker will now point to NORTH. (red led on AAT driver goes to solid red). ◆Now press the "HOME" button on the AATDriver once, the tracker will "Beep". Press the "HOME" button again and again, the tracker will rotate faster and faster or slower and slower. ◆When the rotating stops, STOP pressing the "HOME" button. You have found the "Middle-point" of the pan servo. ◆When you found the "Middle-point" position then press the "TEST" button for 4 times until the "RED LED" on AATDriver goes

	off. Pan servo calibration result is saved **NOTE:** *If you press the "HOME" button too fast, you may accidently miss the "middle-point". Just press the "HOME" button again and again, this procedure will loop again.*
3. **Hard Iron Calibration**	◆Press Off-line button to enter off-line mode. ◆Press Cal. button and wait. ◆The tracker will start to rotate for a while. ◆When the tracker stops rotating, press off-line button to quit off-line mode. The calibration result is saved.

*TRIM Mode

Usually we don't suggest to use this feature, but you can try it if you are still not satisfied with the tracking performance. This feature is used to trim the tracker to left or right if the tracker is not facing the plane correctly.

Procedure:

1. Hold the "CAL." Button on the Tracker while powering on, after powering on release the "CAL." Button.   You have now enabled TRIM mode.

2. During flight press "North" Or "CAL." button to trim left or right until tracker is facing the plane correctly.

Trimming is also possible in TEST mode. You can use TEST button to made the tracker face to north, then user "NORTH" or "CAL." button to trim it until it points to north exactly.

3. Enter Off-line mode then quit off-line mode to save the trim result.

➢ Connect AATDriver to external devices

The AATDriver has a built-in Bluetooth module. Using Bluetooth you can connect your laptop or mobile devices to the AATDriver to view and record the real-time flight data. The Bluetooth password is set to "1234".

The AATDriver has two data output modes: MFD mode and VGPS mode.

Data mode	Baudrate	Remark
MFD	1200bps	The AATDriver outputs data to external device with 5HZ rate in MFD mode. MFD protocol contains more information about the plane than VGPS mode. You can use the ground station software provided by MyFlyDream to check the data. Currently it runs on the J2ME platform (need JSR82 support). The android version is also coming soon.
VGPS	1200bps	The AATDriver outputs data in GPS format (only $GPGGA and $GPRMC sentence, a subset of the NMEA 0813protocol). You can check the plane's track and

		coordinates with a variety of navigation or GPS software. VGPS mode has better compatibility with most hardware and software.

- View flight information with your iPad:
  1. You must jailbreak your iPad to connect to the AATDriver.
  2. Install the MotionX HD software.
  3. Install the BTStack GPS software and connect to the AATDriver after it has been detected (make sure the AATDriver is in VGPS mode). The connection password is 1234. The BTStack GPS should be able to correctly read coordinates from the AATDriver.
  4. Press the "HOME" key on iPad and then run the MotionX HD to check and record the flight path data of the plane.
     - The Android system has software similar to BTStackGPS to help connect your cellphone to external Bluetooth GPS, e.g., BluetoothGps.
     - Here are some screenshots of the MotionX running on the iPad:

- View flight information with the ground station software FDStation of the J2ME:
  FDStation is a J2ME program. Your cellphone must be compatible with CLDC 1.1 and MIDP 2.0, and also support the Bluetooth API (JSR 82) to run it.
  The FDStation software can be downloaded from:
  http://www.myflydream.com/Help1.aspx

  After installing and running the software, search for the AATDriver and use 1234 as password to establish a connection.

  Here are some screenshots of the FDStation software:

DataView :
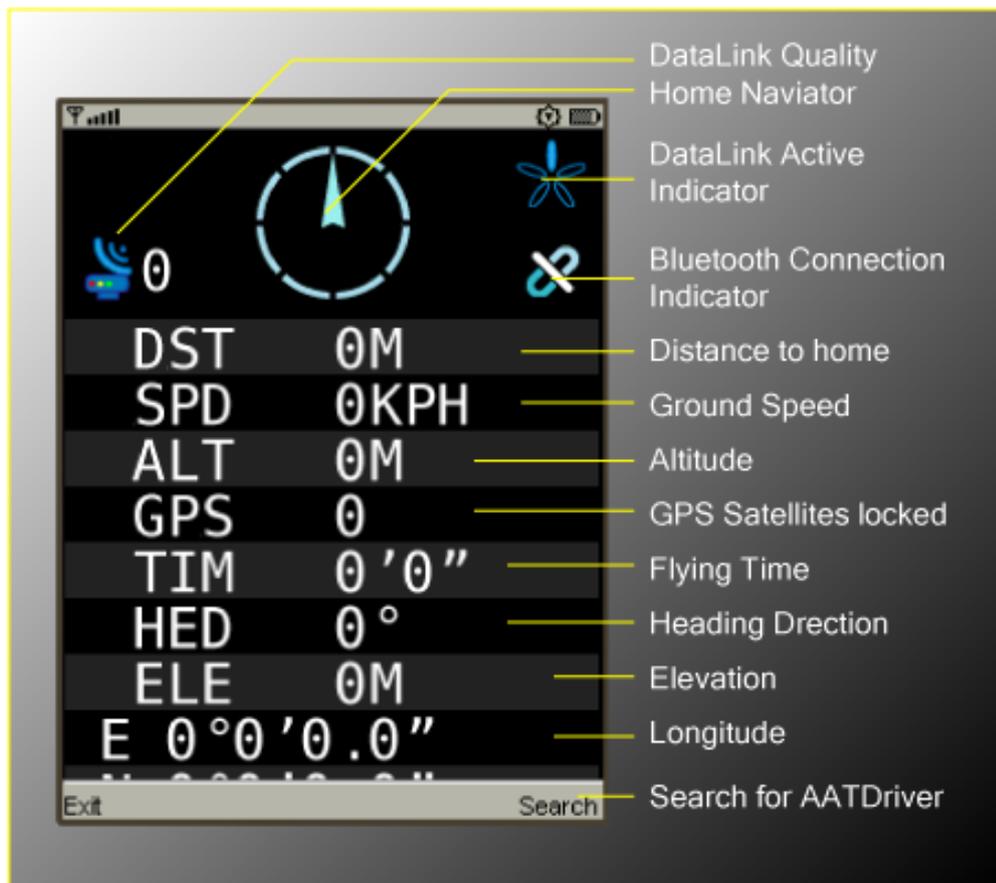
PathView:
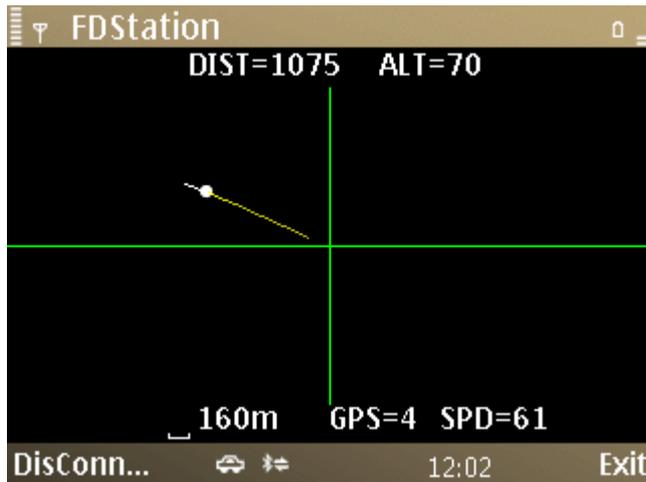
Keys definition of the FDStation software:

- Left: Toggle between DataView and PathView
- Right: Rotate the screen 90 degrees in DataView
- Up/Down:
  Scroll the screen in DataView mode
  Zoom in/Zoom out in PathView mode

7. OSD Functions

The TeleFlyOSD provides OSD functions that can overlay the flight information on the video picture. See "Connection Diagram A" in Chapter 4 for specific connection information.

The three pinouts of the OSD video signal interface (part No. 2) in the following picture are defined as follows:

A (Video In)	B (GND)	C (Video Out)
Video input (Connected to the camera)	Ground	Video output (Connected to the AV Transmitter)
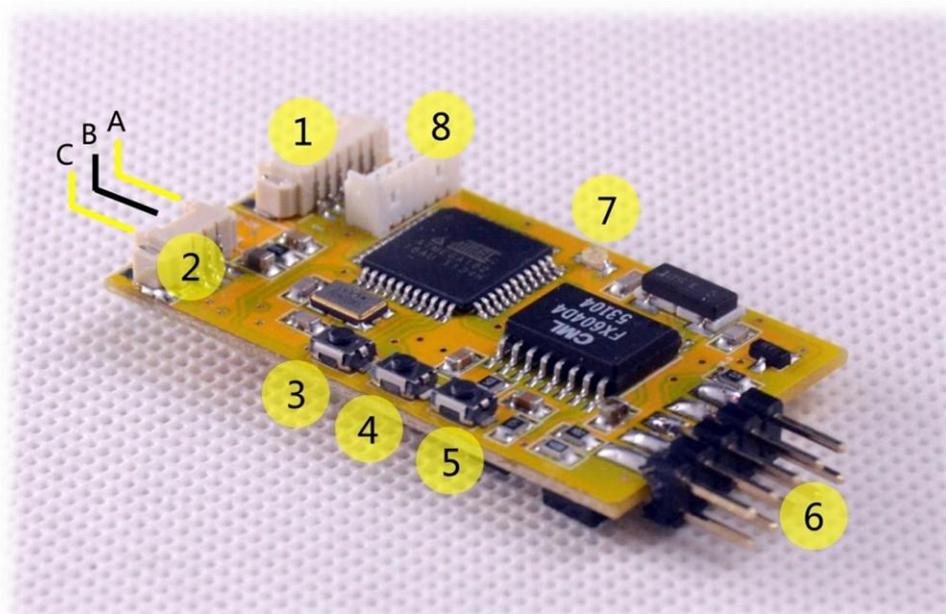
Purpose of the three buttons numbered 3, 4 and 5 in the picture:

Part #	Name	Remark
3	UP Button	Select the previous item
4	SET Button	Enter a menu list，Or change the current item
5	DOWN Button	Select the next item

If the system is connected properly, you can see the following pictures on the video monitor after the TeleFlyOSD is started.
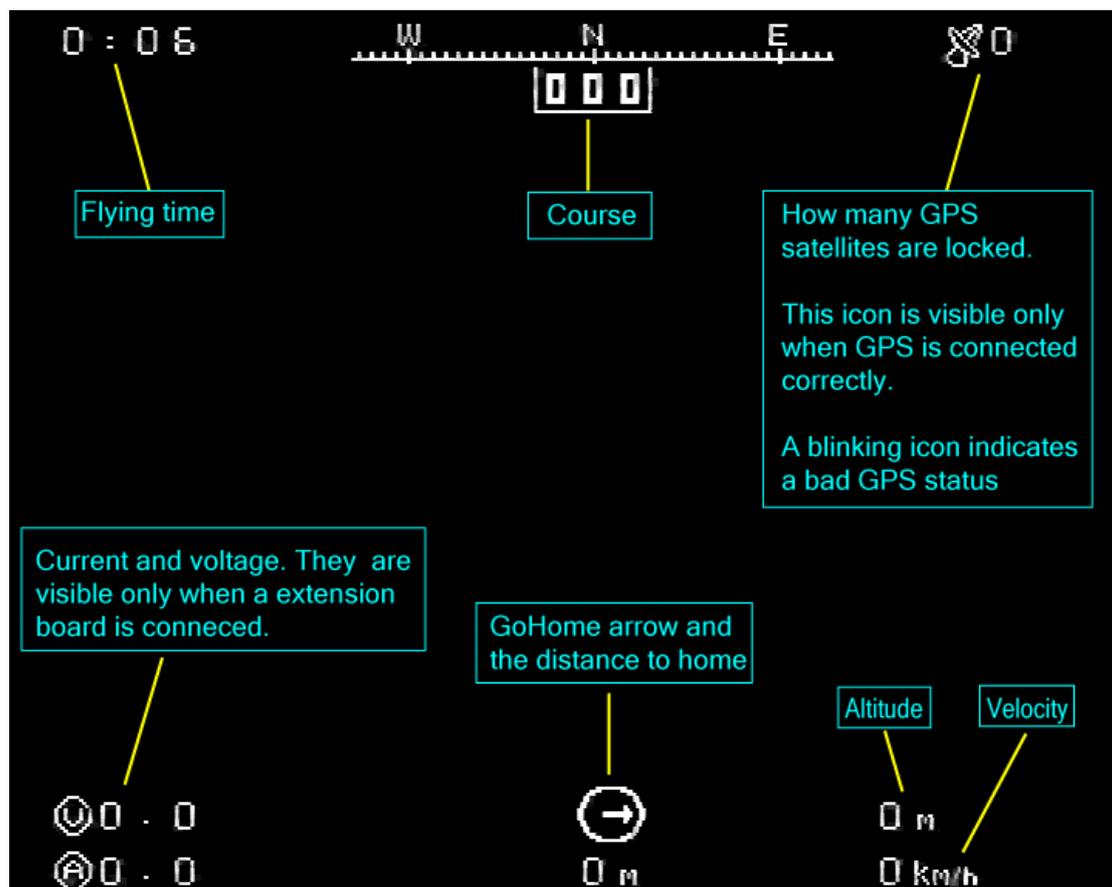
The reading meaning of various parts in the picture has been marked.
Each time you press the "SetHome" button, the flying time is reset to 0.
Before you press the "SetHome" button, the distance to home is not available and displayed as N.A.

By pressing "UP" and "DOWN" you can loop through the following display presets:

GPS view   - Longitude and Latitude and height of both plane and tracker
                    - number of fixed satellites
Null view   - OSD Display OFF
Normal view - The normal OSD Display as shown above

By pressing the "SET" switch, you can enter the following interface of system options:
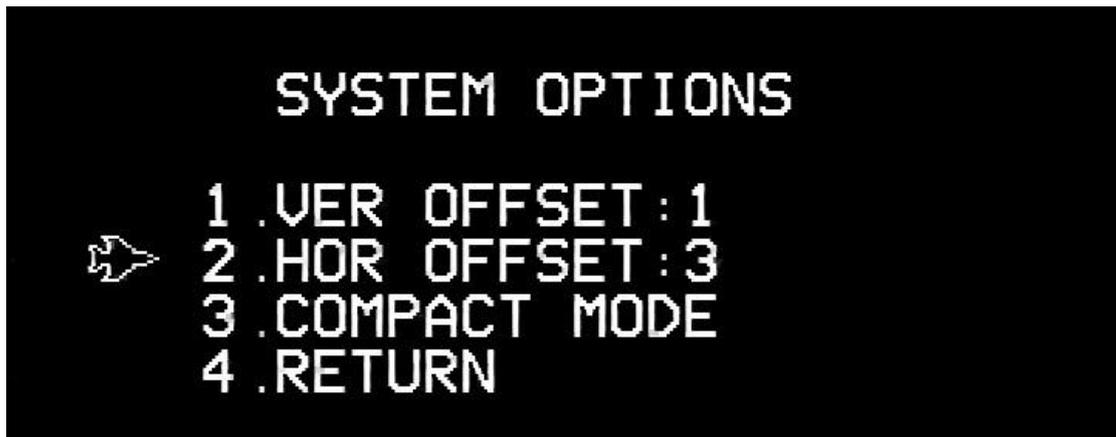
To change options, use the "UP" and "DOWN" buttons to move the marker to the appropriate option and press the "SET" button.

This is a screenshot of a real flight:

Options menu:

Item	Remark
VER OFFSET	Press the SET button repeatedly, and VER OFFSE value will vary between -16 to 15, the whole OSD screen picture moves the corresponding pixels in the vertical direction.
HOR OFFSET	Press the SET button repeatedly, and HOR OFFSE value will vary between -16 to 15, the whole OSD screen picture moves the corresponding pixels in the horizontal direction.
COMPACT MODE	Press the SET button to enable or disable the COMPACT MODE. The OSD picture will occupy one less row in COMPACT mode. Enable this option if your monitor is not able to display the whole OSD picture.

8. FAQ

1). Q: When do I need to make the hard iron calibration?

A: When you change the equipment used on the tracker (Rx, antenna), or feel the accuracy of the tracker is not ideal, you may try to make a hard iron calibration. This is simple, fast, and can be cancelled at any time by restoring the factory settings. If you know some principles of the hard iron calibration, it will help you better use this feature.

You may already know that the tracker relies on the internal electronic compass to determine its own direction so as to align the azimuth of the plane. The intensity of the earth magnetic field is very weak and varies dependent on the region, which is generally about 0.6 gauss. The various electronic devices and ferromagnetic substances in the tracker may generate magnetic fields sufficient to affect the accuracy of the tracker, e.g., the steering gear and built-in motor using permanent magnet. Magnetic fields generated by the load users apply on the tracker, e.g., image transmission receiver and panel antenna, may also affect the accuracy of the tracker.

In the process of hard iron calibration, the tracker spins and analyzes the intensity of the magnetic field around the sensor. Because the steering gear or the electronic circuit generates different magnetic field and geomagnetic field, and they spin with the sensor, we have ways to separate the parameters disturbing the magnetic field in the spinning process to compensate the future sensor data and obtain better tracking accuracy. So whenever you add a device to the tracker, it is necessary to make a hard iron calibration.

You may see from the above that some magnetic interference cannot be corrected even by the hard iron calibration. For example, if there is a ferromagnetic substance on the tripod. Since it does not spin with the tracker, the tracker will always regard the magnetic field it

generates as a part of the geomagnetic field in the calculation. So try to keep away any ferromagnetic objects since they might adversely affect the trackers accuracy
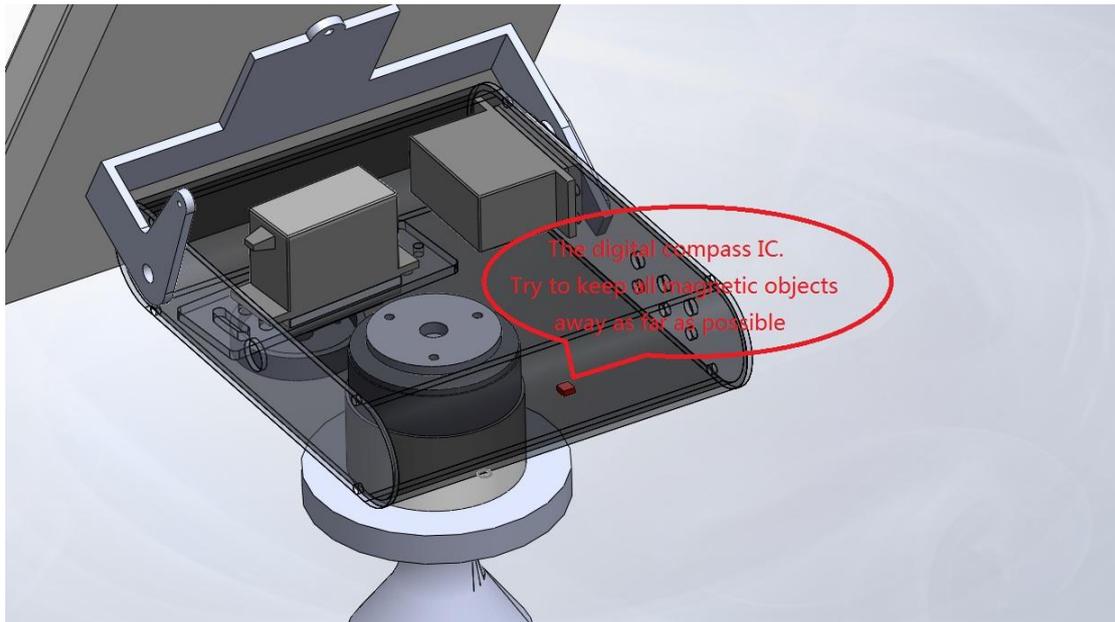
2). Q: How to make the data downlink more reliable?

A: MFD AAT uses the audio channels to transmit data. A clean noise-free audio channel with appropriate level can make the data transmission more reliable. It is suggested the peak-to-peak value of audio output level of the video transmission receiver should be preferably within 0.8~2V. If there is a microphone and amplifier circuit attached to the transmitter, you need to remove them to get the best results.

➢ Some VideoTXs has a build-in microphone circuit. For example the below 5.8G VideoTX:
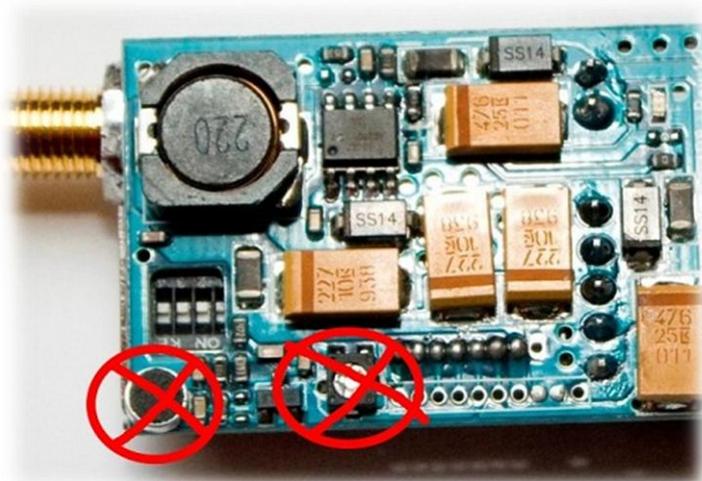
The microphone and potentiometer in the red circles must be removed to get a clean audio channel.

➢ Especially the lawmate 1.2G 100mw VTX has audio problem. It is not able to transmit the audio signal clearly. User need to solder 22~45pf capacitor to fix this issue. the added capacitor should be connected in parallel with the green component beside the red arrow, as the below picture shown.

22~45pf capacitor
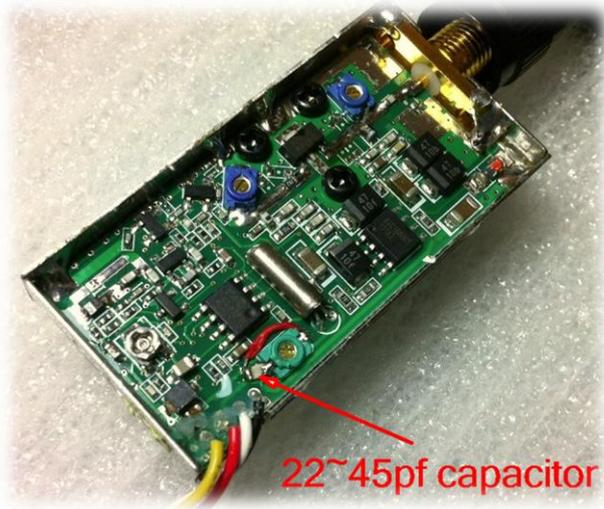
8. Related Resources

- MyFlyDream website: www.MyFlyDream.com
- The Post discussing the tracker on RCGroups.com:
  http://www.rcgroups.com/forums/showthread.php?t=1159128
- Tracking demo video of the tracker:
  http://vimeo.com/36695133
  http://www.youtube.com/watch?v=HKCc3vOvqzg

Appendix A: Pins and Functions of TeleFlyOSD

There are two rows of pins spacing 2.54mm (0.1inch) at one end of the TeleFlyOSD.
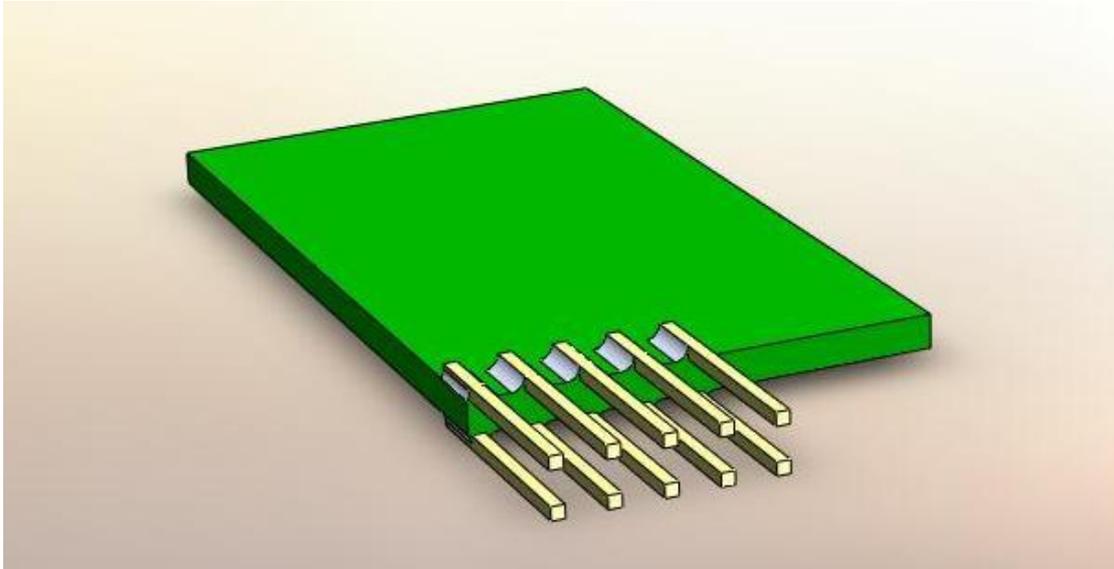
The pins are numbered as follows:
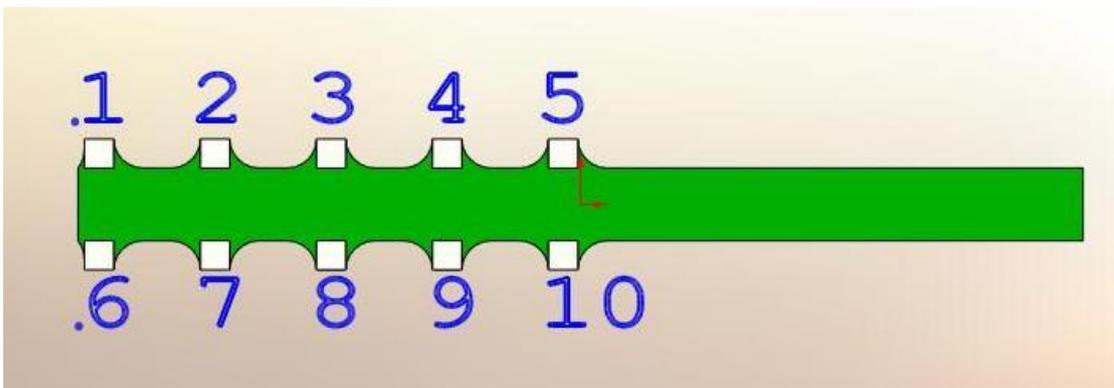
PIN #	Color of the Wire	Name	Remark
1	White	Audio output	Connect to the audio input of the AV transmitter
2	Black	GND	Connect to negative pole of the battery
3	Black	GND	Connect to negative pole of the battery
4	Yellow	Video output	OSD video output.
5	N/A	Null	Used to avoid a misconnect.
6	Red	Power supply	Connect to 6~13V DC power
7	Blue	SetHome	Connect to the SetHome Switch
8	Black	GND	Connect to negative pole of the battery

9	Orange	3.3V output	Used to supply power to a 5V GPS.
10	Green	Data Input	Connect to the GPS data output

Appendix B: Connection Diagram of Some Common GPS Modules

➢ **LS20033**

PIN#	Name	Description
1	VCC	3.3V Power input
2	GND	Ground
3	TX	Data output (TTL level)
4		
5		
6	VBackup	Backup battery supply voltage

● **Connection Diagram**
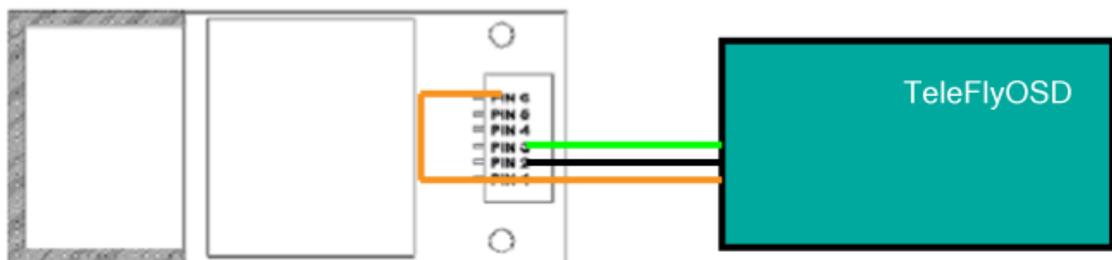
CAUTION: GPS PIN#1 and PIN#6 MUST be connected to +3.3V. This GPS doesn't work without PIN#6 connecting to VCC.

● **Current Consumption : < 70ma**

Appendix C: TeleFlyOSD Firmware Update Steps

- Download programs and firmware packages required for update from
http://myflydream.com/Help1.aspx
- Connect the USB programmer to the update socket of the TeleFlyOSD:
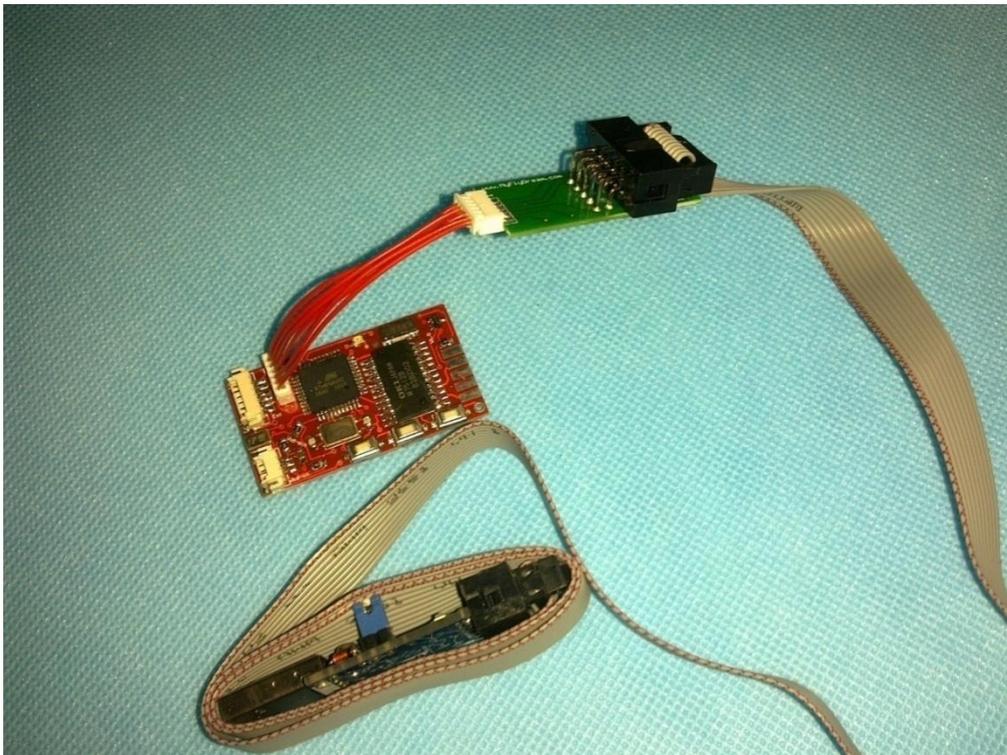
- Run this file: 轩微编程器控制平台.exe (Do not try to rename the file, it won´t work afterwards)
- Insert the USB programmer into the computer and wait for the driver to automatically update. Please allow the appropriate permissions of the firewall.
After the driver is successfully installed, you can see the program interface change from gray to coloured.

➤ Click the LoadProject button to open the firmware to be updated, e.g., TeleFlyOSD_v1_1.xwpprj.
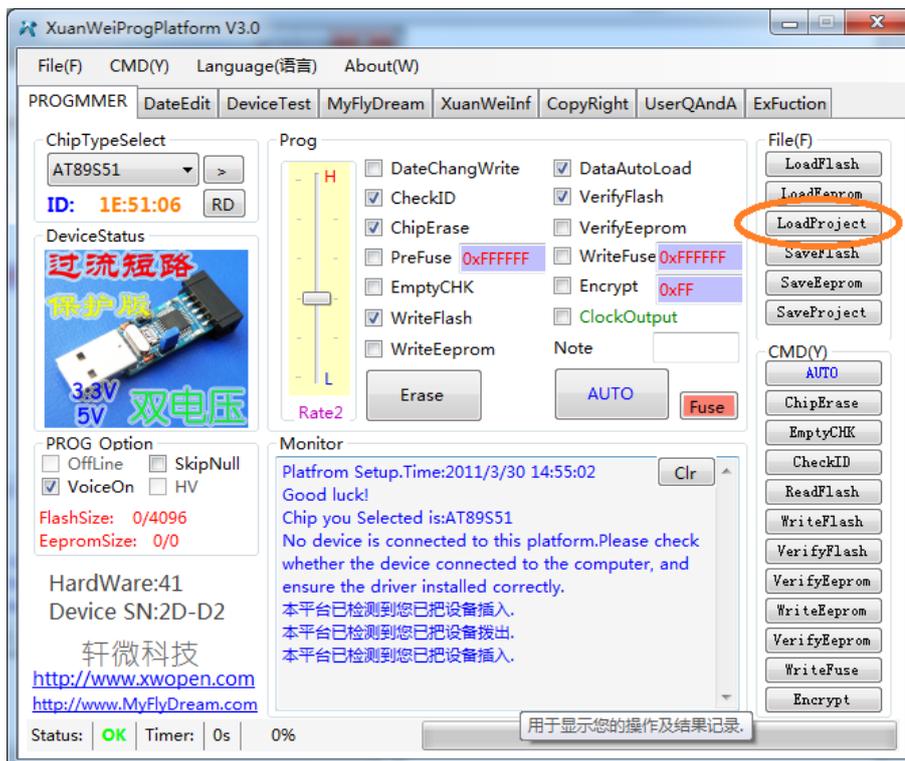
➢ Click the "AUTO" button and wait for about 20 seconds until the update is done.