



Arkbird 2.0 & LITE Autopilot Update Contents

2.0 Autopilot has two CPUs which have to be updated separately.

The upper CPU can be updated directly with provided file .

But you have to send back the lower CPU 's ID for registration. Once registered, you can directly update your autopilot with provided file form in the document next time. **Lower CPU V1.1xxx.hex**

LITE Autopilot has only one CPU comparing to the 2.0, but shares the same update file and methods , you should send back the ID and then use the hex same as 2.0's lower one.

Please feel free to contact us by send an email to us Arkbird@foxmail.com or follow us with our facebook account "[Arkbird FPV](#)", if you have any question or suggestion. Thanks for supporting!

Demonstration of Arkbird VTOL Mode:

<https://www.youtube.com/watch?v=uQibL09skJ8>



Arkbird Vertical Take-off and Landing Airplane (VTOL)

Arkbird VTOL airplane is a unique fpv fixed wing plane with vertical taken off and landing function, perfectly compatible with Arkbird autopilot 2.0 and 2.0 lite, including balance mode, fence mode, return home mode, VTOL mode and other wonderful Arkbird autopilot modes. It is also a unique fixed wings FPV plane with quads characteristics in the FPV field.

Features:

860mm wingspan, suitable size to carry without disassembly;

25 minutes of 45km per hour speed in horizontal flight; Balance mode, return home mode, fence mode, VTOL mode and other typical Arkbird typical modes are changeable during flight;

8 minutes of VTOL mode, similar control skill as quads.

One button switch between level flight and VTOL mode, intelligent PID controller;

Camera keeps horizontal during status switching;

Arkbird patent protection design.

V3.3028 Update Instructions (Lower CPU update, Upper CPU is compatible with old versions.)

1. For adding a serial port to SBUS protocol analysis support, please pay attention that the electrical level of SBUS protocol is opposite to the common serial port. **A SBUS inverter is needed when switching from one to the other.**
2. Connect the SBUS serial port to the autopilot RX port through the SBUS inverter. The autopilot will automatically recognize the SBUS signal within 3 seconds, and will show an "S" at the original RSSI position on the OSD. If your receiver support RSSI voltage, please connect RSSI voltage (0-3.3V) to the AR port of autopilot, enter OSD menu and set "RSSI PORT Vol."ON". Then the OSD will show AR port voltage of 0-3.3V.



3. Optimized RTH angle control, when Roll angle is over 50%, the pitch angle will decrease to 50% at first, that means the plane will turn direction at first and then climb up. Through this optimization, will be reduced the probability of a big heavy-loaded planes to spiral stall when you apply roll and pitch at the same time.
4. Also, if **the distance to home is less then 250m, and the RTH mode has been engaged for over 2 minutes, the throttle will decrease slowly and continuously until it becomes 0.** This is for avoiding the receiver to power down, wiring disconnection, circling on head until power off, resulting in an uncontrolled crash for lack of battery power.

NOTE: Since Futuba's SBUS has many types of protocols, (some "end bytes" are 0x00 and some are 0x04 0x14 0x24 0x34 circulation), could happen that you'll find some incompatibility issues after connecting the SBUS inverter and cannot be recognized automatically. If that's the case, please add our QQ group 19329609 or contact Arkbird@foxmail.com for getting proper assistance.

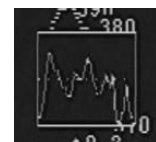
At the same time, Arkbird 433 receiver updated the function of output SBUS mode signal through serial port. Arkbird 433 receiver has been updated to the newest version, after connecting the SBUS inverter, it can connect with other types of SBUS controllers.



V1.3026 Update Instructions: Update both of the upper and lower CPUs.

PS: Arkbird 2.0 must update both the lower and upper CPUs at the same time. Optimized many pixel level animation, please refer to demonstration files.

1. Optimized launch-assist trigger mechanism. Altitude within 20m, it will be triggered previously, but now the launch-assist function must be changed to static then it can be started for avoiding false triggering.
2. Fixed some bugs related to 3D plane interface and Radar mode not displaying properly when flying into south direction.
3. OSD menu "Data Diagram" option can be chosen "Off", "Altitude", "Speed" or "RSSI", after chosen, the data diagram will be shown on the right top of OSD.



"Data Diagram" X-coordinate changes from 30 seconds to 15 seconds; When showing "Speed", "RSSI" and "Altitude", the Y-coordinate unit changes to 100 (for avoiding fast climbing over range).

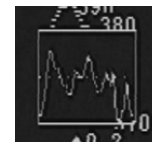
V1.3024 Update Instructions: Update both of the upper and lower CPUs.

1. Adding "Fighter 3D" and "Default 3D" options in the "OSD Pattern" option. The airplane attitudes will be shown as 3D animation.(See picture)

(You may choose 8 airplane 3D models in "RadarPlane" )



2. "Data Diagram" function was optimized when you choose "Altitude", which is for avoiding



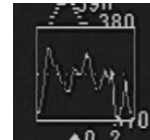
the graph be shown incompletely when the altitude rise accidentally.

3. In the CTL menu, the "Custom mode" can be selected as newly added "Semi-Balance Mode".
When the CH1 and CH2 of rocker is less than 50%, the plane is in Balance Mode. When the rocker is more than 50%, the plane is in Gyro Mode.
This function allows you making a turn with a large dip angle, even vertical rise and roll or other actions. After finished these actions, you only need to move the stick of radio to the center to make the plane back.

V1.3023 upgrade instruction(Upgrade both upper and lower CPU, only for 2.0 OSD interface optimized, 2.0 Lite no need to upgrade.)

Pay attention!! When using this firmware, 2.0 flight controller must be upgraded both upper and lower CPU at the same time. The new firmware adds many animation effects, for any advice or suggestions about the interface, kindly please send e-mail to: arkbird@foxmail.com



1. Added "Data Diagram" option in OSD menu, you may choose "OFF", "Altitude", "Speed" or "RSSI". once opened it, the diagram will be shown as a picture on top right of OSD, the x-coordinate is 30 seconds, the y-coordinate unit is 100 while showing "speed" and "RSSI"

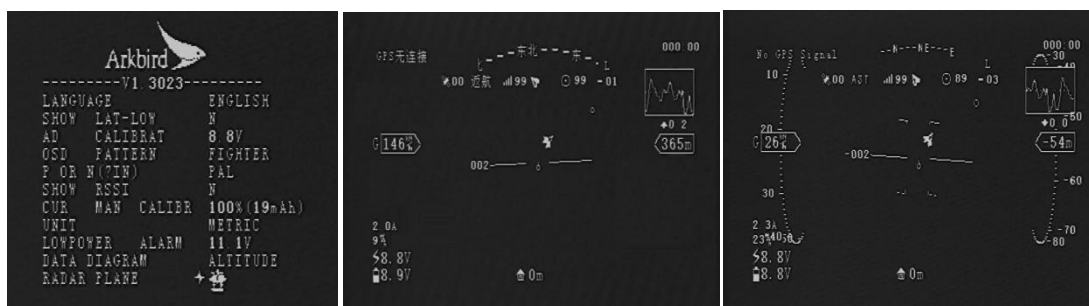


and 50 while showing "altitude". (Speed is GPS ground velocity.)

2. Added "Radar plane types" option in OSD menu, the radar mode plane is no longer marked as an arrow, it can be shown as 8 kinds of plane models as following pictures and 3 sizes are provided.



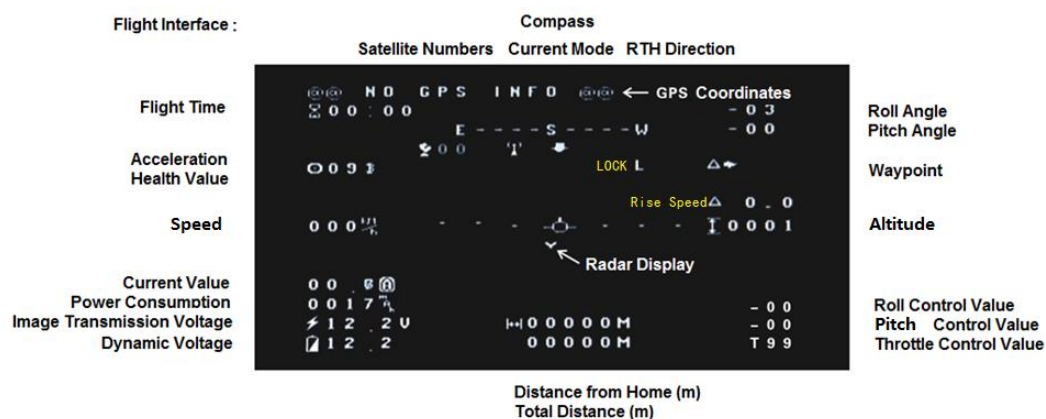
3. When radar mode showing waypoints, the circle icon will change into animation effect.
4. When using data transmission "Formation Flight" function, the opposite plane position will be shown as  and fast flashing in radar coordinate.
5. "Return to Home" mark is changed from circle icon to 3D arrow carton icon as .
6. Fighter interface marking line has been shorten and close up to both sides. Also the horizon line has been shorten to 2/3 for increasing display space.
7. The character strings such as "km/h", "mil/h", "mah" etc. will be shown as icons for decreasing space.
8. The frames at speed and altitude positions will be shorted and changed into cusp.
9. The common interface add frame icons.
10. The power on interface add cartons, and the searching interface add pixel animation effect.



V1.3021 Updated Content (Update of lower CPU only)

1. Simplified Autopilot 2.0 Lite's OSD parameters in VTOL mode, debug parameter values are removed, such as the input and output rudder amount etc., and only left the unlocking mark (after unlock, the throttle status will change from "L" to "O" on the OSD, which is showed under the lower line of A99 signal) and rise speed, which is indicated as ↑ 0.0, shown on the upper line of the altitude.

2. Regards to users' feedback, DragonLink PPM output is delayed for a short time when power on, while Arkbird autopilot will detect PPM port immediately, the time difference caused PPM identification and PPM function lose efficiency. This updated firmware delays 2 seconds to identify PPM for compatible with 433MHz with slow speed. (For any other compatible question please contact us).



V1.3020 Updates Contents (For Arkbird OSD Autopilot 2.0 only, both upper CPU and lower CPU need to be updated)

1. Firmware of V1.3020 keeps same function of V1.3016, which only add OSD setting of Arkbird Autopilot 2.0 for quads and bi-motor fly wing plane, users of 2.0 Lite don't need this firmware.

Attention: Both upper CPU and lower CPU need to be updated together, otherwise you may face firmware compatible issue.

V1.3016 Updates Contents (Update of lower CPU only)

1. Optimizing the control status of vertical mode.

V1.3015 Updates Contents (Default parameter is suitable for Arkbird VTOL Plane)

1. Optimizing the control precision of 45 degrees angel when it is VTOL mode.
2. Optimizing the altitude control method, adding the set of maximum decelerate, throttle adjustment, torque adjustment and other customized parameters for VTOL mode. **Please adjust parameter for any DIY VTOL planes but use default parameter for official Arkbird VTOL plane.**
3. Adding selection of **"Quadcopter/VTOL Plane"** in the OSD mainmenu;
4. Followed is OSD menu when MIX is BIMOFW(BImoto-flywing):



PWM Frequency	“PWM Frequency” Maximum of PWM frequency output speed is 320hz, which is suitable for high speed BEC, (Only affect VTOL mode and Quadcopter)
Motor Toque	During VTOL mode, motors toque caused by difference motors speed needs adjusted by aileron, Please increase this value if there exist torque when control channel 1 to make movement.
Airfoil	Airfoil will adjust the imbalance during VTOL mode and balance mode. Switch to balance mode before gets a stable vertical mode flight, then increase this value if plane’s nose up, otherwise decrease this value.
ReduT-agl2	Throttle will be decreased when plane pushed forward, Please increase this value if throttle is too much when you push CH2 to make plane go forward during VTOL mode,
ReduT-mode	Throttle will be quickly decreased when plane switch to VTOL mode, Please increase this value if plane suddenly up rush. Please decrease this value if plane decreasing when switch to VTOL mode
ACC-comp	Compensation parameters of speed accelerated, Please keep it default.
Alt-CTL	Increasing CTL value is able to make plane more altitude stable, but overlarge value will leads to the up and down plane vibration.
MAX Descend	Arkbird Autopilot will not decrease throttle when rate of descent over the MAX descend, but throttle will be automatically closed when throttle is less than 20%.

5. Quad copter mode and Quad copter mode X added in mix setting, Quads copter parameters set available. PS, Quads copter mode are in beta testing while recommended parameters are not available for the moment, Parameters for normal quads copter such as 450, 330 will be informed soon.



PWM Frequency	“PWM Frequency” Maximum of PWM frequency output speed is 3200hz, which is suitable for high speed BEC, which has influence on VTOL mode only.
Q Roll Kp	Parameter of Kp setting in Quads copter mode.
Q Roll Ki	Parameter of Ki setting in Quads copter mode.
Q Roll Kd	Parameter of Kd setting in Quads copter mode.
Q Ki Speed	Parameter of Ki speed setting in Quads copter mode.
Q Yaw Kd	Parameter of yaw control setting in Quads copter mode.
Q Altitude Ctl	Increasing CTL value is able to make plane more stable, while overlarge value will leads to the up and down plane vibration.
MAX Descend	Arkbird Autopilot will not decrease throttle when rate of descent over the MAX descend, while throttle will be automatically closed when throttle less than 20%.

V1.3010 Updates Contents (Update of lower CPU only)

1. Optimizing data precision of balance mode, vertical mode, and multiple circle rolling, improving performance of grand action, rolling action; increasing the precision value of balance flight.
2. New mode of “BimoFwing” for VTOL plane added in the mix menu. Both DIY fly wing plane and Arkbird VTOL plane are compatible with VTOL mode. For DIY fly wing, Switching to push bi-motor, increasing aileron surface, adjusting CTL value needed. Keep default for Arkbird-VTOL plane.

When CH5<50%, There is no manual mode but is hover mode.
The Autopilot will give 1500us PWM output when entering the OSD Menu, so , Adjust the servo 's midpoint when display OSD menu.

3. “Roll Trim” added in the CTL menu, which is able to adjust the different motors’ speeds under vertical mode, please change this value if your bi-motor plane exist imbalance which caused by different motors’ speed.

“Hover Yield” added in the CTL menu, default pitch angle of VTOL mode is 6 degree, which is able to adjust pitch angle of plane in VTOL mode. Please decrease this value when plane has elevation angle, increase this value if plane has depression angle.

4. For mixed of bi-motors fly wing plane, servo under the camera needed to connect the CH7 out channel of Arkbird autopilot,. Arkbird autopilot will automatically keep a stable pitch angle of camera during the switching from vertical mode to level flight.



Friendly notice: It's better to take a VTOL mode flight test before go to normal flight. Unlocking method of VTOL mode as followed: (see below picture) Throttle will be unlocked and VTOL mode flight will be activated after the throttle status of “L” changed to “O” on the OSD.



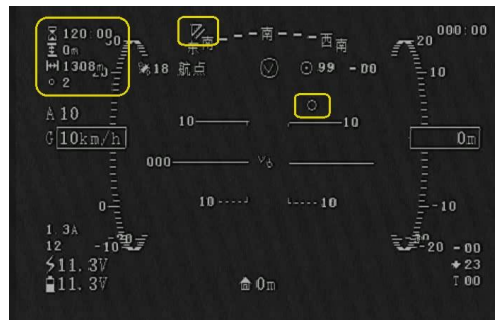
As to Arkbird OSD Autopilot 2.0 Lite, Adding more section of display the input value and output value for each channel; (Picture as followed.) As to Arkbird OSD Autopilot 2.0, OSD of VTOL temporarily not available, please artificially checking throttle status. (This issue will be quickly solved in the coming firmware.)

V1.2013 Updates contents

GCS (Ground Station System) interface, two planes' formation flight function (refer to the GCS and formation flight manual).

1.The OSD interface has changed also, the RTH point figure changed to an arrow, instead of a point line.

2.WayPoint mode interface



switch to waypoint mode , OSD's upper left will display: WayPoint Time, current coordinates to the waypoint Altitude , Distance, waypoint Number, the upper end of the compass will display the waypoint position (to the left or right up and down arrow) , radar coordinate system with small flashing a circle shows the location of the waypoint .

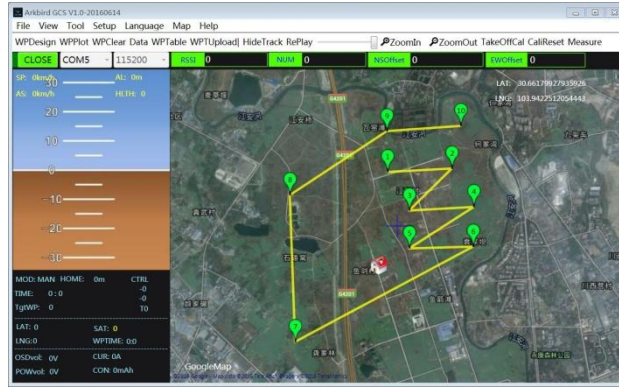
As for the connection of two-airplane formation, in radar coordinates flashing an arrow indicates the position of the other side airplane.

3.Exchange of Coordinates for Two Aircraft Formation



If two sets of Arkbird-OSD Autopilot are connected to Arkbird serial module interface, it can achieve the exchange of coordinates as the other's waypoint, OSD displays the position, tracking formation can be automatically done in switching the waypoint mode. (It cannot be simultaneously used with the ground station software)

It is recommended that firmware version of two Autopilots should be consistent for the avoidance of communication failure. Select "CustomMode" as "Waypoint", it will automatically fly by tracking the coordinates of the other aircraft in switching waypoint mode (CH5>50%, 30%<CH6<75%).



Arkbird GCS (Ground Control System) is a software specifically designed for Arkbird Autopilot, the aircraft flight can be monitored, controlled by computer, compatible to Arkbird 2.0 and Arkbird LITE Autopilot (it supports 50 waypoints, Note: Autopilot needs to be upgraded to 1.2010 or later firmware).

1. Portable suite, readily open after being downloaded, user-friendly;
2. Customized 433 serial module has the frequency hopping function(FHSS), 915 serial module has the forward error correction technique; with the design of plug and play, optimizing the compatibility with ground station program, free of all settings;
3. Two sets of Arkbird Autopilot access to serial module enable the exchange of position, achieve the formation flight, display the position and altitude of the other aircraft on OSD, automatically tracking flight;
4. Support the maps by several providers, including Google, Bing and Baidu Map, support the free saving of offline maps and free saving of zoom level in Frame Selected Area, with no need to worry that it is unusable in case of field operation with unavailable internet access.
5. Support the import and export of waypoint table;
6. Support multi-language.
7. Support the function of track replay;
8. Support the calibration of takeoff point, so that latitude/longitude deviation generated from different maps will be accurately matched by user's click.
9. Support the measuring function;
10. Allow for the setting of emergency point, multiple waypoint actions, Autopilot Channel 5, 6 can be used as waypoint actions.
11. Various action instructions can be immediately executed.
12. Reserve more upgrades.



V1.1023 Updates contents

1. In the CTL control parameters menu, the selection "Lock mode"(curse mode) is deleted , we use a custom mode selection of "Lock Direction & Height" instead of Lock Dir & Height during balance mode
2. In the CTL control parameters menu, the "Custom mode" can be selected as newly added "Lock Dir/Heg", "Lock Dir only ", "Lock Heg only", when selected ,switch Ch5>50%, CH6 to the middle section(30%-70%) and throttle CH3>20% will enable Lock mode, CH1 /CH4 back to center will start Lock Dir, CH2 back to center will start Lock Heg. Throttle down, stick not in center or swich CH5 / CH6 will exit this mode.

V1.1019 Updates contents

3. Bold the font for all the numbers , which makes the numbers and interface easier to be identified.
4. In the Menu "Flapmode" has new selection"OFF", which turns off the flap function and OSD data.
5. You can plug the airspeed sensor into paralleling "RX" port, which makes the "PPM", "RSSI" and "Airspeed" to 3 different ports.
6. Power consumed value's unit "mah" is hided.
7. In the "Default" interface, near the horizon line there will not be two 10°indecator lines。
8. When using PWM mode(connecting 1 to 7 channel separately), if you unplug the CH5 wire, you can use CH6 to switch the 3modes (Manul mode , balance mode, RTH mode)

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Contact us:

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