Thank you for purchasing Arkbird product. Before starting with the assembly of the VTOL plane, a few words regarding the new firmware of Autopilot 2.0 or LITE:

In vertical mode, newly developed settings are available to be customized including parameters adjustment, unlock function and OSD interface instruction. Please refer to "**Arkbird V3.3016 Update Contents**" or the latest upgrading files for more details. Please don't forget to install ESC with BEC or install another BEC 5v to supply power for the servos, because the autopilot does not supply power for them.

The upgraded firmware (V1.3016) will have an option called "BimoFwing" that needs to be chosen to use with Arkbird VTOL plane. The default control values are: 15, 12, 110.

In the BimoFwing option is set, the original "Manual Mode" will be replaced by "Hover Mode". This means that the plane will entry into "Hover Mode" when you select "Manual Mode", then 5th channel icon's will represent the following:

 Return Home Mode

 Hover Mode

 Balance Mode.

The Autopilot will give you 1500us PWM output when entering the OSD menu. Please ddjust the servo 's midpoint when display OSD menu.

The firmware V3.1010 has the option "Roll trim" in the CTL menu. In BimoFwing Mode, this option will adjust the motor speed difference in VTOL mode. Please trim the value if the airplane tilts due to motor speed difference.

Upon finishing installment, please test the airplane in VTOL mode. The option "Hover Yield" (CTL menu with a default value of 6 degrees) will help you to keep the plane hovering straight (without leaning forward or backwards). In VTOL mode, if the airplane leans forward, please reduce the value and if the airplane leans backwards, please increase the value.

To calibrate the center point you can place the airplane upward and directly calibrate

sensor's midpoint instead of horizontally calibrating the airplane. If the airplane is in normal status, you just place the nose upward to make sure that the horizon line in OSD is in middle position in VTOL mode. And then you place the nose forward to make sure that the horizon line is in middle position.

Channel Connections: Channel 1 for left servo, Channel 2 for right servo, Channel 3 for left ESC, Channel 4 for right ESC.

After setup, please switch into balance mode and place the plane horizontally to check whether the auxiliary value and radio reverse value is correct or not (pushing throttle to check direction of the motors and speed difference, adjusting compensation value to restore original direction of airplane.) If the airplane is installed with forward servo, keep default value is fine. (Aileron Roll-positive, Pitch-negative, Control value 15-12-115, the remaining option maintains default value). When switching mode into VTOL mode, please pay attention that the compensation value shall be set to restore original position of air-frame. The incorrect set of radio value will make it impossible to unlock it by splaying out in the VTOL mode.

Unlock method:

Switching between modes:

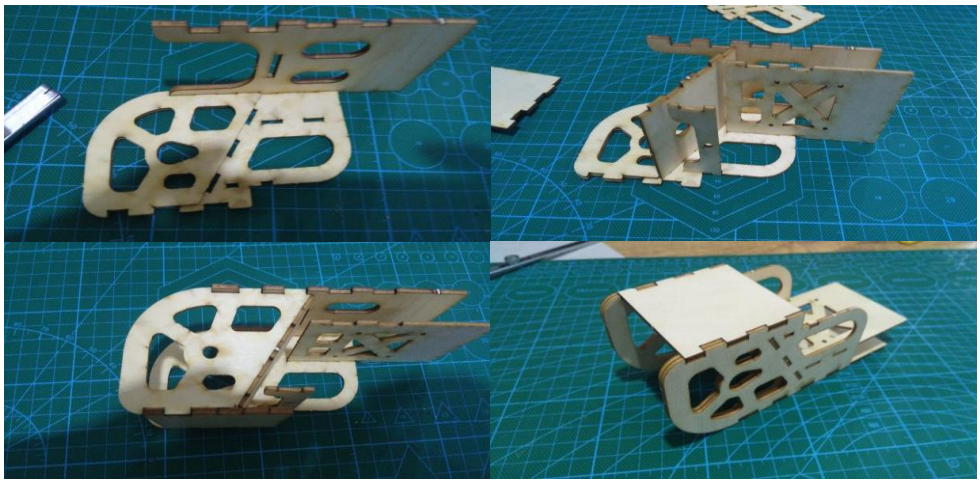
After finishing assembly of the airplane, you can test the stability of the airplane in VTOL mode. Then fly the airplane in balance mode. While switching mode the throttle shall be properly controlled: throttling up to switch from VTOL mode into balance mode and throttling down to switch from balance mode into VTOL mode. **You may want to adjust your throttle curve to have a smoother transition between modes.**

In VTOL mode, the airplane may temporarily lost its GPS fix. Therefore, the airplane can't be automatically stabilized while flying in windy conditions. If the airplane is flying in windy conditions, it may slowly drift, so more manual control needed. If you want to fly the airplane in windy days, please turn into balance mode and fly to upwind direction then switch VTOL mode to decrease throttle to land the plane.

Assembling the plane:

Nose

Please locate the wooden parts shown above. Use No. 502 glue (ergo 5400 recommended) to glue each part following the pictures shown above. Beware of the orientation of the part (colored in red). It should be aligned with the two side panels. Meanwhile be careful with of the position of the two side panels, don't glue them reversed.

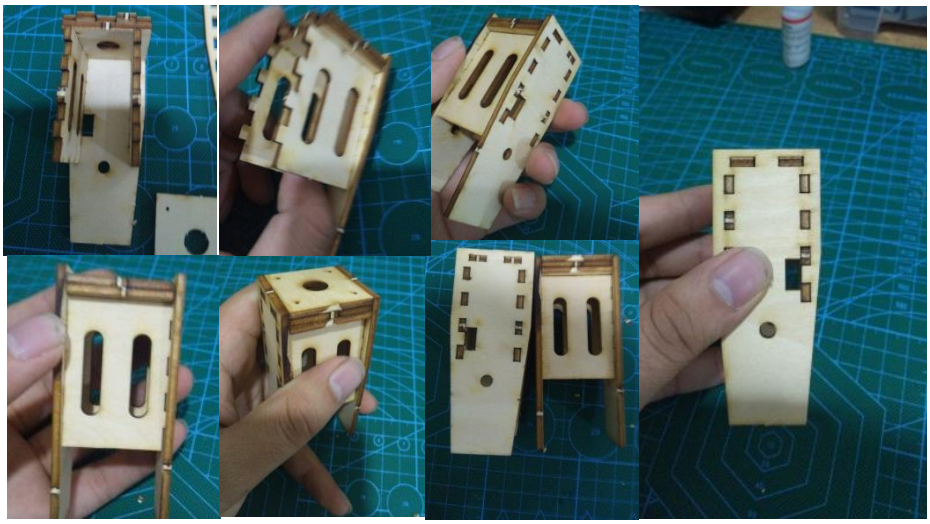


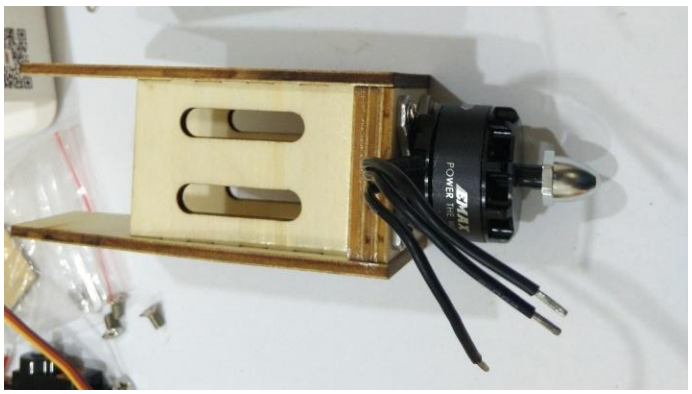
Next, assemble the main fuselage. Follow pictures shown above to stick these parts to the wooden nose. Ordinary foam glue is alright for this.

Next, due to the need of VTOL mode, we need to cut away some part of the plastic foam to ensure the upper and lower air holes are under alignment.

Picking out the parts to assemble motor mounting plate as shown above.

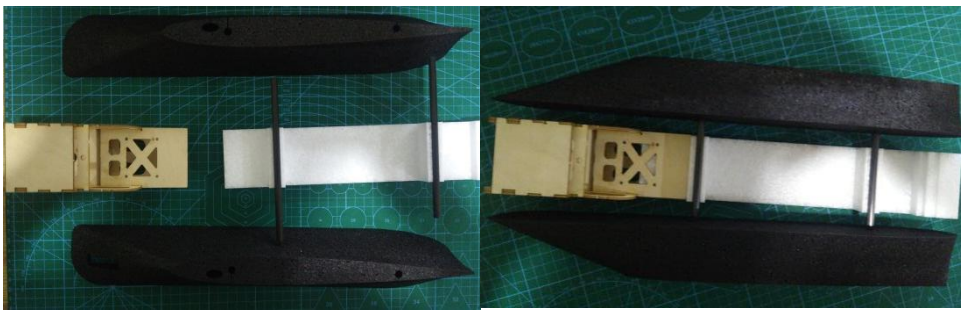
Glue each part to assemble motor mounting plate as shown below:





M3 sunk screws, motor mounting base, flat tail tapping screws and shim are packaged in the accessories bag. Please install them on motor mounting base. The finished assembly is as shown above. There are two set, one for each motor.

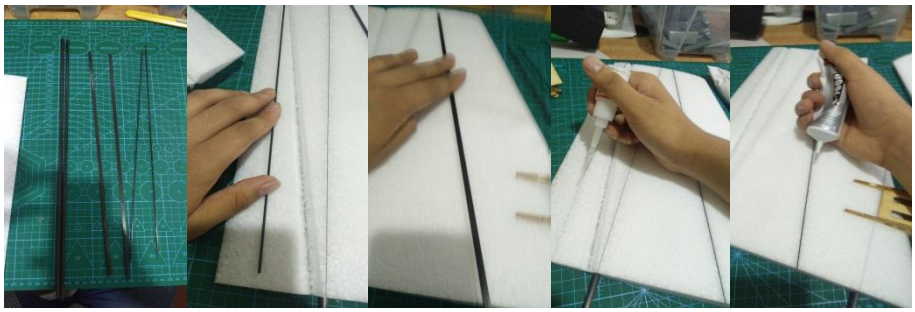
Assembling the fuselage:



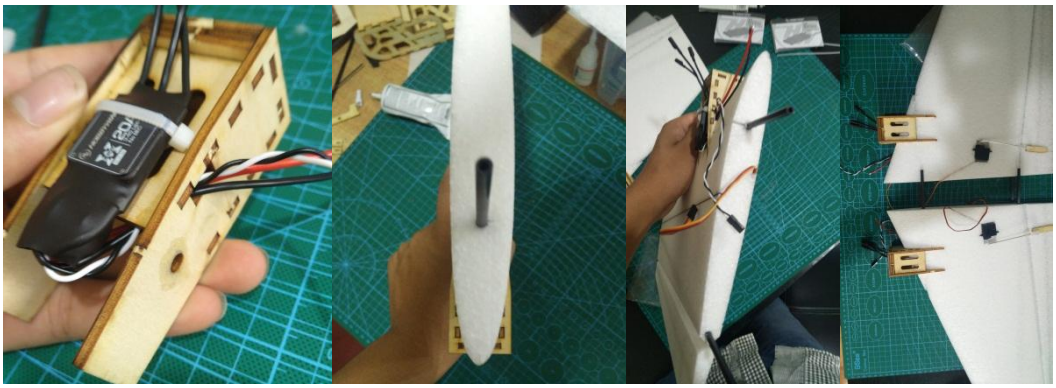
Assemble fuselage. Pick out the foam in the picture and pose the two carbon rods of 7mm as above. Then fix them by sticking glue to the foam and carbon rods.

Attention. The wooden holes may not be in alignment because of size errors. Please carve a slot of 5-6mm long to suit the position of left servo.

String the servo cables following the picture. Use wasted foam to prepare two chips to fix the position of servo. The size of chips depends on servo position and installation holes. Stick the chips with foam glue. Then cut off the excess parts.



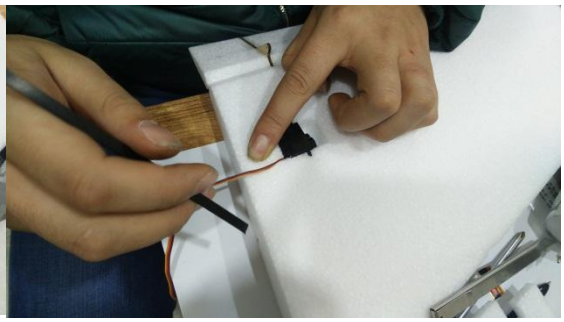
Pick out the carbon rods and carbon chips in the picture. The carbon chips are used to strengthen airfoil and carbon rods are used to strengthen plane control surface. Stick the carbon rods with glue 502 and stick the carbon chips with foam glue.



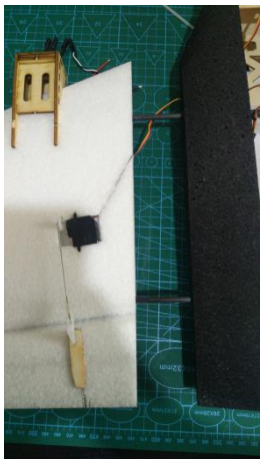
Meanwhile, install the ESC as shown above left picture. Locate 4 carbon rods of 5mm, 2 carbon rods are long and 2 carbon rods are short. Then assemble the ESC with motor base to the airfoil. The short carbon rods will go through the motor base as shown in the picture. But only the carbon rods are to be glued. The motor base should not be glued, it is the final step to fix motor base. The side assembled with ESC is belly of plane. The side assembled with servo is back of plane.

Preparing rudders: pick out rudder parts and stick them with glue 502 as shown in the pictures. Remind keeping the front edge in alignment.

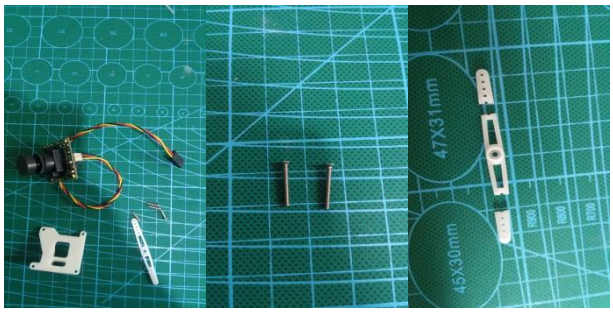
Assemble rudders: cut a notch of 5-8mm long and 6mm deep in the foam as above. Then stick glue around the notch and its inner part. Place the rudders in the right position as shown above. Remind keeping them in alignment with front edge of servo surface.

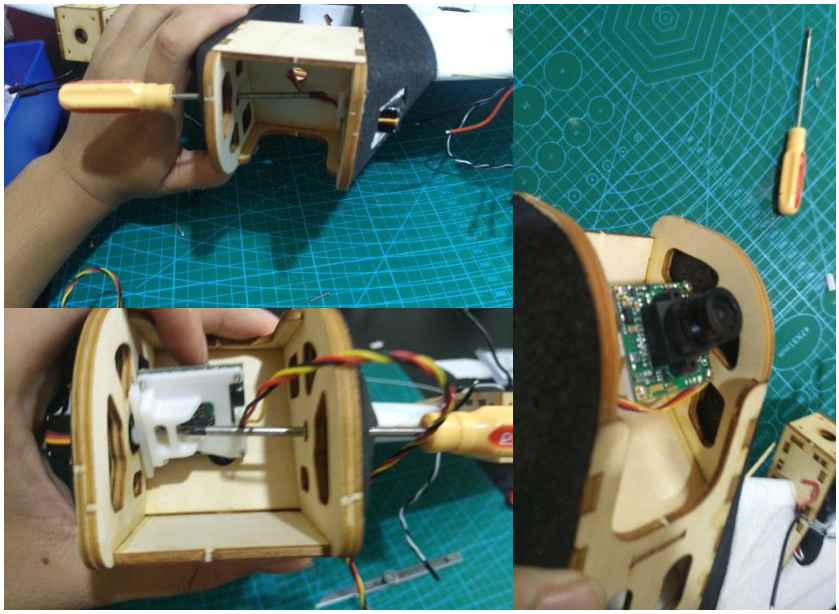
Assemble servo: cut a notch of 5mm deep in front of the servo installation slot. Then press servo cables into the notch. DON'T glue the servo at the moment.




Stick the joint parts and carbon rods with foam glue. Then cross the servo cable through reserved hole. Finally join the airfoil and fuselage as shown above.



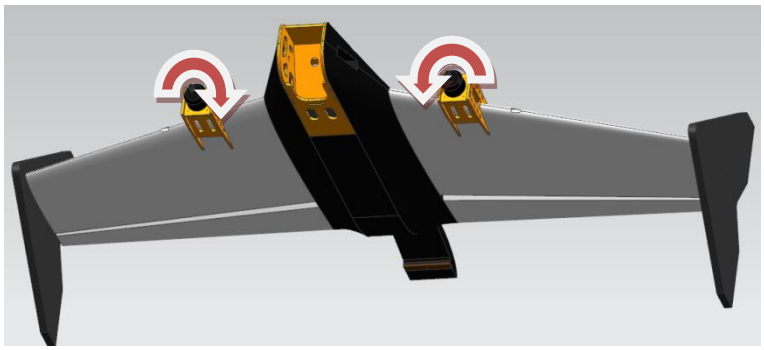
Pick out camera base. Using long rocking shaft and screws to install camera into camera base. The camera is compatible with Arkbird camera. The screws of M1.6*14mm are included in the parts package.



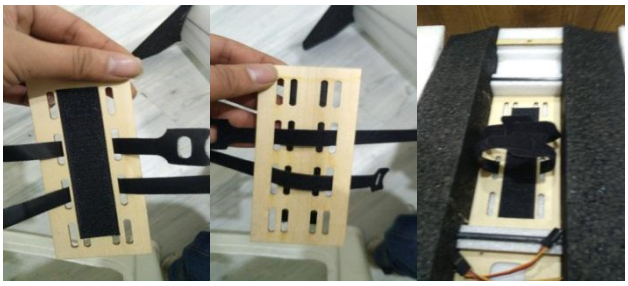
Assemble the camera. Keep the camera at 45 degree angle before powering on the servo. The wire of camera servo should be connected to channel 7 (output) of Arkbid FPV. **The camera will stay horizontal while the autopilot is horizontally or vertically travelling**. And the camera can move up and down by setting the value of channel 7 to a dial in your controller.

Assemble wing fence. Using toothpick or other tools to fix position. Then stick glue to it.

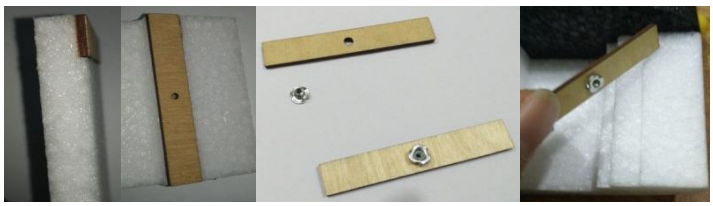
Put the autopilot beside a flat side of desk to make sure wing fences (undercarriage) are in right position.



The direction of rotation of motor should be as is shown above. (Put the belly of airplane in front)

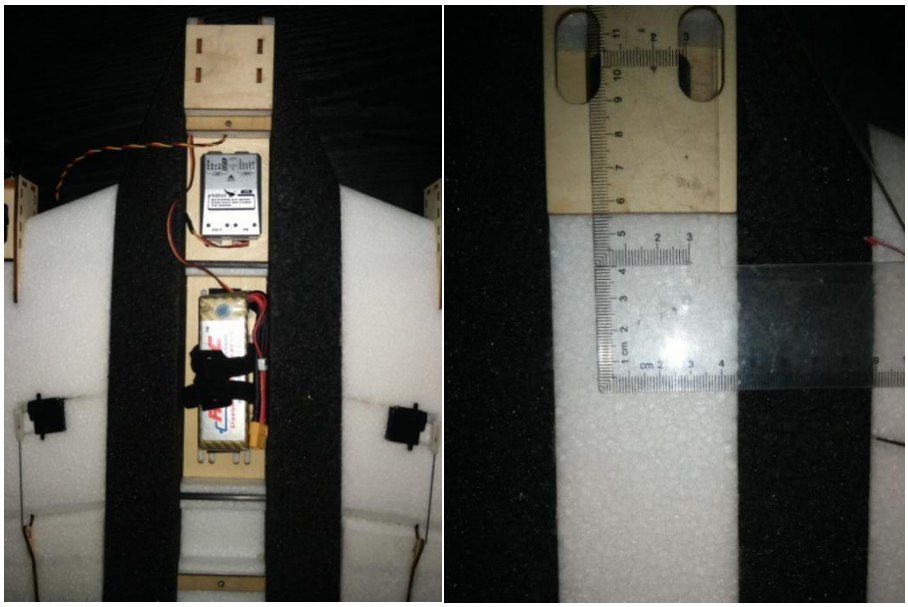


Assemble the battery plate.



Finally, assemble cover plate as shown above. Beware of its back and front.

The wire of camera servo should be connected to channel 7 (output). In balance mode and VTOL mode, the airplane can automatically control the camera and keep it horizontal. And the camera can move up and down by setting the value of channel 7 to a dial in your transmitter.



The position of the Flight controller and battery should be as is shown above. It's better to place the VTX somewhere behind battery. We recommend a 4s 2200 to 3000mah battery. A 4s 2200mah battery will look like the one shown above. The position of a 3000mah battery should be about 1cm closer to the nose of the plane

Center of gravity is about 5.6 cm behind the wooden board (the one that holds the flight controller).

We use aerosol paint to spray different color on the airplane to distinguish front and back side. Users can choose stickers or aerosol paint.

Wingtip device, made of EPP material (EPO material will be used), may be too soft. Please use some carbon sheet to the outside and extending 3mm carbon tube to support the wingtip.