



www.freewing-model.com

Freewing Twin 70mm B-2 Spirit Bomber User Manual

Wingspan: 2200mm

Length: 886mm

Empty Weight: 3200G [w/o Battery]



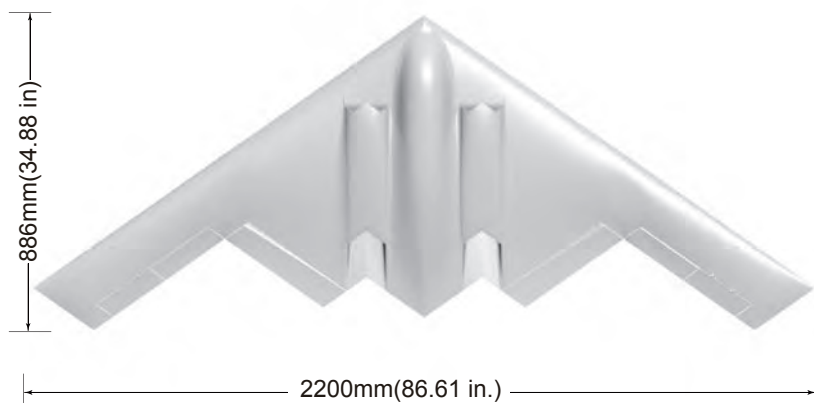
EN 1~10

1	Safety Notices
2	Basic Product Information
2	Package List
	PNP Assembly Instructions
3	Install Main Wing
3	Install the "Beaver Tail"
4	Install Vertical Stabilizer
4	Install Battery
5	Pushrod Instructions
5	Center of Gravity
6	PNP Parameter Setting
	Control Direction Test
7	Dual Rates
8	Pre-installed Component Overview
	Servo Direction
9	Motor Specification
9	Additional Adjustment Instructions
10	

11	重要提示
12	产品规格参数
12	包装列表
	PNP组装步骤介绍
13	主翼组装
13	机身尾部拆件组装
14	垂尾组装
14	电池组装
15	舵面控制钢丝尺寸及安装孔位
15	重要附加说明
16	重心示意图
	PNP调试介绍
17	模型舵面测试
18	舵量范围
	预装电子配件介绍
19	舵机介绍
19	电机介绍
20	飞机调机说明

1. This is not a toy! This B-2 is a highly advanced flying model aircraft and requires intermediate to advanced piloting skills. Beginners must assemble, configure, program, and operate under the guidance of proficient pilots.
2. Before installation, please read through these instructions carefully and operate strictly under instructions.
3. Due to the nature of RC Aircraft, Freewing and its vendors will not be held responsible for any losses.
4. The minimum recommended age for pilots with intermediate to advanced piloting skills is 16 years old.
5. This plane used EPO material with surface spray paint. Avoid all contact with chemicals and solvents.
6. Avoid flying in areas such as public places, high-voltage-intensive areas, near the highway, near the airport or any other place where laws and regulation clearly prohibit RC model flying.
7. Do not fly in bad weather conditions such as thunderstorms, rain, snow, or extreme high or low temperatures.
8. Always inspect the model before flight. Ensure the flight battery is fully charged and in safe working condition.
9. Discard the flight battery properly if it is damaged or defective.
10. Always ensure the radio transmitter is turned on before and whenever the flight battery is plugged in.
11. Do not attempt taking off from or landing onto unsafe surfaces. Avoid uneven surfaces, tall grass, and gravel.

⚠ NOTE: This is not a toy. Not for children under 14 years. Young people under the age of 14 should only be permitted to operate this model under the instruction and supervision of an adult. Please keep these instructions for further reference after completing model assembly.

**Standard Version**Wingload: 48.2 g/dm²Wing Area: 83 dm²

Motor: 2952-2100KV I/R Motor

Servo: 9g MG digital servo (2pcs)

9g Hybrid digital servo (7pcs)

ESC: 60A with 8A UBEC

Ducted fan: 70mm 12-blade fan

Weight: 3200g (w/o Battery)

Other features

Material: EPO

Aileron: Yes

Elevator: Yes

Rudder: Yes

Landing gear: Retract Landing Gear

Cabin door: Yes

Scale Pilot figure: Yes

Li-Po Battery: 6S 4000-6000mAh (1pcs)

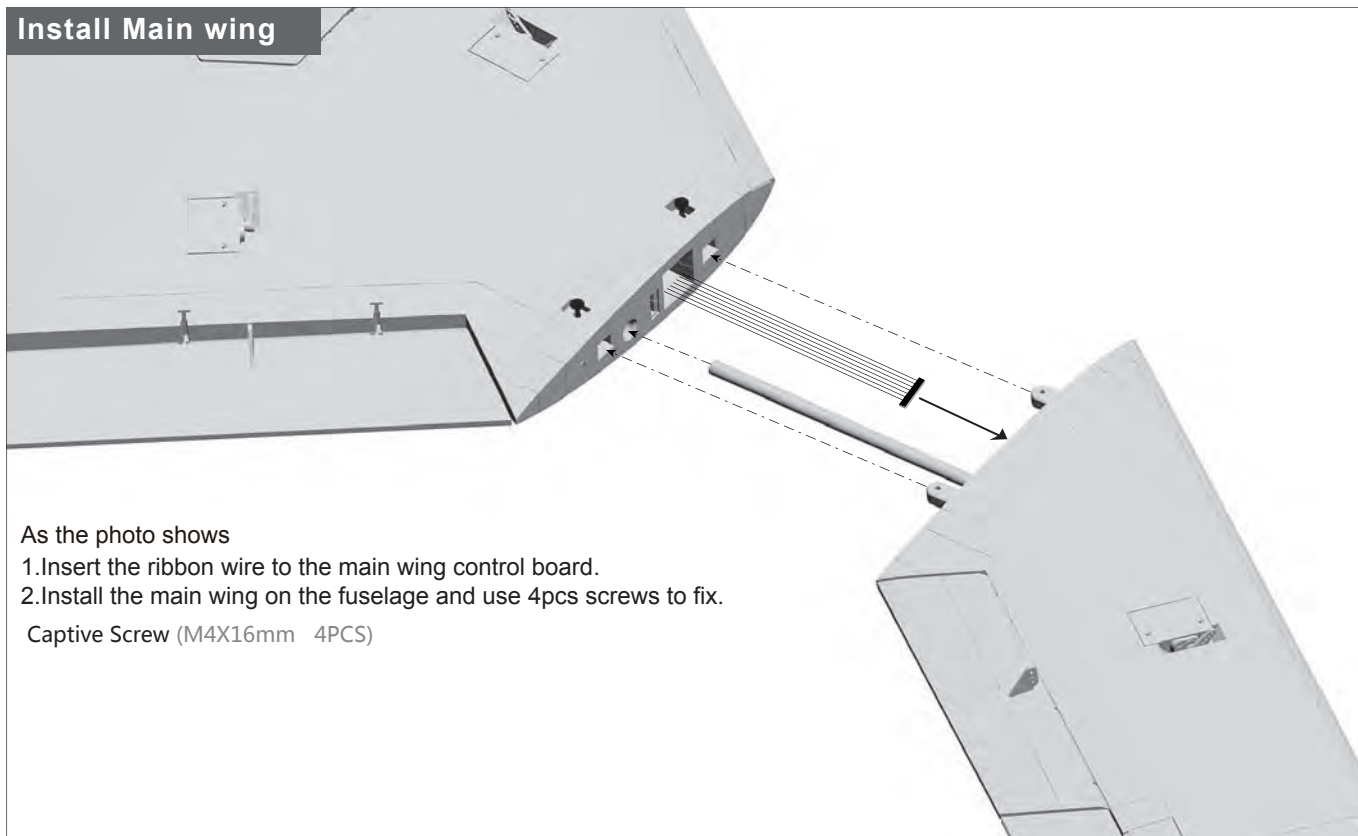
⚠ Note: The parameters in here are derived from test result using our accessories. If use other accessories, the test result will be different. Any problem since of using other accessories, we are not able to provide technical support.

Package List

Different equipment include different spareparts. Please refer to the following contents to check your sparepart list.

No.	Name	PNP	ARF Plus
1	Main wing	Pre-installed all electronic parts	Pre-installed servo
2	Fuselage	Pre-installed all electronic parts	Pre-installed servo
3	Fuselage tail	✓	✓

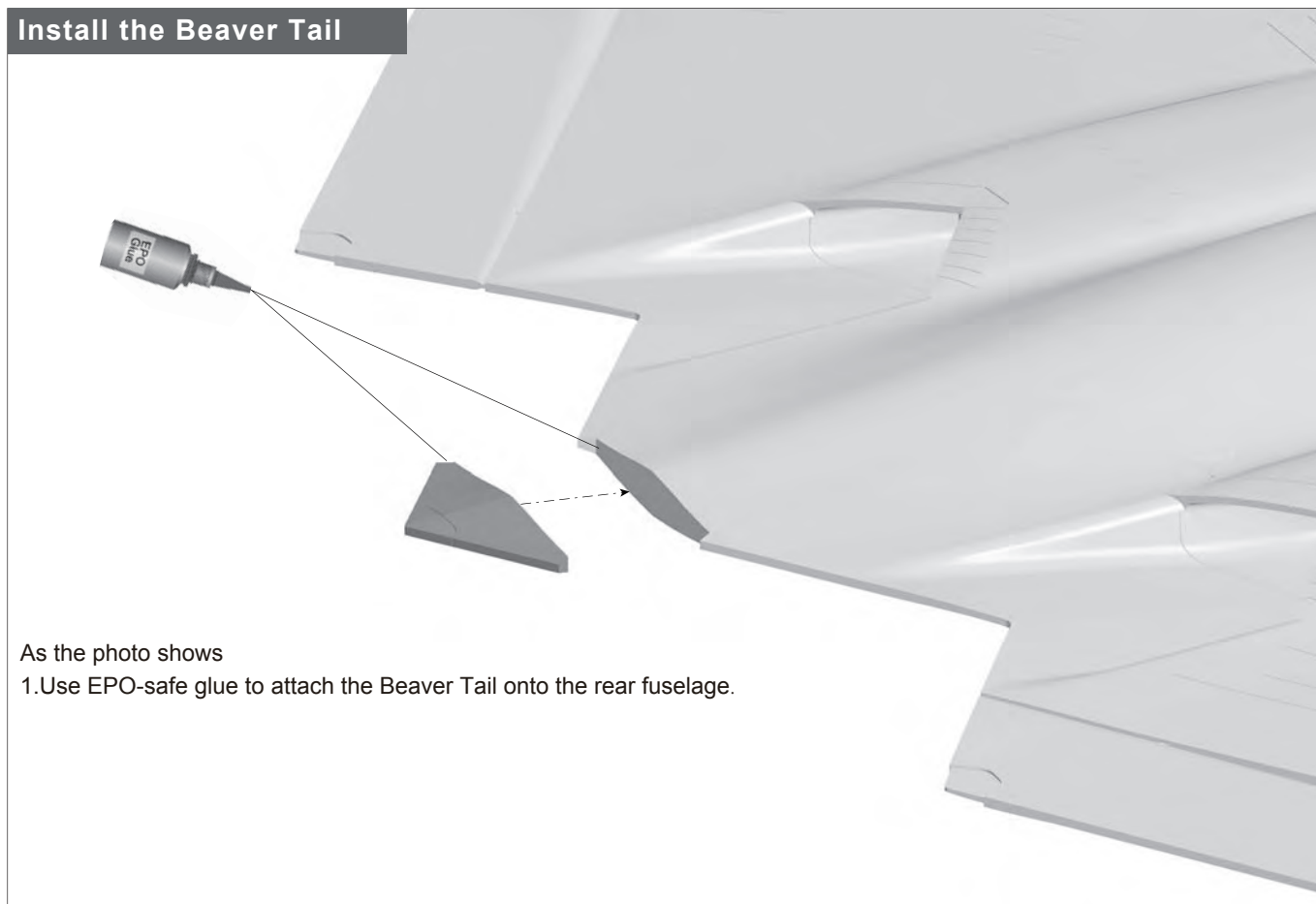
No.	Name	PNP	ARF Plus
4	Screw bag	✓	✓
5	Manual	✓	✓
6	Part bag	✓	✓

Install Main wing

As the photo shows

1. Insert the ribbon wire to the main wing control board.
2. Install the main wing on the fuselage and use 4pcs screws to fix.

Captive Screw (M4X16mm 4PCS)

Install the Beaver Tail

As the photo shows

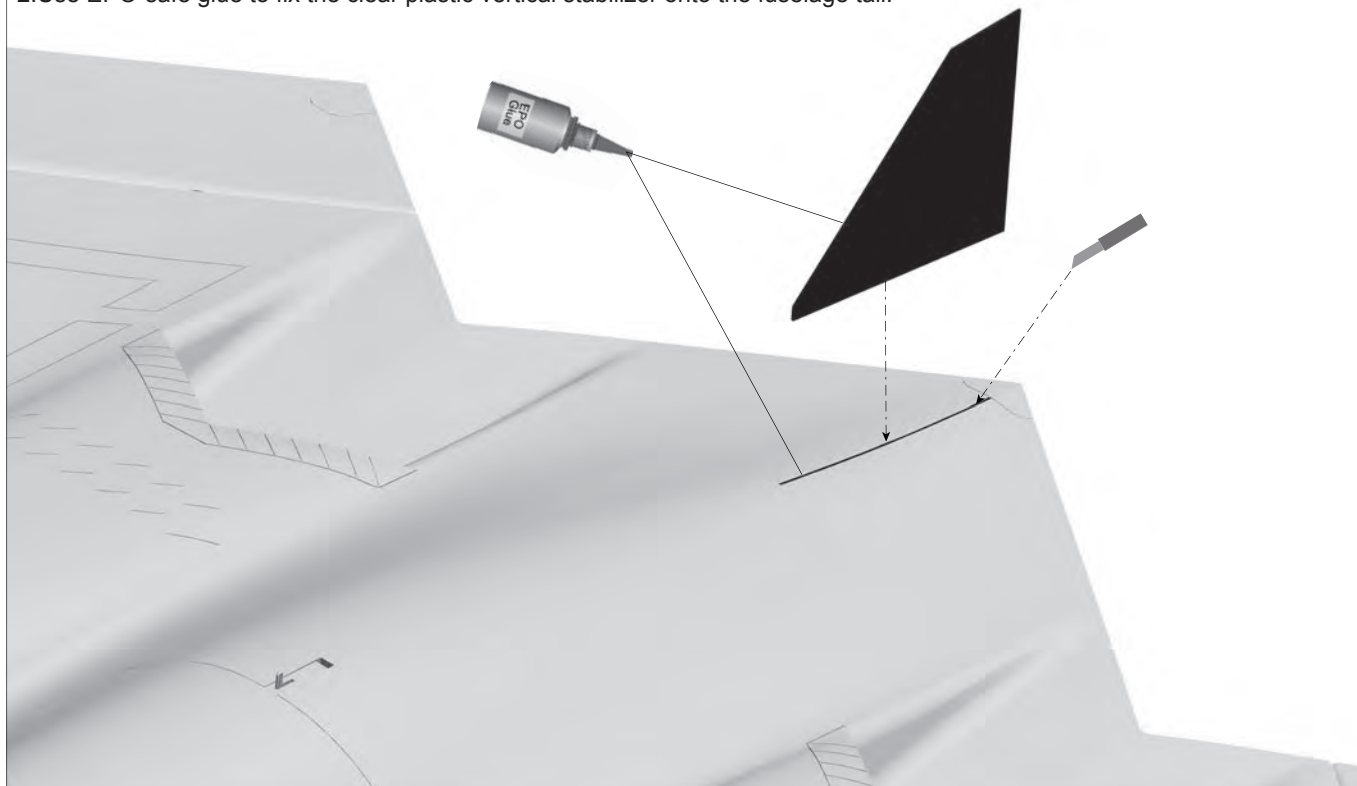
1. Use EPO-safe glue to attach the Beaver Tail onto the rear fuselage.

Install Vertical stabilizer

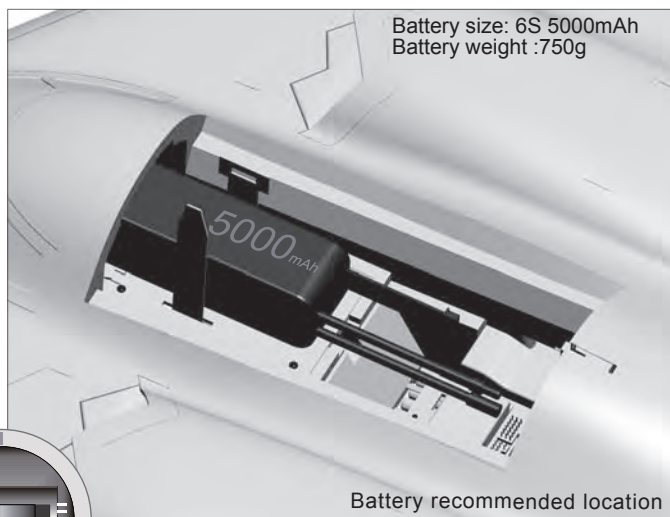
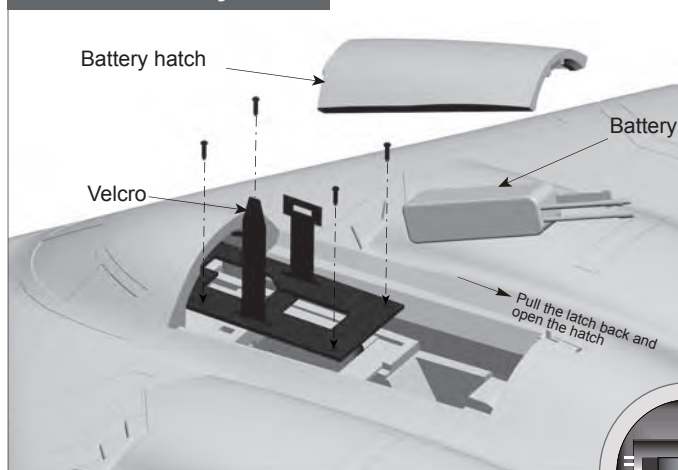
(This step is an optional step that can be installed or not)

As the photo shows

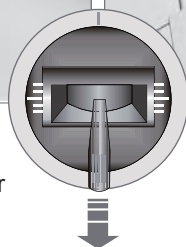
1. With a hobby knife, score the molded line down to a depth of 10mm.
2. Use EPO-safe glue to fix the clear plastic vertical stabilizer onto the fuselage tail.



Install Battery



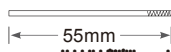
Before connecting the battery and receiver, please switch on the transmitter power and make sure the throttle stick is in the lowest position. Bind your receiver to your transmitter according to your transmitter's instruction manual.



We recommend the following LiPo battery:
6S 22.2V 4000mAh~6S 22.2V 6000mAh
 Discharge rate of C $\geq$ 35C

Pushrod instructions

Nose gear steering pushrod length



Pushrod diameter 1.2mm

Nose gear steering pushrod mounting hole



Nose gear door pushrod length

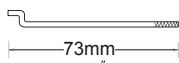


Pushrod diameter 1.2mm

Nose gear door pushrod mounting hole



Rear gear door pushrod length

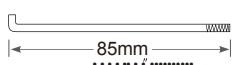


Pushrod diameter 1.2mm

Rear gear door pushrod mounting hole



Aileron pushrod length



Pushrod diameter 1.5mm

Aileron pushrod mounting hole



Elevator pushrod length



Pushrod diameter 1.5mm

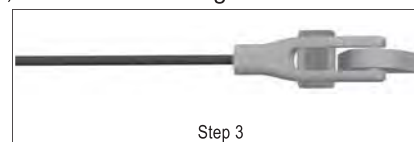
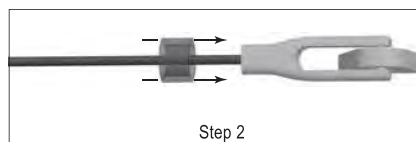
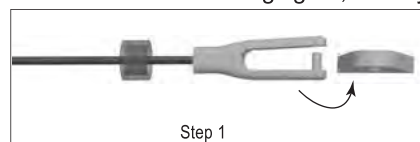
Elevator pushrod mounting hole



Important additional notes

The Y-type clevis used in this product is equipped with a transparent silicone ring for secondary reinforcement, which can effectively prevent the clevis from accidentally loosening.

As shown in the following figure, when you buckle the clevis into the control surface horn, use the silicone ring to cover the clevis.



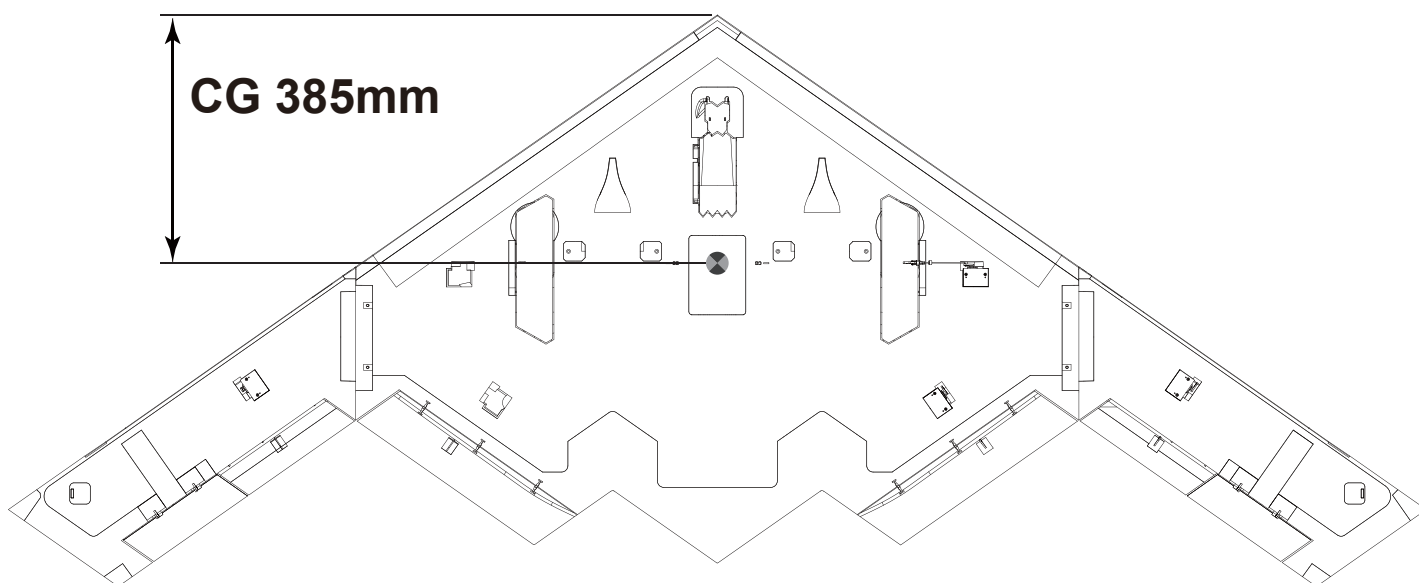
Center of Gravity

Correct Center of Gravity ("CG") is critical for enabling safe aircraft stability and responsive control. Please refer to the following CG diagram to adjust your aircraft's Center of Gravity.

- Depending on the weight of your chosen flight battery, move the battery forward or backward to adjust the Center of Gravity.
- If you cannot obtain the recommended CG by moving the battery to a suitable location, you can also install a counterweight to achieve correct CG. However, with the recommended battery, a counterweight is not required. We recommend flying without unnecessary counterweight.

As the photo shows, the recommended starting CG position has been molded into the bottom of the fuselage.

Please confirm the CG based on this marked position.



Control Direction Test

After assembling the aircraft, it is critical to verify that all control surfaces move in the correct direction corresponding with the inputs you give from your radio transmitter. Power on your radio and then the model, toggle Throttle Hold, then proceed to verify all control inputs and movements are correct.

Aileron

Stick Left



Stick Right



Rudder

Stick Left



Stick Right



Elevator

Stick down



Stick up



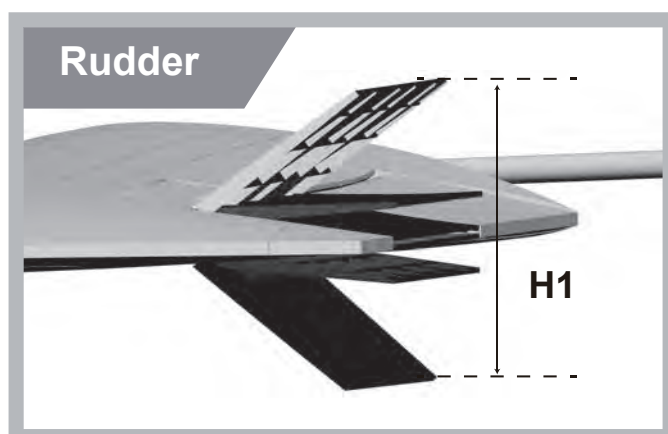
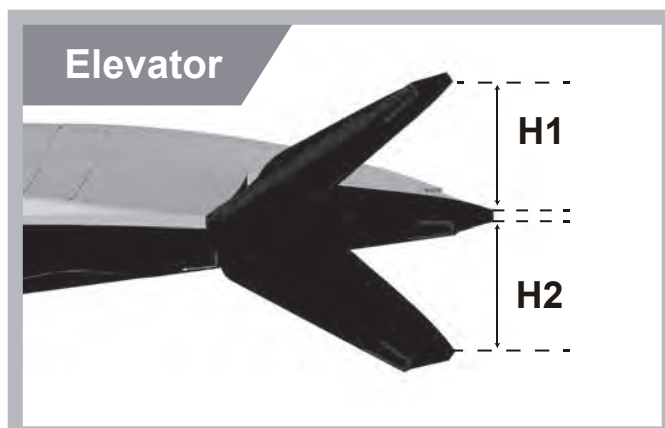
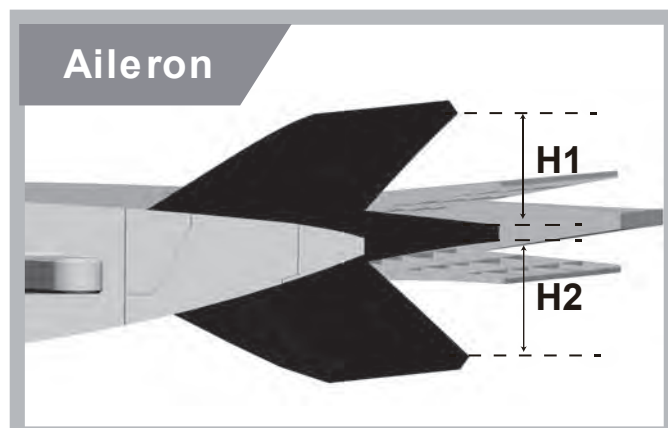
Rudder center position



□ ~45mm

Dual Rates

According to our testing experience, use the following parameters to set Aileron/Elevator Rate. Program your preferred Exponential % in your radio transmitter. We recommend using High Rate for the first flight, and switching to Low Rate if you desire a lower sensitivity. On successive flights, adjust the Rates and Expo to suit your preference.



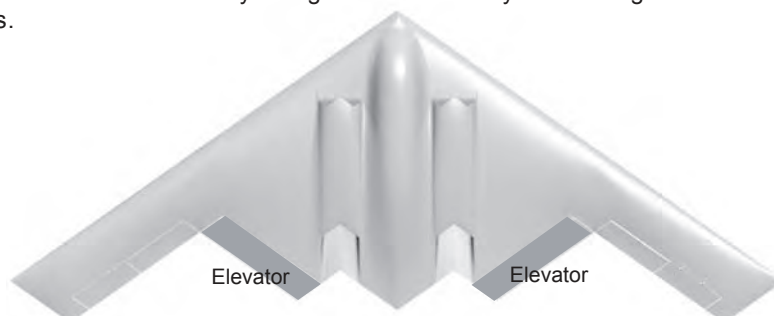
Set drag rudder ("clamshell") to 45mm open, while in the neutral position.

Special note: When setting your neutral rudders you could set them 45mm apart but they may not be "centered" so take your ruler and put it in the middle and set the top rudder to 22.5mm and then the bottom to 22.5mm.

	Aileron (Measured closest to the fuselage)	Elevator (Measured closest to the fuselage)	Rudder (Measured from the bottom)
Low Rate	H1/H2 19mm/19mm D/R Rate : 100%	H1/H2 35mm/35mm D/R Rate : 100%	
High Rate	H1/H2 19mm/19mm D/R Rate : 100%	H1/H2 35mm/35mm D/R Rate : 100%	H1 Maximum opening size 102mm D/R Rate : 100%

⚠ Important Flight Notes:

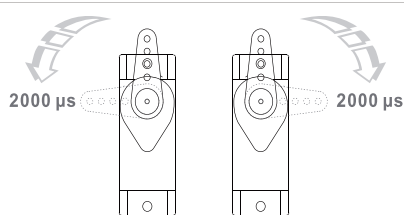
1. Do not hit the rudder abruptly during high-speed taxiing, otherwise this jet may roll over;
2. We recommend 2-3mm of UP Elevator trim while stationary. Program this before your first flight and refine its position to suit your flying preferences.



3. The Freewing B-2 uses the Freewing E52 Gyro to fly

4. The integrated control box mixes both the delta wing function and the aileron mix. Set your radio to NORMAL WING mode. Do not set your radio to a delta wing mix, which will confuse the onboard control box.

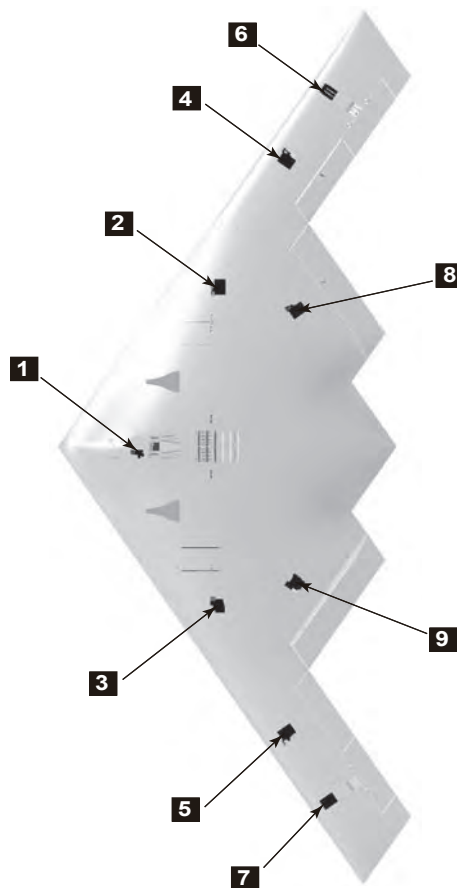
Servo Direction



The servo positive or reverse rotation is defined as follows:
When servo input signal change from 1000μs to 2000μs,
The servo arm is
rotated clockwise, its positive servo.
The servo arm is
rotated counterclockwise, its reverse servo.

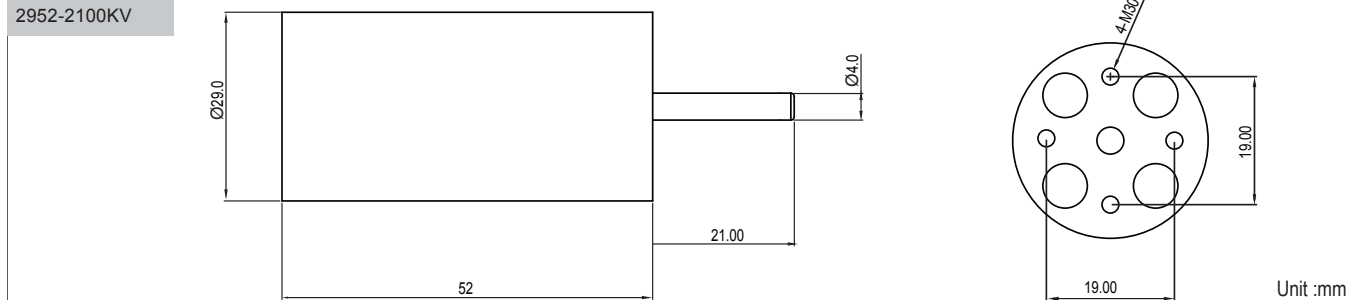
If you need to purchase another brand's servo, please refer to the following list to choose a suitable servo.

Position	Servo regulation	No.	Pos. / Rev.	Cable length
Nose gear steering servo	9g Digital-Hybrid	1	Reverse	300mm
Rear cabin door(L)	9g Digital-Hybrid	2	Reverse	100mm
Rear cabin door(R)	9g Digital-Hybrid	3	Positive	100mm
Aileron(L)	9g Digital-Hybrid	4	Positive	200mm
Aileron(R)	9g Digital-Hybrid	5	Positive	200mm
Rudder(L)	9g Digital-MG	6	Positive	400mm
Rudder(R)	9g Digital-MG	7	Positive	400mm
Elevator(L)	9g Digital-Hybrid	8	Positive	100mm
Elevator(R)	9g Digital-Hybrid	9	Positive	100mm



Motor Specification

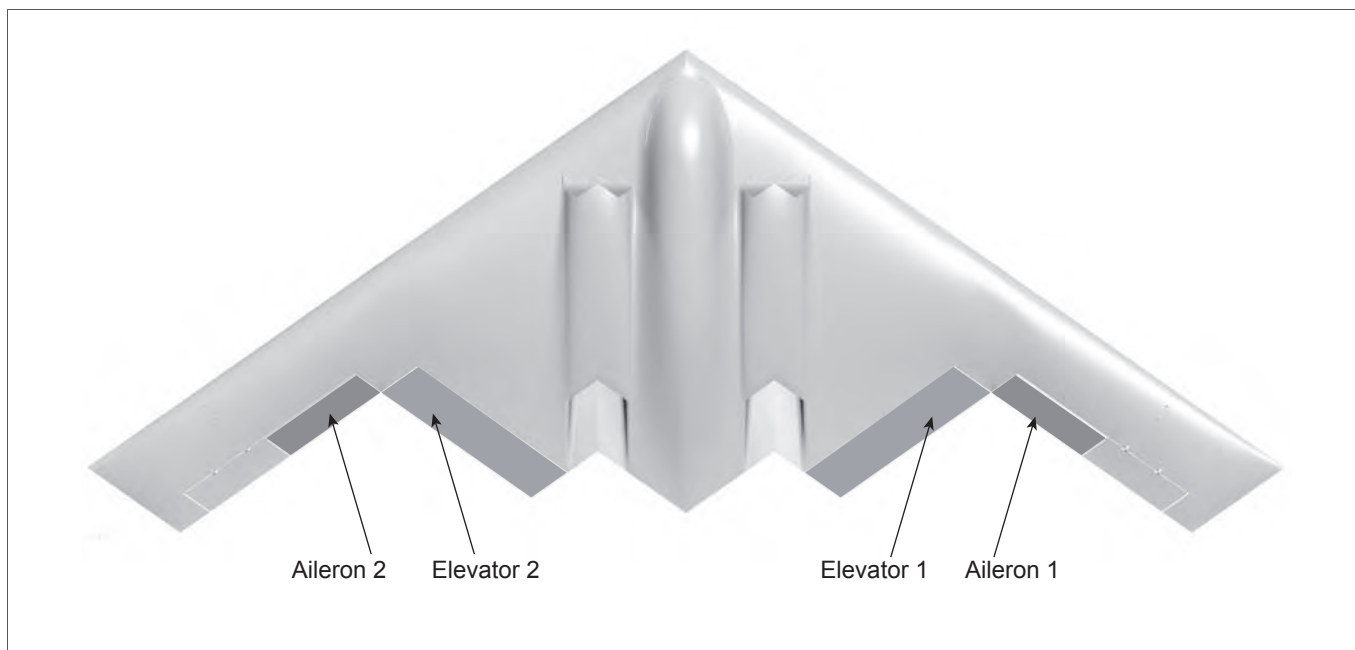
Item No. MI029521
2952-2100KV



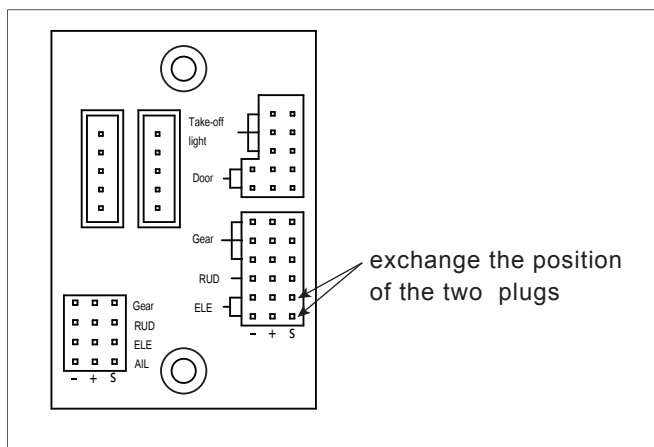
Item No.	Motor size	Motor(KV)	Thrust(g)	Current(A)	Use voltage (V)	Use ESC (A)	EDF Weight (g)	Max power (W)	Efficiency (g/w)
E7219	2952-2100KV	2100KV	2100-2200	50-55	22.2 (6S)	60	230	1170	1.83

Jet adjustment instruction

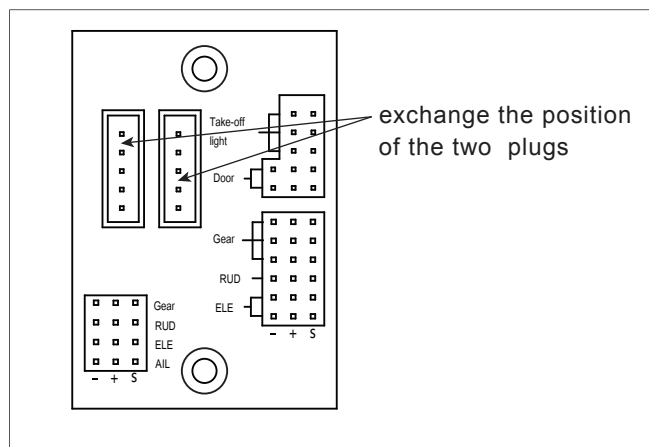
1. The pre-installed integrated control box mixes both the delta wing function and the aileron mix. Set your radio to NORMAL WING mode. Do not set your radio to a delta wing mix, which will confuse the onboard control box.



2. If the direction of Elevator 1 and Elevator 2 is incorrect when the customer uses it, please exchange the position of the two ELE plugs on the control box, as shown in the following:

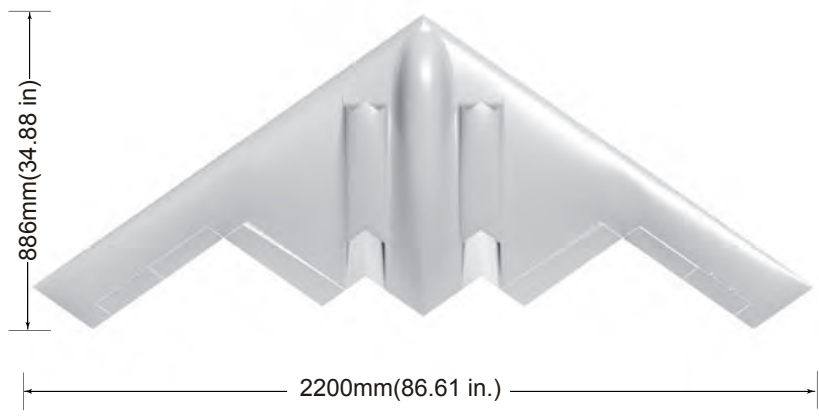


3. If the direction of Aileron 1 and Aileron 2 is incorrect when the customer uses it, please exchange the position of the two AIL plugs on the control box, as shown in the following:



- 1.模型飞机不是玩具,操作者需要具备一定的经验;没有经验的初学者,必须在有丰富经验的专业人士指引下,逐步学习!
- 2.在组装之前,必须认真阅读产品说明书,严格按照说明书指示操作。
- 3.飞翼模型及其销售商,对于违反说明书的要求操作而造成的损失、将不负任何法律责任!
- 4.模型飞机的使用年龄必须是14岁以上的儿童或者成人。
- 5.此模型产品使用EPO材料制成,表面喷涂油漆,不可随意使用化学制剂擦拭,否则会损坏模型产品。
- 6.不可以公共场合、高压线密集区、高速公路附近、机场附近或者其它法律法规明确禁止飞行的场合飞行。
- 7.不可以雷雨、大风、大雪或者其它恶劣气象环境下飞行。
- 8.模型飞机的电池产品,不可以随意乱扔,乱放。存放时,必须保证周边2M范围内,无易燃、易爆物体。
- 9.损坏或者报废处理的模型飞机电池,应妥善回收处理,不准随意抛弃,避免自燃而引发火灾。
- 10.在飞场飞行时,应做到妥善处理飞行后所产生的垃圾,不可随意抛弃、焚毁模型及其配件。
- 11.在任何情况下,都必须保证油门杆处于起始位、发射机处于打开状态时,才能连接模型飞机内部的动力电池。
- 12.无论是模型飞机是在正常飞行过程中,或者是在缓慢降落过程中,都不要尝试用手去回收模型。必须等模型降落平稳以后,再进行回收!

 **注意:** 模型产品是具有一定危险性的产品,请禁止14岁以下的儿童玩耍,14岁以上的儿童,请在有飞行经验的成人指导下使用,无飞行经验的购买者,应当在具有一定电动涵道飞机飞行经验的成人指导下使用! 组装模型前,请仔细阅读说明书,按照说明书的要求进行安装。进行调试和飞行时,请根据说明书指示的参数进行调整。



标准版

翼载荷：48.2 g/dm²
 翼面积：83 dm²
 舵机：9g数字金属齿 (2pcs)
 9g数字混合齿(7pcs)
 电机：2952-2100KV内转无刷电机
 涵道风扇：70mm 12叶涵道
 电调：60A无刷电调 UBEC 8A
 起飞重量：3200g(不含电池)

其它说明

机体材料：EPO，ABS工程塑料
 副翼：有 升降舵：有
 方向舵：有
 起落架：电动收放起落架
 舱门：有
 飞行员：有
 电池范围：6S 4000-6000mAh

⚠ 注意：此处各项参数，均使用本公司配件测试得出，如果使用副厂配件，会有所差异。使用副厂配件时所产生的问题，我们将无法给予技术支持!

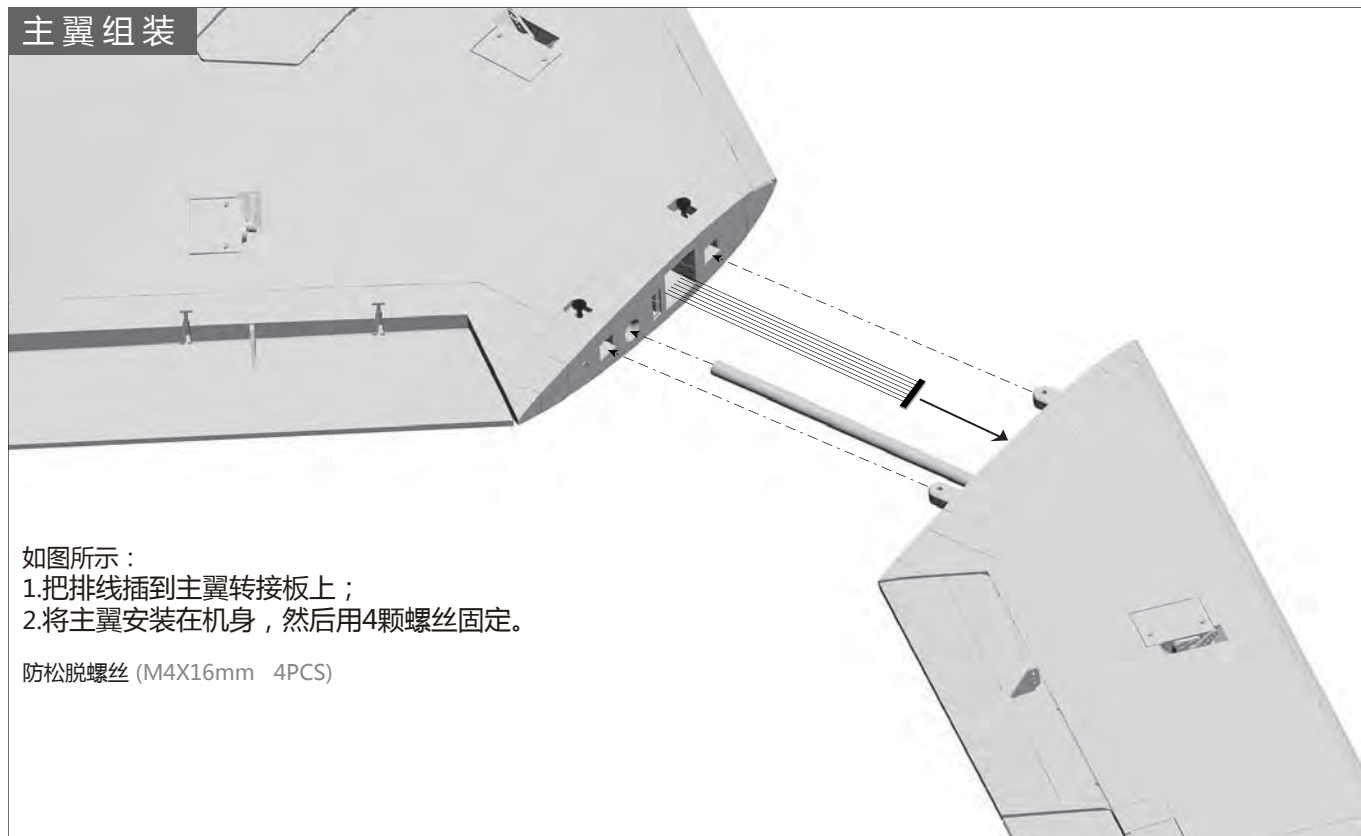
产品包装清单



打开产品包装，核对包装清单。（不同配置的版本，包含内容不同！）

序号	配件名称	PNP	ARF Plus	序号	配件名称	PNP	ARF Plus
1	主翼	预装所有电子设备	预装舵机	4	螺丝包	✓	✓
2	机身	预装所有电子设备	预装舵机	5	说明书	✓	✓
3	机身尾部拆件	✓	✓	6	附件包	✓	✓

主翼组装

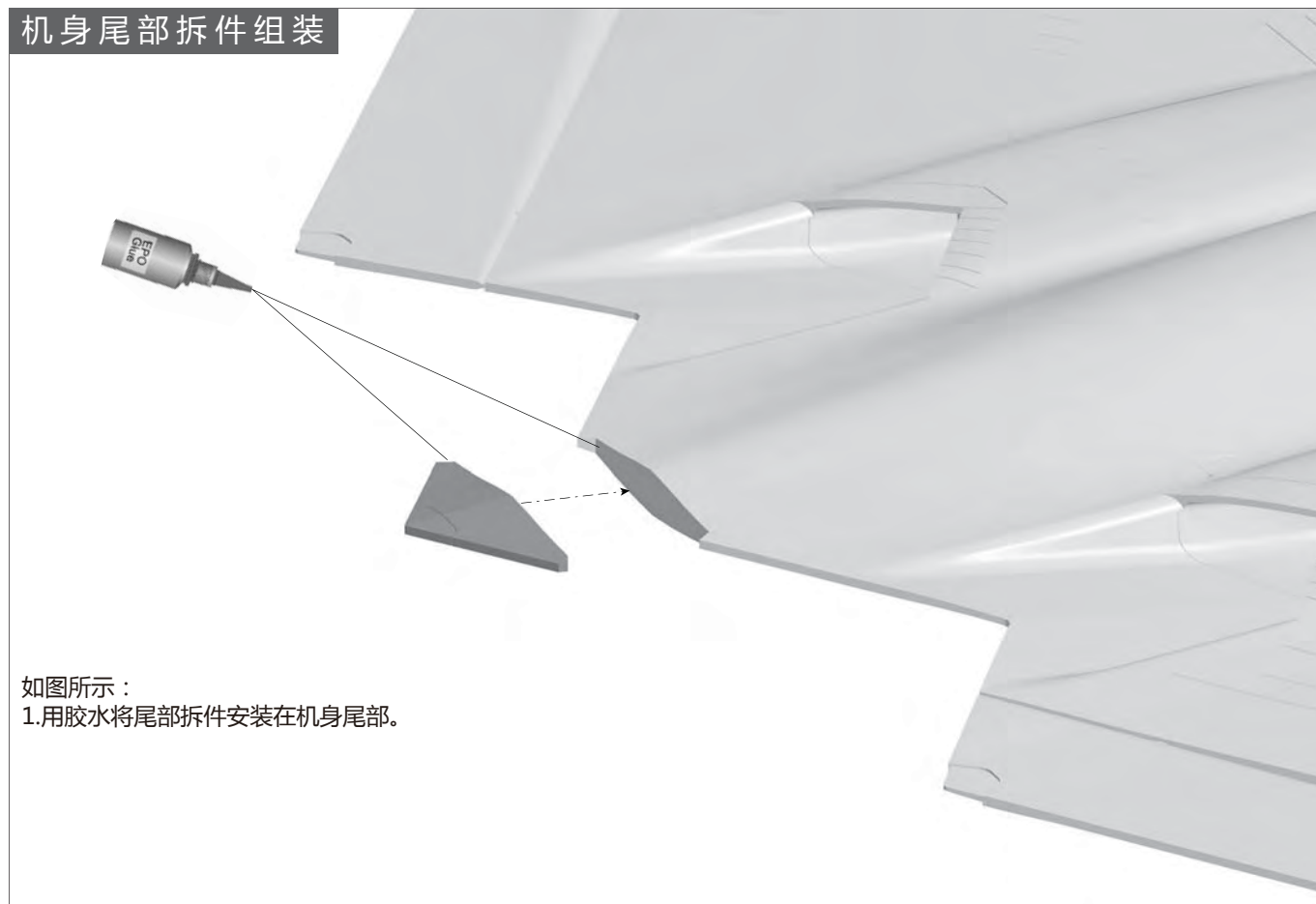


如图所示：

- 1.把排线插到主翼转接板上；
- 2.将主翼安装在机身，然后用4颗螺丝固定。

防松脱螺丝 (M4X16mm 4PCS)

机身尾部拆件组装



如图所示：

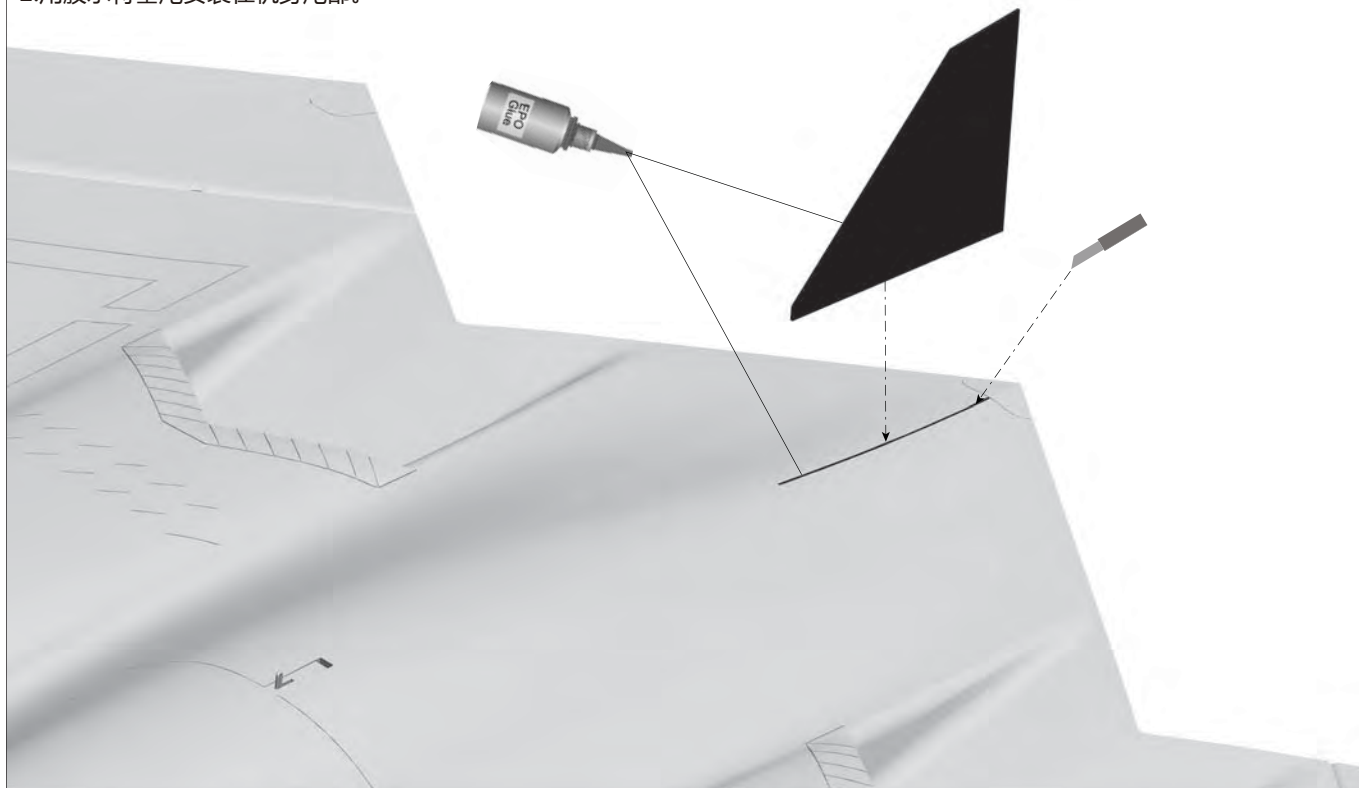
- 1.用胶水将尾部拆件安装在机身尾部。

垂尾组装

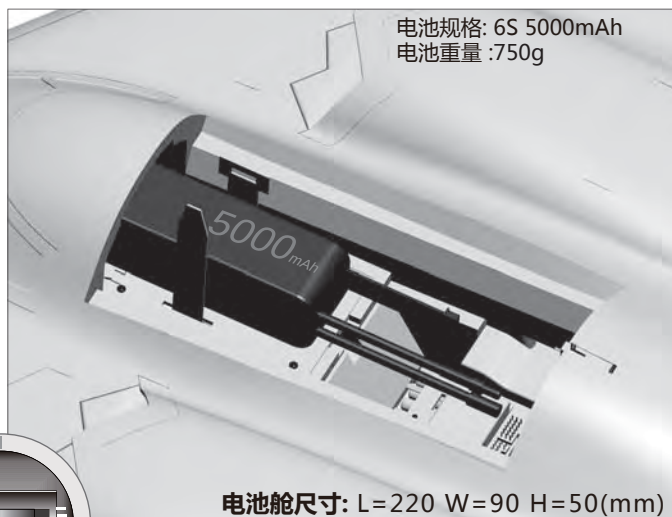
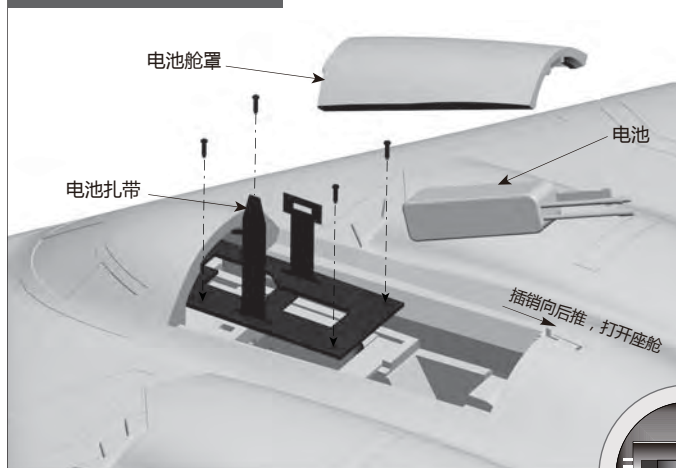
(此步骤为选装步骤可安装可不安装)

如图所示：

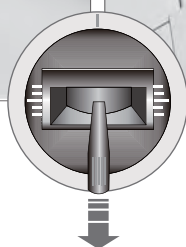
- 1.飞机上面有刻线条，按线条切下去大约10mm深；
- 2.用胶水将垂尾安装在机身尾部。



电池组装说明



将电池与电调连接前，首先请打开发射机电源，确认油门杆处于低位。
安装电池后，启动油门前，请保证没有任何物体在螺旋桨转动直径以内，以免造成事故和人身伤害！



我们建议使用的电池容量和放电倍率如下：
6S 22.2V 4000mAh~6S 22.2V 6000mAh (1pcs)
放电倍率 $\geq 35C$

舵面控制钢丝尺寸及安装孔位

前轮转向控制钢丝尺寸

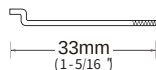


钢丝直径: Ø1.2mm

前轮转向控制钢丝安装孔位



前舱门控制钢丝尺寸

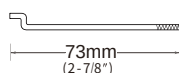


钢丝直径: Ø1.2mm

前舱门控制钢丝安装孔位



后舱门控制钢丝尺寸

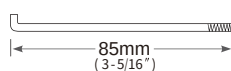


钢丝直径: Ø1.2mm

后舱门控制钢丝安装孔位



副翼控制钢丝尺寸



钢丝直径: Ø1.5mm

副翼控制钢丝安装孔位



升降舵控制钢丝尺寸



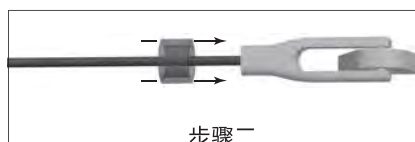
钢丝直径: Ø1.5mm

升降舵控制钢丝安装孔位



重要附加说明:

本产品所使用的“Y”型夹头,均配备了透明硅胶圈进行二次加固,能有效防止夹头意外松开。如下图所示,当您将夹头扣入舵面摇臂后,请使用硅胶圈套住夹头。

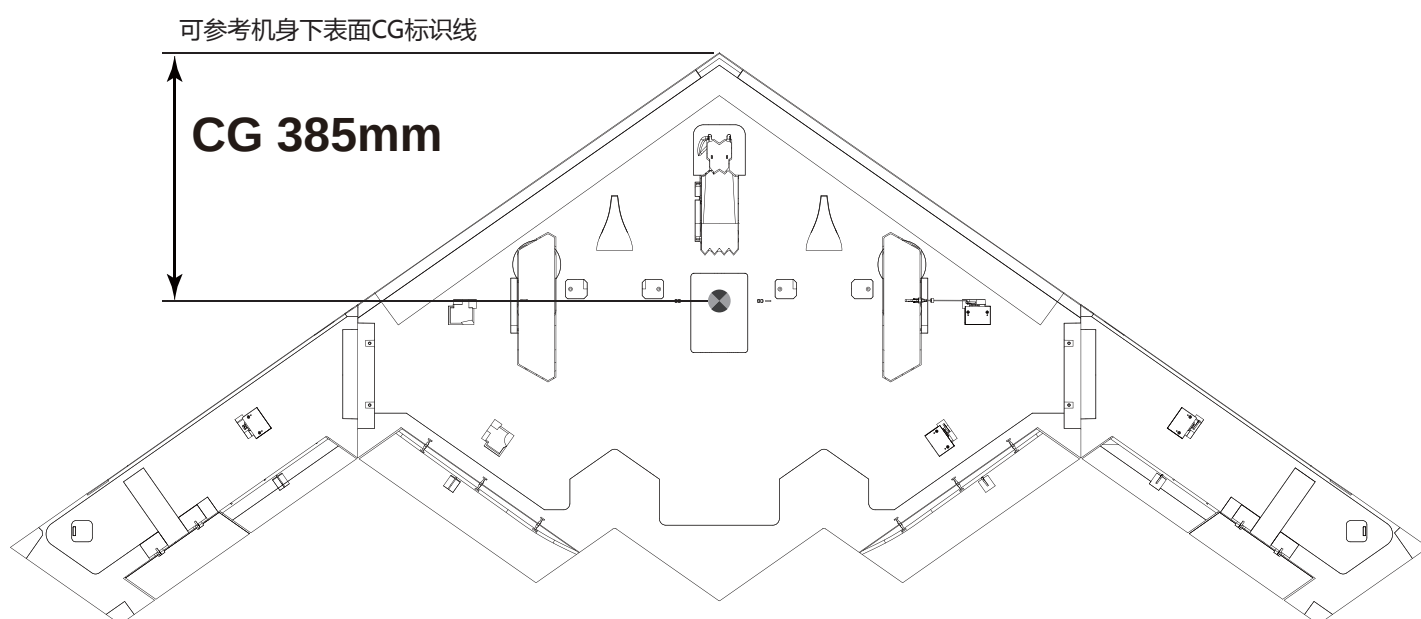


重心示意图

正确的重心，直接关系到飞行的成功与否，请参考下面的重心标示图，来调整飞机的重心。

- 您可以将电池向前，或者向后移动，来调整飞机的重心;
- 如果通过电池的移动无法调整到正确的重心位置，您还可以适当的使用一些其它材料来配重，使飞机的重心处于正确的位置！

如图所示,在机腹表面已经雕刻了重心位置标记.
请根据此标注位置来确认重心。如果标记模糊
不清,那么请根据图示尺寸测量。



舵面测试

当您按前面的步骤组装好飞机后，连接电池，用遥控器测试每个舵面的工作情况，检查各个舵面是否处于居中位置，是否正常工作！

副翼

副翼摇杆
向左运动



副翼摇杆
向右运动



方向舵

方向摇杆
向左运动



方向摇杆
向右运动



升降舵

升降摇杆
向下运动



升降摇杆
向上运动

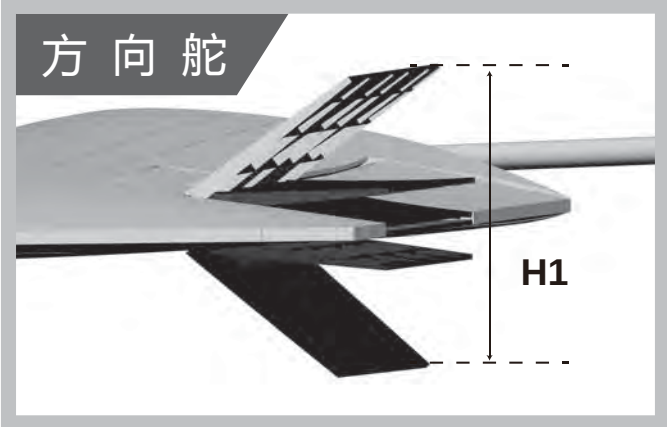
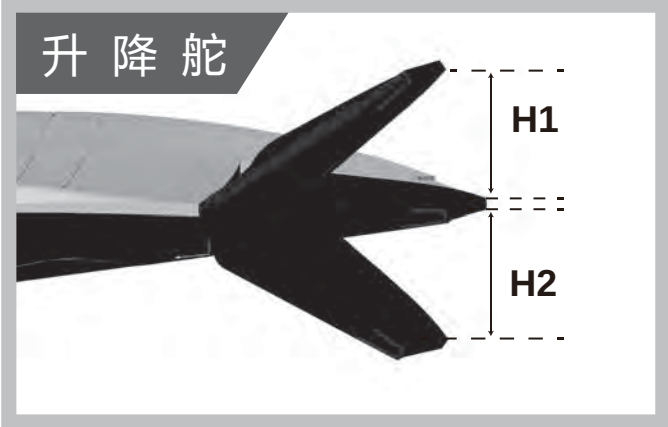
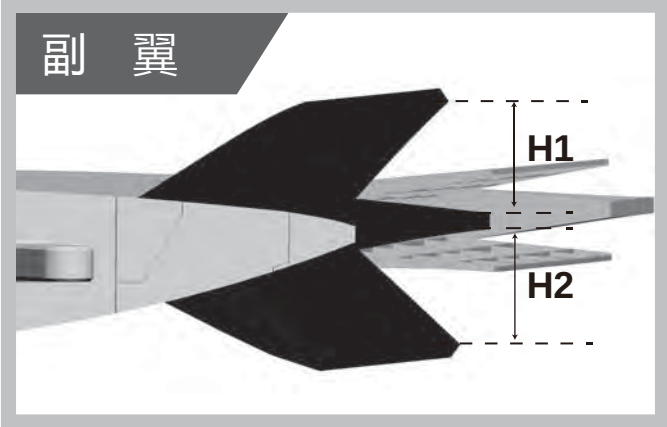


方向舵居中位置图



大、小舵参数

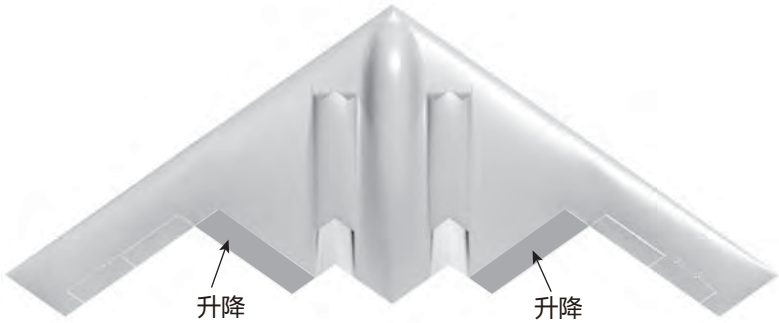
根据我们的测试经验，我们认为，按以下参数来设置大小舵量，将有助于飞行，舵量越大，模型飞机的动作响应更快，动作幅度可以更大。我们建议初次飞行使用大舵量起飞，然后根据个人情况调整到适合您的舵量。



	副翼（内侧）	升降舵（内侧）	方向舵（下端）
小舵量	H1/H2 19mm/19mm 舵量比率：100%	H1/H2 35mm/35mm 舵量比率：100%	
大舵量	H1/H2 19mm/19mm 舵量比率：100%	H1/H2 35mm/35mm 舵量比率：100%	H1开口最大尺寸102mm 舵量比率：100%

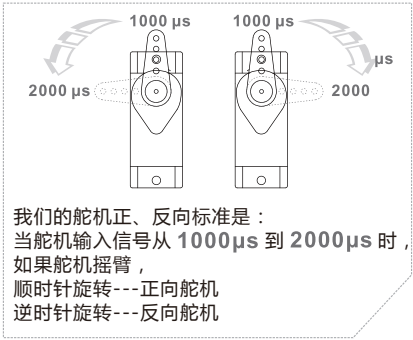
⚠ 飞行注意事项：

- 1.高速滑跑不能急打方向舵，否则飞机可能会甩尾侧翻；
- 2.升降舵需要预调2.5-3mm升舵；



- 3.此飞机需要装备飞翼E52陀螺仪才能飞行；
- 4.集线板里面设计了三角翼混控和副翼方向混控，客户不需要在遥控上再设置，遥控器只要使用普通模式就可以。

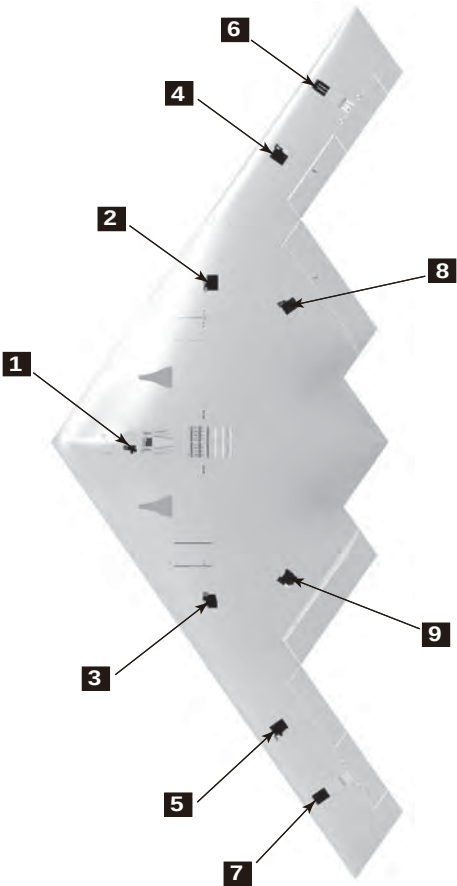
舵机使用介绍



我们的舵机正、反向标准是：
当舵机输入信号从 1000μs 到 2000μs 时，
如果舵机摇臂，
顺时针旋转---正向舵机
逆时针旋转---反向舵机

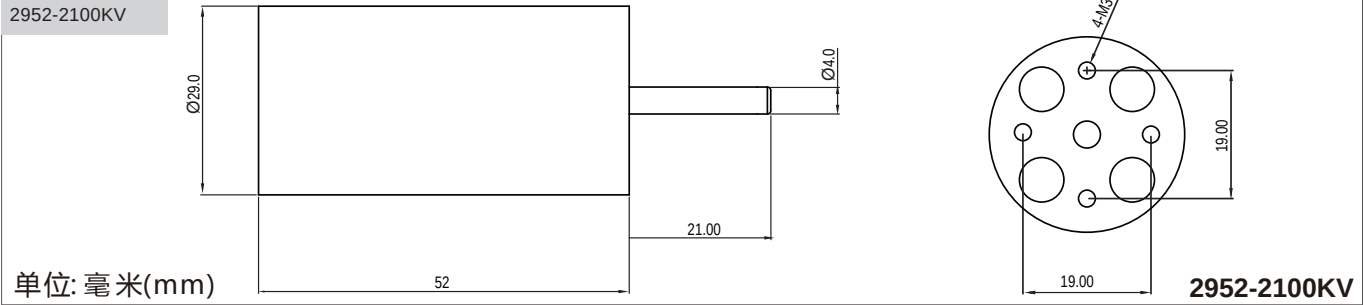
如果您需要选购其它品牌的舵机进行安装，
请参考下面的表格选择的舵机

舵机位置	舵机规格	序号	方向性	线长
前轮转向	9g数码-混合齿	1	反向	300mm
后舵门(左)	9g数码-混合齿	2	反向	100mm
后舵门(右)	9g数码-混合齿	3	正向	100mm
副翼(左)	9g数码-混合齿	4	正向	200mm
副翼(右)	9g数码-混合齿	5	正向	200mm
方向舵(左)	9g数码-金属齿	6	正向	400mm
方向舵(右)	9g数码-金属齿	7	正向	400mm
升降舵(左)	9g数码-混合齿	8	正向	100mm
升降舵(右)	9g数码-混合齿	9	正向	100mm



电机参数

Item No.MI029521
2952-2100KV

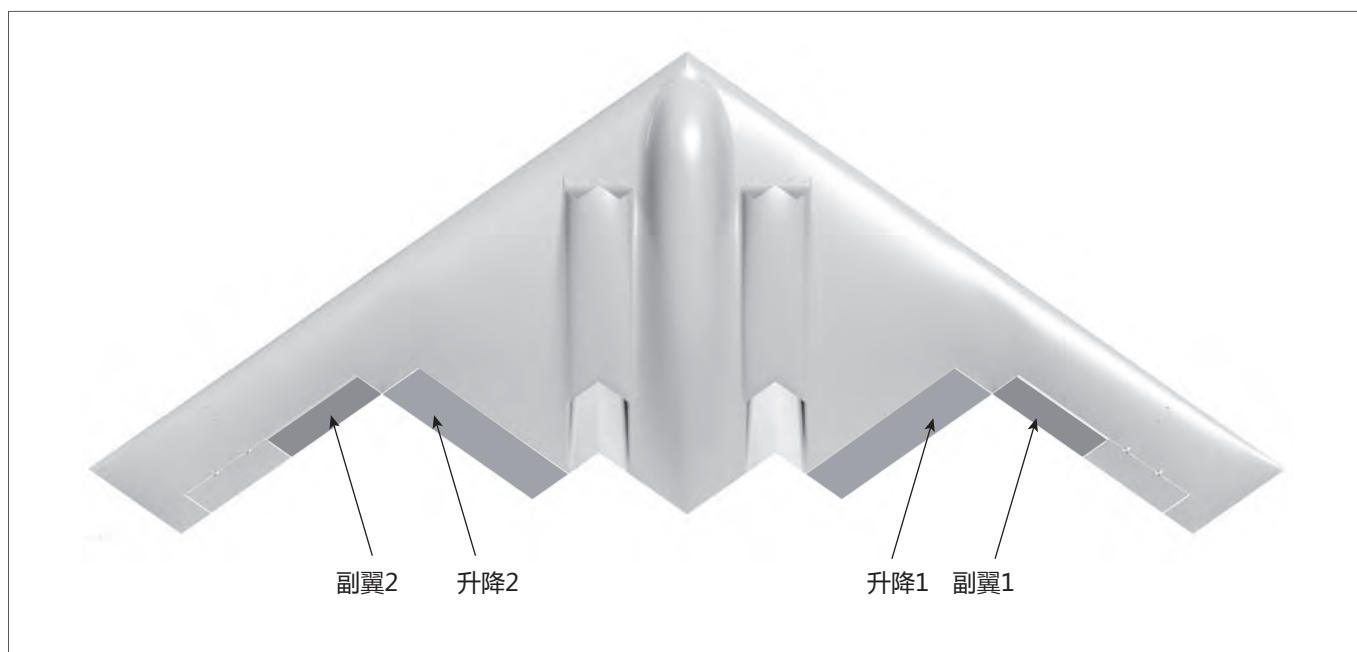


单位: 毫米(mm)

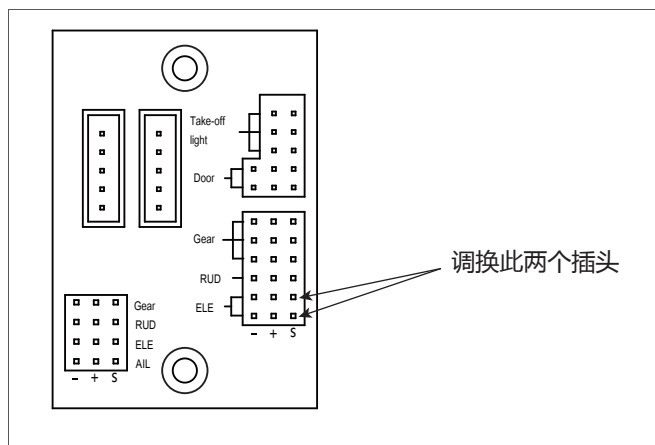
动力组编号	使用电机	电机 (KV)	推力 (g)	电流 (A)	使用电压 (V)	使用电调 (A)	涵道重量 (g)	最大功率 (W)	效率比 (g/w)
E7219	2952-2100KV	2100KV	2100-2200	50-55	22.2	60	230	1170	1.83

飞机调机说明

1.B2飞机的集线板里面已经设置了3角翼混控程序，所以遥控器不需要设置3角翼混控，只需要使用普通固定翼模式即可，另外集线板还设置了方向舵和副翼混控。



2.如果客户使用时出现升降1和升降2的打舵方向不正确，请尝试调换集线板上面的ELE两个插头的位置，如下图所示位置：



3.如果客户使用时出现副翼1和副翼2的打舵方向不正确，请尝试调换集线板上两个排线插头的位置，如下图所示位置：

