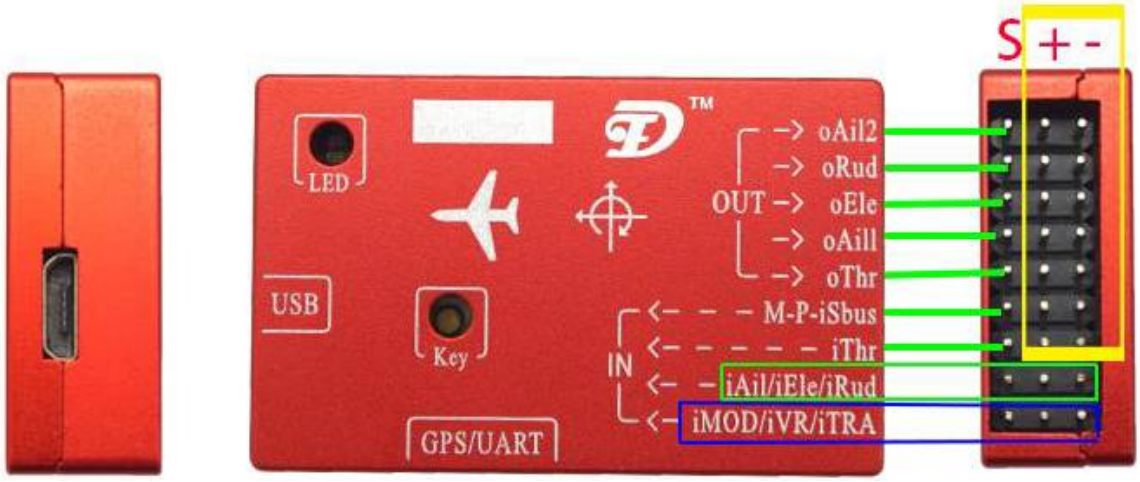
DF RC-H1 固定翼 6 轴平衡仪飞控说明书

Flight control manual of DF RC-H1fixed wing 6-axis balancer


LED
USB
Key
GPS/UART
OUT
-> oAil2
-> oRud
-> oEle
-> oAill
-> oThr
IN
<- - - M-P-iSbus
<- - - - - iThr
<- - iAil/iEle/iRud
<- iMOD/iVR/iTRA



功能介绍：

Function introduction

1. 采用 32 位处理器，高精度 3 轴加速度计、3 轴数字陀螺仪。
   Adopt 32-bit processor, high precision 3-axis accelerometer, 3-axis digital gyroscope.

2. 支持陀螺仪关闭功能、陀螺仪增稳功能（自动姿态锁定）、平衡仪功能、一键救机功能、GPS 自动返航、GPS 自动盘旋、GPS 自 动定高，GPS 飞行中油门自动控制与调节。

   Support gyroscope closing function, gyroscope stabilization function (automatic attitude locking), equalizer function, one-button rescue function, GPS automatic course reversal, GPS automatic hover, GPS self-moving height, GPS auto-throttle control and adjustment in flight.

3. 支持全局总感度调节功能，飞行中感度自由调节。
   Support the global total sensitivity adjustment function, feel free regulation in flight.

4. 支持固定翼、三角翼、V 尾等、内部自动混控，多级滤波算法适用与各种机型。

   Support fixed wing, delta wing, V tail, internal automatic hybrid control, multi-level filtering algorithm applicable to all types.

5. 支持 PWM、PPM、Sbus 输入，并自动识别。
   Support PWM, PPM, Sbus input and automatic identification.

6. 支持 USB 电脑调参、固件升级。
Support USB computer tuning, firmware upgrade.

7. 支持参数设置卡，方便外场调试。
Support parameter setting card, convenient field debugging.

功能说明：

Function description

1. **飞控上电自检**：飞机上电并保持飞控稳定不动（飞机任意姿态）、LED 闪烁并自检，升降舵机向上拉起一个角度（**用于提示自检**），约 6-10 秒后，当升降舵上下来回动 2 次后并回到正常位置，提示可以工作了，**注意：如果你连接了 GPS，这时升降舵会向上拉起一个角度并保持不动（如果是向下拉，一会启动成功后你要注意检查飞控的安装模式设置与陀螺仪正反设置了），直到 GPS 定位成功，GPS 定位成功后升降舵会自动回到正常状态**。

   Self-check on the flight control: the aircraft is powered on and maintains the flight control stable (the aircraft is in an arbitrary posture), the LED flashes and self-check, and the elevator pulls up an Angle (used to indicate self-check) about 6-10 seconds later, when the elevator comes down and moves back twice and returns to the normal position, the indication is ready to work. Note: if you are connected to the GPS, the elevator will pull up at an Angle and remain stationary (if it is pulled down, you should check the setup mode setting of the flight control and the gyroscope setting after successful startup) until the GPS positioning is done, and the elevator will automatically return to normal after successful GPS positioning.

2. **LED 指示说明**：飞控有两个 LED，红色 LED 与蓝色 LED，红色指示启动状态（上电自检的时候闪烁）、接收机信号连接指示（红灯常亮表示接收机信号连接正常、没有接收机信号红灯灭），蓝色指示飞控状态，蓝灯闪烁处于增稳状态、蓝灯常亮平衡状态、蓝灯熄灭普通状态（陀螺仪完全关闭）。注意：每次使用请注意检查遥控器的模式开关与对应的蓝灯指示。

   LED instructions: flight control has two LED, red LED and blue LED, red ordered state (electricity self-inspection on flash), a receiver signal connection instructions (the red light normally on said receiver signal connection normal, no receiver signal red light), blue indicates state of flight control, blue lights flashing in the

steady state, blue light normally on equilibrium state, blue lights ordinary state (gyroscope completely shut down). Note: check the mode switch of the remote control and the corresponding blue light indicator for each use.

3. **陀螺仪关闭功能：**通过第 5 通道的一个 3 段开关来切换，当开关在最小位置时关闭陀螺仪, 如果没有第 5 通道，飞控默认为增稳状态。

   Gyro off function: Switch through a 3-section switch in channel 5, and turn off the gyroscope when the switch is in the minimum position. If there is no channel 5, the flight control defaults to an augmented state.

3. **增稳功能：**通过第 5 通道的一个 3 段开关来切换，当开关在最大位置时开启陀螺仪功能，飞行中根据飞机飞行姿态陀螺仪自动矫正飞机姿态，保证飞行稳定，摇杆操作中不干预操作。

   Stabilizing function: The gyroscope function is turned on when the switch is at its maximum position. The gyroscope automatically corrects the aircraft posture according to the aircraft's flight attitude gyroscope in flight, so as to guarantee the flight stability. No intervention is required in the rocker operation.

5. **平衡功能：**通过第 5 通道的一个 3 段开关来切换，当开关在中间位置时开启平衡功能，飞行中只要摇杆回中，飞机自动平衡飞行。

   Balance function：Switch through a 3-section switch in channel 5. When the switch is in the middle position, turn on the balance function. As long as the joystick is back in the flight, the aircraft will automatically balance.

6. **一键救机功能：**通过第 7 通道的一个开关来启动，当你正确设置好一键救机键后，在任何飞行姿态下，只要拨动此开关一次，飞 机立即回到平衡姿态并保持一定的仰角，任意摇杆动作即解除救 机状态，当你连接了此飞控专用的 GPS 模块、且初始成功，你的 一键救机也就启动了一键返航功能。

One-button save function: Through a switch to start the channel 7, when you set up a key save aircraft key right after, under any flight attitude, as long as the switches, flying machine immediately return to balance and hold a certain elevation, removing any rocking motion is in save machine state, when you connect to the flight control dedicated GPS module, and the initial success, one of your key save the machine will start a key return function.

7. **总感度控制：**通过第 6 通道的一个 VR 旋钮来控制，当 VR 在中间位置时候，感度为 100%，左右旋转相应的比例放大缩小，如果没有第 6 通道，飞控感度默认在 100%位置。

Total sensitivity control: Control via a VR knob of channel 6. When VR is in the middle position, the sensitivity is 100%, and the right and left rotation is correspondingly enlarged and reduced. If there is no channel 6, the flight control sensitivity is at 100% by default.

8. **GPS 功能：**当你连接上专用的 GPS 模块后，飞控就具备 GPS 相关功能，当飞控自检完成后，升降舵会拉起一定的角度，表示正在搜索 GPS 卫星，当 GPS 定位成功、且达到 6 颗卫星后升降舵会回到正常位置，表示可以起飞了。

GPS function: When you are connected to a dedicated GPS module, the flight control will have gps-related power. When the flight control self-check is completed, the elevator will pull up a certain Angle, indicating that GPS satellite is being searched. When the GPS positioning is successful and reaches 6 satellites, the elevator will return to the normal position, indicating that it can take off.

9. **GPS 使用：**通过第 5 通道的一个 3 段开关来切换，当开关在中间位置时开启平衡功能也就开启了 GPS 功能，当你手动操作飞机的时候，完全处于手动操作状态，GPS 完全不干预你的操作，当你不操作飞机约 3 秒后，GPS 功能自动启动，根据你设定的高度、最远距离、盘旋半径，实现自动定高、返航、盘旋。

Use the GPS: A 3 through 5 channels to switch, switch when the switch in the middle a place open balance function is the function of GPS, when you when the manual operation plane, manual operation completely, completely not to interfere in your GPS operation, when you don't fuck for a plane about three seconds, GPS automatic start, set the height of the according to you, the farthest distance from, circle radius, automatic constant high, returning, hovering.

10. **平衡功能使用注意：**当使用平衡功能的时候，一定要水平矫正 飞机，方法：当所有的设置都好了后，利用调参软件或者设置卡 启动水平矫正，将飞机的机头上仰 3-9 度的一个角度，稳定不动，并等待矫正成功，不同飞机不同机型的上仰角度有点区别，角度太小，可能一进入平衡飞机就掉高度，太大又可能爬升太快，以实际多调一下试试。

Balance function use attention: When using balance function, must level correction planes, method: after all the settings are good, use the software or set to start card level correction, the plane back on the head of a 3-9 degrees angle, the steady still, and wait for the correction is successful, Different planes have different elevation angles. The angles are too small and may drop off as soon as the plane is balanced, too big and may climb quickly, adjust the try for real.

遥控器开关控制对应功能表：

Function table for control of remote control switch:

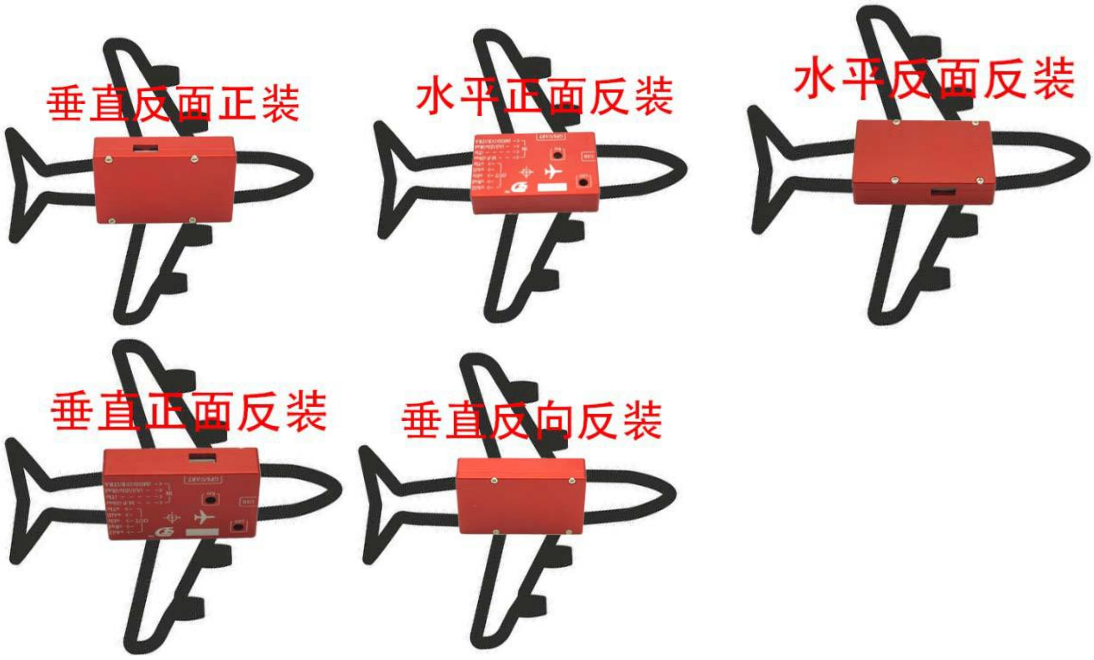
CH7 一键救机 One-button save function	CH6 感度控制 Sensitivity control	CH5 飞行模式 Flight mode	接收机响应动作状态 Receiver response action status
动作 action →			立即自动平衡(GPS 返航) Immediate automatic balance (GPS return)
	大小变化，中间为 100% Change in size, 100% in the middle →		飞机总感度跟随变化（0-200%） Total sense of aircraft follows change (0-200%)
		最大位置 maximum position →	陀螺仪增稳 Gyroscopic stabilization
		中间位置 Middle position →	自动平衡飞行（GPS） Self-balancing flight (GPS)
		最小位置 minimum position →	陀螺仪关闭 gyroscope is off

注意：无 CH6 时，默认总感度为 100%，无 CH5 时，这个默认为最小位置 CH5 配合实现不同功能切换。

Note: in the absence of CH6, the default total sensitivity is 100%. In the absence of CH5, the default is to switch between different functions in the minimum position.

飞控安装模式：

Flight control installation mode:



注意 1：飞控提供 8 种安装模式，方便适用不同机型的飞机，安装模式的正确设置是很重要的，飞控安装好后**首先是要设置好安装模式，再来设置陀螺仪正反，飞行时请评估周围环境是否安全**。

Note 1: the flight control provides 8 installation modes, which is convenient for aircraft of different models. It is important to install the correct setting of the installation mode. After the flight control is installed, the installation mode should be set first, and then the gyroscope should be set. Please assess the safety of the surrounding environment when flying.

注意 2：为使飞控达到良好的使用效果请注意几点提醒，1.使用飞控的飞机，保证你油门推到 80%-90%的时候飞机没有异常的共振，振动在合理换位内（陀螺仪对振动很敏感），否则你要检测是马达问题还是桨不平衡导致，且推力能达到 1:1 以上，2.飞控的安装必须与机身贴合稳固，不要振动几下就松开，飞控与机身的贴合必须做好减振，比如用好的厚的 3M 双面贴，大飞机或者油机可以用专业的减震支架，做好了减振工作，就可以保证飞控的可靠工作，3.正确的设置很重要，起飞前一定要反复确认飞机各轴动作而陀螺仪能做出正确的响应。4.减振的目的，就是将飞机马达转动产生的高频振动隔离起来，

尽量少的传递到飞控，保证飞控的陀螺仪正确识别飞机的姿态以到达正确控制飞机的目的。

Note 2: for the flight control, please pay attention to what time remind good use effect, 1. The use of aircraft flight control, ensure your throttle to 80% - 90% of the aircraft was abnormal resonance, and the vibration within reasonable transposition (gyroscope is sensitive to vibration), or you want to test it is motor problem or oar imbalance causes, and the thrust can reach more than 1:1, 2. The installation of flight control must be firmly attached to the fuselage without releasing after a few vibration. The fitting of flight control to the fuselage must be well damped. 3. Correct setting is very important. It is necessary to confirm the aircraft's axial actions repeatedly before taking off, and the gyroscope can make the correct response.4. The purpose of vibration reduction is to isolate the high-frequency vibration generated by the rotation of the aircraft motor and transmit it to flight control as little as possible, so as to ensure that the gyroscope of flight control correctly identifies the attitude of the aircraft to achieve the purpose of proper control of the aircraft.

注意 3：第一次使用 GPS 功能的时候，请先让飞机上天手动试飞一次，保证飞机的**重心与动力**配置合理，基本能够手动操作飞机、飞行自如，否则应该确认并检查飞机配置，如果飞机自己都不能正常自如飞行，一旦启动 GPS 功能可能也无法正常工作，导致很多异常情况发生，千万注意：动力、震动、重心先调好！

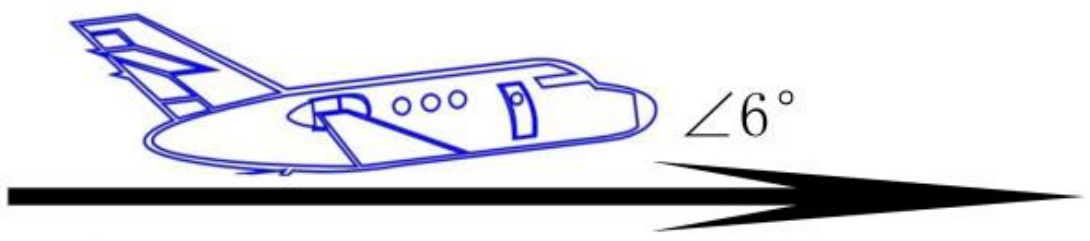
Note 3: the use of GPS for the first time, please let airplane flight manual time, ensure the aircraft's center of gravity and power allocation is reasonable, basic can manual operation plane, flying freely, otherwise should identify and examine the plane configuration, if the plane can't normal since such as flight, once started GPS may not work properly, causing a lot of abnormalities Conditions occur, must note: power, vibration and center of gravity to set first!

注意 4：感度问题，感度应该设置在一个合理的范围内，最好通过第六通道的一个电位器来控制，试飞时反复调小调大，保证飞机在一个比较大的感度位置而不共振，感度过小传感器反馈不灵敏，过大飞机在飞行中会产生共振，设置一定要合理。

Note 4: sensitivity, sensitivity should be set in a reasonable scope, through the sixth best channel of a potentiometer to control, test repeatedly the minor big, ensure the sensitivity of the plane in a larger position without resonance, feeling through small sensor feedback insensitive, large aircraft in flight will produce resonance, set must be reasonable.

飞机水平矫正：

Aircraft leveling correction:



飞控在使用平衡、GPS 功能前，必须做水平矫正，**方法：**将飞机

放置如上图一样的水平姿态∠6-12°，然后启动水平矫正完成矫正。

Flight control before using balance, GPS, correction must be level. Methods: place the aircraft as above the horizontal posture of < 6-12 °, and then start the level correction complete correction.

GPS 参数控制说明：

GPS parameter control instruction:

1. **最低高度：**控制飞机自动飞行在设定的高度，默认 80 米。
   Minimum height: controls the aircraft to fly automatically at the set height, with a default of 80 m.

2. **最远距离：**当启动 GPS 功能后，飞机为 GPS 自动飞行状态，以起飞点为起点，并判断飞机当前与起点的距离，如果大于设置的最远距离，飞机自动启动返航，并飞回起点上空并自动进入盘旋状态，默认 200 米。
2. The farthest distance: when the GPS function is activated, the aircraft will be in the automatic flight state, starting from the departure point and judging the distance between the aircraft and the starting point. If the distance is larger than the set farthest distance, the aircraft will start to turn back and fly back above the starting point and enter the hovering state automatically. The default is 200 meters.

3． **盘旋半径：**当进入盘旋状态，飞机就控制在设置的盘旋半径内飞行，注意：由于风力等因素，飞行的半径可能有一定的偏差，默认 60 米，半径设置越大，盘旋越姿态稳定，盘旋中心是以起飞点向前加 60 米再加半径来确定的位置，一般盘旋都是在你的正前方。

Circle radius: when to hover, the plane is controlled within the set half circle diameter, note: due to factors such as wind, flying radius may have certain deviation, 60 meters by default, the larger the radius, circling the attitude stability, circle center is a take-off point forward with 60 meters radius to determine the location of more, generally hover is right in front of you.

4． **失速速度：**当进入 GPS 自动飞行后，飞行的速度会自动保持在设置的失速速度上，默认 40 公里，失速速度的正确设置很重要，值过大会导致飞行很耗电，值太小会导致飞行异常，系统会根据你设置的值与当前的速度来自动调节油门大小，达到自动飞行的目的。

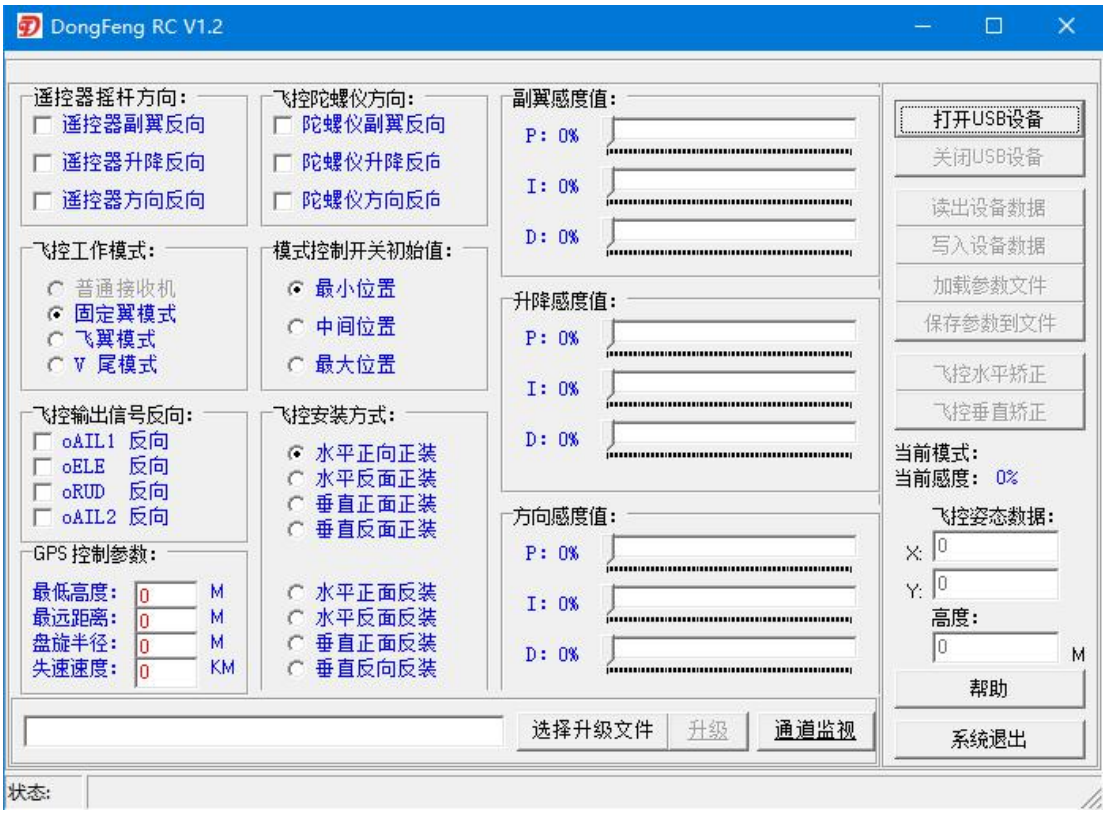
Stall speed: when entering the GPS automatically after the flight, flight speed automatically keep on the stall speed is set, the default 40 kilometers, the stall speed is set up correctly is very important, the value will result in flight are a power hog, value is too small will lead to abnormal flight, the system will according to you to set the value of the to automatically adjust the throttle size, and the current speed to automatic flight achieved.

5． **以上参数的设置出厂都是默认在安全的范围内，你如果想改变里面的参数，请注意国家安全规定法规。**

The above parameters are set by default in the safety range. If you want to change the parameters, please pay attention to the national security regulations.

USB 调参软件：

USB debugging software:



1. USB 是免驱动程序，立插即用，支持 WINXP、WIN7 等。
   USB is a driver free program, plug and play, and supports WINXP, WIN7, etc.

2. 通过 USB 软件可以很方便的对飞控进行各种参数设置，如果飞控有新固件出来，还可以很方便用来升级固件。

   It is convenient to set various parameters for the flight control through USB software. If the new firmware comes out, it can be used to upgrade the firmware.

3. 固件升级：打开 USB 调参软件，选择好要升级的固件如下图
   Firmware upgrade: open the USB debugging software and select the firmware to be upgraded as shown below.

4. 按住飞控 KEY 里面的按键，再连接 USB 到电脑，如果出现上面

图片的LINK OK BOOT字样后，松开按键，点上图的升级按键，升降开始，不成功，再点一下上图的升级按键。

Press and hold the KEY in the flight control KEY, and then connect USB to the computer. If the word "LINK OK BOOT" appears in the picture above, loosen the button, click the upgrade button in the picture above, and the lift starts. If not, click the upgrade button in the picture above again.

设置卡调试飞控参数：

Setting card debugging flight control parameters:

常规飞机动作检查：

Routine aircraft movements:

一键救机飞机动作响应检查：

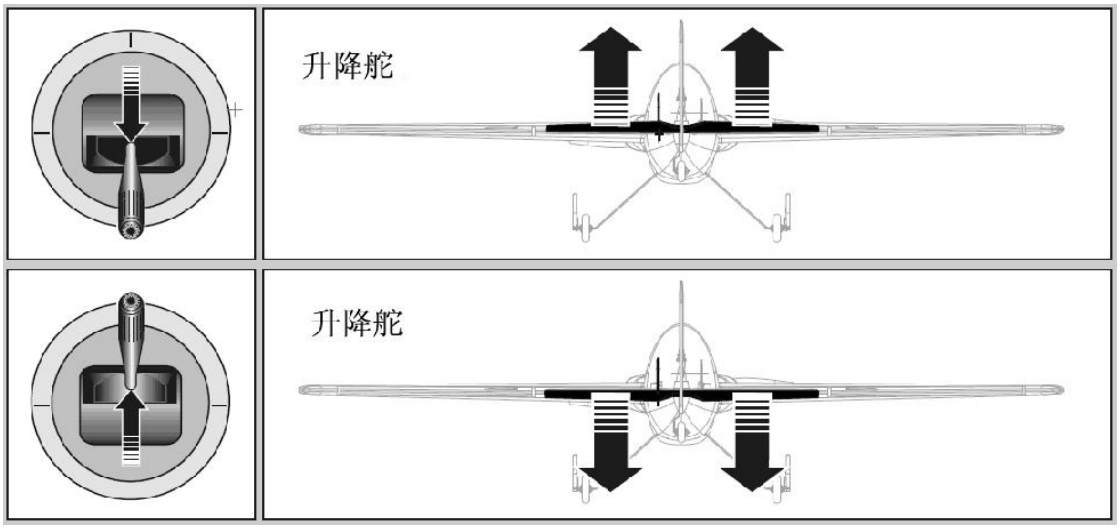
One-button aircraft action response check:

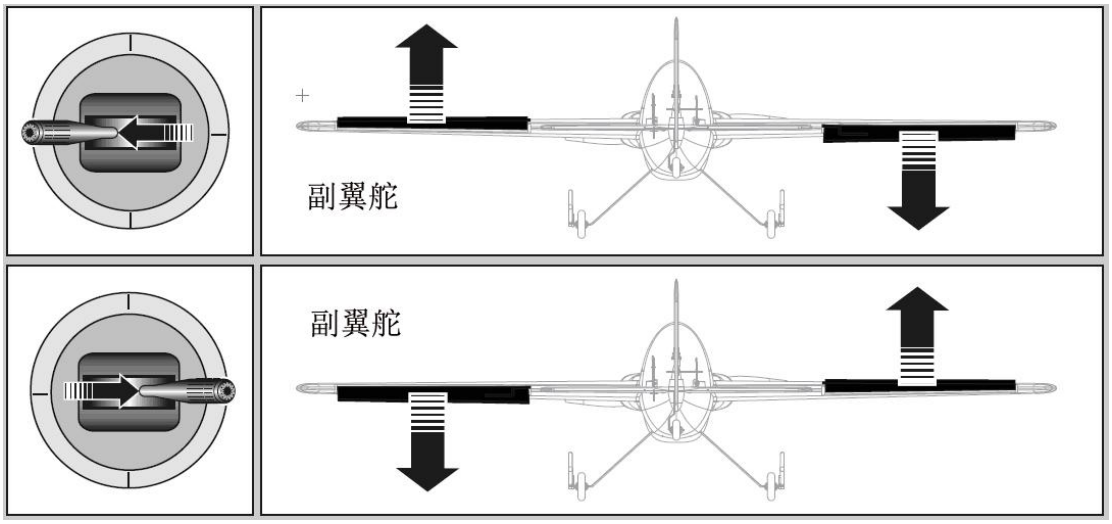
拨动救机键，飞机是否理解请求控制平衡，并将升降舵自动拉起，且升降舵缓慢的减少输出。只有看到上面描述的正常动作，才能说明设置正常，否则可能要检查飞控的安装模式与升降舵的陀螺仪正反。

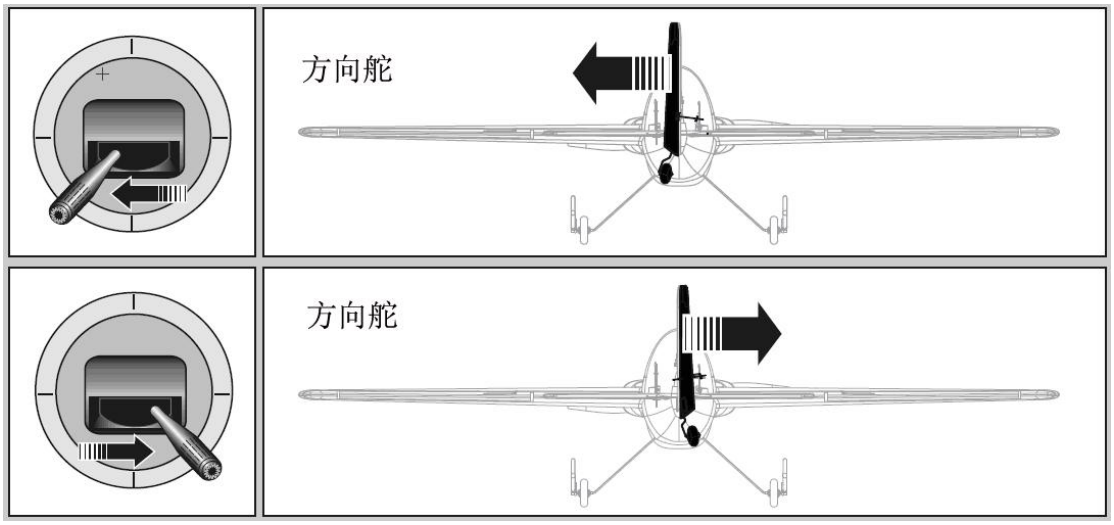
Dial the rescue button to see if the aircraft understands the request for control balance, and pull the elevator up automatically and slowly reduce the output. Only when the normal action described above is seen can it be indicated that the setting is normal. Otherwise, it may be necessary to check the mounting mode of the flight control and the gyroscope of the elevator.

摇杆操作与飞机舵机的正确反应。

Correct response of rocker operation and aircraft steering gear.





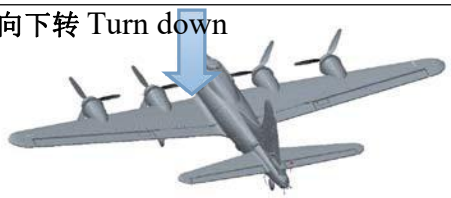


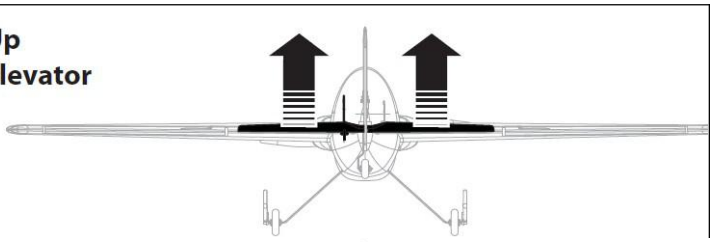
飞机陀螺仪的正确反应：

The correct reaction of the aircraft gyroscope:

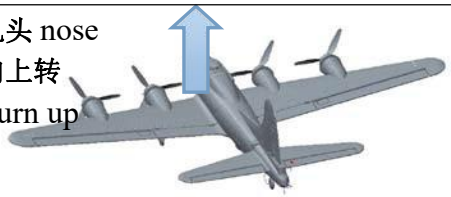
机头 nose

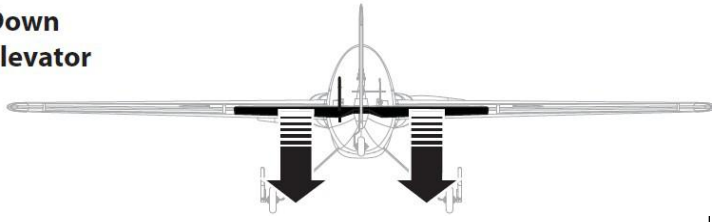
向下转 Turn down

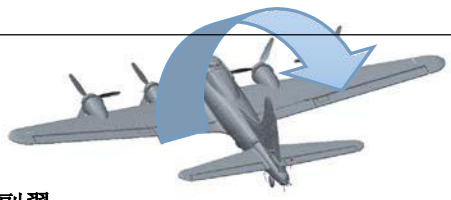


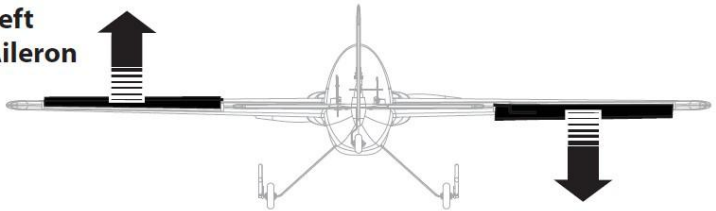


机头 nose
向上转
Turn up

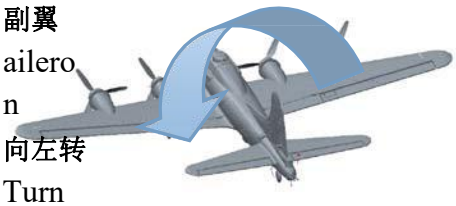
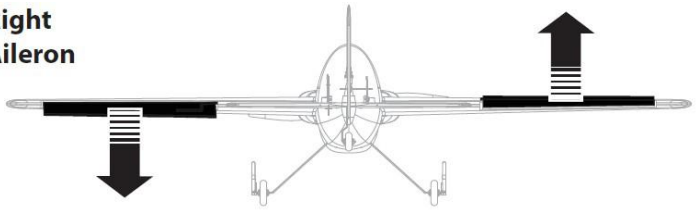
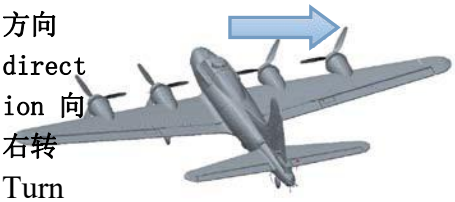
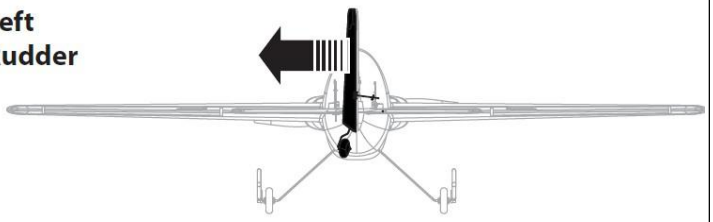
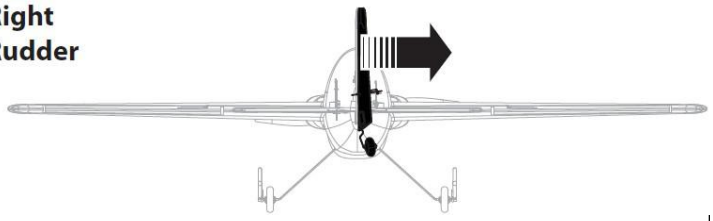








副翼
ailero
n
向右转
Turn
right

副翼 aileron 向左转 Turn left 	Right Aileron 
方向 direction 向右转 Turn right 	Left Rudder 
方向 direction 向左转 Turn left 	Right Rudder 

注意：飞机起飞前的正确设置与飞行的成功与否息息相关，飞机在起飞前请认真检查摇杆控制、陀螺仪控制的动作是否与上述描述完全一致。

Note: the correct setting before takeoff is closely related to the success or failure of the flight. Please carefully check whether the rocker control and gyroscope control are consistent with the above description.