

The Details of Engineering Parameters of H1 Flight Controller.

H1 飞控的工程参数分为：**3D 手动参数**和**GPS 自稳参数**。

3D 手动参数管理 H1 飞控内部的三轴陀螺仪状态，是直升机的基本飞行单元，包括十字盘修正，锁尾控制等。如果想让直升机飞行效果稳定，首先要调试好手动参数。H1 飞控的稳定飞行工作机制是，在内部三轴陀螺仪的基本飞行上叠加一个 GPS 自稳控制。所以调试 3D 手动参数会影响到 GPS 模式的飞行性能，调 GPS 参数，不会对手动飞行有影响。

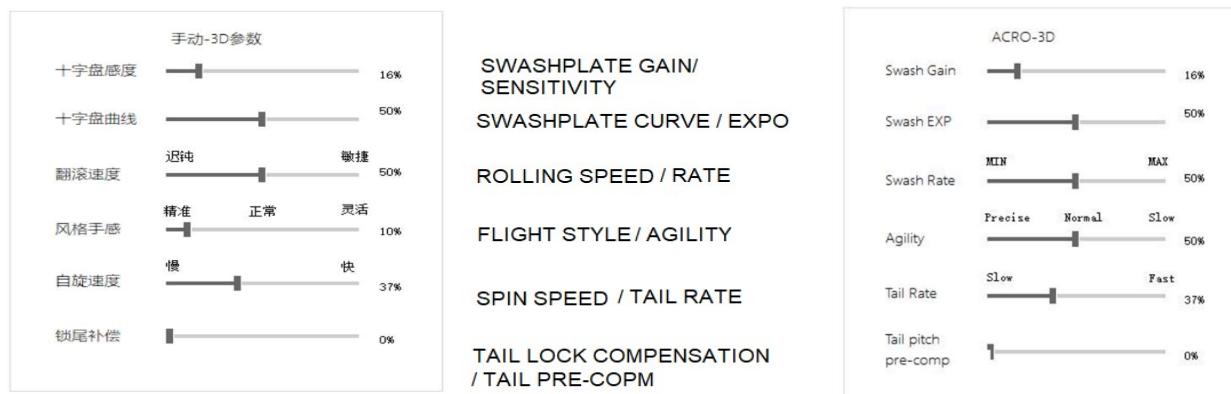
3D 手动参数+GPS 自稳参数=GPS 模式下的稳定飞行。（PS：3D 手动参数为速率控制，GPS 参数为位置控制）

The engineering parameters of H1 flight control are divided into 3D manual parameters and GPS auto-stabilization parameters.

3D manual parameters manage the state of the three-axis gyroscope inside the H1 flight controller, which is the basic flight unit of the helicopter, including swashplate correction, tail lock control, etc. If you want the helicopter flight effect to be stable, you must first adjust the manual parameters. The stable flight working mechanism of the H1 flight controller is to superimpose a GPS stabilization control on the basic flight of the internal three-axis gyroscope. Therefore, adjusting the 3D manual parameters will affect the flight performance of the GPS mode, BUT adjusting the GPS parameters will not affect the manual flight.

3D manual parameters + GPS stabilization parameters = stable flight in GPS mode. (PS: 3D manual parameter is rate control, GPS parameter is position control)

3D 手动参数 3D manual parameters

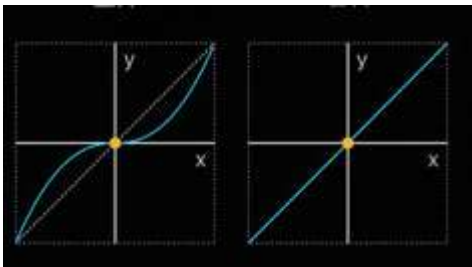


十字盘感度，这个参数和传统陀螺的感度一致。简单现象是，悬停的时候，值过小，直升机修正力度低，值过大，直升机会激烈点头，对尾看就是尾管末端上下跳跃，非左右摇摆。当正常悬停的时候，直升机很稳定，但是全速航线前进，直升机出现波浪形点头的航迹，是修正力度过小的现象，每增加 5%就试飞一次。直到悬停时或者轻微打杆前进时，出现激烈的点头震荡。（注，亚拓 E1-900 和其他直升机有不同，他会激烈的左右震荡机身，有点类似于疯狂打左右副翼）

Swashplate Sensitivity, this parameter is the same as the sensitivity of the traditional gyro. The simple phenomenon is that when hovering, the value is too small, the correction force of the helicopter is low, and the value is too large, the helicopter will nod violently, and the end of the tail tube will jump up and down when viewed from the tail, not swinging left and right. When hovering normally, the helicopter is very stable, but when the flight path is advancing at full speed, the helicopter shows a wavy nodding track, which is a phenomenon that the correction force is too small, and the test flight is performed once every 5% increase. Until hovering or slightly moving forward stick, there is a violent nodding vibration. (Note, the ALIGN E1-900 is different from other helicopters. It will violently oscillate the fuselage left and right, which is a bit similar to moving the left and right ailerons crazily)

十字盘曲线：这个和遥控器里的 EXP 手感曲线是一个意思，值越大作用是，摇杆放在中间附近位置直升机翻滚柔和，是打杆和飞机响应的关系。此项参数，随意修改，并不影响飞行稳定性。左图为 50% 的默认 EXP 手感曲线，右图是 0% 的手感曲线。只控制直升机前后滚翻和左右滚翻。

Swashplate curve/ Expo: This has the same meaning as the EXP feel curve in the remote control. The larger the value, the more soft the helicopter rolls when the joystick is placed near the middle, which is the relationship between the stick and the response of the aircraft. This parameter can be modified at will without affecting flight stability. The left picture is the default EXP feel curve of 50%, and the right picture is the 0% feel curve. Only control the helicopter to roll back and forth and roll left and right.



翻滚速度：这里指的是直升机打满杆的翻滚速度，越大翻滚越快，对飞行稳定性无作用。其实就是循环螺距（副翼和升降的行程）的舵量和反应。你可以加大这个值，飞机反应就越灵敏。如果想获得 KBAR 陀螺仪的手感，需要设置到 100%。默认 50% 飞行柔和并迟钝。

Rolling speed: This refers to the rolling speed of the helicopter with full sticks. In fact, it is the rudder volume and response of the cyclic pitch (aileron and lift stroke). You can increase this value, the more responsive the aircraft will be. If you want to get the feel of the KBAR gyroscope, you need to set it to 100%. The default 50% flight is soft and sluggish.

风格手感：这里和 KBAR 里的风格是一个作用，可以理解为打杆松手刹停加速度。正常情况不要动它，只有大师激烈飞行才能感受到这个值的作用。

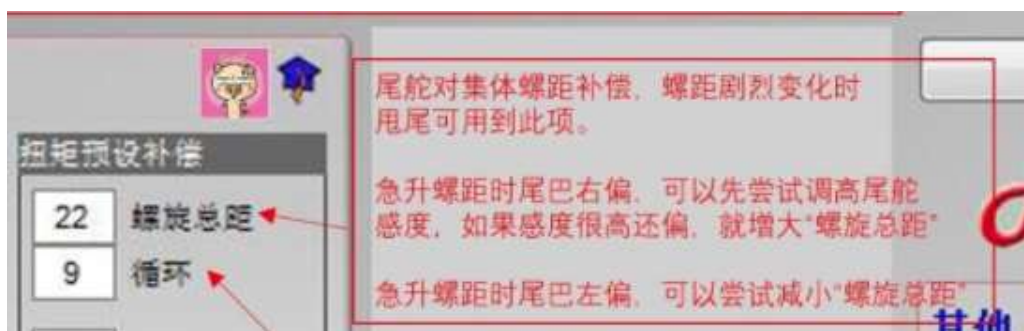
Flight Style: This is the same as the style in KBAR, which can be understood as the acceleration of control stick movements and releasing it(the handbrake). Don't touch it under normal circumstances, only the expert can feel the effect of this value when flying intensely.

自旋速度：这里指的是直升机打满杆的尾吧自旋速度，越大直升机尾巴转越快，对飞行稳定性无作用。其实就是尾巴的舵量和反应。你可以加大这个值，飞机反应就越灵敏。如果想获得 KBAR 陀螺仪的手感，需要设置到 100%，满杆就是一秒转一圈。默认 37%，大概是 2 秒转一圈。

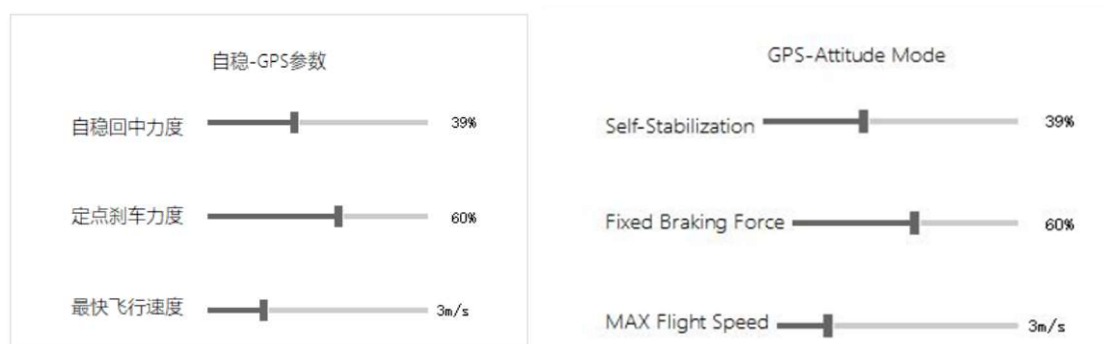
Spin/Pyro speed: This refers to the spin speed of the tail bar when the helicopter is full of rods. The bigger the helicopter, the faster the tail spins, which has no effect on flight stability. In fact, it is the rudder volume and response of the tail. You can increase this value, the more responsive the aircraft will be. If you want to get the feel of the KBAR gyroscope, you need to set it to 100%, and the full pole is one rotation per second. The default is 37%, which is about a circle in 2 seconds.

锁尾补偿：全名，集体螺距对锁尾的欲补偿。抽集体螺距时，尾滑块提前运动来补偿锁尾。此值只有在激烈 3D 飞行有作用。GPS 模式飞悬停航线几乎无作用，调这个值也不会对悬停时尾巴抖有任何改善。

Tail Lock Compensation: the compensation of the collective pitch to the tail locking. When the collective pitch is applied, the tail slider moves in advance to compensate for the tail lock. This value is only useful in intense 3D flying. Flying on a hovering route in GPS mode is almost useless and adjusting this value will not have any improvement on tail shaking when hovering.



自稳 GPS 参数 GPS-Attitude Mode



自稳回中力度: 遥控器前进杆向前猛弹摇杆，飞机前倾斜再回弹到水平位置时的力度。如果 GPS 悬停有轻微摇晃画圈刷锅的摇摆，可适当每次增加 5%，试飞一次。值过大，直升机回弹激烈到震荡。

Self-stabilizing force: the force when the forward stick of the remote control flicks the joystick forward and release, the aircraft tilts forward and then bounce back to the horizontal position. If the GPS mode hovering is slightly shaken while hovering, it can be increased by 5% each time, and test flight once. If the value is too large, the helicopter will rebound violently to the point of shock.

定点刹车力度: 遥控器压杆，直升机前进航线飞行，这时突然松手，直升机会向后仰来刹车。这个值就是控制刹车距离的。注意，直升机最大倾斜角度在 45 度内，大直升机惯性大，刹车都会刹很远。增大这个值，目前没有人刹车翻车的报告，可以随意探索，直到刹车出现激烈点头。

Fixed-point braking force: When move control stick the helicopter flying, suddenly let go of the control stick, the helicopter will lean back and brake. This value controls the braking force/ distance. Note that the maximum tilt angle of the helicopter is within 45 degrees, the inertia of the large helicopter is large, so the brakes will need longer distance. Increase this value, and so far there is no report of someone crash during braking, you can explore at will until the brakes show a fierce nod.

最快飞行速度: 满杆的前进速度，默认 3 米/秒，过大可能会刹不住。或者高速前进的时候点头。

The fastest flight speed: the forward speed of the full stick, the default is 3 m/s, if it is too large, it may not be able to stop. Or nod when moving at high speed.

预设飞行手感 Preset Flight Style



这里的手感模式会对全局有作用，意味着无论是手动模式飞行，还是 GPS 自稳模式飞行，都会有明显感受。主要功能是工程参数里的各种参数的组合预设值。

The **Preset Flight Style/ mode or Maneuverability** will affect the overall settings, which means that whether it is flying in manual mode or in GPS stabilization mode, there will be obvious feelings. The main function is the combined preset value of various parameters in the engineering parameters.

如果设置到**像真机**，那么整个直升机手感会软塌塌的，不建议使用，哪怕你真的是像真机。

If setting to **Scale-Heli**, the whole helicopter will feel soft and too calm. It is not recommended to use it, you can try but it will be boring to some.

标准飞行是常规手感，适合大多数人。（翻滚柔和，自旋缓慢）

Standard flight is a regular feel setting that suits most people. (softer roll, slower spin)

3D 进阶，设置到这个挡位并不是意味着只能飞 3D 了，其实可以飞 GPS 模式，带来的改变就是 GPS 模式下打杆会变得更脆了。连拨一键倒飞直升机翻滚的都更干脆了。部分飞机可能会出现不适应，激烈震荡，如果这情况，手动调小十字盘感度值，每次缩小 5% 飞行测试。切到手动 3D 飞行时，会感觉有 7 成陀螺仪的手感。

3D Beginner, this setting does not mean that you can only fly 3D, in fact, you can fly in GPS mode too, the changes is that the stick movement will become more responsive in GPS mode. Even activation of inverted flight and the helicopter rolls is more straightforward. Some aircrafts may experience discomfort and violent vibrations. If this happens, manually adjust the swashplate gain value by 5% each time for flight testing. When switching to manual 3D flight, it will feel like a 70% gyroscope.

3D 大师模式，这挡位，直升机会非常疯狂。无限贴近于 KBAR 陀螺仪，建议只飞手动模式，GPS 模式可能会因为反应太快而发生震荡。新手勿尝试。

3D master mode/ Expert mode, this setting, the helicopter will be very aggressive/crazy. It is infinitely close to the KBAR gyroscope. It is recommended to fly only in manual mode. The GPS mode may oscillate because the response is too fast. Newbie don't try this setting.