Align 3G Settings Manual

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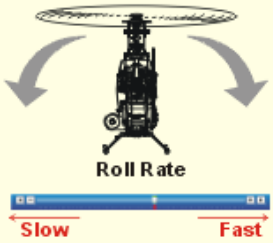
1 Aileron Parameter Setting

1.1 Aileron Control Rate

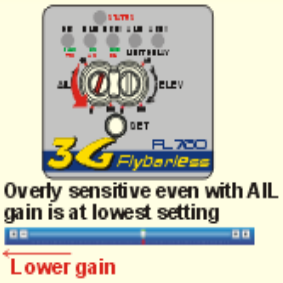
Helicopter roll rate is a personal preference. This parameter is used to compensate for insufficient roll rate settings on your radio. For example, when the AIL SWASH AFR is set to the maximum value on your radio, but higher roll rate is still desired, this value can be increased to achieve even higher roll rate. On the other hand, even though the radio's AIL SWASH AFR can be used for lower roll rate, too low of SWASH AFR value will reduce command resolution (do not lower past 50%). Instead, use this aileron command compensate parameter to reduce roll rate, while maintaining command resolution. The actual roll rate after compensation will be displayed in 「Command display」.

Note: If the roll rate is still insufficient after increasing this parameter, there may not be enough cyclic pitch. Please go back to the 3G flybarless system setup and increase the cyclic pitch, but not exceeding the maximum pitch as recommended in the manual.



1.2 Aileron Total Gain Compensate

A helicopter's gain may be attributed to factors such as servo arm's length, helicopter size, etc. This parameter is used to compensate for insufficient AIL gain settings on your 3G control-unit. For example, when 3G control unit's minimum AIL gain setting is reached and yet it is still too sensitive, the aileron total gain compensate can be decreased. User should try to set the aileron gain compensate value so that the physical dial on 3G control-unit is approximately in the middle, so the gain resolution is maintained, and there are room for fine adjustments using the dial.



1.3 Aileron Roll Lock Gain Adjustment

The roll lock gain adjustment is used to maintain the helicopter on a straight course during high speed sideway flights. Higher value keeps the helicopter straight, but too high of value will result in slow sideway oscillation during hover.

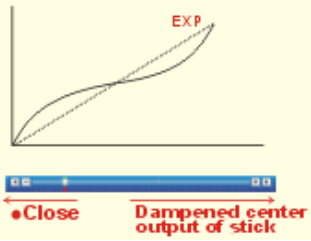
1.4 Aileron Roll Stop Gain Adjustment

The roll stop gain adjust is used to suppress the sideway rocking motion (bobbing) after sudden stop from high speed rolls. Too high of value may result in delay in helicopter position fixing after rolls.

Note: CCPM servos will consume more power and current by increasing brake gain. Too much brake gain may cause BEC current overload. Please keep brake gain below 30% if you can't make sure the current capacity of BEC is enough. You may also decrease the AIL gain to inprove the sideway rocking montion(bobbing) after sudden stop from high speed rolls.

1.5 Aileron Roll EXP Level Setting

Roll exponential setting is used to soften the aileron's sensitivity at mid stick. Setting range is 0 to 5, higher value has larger softening effect. Set this parameter to 0 if the EXP setting on the radio is used instead.

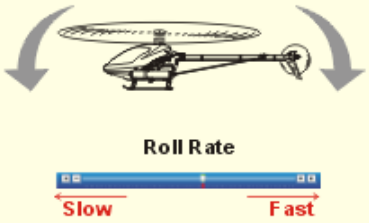


2 Elevator Parameter Settings

2.1 Elevator Control Rate

Helicopter flip rate is a personal preference. This parameter is used to compensate for insufficient flip rate settings on your radio. For example, when the ELE SWASH AFR is set to the maximum value on your radio, but higher flip rate is still desired, this value can be increased to achieve even higher flip rate. On the other hand, even though the radio's ELE SWASH AFR can be used for lower flip rate, too low of SWASH AFR value will reduce command resolution (do not lower past 50%). Instead, use this elevator command compensate parameter to reduce flip rate, while maintaining command resolution. The actual flip rate after compensation will be displayed in 「Command display」.

Note: If the flip rate is still insufficient after increasing this parameter, there may not be enough cyclic pitch. Please go back to the 3G flybarless system setup and increase the cyclic pitch, but not exceeding the maximum pitch as recommended in the manual.



2.2 Elevator Total Gain Compensate

A helicopter's gain may be attributed to factors such as servo arm's length, helicopter size, etc. This parameter is used to compensate for insufficient ELE gain settings on your 3G control-unit. For example, when 3G control unit's minimum ELE gain setting is reached and yet it is still too sensitive, the elevator total gain compensate can be decreased. User should try to set the aileron gain compensate value so that the physical dial on 3G control-unit is approximately in the middle, so the gain resolution is maintained, and there are room for fine adjustments using the dial.

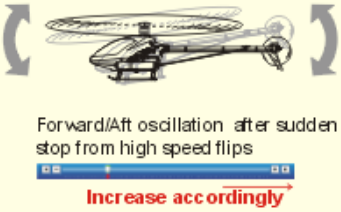
2.3 Elevator Lock Gain Adjustment

The elevator lock gain adjustment is used to maintain the helicopter on a straight course during high speed forward flights. Higher value keeps the helicopter straight, but too high of value will result in slow forward/aft oscillation during hover.

2.4 Elevator Stop Gain Adjustment

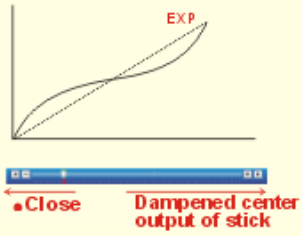
The elevator stop gain adjust is used to suppress the forward/aft rocking motion (bobbing) after sudden stop from high speed flips. Too high of value may result in delay in helicopter position fixing after flips.

Note: CCPM servos will consume more power and current by increasing brake gain. Too much brake gain may cause BEC current overload. Please keep brake gain below 30% if you can't make sure the current capacity of BEC is enough. You may also decrease the ELEV gain to inprove the sideway rocking montion(bobbing) after sudden stop from high speed flips.



2.5 Elevator EXP Level Setting

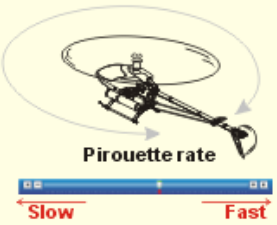
Elevator exponential setting is used to soften the elevator's sensitivity at mid stick. Setting range is 0 to 5, higher value has larger softening effect. Set this parameter to 0 if the EXP setting on the radio is used instead.



3 Rudder Parameter Setting

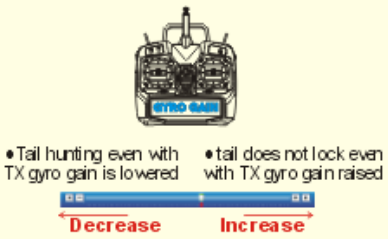
3.1 Rudder Control Rate

This setting is used to adjust the pirouetting rate of 3G system to suit the pilot's preference, with larger value being faster pirouette rate, small value being slower rate.



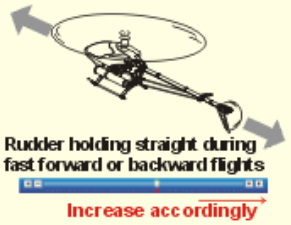
3.2 Rudder Total Gain Adjustment

A helicopter's gain may be attributed to factors such as servo arm's length, helicopter size, etc. This parameter is used to compensate rudder gain settings on your radio. With higher rudder total gain value, the rudder gain value needs to be decreased on the radio. User should try to set the rudder total gain adjustment value so that the rudder gain on radio is approximately 60%, so the gain resolution is maintained, and there are room for adjustments on the radio.



3.3 Rudder Lock Gain Adjustment

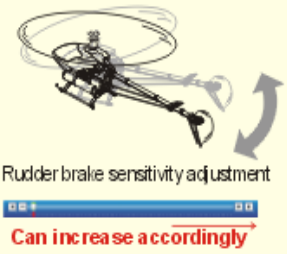
The rudder lock gain adjustment is used to maintain the helicopter on a straight course during high speed forward and backward flights. Higher value keeps the helicopter straight, but too high of value will result in tail oscillation during hover.



3.4 Rudder Stop Gain Adjustment

The rudder stop gain adjust is used to suppress tail oscillation after sudden stop from high speed pirouetting maneuvers. Too high of value may result in delay in helicopter position fixing after pirouetting maneuvers.

Note: If the helicopter frame has abnormal vibrations, increasing this value may cause overcorrection of rudder, result in tail oscillation (hunting).



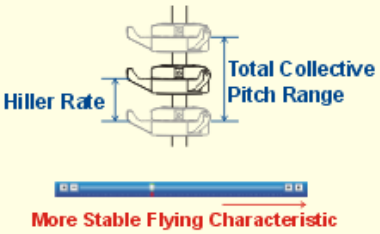
3.5 Pirouette Compensate

This parameter corrects cyclic instability during pirouetting maneuvers. But too high of value may result in excess cyclic gain, causing high speed oscillations.

4 Miscellaneous Settings

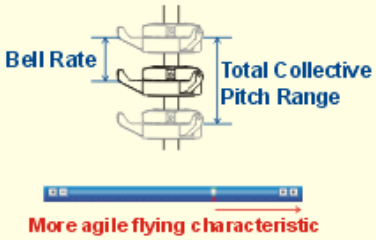
4.1 Hiller Rate

The cyclic pitch control on RC helicopters utilizes the Bell Hiller mixing method. Hiller rate is equivalent to helicopter's stabilizer paddle effectiveness rate. 3G system simulates the effect of Hiller system, but with higher precision and no aerodynamic resistance from paddles. Higher Hiller rate results in more stability in the helicopter, which is suitable for F3C maneuvers. On the 3G system, the sum of Bell and Hiller mixing rate should not be lower than 100%, and no higher than 150%. Lower Hiller rate results in more direct control with faster response. We recommend setting of 70% for stability, and 40% for hard 3D type flying. We recommend no going below 30%, as this would result in helicopter instability.



4.2 Bell Rate

In term of stabilizing system, Bell mixing rate is the ratio between servos and direct link to cyclic pitch. The higher the rate, the faster the response. On the 3G system, the sum of Bell and Hiller mixing rate should not be lower than 100%, and no higher than 150%. We recommend setting of 70% for hard 3D type flying, and 30% for beginners.

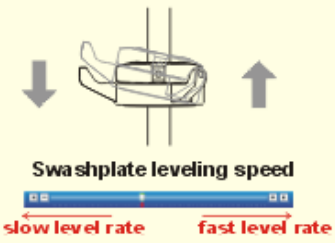


4.3 Collective Compensate

During fast forward flight, if collective pitch changes result in helicopter pitching up or down, this value can be increased to alleviate the pitch instability of the helicopter. But too much collective compensate value can lead to servo stutter during static test of cyclic pitch movements.

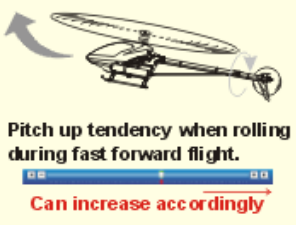
4.4 Swashplate Return Speed

This parameter sets how fast the 3G system levels out the cyclic pitch after helicopter is airborne. The faster it's leveled, the easier the helicopter is to control during liftoff, but fast leveling speed may affect helicopter's fast forward flight performance. To improve fast forward flight performance, if there are minimal vibrations on helicopter, we recommend as low of value as possible without affecting helicopter's ability to liftoff.



4.5 Cyclic Pitch Compensate

During fast forward flight rolling maneuvers, helicopter pitch up tendencies can be corrected with this parameter. But over correcting may result in fast forward/aft oscillation (bobbing) of the head.



4.6 Pirouette Optimum Adjustment

This parameter is used to compensate for drifting of the heli during pirouetting maneuvers. Ideal setting would keep the helicopter stationary during pirouetting maneuvers, and assist the pilot to maintain a straight course during pirouetting forward flight. But excessive value may result in overcorrection by the 3G system, causing unusual behaviors in flips and rolls.

4.7 Cyclic Pitch Motion Delay

This section is for setting the integration functions between aileron, elevator, and rudder on the 3G-FL760 system.