MicroStar 2000 Helicopter Mode

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Comprehensive helicopter support has been added to the MicroStar with firmware version 2.0n. This document provides an overview of the new helicopter features. The helicopter support includes 4 flight modes or flight conditions that are available when you enable the helicopter option. The flight modes are:

- **Normal or default mode** This is the active mode when none of the special switch enabled modes are selected. The helicopter mode must be enabled for any of the helicopter options to apply.

- **Throttle hold mode** Holds the throttle at a fixed position but the throttle control stick still controls pitch of the main rotor blades. This mode is useful for practicing autorotation. In this case, the throttle is set to a low value to simulate a dead stick condition.

- **Stunt mode 1** This mode is very similar to the normal mode but you have the ability to define a different set of parameters for throttle and pitch curves etc. This allows you to define special aerobatic modes for your flight controls.

- **Stunt mode 2** Like stunt mode 1 you can define all the parameters for special flight conditions for your particular application.

The throttle stick on a helicopter plays two roles, control of the engine throttle, and control of the pitch of the main rotor blades. To allow maximum flexibility for the pilot, the MicroStar allows you to define translation tables to convert the throttle stick motion into the needed control for the engine throttle and a separate table to control the rotor pitch. Unique tables can be defined for both throttle and pitch in all modes with the exception of Throttle Hold where only a pitch table is available.

Each flight mode also provides a gyro sensitivity control. This setting is a fixed servo output that is used to define the sensitivity of the gyro. Each mode has its own setting that the user can define. The MicroStar also has a Gyro Sensitivity Tune mode that allows the pilot to adjust the gyro sensitivity while in flight. When this mode is enabled, the *CH7* control is used to define the gyro sensitivity and when the *Option* button is pressed, the servo position is stored in the gyro sensitivity storage location for the selected mode. This tune mode can be selected in the general helicopter settings menu on the transmitter and is reset when transmitter power is cycled. The gyro sensitivity is controlled with receiver CH5.

The normal flight mode and the two stunt modes contain an *Idle Up* function. *Idle Up* can be enabled using the switch of your choice or disabled by selecting "Off" for the switch. When the *Idle Up* switch is enabled the throttle is set at the position

defined for idle up throttle position. This will hold the throttle in this position until the mode is disabled using the defined switch. This is especially useful when using a speed governor or governor mode ESC.

Cyclic/collective pitch mixing (CCPM) is supported on the MicroStar and can be selected from the helicopter option menu. Three 3 servo modes are supported, 140, 120, and 90 degree options. You may find the need to reverse the pitch control depending on your helicopter setup and due to the way this mixing is performed you can't simply reverse a servo channel. To address this problem an option is provided to reverse the pitch direction.

Helicopter control summary:

Aileron	Controls the helicopter roll axis.
Elevator	Controls the helicopter pitch axis.
Throttle	Controls both the engine throttle on the receivers throttle channel and the rotor pitch using CH6 of the receiver.
CH5	Controls the gyro sensitivity.
CH6	Controls the rotor pitch, collective. The CH6 control on the transmitter is the rotor pitch trim.
CH7	Control the gyro sensitivity when in the tune mode. When in the tune mode this transmitter control is routed to CH5 that is use for gyro sensitivity.

If the CCPM mode is enabled, then Aileron, Elevator and CH6 connect to the rotor swashplate.

Helicopter support is included in firmware version 2.0n and later. Please use PC application version 2.10 or later to get full support of this mode. The install file for PC application 2.10 and later includes a configuration file for a Blade400 electric helicopter. You will find this configuration file in the install directory for the application.

Please refer to the MicroStar 2000 Programming Manual 2.0c or later for details on programming the helicopter options as well as all the MicroStar options.

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