BasicHeli1.bin

Very basic helicopter model **with normal mode**. Simplest of setups while still being easy to customize to use your preferred switches. Optimized for throttle governor use (whether Flybarless or ESC governor) but will also work with ungoverned models with some small changes. It does not have bank/setup switching for FBL units or Rescue Mode. Gyro gain (Ch5) is on the Mode switch, allowing you to have different gain settings for Normal, IU1, and IU2.

Features:
1. Throttle and Pitch Curves with normal mode (non-linear throttle and pitch curves)
2. Flight Mode Based Hold and Mode Switches
3. Flight Mode Based Gyro Gain Switching
4. Timer runs when NOT in Throttle Hold
5. SD-Logs run when NOT in Throttle Hold, with delay in logging stop

1a. Throttle Curves
Located in Model Settings > Curves
Applicable Curves:
ThrNrml (Throttle curve for Normal Mode)
ThrIU1 (Throttle curve for Idle Up 1)
ThrIU2 (Throttle curve for Idle Up 2)

Notes:
- Curves are preset at approximate, random values for you to customize to your needs.
- For any straight-line curve (whether flat or linear), 2 point curves are sufficient and this is how IU1 and IU2 are done. Normal mode uses a 7-point curve with all values identical except the very first one. This reduces the chance of your motor shutting off if you accidentally forget to switch into idle up modes before attempting 3D maneuvers by having the throttle on as close to full negative pitch as possible. Note that this makes initial spool up very aggressive if not using a governor or slow start, and you may want to change this to something with a larger ramp up range or just a regular linear curve.
- If you want to use a U- or V-curve for the idle up throttle instead of flat, change ThrIU1 and ThrIU2 as needed. 3 points is sufficient for V-curves; increasing the number of points will allow U-curves or any other curve you want to use.

1b. Pitch Curves
Located in Model Settings > Curves
Applicable Curves:
PitNrml
PitIU1
PitIU2

Notes:
- Pitch curves are rarely used by most people, but they have been included in the model template just in case you want to use them. Both Idle Up pitch curves are just regular linear curves, but the normal mode is what some people choose to use for Normal Mode. It is linear for the positive half, but travel is greatly reduced in the negative pitch direction. If you don't want this, change it to a 3-point curve and make the points -100, 0, 100 like the others.

2. Flight Mode Based Hold and Mode Switches
Located in Model Settings > Flight Modes
Applicable Flight Modes:
FM1: Hold
FM2: Normal
FM3: IU1
FM4: IU2

This page is where you can customize your switch assignments. The use of Flight Modes to activate functions elsewhere in the model means that you don't have to change switch assignments in a bunch of different places if you don't like the default assignments. Changing your throttle hold switch only requires changing one setting in FM1(Hold), and changing your flight mode switch only requires changing one setting in FM2(Normal), FM3(IU1), and FM4(IU2). All other functions that depend on these switches such as throttle curves and pitch curves, as well as gyro gain, will change automatically.

Notes:
- By default, throttle hold is on switch SG, with the switch being pulled all the way towards you being the hold position. Note that if you choose to use a 3-pos switch such as it is here, you must pull the switch ALL the way to this position. The middle position will **not** activate throttle hold. If you use a 2-position switch instead, this is not a concern. The middle position can be used in more advanced setups (see .bin).
- By default, the flight modes (Normal, IU1 and IU2) are on switch SE. To change this, all you must do is change the switch assignments for FM2, 3, and 4 to your new 3-position switch of choice (each flight mode gets assigned a position from the switch).

3. Flight Mode Based Gyro Gain Switching
Located in Model Settings > Mixers
Applicable Mixers:
Gyro Gain

This is an alternative method to using a gyro curve or just a fixed gain for all flight modes. Instead, you simply tell the radio what gyro gain to output based on the flight mode you're in. This means that you can set a gain independently for Normal, IU1, IU2, and Hold modes, allowing you to tune and maximize tail performance in all flight conditions.

Notes:
- There are four "weights" assigned to this Var Mixer. In contrast to a normal Mixer which uses a curve to determine channel output values, here we are just basing the gain output on a condition. In this case, each gain output (in %) is assigned to a Flight Mode. The first one is FM1(Hold), followed by FM2(Normal), FM3(IU1), and FM4(IU2).
- Like with throttle and pitch curves, these are set at approximate baseline values that you should tune yourself. If you know what gyro gain you need for each mode already (e.g. having used another radio on the model), you can simply enter those in each mode. Otherwise, test fly it and adjust each gain as needed after a quick test hover/flight in each flight mode.
- For FM1(Hold), you can usually set this wherever you want since the RPM is typically lower than normal flight. However, if you do a lot of McDougal/dismount autos where the RPM goes quite high, you can tune your tail gain to prevent excessive chatter during those maneuvers with the Hold weight. A good baseline is the same value as whatever works well in Normal mode.

4. Timer runs when NOT in Throttle Hold
Located in Model Settings > Timers
Applicable Timers:
Timer 1

There is a single timer set up on this template. It is a simple countdown, with speech announcements every minute, followed by more often callouts past below 30 seconds remaining.

Notes:
- You should, obviously, change the timer value (by default, it is 4:00) to whatever suits your model and flying style.
- Because once again the timer is activated/deactivated using flight modes, changing your throttle hold switch in Flight Modes settings will not affect the timer's operation. When you are NOT in throttle hold (i.e. you are flying), the timer runs, and when in throttle hold, the timer stops and does not run.

5. SD-Logs run when NOT in Throttle Hold, with delay in logging stop
(Partial) Located in Model Settings > Logic Switches
Applicable Logic Switches:
LS1(WriteLogs)
(Partial) Located in Model Settings > Special Functions
Applicable Special Functions:
SF1(Write Logs)

Logging is a critical part of RC aviation, and while this is a very basic heli model, I feel having logging enabled is worth doing anyway. This is also a more complex logging setup than most choose to use, and while it can be done more simply, this method offers some advantages. This setup allows you to use the throttle hold switch to enable/disable logging, but includes a delay from hitting throttle hold to when logging stops to allow you to continue logging during autorotations.

Notes:
- By default, the delay from hold to logging stop is set to 15 seconds. This is a good number for most people. If you find yourself doing autorotations well in excess of 15 seconds, or simply feel 15 seconds isn't long enough, you can increase the delay in LS1(WriteLogs) under "Delay before inactive". You can also, naturally, decrease the delay if you feel 15 seconds is not necessary (e.g. if you don't do autos at all).
- It's possible that in future versions of Ethos, a "Delay before inactive" option will be added to Special Functions, and the use of a Logic Switch to do this will not be necessary.
- Once again this is done using flight modes, so changing switch assignments is not a concern.