Creating a Basic Helicopter Model Part 3/3: Curves and Wrapping Up

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Creating Curves

Remember curves go from -100 to +100. Don't forget this! It will jump up and bite your posterior. A lot of times curves are listed in manuals in 0 to 100 notation. To convert 0/100 to -100/+100 notation, multiply the 0/100 notation and take away 100. Eg. 60 in 0/100 becomes 20 in -100/+100 notation: (60 * 2 = 120, 120 less 100 = 20).

The Taranis can remove unwanted points from a curve (or add more too). If a curve is flat (like 100, 100, 100, 100, 100, 100), this can be represented as (100, 100) as all the intermediate points are the same.

The curves for this basic model (based on the 450X) are:

- Curve 1 Normal throttle curve (-100, -40, 20, 20, 20) (manual 0, 30, 60, 60, 60)
- Curve 2 Idle Up 1 throttle curve (100, 100) (manual 100, 100, 100, 100, 100)
- Curve 3 Idle Up 1 throttle curve (100,100) (manual 100, 100, 100, 100, 100)
- Curve 10 Hold throttle curve (-100, -100) (manual 0, 0, 0, 0, 0)
- Curve 11 Normal pitch curve (-40, 0, 100) (manual 30, 40, 50, 75. 100)
- Curve 12 Idle Up 1 pitch curve (-100, 100) (manual 0, 25, 50, 75, 100)
- Curve 13 Idle Up 1 pitch curve (-100, 100) (manual 0, 25, 50, 75, 100)
- Curve 20 Hold pitch curve (-100, 100) (manual 0, 25, 50, 75, 100)

Curve 1

So, to program the first curve (throttle Normal):

- 1. "P" to go forwards to screen CURVES
- 2. "E" to edit curve 1
- 3. "-" 4 times to get the point next to -100. Note: This is NOT the value of the point.
- 4. "E" to edit
- 5. Hold "-" till -100 is shown (alternatively, pressing "P" and "X" at the same time takes the value straight to -100)
- 6. "E" to confirm.

Now that you've set the value of that point, let's move on to the others:

- 1. "-" to get the point next to -50, "E" to edit, Hold "-" till -40 is shown, "E" to confirm
- 2. "-" to get the point next to 0, "E" to edit, Hold "+" till 20 is shown, "E" to confirm. Note that this is a positive 20, not a -20.
- 3. "-" to get the point next to 50, "E" to edit, Hold "+" till 20 is shown, "E" to confirm
- 4. "-" to get the point next to 100, "E" to edit, Hold "+" till 20 is shown, "E" to confirm
- 5. "X", then "X" again to go back to the CURVES screen



Curve 1 Complete

Note that CV1 is actually offset, or moved, 20 points both in a negative X (-X) and a positive Y (+Y) direction.

Curve 2

The second curve is throttle Idle Up 1.

- 1. "-" to highlight curve 2
- 2. "E" to edit **curve 2**
- 3. "-" 2 times to get count 5pts, "E" to edit, press "-" 3 times till "2pts" shown, "E" to confirm
- 4. "-" 2 times to get the point next to -100, "E" to edit, Hold "+" till 100 is shown (alternatively pressing "-" and "E" at the same time takes the value straight to 100), "E" to confirm
- 5. "-" to get the point next to 100, "E" to edit, Hold "+" till 100 is shown (or use the "-" and "E" at the same time shortcut), "E" to confirm
- 6. "X", then "X" again to go back to the CURVES screen



Curve 2 Completed

(Note: Curve is a straight line at the very top of the screen image.)

Curve 3

Third curve (throttle Idle Up 2)

- 1. "-" to highlight **curve 3**
- 2. "E" to edit curve 3
- 3. "-" 2 times to get count 5pts, "E" to edit, press "-" 3 times till "2pts" shown, "E" to confirm
- 4. "-" 2 times to get the point next to -100, "E" to edit, Hold "+" till 100 is shown (or use the "-" and "E" at the same time shortcut), "E" to confirm
- 5. "-" to get the point next to 100, "E" to edit, Hold "+" till 100 is shown (or use the "-" and "E" at the same time shortcut), "E" to confirm

6. "X", then "X" again to go back to the CURVES screen



Curve 3 Completed

(Note: Curve is a straight line at the very top of the screen image.)

Curve 10 (throttle hold)

- 1. "-" 7 times to highlight curve 10
- 2. "E" to edit curve 10
- 3. "-" 2 times to get count 5pts, "E" to edit, press "-" 3 times till "2pts" shown, "E" to confirm
- 4. "-" 2 times to get the point next to -100, "E" to edit, Hold "-" till -100 is shown (or use the "P" and "X" at the same time shortcut), "E" to confirm
- 5. "-" to get the point next to 100, "E" to edit, Hold "-" till -100 is shown (or use the "P" and "X" at the same time shortcut), "E" to confirm
- 6. "X", "X" to go back to the CURVES screen



Curve 10 Completed

Curve 11 (pitch Normal)

- 1. "-" to highlight **curve 11**
- 2. "E" to edit curve 11
- 3. "-" 2 times to get count 5pts, "E" to edit, press "-" 2 times till "3pts" shown, "E" to confirm
- 4. "-" 2 times to get the point next to -100, "E" to edit, Hold "-" till -40 is shown, "E" to confirm
- 5. (note: the second point can be skipped as it should already be 0)
- 6. "-" 2 to get the point next to 100, "E" to edit, Hold "+" till 100 is shown, "E" to confirm
- 7. "X", then "X" again to go back to the CURVES screen



Curve 11 Completed

Curve 12 (pitch Idle Up 1)

- 1. "-" to highlight curve 12
- 2. "E" to edit curve 12
- 3. "-" 2 times to get count 5pts, "E" to edit, press "-" 3 times till "2pts" shown, "E" to confirm
- 4. "-" 2 times to get the point next to -100, "E" to edit, Hold "-" till -100 is shown (or use the "P" and "X" at the same time shortcut), "E" to confirm
- 5. "-" to get the point next to 100, "E" to edit, Hold "+" till 100 is shown (or use the "-" and "E" at the same time shortcut), "E" to confirm.
- 6. "X", then "X" again to go back to the CURVES screen



Curve 12 Completed

Curve 13 (pitch Idle Up 2)

- 1. "-" to highlight curve 13
- 2. "E" to edit curve 13
- 3. "-" 2 times to get count 5pts, "E" to edit, press "-" 3 times till "2pts" shown, "E" to confirm
- 4. "-" 2 times to get the point next to -100, "E" to edit, Hold "-" till -100 is shown (or use the "P" and "X" at the same time shortcut), "E" to confirm
- 5. "-" to get the point next to 100, "E" to edit, Hold "+" till 100 is shown (or use the "-" and "E" at the same time shortcut), "E" to confirm
- 6. "X", then "X" again to go back to the CURVES screen



Curve 13 Completed

Curve 20 (pitch hold)

- 1. "-" 7 times to highlight curve 20
- 2. "E" to edit curve 20
- 3. "-" 2 times to get count 5pts, "E" to edit, press "-" 3 times till "2pts" shown, "E" to confirm
- 4. "-" 2 times to get the point next to -100, "E" to edit, Hold "-" till -100 is shown (or use the "P" and "X" at the same time shortcut), "E" to confirm
- 5. "-" to get the point next to 100, "E" to edit, Hold "+" till 100 is shown (or use the "-" and "E" at the same time shortcut), "E" to confirm
- 7. "X", then "X" again to go back to the CURVES screen



Curve 20 Completed

WHEE! You're done with curves!

Wrapping Things Up

This last bit is optional. It activates voice alerts as you change modes. This is done in Special Functions. The audio files you'll use are already on your TX's MicroSD card. The voice alerts these instructions activate are for Normal Mode, Flight Mode 1, Flight Mode 2 and Throttle Hold.

So, to program the first voice (Normal Mode):

- 1. "P" past the GLOBAL VARIABLES and LOGICAL SWITCHES screens until you get to SPECIAL FUNCTIONS. (This assumes you were on the curves screen, if you are re-entering this from the main menu, you can "M", if model not already highlighted ("+", "-" to select, "E"lo then "E" to select, then "P" till you get to SPECIAL FUNCTIONS)
- 2. Check to make sure that SF1 is highlighted, and press "E" to edit it.
- 3. "E" to edit the function type, move the flight mode switch (SE) out and back into normal position (SE(up)), "E" to confirm. SE↑ will show in the window.

- 4. "-" to next column (default Safety), "E" to edit, "+" 8 time to "Play Track", "E" to confirm
- 5. "-" to next column (default ---), "E" to edit, "-" to scroll down to "nrmmod", "E" to confirm. (Next column should say 1x.)
- 6. "X" to finish editing SF1



SF1 Completed

OK, let's take care of the other three:

- 1. "-" to go to SF2
- 2. "E" to edit the function type, move the flight mode switch out and back into normal position (SE(mid)), "E" to confirm
- 3. "-" to next column (default Safety), "E" to edit, "+" 8 time to "Play Track", "E" to confirm
- 4. "-" to next column (default ---), "E" to edit, "-" to scroll down to "fltmode1", "E" to confirm. (Next column should say 1x)
- 5. "X" to finish editing SF2
- 6. "-" to go to SF3
- 7. "E" to edit the function type, move the flight mode switch out and back into normal position (SE(down)), "E" to confirm
- 8. "-" to next column (default Safety), "E" to edit, "+" 8 time to "Play Track", "E" to confirm
- 9. "-" to next column (default ---), "E" to edit, "-" to scroll down to "fltmode2", "E" to confirm. (Next column should say 1x)
- 10. "X" to finish editing SF3
- 11. "-" to go to SF4
- 12. "E" to edit the function type, move the throttle hold out then back engaged position (SF(down)), "E" to confirm
- 13. "-" to next column (default Safety), "E" to edit, "+" 8 time to "Play Track", "E" to confirm
- 14. "-" to next column (default ---), "E" to edit, "-" to scroll down to "thrhold", "E" to confirm. (Next column should say 1x)
- 15. "X" to finish editing SF4

DIE	TAL	TELEMETRY	RADIO SY	STEM	
MENU SPEC	HALFU SE↑ F	NCTIONS Ylay Track	nrmmod		
SF2 PAGE SE3	SE÷ P SE↓ P	Play Track Play Track	fltmode1 <u>fltmode</u> 2		
SF4 SE5	SF↓ F	Play Track	thrhold	1× 🗸	
EXITS				ENT	
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All Special Functions Complete

Model settings are now complete. Congratulations!!!!

Press "X" twice to go back to the main screen.

The advantage of programming this through the transmitter (instead of via Companion) is that if you wanted to correct something at the field, you can. i.e.: Like changing a throttle curve, or the DR and Expo on cyclics, or ... You might want to include a printed copy of this article in your flight box, however, just for backup.

Hopefully by programming like this, it gives you an idea of how flexible the programming is.

Remember, this is the most basic of helicopter models. If you want to add CCPM (covered in another lesson) or advanced functions, there could be a lot more to do. If you are going to attempt something complex, Companion software programming is HIGHLY recommended.

I apologize for this being a long lesson, but it's best to do this all in one go rather than break it up.

The next lesson is binding and testing a helicopter model.

Resources

Here are some links that might come in handy:

- "Newbies guide to the DX6i for RC helicopters" http://www.helifreak.com/showthread.php?t=580508
- "Beginners Taranis programming guide for RC helis" http://www.helifreak.com/showthread.php?t=598718 (Although this is for another make of transmitter, it covers all the concepts as to how and why a transmitter works in relation to an RC helicopter).
- "HeliFreak" RC helicopter specific resource on the net http://www.helifreak.com/
- "HeliFreak OpenTX forum" http://www.helifreak.com/forumdisplay.php?f=353
- "RC Groups" Lots of discussion on RC aircraft and helicopters http://www.rcgroups.com
- "FrSky Taranis with OpenTX 2.0 and beyond" http://www.rcgroups.com/forums/showthread.php?t=2178865
- "FRSKY Taranis 'How to' Thread" http://www.rcgroups.com/forums/showthread.php?t=1914834