

# F3F Setup

for FrSky Taranis

Version 4.0

## Setup Guide

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# 1 Introduction

The Taranis is an amazingly flexible radio. However creating that perfect F3F setup requires advanced skills in OpenTx.

*F3F Setup for Taranis* gives you a competition-proven setup without the hassle of programming from scratch. It offers a simple interface for racing, with real-time adjustment of key mixes for rapid trimming. Configuration is quick and accurate thanks to built-in aids for servo calibration.

## **Application**

- For 6-servo gliders
- V-tail and X-tail versions
- For all stick modes

## **Flight modes**

- Normal, Climb, and Landing
- Reflex option for Normal flight mode
- Voice confirmation
- Switch customisations

## **In-flight adjustments**

- adjuster for snapflap volume
- adjuster for snapflap expo
- adjuster for aileron diff
- adjuster for camber preset
- adjuster for spoiler-to-elevator compensation

## **Spoiler functions**

- Aileron differential suppression
- Reverse Diff
- Spoiler/elev compensation with multi-point curve
- Optional 'instant spoiler' mode
- Adjustable spoiler deadband

## **Control surface calibration**

- 'CAL' mode for adjusting servo centres and limits  
*[improved in v4]*
- Balancing curve for flaps for accurate tracking
- Full rotation on flap servos

## **Misc.**

- Channels 7-9 free for motor etc.

## 1.1 ZIP package contents

The contents of ZIP package are as follows:

Filename	Description
F3F_v40_userguide.pdf	this document
F3F_v40_reference.xls	settings reference
F3F_v40x_setup.eepe	EEPROM image, contains versions: 'X' for cross- and T-tail, 'V' for V-tail
acal.wav	Sound files
acalail.wav (new in v4)	
acalflp.wav (new in v4)	
aclimb.wav	
alanding.wav	
anormal.wav	
areflex.wav	

## 1.2 What you'll need

The following are required:

- X9D or X9E transmitter + OpenTx (see [change log](#) for supported versions of OpenTx)
- USB cable for connecting the transmitter to your PC
- OpenTx Companion on your PC, for transferring models between tx and computer
- A good familiarity with OpenTx's menu navigation and data entry

## 2 Overview of features

First, a quick run through the main features:

### Flight modes

- There are four flight modes: Climb, Normal, Reflex and Landing.
- Mixers are activated automatically on change of flight mode:

	Spoiler(crow)	Snapflap	Camber	Reflex	Combi
Climb			X		X
Normal		X			X
Reflex		X		X	X
Landing	X				X

### Control travel

- Travel/expo for the main controls may be set individually per flight mode, for all flight modes, or for groups of flight modes.

### Trims

- Aileron trim is global across all flight modes.
- Elevator trim is stored per flight mode.
- Rudder and throttle trims are repurposed (see below).

### Camber presets

- Camber is active in Climb mode, and adjustable in flight via rotary knob.
- Negative camber may be configured for Reflex mode.

### Aileron-to-flap mix

- Aileron-to-flap mixing is configurable per flight mode.

### Spoiler (crow) compensation

- Spoiler compensation cancels pitch effects due to spoiler (crow).
- Compensation is adjustable during flight, via the throttle trim.
- Non-linear compensation can be defined via a curve.

### Differential

- Diff is applied to ailerons and flaps.
- Diff is adjustable using the rudder trim.
- Diff settings are stored per flight mode.

### Roll rate enhancement

- Aileron diff is suppressed as spoiler is deployed.
- Reverse diff can be configured to further lower the down-going aileron when full crow is deployed.

### Combi Rudder

- Combi rudder (aileron to rudder mix) is stored per flight mode.

### Snapflap

- Snapflap volume may be adjusted in flight using the throttle trim lever, independently for Normal and Reflex modes.
- Snapflap expo is adjustable in flight via rotary pot.

## 3 Assignments

### 3.1 Flight control assignments

Rudder, Elevator, Spoiler and Throttle are assigned according to stick mode (MODEL SETUP menu). The throttle stick is used for spoiler. Secondary controls are as follows:

Control	Function
Rudder trim	Diff
Throttle trim	Snapflap volume ( <i>Normal and Reflex modes</i> ) Spoiler compensation ( <i>Landing mode</i> )
Rotary knob S1 (X9D), F1 (X9E)	Snapflap expo
Rotary knob S2 (X9D), F2 (X9E)	Camber preset adjust ( <i>Climb mode</i> )

### 3.2 Channel assignments

Channel #	Vtail	Xtail
1		Right aileron
2		Left aileron
3		Right flap
4		Left flap
5	Right Vtail	Elevator
6	Left Vtail	Rudder
7-9		[free]

## 4 Flight modes

### 4.1 Main flight modes

There are four flight modes Climb, Normal, Reflex and Landing. Switch SA selects between Climb, Normal/Reflex, or Landing. Switch SB selects Normal or Reflex when SA is in middle position.

Flight Mode	OpenTx ID	SA	SB
LANDING	FM2	↑	[any]
NORMAL	FM0	Mid	↑ or Mid
REFLEX	FM5	Mid	↓
CLIMB	FM3	↓	[any]

### 4.2 ‘Calibration’ mode

A special ‘CAL’ flight mode is provided for calibrating the servos. When CAL is activated, mixers and trims are disabled, and the raw stick commands are passed through to the outputs. To enable CAL mode:

1. Apply full left aileron and full up elevator
2. Press and release SH
3. Release stick(s). The transmitter cheeps at 3 second intervals

To exit CAL mode, pull SH.

*New in v4:* 3 sub-modes, activated via switch SA:

- SA↑: calibrate flap neutral, and ‘tricky’ ailerons
- SA-mid: calibrate end points
- SA↓: calibrate flap neutral

## 5 Installing *F3F Setup* in your transmitter

All steps from this point forward should be followed in the sequence shown. Use the tick boxes to record your progress.

- ☐ Establish communication with your PC: switch on the transmitter whilst pressing inwards on the horizontal trim levers. Then using a suitable USB lead, connect the Taranis to the computer. The Taranis' SD card should appear as an external drive.
- ☐ Copy the sound (.WAV) files to the **/SOUNDS/{language}** folder on the SD card e.g. for English, folder = **/SOUNDS/en**. NOTE: there are some new sound files in v4.
- ☐ Using OpenTx Companion
  - ☐ Open the F3F .eepe file. Versions for X/T and V tails are displayed in a window.
  - ☐ From the File menu, choose 'Read Models and Settings from Radio'. Your active EEPROM appears in a second window.
  - ☐ Drag one of the F3F models into an empty slot in your EEPROM.
  - ☐ Close the F3F .eepe window.
  - ☐ In the EEPROM window, right-click the new model and choose "Use as Default"
  - ☐ Write the modified EEPROM to the tx (Write Models and Settings to Radio).
  - ☐ Close OpenTx Companion
- ☐ **IMPORTANT:** on your transmitter, **make sure your sticks are calibrated before going further** – from the main screen press **[long Menu], [Page...]**. Remember to cal all knobs and sliders. Failure to calibrate is the main cause of problems including e.g. jumping neutrals and inability to select certain flight modes.
- ☐ Using the transmitter on its own, familiarise yourself with the flight modes. At the end of this step, you should know how to activate:
  - ☐ Climb, Normal, Reflex and Landing modes
  - ☐ CAL mode, including the three sub-modes
- ☐ Check that the flight mode sounds are working correctly. If not, check that the sound files are in the correct location.

## 6 Configuration Part 1: calibrating the servos

Configuration of your model is in two parts: servo calibration, followed by mixer adjustment. This section is concerned with calibration.

The goals of servo calibration are:

- (a) Achieve a symmetrical setup at the servo level and
- (b) Maximise control surface movements
- (c) Linearise control surface responses.

**Correct calibration is essential for diff to work correctly, and for the flaps and ailerons to track precisely.**

All the adjustments in this section are made in CAL mode.

## 6.1 Set servo rotation

The first task is to set the direction of rotation of the servos:

- ☐ Switch on the transmitter (do not power up the receiver yet)
- ☐ Enter CAL mode. The tx will cheep every 3 seconds.
- ☐ Set switch SA to **middle**
- ☐ Open the **OUTPUTS** menu
- ☐ Power up the receiver
- ☐ Using the table below, set the direction of each servo output. To change the direction of an output,
  1. skip to the *Direction* field, then
  2. Press **[Enter]**, and immediate **[Exit]**

OUTPUTS		1464us	Direction	7/13
CH1	RtAil	0.0 -150.0→150.0	←	CV11 1500Δ
CH2	LtAil	0.0 -150.0→150.0	→	CV12 1500Δ
CH3	RtFlap	0.0 -150.0→150.0	→	CV13 1500Δ
CH4	LtFlap	0.0 -150.0→150.0	←	CV14 1500Δ
CH5	RtVee	0.0 -150.0 - 150.0	←	CV15 1500Δ
CH6	LtVee	0.0 -150.0 - 150.0	→	CV16 1500Δ
CH7		0.0 -100.0 - 100.0	→	--- 1500Δ

The table below shows the direction of each control surface in CAL mode.

**Pay particular attention to the notes regarding aileron and elevator!**

Stick command	Control surface	Notes
<input type="checkbox"/> Aileron stick right →	RtAil goes up ↑ LtAil goes up ↑	Ailerons <b>move together</b> in CAL mode
<input type="checkbox"/> Thr stick forward ↑	RtFlap goes up ↑ LtFlap goes up ↑	Ignore “INVERT THROTTLE” warning when reversing.
<input type="checkbox"/> <b>V-TAIL only:</b> Ele stick forward ↑	RtVee goes up ↑ LtVee goes up ↑	Elevator(s) operate in <b>reverse direction to normal</b> in CAL mode
<input type="checkbox"/> <b>X-TAIL only:</b> Ele stick forward ↑	Ele goes up ↑	
<input type="checkbox"/> <b>X-TAIL only:</b> Rud stick right →	Rud goes right →	As normal

- ☐ Exit CAL and enter Normal mode. Check for correct direction of aileron, elevator and rudder (the flaps can't be checked yet).

## 6.2 Calibrate centres and limits

Next, calibrate servo centre and limits. Note that the procedure has changed in v4 - centre and limits are defined using *output curves*.

The end points you set act like mechanical end stops (except they don't stall the servos!). When setting the end-points, consider all combinations of inputs. For example, when setting the upper end point for the ailerons, consider both roll and crow inputs. If your end points don't take both into account, then the aileron will stop early when full crow and aileron are applied together; this may or may not be acceptable to you. **If you don't know the movements required, simply set your end-points to the maximum possible, subject to linkage geometry.**

Min/Max/Subtrim must be left at their default values (-150,150,0 respectively).

Channel	Calibration procedure
<b>CH 4 – Lt Flap</b>	<p>Start by calibrating left flap (CH4). You'll set end points only (ignore flap neutral).</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Enter CAL mode</li> <li><input type="checkbox"/> Set switch SA to <b>middle</b> position</li> <li><input type="checkbox"/> In the <b>OUTPUT</b> menu, highlight <b>CH4</b></li> <li><input type="checkbox"/> Skip to curve field '<b>CV14</b>', and press <b>[long ENTER]</b> to open curve editor <ul style="list-style-type: none"> <li>○ Throttle stick back (↓), adjust <b>point 1</b> for lower end point. Allow enough movement for both crow and aileron inputs.</li> <li>○ Throttle stick forward (↑), adjust <b>point 3</b> for upper end point. Allow enough for (optional) aileron-to-flap mixing.</li> <li>○ Adjust <b>point 2</b> so it lies on the straight line thru points 1 and 3.</li> </ul> </li> <li><input type="checkbox"/> Move throttle stick from one end to the other, observing step intervals. If necessary fine tune point 2 to equalise intervals (i.e. optimise linearity).</li> </ul>
<b>CH 3 – Rt Flap</b>	<p>Next, calibrate the right flap (CH3). You'll adjust a 5-point curve to precisely match the left flap.</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Enter CAL mode</li> <li><input type="checkbox"/> Set switch SA to <b>middle</b> position</li> <li><input type="checkbox"/> In the <b>OUTPUT</b> menu, highlight <b>CH3</b></li> <li><input type="checkbox"/> Skip to curve field '<b>CV13</b>', press <b>[long ENTER]</b> to open curve editor</li> <li><input type="checkbox"/> Adjust points 1 – 5 to exactly match the left flap: <ul style="list-style-type: none"> <li>○ stick <b>fully back</b>, adjust <b>point 1</b></li> <li>○ stick <b>½-back</b>, adjust <b>point 2</b></li> <li>○ stick to <b>centre</b>, adjust <b>point 3</b></li> <li>○ stick to <b>½-forward</b>, adjust <b>point 4</b></li> <li>○ stick <b>fully forward</b>, adjust <b>point 5</b></li> </ul> </li> </ul> <p>To match the end points on left and right sides, it may be necessary to reduce one or other end points for the left flap.</p>
<b>Flap neutral</b>	<p>Next, set the flap neutral:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Enter CAL mode</li> <li><input type="checkbox"/> Set switch SA to <b>down</b> position. An adjustable offset is applied to each flap.</li> <li><input type="checkbox"/> Open the <b>GLOBAL V.</b> menu.</li> <li><input type="checkbox"/> Highlight <b>GV5('FNeut')</b> and skip to the <b>FM0</b> column.</li> <li><input type="checkbox"/> Adjust GV5 for correct neutral. If the flaps are not perfectly in line with each other, then redo calibration for <b>RtFlap</b> above, paying particular attention around the neutral position.</li> </ul>
<i>V-Tail</i> <b>CH 5 – RtVee</b> <b>CH6 – LtVee</b>	<p>Calibrate V-tail (applies to V-tail version)</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Enter CAL mode</li> <li><input type="checkbox"/> In the <b>OUTPUT</b> menu, highlight <b>CH5</b></li> <li><input type="checkbox"/> Skip to curve field '<b>CV15</b>', press <b>[long ENTER]</b> to open curve editor <ul style="list-style-type: none"> <li>○ Ele stick to <b>centre</b>, adjust <b>point 2</b> for correct neutral</li> <li>○ Ele stick forward (↑), set <b>point 3</b> to upper limit</li> <li>○ Ele stick back (↓), set <b>point 1</b> to lower limit. Allow for spoiler comp.</li> </ul> </li> <li><input type="checkbox"/> Repeat for <b>CH6</b> and <b>CV16</b></li> <li><input type="checkbox"/> <b>Check equal travel up/down; left and right surfaces match</b></li> </ul>
<i>X-Tail</i> <b>CH 5 – Ele</b>	<p>Calibrate elevator (applies to X-or T-tail only)</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Enter CAL mode</li> <li><input type="checkbox"/> In the <b>OUTPUT</b> menu, highlight <b>CH5</b></li> <li><input type="checkbox"/> Skip to curve field '<b>CV15</b>', press <b>[long ENTER]</b> to open curve editor <ul style="list-style-type: none"> <li>○ Ele stick to <b>centre</b>, adjust <b>point 2</b> for correct neutral</li> <li>○ Ele stick forward (↑), adjust <b>point 3</b> to upper limit</li> <li>○ Ele stick back (↓), adjust <b>point 1</b> for to lower limit</li> </ul> </li> <li><input type="checkbox"/> <b>Check travel is equal up &amp; down</b></li> </ul>



<i>X-Tail</i> <b>CH 6 – Rudder</b>	Calibrate rudder (applies to X-or T- tail only) <ul style="list-style-type: none"> <li><input type="checkbox"/> Check you're still in CAL mode</li> <li><input type="checkbox"/> In the <b>OUTPUT</b> menu, highlight <b>CH6</b></li> <li><input type="checkbox"/> Skip to curve field '<b>CV16</b>', press <b>[long ENTER]</b> to open curve editor               <ul style="list-style-type: none"> <li>○ Rudder stick to <b>centre</b>, adjust <b>point 2</b> for centred rudder</li> <li>○ Rudder right (→), set <b>point 3</b> for max right movement</li> <li>○ Rudder left (←), set <b>point 1</b> for max left movement</li> </ul> </li> <li><input type="checkbox"/> <b>Check equal travel left/right</b></li> </ul>
<b>CH 1 – Rt Ail</b> <b>CH 2 – Lt Ail</b>	Finally, calibrate ailerons: <ul style="list-style-type: none"> <li><input type="checkbox"/> Enter CAL mode</li> <li><input type="checkbox"/> Set switch SA to <b>down</b> position. The flaps will go to their calibrated neutrals.</li> <li><input type="checkbox"/> In the <b>OUTPUT</b> menu, highlight <b>CH1(RtAil)</b></li> <li><input type="checkbox"/> Skip to curve field '<b>CV11</b>', then press <b>[long ENTER]</b> to open curve editor               <ul style="list-style-type: none"> <li>○ Move aileron stick to <b>centre</b>. Set <b>Point 2</b> for correct centre</li> <li>○ Move aileron stick right (→). Set <b>point 3</b> to desired upper limit, allowing for both crow and aileron movement.</li> <li>○ Move aileron stick left (←). Attempt to adjust <b>point 1</b> so that down-travel = up-travel.                    If down-travel is insufficient to complete this step, then move SA to the <b>up</b> position – this reduces aileron movement by 50%, and sends the flaps to their calibrated neutrals. Now, re-adjust point 1 so that down-travel = the (reduced) up-travel. When you exit CAL mode, full rate will be restored; don't worry if down-travel is excessive – later adjustments to input and diff will reduce it.</li> </ul> </li> <li><input type="checkbox"/> Repeat all steps above for CH2/CV12</li> <li><input type="checkbox"/> <b>Check: constant rate up/down for each aileron, and check left and right ailerons match. Readjust if necessary.</b></li> </ul>

☐ Exit CAL mode.

### 6.3 Backup your EEPROM

Well done, the calibration is complete! A good idea to backup your EEPROM to the SD card now.

- ☐ From the Main Info screen, **[long MENU]**
- ☐ Press **[Page]** till the **VERSION** menu appears, then follow the instructions. The process may take a few seconds.

## 7 Configuration part 2 - setting up travel and mixing

Watch your ship comes to life! You'll make these adjustments using the regular flight modes.

Control / mix	Adjustment point	Adjustment procedure
<input type="checkbox"/> Ail rate/expo	INPUTS→I <sub>Ail</sub>	<p>Set the default aileron movement. Focus on the up-travel (down-travel is governed by Diff adjusted via rudder trim)</p> <ol style="list-style-type: none"> <li>1. Enter Normal mode</li> <li>2. Open the INPUTS menu</li> <li>3. Highlight 'CATCHALL' line in I<sub>Ail</sub> section.</li> <li>4. Open the input editor</li> <li>5. Set <i>weight</i>.</li> <li>6. Click on Diff dropdown, select <i>Expo</i>, and set required value. ('Diff' must be left at zero.)</li> </ol> <p>If different rates are required for specific flight modes, then create additional Input lines <i>before</i> the CATCHALL line. Each line should have relevant mode(s) shown and the rest blanked out. Flight mode numbers as follows:            FM0 = <b>NORMAL</b>            FM2 = <b>LANDING</b>            FM3 = <b>CLIMB</b>            FM5 = <b>REFLEX</b></p> <p><b>IMPORTANT SAFETY NOTE:</b> The 'CATCHALL' line must be the last line, with all flight modes enabled and no switches. This will ensure safe operation if a flight mode is omitted in any preceding lines (if the active flight mode is not specified in any of the lines, the aileron stick will be inoperative!!)</p>
<input type="checkbox"/> Rud travel/expo	INPUTS→I <sub>Rud</sub>	As above
<input type="checkbox"/> Ele travel/expo	INPUTS→I <sub>Ele</sub>	As above
<input type="checkbox"/> Aileron→flap mix	GLOBAL.V→GV1(Ail2Flp)	<p>Aileron-to-flap mixing is configured per flight mode.</p> <ol style="list-style-type: none"> <li>1. Open GLOBAL.V. menu, highlight GV1("Ail2FL").</li> <li>2. Adjust mix for each flight mode:                -Enable Normal mode, adjust GV1/FM0                -Enable Landing mode, adjust GV1/FM2                -Enable Climb mode, adjust GV1/FM3                -Enable Reflex mode, adjust GV1/FM5</li> </ol> <p>Note: down-going movement will be affected by ail diff setting (adjusted via rudder trim)</p>
<input type="checkbox"/> Camber preset	GLOBAL.V→GV4(FICamb)/FM3 GLOBAL.V→GV3(AiCamb)/FM3	<p>Preset camber is available in Climb mode. It's adjustable in flight via S2 (X9D) or F2 (X9E). In this step, you (a) will set the limit of adjustment and (b) the operating camber.</p> <p>Start with flaps:</p> <ol style="list-style-type: none"> <li>1. Rotate S2 (X9D) or F2 (X9E) fully clockwise.</li> <li>2. Enable Climb mode</li> <li>3. Open the GLOBAL.V. menu, highlight GV4(FICamb)</li> <li>4. Adjust value in FM3 column for desired limit of adjustment.</li> <li>5. To set aileron camber, repeat steps 3 &amp; 4 using GV3.</li> <li>6. Finally, rotate S2/F2 for desired 'operating' camber.</li> </ol>
<input type="checkbox"/> Reflex	GLOBAL.V→GV4(FICamb)/FM5 GLOBAL.V→GV3(AiCamb)/FM5	<p>Reflex (negative camber) can be set up in Reflex mode. In this step, you'll set the reflex individually for ailerons and flaps.</p> <p>To set reflex for flaps:</p> <ol style="list-style-type: none"> <li>1. Select Reflex mode.</li> <li>2. Open the GLOBAL.V menu</li> <li>3. Highlight GV4(FICamb) and skip to FM5 column</li> <li>4. Adjust value for required reflex (+ve value)</li> <li>5. To set reflex for ailerons, repeat steps above, but using GV3(AiCamb).</li> </ol>

Control / mix	Adjustment point	Adjustment procedure
<input type="checkbox"/> Spoiler→Flap <input type="checkbox"/> Spoiler→Ail	GLOBAL.V→GV3(AiCamb)→FM2 GLOBAL.V→GV4(FiCamb)→FM2	In this step, you'll set both the flap and aileron movement for spoiler (crow). Start with flaps: 1. Select Landing mode 2. Open the GLOBAL.V menu, highlight GV4 3. Skip to the FM2 column 4. Apply full spoiler (crow) 5. Adjust GV4 for desired downward flap deflection 6. Repeat for ailerons using GV3/FM2, adjusting for correct <i>upward</i> deflection.
<input type="checkbox"/> Combi rudder	GLOBAL.V→GV2(Combi)	Combi rudder is set per flight mode. 1. Open GLOBAL.V menu, highlight GV2("Combi"). 2. Enter +ve values only: -Enable Normal mode, adjust GV2/FM0 -Enable Landing mode, adjust GV2/FM2 -Enable Climb mode, adjust GV2/FM3 -Enable Reflex mode, adjust GV2/FM5 3. Check that the rudder moves in the correct sense
<input type="checkbox"/> Reverse diff	GLOBAL.V→GV6(RevDif)	In this step, you can increase the travel of the down-going aileron when both full crow and full aileron are applied. This improves roll response at full crow. To set this up: 1. Enable Landing mode 2. Open GLOBAL.V menu, highlight GV6/FM2 3. Apply full spoiler and full aileron 4. Adjust GV so that the down going aileron is a little below the centre position. NOTE: this measure for improving roll response is in addition to aileron diff suppression, which is automatically applied.
<input type="checkbox"/> Snapflap	MIXERS→CH11(FlapCm)→Snap MIXERS→CH10(AilCm)→Snap	Snapflap (elevator to flap mixing) is active in Normal and Reflex modes. The amount can be adjusted in flight using the throttle trim. In this step, you'll set the maximum possible snapflap, first for flaps, then for ailerons. Then you'll set the operating snapflap. Start with the flaps: 1. Enable Normal mode 2. Move throttle trim fully back (max snapflap) 3. Open MIXERS menu, go to CH11 (FlapCm) 4. Select the 'Snap' line and open the mixer editor 5. Hold full up elev 6. Adjust mixer <i>weight</i> to provide max possible snapflap. 7. For the ailerons: repeat steps 3-6 but using CH10 (AilCm). 8. While in Normal mode, adjust throttle trim for operational setting. Switch to Reflex mode and adjust.
<input type="checkbox"/> Spoiler→Ele compensation	MIXERS→CH19(SpComp)→Spoilr	Spoiler (crow) compensation is used to cancel crow-induced pitch changes. The amount is adjustable in flight using the throttle trim. In this step, you'll set (a) the limit of adjustment and (b) the 'operating' compensation: 1. Enable Landing mode. 2. Deploy full spoiler. 3. Move throttle trim fully forward (max compensation). 4. Open MIXERS menu, go to CH19 5. Highlight 'Spoil' line, [ <b>long ENTER</b> ] to open mixer editor 6. Adjust <i>weight</i> for desired max possible compensation 7. Move throttle trim for correct operating compensation. NOTE: intermediate response can be adjusted in curve "SpComp". Adjust after flight tests.

Congratulations, you've finished setting up your model! This is a good time to back up your EEPROM again.

## 8 Dynamic mix adjusters

A summary of the mix adjusters for trimming out your ship in flight. Make a copy for the field!

Adjustment	Adjuster	Flight modes	Notes
Aileron Diff	Rudder trim	[all]	Rudder trim right = more roll response/less diff. Range of adjustment = 10 - 70%, trim centre = 40%. Stored independently for each flight mode.
Spoiler comp	Throttle trim	Landing	Trim forward = pitch down For non-linear response adjust points 2-4 of 'SpComp'
Snapflap volume	Throttle trim	Normal, Reflex	Trim back = more snapflap Stored independently for Normal and Reflex modes
Snapflap expo	S1 (X9D), F1 (X9E)	Normal, Reflex	Centre=linear. Clockwise = late, CounterCW = early
Camber	S2 (X9D), F2 (X9E)	Climb	Clockwise = more camber

## 9 Customisations (optional)

This section describes some optional customisations you can make. To avoid confusion, apply these after the basic setup is complete. Previous settings will not be affected.

### 9.1 Flight mode selection method

Flight modes may be selected in one of two ways according to preference:

#### 9.1.1 Using two switches (default)

In this configuration, the active flight mode depends on two switches.

- **SwMain** (3-pos) selects the main flight mode Normal, Landing, Climb.
- **SwRFX** (3-pos) selects Reflex over Normal mode.

The table below shows the adjustment points and switch settings. For **SwMain** and **SwRFX** choose from **SA**, **SB**, **SC**, **SD**, **SE**, or **SG**

Menu point	Setting	Default
FLIGHTMODES → 'Landing' (FM2)	<b>SwMain</b> (↑↓ or -)	SA↑
FLIGHTMODES → 'Climb' (FM3)	<b>SwMain</b> (↑↓ or -)	SA↓
FLIGHTMODES → 'Reflex' (FM5)	<b>SwRFX</b> (↑↓ or -)	SB↓

*Note:* Normal mode is selected when **SwMain** is in the third (unassigned) position. The default is SA-middle.

### 9.1.2 Using 'Instant Spoiler' + 1 switch

In this configuration, Landing mode is selected automatically as the crow is deployed. A single 3-position switch is used to select the remaining flight modes.

The table below shows the necessary adjustments. Substitute your chosen 3-position switch for **SwMain**:

Menu point	Setting	Example
FLIGHTMODES→'Landing' (FM2)	L5	
FLIGHTMODES→'Climb' (FM3)	<b>SwMain</b> (↑↓ or -)	SC↓
FLIGHTMODES→'Reflex' (FM5)	<b>SwMain</b> (↑↓ or -)	SC↑

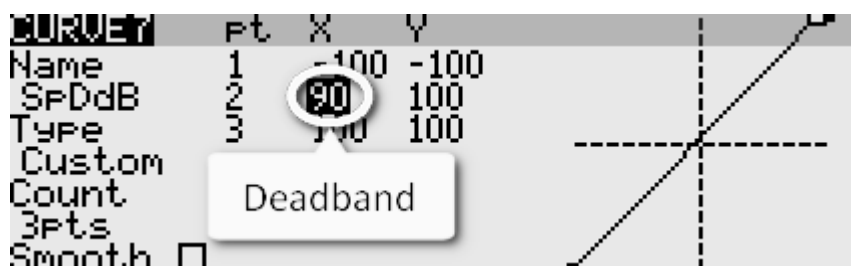
*Note:* Normal mode is selected when **SwMain** is in the third (unassigned) position. In the example above, it would be SC-middle.

## 9.2 Adjusting spoiler stick deadband

The spoiler stick response incorporates some deadband at the idle end to prevent accidental deployment. A small amount of deadband is also desirable to allow for pot drift and ratchet slip.

The default deadband should be fine for most pilots, however it can be adjusted as follows:

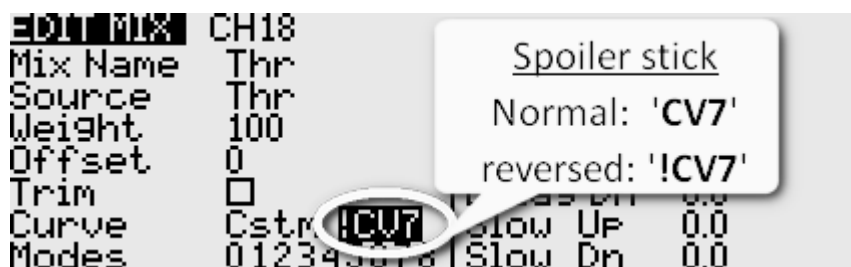
- 1 Go to Curves menu
- 2 Open Curve 7 ('SpDdB')
- 3 Change pt2 -> X. Decrease X to increase the deadband. Recommended max value is 95.



## 9.3 Reversing the spoiler stick

By default, zero spoiler corresponds to throttle stick fully forward. If you prefer zero spoiler with throttle fully back, then reverse the response as follows:

- 1 Open the mixer editor for CH18 (ThDdBd)→Thr
- 2 Skip to the Curve field
- 3 Change the curve from 'CV7' to '!CV7' (note leading exclamation mark).



## 10 Identifying mistakes

With OpenTx, it's easy to make mistakes with data entry, and there is no Undo button. Fortunately, it's quite easy to identify mistakes. The secret is to use the **COMPARE FILES** menu in Companion.

- 1 Start Companion
- 2 Open the (unedited) .eepe file
- 3 Open your working EEPROM
- 4 Open the **COMPARE FILES** window, then drag the corresponding models into it. Compare files generates a list of differences, and any errors should be easy to spot.

## 11 Making your own modifications

Before making your own modifications, please study the Excel documentation carefully and make sure you understand the implications. The recommended workflow is:

- 1 Setup your model first, as described in this guide
- 2 Backup your work
- 3 Apply your modifications incrementally, testing and backing up as you go along.

## 12 Pre-flight checks

Before flying with this setup for the first time, make sure you:

- set the battery alarm threshold to suit your battery chemistry, for both the tx and rx.
- set the failsafe

## 13 Disclaimer

Pretty obvious really, but worth repeating: although this setup is well tested, it's up to the pilot to make sure that the controls respond correctly under all conditions. The author can't be held responsible for any bugs in the setup or documentation. Remember to test your setup thoroughly before flying!

## 14 Contact

If you have any queries or suggestions, or if you find any errors in the documentation, or just want to say hello, then please contact me at <http://rc-soar.com/email.htm>.

Happy flying!  
Mike Shellim