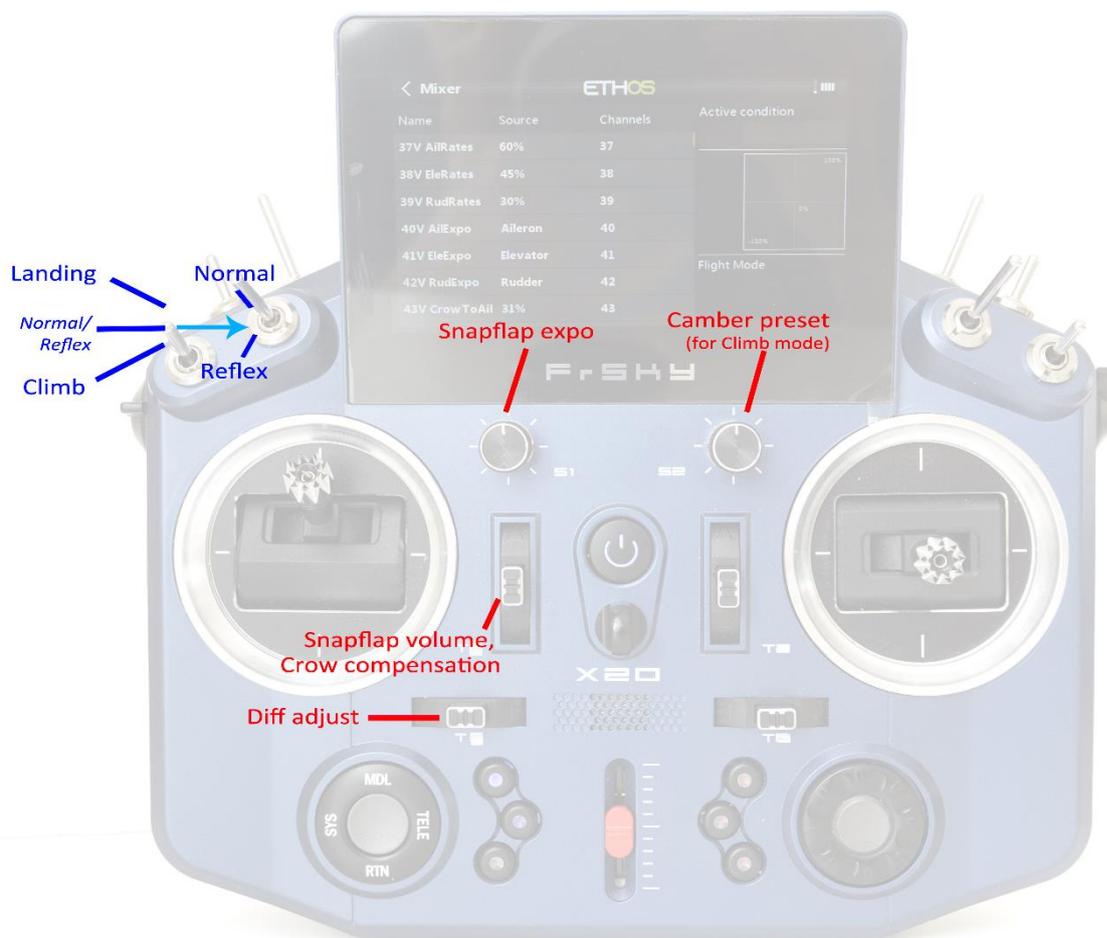


# F3F template for ETHOS

Version 1.1

## Setup Guide

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4 October 2022



F3F template control layout (Mode 2 shown)

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# 1 INTRODUCTION

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## 1.1 TEMPLATE DESCRIPTION

*F3F for Ethos* is for slope soarers with 2 servos in the fuselage and 4 in the wing. It's closely based on the author's well proven OpenTX template.

It offers all the features needed for F3F class moulded models, yet is quick to configure.

### **Application**

- For 6-servo gliders
- V-tail and X-tail
- Any stick mode

### **Flight modes**

- NORMAL, REFLEX, CLIMB, PUMP, and LANDING
- Voice confirmation on change of mode
- Customisable flight mode switches

### **In-flight adjustments**

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

### **Crow functions**

- Choice of deployment methods
- Automatic differential suppression
- Reverse Diff
- Crow/elev compensation with multi-point curve
- Adjustable deadband on crow control.

### **Control surface calibration**

- 'CAL' mode for adjusting servo centres and limits
- Balancing curve for flaps for accurate tracking
- Full rotation on flap servos

### **Other**

- Channels 7-9 free for motor etc.

**READ THROUGH THESE INSTRUCTIONS ONCE BEFORE STARTING!**

**PLEASE FOLLOW THE STEPS IN SEQUENCE**

## 1.2 PACKAGE CONTENTS

Filename	Description
f3f-ethos-11_setupguide.pdf	Setup guide
f3f-ethos-11?_reference.xls	Programming reference
f3f11?xy.bin	Model file (configurable for X- or V-tail)
*.wav	Sound files

## 1.3 REQUIREMENTS

The following are required:

- FrSky transmitter running Ethos v 1.3.3 or above
- USB cable for connecting to PC

## 2 OVERVIEW

### 2.1 FLIGHT MODES

There are five flight modes, plus a special CAL mode.

Switch SA is the main flight mode switch. It selects between CLIMB, {switch SB}, and LANDING.

Switch SB selects between NORMAL and REFLEX.

Flight Mode	SA	SB
NORMAL	Middle	↑ or middle
REFLEX	Middle	↓
LANDING	↑	
CLIMB (/PUMP)	↓	

PUMP mode is an optional flight mode for 'pumping' in F3F competitions. It is disabled by default.

To enable PUMP mode, see section 7.3.

### 2.2 MIXER TABLE

The table below shows the mixers in each flight mode.

FM	Diff *	Ail→Rud	Ail→Flap	Crow brakes	Crow comp *	Snapflap *	Camber *	Reflex
Normal	✓	✓	✓			✓		
Climb	✓	✓	✓				✓	
Landing	✓	✓	✓	✓	✓			
Reflex	✓	✓	✓			✓		✓
Pump	✓	✓	✓			✓		

\* adjustable in flight.

### 2.3 CONTROL ASSIGNMENTS

The default control assignments are for the X20. Make sure that the controls on your particular tx exist and are of the required type.

If necessary, you can reassign the key functions depending on your hardware and preferences. You can also reverse the sense of some controls.

Function	Type	Default	Configuration
Crow brakes	Stick	Throttle stick	Section 7.5
Diff adjustment	Trim	Rudder trim	—
Snapflap volume Crow compensation	Trim	Throttle trim	—
Snapflap expo adjust	Pot or slider	Pot1	Section 7.6
Camber preset adjust	Pot or slider	Pot2	Section 7.7
CAL switch	Momentary	SH	Section 7.4
Main flight mode switch	3-pos switch	SA	Section 7.4
Reflex mode switch	2- or 3-pos switch	SB	Section 7.4

## 2.4 CAL MODE

CAL mode is a special flight mode for calibrating servo end points and centres. When CAL is active, mixers and trims are ignored. To activate CAL mode:

1. Apply full left aileron + full up elevator (pull stick back towards your body) – and hold.
2. Pull and release SH
3. Release sticks.
4. Select the CAL submode using switch SA:
  - SA—: for calibrating servo end points, and balancing the flaps. In this mode, the flaps move in 25% increments.
  - SA↓ for calibrating flap neutral.
  - SA↑ for calibrating with 50% aileron travel. The flaps move to their neutrals.

To exit CAL mode, pull SH.

## 2.5 SERVO ASSIGNMENTS

Servos are assigned as follows:

Channel #	Vtail	Xtail
1	Right aileron	
2	Left aileron	
3	Right flap	
4	Left flap	
5	Right Vtail	Elevator
6	Left Vtail	Rudder
7-12	[free]	

The left and right channels are not interchangeable – *please ensure they are plugged in correctly!*

## 2.6 BASIC OPERATION

### Rates and expo

- Rates/expo may be set globally or per flight mode.

### Trims

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

### Camber and reflex

- In CLIMB mode, camber is adjustable via Pot2.
- In REFLEX mode, reflex is preset.

### Aileron-to-flap mix

- Aileron-to-flap mixing may be set globally or per flight mode.

### Crow->elevator compensation

- Crow compensation is adjustable via the throttle trim.
- Compensation be optimised by adjusting a curve.

### Differential

- Diff is adjustable during flight, using the rudder trim.
- Diff settings are stored per flight mode.

### Roll rate enhancement

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

### Aileron to Rudder mix

- Aileron to rudder mix is global or per flight mode.

### Snapflap

- Snapflap is available in NORMAL, REFLEX and PUMP modes.
- Snapflap volume is independent for each flight mode, and adjustable in flight via the throttle trim.
- Snapflap expo is adjustable via Pot1.

### Pump mode

- PUMP mode is optional. It's for 'pumping' during the 30-second climbout in an F3F comp.

## 3 PREPARING THE TRANSMITTER

---

### 3.1 TRANSFER FILES TO TRANSMITTER

1. Unzip the files in the .zip package to your computer's hard drive.
2. Switch on the transmitter in bootloader mode and establish a USB connection.
3. Copy the model file **f3f11?.bin** to the \models folder on the SD card.
4. Two sets of .wav (sound) files are provided, for English and French. Select the appropriate files, and copy to the \audio folder on the SD card. (Do *NOT* copy to the 'en' or 'fr' subfolder!).
5. Disconnect USB and restart the transmitter.

Activate the model as follows:

6. Go to the **MODEL SELECT** menu and find the model 'F3F-ethos\_11?'.  
7. Click and choose 'Set current model'.
8. Go to the **EDIT MODEL** menu, and change the name as desired.

### 3.2 HARDWARE CONFIGURATION

Now check that all the electronics are set up and ready.

1. The transmitter hardware must be properly calibrated, so do so now if in any doubt.
2. Configure the transmitter RF module.

### 3.3 FAMILIARISATION

Using the transmitter on its own, practice the following:

- Activate NORMAL, CLIMB, LANDING, and REFLEX modes (see Section 2.1).
- Activate CAL mode and sub-modes (see Section 2.4)
- Verify that the sounds are working correctly. If not, check that the sound files are in the correct location (see section 3.1).

## 4 CONFIGURE TAIL TYPE

Configure the tail type in the MIXERS menu.

Mixer	Description	Notes
59 V_IsVtail	Tail type	Weight = 0: X- or T-tail Weight = 1 (default): V-tail

## 5 CALIBRATE OUTPUTS

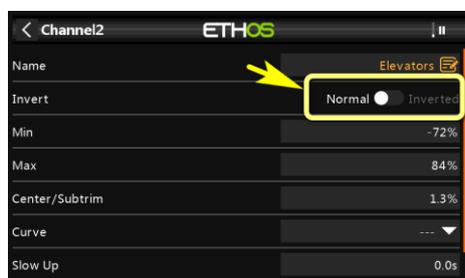
In this section, you will set the operating envelope of each servo – just enough to provide sufficient movement but without damaging your linkages. You'll also balance up the movements on the left and right sides. This section must be completed before configuring the mixers.

### 5.1 SET SERVO ROTATION

First set the rotation direction of the servos:

1. Switch on the transmitter (do not power up the receiver yet)
2. Set throttle stick to centre, Switch SA to middle
3. Enter CAL mode
4. Switch on the receiver
5. Open the **OUTPUTS** menu
6. While still in CAL mode, set the direction of control surfaces according to the table below. *Pay attention to the notes regarding aileron and elevator!*

Stick command	Control surface	Notes
Aileron stick right →	RtAil goes up ↑ LtAil goes up ↑	Ailerons <b>move up together</b> . This is to aid visual calibration later.
Thr stick forward ↑	RtFlap goes up ↑ LtFlap goes up ↑	
<i>V-TAIL only:</i> Ele stick forward ↑	RtVee goes up ↑ LtVee goes up ↑	In CAL mode, elevator operates in <b>reverse direction to normal</b> .
<i>X-TAIL only:</i> Ele stick forward ↑	Ele goes up ↑	
<i>X-TAIL only:</i> Rud stick right →	Rud goes right →	



To reverse a control surface, open the output editor, and change the *Invert* field from 'Normal' to 'Inverted'.

7. Exit CAL mode and enter NORMAL mode.
8. Move the aileron, elevator and rudder sticks, and for normal operation.

**Note that the flaps will not function yet!**

## 5.2 ADJUST SERVO END POINTS AND CENTRES

In this section, you will (a) set the operating range of each servo and (b) compensate for linkage differences between the left and right sides. Note:

- All adjustments in CAL mode.
- Set servo limits to maximum possible - just a little less than the physical limits of the linkages and hinges.
- Adjustments are made using curves. **Do not alter min, max or Subtrim!**
- You may need to experiment to see which end of a curve to adjust, as explained in each note.

Channel	Calibration procedure
<b>CH 4: LtFlap</b>	<p>Start with left flap. In this step, you'll set the end points and servo centre. Do not worry about the flap neutral. it will be set later.</p> <ol style="list-style-type: none"> <li>1. Switch SA to middle</li> <li>2. Enter CAL mode</li> <li>3. In the OUTPUTS menu, open CH4:LtFlap</li> <li>4. Skip to the 'curve' field, and open the curve editor <ul style="list-style-type: none"> <li><input type="checkbox"/> Throttle stick back (↓), then adjust the absolute lower limit with curve point 1 or 3 (whichever works).</li> <li><input type="checkbox"/> Throttle stick forward (↑), adjust absolute upper limit with point 3 (or 1).</li> <li><input type="checkbox"/> Adjust point 2 so it's on the straight line through points 1 and 3.</li> </ul> </li> <li>5. Move throttle stick from one end to the other, observing step intervals. If necessary, you can adjust point 2 to make the response more linear.</li> </ol>
<b>CH 3: RtFlap</b>	<p>Next, calibrate the right flap. A 5-point curve is used, using the left flap as a reference.</p> <ol style="list-style-type: none"> <li>1. Enter CAL mode</li> <li>2. Switch SA to middle</li> <li>3. In the OUTPUTS menu, open CH3:RtFlap</li> <li>4. Skip to the 'curve' field and open the curve editor. Adjust the points to exactly match the left flap. Note: <i>the order of the curve points may be reversed, if the first point doesn't work, try the alternative (in brackets).</i> <ul style="list-style-type: none"> <li><input type="checkbox"/> stick fully back, adjust point 1 (or 5) for the lower limit of travel.</li> <li><input type="checkbox"/> stick ½-back, adjust point 2 (or 4)</li> <li><input type="checkbox"/> stick to centre, adjust point 3.</li> <li><input type="checkbox"/> stick to ½-forward, adjust point 4 (or 2)</li> <li><input type="checkbox"/> stick fully forward, adjust point 5 (or 1) for the upper limit of travel</li> </ul> </li> </ol> <p>To match the end points on left and right sides, it may be necessary to go reduce one or other end points for the left flap in the previous step.</p> <p>Do a final check. Pay particular attention the points adjacent to flap neutral.</p>
<b>Flap neutral</b>	<p>Next, you'll set the flap neutral, by applying an offset mix.</p> <ol style="list-style-type: none"> <li>1. Open the MIXERS menu</li> <li>2. Scroll to mix 55V_FlapOffset</li> <li>3. Activate CAL mode</li> <li>4. Switch SA down.</li> <li>5. Listen for callout 'calibrate flap neutral'.</li> <li>6. Adjust <i>weight</i> for correct neutral. If the flaps are not perfectly in line with each other, then redo calibration for CH3:RtFlap above, paying particular attention to the two points adjacent to the neutral position.</li> </ol>

Channel	Calibration procedure
<i>V-Tail</i> <b>CH 5: RtVee</b> <b>CH 6: LtVee</b>	Calibrate V-tail (applies to V-tail version only). 1. Enter CAL mode (position of SA is not critical.) 2. In the OUTPUTS menu, open CH5:RtVee 3. Skip to the 'curve' field, and open curve editor <ul style="list-style-type: none"> <li><input type="checkbox"/> Ele stick to centre, adjust point 2 for correct neutral</li> <li><input type="checkbox"/> Ele stick forward (↑), adjust end point 3 (or 1) for <b>upper</b> (↑) travel limit.</li> <li><input type="checkbox"/> Ele stick back (↓), adjust point 1 (or 3) for <b>lower</b> (↓) limit.</li> </ul> 4. Repeat for CH6:LtVee 5. Check equal travel up/down; left and right surfaces match
<i>X-Tail</i> <b>CH 5:Elev</b>	Calibrate elevator (applies to X-or T-tail only) 1. Enter CAL mode. (Position of SA is not critical.) 2. In the OUTPUTS menu, highlight CH5:Elevator 3. Skip to 'curve' field, open curve editor <ul style="list-style-type: none"> <li><input type="checkbox"/> Ele stick to centre, adjust point 2 for correct neutral</li> <li><input type="checkbox"/> Ele stick forward (↑), adjust point 1 (or 3) point for <b>upper</b> (↑) limit</li> <li><input type="checkbox"/> Ele stick back (↓), adjust point 3 (or 1) for <b>lower</b> (↓) limit</li> </ul> 4. Check travel is equal up & down
<i>X-Tail</i> <b>CH 6:Rudd</b>	Calibrate rudder (applies to X-or T- tail only) 1. Check you're still in cal mode (position of SA is not critical.) 2. In the OUTPUTS menu, highlight CH6:Rudd 3. Skip to 'curve' field, open curve editor 4. Rudder stick to centre, adjust point 2 for neutral 5. Rudder right (→), adjust end point 1 (or 3) for right limit 6. Rudder left (←), adjust end point 3 (or 1) for left limit 7. Check equal travel left/right
<b>CH 1:RtAil</b> <b>CH 2:LtAil</b>	Finally, calibrate ailerons: 1. Enter CAL mode 2. Set switch SA to down position. The flaps will go to their calibrated neutrals. 3. In the OUTPUTS menu, go to CH1:RtAil and open the curve editor <ul style="list-style-type: none"> <li><input type="checkbox"/> Aileron stick to centre. Set Point 2 for correct centre</li> <li><input type="checkbox"/> Move aileron stick right (→). Set point 3 (or 1) for desired upper limit.</li> <li><input type="checkbox"/> Move aileron stick left (←). Set point 1 (or 3) so that down-travel = up-travel. If down-travel is limited and you cannot complete this step, then move SA to the up position – this reduces aileron movement by 50% during calibration; retry the calibration remembering that you will get double the movement when you exit CAL mode. Don't worry if down-travel is excessive when you exit CAL – later adjustments to the aileron rate and diff will reduce it.</li> </ul> 4. Repeat for CH2:LtAil 5. Check: constant rate up/down for each aileron, and check left and right ailerons match. Readjust if necessary.

Check operation as follows:

1. Exit CAL mode
2. Move the sticks, checking that aileron, elevator and rudder move in the correct sense. Note that **the flaps will not function yet** – they will be configured in the next section.
3. Don't worry that the travel of the ailerons and elevator are excessive – they'll be reduced in the next step.

**WELL DONE! CALIBRATION IS COMPLETE – PLEASE BACKUP YOUR WORK NOW (MAKE A CLONE)**

## 6 MIXER CONFIGURATION

In the final step, you'll set the control travel (rates) and mixers. Refer your plane's instructions for recommended settings. Most settings are via VAR mixes – these are grouped at the top of the mixer list.

### 6.1 RATES AND EXPO

This section is for setting rates (also known as 'control travel') and expo on the main flight controls.

Mixer	Adjusts	Notes
37 V_AilRates 38 V_EleRates 39 V_RudRates	Aileron/Ele/Rud rates.	Set the default rate by adjusting <i>weight</i> . Refer to the instructions for your model for the recommended travel. You can override the defaults for specific flight modes by adding extra weight lines, one per flight mode. To do this, <ol style="list-style-type: none"> <li>1. Click 'Add new weight'</li> <li>2. Click adjacent down arrow</li> <li>3. Select category 'Flight modes', and choose the flight mode</li> <li>4. Set the desired rate</li> </ol> <b>Safety: Never set default rates to zero, even if you specify FM-specific over-rides!!</b> The defaults must always offer sufficient control.
40 V_AilExpo 41 V_EleExpo 42 V_RudExpo	Aileron/Ele/Rud expo.	Go to the <i>weight</i> field, and set the default expo. You can override the default expo by adding extra <i>weight</i> lines, one per flight mode. To do this: <ol style="list-style-type: none"> <li>1. Click 'Add a new weight'</li> <li>2. Click adjacent down arrow</li> <li>3. Select category 'Flight modes', and choose the flight mode</li> <li>4. Set the desired expo</li> </ol>

### 6.2 CROW BRAKES

This section is for setting up crow brakes.

Mixer	Adjusts	Notes
43 V_CrowtoAil	Crow to ailerons up	Adjust this mix for required aileron movement with crow. To configure: <ol style="list-style-type: none"> <li>5. Enter LANDING mode</li> <li>6. Pull the throttle stick fully back/down.</li> <li>7. Adjust <i>weight</i> for desired upward movement of ailerons</li> </ol>
44 V_CrowToFlap	Crow to flaps down	-- as above, for downward movement of flaps --
45 V_CrowComp	Crow to elevator ('compensation')	This mix counteracts pitch changes due to crow. The amount is adjustable in flight using the throttle trim. To configure the maximum compensation: <ol style="list-style-type: none"> <li>1. Activate LANDING mode.</li> <li>2. Deploy full crow.</li> <li>3. Move throttle <i>trim</i> fully forward (for max compensation).</li> <li>4. Adjust weight for desired max compensation</li> <li>5. Move throttle trim back for desired operating compensation.</li> </ol>
54 V_RevDiff	Reverse diff	In this step, you can adjust the travel of the down-going aileron when both full crow and full aileron are applied. This can improve roll response at full crow. To configure: <ol style="list-style-type: none"> <li>1. Activate LANDING mode</li> <li>2. Apply full crow and full aileron</li> <li>3. Adjust weight so that the down going aileron is a little below the neutral position.</li> </ol> NOTE: this measure for improving roll response is in addition to the suppression of aileron diff as crow is deployed (this is done automatically).
56 V_AutoCrow	Enable Autocrow	See section 7.2

## Adjusting pitch trim when crow brakes are deployed

The procedure for trimming out the brakes is as follows:

1. Activate Landing mode
2. First, set the 'base' trim: apply *minimal* crow, and adjust *elevator* trim.
3. Finally, adjust the compensation: apply *maximum* crow and adjust *throttle* trim.

If necessary, the compensation at mid-crow can be fine tuned by adjusting curve CV:CrowComp. Adjust points 2 to 4 only (do not adjust end points).

## 6.3 AILERON => FLAP

The aileron=>flap mix causes the flaps to act like ailerons in response to roll commands.

Mixer	Adjusts	Notes
46 V_AilToFlap	Aileron to flap mix	Adjust <i>weight</i> to set the aileron=>flap mix. Focus on the upward movement of the flaps (downward movement is affected by the diff setting, adjusted with the rudder trim). You can over-ride the default for specific flight modes - same method as rates (see 6.1)

## 6.4 AILERON => RUDDER

Aileron => rudder is useful in landing mode, for improving turn response.

Mixer	Adjusts	Notes
47 V_AilToRud	Aileron to rudder mix	Adjust <i>weight</i> to set the default aileron=>rudder mix. You can over-ride the default for specific flight modes - same method as rates (see 6.1)

## 6.5 CAMBER

Configure maximum camber (Climb mode only)

Mixer	Adjusts	Notes
48 V_CambToAil	Aileron camber	Sets the maximum aileron camber. To configure, enter Climb mode, rotate Pot2 fully clockwise and adjust <i>weight</i> .
49 V_CambToFlp	Flap camber	-- as above, but for flaps --

## 6.6 REFLEX

Set the amount of reflex (Reflex mode only)

Mixer	Adjusts	Notes
50 V_RflxToAil	Aileron reflex	To configure the amount of aileron reflex, enter REFLEX mode and adjust <i>weight</i> .
51 V_RflxToFlap	Flap reflex	-- as above, but for flaps --

## 6.7 AILERON DIFF

Aileron differential reduces the travel of the downgoing aileron in response to roll commands. The reduction is expressed as a percentage of the upgoing travel. Diff is adjusted using the rudder trim as follows:

- Trim left = 50% diff = 50% travel.
- Trim centre = 25% diff = 75% travel
- Trim right = 0% diff = 100% travel.

Diff is flight mode dependent. *Make sure to set the diff for all flight modes!*

## 6.8 FLAP DIFF (CHANGED IN V1.1)

Flap differential works like aileron diff, but for flaps.

Flap diff can be enabled or disabled via a configuration setting as follows:

Mixer	Adjusts	Notes
60 V_FIDfEnable	Flap diff enable	0% = disabled 1% = enabled (default)

## 6.9 ELEVATOR => AIL/FLAP ('SNAPFLAP')

Snapflap is adjustable in flight. Configure separately for ailerons and flaps.

Mixer	Adjusts	Notes
52 V_SnapToAil 53 V_SnapToFlap	Elevator to aileron ('Snapflap')	Snapflap is active in NORMAL, PUMP and REFLEX modes, and is adjustable in each mode independently using the throttle trim. First, configure the <i>maximum possible</i> snapflap as follows: <ol style="list-style-type: none"><li>1. Enter NORMAL mode</li><li>2. Move the throttle trim fully back (for max snapflap).</li><li>3. Apply full up elevator</li><li>4. Select mix V_SnapToAil and adjust <i>weight</i> for required max aileron movement.</li><li>5. Repeat step 4, with V_SnapToFlap to adjust max flap movement.</li></ol> Next, set snapflap for actual flight - adjust the throttle trim for each of the following modes: NORMAL, REFLEX and PUMP (if enabled). Finally, set zero snapflap expo, by centring Pot1. See also section 7.6.

## 6.10 OTHER PARAMETERS

Various other parameters.

Mixer	Adjusts	Notes
57 V_PumpMode	Enable PUMP mode	See section 7.3
58 V_TogglePump	Enable Toggle pump	See section 7.3
59 V_IsVtail	Tail type	0% = X- or T-tail 1% = V-tail
55 V_FlapOffset	Flap neutral offset	Adjusted in CAL mode

# 7 CUSTOMISING YOUR SETUP

This section describes various optional customisations. Your mixer settings etc. will not be affected so you can make these changes any time. Remember to make a backup first (an easy way is simply to 'clone' your setup from the MODEL SELECT menu).

## 7.1 SETTING THE LOW BATTERY ALARM

A low battery alarm is provided, and can be configured as follows:

1. Go to the SPECIAL FUNCTIONS menu
2. Open SF9
3. Set *State* to 'enabled' and set the repeat interval.
4. Go to the LOGICAL SWITCHES menu, open LSW32:BAT\_LOW.
5. Set *Value(X)* to the required threshold voltage.

The alert will be triggered when the voltage drops below the threshold for more than 3 seconds.

## 7.2 CONFIGURING 'AUTOCROW'

Autocrow allows you to activate LANDING mode simply by pulling on the crow stick. Many pilots prefer this style of operation as it avoids having to move a switch. Autocrow is enabled in the MIXERS menu as follows:

Option	Adjustment point	Notes
AUTOCROW	CH56:V_AutoCrow→Weight	0%: disabled (default) 1%: enabled

When Autocrow is enabled, the switch layout automatically changes:

- The previous Landing mode switch (default SA↑) is reassigned to Reflex mode
- The previous Reflex mode switch (default SB) is free for re-use.

## 7.3 CONFIGURING PUMP MODE

PUMP flight mode is optional. Use it to set high rates when 'pumping' in F3F competitions. To enable pump mode:

Option	Adjustment point	Notes
PUMP_ENABLE	CH57:V_PumpMode→Weight	Disable: 0% (default) Enable: 1%

Once enabled, Pump flight mode is activated as follows:

1. Enter CLIMB mode
2. Pull SH↓

Pump mode is cancelled when another flight mode is activated. It can also be toggled on/off via SH↓ as follows:

Option	Adjustment point	Notes
TOGGLE_PUMP	CH58:V_TogglePump→Weight	Allows PUMP mode to be toggled on/off using SH↓. Disable: 0% (default) Enable: 1%

## 7.4 REASSIGNING FLIGHT MODE SWITCHES

Flight mode switches are assigned in logical switches LSW4 – LSW8.

Flight mode	Adjustment point	Default	Notes
Cal & Pump modes	LSW4	SH↓	Must be 2-pos momentary switch (safety!)
<i>Autocrow off</i> : Landing mode	LSW5	SA↑	Must all be same 3-pos switch
<i>Autocrow on</i> : Reflex mode		SA–	
Normal/Reflex mode		SA↓	
Climb mode	LSW7	SA↓	
<i>Autocrow off</i> : Reflex mode	LSW8	SB↓	Regular 2- or 3-pos switch.

## 7.5 CONFIGURING THE CROW STICK

The crow stick incorporates some deadband to prevent accidental deployment. The amount of deadband can be adjusted as follows:

1. Go to the Curves menu and open CV:ThrDB
2. Change Point2 → X. Default is 85.

To reverse the crow stick:

1. Go to the MIXERS menu
2. Scroll down to the 'Throttle' mix for channel 21, then {long press} to open the mixer editor.
3. {Long press} on source ('Throttle') and choose 'negative'. The source changes from 'Throttle' to '-Throttle'.

## 7.6 ASSIGNING OR DISABLING SNAPFLAP EXPO ADJUSTER

By default snapflap expo is assigned to Pot1. You can assign it to a different control as follows:

1. Go to the MIXERS menu
2. Scroll down to the SnapExpoAdj mixer for channel 23, then {long press} to open the editor
3. Change the source as required.
4. To reverse the direction, {long press} on source, and choose 'negative'.

You can also disable the adjustment altogether. To do this, set the source to '---' (step 2). Expo will be fixed at zero and Pot1 can be re-assigned for other purposes.

## 7.7 ASSIGNING CAMBER PRESET ADJUSTER

By default the camber preset adjustment is assigned to Pot2. You can alter this as follows:

1. Go to the MIXERS menu
2. Scroll down to the mix 'CambAdj' for channel 28, then {long press} to open the editor.
3. Change the source from pot2 to another control.

To reverse the control, {long press} on the *source* field, and choose 'negative'.

## 7.8 CONFIGURING POT CHECKS



Once the settings for pot1 and pot2 have been optimised, it's a good idea to configure pot checks – these will warn if the pots have moved away from the optimal positions.

1. Enter the Checklist menu.
2. Click 'load all pot positions'
3. Choose the '~' option (it means 'approximately equal to').

## 8 DISCLAIMER

Although this setup is tested, it's up to the pilot to make sure that the controls respond correctly under all conditions. The author will not be responsible for the consequences of any bugs in the setup or documentation or as the result of changes in Ethos.

***Remember to test your setup thoroughly before the first flight and after any modifications!***

***If in doubt, don't fly!!***

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>.

Safe flying!

Mike Shellim