F3F template
for OpenTX/EdgeTX

Version 6.2

Setup Guide

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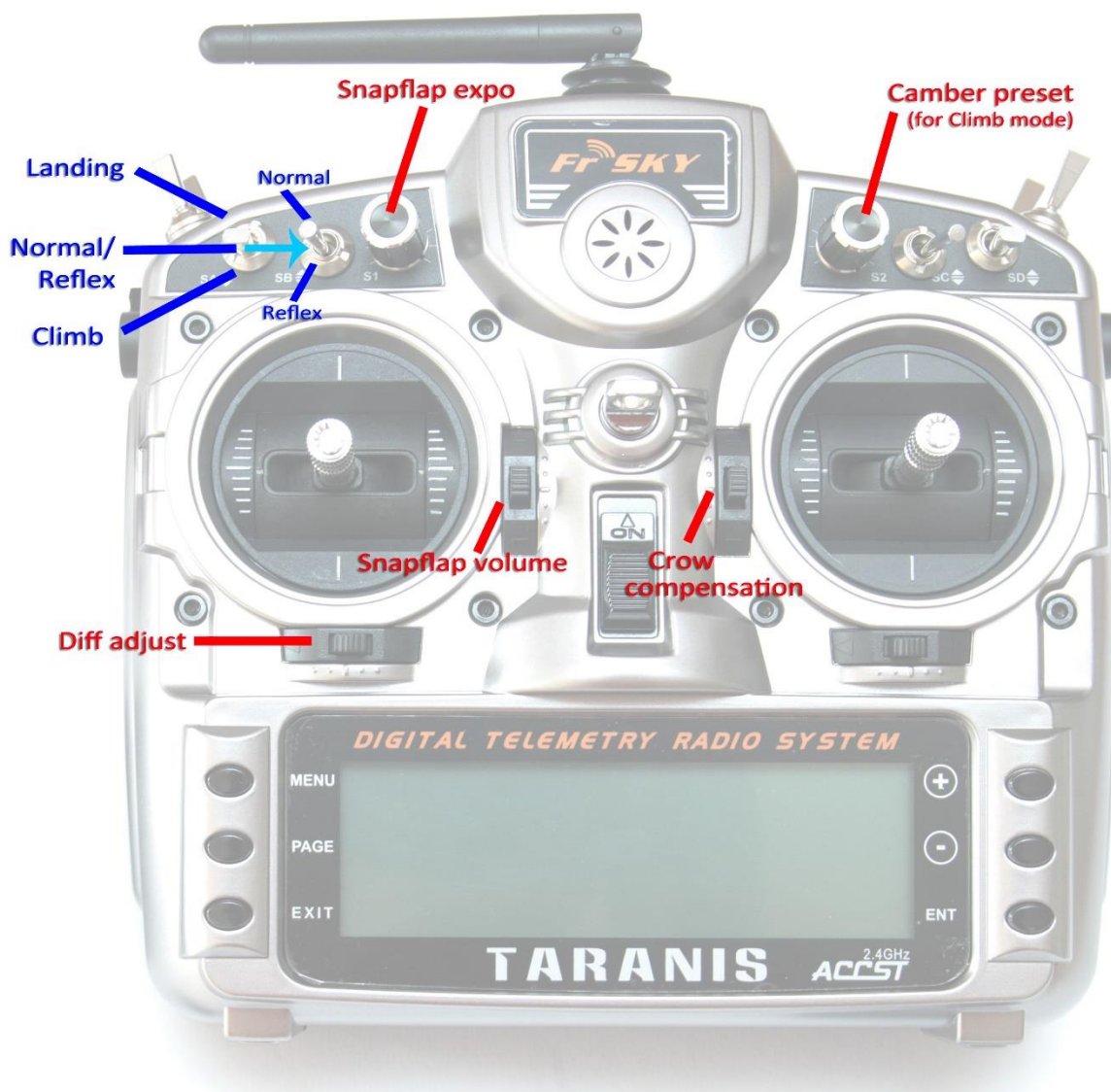
CONTENTS

1 INTRODUCTION

1.1 DESCRIPTION

F3F is a template for slope racers with 6 servos which is well proven in F3F competition. It features quick setup, simple operation, and easy trimming. An integrated CAL mode ensures precise tracking of control surfaces.

Before you begin your journey to a great setup, please observe the golden rules for success:

- *Skim through this guide once through, before starting*
- *Follow the instructions in sequence*
- *Visit the support page for the latest alerts*

1.2 REQUIREMENTS

The following are required:

- Transmitter with at least 1 momentary switch and 1 pot (knob/slider)
- OpenTX 2.3.15 or EdgeTX 2.7.1 or later
- Companion software
- USB cable

1.3 PACKAGE CONTENTS

What's included in the ZIP file:

Filename	Description
F3f_62_userguide.pdf	This document
F3f_62_reference.xls	Settings reference
F3f_62?.otx	Model file with two templates: 'X' for cross- and T-tail, 'V' for V-tail
*.wav	Sound files
Snp500.lua	(optional) advanced snapflap script
Snp500InstallGuide.pdf	Install guide for advanced snapflap mix

2 OVERVIEW

2.1 STICK MODES

The stick mode is defined in **RADIO SETUP → MODE** menu. All stick modes are supported by the template.

2.2 CONTROLS AND SWITCHES *(NEW IN 6.1)*

Controls which are common to all transmitters have fixed assignments:

Function	Control/switch
Roll	Aileron stick + trim
Yaw	Rudder stick
Pitch	Elevator stick + trim
Diff adjust	Rudder trim
Snapflap volume	Throttle trim
Crow compensation	Elevator trim

Other controls/switches are freely assignable according to your transmitter and flying style. The assignments will be done later via your transmitter's **INPUTS** menu - see section 3.3.

Function	Short name	Control type
Main flight mode switch	**SFM**	3-position switch
CAL and Pump mode	**Mom**	Momentary switch *only*
NORMAL/REFLEX mode	**NoR**	2- or 3-position switch
Camber adjust (CLIMB mode)	**Cmb**	T5, T6 or pot
Snapflap alerts	**SAl**	*[Optional]* 2- or 3-pos switch
Snapflap expo adjust	**SnE**	*[Optional]* T5, T6 or pot
Crow	**Cro**	Throttle stick
Snapflap lower deadband	**SL1**	*[Optional]* Slider or pot
Snapflap upper deadband	**SL2**	*[Optional]* Slider or pot

*From this point on, controls will be referred to by their short names ('**SFM**' for flight mode switch, '**NoR**' for normal/reflex switch, '**Mom**' for momentary switch etc.).*

2.3 FLIGHT MODES

There are five flight modes: NORMAL, CLIMB, PUMP, REFLEX and LANDING. Operation is shown in the table below.

Flight Mode	Number	Activation switches	
NORMAL	FM0	**SFM—**	**NoR↑—**
REFLEX	FM3		**NoR↓**
LANDING	FM2	**SFM↑**	
CLIMB/PUMP[1]	FM6/FM5	**SFM↓**	

[1]PUMP mode is disabled by default. For info on setting up, see section 7.3.

There is also a special CAL mode (FM1) for calibrating the outputs.

2.4 MIXER TABLE

The table below shows the mixers active in each flight mode (mix adjusters in brackets):

Flight mode	Crow	Crow comp	Snapflap	Camber	Reflex	Ail to Rudder	Ail to Flap
Climb				✓ (**Cmb**)		✓	✓
Pump			✓ (Thr trim)			✓	✓
Normal			✓ (Thr trim)			✓	✓
Reflex			✓ (Thr trim)		✓	✓	✓
Landing	✓	✓ (Ele trim)				✓	✓

2.5 Servo assignments

Channel #	V-tail	X-tail
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 connected correctly!
Channel assignments can be changed using the author's ChannelChanger script.

2.6 CAL mode

CAL mode (FM1) is a special flight mode for calibrating the outputs. When CAL is activated, mixers and trims are disabled, and the stick values are passed directly to the outputs. To activate CAL mode:

1. Apply full left aileron and full up elevator, and hold.
2. Pull and release **MOM**
3. Release sticks.
4. Listen for voice confirmation that CAL mode is activated.
5. Choose the submode
   - **SFM—**: for calibrating end points, and flaps. The flaps move in 25% increments.
   - **SFM↓**: for calibrating flap offset
   - **SFM↑**: using 50% aileron movement (to avoid damage to linkages)

To exit CAL mode, pull **MOM**.

2.7 Basic operation

This section describes the main features of the template.

Aileron, rudder and elevator trims
- Aileron trim is shared across all flight modes.
- Elevator trim is per flight mode (but see section 6.1 for LANDING mode).
- Rudder and throttle trims are repurposed (see below).

Camber and reflex
- In CLIMB mode, camber is adjustable via a pot (**Cmb**).
- In REFLEX mode, reflex is preset.

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

Brake compensation (brake=>elevator mix)
- Counteracts pitch-up due to brakes.
- Adjusted using elevator trim.
- Compensation curve can be fine tuned.

Aileron differential
- Adjustable per flight mode, via the rudder trim.

Roll rate enhancement with brakes

- *[New in 6.2]* As aileron is applied, the upward offset due to brakes reduces to zero. (No adjustment needed.)

Aileron=>rudder mix

- Aileron=>rudder mix may be set per flight mode.

Snapflap

- Snapflap is available in NORMAL, REFLEX and PUMP modes.
- Snapflap volume is per flight mode, adjustable via the throttle trim.
- Expo is adjustable via **SnE**, for all flight modes.
- Audio alerts at 5% and 95% snapflap, to aid tuning.
- [optional] Advanced snapflap Lua script permits dynamic adjustment of upper and lower deadband.

Pump mode

- PUMP mode is optional, for 'pumping' during the 30-second climbout in an F3F comp.
- Having a dedicated Pump mode allows specific rates to be set.
- PUMP mode is disabled by default.

3 PREPARING THE TRANSMITTER

3.1 TRANSFER TEMPLATE TO TRANSMITTER

Start by transferring the template to your transmitter.

Establish a USB connection

1. Put your transmitter in Bootloader mode (the exact method will depend on your transmitter).
2. Connect transmitter to PC via USB. The tx's SD card and internal memory (if present) should appear as an external drive.
3. Look for a /SOUNDS folder in one of the drives

Copy sound files

1. Copy the supplied sound (.wav) files to the */SOUNDS/{language}* folder. For example, the English folder is */SOUNDS/en*. (Do not copy the sound files to the *system* folder.)

Transfer template to transmitter

1. Start Companion, using a profile for your transmitter
2. Open supplied file *F3F_62.otx*. Separate setups for X- and V-tails are displayed in a window.
3. A popup will appear with translation errors and warnings. These can be ignored – any incorrect or missing controls will be fixed when you assign the controls later.
4. From the File menu, choose *Read Models and Settings from Radio*. The model list from the radio is displayed in a second window.
5. Drag one of the F3F models into an empty slot in the model list.
6. Close the *F3F_62.otx* window.
7. Right-click the new model and choose "Use as Default"
8. From the File menu, choose *Write Models and Settings to Radio*.
9. Close OpenTx Companion
10. Terminate the USB connection
11. Power up the transmitter and check that the template is selected.

3.2 HARDWARE CALIBRATION

The transmitter hardware (sticks, sliders etc.) must be properly calibrated, so do so now if you haven't already calibrated or are not sure. To do a hardware calibration:

1. Open the **RADIO SETUP -> CALIBRATION**
2. Calibrate all sticks, knobs and sliders.

3.3 ASSIGNING THE CONTROLS (*NEW IN 6.1*)

New in version 6.1: all functions may be flexibly assigned depending on your transmitter hardware and layout preferences. *It's important to check the assignments, as Companion does not always set them correctly.*

To check and alter the assignments:

1. Open the **INPUTS** menu and scroll down to lines 10-18. You'll see a list of functions and their controls.
2. Referring to the table below, check each function uses a valid control. The table shows suggested controls for the X9D/TX16S, Zorro and Pocket, for right-handed pilots.

Function	Input name	Valid controls	Suggested control			To disable	
			TX16S	Zorro	Pocket	Cntrl	weight
CLIMB/NORMAL/LANDING select	**SFM**	3-pos switch	SA	SB	SB		
CAL and PUMP select	**Mom**	Momentary *only*	SH	SA	SE		
NORMAL/REFLEX select	**NoR**	2- or 3-pos switch	SF	SE	SA		
Camber (CLIMB mode)	**Cmb**	T5, T6 or pot	S2	S1	S1		
Snapflap alerts on/off	**SAl**	2- or 3-pos switch	SC	SF	SD	MAX	-100%
Snapflap expo adjust	**SnE**	T5, T6 or pot	S1	[disable]	[disable]	MAX	0%
Crow (LANDING)	**Cro**	Throttle stick	Thr	Thr	Thr		
Snapflap Lua param1 (see § 7.6)	**SL1**	Slider or pot	[disable]	[disable]	[disable]	MAX	0%
Snapflap Lua param2 (see § 7.6)	**SL2**	Slider or pot	[disable]	[disable]	[disable]	MAX	0%

To change a control:
1. Highlight the relevant input, then long press {Enter} and choose Edit
2. Skip to the *Source* field and press Enter. The field will blink.
3. Move the desired control or switch. The *Source* field should automatically update itself.

To reverse a control:
1. Highlight the relevant input, then long press {Enter} and choose Edit
2. Reverse the sign of the *Weight*.

Note: all weights must be +100% or -100%. Do not reverse the momentary switch.

To disable a function (*don't delete the input!*):
1. Highlight the relevant input, then long press {Enter} and choose Edit
2. Set *Source* to 'MAX', and
3. Set *Weight* as shown in the last column of the table above

If a control is unassigned, it can be re-used for other purposes.

3.4 FAMILIARISATION

Using the transmitter on its own, practise the following, using the sound callouts as confirmation:

- Activate NORMAL, CLIMB, PUMP (if enabled), REFLEX and LANDING   (see Section 2.3).
- Activate CAL mode and sub-modes (see Section 2.6)
- Verify that the sounds are working correctly. If not, check that the sound files are in the correct location.

Depending on your tx, you may find that you need to reverse one or more controls or switches - see section 3.3.

4 CALIBRATING THE OUTPUTS

In this section you will set the rotation and operating range of the servos.

4.1 SET SERVO ROTATION

First, set the rotation of each servo:

1. Switch on the transmitter (do not power up the receiver yet)
2. Crow stick to centre
3. Enter CAL mode
4. Set flight mode switch (**SFM)** to middle position.
5. Power up the receiver
6. Open the **OUTPUTS** menu
7. Set the servo rotations according to table below.

IMPORTANT: pay special attention to the notes below – some surfaces behave differently in CAL mode!

Stick command	Control surface	Notes
Aileron stick right →	Ailerons ↑	Both ailerons **move up together**
Thr stick back ↓	Flaps down ↓	The stick response is stepped in 25% increments
V-tail only Ele stick forward ↑	Vee surfaces ↑	Elevator operates in **reverse** to normal
X-tail only Ele stick forward ↑	Ele up ↑	
X-tail only Rudder stick right →	Rud goes right →	

To change the direction of an output:

1. Go to the *direction* field
2. Press {enter}, and immediately {return}

```
OUTPUTS   1500us  Direction       7/14
CH1 RtAil    0.0 -150.0- 150.0 ←  RtA 1500▵
CH2 LtAil    0.0 -150.0- 150.0 →  LtA 1500▵
CH3 RtFlap   0.0 -150.0- 150.0 ◄  RtF 1500▵
CH4 LtFlap   0.0 -150.0- 150.0 →  LtF 1500▵
CH5 Elev     0.0 -150.0- 150.0 →  Ele 1500▵
CH6 Rudd     0.0 -150.0- 150.0 →  Rud 1500▵
CH7         0.0 -100.0- 100.0 →  --- 1500▵
```

Do a final check:

1. Exit CAL mode, enter NORMAL mode.
2. Check for correct direction of aileron, elevator and rudder.

Note: The flaps will not function yet!!

4.2 ADJUST SERVO END POINTS AND CENTRES

Next, set the operating limits and centres of the servos. At the same time, you will compensate for linkage differences between the left and right sides.

Note:

- All adjustments are made in CAL mode.
- Servo end points should be set to the maximum possible, subject to equal control surface travel movement on left and right sides.
- Adjustments are made using curves. **Do not alter Min, Max or Subtrim!**

Note: Transmitters with small mono screens (TX12, X-Lite, X9 Lite etc.) do not have a GLOBALVARS menu. Instead, GVARs are accessed through the **FLIGHT MODES** menu.

Channel	Calibration procedure
☐ CH 4 – Lt Flap	Start with the left flap (it will be used as the reference when calibrating the right flap): 1. Enter CAL mode 2. Move flight mode switch **SFM** to middle 3. Go to **OUTPUTS** menu 4. Highlight left flap channel (default CH4) 5. Skip to curve field **LtF**, and press {long enter} to open curve editor 6. Throttle stick fully back (↓), adjust point 1 for *lower* end point. 7. Throttle stick fully forward (↑), adjust point 3 for *upper* end point. 8. Adjust point 2 so it lies on the ***straight line*** between points 1 and 3. Do not worry that the point 2 does not correspond to the airfoil centre line – that will be fixed later. Move throttle stick from one end to the other, observing step intervals. If they are grossly unequal, adjust point 2 to for better linearity.
☐ CH 3 – Rt Flap	Next, CALibrate the right flap so it precisely matches the left flap: 1. Return to **OUTPUTS** menu 2. **SFM** to middle 3. Highlight the right flap channel (default CH3) 4. Skip to curve field **RtF**, press {long enter} to open curve editor Adjust points 1 – 5 to exactly match the left flap: 5. Stick fully back, adjust point 1 6. Stick ½-back, adjust point 2 7. Stick to centre, adjust point 3 8. Stick to ½-forward, adjust point 4 9. Stick fully forward, adjust point 5 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.
Flap offset	Next, CALibrate the flap offset. This must also be done in CAL mode. 1. Return to **OUTPUTS** menu 2. Page to **GLOBALVARS** menu. 3. **SFM** down – listen for 'calibrate flap neutral' 4. Go to cell GV5:Fnu→FM0 5. Adjust offset so that flaps follow the neutral profile If flaps are not in line, redo the calibration of the right flap (see previous step), paying attention to the two points either side of the neutral position.
V-Tail CH 5: RtVee CH 6: LtVee	Next, CALibrate V-tail (V-tail version only) 1. Return to **OUTPUTS** menu 2. Highlight right Vee channel (default CH5) 3. Skip to curve field **ERv**, press {long ENTER} to open curve editor 4. Ele stick to centre, adjust point 2 for correct neutral 5. Ele stick forward (↑), set point 3 to upper limit 6. Ele stick back (↓), set point 1 to *lower* limit. Repeat for left Vee channel (CH6) and curve **RLv** Check equal travel up/down; left and right surfaces match

Channel	Calibration procedure
X-tail CH 5 – Ele	CALibrate elevator (X-tail version only). **IMPORTANT: in** CAL **mode, the elevator moves in reverse to normal.** 1. Go to the **OUTPUTS** menu 2. Highlight the Ele channel (default CH5) 3. Skip to curve field **Ele**, press {long enter} to open curve editor 4. With Ele stick at centre, adjust point 2 so elevator is central 5. Move Ele stick forward (↑), then adjust point 3 for *upper* limit 6. Move Ele stick back (↓), then adjust point 1 for *lower* limit 7. Check elevator travel is equal up & down, reduce one or other side as necessary.
X-tail CH 6 – Rudder	CALibrate the rudder (X-tail version only) 1. Return to the **OUTPUTS** menu 2. Highlight the rudder channel (default CH6) 3. Skip to curve field **Rud**, press {long enter } to open curve editor 4. With stick in centre, adjust point 2 so rudder is central 5. Move Rudder stick right (→), then set point 3 for max right movement 6. Move Rudder stick left (←), then set point 1 for max left movement 7. Check equal travel left/right, reduce one or other side if necessary.

☐ CH 1 – Rt Ail
☐ CH 2 – Lt Ail
	Finally, CALibrate ailerons:
	IMPORTANT: in CAL **mode, the ailerons move together.**
	1. Return to the **OUTPUTS** menu
	2. **SFM** down – listen for 'calibrate flap neutral'.
	3. Highlight CH1:RtAil
	4. Skip to curve field **RtA**, then press {LONG ENTER } to open curve editor
	5. With aileron stick centred, adjust point 2 for correct centre.
	6. Move aileron stick right →, then set point 3 to desired upper limit. Allow enough movement for simultaneous crow and aileron inputs.
	7. Move aileron stick left (←), then set point 1 so that down-travel = up-travel. If you cannot get sufficient down movement due to geometry, then
	   1. Move **SFM** up (↑) – this reduces aileron movement by 50%. *Note:* this reduced rate applies *only in CAL mode*!
	   2. Now try again: Move aileron stick left (←) and adjust point 1 so down-travel = (reduced) up-travel. Full rate will be restored when you exit CAL; don't worry if down-travel is excessive – later adjustments in the **INPUTS** menu, and to aileron diff, will reduce the movement.
	
	Repeat all steps for left aileron (CH2)
	Check for equal up/down movement, and that left and right ailerons match.

Check operation:
1. Exit CAL mode
2. Move the sticks, checking that aileron, elevator and rudder control surfaces move in the correct sense.
   Note that the flaps will not function yet (they will be configured in the next section).
3. The travel will be excessive – don't worry, it'll be dialled down in the next section.

5 CONFIGURING TRAVEL AND MIXERS

In the final section, you'll set the control travel ('rates') and mixers. Watch your model come to life!

5.1 AILERON, ELEVATOR AND RUDDER TRAVEL (INPUTS MENU)

Following calibration, the travel of the control surfaces may be excessive. In this section, you'll reduce the input rates to achieve the required travel.

1. Enter NORMAL mode
2. Open the **INPUTS** menu
3. Highlight [I]Ail, [I]Ele or [I]Rud as required
4. Press {LONG ENTER} and choose Edit
5. Skip to the *weight* field.
6. Adjust weight for required travel. When adjusting ailerons, consider upward travel only (downward travel will be adjusted in the next section.
7. To add expo, skip to *Curve* field, choose 'Expo' as the curve type. Set required value. *Do not set diff here!*

5.2 AILERON DIFF (RUDDER TRIM)

Aileron differential reduces the downward travel of the ailerons in response to roll commands. Diff is adjusted using the rudder trim. Diff varies from 70% to 0% as the trim is moved from left to right, in other words the downward travel increases as the trim is moved to the right - think of it as a roll rate control!

Diff settings are stored independently for each flight mode - *make sure to set diff for all flight modes!*

5.3 CROW BRAKE TRAVEL (GV: ACM, FCM)

Set the brake=>aileron and brake=>flap travel as follows:

1. Open **GLOBALVARS** menu
2. Enable LANDING mode
3. Move throttle stick back (full brake)
4. Go to row 'FCm', column FM2:Landing
5. Adjust value for required down flap movement
6. Go to 'ACm', column FM2:Landing
7. Adjust value for required up aileron movement

5.4 AILERON=>FLAP MIX (GV:A2F)

This mix increases the roll rate by moving the flaps as ailerons. Adjust per flight mode as follows:

1. Open **GLOBALVARS** menu, go to row 'A2F'
2. Activate flight mode to be adjusted - the column is highlighted
3. Adjust value in highlighted column

5.5 CAMBER/REFLEX PRESETS (GV:ACM, FCM)

Camber and reflex are adjustable in CLIMB and REFLEX modes. Ailerons and flaps are configured separately as follows:

1. Open **GLOBALVARS** menu
2. Go to row 'ACm' (for ailerons)
3. Activate the flight mode to be adjusted (CLIMB or REFLEX). When adjusting in Climb mode, rotate the camber control (**Cmb**) to maximum.
   Note: if the camber control works the wrong way, see section 3.3 on how to reverse
4. Adjust value in highlighted column.
5. Repeat for row 'FCm' (for flaps)

5.6 AIL=>RUDDER (GV:A2R)

This mix can help the model during the turn. Adjust per flight mode as follows:

1. Open **GLOBALVARS** menu, go to row 'A2R'
2. Activate flight mode to be adjusted - the column is highlighted
3. Adjust value in highlighted column

5.7 SNAPFLAP (CH13→SNAP, CH14→SNAP)

Snapflap consists of two mixers: Ele=>flap and Ele=>aileron. Snapflap is active in NORMAL, REFLEX, and PUMP modes. The amount is independently adjustable in each flight mode, using the throttle trim.

First, set the snapflap limits for flaps and ailerons. These apply across all flight modes

1. Activate NORMAL mode
2. Move throttle trim fully back (maximum snapflap)
3. Open **MIXERS** menu, go to CH14
4. Select the 'Snap' line
5. Press {long ENTER} to open mixer editor and highlight *weight* field.
6. Hold full up elevator
7. Adjust *weight* to set the limit of snapflap adjustment.
8. For the ailerons: repeat steps 3-7 but using CH13.

Finally, set the snapflap for each flight mode:

9. Enter NORMAL mode, adjust throttle trim
10. Repeat step (9) in REFLEX and PUMP (if enabled).

Snapflap expo can be adjusted with adjuster **SnE**. To reverse or disable the adjuster, see section 3.3. If **SnE** is disabled, expo is zero.

6 FLYING NOTES

6.1 ADJUSTING CROW COMPENSATION

New in version 6 is a simple way of adjusting crow compensation, using the regular elevator trim.
The procedure as follows:

1. Enter NORMAL mode
2. Adjust trim as normal, using the elevator trim.
3. Enter LANDING mode and deploy 75% - 100% brake
4. Adjust compensation, *also using the elevator trim*.
    *   Trim fully back = zero compensation
    *   Trim fully forward = max compensation (80% down elevator)

    Note: when the trim is fully back, you'll hear 'trim centre' in addition to 'minimum trim reached'. This is due to a quirk in OpenTX and is not a cause for worry.

Technical note**:**

*   In Landing mode, (a) the 'base' trim is obtained from NORMAL mode, and (b) the elevator trim is repurposed to adjust the crow compensation mix.

Crow compensation curve.

The compensation curve is defined in CV11:CrC. The default is a typical 'S' shape which should provide good results on most F3/5X models. If necessary, edit the intermediate points only (do not alter the end points).

7 CUSTOMISING YOUR SETUP

This section describes how to customise your setup. You can customise at any time without breaking the setup.

7.1 ADDING RATES

Rates are managed in the **INPUTS** menu. To add a new rate:

1. Go the **INPUTS** menu.
2. Highlight the last line in the Ail, Ele or Rud group.
3. Press {long Enter}, choose 'Insert Before'
4. Create a new input line.
5. Set source = Ail/Ele/Rud as appropriate
6. Set *weight* to the required rate.
7. Set *expo* as required
8. Tick applicable flight modes FM0=NORMAL, FM2=LANDING, FM3=REFLEX, (FM4 not used), FM5=PUMP, FM6=CLIMB.

The example below shows add a high rudder rate (95%) for Pump mode (FM5):
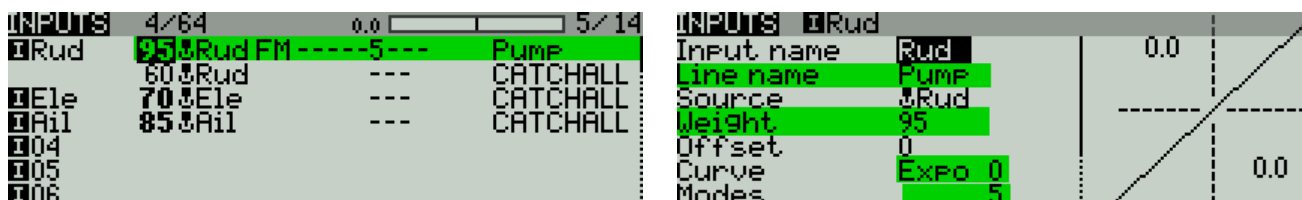
Alternatively, you can specify a switch to select rates directly rather than by flight mode.

Safey note: the last (or only) line should be a 'catchall', that is to say with all flight modes checked, and switch = '---'. This provides a fallback in case none of the previous lines is selected, perhaps due to a data entry error. (If no line is selected, the input will be inactive!)

7.2 CONFIGURING 'AUTOCROW'

Autocrow allows you to activate LANDING mode by pulling on the Crow stick instead of via a switch. Many pilots prefer this style. When the Autocrow option is enabled, the following changes take place:

- LANDING mode is activated by pulling the crow stick
- REFLEX mode is assigned to **SFM↑**
- The previous reflex switch **NoR** becomes free for re-use.

Autocrow is enabled via the **LOGICAL SWITCHES** menu:

Option	Logical switch		Description
AUTOCROW	L02	**Disable: 99** Enable: 100	Enables or disables Autocrow

7.3 CONFIGURING PUMP MODE

PUMP mode is a special mode for 'pumping' to gain height during F3F competitions. It's disabled by default. When enabled, PUMP mode is activated as follows:

1. Enter CLIMB mode
2. Pull momentary switch **MOM**

PUMP is cancelled when another flight mode becomes active. Optionally, it can also be toggled on/off by pulling momentary switch **MOM**.

PUMP mode is configured as follows:

Option	Logical switch		Description
PUMP	L03	**Disable: 99** Enable: 100	Enables or disables PUMP flight mode for this template.
TOGGLE_PUMP	L04	**Disable: 99** Enable: 100	Allows PUMP mode to be toggled on/off using **MOM**↓.

7.4 ADJUSTING CROW STICK DEADBAND

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 CV7 ('CDb')
2. Edit the 'X' value in point 2. Decrease X to increase the deadband. Recommended value is ~85.

7.5 CONFIGURING SNAPFLAP ALERTS

To aid optimisation of snapflap, alerts can be sounded in NORMAL, REFLEX and PUMP modes.

- A short beep as snapflap starts (> 5%)
- A longer beep as snapflap approaches the maximum (>95%)

Beeps are enabled by switch **SAl**↓.

7.6 ADVANCED SNAPFLAP SCRIPT (OPTIONAL)

A Lua script *snp500.lua* is provided for advanced snapflap tuning. It's designed for competition tuning and is not necessary or recommended for sport flying. The script offers dynamic adjustment of snapflap deadband. This is in addition to volume and expo adjustments provided with the default setup. Separate instructions are provided.

Note:

- Script parameters are supplied via **SL1** and **SL2** (see section 2.2) which output to channels 24 and 25.
- EdgeTX transmitters with mono screens are not supported (as they do not support mixer scripts).

8 OTHER ITEMS

8.1 FIELD NOTES

The table below shows the adjustments you can make from the transmitter. Take a copy to the slope!

Adjustment	Adjuster	Flight modes	Notes
Aileron Diff	Rudder trim	*[all]*	Trim right = more roll response/less diff. Trim left = less roll/more diff. Range of adjustment = 0 - 70%, trim centre = 35%. Stored independently for each flight mode.
Crow compensation	Elevator trim	LANDING	Trim fully back = zero comp, trim forward to increase For non-linear response adjust points 2-4 of curve CV11:CrC

Snapflap volume	Throttle trim	NORMAL, REFLEX, PUMP	Trim fully forward = zero snapflap, trim back to increase. Stored independently for NORMAL, REFLEX and PUMP modes
Snapflap expo	**SnE**	NORMAL, REFLEX	Centre=linear. Clockwise = late, CounterCW = early
Camber	**Cmb**	CLIMB	Clockwise = more camber

8.2 FAIL SAFE AND BATTERY ALARM

Before flying with this setup for the first time, remember to:

- Set the failsafe
- Set the battery alarm threshold to suit your battery chemistry, for both transmitter and receiver.

8.3 MAKING YOUR OWN MODIFICATIONS

Before making your own modifications, please study the Excel documentation and make sure you understand the impact of any changes. 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.

8.4 IDENTIFYING ERRORS

Companion offers a useful 'Compare files' tool for tracking down errors. If you suspect an error:
1. Start Companion
2. Open the original unedited file
3. Open your working file
4. Click on **FILE->COMPARE FILES** to open the Compare window, then drag the corresponding models into it.

8.5 DISCLAIMER

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 will not be responsible for the consequences of any bugs in the setup or documentation or as the result of changes in OpenTx.

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

If in doubt, don't fly!!

If you find any errors in this document, or have any queries, please contact me at http://rc-soar.com/email.htm.

Safe flying!

- Mike Shellim