F3J/TD

Template for OpenTX transmitters

Version 3.1

Setup Guide

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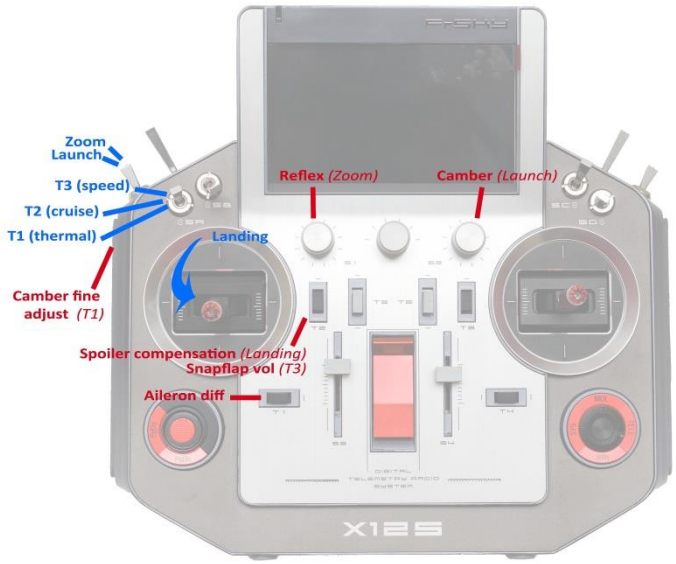

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1 Introduction

F3J/TD is a full-feature template for thermal soaring sailplanes. It offers a super quick route to a competition-ready setup, without the need for advanced programming skills.

An integrated calibration mode ensures precise tracking of surfaces. Key mixes are adjustable in flight.

Before starting, please look at the Support page for any known issues which may affect your setup.

1.1 ZIP file contents

The following files are provided:

Filename	Description
F3j _31_userguide.pdf	this document
F3j _31_reference.xls	settings reference
F3j _31x.eepe *or*.otx	EEPROM image, contains versions: 'X' for cross- and T-tail, 'V' for V-tail
F3j*.wav	Sound files

1.2 Requirements

- Any OpenTX transmitter with side slider and two pots (FrSky X9D, X9DP X9E, X10, X10S, X12S, RadioMaster TX16S etc.)
- OpenTx 2.1 or higher (see change log for recommended versions)

Additional requirements:

- USB cable for connecting the transmitter to PC
- OpenTx Companion, for transferring models between tx and computer

Some familiarity with menu navigation and data entry is assumed.

1.3 Nomenclature

The term 'spoiler' (popular in the UK) is the same as 'crow brake'
The term 'Combi' means aileron-to-rudder mixing.
KAPOW is a flight mode for 'nailing the spot' in TD competitions (after Bob McGowan).

1.4 Features overview

Flight mode/mixer matrix
Mix adjusters in **bold**
p = preset during configuration

	Spoiler (crow)	Spoiler comp	Snapflap	Camber/ reflex	Diff	Ail>Flap	Combi	Rev Diff
Launch				**S2**	**Rud trim**	*p*	*p*	
Zoom				**S1**	**Rud trim**	*p*	*p*	
T1-thermal				**LS**	**Rud trim**	*p*	*p*	
T2-cruise					**Rud trim**	*p*	*p*	
T3-speed			**Thr trim**	*p*	**Rud trim**	*p*	*p*	
Landing	*P*	**Thr trim**			**Rud trim**	*p*	*p*	*p*
Kapow				*p*	**Rud trim**	*p*	*p*	

Trims

- Aileron trim is shared across all flight modes
- Elevator trim is individual per flight mode
- Rudder and throttle trims are repurposed for other functions (see below)

Camber/reflex mixes

- Camber/ reflex may be defined for LAUNCH, ZOOM, T1-THERMAL, T3-SPEED and KAPOW flight modes:
- Camber for T1-THERMAL is adjustable via LS
- Camber for LAUNCH is adjustable using S2 (F2 on X9E)
- Reflex for ZOOM is adjustable via S1 (F1 on X9E)
- Reflex for T3-SPEED is preset during configuration
- Reflex for KAPOW is preset during configuration

Spoiler compensation (spoiler to elevator mix)

- Spoiler compensation is used to counteract pitch changes when deploying spoiler.
- The amount of spoiler compensation can be adjusted during flight via the throttle trim.
- Non-linear compensation can be defined by editing a curve.

Differential

- Diff is applied to ailerons and flaps
- Diff is adjustable in-flight via rudder trim.
- Diff is stored individually for each flight mode.

Roll rate enhancement

- Aileron diff is automatically suppressed as spoiler is deployed.
- Optional 'reverse diff' increases down-aileron movement, when spoiler is deployed.

Combi (aileron to rudder)

- Mixes aileron to rudder.
- Preset per flight mode.

Snapflap

- Snapflap (i.e. elevator to flap mixing) can optionally be set for T3-SPEED mode.
- Snapflap may be adjusted in flight using the throttle trim

KAPOW mode (optional, disabled by default)

- Special flight mode for TD competitions to aid spot landing
- Activated by pushing 95% down on elevator stick
- Applies reflex to ailerons and flaps
- May be activated from any mode except ZOOM and LAUNCH.

2 Assignments and flight modes

2.1 Control assignments

Flight controls are assigned according to **MODEL SETUP → STICK MODE**.
Secondary controls are assigned as follows:

Control	Function	Flight mode
Rudder trim	Aileron diff adjust (per flight mode)	*all*
Throttle trim	Spoiler compensation adjust Snapflap volume adjust	LANDING T3-SPEED
LS	Thermal camber	T1-THERMAL
S1 (X9D, Horus) or F1 (X9E)	Zoom reflex adjust	ZOOM
S2 (X9D/Horus) or F2 (X9E)	Launch camber adjust	LAUNCH

2.2 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	[free]	
8	[free]	
9	[free]	

'Left' and 'right' are from the point of view of an observer looking forwards.
The left and right channels are not interchangeable, so please double-check your connections.

2.3 Flight modes and priorities

Seven flight modes are provided.
Two are for the launch phase: LAUNCH, ZOOM
Three are for normal flight: T1-THERMAL, T2-CRUISE, T3-SPEED
Two for landing: LANDING, KAPOW.
LAUNCH and ZOOM modes take precedence, then KAPOW and LANDING and finally T1, T2 & T3.

Flight Mode	OpenTx ID	Activation		Priority
LAUNCH	FM2	SE↓		V. High
ZOOM	FM3	SE –		V. High
KAPOW[1]	FM4	SE↑ + *elev fully forward*		High
LANDING	FM5	SE↑ + *spoiler applied*		Mid
T1-THERMAL	FM6	SA↓	SE↑ + *spoiler off*	Low
T2-CRUISE	FM0	SA -		Low
T3-SPEED	FM7	SA↑		Low

[1]KAPOW is disabled by default.

2.4 '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 directly to the outputs. This allows max/min and centre reference values to be applied to each servo.

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.

Note: In CAL mode, the response of the flaps is stepped. This is to aid calibration of a 5-point curve.

New in v3: There are three cal sub-modes, activated via switch SA:

- SA—: calibrate servo end points
- SA↓: calibrate flap neutral (new)
- SA↑: calibrate ailerons which have reduced down-travel (new)

3 Configuring your setup

Configuration is accomplished in three phases:

- **Preparation** - install template and calibrate sticks
- **Servo calibration** – define operating envelope of control surfaces
- **Setting travel and mixers** – set rates and mixers

Adjustments should be made in sequence shown. Use the tick boxes to record progress.

☠ Ensure that the motor is disconnected before proceeding.

3.1 Preparation

3.1.1 Transfer files to transmitter

In this step you'll upload the setup to your transmitter's EEPROM, using Companion.

Establish communication with your PC

- □ First, extract all files from .ZIP package and save them to a new folder.
- □ ***X9D/E:*** Switch on the transmitter whilst pressing horizontal trim levers towards the centre
  X10/X12: Switch on the transmitter
- □ Connect the tx to the computer via USB. The transmitter's SD card should appear as an external drive.

Copy sound files

- □ Copy the sound files to the /SOUNDS/{language} folder on the SD card. For example, English folder is "/SOUNDS/en". *Note:* For the Horus, it's recommended to copy these files using a card reader.

Transfer model to transmitter

- □ Launch OpenTx Companion.
- □ Make sure the radio profile is correct for the target transmitter.
- □ Open the f3j_xx.eepe (or .otx) file. Confirm translation of data if prompted. A window will show X and V tail versions of the template.
- □ From the File menu, choose **READ MODELS AND SETTINGS FROM RADIO**. The models in your transmitter are displayed in a second window.
- □ Drag one of the ESOAR models into an empty slot in the model list.
- □ Close the f3j_xx window.
- □ In the transmitter list, right-click on new model and choose "Use as Default"
- □ From the File menu, choose **WRITE MODELS AND SETTINGS TO RADIO**.
- □ Close OpenTx Companion

3.1.2 Calibrate sticks

The sticks must be properly calibrated. Forgetting to calibrate is one of the main causes of problems!, from jumping neutrals to flight modes which cannot be activated. Calibrate as follows:

□ Go to the main screen.
□ Press {long MENU}, then {PAGE} to Calibration menu.

Remember to calibrate all sticks, knobs and sliders.

3.1.3 Re-map controls

The target for this setup is the Taranis X9D. If another supported transmitter is used, for example the X9E, X10, or X12, then check that these mixers have been translated correctly:

Channel->Mixer	Correct mixer source
CH**10**→ CmAj**T1** CH**11**→ CmAj**T1**	**LS**
CH**10**→ CmAj**La** CH**11**→ CmAj**La**	**S2** (except X9E), **F2** (X9E)
CH**10**→ CmAj**Zm** CH**11**→ CmAj**Zm**	**S1** (except X9E), **F1** (X9E)

To check and alter the mixer sources:

- ☐ Open the **MIXERS** menu
- ☐ Scroll to desired channel, and highlight the mix line
- ☐ If the source is incorrect, then
  - ☐ Press {LONG ENTER} to open the mixer editor
  - ☐ Select the correct source
    Tip: You can use the dropdown menu, or simply move the control.

3.1.4 Familiarisation

Using the transmitter on its own, get familiar with selecting the various flight modes (see §2.3). A voice alert will sound as you change modes. At the end of this step, you should be confident with the following:

- ☐ Selecting LAUNCH, ZOOM, T1-THERMAL, T2-CRUISE, T3-SPEED, LANDING and KAPOW (if enabled).
- ☐ Selecting CAL mode and sub-modes

If the sounds aren't working, check that the .wav files are in the correct location (see §3.1.1).

3.2 Calibrate the servos

In this section you'll calibrate the servos, in order to:

- Define the envelope for control surface movements
- Equalise movements on left and right sides.
- Linearise control surface responses

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

Note: correct calibration is essential for diff to work correctly, and for precise tracking of flaps with ailerons.

3.2.1 Prepare for calibration

- ☐ Switch on the transmitter (do not power up the receiver yet)
- ☐ Enter CAL mode, and set switch **SA** to middle.
- ☐ Throttle stick to centre
- ☐ Power up the receiver
- ☐ Open the **OUTPUTS** menu

3.2.2 Set servo direction

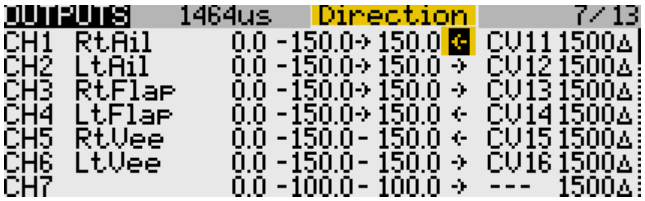
The first task is to set the direction of rotation of each servo.

☐ Set the direction of each servo according to table below. Pay attention to notes regarding aileron and elevator.

Stick command	Control surface	Notes
Aileron stick right →	RtAil goes up ↑ LtAil goes up↑	In CAL mode, **ailerons move together!!**
Thr stick forward ↑	RtFlap goes up↑ LtFlap goes up↑	Ignore any "invert throttle" message when reversing an output.
V-TAIL only: Ele stick forward ↑	RtVee goes up ↑ LtVee goes up ↑	In CAL mode, **elevator(s) operate in reverse to normal!!**
X-TAIL only: Ele stick forward ↑	Ele goes up ↑	
X-TAIL only: Rudder stick right →	Rud goes right →	

To change the direction of a servo:

1. Highlight the channel
2. Skip to the Direction field
3. Press {ENTER}, and immediately {EXIT}



Finally, check operation as follows:

☐ Exit CAL
☐ Enter T2-CRUISE mode.
☐ Check for correct direction of aileron, elevator and rudder (note: the flaps cannot be checked yet).

3.2.3 Set servo centres and travel

In this section you'll use the **OUTPUTS** menu to calibrate (a) servo centre and (b) servo end points and (c) flap neutral. Most adjustments are made in CAL mode.

The servo end points that you set are 'never exceed' limits. They work just like mechanical end stops inside the servo. Set correctly, they will protect your linkages and servos against possible damage, such as when applying simultaneous spoiler and aileron commands.

If you don't know the movements required, then set the end-points to the maximum possible, subject to the restrictions listed below.

Please note the following:

- Calibration is performed using uses curves. **Leave min/max/subtrim at -150/150/0.**
- Calibration is concerned only with the servos – control rates will be adjusted later.
- The flap response in CAL mode is stepped, this is to aid calibration of the right flap which uses a 5-point curve.

Channel	Calibration procedure
□ CH 4 – Lt Flap	Start by calibrating the left flap (CH4). The goal is (a) set the end points, and (b) linearise the response. *Note 2:* The flap neutral will be adjusted later. 1. Enter CAL mode 2. Set switch **SA** to middle position 3. In the **OUTPUTS** menu, highlight CH4 4. Skip to curve field CV14, and press {long ENTER} to open curve editor 5. Throttle stick fully back (↓), adjust point 1 for lower end point. Allow for both crow and aileron inputs. 6. Throttle stick fully forward (↑), adjust point 3 for upper end point. Allow for any aileron-to-flap mixing. 7. Adjust point 2 so it lies on the straight line thru points 1 and 3. 8. Move throttle stick from one end to the other, observing step intervals. You can fine tune point 2 to equalise intervals for best linearity.
□ CH 3 – Rt Flap	Next, calibrate the right flap (CH3). The goal is to precisely match the left flap. 1. Enter CAL mode 2. Set switch **SA** to middle position 3. In the **OUTPUTS** menu, highlight CH3 4. Skip to curve field CV13, 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 neutral	Next, set the flap neutral: 1. Enter CAL mode 2. Set switch **SA** to down position. An adjustable offset is applied to each flap. 3. Open the **GLOBAL VARIABLES** menu. 4. Highlight GV5('FlNeut') and skip to the FM0 column. 5. Adjust GV5 for correct neutral. Check that the flaps are perfectly in line at the neutral position. If not, then check calibration of the right flap (see previous step), paying particular attention to the 2 points either side of the the neutral position.
V-Tail □ CH 5 – RtVee □ CH 6 – LtVee	Calibrate V-tail surfaces: 1. Enter CAL mode 2. In the **OUTPUTS** menu, highlight CH5 3. Skip to curve field 'CV15', 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. Allow for spoiler comp. 7. Repeat for CH6/CV16, ensuring that movements match CH5. 8. Check equal travel up/down; left and right surfaces match

Channel	Calibration procedure
X-Tail ☐ CH 5 – Ele	*X-tail version only* - Calibrate elevator 1. Enter CAL mode 2. In the **OUTPUTS** menu, highlight CH5 3. Skip to curve field 'CV15', press {long ENTER} to open curve editor 4. Ele stick to centre, adjust point 2 for correct neutral 5. Ele stick forward (↑), adjust point 3 to upper limit 6. Ele stick back (↓), adjust point 1 for to lower limit 7. Check travel is equal up & down
X-Tail ☐ CH 6 – Rudder	*X- tail version only* - Calibrate rudder 1. Enter CAL mode 2. In the **OUTPUTS** menu, highlight CH6 3. Skip to curve field 'CV16', press {long ENTER} to open curve editor 4. Rudder stick to centre, adjust point 2 for centred rudder 5. Rudder right (→), set point 3 for max right movement 6. Rudder left (←), set point 1 for max left movement 7. Check equal travel left/right

☐ CH 1 – Rt Ail
CH 2 – Lt Ail
	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, highlight CH1(RtAil)
	4. Skip to curve field CV11, then press {long ENTER} to open curve editor
	5. Move aileron stick to centre. Set Point 2 for correct centre.
	6. Move aileron stick right (→). Set point 3 to desired upper limit, allowing for both crow and aileron movement.
	7. Move aileron stick left (←). Adjust point 1 so that down-travel = up-travel. If you can't get enough down movement due to geometry, then
	  1. Move **SA** 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 to input and diff will reduce it.
	8. Repeat all steps for CH2/CV12. Ensure that movements match CH1.
	9. Check: (a) same up/down rate per aileron, and (b) left and right ailerons match.

☐ Exit CAL.

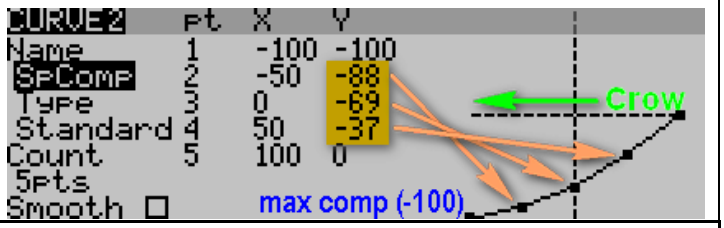
☐ Move the sticks, checking that aileron, elevator and rudder control surfaces move in the correct direction. *Note:* flaps will not respond yet.

☐ Well done, the calibration is now complete! Please **backup your EEPROM.**

3.3 Set control rates and mixers

This is where you model comes to life!

Control / mix	Adjustment point	Adjustment procedure
☐ **Aileron rate**	**INPUTS**→Ail	Set the default rate for ailerons. 1. Enter T2-CRUISE mode 2. Open the **INPUTS** menu 3. Scroll DOWN to [I]Ail 4. Press {long ENTER} and choose Edit 5. Skip to the weight field 6. Adjust weight for required *up*-aileron movement (down movement is affected by diff setting to be adjusted later) 7. If Expo is required, skip to Curve field, choose 'Expo' as the curve type, and set required value in adjacent field. *Note:* The curves for Expo and Diff are applied at the stick level. ***Do not set a value using the Diff curve type*** as it will result in asymmetric stick response. If different rates are needed for certain flight modes, then add additional input(s) ***before the CATCHALL line***. Each new input should have one or more flight mode numbers enabled, and appropriate weight and expo. Flight mode numbers as follows: FM0: T2-CRUISE FM2: LAUNCH FM3: ZOOM FM4: KAPOW FM5: LANDING FM6: T1-thermal FM7: T3-SPEED ***Safety note: The 'CATCHALL' line must have all flight modes enabled, no switch and –Important - it must be the last (or the only) line.***
☐ **Elevator rate**	**INPUTS**→Ele	As above
☐ **Rudder rate**	**INPUTS**→Rud	As above
☐ **Aileron→Flap**	**GVARS**→GV1("A2F")	Aileron to flap mixing is set per flight mode. 1. Open **GLOBALVARS** menu, highlight GV1 line ("A2F"). 2. Activate the flight mode you want to adjust. 3. Skip to highlighted column. 4. Adjust GVAR value for required aileron to flap mix. Note: movement of down-going flap will be affected by diff setting.
☐ **Aileron→Rud**	**GVARS**→GV2("A2R")	Combi (aileron to rudder mix) is set per flight mode. Open **GLOBALVARS** menu, highlight GV2 line ("A2R"). Activate flight mode to be adjusted. Skip to highlighted column. Adjust GVAR value for required aileron to rudder mix
☐ **Spoiler→ Aileron**	**GVARS**→GV3("CmAil")	Sets the upward aileron movement due to spoiler. 1. Open globalvars menu, highlight GV3 line ("CmAil"). 2. Skip to column FM5 3. Enable LANDING mode 4. Move throttle stick back (full spoiler) 5. Adjust GVAR value for required up-aileron movement
☐ **Spoiler→Flap**	**GVARS**→GV4("CmFlap")	Sets the downward flap movement due to spoiler. 1. Open **GLOBALVARS** menu, highlight GV4 line ("CmFlap"). 2. Skip to column FM5 3. Enable LANDING mode 4. Move throttle stick back (full spoiler) 5. Adjust GVAR for required down-flap movement

Control / mix	Adjustment point	Adjustment procedure
☐ **Camber presets**	**GVARS**→GV3("CmAil") **GVARS**→GV4("CmFlap")	Camber configuration is via GV3 (ailerons) and GV4 (flaps). Adjustments are made in the **GLOBALVARS** menu. The effect is different in each flight mode. Here's the procedure: For T3-SPEED (FM7) mode, adjust GV3,GV4 for preset reflex. For KAPOW (FM4), adjust GV3, GV4 for preset reflex. For T1-THERMAL (FM6) mode. Move LS to centre. Then adjust GV3 and GV4 for thermal camber. LS adjusts +/-50%. For LAUNCH (FM2), rotate S2 (F2 if X9E) to centre. Adjust GV3 and GV4 for launch camber. S2 adjusts +/-50%. For ZOOM (FM3), rotate S1 (F1 if X9E) fully clockwise. Adjust GV3, GV4 for max possible reflex. S1 adjusts 0-100%.
☐ **Reverse Differential**	**GVARS**→GV6("RDf")	Adjust travel of down-going aileron when full spoiler and aileron are applied. Use to improve roll response. To configure: 1. Open **GLOBALVARS** menu, highlight GV6/FM5 2. Enable LANDING mode 3. Apply full spoiler and full aileron 4. Adjust GVAR until lower aileron is at the desired position (usually at or slightly below aileron normal centre). NOTE: this measure for improving roll response is in addition to aileron diff suppression, which is applied automatically.
☐ **Spoiler→Ele compensation**	**GVARS**→GV7("Cmp")	Spoiler (crow) compensation is adjustable using the throttle trim during flight. To set max limit of adjustment, 1. Open **GLOBALVARS** menu, highlight GV7/FM5 2. Enable LANDING mode. 3. Move throttle stick fully back (max spoiler) 4. Move throttle trim fully forward (max comp) 5. Adjust GVAR for max possible compensation. 6. Move throttle trim back for initial flight setting Note: After initial flight tests, you can fine tune intermediate response using Curve 2 ('SpComp'). Adjust **points 2-4** only, do not alter end points. Below is example curve where compensation increases sharply on initial application of crow, then tails off: 
☐ **Snapflap**	**MIXER**→CH11('FlapCm')→Snap **MIXER**→CH10('AilCm')→Snap	Snapflap (elevator to flap mixing) can be set in T3-SPEED mode. It's set individually for flaps and ailerons. Master adjustment using throttle trim. 1. Open **MIXER** menu 2. Select CH11->Snap line, and open editing menu 3. Skip to weight field 4. Enable T3-SPEED flight mode 5. Move throttle trim fully back (max snapflap). 6. Hold full up elevator 7. Adjust weight for desired max limit of snapflap adjustment 8. Close mixer editor 9. Repeat for CH10->Snap mix. 10. Using throttle trim, adjust overall snapflap for initial flight setting.

Congratulations, you've finished setting up your model! Just one last thing….

☐ Please back up your EEPROM now!

4 Before you fly

4.1 Battery and fail safe

Before flying:

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

4.2 Field guide

Print a copy for field use:

Adjustment	Flight modes	Adjuster control	Notes
Launch camber	LAUNCH	S2 (9XD/Horus), or F2 (X9E)	Provides +/- 50% fine tuning of Launch preset
Zoom camber	ZOOM	S1 (9XD/Horus), or F1 (X9E)	Adjusts reflex 0 – 100%
Thermal camber	T1-THERMAL	LS	Provides +/- 50% fine tuning of T1-thermal preset
Snapflap volume	T3-SPEED	Throttle trim	Trim forward=zero snap, trim back = max snapflap
Spoiler comp	LANDING	Throttle trim	Trim back=zero comp, trim forward =max comp
Aileron Diff	*[all]*	Rudder trim	Diff saved individually for each flight mode. Range is 0 - 80%
Aileron trim	*[all]*	Aileron trim	Shared by all flight modes
Elevator trim	*[all]*	Elevator trim	Saved individually per flight mode

5 Simple modifications

5.1 Zoom/Launch camber adjusters

By default, S1 and S2 are used to adjust ZOOM and LAUNCH presets. You can use different controls as follows:

Target	Menu points	Default	Set to
LAUNCH camber adjuster	**MIXERS**→CH10→CmAjLa **MIXERS**→CH11→CmAjLa	S2	Spare pot, slider, throttle trim TrmT, or (Horus) auxiliary trimmer
ZOOM camber adjuster	**MIXERS**→CH10→CmAjZm **MIXERS**→CH11→CmAjZm	S1	Spare pot, slider, throttle trim TrmT, or (Horus) auxiliary trimmer

To reverse the direction of the LAUNCH or ZOOM adjuster, reverse the sign in the relevant mixer *weight*

5.2 Main flight mode switch

By default, THERMAL, SPEED and CRUISE modes are selected via switch SA, however you can assign a different 3-position switch as follows:

Menu point	Default	Set to
FLIGHTMODES→thermal (FM6)	SA↓	***3-pos* sw** (↑↓ or -)
FLIGHTMODES→speed (FM7)	SA↑	***3-pos sw*** (↑↓ or -)

Note: The third (unassigned) switch position selects CRUISE mode.

5.3 Launch/zoom switch

By default, LAUNCH and ZOOM modes are selected via switch SE. You can assign a different 3-position switch. In the third (unassigned) position, the main flight mode switch will be active (§5.2).

Menu point	Default	Setting
FLIGHTMODES→Launch (FM2)	SE↓	***3-pos sw***(↑↓ or -)
FLIGHTMODES→Speed (FM3)	SE-	***3-pos sw*** (↑↓ or -)

5.4 Changing cal sub-mode switch

By default, the CAL sub-modes are selected via switch SA. You can use a different switch by altering three logical switches as shown below. The same 3-position switch should be used for all sub modes.

Menu point	Setting	Default
LOGICAL SWITCH→L7→2nd parameter	***3-pos sw*** ↑	SA↑
LOGICAL SWITCH→L8→2nd parameter	***3-pos sw*** -	SA-
LOGICAL SWITCH→L9→2nd parameter	***3-pos sw*** ↓	SA↓

5.5 Adjusting throttle stick deadband

The spoiler stick incorporates some deadband. This helps avoid accidental deployment. The amount of deadband can be adjusted via Curve 4 ('T2S'). Alter the X-value of the middle point to taste. Max recommended value is 95%.

5.6 Reversing spoiler operation

By default, spoiler is off when throttle is fully forward. To reverse the direction of operation:

1. Open the **MIXERS** menu
2. Skip to CH23.
3. Open the mixer editor
4. The curve designation will be displayed as 'CV4' or 'T2S' depending on the version of OpenTx. Choose the same curve but with a leading exclamation mark ('!'), for example '!CV4'.

5.7 Reversing camber adjuster

LS is the default control for camber adjustment in THERMAL mode. To alter the direction of operation,

1. Open the **MIXERS** menu
2. Skip to CH10→CmAjT1
3. Open the mixer editor, and set weight = –50, then close mixer editor
4. Repeat steps 5 and 6 for CH11→CmAjT1

5.8 KAPOW flight mode

KAPOW mode is disabled by default. To enable/disable KAPOW:

1. Open the Flight Modes menu
2. Highlight the KAPOW flight mode line
3. To enable: set the switch to 'L10'

To disable: set the switch to '--- (default)

To activate KAPOW, push fully forward on the elevator stick from any flight mode except LAUNCH and ZOOM. By default, KAPOW will trigger at 95% forward stick. The threshold can be altered in logical switch L10.

Whilst in Kapow mode, the elevator will continue to respond to elevator stick commands for the remaining travel. The elevator offset can be adjusted using the elevator trim (make sure you're in KAPOW mode whilst making the adjustment).

Note: In previous versions of this template, KAPOW could be activated only from LANDING mode. The old behaviour is deprecated, however it can be restored as follows:

1. Open the **LOGICAL SWITCHES** menu
2. Highlight L10.
3. In the AND field, change '---' to 'L6 '

5.9 Zoom flight mode

The ZOOM flight mode is for the second phase of the tow especially for F3J competitions. It's enabled by default.
To enable/disable ZOOM mode:

1. Open the **FLIGHT MODES** menu
2. Highlight the ZOOM flight mode line
3. To enable, set switch to 'SE–' (default)
   To disable, set switch to '---'

6 Tips on servo calibration

Before each flying session, do a quick servo CAL. This will identify any issues due to bad servo centring or bent linkages which much otherwise remain undetected. On exiting CAL mode, all your trims will be restored.

OpenTx has a feature which allows you to transfer your trim settings to the subtrims. It's strongly recommended not to use this, as it's not necessary and will trash your CAL settings.

7 Identifying mistakes

There is no 'Undo' button in OpenTx. Fortunately, it's easy to identify mistakes, using the Compare Files feature in Companion. Follow these steps:

1. Start Companion
2. Open the (unedited) .eepe file
3. Open your working EEPROM
4. From the **FILES** menu, select **COMPARE FILES**, then drag the corresponding models into the window.

Any errors should be easy to spot.

8 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.

9 Safety/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 will not be responsible for any consequences arising from errors in the .EEPE file or documentation. Always test your setup before the first flight, and after any modifications.

If in doubt, don't fly!

10 Contact

If you have any queries or suggestions, or if you find any errors in the documentation please contact me at http://rc-soar.com/email.htm.
Happy flying!

Mike Shellim