

DLG 6S

OpenTX template for six-servo DLG's

Version 2.1

Setup Guide

Mike Shellim
17 Nov 2024



CONTENTS

1	Introduction	2
1.1	Description	2
1.2	Package contents.....	2
1.3	Requirements	2
2	Overview	3
2.1	Stick and control assignments	3
2.2	Switch assignments (<i>new in 2.4</i>)	3
2.3	Flight modes	3
2.4	Servo assignments	3
2.5	Mixer table	4
2.6	Flight timer	4
2.7	CAL mode	4
2.8	Basic operation.....	4
2.9	The flight sequence	5
3	Preparing the transmitter	5
3.1	Transfer template to transmitter	5
3.2	Hardware calibration	6
3.3	Assign switches (<i>new in 2.4</i>).....	6
3.4	Familiarisation	6
3.5	Telemetry	6
4	Calibrating the outputs / servos	7
4.1	Set servo rotation.....	7
4.2	Adjust servo end points and centres	8
5	Configuring travel and mixers.....	11
5.1	Aileron, elevator and rudder travel (Inputs menu)	11
5.2	Aileron diff (rudder trim).....	11
5.3	Rudder launch offset (gv: Rud).....	11
5.4	Crow brake travel (gv: CmA, CmF).....	11
5.5	Aileron=>flap mix (gv:A2F)	12
5.6	Camber/Reflex presets (gv:CmA, CmF)	12
5.7	Ail=>Rudder (gv:A2R)	12
5.8	Snapflap (gv:SnA, gv:SnF)	12
5.9	Reverse Diff (ch19→Ail)	12
6	Using crow brakes.....	13
6.1	Adjusting pitch trim with brakes ('brake compensation').....	13
6.2	Zoom Safe Exit.....	13
7	Customising your setup.....	13
7.1	Hiding Thermal 2	13
7.2	Adding rates	13
7.3	Reversing the throttle/brake stick.....	14
7.4	Launch height announcement.....	14
7.5	Setting the range of diff.....	14
7.6	Adjusting brake stick deadband	14
7.7	Making your own modifications.....	15
8	Disclaimer.....	15

1 INTRODUCTION

1.1 DESCRIPTION

DLG6S is a full feature template for six-servo DLGs with ailerons and flaps (Yoda etc.). It features several features to help you get the best out of your model. Yet it is quick to set up, and fully customisable.

Specification:

APPLICATION

- For DLG gliders with flaps and ailerons
- Any stick mode

LAUNCH HEIGHT CALLOUT

- Optional launch height callout (using ALT telemetry)

7 FLIGHT MODES

- Launch followed by Zoom
- Thermal1, Thermal2, Cruise, Speed
- Landing
- Voice confirmation

TRIM ADJUSTERS

- for aileron diff (per FM)
- for brake compensation

CAMBER CONTROL

- Camber presets, per flight mode.
- Snapflap, per flight mode.

CONTROL SURFACE CALIBRATION

- Special 'CAL' mode for quick calibration
- 5-point balancing curve for flaps

CROW BRAKE FEATURES

- In flight compensation adjustment
- Auto diff suppression
- Reverse diff
- Zoom safe exit

MISC

- Assignable controls and switches
- Integrated flight timer
- Aileron to rudder mix
- Channels 7,8,9 free for other functions

Now begin your journey to a great DLG setup! But first, here are the golden rules for success:

- **READ THROUGH THESE INSTRUCTIONS ONCE BEFORE STARTING**
- **FOLLOW THE INSTRUCTIONS IN SEQUENCE**
- **VISIT THE [SUPPORT PAGE](#) FOR KNOWN ISSUES AND FIXES**

1.2 PACKAGE CONTENTS

Filename	Description
DLG6S_21_SetupGuide.pdf	This document
DLG6S_21_SettingsRef.xls	Settings reference
DLG6S_21*.otx	Model settings
DLG***.wav	Sound files

V2 has extra sound files, *please copy all files if upgrading from v1.*

1.3 REQUIREMENTS

The following are required:

- Transmitter with OpenTX or EdgeTX. Please see [version history](#) for minimum versions.
- A momentary switch on the correct side, for launching
- OpenTx Companion software + USB cable.

2 OVERVIEW

2.1 STICK AND TRIM ASSIGNMENTS

Any stick mode may be used. The stick mode is set in the **RADIO SETUP** → **MODE** menu.

Stick and trim assignments as follows:

Control	Function
Throttle stick	Brakes/landing mode
Rudder trim	Aileron diff adjustment

2.2 SWITCH ASSIGNMENTS (*NEW IN 2.4*)

Switch assignments are 'soft' to cater for different transmitters. The actual physical switches will be assigned later (see section 3.3).

Switch name	Type	Function	Notes
SwMom	Momentary	Launch mode	See section 3.3 for assignment to physical switches
Sw3P	3-pos	Speed/Cruise/Thermal	
SwTherm2	2-or 3pos	Thermal 1 / 2 selector	

From this point on, switches will be identified by **switch name** from the table above.

2.3 FLIGHT MODES

There are 7 flight modes: Launch, Zoom, Landing, Thermal1, Thermal2, Cruise and Speed.

Launch and Zoom have highest priority. Landing has priority over Thermal, Cruise and Speed.

Flight Mode	ID	Activation switches	Priority
Launch	FM2	SwMom↓	High
Zoom	FM3	Follows Launch mode. Elevator up or down to exit	High
Landing	FM4	Throttle stick ↓ (activates brakes)	Mid
Cruise	FM0	Sw3P —	Low
Speed	FM5	Sw3P ↑	Low
Thermal 2	FM6	Sw3P ↓ and SwTherm2↓	Low
Thermal 1	FM7	Sw3P ↓ and SwTherm2↑	Low

2.4 SERVO ASSIGNMENTS

Channel	Function
1	Right aileron
2	Left aileron
3	Right flap
4	Left flap

Channel	Function
5	Elevator
6	Rudder

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.

2.5 MIXER TABLE

The table below shows the mixers in each flight mode. Mix adjusters are in brackets.

Flight mode	Diff	Ail=> Rud	Brakes	Brake Comp	Rudder offset	Camber/ Reflex	Snapflap
Launch	✓(RudTrm)	✓			✓	✓	✓
Zoom	✓(RudTrm)	✓				✓	✓
Landing	✓(RudTrm)	✓	✓	✓(Ele trim)			✓
Thermal1/2	✓(RudTrm)	✓				✓	✓
Speed	✓(RudTrm)	✓				✓	✓
Cruise	✓(RudTrm)	✓				✓	✓

2.6 FLIGHT TIMER

Timer1 is the flight timer.

- *To reset and start:* release Launch switch
- *To stop:* pull and hold Launch switch

2.7 CAL MODE

CAL mode is a special flight mode for calibrating the outputs. When CAL mode is active, stick values are passed directly to the outputs, bypassing mixers and trims. This allows servo end points and centres to be visualised during calibration. To activate CAL mode:

1. Apply full left aileron and full up elevator, and hold.
2. Pull and release momentary switch (SwMom)
3. Release sticks.
4. Select the appropriate submode using the 3-position flight mode switch (Sw3P).

CAL sub mode	Switch	Description
'Calibration'	Sw3P ↑ or —	for calibrating end points and centres. <i>The ailerons move in 25% increments to aid calibration.</i>
'Calibrate flap neutral'	Sw3P ↓	for calibrating the neutral offset

To exit CAL mode, pull the momentary switch again.

Note: when entering CAL mode, Launch mode is activated briefly.

2.8 BASIC OPERATION

Trims

- Aileron trim is shared across all flight modes.
- Elevator trim is independent in each flight mode (but see section 6 for Landing mode).
- Rudder trim is repurposed to adjust differential.

Launch offsets

- The rudder offset is adjusted via a GVAR.
- The elevator launch offset is adjusted using the regular elevator trim.

Aileron differential

- Aileron diff is adjustable per flight mode, via the rudder trim.

Camber control

- Camber/reflex presets are configured individually for Launch, Zoom, Cruise, Thermal1/2 and Speed modes.

Brake compensation (brake=>elevator mix)

- Counteracts pitching due to deployment of brakes.
- The amount of compensation can be adjusted during flight, via the elevator trim.
- The compensation with partial brake can be tuned by editing the compensation curve.

Roll rate enhancement

- Aileron diff is suppressed as brakes are applied, for greater roll authority.
- The downgoing movement can be further increased via a 'reverse diff' setting

Aileron=>rudder mix

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

Snapflap

- Snapflap (elevator=>flaps, ailerons) can be set independently for each flight mode.

2.9 THE FLIGHT SEQUENCE

The flight sequence is as follows:

1. Rotate the model whilst pulling the launch switch. Model enters Launch mode.
2. As the model leaves the hand, release the launch switch. Model enters Zoom mode.
3. Near the top of the climb, **push forward on the elevator stick**. Model exits Zoom mode.
4. Once out of Zoom mode, the flight mode is determined by FM switch (Sw3P) and throttle stick.

3 PREPARING THE TRANSMITTER

3.1 TRANSFER TEMPLATE TO TRANSMITTER

Start by transferring the template to your transmitter.

Establish a USB connection

- Enter Bootloader mode (the exact method will depend on your transmitter) and connect to PC via USB.

Copy sound files

- Copy the supplied sound (.wav) files to the */SOUNDS/{language}* folder on the SD card. For example, the English folder is */SOUNDS/en*.

Transfer template to transmitter

The following procedure will preserve your existing models and radio settings.

1. Start Companion, using a profile for your transmitter
2. Open supplied file *DLG6S_21.otx*.
3. If using a transmitter other than the X9D, you may receive warnings that certain switches are not available. You can ignore these errors for now, as they will be dealt with in section 3.3.
4. From the File menu, choose *Read Models and Settings From Radio*. The models from the radio are displayed in a second window.
5. Drag the *DLG6S_21* model into an empty slot in the model list.
6. Close the *DLG6S_21.otx* window.
7. From the File menu, choose *Write Models and Settings To Radio*.
8. Close OpenTx Companion

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** menu and page to *Hardware -> Calibration*
2. Calibrate all sticks, knobs and sliders.

3.3 ASSIGN SWITCHES (NEW IN 2.4)

Switches **SwMom**, **Sw3P** and **SwTherm2** are 'soft' to cater for different transmitters. The table below (a) describes each switch type and function, and (b) suggests the physical switches to assign for various transmitters. If your transmitter is not shown, please determine suitable switches on your transmitter before proceeding.

Here's how to check and alter the switches:

1. Open the **INPUTS** menu
2. Scroll down to inputs 'SMm', 'SFm', 'ST2'
3. For each input, check (a) the source is a switch, and (b) the switch is of the correct type as in the table below.
To change the switch:
 1. press {long Enter} to open the input editor
 2. change *Source* as required. Do not alter any other fields.

Switch name	Input source to edit	Switch type	Function	Recommended physical switch			
				X9D	Zorro	Pocket	Your tx
SwMom	SMm	Momentary	Launch and CAL modes	SH	SA	SE	?
Sw3P	SFm	3-position	(a) Flight modes (b) CAL submodes	SA	SB	SB	?
SwTherm2	ST2	2- or 3-pos	Thermal 1 / Thermal2	SF	SE	SA	?

3.4 FAMILIARISATION

Using the transmitter on its own, practise the following:

- Activate Launch, Zoom, Thermal1, Thermal2, Cruise, Speed and Landing modes (see Section 2.3).
TIP: start with the throttle stick pushed fully forward.
- Activate CAL mode and sub-modes (see Section 2.7)
- Start/stop/reset integrated flight timer (see Section 2.6)
- Verify that the sounds are working correctly. If not, check that the sound files are in the correct location.

3.5 TELEMETRY

Check that your transmitter is receiving telemetry (if supported by the protocol and hardware). If you encounter problems, try rediscovering your sensors as follows:

1. Open the **TELEMETRY** menu
2. Choose 'Delete all sensors' then 'Discover sensors'

RSSI low/critical warning thresholds are set to 45/42. If using the FrSky ACCESS protocol, change to 35/32 (FrSky recommendation).

4 CALIBRATING THE OUTPUTS / SERVOS

In this section you will calibrate the outputs. This involves setting the rotation and operating range of the servos and equalising travels.

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. Move the throttle stick to the centre position.
3. Enter CAL mode
4. Move switch **Sw3P** to centre position
5. Switch on the receiver
6. Open the **OUTPUTS** menu
7. Set the servo rotations according to table below. **Please pay attention to the notes for elevator and ailerons!**

Stick command	Control surface	Notes
Aileron stick right →	RtAil goes up ↑ LtAil goes up ↑	In CAL mode, both ailerons move together!
Ele stick forward ↑	Ele goes up ↑	In CAL mode, the elevator goes in reverse to normal .
Thr stick forward ↑	RtFlap goes up ↑ LtFlap goes up ↑	In CAL mode, the throttle response is stepped in 25% increments.
Rudder stick right →	Rud goes right →	As normal

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 1500Δ	
CH2 LtAil	0.0 -150.0 - 150.0 →	LtA 1500Δ	
CH3 RtFlap	0.0 -150.0 - 150.0 ↗	RtF 1500Δ	
CH4 LtFlap	0.0 -150.0 - 150.0 →	LtF 1500Δ	
CH5 Elev	0.0 -150.0 - 150.0 →	Ele 1500Δ	
CH6 Rudd	0.0 -150.0 - 150.0 →	Rud 1500Δ	
CH7	0.0 -100.0 - 100.0 →	--- 1500Δ	

Do a final check:

1. Exit CAL mode
2. Enter Cruise mode.
3. Check for correct direction of aileron, elevator and rudder.

Note: The flaps will not function until configured later.

4.2 ADJUST SERVO END POINTS AND CENTRES

The next task is to set the operating limits of the servos. At the same time, you will compensate for linkage differences between the left and right sides of the model. **All the adjustments are made in CAL mode.**

When making the adjustments:

- Set the servo end points to the *maximum* as limited by the linkages and hinges. You may need to refine the adjustments to achieve equal movement on left and right sides – this is described in each step.
- Adjustments are made using curves. **Do not alter min, max or subtrim!**

Note for radios with lo-res mono screens (X-Lite, TX12, Zorro etc.)

On radios with lo-res mono screens, and also on radios running EdgeTX, curves are accessed from the dedicated **CURVES** menu.

These radios also lack a dedicated GLOBALVARS menu. Instead, GVARs are accessed through the **FLIGHT MODES** menu.

Channel	Calibration procedure
<input type="checkbox"/> CH 3 – Rt Flap	<p>Start with the right flap (it will be used as the reference when calibrating the left flap):</p> <ol style="list-style-type: none">4. Enter CAL mode5. Move switch Sw3P to centre position6. Go to the OUTPUTS menu7. Highlight right flap channel (default CH3)8. Skip to curve field RtF, and press {long enter} to open curve editor9. Throttle stick fully back (↓), adjust point 1 for <i>lower</i> end point.10. Throttle stick fully forward (↑), adjust point 3 for <i>upper</i> end point.11. 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. <p>Move throttle stick from one end to the other, observing step intervals. If they are grossly unequal, adjust point 2 to for better linearity.</p>
<input type="checkbox"/> CH 4 – Lt Flap	<p>Next, CALibrate the left flap so it precisely matches the right flap:</p> <ol style="list-style-type: none">1. Return to OUTPUTS menu2. Move switch Sw3P to centre position3. Highlight the left flap channel (default CH4)4. Skip to curve field LtF, press {long enter} to open curve editor <p>Adjust points 1 – 5 to exactly match the right flap:</p> <ol style="list-style-type: none">5. Stick fully back, adjust point 16. Stick ½-back, adjust point 27. Stick to centre, adjust point 38. Stick to ½-forward, adjust point 49. Stick fully forward, adjust point 5 <p>To match the end points on left and right sides, it may be necessary to reduce one or other end points for the right flap.</p>

Channel	Calibration procedure
Flap offset	<p>Next, CALibrate the flap offset:</p> <ol style="list-style-type: none"> 1. Return to OUTPUTS menu 2. Page to GLOBALVARS menu. 3. Move switch Sw3P to down ↓ position, – listen for ‘calibrate flap neutral’ 4. Go to cell GV5:FOF→FM0 5. Adjust offset so that flaps follow the neutral profile <p>If flaps are not in line, redo the calibration of the left flap (see previous step), paying attention to the two points either side of the neutral position.</p>
CH 5 – Ele	<p>CALibrate elevator.</p> <p>IMPORTANT: in CAL mode, the elevator moves in the opposite direction to normal.</p> <ol style="list-style-type: none"> 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 <i>upper</i> limit 6. Move Ele stick back (↓), then adjust point 1 for <i>lower</i> limit 7. Check elevator travel is equal up & down, reduce one or other side as necessary.
CH 6 – Rudder	<p>CALibrate the rudder</p> <ol style="list-style-type: none"> 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.
<input type="checkbox"/> CH 1 – Rt Ail <input type="checkbox"/> CH 2 – Lt Ail	<p>Finally, CALibrate ailerons:</p> <p>IMPORTANT: in CAL mode, the ailerons move together.</p> <ol style="list-style-type: none"> 1. Return to the OUTPUTS menu 2. Move switch Sw3P to down ↓ position – 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 for both crow and aileron movement. 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 <ol style="list-style-type: none"> 1. Move Sw3P up (↑) – this reduces aileron movement by 50%. <i>Note: this reduced rate applies only in CAL mode!</i> 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. 8. Repeat all steps for CH2:LtAil. 9. Check: (a) equal up/down movement, (b) 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 brakes 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!

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.

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 **Cruise** mode
2. Open the **INPUTS** menu
3. Scroll down to [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.
7. To add expo, skip to Curve field, choose 'Expo' as the curve type. Set required value.

When adjusting aileron travel, *consider upward travel only* (downward travel will be adjusted in the next section.)

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. The range is 70% to 0% as the trim is moved from left to right, in other words the downward travel increases (think of the rudder trim 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 RUDDER LAUNCH OFFSET (GV: RUD)

Counteracts rotation of the model following launch. Adjust as follows:

1. Open the **GLOBALVARS** menu
2. Go to row 'Rud', column FM2:Launch
3. Pull on the Launch momentary switch **SwMom**, and hold.
4. Adjust the GV for required offset
5. Release momentary switch
6. Push forward on elevator stick to exit **Zoom** mode.

5.4 CROW BRAKE TRAVEL (GV: CmA, CmF)

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 'CmF', column FM4:Landing
5. Adjust for required down flap movement
6. Go to 'CmA', column FM4:Landing
7. Adjust GV for required up aileron movement

5.5 AILERON=>FLAP MIX (GV:A2F)

This mix can increase the roll rate. 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

5.6 CAMBER/REFLEX PRESETS (GV:CMA, CMF)

Camber and reflex are independently adjustable in Launch, Zoom, Thermal, Cruise and Speed modes.

Ailerons and flaps are configured separately as follows:

1. Open **GLOBALVARS** menu
2. Go to row 'CmA' (for ailerons)
3. Activate the flight mode to be adjusted
4. Adjust value in highlighted column. May be positive or negative.
5. Repeat for row 'CmF' (for flaps)

Typical settings are: zero camber for Cruise and Launch, positive camber for Thermal1/2, and negative camber ('reflex') for Speed and Zoom.

5.7 AIL=>RUDDER (GV:A2R)

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

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

5.8 SNAPFLAP (GV:SNA, GV:SNF)

Snapflap (Ele=>flap, aileron) is adjustable per flight mode. Adjust as follows:

1. Open **GLOBALVARS** menu, go to row 'SnA' (this adjusts ailerons)
2. Activate flight mode to be adjusted - the column is highlighted
3. Adjust value in highlighted column
4. Repeat for row 'SnF' (adjusts flaps).

5.9 REVERSE DIFF (CH19->AIL)

To enhance the roll rate under braking, the template suppresses differential so that full down movement is restored with full crow. You can further increase the downgoing aileron travel by applying reverse diff as follows:

1. Open **MIXERS** menu,
2. Scroll to CH19, 'Ail' line
3. Press {long Enter} to open mixer editor
4. Apply full brakes and full aileron
5. Increase *weight* from the default 100% until the required down movement is achieved.

For best roll response, the downgoing aileron should be a little below the aerodynamic neutral.

6 USING CROW BRAKES

6.1 ADJUSTING PITCH TRIM WITH BRAKES ('BRAKE COMPENSATION')

Brake compensation can be adjusted while flying the model. The procedure is as follows:

1. Enter Cruise mode and adjust elevator trim as required.
2. Apply full brakes. *Still using the elevator trim*, adjust the compensation as follows:
 - Trim fully back = zero compensation
 - Trim fully forward = 80% down elevator

Technical note: In Landing mode, (a) The base trim is derived from Cruise mode and (b) the function of the elevator trim lever changes so that it becomes an adjuster for the compensation mix. Total trim = base trim + compensation.

Adjusting the curve.

The response with partial brake can be tuned by editing curve CV7:BrC. *Alter points 2 – 4 only, do not alter the end points!* The default curve is a typical 'S' shape.

6.2 ZOOM SAFE EXIT

Zoom Safe Exit prevents the brakes from deploying while exiting Zoom mode.

If the brake stick is not in the zero position while exiting Zoom mode, a warning sounds. The brakes remain retracted, and the next lower priority flight mode is selected (Cruise, Thermal1, Thermal2, or Speed). The brakes will be active after the stick is returned to the zero position.

7 CUSTOMISING YOUR SETUP

This section describes how to customise your setup. You can apply these customisations at any time.

7.1 HIDING THERMAL 2

If you prefer, you can hide thermal_2. In that case, only thermal_1 is available; the selector switch **SwT2** can then be re-used for another function.

Function	Menu point	Value	Default
Thermal_2 enable	LOGICALSWITCHES→L4→V2	<100: disabled 100: enabled	Enabled

7.2 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 new rate.
7. Set expo as required
8. Tick applicable flight modes (0: Cruise, 2: Launch, 3: Zoom, 4: Landing, 5: Speed, 6: Thermal1, 7: Thermal2).

Alternatively, you can specify a switch to select rates directly rather than by flight mode.

Here is an example showing triple aileron rates linked to flight modes. Rate = 50% for FM5, and 80% for FM4. For all other flight modes, rate = 75%.



Note that the last (or only) line in each group must have all flight modes checked, and switch = '---'. This provides a safe fallback in case none of the previous lines is selected due to a data entry error. For a deeper explanation [see 'more about inputs'](#).

7.3 REVERSING THE THROTTLE/BRAKE STICK

By default, zero brake is with the throttle stick fully forward. To reverse the stick, so zero is at the bottom:

1. Open the **MIXER** menu
2. Go to CH23:RawBr
3. Go to the Curve field, and change the curve from CV9:Thr to !CV9:Thr (note leading '!').

7.4 LAUNCH HEIGHT ANNOUNCEMENT

If you have ALT telemetry, you can enable the announcement of launch height. This is the difference between the height at launch, and the maximum height achieved until 3 seconds after exiting Zoom mode. To configure,

1. Switch on the receiver and establish telemetry.
2. Open the **TELEMETRY** menu
3. Delete all sensors, then Discover sensors.
4. Verify that the Alt sensor is discovered.

Then edit special function as follows:

Function	Menu point	Note
Launch height callout enable	SPECIAL FUNCTIONS →SF14 (L27) → PlayValue	Set value to ALT+

You can configure the delay for recording the launch height:

Function	Menu point	Note
Callout Zoom delay	LOGICAL SWITCHES →L26→Duration	Default=3secs

7.5 SETTING THE RANGE OF DIFF

Aileron diff is adjusted via the rudder trim. The default range is 0% to 70%. The range can be adjusted by editing the end points of curve CV10:Dif. Negative diff is *not* supported.

7.6 ADJUSTING BRAKE STICK DEADBAND

The brake stick incorporates some deadband to prevent accidental deployment. It can be adjusted as follows:

Function	Menu point	Value	Default
Brake stick deadband	CURVES →CV9:Thr	Set point 2 for required deadband	85

7.7 MAKING YOUR OWN MODIFICATIONS

If you wish to make your own modifications, please study the Excel documentation carefully and make sure you understand the implications of any changes. Recommended workflow as follows:

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

8 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