WINGY

Template for flying wings and delta sailplanes
For OpenTx / EdgeTX

Version 1.2

Setup Guide

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1 Introduction

Wingy is a template for sailplanes with a flying wing or delta configuration. Suitable models include *Alula*, *Wildthing*, *Pibros* and others.

Wingy is quick to configure thanks to integrated servo calibration, dual rates, and in-flight adjustable diff.

Please read through the instructions carefully once, before commencing setup!!
Also, please visit the support page for recent issues and fixes.

1.1 Requirements

- Transmitter with momentary switch and 2- or 3-pos switch
- OpenTx or EdgeTX (see change log for recommended versions)
- Companion software + USB cable.

1.2 Package contents

Filename	Description
wingy12_SetupGuide.pdf	This guide
wingy12x.otx	Model file
wngxxx.wav	Sound files

1.3 Stick assignments

All stick modes are supported according to settings in **RADIO SETUP→STICK MODE**. If this is a new radio, ensure that the stick mode is correctly set.

1.4 Channel assignments

Channel #	Function
1	Right elevon
2	Left elevon

Channel order is important - left and right are from the point of view of an imaginary pilot looking forwards.

1.5 Trims

Aileron and elevator trim act as normal.
Rudder trim adjusts aileron differential.

1.6 Switch assignments *(new in 1.2)*

The template uses two switches. Both are 'soft' in order to cater for different transmitters – actual switches will be assigned later (see section 4.3).

The table below shows the function of the two switches and their 'short' names.

Short name	Function
swMom	CAL mode (Momentary switch)
swRate	Select high/low rates

From this point on, all switches will be referred by their short names!

2 CAL mode

A special CAL flight mode (FM1) is provided for calibrating the servos. When CAL mode is active, the aileron stick value is passed directly to the outputs. To activate CAL mode:

- Apply full left aileron and full up elevator (stick towards you), and hold
- Pull and release **swMom**
- Release stick(s).

The ailerons will move in the same direction in CAL mode.
The elevator stick is inactive in CAL mode. A beep sounds every 5 secs and a voice alert every 15 secs.
To exit CAL mode

- Pull **swMom**.

3 Operational Overview

Aileron differential

- Aileron differential is adjustable in flight (via rudder trim).
- Adjustment range is 0 - 50%.

Dual rates

- Hi or Lo rates can be selected for Elevator and Aileron.

4 Installing the template

This section describes the installation of the template and associated files to your transmitter. Please follow in the correct sequence – this will ensure that your existing models and settings are preserved.

4.1 Copying the template to transmitter

The first task is to copy the files to your transmitter:

Extract files from ZIP package

- □ Extract files from .ZIP package and place in a folder on your hard drive

Connect transmitter to PC

- □ Enter Bootloader mode (with most transmitters, move horizontal trims inwards while powering)
- □ Connect the tx to PC via USB. The tx's SD card and/or internal memory appear as external drive(s).

Transfer sound files

- □ Copy the sound files to the /SOUNDS/{language} folder on the SD card. For example, English folder is "/SOUNDS/en". Do *not* copy to the system folder.

Transfer model file

- □ Start Companion
- □ Open file wingyxxx.otx.
- □ From the **READ WRITE** menu, choose "*Read Models and Settings from Radio*". The transmitter's model list is read and displayed in a second window.
- □ Drag *wingy* into an empty slot in your model list. A list of warnings will appear – ignore them, as they will be fixed when you assign the controls later.
- □ Close the wingyxxx.otx window.
- □ In the model list, right-click *wingy* and choose "Use as Default"
- □ From the **READ WRITE** menu, choose "*Write Models and Settings to Radio*".
- □ Close Companion

4.2 Calibrating the sticks

Ensure the sticks are properly calibrated (**SYSTEM > HARDWARE** menu)

4.3 Assigning the switches (*new in 1.1*)

Each type of transmitter will have its own switch layout and switch id's. It's important therefore to check and, if necessary, modify the switch assignments which are held in a special block of inputs.

- ☐ Open the **INPUTS** menu
- ☐ Scroll down to the start of the assignments block, in line 7.
- ☐ See the table below. For each switch, examine the corresponding input. Check that the *Source* field is not blank and refers to a switch of the correct type. Suggestions for common transmitters are shown.

Switch	Description	Input name	Switch type	Suggested physical switch			
				X9D/TX16S	Zorro	Pocket	Your tx
swMom	CAL mode switch	**SMm**	Momentary *(safety!)*	**SH**	**SA**	**SE**	?
swRate	High/low rate select	**SRt**	2- or 3-position	**SA**	**SB**	**SA**	?

To edit a switch assignment:

1. Highlight the line with the corresponding input name (above, third column)
2. Press **[long Enter]** and select *Edit*
3. Skip to the Source field
4. Change *Source* to a suitable physical switch, as per table above.

4.4 Familiarisation

- ☐ Using the transmitter on its own, familiarise with activating CAL mode, and High/low rates.
- ☐ If sounds are not playing, check that they are in the correct location, and that sound is turned on.

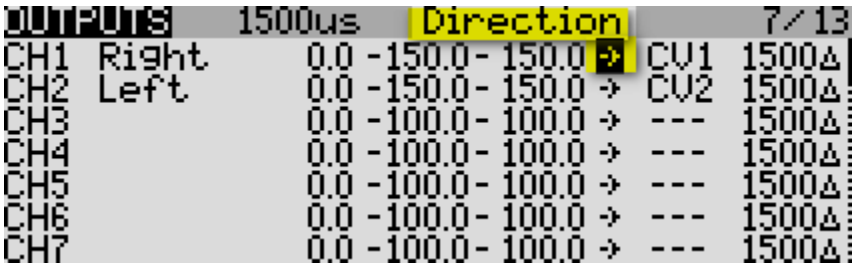
5 Calibrating the servos

In this section you'll set the rotation, end points and centres of the servos.

5.1 Setting servo rotation

Start by setting the rotation of the servos.

- ☐ Move the sticks and check that both elevons move correctly as for normal flight. If one or both elevons is reversed, then change the direction as follows:
  - □ Open the **OUTPUTS** menu.
  - □ Highlight the elevon channel in error, and click {ENTER}
  - □ Skip to Direction field
  - □ Press {ENTER}, and immediately {EXIT}. The elevon should now move correctly.



The elevons should now respond correctly to both elevator and aileron commands.

5.2 Calibrating centres and end points

Next configure the centres and end points of the servos. **All adjustments in this section must be made while in CAL mode**.

Notes:

- In CAL mode, **both elevons move together**. It may look odd, but it makes it easy to match movements on left/right side.
- When adjusting end points, allow for maximum simultaneous aileron and elevator commands.
- Calibration is adjusted via *output curves* – do not adjust min/max/Subtrim (they should be left at -150/150/0).

Channel	Calibration procedure
☐ CH 1 – Rt Elevon	Calibrate right elevon(CH1): ☐ Enter CAL mode ☐ In the **OUTPUTS** menu, highlight CH1 ☐ Skip to the Curve field labelled CV1: Rt ☐ Press {LONG ENTER} to open the curve editor. ☐ Aileron stick in middle, adjust point 2 for correct neutral ☐ Aileron stick fully left (←), adjust point 1 for max downward travel ☐ Aileron stick fully right (→), adjust point 3 for max upward travel ☐ Check that up and down movement are equal, if necessary reduce one or other end point
☐ CH 2 – Lt Elevon	Calibrate left elevon (CH2) ☐ Still in CAL mode, calibrate left elevon (CH2) using curve CV2:Lt. Follow the same steps as for right elevon above.

☐ While still in CAL mode, check that up/down movements match between CH1 and CH2. You can do this by sighting down the centre line. Adjust one or other channel as necessary.

☐ Exit CAL mode. Note that the down-going aileron movement will be reduced due to diff.

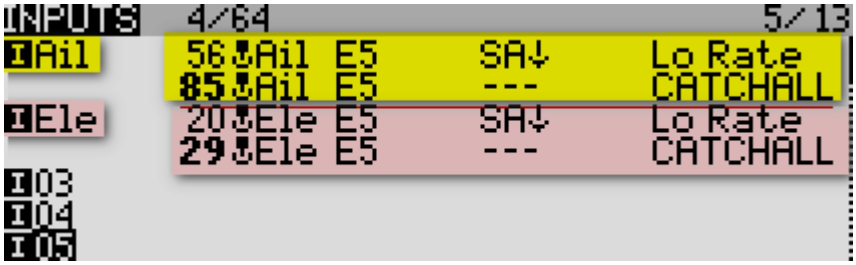
The movements will be more than required for flight; you will reduce these in the next section.

6 Finalise control surface movements

6.1 Adjust control responses ('rates')

Finally, adjust the aileron and elevator responses ('rates'). Refer to the instruction manual for your model. Rate adjustments are made in the **INPUTS** menu.

1. Open the **INPUTS** menu and highlight the line to adjust. Low rate is set in the 'Lo Rate' lines. High rate is set in the 'CATCHALL' lines.
2. Move the rate switch (**swRate**) to the corresponding position (low or high)
3. Press {LONG ENTER} and select Edit
4. Move the stick, and alter *weight* to achieve desired movement.



In the example,

- Aileron high-rate = 85, low-rate = 56
- Elevator high-rate=29, low-rate = 20

SAFETY NOTE: the last line should always be a 'catchall', with *all flight modes checked, and switch="---".* This is good defensive programming in case none of the previous lines is active (without a 'catchall', the control would be inoperative).

6.2 Adjust aileron differential

Adjust aileron differential using the rudder trim. Default diff range is 0-50%; trim centre corresponds to 25% diff. The range of adjustment can be altered by adjusting Curve 3. Moving the trim to the right decreases diff, and increases roll rate.

6.3 Adjust Expo

Expo is used to soften or sharpen responses around neutral. It can be set independently for each input line.

1. Select high or low rate as required
2. Open the **INPUTS** menu and skip to relevant line
3. Press {LONG ENTER} and select Edit
4. Skip to the Curve field and select Expo
5. Skip to the adjacent field and set the value

7 Before the first flight

Before using this setup for the first time, please:

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

8 Applying your own modifications

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

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

9 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 OpenTx.

Test your setup thoroughly 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, or just want to say hello, then please contact me at http://rc-soar.com/email.htm.

Safe flying!
- Mike Shellim