# *E-Soar Maxx for ETHOS*

## Version 2.0
### for Ethos 1.5

# Setup Guide

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*E-Soar Max  control layout (Mode 2 shown)*

# CONTENTS

# 1 INTRODUCTION

## 1.1 DESCRIPTION

*E-Soar Maxx* is an advanced template for electric-powered gliders with 6 servos + ESC.  Unlike *E-Soar Plus* which is purely for sport flyers, *E-Soar Maxx* is targeted at F5J competition pilots. It features two operating modes 'Sport' and 'Competition':

- *Sport mode* works like E-Soar Plus, except it offers just a single arming option (via a switch) instead of three.
- *Competition mode* offers two extra timers, fast idle, and auto motor shutoff for F5J competition and practice.

Competition mode is hidden by default, and a separate document describes how to unlock it. If you don't unlock competition mode, then the template will function fine in sport mode only.

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

## 1.2 REQUIREMENTS

The following are required:
- Transmitter running Ethos 1.5 or above
- USB cable TX <-> PC

## 1.3 PACKAGE CONTENTS

| Filename | Description |
| --- | --- |
| esm-ethos_20_SETUP_GUIDE.pdf | Setup guide |
| esm-ethos_20_competition_setup.pdf | Guide to configuring Competition mode |
| esm-ethos_20?_reference.xls | Programming reference |
| esm20?xy.bin | Model file |
| *.wav | Sound files |

# 2 OVERVIEW

## 2.1 CONTROL ASSIGNMENTS

The template supports all stick modes. Set the desired stick mode (1, 2 etc.) in SYSTEM→STICKS menu.
Default control assignments are shown in the table below. The defaults were designed around the X20 transmitter, however the controls may be reassigned if required – see below.

| Function | Default control | How to re-assign |
| --- | --- | --- |
| Motor | Left slider | See section 7.4 |
| Crow | Throttle stick | See section 7.4 |
| Camber adjust (Thermal mode) | Right slider | See section 7.4 |
| Crow and motor compensation | Throttle trim | - |
| Aileron diff | Rudder trim | - |
| Flight mode selector | SA | See section 7.1 |
| CAL mode<br>Stop flight timer | SH (momentary) | See section 7.3 |
| Motor arming | SF | - |

## 2.2 FLIGHT MODES

There are 5 flight modes: POWER, LANDING, THERMAL, CRUISE and SPEED. In the event of a conflict, POWER has highest priority, then LANDING, then THERMAL/ CRUISE/SPEED.

| Flight Mode | Ethos ID | Activated by | Priority |
|---|---|---|---|
| Power | FM2 | Slider left↑ (motor must be armed) | High |
| Landing | FM3 | Throttle ↓ | Mid |
| Thermal | FM4 | SA ↓ | Low |
| Speed | FM5 | SA ↑ | Low |
| Cruise | FM0 (default) | SA — | Low |

## 2.3 FM/MIXER MATRIX

The table shows the mixers which are active in each flight mode.

| Flight mode | Ail→ Flap | Ail→ Rud | Motor Compensation* | Crow compensation* | Reverse diff | Camber* | Snapflap | Reflex | Diff* |
|---|---|---|---|---|---|---|---|---|---|
| Power | ✓ | ✓ | ✓ | | | | ✓ | | ✓ |
| Landing | ✓ | ✓ | | ✓ | ✓ | | ✓ | | ✓ |
| Thermal | ✓ | ✓ | | | | ✓ | ✓ | | ✓ |
| Speed | ✓ | ✓ | | | | | ✓ | ✓ | ✓ |
| Cruise | ✓ | ✓ | | | | | ✓ | | ✓ |

* adjustable in flight.

## 2.4 CAL MODE

CAL mode is a special flight mode for calibrating the servos. When CAL is active, mixers and trims are ignored.

To activate CAL mode:

1. Apply full left aileron, pull full back on elevator stick, and hold.
2. Pull and release momentary switch (default **SH).**
3. Release sticks.

There are three CAL sub-modes. These are selected via switch **SA**:
- SA—: for calibrating servo end points, and balancing the flaps.  The flaps move in 25% increments.
- SA↓ for calibrating flap neutral.
- SA↑ for calibrating with 50% aileron travel. The flaps move to their neutrals.

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

## 2.5 CHANNEL ASSIGNMENTS

Channels are assigned as follows:

| Channel # | Vtail | Xtail |
|---|---|---|
| 1 | Right aileron | |
| 2 | Left aileron | |
| 3 | Right flap | |
| 4 | Left flap | |
| 5 | Right Vtail | Elevator |
| 6 | Left Vtail | Rudder |
| 7 | Motor | |

'Left' and 'right' are from the point of view of a pilot looking in the direction of flight.
The left and right channels are not interchangeable – *ensure that the servos are plugged in correctly!*

## 2.6 Overview of mixing, trims, rates

**Rates and expo**
- Rates/expo may be global or per flight mode.

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

**Camber and reflex**
- Camber is adjustable in THERMAL mode using right slider.
- Negative camber ('reflex') may be preset in SPEED mode.

**Aileron-to-flap mix**
- Aileron-to-flap mixing may be global or per flight mode.

**Crow->elevator compensation**
- Adjustable in flight, via the throttle trim. Non-linear compensation may be adjusted via a curve.

**Motor->elevator compensation**
- Adjustable in flight, via the Throttle trim.

**Differential**
- Diff is applied to both ailerons and flaps.
- Adjustable in flight, via the Rudder trim, for each flight mode.

**Roll rate enhancement**
- Aileron diff is suppressed, as crow is deployed.
- 'Reverse' diff can be applied to further lower the down-going aileron

**Aileron to Rudder mix**
- Aileron to rudder mix may be set globally or per flight mode.

**Elevator-to-flap ('snapflap')**
- Snapflap may be set globally or per flight mode

## 2.7 Motor arming and Power mode

The default arming switch is SF. It's 'smart' – the motor is guaranteed disarmed at startup regardless of the position of the switch. ***There is no need for startup checks!***

**To arm the motor**
1. Set motor lever (left slider) to off
2. Move SF↑ (if not already ↑)
3. Transition to ↓.

Advancing the motor control will now start the motor.

**To disarm**
- SF↑

**Power mode**

POWER mode is activated automatically when the motor is running. Having a dedicated mode allows you to set different rates, expo under power (see section 5.1).

> ☠ **The arming system does not protect against spinups due to loss of signal. Always set the failsafe, so the motor is commanded to 'off' (-100%) on loss of signal.**

## 2.8 FLIGHT TIMER

Timer1 is configured as a flight timer.

- To start and reset flight timer: start the motor
- To stop: press momentary switch (default SH).

# 3 PREPARING THE TRANSMITTER

> ☠ **Make sure that the motor is disconnected before proceeding.**

## 3.1 TRANSFER FILES TO TRANSMITTER

1. Unzip the files in the package to your computer's hard drive.
2. Switch on the transmitter in bootloader mode and establish a USB connection.
3. Copy the model file **esm20?xy.bin** to the \models folder on the SD card.
4. The sound files must be copied to the folder for voice1. To determine the voice1 folder, look in the SYSTEM>GENERAL menu and make a note of voice1. On the SD card, locate the \audio folder, and then the subfolder for voice1 – this is where the sound files should be copied.
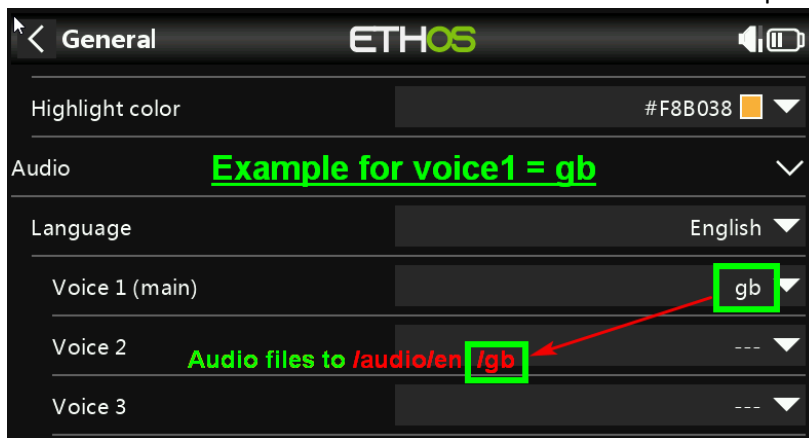


5. Disconnect USB and restart the transmitter.

Now activate the model as follows:

6. Go to the MODEL SELECT menu and find the model 'ESM20?xy'.
7. Click and choose 'Set current model'.
8. Go to the EDIT MODEL menu and change the name as desired.

## 3.2 CONFIGURE THE HARDWARE

Configure the hardware:

1. Ensure that the sticks, sliders and knobs are calibrated (SYSTEM→HARDWARE→ANALOGS CALIBRATION).
2. Configure the transmitter RF module (MODEL→RF SYSTEM).

## 3.3 FAMILIARISATION

Using the transmitter on its own, practise the following:

- Activate CRUISE, THERMAL, LANDING, POWER and SPEED modes (see Section 2.2).
- Activate CAL mode and sub-modes (see Section 2.4).
- Verify that the sounds are working correctly. If not, check that the sound files are in the correct location (see section 3.1).

# 4 SELECTING TAIL TYPE, AND CALIBRATING THE SERVOS

In the section, you'll start basic configuration of the model. This section must be completed before the mixers.

## 4.1 CHOOSE X- OR V-TAIL

The first task is to choose the tail type. This is done in the VARS menu. Enter the setting in the *Values* field.

| VARS | Description | *Values* setting |
|---|---|---|
| V_IsVtail | Tail type | 0% = X- or T-tail (default)<br>1% = V-tail |

## 4.2 CALIBRATE SERVOS

The next task is to calibrate the servos. The goals are:

- Set servo directions.
- Adjust limits and centres.

### 4.2.1 Set servo directions

Check and if necessary set the direction of each servo. ***All adjustments are made in CAL mode.***

1. Switch on the transmitter (do not power up the receiver yet).
2. Set **throttle stick** to centre, **SA** to middle.
3. Enter CAL mode.
4. Switch on the receiver.
5. Open the OUTPUTS menu
6. While still in CAL mode, check the servo directions. *Pay attention to the notes regarding aileron and elevator.*

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

To reverse a servo:
- Open the MODELS→OUTPUTS menu
- Click on the relevant channel to open the edit menu
- Change the Invert option from 'Normal' to 'Inverted'.

7. Exit CAL mode and enter NORMAL mode.
8. Move the aileron, elevator and rudder sticks, and check for normal operation.
   *Note:* **the flaps will not function yet**.

## 4.2.2  Set servo limits and centres

In this step, you will set the servo limits and centres. At the same time, you will compensate for differences between the left and right linkages.

*Note:*

- Servo limits should be set to **the maximum possible** - just a little less than the linkage/hinge limits.
- Adjustments are made using curves - **do not adjust Min, Max or Subtrim!**
- You may need to experiment to see which curve point to adjust, as explained below.
- **All adjustments are made while in CAL mode.**

| Target | Calibration procedure |
|--------|----------------------|
| **CH 4: LtFlap** | Set the end points and centre for the left flap servo.<br>1. Switch **SA** to middle<br>2. Enter CAL mode<br>3. In the OUTPUT menu, open CH4:LtFlap<br>4. Skip to the 'curve' field, and open the curve editor<br> ☐ Throttle stick back (↓), then adjust the absolute lower limit with curve point 1 or 3 (whichever works).<br> ☐ Throttle stick forward (↑), adjust absolute upper limit with point 3 (or 1).<br> ☐ Adjust point 2 so it's on the straight line through points 1 and 3. *Do not worry about the flap neutral position, it will be set later via a mix.*<br>5. Move throttle stick from one end to the other, observing step intervals. If necessary, you can adjust point 2 to make the response more linear. |
| **CH 3: RtFlap** | Next, calibrate the right flap. A 5-point curve is used, using the left flap as a reference.<br>1. Enter CAL mode<br>2. Switch **SA** to middle<br>3. In the OUTPUT menu, open CH3:RtFlap<br>4. Skip to the 'curve' field and open the curve editor. Adjust the points to exactly match the left flap. Note: *the order of the curve points may be reversed, if the first point doesn't work, try the alternative (in brackets).*<br> ☐ stick fully back, adjust point 1 (or 5) for the lower limit of travel.<br> ☐ stick ½-back, adjust point 2 (or 4)<br> ☐ stick to centre, adjust point 3.<br> ☐ stick to ½-forward, adjust point 4 (or 2)<br> ☐ stick fully forward, adjust point 5 (or 1) for the upper limit of travel<br>To match the end points on left and right sides, it may be necessary to the end points for the left flap (see previous step).<br>Do a final check. Pay particular attention the points adjacent to flap neutral. |

| Target | Calibration procedure |
|--------|----------------------|
| **Flap neutral** | Next, you'll set the flap neutral, by applying an offset mix.<br>1. Enter CAL mode<br>2. Open the VARS menu<br>3. Scroll to mix V_FlapNeutral<br>4. Move switch **SA** down, and listen for 'calibrate flap neutral'.<br>5. Adjust the number in the Values field for correct neutral.<br>    If the flaps are not perfectly in line with each other, then redo the calibration for CH3:RtFlap above, paying particular attention to the two points adjacent to the neutral position. |
| *V-Tail*<br>**CH 5: RtVee**<br>**CH 6: LtVee** | ***For V-tail only***<br>1. Enter CAL mode (position of SA is not critical.)<br>2. In the OUTPUT menu, open CH5:RtVee<br>3. Skip to the 'curve' field, and open curve editor<br>    ☐ Ele stick to centre, adjust point 2 for correct neutral<br>    ☐ Ele stick forward (↑), adjust end point 3 (or 1) for **upper** (↑) travel limit.<br>    ☐ Ele stick back (↓), adjust point 1 (or 3) for **lower** (↓) limit.<br>4. Repeat for CH6:LtVee<br>5. Check equal travel up/down; left and right surfaces match |
| *X-Tail*<br>**CH 5:Elev** | ***For X/T tail only***<br>1. Enter CAL mode. (Position of SA is not critical.)<br>2. In the OUTPUT menu, highlight CH5:Elev/RtVee<br>3. Skip to 'curve' field, open curve editor<br>    ☐ Ele stick to centre, adjust point 2 for correct neutral<br>    ☐ Ele stick forward (↑), adjust point 1 (or 3) point for **upper** (↑) limit<br>    ☐ Ele stick back (↓), adjust point 3 (or 1) for **lower** (↓) limit<br>4. Check travel is equal up & down |
| *X-Tail*<br>**CH 6:Rudd** | ***For X/T tail only***<br>1. Enter CAL mode (position of SA is not critical.)<br>2. In the OUTPUT menu, highlight CH6:Rudd/LtVee<br>3. Skip to 'curve' field, open curve editor<br>4. Rudder stick to centre, adjust point 2 for neutral<br>5. Rudder right (→), adjust end point 1 (or 3) for right limit<br>6. Rudder left (←), adjust end point 3 (or 1) for left limit<br>7. Check equal travel left/right |
| **CH 1:RtAil**<br>**CH 2:LtAil** | Finally, calibrate ailerons:<br>1. Enter CAL mode<br>2. Set switch SA to down position. The flaps will go to their calibrated neutrals.<br>3. In the OUTPUT menu, go to CH1:RtAil and open the curve editor<br>    ☐ Aileron stick to centre. Set Point 2 for correct centre<br>    ☐ Move aileron stick right (→). Set point 3 (or 1) for desired upper limit.<br>    ☐ Move aileron stick left (←). Set point 1 (or 3) so that down-travel=up-travel. If down-travel is limited and you cannot complete this step, then move SA to **up** position – this reduces aileron movement by 50% during calibration; retry the calibration remembering that you will get double the movement when you exit CAL mode.<br>    Don't worry if down-travel is excessive when you exit CAL – later adjustments to aileron rate and diff will reduce it.<br>4. Repeat for CH2:LtAil<br>5. Check same travel up/down, and check left and right ailerons match. Readjust if necessary. |

Check operation as follows:

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

***WELL DONE, CALIBRATION IS COMPLETE - BACK UP YOUR SETUP NOW!***

# 5  CONFIGURE MIXERS

In the final step, you will finalise the control surface travels, and configure the mixers.
All settings are made in the 'VARS' menu, in the *Values* field.

## 5.1  RATES AND EXPO

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

| VARS | Adjusts | Notes |
|---|---|---|
| V_AilRates<br>V_EleRates<br>V_RudRates | Rates /<br>control travel | Set the control surface travel in the *Values* field. You can override the default for specific flight modes by adding extra values for each mode. To do this:<br>1. Click 'Add a new value'<br>2. Click adjacent down arrow<br>3. Select category 'Flight modes', and choose the flight mode<br>4. Set the desired rate in the adjacent field<br>***Safety note:*** *Always set the default rate (first weight) so you can control the model. Never set the default rate to zero.* |
| V_AilExpo<br>V_EleExpo<br>V_RudExpo | Expo | Set the default expo in the *Values* field. You can override the default for specific flight modes by adding extra values for each flight mode. To do this:<br>1. Click 'Add new value'<br>2. Click adjacent down arrow<br>3. Select category 'Flight modes', and choose the flight mode<br>4. Set the desired expo in the adjacent Value field. |

## 5.2  AILERON DIFFERENTIAL

Diff affects the downgoing movement of the aileron, and is adjusted using the rudder trim.
*Note:* Diff must be adjusted separately for each flight mode!

## 5.3  CROW BRAKES

This section describes how to set up crow brakes and crow→elevator compensation.

| VARS | Adjusts | Notes |
|---|---|---|
| V_CrowtoAil | Crow to aileron mix | The ailerons should move up as crow is deployed. To configure:<br>1. Enter Landing mode.<br>2. Deploy full crow.<br>3. Adjust *values* field for desired upward movement. |
| V_CrowToFlap | Crow to flap mix | *-- as above, for downward movement of flaps --* |
| V_CrowComp | Max crow compensation | Sets the max crow compensation. Default is 50% of elevator travel, but it can be altered by adjusting *Values* field. Adjust with full crow and throttle trim fully forward.<br>See also "Optimising pitch trim during flight testing" below. |

| VARS | Adjusts | Notes |
|---|---|---|
| V_RevDiff | Reverse diff | In this step, you can increase the travel of the down-going aileron when both full crow and full aileron are applied. This can improve roll response at full crow. To configure:<br>1. Activate LANDING mode.<br>2. Apply full crow and full aileron.<br>3. Adjust *values* field so that the down going aileron is a little below the neutral position.<br>NOTE: this measure for improving roll response is in addition to the suppression of aileron diff as crow is deployed (this is done automatically). |

**Optimising pitch trim during flight testing**

Trim is made up of two components: *base trim* and *crow compensation*. To adjust these during flight tests:

1. Apply *minimal* crow, and adjust base trim with **elevator** trim lever.
2. Apply *maximum* crow and adjust compensation with **throttle** trim lever. Trim back => zero compensation, trim forward = max compensation.

To optimise the trim at intermediate crow settings, you can adjust compensation curve CV:CrowComp. Adjust points 2 to 4 only (do not adjust end points). The default curve has a typical 'S' shape.

## 5.4 AILERON => FLAP

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

| VARS | Adjusts | Notes |
|---|---|---|
| V_AilToFlap | Aileron to flap mix | Adjust *Values* field for the default aileron=>flap mix. You can over-ride the default for specific flight modes – use same method as rates (see section 5.1).<br>When configuring, concentrate on the upward flap movement only (downward movement will be affected by the diff setting, adjusted with the rudder trim). |

## 5.5 AILERON => RUDDER

This mix is useful for improving turn response.

| VARS | Adjusts | Notes |
|---|---|---|
| V_AilToRud | Aileron to rudder mix | Adjust *Values* field for default aileron=>rudder mix.<br>You can over-ride the default for specific flight modes - same method as rates (see section 5.1) |

## 5.6 CAMBER

The camber mix is for slow flight (THERMAL mode)

| VARS | Adjusts | Notes |
|---|---|---|
| V_CambToAil<br>V_CambToFlp | Camber | Camber is active in THERMAL mode, and adjusted via the right slider.<br>Adjustment range = nominal camber +/- 50%. To set nominal camber:<br>1. Enable THERMAL mode.<br>2. Move right slider to centre position.<br>3. Adjust *Values* field for required flap and aileron camber.<br>Check camber range by moving slider forward and back. |

## 5.7  REFLEX

A small amount of reflex can reduce drag when flying fast (SPEED mode)

| VARS | Adjusts | Notes |
|------|---------|-------|
| V_ReflexAil<br>V_ReflexFlap | Reflex | To set the reflex, enter SPEED mode and adjust number in *Values* field. Ailerons and flaps are configured separately. |

## 5.8  ELE => FLAP ('SNAPFLAP')

Snapflap reduces drag when slowing the model with elevator. Pull back on elevator stick to activate.

| VARS | Adjusts | Notes |
|------|---------|-------|
| V_SnapToAil<br>V_SnapToFlap | Snapflap amount | Adjust default snapflap in first *Values* line. Aileron and flaps are configured separately.<br>You can over-ride for specific flight modes, using the same method as rates (see section 5.1) |

## 5.9  MOTOR TO ELEVATOR (COMPENSATION)

This is a 'compensation' mix, to counteract pitch changes due to the motor. Compensation is adjustable when the motor is running, using the throttle trim.

| VARS | Adjusts | Notes |
|------|---------|-------|
| V_MotorComp | Maximum compensation | Sets the limit of compensation adjustment available from the throttle trim. The default is 50% of elevator travel and should be sufficient for most models. |

*Before the first flight*: check motor system:

1. Disconnect the motor.
2. Go to the OUTPUTS screen.
3. Check the value of CH7 is -100 with motor off, +100 at full power.
4. Set the motor compensation to zero (pretend to apply power, and move the throttle trim to the centre).

*Flight testing:* optimising pitch trim with motor

Total pitch trim = base trim + compensation. During flight tests, optimise the trim as follows:

1. Apply *minimal* motor. Adjust base trim with *elevator* trim lever.
2. Deploy *maximum* motor. Adjust compensation with *throttle* trim lever. Zero comp is with the trim in the centre.

# 6  SUMMARY OF TRIMS

Summary of the trim functions:

| Trim | Flight mode | Adjusts | Notes |
|------|-------------|---------|-------|
| Rudder trim | [All] | Aileron Diff | Diff is set per flight mode, Default range is 0 - 70%. Trim centre corresponds to 35% diff |
| Throttle trim | Landing | Crow=>Ele compensation | Zero crow comp is with throttle trim *fully back*. |
| | Power | Motor=>Ele compensation | Zero motor comp is with throttle trim in *centre*. |
| Aileron trim | [All] | Aileron Trim | Aileron trim is global across all flight modes. |
| Elevator trim | [All] | Elevator  trim | Elevator trim is stored per flight mode. |

# 7 CUSTOMISING YOUR SETUP

This section describes the optional customisations. You can make these changes at any time. Before making changes, please back up your setup (easy way is to clone it from the MODEL SELECT menu).

## 7.1 REASSIGNING THE FLIGHT MODE SWITCH

The default mode switch is **SA.** You can specify another 3-position switch, and/or change the positions:
Go to the FLIGHT MODES menu, then:

- Set the switch for THERMAL mode (3 pos switch, any position)
- Set the switch for SPEED mode (same switch as above, but different position)

CRUISE will be selected with the switch in the third (unassigned) position.

## 7.2 REASSIGNING THE ARMING SWITCH

The default arming switch is SF↓. You can reassign a different switch:

1. Go to the LOGICAL SWITCHES screen.
2. Locate LS2: SW2-3P_ARM

Open the editor and Set *Value1* to the desired arming switch and position.
***Safety note:*** *switch must be 2- or 3-position type.*

## 7.3 REASSIGNING THE MOMENTARY SWITCH

A momentary switch is used for CAL mode and stopping the flight timer. The default is SH↓. You can reassign a different momentary switch:

3. Go to the LOGICAL SWITCHES screen.
4. Locate LS1:SW_MOM
5. Open the editor and Set *Value1* to the desired momentary switch, and set the position to ↓.
   ***Safety note:*** *switch must be momentary type, do **not** use a 2- or 3-position switch.*

## 7.4 CONFIGURING CROW, MOTOR AND CAMBER CONTROLS

### 7.4.1 Assigning controls for crow, motor and camber.

Crow, motor and camber functions may be reassigned to any analogue control or 3-position switch. To do this, go the MIXERS menu, highlight the relevant mix (see table below), and open the mixer editor. Then change the source to your choice.

| Function | Control options (mixer sources) | Mixer | Default |
|---|---|---|---|
| Crow | Throttle stick, slider, or 3p switch | MIXERS → **17CrowCtrl** → source | Throttle stick |
| Motor | Throttle stick, slider, or 3p switch | MIXERS → **18ThrotCtrl** → source | Left slider |
| Camber | Throttle stick, slider, or 3p switch | MIXERS → **20Camber** → source | Right slider |

### 7.4.2 Reversing crow, motor and camber controls

You can reverse any of the above controls.

1. Go to the MIXERS menu, highlight the relevant mixer as shown in the table above.
2. Open the mixer editor.
3. Highlight the source field, click the 'hamburger' menu then long press {Enter}.
4. A popup for the options will be displayed; click on 'negative'.

## 7.5 ADJUSTING CROW STICK DEADBAND

The crow input incorporates some deadband to avoid prevent accidental deployment. The default value should suit most pilots, however it can be adjusted as follows:

1. Go to CURVES menu.
2. Open  CrowControl curve
3. Adjust point2→x.  Default value is 85%. Leave y at 100%.

## 7.6 CONFIGURING THE VOLTAGE ALARM

The low battery alert is disabled by default. When enabled, it sounds a "receiver battery low" alert at intervals while the voltage is below a configurable threshold. The alert stops if/when the voltage recovers.

To configure and activate the low battery alarm:

1. Go to the LOGICAL SWITCHES menu, open LS61:RXBAT_LOW.
2. Set the source to 'LiPo' or 'RxBat' as required (you may need to discover sensors first)
3. Set *Value(X)* to threshold voltage.
4. Go to the SPECIAL FUNCTIONS menu, locate SF with condition = 'RXBAT_LOW'.
5. Press {long enter} to open the editor
6. Set *State* to 'enabled' and set the repeat interval.

## 7.7 SUPPRESSING 'MOTOR IS ARMED' ALERTS

By default, an alert is sounded every 15 seconds when the motor is armed but not running. If you're confident with motor operation, you can suppress the repeats. To do this:

- Go to the Special Functions menu
- Locate SF with condition = 'ARMED_NOT_RUN'
- Press {long enter} to open the editor
- Set state to 'disabled.

The alert will now sound once only, immediately after the motor is armed.

## 7.8 ACTIVATING 'COMPETITION' OPERATING MODE

E-Soar Maxx offers a 'Competition' operating mode, with advanced features for F5J competition. This mode is hidden by default. To unlock Competition mode please refer to the document "Competition setup".

# 8 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:

1. Setup your model as described in this manual.
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 Ethos.

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

## If in doubt, DON'T FLY!!

If you have any queries or suggestions, or if you find any errors in the documentation, or just want to say hello, then please contact me at http://rc-soar.com/email.htm.
Safe flying!

Mike Shellim