

E-Soar Maxx for ETHOS

Version 2.1
for Ethos 1.5

Setup Guide

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E-Soar Max control layout (Mode 2 shown)

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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 |
|---------------------------------|---------------------------------------|
| esm21_SetupGuide.pdf | Setup guide (this document) |
| esm21_CompetitionSetupGuide.pdf | Guide to configuring Competition mode |
| esm21?_Reference.xls | Programming reference |
| esm21?xv.bin | Model file |
| *.wav | Sound files |

2 OVERVIEW

2.1 CONTROL ASSIGNMENTS

Stick mode is set in the SYSTEM→STICKS menu. The template supports all available stick modes.

Control assignments are shown in the table below. The defaults were designed around the X20 transmitter, however the controls may be reassigned as shown below.

| Function | Default control | How to re-assign |
|---|-----------------|------------------|
| Motor | Left slider | See section 8.4 |
| Crow | Throttle stick | See section 8.4 |
| Camber adjust (Thermal mode) | Right slider | See section 8.4 |
| Pitch trim, crow compensation, motor compensation | Elevator trim | - |
| Aileron diff | Rudder trim | - |
| Flight mode selector | SA | See section 8.1 |
| CAL mode Stop flight timer | SH (momentary) | See section 8.3 |
| 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 set per flight mode

Trims

- Aileron trim is shared across all flight modes
- Elevator trim is independent for each flight mode. The elevator trim also adjusts crow and motor compensation.
- There is no rudder trim adjustment (the rudder trim lever adjusts aileron diff - see below).
- Throttle trim is disabled

Camber and reflex

- In THERMAL mode camber is adjusted using right slider.
- Negative camber ('reflex') can be preset in SPEED mode,

Aileron-to-flap mix

- Aileron-to-flap mix can be preset per flight mode.

Crow->elevator compensation

- Crow compensation is continuously adjustable, via the elevator trim ('crow aware trim')

Motor->elevator compensation

- Motor->elevator compensation is adjustable via elevator trim.

Differential

- Diff is applied to both ailerons and flaps.
- Diff is adjustable using the Rudder trim for each flight mode.

Roll rate enhancement under braking

- Aileron diff is suppressed as brakes are deployed
- 'Reverse' diff can be applied to further lower the down-going aileron.

Aileron to Rudder mix

- Aileron to rudder mix can be preset, per flight mode.

Elevator-to-flap ('snapflap')

- Snapflap can be preset, 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 the motor

- SF↑

- ⚠ 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.

POWER flight mode

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

2.8 FLIGHT TIMER

Timer1 is configured as a flight timer.

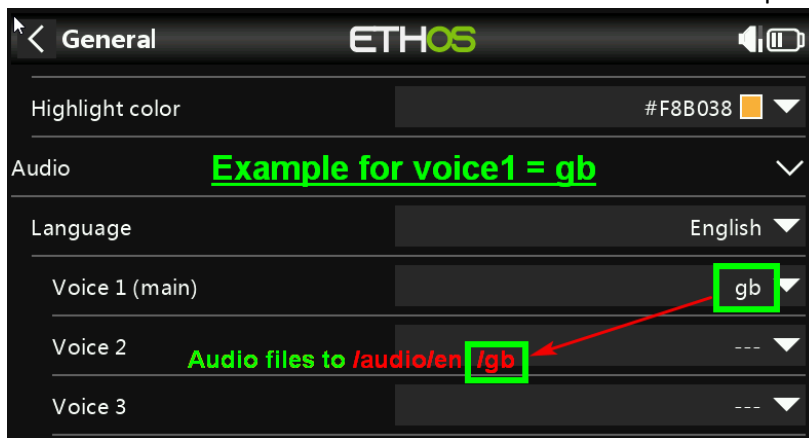
- To start and reset flight timer: start the motor
- To stop: press momentary switch (default SH).

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 **esm21?xv.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 'ESM21?xv'.
7. Click and choose 'Set current model'.
8. Go to the EDIT MODEL menu and change the name as desired.

If you can't see the model, then check that the version of Ethos is at least the minimum for this template.

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) 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 change the direction of each output. **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, set switch **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 ↑ LtAil goes up ↑ | In CAL mode, the ailerons move up together as the aileron stick is moved to the right. This is to aid visual calibration. |
| Thr stick forward ↑ | RtFlap goes up ↑ LtFlap goes up ↑ | |
| <i>V-TAIL only:</i> Ele stick forward ↑ | RtVee goes up ↑ LtVee goes up ↑ | In CAL mode, elevator operates in reverse direction to |

| | | |
|-------------------------------------|------------------|----------------|
| X-TAIL only: Ele stick forward ↑ | Ele goes up ↑ | normal. |
| X-TAIL only: Rud stick right → | Rud goes right → | |

To reverse an output:

- Open the MODELS→OUTPUTS menu
- Click on the relevant channel to open the edit menu
- Change the Invert option from 'Normal' to 'Reverse'.

7. Exit CAL mode and enter CRUISE mode.

8. Move the aileron, elevator and rudder sticks, and check for normal operation

Note: the flaps will not function yet!! Also, travel will be reduced.

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 | <p>Set the end points and centre for the left flap servo.</p> <ol style="list-style-type: none"> 1. Switch SA to middle 2. Enter CAL mode 3. In the OUTPUT menu, open CH4:LtFlap 4. Skip to the 'curve' field, and open the curve editor <ul style="list-style-type: none"> <input type="checkbox"/> Throttle stick back (↓), then adjust the absolute lower limit with curve point 1 or 3 (whichever works). <input type="checkbox"/> Throttle stick forward (↑), adjust absolute upper limit with point 3 (or 1). <input type="checkbox"/> Adjust point 2 so it's on the straight line through points 1 and 3. <i>Do not worry about the flap neutral position, it will be set later via a mix.</i> 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 | <p>Next, calibrate the right flap. A 5-point curve is used, using the left flap as a reference.</p> <ol style="list-style-type: none"> 1. Enter CAL mode 2. Switch SA to middle 3. In the OUTPUT menu, open CH3:RtFlap 4. Skip to the 'curve' field and open the curve editor. Adjust the points to exactly match the left flap. <i>Note: the order of the curve points may be reversed, if the first point doesn't work, try the alternative (in brackets).</i> <ul style="list-style-type: none"> <input type="checkbox"/> stick fully back, adjust point 1 (or 5) for the lower limit of travel. <input type="checkbox"/> stick ½-back, adjust point 2 (or 4) <input type="checkbox"/> stick to centre, adjust point 3. <input type="checkbox"/> stick to ½-forward, adjust point 4 (or 2) <input type="checkbox"/> stick fully forward, adjust point 5 (or 1) for the upper limit of travel <p>To match the end points on left and right sides, it may be necessary to reduce the corresponding end point for the left flap (see previous step).</p> <p>Do a final check. Pay particular attention the points adjacent to flap neutral.</p> |

| Target | Calibration procedure |
|---|---|
| Flap neutral | <p>Next, you'll set the flap neutral, by applying an offset mix.</p> <ol style="list-style-type: none"> 1. Enter CAL mode 2. Open the VARS menu 3. Scroll to mix V_FlapNeutral 4. Move switch SA down, and listen for 'calibrate flap neutral'. 5. Adjust the number in the <i>Values</i> field for correct neutral. <p>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.</p> |
| <i>V-Tail</i> CH 5: RtVee CH 6: LtVee | <p>For V-tail only</p> <ol style="list-style-type: none"> 1. Enter CAL mode (position of SA is not critical.) 2. In the OUTPUT menu, open CH5:RtVee 3. Skip to the 'curve' field, and open curve editor <ul style="list-style-type: none"> <input type="checkbox"/> Ele stick to centre, adjust point 2 for correct neutral <input type="checkbox"/> Ele stick forward (↑), adjust end point 3 (or 1) for upper (↑) travel limit. <input type="checkbox"/> Ele stick back (↓), adjust point 1 (or 3) for lower (↓) limit. 4. Repeat for CH6:LtVee 5. Check equal travel up/down; left and right surfaces match |
| <i>X-Tail</i> CH 5:Elev | <p>For X/T tail only</p> <ol style="list-style-type: none"> 1. Enter CAL mode. (Position of SA is not critical.) 2. In the OUTPUT menu, highlight CH5:Elev/RtVee 3. Skip to 'curve' field, open curve editor <ul style="list-style-type: none"> <input type="checkbox"/> Ele stick to centre, adjust point 2 for correct neutral <input type="checkbox"/> Ele stick forward (↑), adjust point 1 (or 3) point for upper (↑) limit <input type="checkbox"/> Ele stick back (↓), adjust point 3 (or 1) for lower (↓) limit 4. Check travel is equal up & down |
| <i>X-Tail</i> CH 6:Rudd | <p>For X/T tail only</p> <ol style="list-style-type: none"> 1. Enter CAL mode (position of SA is not critical.) 2. In the OUTPUT menu, highlight CH6:Rudd/LtVee 3. Skip to 'curve' field, open curve editor 4. Rudder stick to centre, adjust point 2 for neutral 5. Rudder right (→), adjust end point 1 (or 3) for right limit 6. Rudder left (←), adjust end point 3 (or 1) for left limit 7. Check equal travel left/right |
| CH 1:RtAil CH 2:LtAil | <p>Finally, calibrate ailerons:</p> <ol style="list-style-type: none"> 1. Enter CAL mode 2. Set switch SA to down position. The flaps will go to their calibrated neutrals. 3. In the OUTPUT menu, go to CH1:RtAil and open the curve editor <ul style="list-style-type: none"> <input type="checkbox"/> Aileron stick to centre. Set Point 2 for correct centre <input type="checkbox"/> Move aileron stick right (→). Set point 3 (or 1) for desired upper limit. <input type="checkbox"/> 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. <p>Don't worry if down-travel is excessive when you exit CAL – later adjustments to aileron rate and diff will reduce it.</p> 4. Repeat for CH2:LtAil 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 V_EleRates V_RudRates | Rates / control travel | Set the control surface travel in the <i>Values</i> field. You can override the default for specific flight modes by adding extra values for each mode. To do this: <ol style="list-style-type: none"> 1. Click 'Add a new value' 2. Click adjacent down arrow 3. Select category 'Flight modes', and choose the flight mode 4. Set the desired rate in the adjacent field <p>Safety note: Always set the default rate (first weight) so the model can be controlled safely. Do not set the default rate to zero!</p> |
| V_AilExpo V_EleExpo V_RudExpo | Expo | Set the default expo in the <i>Values</i> field. You can override the default for specific flight modes by adding extra values for each flight mode. To do this: <ol style="list-style-type: none"> 1. Click 'Add new value' 2. Click adjacent down arrow 3. Select category 'Flight modes', and choose the flight mode 4. Set the desired expo in the adjacent Value field. |

5.2 AILERON DIFFERENTIAL

Aileron differential reduces the travel of the downgoing aileron. It's adjusted using the rudder trim – trim right to increase movement (*decrease* diff), left to decrease movement (*increase* diff). It's easier to think of the trim as a roll rate control!

Note: Diff must be adjusted separately for each flight mode!

5.3 V-TAIL DIFFERENTIAL (NEW!)

This setting applies differential to the V-tail surfaces in response to yaw commands (rudder and aileron=>rudder). Applies to V-tail configurations only.

| VARS | Adjusts | Notes |
|-------------|---------------------|--|
| V_VtailDiff | V-tail differential | Set default diff in the <i>Values</i> field. You can over-ride the default for specific flight modes using same method as rates (see section 5.1). |

5.4 CROW BRAKES

This section describes how to configure crow brakes. As brakes are applied, the flaps move down and the ailerons (optionally) move up.

| VARS | Adjusts | Notes |
|--------------|---------------------|--|
| V_CrowToFlap | Crow to flap mix | The flaps move down as crow is deployed. To configure: <ol style="list-style-type: none"> 1. Enter LANDING mode. 2. Deploy full crow. 3. Adjust <i>values</i> field for desired downward flap movement. |
| V_CrowtoAil | Crow to aileron mix | The ailerons optionally move up as crow is deployed. To configure: <ol style="list-style-type: none"> 1. Enter LANDING mode. 2. Deploy full crow. 3. Adjust <i>values</i> field for desired upward aileron movement. |
| V_RevDiff | Reverse diff | With this setting, 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: <ol style="list-style-type: none"> 1. Activate LANDING mode. 2. Apply full crow and full aileron. 3. Adjust <i>values</i> field so that the down going aileron is a little below the neutral position. NOTE: this measure for improving roll response is in addition to the suppression of aileron diff as crow is deployed (this is done automatically). |

5.5 CROW AWARE TRIM (NEW IN 2.1!)

Version 2.1 introduces a Crow aware trim system. Using this feature, you can trim out your brakes precisely *throughout the crow range*, using the regular elevator trim.

How does it work? Put simply: in LANDING MODE the elevator trim is repurposed to *bend the crow compensation curve*. The effect is to make the trim continuously variable. To see how it works,

- Apply say 50% crow
- Move the elevator trim.
- Move the crow stick back and forth, and see how the elevator responds at the 50% position.
- Repeat at other crow settings.

To trim out the brakes during flight, first trim out the model in Cruise mode. Then apply varying amounts of crow and adjust elevator trim as needed. **There is no need to look at the screen.**

Technical note: at transition into LANDING mode, the base trim is inherited from CRUISE mode. As crow is applied, the compensation is added to the base trim to give the final trim offset.

5.6 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 <i>Values</i> 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). When configuring, concentrate on the upward flap movement only (downward movement is adjusted via the diff setting using the rudder trim). |

5.7 AILERON => RUDDER

This mix is useful for improving turn response.

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

5.8 CAMBER

The camber mix is for slow flight (THERMAL mode)

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

5.9 REFLEX

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

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

5.10 ELE => FLAP ('SNAPFLAP')

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

| VARS | Adjusts | Notes |
|-----------------------------|-----------------|--|
| V_SnapToAil V_SnapToFlap | Snapflap amount | Adjust <i>Values</i> lines for each of CRUISE, THERMAL and SPEED modes. Leave the first line (default) at zero. Aileron and flaps are configured separately. |

5.11 MOTOR => ELEVATOR (NEW BEHAVIOUR IN 2.1)

Also known as Motor compensation, this mix applies an increasing amount of elevator offset as the motor is advanced. The mix is active in POWER mode only. The direction and amount of the offset is adjusted using the *elevator* trim. (NOTE: earlier versions of the template used the throttle trim).

This VAR setting determines the *maximum possible* compensation. The default should be fine for most models.

| VARS | Adjusts | Notes |
|-------------|----------------------|---|
| V_MotorComp | Maximum compensation | Sets the limit of compensation available from the elevator trim. The default is +/-50% of elevator travel and should be sufficient. |

Setting the initial compensation on the bench

1. Disconnect the ESC (safety!), power the receiver and servos using a spare battery.
2. Go to the OUTPUTS screen.
3. Activate POWER mode, and advance the motor lever to simulate maximum power
4. Adjust the elevator trim according to the manual for your model.

Technical note: In POWER mode, Total trim = trim from CRUISE mode + compensation.

6 MOTOR SAFETY CHECK

Before connecting the motor/ESC, check the motor channel for correct operation as follows:

1. Disconnect the motor
2. Go to the **OUTPUTS** screen.
3. With the motor disarmed, check that CH7 is -100%
4. Simulate full power and check that CH7 is +100%

7 SUMMARY OF TRIMS

Summary of the trim functions:

| Trim | Flight mode | Adjusts | Notes |
|---------------|------------------------------|-----------------------------|--|
| Aileron trim | [All] | Aileron Trim | Trim value is shared across all flight modes. |
| Rudder trim | [All] | Aileron Diff | Diff range between 0 and 70%. Trim centre corresponds to 35% diff. Adjust for each flight mode. |
| Elevator trim | Landing | Pitch trim with crow brakes | Continuously variable trim |
| | Power | Pitch trim at full throttle | Adjusts motor=>elevator compensation |
| | Cruise, Thermal, Speed | Pitch trim | Regular trim |

8 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).

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

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

8.2 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.

8.3 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.

8.4 CONFIGURING CROW, MOTOR AND CAMBER CONTROLS

8.4.1 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 |

8.4.2 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 icon then long press {Enter}.
4. A popup for the options will be displayed; click on 'negative'.

8.5 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%.

8.6 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 'RxBatt' 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.

8.7 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 PlayAudio (esm1motornotarmed)(15s) - note it's the one with the '(15s)' suffix
- Press {long enter} to open the editor
- Set state to 'disabled'.

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

8.8 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".

9 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.

10 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