

SMOOTH FLITE 16 RRS



Version 7 User Guide

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Thank you for your purchase of the Advance Radio Smooth Flite System.

The Advanced Radio Smooth Flite system was designed with Giant Scale Models in mind and combines Power Distribution, Flite Stabilisation and a 16 Channel Servo control system in the lightest package in it's class (less than 50 grams).

In the past trimming and matching servos would take place via the transmitter. This old school thought would limit you to the number of channels available from the transmitter. With Smooth Flite these functions have been moved to the Smooth Flite system and in doing so brings you much more functionality and flexibility in model setup. You gain at the touch of a button as many as 16 servo outputs that can all be mixed, matched, sub trimmed, reversed and endpoint adjusted. The power of this new system and thought process will become obvious as you start to use the Smooth Flite System.

To add to this we have created much more than just a simple Gyroscope based system. We decided to include a 3 axis gyro, accelerometer, compass and barometer into the hardware. The combination of these sensors gives you much more flexibility in flight stabilisation and that is why we called it Smooth Flite!

LETS GET STARTED — in this guide we will show you how to connect your new Smooth Flite system, General use and setup as well as how to get the most out of the Smooth Flite stabilisation system. Please take the time to read & understand this guide before installation.

TOUCH SCREEN—The touch screen display supplied with the Smooth Flite should be protected from vibration. We don't recommend mounting the Smart Screen in models with gas powered engines.

BATTERIES—Before installation please ensure that your batteries are fully charged. The Smooth Flite System relies on this to know how much your model has consumed from each pack. Smooth Flite collects this information and displays this as a set of battery cells indicators on the Smart Screen. NEVER FLY WITH BATTERY PACKS THAT HAVE 35% OR LESS CAPACITY (RED ZONE ON THE BATTERY INDICATOR). Doing so may put your model at risk.

RECEIVER INSTALLATION—Some receivers don't offer protection against incorrect polarity or pin offset. IT IS IMPORTANT that you observe correct polarity and pins when connecting the receivers to the Smooth Flite system.

Included Items:

- 1 x Live feedback touch screen Smart display
- 1 x Smooth Flite power distribution module.
- 1 x Power LED
- 3 x Receiver cables

Optional Items:

- Pin Flag switch with Advance Radio Flag
- Remote FOB Switch with Advance Radio Flag
- Magnetic Switch with Advance Radio Flag
- 2 x Receivers

Features:

- Built-in Battery Guard Technology. The Smooth Flite constantly monitors battery voltage and current draw and displays this on the Smart Screen display.
- Works with single or dual battery configuration. *Recommended with dual battery.
- Works with all major battery chemistries. LiFe. LiPo, Lion, NiMh, NiCD. Battery voltage range can be from 6volts to 8.4volts.
- Full Dual Battery Redundancy - If one battery fails the other battery takes full control.
- Dual receiver redundancy
- Up to 16 input channels (depending on transmitter capability)
- 16 fully assignable and programmable servo outputs.
- Easy-to-use pre-routed servo routing.
- Independent servo reverse on all channels.
- Sub Trim and end point (3 point) matching on all channels.
- Advanced 15 point matching on all channels
- Maximum Battery Power Balancing – Using dual battery perfect diode technology.
- Proprietary Smooth Flite System with 3 axis Gyro, Accelerometer and Barometer.

Installation and Mounting Instructions

In this section we will explain how to mount both the Smooth Flite and the Smart Display.

The Advanced Radio Smart System gives you the choice of mounting the Smart Screen in the Model or leaving it disconnected for normal flying. The Smooth Flite will operate in normal flying mode without the Smart Screen Connected.

Smart Screen Mounting

If your model is a gas powered and has a high level of vibration then we don't recommend mounting the screen in the model unless you provide a high level of vibration damping when mounting the screen.

If your model provides a low vibration environment (Turbine, Sail Plane, Electric model) then hard mounting of the Smart Screen is possible.

The Smooth Flite provides downlink telemetry so it is not necessary to mount the Smart Screen in the model to view battery data.

Mounting the Smooth Flite System

The Smooth Flite 16 should be securely mounted to the electronics component plate via the 4 mounting holes provided in the case. A loose unit could have undesirable consequences when the gyro is active.

Mounting the Smart Display

To save weight the Smart Screen is not required for normal flying usage. It is only required for programming the Smooth Flite.

Should you wish to mount the Smart Screen in the model for quick battery checks etc then we recommend 2 options of mounting the Smart Screen display.

NOTE: Whichever method of mounting you choose, ensure the cable that comes out of the Smart Screen Display is not crushed in any way. Doing so will reduce the longevity of the cables.

Option 1. Using 3M Velcro adhesives, you can mount the back of the screen to a surface.

NOTE: This is a semi hard mount, and will provide a good resistance to vibration. AVOID MOUNTING IN HIGH VIBRATION AREAS. VIBRATION DAMAGE IS NOT COVERED UNDER WARRANTY. Clean both the back of the Smart Screen and surface that it is being mounted on. Place 3M dots/tape each side of the cable. Trimming as necessary.

IMPORTANT: DO NOT APPLY FORCE DIRECTLY ONTO THE SCREEN

Press on the black case around the screen to ensure it is secure.

Option 2. For hard mounting. The screen case has 2 eyelet holes on each edge of the screen. If you are mounting the screen in a scale cockpit, or in a non vibration model. (e.g. Turbine) these holes can be used to affix the Smart Display.

Simply place the Smart Display where you wish to mount it. Holding it in place, make a dot using a pen or pencil in each eyelet hole. Removing the screen, drill a hole where you placed the dots.

Now simply screw the Smart Display in place.

NOTE: Hard mounting the Smart Display provides little to NO protection against vibration. Use this method if you are using a non vibration model or ONLY where there is little to no vibration. AVOID MOUNTING IN HIGH VIBRATION AREAS.

General Usage and Screen Information

Important: The Smart Screen Display supplied with the Smooth Flite is a touch screen display. It is used in both setup and provides feedback to the user about battery voltage and milliamps used. The screen can be mounted in a model for quick and easy use. However the Smooth Flite will operate during normal flying mode without the Smart Screen connected.

Below is an overview of each screen on the Smooth Flite

Main Smart Screen Display

Battery 1 (B1) and Battery 2 (B2)

Shows input voltage of both battery packs.

Total mA

Shows total milliamps since last charge.

Press here to enter the [Main Menu](#)

Last mA

Shows milliamps used since model was last powered up and resets when model is turned off. Press here to reset [flight timer](#) and [Last mA](#).

FL-T

Flight timer since model was turned on. The timer only operates while on the main screen.

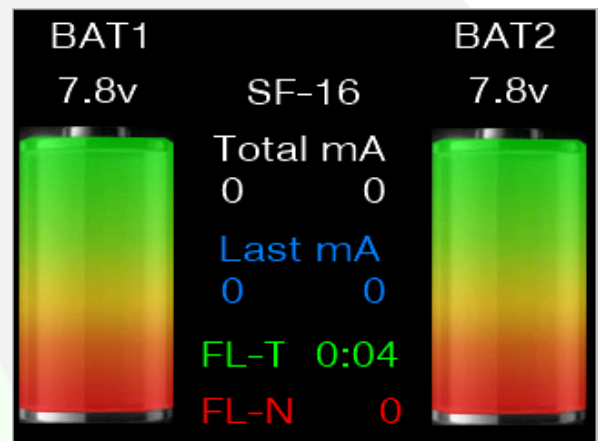
FL-N

Flight number since reset. Gives an indication of number of flights on the models airframe.

Battery Indicators

Shows the remaining capacity in the batteries from 100%

- 0%. **NEVER FLY IF THE INDICATORS ARE IN THE RED.**



Main Menu

Return

Returns back to the previous screen.

Power

Press here to go to the battery setup and reset menu.

Monitor

Press here to go to servo programming menu.

I/O Routing

Pressing here will take you to the channel routing screen.

Servo Match

Pressing here will take you to the 3 point and 15 point servo matching screen,

Receiver

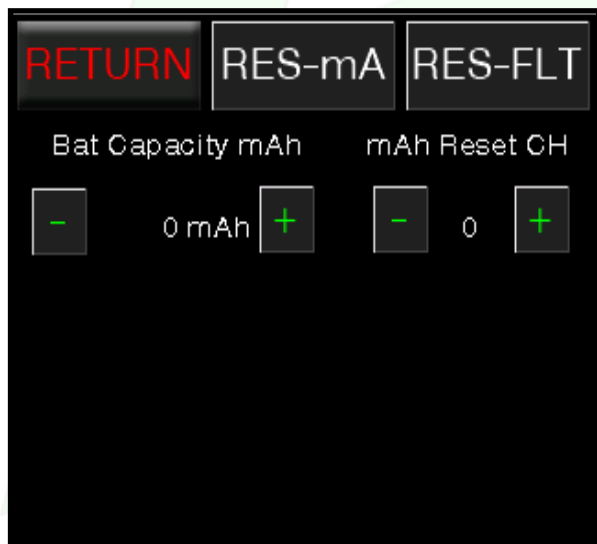
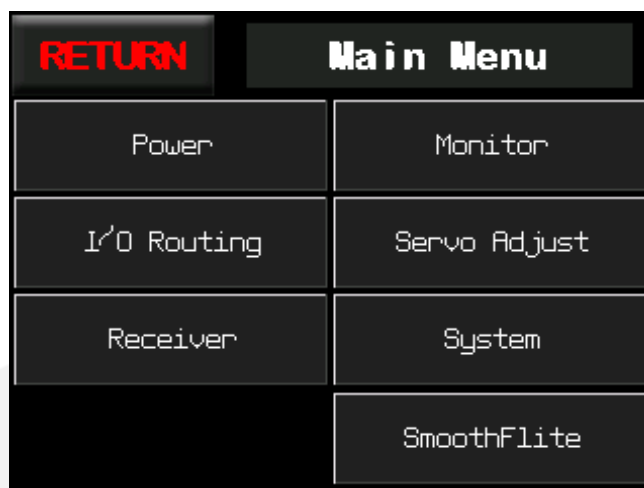
Pressing here will take you to the receiver and frame rate monitor screen.

System

Pressing here will take you to the system page which contains credits and system information

Smooth Flite

Pressing here will take you to the Smooth Flite page.



Power Setup Screen

Return

Takes you back to the previous screen.

RES-mA

Resets total mA used. Please ensure both packs are **FULLY** charged before you reset.

RES-FLT

Resets flight counter and timer to zero. Use this feature mostly when installing in a new airframe or before the maiden flight.

Bat Capacity mA

Shows the capacity of the batteries you are using. We will go through how to set this in the First Time Setup section on page 10.

mAh Reset CH (NEW TO VERSION 7)

Assign a spare channel in your transmitter to a momentary switch.

Use the + and Minus keys to select the assigned transmitter channel.

Holding the momentary switch on for 5 seconds will reset the mAh counters. You may need to reverse the switch function in the transmitter.

I/O Routing Screen

Save

Takes you back to the previous screen and saves your routing choices.

- and + buttons

Press the + and - buttons to select input channels from the transmitter.

Press and hold the + button to automatically increment the transmitter input channel.

Press and hold the - button to decrement the input channel.

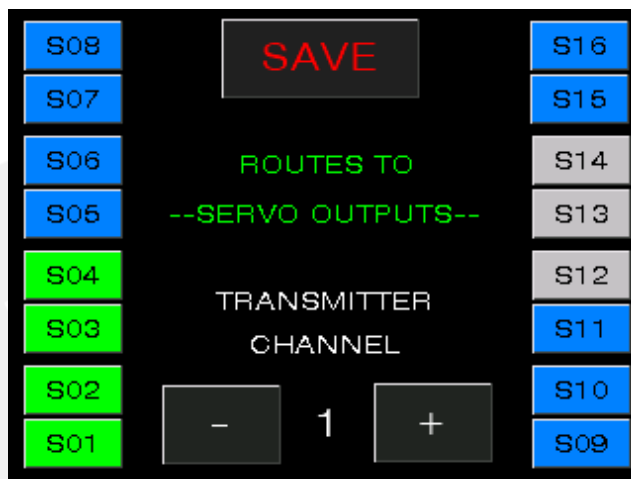
The selected transmitter channel will be routed to any selected (green) servo output.

SF16 version 7.10 upwards can accept up to 20

input channels or as many input channels that your transmitter is capable of sending.

Note: you can only rout input channels that are available from your transmitter.

Example: you can not assign a servo to use transmitter channel 16 when using a 10 channel transmitter.



S01 to S16

S01 to S16 buttons correspond to the servo outputs on the SF16. They can be in 3 colours states and each colour indicates as follows:

Green = The servo output is assigned to the current receiver channel. For Example, in the picture above: **S01, S02, S03 and S04** are currently **assigned (grouped) to transmitter channel 1**.

Blue = The servo output is available to assign. I.E they are not assigned to any receiver channel yet and may be freely selected.

Grey = The servo output has been assigned to a different transmitter input channel and cannot be selected.



Servo Matching screen

Return

Takes you back to the previous screen.

S01—S16

Pressing any of these buttons will take you to the servo matching page for the corresponding servo output on the Smooth Flite. Here you can match the servos with the 3 point and 15 point matching.

Channel Monitor screen

Return

Takes you back to the previous screen.

1/2

Changes the page to higher channels.

Channel Bars

The bars show the current input channels and position.

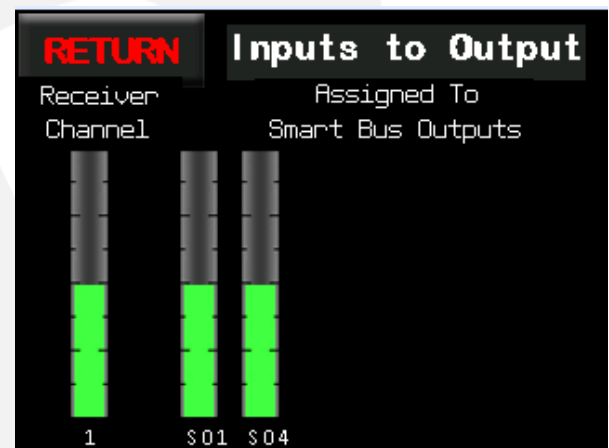
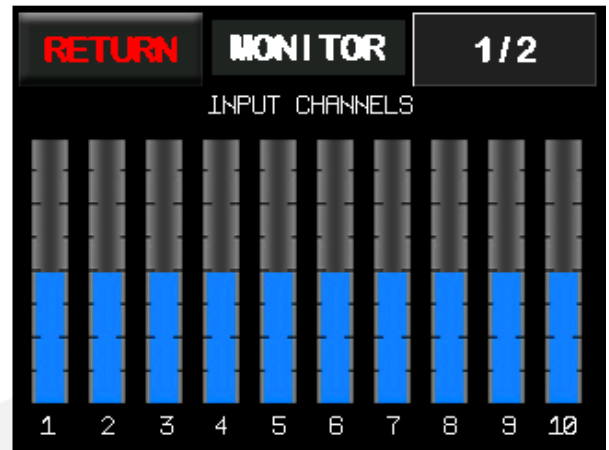
Note: The bars have two colours.

Blue = no servo output has been assigned.

Green = one or more servo outputs has been assigned to this channel.

Tapping any of the green bars will take you to the inputs to outputs screen and show corresponding assigned input to output channel(s).

We will expand on this feature in the servo matching



Sub Trim and Servo Match Menu

Return

Returns you back to the previous screen.

Servo Direction

Reverses the selected servo direction.

Sub Trim & Servo Match

Takes you to the Sub Trim page for the chosen Servo

15 point Servo Match

Takes you to the Multi-point match page.

Sub Trim

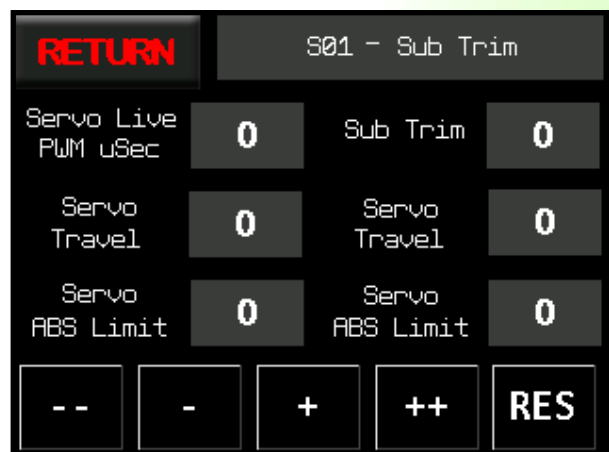
Return Returns you back to the previous screen.

Servo Live PWM Shows the live PWM value of the servo output.

Sub Trim Level shifts the entire range of the chosen servo channel.

Servo Travel Are end point adjustment to increase or reduce servo range relative to stick movement. Also used in conjunction to match multiple servos.

Servo ABS Limit Adjusts the absolute maximum and minimum travel of a servo.



15 Point Servo Matching

Return

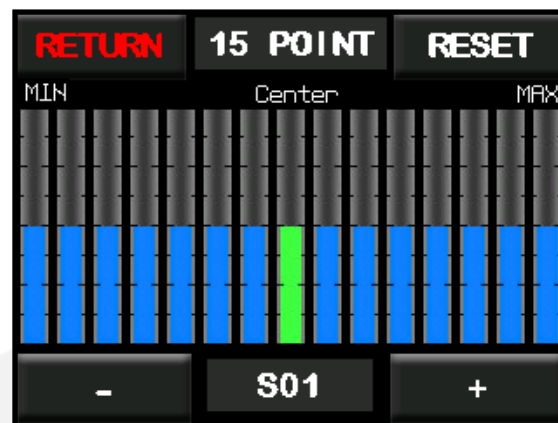
Takes you back to the previous screen.

Reset

Resets the sub trim values back to default.

Vertical Bars

Shows the sub trim applied to the servo. The sub trim values can be changed using the **DEC**, **INC** buttons.



Receiver Page

Return

Takes you back to the previous screen.

Reset

Resets the receiver values back to zero.

Frames

Shows good frames received by each receivers.

Drops

Shows frames not used by the receivers.

Fails

Shows frames received by Smooth Flite with an incorrect checksum value.

Frame Rate

Set the output frame rate of the signal to the servos.

Fail Safe Button

Takes the user to the fail safe set up screen.

Receiver			
Rec	Frames	Drops	FailSafe
1	0	0	0
2	0	0	0
3	0	0	0
Set Fail Safe			

Fail Safe Screen

Return

Takes you back to the previous screen.

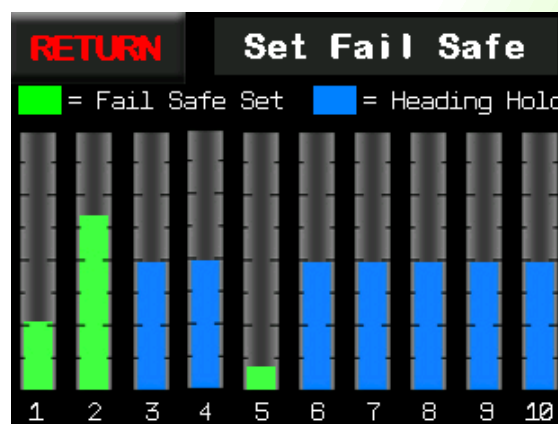
Vertical Bars

Shows the fail safe values based on stick position from the radio. Fail safe is set by pressing the corresponding blue bar.

Note: The bars have two colours.

Blue = Fail safe is set to heading hold for that transmitter channel.

Green = Fail safe is set to a specific position based on the radio



First Time Battery Setup

We are now going to go proceed with a first time setup of the Smooth Flite .

Please ensure your batteries are fully charged before you setup the Smooth Flite.

If you need any additional help with what each button or item does please read the General Usage and Screen information page located on page 7 of this manual.

We recommend you do not have any servos connected to the Smooth Flite during the first time setup.

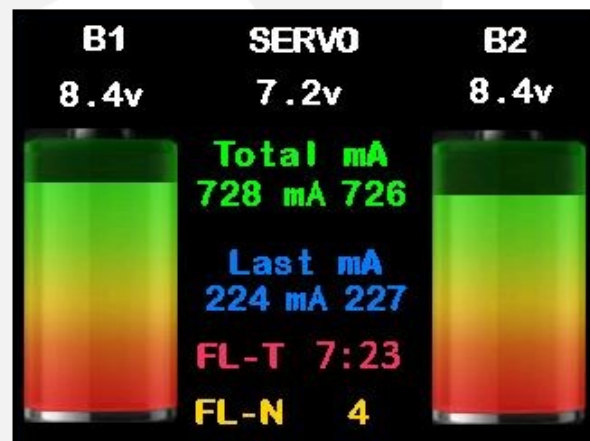
Step 1

Ensure that both batteries are plugged into the Smooth Flite. You will also need to ensure the Smart display is plugged into the switch as it is used for programming.

Upon power up, you will see the AR logo. After a few seconds the Smart Screen will be shown.

Step 2

Press the green **Total mA** text on the Smart Screen, this will take you to the main menu.



Step 3

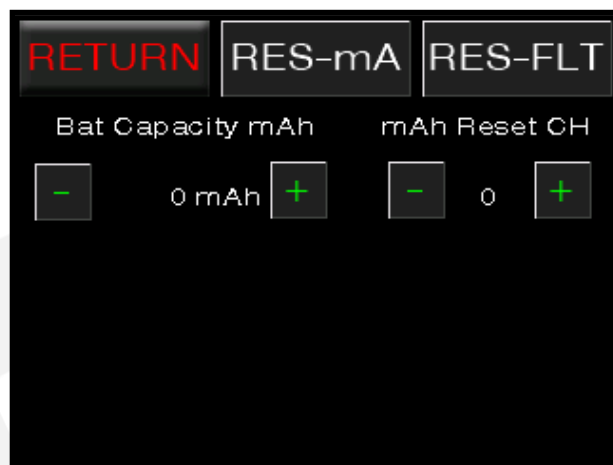
You should now see the Main Menu Screen. Press the **POWER** button on the screen.

Step 4

This is the battery setup screen. Using the a(+, -) buttons below the **Bat Capacity mA** to increase or decrease until you see the correct capacity of one of the connected batteries.

Note: Step 4 is extremely important! Please ensure the capacity is set correctly to the battery packs you are using.

The Smooth Flite uses this capacity value to show the remaining battery capacity on the main screen. If you set this value incorrectly then the remaining capacity indicators may not show the correct remaining battery capacity.



mAh Reset CH (NEW TO VERSION 7)

Assign a spare channel in your transmitter to a momentary switch.

Use the + and Minus keys to select the assigned transmitter channel.

Holding the momentary switch on for 5 seconds will reset the mAh counters. You may need to reverse the switch function in the transmitter.

A value of 0 disables the function

Step 5

Once you have setup these parameters, press the **RETURN** button to save and return to the main menu. Press **RETURN** again to go back to the Smart Screen. You have successfully setup the Smooth Flite Battery monitoring.

Important

The Smart display main Screen shows how much capacity you have left using the battery indicators on the left and right of the battery screen. It is important that the capacity you enter is correct and accurate. If you are unsure about the capacity of your batteries or if your packs are not new we recommend cycling your packs by discharging them and recharging them to full. This will give you the best possible result for the battery packs you are using.

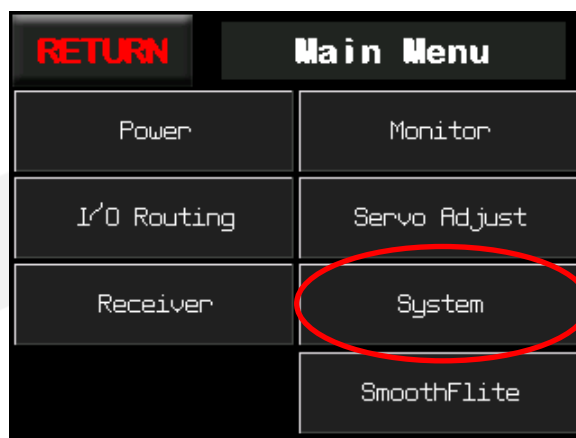
Protocol Selection

Before connecting receivers to the Smooth Flite RRS you will need to select the appropriate protocol to match to your transmitter system. Smooth Flite system supports the following protocols:

SBUS, SBUS2, XBUS, Jeti EX Bus, FRSKY, HOTT, SRXL, SRXL2 and Core in SBUS mode.

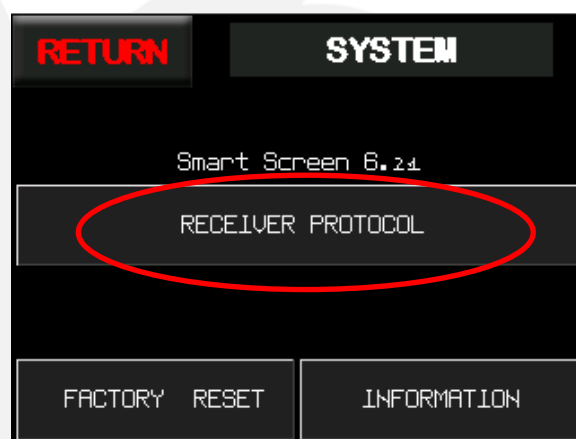
Step 1

From the main Menu tap the "System" button.



Step 2

From the System Page tap "Receiver Protocol".



Step 3

Tap the appropriate button that matches the protocol of your transmitter/receiver system.

Futaba = SBUS2

JR/DFA = X-BUS

Graupner = HOTT

JETI = JETI EX

Spektrum SRXL = AR8010T/ AR9030T receivers.

FRSKY S=Port = SBUS2 with S-Port telemetry

Spektrum SRXL2 or SRXL DX18 Mode = SPM4651T

DO NOT CONNECT 3.3V Spektrum Satellite receivers to the SF16 version of the Smooth Flite.

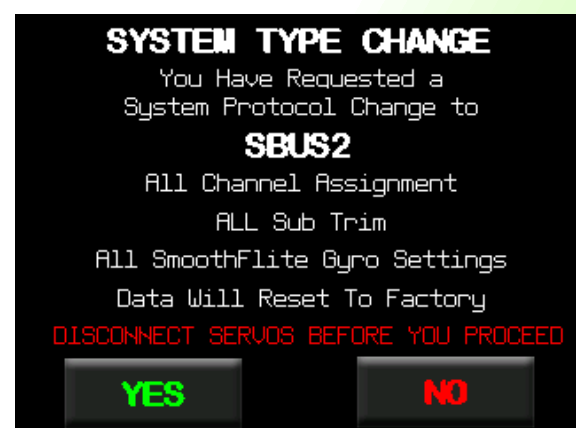
Core SBUS = SBUS receiver connectivity.

Multiplex SRXL = Multiplex SRXL



After making the selection you will be asked to confirm.

PLEASE NOTE changing the protocol will reset the Smooth Flite system to factory defaults erasing all input to output routing, sub trim and Smooth Flite Gyro settings.



Installing the Receivers ARXL Version

The Smooth Flite ARXL includes two receiver connection cables and possibly a third telemetry cable. (For Spektrum SRXL2 receivers you will need to purchase part number BRC857), Standard receiver cables are generally supplied preconnected to the Smooth Flite. These can then be connected to the SBUS2, SRXL, JR XBus, Jeti EX Bus, HOTT port on your receiver.

PLEASE NOTE the polarity of the receiver signal and ground on the receiver before connecting to the Smooth Flite.

The Smooth Flite system will work with either a single or dual receiver setup. The receivers **MUST BE** capable of 7.4V .

We recommend using two HV (high voltage) receivers or similar. If you are unsure please contact Advanced Radio for details.

The Smooth Flite System is designed to supply the power to all the servos. NEVER connect servos directly to the receiver when using the Smooth Flite System.

Note: For more information on how to setup and bind single or dual receivers, please consult your transmitter and receiver manual supplied by the manufacturer.



Please note cable polarity on a RG812BX



Please note cable position on a 7008 receiver. It is possible to plug into the ground pins of the receiver and this may damage the receiver and Smooth Flite system.



Redundant Receiver Cable

Spektrum Receivers = Connect to SRXL/SRXL2 port .

Futaba Receivers = Connect to SBUS2 port.

JR/FDA Receivers = Connect to XBUS port.

JETI Receivers = Connect to EX BUS port.

Graupner Receivers = Connect to SUMD port.

FRSky Receivers = Connect to SBUS port.

Core Receivers = SBUS port.

System Specific Receiver Installation

Please observe the correct polarity and pin placement when connecting the receivers.

Smooth Flite sends telemetry of battery voltage, current and mAh consumption downlink to the connected receivers.

Futaba SBUS2 System.

Smooth Flite supports dual SBUS2 receivers. SBUS2 provides up to 18 channels into the Smooth Flite (depending on transmitter) routed to any of the 16 servo outputs. Connect the two supplied receiver cables to SBUS2 ports.

Please observe the correct polarity and pin placement when connecting the receivers. Telemetry is provided from port R1. No additional translator accessory is required. Only the first bound receiver will accept telemetry in a Futaba system. You **MUST** connect this receiver to port R1 of the Smooth Flite system to receive telemetry.

Jeti EX-BUS System.

Smooth Flite supports all Jeti EX-Bus capable receivers. Jeti EX provides up to 16 channels (depending on transmitter) into the Smooth Flite routed to any of the 16 servo output channels. When using two JETI EX BUS receivers with Smooth Flite you connect receivers to Smooth Flite ports R1 and R2 and to the EXT port of each receiver. Set the receivers to EX bus mode on the Jeti Transmitter. **Please observe the correct polarity and pin placement when connecting the receivers.** Telemetry is provided via the EX bus cable on Smooth Flite port R1.

JR/DFA X-BUS System.

Smooth Flite supports all JR/DFA receivers with XBUS-A. XBUS-A protocol supports up to 16 channels into the Smooth Flite (depending on transmitter) routed to any of the 16 servo output channels. Connect the two supplied receiver cables to Smooth Flite ports R1 and R2 and then to the receiver. **Please observe the correct polarity and pin placement when connecting the receivers.** For Telemetry connect port TEL of the Smooth Flite to the Battery/Sense port of either receiver.

FRSKY.

Smooth Flite supports S-Port capable receivers. Up to 16 channels are available (depending on transmitter) into the Smooth Flite routed to any of the 16 servo output channels. When using two S-Port receivers with Smooth Flite you connect receivers to Smooth Flite ports R1 and R2 and to the SBUS. **Please observe the correct polarity and pin placement when connecting the receivers.** For Telemetry connect port TEL of the Smooth Flite to the S-Port of the primary receiver.

Spektrum SRXL (version 1) System. NOTE This is NOT SRXL2 but it is the original Spektrum SRXL

Connect with the supplied receiver cables one or two SRXL receivers to the SF16 ports marked R1 and R2. Connects to the receiver SRXL port (please note the polarity of the port connection on the receiver).

Please Note: Spektrum SRXL does not support downlink telemetry from external devices. Receiver voltage is however sent from the receiver.

System Specific Receiver installation

Spektrum SRXL2 System. The newest and more powerful SRXL2 system

Version 7.10 and higher of SF16 supports the full features of SRXL2 protocol. SF16 will receive 20 channels when using SRXL2 receivers and depending on your radio TX capabilities.

SF16 Telemetry is sent always sent from the SF16 out from the port marked R1.

From version 7.10 onwards you have several new methods of running the SRXL2 protocol devices.

1) **Method 1: (NEW TO VERSION 7)**

1 x (AR8020T or AR6610T) connected to SF16 R1 port and up to 2 x SPM9747 on port R2 and port marked TEL. **Please note:** For this configuration to work **YOU MUST** have at least 1 x (AR8020T or AR6610T) and 1 x SPM9747 connected to the SF16 to enable strong serial communications.

With this configuration SF16 will send its telemetry from port R1 to the (AR8020T or AR6610T).

The benefit of this configuration is that you will get all the telemetry available from the (AR8020T or AR6610T) receivers as well as the SF16 telemetry.

You will also be able to connect other third party telemetry devices like turbine telemetry to the Xbus port on the (AR8020T or AR6610T).

Connections.

Connect 1 of the supplied receiver cables from SF16 R1 port to the (AR8020T or AR6610T) 3 pin port marked Bind/Prog/SRXL2.

Connect 1 or 2 SPM9747 satellite receivers to R2 port and Tel port.

Please Note: The SPM9747 satellite receiver uses a new 4 pin connector. You will require 4pin to 3 pin adaptor leads SKU BRC857 from AR to connect SRXL2 satellite receivers to SF16.

1) **Method 2:**

1 x SPM4651T telemetry satellites on port 1 and 2 x SPM9747 (non telemetry) satellite receivers.

Using 2 x satellite receivers will allow SF16 to send telemetry data but you will not get external telemetry from third party devices.

Please Note: The SPM9747 satellite receiver uses a new 4 pin connector. You will require 4pin to 3 pin adaptor leads SKU BRC857 from AR to connect SRXL2 satellite receivers to SF16.

Graupner HOTT System.

Smooth Flite supports all receivers with HOTT protocol. HOTT receivers provide up to 16 channels (depending and transmitter) into the Smooth Flite routed to any of the 16 servo output channels. Connect receivers to Smooth Flite ports R1 and R2 to the SUMD port of the HOTT receiver. You will need to set the receiver to SUMD.

Please observe the correct polarity and pin placement when connecting the receivers. For Telemetry connect port TEL of the Smooth Flite to the telemetry port of either HOTT receiver.

Power Box Core

Smooth Flite supports SBUS capable Core receivers. Up to 18 channels are available (depending on transmitter) into the Smooth Flite 16 routed to any of the 16 servo output channels. Connect receivers to Smooth Flite ports R1 and R2 and to the SBUS port on the receiver. **Please observe the correct polarity and pin placement when connecting the receivers.** Battery telemetry is supplied by the receivers.

Please observe the correct polarity and pin placement when connecting the receivers.

Input Channel to Servo Output Routing

During this stage, we will install the receiver and servos.

Important: Check the recommended voltage range of your servos, supplying excessive voltage to your servos may cause damage to the servos.

Before connecting any servos to the Smooth Flite we recommend reading through the following steps. This will allow you to familiarise yourself with Smooth Flite in order to use it to its fullest potential.

During the setup if you have multiple servos on a control surface (Example: 2 servos on an aileron). We recommend setting up the master servo before mechanically connecting the slave.

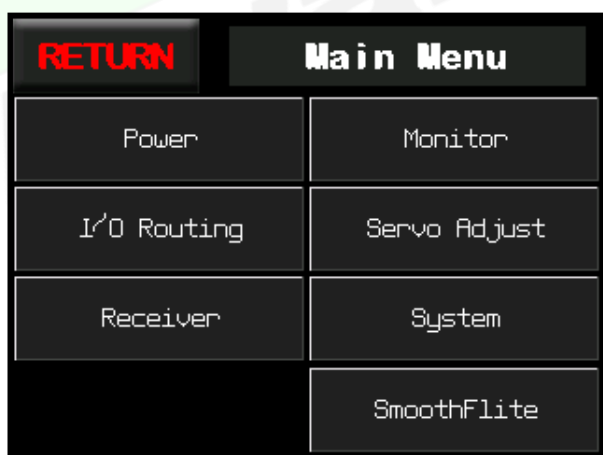
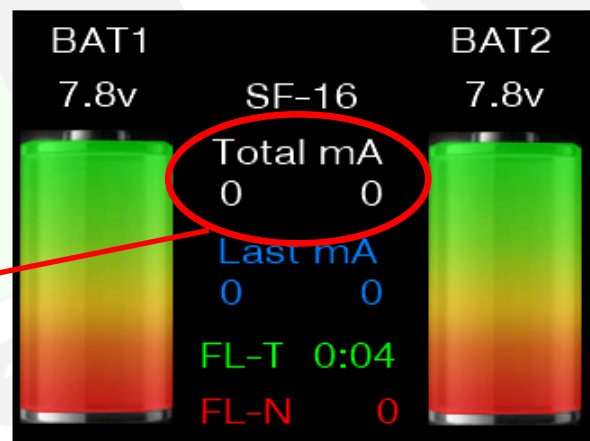
Step 1

Ensure that both batteries are plugged into the Smooth Flite. You will need to plug in the Smart Screen as it is used for programming. Ensure your receiver is plugged into the Smooth Flite and your transmitter is on and bound to your receiver.

For more information see page 6.

Step 2

Press the **Total mA** text on the Smart Screen, this will take you to the main menu.



Step 3

You should now see the Main Menu Screen. Press the **MONITOR** button on the screen. This will take you to the receiver input channel monitor.

Note: The monitor gives you a visual indication of the assigned input channels from your receiver. Your new Smooth Flite RRS comes with primary control surfaces pre-assigned to simplify your setup.

Hint: Create a new model on your transmitter with dual aileron channels, single elevator and single rudder channels.

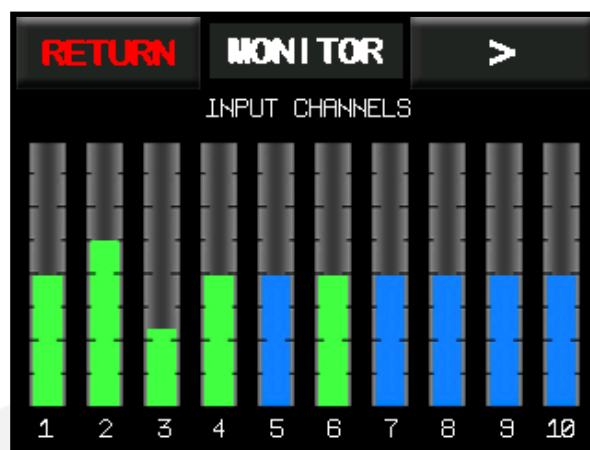
If all is connected correctly, moving the transmitter sticks will cause the green bars on the monitor screen to move.

As you can see, the monitor screen is a good tool for viewing input channel assignments.

For advance setups, we have included a blank assignment sheet at the end of this user guide.

The following steps will show you how you can re-assign channels from the factory setup.

Press return from the monitor screen to return to the main menu.



Step 4

From the main menu, tap the I/O Routing button. The screen (on the left) should appear. In this example, transmitter input channel 1 (coloured white) routes to servo outputs S01, S02, S03 and S04, which are coloured green.

Lets show how easy it is to assign and de-assign additional servo outputs to transmitter channel 1.

Tap the Blue S09 button on the Smart Screen. The S09 should turn green. We have now added servo output 19(S09) to transmitter input channel 1. Smooth Flite makes it that simple!

Tapping S09 a second time, will de-assign it turning it back to blue.



Note: The servo channels are colour coded.

Green = they are assigned to the current transmitter input channel.

Blue = they are not assigned to any transmitter input channel and are available .

Grey = they have been assigned to a different transmitter input channel other than the one currently selected and cannot be selected for this channel.

Step 5

Lets now show you how to move through transmitter input channels. With the Stylus, tap the Plus (+) button once. You should see the input channel change to 2 (coloured white), and the previously green servo output channels will become grey (remember these servo outputs were assigned to input channel 1 so they are not available to input channel 2). Depending on the chosen protocol other servo outputs should show as green i.e. they are assigned to input channel 2. Tapping the Plus (+) sign will move you to higher input channels. Tapping the Minus (-) sign minus sign will move you to lower input channels and eventually back to input channel 1.

Note: YOU MUST press the **SAVE** button in order to confirm any changes to the channel routing. Pressing save also returns you to the Main Menu.

Servo Sub-Trim: Reversing Method 1

The Smooth Flite system is designed to allow you to easily trim up to 16 servo outputs for precise servo matching in multi ganged servo installations, Elevators, flaps and multi motor installations. If servos require matching we recommend for simplicity you do this in the Smooth Flite system. And here is an example of why

Example: Gyro assisted Rudder and ground steering using only 1 transmitter channel.

You assign the transmitter rudder channel to 2 Smooth Flite output channels. Smooth Flite output 1 controls Rudder while output 2 controls Steering. You can reverse/reduce the throw of the rudder and steering channel for better ground steering and the rudder gyro function becomes available to steering for direction assisted take off steering. Nice.

OK, there are two methods to access the servo sub trim and matching function in the Smooth Flite 16.

The following example assumes channel 1 from your transmitter has been assigned to S01 on the Smooth Flite as per factory setup.

From the **Main Menu**, tap on the **SERVO ADJUST** button. This will take you directly to the servo match and sub-trim screen (pictures to the right).

Lets have a look at how to sub-trim and reverse channel S01 on the Smooth Flite.

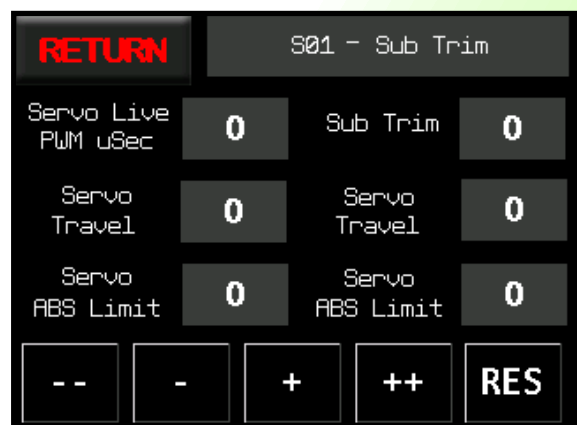
Simply tap on the servo output S01. You should now see the Sub Trim menu for S01. The words **"Editing S01"** will be shown at the top right of the screen (picture to the right) . This can be used to check you have selected the correct channel.

Lets now reverse the servo. Tap the **SERVO DIRECTION** button. This will change the direction of rotation on the servo. Tapping the **SERVO DIRECTION** button a second time will set it to its original direction.

Now lets have a look at sub-trimming a servo. Tap the **"Sub Trim & Servo Match"** button to take you into the Sub Trim Page. Press the Sub Trim +/- buttons to Sub Trim the servo.

This is the same as sub trimming on your transmitter but offers higher resolution and precise servo matching. You can also adjust end points of the servo from this page using **Servo Travel**. The combination of sub trim and Servo Travel will give you precise multi-ganged servo matching or precise matching of elevators, flaps and multi engine models.

TAP RETURN TO COMMIT YOUR TRIM CHANGES TO MEMORY



Servo Sub-Trim: Reversing Method 2

We also provided an input channel **MONITOR** screen so you can easily visualise which transmitter channel is assigned to which servo output and then easily trim and match.

The following example assumes Channel 1 from your transmitter has been assigned to S01 on the Smooth Flite as per factory setup.

From the Main Menu tap on the **MONITOR** button.

The **MONITOR** screen will appear as pictured right.

From the **MONITOR** screen, tap the green bar for transmitter input channel 1. This will take you to the **INPUTS TO OUTPUTS** screen for transmitter input channel 1 (see right).

With reference to this screen, "Receiver channel" 1 (left most column) is "Assigned to Smart Bus outputs" S01, S02, S03 and S04 shows as column 1,2,3 and 4.

Now, Simply tap on "Assigned to Smart Bus output" 1.

You should then see the Sub Trim menu for S01. The words "**Editing S01**" will be shown at the top right of the screen (picture to the right) . This can be used to check you have selected the correct channel.

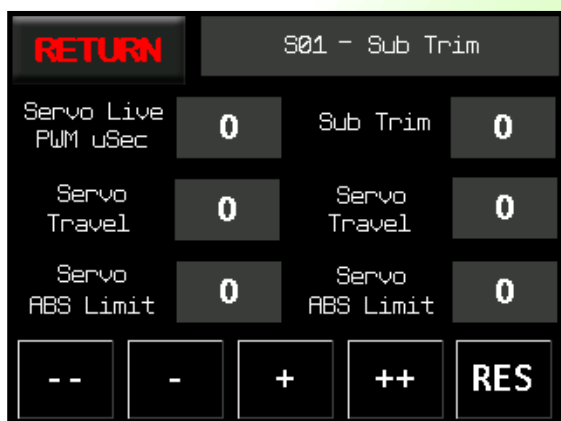
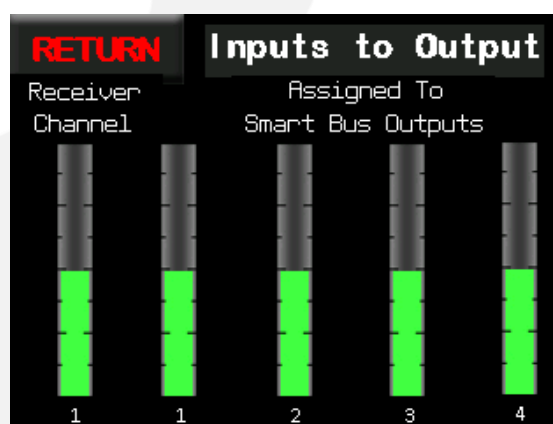
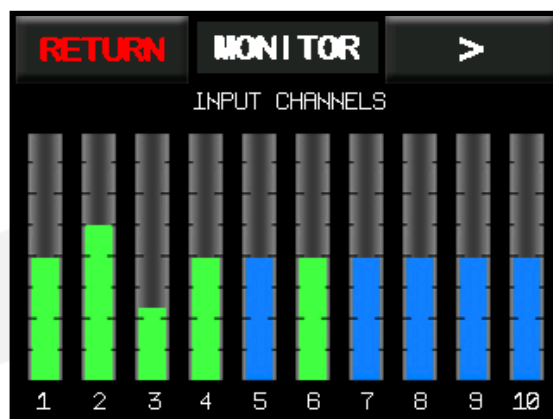
Lets now reverse the servo. Tap the **SERVO DIRECTION** button. This will change the direction of rotation on the servo. Tapping the **SERVO DIRECTION** button a second time will set it to its original direction.

Servo Trave Limit

Smooth Flite also offers a Servo Trave Limit function. You use this feature to set an absolute servo limit irrespective of any Sub Trim in the transmitter or Smooth Flite. Think of this as a protection feature that will stop a servo from over-driving and damaging a control surface.

Example: Dual Flaps 15 point matched with 1 transmitter channel.

You assign the transmitter flap channel to 2 Smooth Flite servo outputs. Smooth Flite output 1 controls left Flap while output 2 controls right flap. You can reverse/reduce the throw of the left and right flap channel for exact matching. And for even more precise matching you can apply 15 point servo matching which is described on the next page.



15 Point Matching

(Smooth Flite All Versions)

15 point matching is useful for getting the best possible match between servos. This includes mechanically matched servos (aileron) or non mechanically matched (left and right elevator, flaps or multi engine models). We are now going to go through the 15 point servo matching process. For best results please do 3 point match before proceeding.

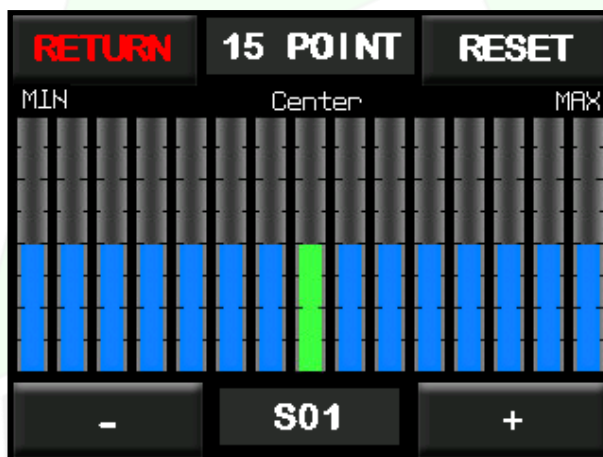
Note: If the servo is only moving a small amount. (Example: 10-15 degrees each way) You will only be able to use a small number of bars on the 15 point match. To use more bars, we recommend you increase the servo range by using a smaller servo arm.

Step 1

From the Sub Trim Screen tap the 15 Point Servo Matching button.

Step 2

You should now see the multi point match screen. Similar to the 3 point match, as you move the transmitter stick for that channel. The bars will change colour from blue to green.



Note: You can return the servos sub trim values back to default by pressing the RESET button.



Step 3

Slowly move the transmitter stick or rotary control for that channel from one side to the other, if at any point you hear servo buzz. Hold the transmitter stick in that position and use the -, + buttons to sub trim at that point. Sub trim the servo until the servo buzz lessens or disappears.

Step 4

Repeat Step 3 for the entire range of the servo, this can be repeated as many times as you wish.

Step 5

Once you are happy with the sub-trim press the **back** button to move back to the 3-point sub-trim page. Pressing back again from the 3-point sub-trim page will save the trim values to memory.

Receiver Menu

All Smooth Flite RRS systems have the added feature of monitoring the connection between the Receiver and the transmitter. This can be used to assist in the optimal placement of your receivers during setup.

We will now go through a process of how to check the quality of the connection between your receiver and your transmitter.

Using the Smart Display, from the **MAIN MENU** tap the **RECEIVER** button. This will take you to the receiver page.

From the receiver page you can see the receiver **FRAMES** received for each individual receiver, these indicate good packets of information sent from the receiver to the Smooth Flite or received by the receiver from the transmitter. You can also see **DROPS**, these are packets have been received by the

Re-

Note: If the number of DROPS (dropped frames) is unusually high, it may indicate there is a problem with that receiver or receiver placement inside the model.

NOTE: It is quite normal to see these numbers with values higher than 0 however, if you are experiencing extremely high drop ratios, please consult your receiver manufacturer for more details on receiver placement.

Receiver			
RETURN	Frames	Drops	FailSafe
1	0	0	0
2	0	0	0
3	0	0	0
Set Fail Safe			

The third column shows **FAILSAFE** (Fail Safe events PER RECEIVER) this value shows the number of failed-to-send events from a receiver to the Smooth Flite i.e. the Smooth Flite was expecting to receive frames but the receiver stopped sending them.

If you experience high numbers in FAILSAFE events during ground testing or after landing do not fly the model until you understand what has caused them.

Powering down the transmitter before powering down the model WILL cause the Smooth Flite to show accumulate FAILSAFE events because the Smooth Flite can no longer see signal from the transmitter.

Information: The Smooth Flite redundant receiver design is evolved from medical system information delivery that must guarantee only good data is used. As such Smooth Flite listens to all receivers all the time. This algorithm ensures only good frames are used and the fastest frames to control surface response in the industry.

Setting Fail Safe

Smooth Flite 16 has Fail Safe function which should be used for all receiver types.

Note: It is extremely important that FAILSAFE is set before flying. We recommend at least setting FAILSAFE on throttle to either idle or off as a matter of safety.

Note: It is important to make sure that FAILSAFE is OFF or not set in the radio. If FAILSAFE is set in both the radio and the Smooth Flite, you may experience servo jumping during a failsafe condition.

Note: In the Smooth Flite RRS, for FAILSAFE to occur, both receivers must enter FAILSAFE. If only one receiver enters FAILSAFE then the system will function on the remaining receiver. This is one of the outstanding safety features of the Smooth Flite RRS.

Step 1

Using the Smart Display, From the **MAIN MENU** tap the **RECEIVER** button. Now tap **FAILSAFE**.

You should see the Fail Safe Page (picture on the right). The **Blue** bars will follow the stick positions of your radio (just like the monitor screen).

The bars represent the first 10 channels outputted from your radio.

Note: The bars have two colours.

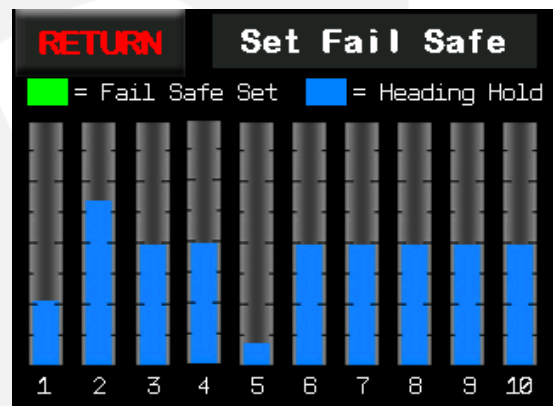
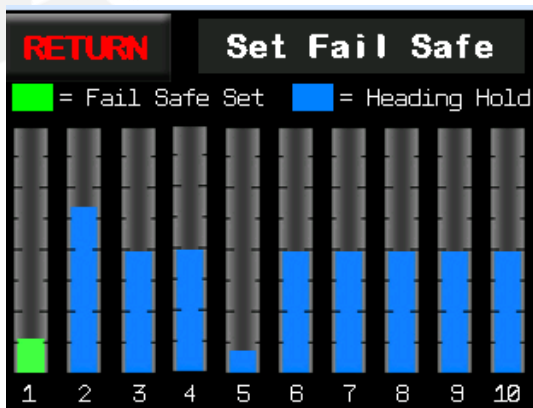
Blue = FAILSAFE is set to heading hold. In a FAILSAFE event the channel and associated servos will hold the last good received channel value.

Green = FAILSAFE is set to a specific position. The channel and associated servos will move to the pre-set FAILSAFE channel value.

The default setting for all channels is heading hold. (**Blue** bars)

Step 2

To set failsafe on any channel tap on the channel bar.



The blue bar will now turn green capturing the current input channel position. Alternate tapping of the Channel bar will cycle between heading hold (**Blue** bar) and FAILSAFE modes (**Green** bar).

Below is an example of how to set FAILSAFE on throttle assuming channel 1 is throttle:

On the Set FAILSAFE screen, move your throttle transmitter stick, the blue bars above channel 1 will move. With your throttle stick at the Idle position, tap the channel bar for channel 1.

The channel bar will now turn green.

you have successfully setup FAILSAFE for throttle.

To test the FAILSAFE function is correctly set up power off the transmitter. Channels set to FAILSAFE should move servos to the pre-set position.

IT IS EXTREMELY IMPORTANT TO SET AND TEST FAILSAFE PRIOR TO OPERATING THE MODEL.

Telemetry with SBUS2 Receivers

Smooth Flite RRS comes with the added ability of downlink telemetry when using a 7008SB or 7003SB SBUS/ SBUS2 receiver.

Note: In order to receive telemetry via Smooth Flite, you must plug the receiver signal into the SBUS2 port. Please ensure that the primary receiver (first bound receiver in a dual receiver setup) is plugged into the R1 port on the Smooth Flite. To check which receiver is the primary receiver, please consult your transmitter manual for reference.

Step 1

Ensure your receivers are plugged into the SBUS2 port.

Step 2

Ensure that the Smooth Flite is on and both receivers are bound to your transmitter.

Step 3

Ensure your transmitter is turned on,

Note: For the following steps we will be using the 18SZ as an example. For all other radios please consult your transmitter manual.

Select the linkage menu on your transmitter.

Now select the sensor menu

Linkage menu	New Normal	6.7V	1/2
Servo monitor	Model select	Model type	
Servo reverse	End point	Servo speed	
Sub-trim	Function	Fail safe	
System type	T1-T6 setting	Throttle cut	
Idle down	Swash ring	Swash	
Stick alarm	Timer	Function name	

Step 4

Page across until you see sensor slot 24, Assign Curr. F1678 to this slot.

Step 5

Page across to slot 27 Assign Curr. F1678 to this slot.

Step 6

Now go to your telemetry screen, you should see the current used in mAHs and the Voltage of both Receiver packs.

Note: Both batteries must be plugged into the Smooth Flite unit to receive voltage up-dates.

Other telemetry systems are similar in how the connect with the Smooth Flite System. We also offer "How To" videos Advanced Radio YouTube channel.

https://www.youtube.com/channel/UCY_uLkfkMiO3OWU8jLm3jZQ?view_as=subscriber

Sensor	New-1 Condit1	6.7V	2/3
Sensor type	ID	Sensor type	ID
13	GPS	19	-----
14	GPS	20	-----
15	GPS	21	-----
16	-----	22	-----
17	-----	23	-----
18	-----	24	-----

Factory Reset

When you use the Sub-Trim and other functions these functions are saved to the permanent memory of the Smooth Flite. RRS. There may be situations where you will want to initialise your Smooth Flite back to the original factory settings. Switching the Smooth Flite to a different model for example would be one of the situations. When you select the Factory feature all the sub-trim data and battery settings will be erased and the Smooth Flite will be returned to “Out-Of-The-Box” settings.

WARNING!

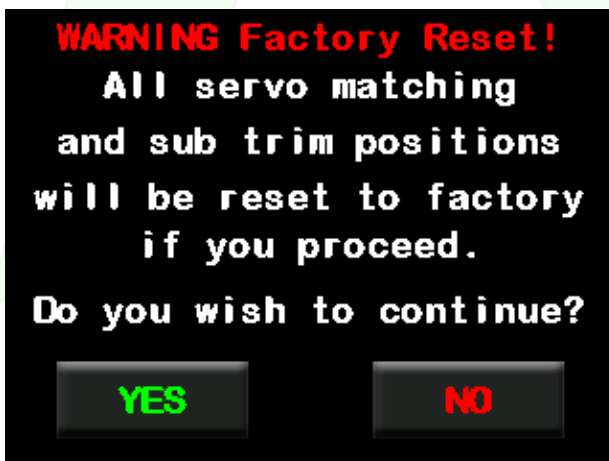
Performing a Factory Reset will erase all sub-trim data and is an irreversible process. Only do this if you are sure you want to reset the Smooth Flite to factory settings.

Step 1

Using the Smart Display, go into the System menu, once here press the FACTORY RESET button.

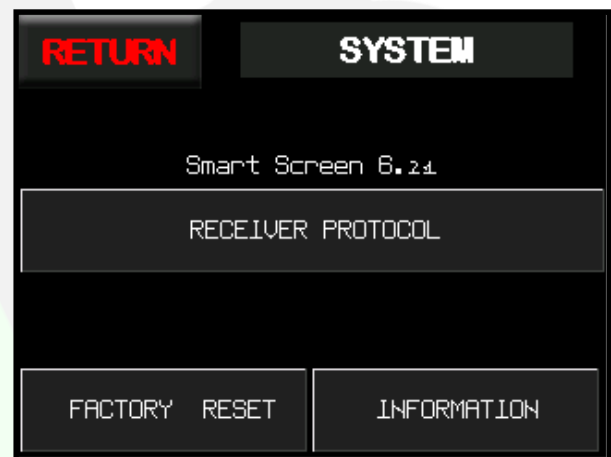
Step 2

A WARNING and Instructions will appear on screen. Please Read this as it is an important process. When ready press **YES** to continue or **NO** to go back to the system screen.



Step 4

After the Factory Reset process is complete the Saving Data Screen will disappear indicating you have reset all data.



Step 3

During the reset process the saving data screen will show for up to 20 seconds. Please DO NOT turn off the Smooth Flite during this process.



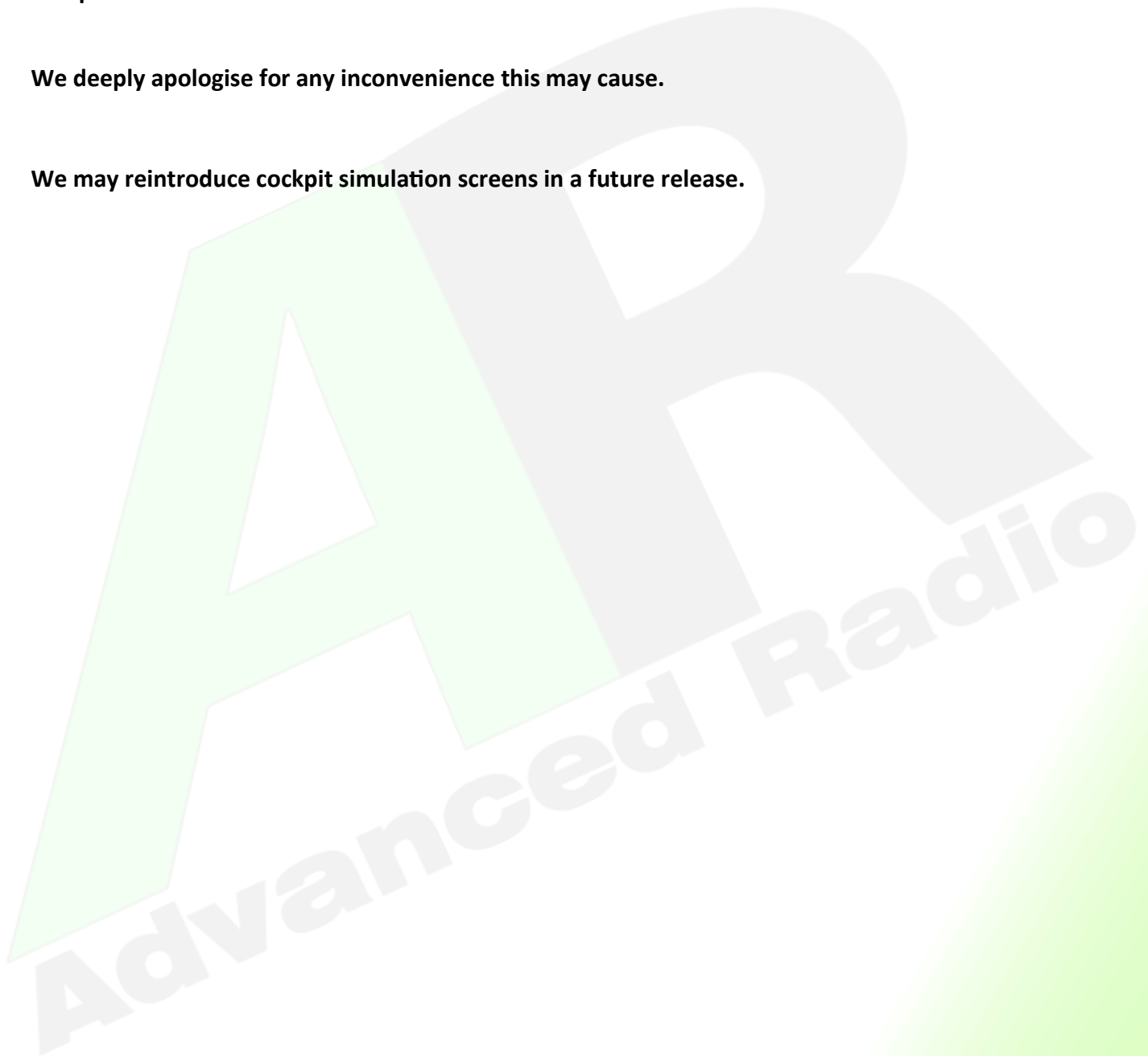
Additional Screens

Cockpit Simulation Screens

PLEASE NOTE: In order to accommodate new user features in version 7 we have had to remove cockpit screens.

We deeply apologise for any inconvenience this may cause.

We may reintroduce cockpit simulation screens in a future release.



Smooth Flite Gyro Menus

Smooth Flite is much more than just a simple Gyro system. It provides an intelligent system that calculates parameters from 4 different sensors to predict the nature of the model to provide, well, the smoothest flying characteristic available today. Smooth Flite combines a 3 axis Gyro, Accelerometer, Compass and Barometer, to provide for more advanced understanding of a model's flight characteristics.

To make setup of the Smooth Flite system simple we have included a Wizard which will guide you through the setup process and ensure you have the smoothest flying model. Before we start the Wizard we will give you a description of each page of the Smooth Flite System. You can jump straight to the Wizard feature if you like but please read the pre-flight checks before you fly the model.

Lets get started

To access the Smooth Flite menu from the main menu tap the **[Smooth Flite]** button. This will take you to the Smooth Flite main Menu (shown below). Lets take a look at the various Smooth Flite menu options.

RETURN	SMOOTH FLITE
Wizard	Channel Assign
Aileron	Elevator
Rudder	Maximum Travel
Model Type	Gyro Mode
Turbine Filter	Advanced Mixes

Return button

Returns you to the main menu

Wizard button

This button will start the setup Wizard and guide you through the setup process.

Chan Assign button

The Channel Assignment button will take you the setup page for channel assignment to Aileron 1 Aileron 2, Elevator, and Rudder as well as Master ON/OFF switch and Variable gain Control Channel. We will talk more about these later.

RETURN	Main Menu
Power	Monitor
I/O Routing	Servo Adjust
Receiver	System
	SmoothFlite

Aileron, Elevator and Rudder buttons

These buttons take you to setup pages for, you guessed it, Ailerons, Elevators and Rudder

Max Travel button

This button will take you to the travel setup page where we set up travel limits for gyro corrections. More about this later.

Model Type button

Takes you to the model setup page where we specify the model type, and weight. These parameters are used in inertia and vibration dampening calculations and are unique to the Smooth Flite system.

Gyro Mode

SF16 offers 2 distinctly differed Gyro feels. From the Gyro Mode page you can select between Sports mode where the gyro is very transparent and Scale mode (for slow graceful scale like flying)

Smooth Flite Gyro Menus

Turbine Filter

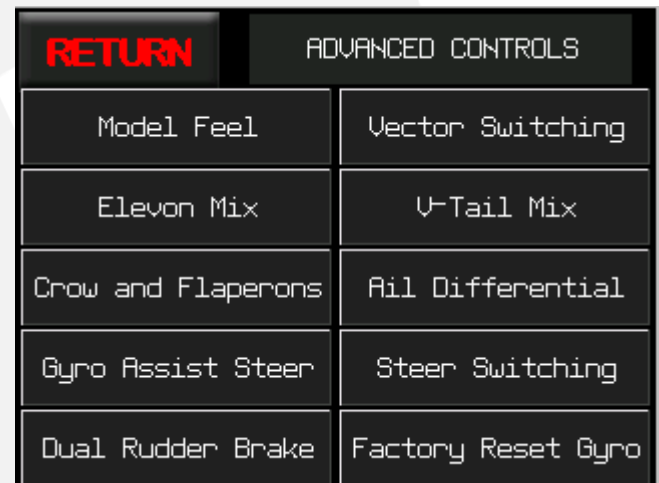
This feature was added in version 7.10 onwards and is a digital filter that will assist in removing harmonic glitches caused by some turbine/airframe combinations.

Advanced button

Takes you to the advanced menu for specific model setups and delving deeper into the Smooth Flite system.

Advanced Mixes

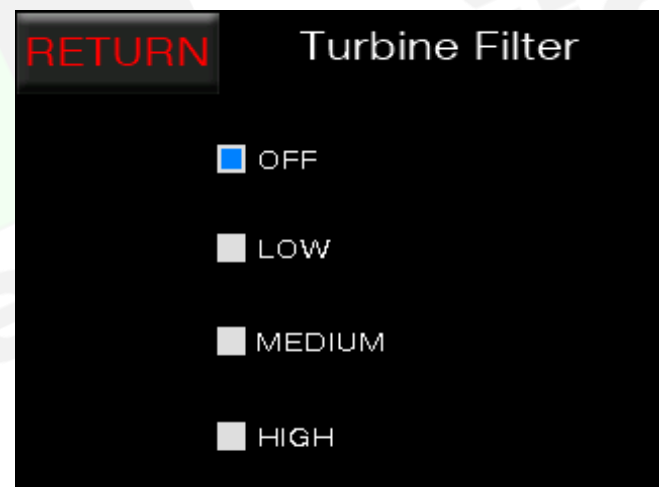
The Advanced Controls menu is the gateway to many of the Smooth Flite advanced features. We will discuss these more in detail later.



Turbine Filter (NEW TO VERSION 7)

If you are operating a turbine model and experience turbine harmonics glitching on the servos then we offer a new advanced digital harmonic filter to assist in reducing the glitching.

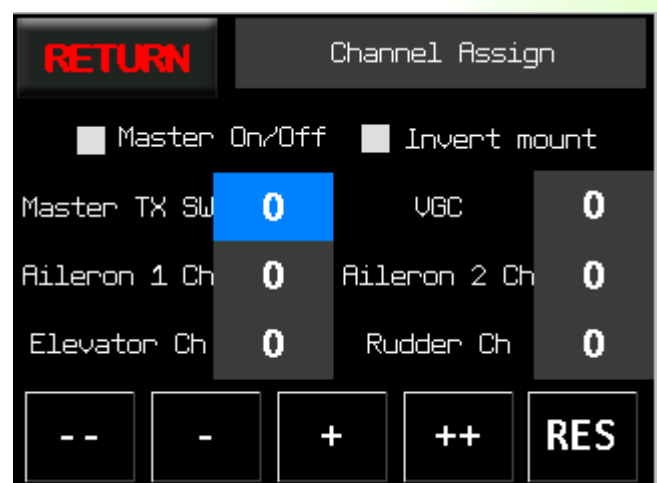
Try setting the turbine filter to low, medium or high. Please only use as much filtering as necessary.



Parameter Editing

To edit a parameter or value you tap the value to be edited. The value background will turn **BLUE**. Then use the buttons at the bottom of the page to change the value. You can also reset a parameter to factory default by tapping the "RES" button.

Once you are happy with the set value tap the value again and it will return to a black background.



Smooth Flite Gyro Setup Wizard

As we mentioned earlier we have included a setup Wizard to guide you through the Smooth Flite assisted flight setup process. Using just the Wizard and pre-Flight check information on the following pages is all that is required to get a standard dual Aileron, Elevator and Rudder model ready to fly with Smooth Flite. If you require the setup of Elevons or V-Tail you can still use the Wizard for the basic setup and then apply advanced parameters later as required. After the Wizard setup pages we will explain in detail all the advanced functions available to you from the Smooth Flite assisted flight system and describe all Gyro pages and functionality.

Before you commence the Wizard it is assumed that you have :

- 1) Set the protocol of the Smooth Flite system to match your transmitter and receiver.
- 2) Have not altered the factory input channel routing from the transmitter. Smooth Flite uses factory input channel routing to simplify the setup process.
- 3) Have a good understanding of the Smooth Flite Input channel to Output channel routing.
- 4) Have assigned outputs to Ailerons, Elevator and Rudder.
- 5) Have a transmitter setup for the model and have assigned a Master Control channel on the
- 6) transmitter to control ON/OFF and gain functions of the Smooth Flite system.

The Wizard will take you through all the parameters in an easy to understand format. After completing the Wizard you will have all the parameters setup for a standard Aileron, Elevator and Rudder model. We will take you through the setup Wizard and explain each page as we go. There are a few fundamental points to getting the absolute best performance out of the Smooth Flite system.

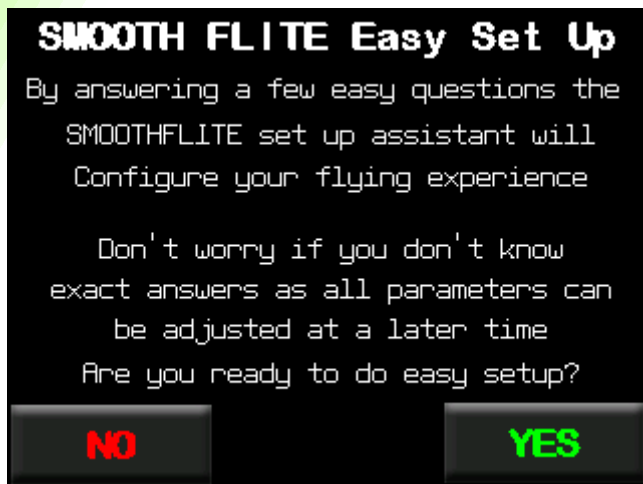
Smooth Flite requires a dual aileron setup on 2 channels. During selection of the protocol you would have noticed that 2 channels were assigned for ailerons. This is important.

It is important that you sub trim all primary flight surfaces (Ailerons, Elevators, Rudder, Steering) outputs via the Smooth Flite system and not in the transmitter. Of course during the maiden flight you may need to trim on the transmitter but initial servo trim setup should be done in the Smooth Flite system. We will explain why trimming in the Smooth Flite system is best as we go through the setup process.

OK, lets get started. From the Smooth Flite menu tap the Wizard button. This will start the setup Wizard.

RETURN	SMOOTH FLITE	
	Wizard	Channel Assign
	Aileron	Elevator
	Rudder	Maximum Travel
	Model Type	Gyro Mode
	Turbine Filter	Advanced Mixes

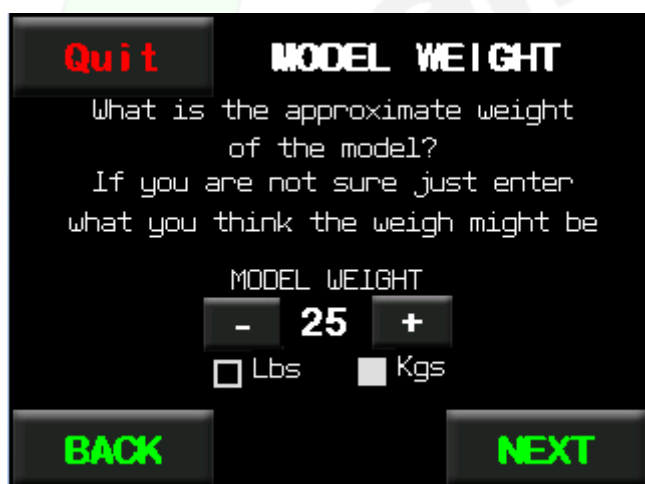
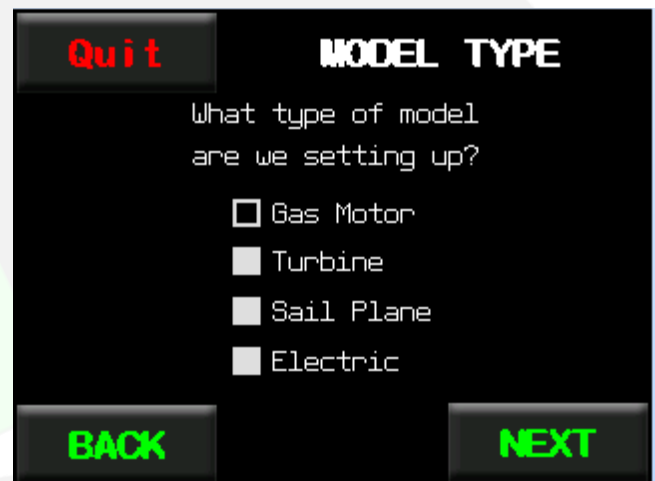
Smooth Flite Setup Wizard



You will be presented with the Smooth Flite Easy Setup page. Please take the time to read this page and when ready press **"NEXT"**. You can also leave the setup Wizard at any time by tapping the **"NO"** or **"QUIT"** buttons.

Model Type

The first question the Wizard will ask is "What type of model you are setting up". One of the advanced features of Smooth Flite is vibration filtering based on the mode type you select. When ready select the model type and press **"NEXT"**. The Wizard will log your selection and take you to the model weight page.

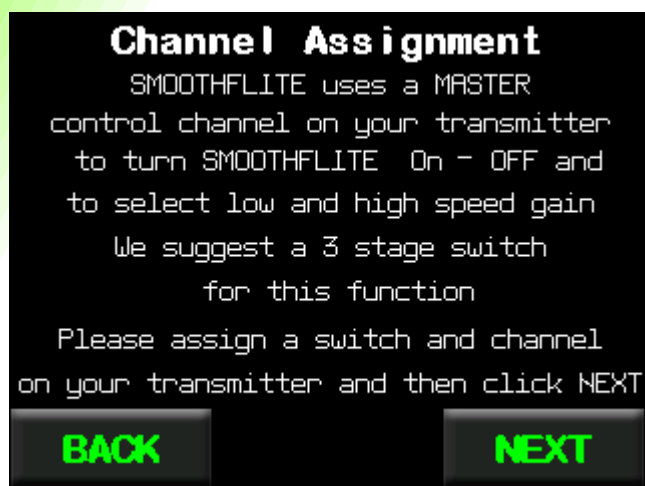


Model Weight

Another of the unique and advanced features of the Smooth Flite system is inertia calculations based on model type and weight. These calculations are used to dampen or liven up control surfaces to provide a real scale like Smooth Flite appearance to the model.

When you are ready enter the model's weight in Lbs or Kgs and press **"NEXT"**. Don't worry if you don't know the exact weight of the model. An approximation is just fine.

Smooth Flite Setup Wizard



After tapping **"NEXT"** from the Model Weight Page you will see the Master Channel Assignment instruction page.

Smooth Flite uses a MASTER control channel on your transmitter to turn SMOOTH FLITE On/Off and to select low and high speed gain settings.

You need to assign a 3 stage switch on the transmitter for this function along with a transmitter output channel. Take the time to read this page and press **"NEXT"**.

Master Channel

When you are ready toggle the Master Switch on the transmitter. The Master Switch search function will find the assigned channel from the transmitter.

Once the channel has been found press **"NEXT"**. The Wizard will log your selection and take you to the Trim Help page. If you are unsure you can also tap the **"HELP"** button for a brief explanation.

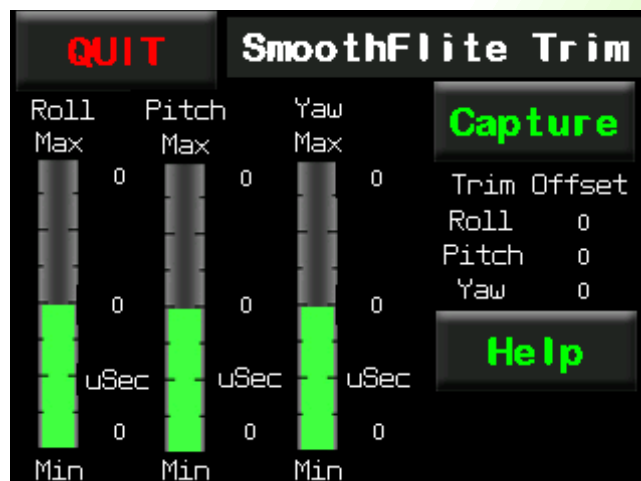


Trim Help page

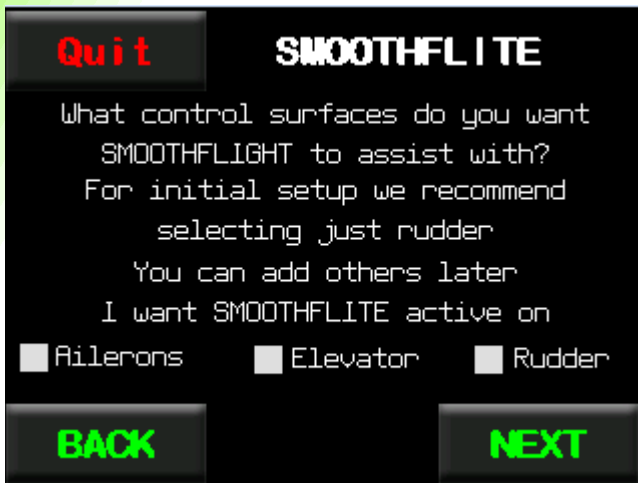
The centre trim and maximum end points are used to tell Smooth Flite maximum servo deflection limits. It is important that we set these correctly for a good flying experience. Please take the time to read this help page. When you are ready press **"NEXT"** to go to the trim page.

Trim

The Trim page captures the minimum, maximum and centre positions for servo travel limits. This will be the maximum and minimum travel that the gyro will apply for corrections. On this page you move the sticks to their minimum and maximum positions. Then let the sticks rest at the centre positions and press the **"Capture"** button. Smooth Flite will store the positions and show the **"NEXT"** button. Press the **"NEXT"** button to move to the SMOOTH FLITE surface assignment page.



Smooth Flite Setup Wizard



After tapping “NEXT” from the Trim page you will see the control surface assignment page. Here you select which controls (Ailerons, Elevators, Rudder) to apply Smooth Flite control.

We suggest for the first flight you apply Smooth Flite to Rudder only so you can get a feel for flying with Smooth Flite. You can always apply to Elevator and Ailerons at a later stage.

After making your selection Smooth Flite will store your choice then tap “NEXT”.

Smooth Flite Model Feel

Smooth Flite is the only gyro system to offer two styles of flying.

- 1) Original Smooth Flite Scale model feel for usage in scale warbirds and turbine models where slower roll rates and scale like flying is important.
- 2) Sports Mode for more agile and 3D type of flying. Sports Mode applies logarithmic proportional algorithm to effect of the gyro on control surfaces.

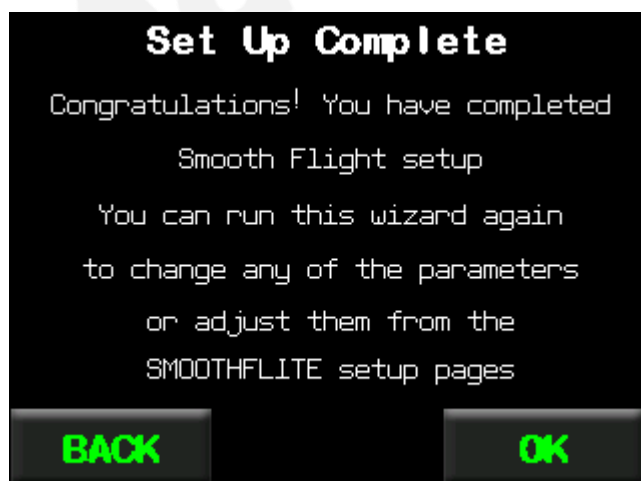
After you make your selection press “NEXT”.



Smooth Flite Mounting

The last thing we need to tell Smooth Flite is whether it is mounted UPRIGHT or INVERTED.

After you make your selection press “NEXT”.



Smooth Flite Setup Complete

Congratulations you have completed the setup for your model. You can run the Wizard again or make manual alterations to the selected parameters from the Smooth Flite parameter pages. When ready press “NEXT” to go back to the Smooth Flite Menu. There are a few checks required before flying the model and we will explain these on the next page.

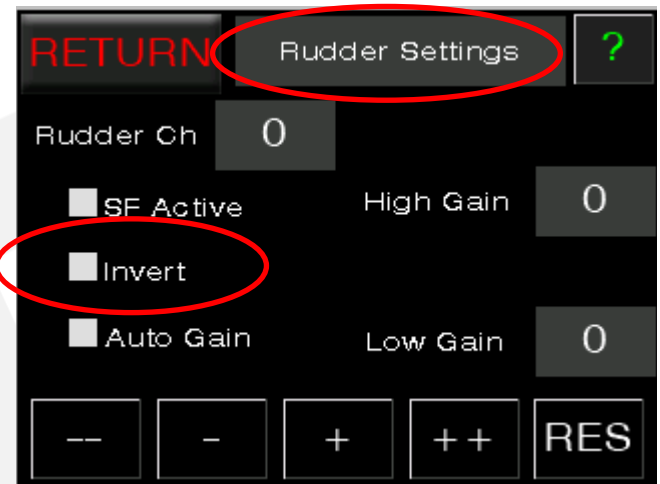
Smooth Flite Gyro Pre-Flight Checks

If you have completed the Smooth Flite Wizard then at this point you have setup for a standard dual aileron, Elevator and Rudder model.

Before flying the model YOU MUST check the control surfaces are reacting correctly to direction changes. This is extremely important. Failure to perform this check could cause a loss of model.

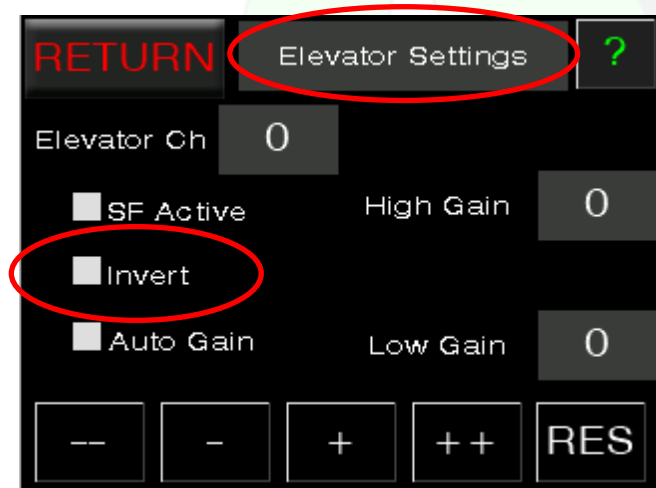
Rudder Check

If you have activated Rudder to be controlled by Smooth Flite then turning the model to the right you should see the rudder deflect to the left i.e. Smooth Flite will correct the rudder right movement with rudder movement to the left. If you see the rudder move to deflect further to the right then you can go to the Rudder page (shown left) and “invert SF Output” This will change the rudder reaction to the opposite direction.



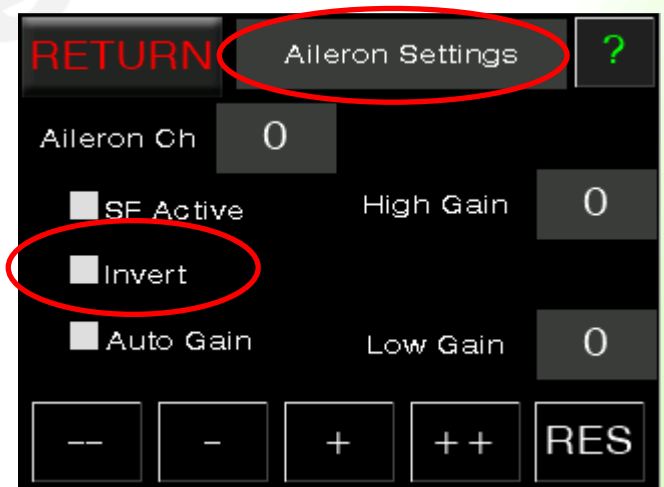
Elevator Check

If you have activated Elevator to be controlled by Smooth Flite then moving the models tail up you should see the Elevator deflect upwards to counteract the movement. If you see the Elevator move downwards then you need to “Invert SF Output” on the Elevator page.



Aileron Check

If you have activated aileron to be controlled by Smooth Flite then lifting a wing UP you should see the Aileron deflect upwards to counteract the movement and the opposite Aileron deflect downwards. If you see the opposite then you need to “Invert SF Output” on the Aileron page.



**Gyro Pre-Flight Checks are
continued on the next page**

Smooth Flite Gyro Pre-Flight Checks

Master Switch Check

If the Pre-flight checks on the previous page check out then you are ready to fly with Smooth Flite activated. Remember from the Wizard setup you assigned a Master Switch control to a 3 stage switch on the transmitter. You can use the Master Switch to turn Smooth Flite control off giving you a non gyro assisted model. The 3 positions of the Master switch are:

Position 1 = Smooth Flite is deactivated. No Smooth Flite effect will be applied.

Position 2 = Smooth Flite is on low gain. Generally for normal flying mode.

Position 3 = Smooth Flite is on high gain. Generally for low speed flying or landing approaches.

First Smooth Flite Assisted Flight

We have mentioned earlier that we recommend flying Smooth Flite on rudder first so you can familiarise the way Smooth Flite feels. You may find that rudder is all that is needed to give you an excellent flying model.

After flying rudder you may want to try activating Smooth Flite on Aileron and Elevator. A general flying characteristic of flying gyro assisted is that the controls will feel like they have a lot of exponential applied. This is quite normal. The feeling will generally increase with higher gain and decrease with lower gain.

Smooth Flite Advanced Stabilisation Features

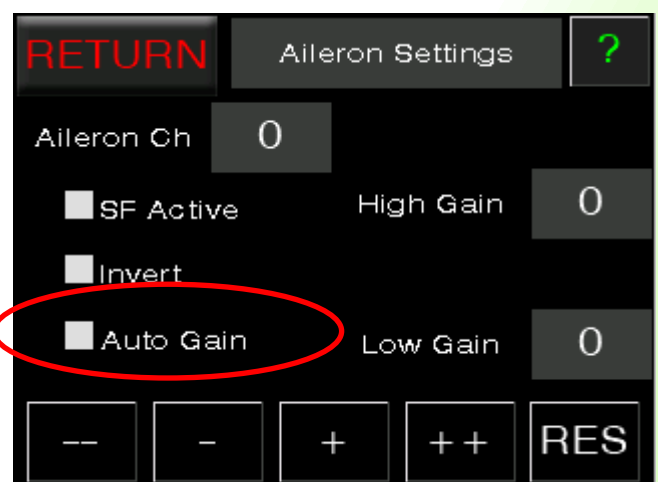
Smooth Flite is much more than just a Gyro. It offers several advanced proprietary features of “Automatic Gain Control” (AGC), “Variable Gain Control” (VGC), “Aerobatic Mode” and “Proportional Modes” to assist with tuning your model and Smooth Flite experience. We will now discuss these Advanced Features.

Smooth Flite Automatic Gain Control (AGC)

One of the symptoms of flying with higher gain on the gyro is that the model may start to oscillate at higher gain settings. At Advanced Radio we employed information gathered from several of the Smooth Flite sensors and have developed our proprietary Automatic Gain Control (AGC) algorithm to correct this situation.

If activated, the Smooth Flite Automatic Gain Control is constantly monitoring the flying characteristic of the model and applying gain up to the level you have chosen to suit the flying characteristic of the model. No other speed sensing module is required.

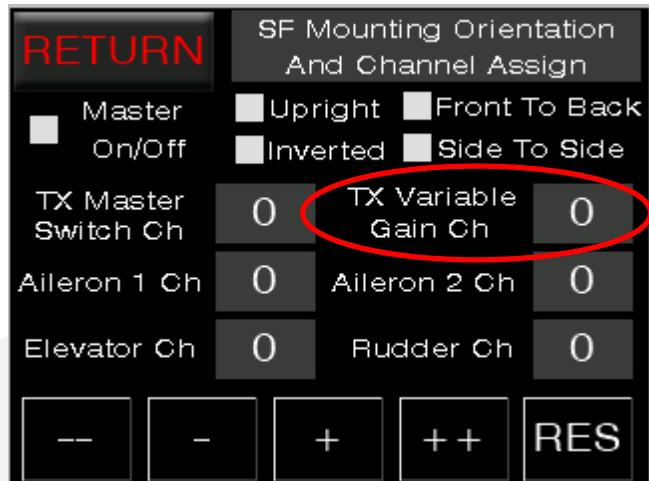
Smooth Flite AGC can be individually applied to Ailerons, Elevator and Rudder and is accessed from the Aileron, Elevator and Rudder control pages. The default factory setting is ON for all surfaces.



Advanced Stabilisation Features

Variable Gain Control (VGC)

In addition to setting high speed and low speed gain settings on the Master Switch, Smooth Flite offers an optional additional Variable Gain channel which can be assigned to say, a rotary dial, a switch or an advanced mix on the transmitter. This might be useful if you disable AGC and require the ability to manually boost gain levels to really high settings for say, hovering etc. VGC allows you to extensively increase and decrease the gain level applied to Smooth Flite in real time. The default factory setting for VGC is OFF. To apply VGC use the plus button to set the desired channel to match to transmitter variable control channel.

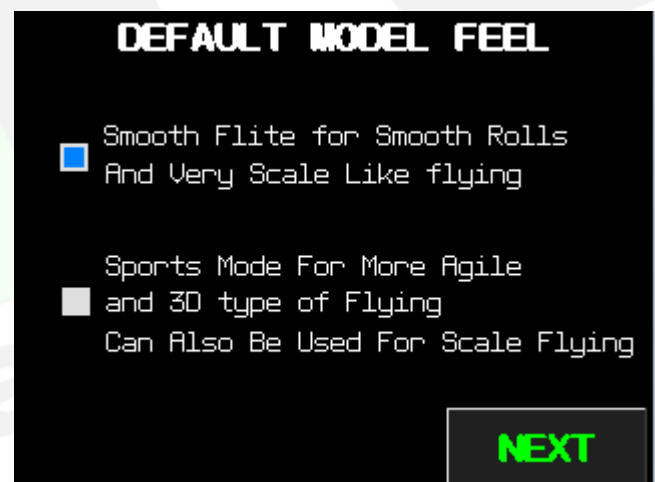


Smooth Flite Model Feel

Smooth Flite is the only gyro system to offer two styles of flying.

- 1) Original Smooth Flite Scale model (Top Gun) feel for usage in scale warbirds and turbine models where slower roll rates and scale like flying is important.
- 2) Sports Mode for more agile and 3D type of flying. Sports Mode applies logarithmic proportional algorithm to effect of the gyro on control surfaces.

After you make your selection press **"NEXT"**.



Smooth Flite Detailed Functions: Channel Assignment

OK, so we have gone through the Smooth Flite setup Wizard and we will now discuss each of the parameters of the Smooth Flite gyro in detail.

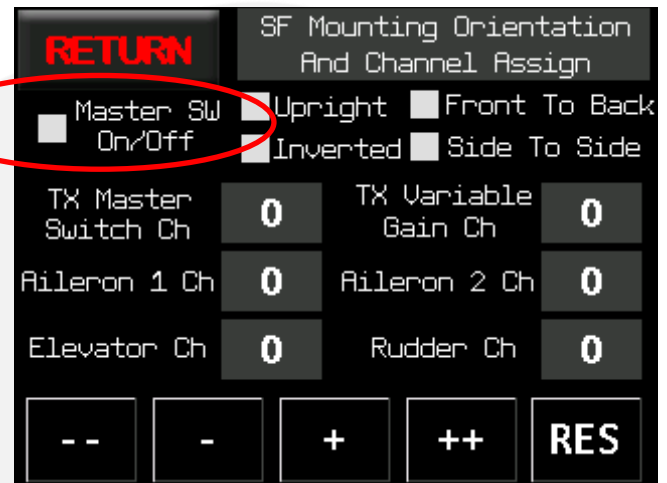
Channel Assignment Page

Tapping the “Chan Assign” button from the Smooth Flite menu will take you to the “CHANNEL ASSIGN” page (shown right).

Master On/OFF

Activates/Deactivates Smooth Flite Gyro functionality. Checking this (as pictured) means Gyro functionality is active. De-checking this literally takes the gyro functionality out of circuit. It is like unplugging the Gyro from the model.

If you ran the Wizard then this function would be active (as shown in the picture)

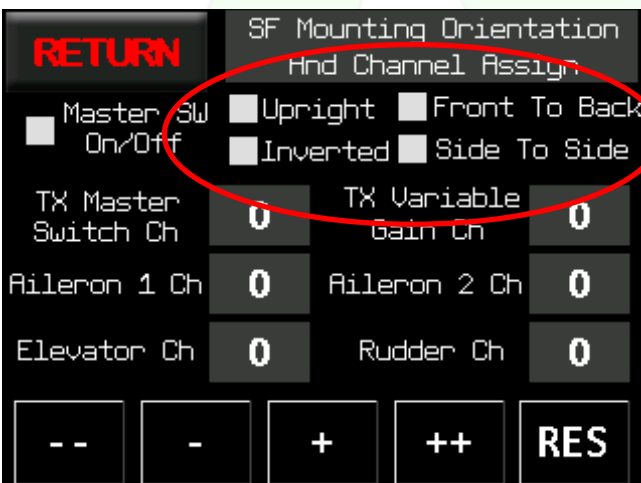


The screenshot shows the 'CHANNEL ASSIGN' page. At the top left is a red 'RETURN' button. The title is 'SF Mounting Orientation And Channel Assign'. Below the title are two rows of checkboxes: 'Master SW On/Off' (checked), 'Upright' (checked), 'Front To Back' (unchecked), 'Inverted' (unchecked), and 'Side To Side' (unchecked). Below these are four rows of channel assignments: 'TX Master Switch Ch' (0), 'TX Variable Gain Ch' (0), 'Aileron 1 Ch' (0), 'Aileron 2 Ch' (0), 'Elevator Ch' (0), and 'Rudder Ch' (0). At the bottom are five buttons: '--', '-', '+', '++', and 'RES'.

Inverted Mount

Tells Smooth Flite to calculate gyro positions based on the Smooth Flite Bus being mounted upright or inverted.

If you ran the Wizard and selected “inverted” then this function would be active (as shown in the picture)



The screenshot shows the 'CHANNEL ASSIGN' page. At the top left is a red 'RETURN' button. The title is 'SF Mounting Orientation And Channel Assign'. Below the title are two rows of checkboxes: 'Master SW On/Off' (checked), 'Upright' (unchecked), 'Front To Back' (unchecked), 'Inverted' (checked), and 'Side To Side' (unchecked). Below these are four rows of channel assignments: 'TX Master Switch Ch' (0), 'TX Variable Gain Ch' (0), 'Aileron 1 Ch' (0), 'Aileron 2 Ch' (0), 'Elevator Ch' (0), and 'Rudder Ch' (0). At the bottom are five buttons: '--', '-', '+', '++', and 'RES'.

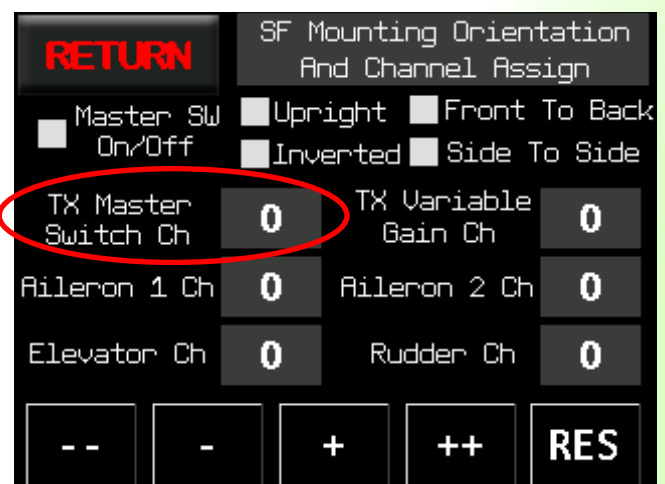
Master TX Switch

This is the channel chosen on the transmitter to turn the gyro ON/OFF, Low and high gain.

If you ran the Wizard then the channel shown here would reflect the channel selected for the 3 position Master Switch on the transmitter.

A value of (0) Zero will deselect this function. Any other value will activate the functionality.

IMPORTANT: Be careful to assign this function to it's own channel and not to a primary flight control TX channel.



The screenshot shows the 'CHANNEL ASSIGN' page. At the top left is a red 'RETURN' button. The title is 'SF Mounting Orientation And Channel Assign'. Below the title are two rows of checkboxes: 'Master SW On/Off' (checked), 'Upright' (checked), 'Front To Back' (unchecked), 'Inverted' (unchecked), and 'Side To Side' (unchecked). Below these are four rows of channel assignments: 'TX Master Switch Ch' (0), 'TX Variable Gain Ch' (0), 'Aileron 1 Ch' (0), 'Aileron 2 Ch' (0), 'Elevator Ch' (0), and 'Rudder Ch' (0). At the bottom are five buttons: '--', '-', '+', '++', and 'RES'.

Smooth Flite Detailed Functions: Channel Assignment

Variable Gain Control (VGC)

In addition to setting high speed and low speed gain settings on the Master Switch, Smooth Flite offers an optional additional Variable Gain channel which can be assigned to say, a rotary dial , a switch or an advanced mix on the transmitter. This might be useful if you disable AGC and require the ability to manually boost gain levels to really high settings for say, hovering etc. VGC allows you to extensively increase and decrease the gain level applied to Smooth Flite in real time. A value of (0) Zero will deselect this function. Any other value will activate the functionality.

IMPORTANT: Be careful to assign this function to it's own channel and not to a primary flight control TX channel.

RETURN		SF Mounting Orientation And Channel Assign	
☐ Master SW On/Off	☐ Upright	☐ Front To Back	☐ Side To Side
☐ Inverted			
TX Master Switch Ch	0	TX Variable Gain Ch	0
Aileron 1 Ch	0	Aileron 2 Ch	0
Elevator Ch	0	Rudder Ch	0
--	-	+	++
RES			

RETURN		SF Mounting Orientation And Channel Assign	
☐ Master SW On/Off	☐ Upright	☐ Front To Back	☐ Side To Side
☐ Inverted			
TX Master Switch Ch	0	TX Variable Gain Ch	0
Aileron 1 Ch	0	Aileron 2 Ch	0
Elevator Ch	0	Rudder Ch	0
--	-	+	++
RES			

Aileron 1 Chan and Aileron 2 Chan

These are the channels that Smooth Flite applies corrective Aileron control.

They are automatically mapped to match your transmitter during the initial Smooth Flite protocol selection.

We strongly recommend these are not altered away from factory setting on the transmitter unless you have a thorough understanding of input channel assignment.

Elevator Chan and Rudder Chan

These are the channels that Smooth Flite applies corrective Elevator and Rudder control.

They are automatically mapped to match your transmitter during the initial Smooth Flite protocol selection.

We strongly recommend these are not altered away from factory setting on the Transmitter unless you have a thorough understanding of input channel assignment.

RETURN		SF Mounting Orientation And Channel Assign	
☐ Master SW On/Off	☐ Upright	☐ Front To Back	☐ Side To Side
☐ Inverted			
TX Master Switch Ch	0	TX Variable Gain Ch	0
Aileron 1 Ch	0	Aileron 2 Ch	0
Elevator Ch	0	Rudder Ch	0
--	-	+	++
RES			

Smooth Flite Detailed Functions: Aileron

Aileron Channel Page

Tapping the “Aileron” button on the Smooth Flite Menu will take you to the “Aileron Channel” page.

SF Active (on Ailerons)

Checking SF Active from the Aileron Channel page (as shown in the picture to the right) will activate Smooth Flite on Ailerons. De-Checking will deactivate Smooth Flite from Ailerons.

If you ran the Wizard and selected “Ailerons” to be active with Smooth Flite then this function would be active (as shown in the picture)



Invert SF Output (Ailerons)

If you have activated aileron to be controlled by Smooth Flite then rolling the model to the right you should see the right Aileron move downwards and the left Aileron move upwards to counteract the roll to the right. If you see the opposite then you need to “Invert SF Output” as shown in the picture to the right. De-checking has the opposite effect.

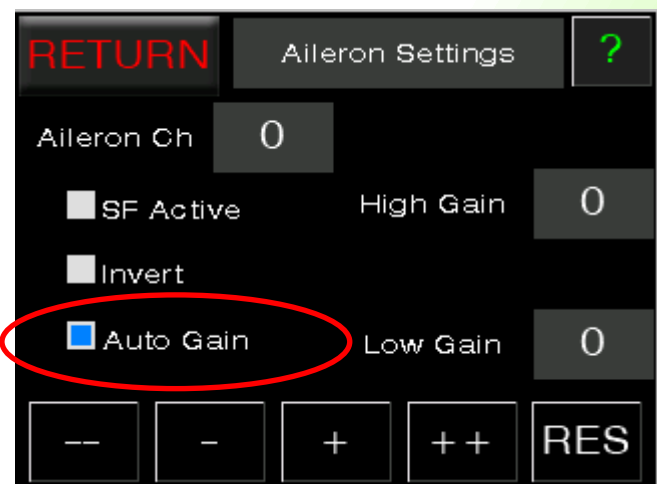
IT IS VERY IMPORTANT that this parameter be set correctly.

Smooth Flite Automatic Gain Control (AGC)

One of the symptoms of flying with too higher gain on the gyro is that the model may start to oscillate at higher gain settings. At Advanced Radio we employed information gathered from several of the Smooth Flite sensors and have developed our proprietary Automatic Gain Control (AGC) algorithm to correct this situation.

If activated, the Smooth Flite Automatic Gain Control is constantly monitoring the flying characteristic of the model and applying gain up to the level you have chosen to suit the flying characteristic of the model. No other speed sensing module is required.

Smooth Flite AGC can be individually applied to Ailerons, Elevator and Rudder and is accessed from the Aileron, Elevator and Rudder control pages. The default factory setting is ON for all surfaces.



Smooth Flite Detailed Functions: Ailerons

Aileron Hi and Low Gain

This is the level of Smooth Flite gain applied to the aileron by the Master Gain Switch.

High Gain is used for low speed flying and landing approaches. Low Gain is used for normal flying conditions.

Many hours of flying have been undertaken by our factory pilots to come up with default values which have been to give good results.

Increasing gain levels to high with Auto gain Control switched off may result in control oscillations.

Note: If you use the Auto Gain Control (AGC) feature then increasing these gain values may have little effect as the auto gain feature will control the maximum level of gain applied by Smooth Flite.



Aileron Hi and Low Offset

Offsets have been removed in version 7.10 upwards as these are now auto calculated in software

Smooth Flite Detailed Functions: Elevator

Elevator Channel Page

Tapping the “Elevator” button from the Smooth Flite menu will take you to the “Elevator Channel” page.

SF Active (on Elevator)

Checking SF Active from the Elevator Channel page (as shown in the picture to the right) will activate Smooth Flite on Elevator. De-Checking will deactivate Smooth Flite from Elevator.

If you ran the Wizard and selected “Elevator” to be active with Smooth Flite then this function would be active (as shown in the picture)



Invert SF Output (Elevator)

If you have activated Elevator to be controlled by Smooth Flite then moving the models tail up you should see the Elevator deflect upwards to counteract the movement. If you see the Elevator move downwards then you need to “Invert SF Output” on the Elevator page.

IT IS VERY IMPORTANT that this parameter be set correctly.

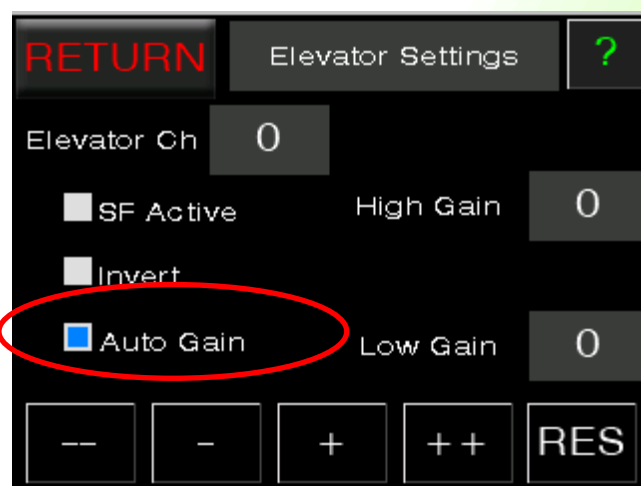
Smooth Flite Elevator Automatic Gain Control (AGC)

One of the symptoms of flying with too higher gain on the gyro is that the model may start to oscillate at higher gain settings. At Advanced Radio we employed information gathered from several of the Smooth Flite sensors and have developed our proprietary Automatic Gain Control (AGC) algorithm to correct this situation.

If activated, the Smooth Flite Automatic Gain Control is constantly monitoring the flying characteristic of the model and applying gain up to the level you have chosen to suit the flying characteristic of the model. No other speed sensing module is required.

Smooth Flite AGC can be individually applied to Ailerons, Elevator and Rudder and is accessed from the Aileron, Elevator and Rudder control pages. The default factory setting is ON for all surfaces.

Testing has found ideal results are achieved with factory gain settings and AGC set to ON.



Smooth Flite Detailed Functions: Elevator

Elevator Hi and Low Gain

This is the level of Smooth Flite gain applied to the Elevator by the Master Gain Switch.

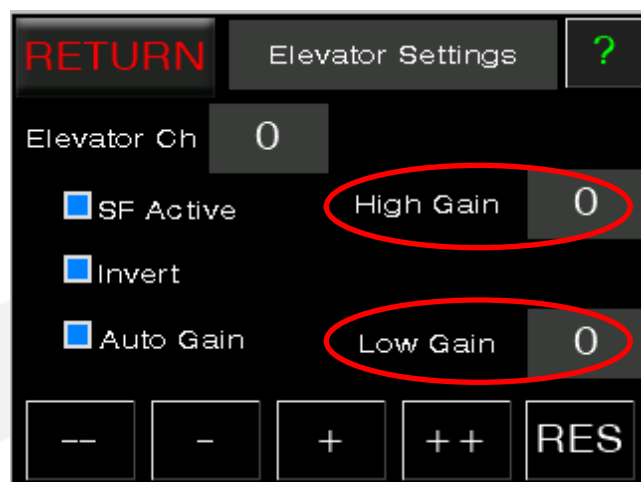
High Gain is used for low speed flying and landing approaches. Low Gain is used for normal flying conditions.

Many hours of flying have been undertaken by our factory pilots to come up with default values that will achieve good results.

Increasing gain levels to high with Auto gain Control switched off may result in control oscillations.

Note: If you use the Auto Gain Control (AGC) feature then increasing these gain values may have little effect as the auto gain feature will control the maximum level of gain applied by Smooth Flite.

Testing has found ideal results are achieved with factory gain settings and AGC set to ON.



Elevator Hi and Low Offset

Offsets have been removed in version 7.10 upwards as these are now auto calculated in software

Smooth Flite Detailed Functions: Rudder

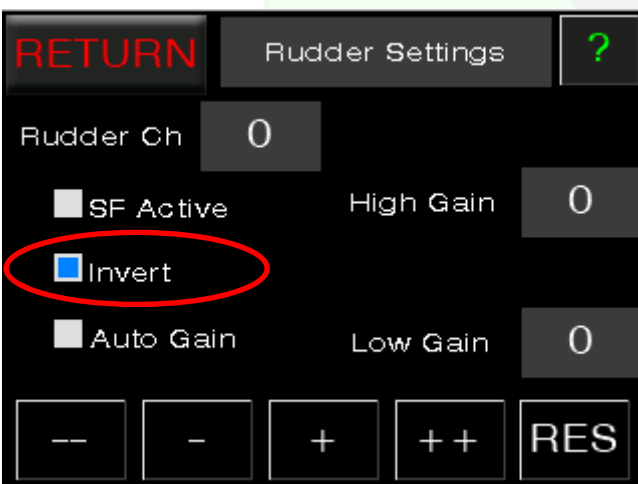
Rudder Channel Page

Tapping the “Rudder” button from the Smooth Flite menu will take you to the “Rudder Channel” page.

SF Active (on Rudder)

Checking SF Active from the Rudder Channel page (as shown in the picture to the right) will activate Smooth Flite on Rudder. De-Checking will deactivate Smooth Flite from Elevator.

If you ran the Wizard and selected “Rudder” to be active with Smooth Flite then this function would be active (as shown in the picture)



Invert SF Output (Rudder)

If you have activated Rudder to be controlled by Smooth Flite then turning the model to the right you should see the rudder deflect to the left. If you see the rudder deflect to the right then you need to “invert SF Rudder Output” This will change the rudder reaction to the opposite direction.

IT IS VERY IMPORTANT that this parameter be set the correctly.

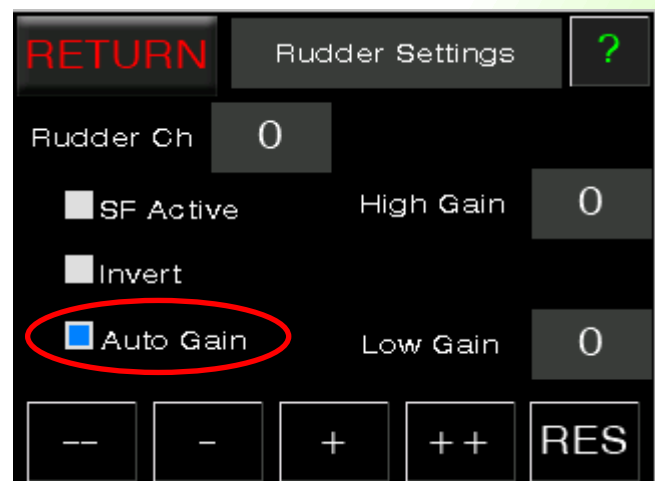
Smooth Flite Rudder Automatic Gain Control (AGC)

One of the symptoms of flying with too higher gain on the gyro is that the model may start to oscillate at higher gain settings. At Advanced Radio we employed information gathered from several of the Smooth Flite sensors and have developed our proprietary Automatic Gain Control (AGC) algorithm to correct this situation.

If activated, the Smooth Flite Automatic Gain Control is constantly monitoring the flying characteristic of the model and applying gain up to the level you have chosen to suit the flying characteristic of the model. No other speed sensing module is required.

Smooth Flite AGC can be individually applied to Ailerons, Elevator and Rudder and is accessed from the Aileron, Elevator and Rudder control pages. The default factory setting is ON for all surfaces.

Testing has found ideal results are achieved with factory gain settings and AGC set to ON.



Smooth Flite Detailed Functions: Rudder

Rudder Hi and Low Gain

This is the level of Smooth Flite gain applied to the Rudder by the Master Gain Switch.

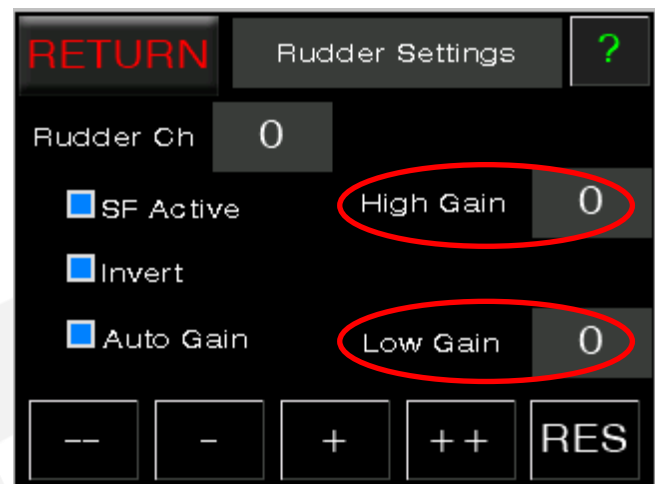
High Gain is used for low speed flying and landing approaches. Low Gain is used for normal flying conditions.

Many hours of flying have been undertaken by our factory pilots to come up with default values which have been to give good results.

Increasing gain levels to high with Auto gain Control switched off may result in control oscillations.

Note: If you use the Auto Gain Control (AGC) feature then increasing these gain values may have little effect as the auto gain feature will control the maximum level of gain applied by Smooth Flite.

Testing has found ideal results are achieved with factory gain settings and AGC set to ON.



Rudder Hi and Low Offset

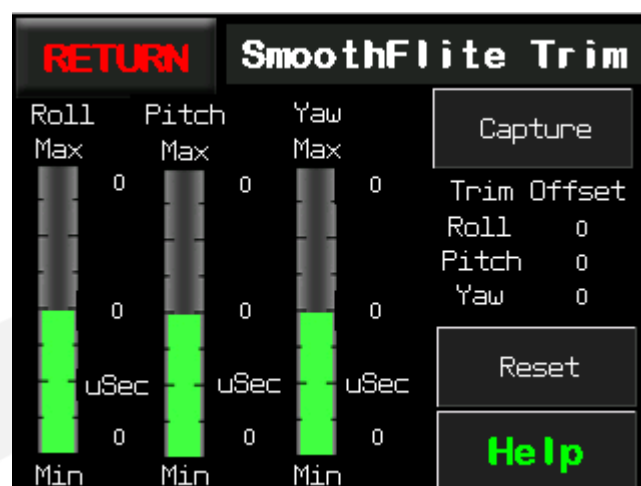
Offsets have been removed in version 7.10 upwards as these are now auto calculated in software .

Smooth Flite Trim

Smooth Flite uses maximum, minimum and centre stick positions in many of its calculations. If you have completed the wizard then you would have already captured these values. However you can redo these values if for example control limits have changed in the transmitter.

To Re-Capture values first tap “Reset” then move the sticks to their minimum and maximum positions. After moving sticks to the minimum and maximum positions let the sticks rest at the centre positions and press the “**Capture**” button. Smooth Flite will store the positions.

The process can be repeated as many times as required.

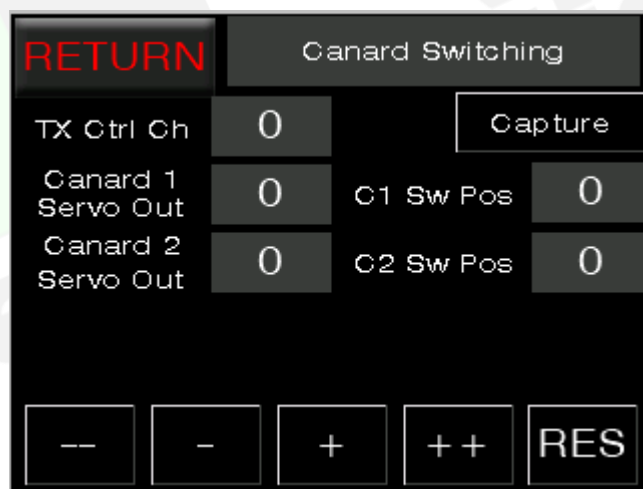


Smooth Flite Advanced Mixing Functions

Canards Switching (NEW TO VERSION 7)

Some pilots request to be able to switch Canards to a static position for landing etc. Version 7.10 upwards has added in the ability to switch canards from active to a static position.

TX Ctrl Ch is the transmitter control channel that triggers the static position. All 20 input channels are available (depending on the number of transmitter channels available) to actuate the mix feature. A TX Control value of 0 (zero) turns the mix feature off.



Hint: For a slow landing approach you might set up Canards to be slightly lowered and elevons to raise a little in the transmitter to give a nice high alpha approach with a delta wing model.

Canard 1/2 Servo Out are the servo outputs that canards have been routed to. SF16 gives you the option of using 1 or 2 servos for canards.

C1/C2 Sw position are the static position that the canards will move to when the position is activated by the switch. These can be adjusted manually with - - + ++ buttons or captured by pressing the capture button.

Capture button - Pressing the capture button will capture the current canard position. Move the canards to the required static position and press the capture button.

Smooth Flite Advanced Mixing Functions

Crow and Flaperons

Crow and Flaperons (as the names suggests) operates on ailerons by providing offset from the normal aileron position.

Smooth Flite provides Offset 3 positions which operate from a 3 position switch. You can of course operate this function from a 2 position switch or a slider or mixed from a channel say, flaps. This gives you a very simple but powerful method of setting any combination of Crow and/or flaperons.

TX Cont Ch is the transmitter control channel that triggers the Offset Position. So for a 3 position switch you would have Switch position 1 = Offset 1, Switch Position 2 = Offset and so on. All 20 input channels are available (depending on the number of transmitter channels available) to actuate the mix feature. A TX Control value of 0 (zero) turns the mix feature off.

Hint: For a slow fly-by you might set up flaps to be lowered, use the flap channel to trigger a small amount of Crow applied to Ailerons all from one switch and with full Gyro control maintained on the ailerons.

Speed is an adjustable parameter (0—10) to slow the movement of the aileron to the crow or flaperon position. 0 = fastest 10 = slowest.

Offset 1, 2, 3 are the Offset positions that the aileron will move to when the position is activated by the switch.

Aileron Differential

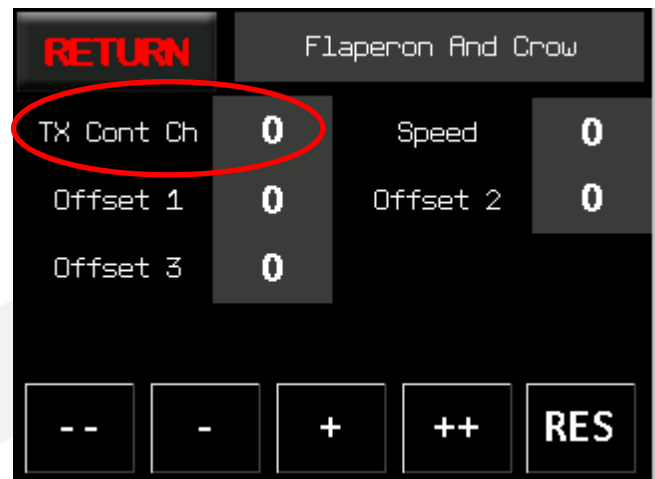
Differential is used to achieve gyro controlled axial rolls where more up or down aileron is applied to the right or left aileron and is one of the reasons that Smooth Flite uses dual Aileron channels.

PLEASE NOTE: This is a Scale Mode feature. If you select Sports Mode then Aileron Differential should be set via the transmitter.

Tapping ON applies differential to ailerons. This will also show the differential amount slider. Use the differential slider to adjust the level of differential.

Tapping “Invert” inverts the differential to the opposite aileron.

Moving the slider will increase or decrease the differential effect.



Smooth Flite Advanced Mixing Functions

Elevons (Aileron to Elevator mixing)

Elevons or Tailerons or Ailevators mixing is the process of mixing aileron into elevator.

Smooth Flite provides you with a separate set of Gyro controlled Elevon mix INPUT channels. This unique feature allows you to maintain gyro controlled Elevators (for Canard control), separate gyro controlled Ailerons for use as, say, flaperons or crow on a complexed jet model installation. All while having a separate set of gyro controlled Elevons.



When you Activate the Elevon mix function several things will happen in the Smooth Flite.

- 1) Input channels 15 and 16 will be assigned to the Elevon function. Input Channels 15 and 16 will then ignore signal from the transmitter. This allows you to then assign as many servo outputs as required from channels 15 and 16 for left and right Elevons.
- 2) Weighted Mix mode will be selected by default.
- 3) Aileron Mix will default to 50%.

Weighted Mix Mode. Smooth Flite has 2 Elevon modes. Weighted mix mode where the percentage of Aileron to Elevator mix will always sum to 100% of combine Elevator and Aileron throws. The balance of Aileron to Elevator is set with the Aileron mix parameter. With an Aileron Mix value of 50%, Weighted mix mode is good for axial rolls (depending on model type). In Weighted Mix Mode Elevator and Aileron movement will be weighted to the percentage set by the Aileron Mix value

EXAMPLE 1: Aileron Mix of 50 will yield Elevons with 50% Elevator and 50% of Aileron throws.

EXAMPLE 2: Aileron Mix of 30 will yield Elevons with 70% Elevator and 30% of Aileron throws.

Non Weighted Mix Mode. If you deselect Weighted Mix mode then the mix will be non weighted. In this mode 100% of Elevator throw is maintained and the Aileron Mix percentage is added to the Elevator throw. This allows for very scale like movement of Elevons. It is important to note that it is possible to over drive Elevons in non weighted mode however, you can limit this drive to the desired maximum positions by setting servo limits in the Servo Output (SO) Sub Trim & Servo Match page.

Aileron Mix is the amount of Ailerons mixed into the Elevator signal and sent to the Elevon processor.

Elevator Direction will reverse the direction of the elevator portion in the elevons. This can be used in combination with the Servo Out Sub Trim pages to get correct directional movement in any setup.

Ail Sw Ch (Aileron Switch Channel) (NEW TO VERSION 7) will allow you to set a channel on the transmitter to switch the aileron in and out of the elevon mix.

[Check the AR product page for setup videos.](#)

Smooth Flite Advanced Mixing Functions

V-Tail (Rudder To Elevator mixing)

V-tail mixing is the process of mixing Rudder into Elevator.

Smooth Flite provides you with a separate set of gyro controlled V-Tail mix INPUT channels. This unique feature allows you to maintain gyro controlled Elevators (for Canard control), separate gyro controlled Rudders for use as, say, gyro controlled steering. All while having a separate set of gyro controlled V-Tail channels.

When you Activate the V-tail mix function several things will happen in the Smooth Flite.

- 1) Input channels 15 and 16 will be assigned to the V-Tail function. Input Channels 19 and 20 will then ignore signal from the transmitter. This allows you to then assign as many servo outputs as required from channels 15 and 16 for left and right V-Tail surfaces.
- 2) Weighted Mix mode will be selected by default.
- 3) Rudder Mix will default to 50%.

Weighted Mix Mode. Smooth Flite has 2 V-Tail modes. Weighted mix mode where the percentage of Rudder to Elevator mix will always sum to 100% of combined Elevator and Rudder throws. The balance of Rudder to Elevator is set with the Rudder mix parameter. In Weighted Mix Mode Elevator and Rudder movement will be weighted to the percentage set by the Rudder Mix value.

EXAMPLE 1: Rudder Mix of 50 will yield Elevons with 50% Elevator and 50% of Rudder throws.

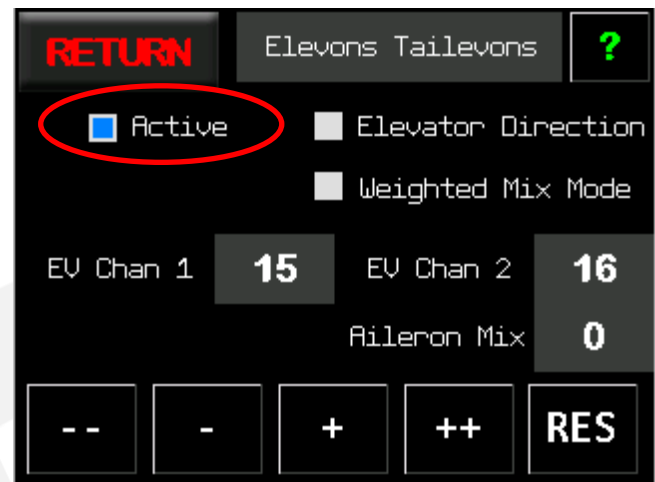
EXAMPLE 2: Rudder Mix of 30 will yield Elevons with 70% Elevator and 30% of Rudder throws.

Non Weighted Mix Mode. If you deselect Weighted Mix mode then the mix will be non weighted. In this mode 100% of Elevator throw is maintained and the Rudder Mix percentage is added to the Elevator throw. It is important to note that it is possible to over drive V-Tail controls in non weighted mode however, you can limit this drive to the desired maximum positions by setting servo limits in the Servo Output (SO) Sub Trim & Servo Match page.

Rudder Mix is the amount of Rudder mixed into the Elevator signal and sent to the V-Tail processor.

Elevator Direction will reverse the direction of the elevator portion in the elevons. This can be used in combination with the Servo Out Sub Trim pages to get correct directional movement in any setup.

[Check the AR product page for setup videos.](#)



Smooth Flite Advanced Mixing Functions

Gyro Assisted Steering Sub Trim

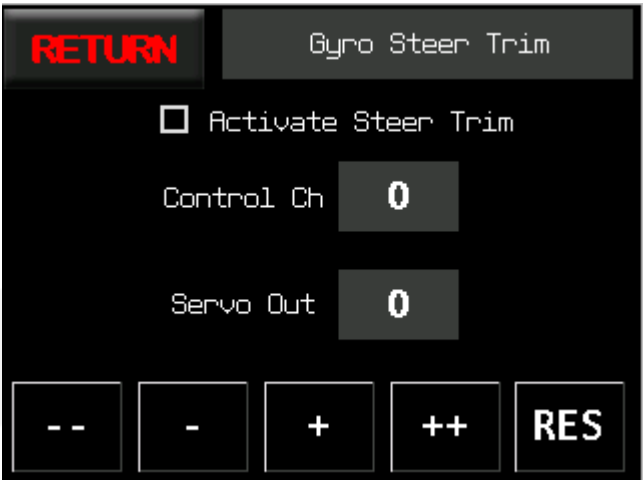
This smooth Flite mix feature allows you to assign gyro assisted rudder to a separate Servo output and then sub trim the servo output from the transmitter.

Activate Steer Trim—turns the mix ON/OFF

Control Channel— is the channel from the transmitter that will provide the steering trim offset.

Servo Output— is the Steering servo output.

Setting values of 0 (zero) in the Control Channel and/or Servo output parameter will also cancel the gyro assisted steering sub trim mix.

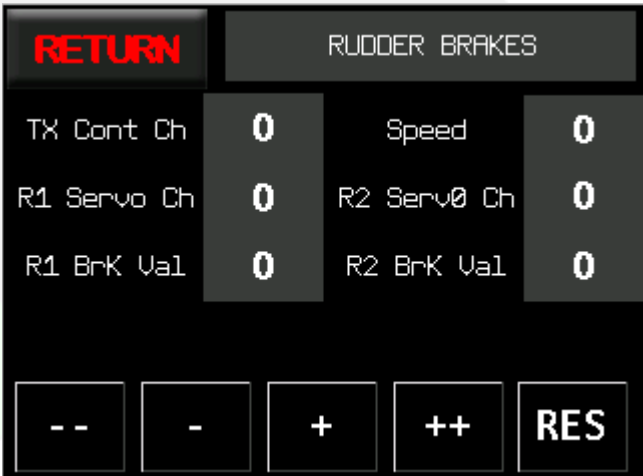


Dual Rudder Brakes

Some models come with dual rudders. Dual rudders can be employed as air brakes for slowing a model.

The Smooth Flite Dual Rudder Brake mix feature allows you to provide an offset to gyro assisted rudders to provide this air brake action.

TX Cont Ch is the transmitter control channel that triggers the Rudder braking Offset Position. All 20 input channels are available (depending on the number of transmitter channels available) to actuate the mix feature. A TX Control value of 0 (zero) turns the mix feature off.



Hint: For a scale presentation you might set up Rudder Brakes to actuate as ground brakes are applied. For air brakes you could use the flap channel. For a combination of both air brakes and ground brakes you would set up a mixed channel in the transmitter that passes signal from ground brakes and flaps (or airbrakes) to the mixed channel and then pass this to the Smooth Flite Rudder Brake Channel. Phew!

Speed is an adjustable parameter (0—10) to slow the movement of the Rudder brake effect. 0 = fastest 10 = slowest.

R1 and R2 Servo Ch—are the 2 Smooth Flite Servo outputs where the braking offset is applied. These would be your dual rudder servo outputs.

R1 and R2 Brk Val are the Offset positions that the Rudders will move to when the position is activated by the TX Control Channel.

Smooth Flite Advanced Mixing Functions

Vectored Thrust Switching and Gyro Boosting

Many modern Sports Jets and some Scale Jets come with single and twin Vectored thrust. For the first time Vectored Thrust pilot this can be a daunting experience so we have provided a mechanism where Gyro assisted vectored Thrust can be switched to ON/OFF/BOOST remotely from the transmitter. Up to 4 Servo outputs can be switched to cover both twin engine and single engine Vectored Thrust models.

TX Cont Ch is the transmitter control channel that triggers the Vectored Thrust switching position. All 20 input channels are available (depending on the number of transmitter channels available) to actuate the mix feature. A TX Control value of 0 (zero) turns the mix feature off.

Vect 1,2,3,4 Out Are the (up to) 4 Smooth Flite Servo outputs that will be switched to the Vect 1,2,3,4 position.

Vect 1,2,3,4 Val Are the (up to) 4 Smooth Flite Servo outputs Offset positions that the Servos will move to when Vectored Thrust is switched off.

Capture will capture and assign the current servo position for the (up to 4) Servo output channels.

VX Button will take you to the Vector gyro boost page where you can boost the gyro up to 200 percent for 3D hovering etc.

Vectored Boost (NEW TO VERSION 7)

Vector Boost will increase the gyro effect on vector outputs up to 200% for hovering etc.

Set the Vector TX ctrl channel to a 3 stage switch on the vector switching page. The result will be Vector OFF/ON/BOOST

The screenshot shows the 'Vector Switching' menu. At the top left is a 'RETURN' button in red. To its right is the 'Vector Switching' title and a green question mark icon. Below the title is a table with four rows and four columns. The first column contains labels: 'TX Ctrl Ch', 'Vect 1 Out', 'Vect 2 Out', 'Vect 3 Out', and 'Vect 4 Out'. The second column contains the value '0' for all five rows. The third column contains labels: 'VX', 'Vect 1 Val', 'Vect 2 Val', 'Vect 3 Val', and 'Vect 4 Val'. The fourth column contains the value '0' for all five rows. At the bottom of the menu are five buttons: '--', '-', '+', '++', and 'RES'.

TX Ctrl Ch	0	VX	Capture
Vect 1 Out	0	Vect 1 Val	0
Vect 2 Out	0	Vect 2 Val	0
Vect 3 Out	0	Vect 3 Val	0
Vect 4 Out	0	Vect 4 Val	0

The screenshot shows the 'Vector Boost' menu. At the top left is a 'RETURN' button in red. To its right is the 'Vector Boost' title. Below the title is a text box containing the following text: 'Vector Boost will increase the gyro effect on the vector outputs up to 200% for Heading Hold hovering'. Below this text is another text box containing the following text: 'Set the TX Ctrl Ch to a 3 stage switch on the Vector Switching page. The result will be Vector OFF/ON/ON (with Boost)'. At the bottom of the menu are three horizontal sliders with blue bars. The first slider is labeled 'Elevator:' and has a value of '0'. The second slider is labeled 'Aileron:' and has a value of '0'. The third slider is labeled 'Rudder:' and has a value of '0'.

Vector Boost will increase the gyro effect on the vector outputs up to 200% for Heading Hold hovering

Set the TX Ctrl Ch to a 3 stage switch on the Vector Switching page. The result will be Vector OFF/ON/ON (with Boost)

Elevator: [Slider] 0

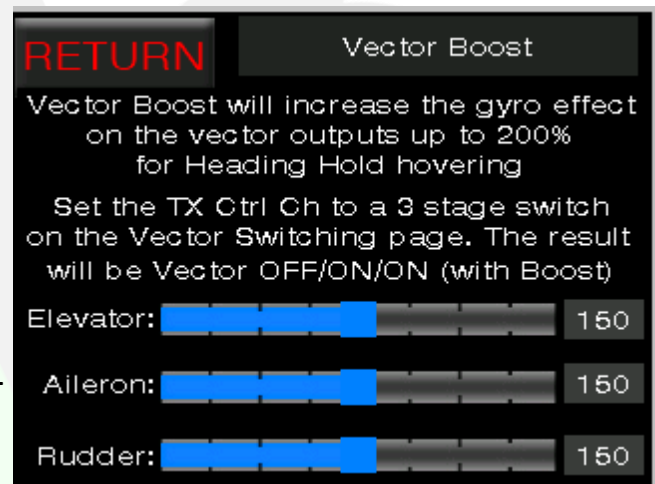
Aileron: [Slider] 0

Rudder: [Slider] 0

Smooth Flite Advanced Mixing Functions

Hint: To set up Vectored Thrust switching. And Vector Boost

- 1) Assign the TX Control Channel from the transmitter to a 3 stage switch.
- 2) Assign the Vect 1,2,3,4 Servo outputs. For a single engine use 1 and 2. For a twin engine you would use all 4 servo outputs.
- 3) Release the transmitter stick so the thrust tubes are at the neutral position and then press the "CAPTURE" button. This will capture and assign the current Servo Output position to the each corresponding Vect 1,2,3,4, Value.
- 4) Test the function by switching the assigned transmitter switch. With the switch in one position all Vectored Thrust tubes should move. Switching to the opposite position all vectored. Thrust tube should move to the captured position.
- 5) Go to the Vector Boost page and set the multiplying amount of gyro gain to apply to the boost function. Please note the boost function will multiply both low and high gyro gain settings. With a setting of 100 percent the original Low and High gyro gain values will operate. Setting a slider to 200 will double the gain for that control surface.
- 6) With the 3 stage switch you should have a result of vector OFF/ON/ON with gyro Boost on the vector outputs. You may need to reverse the output in the transmitter to set the switching to your desired position.
- 7) If no boost is required then set the boost to 100 (default) on the vector boost page.



Smooth Flite Setup Hints

Gyro controlled Rudder and Ground steering

One of the excellent features of Smooth Flite RRS is having unlimited Input to Output routing capabilities as well as sophisticated trimming capabilities. For the best Smooth Flite assisted outcome the following should be performed using Smooth Flite trim functions.

In this Hint we will talk about how to apply Gyro to ground steering as well as rudder.

We will use conventions as a brief Explanation and

[The steps ▶ to get to the ▶ pages to achieve the outcome]

Method.

On the TX, assign a single channel to rudder. The factory setup will automatically do this when you set the protocol to match your TX type.

[Main Menu ▶ System ▶ Receiver Protocol]

Route the TX rudder channel to 2 Smooth Flite servo outputs. One output will be for rudder the second output will be for steering.

[main menu ▶ I/O Routing]

Sub trim the rudder output to get a centred rudder.

[Main Menu ▶ Monitor ▶ Tap the input channel indicator assigned to rudder ▶ Tap the “Assigned To Smart Bus Output” for rudder. You will be in the Sub Trim page for the assigned Rudder where you can perform Sub Trim]

Reverse the servo if necessary and sub trim the steering output to get centred steering. Also adjust endpoints in or out as required. This can and should be performed in the Sub trim pages of the Smooth Flite

[Main Menu ▶ Monitor ▶ Tap the input channel indicator assigned to Rudder ▶ Tap the “Assigned To Smart Bus Output” for steering. You will be in the Sub Trim page for the assigned steering where you can perform servo revers, Sub Trim and end point adjustments]

Run the Smooth Flite Gyro Wizard **[Smooth Flite Gyro setup menu page]** assign Smooth Flite assisted control to Rudder. Because the steering output is assigned to the same input channel as rudder the steering will automatically be gyro assisted for ground steering.

Outcome

You will have Gyro assisted ground steering for take-off and landings.

You can also set up a transmitter channel as the sub trim control for Gyro assisted steering. See the section on “Gyro Assisted steering”

Smooth Flite Setup Hints

Setting up Flaps with a single TX channel

In this Hint we will talk about how to apply a single input channel to control flaps.

We will use conventions of a brief Explanation and

[\[The steps ▶ to get to the ▶ pages to achieve the outcome\]](#)

Method.

On the TX, assign a single channel to flaps.

Route the TX flap input channel to 2 Smooth Flite servo outputs. One output will be for the left flap and the other for the right flap.

[\[Main menu ▶ I/O Routing\]](#)

HINT: If you are using 4 servos for flaps then simply assign 4 servo outputs.

Connect one flap servo (**left or right does not matter. This will be the primary flap and we will match all other flap outputs to this primary flap via the Smooth Flite system**). Set the flap positions on the TX to flaps off, half and full as required.

HINT: We generally set flaps to half initially so as to not over-drive the servo.

Sub Trim the flap closed, half and full positions for the primary flap [\[Main Menu ▶ Monitor ▶ Tap the input channel indicator assigned to flaps ▶ Tap the “Assigned To Smart Bus Output” for this particular physical flap. You will be in the Sub Trim page for the assigned Rudder where you can perform Sub Trim, Reverse and Endpoint matching\]](#)

Hint: Do the above process starting with the TX Flap switch (or Dial) is in the half position so as to not overdrive the servo.

Reverse (if necessary), sub trim and adjust endpoints so the primary flap operates to your requirements.

Once you are happy with the primary flap operation then connect the second flap and perform the same process to match the movement of the secondary flap. You can also use our proprietary 15 point matching on the secondary flap to precisely match it to the primary flap. [\[Main Menu ▶ Monitor ▶ Tap the input channel indicator assigned to flaps ▶ Tap the “Assigned To Smart Bus Output” for this particular physical flap. ▶ Tap “15 point Servo Match”\]](#)

Hint: We set up our primary flap on a 3 position switch and for the setup of the second flap we temporarily transfer to a slider so we can slowly bring the flap down and adjust with 15 point matching to get super matched flaps. After the matching is complete we reassign the flaps to a 3 stage switch.

For additional flap servos just repeat the process above.

Outcome

You will have a single TX channel controlling a complexed array of flap servos.

Also check the product page for how to videos.

Smooth Flite Setup Hints

Elevons, Thrust Vectoring and Canards setup

One of the excellent features of Smooth Flite RRS is having unlimited Input to Output routing capabilities as well as sophisticated trimming capabilities. For the best Smooth Flite assisted outcome the following should be performed using Smooth Flite trim functions.

In this Hint we will talk about how to setup Elevons, Thrust vectoring and Canards. We will describe the exact setup used for our SU37 with Elevons, Thrust Vectoring, Dual Rudders and Canard.

We will use conventions of a brief Explanation and

[The steps ► to get to the ► pages to achieve the outcome]

Method.

On the TX, assign a single channel to elevator, a single channel to Rudder and dual channels to ailerons. The factory setup will automatically do this when you set the protocol to match your TX type.

[Main Menu ► System ► Protocol type]

Route the TX elevator channel to 2 Smooth Flite servo outputs. These will be eventually used for Canard control.

[Main Menu ► I/O Routing]

Route the TX left aileron channel to 2 Smooth Flite servo outputs and the TX right aileron channel to 2 servo outputs. These will be used of Elevon and thrust vectoring.

[Main Menu ► I/O Routing]

Route the TX Rudder channel to 4 Smooth Flite servo outputs. These will be used for dual rudder and rudder thrust vectoring.

[Main Menu ► I/O Routing]

Run The Smooth Flite Gyro Wizard assign Smooth Flite assisted control to Rudder, ailerons and elevator.

[Main Menu ► Smooth Flite ► Wizard]

Select Elevon mixing. Connect the elevon servos to outputs assigned to channels 19 and 20. Slowly move the aileron and elevator sticks being careful not to overdrive the servos. From the Smooth Flite, adjust the servo output Limit positions to the desired maximum movement positions.

[Main Menu ► Smooth Flite ► Advanced ► Tail Type ► Elevons].

From the Smooth Flite Elevon page, if necessary reverse the Elevator direction and adjust the amount of elevator to aileron mix.

Smooth Flite Setup Hints

Elevons, Thrust Vectoring and Canards setup CONTINUED

If the ailerons are moving the wrong way go to the Smooth Flite sub trim page for the ailerons and reverse their movement.

[Main Menu ▶ Monitor ▶ tap the input channel indicator assigned to the Aileron ▶ Tap the “Assigned To Smart Bus Output” for Aileron page. You will be in the Sub Trim page for the assigned Aileron where you can reverse the servo]. You may need to do this for both Aileron servo outputs.

Connect the thrust vectoring up down servos and if necessary reverse, sub trim and adjust endpoints as necessary. The thrust vectoring servos should follow the movements of the elevons in up down and movement.

Connect on Rudder servo. This will be our primary rudder. From the Smooth Flite Sub Trim Page, Sub Trim, Revers and endpoint adjust the primary rudder servo.

Connect the second Rudder servo and repeat the process.

Connect the Rudder Thrust vectoring servos and sub trim as necessary. The Thrust vectoring should now follow the elevon and rudder movements.

Finally connect the CANARD servos and as above Sub Trim, Reverse as necessary.

Hint: With Canards and thrust vectoring you can drastically reduce or increase the Travel (End Points) in the Smooth Flite Sub Trim pages. You can also Limit the travel to a maximum and minimum travel positions. This functionality is available for all 16 Smooth Flite servo outputs. For first flights you might want to reduce Thrust vectoring and Canards a little. You will soon have a feel for how the model reacts to these controls and can adjust them to you liking. It is all possible to perform these functions in the Smooth Flite system and this is why it is much more than a simple power expander.

Outcome

You will have set up one of the most complex RC controlled model available today with Elevons, Thrust Vectoring, Dual Rudders and Canards all with Smooth Flite assisted stabilisation.

Hint: You can add a 5th servo output for Smooth Flite assisted ground steering. Set up smooth Flite gyro assisted steering trim.

Also check the product page for how to videos.

General FAQ

Can I mount the Smart Display in my model.

The Smart Display can be mounted as a simulation cockpit for RC aircraft, however, it should be shock mounted to protect against vibration. All Advanced Radio ARXL products (Smooth Flite and Smart Bus) provide downlink telemetry so in most cases it is not necessary to mount the display in the model.

After setup, do I have to leave the Smart Screen in my model.

No you don't. The Smooth Flite will work perfectly without the Smart Display attached. Please read the FAQ above.

What are the 2 battery/bar pictures on the front screen for?

These pictures show you a percentage of the battery you have left. They will range from 100% to 0% and update as the battery packs are used. Never fly if the packs are in the RED ZONE and always make sure you have set up the correct battery capacity for your battery packs.

If I change the batteries in my model or move the Smooth Flite to a different model will I have to setup the switch again?

Yes, The switch relies on the information that you program into it to be accurate. It can not work to its best if this information is not accurate.

Does the Smooth Flite regulate the voltage?

No, the Smooth Flite 16 does not offer regulated voltage, This is available on the Smooth Flite 26.

Can I Plug 2 different voltages into the Smooth Flite? For example a 3S lipo and a 2S lipo battery

No, you should always use the same voltage (S rating) and capacity packs on both sides of the Switch.

Can I plug 2 different chemistries into the Smooth Flite? For Example: A LiFE and a Li-ion battery

No, you should always use the same chemistries for both batteries.

I have the remote switch version of the Smooth Flite. Can I leave the batteries connected for a prolonged period?

Smooth Flite with the remote switch option will draw a small amount from the batteries each day so for periods longer than a few days you should disconnect the batteries.

Specifications

Operating Voltage:	5.0 — 12.0v (Receivers must be capable of these voltages)
Battery type:	2s LiPo/Lion, 2s LiFePo4, 5s NiMH/NiCd
Receiver:	Dual AR Active Redundancy technology
Receiver Voltage:	HV
Supported protocols:	Jeti EXBUS, SBus, SBus2, JR/DFA XBus-A, HOTT, SRXL, SRXL2.
Telemetry:	Ex-Bus, SBus2, XBus-A, Spektrum SRXL, HOTT, S-PORT
Number outputs:	16 Channels fully programmable
Servo Output Resolution:	0.25 μ s
Frame Rate:	11ms
Gyro Sensor:	Nine-Axis (Gyro + Accelerometer + Compass) MEMS
Barometer:	Pressure: 300-1100 hPa $\pm$ 1 hPa
Graphic Interface:	16k Colour Touch Screen
Dimensions:	66 x 49.5 x 22
Weight Power Unit:	50g (without screen)
Weight Screen:	66g
Temperature:	-30°C to 85°C
EMV Conformance:	EN 55014-1:2006
CE Conformance:	2004/108/EG

Channel Routing for Model _____

Smooth Flite Servo Output	Transmitter Input	Function	Function	Transmitter Input	Smooth Flite Servo Output
S08					S16
S07					S15
S06					S14
S05					S13
S04					S12
S03					S11
S02					S10
S01					S09

Notes

This image shows a full page of white paper with horizontal black ruling lines. A large, semi-transparent watermark is centered diagonally across the page. The watermark consists of a large, bold, light-green capital letter 'A'. Overlaid on the right side of the 'A' is the text 'Advanced Radio' in a grey, sans-serif font. The background of the watermark has a subtle gradient from light green to white.

Smooth Flite 5 Year Replacement Warranty

At Advanced Radio our products are designed and tested to very high standards. We use only the highest quality electronic components sourced from reputable manufacturers; ST Micro, BOSCH, TDK, Linear Technology, Texas Instruments, Cypress Semiconductor Corp and NPX. Our circuit boards are assembled in Australia in a certified ISO900-2008 and ISO 13485 medical devices risk management quality assurance environment.

At Advanced Radio we understand the value of the models that run our RC division of electronics. During our many years of operation we have focused on and developed a high quality product and reputable testing regime. Our QC process has been developed from many years of experience designing and working in medical systems. We understand completely the processes involved to achieve a very high quality and reliable product.

Our QC process provides for complete system functionality testing followed by rigorous load testing and running up a device up to 70°C for a period of 10 minutes under high electrical load. If the unit passes this stress test it is further run and heat soak at 60°C for a period of 8 hours prior to final test where it is load tested for a second time. If it passes these tests it is then packaged.

We believe in our processes and so for the first time in the RC industry we are offering a 5 year warranty on the main Smooth Flite unit if found to be defective in material and/or workmanship when used in the intended purpose.

Shipping charges related to any warranty claim are at the expense of the user, but Advanced Radio may elect to cover shipping charges at its discretion.

Warranty does not cover over voltage or over current damage beyond stated specification.

Warranty does not cover damage due to negligence, abuse, accident, improper installation or improper mounting.

Warranty does not cover loss of time, inconvenience, loss of model, or other incidental or consequential damages.

Smooth Flite Usage Statement

Smooth Flite has competed in its first International competition at Top Gun in May of 2018 in several models with excellent results. Smooth Flite employs state-of-the-art components to bring you the best possible flight experience for your giant scale model.

Smooth Flite is a highly technical product and so it is important that you fully understand the usage of a gyro based system prior to usage of Smooth Flite. This is not a toy. Incorrect setup of gyro parameters in any gyro system can lead to loss of control of a model. If you are unsure of the usage of gyro based systems then seek assistance from more experienced pilots.

Advanced Radio has extensively tested all supported radio protocols with our AR 74XX and 84XX series of servos. These high voltage servos are design proven with superior reliability specifically for giant scale models and work excellently with all AR power distribution products. We highly recommend trying these servos. They really are superior by design. We have also tested with several other leading brands of servos with excellent results.

Smooth Flite servo outputs are filtered to remove spurious noise. This allows the usage of long servo lead lengths however we strongly advise the usage of high quality servo leads like the AR ProLine capable of carrying currents experienced with today's high power high voltage servos.

While every attempt has been made to provide complete user instructions, it is impossible to cover every possible combination of servos, radio type and battery type. If you would like to discuss the set up of your new model please feel free to contact us by FaceBook (Booma RC), Telephone on +61 242955287 or email support@boomarc.com.

We trust you will enjoy using the Advanced Radio Smooth Flite.

Rick and Brendan Gell
AR Design Team.