# FlySky FS-i6 and FS-i6X Programming for Winch and Rudder Control

**Sept 2022 [ Revision 04]**

## Introduction

These instructions were compiled from thoughts originally found on the internet authored by a David Flakelar (in Sydney) and intended for DF65 and DF95s. The transmitters (Tx) work well in conjunction with the FS-iA6B receivers (Rx).

The two FlySky i6 Txs are very similar and adequately control the two primary channels required for most competitive RC yachts. The use of other "channels" (switches) to moderate the two primary channels aids the sailor to more precisely control the yacht under various conditions.

Sailors can easily use the one transmitter with more than one yacht by creating a separate model name for each and installing a separate, extra 'bound' receiver in each additional boat.

These instructions are intended to familiarize interested sailors in two major functions of rudder and winch control of RC yachts that they may not have attempted themselves because the available instructions are intended for RC planes etc. and written in "chinese English."

Having become familiar with the principles and use of the Tx menu system, novice users will then be confident to use additional functions available on the transmitters.

## Overview

### Sheet Control

The winch stick operation is supplemented by the Switch A immediately above and to the left of the winch stick on the transmitter. This two-position switch having an up and down position can be programmed to slightly ease the sheets for both Jib and Main (say 5 to 15 mm) in the **Up** position and to tighten the sheets to the normal close-hauled in the **Down** position. Note that the switch moves in a similar direction to the stick for easing and tightening.

This function can be used to accelerate out of tacks and to quickly ease sheets in stronger puffs of wind, and later; recover normal sailing.

*[The Tx controller also has one three-position switch, and if this switch could be physically moved to the left side, some sailors may wish to have two stages of easing, OR one easing (SwA UP), centre-normal close-hauled (SwA centre), and one tight - for pinching (SwA DOWN) – your choice!]*

### Rudder Control

The rudder stick operation is supplemented by the Switch D immediately above and to the right of the rudder stick on the transmitter. This two-position switch can be programmed to narrow the rudder swing and soften the movement in the centre of the stick travel for smoother, strong wind downwind sailing, by using the **Down** position. In normal light wind conditions, the **Up** position is used to vary the normal rudder swing.

**Menu Control Buttons**

On either side of the screen are two pairs of buttons that need to be fully understood to control programming of the Tx.

To the left is : -

**UP** Used to select a parameter to adjust or increase its value upwards.

**DOWN** Used to select a parameter to adjust or decrease its value downwards.

To the right is : -

**OK** Used to activate the chosen function so adjustments can be made.

Sometimes this button also moves the selection pointer arrow downwards like the **Down** button!

Generally, a quick press,(less than a second) is required, but to access the **MENU**, a long, (about one second) press is required.

**CANCEL** A short press (less than a second) is used to **CANCEL** any changes and exit up the **MENU** system.

A long press (between one and two seconds) is used to **SAVE** the changes and exit up the **MENU** system. This is the most common use of this button.

However, a very long press (say about two plus seconds), some functions will default to a reset *( – don't go there yet!)*.

It often pays to do two presses to go **UP** the menu two steps and come back down again to check what you have actually achieved.

Frankly, these multiple duration presses are quite confusing!

**For some settings, one of the two sticks are used to move the pointer arrow to the desired column of percentage settings**

Should the screen backlight turnoff, it can be turned back on with any button press without altering a setting.

Factory User Manuals are available online and generally cover material for model aircraft.

Sadly, radio sailing needs are not specifically covered, hence these instructions may help to bridge the gap between aircraft and yachts. Try the link below for the FS-i6 manual.

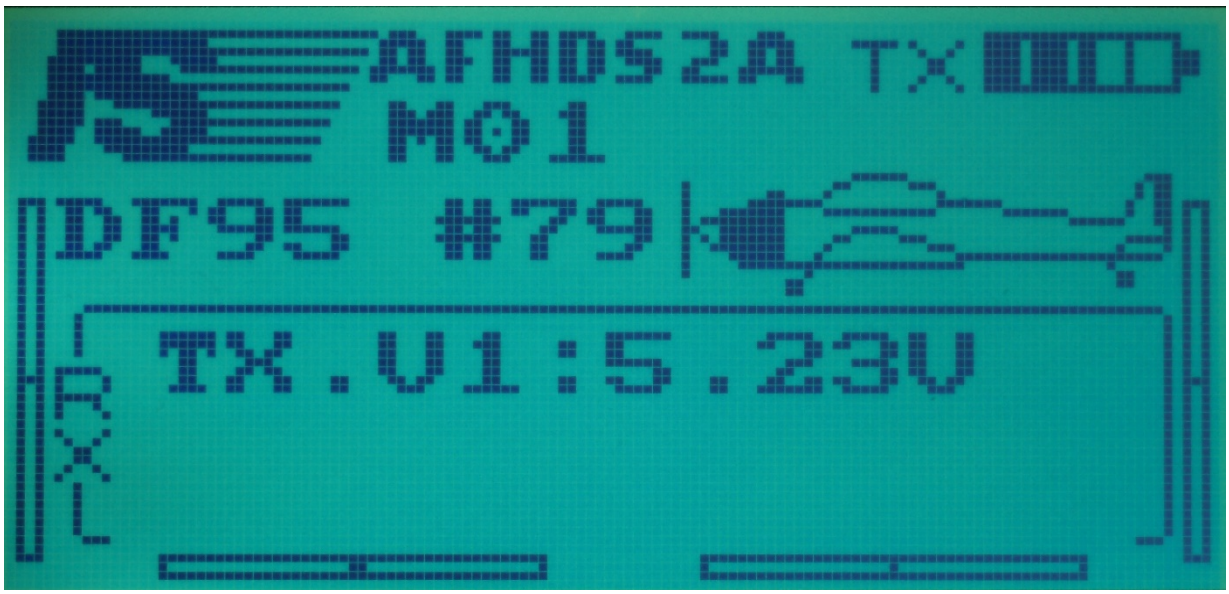
https://static1.squarespace.com/static/5bc852d6b9144934c40d499c/t/5c0787e10e2e721a7f17c998/1543997593953/FS-i6+User+manual+20160819.pdf

**Pre-requisites**

These are the important issues to address initially.

- Boats with RMG Smart winches (IOMs), need to be initially "Setup" using the winch instructions, with the default transmitter travel end points programmed into the RMG winch permitting only about 10 to 20 mm of sheet control travel beyond the normal working end points, yet still within the safe travel of the sheeting system. These settings will protect the boat from accidental damage caused by a powerful winch over or under sheeting in the future.
- You have marked your normal winch travel points (temporally) on your boat, with your fully eased and optimal close-hauled settings. Felt pen marks on masking tape will do. **Retain measured records of these two endpoints for later use**.
- You have set your **Subtrim** to **zero%** on **Channel #3** for the winch.
- You may use your **Channel #1 Subtrim** to whatever percentage aligns your rudder to the centreline. (I prefer to set my four slider Stick Trims to zero for normal sailing and do the original adjustment/correction with Tx software. Should you accidently move these slider controls while sailing, you can quickly reset them to zero and be confident the **Subtrim** software settings will still correctly prevail.)

## The Home Screen




The home screen shown above shows several things: -

- The Model number – **M01,**
- The boat type and sail number – **DF 95 #xx,**
- The model type **–** the selection **Airplane/Glider** also suits **RC Yachts,**
- The **Tx** voltage – **5.23 V,**
- It can show (but the photo doesn't show), the **Rx** voltage,
- All four slider trims set to **zero;** (spot the one that isn't!).

## Model Copy

The transmitter (Tx) can store 20 models: each including most of the characteristics programmed into the Tx.

Sailors with an existing RC yacht and transmitter programmed and functioning satisfactorily should consider copying their working model (probably #01) to a separate model memory location for safe keeping. Should the changes to original prove unsatisfactory, then it is a simple matter to copy the replica back to its original location, over-writing the undesired recent changes.

## 1. Model Copy

a) At the **HOME** screen, select the **MENU** by a long press of the **OK** button,
b) At the **MENU** screen, using the **UP** or **DOWN** button, select the **SYSTEM** screen, (Tx symbol) and select it with quick press of **OK**,
c) At the **SYSTEM** screen, using the **DOWN** button, move the pointer to **Model copy** field, and select it with a quick press of **OK**,
d) At the **Model copy** screen, with the pointer adjacent to the model to be copied, (the upper one), using the **UP/Down** buttons, select its number, (likely to be 01) and confirm it with a quick press of **OK**. The pointer will move down to the **Copy to** field.
e) Using the **UP/Down** buttons insert a number (say ten more – with 10x's **UP**). Note *"Menu to copy"* on the screen. [This message is a hint to use a long press next].
Refer to Photo **1** below.
f) Confirm with a long press (about 1 second) of **OK**.
g) At *"Are you sure"*, using **UP/DOWN** buttons, select **YES** followed by a quick **OK**.
h) **Save** the copy using a long press of **CANCEL**.

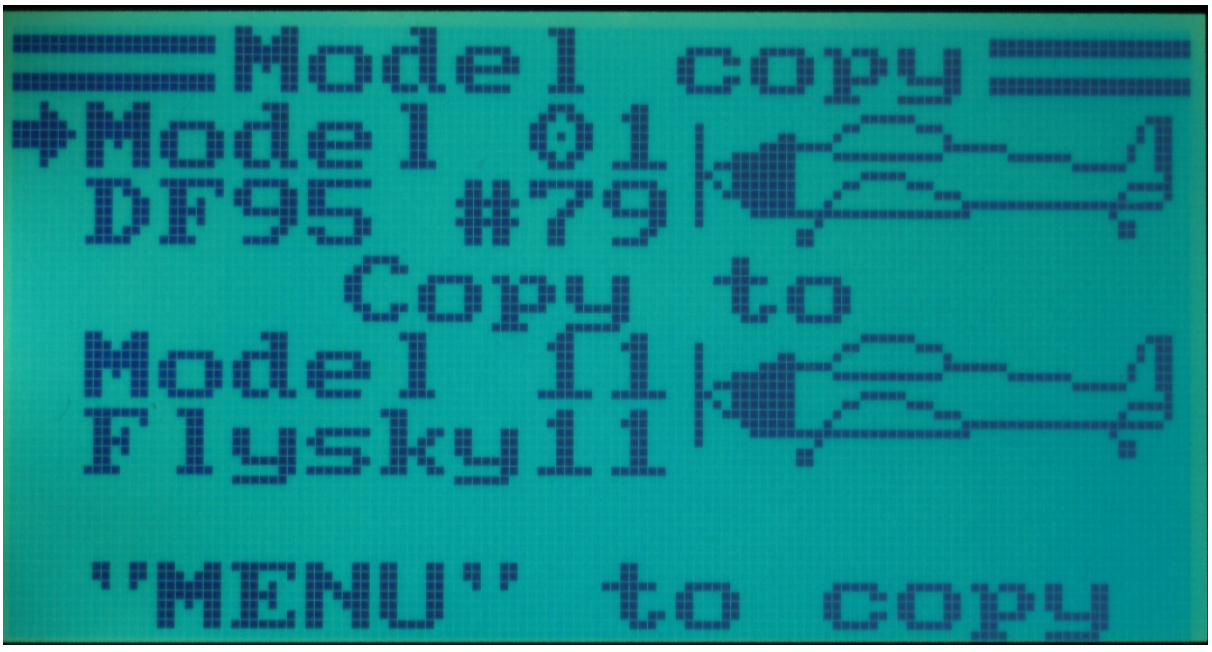



**Photo 1 Model copy prior to f) above.**
**If you have given your model a name, it could appear as above.**

This should save a copy of **Model 01** to **Model 11**.

## Think seriously about creating a back-up NOW!

When satisfied with any new changes to your working model (#01), don't forget to update your back-up model (#11) as well.
Should you ultimately wish to discard any recent changes and return to original settings, just copy your back-up, (in # 11), to its original working position (#01).

Now go to **Model select** and examine **Model 11 (Name DF95/65/IOM #xy)** to confirm it exists, and prove it replicates **Model 01**.

If you experience difficulty in copying or selecting a model, I suggest you use the link to the user manual listed above on page 2, turning to page 18 of the manual.

Most of the settings that follow can be achieved without the Receiver (Rx) in the yacht being turned on. However, some settings are best set or at least trialled after setting to confirm their effects.
The **Display mode** is sometimes beneficial and an aid to explaining the result when **MIX-**ing controls.

## 2. Set Normal End Points

i) At the **HOME** screen, select the **MENU** by a long press of the **OK** button,
j) At the **MENU** screen, using the **UP** or **DOWN** button, select the **FUNCTIONS** screen, (Tools symbol) and select it with quick press of **OK**,
k) At the **Functions** screen, using the **DOWN** button, move the pointer to **End points** field, and select it with a quick press of **OK**,
l) At the **End points** screen, with the pointer at **Ch1 (Rudder),** using **DOWN** button to set the LHS column to 90%. Now move the rudder stick to the right and set that direction to 90%. These adjustments of 90 % both sides limit the rudder maximum travel to about 40 degrees. This figure depends upon your crank lengths for the servo and your rudder. *You can experiment here with your own limits*.
m) While on this screen, now set the important winch sheet travel for the Jib and Main. Quick press the **OK** button twice to move the pointer to **CH3 (winch),** using the **DOWN** button to decrease this to about 95% (a very loose close hauled), move the winch stick UP and adjust the sheet eased position to about 115%, fully out with the main boom nearly at right angles to the centreline fore & aft. *Again, experiment with these percentages. Bear in mind you can later simply change both these limit positions by **SubTrim** as you can with the rudder.*

(These endpoints should be within the travel of the maximum RMG Winch end points.)

When satisfied with the rudder limit settings, these positions can be marked on the transom or the underside of the hull. Likewise for the winch, the sheet travel limits can be marked on the deck, either permanently or on masking tape until sheet lengths are adjusted on both Jib and Main booms.
Refer to Photo **2.**

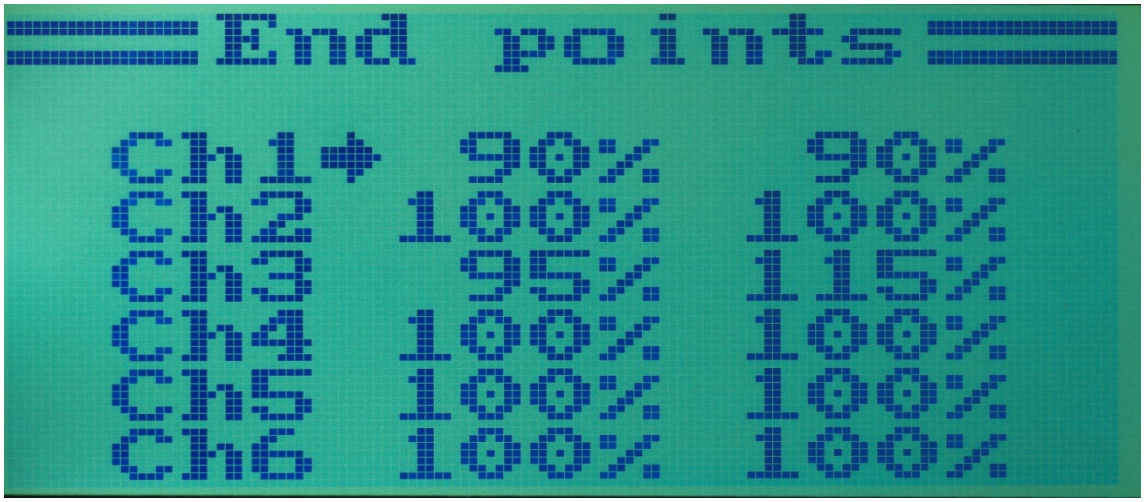


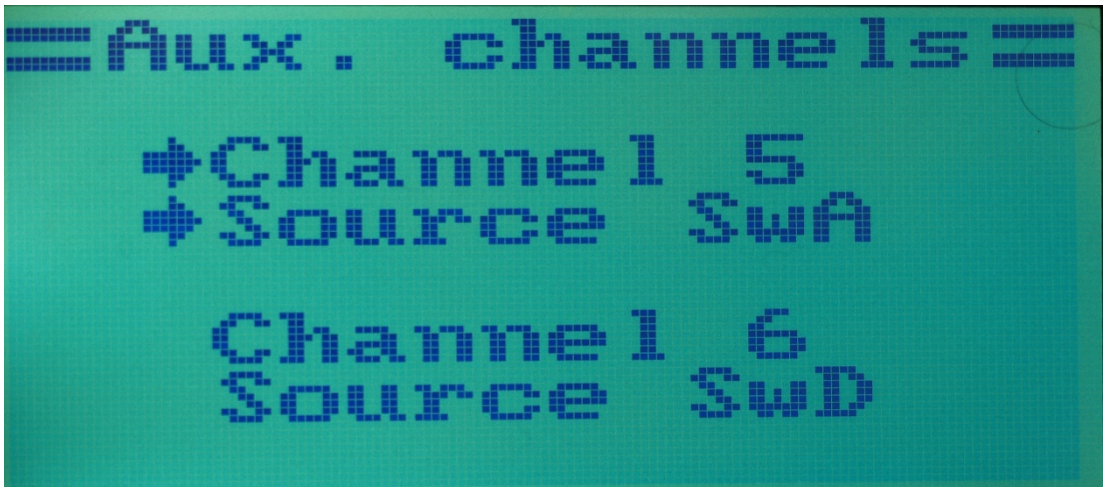

**Photo 2 End Point setting**

## 3. Programming the Transmitter Primary Channels for Switch Control

**<u>Firstly - Select & Assign the Switch A to Channel #5 and Switch D to Channel #6.</u>**

a) At the **HOME** screen, select the **MENU** by a long press of the **OK** button,
b) At the **MENU** screen, using the **UP** or **DOWN** button, select the **FUNCTIONS** screen, (Tools symbol) and select it with a quick press of **OK**,
c) At the Functions screen, using the **DOWN** button, move the pointer to **Aux. channels** field, and select it with a quick press of **OK**,
d) At the **Aux. channels** screen, assign Channel **5** to **SWA** (not the default **Vr-A**) and Channel **6** to **SWD** (not the default **Vr-D**) by using the **UP/DOWN** buttons and field changing with the **OK** button**.**
e) **SAVE** the assignments with a long press of **CANCEL!**
f) Now check your work with an **OK** to see if you have saved the assignments.
Refer to Photo **3A.**

**Photo 3A Assigning Channel 5 & 6 to switches A & D**



**Secondly - Assign the Switch D whilst In Fly Mode, to "Normal" and "Sport" Descriptions**

g) At the **HOME** screen, select the **MENU** by a long press of the **OK** button,
h) At the **MENU** screen, using the **UP** or **DOWN** button, select the **FUNCTIONS** screen, (Tools symbol) and select it with a quick press of **OK**,
i) At the Functions screen, using the **DOWN** button, move the pointer to **Switches Assign** field, and quick press of **OK**,
j) With Switch D **(SwD)** upwards, the pointer at **Fly Mode** using **UP/DOWN** buttons select **SwD.**
**k) FOR FS - i6 Users**
Set both **Idle Mode** and **Thro. Hold** to **SwB, (**any switch we won't want to use**),**
Refer to Photo **3B**.

**FOR FS – i6 X users.** Note this screen is called **"Assign Switches"**
Set both **Idle Mode** and **Thro. Hold** to **NONE,**
Also see Section 10)

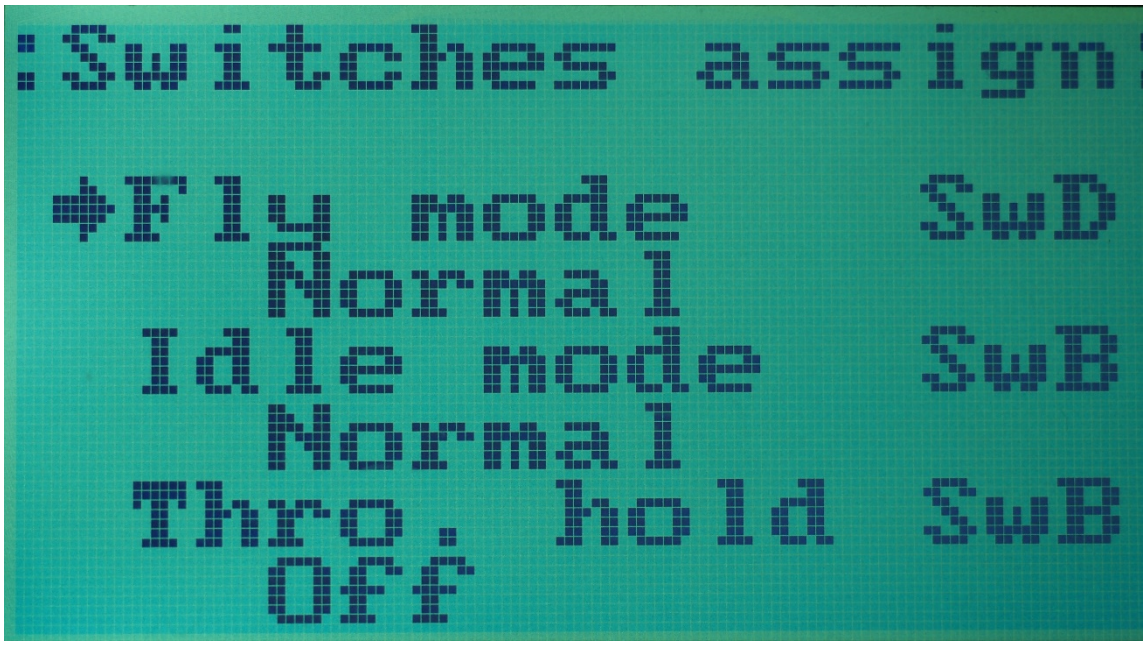



**Photo 3B Assigning Switch D whilst in Fly Mode to "Normal" & "Sport"**

l) **SAVE** these assignments with a long press of **CANCEL!**
Do not hold the press for 3 seconds or more or it will reset to a default setting.
m) Now check your work with an **OK** to see if you have saved the assignments.
Refer to Photo **3B.**

These switch descriptions of "**Norma**l" & "**Sport**" could be associated with various sailing conditions. My guess could be: -

- Normal (SwD - UP) – sailing upwind in the light/middle of **A Rig** wind range and
- Sport (SwD – DOWN) - sailing downwind in the upper end of **A Rig** wind range.

Now Switch A (**SwA**) will be used to ease the sails a programmed amount and Switch D (**SwD**) will be used to soften and limit the rudder action in strong winds downwind.

## 4. Starting with the Rudder (Channel #1)

a) At the **HOME** screen, select the **MENU** by a long press of the **OK** button,

b) At the **MENU** screen, using the **UP** or **DOWN** button, select the **FUNCTIONS** screen, (Tools symbol) and select it with quick press of **OK**,

c) At the Functions screen, using the **DOWN** button, move the pointer to **Dual rate/exp** field, and quick press of **OK**,

d) With switch D (**SwD)** upwards and the pointer on **Ch 1** note the word **Normal.**
Using **OK** select **Rate** and adjust to **100** using the **UP/DOWN** key if necessary
Using **OK** select **Exp** and adjust to **-70** using the **DOWN** key.

e) Now **Save** a with long press of the **Cancel** key.
These settings will apply with **SwD** upwards, the Rate setting permitting full 100% swing of the rudder set in End Points above as well as softening the rudder movement in the central region controlled by the negative (-70 %) exponent.

f) Now switch D (**SwD** ) downwards and the pointer on **Ch 1** note the word, **Sport.**
Using **OK** select **Rate** and adjust to **60** using the **UP/DOWN** key if necessary
Using **OK** select **Exp** and adjust to **70** using the **DOWN** key.

g) Now **Save** a with long press of the **Cancel** key.
These settings, with **SwD** downwards, will apply the Rate setting reducing the swing of the rudder set in End Points above now to only 60%, as well as softening the rudder movement in the central region.

Refer to photos 3 & 4 controlled by the negative (-70 %) exponent.
Observe the two graphs on the screen when you operate switch D up and down.

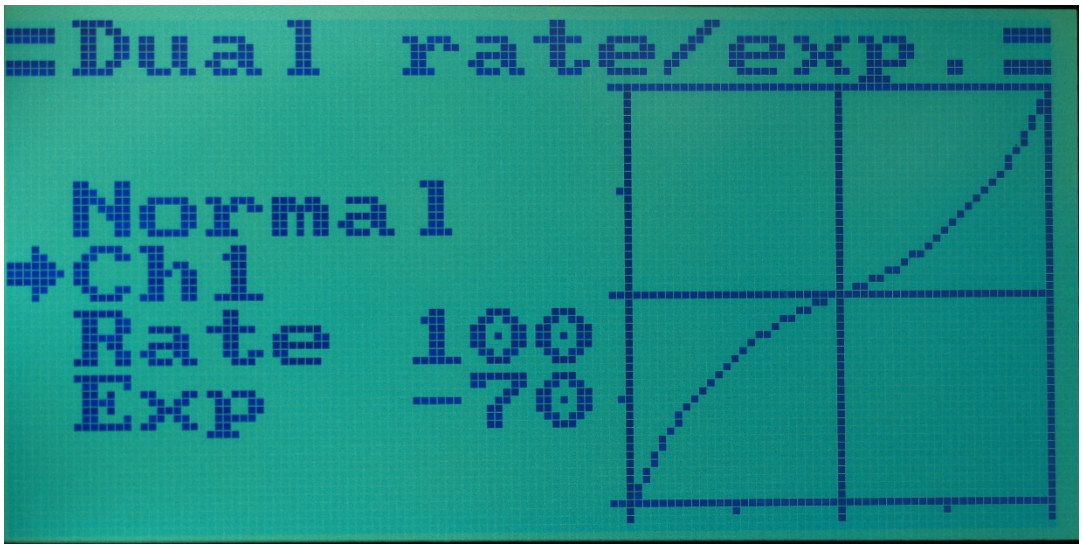



**Photo 3 Normal mode SwD UP**

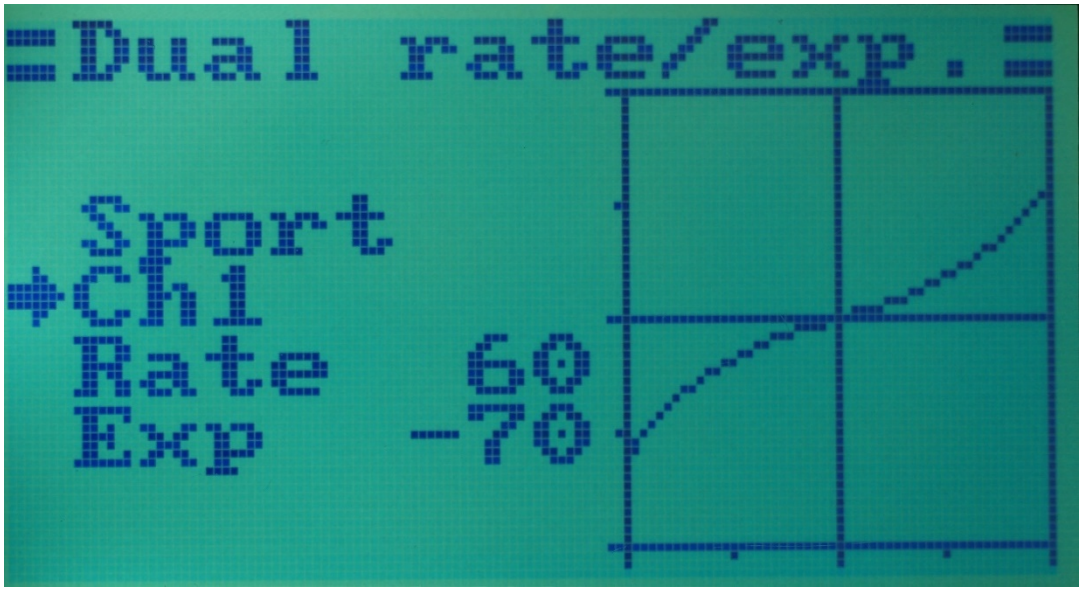



**Photo 4 Sport mode SwD Down**

*You can experiment with both the Rate and the Exponent settings to achieve your own preferences.*

## 5. Continuing with the Winch (Channel #3)

a) At the **HOME** screen, select the **MENU** by a long press of the **OK** button,
b) At the **MENU** screen, using the **UP** or **DOWN** button, select the **FUNCTIONS** screen, (Tools symbol) and select it with quick press of **OK**,
c) At the Functions screen, using the **DOWN** button, move the pointer to **Mix** field, and quick press of **OK**,
d) At the **Mix** screen, ensure the pointer is at **Mix #1** field, and quick press of **OK**,
e) With the pointer at **Mix is**, use **UP/Down** buttons, set **Mix is ON**,
f) Continue as above setting **Master** to **Ch5,**
Continue again, setting **Slave** to **Ch3,**
Continue again, setting **Pos. mix** to **0%,**
Continue again, setting **Neg. mix** to **-12%,**
Continue again, setting **Offset** to **0%,**

Now **Save** a with long press of the **Cancel** key.

Refer to Photo 5 and replicate all the fields.

*As usual, you can experiment with these settings to achieve your own preferences.*
*Some DF winches have been found to not react to small Mix settings between about -8% & zero %.*


**Phot 5 Mix #1**

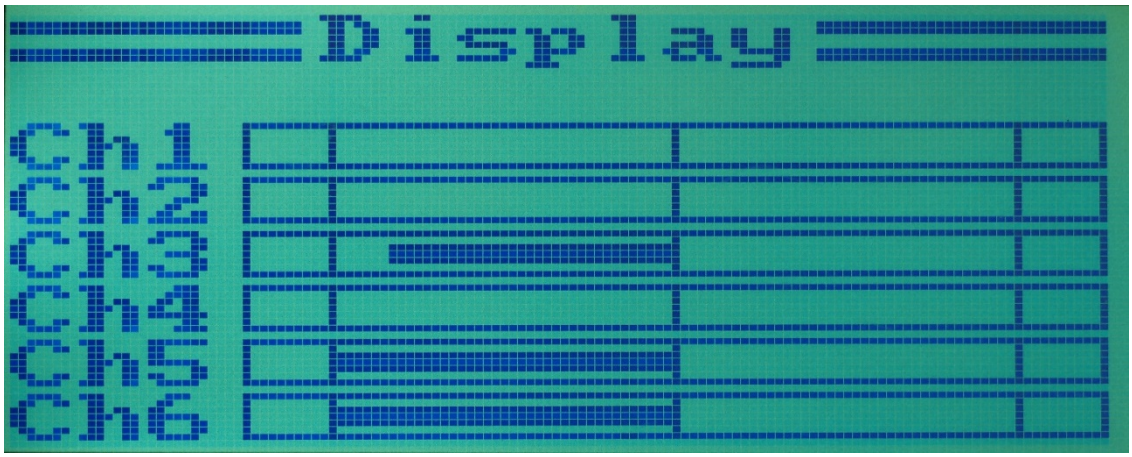
Applying a **Mix** will permit Switch A (**SwA**), now (channel 5), when **UP**, (the same direction as the winch stick when easing), to instruct the winch to ease the sheets **(- 12%).**

When **SwA** is **DOWN,** and the stick is down (close hauled), the 95% end point set above will prevail.

*Now, you have become very confident in use of the buttons, try the following in an abbreviated form: -*

6. **Home > Functions > Display > OK** and prove the following.

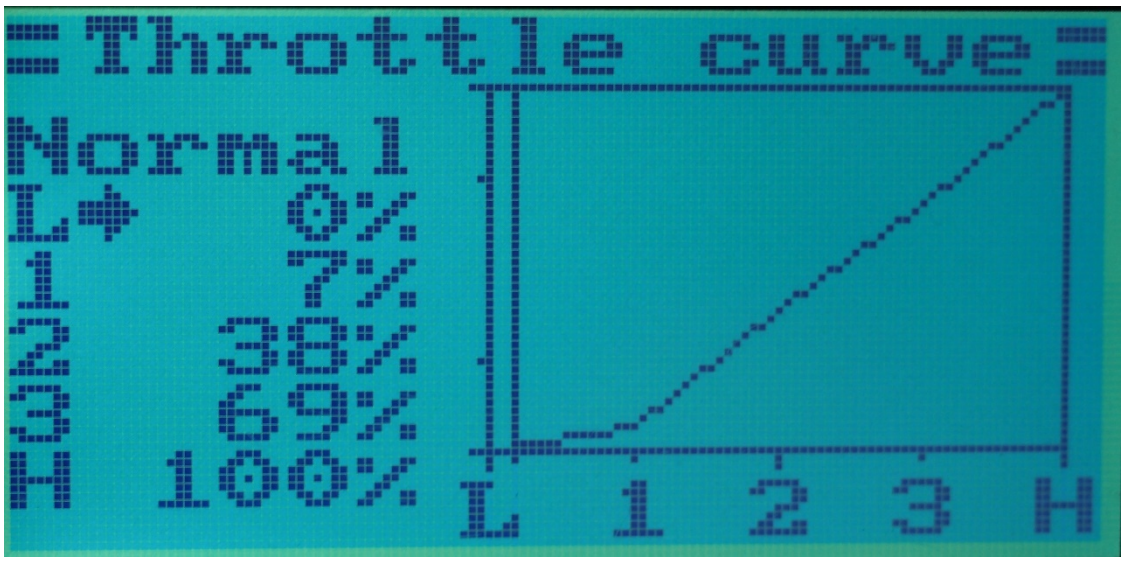
- All switches **UP** & Winch stick **DOWN,**
- Move the rudder stick left and right noting the **Ch1** swing is to 90% each side,
- Switch **SwD Down, CH6** moves from **100% left** to **100% right**,
- Rudder left and right noting the swing is now only **60%** each side.
- Again, all switches **UP** & Winch stick **DOWN,**
- Note **CH5** is **100% left**, Switch **SwA Down** moves **Ch5** from **100% left** to **100% right**, as well as **Ch3**, the winch tightening to **95%.**
- With the winch stick fully **UP, Ch3** moves out to **115%.**



7. **Throttle Curve – Precision Increase in the Bottom 25% of the Winch Stick movement.**

Try this: -

**Home > Functions > Throttle Curve > OK** and replicate the screen contents in Photo below. Now **SAVE.**

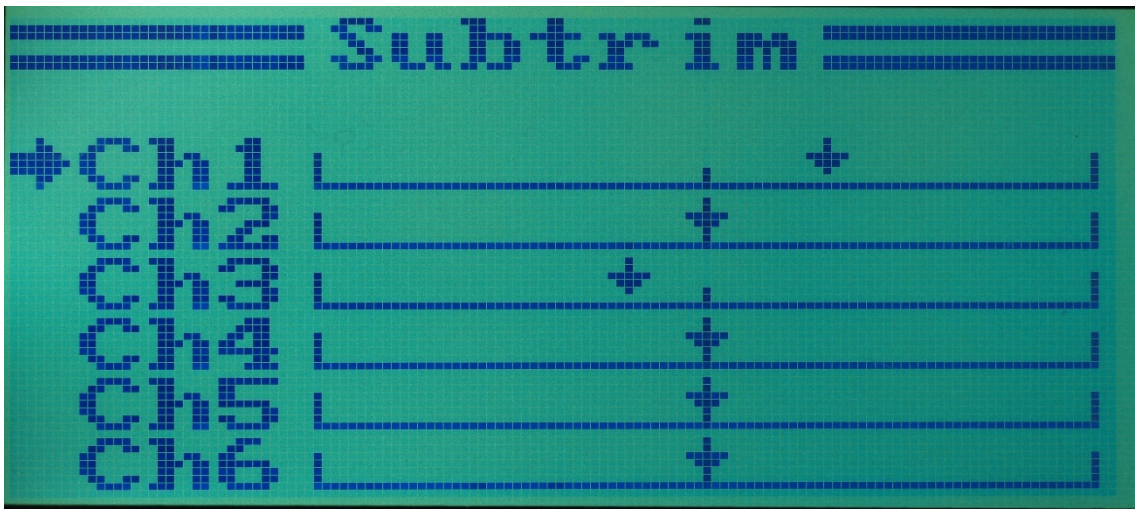



This improves precision of the winch stick giving only 7% easing of the sheets for the first 25% of the stick movement upwards and a linear response thereafter.

## 8. Model Type Selection

Model type selection is important when a new yacht is to be ‘Bound’ (with a second Receiver Rx) using the same Tx. RC yachts are normally set on Mode 2, normally given a unique Number & Name and given the model Type of Airplane/Glider. Once bound and selected by name from Tx memory, all their characteristics will be correctly adopted by the Tx.

## 9. SubTrim Adjustment to correct rudder and Winch Trim

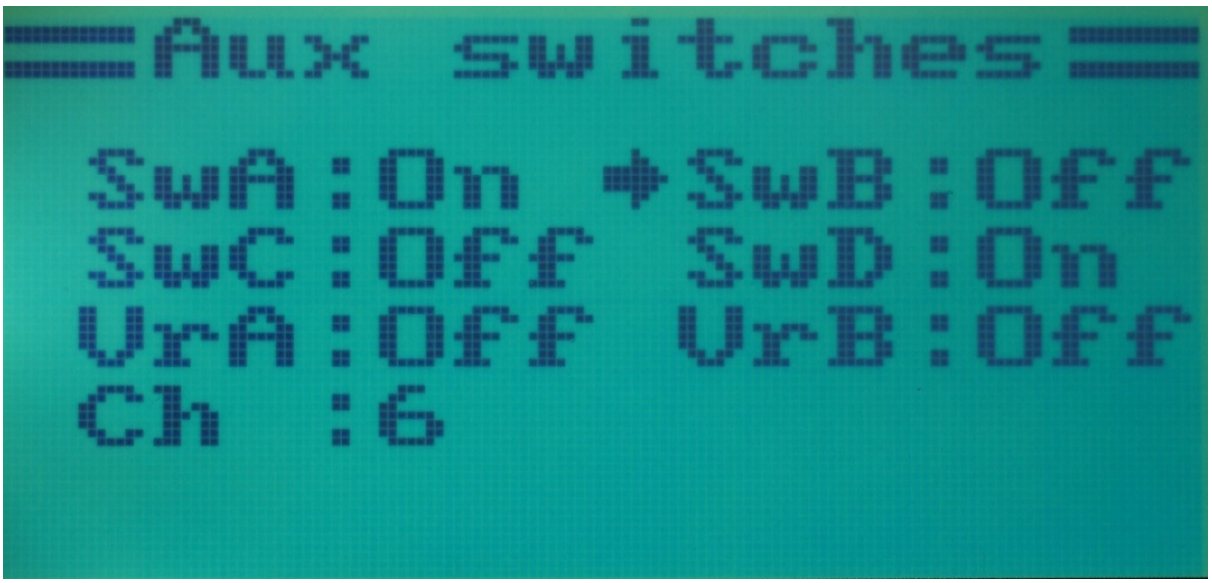



SubTrim can be used to semi-permanently correct minor mechanical imperfections in rudder and winch trim by Tx software. This, however, relies on the sliders adjacent to the rudder and winch sticks to be each set at zero. These sliders can be accidently knocked without the sailor's knowledge and affect the yachts performance during a heat. When the sailor feels something is no longer normal, a glance at the screen slider's positions promptly shows him all is/isn't correct.

In the above photo the rudder (channel #1) has been trimmed to set the rudder dead centre whilst ashore.

The winch has been set to ease the sheets about 5mm because the wind strength is at the top end of the Rig's comfort zone, without coming ashore.

## 10.Extra switch Assignments for FS – i6X users only – Aux Switches




This function has been added to the FS – i6X only and is not available in the older FS – i6.

For only those FS - i6X sailors try this : -

**HOME > System** (Tx Symbol) **>** down to **Aux Switches > OK** and replicate the screen shot above.

# Concluding Notes

1. Drums of different diameters will consistently use different percentage settings through-out the programs and require more or less turns.
2. In setting the winch try using an easing of say 5-15 mm of the sheets from the normal close-hauled position.

**Acknowledgements**

Thanks to Dave Odlum, Brent Field, Barry Martin and Bruce Robins for their suggestions, corrections and contributions.

Hunter Gillies September 2022