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It is the sole responsibility of the user to ensure that the setting up of their transmitter functions as expected on the model.

The Taranis Transmitter Range

The Taranis X9D (discontinued) and X9D Plus. The main difference is that the “Plus” has haptic (vibration alert). It uses a standard SD card.



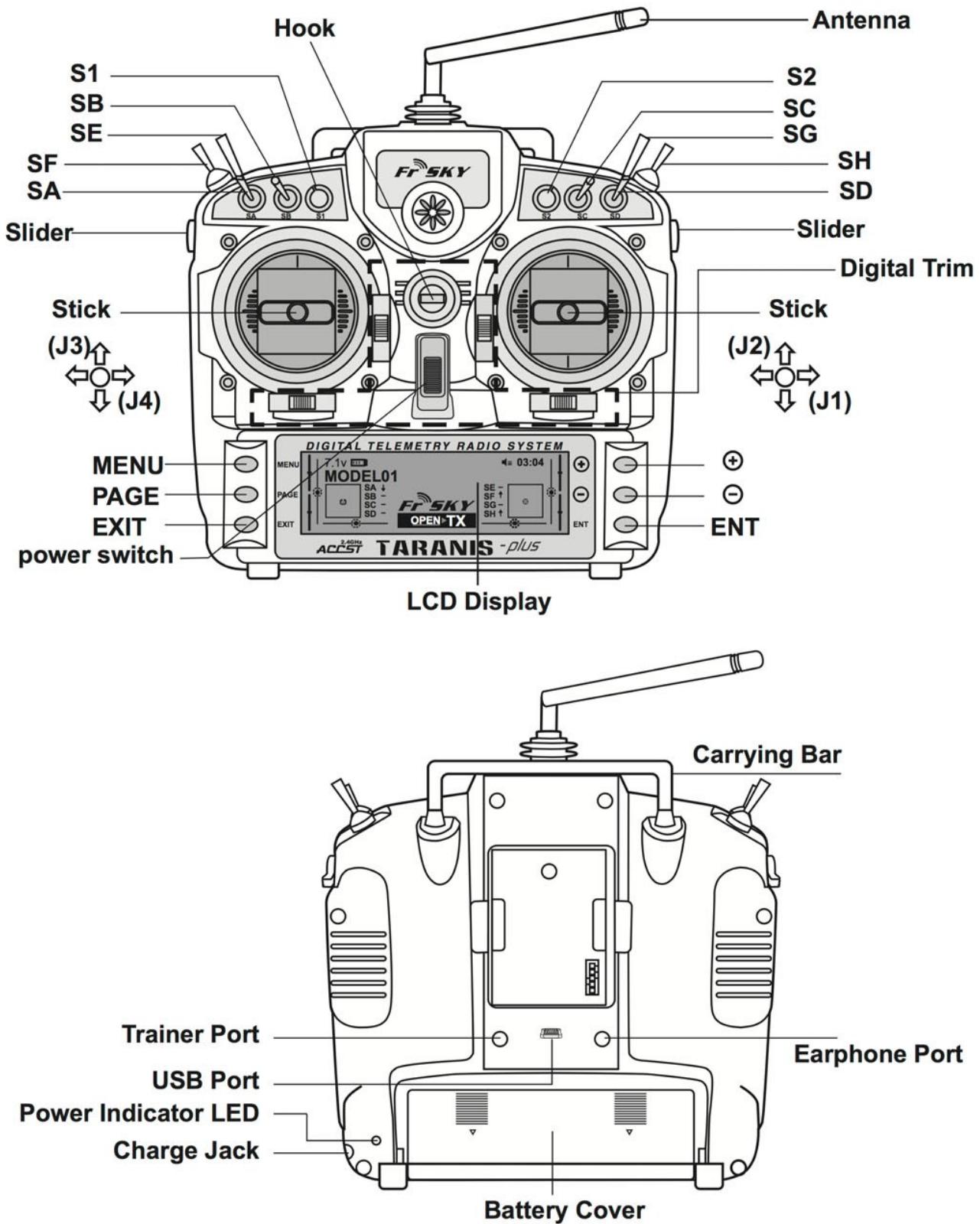
The Taranis X9E. Essentially the same as the X9D but with a different case. Also the external transmitter module can only be fitted from inside the transmitter. It has two additional sliders. It uses a standard SD card.



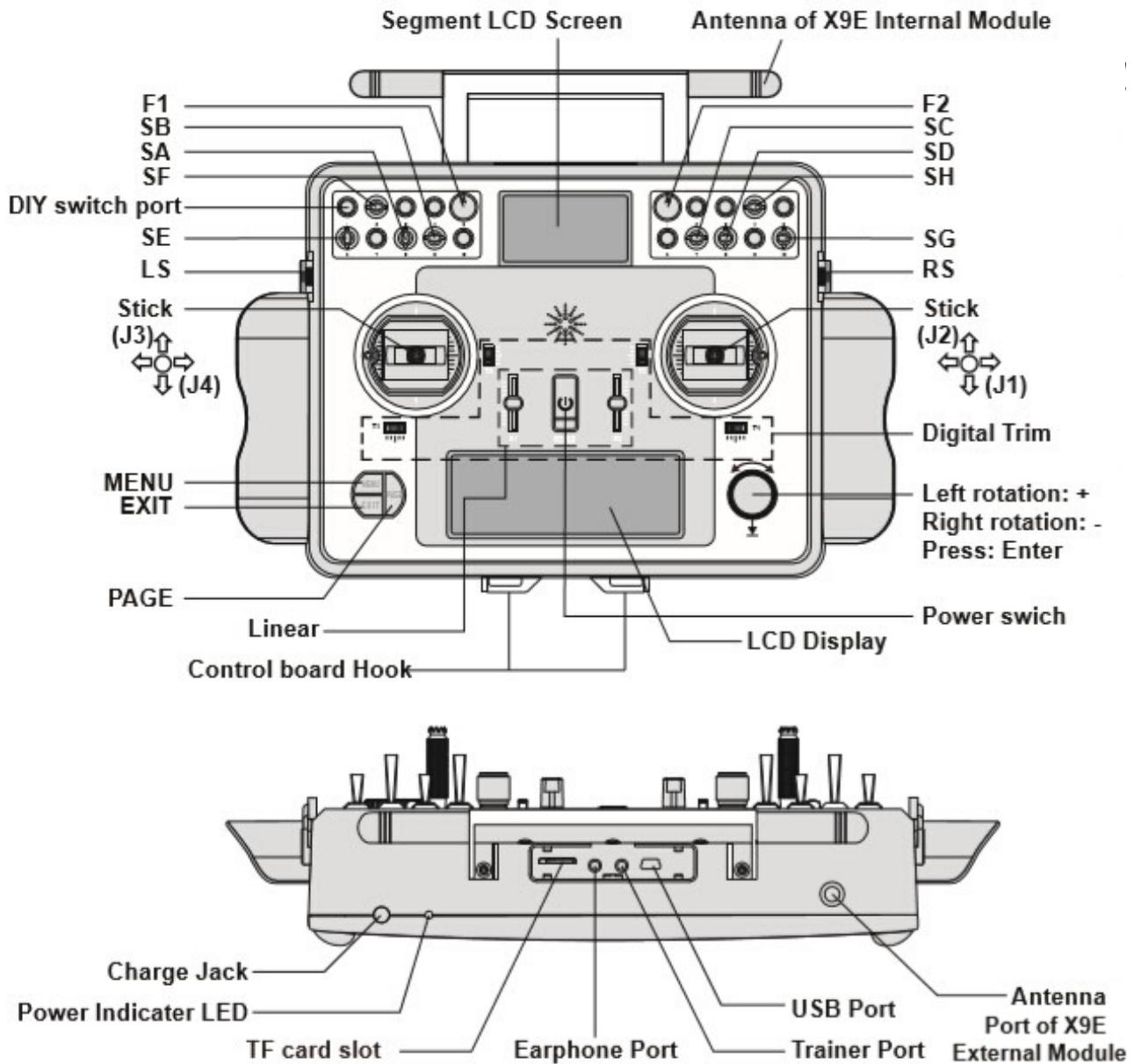
The Taranis Q X7 and Q X7S. Less switches and a smaller screen are the main differences between the X7 and the X9D. The “S” version has better quality gimbals. It uses a micro SD card.



The X9D Plus Transmitter



The Taranis X9E Transmitter

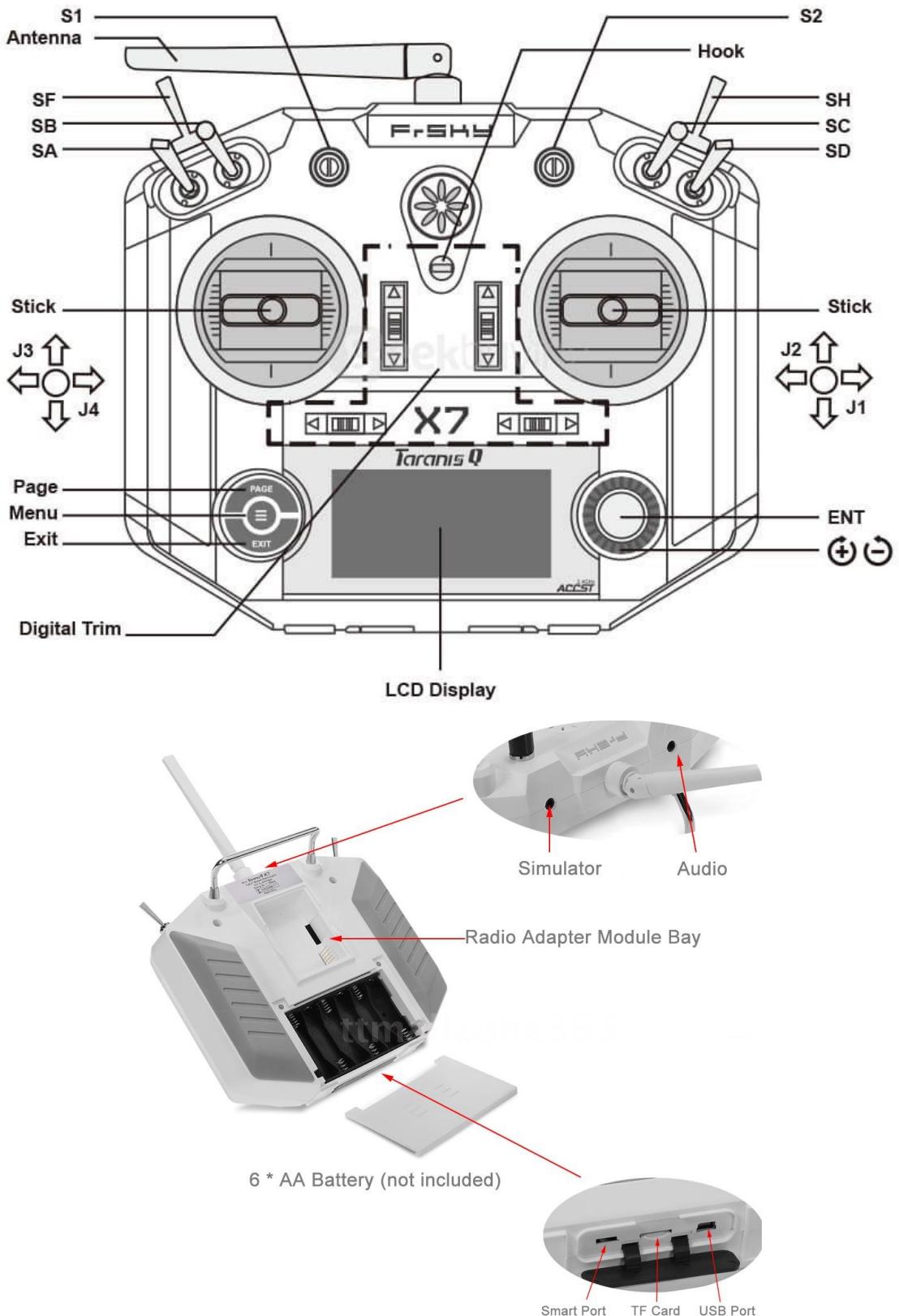


Notice: You can choose the Switch and define its positions in the Mixer menu.

The DIY switch port is a free replacement switch position .

The number of switches can be extended by the DIY switch port.

The Taranis Q X7 Transmitter



Sources Available: Taranis X9

As you work through this guide you will come across various source functions. There are some specialist ones in the **Special Functions** screen. The ones available in **Inputs** and **Mixes** are shown here. However, switches can be altered in the **Radio Settings Menu**, and may not be exactly the same as this.

Source	Available in Inputs	Available in Mixes	
LUA		✓	LUA script (if available)
I[]		✓	Input []
Rud	✓	✓	Rudder
Ele	✓	✓	Elevator
Thr	✓	✓	Throttle
Ail	✓	✓	Aileron
S1	✓	✓	Slider 1
S2	✓	✓	Slider 2 (centre detent)
LS	✓	✓	Left Slider
RS	✓	✓	Right Slider
TrmR	✓	✓	Rudder Trim
TrmE	✓	✓	Elevator Trim
TrmT	✓	✓	Throttle Trim
TrmA	✓	✓	Aileron Trim
MAX	✓	✓	Set source = +100
SA to SH	✓	✓	Switches A to H
L1 to L64	✓	✓	Logical switches 1 to 32
CYC1 to 3	✓	✓	Cyclic 1 to 3
TR1 to TR16	✓	✓	Trainer inputs 1 to 16
CH1 to 32	✓	✓	Channels 1 to 32
Batt	✓		The transmitter battery
Time	✓		Current time
Timer 1 to 3	✓		The three timers
TELE1-?	✓		Telemetry numbers 1 upwards

Sources Available: Taranis Q X7

As you work through this guide you will come across various source functions. There are some specialist ones in the **Special Functions** screen. The ones available in **Inputs** and **Mixes** are shown here. However, switches can be altered in the **Radio Settings Menu**, and may not be exactly the same as this.

Source	Available in Inputs	Available in Mixes	
LUA		✓	LUA script (if available)
I[]		✓	Input []
Rud	✓	✓	Rudder
Ele	✓	✓	Elevator
Thr	✓	✓	Throttle
Ail	✓	✓	Aileron
S1	✓	✓	pot 1
6P	✓	✓	6 position pot
TrmR	✓	✓	Rudder Trim
TrmE	✓	✓	Elevator Trim
TrmT	✓	✓	Throttle Trim
TrmA	✓	✓	Aileron Trim
MAX	✓	✓	Set source = +100
SA to SD, SF, SH	✓	✓	Switches A to D, F and H
L1 to L64	✓	✓	Logical switches 1 to 32
CYC1 to 3	✓	✓	Cyclic 1 to 3
TR1 to TR16	✓	✓	Trainer inputs 1 to 16
CH1 to 32	✓	✓	Channels 1 to 32
Batt	✓		The transmitter battery
Time	✓		Current time
Timer 1 to 3	✓		The three timers
TELE1-?	✓		Telemetry number 1 upwards

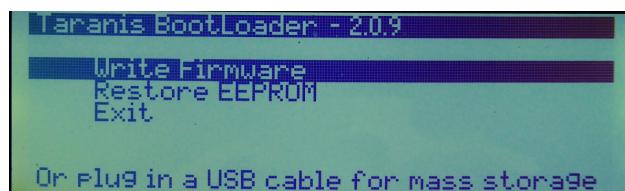
Entering Bootloader Mode

Bootloader mode is a setting on the transmitter so that the transmitter can connect with a computer using the USB lead. This enables files on the transmitter to be read and copied by a computer, and also allows models created on the **OpenTX Companion** to be downloaded to the transmitter.

With the transmitter off, hold both the rudder and aileron trim in towards the centre, and switch on. (Switch up on the X9D and X9E, and short press of the power button on the X7.)



The following screen should come up:



Then a standard USB to Mini-B USB lead can be used to connect to a computer.



Firmwares

What is firmware?

In electronic systems and computing, firmware is a type of software that provides control, monitoring and data manipulation of engineered products and systems. Typical examples of devices containing firmware are embedded systems, such as traffic lights, consumer appliances, remote controls and digital watches, computers, computer peripherals, mobile phones, and digital cameras. The firmware contained in these devices provides the low-level control program for the device.

On the Taranis transmitter there are three different firmwares. The first and most obvious is **OpenTX** itself. However this does not do everything. There is one circuit board in the back of the Taranis with its own firmware. This is the internal XJT module. This firmware takes all the control signals from **OpenTX**, encodes them and transmits them to the receiver. It also looks for telemetry data from the receiver and makes this available back to **OpenTX**. This firmware has been designed and is maintained by FrSky, NOT the **OpenTX** team. The third firmware is actually the bootloader. This is a piece of software that allows the transmitter to communicate with a computer. It is also part of the **OpenTX** software.

As well as these three pieces of firmware, there is also all the data created by **OpenTX** and you, the user, which contains all the settings for each of the models programmed. When stored on a computer this data file has the file extension: **.otx** This is kept in an eprom (a type of computer memory chip) in the transmitter. It can also be saved to the computer, and saved to the SD card in the transmitter. Clearly it is advisable to save copies to either the computer or the SD card, or both. Even better is to save fresh copies every time a new model is added or one is edited.

The Bootloader and **OpenTX** firmwares are maintained by the **OpenTX** team, FrSky maintain the transmitting firmware. Updates of each can be found on the appropriate websites. The **OpenTX** team have been very clever, by including routines in their firmware which will allow the FrSky firmware in both the transmitter and any receivers to be easily upgraded too.

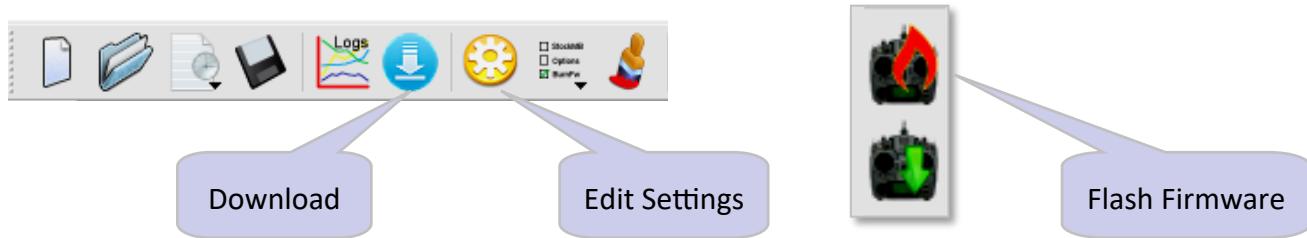
Finally of course there is the **OpenTX Companion**, a separate piece of software which is stored on, and used by, the computer.



Updating the Firmwares

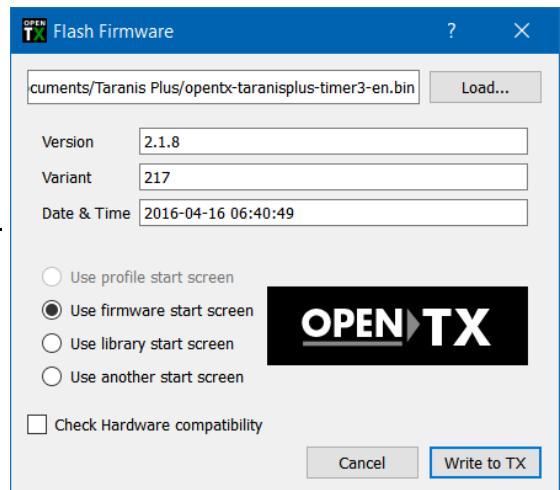
There are two methods for updating the **OpenTX** firmware. The first, and simplest is to use **OpenTX Companion**.

Method 1, Using OpenTX Companion



OpenTX Companion will automatically look for newer versions of the program and will upload them on request. It will then copy newer firmware versions to the transmitter.

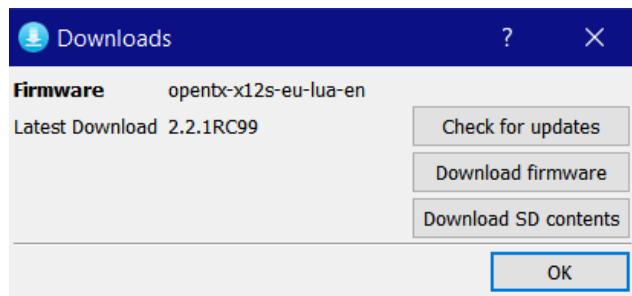
1. Make sure you have the right transmitter identified in **Edit Settings** before you do anything else.
2. Next use the **Download** icon to download the newer version.
3. **ALWAYS** carefully read the update notes that come with the download. Occasionally these will contain warnings if changes are made which will affect the control of a model.
4. Connect the transmitter to the computer with the transmitter switched off.
5. Click on the **Flash Firmware** icon to start the process. The following window should appear:
6. Select any options required and then click on **Write to TX** to update the firmware.
7. If the transmitter is switched on in Bootloader mode when connected to the computer, then this method will still work, but the Bootloader itself will not be updated.



Method 2, Using the Transmitter

This method copies the new firmware file onto the SD card of the transmitter, so that the transmitter can update itself. This method has the advantage of allowing one to go back to an earlier version of **OpenTX** for whatever reason.

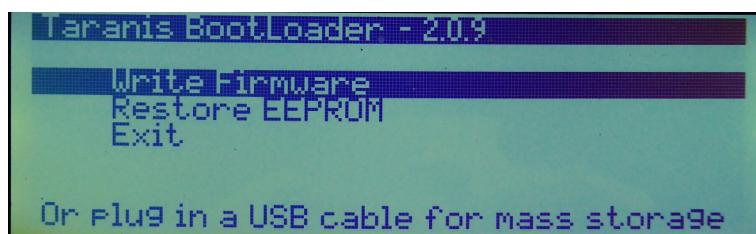
1. Make sure you have the right transmitter identified in **Edit Settings** in the **Companion** before you do anything else. (Click on the **Settings** icon, then select **Settings** to get to this screen.)
2. From **OpenTX Companion**, click on **Downloads** and when the following window opens, click on **Download FW**.
3. Then go to the computer directory where the **OpenTX** files are stored and find the latest file downloaded. It will look something like this, depending which settings were enabled in the **Edit Settings** screen of the **Companion**.



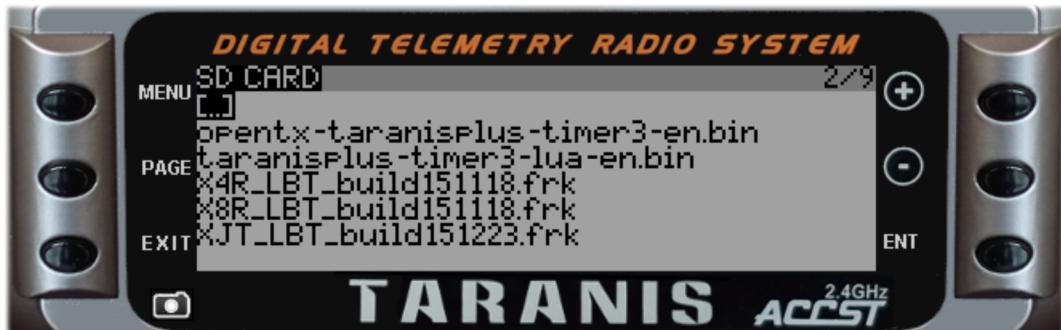
	opentx-taranisplus-timer3-en.bin	19/05/2016 12:54
	opentx-taranisplus-timer3-lua-en.bin	14/12/2015 11:31

4. The various bits between hyphens indicate which options were set in **Edit Settings**. The date will show which is the latest file.
5. Copy the latest file to the SD card in the **FIRMWARES** directory. This can be done with the transmitter in Bootloader mode connected to the computer, or by simply plugging the SD card directly into the computer.

Note: The second filename shown above is too long to be recognised by the transmitter, so it must be shortened to no more than 28 characters plus the “.bin” extension. Longer filenames will be recognised by the computer, however.

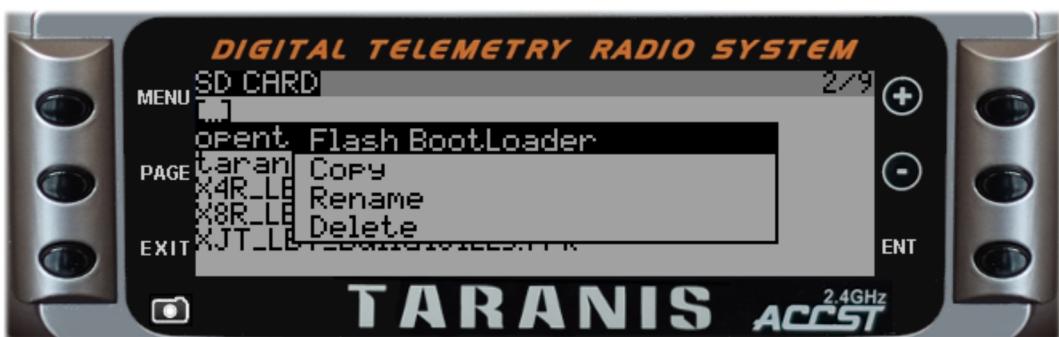


6. With the transmitter in bootloader mode but not connected to the computer, click on **Write Firmware** to update.
7. This does not, however update the Bootloader - it cannot update itself whilst it is in use, so another operation is needed. On the transmitter, go to the **Radio Setup** menu, and page to screen 2 of 9, the SD card screen. Scroll down to **FIRMWARES** and select the appropriate firmware to update.



On the screen above the first firmware displayed is 28 characters long, the longest OpenTx will display. **Any longer, and the file simply does not show in the list.**

- Moving down to the file, another window opens up:



Now the Bootloader can be updated.

- The other options here allow the file to be copied, renamed or deleted.

While it is important that the **Companion** and the transmitter firmware are upgraded to the same version, the Bootloader does not need to be upgraded every time, though it is worth checking the upgrade notes to see if there are any significant changes to the Bootloader.

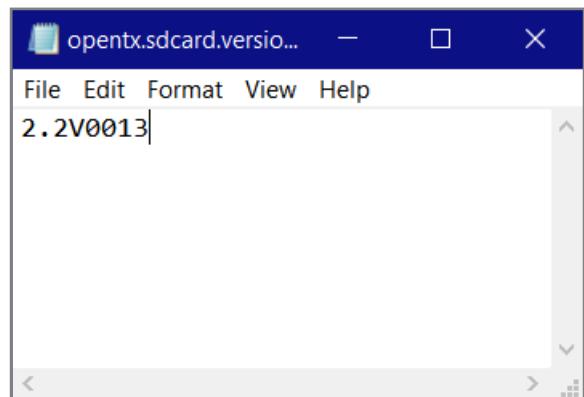
Updating the SD Card

When a new version of **OpenTX** is downloaded, the SD card contents can change too. Do be very careful when doing this as some of your own information can be changed too.

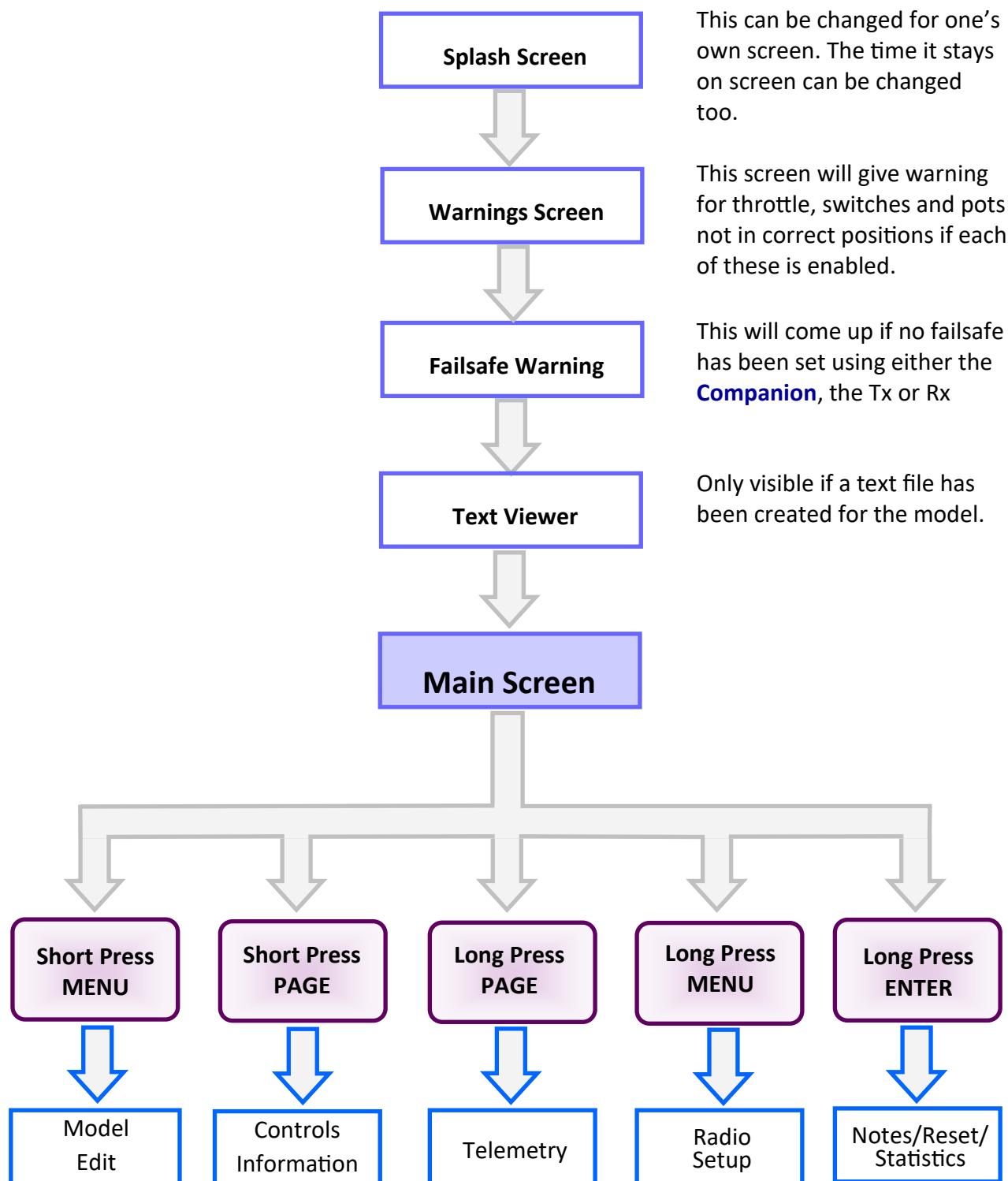
1. Read the release notes, any important changes to the SD card will be notified here. Often it is only major upgrades where any significant changes are made.
2. If there are no important changes, consider NOT altering the SD card contents. However, this will then bring up an SD card error when the transmitter is started.



3. This is easily overcome in one of two ways:
 - ❖ Simply copy the newer version of **opentx.sdcards.version** from the new SD card download in place of the old one, or:
 - ❖ To save having to download the new SD card contents, load the **opentx.sdcards.version** file into something like **Notepad** and just change the version number to the one shown in the error message above and resave.
4. If there are major changes to the SD card, first backup the existing card to your computer, then copy each directory from the downloaded new version to your SD card. Avoid replacing the **MODELS**, and **RADIO** directories as these contain the setup for your radio and models. Also avoid replacing the **SOUNDS** and **IMAGES** directories as these may contain extra sound or model image files you have added yourself, unless absolutely necessary. If these do need updating, then copy any of your own extra images and sounds from your backup copy.



The Taranis Transmitter Menu System



Note:

Along with the above screens, there is the **Bootloader** screen which enables the firmware to be updated, the EEPROM to be restored if a backup was made, or to simply connect the transmitter to a computer.

The Transmitter Radio Setup Screens

There are 9 screens in the **Radio Setup** menu system. A short press of **PAGE** is used to scroll through them. Screen 5 provides more information than available on the **Companion**. Switch test on page 6 tests the 4 joystick trims and the 6 buttons either side of the transmitter screen. Page 8 corresponds to the **Hardware** screen in the **General Settings** menu on the **Companion**. Screen 9 is unique to the transmitter and is for calibrating the joysticks and sliders. It is useful to check these calibrations from time to time. On screen instructions are provided for how to do this.

RADIO SETUP	1/9	RADIO SETUP	1/9
Date	2016-04-13	Date	2018-02-03
Time	09:16:27	Time	19:07:34
Battery meter range	5.1 - 10.1	Battery range	8.5 - 11.5
Sound		Sound	
Mode	NoKey	Mode	NoKey
Volume	<input type="range"/>	Volume	<input type="range"/>
Beep Volume	<input type="range"/>	Beep volume	<input type="range"/>
SD CARD	2/9	SD CARD	2/9
[...]		[BMP]	
[EEPROMS]		[Card backup]	
[FIRMWARES]		[EEPROMS]	
[LOGS]		[FIRMWARE]	
[Model names AUDIO files]		[FIRMWARES]	
[MODELS]		[IMAGES]	
[LAYOUTS]			
GLOBAL FUNCTIONS	3/9	GLOBAL FUNCTIONS	3/9
GF1 ON Volume	•Vol	---	
GF2 ---		---	
GF3 ---		---	
GF4 ---		---	
GF5 ---		---	
GF6 ---		---	
GF7 ---		---	
TRAINER	4/9	TRAINER	4/9
Mode % Source		Mode % Source	
Thr OFF 0 CH1		Thr OFF 0 CH1	
Ele OFF 0 CH1		Ele OFF 0 CH1	
Rud OFF 0 CH1		Rud OFF 0 CH1	
Ail OFF 0 CH1		Ail OFF 0 CH1	
Multiplier 1.0		Multiplier 1.0	
Cal 0.0 0.0 0.0 0.0		Cal 0 0 0 0	
VERSION	5/9	VERSION	5/9
FW : opentx-x9d+		FW : opentx-x7	
VERS : 2.2.1 (ccca71808)		VERS : 2.2.1 (ccca71808)	
DATE : 17-12-2017 10:25:00		DATE : 17-12-2017 10:30:00	
EEPR : 218		EEPR : 218	
UDI : 12345678 55AA55AA 87654321		[ENTER Long]: EEPROM backup	
[ENTER Long]: EEPROM backup		[MENU Long]: Factory reset	
[MENU Long]: Factory reset			

The Transmitter Radio Setup Screens

SWITCH TEST

Minus 0		
Plus 0	Trim -	+
Page 0	↔	0 0
Enter 0	↑	0 0
Exit 0	↓	0 0
Menu 0	○ ↔	0 0

SWITCHES

RE 0	SAT	
	SB-	Trim -
Page 0	SC-	↔ 0 0
Enter 0	SD↑	↑ 0 0
Exit 0	SF↑	↓ 0 0
Menu 0	SH↑	○ ↔ 0 0

ANALOG INPUTS

A1: 0000	0	A2: 0000	0
A3: 0000	0	A4: 0000	0
A5: 0000	0	A6: 0000	0
A7: 0000	0	A8: 0000	0
A9: 0000	0		

Battery Calib 0.2V

ANALOGS

A1: 0000	0	A2: FC00	-100
A3: 0000	0	A4: 0000	0
A5: 0000	0	A6: 0000	0
Battery calib 9.92V			

HARDWARE

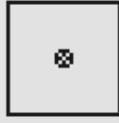
Sticks		
JRud	---	
JEle	---	
JThr	---	
Jail	---	
Pots		
•Si	Scr	Pot with detent.

HARDWARE

Sticks		
JRud	---	
JEle	---	
JThr	---	
Jail	---	
Pots		
•Si	---	Pot w. det.

CALIBRATION

[ENTER] TO START



51 52 LS RS



CALIBRATION

[ENTER] TO START

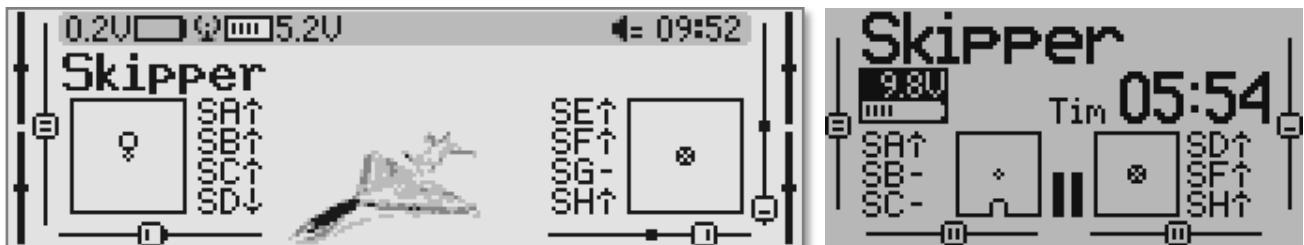


The Transmitter Controls Information Screens

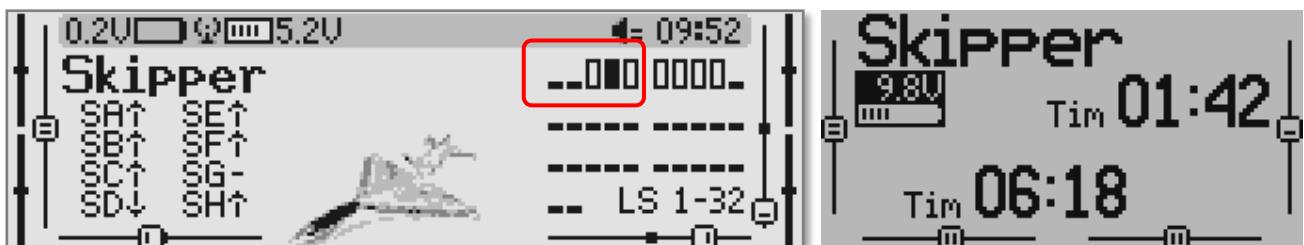
There are 4 screens in the **Controls Information** menu system. The first screen is the main screen. The X9 screen shows the physical states for toggle switches. Stick trims are shown graphically along the sides and bottom if enabled. Knob and slider positions are depicted graphically along both side outer edges. When enabled by the **Model Setup** menu, the clock timers are also displayed. In this case each timer has been given a name. The model name and a picture is also displayed if these are entered. The X7 has a simpler screen showing just the channel values.



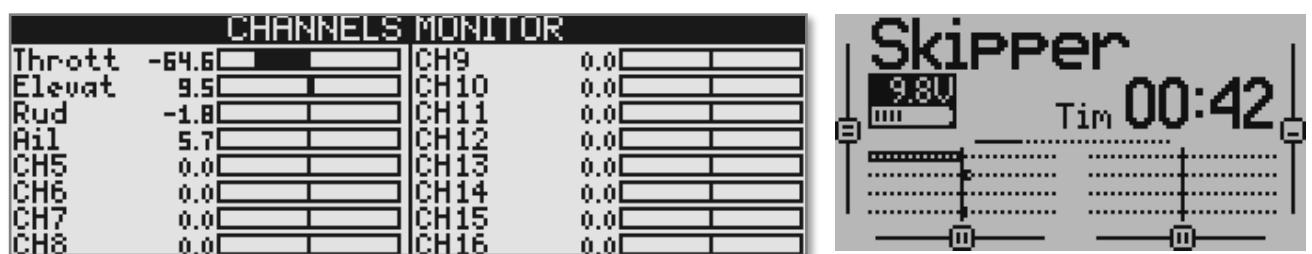
The next screen now shows the position of the joysticks and the switch positions.



The third screen of the Taranis X9 shows the toggle switches and the state of the 32 **Logical Switches**. Each logical switch is shown by either a dash, a hollow block or a filled block and they are grouped in fives. In the red box below, **LS1** and **LS2** are not programmed, **LS3**, **LS4** and **LS5** are programmed but only **LS4** is currently “true”. The X7 third screen gives the value of the timers.

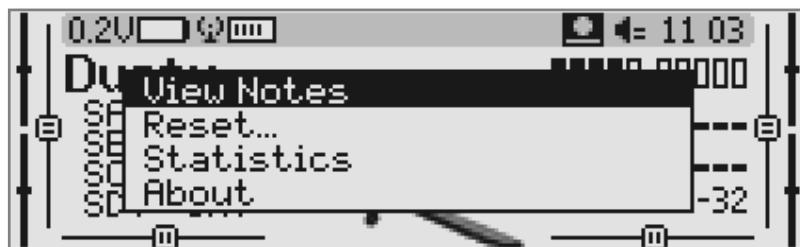


The last screen graphically shows the value for each of the 32 channels ranging from -100% to



The Transmitter Controls Information Screens

A long press of the **ENT** button on the main screen will bring up another sub menu. There are two useful headings here. The first brings up any notes created for the model and stored on the SD card. These notes will always appear when the model is first selected, and can contain any information you wish to keep with the model. This sub menu gives the option to bring up the notes anytime without having to restart the transmitter. There is information on how to create notes in the **How To** section of this user guide. The reset option allows timers and telemetry to be reset.



The Transmitter Telemetry Screens

There are a maximum of 4 telemetry screens available screens. They need to be set up in the **Model Edit Telemetry** screen before they become active. Here are two examples for the Taranis X9D.

SKIPPER	0.20	Tmr1	02:29	Tmr2	05:31
Cels	11.16	Curr+	11.9	RSSI+	94
Cmin	3.72	Cspn	35	RSSI-	0
SWR	30	RxBt	54	T1	02:29
Time	10:26				

SKIPPER	0.20	Tmr1	02:12	Tmr2	05:48
GAlt	1837	1°23'24.89"W			
GAlt+	4035	54°34'35.04"N			
GSpd+	400				

The Transmitter Model Edit Screens

There are 14 model editing screens on the X9 transmitters, and 13 on the X7. These largely match the screens in the [OpenTX Companion Model Editing](#) window. The first screen is the **Model Select** screen.

MODEL SELECTION 17670 bytes free 1/14	MODELSEL free 13332 1/13
* 01 FunFly 635	01 FunFly
02 Musketeer Rd 867	02 RQ-7B Shad
03 Wing Wing 520	03 Musketeer
04 Magician 644	04 Musketeer
05 T-50 747	05 Wing Wing
06 Yak 52 796	06 Magician
07 Jester 605	07 T-50
MODEL SETUP 2/13	SETUP 2/13
Model Name Skipper	Model name Skipper
Model Image Skipper	Timer1 THt 08:00
Timer 1 THt 08:00	Name Tim
Name Timedown	Persist. OFF
Persistent OFF	Minute □
Minute call □	Countdown Silent
Countdown Silent	Timer2 THt 00:00
HELI SETUP 3/13	HELI SETUP 3/13
Swash Type ---	Swash Type ---
Swash Ring 0	Swash Ring 0
Long. cyc. source ---	Long. cyc. ---
Weight 0	Weight 0
Lateral cyc. source ---	Lateral cyc. ---
Weight 0	Weight 0
Coll. pitch source ---	Collective ---
FLIGHT MODES 4/13	FLIGHT MODES 4/13
FMO :0 :0 :0 :0 0.0 0.0	FMO :0 :0 :0 :0 0.0 0.0
FMI --- :0 :0 :0 :0 0.0 0.0	FMI --- :0 :0 :0 :0 0.0 0.0
FM2 --- :0 :0 :0 :0 0.0 0.0	FM2 --- :0 :0 :0 :0 0.0 0.0
FM3 --- :0 :0 :0 :0 0.0 0.0	FM3 --- :0 :0 :0 :0 0.0 0.0
FM4 --- :0 :0 :0 :0 0.0 0.0	FM4 --- :0 :0 :0 :0 0.0 0.0
FM5 --- :0 :0 :0 :0 0.0 0.0	FM5 --- :0 :0 :0 :0 0.0 0.0
FM6 --- :0 :0 :0 :0 0.0 0.0	FM6 --- :0 :0 :0 :0 0.0 0.0
INPUTS 6/64 -100.0 5/14	INPUTS 6/64 5/13
IThr 100 &Thr ---	IThr 100 &Thr ---
IEle 100 &Ele ---	IEle 100 &Ele ---
IRud 100 &Rud ---	IRud 100 &Rud ---
IAil 60 &Ail SA↓ lo rat	IAil 60 &Ail lo rat
80 &Ail SA- med ra	80 &Ail med ra
100 &Ail E25 SA↑ hi rat	100 &Ail hi rat
I05	I05

The Transmitter Model Edit Screens

MIXER 5/64 Thr -100.0  6/14	MIXER RUD Thr 6/13
CH1 100 □ Thr RUD	CH1 100 □ Thr RUD
CH2 100 □ Ele ELE	CH2 100 □ Ele ELE
CH3 100 □ Rud Rud	CH3 100 □ Rud Rud
CH4 100 □ Ail AIL	CH4 100 □ Ail AIL
CH5 -100 □ Ail AIL2	CH5 -100 □ Ail AIL2
CH6	CH6
CH7	CH7
OUTPUTS 988us 7/14	OUTPUTS 988us 7/13
CH1 Thr 0.0 -100.0+ 100.0 → --- 1500Δ	Thr 0.0 -100 100 → --- Δ
CH2 Ele 0.0 -100.0- 100.0 ← --- 1500Δ	Ele 0.0 -100 100 ← --- Δ
CH3 Rud 0.0 -100.0- 100.0 → --- 1500Δ	Rud 0.0 -100 100 → --- Δ
CH4 Ail 0.0 -100.0- 100.0 → --- 1500Δ	Ail 0.0 -100 100 → --- Δ
CH5 Ail2 0.0 -100.0- 100.0 ← --- 1500Δ	Ail2 0.0 -100 100 ← --- Δ
CH6	CH6
CH7 0.0 -100.0- 100.0 → --- 1500Δ	CH7 0.0 -100 100 → --- Δ
CURVES 8/13	CURVES 8/13
CU1 5pts	CU1
CU2 5pts	CU2
CU3 5pts	CU3
CU4 5pts	CU4
CU5 5pts	CU5
CU6 5pts	CU6
CU7 5pts	CU7
GLOBAL VARIABLES 9/13	
GV1 0 0 0 0 0 0 0 0 0	
GV2 0 0 0 0 0 0 0 0 0	
GV3 0 0 0 0 0 0 0 0 0	
GV4 0 0 0 0 0 0 0 0 0	
GV5 0 0 0 0 0 0 0 0 0	
GV6 0 0 0 0 0 0 0 0 0	
GV7 0 0 0 0 0 0 0 0 0	
LOGICAL SWITCHES 10/14	LOGICAL SWITCHES 9/13
L01 a<x Umin 3.40V --- --- 1.0	L01 a<x Umin 3.40V ---
L02 a<x Umin 3.20V --- --- 1.0	L02 a<x Umin 3.20V ---
L03 a~x Timedo02:00 --- --- ---	L03 a~x Tim 02:00 ---
L04 a~x Timedo01:00 --- --- ---	L04 a~x Tim 01:00 ---
L05 a~x Timedo00:00 --- --- ---	L05 a~x Tim 00:00 ---
L06 a~x Cspn 1600mAh --- --- ---	L06 a~x Cspn 1600mAh ---
L07 a~x Cspn 2000mAh --- --- ---	L07 a~x Cspn 2000mAh ---

As can be seen here, **Global Variables** have a separate page on the X9 transmitters, however on the smaller X7 screen and on the **OpenTX Companion**, it is included in the **Flight Modes** setting screen.

The Transmitter Model Edit Screens

There is no **Custom Scripts (LUA scripts)** screen on the **OpenTX Companion** menu system, although they can be loaded into the simulator.

SPECIAL FUNCTIONS	11/14	SPECIAL FUNCTIONS	10/13
SF1 SA↑ Play Track	ailhigh	SA↑ Play Track	ailhigh
SF2 SA- Play Track	ailmed	SA- Play Track	ailmed
SF3 SA↓ Play Track	aillow	SA↓ Play Track	aillow
SF4 SH↓ Play Value	RSSI	SH↓ Play Val	RSSI
SF5 SH↓ Play Value	TimeoutP	SH↓ Play Val	Tim
SF6 SH↓ Play Value	Cels	SH↓ Play Val	Cels
SF7 SH↓ Play Value	Csprn	SH↓ Play Val	Csprn
CUSTOM SCRIPTS	2223bytes	CUSTOM SCRIPTS	11/13
LUA1 ---		LUA1 ---	
LUA2 ---		LUA2 ---	
LUA3 ---		LUA3 ---	
LUA4 ---		LUA4 ---	
LUA5 ---		LUA5 ---	
LUA6 ---		LUA6 ---	
LUA7 ---		LUA7 ---	
TELEMETRY	13/14	TELEMETRY	12/13
RSSI		RSSI	
Low alarm	48	Low alarm	48
Critical alarm	44	Critical alarm	44
Disable telemetry alarms	<input type="checkbox"/>	Disable alarms	<input type="checkbox"/>
Sensors	Value	ID	
1: Cels	---	2	
2: UFAS	---	3	