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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.



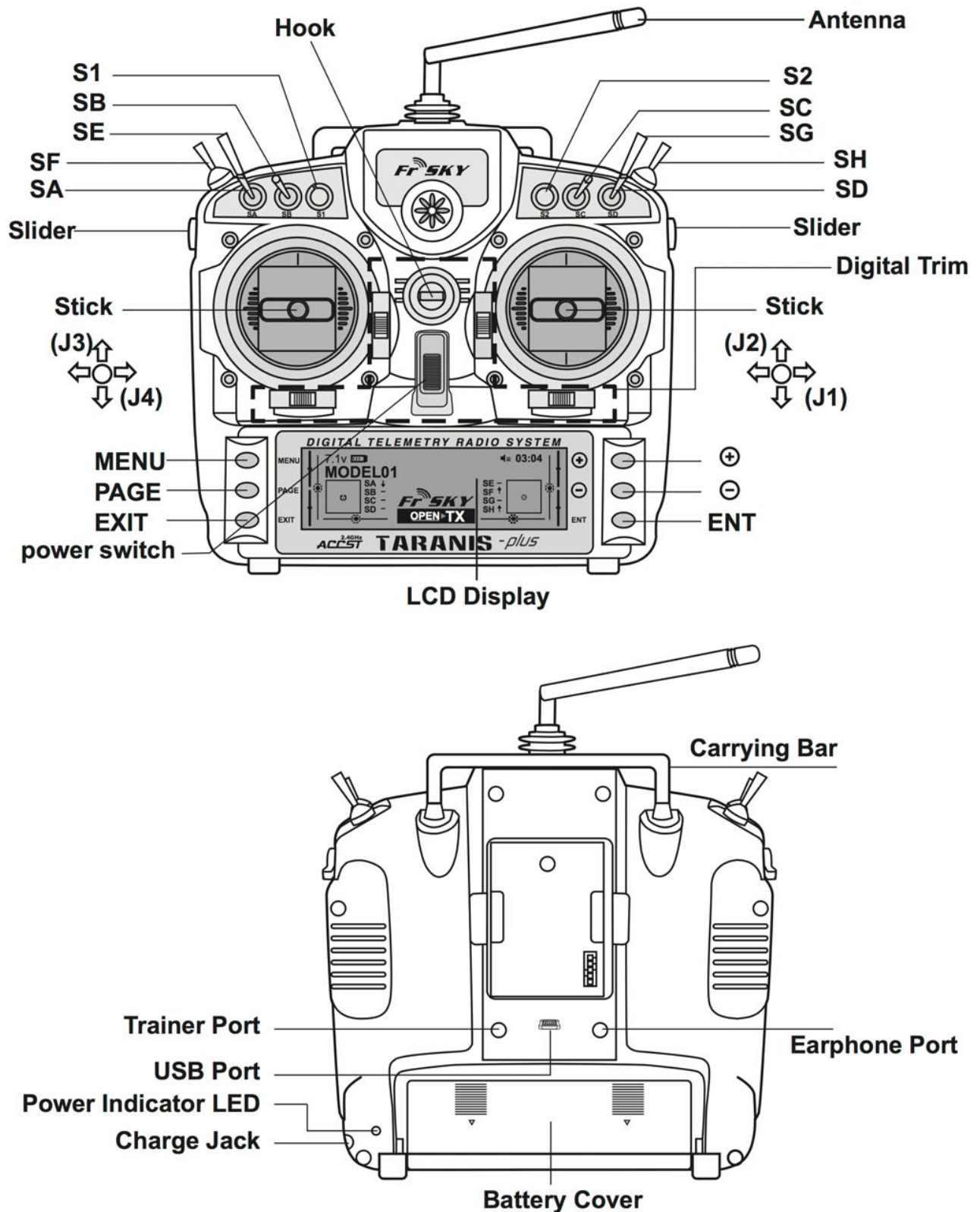
The Taranis X9E. Essentially the same as the X9D but with a different case. Also the external transmitter module can only be fitted from inside the transmitter. It has two additional sliders. It uses a standard SD card.



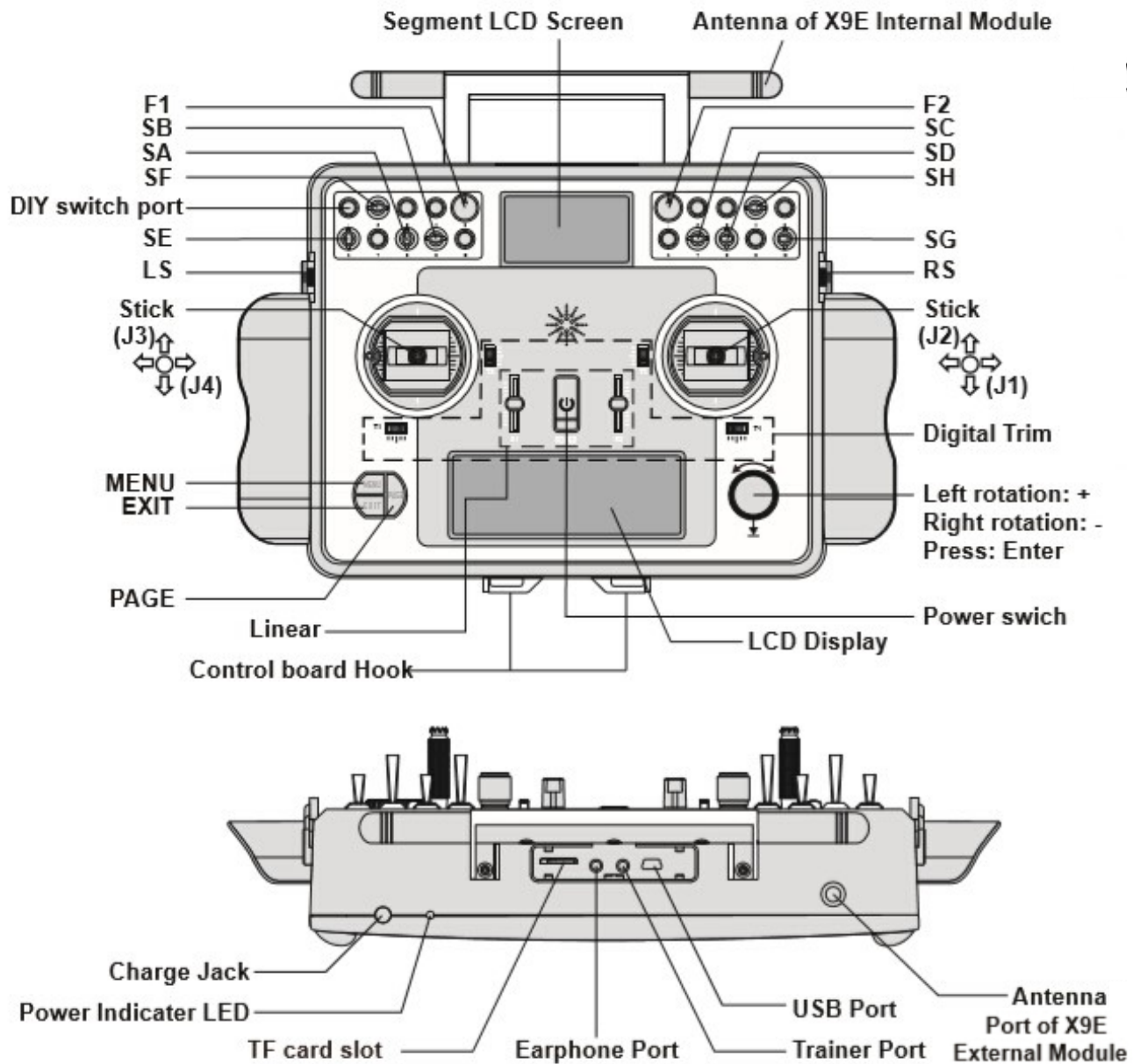
The Taranis Q X7 and Q X7S. Less switches and a smaller screen are the main differences between the X7 and the X9D. The “S” version has better quality gimbals. It uses a micro SD card.



The X9D Plus Transmitter

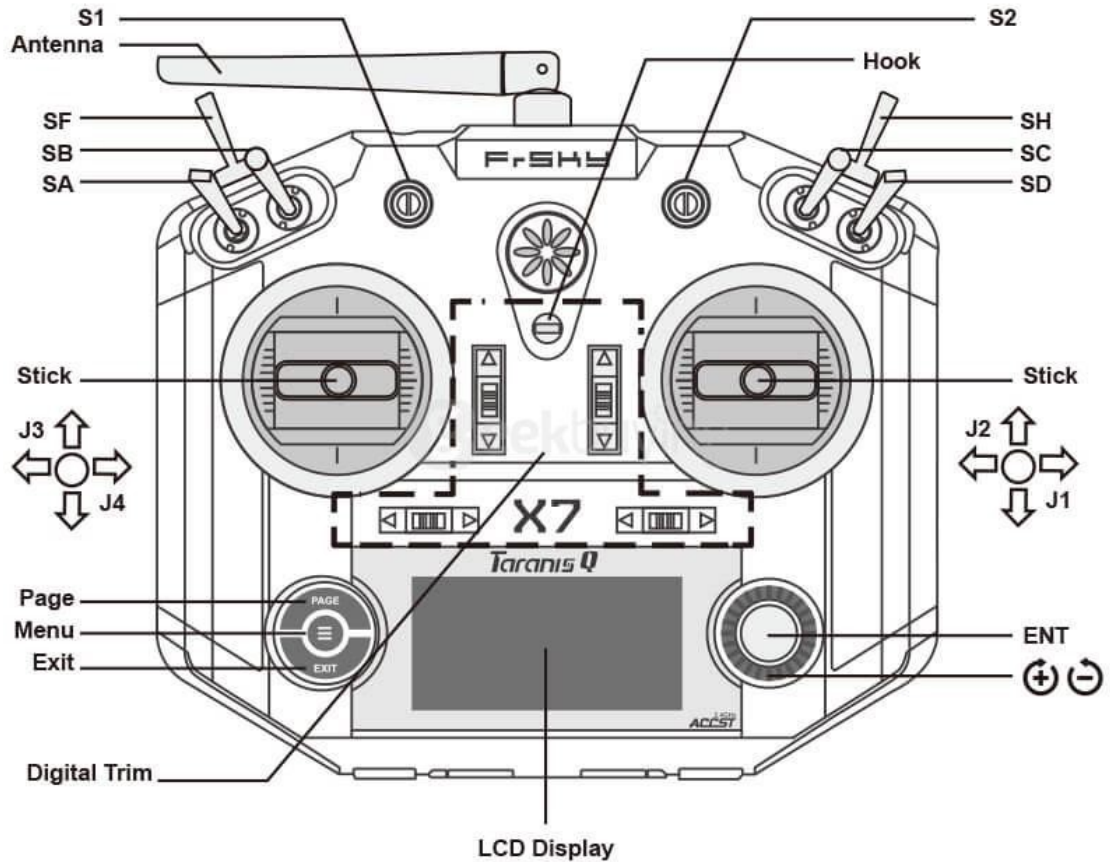


The Taranis X9E Transmitter



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

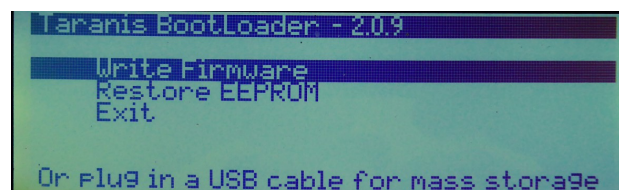
Entering Bootloader Mode

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.

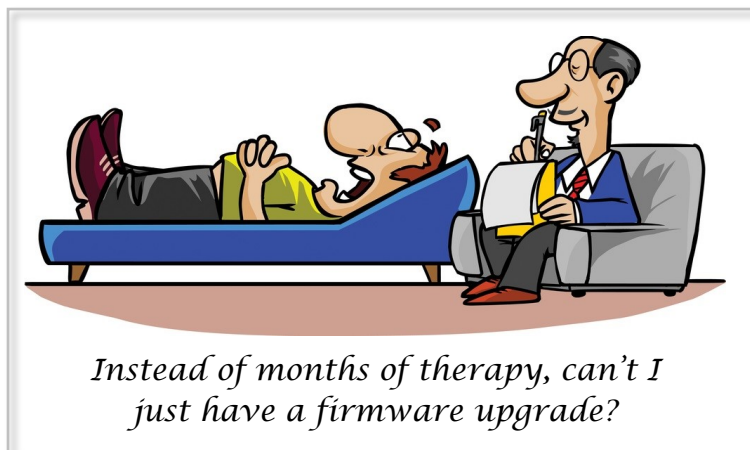


Firmwares

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 eeprom (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.

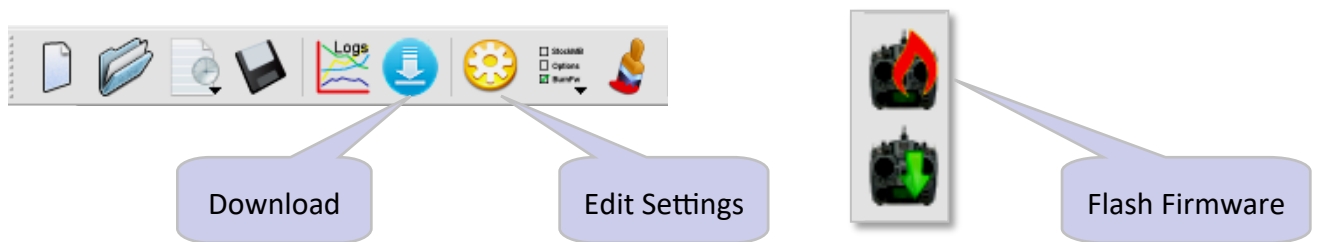
The Bootloader and **OpenTX** firmwares are maintained by the **OpenTX** team, FrSky maintain the transmitting firmware. Updates of each can be found on the appropriate websites. The **OpenTX** team have been very clever, by including routines in their firmware which will allow the FrSky firmware in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

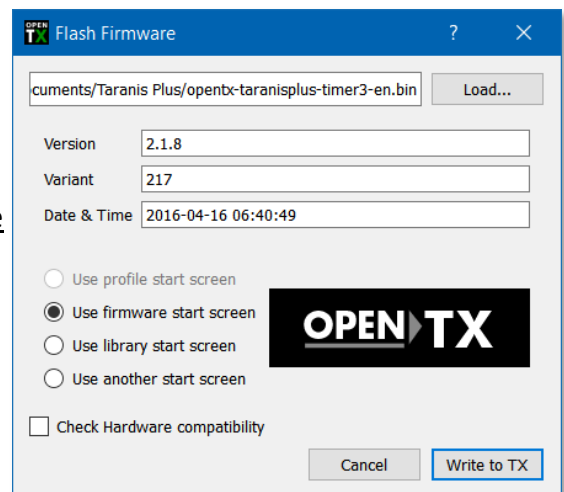
There are two methods for updating the **OpenTx** firmware. The first, and simplest is to use **OpenTX Companion**.

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.

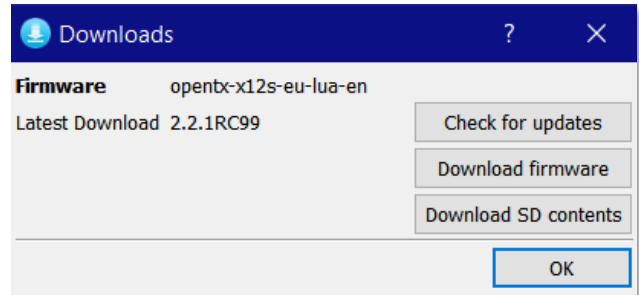


Method 2, Using the Transmitter

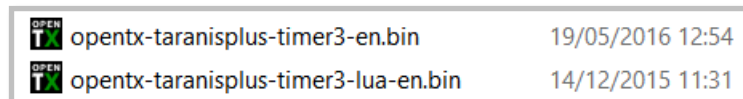
This method copies the new firmware file onto the SD card of the transmitter, so that the transmitter can update itself. This method has the advantage of allowing one to go back to an earlier version of **OpenTX** for whatever reason.

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**.

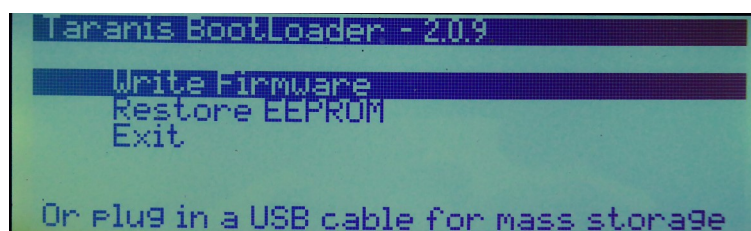


3. Then go to the computer directory where the **OpenTX** files are stored and find the latest file downloaded. It will look something like this, depending which settings were enabled in the **Edit Settings** screen of the **Companion**.

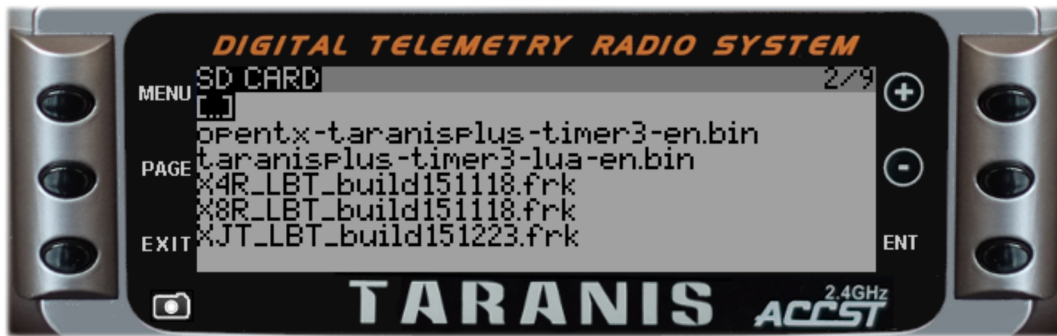


4. The various bits between hyphens indicate which options were set in **Edit Settings**. The date will show which is the latest file.
5. Copy the latest file to the SD card in the **FIRMWARES** directory. This can be done with the transmitter in Bootloader mode connected to the computer, or by simply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

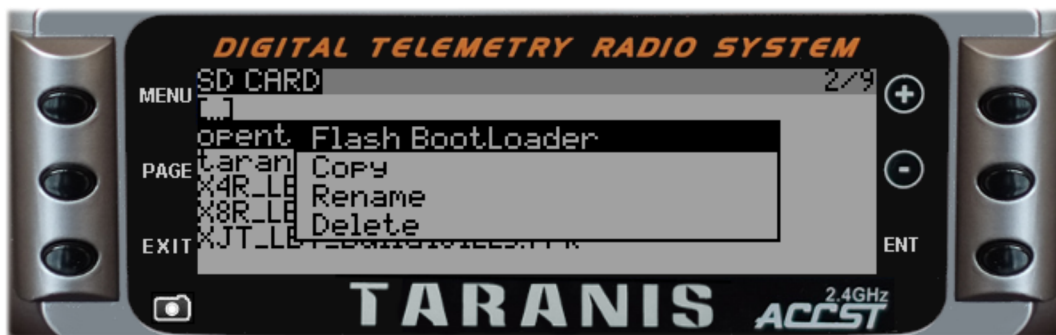


6. With the transmitter in bootloader mode but not connected to the computer, click on **Write Firmware** to update.
7. This does not, however, update the Bootloader - it cannot update itself whilst it is in use, so another operation is needed. On the transmitter, go to the **Radio Setup** menu, and 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.**

8. Moving down to the file, another window opens up:



Now the Bootloader can be updated.

9. 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

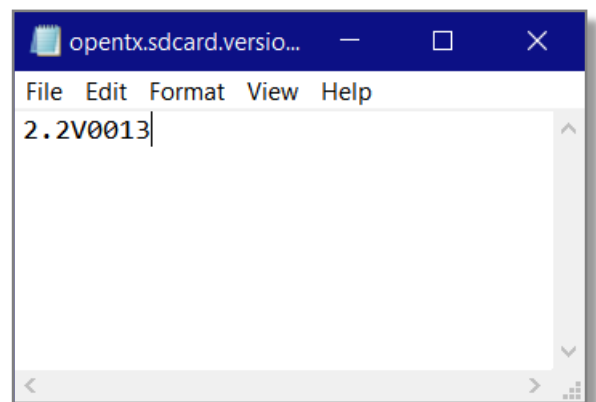
When a new version of **OpenTX** is downloaded, the SD card contents can change too. Do be very careful when doing this as some of your own information can be changed too.

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.



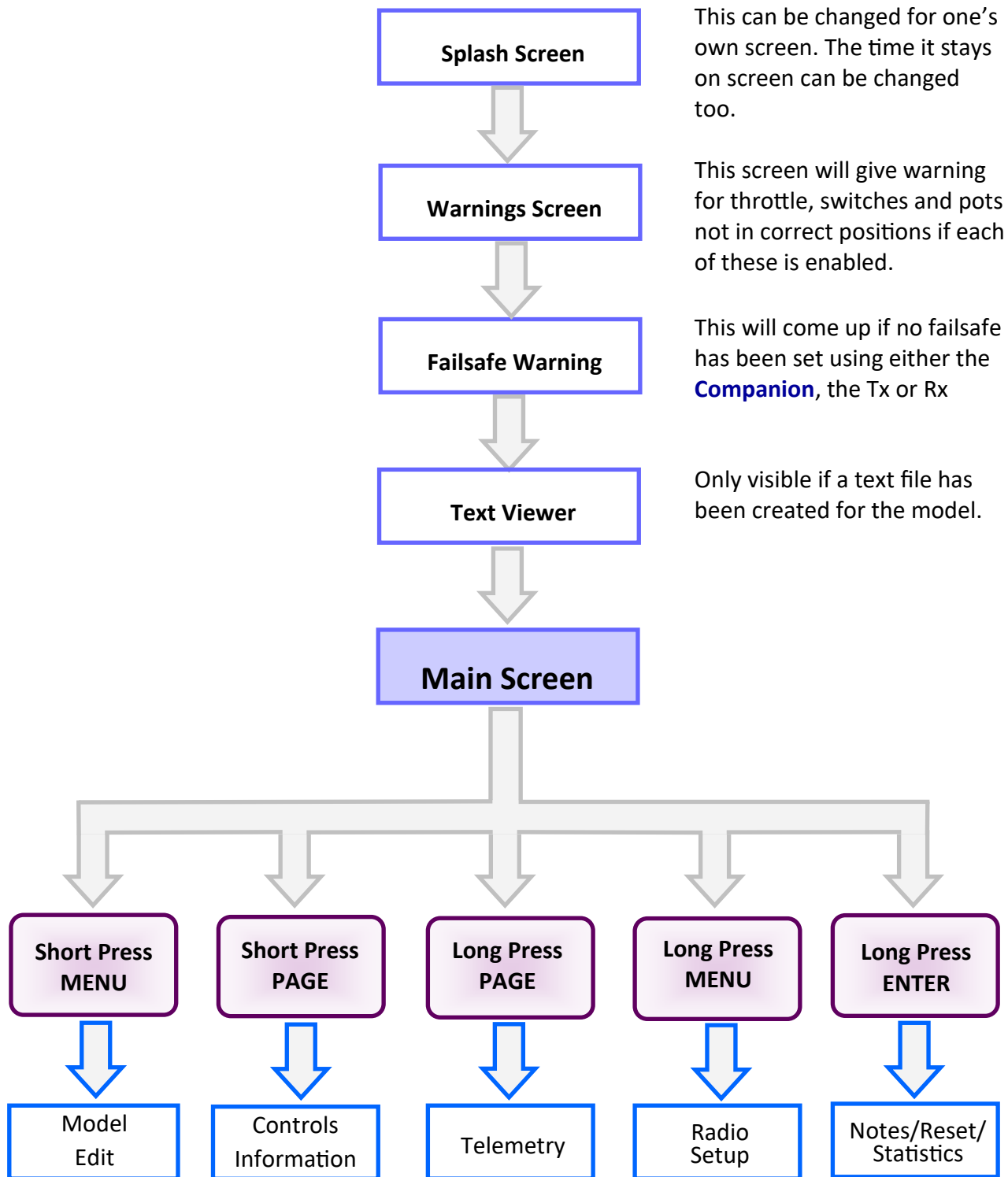
3. This is easily overcome in one of two ways:

- ✳ Simply copy the newer version of **opentx.sdcard.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.sdcard.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
Date 2018-04-13
Time 09:16:27
Battery meter range 5.1-10.1
Sound
Mode NoKey
Volume
Beep Volume
```

```
RADIO SETUP 1/9
Date 2018-02-03
Time 19:07:34
Battery range 8.5-11.5
Sound
Mode NoKey
Volume
Beep volume
```

```
SD CARD 2/9
[BMP]
[EEPROMS]
[FIRMWARES]
[LOGS]
[Model names AUDIO files]
[MODELS]
```

```
SD CARD 2/9
[BMP]
[Card backup]
[EEPROMS]
[FIRMWARE]
[FIRMWARES]
[IMAGES]
[LAYOUTS]
```

```
GLOBAL FUNCTIONS 3/9
GF1 ON Volume Vol
GF2 ---
GF3 ---
GF4 ---
GF5 ---
GF6 ---
GF7 ---
```

```
GLOBAL FUNCTIONS 3/9
---
```

```
TRAINER 4/9
Mode % Source
Thr OFF 0 CH1
Ele OFF 0 CH1
Rud OFF 0 CH1
Ail OFF 0 CH1
Multiplier 1.0
Cal 0.0 0.0 0.0 0.0
```

```
TRAINER 4/9
Mode % Source
Ail OFF 0 CH1
Ele OFF 0 CH1
Thr OFF 0 CH1
Rud OFF 0 CH1
Multiplier 1.0
Cal 0 0 0 0
```

```
VERSION 5/9
FW : opentx-x9d+
VERS : 2.2.1 (cca71808)
DATE : 17-12-2017 10:25:00
EEPR : 218
UID : 12345678 55AA55AA 87654321
[ENTER Long]: EEPROM backup
[MENU Long]: Factory reset.
```

```
VERSION 5/9
FW : opentx-x7
VERS : 2.2.1 (cca71808)
DATE : 17-12-2017 10:30:00
EEPR : 218
[ENTER Long]: Backup
[MENU Long]: Fact. reset.
```

SWITCH TEST 6/9

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

SWITCHES 6/9

RE 0	SA↑	
	SB-	Trim- +
Page 0	SC-	↔ 0 0
Enter 0	SD↑	↑ 0 0
Exit 0	SE↑	↓ 0 0
Menu 0	SH↑	↔ 0 0

ANALOG INPUTS 7/9

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		0.20	

ANALOGS 7/9

A1: 0000	0	A2: FC00	-100
A3: 0000	0	A4: 0000	0
A5: 0000	0	A6: 0000	0
Battery calib		9.920	

HARDWARE 8/9

Sticks	
⌘Rud	---
⌘Ele	---
⌘Thr	---
⌘Ail	---
Pots	
●S1	Scr Pot with detent

HARDWARE 8/9

Sticks	
⌘Rud	---
⌘Ele	---
⌘Thr	---
⌘Ail	---
Pots	
●S1	--- Pot w. det

CALIBRATION 9/9

⊗

[ENTER] TO START

⊗

S1
S2

L5
R5

CALIBRATION 9/9

⊗

[ENTER] TO START

⊗

S1
S2

L5
R5

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.



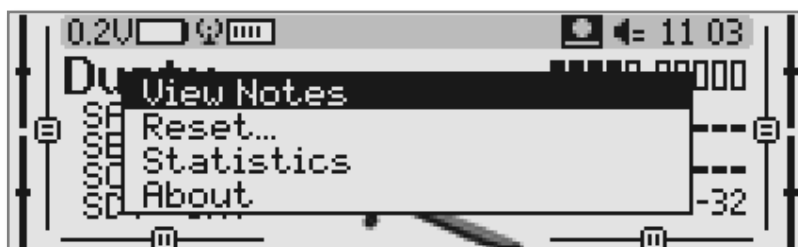
The last screen graphically shows the value for each of the 32 channels ranging from -100% to

CHANNELS MONITOR			
Thrott	-64.6	CH9	0.0
Elevat	9.5	CH10	0.0
Rud	-1.8	CH11	0.0
Ail	5.7	CH12	0.0
CH5	0.0	CH13	0.0
CH6	0.0	CH14	0.0
CH7	0.0	CH15	0.0
CH8	0.0	CH16	0.0



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	0.2V	Imr1	02:29	Imr2	05:31
Cels	11.16	Curr+	11.9	RSSI+	94
Cmin	3.72	CsPn	35	RSSI-	0
SWR	30	RxBt	5.4	T1	02:29
Time	10:26				

Skipper	0.2V	Imr1	02:12	Imr2	05:48
GAIt	183.7	1°23'24.89"W			
GAIt+	403.5	54°34'35.04"N			
GSpd+	40.0				

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		
* 01	FunFly	635
02	Musketeer Rd	867
03	Wing Wing	520
04	Magician	644
05	T-50	747
06	Yak 52	796
07	Jester	605



MODEL SEL free 13332 1/13		
01	FunFly	
02	RQ-7B Shad	
03	Musketeer	
04	Musketeer	
05	Wing Wing	
06	Magician	
07	T-50	

MODEL SETUP 2/13		
Model Name	Skipper	
Model Image	Skipper	
Timer 1	Tht 08:00	
Name	Timedown	
Persistent	OFF	
Minute call	<input type="checkbox"/>	
Countdown	Silent	

SETUP 2/13		
Model name	Skipper	
Timer1	Tht 08:00	
Name	Tim	
Persist.	OFF	
Minute	<input type="checkbox"/>	
Countdown	Silent	
Timer2	Tht 00:00	

HELI SETUP 3/13		
Swash Type	---	
Swash Ring	0	
Long. cyc. source	---	
Weight	0	
Lateral cyc. source	---	
Weight	0	
Coll. pitch source	---	

HELI SETUP 3/13		
Swash Type	---	
Swash Ring	0	
Long. cyc.	---	
Weight	0	
Lateral cyc.	---	
Weight	0	
Collective	---	

FLIGHT MODES 4/13		
FM0	:0 :0 :0 :0	0.0 0.0
FM1	--- :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
FM4	--- :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

FLIGHT MODES 4/13		
FM0	:0 :0 :0 :0	
FM1	--- :0 :0 :0 :0	
FM2	--- :0 :0 :0 :0	
FM3	--- :0 :0 :0 :0	
FM4	--- :0 :0 :0 :0	
FM5	--- :0 :0 :0 :0	
FM6	--- :0 :0 :0 :0	

INPUTS 6/64 -100.0 5/14		
I Thr	100	I Thr ---
I Ele	100	I Ele ---
I Rud	100	I Rud ---
I Ail	60	I Ail SA↓ lo rat
	80	I Ail SA- med ra
	100	I Ail E25 SA↑ hi rat
I OS		

INPUTS 6/64 5/13		
I Thr	100	I Thr ---
I Ele	100	I Ele ---
I Rud	100	I Rud ---
I Ail	60	I Ail lo rat
	80	I Ail med ra
	100	I Ail hi rat
I OS		

The Transmitter Model Edit Screens

MIXER 5/64		Thr -100.0	6/14
CH1	100	Thr	RUD
CH2	100	Ele	ELE
CH3	100	Rud	Rud
CH4	100	Ail	AIL
CH5	-100	Ail	AIL2
CH6			
CH7			

MIXER RUD		Thr 6/13
CH1	100	Thr
CH2	100	Ele
CH3	100	Rud
CH4	100	AIL
CH5	-100	AIL2
CH6		
CH7		

OUTPUTS 988us		7/14
CH1	Thr	0.0 -100.0 -100.0 → --- 1500Δ
CH2	Ele	0.0 -100.0 -100.0 ← --- 1500Δ
CH3	Rud	0.0 -100.0 -100.0 → --- 1500Δ
CH4	Ail	0.0 -100.0 -100.0 → --- 1500Δ
CH5	Ail2	0.0 -100.0 -100.0 ← --- 1500Δ
CH6		0.0 -100.0 -100.0 → --- 1500Δ
CH7		0.0 -100.0 -100.0 → --- 1500Δ

OUTPUTS		988us		7/13		
Thr	0.0	-100	100	→	---	Δ
Ele	0.0	-100	100	←	---	Δ
Rud	0.0	-100	100	→	---	Δ
Ail	0.0	-100	100	→	---	Δ
Ail2	0.0	-100	100	←	---	Δ
CH6	0.0	-100	100	→	---	Δ
CH7	0.0	-100	100	→	---	Δ

CURVES		8/13
CU1	5pts	
CU2	5pts	
CU3	5pts	
CU4	5pts	
CU5	5pts	
CU6	5pts	
CU7	5pts	

CURVES		8/13
CU1		
CU2		
CU3		
CU4		
CU5		
CU6		
CU7		

GLOBAL VARIABLES									9/13
GV1	0	0	0	0	0	0	0	0	
GV2	0	0	0	0	0	0	0	0	
GV3	0	0	0	0	0	0	0	0	
GV4	0	0	0	0	0	0	0	0	
GV5	0	0	0	0	0	0	0	0	
GV6	0	0	0	0	0	0	0	0	
GV7	0	0	0	0	0	0	0	0	

LOGICAL SWITCHES						10/14
L01	a<x	Umin	3.40V	---	---	1.0
L02	a<x	Umin	3.20V	---	---	1.0
L03	a~x	Timed	02:00	---	---	---
L04	a~x	Timed	01:00	---	---	---
L05	a~x	Timed	00:00	---	---	---
L06	a~x	Cspn	1600mAh	---	---	---
L07	a~x	Cspn	2000mAh	---	---	---

LOGICAL SWITCHES				9/13
L01	a<x	Umin	3.40V	---
L02	a<x	Umin	3.20V	---
L03	a~x	Tim	02:00	---
L04	a~x	Tim	01:00	---
L05	a~x	Tim	00:00	---
L06	a~x	Cspn	1600mAh	---
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				
SF1	SA↑	Play Track	ailh9h	1x
SF2	SA-	Play Track	ailmed	1x
SF3	SA↓	Play Track	ailow	1x
SF4	SH↓	Play Value	RSSI	1x
SF5	SH↓	Play Value	Timeup	1x
SF6	SH↓	Play Value	Cels	1x
SF7	SH↓	Play Value	Csen	1x

CUSTOM SCRIPTS 2223bytes 12/13		
LUA1	---	
LUA2	---	
LUA3	---	
LUA4	---	
LUA5	---	
LUA6	---	
LUA7	---	

TELEMETRY 13/14		
RSSI		
Low alarm	48	
Critical alarm	44	
Disable telemetry alarms		<input type="checkbox"/>
Sensors	Value	ID
1: Cels	---	2
2: VFAS	---	3

SPECIAL FUNCTIONS 10/13			
SA↑	Play Track	ailh9h	1x
SA-	Play Track	ailmed	1x
SA↓	Play Track	ailow	1x
SH↓	Play Val	RSSI	1x
SH↓	Play Val	Tim	1x
SH↓	Play Val	Cels	1x
SH↓	Play Val	Csen	1x

CUSTOM SCRIPTS 11/13	
LUA1	---
LUA2	---
LUA3	---
LUA4	---
LUA5	---
LUA6	---
LUA7	---

TELEMETRY 12/13	
RSSI	
Low alarm	48
Critical alarm	44
Disable alarms	<input type="checkbox"/>
Sensors	
1: Cels	---
2: VFAS	---