Quickstart Guide for FrSky Taranis with OpenTX

Welcome to FrSky:

FrSky (pronounced Free Sky) is pleased to welcome you to the exciting world of open platform radios. We trust you will have many years of pleasure with your FrSky Taranis. The Taranis was developed by hobbyists for hobbyists.

Turning on the Taranis:

There are two different modes in which the Taranis can operate. "Operation" mode is the normal mode you will use a vast majority of the time. There is also a utility mode called "Bootloader Mode".

Operation Mode:

To enter operation mode simply slide the power switch in the center of the radio from the lower position to the upper position. You may get one or more warning screens depending upon the current status of the switches, throttle, and failsafe settings. If you wish to ignore the warning screens press the EXIT key to clear that screen. If everything is working well you should then see a splash screen and hear an introduction sound. The radio will then open a new model wizard screen on radios configured with Lua scripts. For the time being, bypass the new model wizard by pressing EXIT to display one of the transmitter's three "default screens". Default screens display the condition of physical and logical switches, the position of the sticks, and other information relevant to the operation of your remote vehicle. Default screens do not change any parameters for the radio or models nor do they display telemetry. Any time you wish to return to a default screen press the EXIT key repeatedly and you'll back out to the most recently displayed default screen.

Operation mode is used for all normal functions of a transmitter including setting up the radio to match your preferences, and model setup and operation.

Navigation Buttons:

The radio has 6 navigation buttons which give you access to a variety of screens. The specific number of screens is dependent upon the options installed with your version of OpenTX.

Keys may have two functions depending upon the screen displayed. One function is accessed by a short press/release. The second function is accessed using a long press of the button.

Radio Setup:

From a default screen a long press of the MENU button will bring you to the RADIO SETUP series of menus. These screens make changes that effect the overall operation of the radio. Use the

PAGE button to navigate through the setup screens which include RADIO SETUP, SD CARD, TRAINER, VERSION, SWITCH TEST, ANALOG INPUTS, HARDWARE, and CALIBRATION. A short press of the PAGE button moves you forward one screen. A long press moves you backward one screen.

Battery Calibration:

In the ANALOG INPUTS screen you will notice that the analog inputs are not absolutely still despite lack of movement of the knobs or sticks. This is normal and is of no consequence.

In the ANALOG INPUTS screen you will see a "Battery Calib" line at the bottom with an editable field showing voltage. To assure accurate transmitter voltage display, use a multimeter to measure the transmitter battery voltage directly and adjust the editable field to match the value measured with the multimeter. To do that: with the field highlighted, press the ENT key. The field will blink. Use the "+" and "-"keys to adjust the voltage reading. Press EXIT when finished. The calibration values are stored in the EEPE. EEPE is the file on the radio that contains all radio and models setups. OPENTX Companion is able, read, store, and edit EEPE files.

Knob and Slider Calibration:

In the CALIBRATION screen you calibrate the sticks, knobs, and sliders of the Taranis.
To calibrate your transmitter simply follow the screen prompts. Note that if calibrating one control, you must calibrate all controls. These calibration settings are stored in the EEPE file along with other model data.

> NOTE: If you overwrite the EEPE (Radio and Model settings) **or update your firmware** your calibration may be overwritten and must be should be performed again.

Model Setup:

Repeatedly pressing the EXIT key will eventually bring you to a default screen. A quick press on the MENU button will initiate the model setup mode. You can page through the model setup screens by quick pressing the PAGE button. Screens include MODEL SELECTION, MODEL SETUP, HELI (optionally), FLIGHT MODES, INPUTS, MIXER, SERVOS, CURVES, GLOBAL VARIABLES (optionally), LOGICAL SWITCHES, SPECIAL FUNCTIONS, CUSTOM SCRIPTS (optionally), TELEMETRY.
A long press of the PAGE button in model setup screens will display the previous screen.

In the MODEL SELECTION screen you can select a specific model by using the "+" and "-" keys. When on the model you wish to select a long press of the ENT will open a window allowing a number of functions including "Select Model". Use the "+" and "-" buttons to highlight "Select Model" Press the "ENT" button to load the model profile.

New model wizard (on radios configured to use Lua scripts):

When viewing the MODEL SELECTION screen with a blank model number highlighted, a long press of the ENT key will pop up a screen allowing you to either Create Model or Restore Model. Restore Model will give you a new model in that slot using the setup from another model previously saved on the TX. Create Model will start a New Model Wizard. The New Model Wizard guides the user through basic control setup. If you choose not use the New Model Wizard, simply hit the EXIT key and then the PAGE Key to set up the model manually having access to all functionality.

The New Model Wizard will ask questions about how want the model setup. Note that you can assign any control to any channel with the Taranis. For example, it doesn't matter at all if throttle is on channel 1, 3, or 8. When in the first screen, the wizard asks if you have an engine (motor). If you choose "Yes" using the "+" or "-" key, your next choice is what channel you want the engine on. Press ENT and use "+" and "-" key to scroll through the channels available.

The PAGE key will take you to the next screen – Ailerons (for fixed wing). Again use ENT followed by "+" or "-" keys to choose "No", "Yes", or "yes, 2 channels". Again the PAGE key will move you to the next screen, and long press on the PAGE key will move you back to the previous screen if you want to change your selection on that screen.

Continue through the Flaps options, airbrakes options, and finally Tail configuration. At the end of the Wizard you get a ready to go screen with a selection overview. Long press of the enter key and you've set up your first model.

Bootloader Mode (utility):

NOTE: The FrSky Taranis is ready to operate. Users don't NEED to use the bootloader unless they desire to change the firmware resident on the radio or connect to OPENTX Companion.

Bootloader mode is a utility mode which allows the radio tremendous flexibility. Bootloader mode allows the user to perform upgrades (and retrogrades) without sending the radio to a service center. The bootloader serves three utility functions.

The primary function is to allow the radio a trouble free connection to the computer for access to the microSD card and/or to modify model and radio settings using a computer program called "OpenTX Companion". OpenTX Companion is not required to modify radio and model settings, as full functionality is available from the radio screen. Many users enjoy the large computer screen interface available through OpenTX Companion to more easily interface with the radio as well as run computer simulations of the setups. OpenTX Companion can downloaded from www.open-TX.org.

The second function is to "Write Firmware". Firmware is the software interface your model uses to interact with the firmware in normal operations mode. The radio is shipped with an

established stable FrSky version of OpenTX. OpenTX development is an ongoing open source project. New and improved versions are made available and easily downloaded using OpenTX Companion. The "Write Firmware" option in the bootloader will allow you to change firmware versions stored on the radio's microSD card in a folder named "FIRMWARES".

The third function of the bootloader is to restore the EEPROM from a previous version saved on the MicroSD card. This safety net can restore your radio and model settings to a previous time.

Connecting by USB:

To use OpenTX Companion with your transmitter you must first connect the transmitter to the computer with a high quality Mini USB cable. The procedure for connecting and disconnecting the transmitter to the computer with USB must be followed carefully to successfully connect and avoid causing issues when disconnecting.

You must place the Transmitter into Bootloader Mode <u>before</u> connecting the Taranis to the computer. Bootloader mode is invoked by pressing the two horizontal trim switches (aileron and rudder) toward the power switch and holding them in that position while powering on the model. If successful, you will note the top line says "Taranis BootLoader" with the version of the bootloader.

> Note: You may see online references to a legacy method of connection using a driver named Zadig and connection with the transmitter off. This method is no longer advised.

Once the Transmitter is in bootloader mode, you can connect it to the computer using a Mini USB Cable plugged into the back of the transmitter. A successful connection will be confirmed on the transmitter screen with the words "USB Connected". At this time (or shortly after) two removable drives will appear on your computer. One drive is called TARANIS and contains two files named EEPROM and FIRMWARE. IT'S CRITICALLY IMPORTANT THAT YOU LEAVE THE "TARANIS" DRIVE ALONE. The second drive will not have a label but will contain folders including BMP, EEPROMS, FIRMWARES, LOGS, MODELS, SCRIPTS, and SOUNDS. This second drive is contained on a microSD card located in the battery bay of the Taranis. You are now ready to access the EEPE file (Radio and Model settings) using OpenTX Companion.

OpenTX Companion:

As stated above the Taranis has much more flexibility than is available right out of the box. Much of this flexibility comes from a program aptly named OpenTX Companion. It's important to note that OpenTX has a vast number of tools available, and they can sometimes overwhelm the new user. **Keep calm** and you soon realize that having a vast array of tools does not mean all of these tools must be employed. There is a large online community of very helpful people and resources available so that even the most intimidated can be successful.

OpenTX Companion is NOT a product of FrSky and is not supported by FrSky. OpenTX Companion is a third party open source project created entirely by hobbyists for hobbyists. As

OpenTX Companion is an ongoing project, there are different versions available at any given time. You will want to use the version of OpenTX Companion that matches the version of OpenTX firmware you have on your radio. The firmware version on your radio can be determined on the version screen in the radio setup screens. OpenTX Companion can be used to upgrade the OpenTX firmware to a more recent version when in bootloader mode. OpenTX Companion can also be used to edit the EEPE file (radio and model settings) on your FrSky Taranis <u>without</u> upgrading the firmware from that shipped on the transmitter**. FrSky supports only firmware versions provided on the transmitter or downloaded from FrSky.** The radio is supplied with a fully functional version of OpenTX. It is recommended that you familiarize yourself with the operation of the radio before considering an upgrade.

IT'S IMPORTANT that the version of OpenTX Companion you use matches the version of OpenTX you are using on your transmitter. New transmitters contain OpenTX 2.1; thus they will work with a 2.1 version of OpenTX Companion and will not work with the older 2.0 versions.

Best practices:

It's beyond the scope of this Quick start Guide to give instructions on the use of OpenTX Companion. That said there are a couple best practices that are prudent to mention.

1. Don't make a new EEPE and write over the radio settings. Back up your existing EEPE before writing the new one.

2. When editing an EEPE,
   a. Read Models and Settings from Radio. (There is a button for this).
   b. Edit the EEPE. Note the General Settings at the top corresponds to the RADIO SETTINGS in the radio and each number corresponds to a model setup.
   c. Save the EEPE to your computer including the date in the name of the EEPE. Keep past EEPE files for reference (or backup) in their own folder on your computer for the future.
   d. Finally Write Models and Settings to Radio (there is a button for this).
   e. Now if you wrote from the same EEPE you read you will avoid overwriting your calibration or other Radio specific information.

DON'T simply unplug the transmitter from the USB Cable – follow procedure below.

Disconnecting USB:

Pulling the USB plug without following a safe removal procedure can corrupt or ruin the microSD card, the Taranis, or other USB devices that the computer can both read and write. Use your favorite search site and search for "Safely Removing USB Devices". Find the procedure that corresponds to the Computer operating system you use. Be sure to safely remove BOTH the TARANIS drive and the MicroSD card drive.

Adding modules:

Your Taranis can accommodate a wide variety transmitter protocols by plugging in third party TX modules that fit a JR/Graupner module bay. You can also increase the number of channels on the Taranis to 32 by installing a FrSky XJT module and using a feature called SBUS. There are also wireless buddy box modules available that fit into the module bay.

Sound and Auxiliary Jacks:

On the back of the Taranis is a 3mm mono audio jack. There is also a 3mm Auxiliary jack which can be used with some flight simulators with the Taranis.

Binding a receiver to a model:

Each model setup in the transmitter is bound to a specific receiver to avoid accidently using the wrong model setup. There are numerous combinations of different types of receivers, modules, and telemetry that can be used. This guide will give general instructions for binding an X or D series FrSky ACCST receiver using the most common configuration. Binding a receiver to a specific transmitter requires that the transmitter be set to bind mode and then the receiver is powered up while a bind button on the receiver is depressed.

Begin by noting if you have a D series receiver or an X series receiver. D series receivers only work with legacy "D series" telemetry sensors, while X series receivers work the state of the art "smart port" telemetry sensors. Both work fine with OpenTX when set up correctly.

Start with the transmitter displaying a default screen. A short press of the menu key will open the MODEL SELECTION screen. Using the "+" and "-"keys select the model to bind. A quick press of the PAGE key will open the MODEL SETUP screen. Using the "+" and "-"keys navigate to the "**Internal RF**" section. Internal RF uses the inbuilt transmitter RF circuitry, the "**External RF**" is for binding receivers to an external transmitter module in the JR/Graupner module bay. If binding a D series receiver, set the **Mode field** on the line below "**Internal RF**" to **D8**. If binding an X series receiver leave the mode set at **D16**. Generally the "**Channel Range**" field is left at **1-8** even if fewer channels will be used. Navigate to the **[Bind]** field below. When the [Bind} field is highlighted a short press of the ENT key will cause the [Bind] field to flash and an audible chirping sound will be heard; the transmitter is now in bind mode.

With the transmitter in bind mode depress the bind button on the receiver and power the receiver while depressing the bind button. Release the button. The bind is instantaneous. Three presses on the EXIT key will release the transmitter from bind mode and display a default screen. Power the receiver off, and then back on. The bind should be complete. Receiver instructions explain the LED color patterns signifying the receiver's connection status. For more information on binding check Open-TXU.org.

Online resources (living firmware):

OpenTX is a living project. Continually changing and improving your hardware investment will give you many years of pleasure and you may to remain up to date with the latest transmitter improvements. As such there is a need for online resources to keep pace with these changes and to provide support and comradery among hobbyists. Be aware that older posts or YouTube videos exist becoming increasingly irrelevant as changes are made. Be cognizant of this when reading or watching material older than a couple of years.

The following resources are excellent places to start looking for further information at the time of this publication.

www.open-TXU.org (Open TX University was named tongue in cheek by a group of hobbyists who sought to make the early learning curve more manageable for new users.

RC Groups: http://www.rcgroups.com/forums/showthread.php?t=2178865 (OpenTX 2.0 and beyond) is a thread started by Scott Page, a personality in the FrSky / OpenTX community who endeavors to help others enjoy the hobby. **The first two posts of this thread are kept updated with information on the latest OPENTX information and a list of other current relevant informational threads.**

http://rcsettings.com/ - A site dedicated to OpenTX EEPE files, and other Taranis specific files and information.

http://openrcforums.com/forum/ - A more advanced and general discussion board aimed a wide variety of open source firmware and hardware. OpenTX developers carry on discussions here and a variety of files including hundreds of OpenTX model icons, splash screens, and sound packages can be found here.

Translations:

www.open-TXU.org has a number of different language translations of this guide available to download.

www.open-TXU.org имеет ряд различных языковых переводов данного руководства доступны для скачивания.

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