

Informal guide to OPEN TX for the 9XR (version r2940).

I know there's a manual already, but it's long. It's all there, including instructions for helicopters, but it's too much for the novice user. Another name for this guide would be "An Abbreviated Guide" because, not only is there a lot left out, but I haven't once mentioned helis or multi rotors. Someone else can do that so go ahead if you feel so moved.

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As a main screen

I always use the screen with the bar graphs to get a quick visual on the channels and how they are changed using the stick, switches and pots. Other main screens are available and you can get to them by pressing [UP] and [DOWN].

Before you create a model, you have to set up the radio.

Radio setup

Here you can set the mode, channel order to suit your system and many other things and they're all self-explanatory. If you're using a DSM2/X module, the correct order is TAER for channel's 1 2 3 and 4. Throttle is CH1 etc.

Other systems are different so you have to check with the manufacturers manual and see what it says about receiver channel order. It therefore stands to reason that your choice of module dictates the type of receiver you use as well as the channel order needed in the Radio Setup screen.

To get to the radio setup screen press [LEFT LONG] from the main screen. Then just keep pressing [LEFT] until you get to it. You'll see other important screens on the way.

Calibration screen

Follow instructions. There's no obvious way out of this so when you've finished press [EXIT] and that will take you back to the main screen.

Battery calibration

You get to this from the analysis screen which has the title ANAS. You need a good multimeter to find the true voltage of the battery. When you've done that, refit the battery and enter in this reading.

Pressing [EXIT] twice takes you back to the main screen.

Creating a new model and moving between screens.

From the main screen press [RIGHT LONG]. In the list, move the cursor to an empty slot and press [MENU LONG]. You have now created a new model. It has no name other than a number, and it will be a basic four-channel plane. Pressing [EXIT] will take you back to the main screen and you will see that the sticks and throttle are working.

Then press [RIGHT LONG] to get to the list of models again. Pressing [RIGHT] or [LEFT] will move you between screens. Pressing [EXIT] twice (sometimes three times) on any screen will get you back to the main screen

Model Select

Indicates which model is active. Follow the same way of working with lines as already outlined in copying moving and deleting. To select a plane, highlight it with the cursor and press [MENU LONG]. You'll see a message that it's loading your model. If you press [MENU], you will highlight the line for moving, copying or deleting. If you press the menu button "short" instead of "long" by mistake, just press Menu "long" to load the model. Pressing [EXIT] takes you to your main screen and you can work the sticks to see that everything is as you expect it to be.

Remember that every time you fly and change the trims, those trim settings will be saved. Resist the temptation to change the trims other than when flying. If you want

to change the trims to what is called “Offsets”, go to the servos screen, scroll down to the bottom and press [MENU LONG].

Delete a model

You can't delete a model that's active, so make another model active then go back and highlight the plane you want to delete. Then press [EXIT LONG], and if you want to proceed, press [MENU]. If you don't want to delete it, press [EXIT].

Templates

You can select a template for your plane as the first move after creating a new model.

Sticks (Dual Rates and EXPO)

Read the paragraphs on moving, copying and deleting below.
To edit any line press [MENU LONG]

For Dual Rates

This is done from the Sticks screen as follows:

Highlight the line : [MENU]
Insert a line after it [RIGHT LONG]
Insert a line before it [LEFT LONG]

On the new line enter a new Weight and a switch to activate. For Ail. Elev and Rud, I will usually assign one switch, for example “Ail” for convenience.

Expo

This is found in the same edit menu for the sticks. Dual rates for any of the control surfaces requires two lines of programming for each one.

To Copy a Line

Highlight the line: [MENU]
Go up or down: press [MENU] again

To Delete a Line

Highlight the line : [MENU]
Press [EXIT LONG]

To Move a Line

Highlight the line : press [MENU] x2 until dotted lasso appears
Move up or down.

Press [MENU]

Servo Reverse

In servos menu, it's the arrow.
Press [MENU] to change it.

Sub Trim

In servos screen, the 1st column is to change the mid point for that control surface (channel)

Differential

You will need a dual aileron setup: two servos: one for each aileron.

Two mixes are needed: one for each switch position.

The switch for ailerons without differential is !GEAR (switch is off)

That's one mix.

To add differential to the ailerons, select GEAR as the activating switch. That's another mix.

CH 2
Right aileron

WEIGHTS is +100
DIFF is 60
Switch is e.g. GEAR

CH6
Left aileron

WEIGHTS is -100
DIFF is 60
Switch is e.g. GEAR

If it doesn't work, change the direction of the servo in the SERVOS menu. If the diff seems to be working in the opposite way to what you want, change the DIFF values, to -60.

You can also implement diff with servos menu. You just change the limits for those channels.

Mixer

I get confused by the term “source” in the edit menu. Think of it in this context: the receiver’s CH4 is activated. What is the source or indeed sources of this activation? We know that stick movement and switch or knob settings/movements (sources) are sent via a mixing function to the transmitter’s rf module and so, through radio, to the receiver and it’s outputs to servos.

For example, what extent can aileron stick movement influence CH4 output on the receiver? When you edit CH4, you decide what, on the transmitter, will influence the servo powered by that output on the receiver in the plane.

As well as all of the rudder stick, some of the aileron stick could influence CH4 – which is the rudder channel on the receiver. If you want this mixing of rudder and aileron to be optional, then specify a switch. Then only when this switch is set to activate this MIX, will this MIX happen. The switch could be ELE. Its up to you but you might have already decided to use the AIL switch for dual rates. More on this at the end of the guide.

In this case, you have to remember that two mixes are now required for CH4. One is simply rudder, and will need a switch assignment of, for example, !ELE.

When a switch is up it is off, and is called “!ELE”

When a switch is down it is on, and is called “ELE” Notice the missing exclamation mark.

So, staying with the above case, !ELE means that only the rudder stick will be the source of what comes out of the receiver CH4. When you throw the switch down to ELE position, then aileron stick movement too becomes a source for the receiver’s CH4.

Dual ailerons

If you are using a spectrum type receiver, copy your mix for CH2 down to CH6. It’s the same method of copying that you use in Dual Rates.

Model Setup

Name: Use [RIGHT] and [LEFT] to change between upper and lower case.

Timer

THS Throttle at zero stops the timer

TH% Lots of throttle.....timer goes fast, and vice versa.

THt Moving the throttle stick starts the timer

Use the exit button on the transmitter to reset all timers (you have two at your disposal.).

Trainer (buddy box)

If you want to use the radio as a master unit in a training context where you have a cable joining two radios, in Custom Functions, enable the trainer switch.

Back in the Trainer screen, set mode to := (replace)

Set Source so that the slave radio channels match for all the sticks.

On the slave radio, select an empty model.

Trainer Sequence...Switch on radio...plug in cable to master radio, then to slave radio.

Centre all the sticks on the slave. On the master, on the trainer screen, scroll down to “Cal” and press [MENU].

If full stick throw on the slave doesn’t match what’s happening on the master main screen, use the multiplier. Change it from “1” to “1.1”, or “1.2” or whatever works to make full throws on the slave radio make for full throws on the master radio.

Now you and your student both control the plane. When the spring loaded trainer switch is held on, the student has control. When the switch is released, all control is back with the instructor.

Throttle cut safety switch.

This is enabled in the “custom functions” screen. It stops the throttle stick from working so if the stick is knocked by accident, the prop won’t get a chance to injure you or anyone else.

Instant trim

Also enabled in Custom functions. You fly the model straight and level and have someone flip the trainer (or other) switch. Now you can let go of the sticks and your model will continue to fly straight and level.

Flaps

Using the three-way switch. We will assume that CH5 on the receiver will be used for flaps. We will also assume that a simple six-channel receiver is being used so using a “y” connector to the two servos will be necessary. It’s critical in this case that the servos are fitted in a different way to the aileron servos. Instead of moving in opposite direction, flaps move in the same direction. Using only one output, the

radio cannot do anything but send identical signals to the flaps servos. Hobbyking sells an inline servo reverser that you can fit to one of the servos. This works especially when servo bays have already been prepared in the same way as the aileron servos.

We are going to create a mix for CH5
1st Mix

Source	MAX
Weight	100
Offset	0
Trim	Off
Curve	Diff 0
Mode	Select 1234
Switch	ID1
Warning	Off
Multiply	ADD

Now you have flaps on CH5 that you can turn off and on using ID1

In the case of flaps, you will probably want the elevator to come up a little at the same time. This can be achieved by creating a “Flight Mode”. It can also be achieved by adding an extra mix to CH 3. We’ve already assigned ID1 to activating flaps in CH 5. Now in CH 3 create an extra mix as follows:

Source	3POS
Weight	100
Offset	-6
Trim	ON DREX ON
Curve	Diff 0
Mode	Select 1234
Switch	ID1
Warning	Off
Multiply	ADD

Now when you change the three way switch to ID1 two things will happen. The flaps will engage and the elevator will be offset to -6. You may have to experiment with this offset value.

Flight Modes

Handling the flight modes screen. Scroll down to a line other than FM0, which is your default (on all the time until you change it). Scroll down to FM1 and press [MENU]. Now you’re in Flight mode 1’s own screen. Give it a name. If you think you want any special mixes and trim adjustment for landing, for instance, then you could call it LAND.

What switch do you want to use to activate it?
What control surfaces need to change every time a landing is made?
Do you want the change to happen slowly?
Do you want the change back to happen slowly?

OK, now back to the main screen. Activate flight mode 1. Change the trims to what you think you will want during landing. You'll be flying slowly so maybe a little up elevator is going to suit slow flying. If flaps are working, then this will compensate for the nose dropping when you activate them. You can also activate flaps using a flight mode. More on this in a minute.

Basically, anything you do to the trims when you are in flight mode 1 will be saved when you deactivate it by switching it off.

You've now created a flight mode you can use when you throw the assigned switch.

Elsewhere, in editing sticks or editing mixes, you can add lines in the sticks screen, mixes in the Mixer screen that work only for flight mode 1.

In this case, whenever the switch activates flight mode 1, whatever you want for landing will happen. Maybe you will want more expo during landing to make the controls feel softer. If you want the flaps to activate during landing, then in the mix for flaps make sure that only FM1 is highlighted in the edit screen for that channel. The same goes for retracts. It's also fun to slow the flaps down. They will look more realistic and the plane will respond more smoothly. If you take time to delay the retracts then first flaps will happen before retracts. Both operations have been initiated by throwing ID0 to ID1. It's that switch just above the elevator/aileron stick so it's not too far away for your index finger to reach it. If you've set up warnings for flaps and retracts, then bleeps will tell you what's happening. You might say to yourself: "Don't land till you hear the bleeps!"

If you're flying a motor glider, why not have flight modes for launch, land, slow, or whatever you think will help. If you fly with a 1300 battery sometimes and a 2200 battery other times, then having a flight mode for each type of battery would be a good idea because the trims required for both would be different. Otherwise, it's just a quick way of having things happen with the plane at different times during the flight. Don't forget to carry out checks with the radio and plane whilst at home and just before you fly. If you crash the plane due to incorrect programming, an awkward moment will result! Keep it simple and there's less chance of a mistake.

Remembering switches

How are you going to remember the programming for each model?

It wouldn't hurt to keep a written record of some kind. Keep it in your transmitter box!

It's definitely a good idea to be as consistent as possible but there's a problem for the novice user of this radio.

If you squint a bit you will see that each control switch or knob (otherwise called a potentiometer or POT) has a label. These are useful but not as useful as you'd think. Think of all the switches you've assigned to different functions. The AIL switch might change rates for all control surfaces on the plane. Instant trim might be achieved by throwing the trainer switch, or you might prefer to assign another switch to this function. Keeping things consistent between models is more difficult than you think, especially when you are experimenting all the time with the aim of making things easier to fly your inevitable growing fleet of aircraft!

This "informal guide" has been my attempt to get to grips with programming the 9XR radio. It started out as an idea to make an "idiots guide". It seems to have evolved into a grander form. It has helped me to work things out. When I first got the radio, it had the original software and a decent downloadable manual. Of course I had to go ahead and flash the radio with Open TX. Then things got really complicated! If you've done this, then I hope this will help you. You know you could start by just using the template screen and select "basic 4 Channel" Then move to dual rates and expo. I think the most basic visual guide of all would be a postcard with a list of how tos for Moving, Copying, Deleting and Inserting. Glue it to the inside of your transmitter box, for quick reference.

You will have noticed that there are various ways of getting to an edit screen and various ways of doing lots of things with this transmitter. It's amazing to think that someone created this software for no money! There are opportunities to donate to "Medicine Sans Frontiers" Download the manual from Hobbyking's web site for the 9XR and use their link or contribute through the Companion 9X program. There's a link in that.

Yours faithfully, M. W.

Acknowledgments

Bruce from RC Reviews for his tutorial on flaps

<http://www.youtube.com/watch?v=zUehWUoiPHQ>

Kjell Kernen from Swiss RC for all his good work producing video guides for the 9XR. Here's a link to his Video on the trainer function.

<http://www.youtube.com/watch?v=cdQcAd0-WYc>