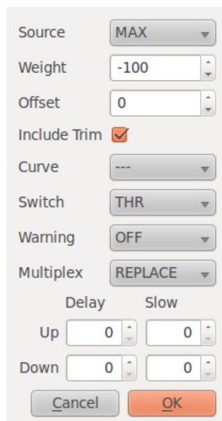
This document is an explanation of the “examples.eepe” file. Contained in the file are several examples of how you *could* setup various mixes found on some model aircraft. Please note that with the flexibility of the er9x software there are many different ways of making something work. These examples are just that, one possible way to setup the mix. There is probably other ways, and possibly some ways that are better.

Slot 1 – Throttle Hold:

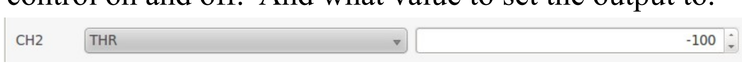
There are 4 ways to setup a throttle hold shown in this model. Channels 1 to 4 illustrate the 4 different ways individually. I put them all in the same model so you could easily compare how each of them works differently.

The first uses the mixer. On the same channel as the throttle, there is another mix added that looks like this:



Here you can see the source is MAX. The MAX input is either 0 or 100. Here is how it works. When the switch is off the MAX input is simply ignored. But when the switch is on, the mix is used in the rest of the channel. This is however a 'replace' mixer. When this mixer is active it overrides everything else in the channel. Flipping the THR switch on will send the output of this channel to -100. There are a couple of reasons you may not want to set up throttle hold this way. The first is should you reverse the throttle channel by mistake your throttle hold would be holding the throttle at full. The second is, if your throttle stick is not all the way down the throttle will jump to wherever the throttle is set at when switch THR is turned off. Test this in the eepe simulator to see what I mean.

The second way to do a throttle hold is not as obvious. Channel 2 is controlled by a safety switch. You can find the safety switches under the “safety switch” tab in eepe. A safety switch requires 2 things. The switch to control on and off. And what value to set the output to.



So you see channel 2 has switch THR and value = -100. This says if the THR switch is on then channel 2's output will be -100. The mixer is completely skipped when a safety switch is enabled. So set these up carefully. Safety switches solve the problem of accidentally reversing the throttle channel. They do not solve the problem of releasing the throttle when the stick is not at idle. That is what our next method is for.

The third method for throttle hold is sticky. I know, huh?? This method solves the problem of releasing the throttle with the throttle stick not at idle. To get the throttle to release you need to turn off the THR switch and move the throttle stick all the way to idle before it will release the hold. This mixer is a bit more complicated. By now you have noticed some strange mixes on channels 12 and 14. These are virtual channels. They have no real output, but can be used to control other channels. This mix also makes use of virtual switches.

CSwitchB	v<ofs	THR	-95
CSwitchC	v>ofs	CH14	0

Here is how this mix works. The throttle hold mix is controlled by virtual switch C (SWC). SWC is on whenever CH14 is greater than 0. CH14 is sent to 100 when the THR switch is activated. CH14 then waits until SWB becomes active. SWB activates only when the throttle stick is moved below -99. I have found only 1 problem with this mix. Sometimes it will not release the throttle hold. This is easily fixed by changing the SWB value to -95.

The last method is a variation of the sticky method, but for heli pilots. On helis there are typically 2 or more modes. One is normal and the other is stunt. In stunt mode the throttle output never goes to zero, or off. In normal mode the throttle starts at idle which is the only place we want it to start. Here are the differences from the other sticky mode. You must have switch ID0 on (this is the 3 position switch and normal mode is typically ID0), and move the throttle stick all the way to idle before it will release. I added one more virtual switch, SW7. Virtual switches 8 and 9 are copies of virtual switches B and C. SW7 is on only when the throttle stick is at idle and the 3 position switch is on ID0 (normal mode). CH12 is the virtual channel for this throttle hold. It is basically a copy of CH14 except that SWB has been replaced by SW7.

Another thing you can do to improve safety is use the safety switch method along with the other methods. This way you take care of both problems with the mix only method. You are now safe from accidental throttle channel reversing, and if you used methods 3 or 4 you cannot disable the throttle hold while the throttle is not set at idle.

Slot 2 - Aileron differential:

There are 2 simple methods to implement aileron differential. This first uses the x>0 and x<0 curves. These curve apply to the input value. So when used for aileron differential moving the aileron stick to the right is greater than 0. So the mix with curve x>0 gets used. It is a simple matter then to get the mixer percentages set the way you like for the proper differential. The nice thing about this method is you can see right away in the mixer menu how your differential is set up.

The second method is a bit less obvious but works just as well as the first. You will notice the 2 mixers are just plain + and – 100, with the AIL stick as input. The differential is set up in the limits screen. Some might find it easier to set up this method as visually it is easier to look at. However this method may not work if you plan to have flaperons as well.

Slot 3 – Flaperons:

The flaperon mixes are enabled by the ELE switch. The first example is full flaperons. Meaning the ailerons move down as flaps as well as up as spoilers. You can see in the mixer channels 1, 2, and 3 are the example 1 flaperons. I only have the 2 aileron and 1 elevator servo shown to keep things simple. When the ELE switch is on both ailerons will move in the same direction. They will move half of what the elevator moves, as well as in the opposite direction.

Example 2 just implements the flaperons as flaps only. The ailerons will move down together but not up.

Ok so I wanted to be crazy and I set all of my percentages to 100. What happens when the aileron hits 100 or the end of its travel and it needs to go more? Will I break my servo? The answer is no. The limits are hard limits, meaning the radio will not output values beyond what is set in the limits menu. If you set the limit to 10, that is all you will get from that output.

Slot 4 – Elevons:

For those of you who have a delta wing. Or a plane whose control surface act like one, you probably need an elevon setup. With elevons the controls do double duty. Not only are they the elevator of the airplane but the ailerons too. So you can see the mix is that simple. The elevator is the same for both channels and the ailerons are the opposite. If you need less control from one function or the other, I would suggest making your adjustments under the dual-rate and expo screen.

Slot 5 – Flaps:

Keep in mind the software is very flexible and there are many ways that things can be done. Here are just a couple of examples of how to set up flaps.

The first uses the 3 position switch. You basically have no flaps, half flaps, and full flaps. I am only showing one output for flaps. If you have 2 servos controlling your flaps you can copy the same mixers to the other channel, and it should be fine. The 3 position switch really just selects a percentage of a max input to output. Also you will see some mixing in with the elevator channel. Most planes when flaps are deployed need an elevator correction to keep them flying level. Adjust the percentages as needed here so the correction is automatically applied when you engage your flaps.

The second method uses one of the pots to set the flap angle. The flaps themselves are turned on and off by the gear switch. Once enabled though the position is set by P2. Also an elevator correction is automatically inserted, and is just a percentage of the flap position. So the more the flaps are deployed the more the elevator will correct.

Slot 6 – Reverse Range Check:

The reverse range check allows you to take the model with you when you range check your aircraft. You would leave the radio behind. Because of the programmable nature of the 9x with custom firmware, you can program channels to move by themselves. A note of caution when setting up the range check mode. Make sure if you are checking an electric model, that the throttle will remain off. Double check that your throttle channel is off before turning on the model and the 9x with the range check model loaded. Also you should make sure that any control surfaces that will be moving will not get overdriven. That channels can be set up for full output. A way around this is to program the mixes to only 50 or even 25 percent.

The servo test template is the one to use for the reverse range check. Load that template into a blank model. Then if the model is an electric set the throttle channel to -100% max. The other channels you wish to have move themselves, set those to 50% CH15. Virtual channel 15 is the channel you want everything to follow. Through the creative use of virtual switches and slow mixers channel 15 moves from -100 to 100 and back. If you want your controls to move faster during the range test. Change the slow values on channel 15. But do not set them to zero! This will cause channel 15 to cycle as fast as possible and you servos won't have time to move. Beside that it might look like a radio glitch all by itself.

I hope this has helped you understand a little bit of how to setup and program your 9x for the aircraft you want to control. Feel free to mix the different examples to get your aircraft setup how you like. If you run into problems just ask in the Rcgroups forum and someone is bound to come up with a solution.

Happy flying!!