

Phoenix (ER9X)

General Model Settings	Custom Switches	
Name: PhoenixM1 Timer: 12:00, TH% Count Up Protocol: PPM: 8 Channels, 300msec Delay Pulse Polarity: POS Throttle Trim: Disabled Throttle Expo: Disabled Trim Switch: --- Trim Increment: Exponential Center Beep: Throttle, P1, P2	SW1	THR AND ID0
	SW2	THR AND ID1
	SW3	THR AND ID2
	SW4	THR AND !ID1 AND RUD
	SW5	THR AND SW9 AND RUD
	SW6	!THR OR SW3 AND RUD
	SW7	SW5 OR SW4
	SW8	!THR OR SW1 AND RUD
	SW9	ELE AND ID1
	SWA	SW3 AND RUD

Limits:

When the servos are at neutral, the flaps are about 30 degree down. Adjust the offset for the flaps, so they are neutral with sticks neutral and set the limits according to the servos

	CH 01	CH 02	CH 03	CH 04	CH 05	CH 06	CH 07-16
Offset	0	31.3	23.7	0.0	15.5	0.0	0.0
Min	-100	-87	-100	-100	-100	-100	-100
Max	100	100	100	100	100	100	100
Invert	NOR	NOR	INV	INV	INV	INV	NOR

This setup (Mode 1) is ment for an electric glider with 4 servos in the wings, one rudder servo, one elevator servo and an ESC for the motor

Before powering on the radio, set all switches down/away from your body and set the throttle stick to motor stop position. I intentionally do not use a safety switch but the RUD Switch as main switch for the motor. (Elevator down for motor throw compensation controlled by the motor channel output does not work correctly when using a safety switch. Motor throw compensation must be active only when the motor is running. But when using a channel with safety switch in a mix, the channel value at the mixer may be high with motor off.)

All flight modes (except Basic) add a certain amount of elevator down (curve 3) depending on the amount of throttle, to compensate for the motor thrust.

Channel 1; right aileron

Channel 2: right flap

Channel 3: left flap

Channel 4: left aileron

Channel 5: elevator

Channel 6: rudder

Channel 7: throttle

Flight mode selection:

Flight modes are selected with the switches THR and ID 0/1/2

Throttle switch off --> Basic

Throttle switch on --> Start, Glide or Break, depending on ID 0/1/2

Throttle switch on, ID 0 --> Flightmode Start

Throttle switch on, ID 1 --> Flightmode Glide

Throttle switch on, ID 2 --> Flightmode Landing

Flightmode Basic:

THR switch is OFF

This is my emergency mode.

RUD switch ON to get control of the motor

Motor, aileron, elevator and rudder are directly controlled without any additional mixes.

Flightmode Start:

Switch **THR to ON** (up)

Throttle fully controls the motor.

The flaps are synchronized with the ailerons, but with less throw.

Rudder is controlled with the rudder stick

Flightmode Glide:

Switch from ID 0 to ID 1

Rudder gets a partial mix from aileron (Combi switch)

Flaps get a partial mix from elevator high (Kick-flaps)

Throttle stick no longer controls the motor. Instead of, it controlls camber for all four surfaces with a maximum of 15 degrees up for speed flying and maximum of 15 degrees down for soaring.

The motor can be activated with switch ELE and controlled with P3 (*switch **ELE to ON***).

Flightmode Landing:

Switch from ID 1 to ID 2

Rudder stick controls the rudder

Throttle stick is split into three parts; crow range, a dead band and the throttle range.

The dead band is about 15 % wide and allows you to easily have the throttle stick in the neutral area.

Crow works in the lower half, that is from neutral (no crow) to minimum stick position towards your body (maximum crow).

The high end of the throttle stick via curve C9 controls the full range of the throttle channel.

With maximum crow, ailerons go up to about 80% and the flaps go fully down.

Depending on the amount of crow, elevator low is added according to curve 10 to compensate for the increased lift due to the low flaps. Maximum low elevator is mixed in for intermediate crow.

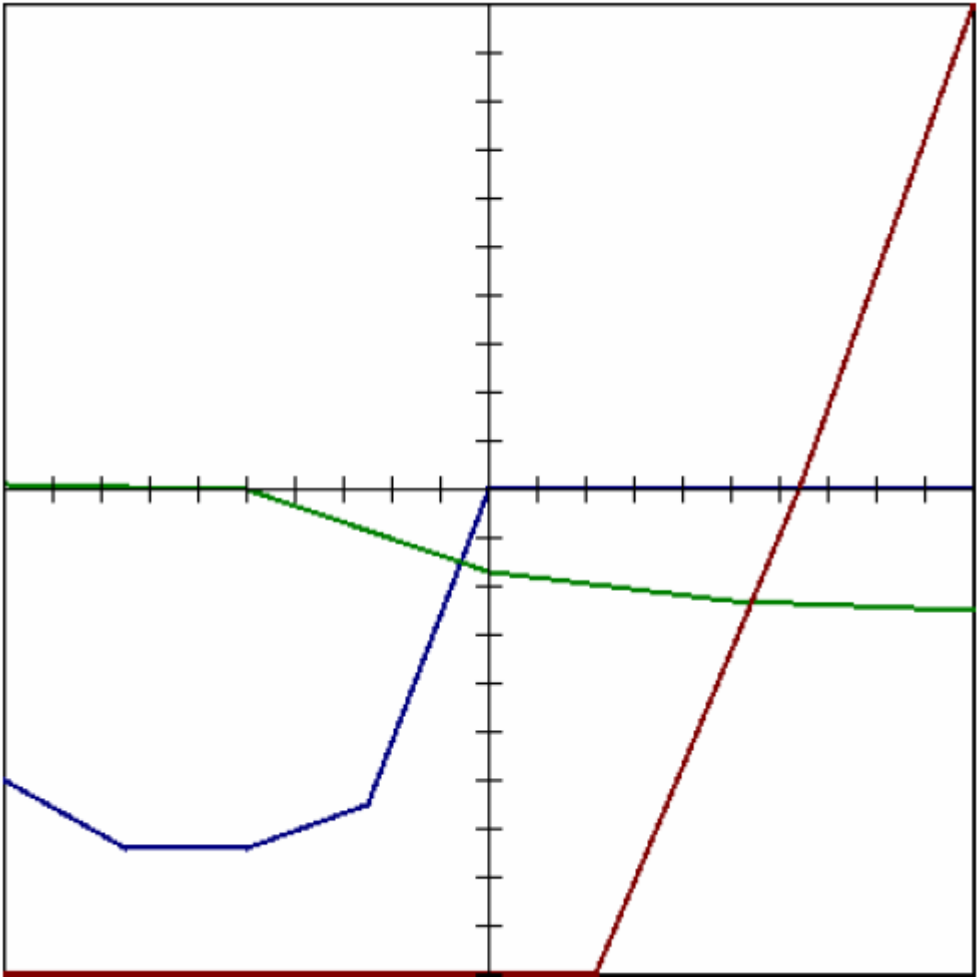
To get an acceptable action of the ailerons with crow, Ch 10 adds in a multiply mix from throttle stick that allows to drive the curve outer aileron down to the normal position (as if no crow was active on that surface).

Mixes

CH01 <i>Aileron right</i>	basic aileron with differential (+80%)Ail diff(+50%)
	Camber: all wing surfaces plus minus 20% splitted into two channels because of switch and slow up/down. (+30%)CH16 Slow(u3:d3)
	Crow: splitted into two channels because of switch and slow up/down. (-90%)CH14 Slow(u3:d3)
	allow maximum aileron down (+100%)CH10 noTrim
CH02 <i>Flap right</i>	Kick-Flaps,Camber and Crow are mixed in Ch11 (+100%)Ch11 noTrim
	Flaps synchronized with aileron but only half throw R(+50%)CH01 Switch(SW1)
CH03 <i>Flap left</i>	Kick-Flaps,Camber and Crow are mixed in Ch11 (-100%)Ch11 noTrim
	Flaps synchronized with aileron but only half throw R(-50%)CH04 Switch(SW1)
CH04 <i>Aileron left</i>	basic aileron with differential (-80%)Ail diff(-50%)
	Camber: all wing surfaces plus minus 20% splitted into two channels because of switch and slow up/down. (+30%)CH16 Slow(u3:d3)
	Crow: splitted into two channels because of switch and slow up/down. (-90%)CH14 Slow(u3:d3)
	allow maximum aileron down (-100%)CH10 noTrim

<u>CH05</u> <i>Elevator</i>	basic elevator (-100%)Ele
	elevator down to compensate for motor throw -50%)CH07 Switch(SW7) noTrim Curve(Curve 3)
	elevator down to compensate for increased lift , when using crow (+56%)CH14 Curve(Curve 10) Slow(u3:d3)
<u>CH06</u> <i>Rudder</i>	basic rudder (+100%)Rud
	Rudder (Kombi Switch) in Glide mode: reduced throw because some aileron is mixed in R(+80%)RUD Switch(SW2) add some throw from aileron (+30%)Ail Switch(SW2) noTrim
<u>CH07</u> <i>Motor</i>	motor control in glide phase via switch ELE and P3. Uses Ch12 for switch so slow up is working (+100%) CH12 Slow(u3:d0)
	Simple model or Start: R(+100%)THR Switch(SW8) noTrim
	Motorcontrol in Break: R(+100%)THR Switch(SWA) noTrim Curve(Curve9)

<u>CH10</u> Addit. Aileron with Crow	<p>To get a normal amount of aileron down with crow, an additional amount of throw is mixed in, depending on throttle stick and aileronstick position. Due to the multiply mix, the maximum aileron down is constant and independent of crow.</p> <p>(-90%)CH14 noTrim Curve(Curve x<0) Slow(u3:d3)</p> <p>mix AIL and THR (CH13) to give the additional throw for the aileron that goes down</p> <p>*(+100%)Ail</p>
<u>CH11</u>	<p>Kick-Flaps:add small amount of flaps low with Ele high</p> <p>(+25%)ELE Switch(THR) noTrim Curve(x<0)</p>
	<p>Camber: splitted into two channels because of switch and slow up/down.</p> <p>(+30%)CH16 Slow(u3:d3)</p>
	<p>Crow: splitted into two channels because of switch and slow up/down.</p> <p>(+100%)CH14 Slow(u3:d3)</p>
<u>CH12</u>	<p>Motorcontrol while Gliding:</p> <p>(-100%)Half</p> <p>R(+100%)P3 Switch(SW5)</p>
<u>CH14</u> Crow	<p>Crow: moves Flaps max down and Ailerons 80% up</p> <p>(+100%)THR Switch(Sw3) noTrim Curve(x<0)</p>
<u>CH16</u> Camber	<p>Camber: throttle moves all surfaces +/- 20%</p> <p>(+100%)THR Switch(SW2) noTrim</p>



Curves:

5 point curve		pt 1		pt 2		pt 3		pt 4		pt5
Curve 3 green elevator compensation of motor throw	Y	0		0		-17		-23		-25
9 point curve		pt1	pt2	pt3	pt4	pt5	pt6	pt7	pt8	pt9
Curve 9 brown throttle in break mode	Y	-100	-100	-100	-100	-100	-100	-38	26	100
Curve 10 blue elevator compensation in break mode	Y	-65	-74	-74	-35	0	0	0	0	0