Connect a Spektrum NX8+ Transmitter to SeligSIM

This guide enables a Spektrum NX8+ transmitter (NX8 in the text) to control the RC model Flight simulator SeligSIM. Note that this method does not use the remapping software vJoy and Joystick Gremlin.

The NX8 transmitter, in common with the newer Spektrum Transmitters, can be set to emulate a Game Controller. When Game Controller mode is selected the RF transmitter is disabled and the Transmitter may be directly connected to a USB port on a "PC" using the supplied USB cable.

SeligSIM Channels

Selig SIM uses 8 control channels where each is dedicated to control a specific function on the aircraft.

Channel Number	Channel Function
1	Flight Modes: Low, Medium or High
2	Reset: to Home or In Place
3	Flaps: Up, Takeoff, and Landing
4	Landing Gear: Up or Down
5	Engine Throttle: 0 to 100%
6	Rudder
7	Elevator
8	Ailerons

Each of the eight channels can have a value in the range -100 through to +100. SeligSIM requires that these channels are input to the simulation in a specific order.

Spektrum RC Transmitter Channels

The Spektrum transmitters have 6, 8, 10, or more channels. When used in an "out of the box" configuration the channels are transmitted in a different order to that used by SeligSIM. This guide explains how to re-order or "Remap" the NX8 transmitter channels to meet the requirements for controlling SeligSIM.

The Spektrum NX8 transmitter

The NX8 transmitter has two 2-way joysticks and 8 selectable switches labeled A through H. Switches A and H are 2-way whereas B though G are 3-way switches.

This guide makes use of switches A through D (with G and H as an option).

Using the guide

If you are very familiar with programming Spektrum transmitters, then everything that you need to know to setup a transmitter to work with SeligSIM is contained in Tables 1, 2, 3 & 4 on the next 2 pages.

Otherwise I suggest you familiarize yourselves with the tables and then follow the step by step guide in the next section.

Table 1 Transmitter Switch Selection

Switch	Controls	Switch Position	Channel Value	Function
A	Landing Gear	SWA - 0	-100	Gear Down
		SWA - 1	+100	Gear Up
B	Reset	SWB - 0	+100	Reset to Home
		SWB - 1	0	Run
		SWB - 2	-100	Reset in Place
C	Flight Mode	SWC - 0	+100	High (Expert)
		SWC - 1	0	Medium
		SWC - 2	-100	Low (Beginner)
D	Flaps	SWD - 0	-100	Flaps: Up
		SWD - 1	0	Flaps: Takeoff
		SWD - 2	+100	Flaps: Landing

Note that switch position zero (0) is used for Flaps Up and Gear Down. Switch C position 0, (ie switch up) selects the high, expert rates and position 2 (switch down) selects the beginner low rates.

Reset is a 3 position switch B where push back, i.e. position 0, Resets to Home and pull forward, position 2, freezes the simulation (Reset in place). To resume the simulation move switch B to the center position.

If you prefer to use different switches or switch positions then go ahead and do it. The only requirement is for the switches to generate the appropriate channel values for each function as shown in table 1.

The thumb-stick configuration is the default for aircraft i.e. Spektrum transmitter Mode 2 with Throttle and Rudder on the left and Aileron and Elevator on the right.

Table 2 Thumb-stick programming

Thumb-stick	Controls	Thumb-stick Position	Channel Value	Function
Left: up/down	Throttle	Left stick - Up	-100	Throttle Max
		Left stick - Down	+100	Throttle Min
Left: right/left	Rudder	Left stick - Right	-100	Turn Right
		Left stick - Left	+100	Turn Left
Right: up/down	Elevator	Right stick - Up	-100	Dive
		Right stick - Down	+100	Climb
Right: right/left	Ailerons	Right stick - Right	+100	Bank Right
		Right stick - Left	-100	Bank Left

Once again, if you prefer to use a different thumb-stick arrangement then it's OK to do so. The only requirement is for the thumb-stick to generate the appropriate channel values for each function as shown in table 2.

Note that Elevator, Ailerons, Throttle and Gear channels need to be reversed from the Spektrum default condition. Reversing the channels must be done <u>after</u> the receiver remapping step.

The Table below shows the standard Spektrum Channel input assignments and the switch assignments.

Table 3 Channel Input Configuration

Spektrum Channel	Function	Spektrum Name	Switch
1	Throttle	Thro	N/A
2	Aileron	Aile	N/A
3	Elevator	Elev	N/A
4	Rudder	Rudder	N/A
5	Gear	Gear	A
6	Flaps	Aux 1	N/A
7	Reset	Aux 2	B
8	Flight Mode	Aux3	C
9			Inh
10			Inh

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The Channel re-ordering for compatibility with Selig SIM is done using the Receiver Port Assignment page. The Rx port assignment should look like table 4 below.

Table 4 Receiver Port Assignments

Spektrum Channel	Receiver Port Assignments
1	Flap (Aux1)
2	Aux3
3	Aux2
4	Gear
5	Aileron
6	Elevator
7	Rudder
8	Throttle

If you are using the default values for the thumb-sticks and switches then use the servo setup function to reverse Gear, Aileron, Elevator and Throttle.

Step by step guide to setup an NX8 transmitter for use with SeligSIM

This is a lengthy procedure. Make sure that the Transmitter battery is fully charged, or connected to a USB port which can maintain the battery charge.

This guide assumes some basic knowledge of how to navigate around the menus, select and change values and enter text using the keyboard function.

Step 1 Create a new model

1. Turn on the transmitter. Press the scroll roller to access the menu system.
2. In the Function List, scroll down and select *System Setup*.
3. In the System Setup Menu select *Model Select.*
4. In the Model Select Menu select *Add New Model.*
5. On the Create New Model Screen scroll to the *Fixed Wing Aircraft icon* and select *CREATE*.
6. In the System Setup Menu select *Model Type.*
7. On the Model Type Screen select the *Powered Aircraft icon.* Confirm the aircraft type.
8. In the System Setup Menu select *Model Name.*
9. On the Model Name screen enter a Model Name (Suggest SeligSIM) Press Back button when done.
10. In the System Setup Menu select *Aircraft Type.*
11. On the Aircraft Type screen, change the Wing to *1 Ail 1 Flap.* Press Back when done.

Step 2 Specify the Input Channel Assignments

1. In the System Setup Menu select *Channel Assign.*
2. On the Channel Input Configuration screen scroll down to 8: RKnb and change to switch *C.*
3. The screen should look like table 5 when done. (Channel 6 will be fixed in the next step).

Table 5 Channel Input Config.

1 Thro: N/A
2 Aile: N/A
3 Elev: N/A
4 Rudd: N/A
5: A
6: N/A
7: B
8: C

Step 3 Configure the Flaps

1. Go back to the Function List menu and select *Flap System*.
2. On the Flap System screen scroll down to the *Switch* and change from Inhibit to switch *D.*
3. Set the position 0 Flap value to -100%.
4. Set the position 1 Flap value to 0%.
5. Set the position 2 Flap value to +100%.
6. Scroll down to *Speed* and set the value to 1.0 s.

Step 4 Re-map the Receiver Inputs

1. Go back to the Function List, scroll down and select *System Setup.*
2. In the System Setup Menu, select *Channel Assign.*
3. At the bottom of the Channel Input Config screen click on *NEXT.*
4. On the Rx Port Assignments screen select channel 1 and change to from Throttle to *Flap*.
5. Repeat the process for each channel changing from the default value to the New value shown in the right hand column. Set Rx channels 9 & 10 to Inhibit

Spektrum Channel	Default Rx Port Assignment	New Rx Port Assignment
1	Throttle	Flap (Aux1)
2	Aileron	Aux3
3	Elevator	Aux2
4	Rudder	Gear
5	Gear	Aileron
6	Flap (Aux1)	Elevator
7	Aux 2	Rudder
8	Aux 3	Throttle

Step 5 Reverse Elevator, Aileron and Throttle channels

1. Go back to the Function List and select *Servo Setup.*
2. Scroll down and click on *Channel Count* and scroll until only 8 channels are visible.
3. Click on *Travel* then scroll and select *Reverse.*
4. On the Reverse Screen reverse AIL, ELE and THR.
5. For Gear Down when switch A in position 0 reverse GER.
6. Click on *Reverse* then scroll and select speed Speed.
7. Set both the GER forward and reverse speeds to 3.0.
8. Move the thumb-sticks and check that the values are consistent with Table 2 (reproduced below).

Thumb-stick ID	Thumb-stick Position	Channel Value	Function
Left: up/down (Throttle)	Left stick - Up	-100	Throttle Max
	Left stick - Down	+100	Throttle Min
Left: right/left (Rudder)	Left stick - Right	-100	Turn Right
	Left stick - Left	+100	Turn Left
Right: up/down (Elevator)	Right stick - Up	-100	Dive
	Right stick - Down	+100	Climb
Right: right/left (Ailerons)	Right stick - Right	+100	Bank Right
	Right stick - Left	-100	Bank Left

Step 6 Set Game controller mode

1. In the System Settings Menu select USB Settings.
2. In the USB settings screen click on *Mode:* and select *Game Controller.*
3. The reprogramming is now complete.

Step 7 Connect to computer and calibrate

1. Connect the Transmitter to your computer and start SeligSIM.
2. Click on *Single Pilot Freestyle.*
3. On the next screen, if the Button below " USB interface" does not say "Spectrum Radio" then click on the button and select Spectrum Radio from the list and click OK.
4. Click on *Transmitter* and then *Calibrate*. Follow the entire procedure (do not skip any steps) click OK. when done.

Optional Extras

If SeligSIM is being used for practice with the transmitter i.e. creating "Muscle, Memory" for your fingers, then there are some commonly used functions that you might want to implement. These are not part of SeligSIM and are not necessary to run it.

Throttle Kill switch

Many RC fliers use an additional switch to kill the motor in the event of a crash. A kill switch also provides an additional layer of safety when the radio control system is first activated.

A 2-way switch is used for this purpose. Position zero (0) is used to disable the motor and position 1 to run.

This guide assigns switch "H" for the kill switch.

1. From the Main Screen press the scroll roller to access the menu system.
2. In the Function List, scroll down and select *Throttle Cut.*
3. Set the Switch to *H* (or any switch of your choice).
4. Set the Position 0 to the value to *-130.* (Recall that the throttle channel has been reversed therefore this value shows as +130 on the Monitor Screen).

Flight Timer

A flight timer can warn the flyer that the battery may be getting low and its time to land.

1. In the Function List, scroll down and select *Timer.*
2. On the timers Screen scroll down to *Time* and set the period to whatever you are comfortable with (default 5 minutes).
3. Scroll down to *One Time* and select *Active*.

This starts the timer when the throttle is raised above 25% and keeps the timer running when the throttle is below 25%.

4. Scroll down and select *NEXT.*
5. On the next Timer page scroll down to *Timer Clear* and select Switch *G* (or any other spare switch).

This will inhibit the timer until the plane is ready for flight, and clear it when required.

A Note on Switch Positions

While most RC Transmitters allow the user to select any switch or switch position for any function, there are some best practices that have come about from years of experience.

The first best practice is to use switches on the left side for in-flight changes such as gear, flaps and flight modes. This allows the right hand to stay positioned on the right thumb-stick where it can quickly react to any attitude changes brought about by a switch change.

A second best practice is to use the same switch position for all switches when starting up the model. This allows for a quick visual check that a “safe” set of functions has been set.

This guide is designed such that position 0 for all switches can be used when when starting the RC model. With all switches in position 0, the Throttle is disabled, Gear is down, Flaps are up, Flight mode is Normal (expert), Model is reset to Home, Throttle is disabled and the Timer (if used) is on hold.

If you are left-handed, or prefer a different set of switches and switch positions then it’s OK to change them. Different switch assignments will not affect the simulation.