



## **Programming Guide for the JR 8103 Heli radio system**

The following is a programming example for a helicopter using the 8103-heli radio. If you follow along, several features of the 8103 will be demonstrated, which should help better understand the abilities of the system.

### **System Set-Up Mode**

To start with we will open a clear model, so press and hold the up and down keys together and flip the power switch on and then release the up and down keys. Press the + and – keys to go into model select. Press the + key until you get to a clear model. Then press the up key twice to get to the model type. To get to the correct type, press the + key to get to HELI, if it is not already in HELI mode. Next you will press the up key to model reset. Press CLR so that it will restore the system to factory defaults. Press the up key to select the modulation of the system. Here you will use the + and – keys to set this to the desired modulation. Press the up key three times, to set the input selection. Now you will press the + key to set the aux 2 to INH. Press the CH key so the arrow now points at GEAR. Here you will press the + key to make this say INH. Press the UP key one time, and this will bring you to SWASH TYP. This is where you can set the radio for CCPM. Press the + key one time for 2 servo – 180 degree, again for 3 servo – 120 degree, and once more for 4 servo 90 degree. If you do not have a CCPM helicopter, leave this at 1 servo NORM. If it is CCPM, choose the type of set up you have. Your instructions for the helicopter should have this information listed as to which type it is. Then you can press the up key till you get to the name selection, and re-name the model. At this point we have set up the system mode for our helicopter.

### **Function Mode**

Next we will set up the function mode of transmitter. If you are still in the system mode, just press the up and down keys together twice, or turn the radio off and back on, and press the up and down keys together again. This will get you into the function mode.

### **Dual Rate and Exponential Set-Up**

Now that we are in the function mode, it brings you to the dual rate set-up. You can set these to your desired amounts. Press the channel key to select the channel, and the + and – keys to set the rates. I would set up the high rate at 100% and the low rate between 80% and 90%. Next press the select key to get to the expo set up for each channel, and use the + and – keys to set the values. You can set various values for each rate. Leave these a 0% to start with, and you can come back to these to set them as desired after test flying the helicopter.

## **Travel Adjustment**

Next we will set up the travel adjustments, so press the up key till you get to the screen where it says TRVL ADJ. in at the top left hand side of the screen. Your manual gives a good description of how to adjust these. Press the select key to get to the second set of 4 channels for adjusting the travel. Most helicopter kit manuals give guidelines for setting of the travel adjustments. Follow these settings for the initial set up of the helicopter and adjust as necessary

## **Sub-Trim Settings**

You will want the sub trim values to be as low as possible. They need to be very close to 0. If you have to change them, try to stay under 20. If you cannot maintain this low of a sub trim, readjust the control linkages and reset the sub trims to 0. This will give the best results and performance.

## **Throttle Hold**

Press the up key until you get to THRO Hold on the top of the screen. Here you will set up the throttle hold for auto rotations, and the position the throttle will go to when the switch is pulled. Press the + key and it will activate the throttle hold. Now adjust the position the throttle will go to by pressing the + or – keys. Adjust this as necessary for your set-up. A rule of thumb is to put your throttle trim in the center, and the throttle stick at idle, and flip the throttle hold switch (upper right hand, long flat switch). When the throttle servo no longer moves when you flip the switch it is all set up. You will want to set your engine such that it idles reliably at mid-trim.

## **Pitch Curve Set-Up**

The pitch curves are very important, and need to be set properly to get the best performance of the helicopter. When properly adjusted together with the throttle curves, the main rotor head RPM should remain consistent throughout all maneuvers and throttle stick positions. This in turn, will also improve the effectiveness and accuracy of the tail rotor and gyro system.

To adjust the pitch curve in the 8103, press the up key until you get to the screen saying PIT. CURV. You will press select to change the flight mode being adjusted, which is normal (hover), stunt mode 1, stunt mode 2, and throttle hold. Press the CH key to adjust the point on the curve to be adjusted, and press the + and – keys to adjust the value at each point. If you press the CH key enough, you will get to a point where you can put in exponential on the curve. Do this only if necessary.

To start with, you will need to get a pitch gauge such as part number JRP960326 from JR. With this gauge you will place the gauge at the tip of the blade, and line the top of the gauge up level with the flybar. This will give you the pitch of the blades. We will need to set the blade pitch at ½ (center) stick first. The pitch at center depends on the flight mode and your level of flight experience. Below is a chart indicating normal settings for the pitch curve in various flight modes. These will work well for most helicopters, but just adjust as needed for your experience and your helicopter. As a general rule, the seesaw mixing arms located on the rotor head will be parallel (level) to the seesaw shaft/flybar assembly at center stick. Set your flight mode switch to normal mode, this is the upper left hand switch right above the elevator dual rate switch. Put this switch all the way back, away from you. Now put your throttle stick at ½ throttle/collective. Now adjust your linkages and the curve in the 8103 to achieve hovering pitch.

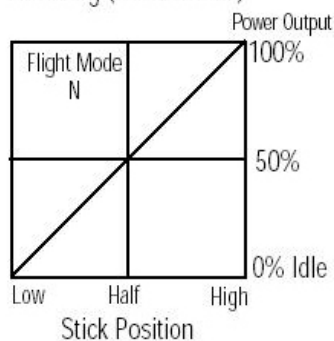
Now you will set your high and low pitch in normal mode, and your low, half, and high pitch settings for stunt modes 1 and 2 and throttle hold. Adjust the points between the center and high/low stick as needed. For a CCPM helicopter, adjust the amount of pitch travel you have, by pressing the up key until you get to Swash Mix. Adjust the Pitch value by pressing the CH key down so the arrow points at PIT, and adjust the value with the + and – keys until you are able to have the pitch travel required.

Flight Mode	Application	Low Pitch (Low Stick)	Hovering Pitch (Half Stick)	High Pitch (High Stick)
N	Hovering	-2°	5°	10°
1	Stunt and Aerobatic Flight	-5°	5°	10°
2	3D Flight	-10°	0°	10°
H	Autorotation	-5°	5°	13°

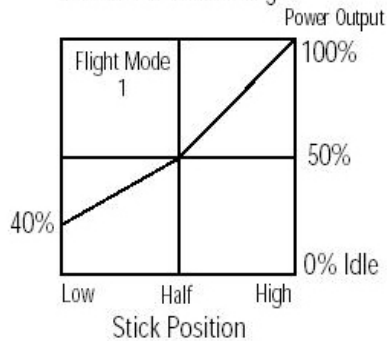
### Throttle Curve Set-Up

The throttle curves will be set similar to the graphs below. The throttle curve can vary greatly due to engine and muffler combinations, so it will be necessary to fine tune and adjust these values during test flights to achieve a constant main rotor rpm for each flight mode and every maneuver. Adjust these values as required, and do so in the same way as adjusting the pitch curves.

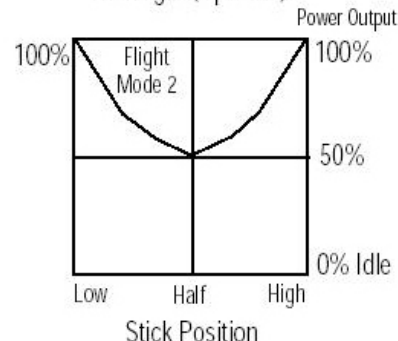
Hovering (Linear Curve)



Stunt & Aerobatic Flight



3D Flight (Optional)



### Gyro Set-Up

Most gyros come with good set-up directions. Follow these when setting up the gyro. The helicopter kit will also most likely have some settings for the gyro for that helicopter. If you have a gyro that has adjustable gain from the transmitter, you will adjust the gain in the 8103 by using the function GYRO SENS. Press the up key until you get this on the top of the screen. Plug the gain lead from the gyro into your gear channel. Press the + key and it will activate the gyro sensitivity set up. You can put the gain adjustment on the rudder dual rate switch, or change it to the flight mode switch by pressing the + key one more time. Press the select key once and you can now adjust the gain settings for position 0 and 1, and you will use the CH key to go between them. If you put it on the flight mode switch, you can also press select one more time, and adjust what gain the gyro will be in each flight mode. Usually you

will put a higher gain on rate 0, so leave the normal mode at 0. For stunt modes, switch it to rate 1 so that you can set up a lower gain for forward flight and aerobatics. In throttle hold you can leave this at 0 or use 1 depending on your preferences. The gain amounts necessary will vary by the helicopter, so set these up by the recommendations in the manual for the helicopter in conjunction with the gyro manual.

On some gyros you can turn tail lock on and off from the transmitter. You can set this up by putting the tail lock on/off plug from the gyro into channel 5 or the gear channel. Use mix 3, so press the up key until you get to PROG MIX 3. Press the + key until the first channel says AUX2. Press the channel key once, and then press the + key until the second channel says gear to make it say GEAR. Now you will press the select key twice to make the arrow point at SW. Press the + key until this says F-S12. Press the select key 3 times, to bring the arrow back to Rate. Put your flight mode switch, upper left hand short 3 position switch, to flight mode 1 or 2. This will be pulling the switch either in the center position or all the way towards you. Now you will press the – key until the value becomes –125. This will activate tail lock in your stunt modes, and rate mode in your normal or hover flight mode. If the gyro does not switch to tail lock, go to your reversing function in the 8103, and reverse the gear channel. This should make it switch to tail lock in those flight modes.

I hope this clears up some questions you have in programming the 8103. There are a lot of things you can do to add and change to the above examples to customize it the set up to your taste. While the examples given may not be used in your case, they should show you how to use the features of the radio to your benefit.