BARRACUDA-80™

By Castle Creations

80 Amp Brushless Sensorless Speed Control for Competition RC Boats

Warning! High power motor systems can be very dangerous! High currents can heat wires and batteries, causing fires and burning skin. Follow the wiring directions carefully! Models equipped with high power motors can cause serious injury. Even though this controller is equipped with a safety arming program, you should still use caution when connecting the main battery and always check battery polarity.

Thank you for purchasing the most technologically advanced brushless electronic speed controller in the world for RC boats! Please take the time to read over these instructions to ensure you get the most from your Barracuda brushless speed control, and enjoy years of trouble-free operation.

1.0 Features of the Barracuda 80™ :

- Extremely Low Resistance (.0006 ohms)
- Up to 80 Amps continuous current
- 12 cells (3s lipo) MAX with BEC
- Six to twenty cells, or 2 to 6 cell Lithium Polymer packs
- BEC (3A) provides power to receiver and servo - eliminates separate receiver battery
- User Programmable Features:
  - Reverse Type
  - Reverse Throttle Amount
  - Low voltage cutoff (LiPo safe)
  - Timing Advance
  - Starting Power
- Safe "power on" arming program ensures motor will not accidentally turn on
- Auto shut down when signal is lost or radio interference becomes severe

2.0 Making Connections on your Barracuda 80™ speed control

Tools required:
- Wire cutters
- Wire stripper (optional)
- Soldering iron (30-40W)

Parts required:
- Rosin core electrical solder
- Battery connector

2.1 Adding a battery connector to your Barracuda 80™:

The battery connector must be added to the power side of the controller (black capacitors, receiver connector, and red and black wire side). The red wire is the positive (+) lead, and must match up to the positive lead from your battery. The black wire is the negative (-) lead, and must match up to the negative lead from your battery. The polarity MUST BE CORRECT or the controller will be damaged from reversed polarity.
Strip just enough insulation off of the battery wires to solder on your battery connector to the controller leads. After the connector is soldered and insulated (shrink tubing or electrical tape) check it ONE MORE TIME to make sure the polarity is correct before you plug in a battery.

2.2 Plugging in motor leads:

With a brushless system, there is no polarity on the MOTOR side of the controller. Simply solder the three leads to your motor (recommended) or solder your choice of connectors to the motor and controller leads. After the throttle calibration routine below – if the motor runs backwards with foreword throttle, simply swap any two of the motor/controller connections and it will reverse the rotation of the motor.

2.3 Connecting to the receiver:

Connect the receiver lead (the three color wires with a connector on the end) to the throttle channel on your receiver (usually channel 2). Do not connect a battery to the receiver, as the Barracuda- 80™ will supply power to the receiver and servo through the receiver connector**.** If you are using more than 12 cells, or 3s Lipo packs, the BEC must be disabled on the controller. Disable the BEC by removing the red wire from the receiver connector.

3.0 Communicating with your new Barracuda 80™:

When programming your Barracuda 80™, it will tell you where you are in the current programming sequence using a combination of sounds and LED flashes. The controller generates sounds through the motor, so it's best to have your motor connected whenever you attempt to configure your Barracuda 80™. The controller signals the motor to make two types of sounds; a longer multi-toned ring (hereafter referred to as a ring), and a short beep (hereafter referred to as a beep). The controller also has a red LED which will flash to give you further indication as to what programming state the controller is in.

3.1 Calibrating the Barracuda 80™ to YOUR transmitter:

<u>IMPORTANT NOTE:</u> Calibration is required for the very first use of the Barracuda 80™ or whenever used with a new/different transmitter.

The Barracuda 80™ contains a throttle calibration feature that you'll want to use the first time you power it up with a new/different transmitter. Performing this exercise will teach the controller how your transmitter works.

- Disconnect battery
- Hold full throttle on your transmitter
- Connect battery
- Barracuda 80™ flashes LED and rings once
- Wait 2 seconds
- Barracuda 80™ flashes led and rings 4 times indicating full throttle measured
- Barracuda 80™ flashes led while beeping, indicating it's time to push full brake
- Push full brake
- Wait 1 second
- Barracuda 80™ flashes led and rings 4 times indicating full brake measured
- Barracuda 80™ flashes led while beeping indicating its time for neutral
- Relax trigger to neutral (center)
- Wait 1 second
- Barracuda 80™ flashes led and rings4 times indicating neutral measured
- Wait for 1 second

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- Barracuda 80™ will flash led and ring twice indicating that it is armed

3.2 Programming Mode

Programming the Barracuda 80™ is as simple as answering a few questions. The Barracuda 80™ asks questions by flashing a setting number, followed by the possible setting values. There are five settings that can be programmed in the Barracuda 80™: 1) Reverse Type, 2) Reverse Throttle Amount, 3) Cutoff Voltage, 4) Timing Advance, 5) Starting Power.

As the programmer, you must answer "yes" or "no" to the setting values as they are presented by the Barracuda 80™. When you enter programming mode the controller will emit a sequence of beeps and LED flashes that tell you which programming step you are in. There are two parts to the beep sequence, the first set of beeps indicates the 'Setting' Number (e.g., Cutoff voltage type), and the second set of beeps indicates a Setting Value (e.g 2 cell LiPo). Answering "no" to a Setting Value will cause the Barracuda 80™ to ask for the next Value. Answering "yes" to a Setting Value will store that setting in the Barracuda 80™s permanent memory. After a setting is stored, the Barracuda 80™ will automatically continue to the next setting until all settings have been stored. NOTE: If you answer "no" to all Setting Values for a particular Setting Number, the Barracuda 80™ will keep whatever value had been previously programmed. Only by answering "yes" to a Setting Value will the Barracuda 80™ store/change that value.

When answering a question, you will need to move the trigger to the yes (full throttle) position or the no (full brake) position and keep it there for about 5 seconds. When the Barracuda 80™ has accepted your answer it will confirm your reply by flashing the LED and emitting a beeping tone. Release the trigger allowing it to go to Neutral to confirm that you are ready for the Barracuda 80™ to ask the next question.

You are not required to continue through all five programming options. For example, if you wish only to change the Reverse Type (option 1) then after programming that setting you can disconnect power from the Barracuda 80™ and you're ready to run. Disconnecting the controller in the middle of programming simply retains the values for the remaining programming options that were previously set up.

3.2.1 Programming Example

The following is a simplified example demonstrating how to "skip" through a program section, how to set a program option, and how to terminate programming early. In this example we will: 1) skip (e.g. do not change) Reverse Type setting, 2) change Reverse Throttle Amount to 12.5%, and 3) terminate programming after this option.

3.2.2 Entering Programming mode

- Disconnect battery
- Hold full throttle on your transmitter
- Connect battery
- Barracuda 80™ flashes led and rings once
- Wait 2 seconds
- Barracuda 80™ flashes led and rings 4 times indicating that it is ready for CALIBRATION mode
- Continue to hold full throttle
- Barracuda 80™ flashes led while beeping
- Wait 8 seconds
- Barracuda 80™ flashes LED and rings 4 times
- Barracuda 80™ flashes led while beeping indicating that you are in PROGRAMMING mode
- Let trigger go neutral (center)

At this point the Barracuda 80™ will be flashing/beeping the following sequence:

Beep – Pause – Beep… and then Repeats

This indicates that you are at Question 1 and it is asking to accept/reject Value 1.

3.2.3 Skipping Programming Sections – No change required

Looking at the table on the last page you can see that Question 1 is 'What reverse/brake type do you want?' and that Value 1 is 'No Reverse'. We don't want to change the current value of this option, so we will say no to each value thereby skipping the programming option.

- Apply full brake for 1 second (NO)
- Barracuda 80™ flashes RED led and rings 4 times, indicating that it has accepted your answer
- Barracuda 80™ flashes/beeps: 'Beep – Pause – Beep - Beep' (Question 1, Value 2)
- Apply full brake for 1 second (NO)
- Barracuda 80™ flashes led and rings 4 times, indicating that it has accepted your answer

At this point you will have answered no to both of the questions in Section 1, so the Barracuda 80™ will move on to Section 2 without modifying the currently stored value.

3.2.4 Changing a Program Option

- Barracuda 80™ flashes/beeps: 'Beep – Beep – Pause – Beep' (Question 2, Value 1)
  From the Table on the last page, Question 2 is 'Reverse Throttle Amount' and Value 1 is '12.5%'. This is the value we want to accept.
- Apply full throttle for 1 second (YES)
- Barracuda 80™ flashes led and rings 4 times, indicating that it has accepted your answer.
- At this point the Barracuda 80™ will move on to Setting Number 3.

3.2.5 Terminating Programming Early

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In this example, we do not need to change any of the remaining programming options, therefore we can terminate the programming routine by disconnecting the battery from the Barracuda 80™. This leaves the remaining programming options at their previously stored values.

3.2.6 A Word About Cutoff Voltages

If you are running NiCad or NiMH cells, the default cutoff voltage of the Barracuda 80™ (5.0V) is normally what you should use, and anything else in the programming is up to your personal preference to change, so you are ready to run!

**** IMPORTANT NOTE: Lithium Polymer Users ****

If you are using Lithium Polymer (Li-Po) batteries, DO NOT operate your boat with the factory default Cutoff Voltage. You *must* change the Cutoff Voltage BEFORE running your boat.

4.0 Troubleshooting:

Everything is hooked up correctly, the BEC (receiver and servo) works, but the throttle does not work.
The controller is not seeing the four seconds of neutral throttle and is not arming. Try moving your throttle trigger slightly in each direction to arm the controller or follow the calibrating function Section 3.1 above. You may also check to make sure that your endpoint adjustments on your radio (if it has them) are set all the way open (both top and bottom, are furthest from zero).

Every time I throttle all the way up, the controller "cuts off" after a few seconds, even with fresh charged batteries.
The controller will automatically shut down the motor if the battery voltage falls below the programmed voltage cutoff (factory preset at 5.0V) for more than half a second. This is to protect your boat from a loss of control caused by too low a voltage at the receiver. If the cutoff is kicking in with fresh charged batteries, it means that the voltage is dropping very quickly. This is usually an indication of a motor that is drawing too much current for the batteries to handle. Try using a smaller prop on the motor, or using batteries with a higher rating (for example, if you are using AAA size cells, you might try going to KAN style/size cells).

Nothing seems to work, receiver and servos are dead, and the throttle is dead.
Check all connections to ensure that they are correct, and that the polarity (+/-) battery connections are correct. If everything is correctly connected, and the receiver and servos still do not work, contact the dealer where you purchased your Barracuda 80™ or Contact Castle Creations directly. (See Section 6.0 below)

5.0 Intended Use

The Barracuda 80™ is intended for exclusive use with boats only. Use in any other vehicles or aircraft is not covered by warranty and will not be supported by Castle Creations.

6.0 Contact/warranty information:

Your Barracuda 80™ is warranted for *one* (1) year from date of purchase to be free from manufacturing and component defects. This warranty does not cover abuse, neglect, or damage due to incorrect wiring, over voltage, or overloading. If you have any questions, comments, or wish to return your Barracuda 80™ for warranty or non-warranty repair/ replacement contact Castle Creations at:

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Tel: (785) 883- 4519 Email: support@castlecreations.com
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PROGRAMMABLE FEATURES

NOTE: Factory Defaults are indicated by asterisk (*)

NOTE: when stetting Lipo cutoff voltage follow your battery manufacturer's recommendations.

Question	Value	Description
1) Brake/Reverse Type	*1) No Reverse	No reverse function.
	2) Forward to Reverse	This setting makes the boat operate freely in forward and reverse
2) Reverse Throttle Amount	1) 12.5%	This setting makes your maximum reverse speed equal to 12.5% of full power
	*2) 25%	This setting makes your maximum reverse speed equal to 25% of full power
	3) 50%	This setting makes your maximum reverse speed equal to 50% of full power
	4) 100%	This setting makes your maximum reverse speed equal to 100% of full power

Question	Value	Description
3) Cutoff Voltage	1) minimal cutoff	Nicad/NiMH cells
	*2) 5V cutoff	Nicad/NiMH cells
	3) 6V cutoff	2 cell Li-Po
	4) 7.2V cutoff	
	5) 9V cutoff	3 cell Li-Po
	6) 12Vcutoff	Use this setting at your own risk! Damage to the controller as a result of using a 4-cell LiPo pack is not covered by the manufacturer's warranty.
4) Timing Advance	1) Low	Max efficiency/runtime.
	*2) Normal	Balance power/runtime.
	3) Race	More power/less runtime.
	4) Extreme	Max power.
5) Starting power	*1) Low	Increase the value of this setting if your model has difficulty starting smoothly under low power.
	2) Normal	
	3) High	

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