

**ELECTRONIC SPEED CONTROL
OPERATING INSTRUCTIONS**



**IMPORTANT PRECAUTIONS
(ESC=ELECTRONIC SPEED CONTROL)**

- Do not run the car near water! Never allow water, moisture, or any foreign material onto the ESC's PC board.
- Never use more than 7 cells (8.4 volts total) in the main battery pack.
- Do not mix instructions. If you are building a vehicle that has a mechanical speed control, do not use the wiring diagram included with the vehicle.
- Never cut or splice the ESC input harness wires. The receiver does not need to have anything plugged into the "battery" slot, it receives power through the ESC input harness which plugs into the CHANNEL 2 slot.
- Three 0.1µF (50V) ceramic capacitors must be properly installed on every motor. (See step 2)
- Always disconnect the battery pack from the ESC when not in use.
- Never turn on the ESC before plugging it into the receiver and switching on the transmitter.
- Be careful not to touch the heat sink when it is hot.

PLEASE FOLLOW ALL INSTRUCTIONS CAREFULLY!

**STEP 1
MOUNTING THE SPEED CONTROL**

The following mounting information will assure that your speed control performs at maximum efficiency and minimizes the chances of overheating and radio interference problems.

MOUNTING THE SPEED CONTROL (Figure 1)

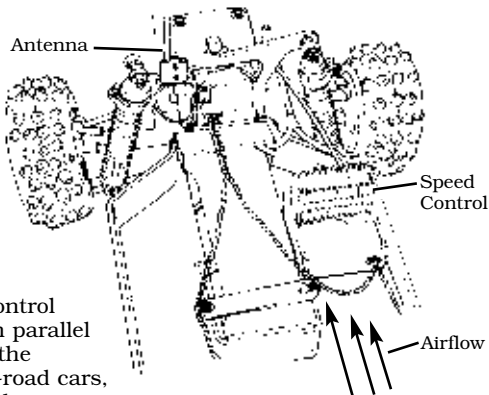
1. Mount the ESC to the chassis using mounting tape. Mounting the ESC to achieve good airflow through the heat sinks is very important for maximum performance. For off-road cars, the ESC should be mounted in the chassis, and as far away from the receiver as possible to prevent radio interference.
2. Mount the ON/OFF switch in a convenient place using mounting tape or screws provided.

MOUNTING THE RECEIVER

To prevent radio interference, mount the receiver and antenna at least two inches away from the motor, batteries, power wires, servo, or any large piece of metal — such as a metal chassis. For off-road cars, the receiver and antenna should always be mounted on the rear shock tower. Mounting the receiver in the tub of the chassis greatly reduces the range of your radio and increases the chance of radio interference. For the best performance, we recommend using an FM receiver.

If your car has a graphite chassis, and you want to mount the receiver on the chassis, mounting the receiver on edge with the crystal and antenna as far away from the chassis as possible to reduce the chance of radio interference.

Figure 1



Mount the speed control to obtain maximum parallel airflow THROUGH the transistors. For off-road cars, or cars with a metal or graphite chassis, mount the ESC on the chassis, and the receiver and antenna on the rear shock tower to reduce radio interference.

**INTRODUCTION TO
SPIKE ESC INSTRUCTIONS**

The following instructions will help you get trouble-free speed control operation. These simple steps will allow your speed control to achieve maximum performance and minimize the chance of problems due to incorrect installation.

Consult the specifications printed on the speed control header card for limitations on the number of cells that the speed control can be used with. You should always ask your hobby dealer or call our service department before using the speed control for an application other than what is listed in these instructions.

The Spike is equipped with a 20 amp reverse protection fuse, which protects the speed control if the battery pack is hooked-up backwards. Replacement fuses can be purchased at a local electronics or automotive supply shop.

- An external diode can be used and may provide slight benefits in brake smoothness and resistance to brake fade.
- The Spike is designed to be used with any stock motor and run on 5 to 7 cells only (1.2 volts/cell connected in series). Using more than 7 cells may damage the speed control.
- When using an external receiver battery pack, the red wire in the speed control input plug should be removed from its plastic housing. Be sure to insulate the exposed metal pin.

Additional Specifications

Voltage Input	5 to 7 Cells
Case Size (w/o heat sinks)	1.65"x.82"x.67" (41mm x 21mm x 17mm)
Weight (w/o heat sinks)	1.27 oz (36g)
On-Resistance	.01
Max. Constant Current	150 amps
Fuse Rating	30A
BEC	5.6 volts

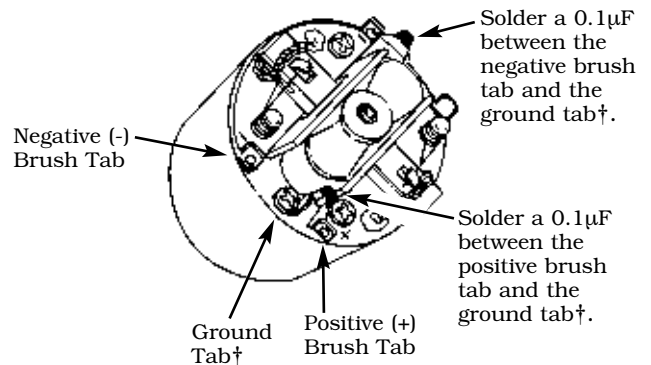
**STEP 2
HOOK-UP INSTRUCTIONS**

INSTALLING MOTOR CAPACITORS (Figure 2)

Motors generate radio noise which can interfere with your receiver and cause problems. Your speed control package includes two 0.1µF, 50V, non-polarized, ceramic capacitors. These capacitors must be used at all times on every motor to help reduce the radio noise generated by the motor and prevent possible damage to the speed control. Solder the capacitors between:

- POSITIVE (+) motor brush tab & GROUND motor tab†.
- NEGATIVE (-) motor brush tab & GROUND motor tab†.

Figure 2 Proper installation of motor capacitors.



† Solder to the can of the motor if your motor doesn't have a ground tab.

**STEP 3
TRANSMITTER ADJUSTMENTS**

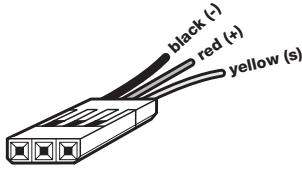
Adjusting your transmitter is critical for proper speed control operation. The transmitter (TX) throttle adjustments are described below:

- ATV, EPA, or ATL — set all to maximum.
- Throttle Trims and Sub Trims — set all at neutral or zero.
- Set the throttle reversing switch to reverse.

STEP 4

RADIO CONNECTOR POLARITIES

The radio connector on this ESC is universal. It can be directly connected to any Futaba® J, Airtronics "Z", Hitec "S", or JR receiver without modification. For proper connection refer to your radio's manual. The yellow "signal wire" on this ESC should be in the same position in the receiver slot as the white wire on Futaba, the blue wire on the new Airtronics "Z" connector, the yellow wire on the Hitec "S" connector, and the orange wire on JR. **WARNING:** This connector is NOT directly compatible with the old Airtronics connector style. For old Airtronics radios, it is highly recommended to use an Airtronics Servo Adapter to connect this ESC to the older style Airtronics radios. **NEVER ALLOW THE RED (+) AND BLACK (-) WIRES TO CROSS ON ANY RECEIVER OR ESC AS PERMANENT DAMAGE WILL RESULT TO BOTH ITEMS.**

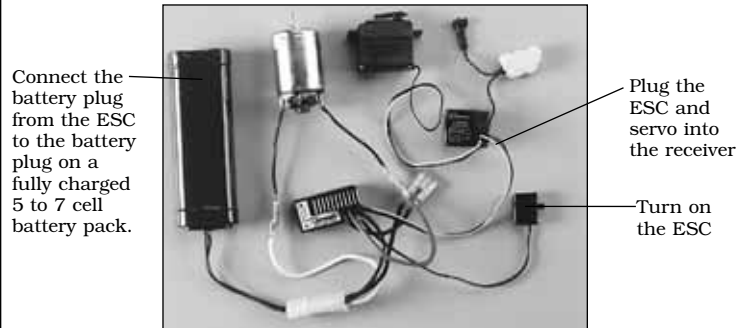


STEP 5

SPEED CONTROL SET-UP

Before you begin this step, your speed control should be plugged into the receiver and your transmitter should have already been adjusted. Before you connect the main battery pack to the speed control, make sure that the ESC switch is turned off. Connect the battery pack to the speed control, turn on the transmitter and ESC, and begin setting the adjustment pots.

CAUTION! Forcing the adjustment pots past their stops can cause internal speed control damage.



SETTING THE ADJUSTMENT POTS

1. Rotate the NEUTRAL pot until the motor stops running.
2. Hold the transmitter at 90% throttle and rotate the HIGH SPEED pot until the motor is at maximum R.P.M.
3. Use the coast brake adjustment on the transmitter to dial in more or less brakes. If there is no coast brake adjustment, rotate the speed control's NEUTRAL pot a few degrees counterclockwise for desired coast brakes and re-adjust the HIGH SPEED pot.

Remember to seal the adjustment pots with tape to keep debris out of the electronic speed control.

TROUBLE SHOOTING GUIDE

Note: The Trouble Shooting Guide is separated into two sections. Please review applicable sections and refer to all instructions.

SPEED CONTROL DOES NOT WORK

Problem: Motor and/or Steering Servo are dead.

- 1) Re-charge dead batteries.
- 2) Bad power plugs.
- 3) Damaged connection between ESC and receiver. Check plug prongs.
- 4) Internal damage†.

Problem: No brakes.

- 1) Transmitter adjusted incorrectly.
- 2) Brake transistor is blown†.

Problem: Case is melted.

Internal damage†.

Problem: ESC runs with switch off.

Drive transistor is blown†.

† - Unit will require service; see "Service Procedures"

SPEED CONTROL WORKS (BUT OTHER PROBLEMS EXIST).

Problem: Receiver glitches or stutters during acceleration.

- 1) The 2 required motor capacitors are not installed or have broken.
- 2) Receiver is dropping out due to a large voltage drop during acceleration. Use either an external battery or a non-BEC receiver designed to be used with ESCs.
- 3) Receiver mounted too close to ESC.
- 4) Bad power plugs or input harness.
- 5) Receiver mounted flat in chassis.

Problem: Model runs slowly or has no acceleration.

- 1) Hi-Speed pot not properly adjusted.
- 2) Bad plug(s), battery, and/or motor.

Problem: Steering Servo works and motor is dead.

Motor brushes are hanging up, are worn out, or motor is bad.

Problem: Overheated motor or hot power plugs.

- 1) Motor is geared too high.
- 2) Shorted motor.
- 3) Defective or loose plug(s).

Problem: Motor runs backwards.

- 1) Motor wired backwards.
- 2) Battery pack is wired backwards.

PREVENTING RADIO PROBLEMS

Radio interference can cause the speed control to rapidly switch between forward and full brakes, causing overheating of the brake transistors and possible damage to the ESC. Here are a few of the most common causes of radio problems:

- **CAPACITORS NOT INSTALLED ON MOTOR.** Electric motors generate radio noise that can interfere with the receiver. To prevent radio problems, every motor should have two 0.1µF (50V) ceramic capacitors installed (See step 2).
- **RECEIVER MOUNTED ON GRAPHITE OR METAL CHASSIS.** Graphite and metal chassis transmit radio noise generated by the motor. To prevent radio problems, mount the receiver on the rear shock tower or away from the chassis. If the receiver is mounted on the chassis, stand it on its side with the crystal as far away from the chassis as possible.
- **RECEIVER ANTENNA CUT OR MOUNTED WRONG.** If the receiver's antenna is cut, the range will be reduced. The antenna should be mounted away from the motor and power wires. Coiling the antenna wire, or keeping the entire antenna inside the body will reduce the range and increase the risk of radio problems.

SERVICE PROCEDURES

PLEASE NOTE: Speed controls that operate normally when received will be charged a minimum service fee and return shipping charges. Before sending your speed control in for service, it is important that you review the Trouble-Shooting Guide in this instruction set. The speed control may appear to have failed when other problems exist in the system — such as a defective transmitter, receiver or servo, or incorrect adjustments/installation.

- Hobby dealers are not authorized to replace speed controls thought to be defective.
- Do not cut the input harness, switch harness, or power wires of the speed control before sending it for service. A fee will be charged for cut wires which must be replaced for testing.

120-DAY LIMITED WARRANTY

DuraTrax warrants this product to be free from defects in materials and workmanship for a period of 120-days from the date of purchase. During that period, we will repair or replace, at our option, any product that does not meet these standards. You will be required to provide proof of purchase date (receipt or invoice).

If, during the 120-day period, your DuraTrax product shows defects caused by abuse, misuse, or accident, it will be repaired or replaced at our option, at a service charge not greater than 50% of the current retail list price. Be sure to include your daytime telephone number in case we need to contact you about your repair.

This warranty does not cover components worn by use, application of reverse voltage, cross connections, poor installation, subsection of components to foreign materials, any alterations to wires, or tampering. In no case shall our liability exceed the original cost of the product.

Your warranty is voided if...

- A. You apply reverse voltage to the Spike ESC by connecting the battery pack backwards, or plugging the motor connectors into the battery pack.
- B. You allow any wires to become frayed which could cause a short.
- C. You use more than 7 cells (1.2V/cell) in the main battery pack.
- D. You tamper with any of the electronic components.
- E. You allow water, moisture, or any other foreign material onto the PC board.
- F. You do not remove the red wire in the input harness when using an external battery pack.
- G. You apply too much pressure when installing the heat sink.
- H. You force the pots past their stops.

Under no circumstances will the purchaser be entitled to consequential or incidental damages. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state. **If you attempt to disassemble or repair this unit yourself it may void the warranty.**

For service to your **DuraTrax** product, either in or out of warranty, send it post paid and insured to:

HOBBY SERVICES
1610 Interstate Drive,
Champaign, IL 61822
(217) 398-0007
E-Mail: hobbyservices@hobbico.com
Internet Address: www.duratrax.com

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