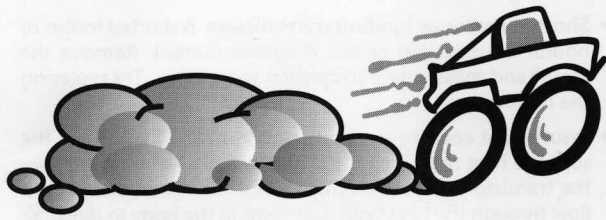


# SPEED CONTROL OWNER'S MANUAL



**NOVAK**  
ELECTRONICS, INC. RACING TEAM

## ABOUT THIS MANUAL

The following instructions will help to provide you with trouble-free operation of your speed control. Following this manual will allow your speed control to achieve maximum performance and minimize the chances of problems due to incorrect installation or set-up.

This manual covers several electronic speed control (ESC) models and a variety of ways that you can hook-up your speed control to best suit your application. Included with your speed control is a "SPECIFICS SHEET" which describes details which are unique to that speed control model.

The limitations on the minimum and maximum number of cell that your speed control can handle is called out by the number in the beginning of the speed control's name.

Example: 410-HPc can use between 4 and 10 cells  
610-HRV can use between 6 and 10 cells

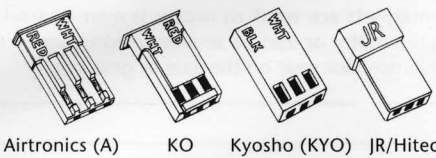
Always consult your hobby dealer or contact our customer service department before using your speed control for an application other than those is listed on the "SPECIFICS SHEET" or in this Owner's Manual.

## PRECAUTIONS

- **READ INSTRUCTIONS CAREFULLY BEFORE USING!**
- **WATER & ELECTRONICS DON'T MIX!** Do not operate model in or around water. Never allow water, moisture, or other foreign materials to get inside the speed control.
- **CHECK THE SPECIFICATIONS** Read the included Specifics Sheet to determine special limitations of the speed control.
- **MOTOR CAPACITORS REQUIRED** Three 0.1 $\mu$ F (50V) ceramic capacitors must be properly installed on every motor to prevent radio interference.
- **DON'T LET HEAT SINKS TOUCH** Never allow the separate banks of transistor tabs or the heat sinks to touch each other or any exposed metal, as this will create a short circuit and damage the speed control.
- **DISCONNECT THE BATTERIES** Always disconnect battery pack from the speed control when not in use.
- **TRANSMITTER ON FIRST** Always turn on the power of your transmitter first so that you will have control of the radio equipment when you turn on the speed control.
- **DON'T GET BURNT!** Heat sinks can get extremely hot, so be careful not to touch them until they have cooled.
- **INSULATE WIRES** Always insulate any exposed wiring with heat shrink tubing to prevent short circuits.

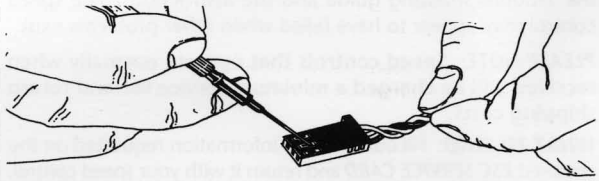
## STEP 1 CHANGING THE INPUT PLUG

Included with your speed control is the Novak Input Plug System™ to convert the Futaba J style input plug harness to be compatible with Airtronics, KO, Kyosho, JR, and Hitec radios. Refer to Figures 1 through 3 to convert plug.

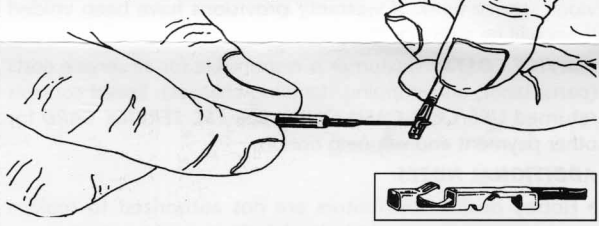


Airtronics (A) KO Kyosho (KYO) JR/Hitec

**FIGURE 1** With a small standard screwdriver, press on each of the three metal prongs until the wires are easy to remove. Remove wires.



**FIGURE 2** With the screwdriver, carefully lift up each of the metal locking tabs to the angle shown.



**FIGURE 3** Insert each pin into the correct plug slot. Each pin should "click" into place. (Airtronics plug shown)

The locking tab must not extend outside the plastic plug housing.

WHT = White wire terminal (signal)  
BLK = Black wire terminal (negative)  
RED = Red wire terminal (positive)

**CAUTION** Improper installation of these wires may cause damage to the receiver, servo, and speed control.

## STEP 2 HEAT SINK INSTALLATION

Heat sinks increase speed control performance and braking power. You must always use the heat sinks while operating the speed control.

Included with your speed control is either a set of one 5 or 6 and one 2 or 3 transistor heat sinks, or a set of three 3 transistor heat sinks. The brake (and reverse) transistors are offset from the drive transistors and must not contact each other. Be sure not to install one heat sink over both the brake and drive transistors.

1. Place speed control on a flat surface.
2. Using your thumb, press the proper heat sink onto the left bank of transistors, and then press the other heat sink onto the right bank of transistors (for 610-RV press the third heat sink onto the center bank of transistors). The heat sinks should press onto the transistor tabs with a snug fit.

If the heat sinks are shifted or are upside down, they will not fit properly. Do not use excessive force when installing the heat sinks as you can damage the transistors or other internal component. Never use a vise or pliers to install the heat sinks.

If the heat sinks are too loose or too tight, you should adjust the heat sink fins. Using a small flat blade screwdriver or needle nose pliers, carefully bend the fins to adjust for a proper snug fit. Make sure all of the transistor tabs make good contact with the inside surface of the heat sinks.

**Do Not Use Glue** to attach the heat sinks.

**Heat Sinks Can Get Extremely Hot**—do not touch until cool.

## STEP 3 MOUNTING INSTRUCTIONS

### MOUNTING THE SPEED CONTROL

1. Use the included double-sided tape to mount speed control. Position the speed control for maximum cooling in the car.
2. Mount the ON/OFF switch in a location where it will be easy to get to even with the body on the model.

### MOUNTING THE RECEIVER

To avoid radio interference, mount the receiver as far away from the motor, battery, servo, and power wires as possible. For off-road cars, mounting the receiver and the antenna on the rear shock tower will reduce radio interference.

## STEP 4 HOOK-UP INSTRUCTIONS

### RECEIVER CONNECTIONS

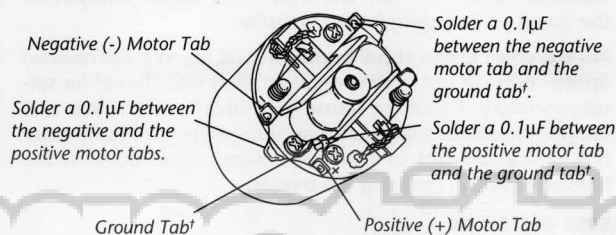
Novak speed controls have built in regulator circuitry that supplies power to the receiver. This eliminates the need to use an external receiver battery pack.

1. Plug speed control signal harness into channel 2 of receiver.
2. Plug servo signal harness into channel 1 of receiver.

### INSTALLING MOTOR CAPACITORS

Electric motors generate radio noise which can interfere with your receiver and cause radio interference problems. Your speed control package includes three 0.1 $\mu$ F, 50 V, 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 & NEGATIVE (-) motor brush tab.
- POSITIVE (+) motor brush tab & GROUND motor tab<sup>1</sup>.
- NEGATIVE (-) motor brush tab & GROUND motor tab<sup>1</sup>.



<sup>1</sup> Solder to the can of the motor if your motor does not have a ground tab.

### SCHOTTKY DIODE INSTALLATION

Some of our speed controls require the use of an external Schottky motor diode. Please read the Specifics Sheet for special instructions (Schottky diodes can not be used on reversible speed controls).

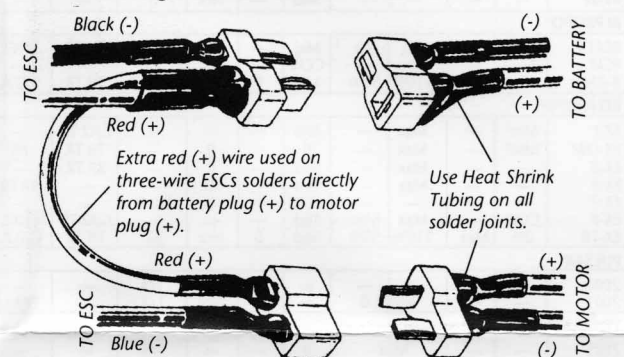
## STEP 4 (Continued) HOOK-UP INSTRUCTIONS

### BATTERY PACK AND MOTOR CONNECTIONS

If your speed control has connectors pre-installed, please refer to the Specific Sheet Wiring Diagram for the proper connections.

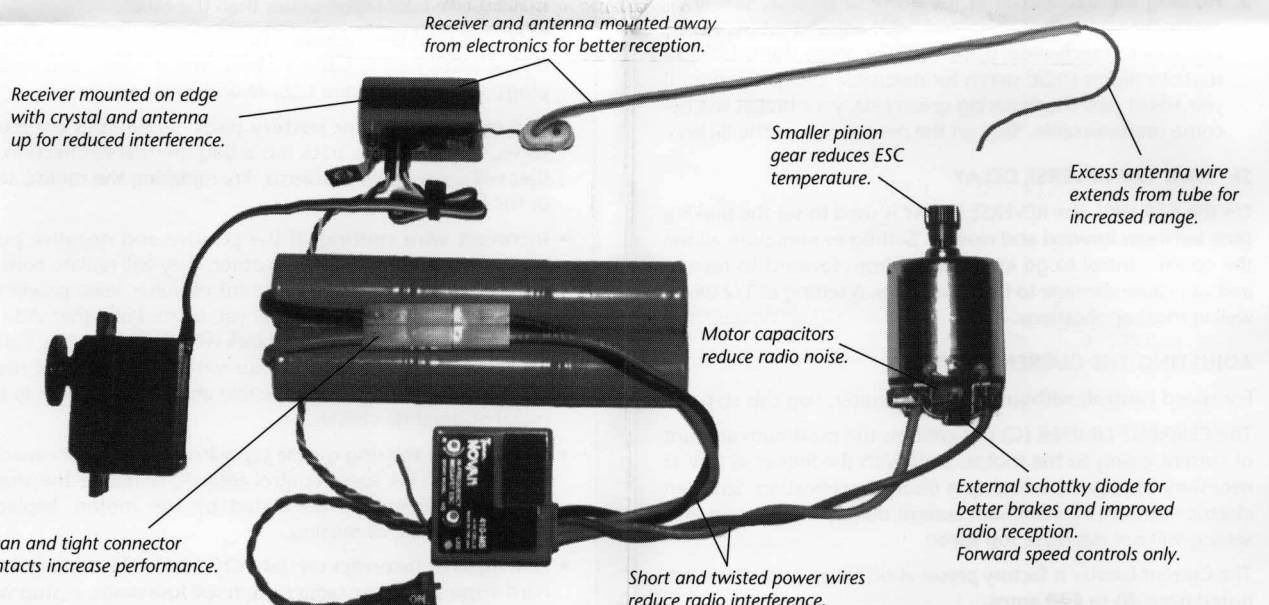
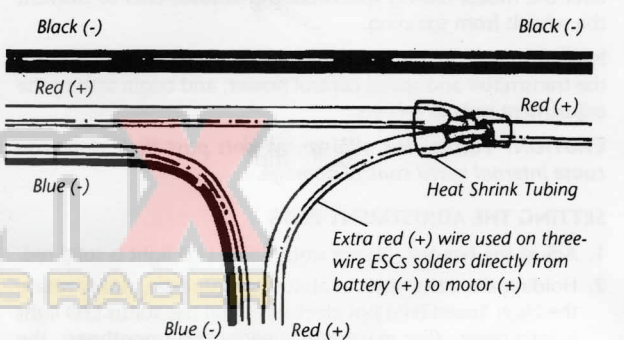
If your speed control has three power wires with no connectors installed, you have two options to connect the speed control to the motor and battery.

1. **Installing Connectors** We recommend installing a high performance connector such as the Dean's Ultra Plug. Solder the speed control wires to the connectors as shown below. Use the included extra piece of red wire if necessary to connect the battery plug to the motor plug. Try keeping the wire length to a minimum for best performance. Use heat-shrink tubing to insulate solder connections.



**NOTE:** Installing the same type and gender connector to both the battery connector and the motor connector will void the warranty. Like connectors allow accidental cross-connection (plugging the battery pack into the speed control motor connector) that can damage the speed control.

2. **Hard Wiring** Direct soldering of the speed control wires can increase performance. Make connections as shown below. The included extra piece of red wire can be used to split the positive battery connection to the speed control and to the motor. Insulate any splices with heat tubing.





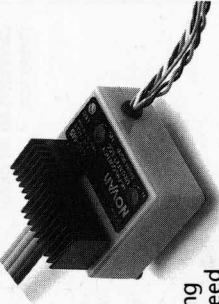
Reverse Voltage Protection  
**RVP**  
 EQUIPPED  
 TEAM NOVAK SOLID STATE

The 410-M5 is equipped with Solid State RVP™ (Reverse Voltage Protection). The exclusive Team Novak Solid State RVP™ system electronically protects the speed control if the battery pack is hooked-up backwards, and eliminates the need for fuses.

When using an external receiver battery pack, follow Method 2 of Step 7 in the Owner's Manual. The Solid State RVP™ system cannot protect the speed control when using Method 1, so we recommend Method 2 which requires the red wire in the speed control input plug to be removed from its plastic housing. Be sure to insulate the exposed metal pin with heat shrink tubing.

NOVAK ELECTRONICS, INC. 18910 Teller Ave., Irvine, CA 92715 • (714) 833-8873  
 Solid State RVP™ is a trademark of Novak Electronics, Inc. # 55-1920-1  
 • Pat. Pend.

Team  
**NOVAK 410-M5**



**410-M5  
 SPECIFICS SHEET**

The following information contains specific items regarding the Team Novak 410-M5 speed control that are not covered in the Speed Control Owner's Manual.

- An external Schottky diode is not needed when using the 410-M5 speed control. A Schottky diode is already installed internally. An external diode can be used and may provide slight benefits in brake smoothness and resistance to brake fade.
- The 410-M5 is designed to be used with any stock or modified motor and run on 4 to 10 cells only (1.2 volts/cell connected in series). Using more than 10 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. See Step 7 in the Owner's Manual.

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**410-M5 WIRING DIAGRAM**

Shown using the factory installed Tamiya style connectors on the battery connection and Associated AMP style connectors on the motor connection.

