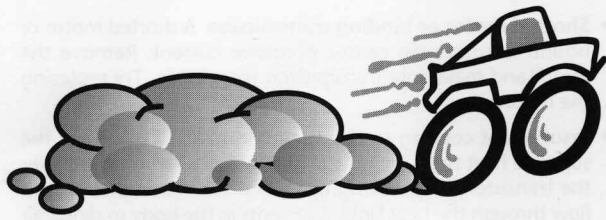


# SPEED CONTROL OWNER'S MANUAL



**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

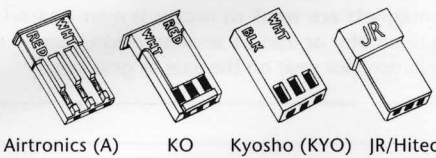
Always consult your hobby dealer or contact our customer service department before using your speed control for an application other than those is listed on the "SPECIFICS SHEET" or in this Owner's Manual.

## 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.

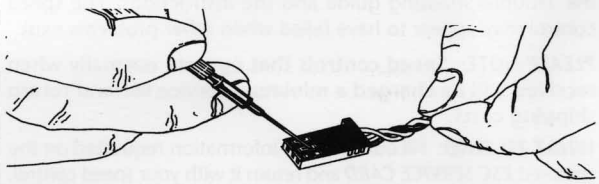
## STEP 1 CHANGING THE INPUT PLUG

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.

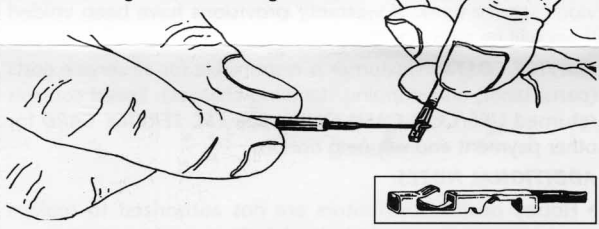


Airtronics (A) KO Kyosho (KYO) JR/Hitec

**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

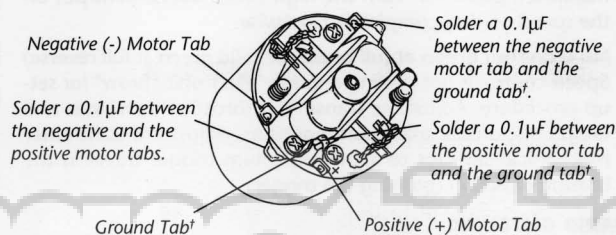
Novak speed controls have built in regulator circuitry that supplies power to the receiver. This eliminates the need to use an external receiver battery pack.

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).

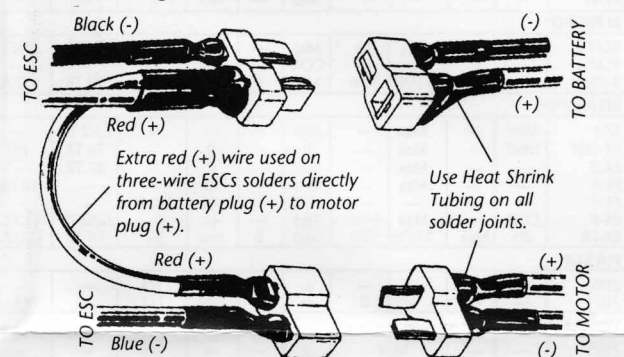
## STEP 4 (Continued) HOOK-UP INSTRUCTIONS

### 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.

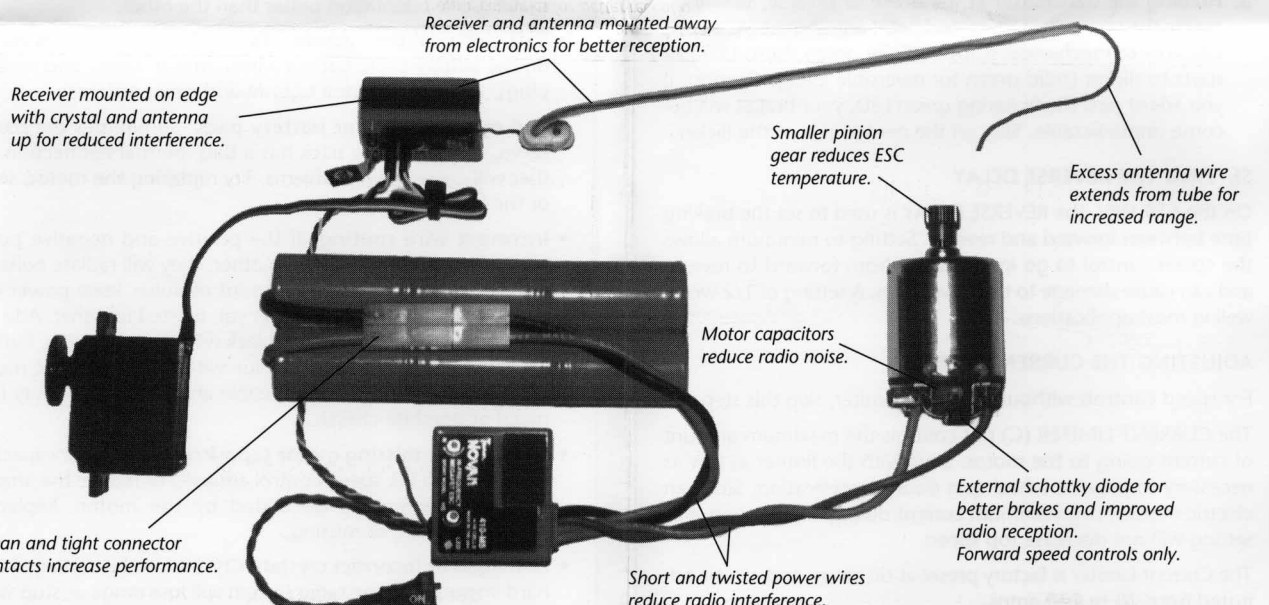
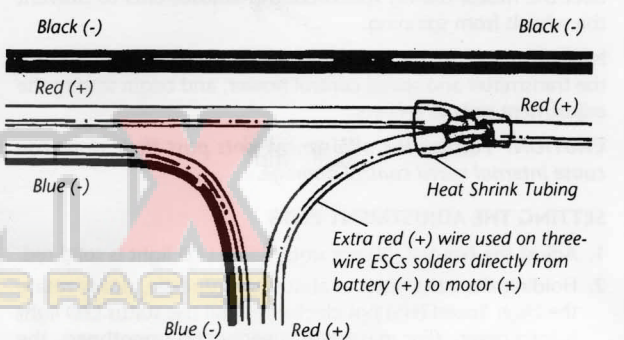
If your speed control has three power wires with no connectors installed, you have two options to connect the speed control to the motor and battery.

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.





## STEP 5 TRANSMITTER ADJUSTMENT

Adjusting your transmitter is critical for proper speed control operation. **Reversible speed controls should be adjusted using the chart supplied in the "SPECIFICS SHEET"**. The transmitter (TX) throttle adjustments are described below:

**ATV, EPA or ATL** – High ATV/EPA controls the amount of throw from neutral to full throttle. Low ATV/EA/ATL controls the amount of throw from neutral to full brake (PUSH BRAKE). ATL is sometimes referred to as Grip Dial (Gr. DI).

**EXP or EXPO** – Controls the linearity of the throttle channel. Since the ESC is linear, it should be set to zero or normal.

**SUB TRIM** – Usually used to center a servo. An ESC does not use this adjustment, it should be set to the zero position.

**TH TRIM or COAST BRAKE** – Usually used to control the amount of coast brakes of the ESC. This comes in handy during racing since the brakes can be adjusted at any time.

### TRANSMITTER NOT LISTED?

If your transmitter is not listed, follow these basic settings:

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

### TX CHART LEGEND

– = None L = Low ↑ = Up TH = Throttle  
BR = Brake Nor = Normal ↓ = Down TR = Trim  
Mid = Middle Rev = Reverse ⇒ = Right CW = Clockwise  
⇐ = Left CCW = CounterCW

### FOR ALL NOVAK FORWARD-ONLY ESCs

TX TYPE	TH EXP	ATL	ATV or EPA HI	ATV or EPA Low	TH TR	SUB TR	REV SW	MECH ADJ	COAST BRAKE	PUSH BRAKE
<b>FUTABA*</b>										
T2PKA	—	—	10	6	-5	—	⇒	Pos 2	CH2 TR	ATV-L
T3PG	0	—	10	10	-5	—	⇒	Pos 2	BR TR	BR Lim
T2P	—	—	—	—	-5	—	⇒	1/3	—	—
T2PB	—	—	—	—	-5	—	⇒	Mid	—	—
T2PD <sup>1</sup>	—	5	10	10	L-5	0	⇒	1/3	ATL	ATL
T2PBKA	—	—	10	10	L-5	—	⇒	Mid	—	ATV-L
T2NCS	—	—	—	—	↓	—	⇒	—	—	—
2NBR	—	—	—	—	↓	—	⇒	—	—	—
T3PB	0	10	10	10	N	0	⇒	1/3	TH TR	ATL
<b>AIRTRONICS*</b>										
CL-3P	0%	—	100%	<60	Mid	—	Nor	—	TH TR	EPA-L
XL-2P	—	—	™Max	Max	Mid	—	Nor	—	TH TR	EPA-L
CS-2P	Nor	—	CW	CW	Mid	—	Nor	—	TH TR	EPA-L
VT-2P	—	—	—	—	L	—	⇐	↓	—	—
RV-2P	—	—	—	—	Mid	—	⇐	↑	—	—
<b>JR PROPO*</b>										
BEAT 2	—	—	10	10	Mid	—	Nor	—	TH TR	EPA-L
PCM	—	—	—	—	CCW	—	Nor	3:1	TH TR	EPA-L
R-756	0%	Max	110%	50%	Mid	0	Nor	—	TH TR	G.D.A.
<b>KO PROPO*</b>										
EX-1	Min <sup>2</sup>	—	Max	—	Mid	—	⇐	—	CH2 TR	—
EX-1 FM	Min <sup>2</sup>	—	Max	—	0	—	⇐	—	TH TR	BR
EX-11	—	—	Max	—	Mid	—	⇐	—	BR TR	—
EX-5	—	—	Max	—	Mid	—	⇐	—	—	BR TR
EX-7	—	—	—	—	CCW	—	⇐	Pos B	—	—
EX-9	CCW	—	Max	Max	Mid	—	⇐	—	CH2 TR	EPA-L
EX-10	0%	Max	110%	50%	Mid	0	Nor	—	TH TR	G.D.A.
<b>PULSAR*</b>										
2000	—	—	—	—	⇐	—	Nor	1/3	—	—
2001	—	—	—	—	⇐	—	Nor	1/3	—	EPA-L
<b>TRAXXAS*</b>										
2025	—	—	Max	—	0	—	⇒	1/3	—	—
2201	—	—	—	—	0	—	⇒	1/3	—	—

\*Refer to original manufacturer's manual. <sup>1</sup>T2PD AM or FM transmitter. <sup>2</sup>Use G.D.A.

## STEP 6 SPEED CONTROL ADJUSTMENTS

Before beginning this step, your speed control should be connected to the receiver and your transmitter should already be adjusted as described in STEP 5.

Before you connect the main battery pack to the speed control, make sure that the speed control's switch is turned off. Disconnect the motor during speed control adjustments to prevent the wheels from spinning.

Next, connect the battery pack to the speed control, turn on the transmitter and speed control power, and begin setting the adjustment pots as follows.

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

### SETTING THE ADJUSTMENT POTS

1. Adjust the Neutral (N) pot until status LED light is solid red.
2. Holding the transmitter at about 90% throttle, slowly rotate the High Speed (HS) pot clockwise until the status LED light is solid green. (For maximum linearity and smoothness, the green LED should light solid just before the end of the transmitter throttle travel.)
3. Holding the transmitter at full brake or reverse, slowly increase the transmitter brake end point adjustment (ATV Low, EPA Low or mechanical stop) until the green status LED just starts to flicker (solid green for reversible ESCs). Caution: If you adjust past the flickering green LED, your brakes will become unpredictable. Stay on the neutral side of the flicker.

### SETTING THE REVERSE DELAY

On the 610-HRV, the REVERSE DELAY is used to set the braking time between forward and reverse. Setting to minimum allows the speed control to go immediately from forward to reverse and can cause damage to the drive gears. A setting of 1/2 works well in most applications.

### ADJUSTING THE CURRENT LIMITER

For speed controls without a Current Limiter, skip this step.

The CURRENT LIMITER (C) pot controls the maximum amount of current going to the motor. Start with the limiter as low as necessary to prevent wheel spin during acceleration. Since an electric motor pulls maximum current during acceleration, this setting will not decrease top speed.

The Current Limiter is factory preset at 60 amps, and can be adjusted from 20 to 140 amps.

Adjusting the Current Limiter should be the last adjustment made to the speed control after all of the other adjustments have been completed. Your battery pack should be fully charged and your car should be set-up similar to how it will be set-up for racing.

(Continued at top of next column)

## STEP 6 (Continued) SPEED CONTROL ADJUSTMENTS

### To adjust the Current Limiter:

1. Run your car on the same surface as you will be racing on, or as close to the same surface as possible. Starting with your car at a complete stop, accelerate to full throttle a few times.
2. IF YOU NOTICE ANY DECREASE IN ACCELERATION: Increase the current setting slightly by rotating the knob clockwise. Repeat this procedure until there is no hesitation.  
IF YOU DO NOT NOTICE ANY DECREASE: Decrease the current setting slightly by rotating the knob counter-clockwise until you notice hesitation, then rotate the knob clockwise in small increments until there is no hesitation

### RACERS TIP

Expert drivers use the Current Limiter to control wasted energy during extremely hard acceleration. By setting the Current Limiter to just above the point where no decrease in acceleration is noticeable, you will reduce wasted energy and motor damage under heavy loads.

## STEP 7 USING AN EXTERNAL RECEIVER BATTERY

A 5 cell external receiver battery pack is recommended if erratic radio operation is experienced during hard acceleration. An external receiver battery is also recommended for 4 cell racing.

Remove the red wire from the plug plastic on the speed control signal harness and insulate the metal pin. Plug the external pack's signal harness into the battery slot of the receiver. You must use both switches with this method. Turn on the external battery pack's switch before turning on the speed control's switch.

## STEP 8 HOOKING UP A FET SERVO

If your speed control has FET servo wire (a short red or blue wire near the switch harness), it can interface with 4 or 5-wire FET servos. All 3-wire FET servos can be installed the same way as normal servos, although an external battery may be required in some cases.

For 4 or 5-wire FET servos, a 3.9 to 10.0 micro Henry inductor (with less than 0.1Ω resistance and minimum 1.5 amps rating) and a 47μF (25V) electrolytic capacitor must be hooked up. The speed control's recharging ability may damage the FET servo if not hooked-up properly. Insulate both leads of the inductor and capacitor with heat shrink tubing.

Please refer to FET servo manufacturer instruction manual.

## TROUBLE-SHOOTING GUIDE

### RADIO SET-UP

- **Status LED is solid red but adjustment pots have no effect** No signal from the receiver to the speed control. Check wiring sequence of the receiver signal harness. Try plugging the speed control signal harness into the steering channel to check for a problem with the throttle channel of the receiver.
- **Neutral adjusts okay but no solid green LED at full throttle** Speed control is not getting enough "electronic throw". Adjust the transmitter throttle throw rates and endpoints to their maximum positions. Turn the high speed adjustment pot on the speed control completely clockwise.
- **No flickering green at full brake (or solid green at full reverse)** Speed control is not getting enough "electronic throw" for set-up procedure. Adjust the transmitter throttle throw rates and endpoints to their maximum positions. Adjust the transmitter mechanical settings to allow maximum trigger travel in the braking direction (pushing the trigger).

### RADIO GLITCHING

- **Incorrect receiver placement** This is the most critical area for radio noise. Keep the receiver and the antenna away from all of the electronics. The battery, motor, speed control, and the motor and battery wires all radiate radio noise and can cause radio interference. Even metal or graphite chassis can funnel radio noise from these components to the receiver. Try mounting the receiver on its edge. Try mounting the receiver on different edges by rotating the receiver. Certain components in the receiver can be polarized in relation to the interference, making one orientation better than the other.
- **Bad electrical connections** Check the electrical connections on the battery pack, battery wires, motor wires, and receiver plugs. Check plugs for a tight fit and clean surfaces.
- **Bad motor, servo, or battery pack** Sometimes the motor, servo, or the battery pack has a bad internal connection and that will cause radio problems. Try replacing the motor, servo, or the battery pack.
- **Incorrect wire routing** If the positive and negative power wires are separated from each other, they will radiate noise between them. For the least amount of noise, keep power wire pairs zip-tied together, or better yet, twisted together. Add two or three twists to the red and black wires that go to the battery. Do the same to the red and blue wires that go to the motor. Keep the wires as short as possible and keep them away from metal or graphite chassis.
- **Damaged or missing motor capacitors** The motor capacitors supplied with the speed control are used to reduce the amount of radio interference generated by the motor. Replace if cracked, broken, or missing.
- **Damaged or incorrect crystals** Crystals can be damaged from hard impacts and the radio system will lose range or stop working. Also, always use matched crystal pairs supplied by the transmitter manufacturer. Different manufacturers use different crystal specifications that affect how the signal is processed. A mismatched pair might work in a radio system, but it will not have the same range as the correct crystal set. Be sure that the transmitter crystal is in the transmitter and the receiver crystal is in the receiver.

## TROUBLE SHOOTING GUIDE (Continued)

### OVER-HEATING

- **Motor over-gear** An over-gear motor will draw excessive current causing the speed control to overheat. Try a smaller pinion gear on the motor, or a larger spur gear on the axle or gear box.
- **Shorted motor or binding transmission** A shorted motor or bound transmission causes excessive current. Remove the motor and make sure transmission spins freely. Try replacing the motor.
- **Insufficient cooling to the speed control** ALWAYS use the supplied heat sinks. Adjust the heat sink fins for a snug fit over the transistors. Try placing the speed control so that air can flow through the heat sinks. Cut vents in the body to direct air over the speed control. Use the optional speed control cooling fan (#5645) to cool the heat sinks.
- **Reversible ESCs:** If the throttle reversing switch on the transmitter is in the wrong position, the forward transistors will be used for reverse drive and the reverse transistors for forward drive. This will quickly over heat the reverse transistors since they have less power handling capability. With the reverse delay set to maximum, there should be a delay (a braking period) from forward movement to reverse movement if the transmitter reversing switch is set correctly.

### BRAKES FADE OR ARE UNPREDICTABLE

- **ESC brakes are not set-up properly** The brake adjustment is very sensitive on the speed controls. If the adjustment is allowed to go past the flickering green light, the brakes will become unpredictable.
- **Brake transistors are over heating** If the brake transistors over heat, the voltage drop increases and the brakes will lose power. Try replacing the external Schottky diode. If the diode is missing or damaged, the brakes will over heat and fade. Using an external Schottky diode on speed controls with built in diodes will greatly reduce brake heating.
- **Motor magnets are weak or motor is over-gear** Try replacing the motor or using a smaller pinion gear on the motor or a larger spur gear on the axle or gear box.

## SERVICE PROCEDURES

Before sending in your Novak speed control for service, review the Trouble-Shooting guide and the instructions. The speed control may appear to have failed when other problems exist.

**PLEASE NOTE:** Speed controls that operate normally when received will be charged a minimum service fee and return shipping costs.

**WHAT TO SEND:** Fill out all of the information requested on the enclosed ESC SERVICE CARD and return it with your speed control.

**WARRANTY WORK:** For warranty work, you MUST CLAIM WARRANTY on the ESC SERVICE CARD and include a valid cash register receipt with purchase date on it, or an invoice from previous service work. If warranty provisions have been voided there will be a service charge.

**SERVICE COSTS:** Customer is responsible for all service costs (parts, labor, and shipping/handling charges). Speed controls returned UPS/COD CASH ONLY. See ESC SERVICE CARD for other payment and shipping options.

### ADDITIONAL NOTES:

- Hobby dealers/distributors are not authorized to replace speed controls thought to be defective.
- If a hobby dealer returns your speed control for service, submit a completed ESC SERVICE CARD to the dealer and make sure it is returned with the speed control.
- To provide the most efficient service possible to our customers, it is not out policy to contact customers by phone or mail.
- Novak Electronics does not make any electronic components (transistors, resistors, fans, etc.) available for sale.

## CUSTOMER SERVICE

### CUSTOMER SERVICE HOURS (PST)

Monday-Friday: 8:00am-4:00pm  
(714) 833-8873 • FAX (714) 833-1631

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## PRODUCT WARRANTY

Novak Electronics, Inc. guarantees all electronic speed controls to be free from defects in materials or workmanship for a period of 90 days from original date of purchase (verified by dated, itemized sales receipt). This warranty does not cover incorrect installation, components worn by use, not using the heat sinks, short-circuiting the heat sinks, component damage from excessive force applying the heat sinks, Pot damage from excessive force or over-rotating, not properly installing three 0.1μF (50V) capacitors on motor, damage from incorrect installation of FET servo or external receiver battery pack, any splices to input signal or switch harnesses, damage due to cross-connection of motor and battery wires, tampering with internal electronics, allowing water, moisture, or any other foreign material to enter speed control or get onto the PC board, incorrect installation of alternate input plug plastic, allowing exposed wiring to short-circuit, not using a Schottky diode on motor if needed (see SPECIFICS SHEET), using more or less than the recommended number of cells in the main battery pack, or any damage caused by a crash.

In no case shall our liability exceed the product's original cost. We reserve the right to modify warranty provisions without notice.

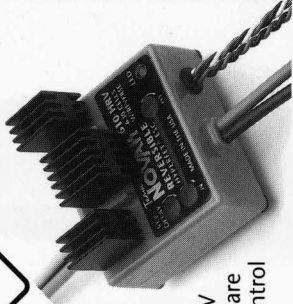
Because Novak Electronics, Inc. has no control over the connection and use of the speed control, no liability may be assumed nor will liability be accepted for damage resulting from the use of this product. Every speed control is thoroughly tested and cycled before leaving our facility and is, therefore, considered operational. By the act of connecting or operating this speed control, the user accepts all resulting liability.





# 610

REVERSIBLE



## 610-HRV SPECIFICS SHEET

The following information contains specific items regarding the Team Novak 610-HRV reversible speed control that are not covered in the Speed Control Owner's Manual.

- Schottky diodes can not be used on reversible speed controls. Diodes are designed to allow current to pass in only one direction, and can not survive reverse polarity situations. The 610-HRV is designed to be used without a Schottky diode.
- The reverse feature of the 610-HRV is designed to be used for short periods only. It is not designed to handle extended driving in reverse direction. The 610-HRV will overheat and shut down if driven for too long in reverse.
- When using an external receiver battery pack, the red wire in the speed control input plug must be removed from its plastic housing. Be sure to insulate the exposed metal pin.

610-HRV TRANSMITTER ADJUSTMENTS. See Pg. 15 of Owner's Manual for legend.

TX TYPE	TH EXP	ATL	ATV or EPA		TH	SUB	REV	MECH	COAST	PUSH	
			Hi	Low							TR
<b>FUTABA*</b>											
T2PKA	—	—	10	6	—	—	—	Pos 3	CH 2 TR	—	ATV-L
T3PG	0	—	—	—	—	—	Nor	Pos 3	BR TR	—	BR Lim
T2PB	—	—	—	—	—	—	Rev	1/2	—	—	—
T2PD1	—	—	—	—	—	—	Rev	1/2	—	—	—
T2PRKA	—	5	10	10	L-5	0	Rev	—	ATL	—	ATL
T2NCS	—	—	—	—	—	—	Rev	—	—	—	ATV-L
T2NBR	—	—	—	—	—	—	Rev	—	—	—	—
T3PB	0	10	10	10	N	0	Rev	1/2	TH TR	—	ATL
<b>AIRTRONICS*</b>											
CL-3P	0%	—	100%	<60	Mid	—	Nor	—	TH TR	—	TH EPA-L
XL-2P	—	—	Max	Max	Mid	—	Nor	—	TH TR	—	EPA-L
CS-2P	Nor	—	—	CW	Mid	—	Nor	—	TH TR	—	EPA-L
VT-2P	—	—	—	—	L	—	←	↑	—	—	—
<b>KO PROPO*</b>											
EX-1	Min	—	Max	—	Mid	—	←	—	CH 2 TR	—	—
EX-1 FM	Min	—	Max	0	—	—	↑	—	TH TR	—	BR
EX-1J	—	—	—	—	—	—	↑	—	BR TR	—	—
EX-5	—	—	Max	—	Mid	—	↑	—	—	—	BR TR
EX-7	—	—	—	—	Mid	—	↓	—	Pos A	—	—
EX-9	CCW	—	Max	—	Mid	—	↓	—	CH 2 TR	—	EPA-L
EX-10	0%	Max	110%	50%	Mid	0	Nor	—	TH TR	—	Gr. DI. A
<b>JR PROPO*</b>											
BEAT 2	—	—	10	10	Mid	—	Nor	—	TH TR	—	EPA-L
PCM	—	—	—	—	CCW	—	Nor	1:1	—	—	—
R-756	0%	Max	110%	50%	Mid	0	Nor	—	TH TR	—	Gr. DI. A
<b>PULSAR*</b>											
2000	—	—	—	—	←	—	Nor	1/2	—	—	—
2001	—	—	—	0	←	—	Nor	1/2	—	—	EPA-L
<b>TRAXXAS*</b>											
2025	—	—	—	Max	0	—	⇒	1/2	—	—	—
2201	—	—	—	—	—	—	⇒	1/2	—	—	—

\* Refer to the manufacturer's original manual. †T2PD AM or FM transmitter # SS-1800-1  
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