



PRECAUTIONS



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 ESC (Electronic Speed Control).

4-10 CELLS (CYCLONE); 4-6 CELLS (ATOM) ONLY Never use more than 10 sub-C cells (1.2 volts DC/cell) in the Cyclone or 6 sub-C cells in the Atom's main battery pack.

MOTOR CAPACITORS REQUIRED Three 0.1 μ F (50V) ceramic capacitors must be properly installed on every motor to prevent radio interference.

POWER CAPACITOR REQUIRED It is necessary to use the supplied power capacitor on the ESC in order to dissipate noise and smooth out voltage spikes. It is also necessary to use the Schottky diode with the Atom.

NO REVERSE VOLTAGE! Reverse battery polarity can damage the ESC. Disconnect battery immediately.

DON'T LET TRANSISTOR TABS TOUCH Never allow the two transistor tab banks or the heat sinks to touch each other, solder posts or any exposed metal, as this will create a short circuit and damage the ESC.

DISCONNECT THE BATTERIES Always disconnect the battery pack from the ESC when not in use.

TRANSMITTER ON FIRST Always turn on the transmitter first. This will give you control of the radio equipment when you turn on the ESC.

DON'T GET BURNED! Transistor tabs can get hot. Do not touch them until they have cooled.

INSULATE WIRES Always insulate exposed wiring with heat shrink tubing to prevent short circuits.

PLEASE FOLLOW ALL INSTRUCTIONS CAREFULLY!

CYCLONE & **ATOM** **OWNER'S MANUAL**

The Novak Cyclone (#1765) and Atom (#1770) Programmable ESCs, are all-digital, microprocessor-based electronic speed controls which use advanced micro components to deliver the best possible performance with the smallest size and lightest weight.

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

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FEATURES LISTING

The Cyclone and Atom ESCs are loaded with features, such as:

- **Highest motor control frequency** (up to 23,400 Hz).
- **256 discrete steps forward & 256 discrete steps braking** for smoothest trigger response available (0.39% per step).
- **Adjustable minimum brake** that can be set from 0% to 75% with the use of a simple adjustment pot.
- **Three different user-selectable profiles** to suit the desired application (off-road, touring sedan, 1/12 scale, oval, etc.) and ability to store one **Custom Profile** (created with the optional *Pit Wizard #1035* or *ESC Profile Software #1030*). Accessed with the **One-Touch Set-Up™** button, these profiles give racers extreme flexibility and a competitive advantage.
- The **Data Link™** allows the ESC to be connected to the Novak *Pit Wizard* or *ESC Profile Software* w/IBM compat. PC.
- **Quickest response to change in transmitter signal** (fewer than 500 micro seconds).
- **Low-voltage operation** enables the ESC's control electronics to work error free down to 2 volts DC.
- **Polar Drive Technology™** and **HYPERFET III™** transistors provide smooth throttle control and cool running operation. This technology also provides improved radio system performance by reducing motor-generated radio interference.
- **Radio Priority Circuitry™** maintains control of the vehicle after the battery pack has "dumped," and helps eliminate servo jitters during heavy-load applications.
- Built-in 6-volt/3-amp **BEC** (Battery Eliminator Circuit) to power the radio system and the most power-hungry servos, without the use of an external receiver battery. The BEC circuit is fully protected from overloading.
- Low-resistance **Solder Posts** for quick installation, clean replacement, and unlimited positioning of any size power wires.
- Built-in **Brake Light Circuitry** and **Brake Light LED Kit** are included to power two external LEDs, adding realism to Formula 1 and touring cars. (Cyclone only)

STEP 1: CHANGING THE INPUT HARNESS

1. The Cyclone and Atom ESCs include the Novak Input Plug System™ to convert the Futaba J style signal harness to be compatible with Airtronics/Sanwa (AIR), KO, Kyosho (KYO), and JR/Hitec/AIR Z (JR) receivers. *Refer to Figures 1-5*

NOTE: *It is important that the metal locking tabs do not extend outside the plastic plug housing.*

FIGURE 1 Additional Plugs Included



AIR

Airtronics/Sanwa



KO

KO Propo



KYO

Kyosho



JR

JR/Hitec/AIR Z

FIGURE 2 With a small standard screwdriver, press on each of the three metal prongs until the wires are easy to remove. Remove wires.



Continued

STEP 1: Changing the Input Harness (continued)

FIGURE 3 With the screwdriver, carefully lift each of the metal locking tabs to the angle shown below.

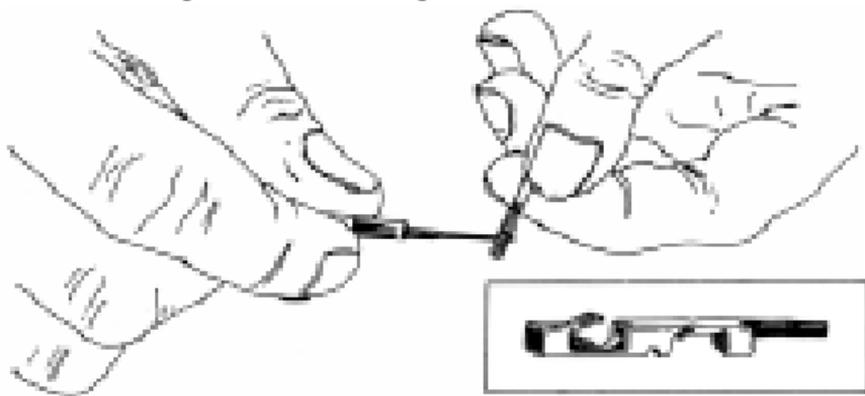
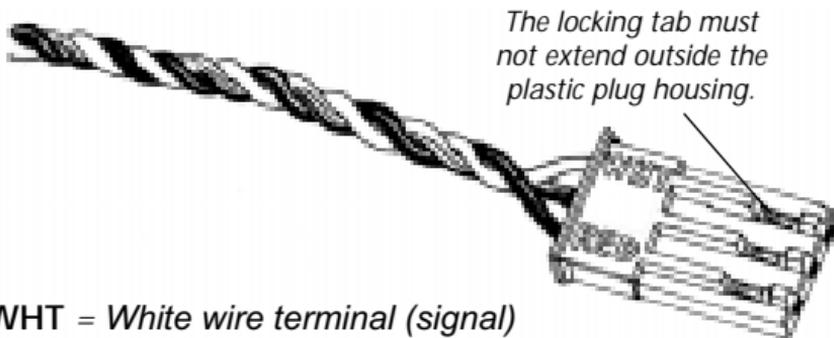


FIGURE 4 Insert each pin into the correct plug slot. Each pin should "click" into place. (Airtronics plug shown)



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 1: Changing the Input Harness (continued)

- If you have an Airtronics/Sanwa Z-style receiver, you will need to change the input signal harness of the Novak speed control to the JR plug plastic. *Refer to Figure 5*

FIGURE 5 JR plug plastic



- To plug the speed control harness into the Z-style receiver, make sure that the white (signal) wire side of of the connector is toward the middle of the receiver. *Refer to Figure 6*

FIGURE 6 JR plug plastic wired into Z-style receiver



STEP 2: MOUNTING INSTRUCTIONS

The following information will help ensure that the Atom and Cyclone perform at maximum efficiency, and will minimize the chances of overheating and radio interference.

1. DETERMINE THE BEST ESC MOUNTING LOCATION

To prevent radio interference, the speed control should be positioned away from the receiver and antenna as shown in the *Cyclone/Atom Hook-Up Photo (Figure 11)*.

Choose a mounting position where the power wires will not obstruct movement of the T-Bar or suspension. Although heat sinks are not required, cooler operating temperatures mean higher efficiency, so pick a mounting position to allow maximum airflow through the transistors.

2. INSTALL THE SPEED CONTROL

Mount the speed control with the included double-sided tape to isolate it from shock and vibration.

3. INSTALL THE SPEED CONTROL'S ON/OFF SWITCH

Determine a convenient place to mount the switch where it will be easily accessible. Mount the switch using a piece of double-sided tape or a screw.

4. INSTALL THE RECEIVER

Mount the receiver as far from the ESC, motor, power wires, battery, and servo as possible. These components emit radio noise when the throttle is applied. If you have a graphite or aluminum chassis, place the receiver on edge with the crystal and antenna away from the chassis. Use the double-sided tape provided to mount and isolate from shock and vibration.

Continued

STEP 2: Mounting Instructions (continued)

5. INSTALL THE ANTENNA

Mount the antenna as close to the receiver as possible. Trail any excess wire off the top of the antenna mast.

NOTE: Do not cut or coil excess wire, or range will be reduced.

STEP 3: HOOK-UP INSTRUCTIONS

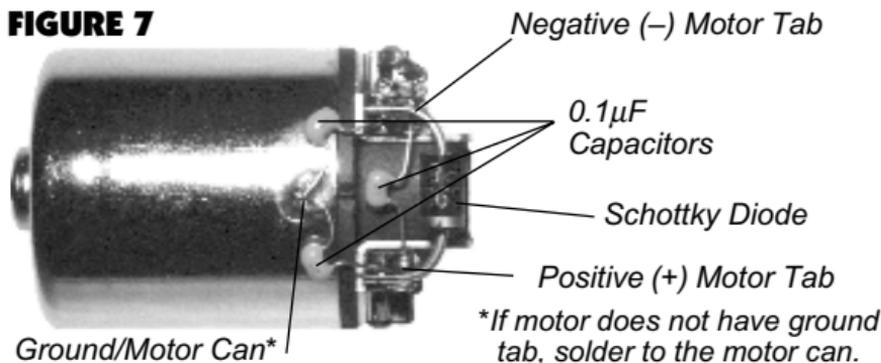
1. INSTALL MOTOR CAPACITORS (Refer to Figure 7)

Electric motors generate radio noise that can interfere with your receiver and cause radio problems. Included in the speed control's accessory kit are three $0.1\mu\text{F}$ (50V) non-polarized, ceramic capacitors. These capacitors must be installed on every motor to help reduce the noise generated by the motor and also to prevent possible damage to the speed control.

Solder $0.1\mu\text{F}$ (50V) capacitors between:

- POSITIVE (+) motor tab & NEGATIVE (-) motor tab.
- POSITIVE (+) motor tab & GROUND tab*.
- NEGATIVE (-) motor tab & GROUND tab*.

FIGURE 7



Continued

STEP 3: Hook-Up Instructions (continued)

2. INSTALL SCHOTTKY DIODE (Refer to Figure 7)

The Cyclone uses an internal Schottky diode, while the Atom does not. For added performance, it is recommended that an external Schottky diode be installed on all motors, and **must** be used with the Atom. This will increase the efficiency and reduce the operating temperature of the speed control.

Solder the lead **closest to the silver stripe** on the Schottky to the **POSITIVE (+)** motor tab. Solder the lead **opposite the silver stripe** on the Schottky to the **NEGATIVE (-)** motor tab.

NOTE: If installed backwards, a Schottky diode will be destroyed. The body of a bad diode will normally crack open. Replace only with Schottky diodes that have a minimum rating of 35 volts DC/8 amps. Schottky diodes are available in **Novak Kit #5640**, and 0.1 μ F capacitors in **Novak Kit #5620**.

3. INSTALL POWER CAPACITOR

Included with the Cyclone & Atom is a high-frequency, low-impedance power capacitor, that will improve the ESC's performance by dropping the operating temperature 10-15°F. It is necessary to install this power capacitor to dissipate noise and smooth voltage spikes generated by the ESC's ultra-fast switching circuit, especially in heavy-load applications, and when ambient temperature exceeds 85°F. Extra power capacitors are available in **Novak Kit #5670**.

NOTE: Failure to use the power capacitor may result in damage to the speed control and will void the warranty.

As the Cyclone & Atom speed controls were designed to allow greater flexibility for the user, they come with the power capacitor and power wires unattached. This allows you to install the power capacitor and position the power wires according to your individual car set-up.

The power capacitor is polarized with the side of the **negative**

Continued

STEP 3: Hook-Up Instructions (continued)

lead (short lead) marked with a *stripe and minus (-) sign*. The *positive lead* (long lead) *is unmarked*.

Two methods of connecting a power capacitor to both the Atom and Cyclone are:

METHOD ONE: Solder Power Capacitor to Solder Posts
Refer to Figures 8 & 9

Using some of the supplied mounting tape, attach the power capacitor to the side of the speed control so the *negative lead* can be soldered to the solder post marked **BLK** and the *positive lead* can be soldered to the post marked **RED**. For protection, slide a piece of small vinyl tubing (included) over each lead of the power capacitor. **Solder the power capacitor leads to the appropriate solder posts.**

FIGURE 8 Example of *Method One*—Power Capacitor soldered to Solder Posts and mounted to *side* of Cyclone.

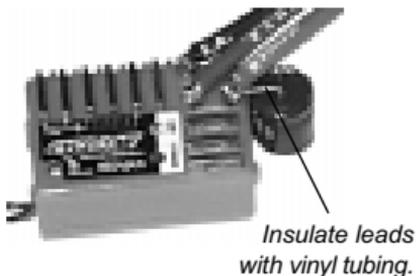
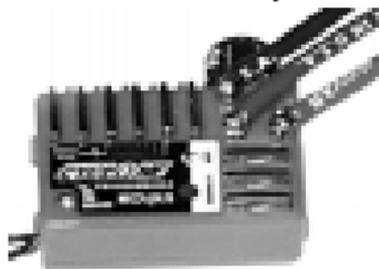


FIGURE 9 Another example of *Method One*—Power Capacitor soldered to Solder Posts and mounted to *back* of Cyclone.



METHOD TWO: Solder Power Capacitor to Power Wires
Refer to Figure 10

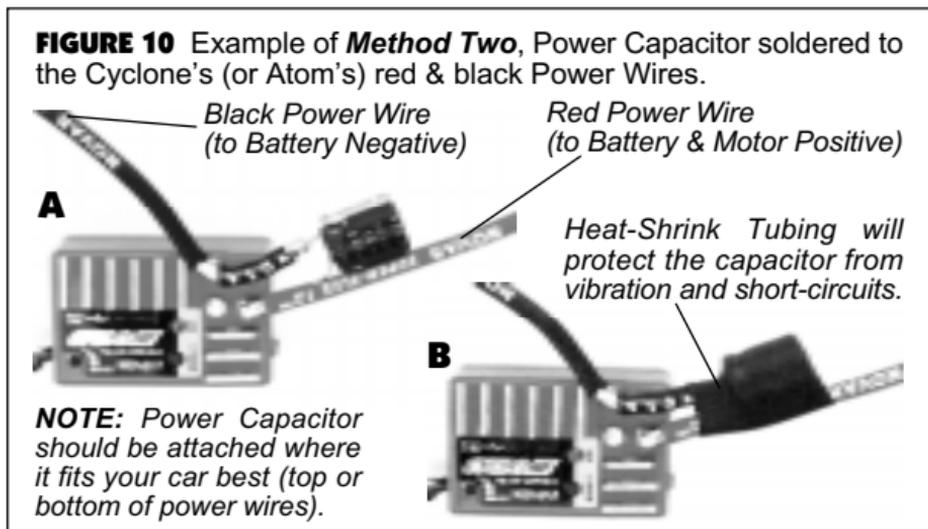
Solder the power capacitor to the black (negative) and red (positive) power wires. Although the capacitor can be connected to the power wires anywhere from the speed control to the battery, the closer it is to the speed control, the more effective the power capacitor will be.

Continued

STEP 3: Hook-Up Instructions (continued)

Make a small splice on the black and red power wires. Solder the power capacitor's *negative lead* to the splice on the black power wire. Solder the power capacitor's *positive lead* to the splice on the *red power wire*.

Slide the included large heat shrink tubing over the capacitor and connection. This will protect the capacitor from vibration and the capacitor's leads from short-circuiting.



4. INSTALL POWER WIRES

The Cyclone comes with Super-Flex 12™ gauge power wires and the Atom comes with 14 gauge power wires which solder onto low-resistance Solder Posts. With the use of Solder Posts, you can change what gauge power wire is used, the position of the wires, and replace the wires with ease. Sets containing blue, red, and black pre-tinned wires are available in Novak Kits #5507 for 14G, #5517 for 16G, and #5537 for Super-Flex 12™.

Continued

STEP 3: Hook-Up Instructions (continued)

To Install Power Wires: Tin the end of the power wires and the Solder Posts. Solder the power wires to their respective posts. The color designation for the wire is etched on the ESC's case, next to the corresponding solder post.

SOLDERING TIP: Be careful not to position the power wires over the transistor tabs. When soldering, it is important to work quickly! Be careful not to apply excessive heat as the solder posts will transfer heat quickly to the Cyclone or Atom's PC board, causing the solder to reflow. Do not use high temperature solder (e.g. Silver Solder). However, using an iron without enough power will also overheat the post and PC board before it reflows the solder.

For #5 through #9 refer to Cyclone Hook-Up Photo (Figure 11)

5. CONNECT SPEED CONTROL TO THE RECEIVER

After the proper input plug plastic has been installed to match the receiver (*Refer to Step 1*), plug the speed control into the **THROTTLE CHANNEL** of the receiver.

6. MAKE SURE SPEED CONTROL IS SWITCHED OFF

7. CONNECT SPEED CONTROL TO THE BATTERY PACK

Cut the **BLACK** power wire of the speed control to the desired length and strip about 1/4" of insulation off the end. Solder to the *negative* side of a completely charged 4 to 10 cell battery pack (1.2 volt DC/cell).

Strip a short section of insulation (1/4"–3/8") from the middle section of the **RED** power wire of speed control where it will attach to *positive* of battery pack. Solder the stripped section of **RED** power wire to *positive* of battery pack.

8. CONNECT SPEED CONTROL TO THE MOTOR

Cut the **BLUE** power wire of the speed control to the desired length and strip about 1/4" of insulation off the end. Solder to the *negative* tab of the motor.

Cut the **RED** power wire of the speed control (*after battery*

Continued

STEP 3: Hook-Up Instructions (continued)

pack connection) to desired length and strip about 1/4" of insulation off the end. Solder to **positive** tab of motor.

9. USING PLUGS FOR BATTERY & MOTOR CONNECTION

High-quality/low-resistance connector plugs, such as Dean's Ultra Plugs, can also be used to connect the motor and battery pack. Be sure to use connectors that can not be connected backwards, as this will damage the speed control.

NOTE: *It is good practice to use a female connector on the main battery pack to keep the pack from shorting if the connector touches a conductive surface.*

If you plan to use connector plugs for both the battery pack and the motor, use a male connector on the ESC wires going to the battery pack and a female connector on the wires going to the motor. By doing this, you will avoid plugging the battery pack into the motor output of the ESC by mistake.

PERFORMANCE TIP: *For improved radio performance, try twisting the BLUE & RED motor wires one or two times as they go from the speed control to the motor. This can help reduce any radio noise that may be emitted from the power wires.*

STEP 4: TRANSMITTER ADJUSTMENTS

BASIC TRANSMITTER ADJUSTMENTS

1. Set **HIGH ATV** or **EPA** to **maximum** setting.
[Controls amount of throw from neutral to full throttle]
2. Set **LOW ATV**, **EPA**, or **ATL** to **maximum**.
[Controls amount of throw from neutral to full brakes.]
NOTE: Reduce this after performing One-Touch Set-Up to reduce amount of brakes.
3. Set **EXPONENTIAL** to **zero**.
[Controls the linearity of the throttle channel]
4. Set **THROTTLE CHANNEL TRIM** to **middle** setting.
[Adjusts the neutral position of the throttle channel]
5. Set **MECHANICAL THROW ADJUSTMENT** to position with **2/3 throttle** and **1/3 brake** throw.
[Adjusts pistol-grip transmitter's throttle trigger throw]
6. Set **ELECTRONIC THROW ADJUSTMENT** to **7:3, 70% forward** and **30% brake**.
7. Set all other transmitter throttle settings to the transmitter default settings.

SPECIFIC TRANSMITTER ADJUSTMENTS

The following charts show exact settings for today's most popular transmitters used for racing. These settings will provide maximum linearity and control, and the smoothest feel for the Cyclone and Atom ESCs.

Continued

STEP 4: Transmitter Adjustments (continued)

TRANSMITTER CHART ABBREVIATIONS	
<i>CW</i>	<i>Clockwise</i>
<i>CCW</i>	<i>Counter-Clockwise</i>
<i>F</i>	<i>Full throttle trigger position</i>
<i>B</i>	<i>Full brake trigger position</i>

AIRTRONICS CL-3PS

FIRST: With the trigger in the brake position, set EPA/TH to 90%, then adjust the TH-EPA-L knob to full counter-clockwise position.

EPA/TH (F/B)	ARC-TH	REV-TH	TH-TRIM
140%/160%	0%	NOR	(Middle)

NOTE: After speed control set-up, the TH-EPA-L knob will be used to reduce maximum push brake.

AIRTRONICS CS-2P

TH-EXPO	EPA-HIGH	EPA-LOW	Rev.Switch	TH-TRIM
NOR (cw)	(cw)	(cw)	NOR	(Middle)

NOTE: After speed control set-up, the EPA-LOW pot will be used to adjust maximum push brake.

AIRTRONICS M8

EPA-(BR/HI)	EXP-(BR/HI)	TRM(SUB)	REV	TRIM-TH
110%/125%	0%/0%	0	NORMAL	(Middle)

NOTE: After ESC set-up, TRIM-TH will be used to adjust coast brake, and the "+ BRAKE -" thumb-switch will be used to reduce maximum push brake (*do not go above 110% EPA-BR*).

Continued

STEP 4: Transmitter Adjustments (continued)

KO PROPO PRECIOUS

SUB•TRIM _(TH)	REV. SW _(TH)	Trim: Pos _(TH)	TH: PUNCH _(F/B)
0	REVE	0%	0%/0%

TH: HiPOT	TH: BRAKE
H100	B100

NOTE: After speed control set-up, TH-BRAKE will be used to adjust maximum push brake.

KO PROPO MARS

SUB•TRIM _(TH)	REVERSE _(TH)	Et2:Pos _(TTrim)	TH: PUNCH _(F/B)
0	REVE	0	0%/0%

TH: HiPOT	Et4:Pos _(BRAK)
H100	100

NOTE: After speed control set-up, Et4 will be used to adjust maximum push brake.

FUTABA 3PJ

SUB.TR	TH.N	SERVO REVERSE	ATL	ATV _(F/B)	EXP _(F/B)
0%	7:3	REV	100%	90%/110%	0%/0%

NOTE: After speed control set-up, ATL will be used to adjust maximum push brake.

STEP 5: SPEED CONTROL SET-UP

Before beginning this step, the speed control should be connected to the receiver and to a charged battery pack (4-10 cells for the Cyclone, 4-6 cells for the Atom), and the transmitter should be adjusted according to *Step 4*.

1. TURN ON THE TRANSMITTER

2. TURN ON THE SPEED CONTROL

Slide the **ON/OFF** switch to the **ON** position.

3. With the transmitter throttle in the neutral position, press and hold the ESC's **1-TOUCH** button (One-Touch Tool included) until the status LED *turns solid red* (approximately three seconds).

NOTE: If the 1-TOUCH button is pressed for fewer than 3 seconds, the LED will blink red six times and you will need to start this process over.

4. RELEASE THE SPEED CONTROL'S 1-TOUCH BUTTON

5. PULL THE TRANSMITTER'S TRIGGER TO THE FULL THROTTLE POSITION (Refer to Figure 12)

This must be done as soon as you release the **1-TOUCH** button to ensure that the speed control learns the **Full Throttle** position. Moving the trigger gradually and/or hesitating after releasing the **1-TOUCH** button may cause less than the **Full Throttle** position to be learned. Hold the trigger there until the status LED *turns solid green*.

NOTE: The motor will not run during set-up even if it is connected to the speed control.

6. PUSH THE TRANSMITTER'S TRIGGER TO THE FULL BRAKE POSITION (Refer to Figure 13)

Continued

STEP 5: Speed Control Set-Up (continued)

This must be done as soon as the LED turns solid green to ensure that the speed control learns the **Full Brake** position. Moving the trigger gradually and/or hesitating after the status LED turns solid green may cause less than the **Full Brake** position to be learned. Hold the trigger there until the status LED *blinks green*.

7. RETURN TRANSMITTER'S THROTTLE TO NEUTRAL POSITION

The status LED will *turn solid red*, indicating that proper programming has been completed.

Your speed control is now set and ready to race!

NOTE: If transmitter settings are changed, it will be necessary to complete the above sequence again. If problems are experienced during set-up, turn off the speed control and repeat all steps in this section.



FIGURE 12 Full Throttle position.



FIGURE 13 Full Brake position.

STEP 6: THROTTLE PROFILE SELECTION

Since drivers have their own racing preferences, the Cyclone & Atom are factory-programmed with three user-selectable profiles to choose from. This chart describes them.

PROFILE	Measurement Units	Dead Band	Minimum Drive	Brake Frequency	Drive Frequency
		%	%	KHz	KHz
1 Stock		6	6.0	3.90	5.86
2 Drag Brake		6	6.0	5.86	7.80
3 Modified		4	1.5	3.90	15.60

NOTE: These three profiles are not exclusive to the listed applications. Experiment with all three profiles and see which works best for your particular use.

Before beginning this step, the ESC should be connected to the receiver and to a charged battery pack (4-10 cells for the Cyclone; 4-6 cells for the Atom).

1. TURN ON THE TRANSMITTER
2. TURN ON THE SPEED CONTROL
3. PRESS AND HOLD THE ESC'S 1-TOUCH BUTTON until the status LED *turns solid green* (approximately six seconds). The LED will first turn red. A few seconds later it will turn solid green.
4. RELEASE THE 1-TOUCH BUTTON and approximately one second later, the status LED will *blink red*. The number of times the LED blinks indicates the profile number selected. For example if the status LED blinks red twice after the button is released, then profile 2 is selected, and so forth.

Continued

STEP 6: Throttle Profile Selection (continued)

5. After the status LED is finished blinking, press and release the **1-TOUCH** button. This will select the next profile and the LED will blink the appropriate number of times to indicate which profile is selected.

NOTE: After profile **3** has been selected, the selection process rolls over to profile **1**.

6. Once you have selected the desired profile and the 1-Touch button has not been pressed for approximately five seconds, the speed control loads the selected profile into memory, exits the profile selection mode, and the status LED **turns solid red**. The selected profile is stored in a non-volatile memory, which will remain stored after the speed control's power has been turned off.

CUSTOM PROFILE NOTE: The Cyclone & Atom are able to access a fourth profile. This Custom Profile can only be created with the Novak *Pit Wizard* or *ESC Profile Software* (connected via the ESC's **Data Link™**). Once a customized profile has been created and downloaded into the ESC, the throttle profile selection will have a profile 4. You may access this profile by following the same procedures in this step (if status LED blinks red four times after the button is released, then the Custom Profile is selected). For further details refer to the *Pit Wizard* or *ESC Profile Software* instruction manual.

Programmable parameters with the Novak Pit Wizard (#1035) or ESC Profile Software (#1030) include:

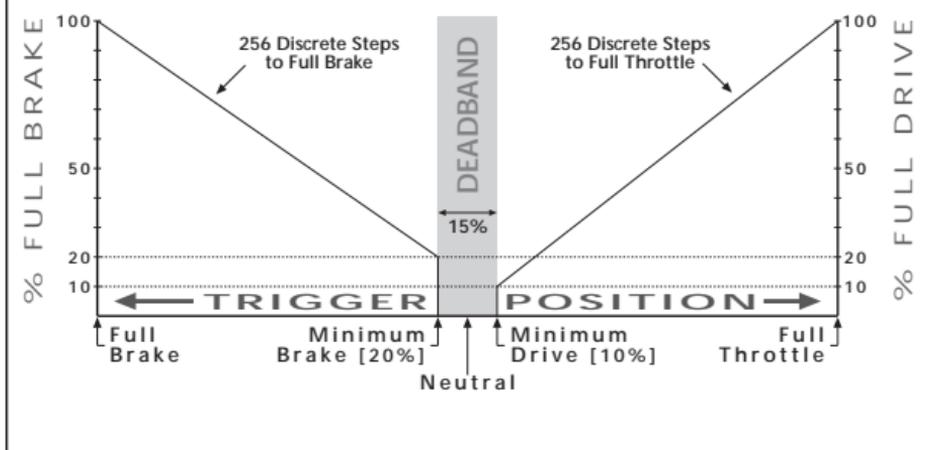
- Neutral Position
- Full Throttle Position
- Full Brake Position
- Dead Band Value
- Drag Brake Value
- Drag Brake Frequency*
- Drive PWM Frequency*
- Brake PWM Frequency*
- Minimum Drive Value
- Drag Brake Toggle (on/off)

*Adjustable from 122 Hz to 23,400 Hz

Continued

STEP 6: Throttle Profile Selection (continued)

FIGURE 14 General Diagram of Minimum Brake, Dead Band and other parameters.



MINIMUM BRAKE ADJUSTMENT

The Cyclone & Atom come with a Minimum Brake Adjustment feature to give the user control over the starting value of the brake throw. This adjustment is made with the ESC's **BRAKE** pot, using the included adjustment screwdriver. DO NOT rotate the pot beyond its end stop—this will damage the pot and void the warranty.

- By turning the **BRAKE** adjustment pot **clockwise** , the amount of minimum brake is increased to a **maximum of 75%** of the total brake throw.
- When the **BRAKE** pot is turned **all the way counter-clockwise** , the amount of minimum brake is set to **0.39%**. This means that the first brake pulse is 0.39% of the total brake throw.

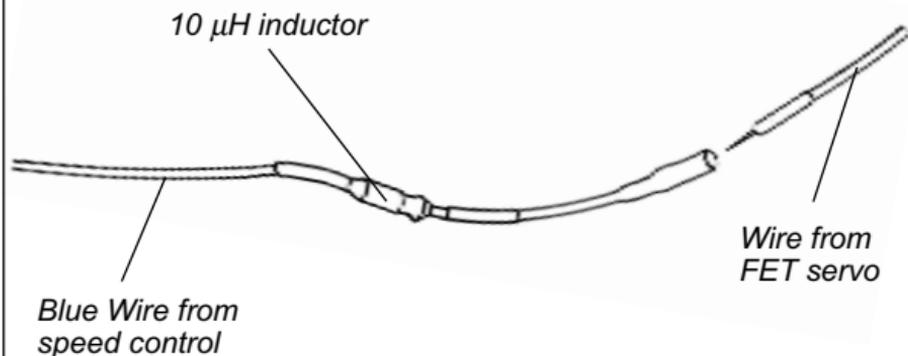
FET SERVO CONNECTION

The Cyclone & Atom are wired for connecting a FET Servo. This type of servo requires a fourth wire connection. The fourth wire from the servo is connected to the **small, blue 24-gauge silicone wire** coming out of the ESC. In the Cyclone, this wire supplies 6 volts of power to the servo and is controlled by the speed control's ON/OFF switch. In the Atom, this wire supplies battery voltage to the servo, and is also controlled by the speed control's ON/OFF switch.

NOTE: Do not allow the blue FET servo wire to come in contact with the chassis or battery terminal, as this may damage the power switch, switch wires and the speed control's PC board, consequently voiding the product warranty.

If you experience radio glitching with the installation of the FET servo, try installing a $10\mu\text{H}$ inductor (usually supplied with servo) in series with the blue wire as shown in *Figure 15*.

FIGURE 15 Installing a $10\mu\text{H}$ inductor in series to the speed control's small blue wire.



USING A RECEIVER BATTERY PACK

The Cyclone & Atom do not require an external receiver battery pack for most racing situations. Built-in Radio Priority Circuitry™ provides complete control of the steering servo even after the main battery pack has "dumped" and can no longer provide the power required to operate the motor. However, applications using multiple high-powered servos, and/or main battery packs with 8 (Cyclone only) or more cells require the use of an external receiver battery pack to prevent overloading of the ESC's voltage regulator. *Failure to use a receiver battery pack in these applications may result in damage to the voltage regulator and will void the product warranty.*

1. Plug an external 5-cell nickel cadmium (1.2 V DC/cell) receiver battery pack into the battery slot of the receiver.
2. Leave the ESC's ON/OFF switch in the OFF position. This switch is not used with this configuration.
3. Use the ON/OFF switch on the external receiver battery pack to turn the system power on and off.

INSTALLING BRAKE LIGHTS

NOTE: The Atom does not include brake light circuitry.

The Cyclone is equipped with built-in Brake Light Circuitry and includes Novak's Brake Light LED Kit for easy installation of brake lights. The Brake Light Kit includes: two LEDs, two brake light mounting brackets, JST connector harnesses, double-sided mounting tape, heat shrink tubing and screws.

Continued

Installing Brake Lights (continued)

TO CONNECT BRAKE LIGHTS TO THE CYCLONE

Refer to Figure 16

1. Strip about 1/4" of insulation off both the small (26-gauge) red & black brake light wires that exit the side of the Cyclone.
2. Remove the insulation from the JST harness that is pre-stripped at the end of the wire and slip the heat shrink tubing over each wire.
3. Connect the JST harness to the brake light wires of the speed control by twisting or soldering the two wires. Connect the black (negative) JST wire to the black 26-gauge ESC wire, and the red (positive) JST wire to the red 26-gauge ESC wire. *If you are using two LEDs, connect both of the red wires from the JST harnesses to the ESC's small red wire. Do the same for the small black wire.*
4. Slide the heat shrink tubing over the twisted or soldered wire connection. Heat the shrink tubing with a heat gun, lighter, or hair dryer to insulate the connection. *This will protect the ESC from a shorting if wires are left exposed.*
5. Insert the LED into the mounting bracket so the two metal leads go into the large opening, then through two of the small holes on the back of the bracket. *The metal lead on the flat side of the LED is the positive lead.*
6. Connect the JST connector to the LED leads with the positive (flat side) lead going to the side of the JST connector marked RED, and the negative lead (opposite flat side) going to the side of the JST connector marked BLK. *Connecting the LED backwards will not cause damage, but the LED will not illuminate.*

Continued

Installing Brake Lights (continued)

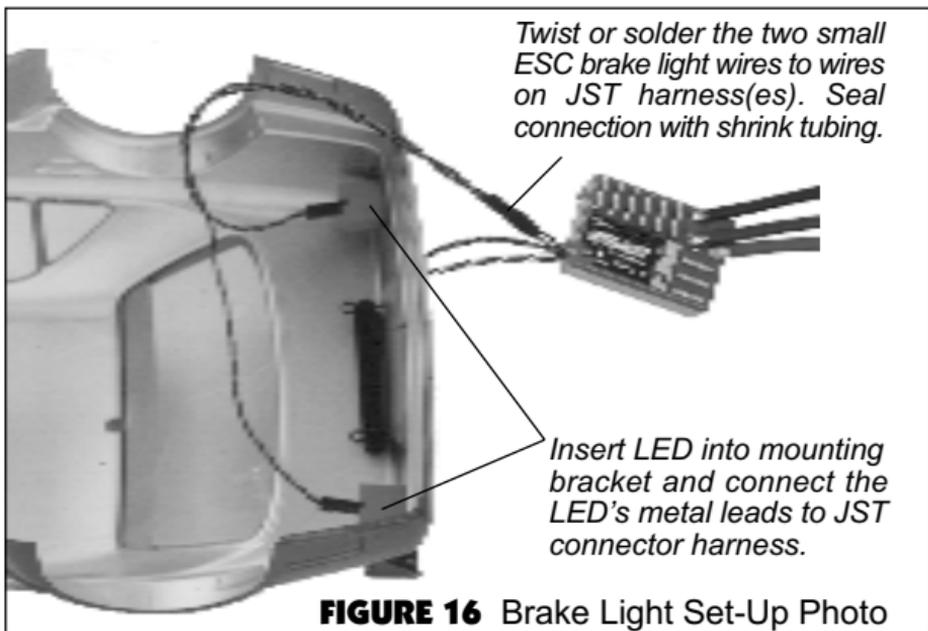
MOUNTING THE BRAKE LIGHT BRACKETS

The brake light brackets can be mounted behind the taillight section of the car body, or onto most any vertical or horizontal surface on the chassis or body.

- To mount the brackets to the taillight section, insert the screws through holes in the car body and into the screw openings in the bracket.
- To mount the brackets to the chassis, either use Shoe-Goo™, double-sided mounting tape, the existing screw hole, or drill two holes at the proper spacing.

Congratulations!

You've just made your R/C car even hotter by adding realistic brake lights which will operate when your Cyclone is in neutral or during braking. Have fun!



TROUBLE-SHOOTING GUIDE

This section describes possible speed control problems, causes and solutions. For additional help, please call Novak Technical Assistance.

Cyclone or Atom Will Not Program Properly

- ***Too little transmitter throw***—Increase the ATV/EPA setting to maximum.
- Make sure ESC is plugged into the throttle channel of receiver. Check throttle channel operation with a servo.
- ***ESC's 1-TOUCH button not held long enough***—Press and hold 1-TOUCH button until status LED turns solid red.

Loss of Throttle Control

- ***ESC affected by excessive vibration or a hard impact***—Isolate speed control from shock and vibrations with mounting tape, as recommended in **Step 2**.
- Repeat **One-Touch Set-Up** process.
- ***Internal Polar Drive Capacitor is blown***—Refer to **Service Procedures**.

Steering Channel Works, But Motor Will Not Run

If status LED is solid RED at all throttle positions:

- ***No signal from receiver***—Make sure ESC is plugged into throttle channel of receiver. Check throttle channel operation with a servo. Check the wiring color sequence of the ESC's input harness. On Airtronics/Sanwa Z-style receiver, be sure white signal wire side of plug is towards the inside of the receiver.

If status LED is RED at neutral/GREEN at full throttle:

- ***Check motor connections***. Check motor and brushes.

Continued

Other causes:

- **ESC is not set**—Repeat **One-Touch Set-Up** process.
- Check wiring and connections. Check operation of system without ESC.

Receiver Glitches/Throttle Stutters During Acceleration

- **Motor capacitors broken or missing**—Refer to **STEP 3**.
- **Receiver or antenna too close to speed control, power wires, battery, or motor**—Refer to **STEP 2**.
- **Bad connections**—Check wiring and connectors.
- **Excessive current to motor**—Use a milder motor or smaller pinion gear.
- **Motor brushes worn**—Replace brushes. As motor brushes wear, excessive motor noise will be generated. The motor commutator may need to be cleaned or trued to help the motor run more efficiently.
- **Internal Polar Drive Capacitor is blown**—Refer to **Service Procedures**.

ESC Is Melted Or Burnt/ESC Runs With Switch Off

- **Internal damage**—Refer to **Service Procedures**.

SERVICE PROCEDURES

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

Before sending in your speed control for service, it is important that you review the Trouble-Shooting Guide and all instructions. The speed control may appear to have failed when other problems exist in the system such as a defect in the transmitter, receiver or servo, incorrect adjustments/installation.

- If you have a Custom Profile installed on your speed control, Novak recommends you make a copy of it before sending your speed control in, as Novak cannot guarantee that it will remain in the ESC after servicing.
- Do not cut the input harness or switch harness off the speed control before sending it in for service. Cut wires must be replaced for testing purposes, and will be charged the current service fees.
- Hobby dealers or 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 **SERVICE CARD** to the dealer and make sure it is included with the speed control.
- Novak Electronics, Inc. does not make any electronic components (transistors, resistors, etc.) available for sale.

Continued



Service Procedures (continued)

WHAT TO SEND

Completely fill out all of the information requested on the included **SERVICE CARD** and return it with your speed control. This will help ensure proper servicing of your product. It is not necessary to send the instruction manual, box or accessories.

WARRANTY WORK

For warranty work, you **MUST CLAIM WARRANTY** on the **SERVICE CARD** and attach a valid, dated receipt, or an invoice from previous service work. If any warranty provisions have been voided, there will be a service charge. *Refer to Product Warranty.*

SERVICE OPTIONS

In addition to repairing the ESC, there are other service options—*Refer to the included SERVICE CARD.*

SERVICE COSTS

The customer is responsible for all service costs (parts, labor, and shipping/handling charges). Speed controls are returned UPS/COD CASH ONLY—unless a VISA or MasterCard account number or personal check information is provided on the **SERVICE CARD**.

IN A HURRY?

Send items to Novak Electronics by a one or two-day shipping service—such as UPS Red/Blue Label or Federal Express Overnight. Customer assumes all shipping and insurance charges.

Continued

Service Procedures (continued)

HELPFUL INFORMATION YOU SHOULD KNOW:

- CUSTOMER SERVICE HOURS (*Pacific Standard Time*)
Monday-Thursday: 8 am - 5 pm
Friday: 8 am - 4 pm (*Closed every other Friday*)
PHONE: (714)* 833-8873
FAX: (714)* 833-1631

**Effective 4/18/98, area code will change to 949.*

- SEND UNITS TO:
Novak Electronics, Inc.
18910 Teller Ave.
Irvine, CA 92612 USA
Attn: Service Department
- WEBSITE ADDRESS:
www.teamnovak.com
e-mail: customersupport@teamnovak.com
Novak's website is an excellent source of information for R/C car newcomers and veterans alike. Loaded with tons of information about our products, as well as answers to commonly asked questions, everything you ever wanted to know about Team Novak can be found here including: *Product Information Pages; Q & A; Trouble-Shooting; Glossary; Tech Talk; How-to; Customer Service; Team Secrets; History; Hot News; Events* and a *Download* section where you can find up-to-date service cards and various instruction manuals. Whether you're searching for specific information, or just want to browse, check out Team Novak's website and enter the exciting world of R/C cars!

CYCLONE & ATOM SPECIFICATIONS

SPECIFICATION	CYCLONE	ATOM
Programmable	Yes	Yes
Discrete Steps (For/Rev)	512 (256/256)	512 (256/256)
Input Voltage (1.2VDC/cell)	4-10 cells	4-6 cells
Motor Limit	None	None
Case Width (in/cm)	1.73/4.40	1.23/3.12
Case Depth (in/cm)	1.10/2.79	1.16/2.95
Case Height (in/cm)	0.79/1.99	0.69/1.75
Weight* (ounces/grams)	1.44/40.8	1.00/28.4
On-Resistance [†] @Trans (Ω)	0.00067	0.00130
Drive Current [†] (amps)	480	240
Braking Current [†] (amps)	160	80
Minimum Brake (adj.)	0-75%	0-75%
Drive PWM Freq.** (KHz)	5.86/7.8/15.6	5.86/7.8/15.6
Brake PWM Freq.** (KHz)	3.9/5.86/3.9	3.9/5.86/3.9
BEC (volts/amps)	6.0/3.0	6.0/3.0
Schottky Diode	Internal	External
Topology	Polar Drive™	Polar Drive™
Transistor Type	HYPERFET III™	HYPERFET III™
Adjustment Type	One-Touch	One-Touch
Wire Size (gauge)	Super-Flex 12™	14
Brake Light Circuitry	Yes	No
Brake Light Kit	Included	N/A
Heat Sinks	Not Required	Optional

† Transistor's and diode's rating @ 25°C junction temperature.

*Adj. from 122Hz to 23,400Hz using optional Pit Wizard or ESC Profile Software.

**Weight without heat sinks and 9" lengths of power wire.

•Cyclone & Atom include input plugs for use with the following: Futaba J, Airtronics/Sanwa, KO, Kyosho, JR, Hitec, and Airtronics/Sanwa Z.

PRODUCT WARRANTY

Novak Electronics, Inc. guarantees the Cyclone & Atom to be free from defects in materials and workmanship for a period of 120 days from original date of purchase (*verified by dated, itemized sales receipt*). Warranty does not cover incorrect installation, components worn by use, damage from using more than 10 cells (1.2 volt DC/cell) with Cyclone or 6 cells with Atom for input voltage, failing to properly insulate the ESC brake light wires resulting in a short, cross-connection of battery/motor, using the same type and gender plugs for both the battery and motor connections, reverse voltage application, damage resulting from thermal overload, damage from excessive force when using 1-TOUCH button or Minimum Brake adjustment pot, damage from incorrect installation of receiver battery pack or FET servo, shorting the blue FET servo wire to negative battery terminal, damage from excessive force while installing or short-circuiting heat sinks, damage from not installing three 0.1 μ F (50V) capacitors on motor or not installing the power capacitor on ESC, splices to switch or receiver signal harnesses, damage from disassembling case, tampering with internal electronics, allowing water, moisture, or any other foreign material to enter ESC or get onto PC board, incorrect installation of alternate input plug plastic or solder posts' power wires, allowing exposed wiring to short-circuit, 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 connection and use of the ESC, no liability may be assumed nor will be accepted for damage resulting from the use of this product. Every ESC is thoroughly tested and cycled before leaving our facility and is, therefore, considered operational. By the act of connecting/operating ESC, the user accepts all resulting liability.



Keep Receiver and Antenna
away from motor, servo,
battery, and power wires.

Trail excess wire
off antenna mast.
(Do not cut or coil)

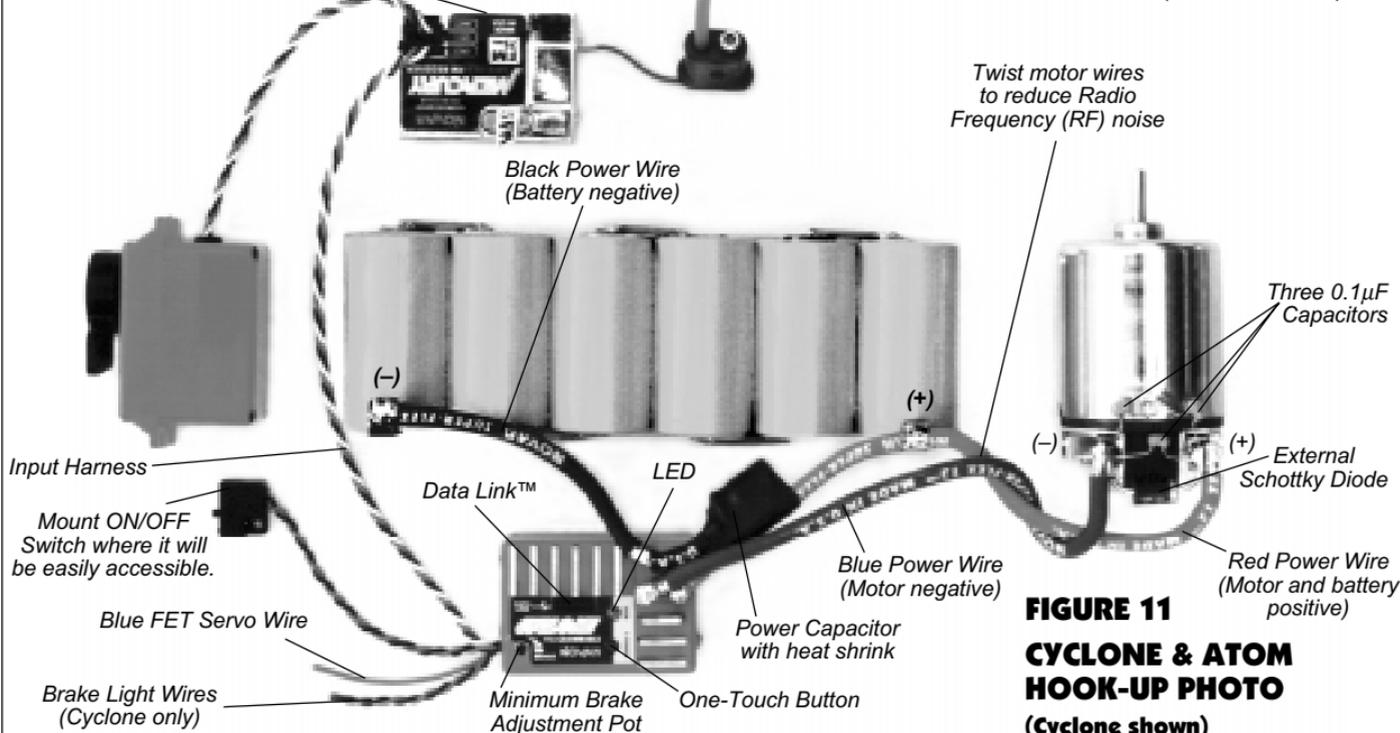


FIGURE 11
CYCLONE & ATOM
HOO-K-UP PHOTO
(Cyclone shown)