

ERROR CODES

The Havoc 3S ESC is equipped with internal protection. The following is a list of error codes depicted through LEDs—most flash when throttle is applied.

- **All status LEDs scroll from left to right**—Check blue sensor harness wire for disconnection or motor does not have temperature protection. For proper operation, replace blue sensor harness wire or motor with temperature protection. Check Novak Web site for motor compatibility list.
- **Red & Green status LEDs on solid**—Check input signal harness connections at ESC and receiver. Check input signal harness wiring sequence—Refer to Step 1.
- **Red & Green status LEDs alternating**—Li-Po Cut-Off triggered—Replace or charge battery. Incorrect battery selection or battery voltage may be too low.
- **Red status LED on solid & Green LED blinking**—Check motor sensor harness connection. Possible internal motor damage.
- **Blue & Green status LEDs both blinking**—Possible ESC shut-down due to locked rotor detection—Return throttle to neutral position to regain motor control—Check vehicle's drive train for free operation.
- **Blue & Red status LEDs blinking**—Possible ESC thermal shut-down—Check gear ratio & free operation of drive train for possible overloading/ESC is being severely over-loaded—allow system to cool & return throttle to neutral position to regain motor control. LEDs will continue to blink until system is cooled down.
- **Blue & Amber status LEDs blinking**—Possible motor thermal shut-down—Check gear ratio & free operation of drive train for possible overloading/motor is being over-loaded—allow system to cool & return throttle to neutral position to regain motor control. LEDs will continue to blink until system is cooled down.
- **Blue & Green (Locked Rotor Detection), Blue & Red (ESC Thermal Shut-Down), or Blue & Amber (Motor Thermal Shut-Down) status LEDs blinking**—ESC may have shut-down & ESC's neutral point is too far off to sense that transmitter throttle has been returned to neutral—Refer to Step 5.

SENSOR HARNESS WIRING

Should any of the 26G sensor harness wires pull out of the connector on the end of the motor's sensor harness, re-insert them in the appropriate slot in the connector as shown below. There is a small plastic tab that grabs a small raised barb on the back of the metal socket crimped onto the wire's end. The plastic tab should be checked to make sure it has not deformed excessively before inserting the metal socket into the plastic connector housing with the barb toward to plastic tabs.

If the motor's sensor harness gets damaged, please contact our Customer Service Dept.

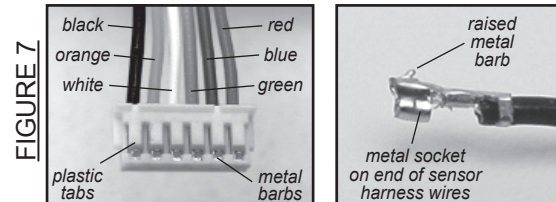


FIGURE 7

AUXILIARY FAN OUTPUT

The included Novak 30x30x6mm clear cooling fan (Novak kit #5648) is required for the Havoc 3S ESC when using a 3-cell Li-Po pack. In addition, the fan comes with the connector already on it to match the pins on the Havoc 3S.

The Havoc 3S ESC features a set of power output pins for running auxiliary cooling fans, so you can add fans to the motor, the ESC or both, and they will switch on and off with the ESC's power switch. These pins output 6.0 VDC (same as the BEC), so you will get maximum output from your cooling fans without over powering them by running directly from the battery pack's voltage.

The pin-out label located on the front lower section of the ESC's case (under the pins, push button & LEDs) shows the polarity of the fan power output pins.

They are the 2 pins on the front edge of the circuit board—Positive (+) is on the left, and Negative (-) is on the right. **The set of 3 pins behind them are for the user-replaceable input signal harness—The polarity of those is the same: Positive in the middle, Negative on the right and the extra pin on the left is for the input signal.**

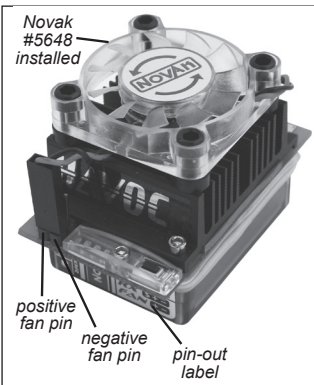


FIGURE 8

TROUBLE-SHOOTING GUIDE

Motor Does Not Operate and ESC LEDs Are Scrolling

- Motor may not have temperature protection—ESC will not operate without Thermal Overload Protection. Check Novak Web site for the complete motor compatibility list.
- Blue sensor harness may be disconnected—Check connection.

Steering Channel Works But Motor Will Not Run

- Possible receiver damage—Check operation with a different receiver.
- Possible internal damage—Refer to Service Procedures.

Receiver Glitches/Throttle Stutters During Acceleration

- Low voltage to receiver—Try Glitch Buster capacitor on receiver (Novak part #5626).
- Receiver or antenna too close to ESC, power wires, battery, or motor.
- Battery pack damaged or weak—Try a different battery pack.
- Bad connections—Check wiring, connectors, & sensor harness.
- Motor's magnet has weakened or overheated—Replace rotor (#5908).
- External Power Trans-Cap module damaged/not installed—Replace Power Trans-Cap module--3S (Novak #5686).

Motor and Steering Servo Do Not Work

- Check wires, receiver signal harness wiring & color sequence, radio system, crystals, battery/motor connectors, & battery pack.
- Power wires too close to signal wires—Do not bundle power & signal wires.
- Possible receiver damage—Check operation with a different receiver.
- Possible internal damage—Refer to Service Procedures.

Brushless Motor Runs Backwards

- Reverse motor rotation direction—Refer to 'Programming/Gearing' sheet.

Speed Control Runs Excessively Hot

- Gear ratio too low (pinion too big)—Increase gear ratio (use smaller pinion) (see 'GEAR SELECTION').

Model Runs Slowly/Slow Acceleration

- Gear ratio too high—Reduce gear ratio (see 'GEAR SELECTION').
- Check battery & connectors—Try another battery; replace connectors/ battery if needed.
- Incorrect transmitter/ESC adjustment—Refer to Step 5.
- External Power Trans-Cap module damaged/not installed—Replace Power Trans-Cap module (Novak #5686).
- Bad battery—Replace Battery Pack.

ESC Is Melted Or Burnt/ESC Runs With Switch Off

- Internal damage—Refer to Service Procedures.

*For more assistance call our Customer Service Department or check our Web site.

SERVICE PROCEDURES

Before sending your speed control or brushless motor system in for service, review Trouble-Shooting guide and instructions. System may appear to have failed when other problems exist.

After reviewing instructions, if you feel that your ESC/system requires service, please obtain the most current product service options and pricing by the following ways:

WEB SITE: Print a copy of the **PRODUCT SERVICE FORM** from the CUSTOMER SERVICE section of the Web site. Fill out the needed information on this form and return it with the Novak product that requires servicing.

PHONE/FAX: If you do not have access to the internet, please contact our customer service department by phone or fax as listed below.

WARRANTY SERVICE: For warranty work, you **MUST CLAIM WARRANTY** on **PRODUCT SERVICE FORM** & include a valid cash register receipt with purchase date and dealer name & phone number on it, or an invoice from previous service. If warranty provisions have been voided, there will be a charge.

- **ESCs returned without a serial number will not be serviced under warranty •**

ADDITIONAL NOTES:

- Dealers/distributors are not authorized to replace products thought to be defective.
- If a hobby dealer returns your product for service, submit a completed **PRODUCT SERVICE FORM** to the dealer and make sure it is included with product.
- Novak Electronics, Inc. does not make any internal electronic components (transistors, resistors, etc.) available for sale.
- Products that operate normally will have a service charge.

Novak Electronics, Inc.

(949) 833-8873 • FAX (949) 833-1631

Customer Service e-mail: cs@teamnovak.com

Service Hours: refer to Novak Web site

www.teamnovak.com

BASIC SET-UP GUIDE — HAVOC 3S ESC

• See Programming/Gearing sheet for Proper Gearing, Profile Selection, Custom Programming & Li-Po Cut-Off •



Sensor-Based and Fully Programmable to Wreak Havoc at High Speeds!

The Havoc 3S Brushless/Brush ESC has the ability to run on either two or three-cell Li-Po batteries, which allows users to run a wider range of batteries and ramp up the speed. It also contains nine adjustable parameters to fine-tune brake and throttle response.

The Havoc 3S ESC is compatible with sensed brushless and brush motors. The Havoc 3S features Novak's Smart Braking II (you don't go into reverse until you shift into reverse by returning the trigger to neutral and then back to reverse), Thermal Overload Protection, high-power B.E.C. for strong/fast servo response, Polar Drive & Digital Anti-Glitch circuitries for cool & smooth operation, and Radio Priority circuitry for the ultimate in control, right down to the end of the charge.

Add to this a cooling fan, user-replaceable battery wires, trans-cap module--3S, input harness, and the Havoc 3S ESC has it all!

To benefit from all of the technical features of the Havoc 3S ESC, PLEASE READ ALL INSTRUCTIONS BEFORE OPERATION

PRECAUTIONS

WATER & ELECTRONICS DON'T MIX!

Allowing water, moisture or other foreign materials to get inside ESC will void warranty.

MUST BE 14 YEARS OR OLDER TO OPERATE

This product is not a toy and is not intended for use by children under 14 years of age without the strict supervision of an adult.

NO SCHOTTKY DIODES!

Schottky diodes are never used with reversible ESCs, including brushless. Do not use Schottky diodes with Havoc 3S ESC!

DO NOT FREE REV OR OPERATE WITHOUT LOAD!

This includes running the motor without a pinion or holding the car in the air and running the motor at or close to full power. Free revving will void the warranty!

DISCONNECT BATTERIES WHEN NOT IN USE

Always disconnect batteries from ESC to avoid short circuits and possible fire hazard.

2-3 CELL LI-PO OR 4 TO 9 CELLS ONLY

If using Li-Po batteries, use a 2 or 3 cell (2-3S) pack for the vehicle's main battery & be sure the Li-Po Cut-Off programming option is turned ON (refer to page 6).

If using Ni-Cd or Ni-MH batteries, NEVER use more than 9 cells (1.2VDC/cell) in the vehicle's main battery pack.

NOVAK BRUSHLESS MOTORS ONLY

The Havoc 3S is designed for use with sensor-based, thermally protected Novak Brushless Motors. Check Novak Web site for motor compatibility list.

NO REVERSE VOLTAGE!

Reverse battery polarity can damage ESC & void warranty. Disconnect battery immediately if a reverse connection occurs.

POWER TRANS-CAP MODULE REQUIRED

An external 3S power trans-cap module is installed on ESC & MUST be used. Failure to use Trans-Cap module will result in higher temperatures & possible thermal shut-down or damage.

TRANSMITTER ON FIRST

Always turn on the power of the transmitter first so that you will have control of the vehicle when you turn it on.

GOOD QUALITY LI-PO BATTERIES SUGGESTED

Using Li-Po batteries that cannot supply the amount of current required by this system will result in possible battery pack, ESC & motor damage, and will void the warranty.

GOOD QUALITY TRANSMITTER SUGGESTED

With the higher performance of brushless systems, undesirable radio system noise may occur when used with lower quality transmitters (like some RTR radios).

DO NOT BUNDLE POWER & SIGNAL WIRES TOGETHER

RF noise in the power wires can adversely affect radio system performance.

INSULATE WIRES

Always insulate exposed wiring with heat shrink tubing or electrical tape to prevent short circuits.

NO CA GLUE

Exposure to CA glue or its fumes can cause damage to internal components of the ESC and result in premature failure.

SPECIFICATIONS

Input Voltage.....	2-3 Li-Po cells, 4-9 cells (1.2 VDC/cell)
ESC Footprint	1.18"x1.54" [30x39.1mm]
ESC Weight (w/o wires).....	1.50 ounces [42.6 grams]
B.E.C. Voltage/Current.....	6.0 volts DC/3.0 amps
Power Wire (Battery/Motor).....	14G Super-Flex Silicone
On-Resistance (Brushless).....	0.0012 @25°C trans.temp.
On-Resistance (Brush-Mode).....	0.0012 @25°C trans.temp.
Motor Limit (Brushless)	Down to 8.5-turn Novak (with fan on 3S)
Motor Limit (Brush-Mode)...	27-turn 540-size motor/12-turn 550-size motor
Throttle Settings (Brushless)	Forward/Brake/Reverse (Linear/Expo)
Throttle Settings (Brush-Mode).....	Forward/Brake/Reverse

OPTIONAL ACCESSORIES

REPLACEMENT POWER TRANS-CAP MODULE--3S [Novak kit #5686]

The Havoc 3S comes with a factory-installed 3S Power Trans-Cap Module. One **MUST BE USED** to maintain cool & smooth operation.

ESC 14G BATTERY HARNESS WITH TRAXXAS® PLUG [Novak kit #5331]
Replacement Traxxas-compatible plug harness for Havoc 3S/Ballistic Systems (#3080-3082)

BRUSHLESS MOTOR CONNECTOR WIRE SET -- 14G [Novak kit #5332]
Replacement motor connector wire set for Havoc 3S/Ballistic Systems (#3080-3082)

SUPER-FLEX SILICONE 14G WIRE [Novak kits #5500 & 5508]
Novak Super-Flex wire for power wiring. 14 gauge silicone wire in kit #5500 (36"red & 36"black) or kit #5508 (2 each of 9"red/black/blue/yellow/orange).

INPUT SIGNAL HARNESS [Novak kits #5315 & 5320]
User-replaceable input signal harness is available in both short and long lengths. 4.5" harness in Novak kit #5315, and 9.0" harness in Novak kit #5320.

REPLACEMENT 30x30x6MM COOLING FANS [Novak kits #5648 & 5652]
Novak cooling fans fit Havoc 3S's heat sink perfectly & have correct power plug for easy connection. Single fan in Novak kit #5648 and 2-pack of fans in Novak kit #5652.

LEAD-FREE 3% SILVER RACING SOLDER [Novak kit #5831, 5832 & 5833]
High silver content for ultra low-resistance solder joints for high efficiency and better performance. 6g in Novak #5831, 15g in Novak #5832 and 100g in Novak #5833.

ESC SWITCH HARNESS [Novak kit #5600]

Replacement switch for Havoc 3S ESC and all Novak ESCs with switches.

PRODUCT WARRANTY

The Havoc 3S Brushless/Brush ESC is guaranteed to be free from defects in materials or workmanship for a period of 120 days from the original date of purchase (verified by dated, itemized sales receipt). Warranty does not cover incorrect installation, components worn by use, damage to case or exposed circuit boards, damage from using more than 9 cells (1.2 volts DC/cell) or more than 3 Li-Po cells input voltage, damage resulting from using Li-Po batteries without Smart-Stop circuitry active, using insufficient Li-Po batteries that cannot supply the amount of current required by this system, cross-connection of battery/motor power wires, overheating solder tabs, reverse voltage application, damage resulting from thermal overload or short-circuiting motor (or connecting a brushless motor sensor harness while operating in Brush-Mode), damage from incorrect installation of FET servo or receiver battery pack, damage due to free revving of motor, damage due to using a non-Novak motor, a non-sensored motor or a motor lower than 8.5 turns, not using or incorrect installation of a Trans-Cap module--3S on the ESC or from using a damaged Trans-Cap module--3S, using a Schottky diode, using non-Novak Trans-Cap module--3S or motor, splices to input, ON/OFF switch, or sensor harnesses, damage from excessive force when using the One-Touch/SET button or from disassembling case, tampering with internal electronics, allowing water, moisture, or any other foreign material to enter ESC or get onto the PC board, incorrect installation/wiring of input plug plastic, allowing exposed wiring or solder tabs to short-circuit, or any damage caused by a crash, flooding or natural disaster.

Because Novak has no control over the connection & use of the speed control or other related electronics, no liability may be assumed nor will be accepted for any damage resulting from the use of this product. Every Novak speed control & motor is thoroughly tested & cycled before leaving our facility and is, therefore, considered operational. By the act of connecting/operating speed control, user accepts all resulting liability. In no case shall our liability exceed the product's original cost. We reserve the right to modify warranty provisions without notice. This product is not a toy and is not intended for use by children under 14 years of age without the strict supervision of an adult. Use of this product in an uncontrolled manner may result in physical damage or injuries—take extra care when operating any remote control vehicle. Designed by Novak Electronics, Inc. in Irvine, CA and assembled with globally sourced components. ©2010 Novak Electronics, Inc. • All Rights Reserved • No part of these instructions may be reproduced without the written permission of Novak Electronics, Inc. • Havoc 3S ESC, Smart Braking II, Polar Drive Technology, Radio Priority Circuitry, & One-Touch Set-Up are all trademarks of Novak Electronics, Inc.

STEP 1 — CONNECT INPUT HARNESS

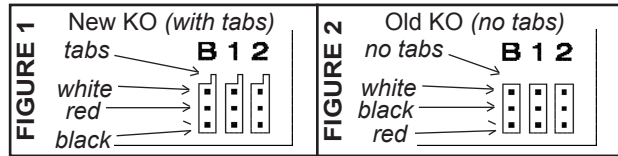
The Havoc 3S ESC has the industry-standard receiver input connector on a user-replaceable input harness & **works with all major radio brand's new receivers**. However, some very old receivers must have the wiring sequence in the plastic 3-pin connector housing changed. **This is important, because receiver & servo electronics may be damaged if the sequence is incorrect.**

CHANGING WIRING SEQUENCE AT RECEIVER

JR • Hitec • Futaba • New KO • Airtronics Z

JR, Hitec, Futaba, new KO, & Airtronics Z receivers do not need input harness re-wiring. Airtronics Z receivers have blue plastic cases & new KO cases have tabs on the input harness openings as in Figure 1.

- Plug one end of the input signal harness into the **THROTTLE CHANNEL (#2)** of receiver with the **BLACK wire toward the outside edge** of receiver case.
- Plug the other end of the input harness into 3-pin header inside the ESC's case with the **WHITE wire toward the 'S' (signal) marking** on the ESC's case above the rectangular signal harness opening.



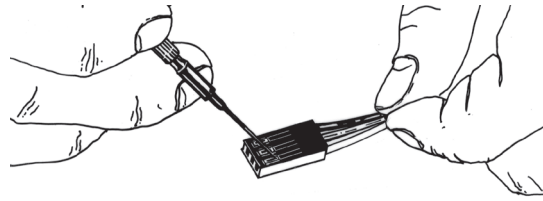
Old-style KO • Old-style Sanwa/Airtronics

If you have an older KO or Sanwa/Airtronics, you must change the sequence of the ESC's input harness wires—**Old Sanwa/Airtronics cases are black color & Old KO cases do not have tab openings, as in Figure 2 above.**

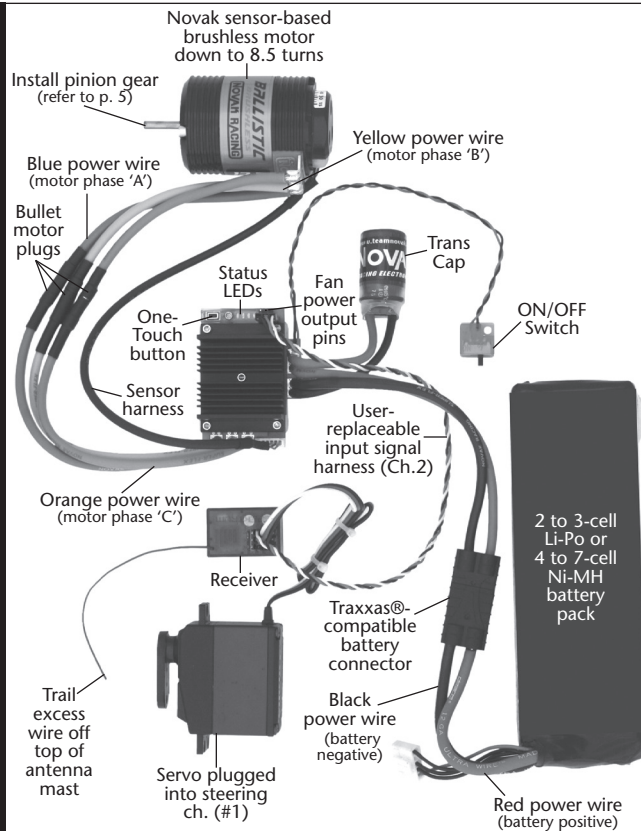
- Using a small flat blade screwdriver, **remove the red & black wires** from the plastic housing at the receiver end of the input harness as in Figure 3 below.
- **Interchange the red and black wires** in the plastic 3-pin connector housing at the receiver end of the input harness.
- Insert modified end of the harness into the **THROTTLE CHANNEL (#2)** of receiver with the **RED wire toward the outside edge** of receiver case.
- Plug the other end of the input harness into the ESC with the **WHITE wire toward the 'S' (signal) marking** on the ESC's case.

FIGURE 3

With a small flat-bladed standard screwdriver, gently lift plastic prong until wire and metal socket easily slide out of plastic housing.



BRUSHLESS-MODE SET-UP PHOTO (FIGURE 4)



STEP 2 — WIRING ESC & MOTOR

NOVAK BRUSHLESS MOTORS (Figure 4)

1. MOTOR CAPACITORS NOT NEEDED

Novak brushless motors do not require external motor capacitors.

2. DO NOT USE SCHOTTKY DIODES WITH HAVOC 3S ESC

Schottky diodes must **NOT** be used with reversible ESCs (including brushless). Schottky diode usage **will** damage the ESC & void warranty.

3. FACTORY-INSTALLED POWER TRANS-CAP MODULE REQUIRED

The factory-installed Power Trans-Cap module **MUST** be used with brushless & brush-type motors. **If Trans-Cap module becomes dented or damaged, ESC failure can occur—replace immediately. Longer Trans-Cap module wires will decrease performance.**

4. CHECK FOR PROPER GEARING

Refer to the 'PROPER GEAR SELECTION' portion of the PROGRAMMING/GEARING Sheet (Pg.5) to determine proper gearing & avoid overheating.

5. SOLDER MOTOR POWER WIRES TO MOTOR

*Skip this step if installing complete system with ESC factory-wired to motor.

A. Cut the **BLUE, YELLOW & ORANGE** silicone motor power wires to the desired length, and strip 1/8-3/16" of insulation from the end of each wire. Tightly twist the exposed strands of wire, and tin the exposed end section of each wire with solder using a good, high heat iron.

B. Solder the ESC's **BLUE Phase 'A'** motor wire to the **motor's phase 'A' solder tab**. Apply heat to exposed wire with soldering iron, and add solder to the tip of the iron & the wire—Add just enough solder to form a clean & continuous joint from the solder tab up onto the wire.

IMPORTANT NOTE: DO NOT OVERHEAT SOLDER TABS

Prolonged/excessive heating of solder tabs (motor or ESC) will cause damage.

C. Solder the ESC's **YELLOW Phase 'B'** motor wire to the **motor's phase 'B' solder tab** as described in Step 5B above.

D. Solder the ESC's **ORANGE Phase 'C'** motor wire to the **motor's phase 'C' solder tab** as described in Step 5B above.

Note: Make sure no wire strands have strayed to an adjacent solder tab, this will result in short-circuiting & severe ESC damage, which will void the warranty.

6. CONNECT MOTOR'S SENSOR HARNESS TO ESC

Insert the 6-pin connector on the end of the motor's sensor wires into ESC's sensor harness socket—the connector is keyed and will only go together in one direction.

7. INSTALL PINION GEAR (refer to Proper Gear Selection on p.5)

Note: When wiring the vehicle's electronics, short wires & clean/neat installations will give you better performance, higher efficiency & less radio problems (glitching, etc.). Try your best to keep power wires away from signal wires & receiver/antenna.

WIRING FOR BRUSH-TYPE MOTORS (Figure 6)

1. DISCONNECT BRUSHLESS MOTOR SENSOR HARNESS

The Havoc 3S ESC automatically switches to Brush-Mode when the ESC power is switched ON and no brushless sensor harness is connected.

2. INSTALL MOTOR CAPACITORS

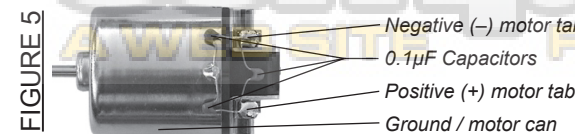
Electric brush-type motors generate RF noise that causes interference. Three 0.1µF (50V) non-polarized, ceramic capacitors must be used on all motors to reduce motor noise & prevent ESC damage.

Note: Some motors come with built-in capacitors. If your motor only has 2 capacitors, you need to install a capacitor between the positive & negative motor tabs—if you experience radio interference with built-in capacitors only, install external ones.

Solder 0.1µF (50V) capacitors between:

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

*If motor has no ground tab (as shown here), solder the capacitors to motor can.



3. SOLDER MOTOR POWER WIRES TO MOTOR

With brush-type motors, the Havoc 3S ESC's **BLUE** and **YELLOW** wires must be connected to the motor. It is recommended to use Novak's 3.5mm Low-Loss Power Connectors (#5730-5733) for a strong connection.

A. The **ORANGE** wire is unused with brush-type motors. It can be either desoldered from the ESC's PCB, or heat shrunk and zip tied to prevent shorting.

B. Connect the **BLUE** ESC wire to the **NEGATIVE (-) Motor Tab**.

C. Connect the **YELLOW** ESC wire to the **POSITIVE (+) Motor Tab**.

4. INSTALL PINION GEAR (refer to Proper Gear Selection on p.5)

STEP 3 — ESC MOUNTING

Mount ESC with power wires away from other electronics & moving parts. Select a location that allows airflow through heat sinks—**If the ESC gets air flow, it will run cooler; and that means it will be more efficient, and you will go faster!**

1. MOUNT SPEED CONTROL IN VEHICLE

Use the included double-sided tape to mount ESC in vehicle (**do not glue**). Avoid contact with side walls or other components to minimize vibration.

Be sure receiver & antenna are mounted as far from ESC, power wires, battery, & servo as possible—these components all emit RF noise when throttle is applied. On graphite or aluminum chassis vehicles, it may help to place receiver on edge with crystal & antenna as far above chassis as possible.

Note: Mount antenna as close to receiver as possible—trail any excess wire off top of antenna mast (cutting or coiling excess antenna wire will reduce radio range). Do not wrap signal wires around power wires.

2. SECURE POWER TRANS-CAP MODULE TO CHASSIS

Use included double-sided tape, or a tie-wrap, to mount Trans-Cap module to the vehicle's chassis or shock tower. Trans-Cap module can also be tie-wrapped along the power wires—this requires less space on the chassis and provides good vibration isolation.

3. INSTALL ON/OFF SWITCH

Use a screw or the included double-sided tape, and mount the switch where it will be easy to access—be sure to select a position where it will not get damaged or get switched OFF during a crash or roll-over.

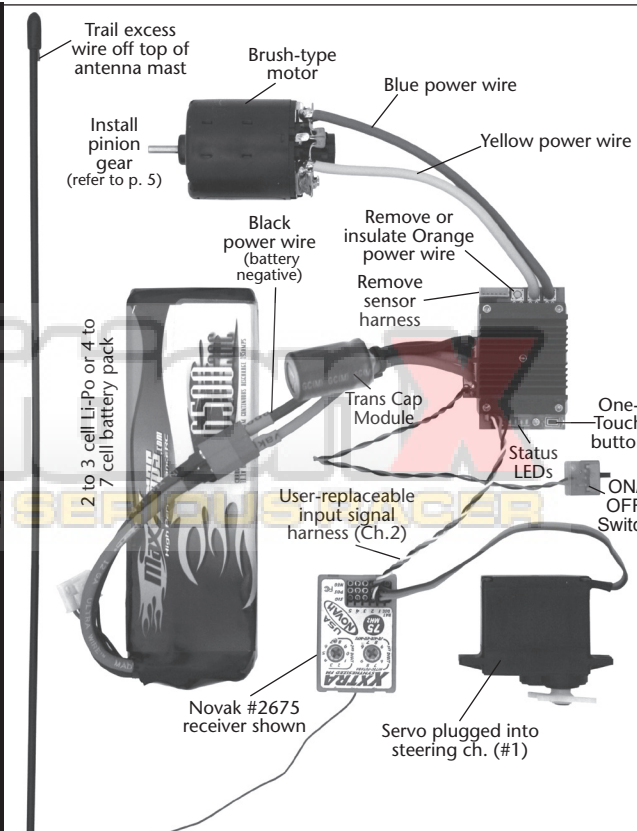
USING A RECEIVER BATTERY PACK

The Havoc 3S ESC has an internal 6V/3.0A BEC, so a receiver battery pack is unnecessary. If you would like to use a receiver battery pack or external BEC, please follow these steps to ensure normal operation:

1. Connect receiver battery pack/external BEC into battery slot of the receiver. Receiver battery pack/BEC should have an ON/OFF switch installed.
2. Leave the ESC's input harness intact. First turn the receiver battery pack ON, then cycle the ESC's switch from ON to OFF. The ESC will remain ON even though the switch is OFF.

After running your vehicle, simply turn OFF receiver battery pack/external BEC. Always disconnect main battery pack when vehicle is not in use.

BRUSH-MODE SET-UP PHOTO (FIGURE 6)



STEP 4 — BATTERY CONNECTION

Skip this step if the ESC has been factory wired with a battery connector.

1. SOLDER ESC'S RED WIRE TO BATTERY PACK POSITIVE (+)

Cut the speed control's RED silicone power wire to the proper length so it will reach the battery pack's POSITIVE (+) terminal or connector. Strip 1/8-1/4" of insulation from the end of the wire. Tin and solder the exposed section of wire to battery pack POSITIVE (+) or the corresponding side of connector to be used. If using connectors, see notes below.

2. SOLDER ESC'S BLACK WIRE TO BATTERY PACK NEGATIVE (-)

Cut the speed control's BLACK silicone power wire to the proper length so it will reach the battery pack's NEGATIVE (-) terminal or connector. Strip 1/8-1/4" of insulation from the end of the wire. Tin and solder the exposed section of wire to battery pack NEGATIVE (-) or the corresponding side of connector to be used.

IMPORTANT NOTE ABOUT BATTERY QUALITY

Using Li-Po batteries that cannot supply the amount of current required by this system will result in possible battery pack, ESC & motor damage. You **MUST** use high-quality batteries (25C or higher discharge rating). Damage resulting from use of inadequate cells will not be covered by the warranty.

CONNECTOR USAGE AND SELECTION

If you are going to use connectors, we suggest low-loss battery connectors (**do not use crimp type**) like Dean's Ultra, Novak's 3.5mm Low-Loss Power Connectors (#5731) or Traxxas® High Current Plugs.

- Use polarized connectors. Reverse voltage will damage the ESC & void warranty.
- Use a female connector on battery packs to avoid shorting.

Note: ESC comes with the Li-Po Cut-Off Circuitry turned ON for operation with Li-Po batteries—be sure to turn feature OFF if using Ni-MH or Ni-Cd cells (refer to page 6 to change programming).

STEP 5 — ONE-TOUCH PROGRAMMING

With ESC connected to (at least) a receiver & a charged battery pack:

1. **TURN ON THE TRANSMITTER'S POWER**
2. **PRESS & HOLD ESC'S ONE-TOUCH/SET BUTTON**
3. **TURN ON THE SPEED CONTROL'S POWER**
With transmitter throttle at neutral, and still pressing the SET button, slide the ESC's ON/OFF switch to ON position.
4. **CONTINUE HOLDING SET BUTTON UNTIL RED LED COMES ON**
5. **RELEASE SET BUTTON AS SOON AS LED TURNS RED**
6. **PULL TRANSMITTER THROTTLE TO FULL ON POSITION**
Hold it there until the **green status LED turns solid green**.
Note: Motor will not run during programming even if connected.
7. **PUSH TRANSMITTER THROTTLE TO FULL BRAKES**
Hold it there until the **green status LED blinks green**.
8. **RETURN TRANSMITTER THROTTLE TO NEUTRAL**
Red status LED will **turn solid red**, indicating that speed control is at neutral and that proper programming has been completed.

NOTE: If transmitter settings are changed, One-Touch Programming must be repeated. If you experience any problems, turn off ESC & repeat One-Touch.

REMEMBER: Whenever One-Touch set-up is performed, ESC automatically reverts to factory default settings.

TRANSMITTER ADJUSTMENTS

If you have any problems with Step 5, adjust transmitter as follows and then repeat One-Touch programming in Step 5:

- A. Set **HIGH ATV** or **EPA** to **maximum** setting.
[amount of throw at full throttle]
- B. Set **LOW ATV**, **EPA**, or **ATL** to **maximum** setting.
[amount of throw at full brakes]
- C. Set **EXPONENTIAL** to **zero** setting. [throttle channel linearity]
- D. Set **THROTTLE CHANNEL REV. SWITCH** to either position.
- E. Set **THROTTLE CHANNEL TRIM** to **middle** setting.
[adjusts neutral position/increases or decreases coast brakes]
- F. Set **ELECTRONIC TRIGGER THROW ADJUSTMENT** to **50% throttle** and **50% brake** throw—best for reversible ESCs.
[adjusts trigger throw electronic/digital pistol-grip transmitters]
- G. Set **MECHANICAL TRIGGER THROW ADJUSTMENT** to position with 1/2 throttle and 1/2 brake throw.