

PROFILE SELECTION & PROPER GEARING

#55-1720P-1

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ATTENTION: Correct gearing is essential to getting proper performance from your brushless motor system!

THROTTLE PROFILE SELECTION

The XBR is equipped with 4 user-selectable Throttle Profiles, as shown below.

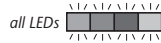
XBR THROTTLE PROFILES

	BRUSHLESS PROFILES			BRUSH-MODE
	1	2	3	4
w/Reverse	yes	no	yes	no
Reverse%	100%	n/a	25%	n/a
Programmable	yes	yes	yes	yes
Min.Brake%	0%	0%	0%	0%
Drag Brake	off	off	off	off
Dead Band%	5%	5%	5%	5%
Min.Drive%	1%	1%	1%	1%

NOTE: XBR is factory set to Profile #1

XBR reverts back to Profile #1 & default settings when One-Touch set-up is performed.

SELECTING BRUSHLESS PROFILES:



With ESC on & connected to a charged battery (transmitter ON or OFF):

1. IF TRANSMITTER IS OFF, DISCONNECT ESC FROM RECEIVER

To avoid possible radio interference, remove the ESC's input signal harness from the receiver--Green LED will stay on to indicate no signal from receiver.

2. PRESS & HOLD THE ESC'S ONE-TOUCH SET BUTTON

Continue to hold SET button on ESC until all 4 LEDs turns on.

Note: You will continue holding past all the LED programming indicators in the ESC's software as shown in the flow chart on back side of this sheet.

3. RELEASE SET BUTTON AS SOON AS ALL 4 LEDs COMES ON

Once released, the 4 status LEDs will flash to indicate what Throttle Profile is currently selected. The number of times the LEDs flash indicates the Brushless Throttle Profile selection (1 of 3).

4. QUICK PRESS (& release) SET BUTTON TO CHANGE SELECTION

Each press will change to the next consecutive Throttle Profile. (After Profile 3 in Brushless-Mode, the sequence begins again at Profile 1)

Note: there is a time constraint during this selection process.

5. ESC STORES SELECTION & BEGINS TO EXIT PROGRAMMING

If SET button is not pressed for 3 seconds, ESC stores selected Profile in memory, exits to neutral & is ready to go. (LEDs turn off in a rolling motion left to right, then Red LED turns on solid--Green LED will be on if no transmitter signal present & Blue or Blue & Amber LEDs on if Drag or Min. Brakes above 0%).

Note: ESC reverts to factory default settings & Throttle Profile #1 whenever One-Touch set-up is performed (reverts to Profile #4 Brush-Mode if no brushless motor sensor harness is connected).

PROPER GEAR SELECTION

Motor operating temperature is the ONLY way to properly set the vehicle gearing

The motor should be 160-175°F MAX at end of run!

Change the gearing to avoid overheating.

General Gearing for 6-Cell Ni-MH or 2-cell Li-Po Use:

MOTOR	PINION
EX8.5/SS8.5/SS5800	1 tooth higher pinion than normally used on 13-17T brush motor
EX10.5/SS10.5/SS4300	1 tooth higher pinion than normally used on 19T brush motor
EX13.5/SS13.5	2-3 teeth higher pinion than normally used on 27T brush motor

If you do not change gearing after switching to brushless, you will be over-gear and will have slow acceleration & excessive temperatures!

With the broad brushless power band, you can go 1-2 teeth higher pinion than listed above for more top speed, but remember going higher will produce excessive ESC & motor heating. Check the motor's operating temperature after making any gearing adjustments--motors are designed to operate from 160°F-175°F.

PROFILE ADJUSTMENTS

The following parameters are adjustable in the ESC's software:

MINIMUM BRAKE (1 of 7 settings from 0 to 18%)--The amount of braking applied with the first pulse of transmitter brake information.

Raising this setting starts the braking at a stronger/higher level.

DRAG BRAKE (1 of 7 settings from 0% (off) to 18%)--The amount of braking applied while the transmitter is at neutral. Also known as 'coast' or 'auto' brakes.

Raising this setting makes the motor slow down more without pushing the transmitter's trigger into the brake/reverse direction.

(With Drag Brakes on settings 2-10, the Minimum Brake value is the same as the Drag Brake value)

DEAD BAND (1 of 5 settings from 2 to 6%)--The space between Minimum Brake and Minimum Drive, with neutral in the middle.

Raising this setting will increase the 'free play', or distance your trigger must move before forward drive or braking will begin.

MINIMUM DRIVE (1 of 5 settings from 1 to 12%)--The amount of forward drive applied with the first pulse of transmitter throttle information.

Raising this setting makes the motor start at a stronger/higher level so it takes off more aggressively from neutral.

LI-PO CUT-OFF CIRCUITRY

When active (see programming on reverse side to turn ON/OFF), the built-in Smart-Stop Li-Po Cut-Off Circuitry lets you safely use Lithium Polymer batteries by cutting off the ESC's throttle output when a critical safety voltage is reached.

The circuitry constantly monitors the pack voltage. When it gets close to the critical safety voltage (6.25V) it begins interrupting, or 'blipping' the throttle output as an early warning that the battery's voltage is getting low and the throttle output will soon be completely shut off.

When the critical voltage is reached, the throttle output to the motor gets completely shut down to keep the voltage from dropping further (Red & Green LEDs will alternately flash & you still have steering control). **Re-charge battery after Smart-Stop circuitry shuts off throttle.** Even though the pack's voltage will rise (after a short resting period) to a level high enough to run the motor again, this is not good for Li-Po batteries--Reaching the critical safety voltage too many times can damage the cells. **DO NOT CONTINUE TO RUN VEHICLE AFTER THE SMART-STOP HAS SHUT DOWN THE THROTTLE OUTPUT THE FIRST TIME.**

During power-up when the ESC is switched ON, the Amber & Red LEDs will flash together 3 times to indicate Li-Po Cut-Off is ACTIVE.

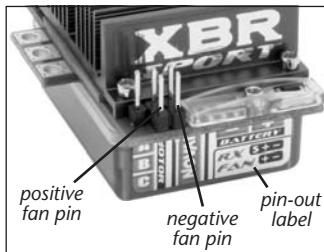
With the Li-Po Cut-Off turned ON & using Ni-Cd or Ni-MH cells, the circuitry will shut off the ESC's throttle output very early into the run, due to the different characteristics of these batteries.

AUXILIARY FAN OUTPUT

The XBR features a set of power output pins for running auxilliary cooling fans, so you can add fans to the motor, the ESC, or both, and they will switch on & 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.



The Novak 30x30x6mm clear cooling fan (Novak kit #5648) is the same one that comes with the GTB ESC, and not only fits the size of the XBR's heat sink perfectly, it also comes with the connector already on it to match the pins on the XBR. Fans that do not have the proper connector on them will need a connector (one end of an old receiver input harness would work well) put on, or will need to be soldered to the pins--Take extra care if attempting to solder to the fan power output pins--Do not overheat the pins or circuit board, and do not allow any solder or wire strands to cause a short circuit with other pins.

MOTOR ROTATION SELECTION

The XBR software lets you reverse a brushless motor's rotation direction (see reverse side of this sheet to select rotation). This allows installation in vehicles with counter-rotating drive trains (or opposed transmissions), without compromising performance. Because the ESC will be operating in its normal forward & reverse modes, features like Smart Braking continue to operate normally.

ADVANCED -- CUSTOM PROGRAMMING

PLEASE NOTE: This page contains optional Advanced Programming items! No further adjustments are required.
 (but don't worry, you can always reset factory defaults by performing the One-Touch programming again, so go ahead & experiment--that's why the programming is in there, right?)

TO CUSTOM PROGRAM PROFILES:

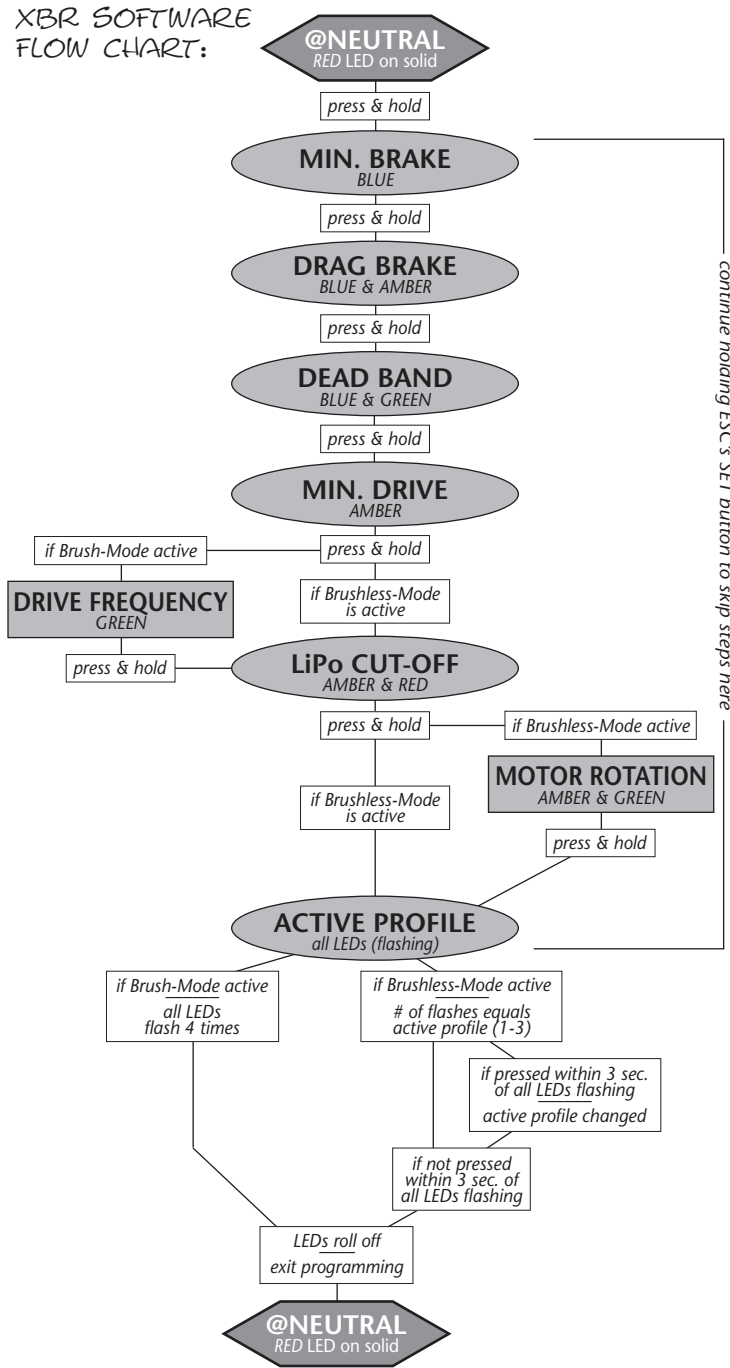
Your transmitter can be either ON or OFF:

- IF TRANSMITTER IS OFF, DISCONNECT ESC FROM RECEIVER**
Remove input signal harness from receiver to avoid radio interference.
- CONNECT SPEED CONTROL TO A CHARGED BATTERY PACK**
- SLIDE ESC's ON/OFF SWITCH TO 'ON' POSITION**
- MAKE SURE THE THROTTLE PROFILE TO ADJUST IS ACTIVE**
If you are not sure what profile is selected, follow the procedures in 'Throttle Profile Selection' to check or select the desired profile.
- FOLLOW STEPS ON RIGHT SIDE OF THIS PAGE TO CUSTOMIZE ESC**
You can adjust different parameters (described on back side of this sheet) to fine tune the speed control to perform & feel the way you like it.

Remember that you can not access the Brush-Mode (Profile #4) without disconnecting the brushless motor's sensor harness from the ESC.

Note: there is no time constraint during selection process of custom parameters.

XBR SOFTWARE FLOW CHART:



RESTORING FACTORY DEFAULTS:

Every time you perform the One-Touch Set-Up, the factory default settings are restored for each of the throttle profiles & ESC reverts to Profile #1.

TO ADJUST MINIMUM BRAKE: (using this turns off drag brakes)

- PRESS & HOLD SPEED CONTROL'S SET BUTTON**
With ESC at neutral, press & hold SET button until the **BLUE** status LED turns on solid--Release ESC's SET button once LED is on solid.
- SELECT MINIMUM BRAKE PERCENTAGE**
Blue status LED flashes to indicate active Minimum Brake setting. Quick press & release SET button to select desired setting. **BLUE LED STAYS ON ALWAYS**

Setting (# of flashes):	1	2	3	4	5	6	7
Minimum Brake (%):	0	3	6	9	12	15	18
- PRESS & HOLD SET BUTTON TO STORE SELECTION**
When SET button is pressed & held for about 1 second, the new selection is stored in ESC's memory--The 4 status LEDs will scroll back & forth to indicate ESC is exiting programming & the Red LED will turn on solid (Blue LED also on if Min.Brake above 0%)--ESC is at neutral & ready to go.

TO ACTIVATE & ADJUST DRAG BRAKE:

- PRESS & HOLD SPEED CONTROL'S SET BUTTON**
With ESC at neutral, press & hold SET button until the **BLUE & AMBER** status LEDs turn on solid--Release SET button once LEDs are on solid.
- SELECT DRAG BRAKE PERCENTAGE**
Blue & Amber status LEDs flash to indicate Drag Brake setting (Min.Brake setting will be the same as Drag Brakes). Quick press & release SET button to change Drag Brake setting. **BLUE & AMBER LEDs ON ALWAYS**

Setting (# of flashes):	1	2	3	4	5	6	7
Drag Brake (%):	off	3	6	9	12	15	18
- PRESS & HOLD SET BUTTON TO STORE SELECTION**
Selection is stored in memory--Status LEDs scroll back & forth and ESC exits programming. Red LED turns on solid (Blue & Amber LEDs may also be on)--ESC is at neutral & ready to go.
To re-activate standard braking (no drag brakes during neutral), set to 1 or repeat Min.Brake adjustment.

TO ADJUST DEAD BAND:

- PRESS & HOLD SPEED CONTROL'S SET BUTTON**
With ESC at neutral, press & hold SET button until the **BLUE & GREEN** status LEDs turn on solid--Release SET button once LEDs are on solid.
- SELECT DEAD BAND PERCENTAGE**
Blue & Green status LEDs flash to indicate active Dead Band setting. Quick press & release SET button to change setting.

Setting (# of flashes):	1	2	3	4	5
Dead Band (%):	2	3	4	5	6
- PRESS & HOLD SET BUTTON TO STORE SELECTION**
Selection is stored in memory--Status LEDs scroll back & forth and ESC exits programming. Red LED turns on solid (Blue & Amber LEDs may also be on)--ESC is at neutral & ready to go.

TO ADJUST MINIMUM DRIVE:

- PRESS & HOLD SPEED CONTROL'S SET BUTTON**
With ESC at neutral, press & hold SET button until **AMBER** status LED turns on solid--Release SET button once LED is on solid.
- SELECT MINIMUM DRIVE PERCENTAGE**
Amber status LED flashes to indicate active Minimum Drive setting. Quick press & release SET button to change setting.

Setting (# of flashes):	1	2	3	4	5
Minimum Drive (%):	1	3	5	8	12
- PRESS & HOLD SET BUTTON TO STORE SELECTION**
Selection is stored in memory--Status LEDs scroll back & forth and ESC exits programming. Red LED turns on solid (Blue & Amber LEDs may also be on)--ESC is at neutral & ready to go.

TO ADJUST DRIVE FREQUENCY: (Profile 4 ONLY)

- PRESS & HOLD SPEED CONTROL'S SET BUTTON**
With ESC at neutral, press & hold SET button until **GREEN** status LED turns on solid--Release SET button once LED is on solid.
- SELECT DRIVE FREQUENCY**
Green status LED flashes to indicate active Drive Frequency setting. Quick press & release SET button to change setting.

Setting (# of flashes):	1	2	3	4	5	6	7
Drive Frequency (kHz):	1.5	2.5	3.5	4.5	6.5	8.5	11
- PRESS & HOLD SET BUTTON TO STORE SELECTION**
Selection is stored in memory--Status LEDs scroll back & forth and ESC exits programming. Red LED turns on solid (Blue & Amber LEDs may also be on)--ESC is at neutral & ready to go.

TO ACTIVATE LiPo CUT-OFF CIRCUITRY:

- PRESS & HOLD SPEED CONTROL'S SET BUTTON**
With ESC at neutral, press & hold SET button until the **AMBER & RED** status LEDs turn on solid--Release SET button once LEDs are on solid.
- TURN LiPo CUT-OFF CIRCUITRY ON or OFF**
Amber & Red status LEDs flash to indicate LiPo Cut-Off Circuitry setting. Quick press & release SET button to change setting.
1 flash = OFF 2 flashes = ON
- PRESS & HOLD SET BUTTON TO STORE SELECTION**
Selection is stored in memory--Status LEDs scroll back & forth and ESC exits programming. Red LED turns on solid (Blue & Amber LEDs may also be on)--ESC is at neutral & ready to go.

TO REVERSE MOTOR ROTATION:

- PRESS & HOLD SPEED CONTROL'S SET BUTTON**
With ESC at neutral, press & hold SET button until **AMBER & GREEN** status LEDs turn on solid--Release SET button once LEDs are on solid.
- TURN LiPo CUT-OFF CIRCUITRY ON or OFF**
Amber & Green status LEDs flash to indicate motor rotation direction. Quick press & release SET button to change setting.
1 flash = Normal 2 flashes = Reverse
- PRESS & HOLD SET BUTTON TO STORE SELECTION**
Selection is stored in memory--Status LEDs scroll back & forth and ESC exits programming. Red LED turns on solid (Blue & Amber LEDs may also be on)--ESC is at neutral & ready to go.