www.RaceDigitalDelay.com

ELITE CROSSOVER

Instruction Manual

The
ELITE
CROSSOVER
From
DIGITAL DELAY

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Congratulations on your purchase of the Elite Crossover delay box from Digital Delay. Even though the Elite Crossover is small, it still offers the many of the same features found in our larger Delay Boxes like the Mega 450, Elite 600, and the Elite 700. This means the Elite Crossover is a very versatile and powerful Delay Box.

The Elite Crossover may seem overwhelming at first. But even if you have never owned a Delay Box, the layout of the screens, and the commonality of how data is entered and viewed on the screens, eases the learning process of the Elite Crossover.

The Elite Crossover comes with an external Relay board and a 6.5 foot cable to connect them. If you require a longer cable for your application please call Digital Delay.

Digital Delay also offers a wiring kit for the Elite Crossover to help with the installation. Please call or check our website for more information.

Basic Overview

The Elite Crossover is really two Delay Boxes in one, a Bracket Delay Box and a Pro Delay Box each with their own independent screens and settings. There are up to twelve Bracket Mode screens and up to eleven Pro Mode screens.

The Elite Crossover has the capability to run three 2-Stage Timers at one time. The 2-Stage Timers are labeled Timer 1, Timer 2, and Timer 3. Each of the Timers has its own set of settings for both Bracket and Pro Modes.

The Elite Crossover can also shift the vehicle by time or RPM, up to five shifts. Here again, the shifter has separate shift points for both Bracket and Pro Mode.

The Startling Line Enhancer (S.L.E.) now has its own output. In Pro Mode the S.L.E. now has a fixed Hold Time. This allows the Transbrake solenoid to fully set before the engine goes to full throttle. The all new S.L.E. Starting Line Mode allows the driver to select if the Transbrake Button will also set the S.L.E. or not.

The Line Lock has its own output and the Burn-out feature allows the Line Locks to be activated during a burn-out for a pre-set amount of time. The Line Lock Starting Line Mode allows the driver to select if the Line Locks will engage along with the Transbrake solenoid or not.

Along with being able to Tap Up and Down in the same pass, the Elite Crossover has a Multi Tap feature. That allows large amounts of time to be subtracted from the first Delay started.

The Elite Crossover also has our Set and Go pushbutton mode. Allowing all timing to start on the press of the Transbrake button, instead of the release.

The Driver's Reaction Tester has an LED for practicing, giving the most realistic reaction times possible. The Elite Crossover also keeps track of and displays your average while practicing.

ELITE CROSSOVER

Table of Contents

Categorized Contents

Getting Started

Before using the Elite Crossover, a basic understanding of how the display and switches are structured, is needed.

Basics for the Display and Switches

There are several screens, each with its own values or settings. Each screen shown on the display is divided into three sections. The center section is used to indicate the values or settings currently being shown on the left and right sections of the display. The MENU switch located directly under the center section of the display is used change what screen is being shown on display. There are four ADJUSTMENT switches located under both the left and right sections of the display. The ADJUSTMENT switches are used to make changes to the values or settings currently being shown.

The PRO/BRACKET mode switch located at the bottom right is used to select whether the Elite Crossover is in Pro or Bracket mode. For each mode there is a home screen, the Dial-ins for Bracket Mode and Pro Delay for Pro Mode. The home screen is the screen that is shown when the Elite Crossover is turned on or reset.

The SETUP/RESET switch located at the bottom left has two functions. First, pressing this switch to the left accesses the Setup screens. The Setup screens allow the Elite Crossover to be tailored to meet the vehicle needs. Secondly, moving the switch to the right resets the processor. Resetting the Elite Crossover, returns back to the home screen and cancels any timers that may be running. The same as turning power off and back on.

The yellow LED right below the MENU switch is used when practicing with the Driver's Reaction Tester.

Initial Setup of the Elite Crossover

When the Elite Crossover arrives and you turn it on, you will see the Bracket Mode Dial-In screen. With the initial factory settings, the Elite Crossover will function as a basic Crossover Delay Box, without any changes needed.

To use the additional features of the Elite Crossover, information needs to be entered. Before entering times for Pro or Bracket mode, it is recommended that you configure the Setup screens first. The Setup screens are used to tell the Elite Crossover how you want the push-button inputs and outputs to function. Also the Max Number of Shifts setting is used to disable unneeded Shift Point screens. Once these initial Setup settings have been entered, most will not need to be changed unless the setup of the vehicle is changed.

Setting Setup Screens

There are thirteen Setup screens. The Setup screens can be accessed from either Pro or Bracket mode. To enter into Setup mode push the Setup/Reset switch to the left. To show the Elite Crossover is in Setup mode the center section of the display will flash. There are three ways to get back to normal run mode. First is to reset the Elite Crossover, you can either reset the Elite Crossover using the Setup/Reset switch or turn the power off and back on. Secondly, the Elite Crossover will automatically return to normal run mode after 30 seconds of inactivity. Finally if a transbrake button is pressed, the Elite Crossover will exit out of Setup mode and return to normal run to make a pass.

Note: Using the Reset switch not only exits Setup but also turns off any output that is active. This includes the Transbrake output.

The Tap / Multi Tap Count Screen

Setup Mode Screen 1

While the Tap Count screen is not a setup screen, it was placed here for easy access. The Tap Count screen is used to indicate how many times the Tap Up, Tap Down, and the Multi Tap were used on the last pass. These three Tap features allow you to make adjustments to your Delay time if you feel you have released the Transbrake Push-button at the wrong time.

The Tap Up and Down are shown on the left screen. The Multi Tap is shown on the right screen.

Left Screen Adjustment Switches

Use any Adjustment Switch either ↑ or ↓ to clear all the Tap Counts.

Right Screen Adjustment Switches

Use any Adjustment Switch either ↑ or ↓ to clear all the Tap Counts.

Pro/Bracket Switch

The setting of the Pro/Bracket switch has no effect when in Setup mode.

Setup/Reset Switch

Use the Setup/Reset switch → to exit Setup mode. Upon exiting the Elite Crossover will go to the home screen for either Pro or Bracket mode depending on how the Pro/Bracket switch is set.

Menu Switch

Use the Menu Switch ↑ to go to the Shift Control screen. Use the Menu Switch ↓ to go to the Tap Up and Tap Down Amount screen.

The **Tap** is explained on page 36.

Tap Up and Tap Down Amount Screen

Setup Mode Screen 2

The Tap Up and Tap Down amounts are adjusted on this screen. Any value from .000 - .099 can be entered for either Tap amount.

Left Screen Adjustment Switches

Use the right two Adjustment Switches either ↑ or ↓ to set the Tap Up amount.

Right Screen Adjustment Switches

Use the right two Adjustment Switches either ↑ or ↓ to set the Tap Down amount.

Pro/Bracket Switch

The setting of the Pro/Bracket switch has no effect when in Setup mode.

Setup/Reset Switch

Use the Setup/Reset switch → to exit Setup mode. Upon exiting the Elite Crossover will go to the home screen for either Pro or Bracket mode depending on how the Pro/Bracket switch is set.

Menu Switch

Use the Menu Switch ↑ to go to the Tap / Multi Tap Count screen. Use the Menu Switch ↓ to go to the Multi Tap Amount Screen.

The **Tap** is explained on page 36.

Multi Tap Amount Screen

Setup Mode Screen 3

This screen has settings for the Multi Tap amount. The Multi Tap amount can be set from 0 – 9. The Multi Tap is used to subtract large amounts of delay.

Left Screen Adjustment Switches

Use the right Adjustment Switch either ↑ or ↓ to set the Multi Tap amount.

Right Screen Adjustment Switches

The Adjustment Switches have no function on this screen.

Pro/Bracket Switch

The setting of the Pro/Bracket switch has no effect when in Setup mode.

Setup/Reset Switch

Use the Setup/Reset switch → to exit Setup mode. Upon exiting the Elite Crossover will go to the home screen for either Pro or Bracket mode depending on how the Pro/Bracket switch is set.

Menu Switch

Use the Menu Switch ↑ to go to the Tap Up and Tap Down Amount Screen. Use the Menu Switch ↓ to go to the How Late Screen.

NOTE: To turn off the Multi Tap feature set the Multi Tap amount to zero.

The **Multi Tap** is explained on page 37.

How Late Screen

Setup Mode Screen 4

This screen has the How Late information. A How Late is automatically generated anytime two shots at the tree are taken. If only one hit at the tree is taken the How Late will be zero.

Left Screen Adjustment Switches

Use any Adjustment Switch either ↑ or ↓ to clear the How Late information.

Right Screen Adjustment Switches

Use any Adjustment Switch either ↑ or ↓ to clear the How Late information.

Pro/Bracket Switch

The setting of the Pro/Bracket switch has no effect when in Setup mode.

Setup/Reset Switch

Use the Setup/Reset switch → to exit Setup mode. Upon exiting the Elite Crossover will go to the home screen for either Pro or Bracket mode depending on how the Pro/Bracket switch is set.

Menu Switch

Use the Menu Switch ↑ to go to the Multi Tap Amount Screen. Use the Menu Switch ↓ to go to the Push-button Mode and Safety Lockout screen.

NOTE: A How Late time is only shown when taking two shots at the tree.

The **How Late** is explained on page 35.

Push-button Mode and Safety Lockout
Setup Mode Screen 5

The Push-button mode is used to set how the Transbrake button(s) functions. The Safety Lockout time is used to disable the Transbrake buttons, to keep the driver from accidently applying the Transbrake after the vehicle leaves the starting line.

Left Screen Adjustment Switches

Use the right Adjustment Switch either ↑ or ↓ to set the Push-button mode.

Right Screen Adjustment Switches

Use the right two Adjustment Switch either ↑ or ↓ to set the Safety Lockout time.

Pro/Bracket Switch

The setting of the Pro/Bracket switch has no effect when in Setup mode.

Setup/Reset Switch

Use the Setup/Reset switch → to exit Setup mode. Upon exiting the Elite Crossover will go to the home screen for either Pro or Bracket mode depending on how the Pro/Bracket switch is set.

Menu Switch

Use the Menu Switch ↑ to go to the How Late screen. Use the Menu Switch ↓ to go to the S.L.E. Control screen.

NOTE: To turn off the Safety Lockout feature, set the Safety Lockout time to zero.

The **Push-button Modes** are explained on page 49.

S.L.E. Control
Setup Mode Screen 6

The Starting Line Enhancer (S.L.E.) Control screen is used to set the S.L.E. Throttle mode and whether the S.L.E. is engaged along with the Transbrake or not.

Left Screen Adjustment Switches

Use the Adjustment Switches either ↑ or ↓ to set the S.L.E. Throttle mode. The S.L.E. Throttle Mode is used to control whether the S.L.E. output will supply 12 Volts "High" or remove 12 Volts "Low" when engaged.

Right Screen Adjustment Switches

Use the Adjustment Switches either ↑ or ↓ to select Normal mode "Norm" for engaging S.L.E. with the Tap Down PB only or Plus Starting Line "+Line" for engaging S.L.E. with Tap Down PB or the with the Transbrake.

Pro/Bracket Switch

The setting of the Pro/Bracket switch has no effect when in Setup mode.

Setup/Reset Switch

Use the Setup/Reset switch → to exit Setup mode. Upon exiting the Elite Crossover will go to the home screen for either Pro or Bracket mode depending on how the Pro/Bracket switch is set.

Menu Switch

Use the Menu Switch ↑ to go to the Push-button Mode and Safety Lockout screen. Use the Menu Switch ↓ to go to the Line Lock Control screen.

The **S.L.E.** modes are explained on page 40.

Line Lock Control

Setup Mode Screen 7

The Line Lock Control screen is used to set the time for the Burn-out Timer and whether the Line Locks will be used for only the Burn-out or for the Burn-out and at the Starting Line.

Left Screen Adjustment Switches

Use the Adjustment Switches either ↑ or ↓ to set the Burn-out Time.

Right Screen Adjustment Switches

Use the Adjustment Switches either ↑ or ↓ to select Normal mode "Norm" for Burn-out only or Plus Starting Line "+Line" for Burn-out and Line Locks with Transbrake.

Pro/Bracket Switch

The setting of the Pro/Bracket switch has no effect when in Setup mode.

Setup/Reset Switch

Use the Setup/Reset switch → to exit Setup mode. Upon exiting the Elite Crossover will go to the home screen for either Pro or Bracket mode depending on how the Pro/Bracket switch is set.

Menu Switch

Use the Menu Switch ↑ to go to the S.L.E. Control screen. Use the Menu Switch ↓ to go to the Shift Control screen.

NOTE: To turn off the Burn-out Timer feature, set the Burn-out time to zero.

The **Line Lock** modes are explained on page 41.

Shift Control

Setup Mode Screen 8

The Shift Control screen is used to set the Shift Output Mode and the Max number of shifts.

Left Screen Adjustment Switches

Use the Adjustment Switches either ↑ or ↓ to set the Shift Output mode. The Shift Output mode is used to control whether the Shift output will supply 12 Volts "High" or remove 12 Volts "Low" when a shift occurs.

Right Screen Adjustment Switches

Use the Adjustment Switches either ↑ or ↓ to set the Max number of shifts. Set the Max number of shifts equal to the number of shift your vehicle makes.

Pro/Bracket Switch

The setting of the Pro/Bracket switch has no effect when in Setup mode.

Setup/Reset Switch

Use the Setup/Reset switch → to exit Setup mode. Upon exiting the Elite Crossover will go to the home screen for either Pro or Bracket mode depending on how the Pro/Bracket switch is set.

Menu Switch

Use the Menu Switch ↑ to go to the Line Lock Control screen. Use the Menu Switch ↓ to go to the Timer 1 Throttle mode screen.

The **Shift Control** is explained on page 43.

Timer 1, 2, and 3 Screens

Setup Mode Screens 9, 10, and 11

The next three screens are the 2-Stage Timer Throttle Mode screens. The Throttle Mode is used to control whether the output will supply 12 Volts (On) or remove 12 Volts (Off) for each stage. Each Timer has a Throttle mode associated with it. The Throttle Mode has two settings shown as on/off or off/on. All of the Throttle mode screens are adjusted in the same way.

Left Screen Adjustment Switches

Use any Adjustment Switch either ↑ or ↓ to reverse the Throttle mode.

Right Screen Adjustment Switches

Use any Adjustment Switch either ↑ or ↓ to reverse the Throttle mode.

Pro/Bracket Switch

The setting of the Pro/Bracket switch has no effect when in Setup mode.

Setup/Reset Switch

Use the Setup/Reset switch → to exit Setup mode. Upon exiting the Elite Crossover will go to the home screen for either Pro or Bracket mode depending on how the Pro/Bracket switch is set.

Menu Switch

Use the Menu Switch ↑ to go to the Shift Control Screen. Use the Menu Switch ↓ to go to the Timer 1, 2, and 3 Throttle mode screens then the P.T.S.O. screen.

The **Throttle Mode** is explained on page 38.

P.T.S.O.

Setup Mode Screen 12

The (P.T.S.O) Programmable Throttle Stop Override screen is used to set the P.T.S.O. amount and to show the count of how many time the P.T.S.O. was used on the last pass.

Left Screen Adjustment Switches

Use the Adjustment Switches either ↑ or ↓ to set the P.T.S.O. amount.

Right Screen Adjustment Switches

Use the Adjustment Switches either ↑ or ↓ to clear the P.T.S.O. count.

Pro/Bracket Switch

The setting of the Pro/Bracket switch has no effect when in Setup mode.

Setup/Reset Switch

Use the Setup/Reset switch → to exit Setup mode. Upon exiting the Elite Crossover will go to the home screen for either Pro or Bracket mode depending on how the Pro/Bracket switch is set.

Menu Switch

Use the Menu Switch ↑ to go to the Timer 3 Throttle mode screen. Use the Menu Switch ↓ to go to the Contrast Control screen.

NOTE: To turn off the P.T.S.O. feature, set the P.T.S.O. amount to zero.

The **P.T.S.O.** is explained on page 39.

Contrast

Setup Mode Screen 13

The Contrast adjust screen is used to adjust the display for optimal viewing. Any number from 1, the lightest, to 9, the darkest, can be used.

Left Screen Adjustment Switches

Use the Adjustment Switches either ↑ or ↓ to set the Contrast amount. A setting of 5 is standard.

Right Screen Adjustment Switches

The Adjustment Switches have no function on this screen.

Pro/Bracket Switch

The setting of the Pro/Bracket switch has no effect when in Setup mode.

Setup/Reset Switch

Use the Setup/Reset switch → to exit Setup mode. Upon exiting the Elite Crossover will go to the home screen for either Pro or Bracket mode depending on how the Pro/Bracket switch is set.

Menu Switch

Use the Menu Switch ↑ to go to the P.T.S.O. screen. Use the Menu Switch ↓ to go to the Tap/Multi Tap Count screen.

NOTE: The Contrast screen is the only setup screen that doesn't flash. This is to help with adjusting the contrast without the distraction of the flashing.

Dial-ins Screen

Bracket Mode Screen 1

The Dial-in screen is the "home" Bracket Mode screen. This screen is where you enter the dial-ins, yours and your opponents.

Left Screen Adjustment Switches

Use any Adjustment Switch either ↑ or ↓ to enter your dial-in.

Right Screen Adjustment Switches

Use any Adjustment Switch either ↑ or ↓ to enter your opponents dial-in (their dial).

Pro/Bracket Switch

Set the Pro/Bracket switch → to view the Bracket mode screens. Set the Pro/Bracket switch ← to view the Pro mode screens.

Setup/Reset Switch

Use the Setup/Reset switch ← to enter Setup mode. Use the Setup/Reset switch → to reset the Elite Crossover. When the switch is moved to the reset position, any timing functions are canceled and all the outputs are turned off. When the switch is then released all the outputs will return to their initial setting, the same when the unit is first turned on.

Menu Switch

Use the Menu Switch ↑ to go to the Drivers Reaction Tester screen. Use the Menu Switch ↓ to go to the Delay screen.

The **Dial-ins** are explained on page 33.

Delay 1 and 2 Screen

Bracket Mode Screen 2

The Delay1 and Delay 2 screen is the where you enter the Delay Times. The Dial-ins and the Delay Times are used to control how long the Transbrake solenoid stays engaged after the push-button is released.

Left Screen Adjustment Switches

Use any Adjustment Switch either ↑ or ↓ to enter your Delay 1 time. (First shot at tree)

Right Screen Adjustment Switches

Use any Adjustment Switch either ↑ or ↓ to enter your Delay 2 time. (Second shot at the tree).

Pro/Bracket Switch

Set the Pro/Bracket switch → to view the Bracket mode screens. Set the Pro/Bracket switch ← to view the Pro mode screens.

Setup/Reset Switch

Use the Setup/Reset switch ← to enter Setup mode. Use the Setup/Reset switch → to reset the Elite Crossover. When the switch is moved to the reset position, any timing functions are canceled and all the outputs are turned off. When the switch is then released all the outputs will return to their initial setting, the same when the unit is first turned on.

Menu Switch

Use the Menu Switch ↑ to go to the Dial-ins screen. Use the Menu Switch ↓ to go to the Timer 1 screen.

The **Delays** are explained on page 33.

Timers 1, 2, and 3 Stage Time Screens

Bracket Mode Screens 3, 4, and 5

The next three screens are the 2-Stage Timer screens. The Timer screens are where the stage times are entered to control down track events. All three Timers are adjusted and work the same way.

Left Screen Adjustment Switches

Use any Adjustment Switch either ↑ or ↓ to enter your Stage 1 time. (When the T-Stop closes)

Right Screen Adjustment Switches

Use any Adjustment Switch either ↑ or ↓ to enter your Stage 2 time. (How long the T-Stop stays closed)

Pro/Bracket Switch

Set the Pro/Bracket switch → to view the Bracket mode screens. Set the Pro/Bracket switch ← to view the Pro mode screens.

Setup/Reset Switch

Use the Setup/Reset switch ← to enter Setup mode. Use the Setup/Reset switch → to reset the Elite Crossover. When the switch is moved to the reset position, any timing functions are canceled and all the outputs are turned off. When the switch is then released all the outputs will return to their initial setting, the same when the unit is first turned on.

Menu Switch

Use the Menu Switch ↑ to go to the Delay 1 and 2 screen. Use the Menu Switch ↓ to go to the Timer 2, 3, and then Shift 1 screen or the Drivers Reaction Tester if Shift Max is set to zero.

The **Timers** are explained on page 38.

Shift Control Screens

Bracket Mode Screens 6-10

The next five Shift Control screens are used to enter up to five Shift Points and to select whether each of the shifts will be a by time or RPM. All five of the Shifts are adjusted and work the same way. Depending on the setting of the Max Shift Count, some or all of the Shift Control screens may be disabled.

Left Screen Adjustment Switches

Use any Adjustment Switch either ↑ or ↓ to enter select if the shift will be for time or RPM.

Right Screen Adjustment Switches

Use any Adjustment Switch either ↑ or ↓ to enter the time or RPM the shift will occur. (Shift point)

Pro/Bracket Switch

Set the Pro/Bracket switch → to view the Bracket mode screens. Set the Pro/Bracket switch ← to view the Pro mode screens.

Setup/Reset Switch

Use the Setup/Reset switch ← to enter Setup mode. Use the Setup/Reset switch → to reset the Elite Crossover. When the switch is moved to the reset position, any timing functions are canceled and all the outputs are turned off. When the switch is then released all the outputs will return to their initial setting, the same when the unit is first turned on.

Menu Switch

Use the Menu Switch ↑ to go to the Timer 3 screen. Use the Menu Switch ↓ to go to the next shift screen or the Tach screen.

The **Shift Control** is explained on page 44.

Tach and Number of Cylinders Screen

Bracket Mode Screen 11

The Tach and Number of Cylinders screen is used to enter the number of cylinders and view the built-in Tach. When the engine is off the Tach will show the peak RPM.

Left Screen Adjustment Switches

Use any Adjustment Switch either ↑ or ↓ to select the number of cylinders.

Right Screen Adjustment Switches

Use any Adjustment Switch either ↑ or ↓ to clear the peak RPM.

Pro/Bracket Switch

Set the Pro/Bracket switch → to view the Bracket mode screens. Set the Pro/Bracket switch ← to view the Pro mode screens.

Setup/Reset Switch

Use the Setup/Reset switch ← to enter Setup mode. Use the Setup/Reset switch → to reset the Elite Crossover. When the switch is moved to the reset position, any timing functions are canceled and all the outputs are turned off. When the switch is then released all the outputs will return to their initial setting, the same when the unit is first turned on.

Menu Switch

Use the Menu Switch ↑ to go to the last Shift screen. Use the Menu Switch ↓ to go to the Driver's Reaction Tester screen.

Tach and Number of Cylinders are explained on page 45.

Driver's Reaction Tester

Bracket Mode Screen 12

This screen allows you to test your reaction time using the Push-buttons mounted in the vehicle. To practice, for Push-button Modes 1 – 4 press and hold down the push-button connected to the P.B. 1 terminal. For Push-button Mode 5 press the button connected to P.B. 2. When the light below the Menu switch comes on, for Push-button Modes 1 – 4 release the button being held. For Push-button Mode 5 press the button connected to P.B. 1. Your average is shown on the left side and reaction time is shown on the right side.

Left Screen Adjustment Switches

Use any Adjustment Switch either ↑ or ↓ to clear the current average reaction time.

Right Screen Adjustment Switches

The Adjustment Switches have no function on this screen.

Pro/Bracket Switch

Set the Pro/Bracket switch → to view the Bracket mode screens. Set the Pro/Bracket switch ← to view the Pro mode screens.

Setup/Reset Switch

Use the Setup/Reset switch ← to enter Setup mode. Use the Setup/Reset switch → to reset the Elite Crossover. When the switch is moved to the reset position, all the outputs are turned off. When the switch is then released all the outputs will return to their initial setting.

Menu Switch

Use the Menu Switch ↑ to go to the Tach screen. Use the Menu Switch ↓ to go to the Dial-ins screen.

The **Driver's Reaction Tester** is explained on page 47.

Pro Screen

Pro Mode Screen 1

The Pro screen is the "home" Pro Mode screen. This screen is where you enter your pro delay time.

Left Screen Adjustment Switches

The Adjustment Switches have no function on this screen.

Right Screen Adjustment Switches

Use any Adjustment Switch either ↑ or ↓ to enter your pro delay.

Pro/Bracket Switch

Set the Pro/Bracket switch → to view the Bracket mode screens. Set the Pro/Bracket switch ← to view the Pro mode screens.

Setup/Reset Switch

Use the Setup/Reset switch ← to enter Setup mode. Use the Setup/Reset switch → to reset the Elite Crossover. When the switch is moved to the reset position, any timing functions are canceled and all the outputs are turned off. When the switch is then released all the outputs will return to their initial setting, the same when the unit is first turned on.

Menu Switch

Use the Menu Switch ↑ to go to the Driver's Reaction Tester screen. Use the Menu Switch ↓ to go to the Timer 1 screen.

Timers 1, 2, and 3 Stage Time Screens

Pro Mode Screens 2, 3, and 4

The next three screens are the 2-Stage Timer screens. The Timer screens are where the stage times are entered to control down track events. All three Timers are adjusted and work the same way.

Left Screen Adjustment Switches

Use any Adjustment Switch either ↑ or ↓ to enter your Stage 1 time. (When the T-Stop closes)

Right Screen Adjustment Switches

Use any Adjustment Switch either ↑ or ↓ to enter your Stage 2 time. (How long the T-Stop stays closed)

Pro/Bracket Switch

Set the Pro/Bracket switch → to view the Bracket mode screens. Set the Pro/Bracket switch ← to view the Pro mode screens.

Setup/Reset Switch

Use the Setup/Reset switch ← to enter Setup mode. Use the Setup/Reset switch → to reset the Elite Crossover. When the switch is moved to the reset position, any timing functions are canceled and all the outputs are turned off. When the switch is then released all the outputs will return to their initial setting, the same when the unit is first turned on.

Menu Switch

Use the Menu Switch ↑ to go to the Pro screen. Use the Menu Switch ↓ to go to the Timer 2, 3, then Shift 1 screen or if Shift Max is set to zero the Drivers Reaction Tester.

The **Timers** are explained on page 38.

Shift Control Screens

Pro Mode Screens 5-9

The next five Shift Control screens are used to enter up to five Shift Points and to select whether each of the shifts will be a by time or RPM. All five of the Shifts are adjusted and work the same way. Depending on the setting of the Max Shift Count, some or all of the Shift Control screens may be disabled.

Left Screen Adjustment Switches

Use any Adjustment Switch either ↑ or ↓ to enter select if the shift will be for time or RPM.

Right Screen Adjustment Switches

Use any Adjustment Switch either ↑ or ↓ to enter the time or RPM the shift will occur. (Shift point)

Pro/Bracket Switch

Set the Pro/Bracket switch → to view the Bracket mode screens. Set the Pro/Bracket switch ← to view the Pro mode screens.

Setup/Reset Switch

Use the Setup/Reset switch ← to enter Setup mode. Use the Setup/Reset switch → to reset the Elite Crossover. When the switch is moved to the reset position, any timing functions are canceled and all the outputs are turned off. When the switch is then released all the outputs will return to their initial setting, the same when the unit is first turned on.

Menu Switch

Use the Menu Switch ↑ to go to the Timer 3 screen. Use the Menu Switch ↓ to go to the next shift screen or the Tach screen if no more shifts.

The **Shift Control** is explained on page 43.

Tach and Number of Cylinders Screen

Pro Mode Screen 10

The Tach and Number of Cylinders screen is used to enter the number of cylinders and view the built-in Tach. When the engine is off the Tach will show the peak RPM.

Left Screen Adjustment Switches

Use any Adjustment Switch either ↑ or ↓ to select the number of cylinders.

Right Screen Adjustment Switches

Use any Adjustment Switch either ↑ or ↓ to clear the peak RPM.

Pro/Bracket Switch

Set the Pro/Bracket switch → to view the Bracket mode screens. Set the Pro/Bracket switch ← to view the Pro mode screens.

Setup/Reset Switch

Use the Setup/Reset switch ← to enter Setup mode. Use the Setup/Reset switch → to reset the Elite Crossover. When the switch is moved to the reset position, any timing functions are canceled and all the outputs are turned off. When the switch is then released all the outputs will return to their initial setting, the same when the unit is first turned on.

Menu Switch

Use the Menu Switch ↑ to go to the last Shift screen. Use the Menu Switch ↓ to go to the Driver's Reaction Tester screen.

Tach and Number of Cylinders are explained on page 45.

Driver's Reaction Tester

Pro Mode Screen 11

This screen allows you to test your reaction time using the Push-buttons mounted in the vehicle. To practice, for Push-button Modes 1 – 4 press and hold down the push-button connected to the P.B. 1 terminal. For Push-button Mode 5 press the button connected to P.B. 2. When the light below the Menu switch comes on, for Push-button Modes 1 – 4 release the button being held. For Push-button Mode 5 press the button connected to P.B. 1. Your average is shown on the left side and reaction time is shown on the right side.

Left Screen Adjustment Switches

Use any Adjustment Switch either ↑ or ↓ to clear the current average reaction time.

Right Screen Adjustment Switches

The Adjustment Switches have no function on this screen.

Pro/Bracket Switch

Set the Pro/Bracket switch → to view the Bracket mode screens. Set the Pro/Bracket switch ← to view the Pro mode screens.

Setup/Reset Switch

Use the Setup/Reset switch ← to enter Setup mode. Use the Setup/Reset switch → to reset the Elite Crossover. When the switch is moved to the reset position, all the outputs are turned off. When the switch is then released all the outputs will return to their initial setting.

Menu Switch

Use the Menu Switch ↑ to go to the Tach screen. Use the Menu Switch ↓ to go to the Pro screen.

The **Driver's Reaction Tester** is explained on page 47.

Understanding the Dial-ins and Delays

The Dial-in screen shows Your Dial-in and Their Dial-in. The next screen, the Delay Screen shows both the Delay 1 and Delay 2 times. These four time settings are used to control how long the Transbrake solenoid stays engaged after the push-button is released. The main feature here is the ability to Crossover, to go off the opponent's top yellow light if you are the faster vehicle. The Elite Crossover always does a subtraction of Your Dial-in time from Their Dial-in time. If the result is greater than zero it's added to Delay 1. This new combined time of Delay 1 plus the difference of the Dial-ins is called the Crossover time.

Example, when the vehicle is staged, the push-button connected to the P.B. 1 terminal is pressed. When the push-button is pressed the Transbrake will engage. When the opponent's top yellow light comes on, the button is released and then the Crossover time starts counting down. When the Crossover time reaches zero the Transbrake is released. Thus, releasing the vehicle from the starting line and starting the pass.

When it is desirable not to Crossover, set the Dial-ins to the same number. When the Elite Crossover does the subtraction of Your Dial-in time from Their Dial-in time the difference will be zero. This result is then added to Delay 1 but because the added value was zero only the Delay 1 time will be used as the delay amount for the Transbrake.

The Elite Crossover also allows a second hit at the tree. This is where the Delay 2 time is used. Depending on the Push-button Mode, the second hit at the tree can be done with the same button connected to P.B. 1 or a second push-button connected to P.B. 2, this is explained in *Understanding the Push-button Modes*. The Delay 2 time is usually set so that the second hit at the tree is on your top or

bottom yellow. The Delay 2 time can be used even if the main Crossover delay is not being used, however this is not commonly done.

For this example of two hits at the tree, two buttons are used and the Push-button Mode is set to Two Hits with Two Buttons. The vehicle would be staged and both push-buttons would be pressed and held. This would engage the Transbrake. When the opponent's top yellow light comes on, the button connected to P.B. 1 would be released. This would start the countdown of the Crossover time. Then when your bottom yellow light comes on the push-button connected to P.B.2 would be released. This would start the countdown of the Delay 2 time. When either the Crossover time or the Delay 2 time reaches zero the Transbrake is released. If the two times do not reach zero at the same time a new How Late time is generated and stored in memory. The How Late time is displayed on Setup screen number 4.

Note: No Delay Box including the Elite Crossover can tell which hit at the tree is better, only which hit at the tree reached zero first. This means that if the first release on the opponent's top yellow was a perfect light and the second release on your bottom yellow was red, you will red light.

If you are new to using a Delay Box, a good way to get started is to cancel out the Dial-ins, by either entering all zeros, or the same number in both Dial-ins. Then enter 1.000 second for Delay 1 as this is a good starting value. Make some time trial passes, releasing the push-button on your top amber light. Adjust the Delay 1 time, by adding more time for a red light or subtracting time if late, to get as close to a perfect reaction time as possible. Once Eliminations start, make sure to enter the Dial-ins for you and your opponent. Release the push-button on the first amber light that comes on, regardless of the side of the tree.

Understanding the How late Screen

The How Late is only used when the Push-button Mode is set for two shots at the tree, either P.B. Mode 2, 3, or 4. When taking two shots, the quicker of the two will release the Transbrake. The How Late time, shown on the right section of the display, shows how much later the Transbrake would have released using the other shot at the tree. The left section of the display shows which shot at the tree was used to release the Transbrake.

For example, if the Dly= shows a "2" it indicates that Delay 2 was used to release the Transbrake. And if the How Late time is ".012" it indicates that Delay 1 would have released .012 seconds later. This means if your reaction time was .010 on the time slip, add the How Late time of .012 to the .010 for a total reaction time of .022 this is what your reaction time would have been if Delay 1 had been used.

The How Late information is stored in memory until a new delay cycle is started. Each time a delay cycle is started the How Late time and Delay Used indicator are reset to zero.

Note: No Delay box can tell which of the two shots at the tree was better, only which was faster. This means the Transbrake will release when either of the delay times reaches zero, even if it results in a red light.

Understanding the Tap / Multi Tap Screens

The three Tap features allow you to make adjustments to your Delay time if you feel you have released the Transbrake Push-button at the wrong time. The Tap features only work while the Transbrake time is counting down and only affects the first delay started. So if Delay 1 is started before Delay 2 the Tap features only affects Delay 1.

Tap Count

The Tap Up and Tap Down counts are shown by the left section of the screen. The Multi Tap count is shown on the right section of the display. The counts are used to show how many times the Tap Up, Tap Down, and Multi Tap Push-buttons were pressed. If a Tap Up, Tap Down, or Multi Tap button is not used during a pass the corresponding Tap Count will be zero. The Tap Counts are stored until the next time the Transbrake is used.

Tap Up

The Tap Up feature is used to keep from red lighting if you released the Transbrake Push-button too early. The right 2 digits of the Tap Up amount show the amount of time that will be added each time the Tap Up button is pressed. This Tap Up amount will only be added to the first delay started. Any number from .000 to .099 can be used for the Tap Up amount. The push-button connected to the P.B. 4 input is the Tap Up Push-button.

Tap Down

The Tap Down is used to keep from having a bad light if you released the Transbrake push-button a little late. The right 2 digits of the Tap Down amount show the amount of time that will be subtracted each time the Tap Down button is pressed. This Tap Down amount will only be subtracted from the first delay started. Any number from .000 to .099 can be used for the Tap Down amount. The push-button connected to the P.B. 3 input is the Tap Down Push-button.

Multi Tap

The Multi Tap is used to keep from having a bad light if you released the Transbrake Push-button very late. The Multi Tap feature works by taking several Tap Downs with the single press of a button. An example is, if the Multi Tap setting is set to 5, each time the Multi Tap button is pressed it's the same as pressing the Tap Down button five times.

The Multi Tap setting is shown on the left section of the screen. Any number from 0 to 9 can be used for the Multi Tap setting. The right section of the display shows the Multi Tap amount. The Multi Tap amount is calculated by taking the Tap Down amount and multiplying it by the Multi Tap setting. The Multi Tap amount is how much time will be subtracted from the first delay started, each time the Multi Tap button is pressed. The push-button connected to the P.B. 2 input is the Multi Tap button. The Multi Tap feature cannot be used when the P.B. Mode is set to 2.

Understanding the Timers

The Elite Crossover has three 2-Stage Timers. The 2-Stage Timers are used to control down-track events, using a pre-programmed time. Some examples of what a 2-Stage Timer may control are Throttle Stops, Nitrous solenoids, a Lockup Converter, Electrically controlled shocks, and Lean-out Valves.

Since all of the Timer screens function the same, the information below and on the next page can be used for Timer 1 Settings, Timer 2 Setting, or Timer 3 Settings.

Timing of a 2-Stage Timer starts at the release of the Transbrake solenoid. When the Transbrake releases, the Stage 1 time starts counting down. At the completion of Stage 1, the time for Stage 2 starts counting down.

Another way of looking at the Stage timing is, Stage 1 is how far out the vehicle goes before the Stage 2 time starts. The Stage 2 time would be how long a device is active (its duration).

Throttle Stop example, Stage 1 would be how far out the vehicle went in time before the Throttle Stop closed. Stage 2 would be how long the Throttle Stop stayed closed.

Nitrous example, Stage 1 would be how far out the vehicle went in time before the Nitrous turned on. Stage 2 would be how long the Nitrous stayed on. If it is desired to have the Nitrous on for the rest of the pass, enter a Stage 2 time greater than the vehicle's ET.

Understanding Throttle Mode

The Throttle Mode is used to control whether the Timer output will supply 12 Volts (On) or remove 12 Volts (Off) for the Stages. Each Timer has a Throttle Mode associated with it. Each Timer's Throttle Mode has two

settings off/on or on/off. The Throttle Mode for each Timer can be checked or changed, when viewing the corresponding Timers Setup screen. When viewing a Timers Setup screen, the Stage 1 Throttle mode is shown on the left section of the display and Stage 2 is shown on the right section of the display. A Stage set to *on*, indicates +12Volts out for that Stage. A Stage set to *off* indicates no Voltage out for that Stage. Example, if the Stage 1 Throttle Mode is set to off then no voltage will be put out for the duration of the Stage 1 time. As the Stage 2 Throttle Mode is always the opposite of Stage 1, in this example the Throttle Mode for Stage 2 has to be on. Therefore at the completion of Stage 1 the output will switch and put out +12Volts for the duration of the Stage 2 time.

Understanding the P.T.S.O

P.T.S.O. stands for Programmable Throttle Stop Override. The P.T.S.O. only affects Timer 1. The P.T.S.O. feature can be thought of as a Tap Down for Timer 1. By using a button connected to the P.B. 3 input, the P.T.S.O. allows a programmable amount of time to be subtracted from Stage 2 of Timer 1.

After the Transbrake releases the Elite Crossover waits a quarter of a second before enabling the P.T.S.O. This is to ensure that a late Delay Tap Down is not registered as a P.T.S.O. Once the P.T.S.O. is enabled, each time the Tap Down button is pressed while in either Stage 1 or 2 the P.T.S.O. time amount is subtracted from Stage 2.

The P.T.S.O Count is the number of times the button for the P.T.S.O. was pressed on the last pass.

NOTE: To turn off the P.T.S.O. enter all zeros for the P.T.S.O. value.

Understanding the S.L.E.

S.L.E. stands for Starting Line Enhancer. The S.L.E. feature is typically used in-conjunction with an in-line linkage Throttle Stop. When activated, the S.L.E. will close the Throttle Stop. This allows the driver to push the gas pedal to wide open throttle position and have the engine rev only to the preset RPM level.

Bracket Mode S.L.E.

In Bracket Mode the S.L.E. can be activated two different ways. First, before the vehicle is staged, if the Tap Down button is pressed the S.L.E. is activated. Secondly, when the Plus Starting Line feature (+Line) is turned on, pressing the Transbrake Push-button during the staging of the vehicle will cause the S.L.E. to activate. Once activated, the S.L.E. stays on until the Transbrake Push-button is released and the Crossover time has been counted down. Once the Crossover time is done, the Delay 1 time starts counting down and the S.L.E. Output is turned off returning the engine to full throttle. This means, when Crossing Over the S.L.E. will turn off when the box starts counting down your side of the tree.

Pro Mode S.L.E.

In Pro Mode the S.L.E. can only be activated by pressing the Tap-Down button before the Transbrake is engaged. When activated, the S.L.E. will close the Throttle Stop. This allows the driver to push the gas pedal to wide open throttle position and have the engine rev only to the preset RPM level. Once activated the S.L.E. stays on until the Push-button used to apply the Transbrake is pressed. When the Push-button is pressed the Elite Crossover waits about 1/4 of a second for the Transbrake to fully engage, then turns off the S.L.E. returning the engine to full throttle.

S.L.E. Throttle Mode

There are two S.L.E. Throttle Mode settings, High and Low. If set to High, when the S.L.E. Output is activated it will put out +12Volts. If set to Low, when the S.L.E. output is activated it will remove +12Volts. To change the S.L.E. Throttle mode, go to the S.L.E. Setup screen in. Then use the adjust switches under the left section of the display to select High or Low.

S.L.E. Starting Line Mode

The S.L.E. Starting Line Mode only affects the S.L.E. in Bracket Mode. When set to normal, shown as "Norm" on the screen, the S.L.E. will only activate with the Tap Down button. When set to plus starting line, shown as "+Line" on the screen, the S.L.E. will activate with the Tap Down button or with the Transbrake solenoid. This feature is used when the driver wants to stage the vehicle without having the gas pedal on the floor. Or if a Tap Down button has not been installed in the vehicle. To set the S.L.E. Starting Line mode to normal or plus starting line, go to the S.L.E. Setup screen. Then use the adjust switches under the right section of the display to select "Norm" or "+Line".

Understanding the Burn-out Timer and Line Lock Mode

The Burn-out Timer is used to control the length of the burn-out. This has the benefit of making the length of the burn-outs the same every time. The Burn-out Timer has two modes of operation, one with the Tach wire connected and one without the Tach wire connected.

With the Tach wire connected, the Elite Crossover will wait to start counting down the Burn-out Time, until the engine reaches 3500 RPM. With the Tach wire connected

and the engine running, when the Line Lock button is pressed the Line Lock solenoid(s) is turned on. The Line Lock button can be released at this point and the Line Lock will stay engaged. Then when the Burn-out is started and the engine RPM exceeds 3500 RPM the Burn-out Timer starts timing. When the count reaches zero the timer will release the Line Lock solenoid(s) allowing the vehicle to move forward.

Without the Tach wire connected, the Elite Crossover will start counting down the Burn-out Time when the Line Lock push-button is released. When the Line Lock button is pressed and held the Line Lock solenoid(s) is turned on. The engine is then brought up to the desired RPM at which time the Line Lock button is released. When the button is released the Elite Crossover will start counting down the Burn-out Time. When the count reaches zero the timer will release the Line Lock solenoid(s) allowing the car to move forward.

Line Lock Mode

The Line Lock Mode is used to select whether the Line Locks will be used only for the burnout or for both the burn-out and at the starting line. When the Line Lock Mode, is set to normal, shown as "Norm" on the screen, the Line Lock are only for the Burn-out. When the Line Lock mode is set to plus starting line, shown as "+Line" on the screen, the Line Locks work for the burn-out and with the Transbrake solenoid at the starting line. Regardless of whether in the Elite Crossover is in Pro or Bracket mode, the Line Lock mode setting works the same.

Shift Mode Screen

The Shift Mode screen is only accessible from Setup mode. The Shift Mode screen should only need to be set up once. These settings are used to tell the Elite Crossover how many shifts are needed and when a shift occurs, whether the shift output needs to apply or remove power.

Max Shift Number

The Max Shift Number is displayed on the right section of the display. The Max Shift Count is used to tell the Elite Crossover how many shifts are needed. Example, if the Max Shift Count is a 2, the Elite Crossover will only do 2 shifts. Also the Max Shift Count is used to disable any Shift Control screens that will not be used. This reduces the number of screens that have to be cycled through with the Menu switch.

NOTE: Setting the Max Shift Number to zero turns of the shift feature. This would be done when some other device is being used to shift the vehicle.

Shift Mode

The Shift Mode is used to select whether +12 Volts is applied or removed from the output for the shift. Select a setting of "LO" for shifter requiring the removal of +12Volts to shift. This would be considered Normally Closed contacts. Select a setting of "HI" for a shifter requiring +12Volts to shift. This would be considered Normally Open contacts. The Shift Mode is shown on the left section of the screen. Use any of the left side adjustment switches, to toggle between the "HI" and "LO" Shift Mode settings.

Understanding the Shift Control Screens

There are up to five Shift Control screens, one for each shift point. The number of viewable Shift Control screen is set by the Shift Max Count. When viewing a Shift Control screen the center section of the display will show "Sft" followed by the shift number you are viewing. Example if the center section of the display is showing "Sft2" you are looking at the second shift point.

Shift Points

The Shift Points are displayed on the right section of the display. In both Bracket Mode and Pro Mode the Elite Crossover can handle up to 5 shifts each pass. The 5 shifts can be made by time, RPM, or a combination of both. The shifts occur in sequence starting with Shift Number 1 and progressing to Shift Number 5. As each shift is completed the Elite Crossover checks to see if the next Shift Point setting is valid. If the next shift point is invalid the shift routine is terminated and no further shifts will occur. The only invalid RPM setting is zero. If the next Shift Point is a Time, the Elite Crossover checks to make sure that the time setting for the Shift Point is greater than the amount of time that has gone by since the release of the Transbrake. If the amount of time is not greater, the next Shift Point is invalid.

NOTE: The Elite Crossover only checks for valid shifts, for 20 seconds after the Transbrake releases. After 20 seconds the Shift routine is terminated and no further shifts will occur.

Shift by RPM or Time

The time or RPM selection for each shift is shown on the left section of the display. Elite Crossover can handle up to five shifts on each pass. These five shifts can be made by

time, RPM, or a combination of both. To select if a shift will be by time or RPM, while the shift point for the desired shift is being shown, use any of the left adjust switches to switch between time and RPM.

Changing the Shift Points

New for Elite Crossover**:** Each Shift Point now has two memory slots, one for RPM and one for time. This means the Elite Crossover will remember both the last RPM and the last time value for each Shift Point.

After making sure the correct Shift Number and time or RPM has been selected, the Shift Point can be changed using the right side adjustment switches. Each of the 4 adjustment switches controls a single digit.

Understanding the Tach Screen

Number of Cylinders

This setting is used in calculating the engine RPM for the Tach and shifting by RPM. There are 5 cylinder settings 2, 4, 6, 8, and 10. The Number of cylinders is shown on the left section of the display. Use any of the left adjustment switches to change the setting.

Tach and Peak RPM

Anytime the engine is running, the right section of the Tach screen, will function as a digital Tach, displaying the engine RPM. When the engine is shut off the Peak RPM is shown in place of the Tach. The Peak RPM value will be the highest RPM the engine has reached since the last time the Peak RPM cleared. Use any of the right side adjustment switches can be used to clear the Peak RPM resetting it to zero.

Testing the Shift Routine

First test the Shift terminal for output. The easiest way to test the shift output, is to toggle the Shift Mode (explained on page 43) between the HI and LO settings. Each time the Shift Output Mode changes states the shifter should also move. If the shifter does not move, disconnect all wires connected to the Shift terminal. Then using a Digital Volt Meter or a test light, check the Shift terminal for power. It should have 12 Volts when the Shift Output Mode is set to LO and zero Volts when the Shift Output Mode is set to HI. If the Elite Crossover passes the first test, move onto the second test. If the output does not change, check to see if the fuse for the shift output is good. If the fuse is good, contact Digital Delay.

The second test is a time shift; this checks the input side or the push-button side of the Elite Crossover. Set the Elite Crossover to a one second shift on time. After entering the shift, press and release the button connected to the P.B. 1 terminal. One second after the Transbrake releases, the shifter should move from low gear to second gear. If the Elite Crossover passes the second test continue on to the final test. If the shifter does not move, check to see if when the button connected to the P.B. 1 terminal is pressed and held that the red LED for P.B. 1 lights up. If the LED does not light check the button for proper operation and wiring from the button to the P.B. 1 terminal. If you can't find a problem with the button or the wiring, disconnect the button from the P.B. 1 terminal. Next test the P.B. 1 input, by using a short piece of wire to jump from the power stud to the P.B. 1 terminal. When the wire is connected between the two points the wire will act as a temporary button and the red LED for P.B. 1 should light up. If the LED for P.B. 1 does not light, contact Digital Delay.

The Final test is an RPM shift, this checks the Tach input. Set the Elite Crossover to shift at 3000 RPM. Then while looking at the Tach on the Elite Crossover start the engine, once started the Tach should go from Peak RPM to current engine RPM. Next while idling at 800 or more, press and release the button connected to the P.B. 1 terminal. After the Transbrake releases, the Elite Crossover will compare the Shift Point against the current engine RPM for 20 seconds. Slowly bring the engine RPM up past the 3000 RPM shift point and then back down to an idle within the 20 second limit. The shifter should move, and hold for four tenths of a second, when the RPM reaches 3000. After the four tenths of a second the Shifter should release and the Elite Crossover will move on to the second Shift Point. **If all three tests pass, all of the Elite Crossover shift features are working.**

If the Tach on the Elite Crossover does not work check the wire from the ignition box Tach output to the Tach terminal on the Elite Crossover. If the Tach is showing an RPM but seems to be off, check the Number of Cylinders setting. If you are still having problems, contact Digital Delay.

Understanding the Driver's Reaction Tester

This improved feature in the Elite Crossover allows a driver using the buttons mounted in the vehicle to test their reaction time. This feature can also be used to test different kinds of buttons and button locations in the vehicle for the quickest release possible.

To practice, for Push-button Modes 1 – 4 press and hold down the push-button connected to the P.B. 1 terminal. For Push-button Mode 5 press the button connected to P.B. 2. When the light below the Menu switch comes on, for

Push-button Modes 1 – 4 release the button being held. For Push-button Mode 5 press the button connected to P.B. 1. The Elite Crossover will now display your reaction time on the right section of the display. Keep in mind that the Reaction time does not directly correlate to the Delay times used on the Delay screen. This is because the Reaction Tester does not take into account the vehicle's roll out time. A close approximation of the vehicle's roll out can be calculated by subtracting the average of 10 passes from your normal Delay 1 time. If you take more than one practice shot while in the Driver's Reaction Tester, the left section of the display will show average reaction time. If you let go of the button too soon, before the bulb turns on, "Red" will be shown on the right section of the display to indicate a red light. If you do not let go of the button within .75 seconds after the bulb comes on, "Miss" will be shown on the right section of the display to indicate a missed light.

To exit the Driver's Reaction Test Mode, use the Menu switch. The Elite Crossover will also automatically exit the Driver's Reaction Test Mode after 30 seconds of inactivity. Each time a push-button is pressed for a practice hit, the 30 second timer resets.

The Driver's Reaction Tester can also be used to check different buttons and button locations for consistency and speed. Start by getting a reaction time average, at least 10 passes. Then compare with an average from either another push-button or the same button mounted in a different location.

NOTE: Use any of the left side adjustment switches to clear the average of the Driver's Reaction times.

NOTE: When in the Driver's Reaction Test Mode, the Transbrake solenoid will not be activated.

Understanding the
The Push-button Inputs

The buttons are used to start all timing sequences of the Elite Crossover. While up to four buttons can be connected to the Elite Crossover at one time, for the Elite Crossover to work a button must be connected to the P.B. 1 input terminal.

The Additional Button Functions Chart on page 57 shows the primary function along with any other functions for each of the buttons. The primary, second, and third function of each button is, depends on whether the Elite Crossover is in Bracket or Pro Mode and what the Push-button Mode is.

Push-button Modes

The 5 different Push-button Modes are listed below, each button mode changes how the Elite Crossover handles the input from the push-buttons to control the Transbrake, allowing the driver to select the preferred method.

1) PB Mode 1 – one hit at the tree with one button: Use this mode if you only planning on taking one hit at the tree. This is the most commonly used mode.
2) PB Mode 2 – two hits at the tree with two buttons: Use this mode if you want to take two hits at the tree with two separate buttons.
3) PB Mode 3 – two hits at the tree with one button: Use this mode if you want to take two hits at the tree with one button.
4) PB Mode 4 – two hits at the tree with one button: Use this mode if you flinch a lot at the starting line. In this mode you can cancel the first hit because of a potential red light due to a flinch and switch to a second hit.

5) PB Mode 5 – Set and Go: Use this mode if you want the start the delay timing on the press of the button instead of the release. One hit at the tree using two buttons. Explained further on page 52.

Push-button Safety Lockout

The Push-button Safety Lockout Time is a safety feature that keeps the Transbrake from being reapplied when a button is accidentally bumped or pressed during a pass. This safety feature only affects the Transbrake button(s) after the vehicle leaves the starting line. The time entered is in seconds and is the amount of time that any button used to apply the Transbrake will be disabled after the Transbrake releases. In most cases, the amount of time entered for the Safety Lockout is just long enough to get the vehicle out of low gear. This is because most Transbrake solenoids will not function in high gear. However if the vehicle's Transbrake will function in high gear, a larger time is recommended.

NOTE: A setting of 00 will turn this feature off.

Button 1 Functions

When in Bracket Mode

P.B. Mode Set to 1

This is the most commonly used setting. Press the button down when staging the vehicle, and then release the button, usually on the top yellow light. When the button is released the Elite Crossover will start counting down the Crossover/Delay 1 time.

If the button is pressed again the countdown is terminated. Then when the button is then released again the Elite Crossover will start counting down the full Crossover/Delay 1 time again. This is helpful if the driver

flinches (lets go of the button before the top yellow comes on).

P.B. Mode Set to 2

Uses two Push-buttons, one for each Delay time. With Button 1 starting the Crossover/Delay 1 time and Button 2 starting the Delay 2 time. The main benefit of this setting is, it allows two shots at the tree, in case you missed the tree with your first release. Also if the driver flinches on the first hit, Button 1 can be pressed again to avoid a red light. The downside is, having to use two separate Push-buttons at the starting line is a loss of a button input for other uses.

P.B. Mode Set to 3

Allows two shots at the tree with one button, this is usually both top yellows but can be set for top and bottom on the same side of the tree. When the button is released the first time, the Crossover/Delay 1 time starts counting down. The button is then pressed and released a second time, which starts the Delay 2 time counting down. The Transbrake will release when either of the delay times reaches zero, even if this results in a red light.

The main benefit of this setting is, it allows two shots at the tree using only one Push-button, in case you missed the tree with your first release. The downside is you cannot reset the first delay to stop a red light if you flinch. The second press of the button switches to Delay 2 while Crossover/Delay 1 time continues counting down.

P.B. Mode Set to 4

Similar to P.B. Mode 3. The main difference is that when the button is pressed the second time, the Crossover/Delay 1 time is canceled. When Button 1 is released the first time, the Crossover/Delay 1 time starts counting down. If Button 1 is then pressed a second time,

the Crossover/Delay 1 time is canceled. Then when Button 1 is released a second time, Delay 2 time starts counting down.

The Transbrake will only release on Crossover/Delay 1 if Button 1 is not pressed a second time. However if Button 1 is pressed and released a second time the Transbrake will be released when Delay 2 time reaches zero.

P.B. Mode Set to 5

This mode requires two buttons to operate the Transbrake. If the Transbrake has not already been activated, pressing Button 1 has no effect. If the Transbrake has been set by Button 2, pressing Button 1, usually on the top yellow light, starts the counting down of the Crossover/Delay 1 time.

If the button is pressed again the Elite Crossover will start counting down the full Crossover/Delay 1 time again. This is helpful if the driver flinches (presses the button before the top yellow comes on).

When in Pro Mode

P.B. Mode is set to 1, 2, 3, or 4

When the P.B. mode is set to 1, 2, 3, or 4 the Elite Crossover will automatically use P.B. Mode 1 for Pro mode. This is because P.B. modes 2, 3, and 4 won't work with a Pro Tree. Press the button down when staging the vehicle, and then release the button when the three yellow lights come on. When the button is released the Elite Crossover will start counting down the Pro Delay time.

P.B. Mode Set to 5

This mode requires two buttons to operate the Transbrake. If the Transbrake has not already been activated pressing Button 1 has no effect. If the Transbrake has been set by Button 2, when the three yellow lights on the tree come on, press the Button 1 to start the countdown of the Pro Delay time.

Button 2

When in Bracket Mode

P.B. Mode is Set to 1,3, or 4

The first function for Button 2 is to be the Back-up button. This feature is used by vehicles that require the Transbrake solenoid to be engaged to back-up. The Back-up feature is explained on page 54.

The second function for Button 4 is Multi Tap, allowing large amounts of time to be subtracted from the first delay started. The Multi Tap feature is explained on page 37.

There is no third function for Button 2 in Bracket Mode.

P.B. Mode is Set to 2

Button 2 is only used to activate Delay 2. Each time Button 2 is pressed the Transbrake solenoid is engaged and the Delay 2 time value is loaded into a counter. When the button is then released the counter starts timing down. When the counter reaches zero the Transbrake solenoid is released.

P.B. Mode is Set to 5

The only function for Button 2 is to set the Transbrake solenoid. When the button is pressed the Transbrake will engage.

There is no second or third function for Button 2 in Bracket Mode.

When in Pro Mode

P.B. Mode is Set to 1, 2, 3, or 4

The first function for Button 2 is to be the Back-up button. This feature is used by vehicles that require the Transbrake solenoid to be engaged to back-up. The Back-up feature is explained on page 49.

There is no second or third function for Button 2 in Pro Mode.

P.B. Mode is Set to 5

The only function for Button 2 is to set the Transbrake solenoid. When the button is pressed the Transbrake will engage.

There is no second or third function for Button 2 in Bracket Mode.

Button 3 Settings

When in Bracket Mode

Any P.B. Mode

The first function for Button 3 is to set the S.L.E. so the vehicle can be staged with the gas pedal fully depressed. The S.L.E. feature is explained on page 40.

The second function for Button 3 is to Tap Down, allowing time to be subtracted from the first delay started. The Tap Down feature is explained on page 36.

The third function for Button 2 is to activate the P.T.S.O., a Timer 1 Tap feature. The P.T.S.O. feature is explained on page 39.

When in Pro Mode

Any P.B. Mode

The first function for Button 3 is to set the S.L.E. so the vehicle can be staged with the gas pedal fully depressed. The S.L.E. feature is explained on page 40.

The second function for Button 3 is to activate the P.T.S.O., a Timer 1 Tap feature. The P.T.S.O. feature is explained on page 39.

There is no third function for Button 3 in Pro Mode.

Button 4 Settings

When in Bracket Mode

Any P.B. Mode

The first function for Button 4 is to activate the Burn-out Timer for the Line Lock solenoid(s). The Burn-out feature is explained on page 41.

The second function for Button 2 is Tap Up, allowing time to be added to the first delay started. The Tap Up feature is explained on page 36.

There is no third function for Button 4 in Bracket Mode.

When in Pro Mode

Any P.B. Mode

The first function for Button 4 is to activate the Burn-out Timer for the Line Lock solenoid(s). The Burn-out feature is explained on page 41.

There is no second or third function for Button 4 in Pro Mode.

Back-up Feature

If the P.B. Mode is set to 1, 3, or 4, a button connected to the P.B. 2 input can be used to back up the vehicle without starting a delay cycle. The advantage of using a Back-up button over a bypass button is the current for the Transbrake solenoid does not pass through the switch. It is possible to wire more than one switch to the P.B. 2 input. Example, a toggle switch could be used for backing up and then a separate push-button could be used for Tapping up.

Note: If a toggle switch is going to be used to activate the Back-up feature, care must be taken to remember to turn off the switch to avoid damage to the solenoid and Relay Board.

Bypass Button

If Button 2 is not going to be used to back up the vehicle, a bypass button can be used. To wire in a bypass button take one wire from your button and connect it to the Power post on the Relay Board. Then connect the other wire from the button to the Transbrake terminal on the Relay Board.

Note: The button and wiring used for the bypass button will need to be able to handle the current of the Transbrake solenoid.

Additional Button Functions Chart for Bracket Mode

Button	Push-button Mode	Section 1 Before Trans Applies	Section 2 While Trans is Applied	Section 3 After Trans Releases
1	1 and 2	Applies Transbrake Applies S.L.E. if S.L. Mode On Applies L.L. if S.L. Mode On	Restarts the Crossover Timer Restart S.L.E. Timer Reapplies L.L. if used	Resets to Section 2 and applies Transbrake Reapplies S.L.E. if used Reapplies L.L. if used
	3	Same as Above	Second Press -- Starts Delay 2 / additional presses restarts Delay 2	Same as Above
	4	Same as above	Second Press -- Cancels Delay 1 / Second release starts Delay 2	Same as Above
	5	starts the Crossover Timer	Restarts the Crossover Timer	N/A
2	1	Transbrake -- Back-up	Subtracts X times the Tap Down amount from the first delay started	N/A
	2	Applies Transbrake -- Delay 2	Restarts Delay 2	Restarts Delay 2
	3	Transbrake -- Back-up	Subtracts X times the Tap Down amount from the first delay started	N/A
	4	Transbrake -- Back-up	Subtracts X times the Tap Down amount from the first delay started	N/A
	5	Applies Transbrake Applies S.L.E. if S.L. Mode On Applies L.L. if S.L. Mode On	N/A	Restarts the Crossover Timer Restart S.L.E. Timer Reapplies L.L. if used
3	1	Applies S.L.E. if used	Tap Down -- Subtracts Tap Down amount from first delay started	P.T.S.O.
	2	Applies S.L.E. if used	Tap Down -- Subtracts Tap Down amount from first delay started	P.T.S.O.
	3	Applies S.L.E. if used	Tap Down -- Subtracts Tap Down amount from first delay started	P.T.S.O.
	4	Applies S.L.E. if used	Tap Down -- Subtracts Tap Down amount from first delay started	P.T.S.O.
	5	Applies S.L.E. if used	Tap Down -- Subtracts Tap Down amount from first delay started	P.T.S.O.
4	1	Applies Line Lock -- Burn-out	Tap Up -- adds Tap Up amount to first delay started	N/A
	2	Applies Line Lock -- Burn-out	Tap Up -- adds Tap Up amount to first delay started	N/A
	3	Applies Line Lock -- Burn-out	Tap Up -- adds Tap Up amount to first delay started	N/A
	4	Applies Line Lock -- Burn-out	Tap Up -- adds Tap Up amount to first delay started	N/A
	5	Applies Line Lock -- Burn-out	Tap Up -- adds Tap Up amount to first delay started	N/A

The Relay Board

The Relay Board is where all the electrical connections are made. The cable from the Elite Crossover plugs into the socket on the Relay board, it will only fit in one way. This is the only connection that is necessary between the two. The Relay Board has two power studs, one for ground and one for power. It also has a Tach input, four push-button inputs, and 7 fused outputs.

The Colored Status LED's.

The green LEDs are used to indicate whether the Relay Board has power and if a fuse has blown. When power is applied to the Relay Board the green LEDs will light. If power is applied, and there is an unlit green LED, the fuse for that output has blown indicating there is a problem with the wiring or the device connected to that output. Once the problem is fixed, replace the fuse with a new one.

The yellow LEDs are used to indicate which output is turned on and supplying battery power to a device.

The red LEDs are used to indicate that a button is pressed (or active).

Wiring the Power and Ground Studs

The **power stud** should be connected to a power source capable of supplying enough current to run all the devices connected to the Elite Crossover's outputs at the same time. In most cases this will either be the Master Cutoff switch or the Starter Solenoid. Use whichever one is closer to the Relay Board. The gauge of the power wire needs to be selected according to current load. To figure out your total current load, add up the individual current draw of

each device connected to an output. Then use the list below to see what gauge power wire you need.

1-15	Amps 14 gauge
16-25	Amps 12 gauge
26-40	Amps 10 gauge
41-60	Amps 8 gauge
61-80	Amps 6 gauge
81-120	Amps 4 gauge

The **power stud** can also be used as a power source for each button that is connected to any of the push-button inputs.

The **ground stud** should be connected to a non-aluminum chassis ground with a 14 gauge wire. If additional devices are going to use the ground stud as a common connection point, the 14 gauge wire going to the chassis should be increased to handle the additional current.

Wiring the Tach Input

If you are planning on shifting by RPM, the Tach input needs to be connected to the Tach output on the ignition box.

Wiring the Push-buttons

There are four push-button inputs, labeled P.B. 1, P.B. 2, P.B. 3, and P.B. 4. P.B. 1 is always the primary Transbrake push-button.

All four push-button inputs wire the same, so only P.B. 1 will be explained, follow the same procedure for the other push-buttons. Most push-buttons only have two

wires. Connect one wire to the power stud and the other wire to the P.B. 1 terminal. No other connections to the push-button wires should be made. If your push-button has three wires you will only need to use two of them. The two wires are the Common (C) and the Normally Open (N O). The Normally Closed (N C) wire is not used.

Wiring the Outputs

The Relay board has seven outputs. They are Trans, Line Lock, S.L.E., Timer 1, Timer 2, Timer 3, and Shift. Each of the seven outputs has its own fuse. The Trans, Line Lock, and S.L.E. outputs are each rated at 15 Amps max and come with a 15 Amp fuse installed on the Relay Board. The three Timer and the Shift outputs are each rated at 40 Amps max and come with a 20 Amp fuse installed on the Relay Board. Any of the 20 Amp fuses can be increased up to 40 Amps when needed. When wiring a device to any of the outputs on the Relay Board it is important to use the correct wire gauge for the current load. Use the list below to see what wire gauge is needed for the device.

1-15 Amps 14 gauge
16-25 Amps 12 gauge
26-40 Amps 10 gauge

The **Trans** terminal is the Transbrake output. The Trans output is where the Transbrake solenoid and the 2 step wire would connect.

Connect one wire from your Transbrake solenoid to the Trans terminal. Connect the other wire from the Transbrake solenoid to ground. Also connect the red wire from a 2 Step or the wire coming from the Launch terminal on the ignition box to the Trans terminal.

The **Line Lock** terminal is a dedicated output for use with a Line Lock solenoid(s). The Line Locks can be used to hold the vehicle for a timed burn-out and/or to assist the Transbrake solenoid at the starting line. If you want to use either of the Line Lock features, connect one wire from your Line Lock solenoid(s) to the Line Lock terminal. Connect the other wire from the Line Lock solenoid(s) to a ground.

The **Starting Line Enhancer** (**S.L.E.**) terminal is a dedicated output for use with a **Linkage** style Throttle Stop to control the engine RPM at the starting line. If you want to use the S.L.E. feature, connect one wire from your Linkage Stop solenoid to the S.L.E. terminal. Connect the other wire from the Linkage Stop solenoid to a ground.

If you want to use an **Air** Under the Carb Throttle Stop as an S.L.E. you can use the S.L.E. output Terminal.

If you want to use an **Electric** Under the Carb Throttle Stop as an S.L.E. you must wire in an external relay to handle the higher current of the Electric Throttle stops.

The **Timer** terminals all work the same. So only the Timer 1 will be explained. When you receive the Relay Board the Timer 1 output will have a 20 Amp fuse. This can be increased to a 40Amp fuse if more current is needed. Depending on what is being controlled by Timer 1 the Throttle mode can be set so the output will supply or remove 12 Volts. The Timer output cannot supply ground. One wire from the device needs to be connected to the Timer 1 terminal and the other wire from the device needs to be connected to ground.

Note: If the device to be controlled needs Ground, instead of +12 Volts, an additional relay will need to be installed between the device and the Relay Board.

To wire the additional relay;

Connect pin 85 to the desired Relay Board output.
Connect pin 86 and 30 to Ground.
Connect pin 87 to the device.

The **Shift** terminal is a dedicated output for use with a Shift solenoid. The Shift output can be used to shift the vehicle up to 5 times by either RPM or Time. Combinations of RPM and time can also be used. If you want to use the Shift feature, connect one wire from your Shift solenoid to the Shift terminal. Connect the other wire from the Shift solenoid to a ground.

CAUTION: Reading these instructions may cause headaches and a strong desire to sleep!

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