



# The Little Box

## Instructions

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# The Keypad

The keypad is made up of a row of five keys. Each of the five keys has three functions with the exception of the (Change/2nd) button which has only two functions. The main function of each key is shown inside the box, which is around each of the keys. The second function of each key is shown directly below each of the keys. The first two functions of each key are listed below. With the exception of the (Change/2nd) all of the keys have an arrow inside the box surrounding the key. The arrows are used when changing the value in the display. This third function is explained in Changing the Values.

## Change/2nd

The (Change/2nd) key has only two functions, which are, to put the unit into Change Value Mode, and to allow the 2nd function of the other four keys to be selected. To put the unit into Change Value Mode simply press and then release only the (Change/2nd) key. The display will now flash indicating the unit is in the Change Value Mode. The Change Value Mode is explained in Changing the Values. The selecting of a second function is done by first pressing and holding down the (Change/2nd) key. While holding down this key press one of the other keys. This will select their second function. Once a second function has been selected both keys must be released before any additional key presses will be accepted.

## Your Dial / How Late

The main function of the (Your Dial) key is, to recall and display Your Dial-in on the display. This is done by pressing and releasing only the (Your Dial) key. Once Your Dial-in is displayed it can be changed by entering into the Change Value Mode. This is explained in Changing the Values. The second function of the (Your Dial) key is to display the How Late. This is done by holding down the (Change/2nd) key and then pressing the (Your Dial) key. Once both of the keys have been pressed both must be released before any additional key presses will be accepted. The How Late is explained in greater detail in Understanding the How Late.

## Their Dial / PB Mode

The main function of the (Their Dial) key is, to recall and display Their Dial-in on the display. This is done by pressing and releasing only the (Their Dial) key. Once Their Dial-in is displayed it can be changed by entering into the Change Value Mode. This is explained in Changing the Values. The second function of the (Their Dial) key is to display the PB Mode. This is done by holding down the (Change/2nd) key and then pressing the (Their Dial) key. Once both of the keys have been pressed both must be released before any additional key presses will be accepted.

The PB Mode is explained in greater detail in Understanding the Push Button Modes. Changing the PB Mode values is explained in Changing the Values.

### Delay 1 / Tap Up/Down

The main function of the (Delay 1) key is, to recall and display Delay 1 on the display. This is done by pressing and releasing only the (Delay 1) key. Once Delay 1 is displayed it can be changed by entering into the Change Value Mode. This is explained in Changing the Values. The second function of the (Delay 1) key is to display the Tap Up/Down mode. This is done by holding down the (Change/2nd) key and then pressing the (Delay 1) key. Once both of the keys have been pressed both must be released before any additional key presses will be accepted. The PB Mode is explained in greater detail in Understanding the Tap Up/Down Modes. Changing the Tap Up/Down Mode value is explained in Changing the Values.

### Delay 2 / Reaction Tester

The main function of the (Delay 2) key is, to recall and display Delay 2 on the display. This is done by pressing and releasing only the (Delay 2) key. Once Delay 2 is displayed it can be changed by entering into the Change Value Mode. This is explained in Changing the Values. The second function of the (Delay 2) key is to enter the unit into the Driver's Reaction Test Mode. This is done by holding down the (Change/2nd) key and then pressing the (Delay 2) key. Once both of the keys have been pressed both must be released before any additional key presses will be accepted. The Driver's Reaction Tester is explained in greater detail in Understanding the Reaction Tester.

## Understanding the How Late

To display the How Late information, hold down the (Change/2nd) key and then press the (Your Dial) key. Once both of the keys have been pressed both must be released before any additional key presses will be accepted. The How Late information is shown on the display. If the Transbrake is released by Delay-1 the left most digit will be a "1". If the Transbrake is released by Delay-2 the left most digit will be blank. The remaining digits display the How Late time. For example, if the number displayed is ".012" it would mean that Delay-2 was used to release the Transbrake and Delay-1 was .012 seconds later than Delay-2. So if your reaction time was .510 on the timeslip, add the How Late time to the .510 for a total reaction time of .522 on the crossover delay.

## Understanding the Push Button Mode and the Interrupt Timer

To show the Push Button Mode and Interrupt Time, press and hold down the (Change/2nd) key and then press the (Their Dial) key. Once both of the keys have been pressed both must be released before any additional key presses will be accepted. The Push Button Mode and Interrupt time are now shown on the display. The two left most digits show the Interrupt Time, this is a programmable amount of time (0 to 99 seconds) that, after the Transbrake releases, both PB.-1 and PB.-2 push button inputs are disabled. This safety feature is to keep the driver from re-engaging the Transbrake solenoid after leaving the starting line by accidentally hitting either button. While the push buttons are disabled the display will show three dashes.

The right most digit will show either a "1" or "2" to indicate which Push Button Mode the unit is in. When in Push Button Mode 1, the push button connected to PB. - 1 starts both the primary and secondary delays in this sequence. This is normally done by releasing the button on the opponent's top yellow then pressing this same button down again, and then releasing the button a second time on your top yellow. However any set of desired lights can be used by adjusting the box's delay times (i.e., your top and bottom lights). After both delay timers have been started the delay box will take the faster of the two delays to release the Transbrake and store the slower of the two delays as the How Late time.

When in Push Button Mode 2, each button controls one of the two delays. The button connected to the PB.-1 input starts the primary, and the button connected to PB.-2 starts the secondary, delay. One or both push buttons can be used in any sequence. When in Push Button Mode 2 the Tap Up/Down feature of the box is not available.

## Understanding the Tap Up/Down Feature

The Tap Up/Down Feature allows the driver to either add or subtract a programmable amount of time from Delay 1 while the box is timing. This is done by selecting whether to add (Tap Up) or to subtract (Tap Down) and the programmable amount time (Tap amount) before staging the vehicle. Then after starting the primary delay, every time the push button connected to PB.-2 is pressed, up to nine times, the Tap amount will be either added or subtracted from the primary delay. The number of times Delay 1 is tapped in a signal pass is stored as the Tap Count.

**NOTE:** Both the How Late and Tap count information are stored in memory until a new, How Late or Tap count, replaces the old one.

# Changing the Values

## Setting Dial-In Times

To set a new Dial-In time into either Your Dial or Their Dial, press the corresponding key for Your Dial or Their Dial and the selected Dial-In will now be displayed. Next press the Change key, the display will flash indicating the unit is in Change Value Mode. While in the Change Value Mode use the four arrow keys to change the value of the Dial-In. Each arrow key changes only one digit of the Dial-In value, meaning the left most arrow key will only affect the left most digit and the second left most arrow key will only affect the second left most digit and so on for the rest of the arrow keys. Each time an arrow key is pressed, the number in its corresponding digit will increase by one (i.e., a 4 would become a 5). Once the digit has reached the value of nine it will be reset to zero the next time the arrow key is pressed. With the exception of the left most digit which can only be either a blank (meaning zero) or a one. As the numbers are changed they are shown on the display, indicating the numbers are accepted and entered into memory. Once the desired number has been entered press the Change key again to exit Change Value Mode. The Dial-In value can be set to any number from 0.00 to 19.99 seconds.

## Setting Delay Times

To set a new delay time into either Delay-1 or Delay-2, press the corresponding key for Delay-1 or Delay-2 and the selected delay will now be displayed. Next press the Change key, the display will flash indicating the unit is in Change Value Mode. While in the Change Value Mode use the four arrow keys to change the value of the delay as described in changing the Dial-In Times. The delay values can be set to any number from 0.000 to 1.999 seconds.

## Setting Push Button Mode and the Push Button Interrupt Time

To be able to change either the Button Mode or the Interrupt Time, it must first be showing on the display. To show the Push Button Mode and Interrupt Time, press and hold down the (Change/2nd) key and then press the (Their Dial) key. Once both of the keys have been pressed both must be released before any additional key presses will be accepted. The Push Button Mode and Interrupt time are now shown on the display. Next press the Change key, the display will flash indicating the unit is in Change Value Mode. While in the Change Value Mode, use the two left most arrow keys to set the Interrupt Time, to any number from 0 to 19 seconds, and use the right most arrow key to switch the unit between Push Button Modes 1 and 2.

## Setting and Displaying the Delay Bump Information

To show the Tap Up/Down information, press and hold down the (Change/2nd) key and then press the (Delay 1) key. Once both of the keys have been pressed both must be released before any additional key presses will be accepted. The Tap Up/Down Information will now be shown on the display. The right most digit shows the programmable Tap amount (1 to 9 hundredths of a second). The number on the left side of the display is the Tap Count. An arrow in top left hand side of the display is used to indicate whether the unit is in Tap Up Mode (arrow on) or Tap Down Mode (arrow off). To change either the Tap Mode or Tap Amount press the Change key, the display will flash indicating the unit is in Change Value Mode. While in the Change Value Mode, use the right most arrow key to set the Tap amount, to any number from 0 to 9 hundredth of a second, and use the left most arrow key to switch the unit between Tap Up Mode and Tap Down Mode.

## Understanding the Driver's Reaction Tester

This new feature in delay boxes allows a driver using the buttons mounted in the vehicle to test his or her reaction time. This can also be used to test different kind of buttons and locations that they are mounted in the vehicle for the quickest release possible.

To enter into the Driver's Reaction Test Mode press and hold the (Change/2nd) key and then press the (Delay 2) key. Once both of the keys have been pressed both must be released to continue. Once in Reaction Test Mode every segment on the display will be turned on, this can also be used to check for proper screen operation. Next when any push button connected to either PB.-1 or PB.-2 is pressed and held down, the screen will go blank. After 2 seconds the screen will turn back on, at which time the driver releases the push button being held. The display will now show the amount of time from when the display turned on to when the push button was released, this is the driver's reaction time. If the driver lets go of the button too soon, before the display turns on, three dashes will be shown on the screen to indicate a red light. If the driver does not let go of the button within .75 seconds after the screen turns on, the display will show all nines to indicate a missed light. To exit the Driver's Reaction Test Mode press any key on the keypad. If neither push button is pressed, the unit will automatically exit the Driver's Reaction Test Mode after 30 seconds. Each time a push button is pressed the 30 second resets.

**NOTE:** When in the Driver's Reaction Test Mode, the Transbrake solenoid will not be activated when a push button is pressed. This is to prevent any damage to the solenoid from over heating.

# Features and Specifications

## Features:

- Microprocessor controlled with large display
- Crystal controlled oscillator for extreme accuracy
- Large 5 button keypad for easy use with or without gloves
- Selectable one or two buttons to hit the tree
- Programmable Tap Up/Down with displayable Tap count
- Built-in How Late with delay used indicator
- Programmable push button lock out for safety
- Built-in Driver's Reaction Tester **\*\* NEW FEATURE \*\***
- Mounting tabs for easy installation

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## Specifications:

- Input Voltage Range: 10 to 18 Volts DC
- Transbrake Output Current: 20 Amps. continuous
- PB.-1 Current Draw: 0.1 Amps. at 12 Volts DC
- PB.-2 Current Draw: 0.1 Amps. at 12 Volts DC
- Dial-In Selection Increments: .01 Seconds
- Dial-In Selection Range: 00.00 to 19.99 Seconds
- Delay Selection Increments: .001 Seconds
- Delay Selection Range: 0.000 to 1.999 Seconds
- Push Button Lock Out Range: 0 to 19 Seconds
- Tap Up/Down Range: .01 to .09 Seconds
- Reaction Tester Range: .000 to .750 seconds
- How Late Range: .000 to .999 seconds
- Operating Temperature Range: -45 to 150 degrees F.

## The Terminal Strip

- +12 Volts:** Connect the +12 Volts terminal to a switched 12 Volt source with enough amperage capable of driving any device connected to the Transbrake Terminal.
- Transbrake:** Connect the Transbrake terminal to the Transbrake solenoid. Connect the red wire (low side) of the 2-Step here if used.
- Ground:** Connect the Ground terminal to the Neg. terminal on the battery or to a good steel ground, not aluminum.
- PB. - 1:** In Push Button Mode 1 the push button connected to PB.-1 terminal is used to control the primary delay and the secondary delay in sequence. In Push Button Mode 2 the push button connected to PB.-1 terminal is used to control only the primary delay.
- PB. - 2:** In Push Button Mode 1 the push button connected to PB.-2 terminal is used to control the Tap Up/Down feature. In Push Button Mode 2 the push button connected to PB.-2 terminal is used to control the secondary delay only.

