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Mega 475

Instruction Manual

The
MEGA 475
From
DIGITAL DELAY

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Congratulations on your purchase of the Mega 475 the latest delay box from Digital Delay. The Mega 475 is the first Delay box from Digital Delay to control a digital Dial Display board. The Mega 475 can control any Digital Delay version 2 Dial Display boards, including multiple display boards and our Dual View display boards.

To design the Mega 475 we started with the Mega 450 added the new ability to control a Dial Display board. Then we further improved the design by adding some new features and upgrading others, while retaining everything that made the original Mega 450 the bestselling Delay Box.

The Mega 475 may seem overwhelming at first. But even if you have never owned a Mega or Elite series 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 Mega 475.

Digital Delay also offers a wiring kit for the Mega 475 to help with the installation. Please call or check our website for more information.

Upgrading from a Mega 350,450, or Elite 500

If you are upgrading from a Mega 350, 450 or an Elite 500 you will find the Mega 475 is similarly laid out. The Keypad is the same and the screens are laid out in the same four-line fashion. For the most part, the six blue function keys; BRKT, Setup, Next, Clear, Up Arrow and Down Arrow, work the same. Switching between Bracket and Pro is also done in the same fashion as the earlier units. Pressing the Setup key followed by the number 9 key sets the unit in Pro Mode. Pressing the Bracket key (BRKT) sets the unit in Bracket Mode.

While there are new features in the Mega 475, the biggest change is the ability to directly control our full line of V2 Dial Display boards. Just enter a new value for Your Dial and the number is automatically displayed on the Dial Display Board.

The Mega 475 also has the Set and Go Push-button Mode. This Push-button Mode uses the press of one button to apply the Transbrake solenoid. Then on the press of a second button the timing starts counting down.

Even if you feel very comfortable with how the earlier boxes work, it is recommended you review the following upgrades to these features.

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Basic Overview

The Mega 475 is our first Delay Boxes to control a Dial Display board. When you enter a new time for Your Dial it is automatically sent to the Dial Display board. No extra control box needed. The Mega 475 is compatible with all of our version 2 Dial Display boards including multiple Dial Display boards and our Dual View Display boards. The Mega 475 also has separate Day and Night intensity settings.

The Mega 475 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 nine Bracket Mode screens and seven Pro Mode screens.

The Mega 475 has the capability to run two 4-Stage Timers at one time. The 4-Stage Timers are labeled Timer 1 and Timer 2. Each of the Timers has its own set of settings for both Bracket and Pro Modes.

The Mega 475 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 Tach and Replay Tach are accurate to 50 RPM increments. The Tach also has a built-in peak RPM feature. The Replay Tach can now store up to 9 passes for later review on the screen of the Mega 475. The Replay Tach can also store any shifts made by the Mega 475.

The Startling Line Enhancer (S.L.E.) can be set from 0.00 to 9.99 seconds in Bracket Mode. 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 set the S.L.E. or not.

The Mega 475 is the first Mega series box that allows ability to be able to Tap Up and Down in the same pass. This can be done in any Push-button Mode except 2 and 5.

Getting Started

Before using the Mega 475, a basic understanding of how the screens and keypad are structured, is needed.

Basics for the Screen and Keypad

There are two home screens, one for Bracket Mode and one for Pro Mode. The Bracket Screen is the home screen for Bracket Mode. The Bracket Screen has the Dial-ins and Delays settings. The Bracket Screen can be returned to at any time by pressing the **Bracket** key (BRKT) on the keypad. This will also put the Mega 475 into Bracket Mode. The Pro Screen is the home screen for Pro Mode. The Pro Screen can be returned to at any time by pressing the **Setup** key followed by the **Number 9** key. This will also put the Mega 475 into Pro Mode.

All of the screens have four lines of information. A line displaying " -- " indicates that feature or time is turned off. For most screens, the text is to the left of each line to tell you what value or mode setting is being displayed for that line. The exceptions are the Replay Tach and the Driver's Reaction Tester, which do not have the text.

On the far right side of the screen, Selection Arrows are used to show which line is currently selected. The **Next** key is used to move the Selection Arrows. When the **Next** key is pressed the Selection Arrows will move to the next available line on the screen. If the bottom line is selected and the **Next** key is pressed, the Selection Arrows will move to the top most available line.

If the selected line has a number value, pressing the **Clear** key will clear the number allowing a new value to be entered using the numerical keys. Also often when a line with a number value is selected, pressing the **Up Arrow** or **Down Arrow** key will cause the value to increase or decrease by one each time the Arrow key is pressed.

If the selected line has a mode setting, use the **Up Arrow** or **Down Arrow** key to change the mode settings. In a few cases the **Zero** key is used to change mode settings. Example, the **Zero** key changes Throttle mode for the Timers.

The **Setup** key is used to view other screens, each time the **Setup** key is pressed the next screen will be shown.

Note: The only way to get to the Bracket home screen is to press the Bracket (BRKT) key.

Initial Setup of the Mega 475

When the Mega 475 arrives and you turn it on, you will see the Bracket Mode Dial-In and Delay Screen. With the initial factory settings, the Mega 475 will function as a basic Crossover Delay Box, without any changes done to it.

To use the additional features of the Mega 475, information needs to be entered. There are two sets of screens, one set for Bracket Mode and one set for Pro Mode. Some of the features can only be set while in Bracket Mode. For example, the S.F.O. Mode is only accessible when in Bracket Mode. For this reason it is recommended that you setup the Bracket Mode screens first. Once the initial settings have been entered, most will not need to be changed unless the setup of the vehicle is changed.

Setting Bracket & Pro Mode Screens

The next section of the instructions will list what is on each line of the 9 Bracket screens (pages 12-19) and the 6 Pro screens (pages 20- 24). Also listed, are which keypad keys are used, to change the value or setting for each line.

The Dial-In and Delay Screen

Bracket Mode Screen 1

The Dial-in and Delay screen is the "home" Bracket Mode screen. Press the **BRKT** key to return to this screen at any time. This screen is where you enter your dial-in and delay times.

The **Selection Arrows** on the right side of the screen are used to show the line that is currently selected.

Use the **NEXT** key to change the selected line.

Your Dial

Use the **CLEAR** key, then use the **NUMERICAL** keys to enter a time. Or use the ↑ or ↓ key to increase or decrease the time by one. Dial Display explained page 43.

Their Dial

Use the **CLEAR** key, then use the **NUMERICAL** keys to enter a time. Or use the ↑ or ↓ key to increase or decrease the time by one.

Delay 1

Use the **CLEAR** key, then use the **NUMERICAL** keys to enter a time. Or use the ↑ or ↓ key to increase or decrease the time by one.

Delay 2 (used for second hit at the tree)

Use the **CLEAR** key, then use the **NUMERICAL** keys to enter a time. Or use the ↑ or ↓ key to increase or decrease the time by one.

The Delay 2 line is only used with Push-button Modes 2, 3, or 4.

Press the **SET UP** key to go to the Special Functions Screen 1.

Special Functions Screen 1

Bracket Mode Screen 2

The Tap features allow you to make adjustments to the Delay time, as it is being counted down. The How Late shows the amount of time that was remaining on the unused Delay when taking two shots at the tree. The Push-button Mode controls how the Mega 475 handles the push-buttons to start a pass. The S.F.O. Mode controls what the S.F.O terminal will function as. Example, Mode 3 is Line Lock control.

The **Selection Arrows** on the right side of the screen are used to show the line that is currently selected.

Use the **NEXT** key to change the selected line.

Tap Up / Down

Use the **CLEAR** key, then use the **NUMERICAL** keys to enter a time. Or use the ↑ or ↓ key to increase or decrease the time by one.

How Late (Only used when taking two shots at the tree)

Use the **CLEAR** key, to clear both the How Late information and the Tap Count.

P.B. Mode and Interrupt Time

Use the **CLEAR** key, then use the **NUMERICAL** keys to enter a Push-button Interrupt time. Use the ↑ or ↓ key to change the P.B. Mode.

S.F.O. Mode

The S.F.O. modes are 1 – 5, use the ↑ or ↓ key to increase or decrease the value by one.

Press the **SET UP** key to go to the Special Functions Screen 2.

Special Functions Screen 2

Bracket Mode Screen 3

This screen has settings for the S.L.E. (Starting Line Enhancer), P.T.S.O. (Programmable Throttle Stop Override), Timer 1 Range and Timer 2 Range. The Timer ranges adjust whether a Timer can be programmed down to a Thousandth or Hundredth of a second.

The **Selection Arrows** on the right side of the screen are used to show the line that is currently selected.

Use the **NEXT** key to change the selected line.

S.L.E.

Use the **CLEAR** key, then use the **NUMERICAL** keys to enter a time. Use the ↑ or ↓ key to turn starting line mode on or off. Hold the **ZERO** key down to change the S.L.E. Throttle Mode.

P.T.S.O

Use the **CLEAR** key, then use the **NUMERICAL** keys to enter a time. Or use the ↑ or ↓ key to increase or decrease the time by one. All zero's shown as (--) is off.

Timer 1

Use the ↑ or ↓ key to switch the Timer 1 range between high "HI" and low "LO" modes.

Timer 2

Use the ↑ or ↓ key to switch the Timer 2 range between high "HI" and low "LO" modes.

Press the **SET UP** key to go to the Timer 1 screen.

Timer 1 and 2 Screens

Bracket Mode Screens 4 and 5

The next two screens are the 4-Stage Timer screens. All of the Timer screens are adjusted in the same way. The Timer 2 screen is only accessible when the S.F.O. mode is set to 2.

The **Selections Arrow** on the right side of the screen are used to show the line that is currently selected.

Use the **NEXT** key to change the selected line.

Stage 1

Use the **CLEAR** key, next use the **NUMERICAL** keys to enter a time. Or use the ↑ or ↓ key to increase or decrease the time by one.

Stage 2

Use the **CLEAR** key, next use the **NUMERICAL** keys to enter a time. Or use the ↑ or ↓ key to increase or decrease the time by one.

Stage 3

Use the **CLEAR** key, next use the **NUMERICAL** keys to enter a time. Or use the ↑ or ↓ key to increase or decrease the time by one.

Stage 4

Use the **CLEAR** key, next use the **NUMERICAL** keys to enter a time. Or use the ↑ or ↓ key to increase or decrease the time by one.

To change the **Throttle Mode**, hold down the **ZERO** key for 2 seconds, explained on page 38.

Use the **SET UP** key to get to the Shift Control screen.

Shift Control

Bracket Mode Screen 6

The Mega 475 can handle up to 5 shifts by time or RPM in a single pass.

The **Selection Arrows** on the right side of the screen are used to show the line that is currently selected.

Use the **NEXT** key to change the selected line.

Tach

Displays engine RPM when running. When the engine is not running, displays the Peak RPM. This is the highest RPM the engine reached, since the last time the Peak RPM was cleared. Use the **CLEAR** key, when the engine is off to clear the Peak RPM.

Shift Point

Use the **CLEAR** key, then use the **NUMERICAL** keys to enter a Shift Point. Or use the ↑ or ↓ key to increase or decrease the Shift Point value by one.

Number of Cylinders

Settings of 4, 5, 6, 8, 10, and 12 are available. Use the ↑ or ↓ key to select the desired setting.

Shift mode

Use the ↑ to select the Shift mode HI or LO. The Shift Mode can only be changed when Shift 1 is displayed. Use the **ZERO** key to change which Shift 1 through 5 is being displayed. Use the ↓ key to select if the shift will be by time or RPM for the displayed shift.

Press the **SET UP** key to go to the Dial Display Intensity Control screen.

Dial Board Intensity Control

Bracket Mode Screen 7

The Mega 475 has separate Day and Night intensity settings. Values from zero (Off) to six, the brightest, can be set for both Day and Night.

The **Selection Arrows** on the right side of the screen are used to show the line that is currently selected.

Use the **NEXT** key to change the selected line.

Day Intensity Setting (Top Line)

Use the ↑ or ↓ key to increase or decrease the intensity value by one. A zero turns off the Day Dial Display Controller feature of the Mega 475.

Night Intensity Setting (2nd Line)

Use the ↑ or ↓ key to increase or decrease the intensity value by one. A zero turns off the Night Dial Display Controller feature of the Mega 475.

Note: To turn off the Dial Display control part of the Mega 475, set the intensity setting for both Day and Night to zero. This would be done if the Mega 475 is not connected to a Dial Display or if there is communication failure that can't be resolved.

Press the **SET UP** key to go to the Driver's Reaction Tester screen.

The Driver's Reaction Tester Screen

Bracket Mode Screen 8

This screen allows you to test your reaction time using the push-buttons mounted in the vehicle. When this screen is first displayed, everything on the screen is turned on at the same time. This is a quick way to check for full functionality of the display. To practice, for Push-button Modes 1 – 4 press and hold down a push-button connected to either the P.B. 1 or P.B. 2 terminal. For Push-button Mode 5 press the button connected to P.B. 2. The screen will go blank. Then when the screen displays eights on the screen, release the button. 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 Mega 475 will now display your reaction time. Keep in mind that the reaction time does not directly correlate to the Delay times used on the Dial-in and Delay screen. This is because the Reaction Tester does not take into account the vehicle's roll out time.

NOTE: While using the Driver's Reaction Tester, the Transbrake solenoid will not be activated. This is to prevent any damage to the solenoid from over-heating.

Reaction Time (Top Line)

This is your current reaction time while practicing.

Average (2nd Line)

This is your average reaction time this session. The **Clear** key can be used to clear the Average time on the Driver's Reaction Tester Screen.

Note: After 30 seconds of non-use the Mega 475 will automatically return to the Dial-In and Delay Screen.

Press the **SET UP** key to go to the Replay Tach screen.

The Replay Tach Screen

Bracket Mode Screen 9

This screen allows you to review the last 9 recorded passes you made.

Note: The Replay Tach screen can only be viewed when the engine is not running. If the engine is started while viewing the Replay Tach the Mega 475 will automatically return to the Dial-in and Delay screen.

Replay Tach

This is the recorded engine RPM, for the time shown on the next line.

Time

The time is in relation to the release of the Transbrake solenoid. To jump to a specific time, use the **CLEAR** key, then use the **NUMERICAL** keys to enter the time. Or use the ↑ or ↓ key to scroll through the pass.

Pass #

This is the pass being viewed. With 1 being the last pass and 9 being 9 passes ago. Use the **NEXT** key to select the desired pass to replay.

Shift #

The shifts can be directly viewed by pressing the **NUMERICAL** keys 1 through 5. Pressing the **Zero** key will return you to the starting line RPM.

Press the **SET UP** key to go to the Tap / Multi Tap and How Late Screen.

The Pro Screen

Pro Mode Screen 1

The Pro screen is the "home" Pro Mode screen. Press the **SET UP** key followed by the **9** key to return to this screen at any time. This screen allows you quick access to the values needed most for Pro light racing. Your Delay, first Shift Point, and the first two Stage Times for Timer 1.

The **Selection Arrows** on the right side of the screen are used to show the line that is currently selected.

Use the **NEXT** key to change the selected line.

Shift 1

Use the **CLEAR** key, then use the **NUMERICAL** keys to enter a time. Or use the ↑ or ↓ key to increase or decrease the time by one.

Stage 1 (Timer 1)

Use the **CLEAR** key, then use the **NUMERICAL** keys to enter a time. Or use the ↑ or ↓ key to increase or decrease the time by one.

Stage 2 (Timer 1)

Use the **CLEAR** key, then use the **NUMERICAL** keys to enter a time. Or use the ↑ or ↓ key to increase or decrease the time by one.

Delay

Use the **CLEAR** key, then use the **NUMERICAL** keys to enter a time. Or use the ↑ or ↓ key to increase or decrease the time by one.

Press the **SET UP** key to go to the Pro Mode Timer 1 screen.

Timer 1 and 2 Screens

Pro Mode Screens 2 and 3

The next two screens are the 4-Stage Timer screens. All of the Timer screens are adjusted in the same way. The Timer 2 screen is only accessible when the S.F.O. mode is set to 2.

The **Selections Arrow** on the right side of the screen are used to show the line that is currently selected.

Use the **NEXT** key to change the selected line.

Stage 1

Use the **CLEAR** key, next use the **NUMERICAL** keys to enter a time. Or use the ↑ or ↓ key to increase or decrease the time by one.

Stage 2

Use the **CLEAR** key, next use the **NUMERICAL** keys to enter a time. Or use the ↑ or ↓ key to increase or decrease the time by one.

Stage 3

Use the **CLEAR** key, next use the **NUMERICAL** keys to enter a time. Or use the ↑ or ↓ key to increase or decrease the time by one.

Stage 4

Use the **CLEAR** key, next use the **NUMERICAL** keys to enter a time. Or use the ↑ or ↓ key to increase or decrease the time by one.

To change the **Throttle Mode**, hold down the **ZERO** key for 2 seconds, explained on page 38.

Use the **SET UP** key to get to the Shift Control screen.

Shift Control

Pro Mode Screen 4

The Mega 475 can handle up to 5 shifts by time or RPM in a single pass.

The **Selection Arrows** on the right side of the screen are used to show the line that is currently selected.

Use the **NEXT** key to change the selected line.

Tach

Displays engine RPM when running. When the engine is not running, displays the Peak RPM. This is the highest RPM the engine reached, since the last time the Peak RPM was cleared. Use the **CLEAR** key, when the engine is off to clear the Peak RPM.

Shift Point

Use the **CLEAR** key, then use the **NUMERICAL** keys to enter a Shift Point. Or use the ↑ or ↓ key to increase or decrease the Shift Point value by one.

Number of Cylinders

Settings of 4, 5, 6, 8, 10, and 12 are available. Use the ↑ or ↓ key to select the desired setting.

Shift mode

Use the ↑ to select the Shift Mode HI or LO. The Shift Mode can only be changed when Shift 1 is displayed. Use the **ZERO** key to change which Shift 1 through 5 is being displayed. Use the ↓ key to select if the shift will be by time or RPM for the displayed shift.

Press the **SET UP** key to go to the Driver's Reaction Tester screen.

The Reaction Tester Screen

Pro Mode Screen 5

This screen allows you to test your reaction time using the push-buttons mounted in the vehicle. When this screen is first displayed, everything on the screen is turned on at the same time. This is a quick way to check for full functionality of the display. To practice, press and hold down the push-button connected to the P.B. 1 terminal. If the Mega 475 is in Push-button Mode 5, press the button connected to P.B. 2. The screen will go blank. Then when the screen displays eights on the screen, release the button or for Push-button Mode 5 press the button connected to P.B. 1. The Mega 475 will now display your reaction time. Keep in mind that the reaction time does not directly correlate to the Delay time used on the Pro screen. This is because the Reaction Tester does not take into account the vehicle's roll out time.

NOTE: While using the Driver's Reaction Tester, the Transbrake solenoid will not be activated. This is to prevent any damage to the solenoid from over-heating.

Reaction Time (Top Line)

This is your current reaction time while practicing.

Average (2nd Line)

This is your average reaction time this session. The **Clear** key can be used to clear the Average time on the Driver's Reaction Tester Screen.

Note: After 30 seconds of non-use the Mega 475 will automatically return to the Dial-In and Delay Screen.

Press the **SET UP** key to go to the Replay Tach screen.

The Replay Tach Screen

Pro Mode Screen 6

This screen allows you to review the last 9 recorded passes you made.

Note: The Replay Tach screen can only be viewed when the engine is not running. If the engine is started while viewing the Replay Tach the Mega 475 will automatically return to the Pro screen.

Replay Tach

This is the recorded engine RPM, for the time shown on the next line.

Time

The time is in relation to the release of the Transbrake solenoid. To jump to a specific time, use the **CLEAR** key, then use the **NUMERICAL** keys to enter the time. Or use the ↑ or ↓ key to scroll through the pass.

Pass #

This is the pass being viewed. With 1 being the last pass and 9 being 9 passes ago. Use the **NEXT** key to select the desired pass to replay.

Shift #

The shifts can be directly viewed by pressing the **NUMERICAL** keys 1 through 5. Pressing the **Zero** key will return you to the starting line RPM.

Press the **SET UP** key to go to the Pro Screen.

Understanding the Dial-ins and Delays

The Dial-in and Delay Screen displays both of the Dial-in times and both of the Delay 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 Mega 475 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 Mega 475 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 Mega 475 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 line 4 of the Tap / Multi Tap & How Late screen.

Note: No Delay Box including the Mega 475 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 Special Functions Screen 1

Tap Amount

The Tap amount is shown by right two digits on the top line. This value will be used for both the Tap Up amount and the Tap Down amount. Any number from .000 to .099 can be used for the Tap amount. The Tap amount only effects the first delay started.

Tap Count

The Tap Count is shown by the left digit on the top line. The count is used to show how many times the Tap Up, Tap Down, or a combination of the Tap push-buttons were pressed. The next digit on the top line will either be blank (up) or show a minus sign (down) to indicate if the Tap Amount was added or subtracted from the first delay started.

Because you can Tap Up and Down in a single pass and the Tap amount is the same for both, the Tap count will show a sum of the Taps. Example if the Tap Amount is 07 and the Tap Up button was pressed once (+1) and the Tap Down button was pressed twice (-2) the sum is -1. This would be shown on the screen as 1-07 indicating that the result was one Tap Down and .007 was subtracted from the delay time.

The Tap Count is stored until the next time the Transbrake is used. If neither the Tap Up or Tap Down buttons are used during a pass the Tap Count will be zero.

Tap Up

The Tap Up feature is used to keep from red lighting if you released the Transbrake push-button too early. The Tap Amount shows the amount of time that will be added each time the Tap Up button is pressed. The push-button

connected to the (Line Lock Push-button) L.L.P.B. 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 Tap Amount shows the amount of time that will be subtracted each time the Tap Down button is pressed. The push-button connected to the Tap P.B. input is the Tap Down push-button.

How Late

The How Late is only enabled when the Push-button Mode is set to either 2 or 3. In either of these two cases the Mega 475 is set up to take two shots at the tree. When both Delay 1 and Delay 2 are counting down at the same time, a How Late time is automatically generated at the release of the Transbrake solenoid. The left digit is the Delay Used. Delay Used indicates which delay that was used to release the Transbrake solenoid, by displaying either a 1 for Delay 1 or a 2 for Delay 2. The rest of the digits are the How Late time. The How Late time shows how much later the Transbrake would have released using the other delay time. For example if the Delay Used 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.

Note: No Delay box including the Mega 475 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.

Note: The Mega 475 updates the Tap and How Late information each pass. So there is no need to manually clear the Tap Count and How Late.

If you want to manually clear the Tap Count and How Late information, the Selection Arrows need to be on the second line, and then press the CLEAR key.

Push-button Mode and Interrupt Time

There are 5 different Push-button Modes listed below, including Set and Go which sets the Transbrake on the press of button and starts the counting down on the press of a second button. Each button mode changes how the Mega 475 handles the input from the push-buttons to activate 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 31.

In P.B. Mode 1 only Push-button 1 is used to apply the Transbrake. Every time the button connected to the P.B. 1 input is pressed, the transbrake solenoid is applied and the Cross time (dial-in difference + Delay 1) is reset to the starting point. When the button is released the delay time starts counting down. If the button is pressed and released again before the Transbrake releases the Mega 475 will restart the full delay sequence again. This can be very helpful if you flinch and let go of the push-button before the tree comes on.

In P.B. Mode 2 Push-button 1 and Push-button 2 can be used to apply the Transbrake. P.B. 1 is used to control the Cross time (dial-in difference + Delay 1) and P.B. 2 to control Delay 2. If you flinch, either timer can be reset just like P.B. Mode 1, with P.B. 1 restarting the Delay 1 time and P.B. 2 restarting the Delay 2 time.

In P.B. Mode 3 only Push-button 1 is used to apply the Transbrake. When the button connected to the P.B. 1 input is pressed, the transbrake solenoid is applied and the Cross time (dial-in difference + Delay 1) is reset to the starting point. When the button is released the Cross time starts counting down. If the button is pressed again the Delay 2 time is reset to the starting point. When the button is released the second time the Delay 2 time starts counting down. Whichever timer reaches zero first releases the Transbrake solenoid and generates a How Late time.

If you flinch, you can't restart Cross time. This means if you let go of the push-button before tree comes on you will red light. This is the only drawback to using one button for two shots at the tree.

In P.B. Mode 4 only Push-button 1 is used to apply the Transbrake. When the button connected to the P.B. 1 input is pressed, the Transbrake solenoid is applied and the

Cross time (dial-in difference + Delay 1) is reset to the starting point. When the button is released the Cross time starts counting down. If the button is pressed again the Delay 2 time is set to the starting point and the counting down of the Cross time is canceled to keep from red lighting. When the button is released the second time the Delay 2 time starts counting down. When the Delay 2 timer reaches zero the Transbrake solenoid is released.

In P.B. Mode 5 the push-button connected to the P.B. 2 terminal is used to apply the Transbrake and set the Cross time (dial-in difference + Delay 1) to the starting point. When the button connected to the P.B. 1 input is pressed, the Cross time starts counting down. If the button is pressed again the again before the Transbrake releases the Mega 475 will restart the full delay sequence again. This can be very helpful if you flinch and press the push-button before the tree comes on.

Push-button Interrupt Time

The Push-button Interrupt 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 in Push-button Interrupt Time is just long enough to get the vehicle out of low gear. This is because most Transbrakes 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.

S.F.O. Mode

S.F.O. stands for Selectable Function Output. This mode is used to control what the function of the S.F.O. output is. There are five different S.F.O. modes (1-5) listed below.

1) S.F.O. Mode 1 – Sets the S.F.O. output terminal to function as a Starting Line Enhancer (S.L.E.). This is the most commonly used mode.
2) S.F.O. Mode 2 – Sets the S.F.O. output terminal to function as the second 4 Stage Timer (T2). Only when the S.F.O. mode is set to 2 will the Timer 2 screen be available.
3) S.F.O. Mode 3 – Sets the S.F.O. output terminal to function as a Line Lock Control. This allows the Line Locks to be used for a burnout and at the starting line.
4) S.F.O Mode 4 – Sets the S.F.O. output terminal to function as a spare Transbrake output. This can be used if the main Transbrake output was damaged by a short.
5) S.F.O Mode 5 – Turns the S.F.O. output terminal off.

Note: If the S.F.O. terminal is not going to be used, set the S.F.O. mode to 5.

The Line Lock Control is only set in Bracket Mode but works the same in both Bracket Mode and Pro Mode. When Line Lock Control is enabled, the Line Locks are activated by themselves for a burn-out using the Line Lock push-button. The Line Locks are activated again with the Transbrake solenoid when the vehicle is staged.

Understanding the Special Functions Sreen 2

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 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 starting line setting 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 Delay time is counting down. While the Transbrake Delay time is counted down the Mega 475 compares the S.L.E time to the remaining Delay time. When the Delay time becomes less than the S.L.E. time the S.L.E. Output is turned off and the engine is returned to full throttle.

Any value between 0.00 and 9.99 can be used as a S.L.E. time. A typical S.L.E. value is eight tenths (0.800). This setting will open the throttle eight tenths (0.800) of a second before the Transbrake releases. If the motor does not get up against the 2 Step in this amount of time, an S.L.E. value greater than eight tenths (0.800) should be used.

If all nines (9.99) are entered the throttle will open up as soon as the **Transbrake push-button is released.** If all zeros (0.00) are entered the throttle will open up **when the Transbrake releases.**

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, at which time the S.L.E. waits about 1/4 of a second for the Transbrake to fully engage then turns off, and the engine is returned to full throttle.

Note: Pressing the Seven key while the S.L.E is activated, cancels the S.L.E. and returns full throttle control.

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. With the S.L.E. line selected, the S.L.E. Throttle Mode is changed by holding down the **ZERO** key until the output changes states.

S.L.E. Starting Line Mode

The Starting Line Mode only affects the S.L.E. in Bracket Mode. When turned on and in any P.B. Mode except 5, the S.L.E. will activate with the Transbrake solenoid or the Tap Down button. 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. With the S.L.E. line selected, use the ↑ or ↓ key to turn the starting line mode on or off. When turned on an "**L**" will be displayed just before the S.L.E. time.

Note: When in P.B. 5 the Starting Line Mode is forced to off.

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 either or both Stages 2 and 4 of Timer 1.

After the Transbrake releases, the Mega 475 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. Each time the Tap Down button is pressed while in either Stage 3 or 4, the P.T.S.O. time amount is subtracted from Stage 4.

Note: To turn off the P.T.S.O. enter all zeros for the P.T.S.O. value. When off, " -- " will be displayed.

Timer 1 Range

Each 4-Stage Timer also has a Timer Range setting. The Timer 1 range setting is used to control whether Timer 1 Stages 1 and 2 go from 0.000 to 9.999 or 00.00 to 99.99 seconds. With "LO" = X.XXX and "HI" = XX.XX. Stages 3 and 4 can't be changed and are always 00.00 to 99.99 seconds.

Timer 2 Range

The Timer 2 range setting works just like the Timer 1 range setting, but effects Timer 2 Stages 1 and 2.

Understanding the Timers

Both the Timers in the Mega 475 are 4-Stage Timers. The 4-Stage Timers are used to control down-track events, using a pre-programmed time. Some examples of what a 4-Stage Timer may control are Throttle Stops, Nitrous solenoids, a Lockup Converter, Electrically controlled shocks, and Lean-out Valves.

Note: Timer 1 is always available, but Timer 2 is only available when the S.F.O. mode is set to 2.

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

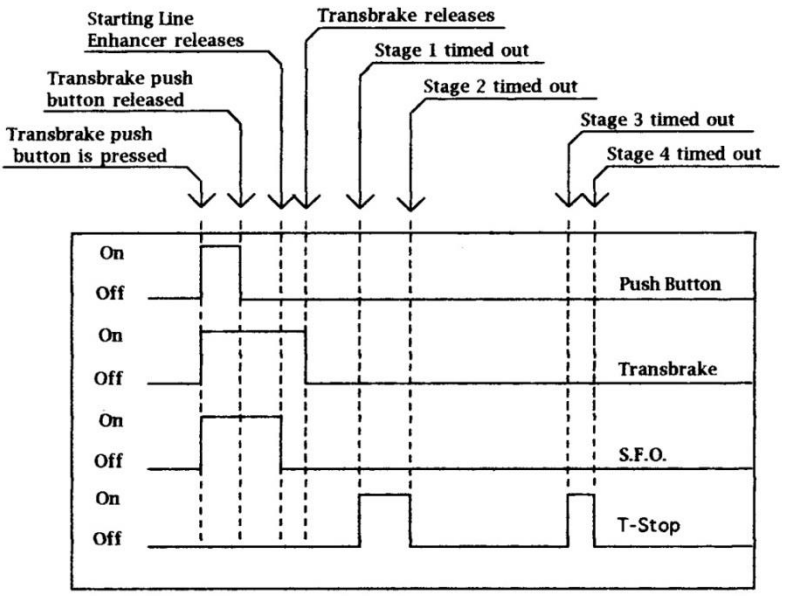
Timing of a 4-Stage Timer starts at the release of the Transbrake solenoid. When the Transbrake releases, the times for both Stages 1 and 3 start counting down. At the completion of Stage 1, the time for Stage 2 starts counting down and at the completion of Stage 3, the time for Stage 4 starts counting down. Additionally, the Stage 3 time must be greater than the Stages 1 and 2 times added together. If the Stage 3 time is less than the total of Stages 1 and 2 added together, or if Stages 3 and 4 are set to zero, Stages 3 and 4 will be turned off.

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). Stages 3 and 4 can be used to repeat what Stages 1 and 2 did further down the track. Using only Stages 1 and 2 an example is, if a Throttle Stop is being used, 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. Another example using only Stages 1 and 2 is, if Nitrous is being used, 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.

The Chart below shows the operation of the 4-Stage Timer in relation to the release of the Transbrake solenoid.

Crossover Delay = 01.35
Starting Line Enhancer = 00.40
Timer 1 = 1.000
Timer 2 = 2.000
Timer 3 = 08.00
Timer 4 = 00.50



Understanding Throttle Mode

The Throttle Mode is used to control whether the output will supply 12 Volts (On) or remove 12 Volts (Off) for the Stages. Each 4-Stage Timer has a Throttle Mode associated with it. The Throttle Mode has two settings shown as on/off/on/off or off/on/off/on. The Throttle Mode for each Timer is displayed vertically down the right side of the screen next to the time for the corresponding Stage. A Stage set to *on*, indicates +12Volts out for that Stage. A Stage set to *off* indicates no Voltage out for that Stage. For example, if next to Stage 1 the Throttle Mode is 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.

To change the Throttle Mode on any 4-Stage Timer screen, hold down the Zero key for two seconds.

Canceling a Timing Cycle Using the Clear Key

Pressing the clear key after the Transbrake has released, will cancel any push-button interrupt time, stage timers, and shift points that have not completed.

When using the clear key to cancel a timing cycle, great care should be taken to insure that the clear key is pressed before completion of both the shifter and the stage timers cycles. If the clear key is pressed after completion of both the shifter and stage timers cycles, the Mega 350/450 will be in data entry mode and clear key will function normally causing the currently selected line on the screen to be blanked.

Understanding the Shift Control Screen

Tach and Peak RPM

Anytime the engine is running, the top line of the Shift control screen will function as a digital Tach, displaying the engine RPM. When the engine is shut off the Peak RPM is shown on the display 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. To clear the Peak RPM, move the selection arrows to line 1 using the Next key. While the selection arrows are on line 1, pressing the Clear key clears the Peak RPM resetting it to zero.

Shift Points

The Shift Points are displayed on the second line. In both Bracket Mode and Pro Mode the Mega 475 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 Mega 475 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 Mega 475 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. This means that for vehicles that require only one shift, the driver should set the second Shift Point to zero regardless if the shift is by RPM or Time.

Note: The Mega 475 only checks for valid shifts, for 20 seconds <u>after</u> the Transbrake releases.

Number of Cylinders

This setting is used by the Tach, RPM shift, and the Replay Tach in calculating the engine RPM.

Shift Number

The Shift Number is displayed on the right side of line 4 and corresponds to the displayed Shift Point, which means if the Shift Number was a 2, the Shift Point for the second shift is being displayed on line 2. To view all of the Shift Points, move the selection arrows to line 4 using the **NEXT** key. With the selection arrows on line 4, each time the **ZERO** key is pressed and released the Shift Number will increase by one and the corresponding Shift Point will be displayed on line 2. If the Shift Number is five and the Zero key is pressed and released, the Shift Number will be set to one.

Shift Mode (Down Arrow key)

The Shift Mode is used to select whether +12 Volts is applied or removed from the output for the shift. Select the setting "LO" (Normally Closed) for shifter requiring the removal of +12Volts to shift. Select the setting "HI" (Normally Open) for a shifter requiring +12Volts to shift. The Shift Mode can only be changed when viewing the first shift. To change the Shift Output, while the Shift Number is set to one and the selection arrows are on line 4, press and release the Down Arrow key. Each time the Down Arrow key is pressed and released the Shift Output Mode will toggle between the "HI" and "LO" settings.

Shift by RPM or Time (Up Arrow key)

The Mega 475 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 selection arrows are on line 4, press and release the Up Arrow key. Each time the Up Arrow key is

pressed and released the Shift will toggle between either an RPM or a Time shift. On line two, as the Shift is toggled between RPM and Time, the text TIME and a decimal will be shown for a Time shift or the text RPM for an RPM shift.

Changing the Shift Points

After making sure the correct Shift Number and Shift Mode has been selected, the Shift Point can be adjusted in three ways.

The first way is using the ↑ or ↓ key. To use the ↑ or ↓ key to adjust the Shift Point, the selection arrows must first be on line 2. Then use either the Up arrow key, to scroll up, or the Down arrow key to scroll down.

The second way to change the Shift Point is by using the Clear key while the selection arrows are on line 2. Press and release the Clear key, the display line 2 will go blank indicating the unit is ready to accept the new Shift Point. Now using numerical keys enter the new Shift Point, leading zeros do not have to be entered. For example if a time of 2.35 for a Shift Point was desired 235 would be entered on the keypad. If less than four digits are entered for a Shift Point, pressing the Next key will act as an enter key and the leading zeros will be displayed on the LCD. As the numbers are entered they are shown on the display, indicating the numbers are accepted and entered into memory. If a mistake is made while entering the Shift Point, press and release the Clear key and re-enter the Shift Point again.

The last way to change the Shift Point is by using the Clear key while the selection arrows are on line 4. The only difference in using the Clear key from line 4 as opposed to line 2 is that when the Clear key is pressed and released the selection arrows will be displayed on both line 2 and line 4. This is to indicate that line 2 is being updated from line 4.

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 the previous page) 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 Mega 475 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 Mega 475. Set the Mega 475 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 Mega 475 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 text "Transbrake On" comes up on the screen. If the text "Transbrake On" does not come on 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 ground terminal 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 text "Transbrake On" should come on. If not, contact Digital Delay.

The Final test is an RPM shift, this checks the Tach input. Set the Mega 475 to shift at 3000 RPM. Then while looking at the Tach on the Mega 475 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 Mega 475 will compare the Shift Point against the current engine RPM for 20 seconds. So 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 Mega 475 will move on to the second Shift Point. **If all three tests pass, all of the Mega 475 shift features are working.** If the Tach on the Mega 475 does not work check the wire from the ignition box Tach output to the Tach terminal on the Mega 475. If the Tach is showing an RPM but seems to be off, check the Number of Cylinders setting on line 3. If you are still having problems, contact Digital Delay.

Understanding Dial Board Control

When Your Dial is selected on the Mega 475 using the Selection Arrows, after a short pause, Your Dial time will flash between the 3 dashes and the dial amount. While Your Dial is flashing, the Dial Display Board will show 3 dashes indicating the Dial-in is being updated. Once you are done updating Your Dial, press the NEXT key to enter and send the new Dial time to the Dial Display.

The Dial Display board has two separate intensity settings, one for Day and one for Night. Both the Day and Night settings have seven intensity levels 0 – 6, with zero being off and six being the brightest. Line 1 of screen 7 is the Day setting and line 2 is the Night setting. The Night intensity setting is used when the tan wire is supplied power. The Day intensity setting is used when power is removed

from the tan wire or if the tan wire is left disconnected. Typically the tan wire is connected to the Taillight circuit. Then anytime the taillight is turned on the Night intensity level is used and when the taillight is off the Day intensity level is used.

Turning off the Dial Board Feature

Selecting an intensity level of zero for both the Day and Night settings turns off the Dial Controller part of the Mega 475. This should be done anytime the Mega 475 is being used without a dial board, to keep from getting constant error messages.

Error Messages

In the event of a communication error between the Mega 475 and the Dial Display board, the bottom line on the Mega 475 screen will flash between three dashes and an error code number.

E-01: A "No Board" error code of 1 shown as E-01 on the screen, means the Mega 475 cannot detect the Dial Display board. This can be caused by the Dial Display not having power, or there is a problem with the purple wire not making connection between the Mega 475 and the Dial Display board.

E-02: A "Communication Fail" error code of 2 shown as E-02 on the screen, means the Dial Display board not receiving good data. This is usually caused by a problem with the blue wire not making connection between the Mega 475 and the Dial Display board.

A error code of Err shown on the Dial Display, is caused by a problem with the blue wire not making connection between the Mega 475 and the Dial Display board.

Understanding the Driver's Reaction Tester

This exclusive Digital Delay feature allows a driver using the buttons mounted in the vehicle to test their reaction time. The Driver's Reaction Tester in the Mega 475 has been improved and now keeps and displays an average of your reaction time while practicing. The Reaction Tester feature can also be used to test different kinds of buttons and button locations in the vehicle for the quickest release possible.

To practice, press and hold down a push-button connected to the P.B. 1 terminal, the screen will go blank. After 2 seconds all eights will be shown on the screen, at which time the driver releases the push button being held. The display will now show the amount of time from when the eights were displayed 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, 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 eights are displayed, the display will show reaction time of all nines to indicate a missed light. If you take more than one practice shot while in the Driver's Reaction Tester, line 2 will display the average reaction time. If the Mega 475 is in P.B. Mode 2 the button connected to the P.B. 2 terminal can also be used to practice with.

Keep in mind that the Reaction time does not directly correlate to the Delay times used on the Dial-in and Delay screen. This is because the Reaction Tester does not take into account the vehicle's roll out time. An approximation of the vehicle's roll out can be calculated by subtracting the average of 10 passes from your normal Delay 1 time.

To exit the Driver's Reaction Test Mode, press the **SET UP** or **BRKT** key. The Mega 475 will 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: The **CLEAR** key can be used to reset the Average Driver's Reaction time.

NOTE: When in the Driver's Reaction Test Mode, the Transbrake solenoid will not be activated. This is to prevent any damage to the solenoid from overheating.

Understanding the Replay Tach

The Mega 475 has a built-in Replay Tach that can store 9 passes. When the Mega 475 records a pass, the engine RPM is recorded every hundredth of a second for fifteen seconds after the Transbrake releases. After a pass has been recorded and the engine is turned off the pass can be reviewed on the screen of the Mega 475.

Recording a Pass

To start the Mega 475 recording, the unit must first be armed. This is done by pressing and releasing the push-button that is connected to the L.L.P.B. terminal, before the Transbrake is engaged. With the Mega 475 armed, the recording starts at the release of the Transbrake, when a delay cycle is run. While the Mega 475 is recording, "Recording" will be displayed on the screen. Each time a pass is recorded the oldest pass, pass 9, is erased.

Replaying a Pass

To replay a recorded pass the engine must be turned off. Then when the Replay Tach screen is being displayed, the top row of digits display the engine RPM, with the next row down being the corresponding time. The time is relative to the release of the Transbrake. The third line will display which of the 9 passes is being replayed. The last line will show the current Shift Point being displayed.

Use the **NEXT** key to select the desired pass to be replayed. Each time the **NEXT** key is pressed the pass number will increase by one. Keep in mind that pass 1 is the most current and pass 9 is the oldest recorded pass.

Once a pass has been selected, there are three ways to look at information. First, if any shifts occurred during the recording of a pass, the time and RPM of each shift will also

have been recorded. To recall the Shift Point(s) press the number key corresponding to the shift desired. An example would be, if at least two shifts had been recorded, the Replay Tach will display the time and RPM that the second shift occurred, when you press the number 2 key. If a second shift had not been recorded the Mega 475 will display the starting line RPM, when the Transbrake released.

The second way is to use the Up and Down Arrow keys to scroll the time up and the down. There are four scrolling speeds in each direction with the scrolling stopped in the middle. Each time a corresponding Arrow key is pressed and released the scrolling speed will speed up. If while the time is scrolling and the opposite Arrow key is pressed and released the scrolling speed will slow down. Example if the Up Arrow key was pressed three times to get a faster scrolling speed, pressing the Down Arrow key once would cause the scrolling speed to slow down. Pressing the Down arrow an additional two times would cause the scrolling to stop. If the Down Arrow was then pressed again the time would start scrolling down.

The last way is to use the Clear key and the numerical keys to jump directly to a specific time during the pass. When you press the Clear key the time will go blank indicating the Mega 475 is ready for you to enter the time you want to go directly to. All four digits must be entered. Example if time of 5.50 is wanted, enter 0550 on the keypad. Once the desired time is displayed you can scroll forward or back from that point using the Arrows keys.

Note: To return to starting point of the recorded pass, press the Zero key.

The Push-button Inputs

The buttons are used to start all timing sequences of the Mega 475. There are four push-button inputs, labeled P.B. 1, P.B. 2, Tap P.B., and L.L. P.B. The P.B. 1 terminal is the primary button input and must be connected, for the Mega 475 to work.

Most buttons have more than one purpose, the Additional Button Functions Chart on page 55 shows the primary function along with any other functions for each of the buttons.

What the primary, second, and third function of each button is, depends on whether the Mega 475 is in Bracket or Pro Mode and what the Push-button Mode is. Each button is listed below individually to explain their functions depending on these conditions.

Button 1 Functions

Note: P.B. Mode 1 – 4 start timing on the release of the button. P.B. 5 is the opposite and starts timing on the press of the button**.**

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 Mega 475 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 Mega 475 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, pressing the button down, usually on the top yellow light, starts the counting down of the Crossover/Delay 1 time.

If the button is pressed again the Mega 475 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 Mega 475 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 Mega 475 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, when the three yellow lights on the tree come on, press the button to start the countdown of the Pro Delay time.

Button 2

When 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 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 62.

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

P.B. Mode is Set to 5

The first function for Button 2 is to set the Transbrake solenoid. When the button is pressed the Transbrake will engage, however on the release of the button the timing is started.

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 62.

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

P.B. Mode is Set to 5

The first function for Button 2 is to set the Transbrake solenoid. When the button is pressed the Transbrake will engage, however on the release of the button the timing is started.

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

Tap Button Settings

When in Bracket Mode

Any P.B. Mode

The first function for the Tap button 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 33.

The second function for the Tap button is to Tap Down, allowing time to be subtracted from the first delay started. The Tap Down feature is explained on page 28.

The third function for the Tap button is to activate the P.T.S.O., a Timer 1 Tap feature. The P.T.S.O. feature is explained on page 35.

When in Pro Mode

Any P.B. Mode

The first function for the Tap button 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 33.

The second function for the Tap button is to activate the P.T.S.O., a Timer 1 Tap feature. The P.T.S.O. feature is explained on page 35.

There is no third function for the Tap button in Pro Mode.

Line Lock Button Settings

When in Bracket Mode

Any P.B. Mode

The first function for the Line Lock button is to activate the Line Lock solenoid(s) for a burn-out. This also arms the Replay Tach at the same time.

The second function for Line Lock button is Tap Up, allowing time to be added to the first delay started. The Tap Up feature is explained on page 27.

There is no third function for the Line Lock button in Bracket Mode.

When in Pro Mode

Any P.B. Mode

The first function for the Line Lock button is to activate the Line Lock solenoid(s) for a burn-out. This also arms the Replay Tach at the same time.

There is no second or third function for the Line Lock button in Pro Mode.

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.F.O. Mode = 3	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	
2	1, 3, and 4	Transbrake -- Back-up Feature	N/A	N/A
	2	Applies Transbrake -- Delay 2 Applies S.L.E. if S.L. Mode On Applies L.L. if S.F.O. Mode = 3	Restarts Delay 2 Restart S.L.E. Timer Reapplies L.L. if used	Restarts Delay 2 Reapplies S.L.E. if used Reapplies L.L. if used
	5	Applies Transbrake	N/A	N/A
Tap	All	Applies S.L.E. (Starting Line Enhancer) if S.F.O. Mode = 1	Tap Down -- Subtracts Tap Down amount from first delay started	P.T.S.O.
Line Lock	All	Arms Replay Tach to Record If S.F.O. Mode is set to 3 Applies Line Lock for Burn-out	Tap Up -- adds Tap Up amount to first delay started	N/A

Wiring
The Terminal Strip

The terminal strip is made up of Power, Ground, 4 Button Inputs, one Tach input, and 4 Outputs. The four Outputs are rated for 12Amps each. If higher currents are required, an external relay needs to be wired between the output and the device, page 61.

+12VDC Terminal: Connect the +12VDC terminal to a power source capable of supplying enough current to run all the devices connected to the Mega 475'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 Mega 475.

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 on the Mega 475. 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

If the power wire is less than 5 feet long you can use the next size smaller wire. (20 Amps less than 5 feet – use 14 gauge)

If the power wire is more than 10 feet long you need to use the next size larger wire. (20 Amps more than 10 feet – use 10 gauge)

Trans Terminal: 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.

S.F.O. Terminal: Connect the S.F.O. (Selectable Function Output) to a device that is to function in one of the following four ways.

1) (S.L.E) Typically a Linkage Throttle Stop to function as a Starting Line Enhancer 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 stop.

2) (Timer 2) A device to be controlled by the second four-Stage timer. Depending on what is being controlled by Timer 2 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 S.F.O. 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 wired between the Mega 475 and the device, page 61.

3) (**Line Lock**) The Line Lock solenoid(s) can be used to hold the vehicle for a burn-out and 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 S.F.O. terminal. Connect the other wire from the Line Lock solenoid(s) to a ground.

4) (Spare Transbrake) Connect to the Transbrake solenoid, this is to be used only as a temporary output when the Trans terminal has been damaged.

Make sure that the S.F.O. mode setting is correct for the device being used.
Incorrect settings will cause undesirable results.

T. Stop Terminal: This is the main 4-Stage timer called Timer 1. This output is connected to a Throttle Stop or some other device, to be controlled by the 4-Stage timer down track. 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 T. Stop 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 wired between the Mega 475 and the device page 61.

Shift Terminal: 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. It is recommended that the wire going from the Mega 475 shift terminal to the shift solenoid be separated from all other wires to eliminate cross talk between the wires. If all wires are bundled together undesirable results may occur.

Ground Terminal: Connect the Ground terminal to the Neg. terminal on the battery or to a good steel ground, not aluminum. A 14 gauge wire is recommended.

P.B. 1 Terminal: P.B. 1 stands for Push-button 1, this is the primary push-button. This is the only push-button input that must have a button connected to it, for the Mega 475 to function. Connect either wire from the push-button to the P.B.1 Terminal. The other wire from the button is then connected to ground. No other connections to the push-button wires should be made. See page 49 for more information on setting button modes.

P.B. 2 Terminal: P.B. 2 stands for Push-button 2. Connect either wire from an optional push-button to the P.B.2 Terminal. The other wire from the button is then connected to ground. See page 49 for more information on setting button modes.

Tap P.B. Terminal: Connect either wire from an optional push-button to the Tap Terminal. The other wire from the button is then connected to ground. This button can control three different operations.

1) If the Starting Line Enhancer feature is turned on and the Tap push-button is pressed the throttle will close allowing the car to be staged at a preset RPM before the Transbrake is applied.

2) After a Transbrake push-button has been released, every time the Tap push-button is depressed a programmable amount of time is subtracted (Tap Down) from, the first delay time started until the Transbrake is released.

3) A third of a second after the Transbrake releases and for every time the Tap push-button is depressed a programmable amount of time is subtracted from the second or fourth stage times. See *Understanding the P.T.S.O.*

Line Lock P.B. Terminal: Connect either wire from the optional push-button to the L.L. P.B. Terminal. The other wire from the button is then connected to power. This button can control three different operations.

1) Any time before the vehicle is staged, pressing the Line Lock push-button will arm the Replay Tach for recording.
2) With the S.F.O. mode is set to 3 and before the Transbrake is engaged, if Line Lock push-button is pressed the Line Lock solenoid(s) connected to S.F.O. will be engage for the burn-out.
3) After a Transbrake push-button has been released, every time the Line Lock push-button is depressed a programmable amount of time is added (Tap Up) to, the first delay time started until the Transbrake is released.

Note: The Line Lock Push-button input is the only button input to use power instead of ground.

Tach Terminal: Connect the Tach terminal to the tach output on the ignition. The Tach terminal must be connected for proper operation of the Mega 475, when shifting by RPM or utilizing the Replay Tach feature.

Additional Wiring Help

Wiring Three Wire Push-buttons

Most push-buttons only have two wires. 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.

High Current Relay

When higher currents are required, an external relay needs to be wired between the output and the device.

To wire the additional relay;

Connect pin 85 to the desired terminal strip output.
Connect pin 86 to ground.
Connect pin 87 to power.
Connect pin 30 to the device.

Grounding Relay

If the device to be controlled needs Ground, instead of +12 Volts, an external relay needs to be wired between the output and the device.

To wire the additional relay for ground;

Connect pin 85 to the S.F.O. terminal.
Connect pin 86 and 87 to Ground.
Connect pin 30 to the device.

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.

If the P.B. Mode is set to 5 the button connected to the P.B. 2 input can be used to back-up the vehicle without starting a delay cycle. Press the button to engage the Transbrake to back-up. When done press the CLEAR key on the keypad to release the Transbrake without starting a timing cycle. If the S.L.E. is being used and the starting line feature is turned, the S.L.E. will also turn on when backing up.

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 terminal on the Mega 475. Then connect the other wire from the button to the Transbrake terminal on Mega 475. The Bypass Button will engage the Transbrake without starting a timing cycle.

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

Recommended Wire Gauge for Current

A Voltage drop is the amount of voltage lost through a wire. Example of a 2 Volt drop would be if one end of the wire has 12 Volts and the other end has 10 Volts. Voltage drops are caused by undersized wiring in the vehicle, resulting in solenoids not getting the needed voltage for proper operation. A voltage drop occurs as current is pulled through a wire by the load. A load is any device being supplied power by the wire, example a Transbrake solenoid. When a load is put on a wire, a Voltage drop will occur. The larger the wire the smaller this voltage drop will be. To minimize the voltage drop through the vehicle wiring, use the listing below to select the wire gauge needed.

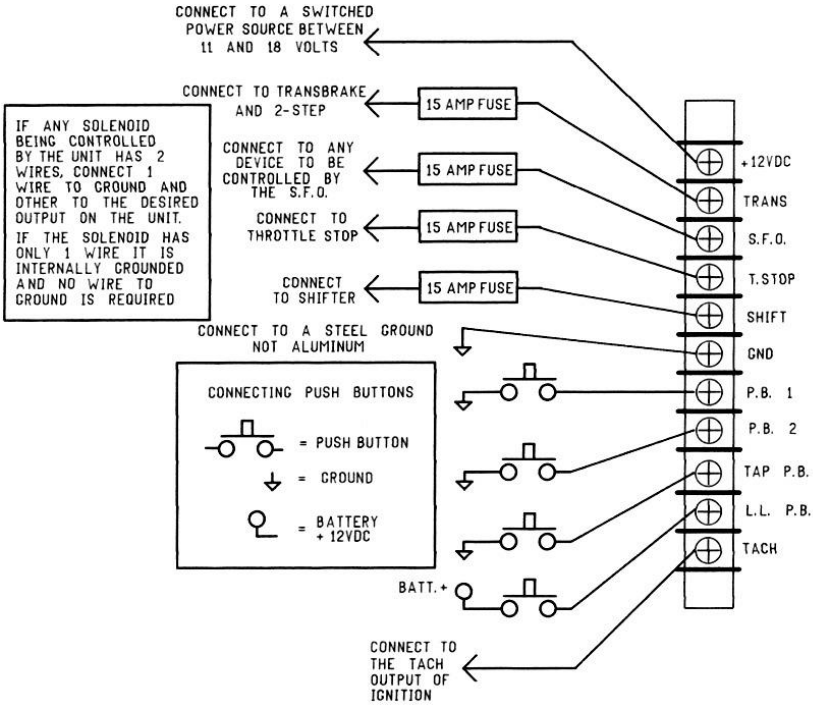
1-15	Amps 14 gauge
16-25	Amps 12 gauge
26-40	Amps 10 gauge
41-60	Amps 8 gauge
61-80	Amps 6 gauge
81-120	Amps 4 gauge

The length of wire also affects the amount of the Voltage drop. Every foot of wire used will increase the total amount of Voltage dropped by the wire. To compensate for this;

If the wire is less than 5 feet long you can use the next size smaller wire. (20 Amps less than 5 feet – use 14 gauge)

If the wire is more than 10 feet long you need to use the next size larger wire. (20 Amps more than 10 feet – use 10 gauge)

Wiring the Mega 475



Mounting the Mega 475

For complete viewing of the large LCD, care should be taken when mounting the unit to make sure that the display is angled towards the driver's eyes. Before mounting the Mega 475, place the box in the desired location and check the legibility of the display in both day and night conditions.

Wiring the Mega 475 to the Dial Display Board

There are three wires a Blue, Purple, and a Tan coming out of the Mega 475 on the top right side. The Blue and Purple are used for data while the Tan is used to control whether the Day or Night intensity is selected.

Blue Wire: Connect the Blue wire from the Mega 475 to the Blue wire on a V2 Mega Dial display board. This wire is the data in to the Dial Display.

Purple Wire: Connect the Purple wire from the Mega 475 to the Purple wire on a V2 Mega Dial display board. This wire is the data out from the Dial Display.

Tan Wire: Connect the Tan wire from the Mega 475 to the Taillight circuit in the vehicle. When the taillight is turned on, the Tan wire is supplied power and the Night intensity setting is selected. When the taillight is turned off, power is removed from the Tan wire and the Day intensity is selected.

Note: If you don't want the intensity to change when you turn the taillight on and off, set the Day and Night intensity levels the same. You can also just leave the tan wire disconnected.

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

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