

SUPER CROSSOVER REACTION TIME DELAY INSTRUCTION MANUAL

INDEX

Installation Instructions.....	pg 1	Setting Transbrake Delay.....	pg 5
Basic Transbrake Wiring.....	pg 2	Additional Features.....	pg 6
Optional Line Lock Wiring.....	pg 3	How Late Timer.....	pg 6
Optional Nitrous Wiring.....	pg 3	General Information.....	pg 6
Button Use.....	pg 4	Delay Box Theory & Operation.....	pg 7
Delay Box Types	pg 4	Setting Parameters.....	pg 8

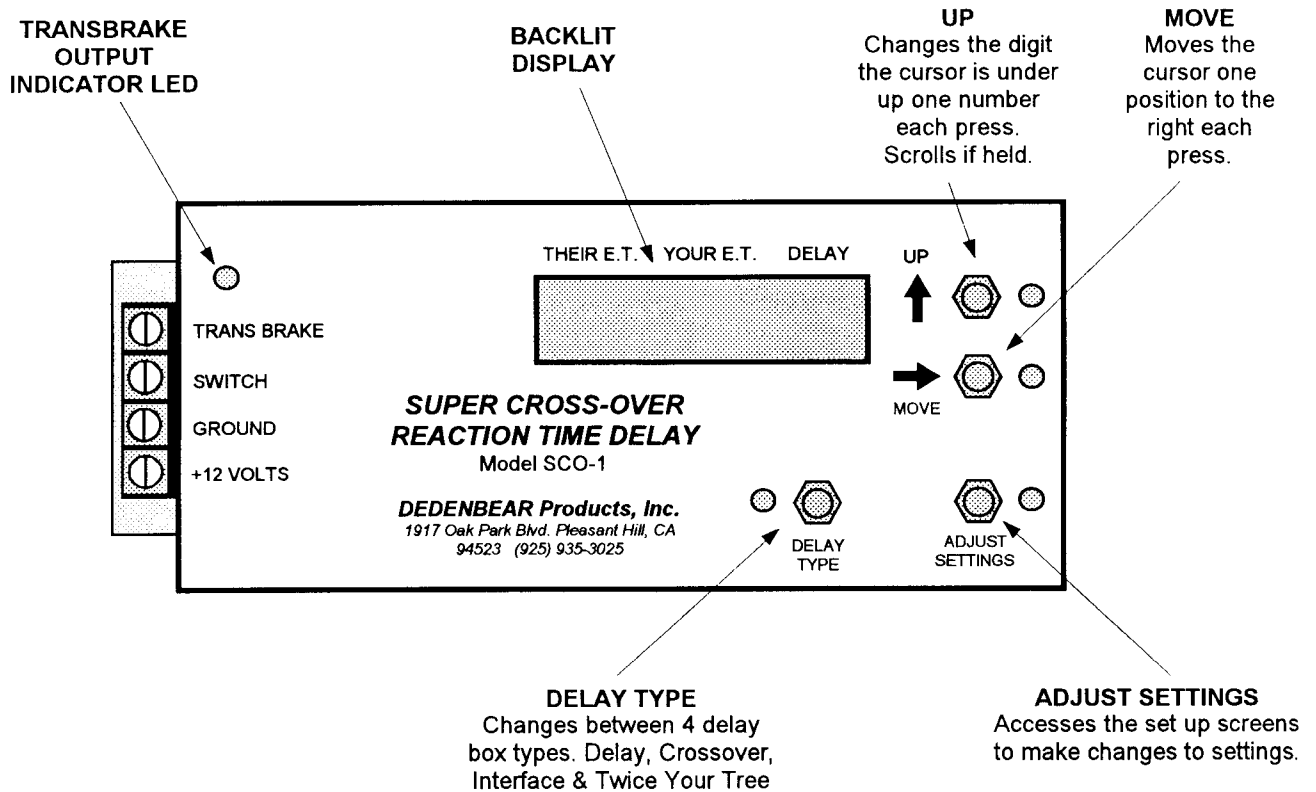
INSTALLATION

Using #8 screws through the rubber grommets in the base, mount the Super Crossover away from heat, vibration and the ignition system.

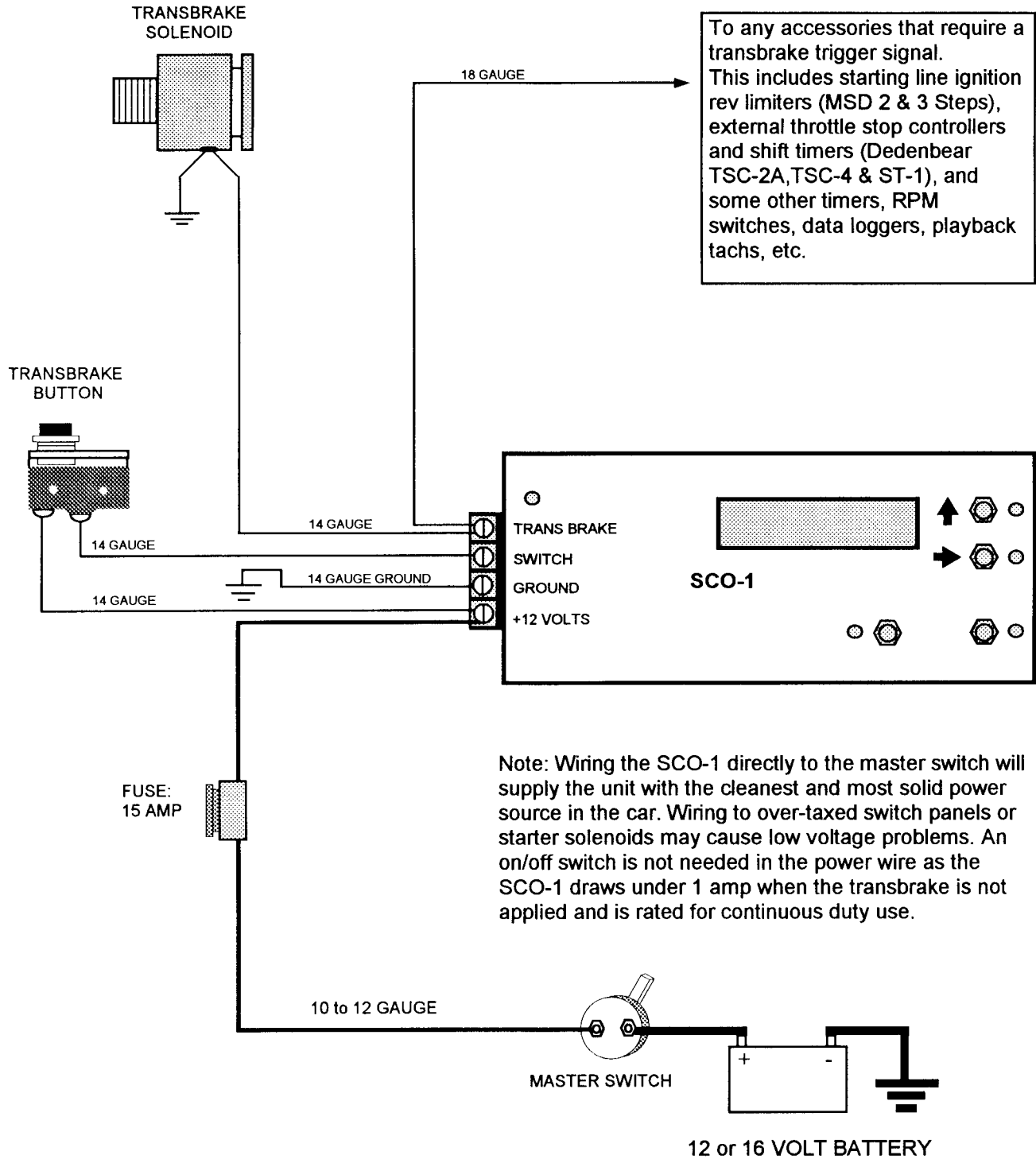
Make sure the driver can reach the buttons when strapped in and angle the unit if needed so the display can be read straight on. If the box is mounted so the display is viewed more than 10 degrees off center, it will be hard to read.

Wire the Super Crossover as shown on page 2. Make sure the power lead comes straight from the master switch and the ground goes to a solid chassis ground, not sheet metal panels.

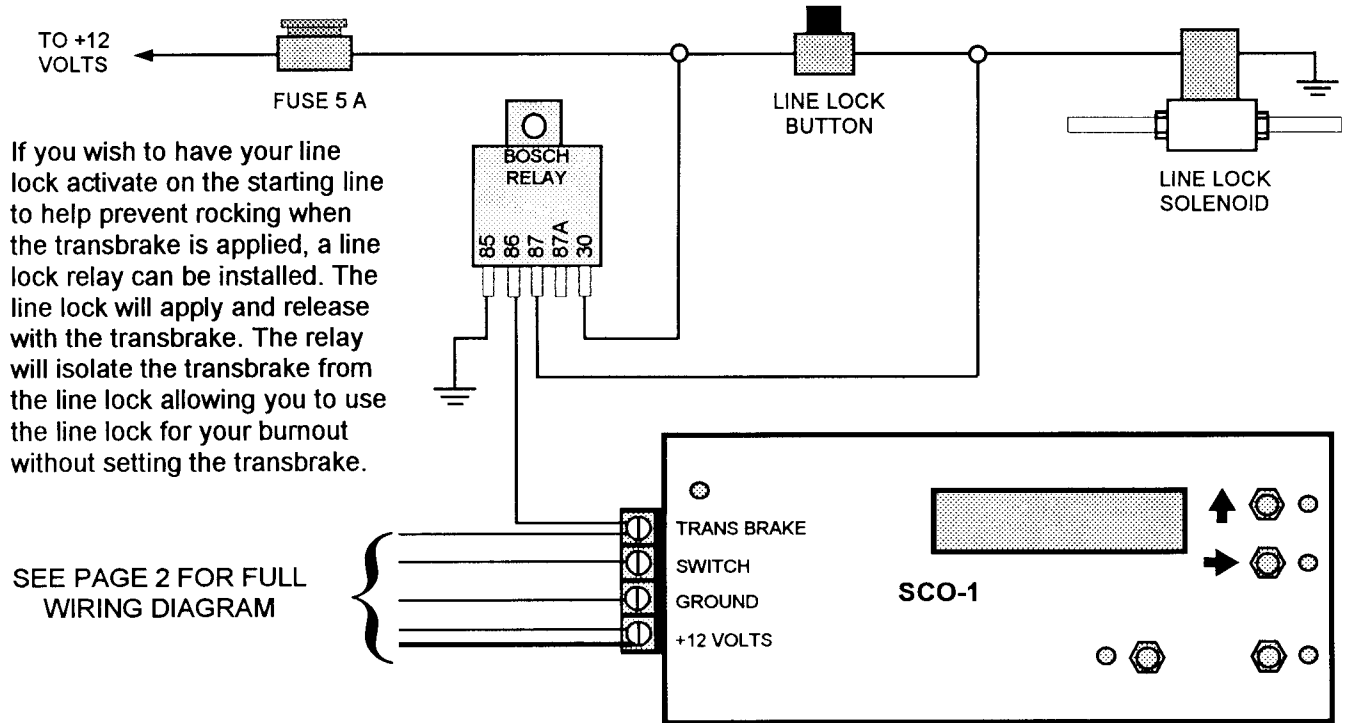
BUTTON QUICK REFERENCE



WIRING THE SCO-1

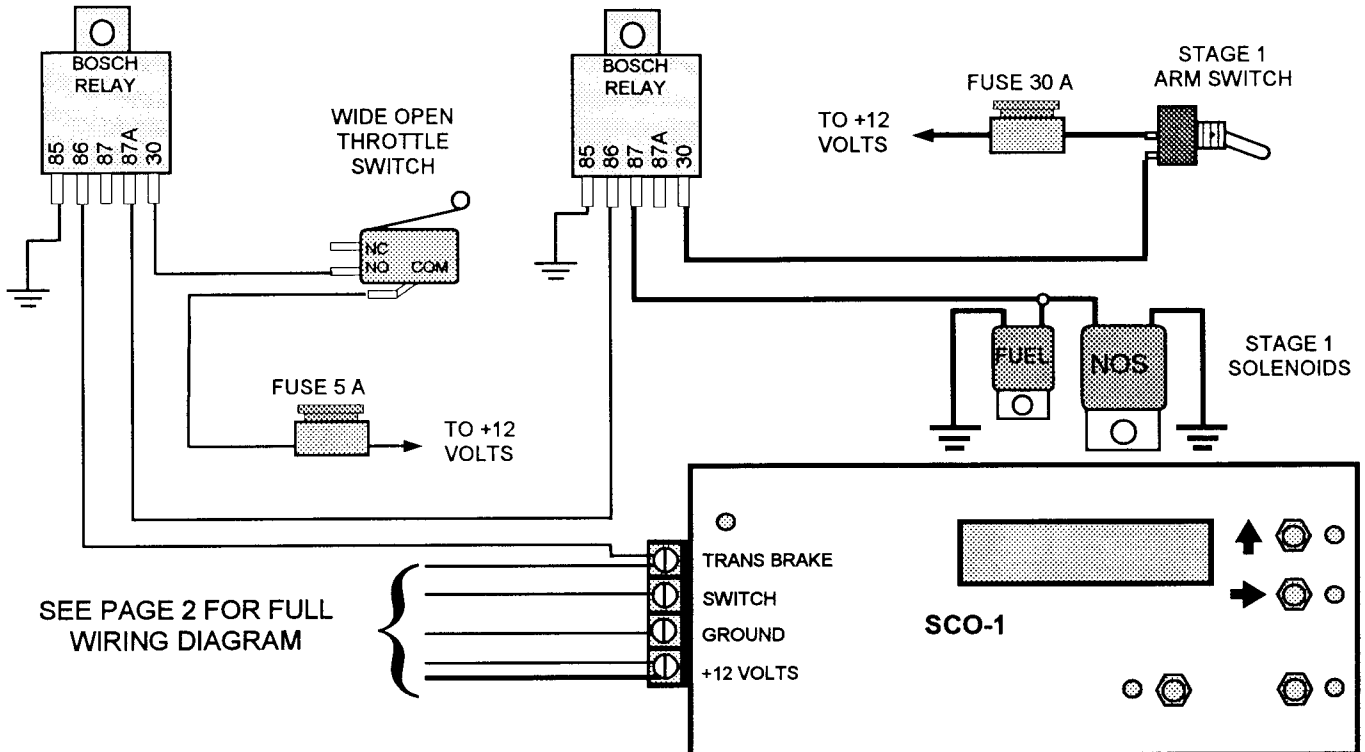


OPTIONAL WIRING: LINE LOCK RELAY



OPTIONAL WIRING: NITROUS STAGING RELAY

A staging relay installed in a single stage nitrous system will keep the nitrous turned off until release of the transbrake solenoid. This will allow you to stage the car at wide open throttle without the nitrous activating. At launch of the car, the nitrous will activate until the throttle is backed off.



BUTTON USE



ADJUST
SETTINGS

ADJUST SETTINGS Button: This button accesses your delay settings. Each time you press the Adjust Settings button, different set-up screens come up and allow you to make changes to your Delay, Your ET, Their ET, Bottom Delay, Cross Comp, Delay On, & TB Lockout settings. Each time you push the adjust settings button, it will step you to the next prompt screen. The SCO-1 will only ask for the settings needed for the particular mode you are in, for example when adjusting settings when in Run Delay, the SCO-1 will not ask for a Their ET setting. After your adjustments are made, the SCO-1 automatically returns to the run mode after 8 seconds.



MOVE

MOVE Button: This button moves the cursor one position to the right every time it is pressed. Move the cursor under the digit you wish change.

UP



UP Button: This button changes the digit the cursor is under up one number each press. Scrolls if held.



DELAY
TYPE

DELAY TYPE Button: This button selects which of the 4 delay box modes you wish to run. They are Delay, Crossover, Interface and Twice Your Tree.

DELAY BOX TYPES

THEIR ET YOUR ET DELAY

		1.000
RUN (DELAY)		

DELAY: A simple 4 digit delay box used for pro tree classes and leaving off your top amber for full tree classes. The box simply delays for the time set and releases the transbrake. The Their ET and Your ET settings are not shown on the display as they are not used in the Delay mode.

THEIR ET YOUR ET DELAY

10.00	9.00	1.000
RUN (CROSSOVER)		

CROSSOVER: Used in full tree bracket racing for launching off your opponent's top bulb when you are the faster car. The SCO-1 calculates the handicap by subtracting the Your ET setting from the Their ET setting and adds it to your delay time.

THEIR ET YOUR ET DELAY

10.00	9.00	1.000
RUN (INTERFACE)		

INTERFACE: This is used the same as crossover except it allows you to take two hits at the tree. You leave off the opponent's top bulb, press the transbrake button again, then release off your own top bulb. The box will release the transbrake on the *quicker* of the two releases. This means if your release on the opponent's top bulb gives you a .520 light and the release on your top bulb gives you a .505 light, the box will launch the car on the .505 light. Remember, the interface always chooses the *quicker* light and will choose a .490 over a .500.

THEIR ET YOUR ET DELAY

RUN	.100	1.000
TWICE YOUR TREE		

TWICE YOUR TREE: This mode functions the same as the Interface mode except it allows you to take two hits at your tree, one off your top amber, and one off your bottom amber. Like in the interface mode the SCO-1 will choose the *quicker* of the two reaction times.

SETTING TRANSBRAKE DELAY

To set your transbrake delay you must first choose which delay box type you wish to run by pressing the DELAY TYPE button. The SCO-1 will only ask you for the settings required for that particular mode. Example: When you are in RUN (DELAY) it will not ask you for THEIR ET setting since you are not crossing over. All of the shared settings between these modes will transfer when you change to a different mode. Example: Your delay setting will transfer over to all four different delay box modes along with your DELAY ON, and TB LOCK OUT settings.

THEIR ET YOUR ET DELAY

10.00 9.00 1.000
RUN (INTERFACE)

RUN SCREEN: This is the screen the SCO-1 will display when it is "ready to run". It will always display your DELAY setting. When in Crossover or Interface mode it will also display the THEIR ET and YOUR ET settings. When in Twice Your Tree mode the BOTTOM DELAY setting will appear to the left of the DELAY setting.



ADJUST
SETTINGS

Press the ADJUST SETTINGS button to enter the transbrake adjust settings menu. Each time you press this button it will advance to the next set-up screen. Once you have advanced through all of the screens, the box returns back to run mode. If you happen to go too fast and pass the set up screen you want, you can continue to press the ADJUST SETTINGS button and cycle back through the menu. When you are through making adjustments to the settings, the box will automatically return to the run mode in 8 seconds.

SETUP MODE
DELAY 1.000

DELAY: When you first press the Adjust Settings button, the delay setting will appear. Use the Move & Up buttons to change this setting. For leaving off the top bulb on a full tree, this setting is typically around 1.000 second.

SETUP MODE
THEIR ET 10.00

THEIR ET: This is the next screen that will appear in Interface and Crossover modes (not needed in Delay or Twice Your Tree modes). Use the Move & Up buttons to change this setting to your opponent's dial-in.

SETUP MODE
YOUR ET 09.00

YOUR ET: This is where you enter you own vehicle's dial-in. Use the Move & Up buttons to change this setting.

SETUP MODE
BOT DELAY .100

BOT DELAY: Bottom bulb delay time is the amount of delay you need for a bottom bulb release on a full tree. This is the delay for the second hit when in Twice Your Tree mode. It is also the delay used by the "Last Chance" feature while in Interface mode. Use the Move & Up buttons to change this setting.

SETUP MODE
CROSS COMP .015

CROSS COMP: Crossover compensation time is used to compensate for late lights when crossing over. When you cross over and leave off your opponent's tree you get an indirect view of his top bulb instead of a direct view like on your side. This results in a reaction time that is about .010 to .020 seconds slower. Crossover compensation automatically subtracts this time from your delay setting whenever you crossover. Use the Move & Up buttons to change this setting.

SETUP MODE
DELAY ON .100

DELAY ON: This is the amount of time the box pauses from when the transbrake button is depressed until the transbrake sets. This prevents transbrake application if the button is accidentally bumped or brushed while driving down the return road or in the staging lanes.

SETUP MODE
TB LOCKOUT 03

TB LOCK OUT: This is the amount of time the box will lock out the transbrake so the driver cannot re-apply the transbrake during the pass. Use the Move & Up buttons to change the lock out in increments of whole seconds.

ADDITIONAL FEATURES

ARP (Accidental Release Protection): Occasionally you may anticipate the lights and release the button too early. ARP lets you recover from this situation. In Delay and Crossover modes, you simply press the transbrake button again before the car launches and the SCO-1 will instantly reset itself. In Interface and Twice Your Tree modes this does not work because the SCO-1 is expecting a second hit. To avoid a red light you can use the Last Chance feature.

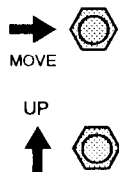
Last Chance: This feature works only in Interface and Twice Your Tree modes. If you think either or both of your releases were too quick, press the transbrake button down a third time to cancel the first two hits, then release the button off your bottom bulb to launch the car. If your car red lights off the bottom bulb, add some time to the Bottom Bulb delay and the Last Chance feature will use the delay from that setting.

Dial-ins Incorrect: If the Their E.T. setting is accidentally set lower than the Your E.T. setting, this message will be displayed. If you make a pass without fixing the problem, the SCO-1 will assume the handicap is zero and will only use the delay setting.

Leaving The Set Up Menu, Three Ways To Leave:

- 1) Do nothing and the unit will return to the run mode automatically after 8 seconds.
- 2) Press the Transbrake button and the unit will instantly return to run mode.
- 3) Clock through the set up menu by repeatedly pushing the adjust settings button until you get back to run mode.

HOW LATE TIMER



How Late: In the Interface and Twice Your Tree modes where you can take two hits at the tree, the How Late feature tells you which of the hits was faster and by how much. In Interface mode the How Late timer will display "THEIR TREE BY: .XXX" or "YOUR TREE BY: .XXX" or "LAST CHANCE ACTIVATED". As an example, if you were in Twice Your Tree mode, the display might read "TOP BULB BY: .023". This means that you were quicker leaving off your top bulb than your bottom bulb and that you were .023 seconds quicker. The SCO-1 released the transbrake off the top bulb hit in this example. If you had cancelled the first two hits by pressing the button a third time, the display would read "LAST CHANCE ACTIVATED". After a run is made the How Late information is recalled by pressing and holding the Up arrow and the Move arrow buttons at the same time.

GENERAL INFORMATION

Memory: The microprocessor in the SCO-1 will remember all of your settings, even after turning off the power. There are no internal batteries to die, so the unit will keep your last settings forever.

Battery Chargers: It is important to make sure to have your master disconnect switch off while hooking up your charger between rounds. When the first contact is made between the charger and the battery, there may be a voltage spike that could damage electronics. After the charger is hooked up, the master switch can be turned back on to run the water pump, fan, etc.

Temperature: If the SCO-1 ever gets over 160 degrees, the display will get dark and unreadable. This does not damage the unit, simply cool it off and the display will return to normal.

Welding: If any welding needs to be done to the car, disconnect **all** wiring from the SCO-1 to prevent damage.

OPERATION

OPERATION

Set the SCO-1 with all your settings. Shallow stage the car. Press the transbrake button to set the transbrake. Release the transbrake button at the flash of all three amber bulbs (pro tree) or at the flash of the top amber bulb (full tree). The SCO-1 will continue to hold the transbrake for the preset delay time. When the time expires, the SCO-1 will release the transbrake solenoid, launching the car.

PRO TREE RACING

The SCO-1 is used to keep a car from red lighting on a pro tree by delaying the release of the transbrake. The delay type should be set to Run Delay. Typical delay settings on a pro tree range from 0.001 to 0.050. If your car will not red light on a pro tree, set the SCO-1 Delay Setting to 0.000.

FULL TREE RACING

By delaying the release of the transbrake it becomes possible to release the transbrake button on the top (first) amber bulb of the christmas tree. Releasing off the top bulb is the preferred method because it is more consistent than a bottom bulb release. The increased consistency comes from not anticipating the bottom bulb and being able to just "hit" the top bulb as quick as possible allowing for a more natural human reaction. Top bulb release also allows the driver to stage and release the button the same every pass. If the car is launching late or early, changes to reaction times can now be made by adjusting the SCO-1 instead of having the driver try to mentally speed up or slow down.

Typical delay settings for launching off the top bulb are 0.950 to 0.990 for door cars and 1.020 to 1.080 for dragsters and altered. Delays as low as 0.850 for slower cars and as high as 1.100 for very hard launching cars can be reached.

USING CROSSOVER

When racing a full bracket tree or a cross talk tree, if you are the faster car, your opponent will be leaving first. This means his/her top amber bulb will light first on a bracket tree, or both top bulbs will light at the same time on a cross talk tree. In this situation you need to cross over. Crossing over allows you to release the transbrake button on your opponent's top amber (full tree) or your top amber (cross talk tree). Crossing over is done with the SCO-1 by switching the delay type to Run Crossover and entering your dial-in and your opponent's dial-in to the delay settings. The SCO-1 will automatically calculate the handicap and add it to your delay setting allowing you to launch off your opponent's top amber. For example your delay setting is 1.020 and you are dialed in at 8.50, your opponent's dialed in at 9.70. The SCO-1 will subtract your dial from your opponent's dial ($9.70 - 8.50 = 1.20$) then add it to your delay setting ($1.20 + 1.020 = 2.220$).

USING INTERFACE

When you are the faster car by a minimum of 1 second, the Interface mode can be used. This is used the same as crossover except it allows you to take two hits at the tree. You leave off the opponent's top bulb, press the transbrake button again, then release off your own top bulb. The box will release the transbrake on the *quicker* of the two releases. This means if your release on the opponent's top bulb gives you a .520 light and the release on your top bulb gives you a .505 light, the box will launch the car on the .505 light. Remember, the interface always chooses the *quicker* light and will choose a .490 over a .500.

If you feel that one of the button releases was a red light, push the button down a third time to activate the Last Chance feature so you can leave off the bottom bulb. This will cancel out the first two releases and allow for a single shot at your bottom bulb.

If you only release the button once in Interface mode, the SCO-1 will choose that release for the delay of the transbrake.

USING TWICE YOUR TREE

This mode functions the same as the Interface mode except it allows you to take two hits at your tree, one off your top amber, and one off your bottom amber. As in the Interface mode, the SCO-1 will choose the *quicker* of the two reaction times.

ADJUSTING FOR EARLY (RED) LIGHTS

When a car red lights, it has left too early. To compensate for this in the SCO-1, you must add time to the delay setting. For example, if you had 0.980 in your delay setting and went -0.040 red, you would want to add at least 0.040 to your setting making it 1.020. In addition, a "cushion" of 0.010 is usually added on top to avoid cutting another red light making the delay setting 1.030.

ADJUSTING FOR LATE (GREEN) LIGHTS

When a car green lights, it has left too late. To compensate for this in the SCO-1 you must subtract time from the delay setting. For example, if you had 0.980 in your delay setting and went $+0.040$ green, you would want to subtract 0.040 from your setting making it 0.940. A "cushion" of 0.010 is usually added back to the delay setting to avoid cutting a red light making the delay setting 0.950.

FACTORY SETTINGS AND PARAMETERS

SETTING	RANGE	FACTORY SETTINGS
DELAY	0.000 to 1.999 sec.	1.000
THEIR E.T.	0.000 to 1.999 sec.	10.00
YOUR E.T.	00.00 to 19.99 sec.	9.00
CROSS COMP	.000 to .099 sec.	.015
BOT DELAY	0.00 to .299 sec.	.100
DELAY ON	00.00 to 19.99 sec.	.010
TB LOCK OUT	00 to 19 seconds	15

NOTES

SERVICE AND WARRANTY

SERVICE

DO NOT RETURN TO DISTRIBUTOR. CALL DEDENBEAR DIRECTLY.

If you think your box has a problem or needs to be serviced, call us first before removing it from the car (we may be able to troubleshoot the unit while it is still in the car). If it is necessary to return the unit to our facility, call first; then package it carefully and include a note describing the problem. Provide your name, address, work and home phone numbers so we can contact you regarding return shipment. Turn-around time on repairs is typically 24-48 hours.

CALL DEDENBEAR, MONDAY TO FRIDAY, 8 AM TO 5 PM PACIFIC TIME

SHIP TO: DEDENBEAR PRODUCTS, REPAIR DEPARTMENT, 1917 OAK PARK BLVD., PLEASANT HILL CA 94523

LIMITED 1 YEAR WARRANTY

Dedenbear Products components are warranted directly by Dedenbear Products against defective material or workmanship under normal use and service for a period of one (1) year after purchase. Dedenbear Products will repair or replace the defective unit at Dedenbear Products option, free of charge. This warranty does not cover any damage to the component caused by abuse, mishandling, alteration, accident, electrical current or voltage fluctuations, failure to follow installation/operating instructions, storage and environmental conditions, or repair attempts made by anyone other than Dedenbear Products authorized service facility.

DEDENBEAR PRODUCTS SHALL NOT BE LIABLE FOR INJURY, CONSEQUENTIAL, OR OTHER TYPE DAMAGES RESULTING FROM THE USE OF ITS PRODUCTS, OTHER THAN THE LIABILITY STATED ABOVE. This warranty is in lieu of all other warranties of merchantability or fitness of use. This warranty gives you specific legal rights, and you may also have other rights which vary state to state.

1917 Oak Park Blvd - Pleasant Hill, CA 94523 - (925) 935-3025 - Fax (925) 935-2287 - www.dedenbear.com - email@dedenbear.com