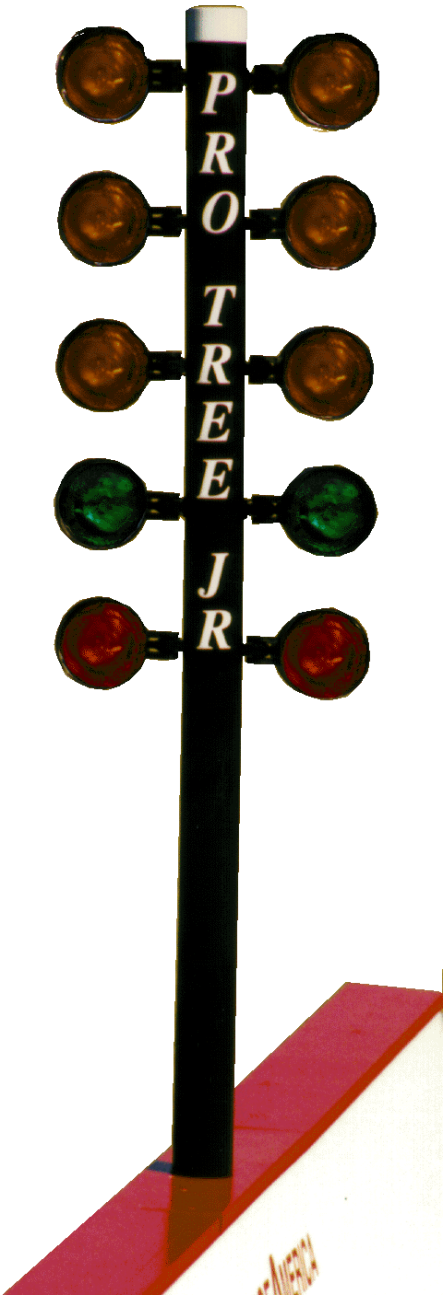
PRO TREE JR

DRAG STRIP TIMING SYSTEM

WITH SINGLE LANE TIMER

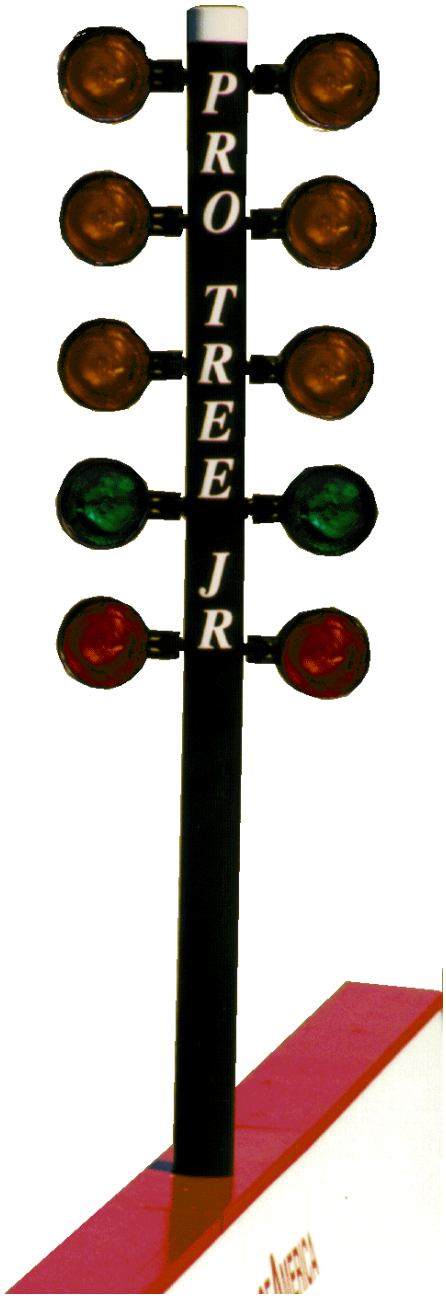
OWNERS MANUAL



PRO TREE JR™

DRAG STRIP TIMING SYSTEM
WITH SINGLE LANE TIMER

SET-UP
&
OPERATION
MANUAL



RADIO CONTROL DRAG RACE TIMING PRODUCTS

by

RACEAMERICA, Inc.

PO Box 3469
Santa Clara, CA 95055-3469
(408) 927-6064

Part # 2200B & 2200H

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RADIO CONTROL DRAG RACE TIMING PRODUCTS

by **RACEAMERICA**

INTRODUCTION

The **PRO TREE JR** Drag Race Timing System by **RACEAMERICA** was developed specifically for R/C Car Drag Racing. This product provides a full set of features for the relatively new sport of R/C Car Drag Racing. The current release of the timer includes a standalone single lane timer operation in additiion to the **PRO TREE JR** operation.

The **PRO TREE JR** is designed to be used by race clubs and commercial race operations. The feature set of this product provides true NHRA realism as well as convenience and flexibility for the race director through use of on board race management features.

RACEAMERICA has established itself as the leader in RC Drag Race Timing Systems. This system represents the latest technology in race timing accuracy and reliability.

Safety Warning - Caution

Please realize R/C Dragsters travel at very high rates of speed and represent projectile objects capable of inflicting significant harm or damage to objects which they may contact by accident. When using these products, be sure to keep all personnel a safe distance from any safety risk associated with cars traveling at high rates of speed.

The PRO TREE JR utilizes Infra-Red light transmission technology. The Beam Emitter units produce Infra-Red light which cannot be seen by the unaided eye. Do not look directly into the Beam Emitter units to see if they are functioning correctly. Prolonged exposure could create temporary adverse visual effects to some individuals. Follow the procedures for set up and calibration outlined in this manual.

RACEAMERICA

TRACK DESIGN AND RACE TIMING PRODUCTS

LIMITED WARRANTY

To the original purchaser of this RACEAMERICA product, RACEAMERICA warrants it to be in good working order for a period of ninety (90) days from the date of purchase from RACEAMERICA or an authorized RACEAMERICA distributor. Should this product malfunction during the warranty period, RACEAMERICA will, at its option, repair or replace it at no charge, provided the product has not been subjected to misuse, abuse, or alterations, modifications, and/or repairs not authorized by RACEAMERICA.

Any product requiring Limited Warranty service during the warranty period should be returned to RACEAMERICA with proof of purchase. If return of merchandise is by mail, the customer agrees to insure the product, prepay shipping charges, and ship the product to the repair facility identified by RACEAMERICA.

ALL EXPRESSED AND IMPLIED WARRANTIES FOR THIS PRODUCT ARE LIMITED IN DURATION TO THE ABOVE NINETY DAY PERIOD.

UNDER NO CIRCUMSTANCES WILL RACEAMERICA BE LIABLE TO THE USER FOR DAMAGES, INCLUDING ANY LOST PROFITS, LOST SAVINGS, OR OTHER INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OF, OR INABILITY TO USE, SUCH PRODUCT.

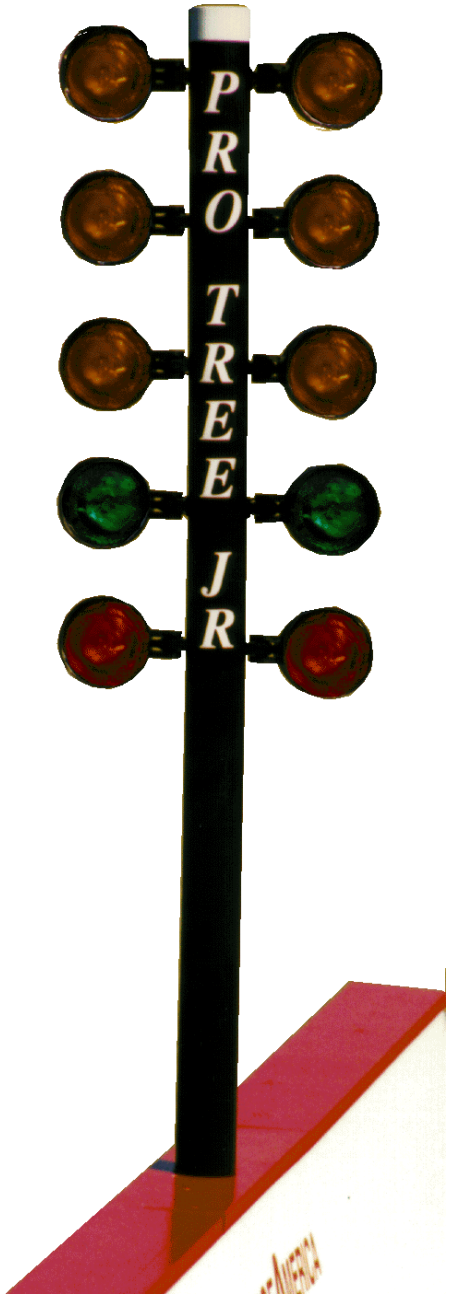
THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH MAY VARY FROM STATE TO STATE.

PRO TREE JR

OPERATION

DRAG STRIP TIMING SYSTEM

WITH SINGLE LANE TIMER



PRO TREE JR

PRO TREE JR PACKAGE CONTENTS

2200H & 2200B

Each PRO TREE JR package includes:

1 - PRO TREE JR InLineBase Unit

1 - PRO TREE JR Light Tree Module

1 - PRO TREE JR Console Display Unit

4 - Beam Emitter units

4 - Track Sensor units

1 - Interconnect Cable Assembly for Start/ Speed/Finish (long cable)

1 - Interconnect Cable Assembly for Tree to Console (short cable)

1 - Set of Miscellaneous alignment shim blocks

1 - Owners Manual

2 - Reusable shipping containers

SINGLE LANE TIMER PACKAGE CONTENTS - 2200HS

Each SINGLE LANE TIMER package includes:

1 - PRO TREE JR Console Display Unit

2 - Beam Emitter units (Base unit)

2 - Track Sensor units (Base unit)

1 - Interconnect Cable Assembly for Start/ Speed/Finish (long cable)

1 - Owners Manual

OTHER REQUIREMENTS

You will need these additional items to operate your PRO TREE JR

1 - 12 Volt Auto/Marine Battery

16 - AA Alkaline batteries (for Beam Emitter units)

The following items may be added to complement your system and ease set up.

1 - Table or Stand for Console unit

4 - Precision Speed Trap Spacer Boards (10') (for Speed Trap Option)

1 - Cord Reel Winder Spool

3 - Emitter/Sensor Protector Ramps

Plans are included for a reset console stand, spacer boards and protector ramps in the "Helpful Hints" section of this manual. A cord reel winder spool can be purchased at most hardware or building supply stores.

PRODUCT SPECIFICATIONS

The following listing provides the designed performance specifications for the PRO TREE JR Drag Race Timing System:

Light Tree Dimensions	58"H X 12.5"W X 24"D
Track Lane Width	4 to 20 Feet
Elapsed Time Display	up to 90 seconds
Reaction Time Display	up to 9.999 seconds
Time Accuracy	0.001 seconds
Speed Display	2.00 to 80.0 MPH
Power Requirements	
PRO TREE JR	12V Auto/Marine Battery
IR Beam Emitter	4 - AA Alkaline Batteries

THEORY of OPERATION

The PRO TREE JR is a completely self contained race timing system made with the latest technology CMOS/TMOS circuit components to provide a complete Drag Racing solution for individuals and clubs and commercial tracks. The system contains an internal quartz crystal clock to maintain the accuracy to one thousandth of a second and an advanced microprocessor to provide total race control and display of race results.

Power is supplied to all components of the PRO TREE JR system from the 12V battery located in the tree base. Control of the entire feature set is accomplished through a single 12 button keypad.

Once the system is properly setup and aligned on the racing surface, commands are entered via the keypad to prepare for the next timed run. The system also contains a startup selftest and automatic detection of misaligned sensors.

The Beam Emitter units operate on invisible (to the unaided human eye) Infra Red light. The coded light frequencies are constantly received by the Track Sensor units until a car interrupts reception ('breaks' the beam).

The Beam Emitter to Track Sensor transmission operates on Line of Sight principles. This makes alignment of units critical. Tips are provided to aid alignment on surfaces that are other than flat. The units will operate over a wide range of conditions but should not be operated beyond the specification parameters (less than 4 ft or more than 20 ft).

Accuracy of the speed display is very closely related to the accuracy of placement of the Speed Trap emitters and sensors. An 1/4th inch of placement error will cause a 0.1 MPH error in the speed measurement.

In preparation for a typical run, the Starting Sequence and Reaction Time modes are selected. For Index or Bracket racing, the drivers times are entered before the race. Each lane is staged by interruption of the beam signal between the START Beam Emitter and the START Track Sensor by the drag car. Fouls are indicated for each car if it interrupts the beam between the START Beam Emitter and the START Track Sensor prior to the illumination of the GREEN light. Once staged, the countdown starting sequence is started by pressing '2' on the keypad.

The driver starts on the GREEN light signal for their particular lane. The system begins timing the drivers reaction time when the last Yellow is illuminated. Reaction time is stopped once the car interrupts or "Breaks" the START beam.

As the run progresses, the vehicle will interrupt the SPEED beam (for systems with the optional SPEED sensing). At this point SPEED timing will begin. At the end of the run, the vehicle will 'break' the FINISH beam. At this point the ELAPSED TIME counter is stopped and displays the number of seconds the run has taken, the ET. The FINISH beam also represents the end of the Speed Trap section. The green light will illuminate for the first car to "BREAK" the FINISH beam. The system is designed to allow the race director to apply local racing rules in determining the actual winner after considering foul starts and breakouts. Staging, fouls, and End-of-Race winner are indicated by the PRO TREE JR Lights while Reaction Time (RT), Elapsed Time (ET), and SPEED are displayed on the LED Display of the Console.

The ELAPSED TIME will continue to count until the run is completed, terminated by the operator, or 90.000 seconds is reached.

The serial port may be connected to any serial printer to print race results. RACEAMERICA offers a completely portable battery powered serial printer which are hard to find and avoid the need for portable generators.

SET-UP STEPS - PRO TREE JR

STEP 1 -

Familiarize yourself with the components pictured in this manual and how the system goes together. The interconnect cables contain the differentiating circuitry to provide proper operation when correctly assembled.

Precisely measure the key points on your track surface and mark with chalk, paint or tape. Start by marking the starting line, finish line (132 feet away for a 1/10th Scale Quarter Mile, 165 feet for 1/8th Scale and 330 feet for true Quarter Scale) and the start of the speed trap ten feet back from the finish line. The track lane width should be between four (4) and twenty (20) feet. Most tracks run 8 to 15 foot lane widths. To help in determing track width, use a string across the surface to check for distance and crown. Crowning more than one half inch will require use of the alignment shims and the method shown in the Emitter/Sensor Alignment diagrams.

The distance between the speed trap sensor and stop sensor is critical to correctly display the speed.

Note carefully the areas where precise measurement is very important. The "Speed Trap" distance must be exactly ten (10) feet between the block center lines. Each one quarter inch of placement error translates to 0.1 MPH error in the speed measurement.

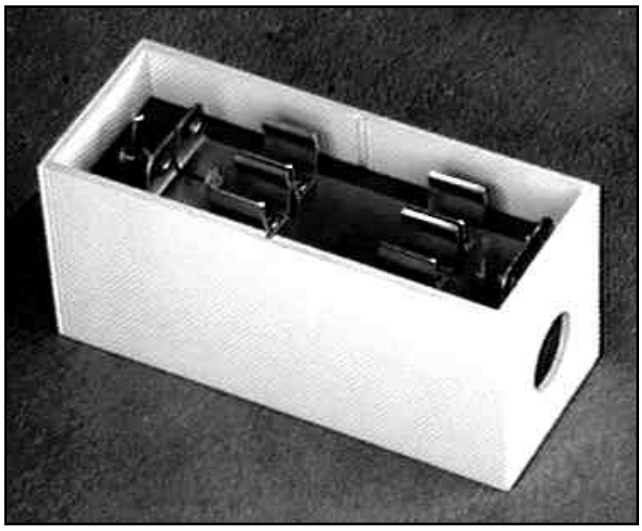
STEP 2 -

Layout the interconnect cable on the track site. The longer cable connects from the Console to the Start/Speed/Finish Track Sensors; the shorter cable connects between the Base of the Tree and the Console. Refer to the track set up picture to better understand the placement of cables and other accessories.

The free standing beam emitters are placed on the outside of the track and the track sensors with interconnect cable and console up the middle of the track. Each of the beam emitter and track sensor units are fully interchangeable with a like unit. The console unit will always be at the start end of the track. Twenty feet of cable will allow a variety of placement needs.

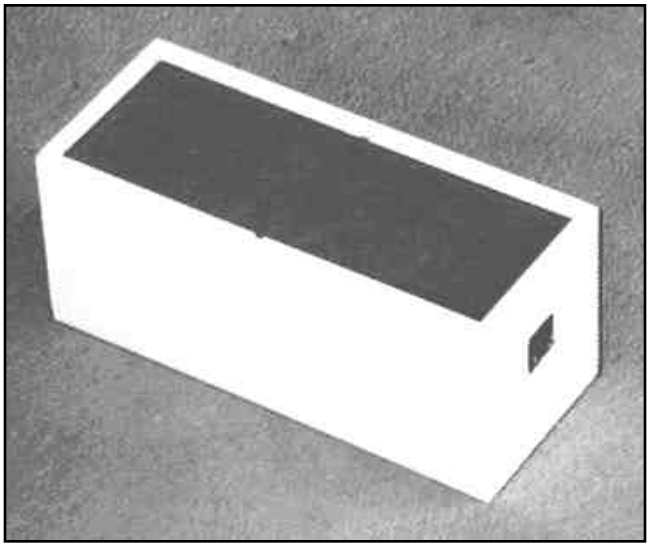
STEP 3 -

You must do some preliminary assembly of the base and the Tree. The Tree is assembled by inserting the bottom section into the top section and twisting until hand snug. The connector and cable of the Tree are inserted into the hole on the top of the Base. Cables for the power from the battery and console are connected with the appropriate connectors (see diagrams and pictures). Connectors are labelled for proper orientation. The battery will be placed in the base later on to maintain stability in a windy situation



Beam Emitter Unit base

Note On/Off switch and placement for four AA batteries for each unit. All Beam Emitter units are fully interchangeable with one another.



Track Sensor Unit back side

Note cable connector in the back. All Track Sensor units are fully interchangeable with one another. Picture is base up.

before the Tree is inserted.

STEP 4 -

Place the four (4) Track Sensor units on the track at the START and FINISH locations in the center of the track and connect to the interconnect cable. If the optional speed Track Sensors are to be used, they should be placed at the start of the Speed Trap. Placement must be consistent to the locations you marked in STEP 1. Center the Track Sensor over the mark. Aim the Track Sensor units perpendicular to the track so they will receive the signal from the Beam Emitter units placed on the other side. You may space the units with spacer blocks as described in "Helpful Hints" to ease set up and insure consistent accuracy.

STEP 5 -

The 20' of cable allows the System Console to be placed away from the Tree and back from the starting line. Stretch out the interconnect cable and place on the track. Once in place, connect all Track Sensors keeping in mind the Right lane is indicated by the Gray Shield at the connector end.

Lay out the shorter Tree to System Console cable between the location for the Tree and the location for the System Console. Connect this shorter cable to the System Console in the connector labelled PRO TREE JUNIOR.

NOTE: DO NOT CONNECT THE SHORTER CABLE TO THE TRACK SENSOR CONNECTOR ON THE SYSTEM CONSOLE WITH POWER APPLIED. DAMAGE MAY RESULT TO THE PRO TREE JR OR THE SYSTEM CONSOLE NOT COVERED BY THE WARRANTY.

Connect the longer interconnect cable to the System Console unit connector labelled TRACK SENSORS.

STEP 6 -

Remove the side panels of the Tree Base by lifting up in the middle bottom. This is accomplished by placing your finger in the slot at the bottom of the side panel and pushing up until the side panel lifts out of the lower slot. Swing the bottom of the panel out sligthly and pull down to remove it from the upper guide groove.

Place the Tree Base in place over both cables and route the shorter cable through the front hole in the bottom of the Tree Base. Connect the shorter interconnect cable to the connector located at the front of the Tree Base.

Track Sensors Set Up

Note the single cable from the tree to the Start end of the track. The cable with the Gray Shield as shown below goes into the RIGHT Lane Sensors on all locations. Right Lane is viewed from the starting line.

Connect the Light Tree multicolored cable to the connector located at the front of the Tree Base.

Place the Battery in the base with the long side of the battery running front to back. This should provide a side view of the battery.

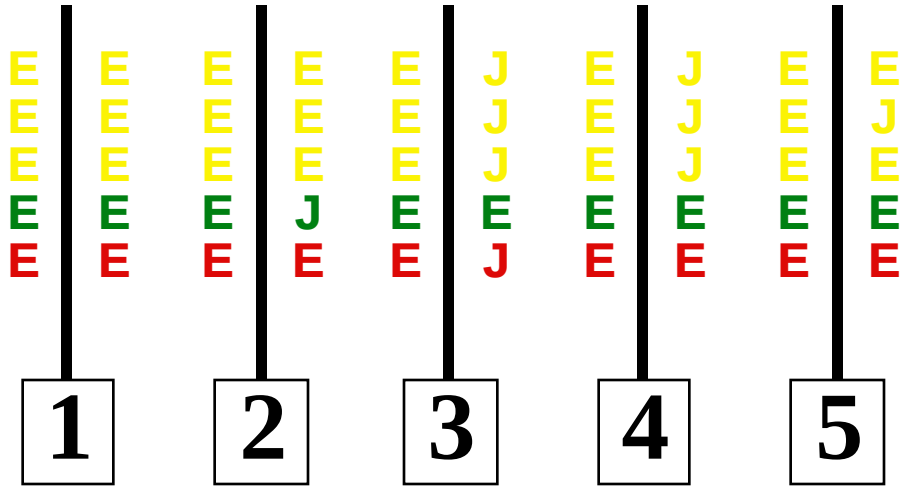
Once the battery has been connected, replace the side panels by inserting them into the upper groove and lifting. Swing the bottom of the panel inward and lower into the lower grove.

STEP 7 -

If additional Center Lane Dividers have been purchased, install them by placing the end plate and lower spacers on the track. Place the side panels into the lower grove and insert the upper red panel starting at one end and sliding over the side panels.

You have now set up your system and are ready to turn on the power. See OPERATION Section.

PRO TREE JR SAMPLE DISPLAY CONDITIONS



EXAMPLE	CONDITION
1	Cars Staged in both lanes
2	Winner Right lane (NHRA rules apply)
3	Foul Right lane (PRO Tree)
4	Bracket Start (PRO or FULL Tree)
5	Bracket Breakout (Middle Yellow On Solid)

KEY: **E** - **Light OFF**

J - **Light ON**

STANDALONE OPERATION

The Pro Tree JR System Console is supplied its power from the 12 volt battery located in the Tree Base. The System Console is able to operate without the 12 volt battery by connecting a 6-cell R/C battery pack to the Tamiya style connector located in the battery compartment of the System Console. This allows timing of cars without the use of the Tree or Tree Base. When used in this configuration, the speed and ET readings will be valid but the RT reading will not be correct since there will be no tree to indicate when the green light is on.

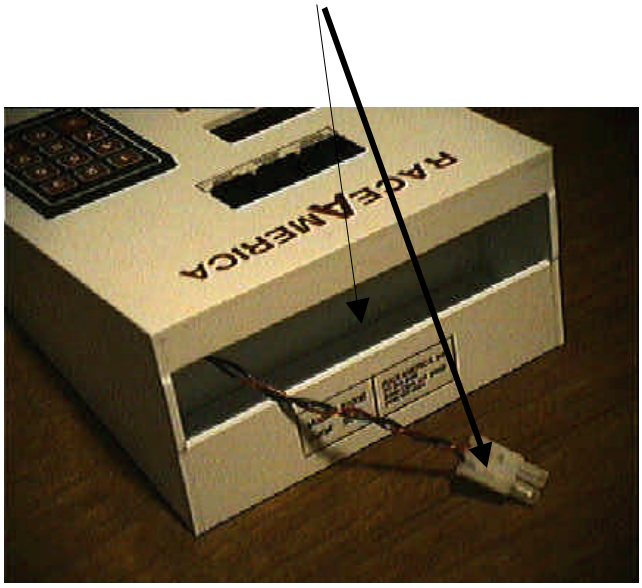
Power is supplied to the Track Sensors from the System Console. If the Tree is connected to the System Console, the Track Sensors receive power from the 12 volt battery in the Tree Base. If the 6-cell battery pack is used, the Track Sensors receive power form the 6-cell battery pack.

BATTERY LIFE

Battery life for the 12 volt battery is very long while the expected time for the 6-cell battery pack is around 10 hours for a fully charged battery pack. If the system exhibits erratic operation when using the 6-cell battery pack, the battery voltage may be too low and require charging. 6-cell battery packs below approximately 7.0 volts may provide erratic operation.

The Infrared Beam Emitters require four AA size batteries. Voltages below approximately 4.2 volts may cause erratic alignment problems. Replace the batteries to restore proper operation.

Notice the location of the connector for the optional 6-cell R/C battery pack. The battery is stored in the battery compartment in the rear of the System Console.



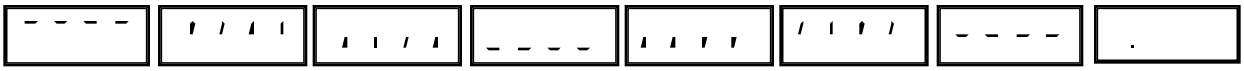
OPERATION STEPS - PRO TREE JR

STEP 1: POWER-ON Selftest

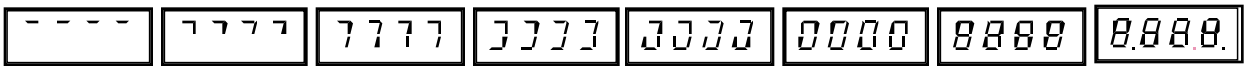
After connecting all cables, connect a 12 volt auto or marine battery to the timing system using the red and black alligator clips connected to the electronics in the Base of the Tree. If using the Single Lane Timer operation, connect a 6, 7, or 8 cell battery pack to the connector on the rear of the timer console. RED to positive (+) and BLACK to negative (-). Each time power is applied to the timing system, a selftest sequence is initiated by the microprocessor to insure proper operation of the display and electronics. To insure all visual components are operational, the following sequence should be observed:

LED Display:

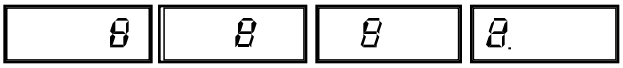
Each segment of the 4-digit LED display will illuminate in sequence.



Segments of the 4-digit LED display will illuminate in an additive format.



Each digit with its decimal point will illuminate from right to left.



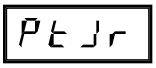
LED Display:

The product number, serial number, and microprocessor code revision level are displayed.

At this point, selection of Single Lane Timer operation or Pro Tree JR operation is selected. The LED display flashes the current operation:

LANE for Single Lane Timer operation

PTJR for dual lane Pro Tree JR operation



Press any key to toggle between operation modes. Press # when the desired displayed mode is displayed.

Light Tree: (Pro Tree JR operation)

Each light on the left side will illuminate in sequence starting from the bottom RED light up through the top YELLOW lights.

Each light on the right side will illuminate in sequence starting from the bottom RED light up through the top YELLOW lights.

Both lanes will sequence together starting with the top YELLOW lights down through the RED lights.

All lights will illuminate in sequence starting from the bottom left up to top YELLOW then the bottom right up to top YELLOW. The speed of the test will be at 2 times the previous tests.

All lights will go out, then all lights will flash on simulaneously, then off

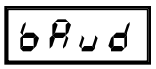
Visually inspect both the Console LED Display and the Light Tree for proper operation. All other circuitry is internally tested by the microprocessor. Upon completion of both selftests, the timing system will be ready for use with tree and display blank. If an error occurs, the timing system will not respond to the keypad or the sequence above will not start or follow to completion.

STEP 2: Configure the Printer and Track Sensors

Configure RS232 port and printer: (if a printer is connected to the console)

Press 8

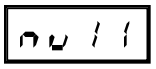
The LED Display is currently flashing the printer baud rate of 1200 bits per second.



Press any key to advance the flashing baud rate to the next available speed.

Press # to accept the displayed printer communications baud rate,

The quantity of NULL characters to be added to the printer as a delay is now flashing.



Null characters are used to allow older printers sufficient time to carriage return or line feed without loss of timeslip information.

Enter the desired quantity of nulls and press #

The quantity of LINE FEEDs is now flashing.

Enter the desired number of of line feeds to allow the printout to eject from the printer. (Generally, 17 line feeds are used to allow 2 timeslip per page for standard paper but will depend upon the type of printer and the paper size being used as timeslips.)

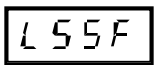
Enter the desired quantity of line feeds and press #

(NOTE: OLDER UNBUFFERED SERIAL PRINTERS MAY REQUIRE A TIME DELAY DURING CARRIAGE RETURNS AND LINE FEEDS. IF THE TIMESLIP IS MISSING SOME INFORMATION OR PRINTS ERRATICALLY, INCREASE THE NUMBER OF NULLS UNTIL ALL INFORMATION IS PRINTED. IF THE MAXIMUM OF 99 NULLS DOES NOT RESOLVE THE MISSING INFORMATION, A SLOWER BAUD RATE MUST BE SELECTED AND THE QUANTITY OF NULLS ADJUSTED. REMEMBER, AT 300 BAUD, 99 NULLS EQUALS A 3.3 SECOND DELAY!)

Verify track sensor alignment: START/SPEED/FINISH

Press 0 (Single Lane Timer operation will display right lane alignment information only)

LED Display indicates the status of the left lane Track Sensor alignment:

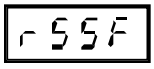


The 'L' is for left lane. The leftmost 'S' is the column where the START sensor status will appear. The rightmost 'S' is the column where the SPEED sensor status will appear, and the 'F' is the column for the FINISH sensor status.

The LED Display then displays the status of each sensor on the left lane. If any digit is incrementing, the associated track sensor/emitter pair is out of alignment. Adjust the appropriate sensor until the digit no longer increments.

If a digit is non-zero or increments intermittently, a sensor/emitter pair is partially misaligned. Adjust the appropriate sensor until the digit no longer increments.

Press any key to view the status of the right lane Track Sensor alignment:



The 'r' is for right lane. The leftmost 'S' is the column where the START sensor status will appear. The rightmost 'S' is the column where the SPEED sensor status will appear, and the 'F' is the column for the FINISH sensor status.

The LED Display then displays the status of each sensor on the right lane. If any digit is incrementing, the associated track sensor is out of alignment. Adjust the appropriate sensor/emitter pair until the digit no longer increments.

If a digit is non-zero or increments intermittently, a sensor is partially misaligned. Adjust the appropriate sensor until the digit no longer increments.

Press any key to view the left lane Track Sensor alignment. All sensors are being monitored although only 3 sensors are displayed at any time on the LED Display.

Systems purchased without the optional Sensor/Emitter pairs for Speed detection will see the Speed digits increment continuously. The system will still operate without the Speed function.

To verify the new alignments, press # and repeat this function and verify all digits remain at zero.

(NOTE: IF ERRATIC TIMES AND SPEEDS OCCUR DURING A RUN, A TRACK SENSOR MAY REQUIRE A SLIGHT ADJUSTMENT. TO MONITOR FOR INTERMITTENT OPERATION OF THE TRACK SENSORS, PRESS 0 AND VIEW THE DISPLAY OVER SEVERAL MINUTES. IF ANY OF THE ZEROES ARE REPLACED BY ANOTHER DIGIT, THE TRACK SENSOR HAS DETECTED AN OBJECT OR IS EVER SO SLIGHTLY OUT OF ALIGNMENT. ON WINDY DAYS, LEAVES AND OTHER OBJECTS MAY FOOL THE TRACK SENSORS. THIS WILL GREATLY CONTRIBUTE TO INTERMITTENT INCORRECT MEASUREMENT OF SPEED AND TIME.)

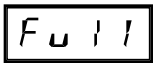
STEP 3: Configure Each Run (Pro Tree JR operation)

Select Full or Pro tree starting format:

Press 3

LED Display illustrates starting format to be used.

Press 3 again to toggle back to the other starting format.



Selected starting format will remain unchanged until ALTERED by the 3 key.

(At power on, the default starting format will be the PRO tree)

Bracket/Index entry for an individual run: (2200B Models ONLY)

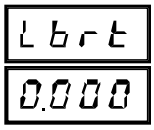
Press 1

The left lane bracket/index is displayed with the first digit flashing for entry.

Press any number for each flashing digit in the display.

Press the * key for ET's above 9.999 seconds to move the decimal point position.

Press the # key when left lane bracket entry is complete.

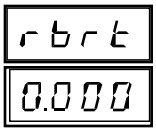


The right lane bracket/index is displayed with the first digit flashing for entry.

Press any number for each flashing digit in the display.

Press the * key for ET's above 9.999 seconds to move the decimal point position.

Press the # key when left lane bracket entry is complete.



(At power on, the default bracket/index is set to all zeroes for both lanes)

Run a race using current brackets and tree starting format:

Press 2

Tree begins starting sequence.

After each lane (in which a car has started) has finished, run results are displayed.

If one lane does not finish after breaking the START beam, press # to end the run and display the results.

All foul starts will be indicated for each lane by the RED light.

All bracket or index breakouts will be indicated for each lane by the center YELLOW light.

The first car to cross the finish line is indicated by the GREEN light.

(NOTE: IN THE EVENT OF A REDLIGHT OR A BREAKOUT, THE TREE AND LED DISPLAY PROVIDE THE NECESSARY INFORMATION TO APPLY RACING RULES TO DETERMINE THE TRUE WINNER. THE SYSTEM HAS BEEN DESIGNED TO ALLOW THE FINAL DECISION TO BE LEFT UP TO THE JUDGEMENT OF THE RACE DIRECTOR AND THE LOCALLY ACCEPTED RACING RULES.)

STEP 3: Configure Each Run (Single Lane Timer operation)

Time a run for ET and optional MPH:

Press 2

The timer is ready to time a run when the LED display flashed the run indication and blanks the LED display.

If the right lane does not finish after breaking the START beam, press # to end the run and display the results.

Optional Post-Run Features

Print last race results:

Press 6

Run results are sent to the Printer along with current tree and bracket information using the configured baud rate, null characters, and line feeds.

(NOTE: FOR PRO TREE JR OPERATION, THE PRINTOUT WILL DEFINE THE WINNER AS AN INDICATION OF THE FIRST CAR TO CROSS THE FINISH LINE. IF THE RACE DIRECTOR DETERMINES THE WINNER OF THE RACE DIFFERS FROM THE PRINTOUT, THE PRINTOUT SHOULD BE ALTERED BY THE RACE DIRECTOR PRIOR TO DISTRIBUTION TO THE DRIVERS)

Clear the display and tree:

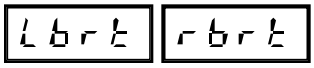
Press # (Pro Tree JR operation)

LED Display and tree are reset and blank.

Recall and display the last bracket entered: (Model 2200B ONLY)

Press 4

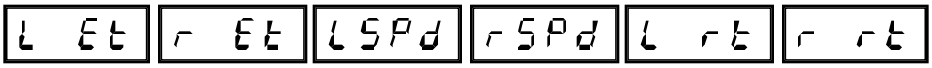
LED Display scrolls the last entered brackets for the left and right lanes. (At power on, the default bracket is zero for both lanes)



Recall and display the last run results:

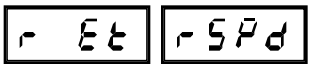
Press 5 (Pro Tree JR operation)

Tree lights are updated and the LED Display sequences through the left ET, right ET, left speed, right speed, left RT, and right RT.



Press 5 (Single Lane Timer operation)

The LED Display sequences through the right ET, right speed.



Recall and display the last run results for the left lane only:

Press 7 (Pro Tree JR operation)

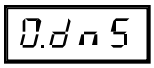
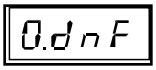
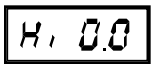
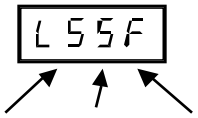
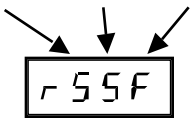
The LED Display sequences through the left ET, left speed, and left RT.

Recall and display the last run results for the left lane only:

Press 9 (Pro Tree JR operation)

The LED Display sequences through the left ET, left speed, and left RT.

PRO TREE JR - TROUBLESHOOTING

CONDITION	POSSIBLE SYMPTOMS
Car is not detected by sensors	Emitter/Sensor alignment is to high System battery is low Poor road contour
Unable to align sensors	Add wedges to align to line of sight Move units closer together Exchange with working units Emitter batteries are low Use Alignment Display (press 0) until digits stop counting
System Displaying Erratic Information	Disconnect/Reconnect and observe selftest
LED display on console displays:	
	Car in this lane did not interrupt the START beam or no car was in this lane
	Car in this lane did not interrupt the FINISH beam or no car was in this lane
	Speed of car in this lane was greater than 80.00 mph or SPEED sensors not present or car did not interrupt SPEED beam
	Speed of car in this lane was slower than 2.00 mph or SPEED beam interrupted early by something on the track
After starting race (press 2), LED display shows:	
	Left lane sensor alignment. The flashing 'S' or 'F' indicates the START, SPEED, or FINISH sensor needs attention. Emitter battery voltage may be low.
Start Speed Finish	
	Right lane sensor alignment. The flashing 'S' or 'F' indicates the START, SPEED, or FINISH sensor needs attention. Emitter battery voltage may be low.

MAINTENANCE REQUIRED

PRO TREE JR MAINTENANCE

The PRO TREE JR Tree, Display, Console, Beam Emitters and Track Sensors do not require any maintenance.

To ensure continuous operation on raceday, the only maintenance required is to keep track of battery hours so as to have fully charged batteries. The Auto/Marine Battery should be recharged after each days use. Plan to replace the alkaline AA cells in the Beam Emitters at about 40 hours use. If you are using rechargeable AA cells, recharge them each day. Low voltage of either item will cause intermittent operation of the system.

Bulbs for the Tree can be replaced by purchasing 11Watt/12Volt style bulbs from a home and garden supply store (Intermatic Malibu brand). Note carefully the way the lens assembly comes apart and reassemble in the reverse steps after installing the new lamp.

Beyond these items, you should not encounter any routine maintenance with the operation of your timing system.

SPARE PARTS

RACEMAERICA recommends a spare set of emitter, sensor and track cable are available in the event of an unfortunate accident. All available spare parts are listed on the Order Form and are available from your distributor or directly from RACEAMERICA.

SHIPPING CONTAINER

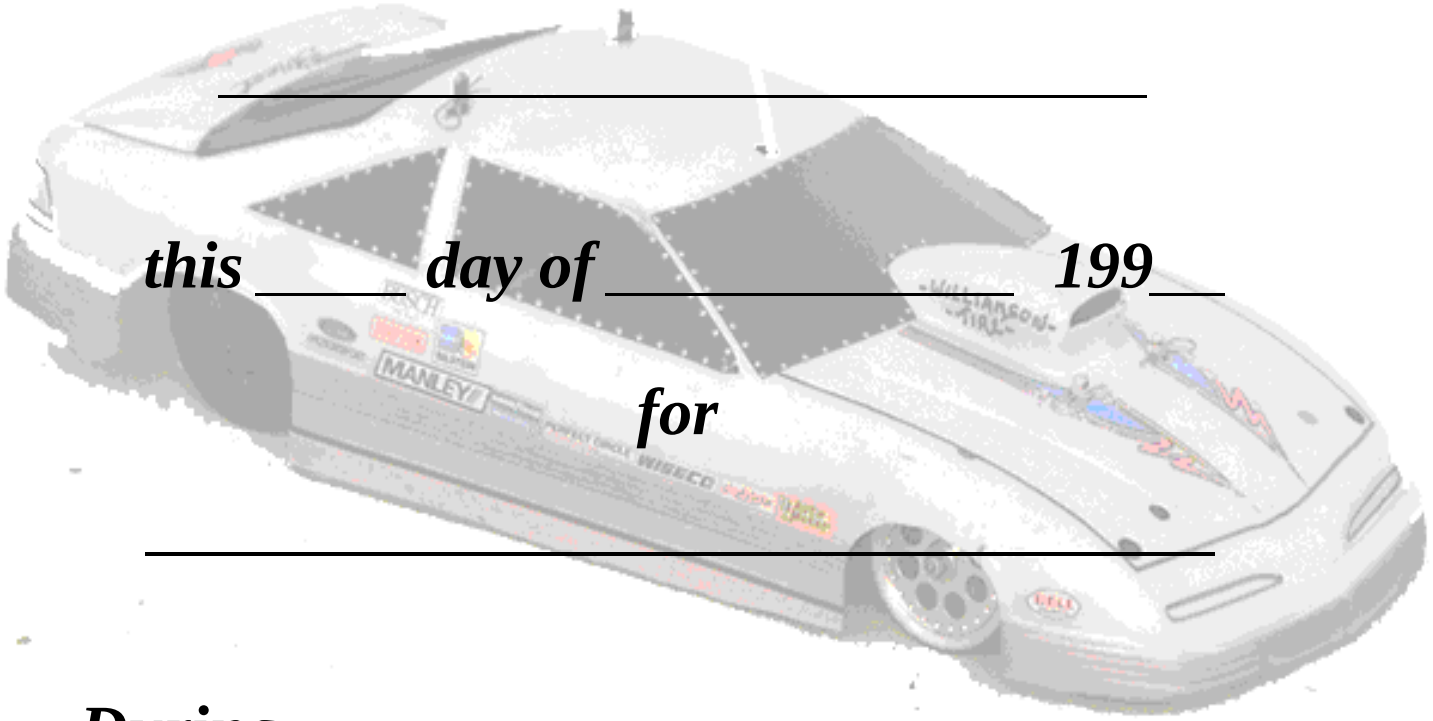
Save the shipping containers you received the system in to protect the system in storage when you are not racing.

CERTIFICATE of ACHIEVEMENT

PRESENTED

to

_____



this _____ day of _____ 199___

for

_____

During _____

(event name)

RACE AMERICA

Product Registration Form

Returning this registration form entitles you to warranty service and special benefits, including upgrade notices and technical support. Please take the time to complete and return.

First & Last Name _____

Company Name _____

Street Address _____

Address Line 2 _____

City _____

State ZIP _____

Daytime Phone (_____) _____

SERIAL NUMBERS

PRO TREE JR Display Unit _____

Beam Emitter _____ _____

_____ _____

_____ _____

Track Sensors _____ _____

_____ _____

_____ _____

_____ _____

Purchased From _____

Address _____

Purchase Date _____

What Hobby magazines do you read? **R/C Car Action** **Competition Plus**

How much do you spend each year on RC Cars? _____

How often do you race in an organized program? _____

Types of racing you participate in - Off-Road Pavement Truck Pulls Drag Cars

Comments or Suggestions? _____

_____

RACE AMERICA, INC.
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SANTA CLARA, CA 95055-3469
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