RACEAMERICA

Timing Systems

2300 Series JR Competition

Dual Lane Drag Timing System Owner's Manual

Rev F

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RACEAMERICA

T i m i n g S y s t e m s

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 RACEAMERICA, Inc., 280 Martin Avenue, Unit #1, Santa Clara, CA 95050.

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PACKAGE COMPONENTS

The standard Model 2300 JR Competition dual lane drag package includes:

1 - 2300 Series Console Unit factory configured as follows:
- Heads-up (2300H) or Index (2300B) Starts
- Speed Trap length of 10', 66' or 20M
- Speed display in MPH or KPH
- Standard or Custom Timeslip Header

1 - Competition 12 VDC Tree with Staging
1 - Base Plate Tree Stand/30" Iron Pipe
1 -Owner's Manual

- Centerline Cable Option includes:
  1 -Interconnect Cable for SPEED/FINISH
  1-Extension cable section for 1320' cabling
  2 - 5040A IR Beam Emitters (Finish)
  2 - 5140C IR Track Sensors (Finish)
  2 - 5058A IR Beam Emitters (Stage/Start)
  2 - 5158C IR Track Sensors (Stage/Start)

- Outside Cable Option includes:
  1 -Interconnect Cable for SPEED/FINISH
  1-Extension cable section for 1320' cabling
  1 - 5042A IR Beam Emitter (Finish)
  2 - 5140C IR Track Sensors (Finish)
  2 - 5058A IR Beam Emitters (Stage/Start)
  2 - 5158C IR Track Sensors (Stage/Start)

Model 2300 Available Options:
Cabling options:
- Centerline - 132', 200', 330', 660', 1320'
- Outside - 200', 330', 660', 1320'

6013B Speed Detection: (MPH or KPH)
02-2502 - Professional 110VAC Tree with Pre-stage*, Stage and Rear Facing Lights
02-2505 - Professional 220VAC Tree with Pre-stage*, Stage and Rear Facing Lights
6025B Professional Dual Beam Staging Option:
- 2-Dual IR Beam Emitters (less 2 5058A)
- 2-Dual IR Track Sensors (less 2 5158C)

7540A Foam Stands
5040D IR Beam emitter (for Speed/Finish)
6789A Starter's Button - 25 foot cable
6038S Dot-Matrix Times5lip Printer Package
3122A Custom Timeslip Header
3121A RASCORE Data Capture Software for PCs
6523B/6823B Single Line Dual Lane Digital Scoreboard
4500A Data Communication PODs (for printers and displays greater than 25 ft from console)

*Pre-stage operates via console program button.

LOCAL REQUIREMENTS

Additional items required to operate the 2300 Series timing system package and options:

Batteries for Beam Emitters (see table pg 6)
DC TREE - 12VDC automotive battery

AC TREE - See Proper wiring and phase checks
1 -110VAC 20Amp circuit
1 - Surge Suppression Power Strip (20A)
8 - 60W 110VAC Stage/Pre-Stage Bulbs
20 - 100 W 110VAC Floodlights (12 Yellow, 4 Green, 4 Red)

Other options:
12VDC source for each printer or Scoreboard (AC adapters available)

PRODUCT SPECIFICATIONS

The following listing provides the designed performance specifications for the 2300 Series timing systems:

Start/Finish Lane Width	4 to 50 Feet
ET Timer Capacity	up to 90.000 sec
RT Timer Capacity	up to 9.999 sec
Time Accuracy	0.001 seconds
DC TREE Dimensions	75" X 20" X 20"
DC TREE Weight	~ 45 pounds
AC TREE Dimensions	82" X 20" X 20"
AC TREE Weight	~ 55 pounds
Power Requirements:A	
DC TREE	12VDC Source
AC TREE	110 VAC - 20A
Emitters	AA/D batteries

THEORY OF OPERATION

Competition
12VDC TREE

The 2300 Series Drag Timers are microprocessor controlled completely self contained race timing systems utilizing the latest CMOS technology circuit components to provide a highly accurate drag timing solution. The system contains an internal quartz crystal clock to maintain time accuracy and display of race results to one thousandth of a second.

Power is supplied to the timer console and track sensor components from the TREE.

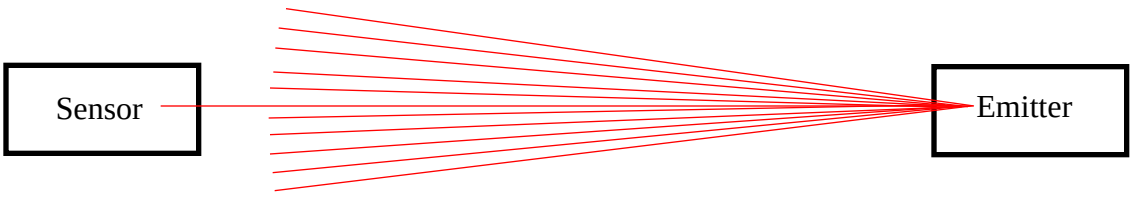
The Beam Emitters and Track Sensors operate on invisible (to the unaided human eye) Infra-red light. The coded light frequencies are constantly received by the Track Sensors until a car interrupts reception ('breaks' the beam).

The IR Beam Emitter to Track Sensor transmission operates on Line-of-Sight principles. This makes alignment of these units critical. These units will operate over a wide range of conditions (full sun to total darkness) but should not be operated beyond the specification parameters (4 ft to 50 ft).

Once the system is properly set up and aligned on the racing surface, the timer console will 'monitor' the track sensor each time a run is made.

In racing mode, the system microprocessor takes control of checking for a valid set of start conditions (expected blocked and unblocked sensors), then starts the lights (with adjustment for Full and Pro formats as well as any bracket or index adjustments) while watching for a start in either lane (a foul start will freeze the tree at the point of foul), records Reaction Time for each lane as the racers start, then watches for subsequent beam interruptions at the Speed and Finish points; after all data is collected, NHRA rules are applied to determine the winner and display this on the TREE and output to printers and Scoreboards connected to the system.

Professional
110VAC TREE



The Emitter throws a spot light like beam of infra-red light; the Sensor should be aligned near the center of the beam for optimal reception and alignment.

Track Sensors and Beam Emitters

OPERATION

RACEAMERICA utilizes a variety of Track Sensors and Beam Emitters in its timing systems. All operate on line-of-sight infra-red beam principles. The beam is created by the Beam Emitter and received by the Track Sensor. The operating specification is for a gap of between four and fifty feet between the Emitter and Sensor. These will operate in conditions ranging from full sun to total darkness without adjustment when properly aligned. The Beam Emitters require a power source (batteries or AC adapters) while the Track Sensors are powered from the cable to the Control Console. The infra-red beam is a coded frequency which is detected by the sensor. Different frequencies are used for different locations in different systems. Beam Emitter voltage should not fall below 4.5 Volts DC while operating.

The beam operates on a generally established condition (ie, the sensor senses the presence of the beam), and is interrupted (broken) by the racer (beam blocked). The beam will automatically reestablish after being blocked. The detection of vehicles passing through the beam rapidly highlights the sophistication of this technology. In fact, many small items such as leaves, water, snow can interrupt the beam. RACEAMERICA tries to minimize the impact of these occurances by requiring multiple short interruptions of the beam to indicate an interruption as well as verification of expected beam conditions before a race is allowed to start.

RACEAMERICA Professional Dual Beam Sensors utilize multiple infra-red frequencies due to the close proximity of each sensor to positively insure the correct signal is broken or blocked. This is why track position and orientation is critical.

RACEAMERICA Single Beam Staging/Start Sensors (5058A/5158C) operate in both blocked and unblocked modes depending on system conditions. The unblocked mode allows for alignment check. The mode is reversed once a car has staged (blocked the beam) and the system is about to start a race. The ET timer for a lane with a blocked beam will start when the beam is reestablished as the vehicle pulls away. The beam can reestablish in less than 0.0001 seconds.

RACEAMERICA offers several different sensor and emitter models; depending on a variety of requirements. The following table summarizes the different Sensor/Emitter combinations utilized with the Model 2300 JR Competition system. In general, non-similiar pairings will not function correctly.

Sensor	Emitter	Application
5140C Single Beam Sensor	5040A Single Emitter, ‘AA’ Batteries (4) 5040D Single Emitter, ‘D’ Batteries (4) 5042A Dual Emitter, ‘D’ Batteries (4)	Speed/Finish Detection
5158C Single Sensor	5058A Single Emitter, ‘AA’ Batteries (4)	For Single Beam Stage/Start
5258L/R Dual Sensor		For Dual Beam RC/Snowmobiles
5156L Left Dual Beam	5056L Left Dual Beam, ‘D’ Batteries (4)	For Professional Dual Beam
5156R Right Dual Beam	5056R Right Dual Beam, ‘D’ Batteries (4)	Stage/Guard Starts

Notes: 5140C, 5040A, 5042A, 5158C and 5058A units will operate in protective Foam Stands (7540A) on the race surface.

5140C Sensor

5040A/5042A Emitter

Used for Speed and Finish track locations. Emitters utilize 'AA' batteries.

5040D Emitter

Upgrade emitter for Speed and Finish - utilizes four 'D' batteries each

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5158C Sensor

5058A Emitter

These Sensors and Emitters are used for single beam Stage/Guard positions.

5156l/R Dual Beam Sensor

5056L/R Dual Beam Emitter

Professional Dual Beam Sensors and Emitters are an upgrade used for Stage/Guard Drag Race configurations. Because these Sensors and Emitters utilize two different infra-red frequencies for Stage and Start, track position is critical - note marking on units.

Serial Port
for RS232 Communications
(Printer, PC and Scoreboard Options)

Track Sensor/
Tree Cable

JR Competition Console Connectors

The Console connector panel; a Starter's Button connector is available on the Track Sensor cable for this option (at the starting line).

SET-UP STEPS - 2300 SERIES

RACEAMERICA has tried to make use of the timing system as simple as possible, however, it is strongly suggested that the system be set up in a race simulation area without stretching the cables all out to gain familiarity with basic operation of the components prior to race day. This can be done in a driveway or garage. Walking through beams can simulate vehicles for purposes of familiarizing one with basic operation.

STEP 1 - Familiarize yourself with the components pictured in this manual and how they interconnect. The Track Sensor Interconnect Cable is configured for connection between the starting line, the finish line and the timer console. Several connectors may connect different segments of this cable. The cable is keyed to match the start line and finish line track sensors, position identified at the track sensor end of the cable. The large round connector connects to the console and the smaller connectors (RJ11) connect to the Track Sensors at the start line and the finish line and speed trap (optional) as indicated on the cable near the RJ11 connector. Make sure the correct sensor is connected at each position (with the correct emitter opposing it)

STEP 2 - Identify the emitter/sensor placement at the start line and finish line. The lane width should be set between four (4) and fifty (50) feet. Layout the Track Sensor Interconnect Cables on the track site as illustrated on the Track Sensors/Cabling Diagram pages based on the options included with the system. Speed Trap sensor spacing should be set to the system condition to record accurate speeds. To help in determining initial beam emitter to track sensor alignment in wide track widths, use a string stretched between the beam emitter and track sensor or eyeball a straight line between units. The system alignment mode will be utilized to verify alignment after power-up.

STEP 3 - Attach the TREE to the base as shown in the setup photos. Multiple base plates may be required for windy racing conditions. Install lamps in the AC TREE models.

STEP 4 - Connect the TREE to Sensor cable. This is the round four conductor connector. Refer to the picture of the Console connector panel. Cable routing should be such as to avoid vehicle and pedestrian traffic. Additionally, avoid running any of the system cables in conduit next to 110VAC power lines as intermittent failures may occur.

STEP 5 - Connect cables for optional Starter's Button, Printers, PCs, PODs and Large Digital Scoreboards to the appropriate connectors.

STEP 6 - Connect the system to the power source. For the DC TREE, connect the RED (+ or Positive) and BLACK (- or Negative) alligator clips to the 12VDC battery and you're ready to begin. Operating the system from a battery connected to a charger or running car engine will result in an over voltage condition and damage the timer.

For the AC TREE, connect the TREE to the AC power source. If operating with optional AC power, verify all AC power is connected as shown on page 9 (have a qualified electrician verify the wiring if necessary - severe damage to the system can occur if the wiring is not correct). With AC power, a surge suppression power strip may be required at the TREE to compensate for line voltage fluctuations.

Go to Power On/Self Test section.

2300 JR Competition System showing Console, Sensors and Emitters

110 VAC POWER CONNECTIONS - 2300 SERIES

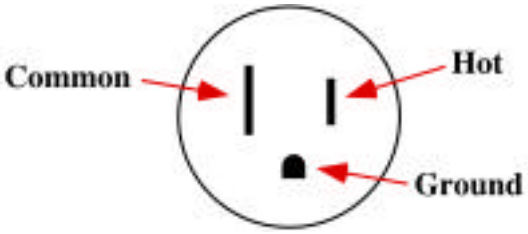
110VAC POWER OUTLETS

Severe damage to the timing system and peripheral devices can result if the AC power outlets and extension cord wiring is improperly wired or out of phase!

To insure correct AC power installation and operation, all electrical outlets and extension cords used with the timing system and peripheral devices (PC, Printer, Scoreboards) should be checked before power is applied to the system. All electrical outlets and extension cords should be wired correctly and using the same leg (same 110VAC phase) of incoming power.

A qualified electrician should use the following diagrams to confirm proper wiring and phase of all electrical outlets and extension cords.

-- Proper Wiring



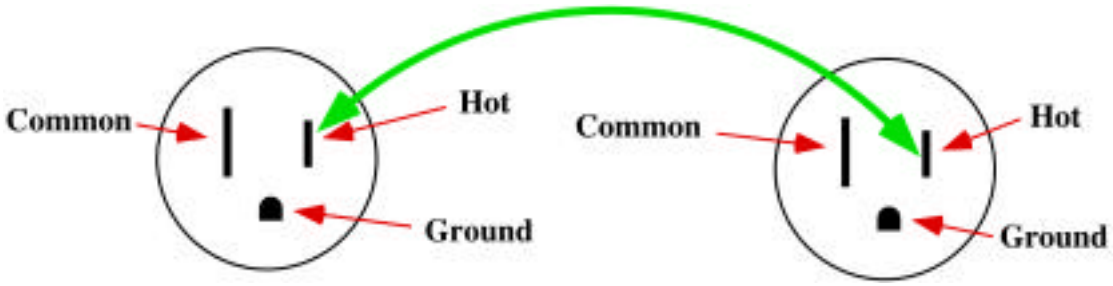
Typical Grounded Electrical Plug

AC Voltage Check - use voltmeter capable of measuring AC voltage

Between Common and Hot - 110 VAC
Between Common and Ground - 0 VAC
Between Hot and Ground - 110 VAC

-- Proper Phase

All devices connected to the timing system must be on the same phase of the AC cycle - in phase - before power is applied!



AC Voltage Check - use volt meter which can measure AC voltage

Between Hot and Hot - 220+ VAC - OUT OF PHASE
Between Hot and Hot - 0 VAC - IN PHASE

Assembled Tree and Base Plate

The assembled Tree - note the base orientation is at a 45 degree angle to the tree for increased stability.

Multiple base plates can be screwed together to increase stability if required for windy environments.

Power Cord

Tree Interconnect Cable

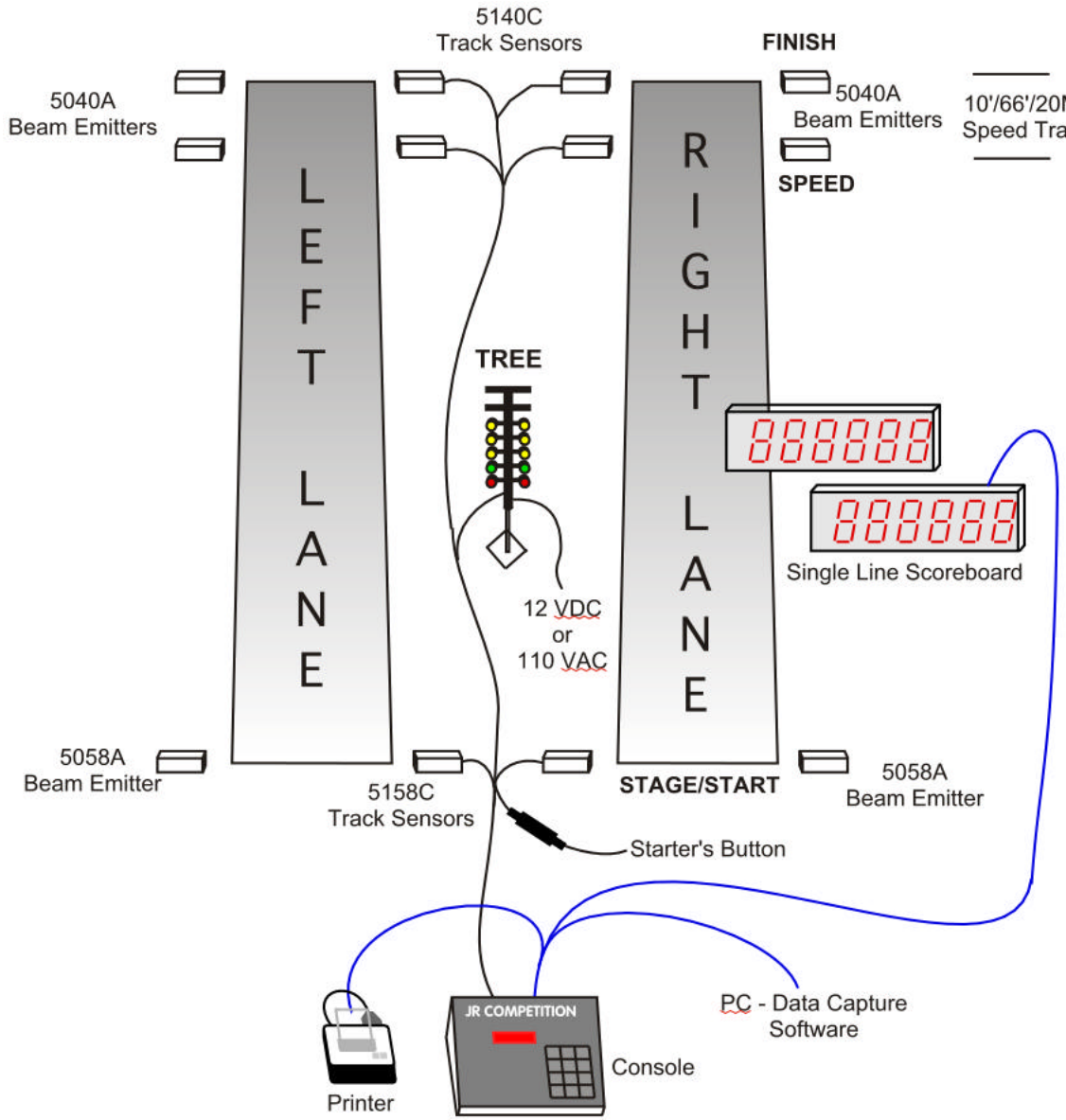
The TREE as seen from the back; do not connect the power until all cables have been connected and the system is ready for power up.

TREE CLAMP ASSEMBLY

The iron pipe is held in place by two clamps at the base of the tree. Assembly is easy if the pipe is inserted into the base of the tree with the tree sitting face up horizontally. Push up the clamp from the bottom to allow the pipe to go through each of the two clamps; a Stop bolt is in place to limit the pipe travel.

The iron pipe clamps from the back side - the nuts should be tightened to a little more than finger tight to hold the tree adequately in the vertical orientation.

TRACK SENSORS/CABLING DIAGRAM
Centerline cables
Single Beam Stage/Start with Speed Detection



NOTES:

Cable length between console and starting line is 50 feet.

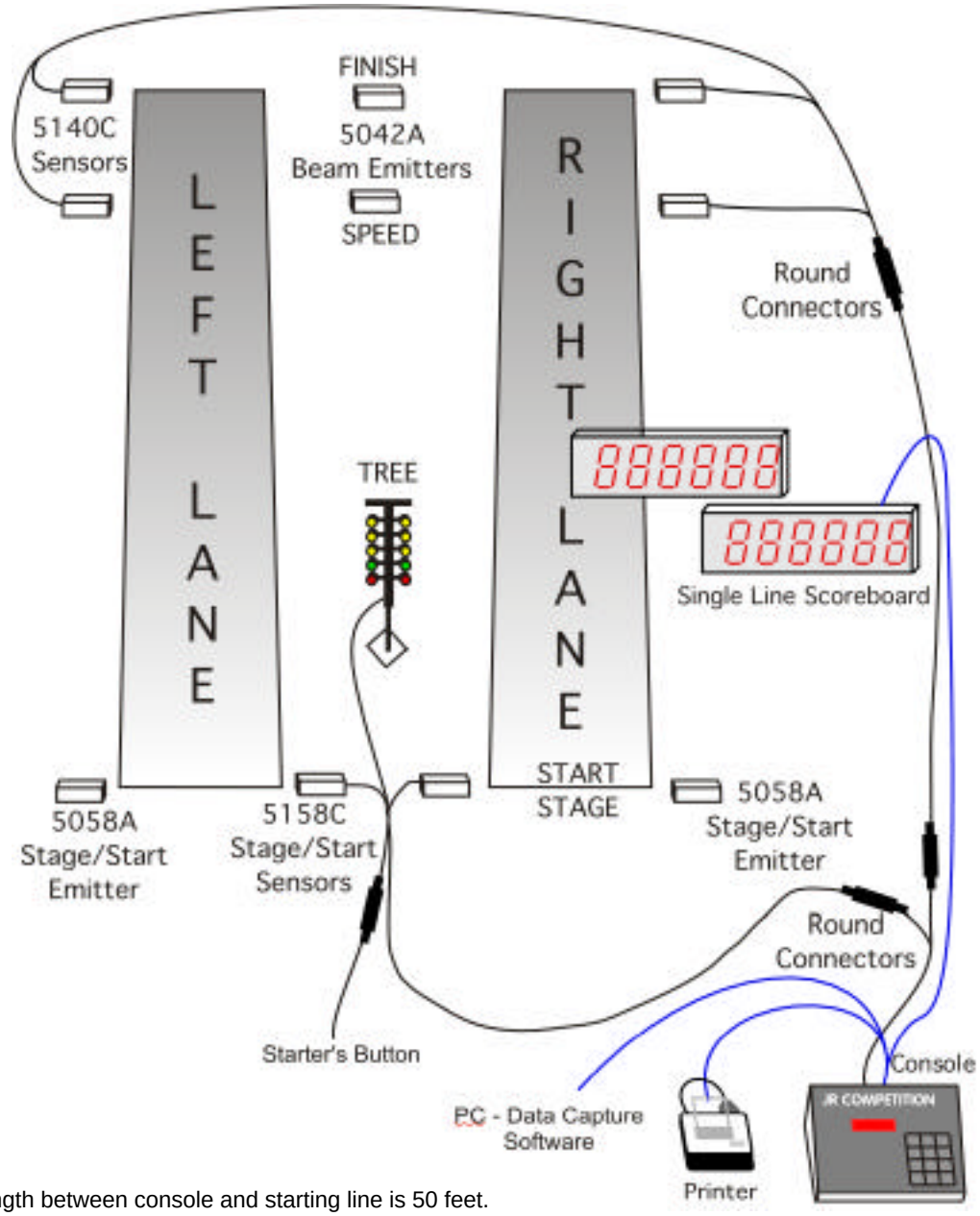
Speed Trap distance is preset at the factory at 10 feet, 66 feet or 20 meters. Connectors are on the cable even if the Speed Option is not purchased and the option can be disabled on the console.

Track cable lengths can be from 132' to 1320' as required. Cables can be routed down the center of the track or outside. Lengths of 500 feet or more are broken into segments. Cable winders are convenient for long lengths.

Peripheral devices such as Printers, PCs and Scoreboards can operate up to 25 feet on RS232 communications; conversion to RS422 allows placement at greater distances. Communication PODs can also be used for multi-drop connections to use several connected devices.

The Starter's Button is on a 25 foot cable.

TRACK SENSORS/CABLING DIAGRAM
Outside cables
Single Beam Stage/Start with Speed Detection



NOTES:

Cable length between console and starting line is 50 feet.

Speed Trap distance is preset at the factory at 10 feet, 66 feet or 20 meters. Connectors are on the cable even if the Speed Option is not purchased and the option can be disabled on the console.

Track cable lengths can be from 132' to 1320' as required. Cables can be routed down the center of the track or outside. Lengths of 500 feet or more are broken into segments. Cable winders are convenient for long lengths. 80 feet of cable is put between left and right lane sensors.

Peripheral devices such as Printers, PCs and Scoreboards can operate up to 25 feet on RS232 communications; conversion to RS422 allows placement at greater distances. Communication PODs can also be used for multi-drop connections to use several connected devices.

The Starter's Button is on a 25 foot cable.

POWER ON/SELF TEST

Connecting the power to the TREE turns on the system and places the RACEAMERICA 2300 Series Timer into a selftest of the microprocessor circuitry, the LED display (Light Emitting Diode) and the 'Christmas' Tree. This is an internal test as well as a visual check of each display and TREE lights. The LED Displays sequence through each segment of all four digits, then illuminates each segment and decimal point of all four digits until the number '8' is illuminated with the decimal point. The LED Display then places an '8' with decimal point in the far right digit and shifts the display to the left through all four digits.

The LED Displays then sequence through the PRODuct number and the CODE revision level contained within each microprocessor.

Next, the TREE sequences through a lamp test and circuitry test by illuminating the left red lamp and stepping up through the green and yellows, Stage and Pre-stage (AC TREE only) on the left side, then on the right side to Stage and Pre-stage (AC TREE). The tree then illuminates all top Stage (Pre-stage) lamps and steps down through each set of lamps for both lanes. The final power-on self test is the lamps are all sequenced on starting with the red up the left side, then the red up the right side. All lamps are then flashed once to conclude the self test. When the tree has completed the self test display, the system is fully functional and ready for final setup. If the lights do not follow this sequence or some lights were not illuminated, check for insufficient power or defective bulbs.

ALIGNMENT MODE

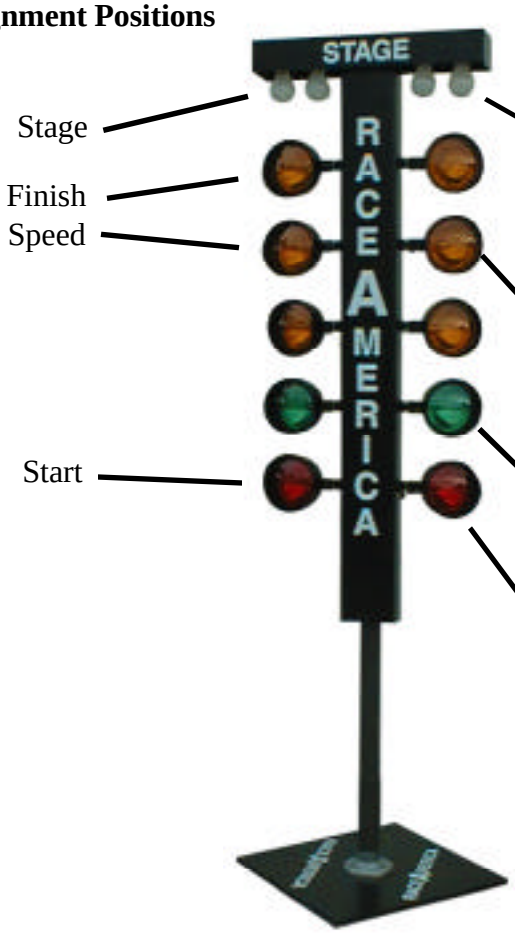
All RACEAMERICA timing systems have an alignment mode. This is very usefull for verifying correct Emitter/Sensor alignment. After the track layout has been determined and the Sensors and Emitters placed in the proper positions (open holes facing each other), enter alignment mode on the console (press **[0]** key) to verify correct alignment. Alignment conditions will also display on the TREE as shown in the definitions of Tree Lights picture. The LED Display momentarily indicates the position on each sensor on the display with letters representing each emitter/sensor pair **[LSSF].** The leftmost **[S]** indicates the START emitter/sensor pair, the center **[S]** indicates the SPEED emitter/sensor pair, the **[F]** indicates the FINISH line emitter/sensor pair. The **[L]** indicates the LEFT lane is being monitored. The Status Display then changes each digit to a zero for each sensor being monitored **[L000]**. If the Beam Emitter and Track Sensor are operating properly and aligned, the '0' digit will not change and the TREE lights will be OFF. If the Beam Emitter and Track Sensor are not properly aligned, the '0' digit for each emitter/ sensor pair will count slowly if slightly out of alignment or continuously if they are not functioning properly or way out of alignment and the corresponding TREE light will be on or flickering. Once the emitter/sensor pair are aligned properly, the digit will stop counting and the TREE lights will go out. If the alignment is off a little or intermittent, the digit for that emitter/ sensor pair will count when they float out of alignment. Note that with the Stage/Start position, both the Stage light and the Red light will illuminate on the TREE when either is out of alignment. Press the **[0]** key again to toggle to the other lane for review. Even though all alignment positions show on the TREE at any time, use the console display to confirm there is no intermittent condition. It should also be noted that once the zero digit has left the display, it will never stop at zero again. This can be helpful for leaving the system in alignment mode for an extended period of time to check on an intermittent condition.

To maximize the alignment of the emitter/ sensor pairs, it is suggested to rotate the beam emitter slowly left and right until the alignment for that pair begins to count. This technique will determine the maximum lateral detection angle. Rotating the beam emitter up and down until the alignment starts counting determines the maximum vertical detection angle. Once these extremes are established, position the Beam Emitter in the center of the left/right detection

DEFINITIONS OF THE TREE LIGHTS

Tree Alignment Positions

Tree Racing Indications



The dual white lamps at the top of the tree will illuminate when a vehicle breaks the STAGE beam.

The center Yellow light illuminated indicates a bracket/index breakout in this lane when compared to the dial-in.

Green light illuminated indicates the winning lane after applying NHRA rules.

The Red light illuminated indicates an early or fouled start in this lane.

The TREE displays sensor alignment by illuminating a bulb for each sensor position when in alignment mode (left legend)
The TREE also displays a full variety of information during racing activity (right legend).

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angle and up/down detection angle. Repeat this same process with the other beam emitters and track sensors. This will maximize the alignment accuracy.

Remember, the beam emitters and track sensors operate on a 'Line-of-Sight' concept and may require shims if they are installed on a street with a crown. Leaves, people, and other debris will also break the beams and could give false signals, so keep everyone and everything clear of the beam emitters and track sensors during racing activity. Lane width should be between four and fifty feet; a string stretched between the emitter and sensor may aid alignment or just eyeball a straight line.

Press the **[#]** pound sign key to exit Alignment Mode.

SYSTEM CONFIGURATION

The system may need to be adjusted for specific options present each time the system is powered up. In this section, set the following parameters (defaults in parenthesis):

- Printer line feeds to eject timeslip (12)
- Number of timeslips to autoprint (1)
- Pre-stage functionality - AC TREE (OFF)
- Speed Detection (ON)

The default parameters do not need to be changed if the system is configured with Speed. If not using a printer or AC TREE, no action is required for those parameters. Parameters may be changed at any time but must be reset each time power is turned on.

Press the **[5]** key on the Keypad to enter the system configuration section, the console displays **[LF]** and the user is prompted for the number of line feeds to add to the end of the timeslip to properly eject the timeslip for tearoff. Enter the number of line feeds required and press the **[#]** pound sign key to enter. **[Auto]** will show the number of copies to autoprint; press a number on the keypad (1-9) for desired number to autoprint; press **[#]** to save.

Following the print parameters, the **[5]** key will define the Pre-Stage functioning (AC TREE ONLY). The Display will show **[OFF]** which means Pre-Stage is always OFF; pressing the [#] key accepts this mode. Press any key other than **[#]** to turn on Pre-Stage; the Display will show **[StAg]** which will turn on the Pre-Stage lights when the Stage lights come on; press any key again and the display will show **[-2-]** to redefine how the **[2]** button works to manually control the Pre-Stage lights to tell the next set of drivers to come to the line. Accept the Pre-stage functionality by pressing the **[#]** key.

Next the Speed detection prompt will appear; press the **[5]** key to toggle between **[ON]** and **[OFF].** Select ON if the Speed option is included with the system and the sensors are connected at the Speed cable ends, otherwise select OFF. Press the **[#]** key to accept the selection and leave System Configuration.

At this point the timer is ready to time the first run.

RUNNING A RACE

The system should be powered on, aligned and configured. Press the [#] key to clear any display condition.

Next, race parameters for starting light sequence and any Dial-in times need to be configured. Select the desired starting sequence (Pro or Full) by pressing the **[3]** key. This will toggle the starting sequence between the PRO format (all yellows then green at a 0.400 second interval) and the FULL or SPORTSMAN format (each yellow then green at 0.500 second intervals). The default condition is Pro lights; this change remains until changed again. If running brackets on model 2300B, press the [1] key to input the racers Dial-in times. Press the [#] key to clear the system.

Stage the race vehicles by moving them into the Stage/Start beams (Stage lights on the TREE come on).

To start the race, press the **[2]** key. The system will automatically check the alignment of all sensors and emitters prior to starting the tree. If the alignments are all good after the **[2]** key was pressed, the TREE will begin the starting light sequence. If a driver interrupts the starting beam prior to the green lamp illuminating in that lane, the starting sequence will stop for that lane, freezing the tree and illuminating the red/yellow lamps indicating a redlight start in that lane. Once a driver crosses the starting line, they must cross the finish line to complete their run. The TREE will continue to illuminate the red or green lamps until both lanes have crossed the finish line (or only one lane crosses the finish line in the case of a BYE run). When both vehicles cross the finish line, the LED Display will indicate the end of the run by displaying **[End]** and the TREE will blank.

After both lanes have completed their runs, the TREE will display the redlight conditions of each lane. The green lamp will be illuminated for the winning lane after applying NHRA rules for *reaction time*, breakouts, redlights, and first to cross the finish line. If a printer option is present, the selected number of prints will print. **[Prnt]** will display in window after a race when printing is occuring. Additional prints can be made by pressing the **[6]** key. If a Scoreboard option is present, the Scoreboard will display the selected information (ET/MPH/RT).

The Console Display will show **L--r** with one blinking indicating the winner. Pressing **[7]** will display **[L Et]** followed by the elapsed time in seconds for the left lane; press **[7]** and the display will show **[r Et]** followed by the elapsed time in seconds for the right lane. If a lane did not finish, the elapsed time is replaced by **[.dnF]** for that lane. If a lane did not start, the elapsed time is replace by **[.dnS]** for that lane. If the Speed option is present, pressing the **[8]** button will display Speed for the left lane,the LED display will then sequence through the Speed readings by displaying **[LSPd]**, then the speed in miles per hour for left lane; press **[8]**, then **[rSPd]** followed by the speed in miles per hour for the right lane will display. If the Speed sensor/emitter pair are not connected, the reading will be zeroes.

Press **[9]** to display RT. The LED displays the Reaction Times by displaying **[L rt]** , then the reaction time in seconds for the left lane, press the **[9]** key, **[r rt]** followed by the reaction time in seconds for the right lane will display. If a lane did not start, the reaction time is replaced by **[.dnS]** for that lane.

If an emitter/sensor pair are out of alignment when the **[2**] key is pressed, the console will display **[LSSF]** or **[rSSF]** in the LED displays and flash the offending emitter/sensor pair. Pressing the **[0]** key will enter alignment mode and the problem can be corrected by re-aligning the emitter/sensor pair.

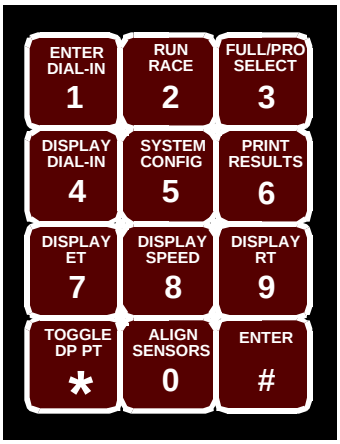
If using an AC TREE and the Pre-stage has been configured in the '2' mode, the Pre-stage lights will illuminate the first time the **[2]** key is pressed telling the racers that a start is imminent, then the TREE will come down when the **[2]** key is pressed again.

These results are available for recall until the **[2]** key is pressed for a new race.

Dial-in racing (available with the 2300B model) is started by pressing the **[1]** button on the Keypad and entering the dial-in for the Left and Right lanes; the next start will apply the appropriate differential to the starting sequence of the race. At the end of a Dial-in race, the TREE will additionally indicate a bracket breakout if one occurs on either lane by illuminating the center yellow light. Dial-in selections can be checked by pressing the **[4]** key. Use the **[*]** key to move the decimal point for times greater than 9.999 sec.

NOTE: As a general rule, if the TREE has a green or red lamp illuminated, one of the lanes has not completed its run and crossed the finish line. The **[#]** pound sign key must be pressed by the operator to end the race as a safety precaution. If a race ends immediately after pressing **[2]**, a finish line sensor may have been bumped out of alignment after the start of the run. This would be indicated by an incorrectly low ET in one of the lanes.

Model 2300H Keypad



Model 2300B Keypad

KEYPAD FUNCTIONS

The Model 2300 Drag System ships configured either for Heads-up (2300H) or Dial-in (2300B) options.

The following defines the keypad key functionality:

KEY 0

To check or monitor the alignment of the IR Track Sensors and Beam Emitters in all four lanes, press the **[0]** key to enter alignment mode. See the section on **ALIGNMENT MODE** earlier in this manual.

KEY 1

Press the **[1]** key to enter the bracket or index for each lane on the 2300B dual lane system. The LED display momentarily displays **[Lbrt]** then prompts the user to enter the bracket or index for the left lane. To enter numbers greater than 9.999 seconds, press the **[*]** key to toggle the decimal point to enable entry to 99.99 seconds. Press the **[#]** pound sign key to enter the bracket/index for the left lane, **[rbrt]** momementarily displays and the user is prompted for the right lane's bracket/ index value. Press the **[#]** pound sign key to enter the bracket/index for the right lane.

KEY 2

The **[2]** button is used to start a race. If using an AC TREE and the the system is configured to turn on the Pre-Stage lights before the start; the first button press will illuminate the Pre-Stage lights, a second press will start the race.

KEY 3

Pressing the **[3]** key toggle the starting lights sequence from PRO mode to FULL or SPORTSMAN mode. The LED Displays on the console will confirm which starting sequence will be used. To toggle back to PRO sequence, press the **[3]** key again. Reapeated presses of the **[3]** key will toggle between these two starting sequences.

KEY 4

Pressing the **[4]** key (2300B model) will display the current bracket/index values for the left lane, press **[4]** again to view the right lane, press **[#]** to leave Index review.

KEY 5

The **[5]** key is used to setup the System Parameters. Press the **[5]** key to step through the setup, the console displays **[LF]** and the user is prompted for the number of line feeds to add to the end of the timeslip to properly eject the timeslip for tearoff. Enter the number of line feeds required

and press the **[#]** pound sign key to enter. **[Auto]** will show the number of copies to autoprint; press a number on the keypad (1-9) for desired number to autoprint; press **[#]** to save.

Following the print parameters, the **[5]** key will define the Pre-Stage functioning (AC TREE ONLY). The Display will show **[OFF]** which means Pre-Stage is always OFF; pressing the [#] key accepts this mode. Press any key other than **[#]** to turn on Pre-Stage; the Display will show **[StAg]** which will turn on the Pre-Stage lights when the Stage lights come on; press any key again and the display will show **[-2-]** to redefine how the **[2]** button works to manually control the Pre-Stage lights to tell the next set of drivers to come to the line. Accept the Pre-stage functionality by pressing the **[#]** key.

Next the Speed detection prompt will appear; press the **[5]** key to toggle between **[ON]** and **[OFF].** Select ON if the Speed option is included with the system and the sensors are connected at the Speed cable ends, otherwise select OFF. Press the **[#]** key to accept the selection and leave the System Configuration.

Other printers connected to the JR Competition system must be configured for RS232 serial communications, 9600 baud, No Parity, 1 Stop Bit, No Handshake; thsee parameters can be set on the printer.

KEY 6

To *manually* print the timeslip to the printer, press the **[6]** key. This can be done at any time to verify cabling and printer settings; race results in a test condition may all be zeros.

KEY 7

To display the ET results from the last run, press the **[7]** key for the left lane, press **[7]** again to view the right lane, press **[#]** to clear.

KEY 8

To display the Speed results from the last run, press the **[8]** key to display the left lane, press **[8]** agian to display the right lane, press **[#]** to clear.

KEY 9

To recall only the Reaction Time results from the last run, press the **[9]** key to display the left lane, press **[9]** again to display the right lane, press **[#]** to clear.

KEY*

To toggle the decimal point position for Dial-In racing (2300B Models).

KEY #

The **[#]** pound key is used to accept input values, end races without a finish or clear the TREE.

STATUS DISPLAY MESSAGES

During normal operation, messages will appear in the Status Display. These messages indicate status, mode of operation, or events occurring on the race track. Many of these messages are covered elsewhere in this manual and are alphabetically summarized in the following section as a reference:

ALgn

This message indicates the system is entering the alignment mode for checking the alignment of the emitter/sensor pairs on the track.

Baud

During configuration of the printer, the user is prompted to enter the desired baud rate of the printer attached to the console.

CodE

This message appears during the power-up sequence and indicates the software code level running in the RACEAMERICA timer.

End

This messages indicates all starting vehicles for that pair of lanes have crossed the finish line and the run is over.

Lbrt

During entry of the bracket/index values for the left lane, this message is displayed to indicate the left lanebracket/index.

L Et

During recall of the race results, this message indicates the left lane elapsed time is being displayed..

L rt

During recall of the race results, this message indicates the left lane reaction time is being displayed.

LF

During configuration of the printer, the user is prompted to enter the desired number of line feeds to be added to each timeslip to properly eject the paper for tearoff from the printer.

LSPd

During recall of the race results, this message indicates the left lane vehicle speed is being displayed..

LSSF

When entering Alignment Mode, this message will appear in sequence to indicate the alignment of the Track Sensors and Beam Emitters will be continuously monitored and the results displayed for the left lane.

Prod

This message appears during power-up sequence and indicates the product number of the timer.

rbrt

During entry of the bracket/index values for the left lane, this message is displayed to indicate the right lanebracket/index.

r Et

During recall of the race results, this message indicates the right lane elapsed time is being displayed..

r rt

During recall of the race results, this message indicates the right lane reaction time is being displayed.

rSPd

During recall of the race results, this message indicates the right lane vehicle speed is being displayed.

rSSF

When entering Alignment Mode, this message will appear in sequence to indicate the alignment of the Track Sensors and Beam Emitters will be continuously monitored and the results displayed for the right lane.

MAINTENANCE

The 2300 Series Console, Beam Emitters, and Track Sensors do not require any maintenance beyond simple cleaning. Keep your system components dry between uses.

To insure uninterruptted operation on raceday, it is suggested to keep track of battery usage hours so as to have fully charged batteries. Plan to replace the alkaline AA cells in the Beam Emitters after about 60 hours use. If you are using rechargeable AA cells, recharge them each day. Low battery voltage (Emitters below 4.0V DC) will cause intermittent operation of the system resulting in intermittent cars detected at the starting line or the finish line as the batteries power weakens.

To maintain the highest level of timing accuracy and minimize false trips, annual preventative maintenance and calibration should be performed on all system track sensors and beam emitter units.

SPARE PARTS

Further to minimize race program interruptions, RACEAMERICA recommends some spare parts. A spare emitter/sensor pair and end of track cable sections should be available in the event of an unfortunate accident during a program. Contact RACEMERICA for availability and pricing of spares items.

SUPPORT AGREEMENTS

Support agreements are available from RACEAMERICA providing Telephone Assistance on technical issues and operational questions, repair and/or replacement of hardware failures, Software and Firmware updates and bug reporting, and Annual Preventative Maintenance on all system track sensors and beam emitter units. Contact RACEAMERICA for more information and pricing of Support Agreements.