



The Leader in Event Critical Timing Electronics

Model 3230D

S-Trap



Speed Detector

Owner's Manual

Rev G

RaceAmerica Corporation
P.O. Box 3469
Santa Clara, CA 95055-3469
USA
(408) 988-6188
<http://www.raceamerica.com>
info@raceamerica.com

Copyright 2005 RACEAMERICA, Inc.

Table of Contents

LIMITED WARRANTY	3
PACKAGE COMPONENTS.....	4
POWER REQUIREMENTS	4
PRODUCT SPECIFICATIONS.....	4
AVAILABLE OPTIONS	4
THEORY OF OPERATION.....	4
SET-UP STEPS - 3230 SERIES.....	5
CABLING DIAGRAM	6
POWER-ON/SELF-TEST	7
ALIGNMENT MODE.....	7
CONFIGURATION.....	7
MAKING A SPEED RUN.....	8
SYSTEM OPTIONS.....	8
MAINTENANCE	9
SPARE PARTS.....	9
SUPPORT AGREEMENTS	9
FOAM STAND ASSEMBLY	10

RACE AMERICA

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.

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.

PACKAGE COMPONENTS

Each 3230D S-Trap package includes:

- 1 -3230D Series Console Unit
- 2 - 5040 IR Beam Emitters
- 2 - 5140 IR Track Sensors
- 1 - Cable Assembly for Track Sensors
 - 66 ft Trap; 25 ft Console to Speed
- 1 - 12VDC Power Patch Cable
- 1 - Owners Manual

POWER REQUIREMENTS

Additional items required to operate your 3230D:

- 1 - 12VDC automotive battery for portable operation outdoors
- 4 - AA Alkaline batteries per Beam Emitter

PRODUCT SPECIFICATIONS

The following listing provides the designed performance specifications for the 3230D:

Speed Trap Lane Width	4 to 50 Feet
Speed Trap Distance	66 Feet
Minimum Speed	0.05 MPH
Maximum Speed	800.00 MPH
Display Readout	0.01 mph
Printout	XXX.XX MPH
Vehicle number	XXXX

Power Requirements:

3230 Console	12VDC Battery or AC Adapter
IR Beam Emitter	4 - AA Batteries

AVAILABLE OPTIONS

- 6038S Timeslip Printer
- 5050 75ft range Beam Emitter
- 5060 250 ft range Beam Emitter
- 05-3231 500ft Extension Cable
- 6070B Carry Case
- 6560/6860 Large Digital Display

- 6076A Heavy duty Carry Case for 6860
- 6075A Soft side carry case for 6560
- 6502A AC Adapter
- 7540B Foam Stands

THEORY OF OPERATION

The 3230 S-Trap is a completely self contained speed trap timing system made with the latest technology CMOS circuit components to provide a highly accurate speed trap 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 of the 3230 by the 12VDC automotive batteries connected to the RED and BLACK alligator clips or the AC Adapter ordered with the system. Power is connected to the 3230 using the power cable supplied with the timer. An absolute minimum of 11.0VDC is required for reliable operation of the system when using a printer connected to the console. Under normal conditions, a properly charged battery will operate for several days of racing without requiring a recharge.

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 vehicle 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. Tips are provided to aid alignment on surfaces that are other than ideal. Standard 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 50 ft). Optional beam emitters can operate with up to 250 ft lane widths

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. The system can be configured to allow vehicles to enter the speed trap from either direction.

SET-UP STEPS - 3230 SERIES

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 speed line, the finish line and the timer console.

The 12VDC battery is connected with the RED alligator clip to plus (+) terminal of the battery and the BLACK alligator clip to (-) terminal of the battery. Connect the other end containing the power connector into the console. When using an AC Adapter or the 12V battery, the power connector should be connected to the timer first, then apply power to the cable after all cables are in place as mentioned in STEP 3.

The free standing, battery powered Model 5040 IR Beam Emitters are placed on one side of the speed line and finish line and the Model 5140 IR Track Sensors are placed on the other side of the speed line and finish line. Each of the Beam Emitter and Track Sensor units are fully interchangeable with each other. The Track Sensor Cable is keyed and labelled to match the speed line and finish line track sensor, position identified at the track sensor end of the cable.

STEP 2 -

Identify the emitter/sensor placement at the speed line and finish line. The distance between the two sense points should be exactly 66 feet (measure from center of sensor to center of sensor and the same for the emitters). The lane width should be set between four (4) and fifty (50) feet for the standard 5040 Beam Emitters. To help in determining initial Beam Emitter to Track Sensor alignment in larger track widths, use a string stretched between the beam emitter and track sensor or eyeball a straight line between units. Keeping the sensors and emitters up off the ground will minimize ground effect and blowing debris.



Model 5040/5050 - IR Beam Emitter

Note On/Off switch and placement for four AA batteries for each Beam Emitter. All Beam Emitters are fully interchangeable with one another. Picture shows top and bottom of units.



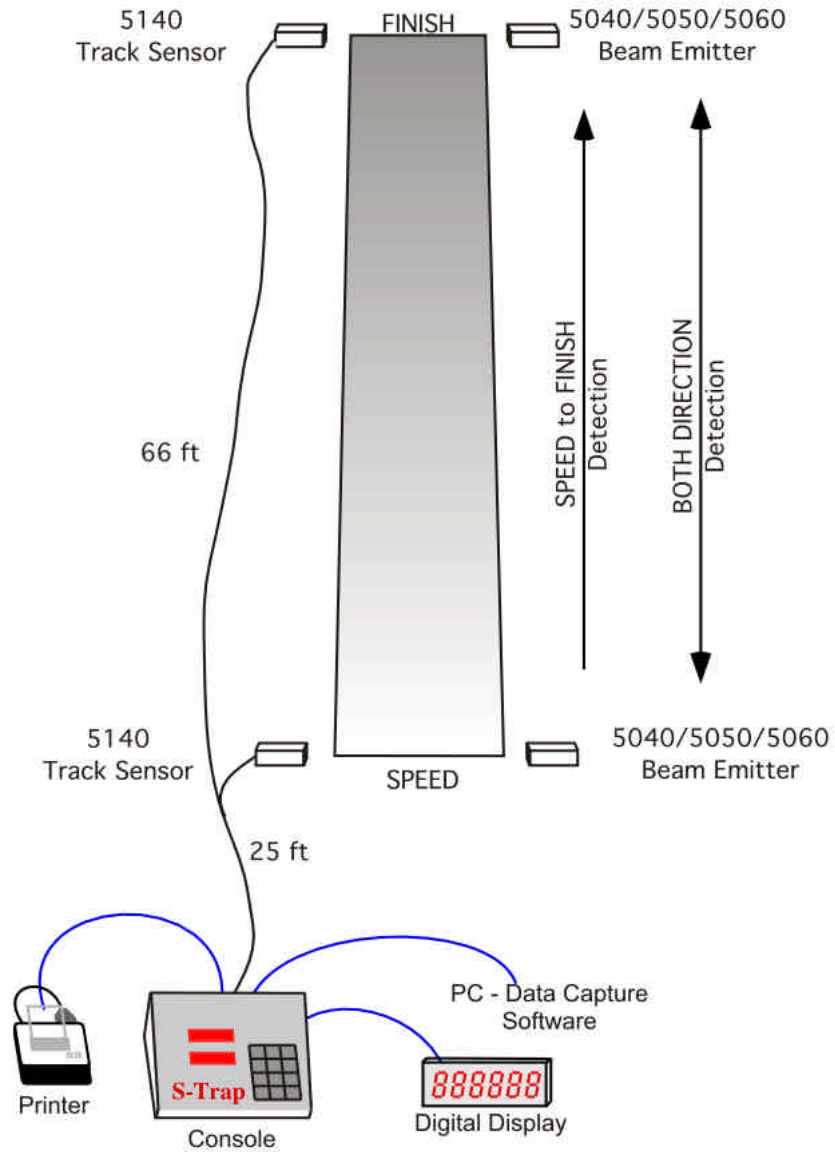
Model 5140 - IR Track Sensor

Note cable connector is located in the side facing away from the track. All Track Sensor are fully interchangeable with one another. Track Sensor is pictured both top and bottom sides up.

STEP 3 -

Layout the Track Sensor Cable on the track site as illustrated on the next page. The large round connector connects to the console and the two smaller connectors (RJ11) connect to the Track Sensors at the speed line and the finish line as indicated on the cable near the RJ11 connector. Connect the Track Sensor Cable to the Timer Console.

CABLING DIAGRAM



The 3230D S-Trap uses a 66 foot speed trap distance between placement of the speed line and the finish line.

Optional 500 ft extension cables are available to place the console near the start of the run.

POWER-ON/SELF-TEST

Connecting the 12VDC battery to the 3230 System Console places the RaceAmerica 3230 Timer into a self-test of the microprocessor circuitry and the LED display (Light Emitting Diode). This is an internal test as well as a visual check of the display segments. The LED Displays sequence through each segment of all four digits, then illuminates each segment and decimal point of all 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 [3230] and the CODE revision level (e.g. [C.00.0]) contained within the microprocessor. The LED Display then blanks out the display.

ALIGNMENT MODE

To verify all Track Sensors are properly aligned with their Beam Emitters, the timer enters into Alignment Mode. The LED Display momentarily indicates the position on each sensor on the display with letters represent each emitter/sensor pair [S----F]. The [S] indicates the SPEED line emitter/sensor pair while the [F] indicates the FINISH line emitter/sensor pair. The Status Display then changes each digit to a zero for each sensor being monitored [S0--0F]. If the Beam Emitter and Track Sensor are operating properly and aligned, the 0 digit will not change. 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. Once the emitter/sensor pair are aligned properly, the digit will stop counting but not go back to zero. If the alignment is off a little or intermittent, the digit for that emitter/sensor pair will count when they float out of alignment. 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 Sensor during racing activity.

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 angle and up/down detection angle. Repeat this same process with the other Beam Emitter and both Track Sensors. This will maximize the alignment accuracy. It should also be noted that once the zero digit has started counting, it will never stop at zero again unless Alignment Mode is exited and reentered. This can be helpful for leaving the system in alignment mode for an extended period of time to check on an intermittent condition.

At this point the system is properly aligned. Press the [#] **ENTER** key to exit Alignment Mode.

CONFIGURATION

The S-Trap ships with the following factory default settings:

Auto Print Timeslip	1
Print Line Feeds	12
One way Speed detection	

If any of these settings need to be changed, press the [8] **CONFIG** key on the Keypad to enter the system configuration mode, the console displays [LF] [12] (Upper/Lower displays) and the user is prompted for the number of line feeds (blinking digit) 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 [#] **ENTER** key to confirm. Next [AutoPr] [1] will show the number of timeslip copies to

automatically print each time a race ends; press a number on the keypad (0-9) for desired number of copies; next [**dEtEct**] [**S to F**] will show on the display for Speed detection in one direction from Speed to Finish; press the [**8**] key to toggle to [**botH**] to detect speed in either direction through the trap for any run; press [**#**] **ENTER** to save. To change any of the configuration, press the [**8**] **Config** key again.

MAKING A SPEED RUN

Before timing a run, it may be desirable to enter the racer numbers so they will appear on the printout and in data transmitted to PC capture software. To enter a racer four digit number, press the **CAR#** [**9**] key on the keypad to view the existing entries; press [**9**] again to enter a new number; press [**#**] **ENTER** to accept the entry.

To time a run, press the **RUN** [**2**] key. The timer immediately checks all track sensors to insure they are operating and aligned properly. The timer performs this function automatically while displaying [**rESEt**] [**- - - - -**] 1 to 6 dashes on the upper/lower LED displays. If a sensor fails the alignment test by triggering during this test, the timer will indicate [**FAIL**] [**S - - - - F**] with the offending sensor position flashing. If both sensor/emitter pairs are aligned, the LED display will display [**rEAdy**] when it is ready to time a run. Then display the car number [**XXXX**] in the upper display and [**- - - -**] in the lower display. Once the **SPEED** sensor is triggered, the lower display will display [**S - - - -**] until the **FINISH** sensor is triggered. At this point the LED display displays [**SPEED**] [**XXX.XX**] as the results of the run and sends the results to any connected PCs, Scoreboards or printers. Press **PRINT** [**0**] to send or resend the data to the printer. If configured for Speed detection in either direction, breaking the **SPEED** or **FINISH** sensor first will begin the process. [**- - - - F**] will display if the Finish sensor is triggered first; [**S - - - -**] as above if the Speed sensor is triggered first.

Note: If the Finish sensor is triggered and the 3230 is not configured for both directions, a **SPEED** of 999.99 will be displayed.

If a Fail condition is detected, press [**#**] **ENTER** to go to alignment mode to correct the bad alignment, press [**#**] **ENTER** to leave alignment mode.

Press **RUN** [**2**] to time another run.

ABORT A RUN PRIOR TO FINISH

To stop the timer during a run, press the [**#**] **RETURN** key and the timer will show [**Abort**] [**run**] in the upper/lower displays, press [**#**] **RETURN** again to clear the displays.

SYSTEM OPTIONS

Several options (Printer, Scoreboard or PC) can be connected by a RS232 cable connection up to 100 feet or by a Wireless Link for greater distances (line of sight up to a quarter mile). Connectors are on the underside of the console.



Model 3230D - Keypad

PRINTER OPTION

Connect the timeslip printer interface cable to the 3230 S-Trap using the **RS232 PRINTER PORT** on the console. The 3230 will auto print the configured number of timeslips after each run. Additional copies can be printed by pressing the **[0] PRINT** key before the timer is reset. The print function is disabled if the timer is timing a run.

SCOREBOARD OPTIONS

The S-Trap can be connected to a scoreboard to display race results for a crowd and the competitors. Connect the model 6528/6828 Scoreboard to view the ET immediately upon completion of each run. Connect the RS232 blue interface cable to the PC or Scoreboard connector.

ADDING PC CAPTURE SOFTWARE

The S-Trap can be connected to a PC (Windows 95 or later Operating System) to capture the speeds and build a file with racers names and race results. RaceAmerica offers an optional data capture software package for this purpose.

The software captures the timer data plus data/time stamps from the PC plus allows entry of racer information. All data is then saved in a tab delimited file for further use and analysis with popular spreadsheet and database application programs.

MAINTENANCE

The 3230 Series Console, Beam Emitters, and Track Sensors do not require any maintenance.

To insure uninterrupted 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.

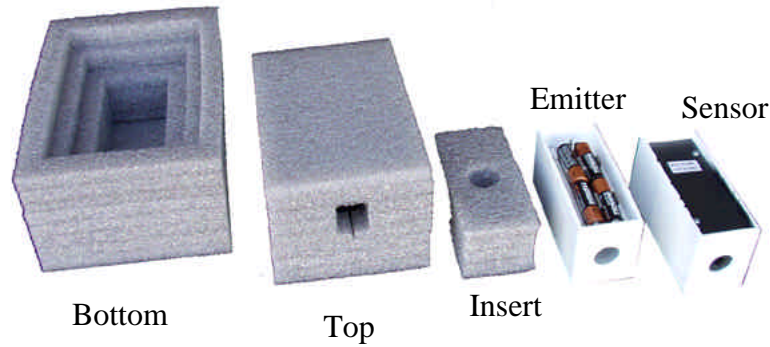
SPARE PARTS

Further to minimize race program interruptions, RaceAmerica recommends some spare parts. A spare emitter/sensor pair and sensor cable should be available in the event of an unfortunate accident during a program. Contact RaceAmerica 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.

7540B - Foam Stand Assembly Instructions



'AA' Battery Emitter & Sensor Installation:

1. Separate the Bottom of the Foam Stand from the Top.
2. Remove the Insert from the Top.
3. Place the 5040 Emitter or 5140 Sensor into the upper half with the bottom side showing. Install batteries and turn on the Emitter.
4. Replace the Insert into the Top. Connect the cable to the Sensor
5. Insert the Top into the Bottom. Place on the track



Installing a 5040 Emitter
Similar for 5140 Sensor

5042 Emitter:

1. Same as above except place the 'C' Battery pack in the Bottom and connect the wire to the Emitter.

Additional Stability - add weight to the Bottom

1. Place a weight into the Bottom well.



5042 Emitter



Complete Installation