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INNOVATION. TECHNOLOGY. RELIABILITY.

The Leader in Event Critical Timing Electronics

Models 6532E/6832E Display Timer Owner's Manual

Rev M

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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.

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

PRODUCT OVERVIEW

Model 6532E/6832E Display Timers (hereafter referred to as 6X32E) are micro-processor controlled systems based upon the 7-segment format display digit using the latest technology Ultra-Bright LEDs. The 6X32E Display Timer is a standalone integrated Timer and Digital Display with live running time. Model 5140 Infra-red Track Sensors located on the race track relay start and stop signals to the 6X32E for timing purposes. The system operates on simple pushbutton operation for Reset (Clear) and Sensor alignment. Output can be captured with the PC Capture software via the data connection.

The Display Timer is offered in 5" and 8" digits. The display is viewable at wide angles and in full sun. The Sensors operate in a wide range of conditions from total darkness to full sun.

NOTE: THIS PRODUCT USES ULTRA-BRIGHT LED TECHNOLOGY. DUE TO THE BRIGHTNESS LEVEL OF THIS DISPLAY, CARE SHOULD BE TAKEN, AS WITH ANY BRIGHT LIGHTING SOURCE,TO AVOID PROLONGED VIEWING AT CLOSE RANGE AND SHORT DISTANCES. AS WITH ANY BRIGHT LIGHTING SOURCE, VISION MAY BE AFFECTED SHORT TERM SIMILAR TO CAMERA FLASHES.

PACKAGE COMPONENTS

Each Large Digital Display Timer package includes:

1 - Display Timer Unit
1 - Track Sensor cable set
2 - Sensor Interconnect Cable (100'/300')
2 - Infra-red Beam Emitters, model 5040
2 - Infra-red Track Sensors, model 5140
1 - Owner's Manual
2 - Table stands (5" only)

AVAILABLE OPTIONS

Cabling options:
   Up to 1320 feet Start to Stop sensors
7540 Foam Stands
5050 Extended range beam emitters (75')
6038S Dot-Matrix Timeslip Printer Package
7606B Suspension Arm Display Stand
6501A AC Adapter
6075A Soft Side Carry Case (for 5" Display)
6076A Heavy Duty Carry Case (for 8" Display)
6077A Soft Side Carry Case (for 8" Display)

POWER REQUIREMENTS

The Display Timer operates on any 12VDC power source capable of 0.85 ampere current load maximum. An automotive battery is ideal

The model 5040/5050 IR Beam Emiiters require four AA-size batteries. Batteries may be alkaline or NiCad rechargable.

PRODUCT SPECIFICATIONS

The following listing provides the designed performance specs for the 6X32E Timers:

SPECIFICATIONS Model 6832E

Display Type:	7-Segment
Digit Height:	Eight Inch Tall
Number of digits:	Six
Dimensions:	14-1/4" x 46-3/4" x 3"
Mounting:	Top 1/4" Eyelets - 30" c
Housing:	Powder Coated Steel
View Filter:	Red Transparent acrylic
View Range:	320' in full sun
Power Reqt:	12VDC/1A

SPECIFICATIONS Model 6532E

Display Type:	7-Segment
Digit Height:	Five Inch Tall
Number of digits:	Six
Dimensions:	11.5" x 29.5" x 3"
Mounting:	Top 3/16" Eyelets - 22"c
Housing:	Powder Coated Steel
View Filter:	Red Transparent acrylic
View Range:	200' in full sun
Power Reqt:	12VDC/1A
View Filter:	Red Transparent acrylic
View Range:	200' in full sun
Power Reqt:	12VDC/1A

THEORY OF OPERATION

Model 6X32E Large Display Timer is a standalone elapsed time timer and large digital display with an interconnect cable to connect the Infra-red Sensors and the hand-held push-button. The display timer contains an alignment mode to insure alignment of the sensors to the respective emitters at each location on the track.

Pressing the push-button resets the display and places the display timer into a ready mode. When a vehicle passes between the start emitter and start sensor 'breaking' the start beam, the timer begins to count and displays the elapsed time in the selected format of hours, minutes, seconds and fractions. When the vehicle breaks the finish
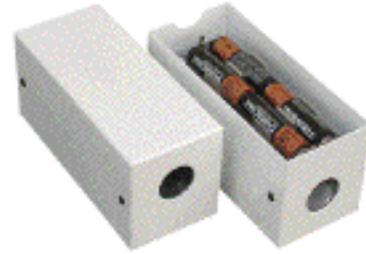
Model 5040 - Infra-red Beam Emitter

Note On/Off switch and placement for four AA batteries for each Beam Emitter. All Beam Emitters are fully interchangeable with one another.
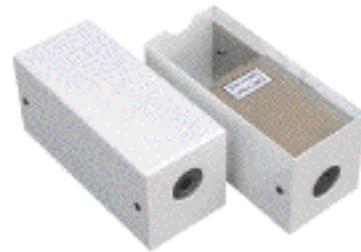
Model 5140 - Infra-red Track Sensor

Note cable connector is located in the side facing away from the track. All Track Sensors are fully interchangeable with one another.

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beam, the timer displays the elapsed time.

Five levels of brightness can be selected at power-on for different lighting conditions

The timer will not reset for a run if either of the sensors are out of alignment.

PRODUCT SET-UP

Model 6X32E Large Display Timer is designed to hang free using the top eyelets supplied with the display. A display stand is also available from RaceAmerica to hang the display at a good viewing level 40" above ground level.

RaceAmerica has tried to make use of the display timer 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 Cable is configured for connection between the starting line, the finish line and the timer. Several connectors may connect different segments of this cable. The cables are 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 display and the smaller connectors (RJ11) connect to the Track Sensors at the start line and the finish line as indicated on the cable near the RJ11 connector.

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 page.

STEP 3 - Connect the Power

Power is supplied to the display through the 12VDC power input alligator clips. Connecting power to the display will set the display into a power-up selftest mode.

POWER-ON SELF-TEST

When the 6X32E power source is connected, the display timer begins an internal self-test and external visual check of the display elements.

The self-test begins by stepping through each segment of all digits, one segment at a time including the colon or decimal point which exist to the right of each digit except the rightmost digit. The self-test continues by sequentially illuminating each segment until all segments, colons, and decimal points are on. The self-test continues by drawing a square frame by sliding a small square from left to right, then down and

right to left. The square then collapses and the revision level of the code(eg **[--H.0--]**) running in the microprocessor is displayed, then **[rEAdy]** scrolls in from left to right, flashes from full bright to full dim, and blanks out. The display then advances to Alignment Mode.

ALIGNMENT MODE

On initial system powerup, the system automatically enters Alignment Mode; the display shows Align **[ALIGn]** briefly, then **[-S--F-]** is displayed indicating the **S**TART and **F**INISH sensor/emitter pairs followed by **[0S--F0]**.

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 (1-2-3....8-9-1-2...) 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. If the alignment is off a little or intermittent, the digit for that emitter/sensor pair will count when they float out of alignment.

To optimize the alignment of the emitter/sensor pairs, it is suggested to rotate the beam emitter slowly left and right until out of alignment, to detect the left/right limits of alignment. Viewing the display to establish these limits will help establish the extremes of the emitter/sensor alignment. This technique will determine the maximum lateral detection angle. Rotating the beam emitter up and down until out of alignment 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 all other beam emitters and all Track Sensors. This will maximize the alignment accuracy.

When both sensors are aligned, press the button to exit alignment mode and enter Run Mode. To return to alignment mode, press and hold the button until the Align sequence is displayed.

TRACK SENSORS/CABLING DIAGRAM
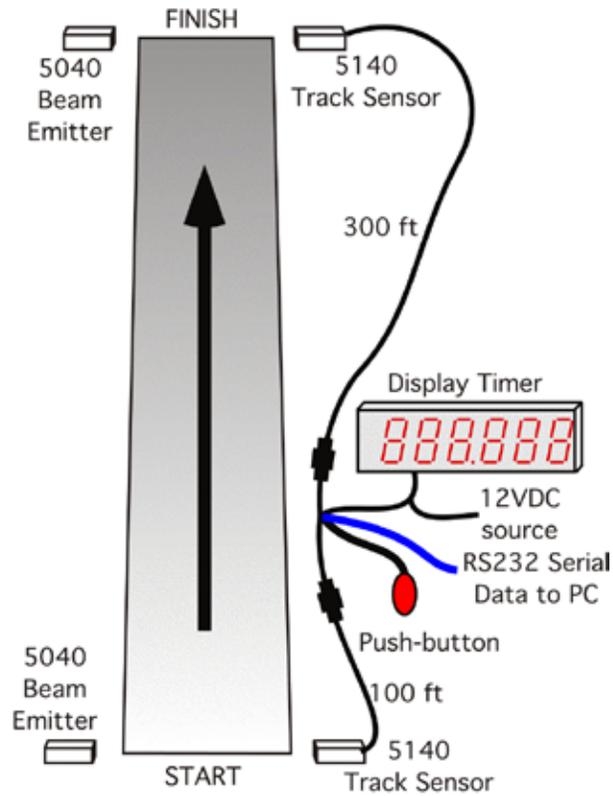
NOTES:

Standard cable lengths shown, optional track cable lengths can be from 50' to 1320' as required.

With different length sensor cables, either one can be start or finish since the main interconnect cable segment identifies the position.

Peripheral devices such as printers can operate up to 100 feet on RS232 communications; conversion to RS422 allows placement at any distance.

CONFIG MODE

To select the timing display format and display intensity, press and hold the reset push-buton when power is initially applied to he timer display. Continue to hold the push-button until [ConFiG] appears on the display. Release the push-button to select the timing format. Each press of the push-button will display the maximum time in the next format:

999.999	SSS.FFF
9:59.999	M:SS.FFF
99:59.99	MM:SS.FF
99:59:99	HH:MM:SS

Press and hold the push-button to select the desired format. Next [8888 1] is displayed to select the display brightness level. Each press of the push-button will cycle through the available brightness levels. Press and hold the push-button to select the desired level. Each time the display timer is powered on the last format is used and the brightness defauls back to full brightness.

OPERATION

Enter the Run Mode by pressing the push-button, the display shows a progressive sequence of dashes **[------]** , then the timer blanks everything except a decimal point **[___.___]** indicating it is ready to time a run. When an object breaks the start beam, the timer will immediately begin to count live and display elapsed time. When an object breaks the finish beam, the timer freezes the elapsed time. Press the push-button to reset the timer for another run.

Both sensors are checked for proper alignment before the timer is reset and allowed to start. If either or both sensors are out of alignment, the display will show **[-S--F-]** with the non-aligned sensor position letter flashing. Go to Align Mode (press and hold the button), correct the problem, exit align and start the next run.

MAINTENANCE

The 6X32 Series Display Timer, Beam Emitters, and Track Sensors require minimal maintenance.

Periodically clean off the red acrylic front of the display with a soft wet rag; be careful not to scratch the surface with dust or sand which may be on the front or in the rag.

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 ≤4.2V DC) will cause intermittent operation of the system resulting in intermittent detections 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 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.

DISPLAY STAND ASSEMBLY INSTRUCTIONS

This assembly instruction is intended for use with six digit eight inch digital displays.

7606B Stand Kit Contents

2 - Suspension Stand Arms with 'J' hooks
1 - Pipe Flange
2 - 20 in pipe sections
1 - Pipe union
1 - Base Plate with Pipe Flange
2 - 1/4-20 bolts with wing nuts

Assembly

1) Assemble the suspension arms with the pipe flange and 1/4-20 bolts at most extreme angle setting. Orient flange and 'J' hooks down.

2) Connect the two pipe sections with the coupling and screw into the base plate flange to assemble the post.

3) Carefully screw the suspension arm assembly onto the post. Align such that arms will suspend the display over the center of the base plate on the diagonal for maximum stability.

4) Hang the display on the 'J' hooks; some droop is normal; the display will swing in the wind.

Additional Stability - (if required)

1) Place a weight onto the base plate or stake it into the ground

Suspension Arms

Pipe section

Flange and Arms assembly detail

Pipe Union

Base Plate
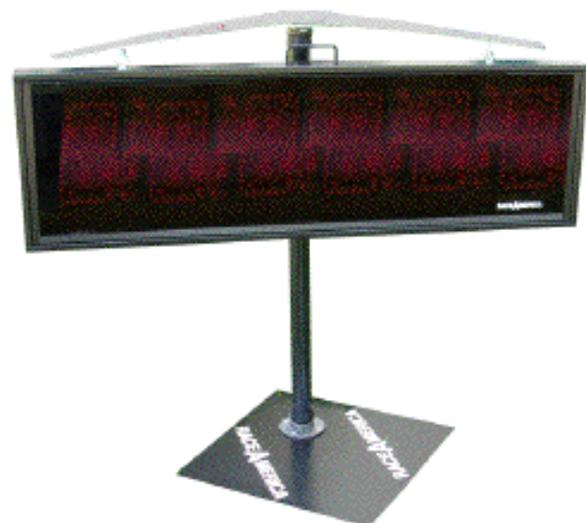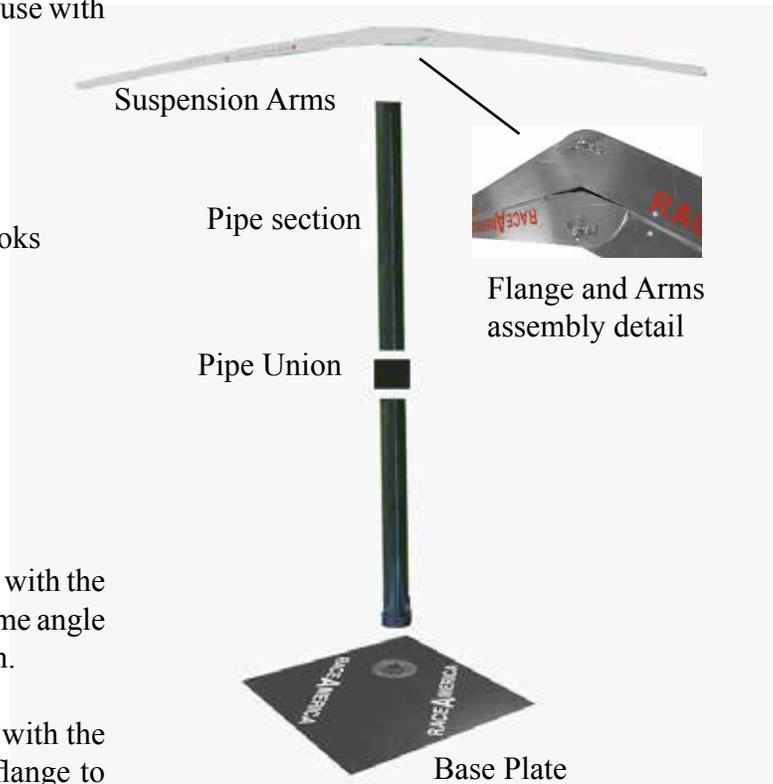
Assembled Suspension Stand