RACE AMERICA

INNOVATION. TECHNOLOGY. RELIABILITY.

The Leader in Event Critical Timing Electronics

Model 6632SC
Stopwatch Display Timer
Owner's Manual

Rev B

RaceAmerica Corp.
280 Martin Ave. Unit#1
Santa Clara, CA 95050
(408) 988-6188
www.raceamerica.com
info@raceamerica.com

Table of Contents

RACE AMERICA

INNOVATION. TECHNOLOGY. RELIABILITY.

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.

PRODUCT OVERVIEW

The five 15" digit Stopwatch Display Timer (6632SC) is a microprocessor controlled system based upon the 7-segment format display digit using the latest technology Ultra-Bright LEDs. The Stopwatch Display Timer is a standalone integrated Timer and Digital Display with live running time. The timer operates with a simple push-button for Start/Stop/Reset functions. The Stopwatch Timer is additionally offered in 5" or 8" high digits and four or six digit models. The six digit timer is capable of counting up to 99 minutes, 59 seconds (MM:SS) or 999.999 seconds (SSS. FFF) and counting down from 64 pre-configured times (one to 64 minutes). The four digit timer is capable of counting up to 99 minutes, 59 seconds (MM:SS) or 999.9 seconds (SSS.F) and counting down from 64 pre-configured times (one to 64 minutes). The timer can also function as a time of day 12 hour clock.

The display is viewable at wide angles and in conditions from full sun to total darkness without adjustment.

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.

THEORY OF OPERATION

The Stopwatch Display Timer is a standalone elapsed time timer and large digital display operated by a handheld push-button.

The timer is DIP switch configurable for count up or count down operation or use as a time of day clock. In the count down mode, the starting point can be set from one to 64 minutes.

Press and hold the push-button to reset the display; press the push-button to start the display counting (either up or down). Press the push-button again to stop the count, press again to rusume or press and hold to rreset.

PACKAGE COMPONENTS

1 - 15" digit display unit
2 - Hanger Plates
1 - Push-button cable
1 - 12VDC Power Patch Cord
1 - Owner's Manual

Model 6632SC Available Options:

6501A 12VDC/3A AC Power Adapter
6401B Permanent Installation Kit (includes AC)

LOCAL REQUIREMENTS

Additional items required to operate the 6632SC Display Timer and options:

1 - 12VDC/2A Power source
1 - Mounting structure

PRODUCT SPECS Model 6632SC

Display Type:	7-Segment
Digit Size:	15" x 7.75
Number of digits:	Five
Dimensions:	64.6"W x 22.3"H x 4"D
Mounting:	Ends 1/4"-20 PEM nuts
Housing:	Powder coated aluminum
View Filter:	Red Transparent acrylic
View Range:	660' in full sun
Power Reqt:	11.5 to 12.6VDC/2A
Weight:	38#
Operating Range	-20ºF to 120ºF
Display Formats:	See Table Page 6

TIMER SET-UP

The Stopwatch Display Timer is designed to be mounted into or hung from a permanent structure.

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 and operation familiarity be gained prior to actual use. This can be done virtually anywhere.

STEP 1 -

Familiarize yourself with the components pictured in this manual and how they interconnect. The diagrams on the next page shows provided 3/8-18 mounting nut locations. The push-button cable connects to the RJ45 connector on the back. The Power Patch Cable connects to a 12VDC source. Note the DIP switch panels located next to the cable connectors. See DIP Switch Definitions section for the setup configuration to be used. All switches except #1 can be changed with power on and a simple reset (press/hold the push-button for one second) will change the setting.

STEP 2 - Connect Power - Patch cord

Power is supplied to the display through the 12VDC power input alligator clips. Connecting power to the display begins the power-up self-test mode.

POWER-ON SELF-TEST

When the timer power source is connected, the display timer begins an internal self-test and 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. Then the revision level of the code ([J.6]) running in the microprocessor is displayed, then blanks out.

If the display is set to count UP, the colon/decimal point will show the blank display format with colon/decimal point illuminated for the selected mode.

If the display is in count DOWN mode, the display will show the number of minutes **[XX:00.0]**.

If the display is set to clock mode, the display will show **[XBBB-]**; where X is toggling between **0** and **1**, **B** is a blank position.

TIMER OPERATION

COUNT UP MODE

In the count up Stopwatch mode, the timer begins live counting when the push-button is pressed and will count in minutes/seconds format until the push-button is pressed again - when it will freeze the time. In the count up mode the display will show **MM:SS.F** where the letters designate **M**inutes, **S**econds and **F**ractions **SSS. FF or HH:MM** (**H**ours, **M**inutes).

COUNT DOWN MODE

In the count down mode, the timer starts counting down from the pre-selected point when the push-button is pressed and stops the countdown the next time the push-button is pressed or when it reaches zero time. In the count down mode, the six-digit display shows **MM:SS.F** where the letters designate **M**inutes, **S**econds and **F**ractions of a second.

CLOCK MODE

The time is set on the display and then enabled by one last press of the button; if the time needs to be coordinated with the actual time of day or other clocks, this will allow for either or both conditions. Figure out the start time for the clock (maybe a few minutes ahead of actual time to allow for setting). Set the Hours:Minutes (HH:MM) time of day as follows:

1) With the first digit toggling between **0** and **1** (the only possible choices for this position), press the push-button and release when the desired digit is displayed.

2) The first digit will freeze and the second digit will cycle between **0** and **2** (if the first position is a 1) or **1** and **9** (if the first position is **0**); press

5-Digit Scoreboard Mounting Dimensions
Using 3/8-18 Bolts

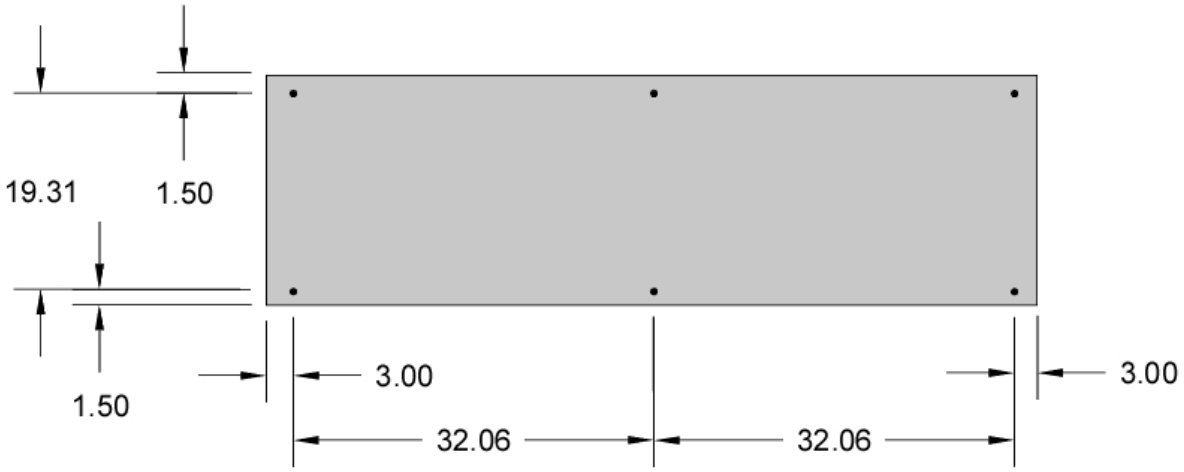

Figure 1 - Mounting dimensions for 15” digit scoreboards

TIMING SPECIFICATIONS

Timing:

Count UP --------00:00.00 to 99:59.9--------
(Min:Sec.Fractions)

(Sec.Fractions) --------000.00 to 999.99---------
--

(Hour:Min) ----------00:00 to 99:59----------

Count DOWN ------ From 1 to 64 minutes ------
(Min:Sec.Fractions)

Time of Day Clock ----------HH:MM----------
(Hours:Minutes)

the push-button and release when the desired digit is displayed.

3) The second digit will freeze and the third digit will cycle between **0** and **5**; press the push-button and release when the desired digit is displayed.

4) The third digit will freeze and the fourth digit will cycle between **0** and **9**; press the push-button and release when the desired digit is displayed.

5) The fourth digit will freeze, the colon goes out and the display will look like **[XXXX-]**. Press the push-button one last time to enable the clock; the colon will come back on. This allows the clock to be synched with multiple units or the actual time of day (or both).

The push-button can be removed from the connector in the back of the clock after the time has been set.

If the time needs to be reset for any reason (power failure), plug in the push-button if it is not already plugged in, then cycle power OFF, then ON and restart at Step 1.

In Count Up or Count Down mode, press and hold the push-button for 1 second to reset the timer, the timer will return to a start condition. In Count Up or Count Down modes, all DIP switches can be changed except #1 without cycling power to the unit, a reset will set the new condition.

DIP SWITCH DEFINITIONS

The 6632SC Stopwatch Timer can operate in three different modes, Count Up, Count Down and Clock. There are two banks of 8 DIP switches (S1 and S2) located on the back of the Display Timer numbered from 1 to 8 and can be switched ON or OFF. The ON position is indicated on the switch itself. Each switch function and setting are discussed below. Bank S2 should be set to all OFF. The following settings apply to Bank S1 (left side looking at the back).

Mode/Display Selection

Switches 2/3/4/5 set either Count UP or Count DOWN and Clock operational modes.

Mode	2	3	4	5
Count UP				
MM:SS.F	ON	ON	ON	ON
SSS.FF	ON	OFF	ON	ON
HH:MM	ON	OFF	ON	OFF
Count DOWN				
MM:SS.F	OFF	(See page 8)		
Clock				
HH:MM	ON	ON	OFF	

Diagnostic mode

Switch number 1 enables and disables the diagnostic capabilities of the Large Display. When enabled, the Large Display receives data and displays error codes when invalid data has been received. The following table is used to set switch number 1 to enable/disable the diagnostic feature:

Diagnostic Mode	1
Disabled	OFF
Enabled	ON

NOTE: IF SWITCH NUMBER 1 IS SET TO 'ON' DURING THE POWER UP SELF-TEST, THE DISPLAY WILL CONTINUOUSLY LOOP ON THE SELF-TEST UNTIL SWITCH NUMBER 1 IS SET TO THE 'OFF' POSITION.

Count DOWN Start Time

Switches 3 thru 8 set the Count DOWN starting time.

Time (min)	3	4	5	6	7	8
1	ON	ON	ON	ON	ON	ON
2	ON	ON	ON	ON	ON	OFF
3	ON	ON	ON	ON	OFF	ON
4	ON	ON	ON	ON	OFF	OFF
5	ON	ON	ON	OFF	ON	ON
6	ON	ON	ON	OFF	ON	OFF
7	ON	ON	ON	OFF	OFF	ON
8	ON	ON	ON	OFF	OFF	OFF
9	ON	ON	OFF	ON	ON	ON
10	ON	ON	OFF	ON	ON	OFF
11	ON	ON	OFF	ON	OFF	ON
12	ON	ON	OFF	ON	OFF	OFF
13	ON	ON	OFF	OFF	ON	ON
14	ON	ON	OFF	OFF	ON	OFF
15	ON	ON	OFF	OFF	OFF	ON
16	ON	ON	OFF	OFF	OFF	OFF
17	ON	OFF	ON	ON	ON	ON
18	ON	OFF	ON	ON	ON	OFF
19	ON	OFF	ON	ON	OFF	ON
20	ON	OFF	ON	ON	OFF	OFF
21	ON	OFF	ON	OFF	ON	ON
22	ON	OFF	ON	OFF	ON	OFF
23	ON	OFF	ON	OFF	OFF	ON
24	ON	OFF	ON	OFF	OFF	OFF
25	ON	OFF	OFF	ON	ON	ON
26	ON	OFF	OFF	ON	ON	OFF
27	ON	OFF	OFF	ON	OFF	ON
28	ON	OFF	OFF	ON	OFF	OFF
29	ON	OFF	OFF	OFF	ON	ON
30	ON	OFF	OFF	OFF	ON	OFF
31	ON	OFF	OFF	OFF	OFF	ON
32	ON	OFF	OFF	OFF	OFF	OFF
33	OFF	ON	ON	ON	ON	ON
34	OFF	ON	ON	ON	ON	OFF
35	OFF	ON	ON	ON	OFF	ON
36	OFF	ON	ON	ON	OFF	OFF
37	OFF	ON	ON	OFF	ON	ON
38	OFF	ON	ON	OFF	ON	OFF
39	OFF	ON	ON	OFF	OFF	ON
40	OFF	ON	ON	OFF	OFF	OFF
41	OFF	ON	OFF	ON	ON	ON
42	OFF	ON	OFF	ON	ON	OFF
43	OFF	ON	OFF	ON	OFF	ON
44	OFF	ON	OFF	ON	OFF	OFF
45	OFF	ON	OFF	OFF	ON	ON
46	OFF	ON	OFF	OFF	ON	OFF
47	OFF	ON	OFF	OFF	OFF	ON
48	OFF	ON	OFF	OFF	OFF	OFF
49	OFF	OFF	ON	ON	ON	ON
50	OFF	OFF	ON	ON	ON	OFF
51	OFF	OFF	ON	ON	OFF	ON
52	OFF	OFF	ON	ON	OFF	OFF
53	OFF	OFF	ON	OFF	ON	ON
54	OFF	OFF	ON	OFF	ON	OFF
55	OFF	OFF	ON	OFF	OFF	ON
56	OFF	OFF	ON	OFF	OFF	OFF
57	OFF	OFF	OFF	ON	ON	ON
58	OFF	OFF	OFF	ON	ON	OFF
59	OFF	OFF	OFF	ON	OFF	ON
60	OFF	OFF	OFF	ON	OFF	OFF
61	OFF	OFF	OFF	OFF	ON	ON
62	OFF	OFF	OFF	OFF	ON	OFF
63	OFF	OFF	OFF	OFF	OFF	ON
64	OFF	OFF	OFF	OFF	OFF	OFF
Time (min)	**3**	**4**	**5**	**6**	**7**	**8**

MAINTENANCE

The 6632 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.

SPARE PARTS

Further to minimize race program interruptions, RaceAmerica recommends some spare parts. A spare push-button 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.

Permanent Display Installation Kit

Part # 6601A

Kit Application

The Permanent Display Installation Kit is designed for tracks where permanent installation of the display is required. Power and data connections are routed to the scoreboard through 3/4" conduit attached to the backside of the display. The kit provides connection to a 110VAC or 230VAC source to power the scoreboard. Mounting hardware attaches to the display and provides weather protection for the electrical connections.

Kit Components

- Lower bracket with 3/4" conduit connectors
- Aluminum cover
- 110/230VAC Power Adapter brick
- Screws for attachment to enclosure (#8-32 X 3/8").

Kit Installation

1. After mounting the display securely, attach the Lower Bracket with conduit connectors using two screws (#8-32 X 3/8")

.

2. Secure the AC Adapter to the velcro pad and plug into the power plug on the display.

3. Bring in 110/230 VAC power through one of the conduit connectors and splice to the appropriate wires for the AC source.

4. Bring in the data cable through the other conduit connector and connect to the circuit board. Do not route data cables in the same conduit as power cables. (Wireless units will not have a data cable).

5. Install the Cover over the AC Adapter and wires; secure with six screws (#8-32 X 3/8").