



INNOVATION. TECHNOLOGY. RELIABILITY.

# *Wireless Display Timer Owner's Manual*

*Models 6532EW/6832EW/6532EX/6832EX*

Rev B



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## LIMITED WARRANTY

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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

Model 6532EW/6832EW/6532X/6832X Display Timers (hereafter referred to as 6X32Ex) are micro-processor controlled systems based upon the 7-segment format display digit using the latest technology Ultra-Bright LEDs. The 6X32Ex 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 6X32Ex for timing purposes. The system operates on simple push-button operation for Reset (Clear) and Sensor alignment. Output can be captured with PC Capture software.

The Display Timer is offered in 5" or 8" digits, 900MHz (Domestic USA) or 2.4GHz (International). The display is viewable at wide angles and in full sun. The Sensors operate in conditions from total darkness to full sun 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. WITH ANY BRIGHT LIGHTING SOURCE, VISION MAY BE AFFECTED SHORT TERM SIMILAR TO CAMERA FLASHES.

## PACKAGE COMPONENTS

Each Display Timer package includes:

- 1 - Wireless Display Timer Unit
- 2 - T-Links model 5800C ID 'A' and ID 'B'  
or model 5800CX (International)
- 1 - 05-5825 T-Link to sensor cable 25ft
- 1 - 05-5832 T-Link Sensor/Push-button cable
- 1 - 06-23SB Reset Push-button cable 25ft
- 2 - Infra-red Beam Emitters, model 5040
- 2 - Infra-red Track Sensors, model 5140
- 1 - 5890A T-Link charger
- 1 - Owner's Manual
- 2 - Table stands (5")

## AVAILABLE OPTIONS

- 7540 Foam Stands
- 5050 Extended range beam emitters (75')
- 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)
- 5058/5158 slow response emitters and sensors  
(good for mud racing)

## 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 Emitters require four AA-size batteries. Batteries may be alkaline or NiCad rechargeable.

## PRODUCT SPECIFICATIONS

The following listing provides the designed performance specs for the 6X32Ex Timers:

### SPECIFICATIONS Model 6832Ex

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 Req't:	12VDC/1A
Wireless Frequency:	
Domestic	900MHz
International	2.4 GHz
Timer Range	
M:SS.FFF	9 min 59.999 sec
SSS.FFF	999.999 seconds

**SPECIFICATIONS Model 6532Ex**

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 Req't:	12VDC/1A
View Filter:	Red Transparent acrylic
View Range:	200' in full sun
Power Req't:	12VDC/1A
Wireless Frequency:	
Domestic	900MHz
International	2.4 GHz
Timer Range	
M:SS.FFF	9 min 59.999 sec
SSS.FFF	999.999 seconds

**THEORY OF OPERATION**

Model 6X32Ex Wireless Display Timer is a standalone elapsed time timer and large digital display with a wireless interface between the Infra-red Sensors with hand-held reset push-button and the display. The display timer contains an alignment mode to insure alignment of the sensors to the respective emitters at each location on the track.

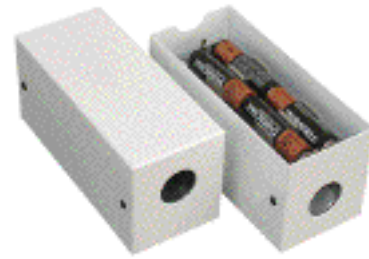
Pressing the push-button resets the display and places the display timer into a ready mode. When a vehicle passes between the start emitter and start sensor 'breaking' the start beam, the timer begins to count and displays the elapsed time in the configured time format. When the vehicle breaks the finish 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.

A diagnostic mode monitors battery level, RF signal integrity and sets the display brightness.

Wireless operation allows for large distances between Start, Finish and the display.

**Model 5040 - Infra-red Beam Emitter**

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

**PRODUCT SET-UP**

Model 6X32Ex 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 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 connected between the sensor and T-Link T-Port connector. The smaller connectors (RJ12) connect to the Track Sensors at the start line and the finish line as indicated on the cable near the RJ12 connector. The push-button can be operated from either end of the track.

Screw on antennas to the display and T-Links.

**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/T-Link cables on the track site as illustrated on the Track Sensors/Cabling Diagram page. The push-button can be located at either the start or finish. The T-Link ID 'A' unit must be at the start and the ID 'B' unit at the finish. The T-Link ID can be found on the bottom of each T-Link. Best results are obtained when a clear 'line of site' can be maintained between all antennas. Review the Track Sensor/Cabling diagram.

**STEP 3 - Connect the Power**

Power is supplied to the display through the 12VDC power input Molex connector and alligator clips or AC adapter. Connecting power to the display will set the display into a power-up self-test and run mode or Configure and Diagnostic modes if the 05-0321 adapter cable with push-button is connected to the back of the display, and pressed/released while power is turned on.

**POWER-ON SELF-TEST**

When the 6X32Ex 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 is now ready to time a run.

**POWER-ON CONFIG & DIAG**

Configuration and Diagnostic modes are entered using the push-button with the 05-0321 Adapter cable plugged into the back of the display. Press and release the push-button as power is turned on to enter the menu selection for [**ConFiG**] and [**-diAG-**]; press and release when the desired selection is displayed.

**CONFIG MODE**

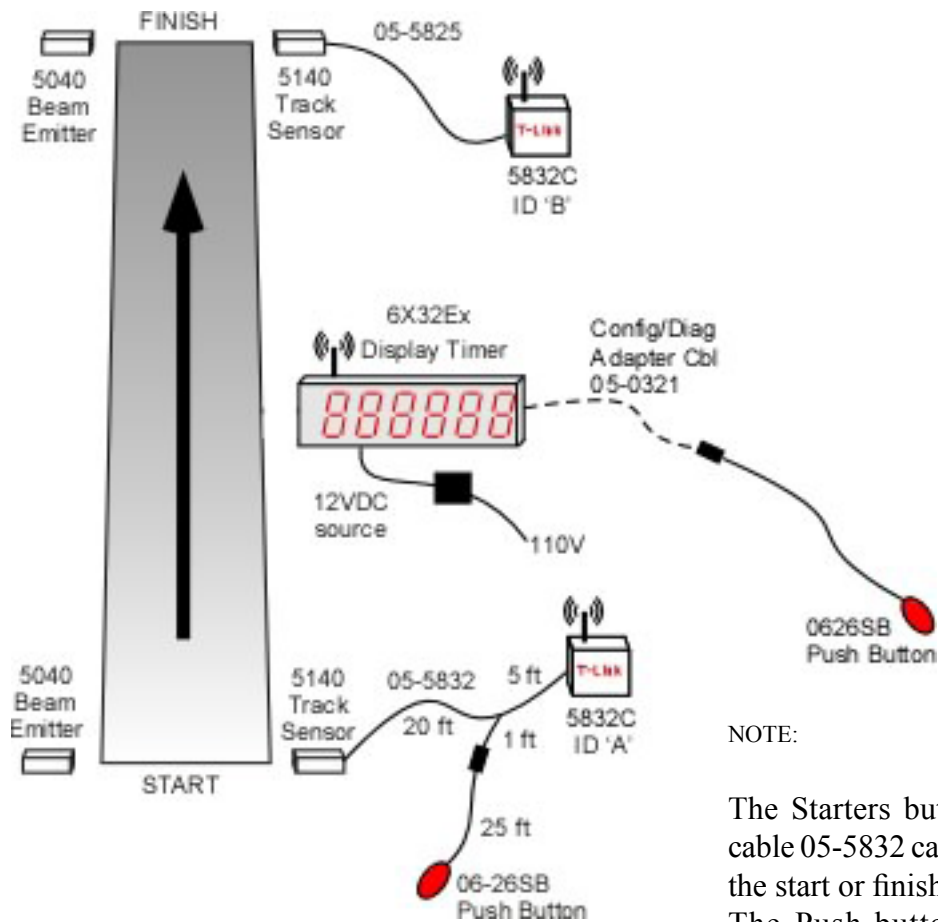
To select the timing display format and display intensity, press/release the reset push-button when the desired timing format is displayed.

<b>999.999</b>	<b>SSS.FFF</b>
<b>9:59.999</b>	<b>M:SS.FF</b>

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 release the push-button to cycle through the available brightness levels. Press/Hold to select the desired level. Each time the display timer is powered on the last time format is used and the brightness defaults back to full brightness. The timer is now ready to time a run.

**DIAGNOSTIC MODE**

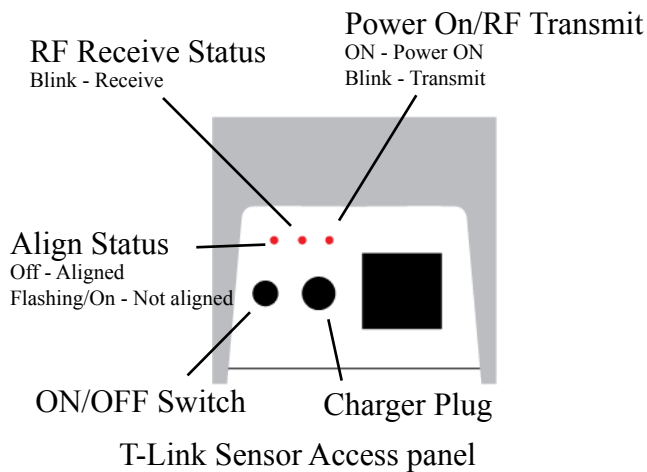
TRACK SENSORS/CABLING DIAGRAM



NOTE:

The Starters button/reset combo cable 05-5832 can operate at either the start or finish.

The Push-button connected to the 05-0321 adapter cable is used to enter Config and Diagnostic modes.



Diagnostic Mode consists of four tests to assist troubleshooting setup and operation of the Standalone Display Timer timing system. Tests are as follows:

- Test the one way wireless connectivity between the display and the T-Link wireless track electronics
- Monitor and display the wireless integrity level to determine signal strength and wireless interference level in the area
- Monitor and display the battery level of the T-Link wireless track electronic sensor units
- Monitor and display the alignment status of the start and finish beams

Diagnostic mode begins with [**Send**] displayed, the receive status LED off, and the transmit status LED on blinking off momentarily. The T-Link Wireless Sensors will indicate they are receiving the signal by blinking the center LED and the right LED is constantly on.

Press and release the push-button to advance and monitor the wireless RF signal integrity with [**-rf-**] displayed. The left dash is the start line and the right dash is the finish line. The dashes on the display will begin to count up as signals are received from the T-Link units on the track. 0 displayed represents 0%, 1 represents 10%, 2 represents 20% etc. until a dash appears representing 100%. This is an indication of the consistency of the RF signal integrity. If this number jumps around, there is a high level of interference in the area. If the number remains high, the RF signal strength is very good. If the number remains low, the RF signal is somewhat weak. The position of the T-Links and display can be moved to optimize the RF Integrity level.

Press and release the push-button to advance to monitor the Battery Level of the T-Links on the track indicated by [**-bL-**] displayed. The left dash is the start line and the right dash is the finish line. The dashes will be replaced by the percentage of

battery power remaining. 0 for 0%, 1 for 10%, 2 for 20%, etc and a dash for 100%.

Next, the system enters Alignment Mode; the display shows [**-S--F-**] indicating the START and FINISH sensor/emitter pairs followed by [**0S--F0**]. The center dashes are blinking.

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....8-9-0-1-2...) 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.

Note that alignment also shows on each T-Link by observing the left Led (steady blink - aligned, irregular/ot of alignment).

## OPERATION



## SPARE PARTS

Enter the Run Mode by pressing the push-button, 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.

The push-button can be connected to either T-Link or the display (with adapter cable) to reset the display for another run.

## MAINTENANCE

The 6X32Ex Wireless 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 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  $\leq 4.2V$  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.

Charge the T-Links until the charger indicator light turns green. DO NOT fully discharge the batteries before charging (lead acid).

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.

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 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.

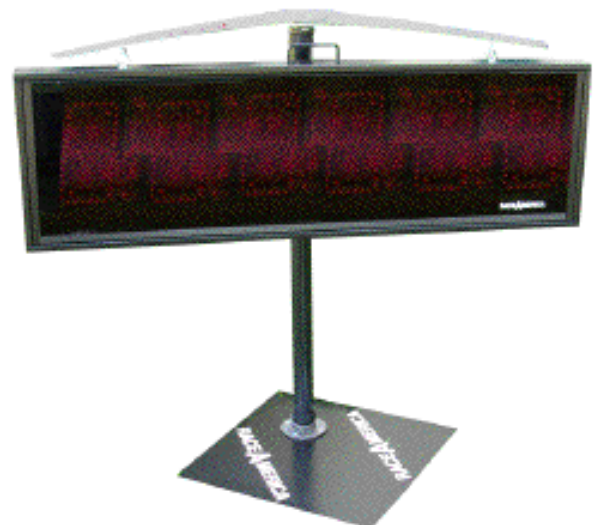
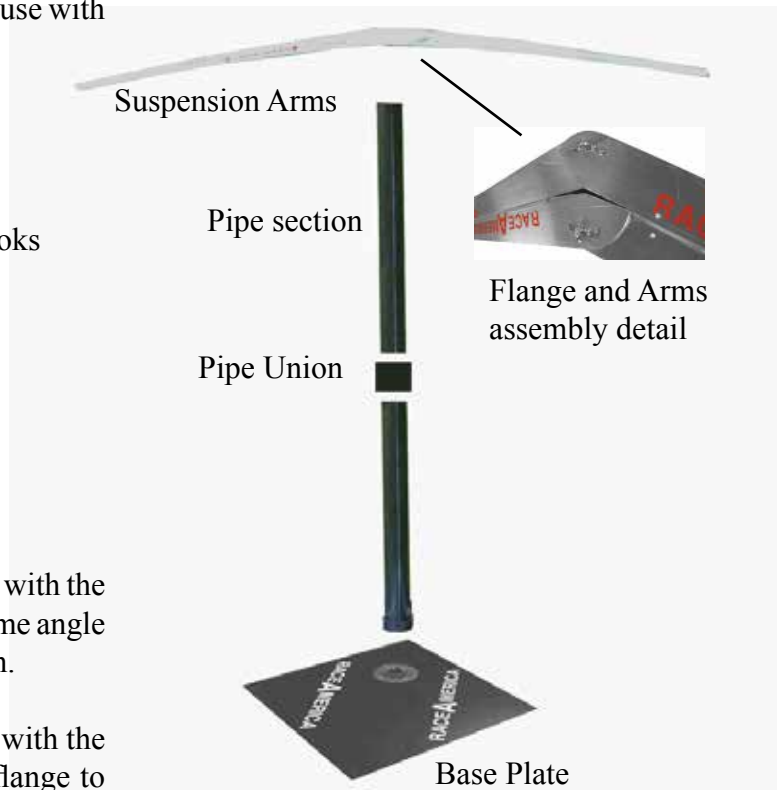
2) Connect the two pipe sections with the coupling and screw into the base plate flange to assemble the post.

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



Assembled Suspension Stand