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# *T-Link3.0 Wireless SBD Timer*

## *Model 5842AW/5842AZ*

Rev A1


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## PRODUCT OVERVIEW

The Wireless SBD (Soap Box Derby) Timer replaces track cables normally used to connect track sensors to the timing system. Model 5842 T-Link 3.0 units report sensor trips to a PC which will calculate differential times, elapsed times and winning lane data.

The wireless T-Link 3.0 units operate over a wide range of conditions. Optimal conditions are line of sight between sending and receiving units and six feet of ground clearance. Range can exceed one mile. High gain antennas can be utilized for greater distances or noisy environments.

Diagnostics such as Beam alignment, RF signal integrity, and T-Link 3.0 Battery Level are available from the PC software.

## PACKAGE COMPONENTS

Each Wireless SBD package includes:

3 - 5842AW/AZ T-Link3.0 IDs ‘A’, ‘B’
1 - 4520USPD USB Wireless
1 - IR Beam Emitter (5042)
2 - IR Track Sensors (5140)
2 - Sensor Cables -25ft (05-5825)
1 - Owners Manual

## LOCAL REQUIREMENTS

Data Capture or Race Management software to collect, display and manage results.

## PRODUCT SPECIFICATIONS

**Model 5842 T-Link3.0**

| | |
|---|---|
| Frequency | 900MHz band |
| USB Battery Pack | 55-E670 |

T-Port Connections

| | |
|---|---|
| ID ‘A’ | Lane 1 Finish |
| ID ‘B’ | Lane 2 Finish |
| ID ‘C’ | Start Sensor |
| Connection Type | RJ-45 Modular |
| Max Operating Range | -20ºF to 120ºF |
| Battery Life | 24 hours |

## AVAILABLE OPTIONS

6770 Wireless Win Lights
ET Start package
3120A AXWare Derby Data Capture S/W
3120B AXWare Derby Race Mgnt S/W
3120C AXWare Derby AASBD S/W
6070T1 Blow mold case (holds 2 T-Links)
6038P - Printer (connects to PC)
7540 Foam Stands (for emitters & sensors)

## SBD SETUP

Each SBD T-Link 3.0 unit is configured with a unique ID code and a wireless optimizer code. These codes are listed on the identity label located on the bottom of the T-Link 3.0 unit. Valid T-Link 3.0ID codes are ‘A’ and ‘B’ for Finish positions, and ‘C’ for optional Start ET sensor. The wireless optimizer code is also listed on the identity label. The optimizer code identifies wireless communications optimization and compatibility with other T-Link 3.0 units. See layout diagram for full setup.

Install the antennas on all T-Link 3.0 units in an upright position. Hold the upper portion of the antenna while tightening the knurled area on the bottom portion of the antenna.

NOTE: The Beam Emitter/Track Sensors operate on line of sight from four to fifty feet apart. Positioning the infra red beams about six inches off the ground will minimize false trips.

Plug in the 4520USPD USB cable into a USB PC port. If the battery charge is at minimum charge, the T-Link 3.0 will power off even if the power switch is ON. If the 4520USPD is the only unit powered on, the LED will quick flash red each time it transmits. When other T3’s are powered on, the LED will flash green when a wireless signal is received. During normal operation, the LED on

## TYPICAL SBD TRACK SETUP

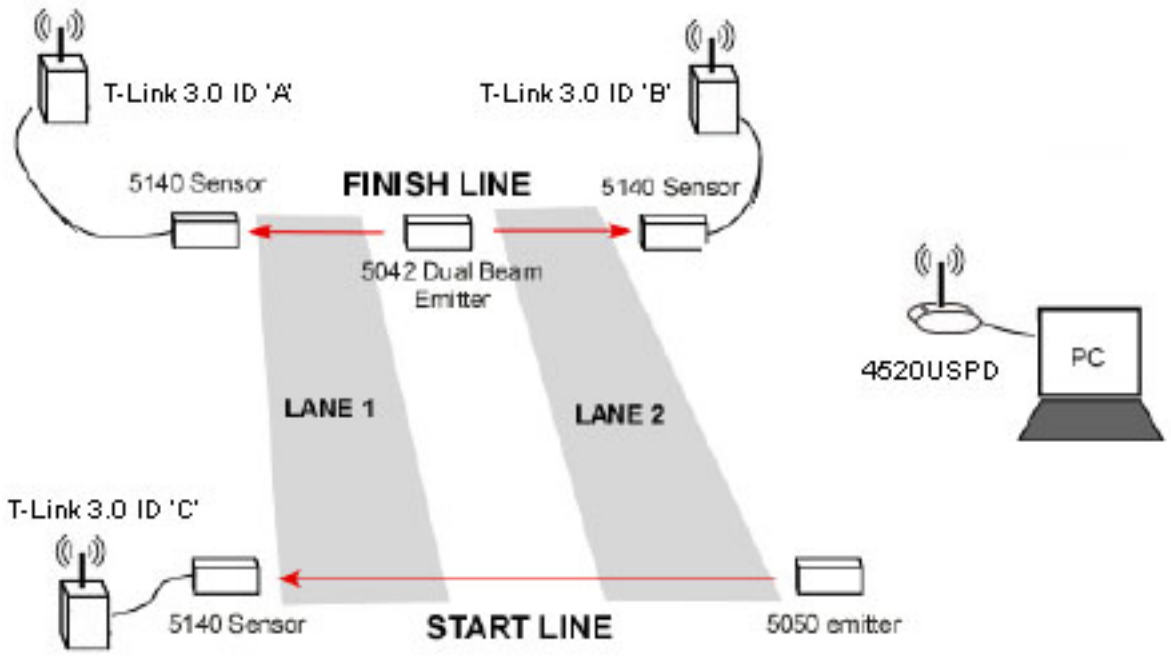


Figure 1 - T-Link 3.0 Wireless SBD Layout

each T3 will flash red during transmit and flash green each time signal is received from another T-Link 3.0.

The wireless SBD Timer requires a PC with data capture or race management software to publish the race results.

## USING WIN LIGHTS

Optional Wireless Win Lights can be connected Wirelessly to the timing system and receive signals from the 4520USPD unit.

When the Win Lights are not indicating a winning lane they are continuously waiting for the first beam to be blocked. Once a finish is detected, the Win Light for that lane will flash for 10 seconds, then clear automatically and return to idle state waiting for the next beam to be blocked.

## USING PC SOFTWARE

Locate the 4520USPD and connect the USB cable and plug the other end into a USB PC port. Windows should acknowledge the unit with a tone and establish a COM port for use if teh drivers installed properly. Install the PC Software, configure the software for the PC COM port receiving the data; use the software 'Help' sections as required.

## OPERATION

When the SBD Timer is set up and aligned with T-Links, it is time to race. The system allows ten seconds (10 sec) after the first finish to allow the second racer to finish before reseing. Upon completion of the race, the winning lane and differential and/or ET will display on the PC (XX. XXX) an/or the LED Display.

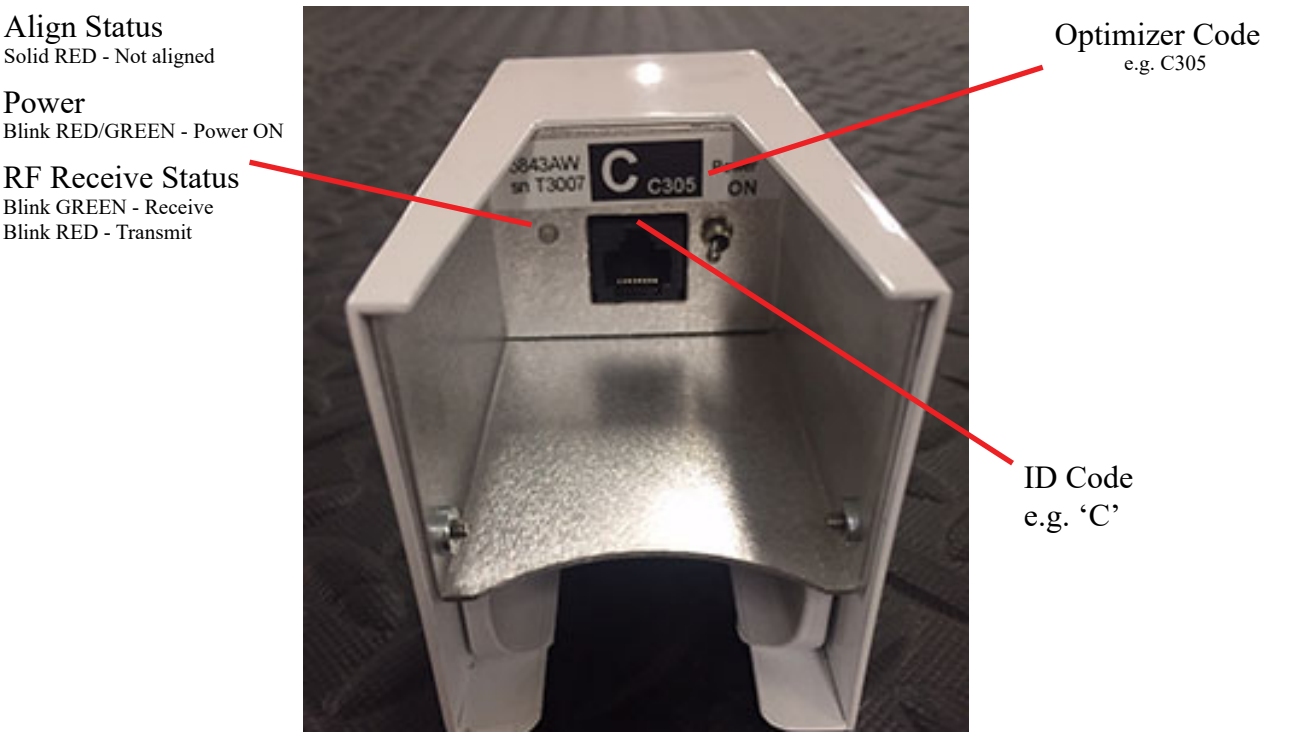


Figure 2 - T-Link 3.0 power and external connections

After each race, the timer is locked out for ten seconds to allow dirt and dust to settle.

## USING SPARE T-LINKS

T-Link 3.0 identifier codes are preset at the factory. Using an external Reconfig Jumper provided with a backup T-Link 3.0 unit, a T-Link's ID code can be changed enabling a single backup unit to replace any unit with the same optimizer code. With the 5842 T-Link, a unit can be reconfigured as an ID 'A', 'B' or 'C' unit. To temporarily change the ID code of a T-Link 3.0 unit, power the unit off. Select the Reconfig Jumper with the desired ID code and install into the T-Port of the T-Link 3.0 unit to be reconfigured. Power on the T-Link3.0 unit. The left LED will flash three short times to confirm the T-Link2 unit has been reconfigured to the new ID code. Unplug the Reconfig Jumper and connect any cables to the T-Link 3.0 unit for normal use. Do not power off the T-Link 3.0 unit after a new ID code has been assigned. The change of ID is temporary. When the T-Link 3.0 unit is powered off, the ID code will revert back to the preset ID shown on the bottom of the T-Link 3.0 unit.

## BATTERY CHARGE

Charge the USB Battery Pack using the an external USB charger unit. All functional electronics are disabled during battery recharge to avoid damage. Typically a full battery charging will take 6-8 hours. The charger indicator LED will turn from red to yelow to green when charging is complete.

## TECHNICAL DETAILS

### Connection to a PC or Timer:

The T-Port is a RJ45 connector with 8 conductors. Viewing the T-Port, pin 1 is on the left side and pin 8 is on the right side of the connector. For RS232 serial data communications, pin two is ground and pin one is data sent from the T-Link 3.0unit. All other pins should not be connected to avoid damage to the T-Link 3.0 unit.

### Data String Protocol:

Data strings are sent from the 4520USPDunit to provide timing timestamps from each track sensor, battery charge level in each T-Link 3.0 unit, and RF Data Integrity level of the wireless communications between the T-Link 3.0 units. The data strings are always terminated by a 'carriage return' (cr) character and are 11 characters in total length.

<id> is the ID code of the T-Link 3.0 - A thru G are valid

<timestamp> is a 9-digit number for timing use
<error code> is a single digit number explained under Error Codes
<rev level> is a 3-digit number of the Revision Code of the T-Link
<batC> is a single digit number of the Battery Charge Level of a T-Link unit
<rfC> is a single digit number of the RF Integrity Level of a T-Link unit

<id> <timestamp> cr

ZB <batA><batB><batC> 000 <batZ> cr

ZW 00 <rfA><rfB><rfC> 0000 cr

<id> E <error code> 0000000 cr

<id> R <rev level> 00000 cr

All error messages are real time during normal operation with different levels of urgency. Errors E1, E3, and E5 indicate local interference effecting the wireless communications or loss of signal. These are error messages to alert the user of intermittent interference and do not effect the accuracy of the timing system unless the error codes continue for more than 10 seconds of operation. Errors E2 and E4 also indicate local interference effecting the wireless communications or loss of signal unless these error codes are preceded by 10 seconds of continuous error codes.

## MAINTENANCE

To insure uninterrupted operation on race day, it is suggested to keep track of battery usage hours so as to have fully charged batteries. To maintain the highest level of timing accuracy and minimize false trips, annual preventive 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 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 Preventive Maintenance on all system track sensors and beam emitter units. Contact RaceAmerica for more information and pricing of Support Agreements.

## REVISION HISTORY

07/14 - Initial release