



# *User's Guide*

## **TURBO**

### *Pinewood Derby Finish Line and Timer*



**Release 2.1**

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**NewBold Products, Atlanta GA**  
[www.newboldproducts.com](http://www.newboldproducts.com)

# 1. YOUR SHIPMENT

Thank you for purchasing the **TURBO**, Pinewood Derby Timer. The **TURBO** represents the ultimate in technology designed to enhance your race experience through a fair measurement for the racers and an exciting visual experience for the audience. Please take a few minutes to review this Manual to get the most from your equipment.

Your **TURBO** shipment includes a number of components that together form the complete system. Table 1 indicates the quantity of each component that is required for tracks from 1 to 8 Lanes. The quantities shown in Table 1 are the minimum quantity for a given number of lanes. Your order may include additional quantities and/or other items.

**Table 1. TURBO Components**

Component		Number of Lanes							
		1	2	3	4	5	6	7	8
Timer Module		1	1	1	1	1	1	1	1
Bridge Section *		1	1	2	2	3	3	4	4
Bridge Support Brackets (pair) *	<i>Note: These brackets are pre-assembled with the Bridge Section(s)</i>	1	1	1	1	1	1	1	1
Lane Module		0	2	3	4	5	6	7	8
"I" Bracket A		1	1	1	1	1	1	1	1
"I" Bracket B		1	1	1	1	1	1	1	1
3V Distribution Board		1	1	1	1	1	1	1	1
12 Inch IR Cable		1	2	3	3	3	3	3	3
24 Inch IR Cable		0	0	0	1	2	3	4	5
Start Switch w/cable		1	1	1	1	1	1	1	1
15VDC Supply		1	1	1	1	1	1	1	1
#2, Machine Screws		2	2	2	2	2	2	2	2

\* **Note:** The Bridge Sections are shipped pre-assembled with the Bridge Support Brackets. This is the Bridge Assembly.

## 2. INSTALLATION

This section describes how to connect the TURBO components and install the system on your track. Section 3 of the User's Guide provides instructions for how to test the system. Refer to Table 1 for pictures of the individual components referenced in the Installation steps. Example pictures in this section are for a 4-Lane installation.

### Tools Required:

(1) Drill with 1/4" bit (2) Regular screwdriver (3) Phillips screwdriver (4) Needle nose pliers (5) Tape or pencil to mark finish line

#### **Step 1 Install Infrared Light Sources at Finish Line**

- 1a. Determine where you want to position your finish line on the track.
- 1b. Use pencil, chalk line, or tape to mark across the track at the finish line. Mark the center of each lane with your pencil.
- 1c. Drill a 1/4 Inch hole at each location marked in step 1b.

#### **Step 2 Connect IR Light Sources to 3V Distribution Card**

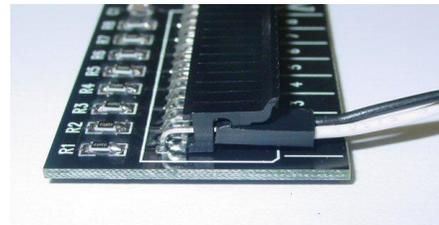
2a. Run IR Cable through each 1/4 Inch hole starting with the connector. Pull the IR Cable through until the IR source is flush with the track surface. Use 12 Inch IR Cable for Lanes 1 through 3 and 24 Inch IR Cables for Lanes 4 through 8.

\*\*\**(Note: Lane 1 is the lane that is closest to the Timer Module for your installation.)*

2b. Route the connectors for each IR Cable underneath the track and to the side nearest to where the Timer Module will sit.

2c. Connect each IR Cable connector to the 3V Distribution Card. Note that the connectors have a polarity and only connect to the 3V Distribution Card in *one orientation*. See the photo below and note the location of the white (or silver) and black (or copper) wires. Some cables use silver and copper colored wires instead of white and black. Extra cable length can be stored beneath the track to be out of the way.

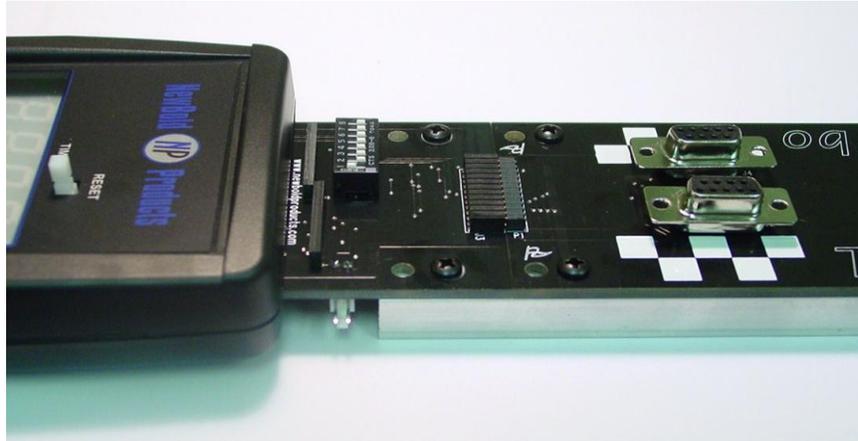
Note: Needle Nose pliers may be required to plug and unplug the IR cable connectors.



**Step 3 Connect Timer Module to Bridge Assembly**

**3a.** Connect the Timer Module to the Bridge Assembly by mating the 24-pin header on the Bridge with the 24-pin socket on the Timer Module. Insert until the Timer and Bridge are flush against each other.

**3b.** Install two 6-32 screws through the Timer Module and into the Bridge Support Brackets and fasten using the 6-32 nuts.



**Step 4 Mount Timer and Bridge Sections to “I” Brackets**

**4a.** Lift the Timer Module up and connect the Timer Module to I-Bracket A using the Velcro strips on Timer Module and I-Bracket A.

**4b.** Connect the other end of the Bridge Assembly to I-Bracket B using two 6-32 screws and nuts.

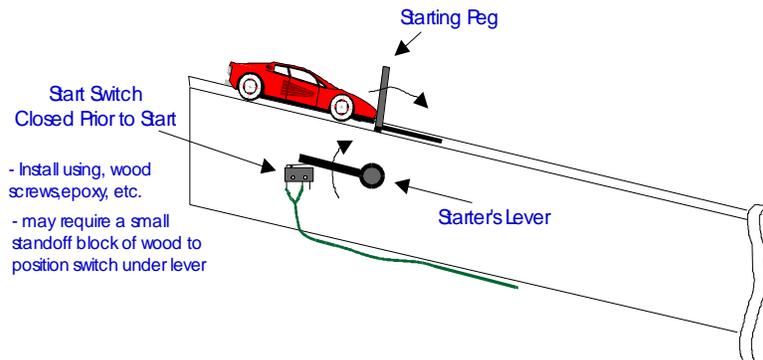


## Step 5 Install Start Switch

**5a.** Determine the best location to mount the start switch for your particular track and starting lever mechanism.

**5b.** Use the two, #2 machine screws to mount the start switch to your track. You may need to mount the switch to a smaller block of wood or aluminum and mount that block to your track, to align the switch with the start lever or mechanism.

*Note: The exact installation is dependent on your track design. The switch should be installed so the **switch opens** when the starting lever of your track moves to start the race. Also be sure to move the lever quickly so that cars are not leaning on the Starting Peg as it moves forward. If you impede the car's progress with the Starting Peg, the elapsed times can vary from race to race, dependent on the speed at which the lever is moved. The switch needs to be closed for more than .5 seconds between races.*



## Step 6 Position **TURBO**, Connect 3V Distribution, Connect Start Switch

**6a.** Move the Assembled **TURBO** (Timer Module, Bridge Assembly, and I-Brackets) into position over the drilled IR Sources at the Finish Line. Make sure each phototransistor (bottom side of Bridge) is directly over the IR Source for each lane. The I-Brackets can be drilled and mounted onto a piece of plywood placed under the track for added stability.

**6b.** Connect the Start Switch connector to the Timer Module connector labeled "ST". Polarity for this connector does not matter.

**6c.** Connect the connector from the 3V Distribution Board to the mating connector on the Timer Module. The mating connector is orange or white and located on the bottom of the Timer Module near where the Timer connects to the 1<sup>st</sup> Bridge Section.



### Step 7 Install Lane Modules

7. Carefully plug each Lane Module into the Bridge Assembly. Support the bottom side of the Bridge with one hand and plug the Lane Module in with the other hand. (Note: Lane Modules can be installed on either or both sides of the Bridge Section, depending on your track setup and where the Timer Module sits.)



### Step 8 Connect Power Cable & PC Cable (if used)

8a. Connect the serial port cable to the Timer Module at the connector labeled “RS-232”. If using USB port cable, go ahead and route it to the computer but do not plug it into the timer yet.

8b. Connect the plug from the DC Power Supply to the Timer Module at the connector labeled “15 VDC”. This will turn the **TURBO** on.

## 3. TESTING THE TURBO INSTALLATION

### When the TURBO is Turned On:

The **TURBO** turns on when the 15VDC wall adapter plug is inserted into the Timer Module. When the timer starts it cycles through the following steps:

- 1) The digits for Elapsed Time, Lane, and all connected Lane Modules count up from 1 to 9.
- 2) The displays clear.
- 3) The **TURBO** determines the number of lanes in use. The “Lane” display on the Timer Module will indicate the number of lanes in use. The **TURBO** looks for lanes where the IR Cables are installed and are aligned with the Bridge Section above the track. If the Lanes found does not match the number expected check to be sure that the IR source is positioned directly beneath the detector on the bottom of the Bridge Section.
- 4) The Timer waits for the user to press the “Reset” button.
- 5) The Timer enters race mode, where it waits for the start switch to close for more than .5 seconds and open.

### Configuring the Elapsed Time Display:

The **TURBO** has a 5 digit Elapsed Time display as a standard part of the Timer Module. After the race finishes this display will either display the winning time and corresponding lane number, or can display the elapsed times for all lanes starting from the 1<sup>st</sup> place lane. The Timer Module has a configuration switch (near the connection to Bridge) that allows you to configure how the Elapsed Time display is used. Only Switch 1 and 2 are used at this time.

Switch 1:        ON        → Display winning time only        **[Factory Default]**

Switch 2: OFF → Display elapsed times for all lanes  
 ON → Hold each time until Reset is pressed  
 OFF → Auto cycle through times, 5 seconds each. **[Factory Default]**  
 Press Reset after last lane.

**Selecting USB or RS-232 for PC Communications:**

If you ordered the internal USB interface with your **TURBO** system you have the option to use USB or RS-232 (serial port) to communicate with your PC. Note that when the USB option is installed, both interfaces will send data from the timer to the PC all the time. You must set the jumper on the timer board itself to select which interface on the timer will receive data from the PC – only one interface, USB or RS-232 can receive the reset command from the connected PC. The factory default is to receive using USB if the internal USB option is installed.

To select which interface will receive data from the PC open the Timer Module case by removing the four (4) screws on the backside of the case. Find the 3-pin jumper located about 1 inch above the USB connector. The 3-pin jumper is labeled “J7”. Move the jumper to the left side to select RS-232 or to the right side to select USB. This only affects the receive path. Data will always be sent from both interfaces out to the PC.

**Setting Up Your PC to Communicate With the TURBO:**

The **TURBO** sends data to your PC at 1200 baud, with 7 data bits, no parity, and 2 stop bits. You should also turn flow control “OFF”.

**Note 1:** If you are going to use race software such as DerbyMaster or Grand Prix Race Manager, you must close Hyperterminal before starting your race software.

**Note 2:** Within the race software you can select “TURBO” or “DTX000” as the timer interface. Both timer families use the same communications protocol. You do not have to configure anything else on the serial port to use Grand Prix Race Manager, DerbyMaster or Racetender programs.

**Note 3:** If you are using the NewBold Products internal USB interface or a USB to serial adapter, you must install the driver software for the USB interface before you can communicate to the **TURBO** using USB. If you can not find your driver disk and you purchased the USB interface or adapter from us, you may download the driver from our website at [www.newboldproducts.com](http://www.newboldproducts.com) under Questions. See the instructions located on the **USB Driver CD** “Readme” file for installation information.

If you are using the Windows operating system on your computer you likely have the terminal program “Hyper Terminal”. This program can typically be found under <Start>, <Programs>, <Accessories>, <Hyper Terminal>. Once you have started this program, go to <File>, <New Connection>.

The program will prompt you for a name, you could call the session “**TURBO**” or whatever you prefer. After giving a name, you will have a phone number dialog box. From this dialog box edit the “Connect Using” box to say “Direct to Comx”. Where Comx is Com1, Com2, etc. The serial port for many PCs will be Com1, but this varies.

After entering your Com port and <OK>, you will see a Comx Properties dialog box. At this box enter the connection properties as Bits per second = 1200, Data bits = 7, Parity = none, Stop bits = 2, Flow control = none. Once you have setup your session you can save it as “**TURBO**” or another name and each time you use the **TURBO** you can startup Hyper Terminal and simply load this file.

The data sent from the TURBO to your PC will have the following format, assuming 4 Lanes are in use (shows 1<sup>st</sup> Place Lane #, 1<sup>st</sup> Place Time, 2<sup>nd</sup> Place Lane #, 2<sup>nd</sup> Place Time,.....):

TURBO NewBold Products  
 1 2.5455 2 2.9831 3 3.7745 4 3.8224

1 2.6790 3 3.1288 2 3.2092 4 3.5644

:

### **Running Test Races:**

After power is applied to the **TURBO** and Reset is pressed all of the LEDs will be cleared on the Timer Module and Lane Modules. At this point the timer is ready to start a race. The Timer Module waits for the Start Switch to close and remain closed for at least 0.5 seconds. When the start switch opens, the timer begins counting the elapsed time and monitoring each lane for the finish event. The decimal point on the Timer will also light up, showing that the timer is operating. When a car passes over the IR light source (installed into the center of each lane at the finish line), the Lane Module above that lane will display the finish position for that lane.

Once all lanes have finished OR 9.9999 seconds has elapsed, the race will conclude. Once the race concludes the timer sends the finish order and all times to the PC port and will display the elapsed time for either the winning lane or all lanes, depending on the configuration set using Switches 1 and 2 (see "Configuring the Elapsed Time Display" section above).

## **4. TROUBLESHOOTING**

Before racing, run multiple test runs to test all lanes and several finish order combinations. Make sure that the IR light sources are properly aligned with the photo sensors on the Bridge module. The photo sensors should be directly over the IR source.

Timer gives very low times for one or more lanes or incorrect finish order. Photosensors on bottom of bridge section are not directly above the IR source or photosensors on bottom of bridge section are bent. They must face straight down.

When power is applied, not all lanes are found. Photosensors on bottom of bridge section are not directly above the IR source or photosensors on bottom of bridge section are bent. They must face straight down.

Timer serial port connects to HyperTerminal, but will not connect to race management software. Comm port may be assigned to another serial port device such as a Palm Pilot, phone, etc. or HyperTerminal may still be open. *Make sure Hyperterminal is not running if you are using another software package such as DerbyMaster or GrandPrix Race Manager.*

Computer is not receiving information from timer. If you are using a USB port to connect to the computer, you need to verify the driver was installed and is the correct driver. Check the Windows Hardware Device Manager to verify that your driver is working and that a Comm port has been assigned to the USB port. If you do not see, you need to reinstall the driver. If you no longer have your driver CD, you may try to download it from our website under the Questions tab.

One or more of the lanes is not found after the timer cycles the display from 0 to 9. IR Cable may be plugged in to the 3V Distribution board incorrectly. Refer to the picture in Step 2 of the Installation. Also, the IR emitter located in the track may not be directly beneath the IR sensor that is on the bottom of the bridge section above. Additionally, the IR emitter may have been damaged. Check to make sure all emitters look the same with a glass-like round circle in the middle.

## **5. TECHNICAL SUPPORT**

For technical support on your product, please use the following methods to reach the correct person to help you. NewBold Products does not provide technical support for Race Management software that we distribute for the companies listed below.

TURBO Hardware – questions on operation, installation and upgrades:

Contact: NewBold Products  
[support@newboldproducts.com](mailto:support@newboldproducts.com)  
www.newboldproducts.com  
1 (866)-NEWBOLD, or 678-812-4585  
fax: 815-301-3426

Grand Prix Race Manager Software – all questions on installation, operation etc.

Contact: Lisano Enterprises  
[info@grandprix-software-central.com](mailto:info@grandprix-software-central.com)  
www.grandprix-software-central.com  
1 (303) 362-1300

DerbyMaster Race Software – all questions on installation, operation etc.

Contact: Enterprising Ideas  
[support@enterprisingideas.com](mailto:support@enterprisingideas.com)  
www.enterprisingideas.com  
1 (972) 394-0381

## **6. Contacting NewBold Products, Warranty and Return Policy**

Send us email: [newboldproducts@gmail.com](mailto:newboldproducts@gmail.com) Preferred!

Call us: 866-NEWBOLD or 678-812-4585

Mail: NewBold Products, 1200 Oakhaven Drive, Roswell, GA 30075

### **6- Year Parts & Labor Warranty**

NewBold Products provides a six-year warranty for all TURBO equipment, starting from date of purchase and covering parts and labor. The warranty period is 1 year for equipment used commercially such as in track and timer rental to other groups. If you believe your equipment needs warranty repair contact us to let us know the nature of the problem so that we can resolve it over the phone if possible. If the problem cannot be corrected over the phone we will request the equipment be returned to us for repair. The customer is responsible for shipping the product back to NewBold Products. NewBold Products will repair and return the equipment via Priority Mail or FedEx Ground. Faster shipping is available at actual cost and at the customer's expense. Warranty repairs are not applicable for modified or damaged equipment.

### **90 Day Return Policy**

If for any reason, you are not satisfied with your equipment purchase, you may return it within 90 days of purchase for a full refund (excluding shipping charges). Once equipment is received and inspected we will issue a refund. This return policy does not apply to any modified or damaged equipment.