

Using Race Timer

An instructional Guide By
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Introduction

Welcome to the world of Automated Pinewood Derby racing! This guide was created to meet a need for a complete, step by step guide on how to run a successful Pinewood Derby race using the “**Least Expensive Pinewood Derby Timer**” hardware design and Mark Logan's **Race Timer** software.

You probably know by now that finish line disputes can ruin an otherwise fun scouting event. Using a computer to determine the winners makes sure there are no claims of judging errors or favoritism. When the Race Timer software is used in conjunction with the Heat Generator software (also detailed in this manual) even the vagaries of “lane speed” are removed as every car races on every lane so the track itself is removed as a variable and it's all up to how well the cars perform.

I hope you find this guide useful, but if you have any suggestions or comments please feel free to email them to Vern Graner (vern@graner.com). Thank you and Happy Racing! :)

Before you begin

Simply put, the Race Timer software is used to determine the winner of each race (or “heat”) and then to determine the overall winner of the event. The Race Timer software requires the “Least Expensive Pinewood Derby Timer” hardware in order to operate. Though it is possible to setup heats, groups, names and cars, you must first build or acquire the “Least Expensive Pinewood Derby Timer” hardware before you are able to test or operate the actual timer for a race. The “Least Expensive Pinewood Derby Timer” hardware is detailed on the yahoo! Group located here:

<http://groups.yahoo.com/group/PinewoodTimer/>

You can build the “Least Expensive Pinewood Derby Timer” completely from scratch using schematics located on the above yahoo! site, or you can purchase a printed circuit board to ease the process from this web site:

<http://pinewood.hmpg.net/>

System Requirements

In order to use the Race Timer software, you will need the following:

- A **Basic** understanding of Computers and Electronics
 - x86 (Intel or AMD) based computer
 - A Parallel port (See Illustration 1)
 - Windows® 98 or higher
 - 32 meg of memory (or more)
 - 5 meg of hard drive space (or more)
 - PKZIP or other ZIP decompression program
 - Patience :)
- In most cases your standard home PC will be sufficient. However, when using a laptop computer, it is important to check to make sure there is a DB25 Parallel Port connector available.



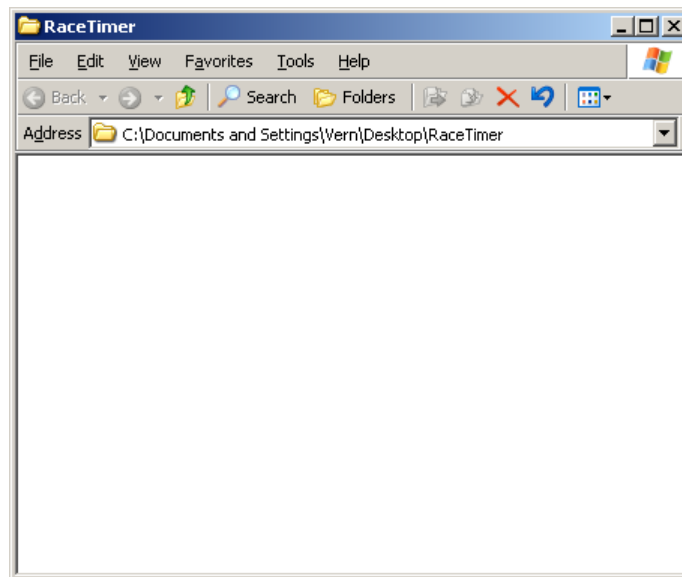
Illustration 1: a “DB25” Parallel Port

Note: Many newer laptop computers do not provide a parallel port as it is considered “obsolete”. A laptop without a parallel port will **not** work as a host for the Race Timer software!

Downloading the program

You will need to download a series of files and copy them to the appropriate locations on your PC before you can use the Race Timer software. As of this writing, there is no “SETUP.EXE” to do this for you, but getting the software downloaded and installed is a relatively simple process.

First you will need to create a folder on the “desktop” of your PC with the name “RaceTimer” as shown here:



Next you would need to go to the FILES section of the “Least Expensive Pinewood Derby Timer” YAHOO! Group shown here:

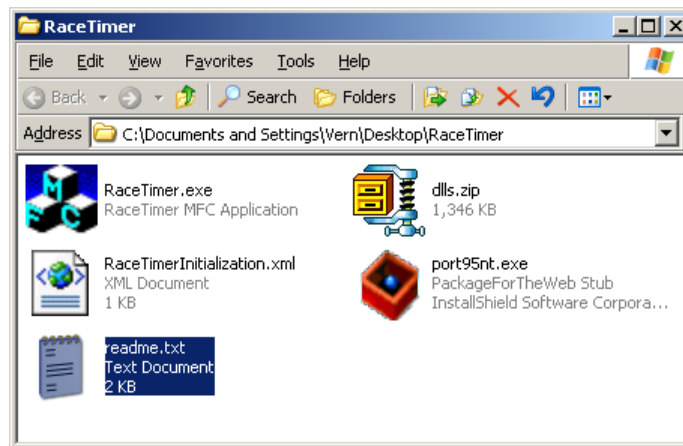
<http://groups.yahoo.com/group/PinewoodTimer/files/RaceTimer/Test%20Software/>

TIP: The above URL is valid at the time of this writing, but if you do not find the files listed there, visit the general files section and look for information as to where the files are now located.

And download the following files:

```
RaceTimer.exe  
readme.txt  
RaceTimerInitialization.xml  
dlls.zip  
port95nt.exe
```

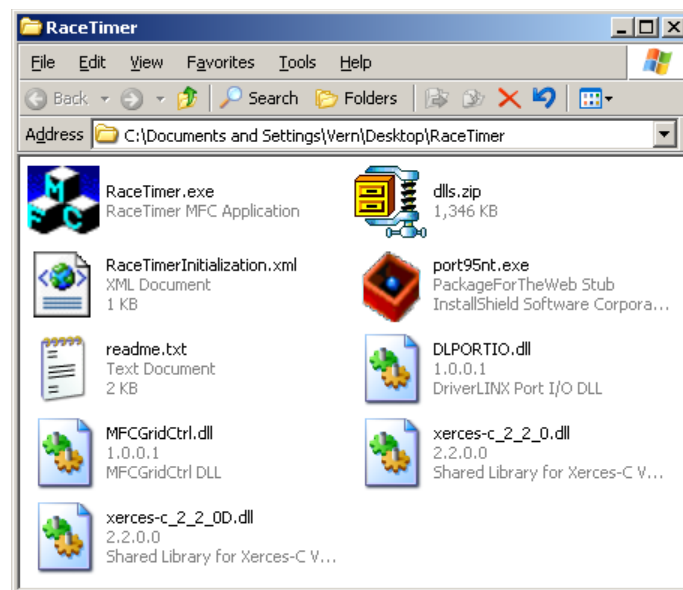
and place them inside a folder as shown here:



You now need to “UNZIP” the archive containing the DLL files in order to be able to use them. Use PKZIP, WINZIP or if you have Windows XP, you can use the built-in file decompression routine to decompress them. The `dlls.zip` file will decompress into these component files:

```
DLPORTIO.dll  
MFCGridCtrl.dll  
xerces-c_2_2_0.dll  
xerces-c_2_2_0D.dll
```

Make sure all four DLL files are present in the folder (you may need to turn on show hidden/system files in order for the files to be visible). Your directory should now resemble the following screen shot:

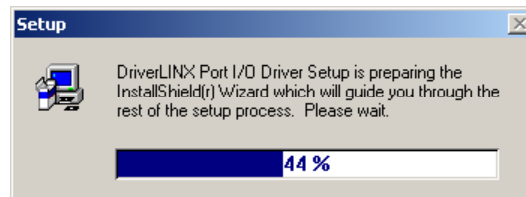


You now have all the software necessary to operate Race Timer. All we have to do now, is setup and install it! :)

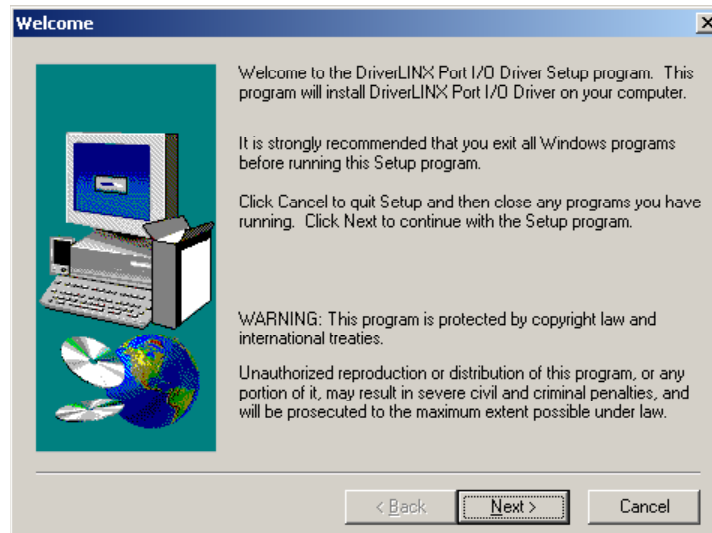
Setup

Installing The PORT95NT Program

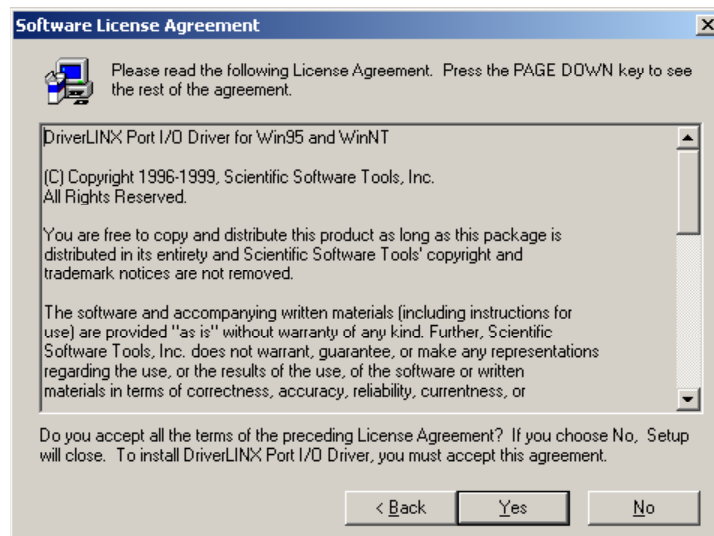
In order to insure that your Race Timer software can “see” the parallel port's individual pins (and ultimately, the circuit that you build for the , you must install a “driver”. The PORT95NT.EXE file contains a driver that provide direct access to the Parallel port of your computer. To install the double click the PORT95NT.EXE file. You should see this requester:



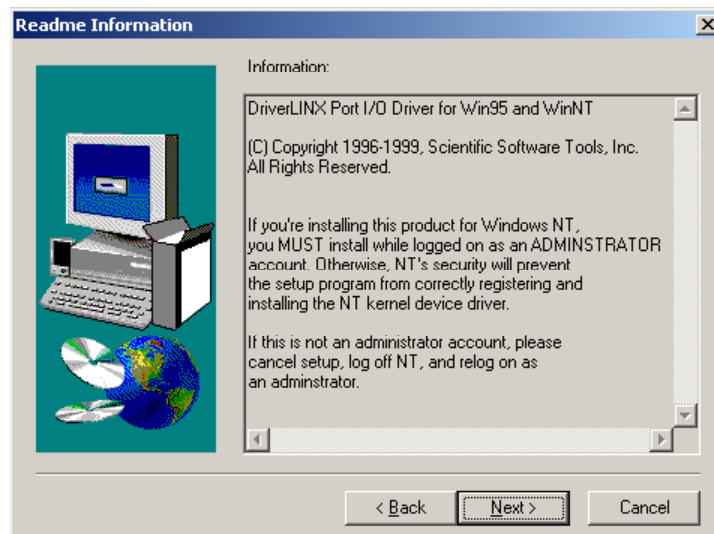
This is the decompression of the program. When it completes, you will be presented with this requester:



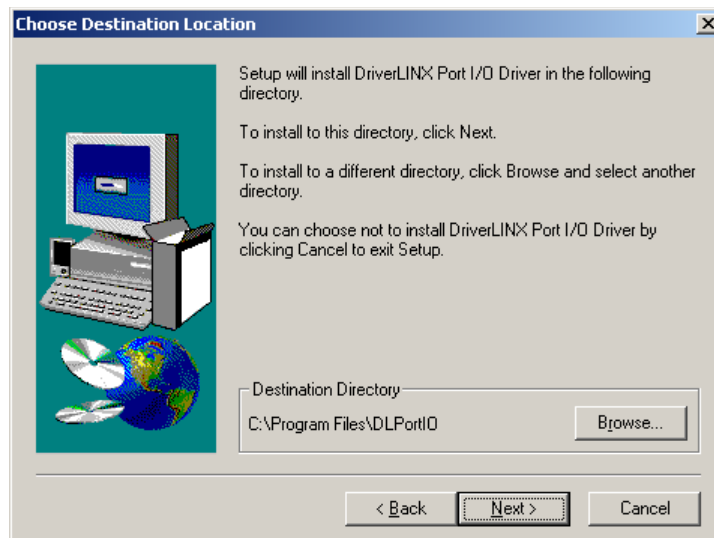
From here you click NEXT and you will be presented with the license agreement requester shown here:



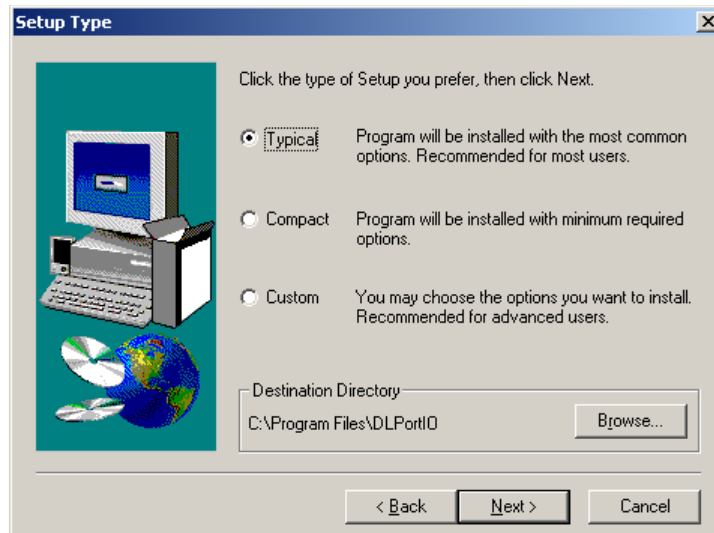
Read the license agreement and then, if you agree to the terms and conditions, select the “yes” button. The program then presents you with the README file that provides details about the program as shown here:



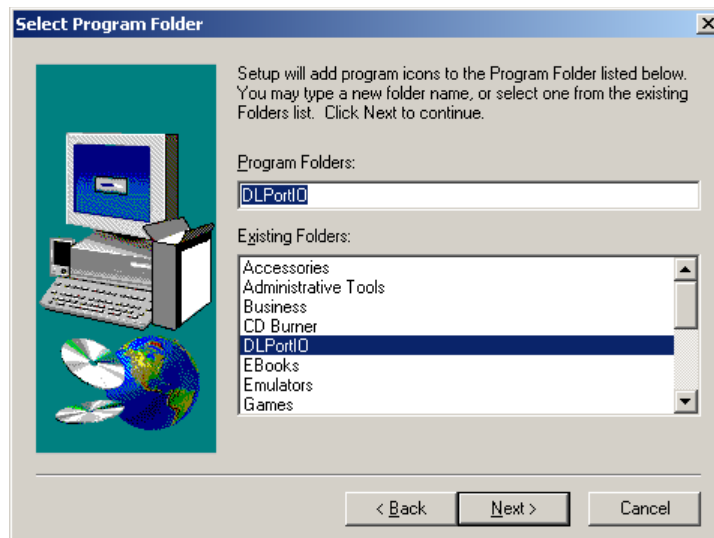
Click NEXT and you will be presented with the location where the files will be placed. It is recommended that you leave these at their defaults as shown here:



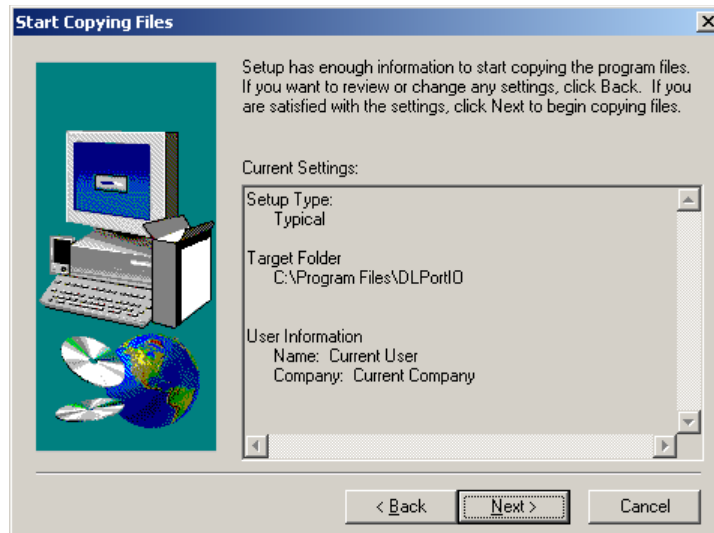
Click NEXT and you will be shown the options for installation. It is recommended that you leave this at its default setting of “typical” as shown here:



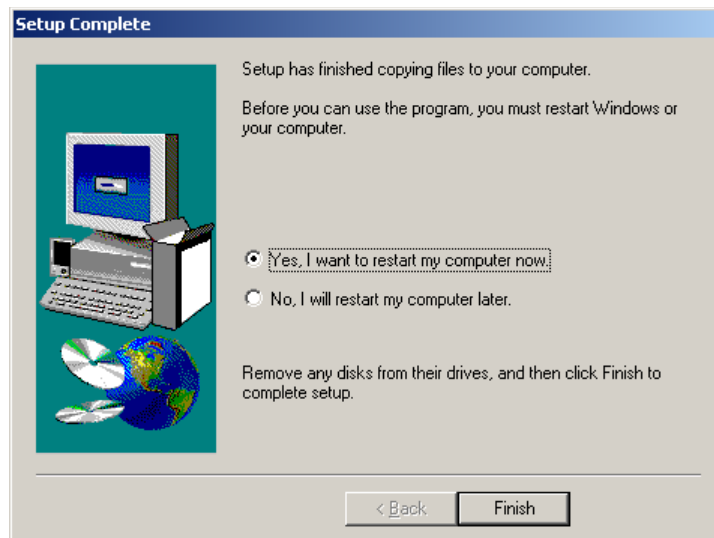
Click NEXT and you will be presented with a requester that shows the location where shortcuts for the program will be located. We recommend that you leave the default as shown here:



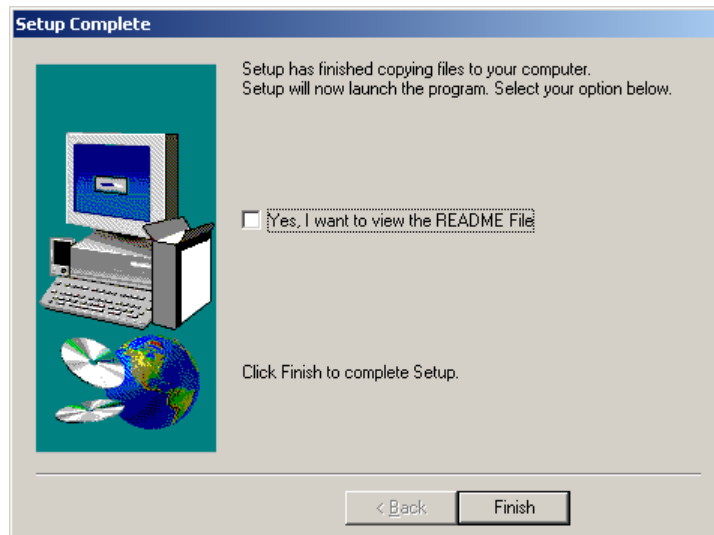
Click NEXT and you will be presented with a requester that shows the destination for the files. We recommend that you leave the default as shown here:



Click NEXT and you will be presented with a requester that, as the default setting, offers to Reboot your PC. We recommend that you change the setting to NO (we do NOT need to reboot yet) and then click FINISH on the following requester:



You should see the following requester:

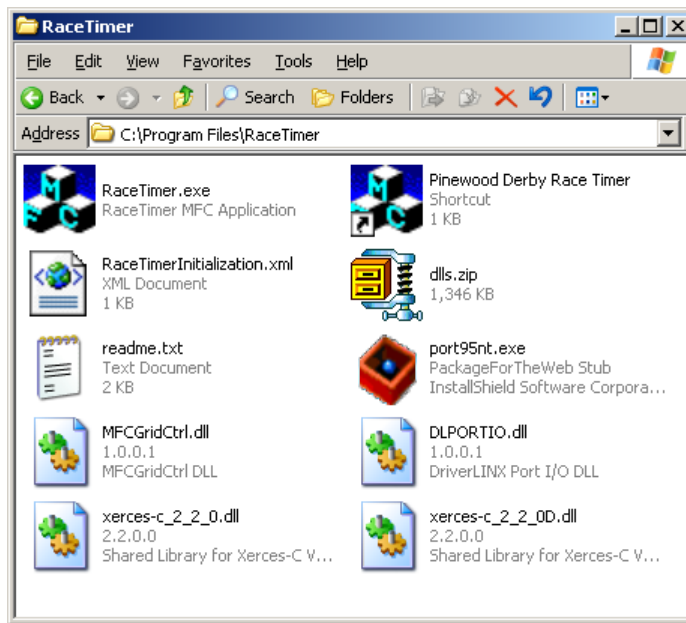


Leave the box UNCHECKED and click FINISH. The installation of the PORT95NT.EXE drivers is now complete.

Installing The Race Timer program

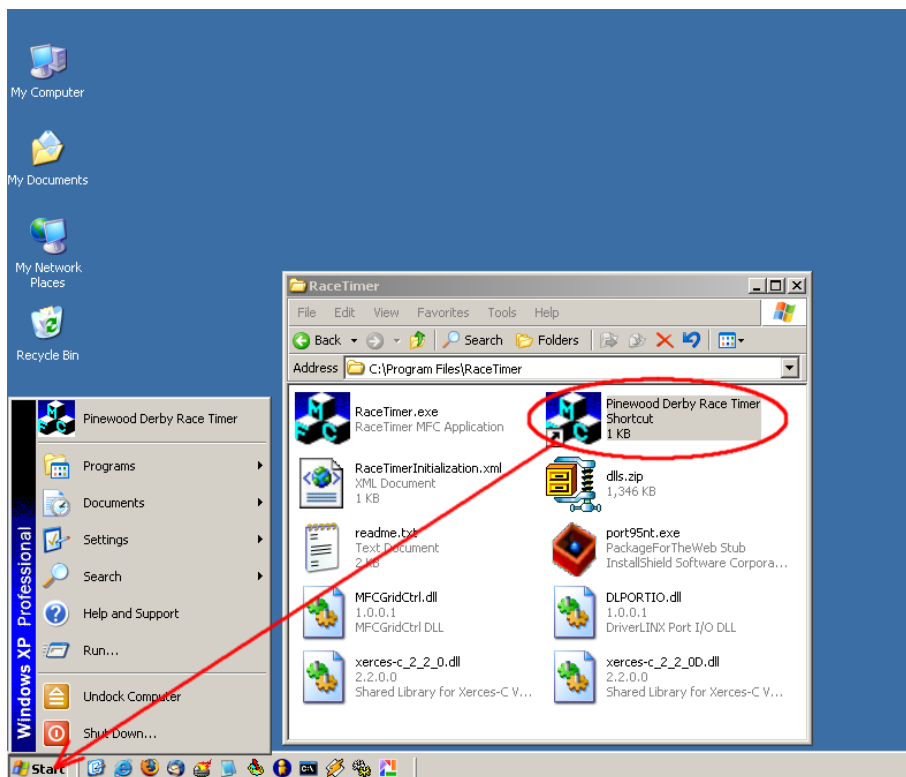
The Race Timer software does not come bundled with a SETUP program that automates its installation via a wizard as the Port95NT program does. Instead, you would need to manually place the files on your machine by performing the following steps:

MOVE the "RaceTimer" folder from your desktop to "C:\Program Files\" folder. Next, open "C:\Program Files\RaceTimer" and create a SHORTCUT to the RACETIMER.EXE file as shown here:



TIP: You may rename the shortcut from its default name to something more descriptive as shown in this example. Doing so will not adversely affect the operation of the shortcut.

Next, drag the Shortcut you created to the “Start” button as shown here:

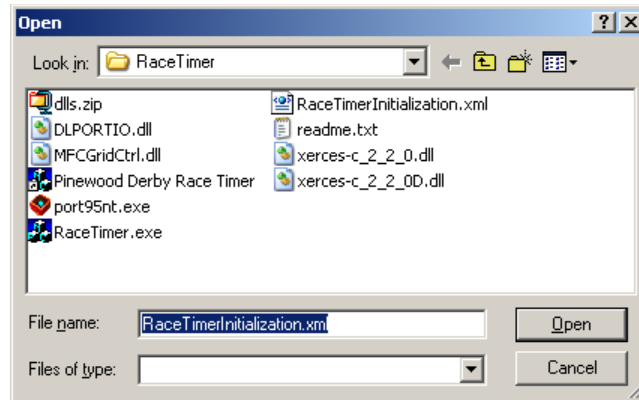


TIP: If you prefer, you may drag the shortcut to your desktop or even the Quick Launch bar. The final location is irrelevant as long as it is convenient for you.

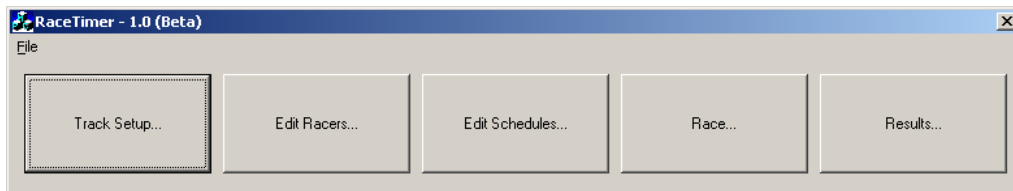
You should now be ready to run the Race Timer program.

Running the Race Timer Program

To start the Race Timer software, select start, then select the Race Timer shortcut. The program will immediately present you with a requester as shown here:

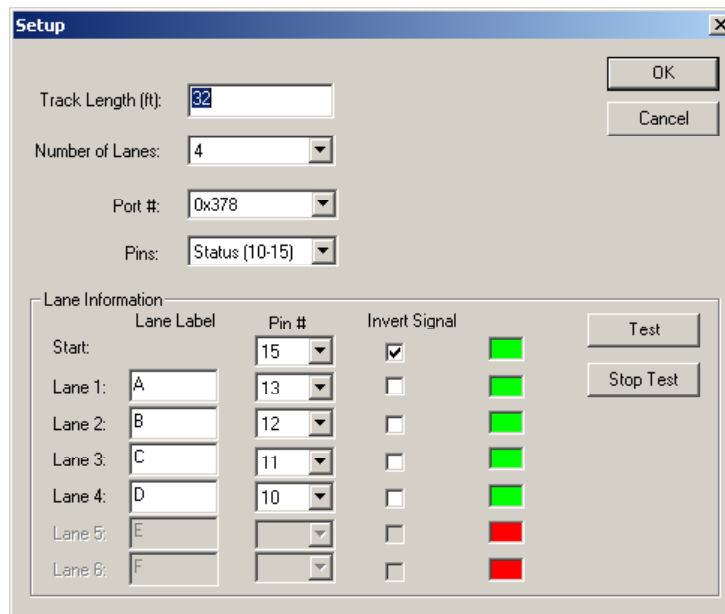


You need to navigate to the location of the RaceTimer folder ("C:\Program Files\RaceTimer") and select the "RaceTimerInitialization.xml" file. Once you have selected the file, click "OPEN" and you will be presented with the following screen:



Track Setup

The track setup button is used to both configure and to test your race track sensors and start gate. When pressed you are presented with the following screen:



Track Information

Track information is universal to the track itself. You will need to enter or select a value for the following fields:

- **Track Length (ft):** This should be the total length of your total track measured from the start gate to the finish line sensors. This value is used to determine scale speed.
- **Number of lanes:** This should be equal to the number of lanes you will be using while racing. If your track has four lanes and four finish line sensors choose “4”.
- **Port #:** The most common value for this will be “0x378” which signifies you are using Parallel Port #1 (also known as LPT1) on an AT class computer. If you are using your parallel port for a printer (some people choose to do this so they can use the Parallel Port #1 to allow a printer to print the race results on the spot) you may opt to use “0x278” which is parallel port #2, or “LPT2”. The “0x3BC” value is rarely used as it is the address of a printer port on the original IBM XT class of computer.
- **Pins:** This setting is used to choose which of the 25 pins in the parallel port to which you are connecting sensors. The two choices are “STATUS 10-15” or “DATA 2-9”. If you construct the circuit as shown in the “World's Least Expensive Pinewood Derby Timer” web site, you will be using “DATA 2-9”. This setting is just used to determine which pins on the parallel port the software should monitor for changes (i.e. finish line and start gate).

Lane Information

The Lane Information section allows you to customize the software to detect the lanes and hardware as you have built them. This allows you to correct any issues you may have from building the hardware (mis ordered sensors, N.O. Switch instead of N.C. Etc)

- **Start:** You may choose which pin you have used for the start gate detector here. You may also

choose to “invert” the sensor. The proper configuration is to have the RED/GREEN box indicate “GREEN” when the gate is CLOSED. When the gate is “open” the sensor should show “RED”.

- **Lane Label:** The default configuration is to have Lane 1 labeled “A”, however, you can name the lanes whatever you prefer. For example, some Packs have decided to sell advertising as a fund raiser activity and have named the lanes after the sponsor for example “Lane1:” can be “Joe's BBQ”. You could also name the lanes after famous race tracks such as “Daytona” or “Indy”. However, most people leave the tracks labeled with the letters.

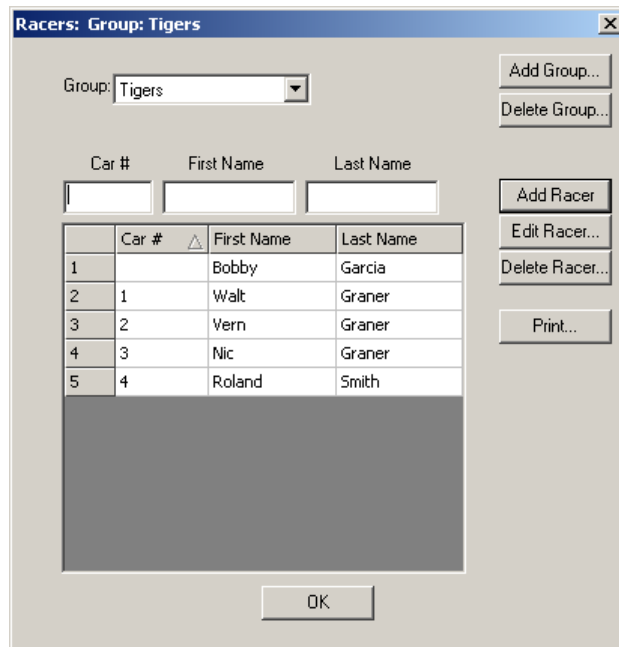
TIP: Not having the INVERT check box set appropriately has been the cause of MANY problems for people trying to operate a race. In order to avoid timing problems, you MUST make sure the indicator box shows GREEN when the gate is in the CLOSE (i.e. Stopping the cars from rolling down the track) position!

Edit Racers

The Edit Racers button is where you configure groups and populate them with the names of the scouts who will be racing. When pressed, the following screen is presented:

The screenshot shows a window titled "Edit Racers" with a close button (X) in the top right corner. At the top left, there is a "Group:" label followed by a dropdown menu. To the right of the dropdown are two buttons: "Add Group..." and "Delete Group...". Below the dropdown are three input fields labeled "Car #", "First Name", and "Last Name". Below these fields is a table with three columns: "Car #", "First Name", and "Last Name". The table body is currently empty. To the right of the table are three buttons: "Add Racer", "Edit Racer...", and "Delete Racer...". Below these buttons is a "Print..." button. At the bottom center of the window is an "OK" button.

You would begin by creating the groups that will be participating. Most commonly this would be Wolves, Tigers, Bears and Weblos. After creating the groups, you would enter in the name and car number for each scout participating as shown here:



The car numbers shown are arbitrary. The only requirement is that the car number match the car upon which a the number exists. Some packs prefer to assign car numbers to the scouts, others allow the scouts to chose a car number themselves. The RaceTimer software can operate with either or even no car numbers at all.

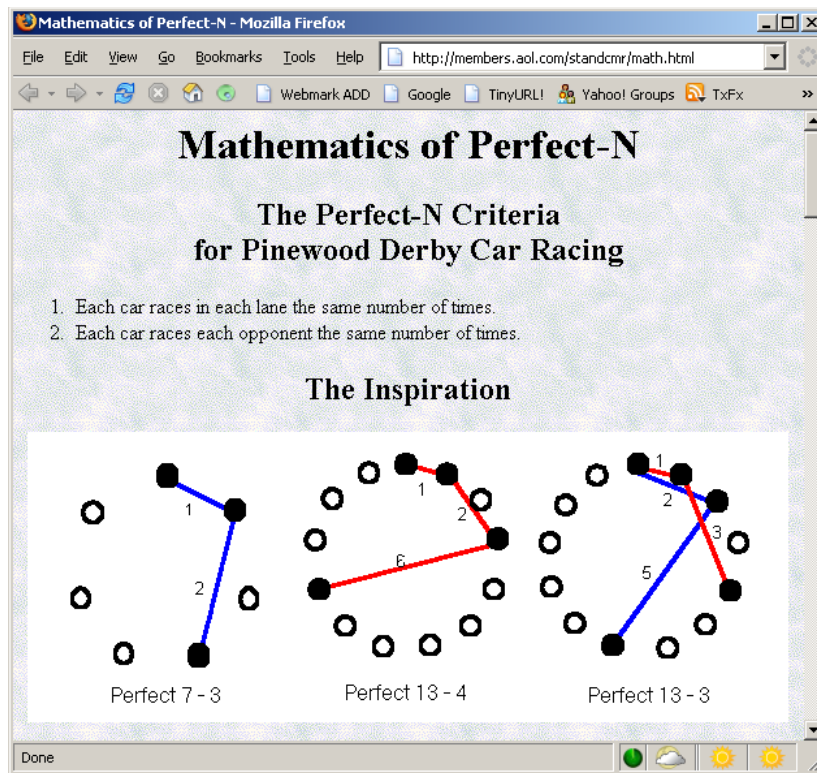
TIP: Though you may be tempted to enter **all** the names of **all** the scouts that will be participating in your race, experience has shown it may be best to enter **ONLY** those scouts that have presented their cars at check-in time. If you enter all the scouts, and some do not show up on race day, you will have to run heats with those cars “missing”. This is known as “Running Holes”. Not only does this slow down the pace of the racing (decreasing excitement) but it draws attention and possibly ridicule to a scout who either didn't show up or who's car was disqualified (i.e. could not be checked in due to violations or defects).

Edit Schedules

The Edit Schedules button is used to enter the order of the cars, know as “heats”. This area is usually populated by using the “Partial Perfect-N” chart that you would generate using the tool located at this link:

<http://members.aol.com/standcmr/ppngen.html>

The idea behind “Partial Perfect N” is to insure the track itself does not influence the outcome of the race. For example, in many cases, one lane will be “faster” than others due to some variance (levelness, smoothness, gate release time, etc.). The Partial Perfect N race order is generated and then imported into the Race Timer program and used to order the races. The mathematics behind the Perfect-N are covered in great detail here:



<http://members.aol.com/standcmr/math.html>

This is a good web site to print out and keep around in your race binder. You can present it to anyone who asks about the order of the races and why the races are being run in a particular manner. This is a good way to forestall arguments about the order of the races or claims of a “fast lane” or other preference being extended to a particular car/scout. :)

Race

The Race button is used to *actually run a race!* You press this button to have an interface presented that will allow you to start a race.

Results

The Results button is used to display the results after you have finished all your heats. The standings for the top participants will be displayed here.

The Hardware

Building the circuit

Testing the circuit

Once you have the hardware constructed and connected to the parallel port, you will need to test and make sure it is functioning as expected. Open the RaceTimer.exe program and select the Track Setup button as shown here:

More to come... :)