Computrainer

Bicycle Training Technology for World Class Performance

Challenge PC1 Software

Users Guide

CompuTrainer Pro

Challenge PC1 Software

Users Guide

Table of Contents

Congratulations!

Welcome! You are the owner of the *RacerMate Challenge PC1 Software*. The Pro CompuTrainer with the PC1 software was designed for lower cost PC's that do not have full 3D gaming capabilities. This would include older laptop PC's and PC's built on the Pentium 1 platform with video cards containing less than 8 MB of video RAM.

Though it is "graphically challenged" in comparison to our CompuTrainer 3D software, it is not in the least functionally challenged. It contains features that make it as robust a product as you can get for indoor training. Features include Modem racing and full screen SpinScan (both Bar and Polar versions) and simple table-generated course profiles. PC1 provides all the training data you need -- if high-end graphics are not what you need to keep you on the bike.

Please read through this, and other accompanying operation manuals thoroughly to take full advantage of all the sophisticated capabilities your CompuTrainer provides. Certain items in the manual are constantly overlooked and result in the majority of technical support calls. You will find a  (hand) indicating these potential areas of concern.

Software updates and new courses may be offered over time and to access these updates you should go to our web site at *www.computrainer.com*. This is also a good resource for information on troubleshooting your CompuTrainer and contacting technical support.

Thank you for purchasing the CompuTrainer Pro PC1 software and please keep this manual in a safe place for quick reference!

Software Installation Procedure

CompuTrainer is shipped with as many as four separate programs, each with its own installation executable. Before inserting the CD-ROM into the drive check the CD-ROM cover sleeve for any installation notes newer than what is stated here.

To Install:

1. Start Windows™ (if not already running).
2. Close all Windows™ programs to prevent possible problems.
3. Insert the CompuTrainer Software CD. An Install Menu screen appears.
4. Click on the program you wish to install. Follow the instructions to complete the install.
5. Continue to add other software choices until all desired software programs have been installed.

If the Install Menu screen does not appear:

1. Double-click the My Computer icon.
2. Double-click the icon for your CD-ROM drive.
3. Double-click Autorun.exe (to activate the menu).
4. Continue as noted in item 4 above.

Be sure to read the readme.txt file for each version of CompuTrainer software for last minute up-to-date changes that didn't make it into this manual. Shortcuts to the readme.txt files are provided in the Start Menu Program Groups of each program.

Uninstalling Procedure

CompuTrainer software can be uninstalled easily. This will remove the program files that were added to your PC at the time the software was first installed, but may not remove files added after the program was installed, such as rider data files and saved performance files. An option for that is shown below.

To Uninstall:

1. Start Windows™ (if not already running).
2. Close all Windows™ programs to prevent possible problems.
3. Go to the Program group for the Challenge PC1 program.
4. Click on the Uninstall link. Follow the instructions to complete the software removal..
5. To verify all the files are removed, double-click My Computer and then double-click the drive you installed the software. Locate the Challenge PC1 folder and right-click this folder and then left-click on delete.

Please note: *Uninstalling and deleting files may remove courses and saved performance files that can not be replaced. Be sure if you intend to use these types of files in the future that you copy them to a remote temporary location until they are needed again.*

Quick Setup Guide

Step 1 -- Familiarize yourself with the CompuTrainer connections. Plug the PC interface into a free serial port on the back of your PC, or using a USB to Serial adapter plug the PC interface into that.

Step 2 -- Connect the CompuTrainer to the Serial Port PC Interface using the Stereo Cable supplied.

Step 3 -- Install the software. When installed, run the program using the Programs shortcut provided.

Step 4 -- Run the Test Com Port program from the Tests menu on the Challenge PC1 menu. After the test completes, the results of the test will indicate what communications port the CompuTrainer is on. This information is needed to complete the setup of Rider One or Rider Two / Comm Ports.

Step 5 -- Chose Rider One menu and select CompuTtrainer, then select Comm Ports and mark the correct com port as found in the test results of step 4. If you have two CompuTrainer's, then select Rider Two and set up the Com Ports for it also.

Step 6-- If you do not have a second CompuTrainer, select Rider Two and choose the Pacer for your first time use. Then select Rider Two / Pacer and edit the power setting the Pacer will use. This value, though preset here, can be edited using the +/- keys on the Handlebar Controller during the race.

Step 7 -- Select **Rider One / New** and create a Rider Data File for yourself.

Step 8 -- Choose **Options** from the menu and then select **Course**. Browse through and select the course you would like to ride and then left-click **Open**. The menu will close.

Step 9 -- Make any other selctions in the *Options* menu that you prefer, like **Drafting On** or **Metric On** *("On" is when the menu is check-marked).*

Step 10 -- Select **Start / Race** (or **SpinScan**). If you select Race, then a Race Status Screen will appear. If this information is correct, the select **OK**. If you select SpinScan, the SpinScan screen will appear.

Step 11 -- Mount the bike and press the **F1** key to begin the race or the SpinScan session.

Step 12 -- When finished with the ride, detailed instructions are available in this manual to walk you through saving races and SpinScan sessions.

Step 13 -- Have Fun!

Step 1....Insert the PC Interface Module

Plug the **Interface Module** into an available Serial Port on the back of the PC. If you do not have an available 9 pin serial port, but do have a 25 pin serial port (NOT the parallel port used for your printer), use a 9 to 25 pin serial adapter (available at your local PC retailer or from Radio Shack as part number 26-287). CompuTrainer does not provide communication to your PC by means of anything other than serial.

PC's Without Serial Ports

It is possible to have a PC without a 9 or 25 Pin serial port. In cases like these you will likely have a free USB port. USB for CompuTrainer has been investigated and it was determined the best alternative would be the use of a USB to Serial adapter, available from your local PC retailer or from RacerMate.

USB to Serial adapters

When using a USB to Serial Adapter, follow these instructions after installing the USB adapter to confirm the correct settings needed for successful operation:

1. Right-click on My Computer and left-click on Properties.
2. Left-click on the Device Manager tab.
3. Left-click on the (+) sign to the left of "Ports."
4. Left-click to highlight the device that corresponds to the USB Serial adapter.
5. Left click on the Properties button
6. Left-click on the Resources Tab and confirm these setting:

Bits per second:	9600
Data bits:	8
Parity:	None
Stop bits:	1
Flow Control:	Xon/Xoff

7. Apply the changes (if made) and exit the Device Manager.

Step 2....Plug the Stereo Cable Into PC Interface Module and Handlebar Controller

Plug one end of the ***Stereo Cable*** into the jack on the **Interface Module** for the main CompuTrainer. If a "Second CompuTrainer" is also to be used, it will require a second **Interface Module** (available from RacerMate – part number R982-173-00) plugged into another Serial Port. Plug the other end of **Stereo Cable** into the **Pro Handlebar Controller - EXT. PC** jack.

PC Dedication and CompuTrainer

One obstacle you may need to overcome when using a Personal Computer (PC) and CompuTrainer is whether you can dedicate your PC to the CompuTrainer location. If you plan to use your CompuTrainer in a room other than where your PC is located, some forethought will be required in respect to how you use your PC.

Not every command needed to setup and operate your CompuTrainer is available using the 6 Handlebar Controller keypads; therefore, setting up a race will usually be done at the PC; however, starting the race, pausing the race, changing between SpinScan and Course Anticipator views will be initiated by key presses from the Handlebar Controller.

Maximum Cable Lengths

My CompuTrainer and computer are in two different rooms!

If you intend to place your CompuTrainer in a room other than where your PC is located, extended lengths of cable will be needed to connect the two systems together. Unfortunately not all cables on the PC are easily available in lengths over 6 feet. The following should help you decide what works best for your situation.

1 Stereo Cable: The ***Stereo Cable*** can be up to 150 feet long. This wire transfers data between the CompuTrainer and the PC. You can order this cable from RacerMate in 50-foot lengths (part number R980-064-50), which includes a coupler.

2 PC to PC Monitor: The longest cable readily available to extend a PC monitor is 6 feet. Signal loss is a major concern with extending this cable, so a good 6' cable can cost as much as $30.00 and does very little to help in this application. Specialty cable makers found on the Internet do make cables that exceed this 6 foot length, but be prepared to spend a few bucks for these.

3 PC to TV: Adding a new PC to TV video card (replacing your existing video card) ***or*** installing a VGA to TV "Presentation Device" which has S-Video or Video outputs to your PC will connect it to a Television *(see the system requirements page or our web site for current information about video cards)*. The following examples explain what may then be needed to connect the PC to a TV:

a) ***TV's with only an RF input (Cable TV input only):*** Connect a ***high quality coaxial cable*** between the Composite Video Output of the video card and the RF input on the TV using a RadioShack Part No. 15-1244 Video to RF Modulator. This device converts video from the video card to a RF signal the TV can use.

b) ***TV's with audio/video inputs:*** Connect a high quality video cable (with RCA style connectors) between the Video Output of the video card to the Video Input on the TV. For lengths over 6 feet connect a high quality coaxial cable with RCA style adapters (Radio Shack part no. 278-252) between the PC and TV.

c) ***S-Video compatible TV's:*** This type of connection is by far the best in terms of a quality reproduction of PC monitor graphics, but S-video cables are typically less than 25 ft. long. Longer cables are available from specialty cable suppliers on the Internet, but in general using S-Video will be limited to close proximity PC to TV use.

Note: Extended length **Stereo Cable** and coaxial cable are both available from RacerMate.

4 PC Keyboard and Mouse: Only 6 foot cables are available. Wireless mice and keyboards are available that offer ranges up to 25 feet.

Step 3.....READY TO USE

All PC connections complete, you can now use your Personal Computer with your CompuTrainer. When a Race Screen is showing, the Handlebar Controller displays the word Pro and Heart Rate or Cadence.

Step 6.....Testing for Installled Components

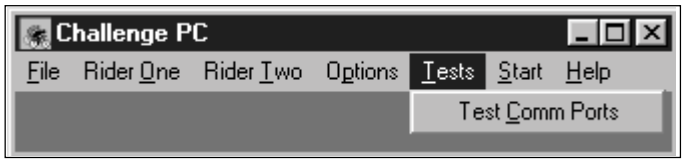
The Challenge PC1 software comes with a very useful tool to help determine what Serial Communication Ports are functional and the devices that may be attached to them. The CompuTrainer is constantly send a message saying, "I'm a CompuTrainer" and this test can pick up on that. Using this test will confirm whether the CompuTrainer is communicating to the PC and what port settings will be needed for the Rider One and Rider Two Comm Port settings.

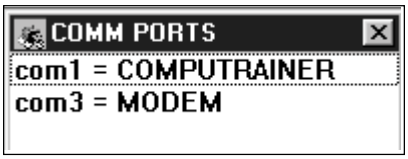
Please be aware that this test only indicates serial communication port settings, but does not make any changes to the communication port settings in any CompuTrainer software package – these must be set by the end user!

Also note, when connecting two CompuTrainers, the software cannot determine the position for each (left and right). To determine which CompuTrainer owns which COM port on the computer, plug in only the left CompuTrainer and run the Test Comm Ports program. The COM port for it will be the only one displayed. Write this number down with a permanent marker near the port on the back of the computer. Now plug in the right-hand CompuTrainer *(both can now be inserted)* and rerun the test. The newly inserted CompuTrainer will now appear with its respective COM port indicated. Write this number also on the back of the computer for future reference.

1 To begin the test, turn the **CompuTrainer(s) ON**. Be sure the **Stereo Cable(s)** are inserted correctly into Handlebar Controller(s) and PC Interface Module(s).

2 Double click the *Challenge.exe* icon in the Challenge PC1 Program Group. The PC1 Setup Menu will open (below left): Choose **Tests** then **Test Comm Ports**.





3 When the test is completed, a window like the one above (right) will display. Write the com port information displayed in the space provided at the bottom of this page for use in the Rider One and Rider Two Port Settings used in all CompuTrainer software.

4 If no CompuTrainer is found during this test, please refer to Appendix C - PC and PC1 Setup Tips at the rear portion of this manual.

What do I do with the communications test results?

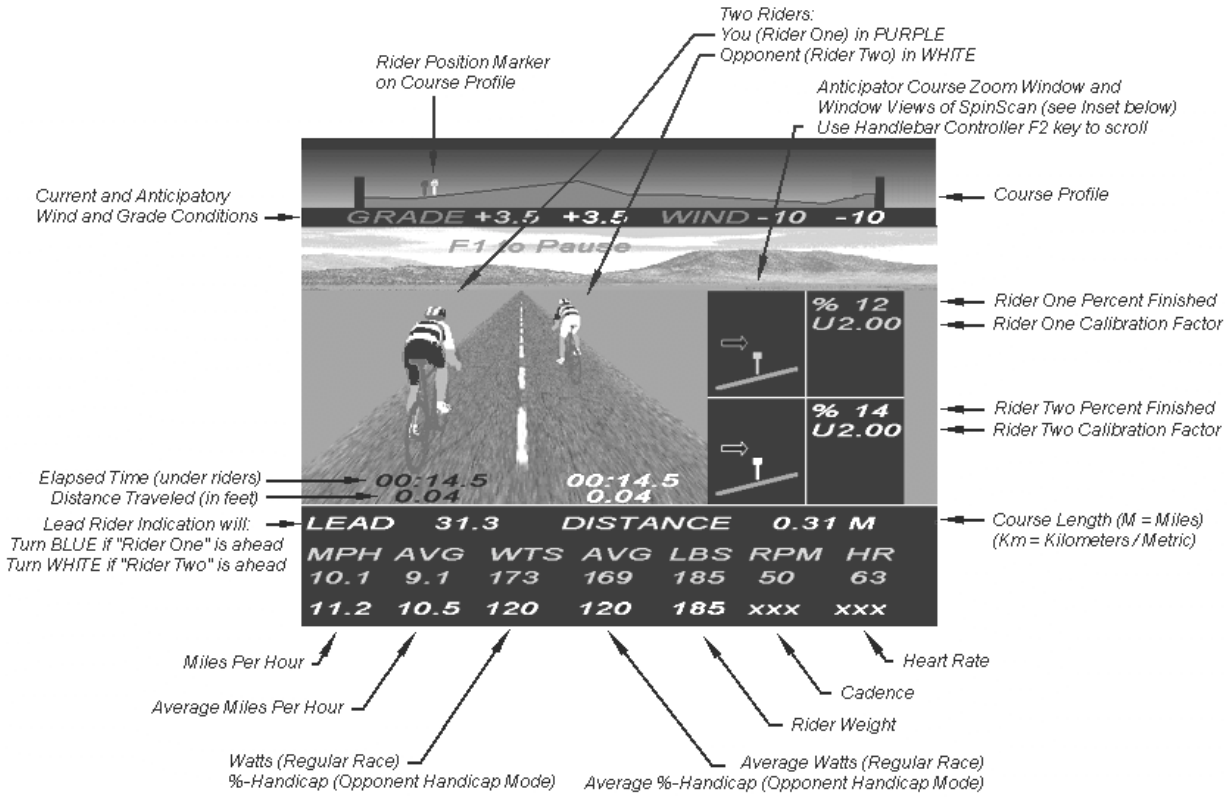
*Use the results of this test to enter **Com Port** settings when Rider One is a CompuTrainer and Rider Two is a Second CompuTrainer or Modem. This program will only test for installed components and does NOT configure the **Com Port** option within Rider One and Rider Two of **Challenge PC1** or Source in **CompuTrainer CS** or the Port settings in **CompuTrainer 3D**.*

Com Port Results

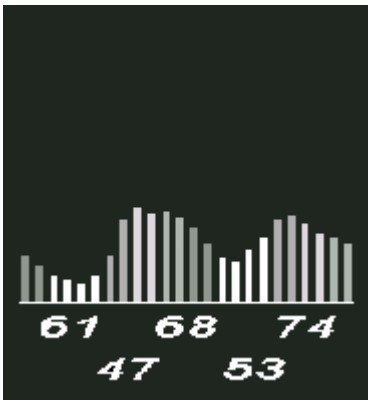
Com1	**Com2**	**Com3**	**Com4**
Com5	**Com6**	**Com7**	**Com8**

The Race Screen...In More Detail

The **Main Screen** is the Race Screen. All the information on this screen is collected from the Setup Window Menus and should be correctly entered **before** starting a race to assure accurate calculation and display of weight, watts, opponent reaction.



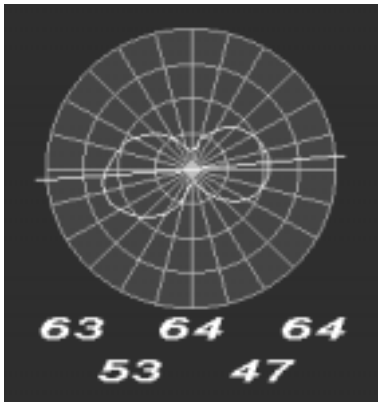
Please Note: Information on the screen is in both Blue and White. Information in Blue is for the Left Rider (Rider One) and Information in White is for Right Rider (Rider Two).



Bargraph & Polar SpinScan Insets

←***SpinScan Numbers***→

←***Power Splits***→



Please Note: Information on the SpinScan portion of the Race Screen can be found in the section of the manual dealing with SpinScan starting on page 27.

General Description...How It Works

Setup and Race Screen initiation of the Challenge PC1 software is made from your Personal Computer. Starting the race is accomplished from the Handlebar Controller Keypad. The race is controlled by the parameters you set in the Challenge PC1 drop down menus, and these must be set correctly before the race can begin. The following pages describe each "drop down menu" in detail beginning with rider setup and Challenge PC1 file formats.

> **Please** refer to the Handlebar Keypad Quick Reference Guide in the back of this manual for an overview of keypad functions available at the bike.

Menus, Windows™ Operating Systems, and Customer Support Limitations

Windows™ uses a system of drop down menus each with a specific set of options for the specified heading. The Challenge PC1 software has a fairly intuitive menu structure which should allow the advanced PC user an easy setup. For those who may be using the computer for the first time, there are many books available which will help you grasp concepts such as "Saving", "Opening", "Copying" and "Deleting" of files using Windows™. It would be impossible, within the scope of this manual, to go into much detail on some of the many ways of working within Windows™. We will, whenever possible, give you step by step instructions for using the Challenge PC1 software.

The Challenge PC1 Basic File Menu

The current file structure for Challenge PC1 includes the following menu headings:

The menus which affect a live race are limited to the following headings:

Rider One This menu includes two options for Rider One. The first is a live rider on a CompuTrainer Pro and the second is running Rider One from a "Saved Race".

Rider Two This menu includes all possibilities of opponent - from pacer to modem. Among the many features in PC1 is the ability to save the Pacer's race data on any course, so as to create a "smart pacer" from the modifications made during the race. You can save both Rider One data and Rider Two data to use as saved races - not just the winner as in previous versions.

Options This menu is used for setting the course, turning drafting on and off, setting the course for metric operation, saved race handicapping, precursory window options (course zoom or SpinScan™ or none), and full screen SpinScan™ options.

Start This menu lists two options: Race and SpinScan. Selecting **Race** will eventually bring you to the Race Screen, wheras the **SpinScan** selection brings you to the SpinScan display.

As previously mentioned, each drop down menu heading and its respective sub headings will be described in full detail later in this manual. Understanding the settings in these three aforementioned headings will get you into your first race quickly.

To fully utilize every possible feature of the Challenge PC1 software, carefully read all of the following pages carefully.

Creating a Rider Data File (.rdf file)

Before you use the Challenge PC1 software for the first time, you must create a ***Rider Data File***. Once created, you will store this file, and others like it, on the hard drive of your personal computer as a permanent record for *every* rider. On subsequent uses the *Rider Data File* can be recalled eliminating the need to retype this information.

With the release of other CompuTrainer software – in particular CompuTrainer CS, there is information you will input in PC1 that isn't used in PC1, i.e., your age and gender. You will likely be using these saved Rider Data Files well beyond the release of future enhancements, so fill in these details completely and accurately.

☆ ***Tip:*** *Should Rider Data information require modification, create a new Rider Data File and save it with the same name as the previous file, and the new file will replace the old file.*

Creating a Rider Data File step by step

1 Left-click on ***Rider One*** in the Setup Menu. A drop down menu will appear with Rider One options.

2 If there is a check mark next to ***CompuTrainer***, choose ***New***. If ***Saved Race*** is check marked, select ***CompuTrainer*** (the menu will close). In this case re-select ***Rider One***, then ***New***. A Rider Data File creation window will appear (fig. 1) to allow input of rider information.

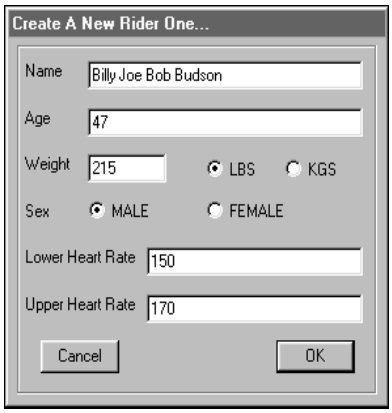


Fig. 1 Creating a Rider Data File (.rdf)

3 Type in your first and last name and then, using the Tab key, proceed through the list to complete the Rider Data File.

4 When inputting your Weight, *include the bicycle weight also*. Be certain to indicate whether the weight is in **Lbs** or **Kgs**.

5 To determine your Heart Rate Limits, see page 18 of the Pro Basic manual and consult a doctor when necessary.

6 When finished with your Rider Data File, left click on ***OK*** and a *Save As* window will open (see Fig. 2).

7 A choice of where to save the file, what to name the file and the default "Save As" type of **.rdf** (rider data file) is given, but use the default settings for the Save in: and Save as type: selections. Type an appropriate file name in the space provided, i.e., Billy202, where Billy is your name and 202 is the month and year. Because Windows™ allows long file names, you can specify up to 255 characters with spaces, but we recommend limiting the length to about 18; the amount that fits in the dialog box.

8 When finished, left-click ***Save*** to save the file to your PC.

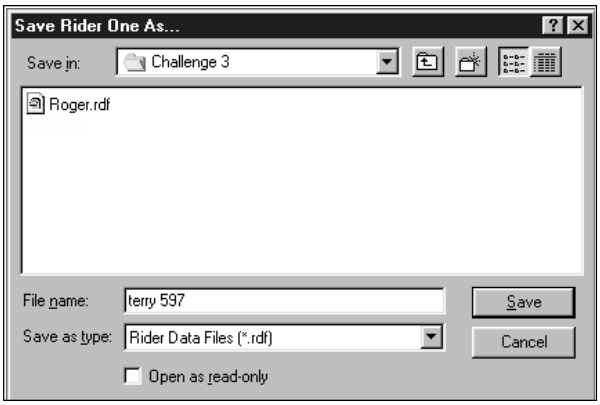


Fig. 2 Saving a Rider Data File (.rdf)

Using Rider Data Files

The last created (or opened) *Rider Data File* remains active until a different Rider One (or Two) is established. On subsequent uses, if no one new uses the CompuTrainer and no one has changed the Rider Data File being used for Rider One (or Two), this setting will not require daily attention.

Please Note: A race status window will appear just before the Race begins and will display the current Rider Data File for only Rider One. You should look to see if the rider data is correct before beginning your ride.

Rider Data Files for Multiple Users

Every user of the CompuTrainer can establish a *Rider Data File* at any time using Rider One / CompuTrainer / New. If you choose to create multiple Rider Data Files concurrently, remember the last file created is the one stored and will be the "active" user.

☆ ***Tip:*** *If you are unsure who used the CompuTrainer Challenge PC1 software last, go ahead and quickly use Rider One / CompuTrainer / Open and select the correct .rdf file.*

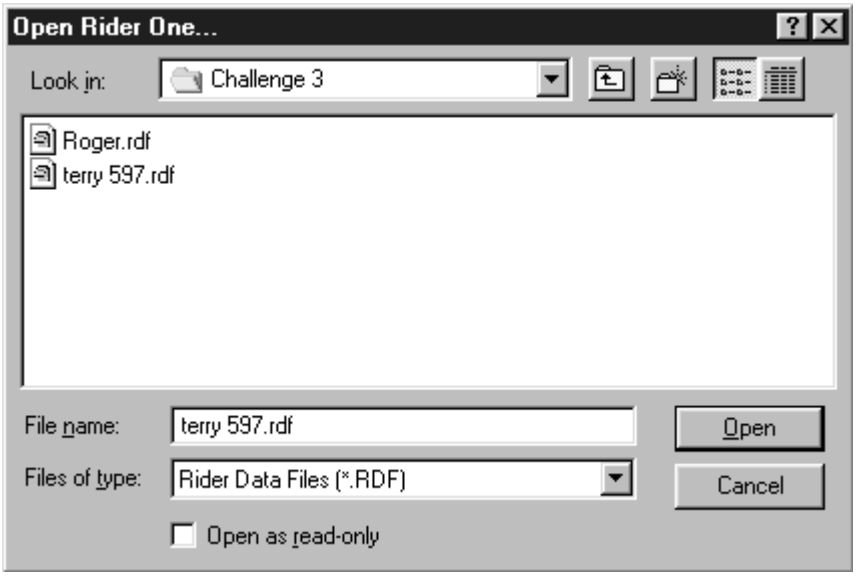
Opening a saved Rider Data File

1 Left click on **Rider One** (or **Two**) and if **CompuTrainer** is check marked, left click on **Open** (fig 3).

2 Left click on the file you wish to open and it will appear in the text box called: File name.

3 Left click on the **Open** button and a dialog box will open confirming the file you opened.

4 Left click on the **OK** button to close the confirmation dialog box.



(Fig. 3) Opening a Rider Data File (.rdf)

Rider One Setup

After you have established Rider Data Files for the users of your CompuTrainer system, you can setup who Rider One and Rider Two will be. Rider One can be a live rider on a CompuTrainer or, a Saved Race. The sub-options are only available when the parent option is check marked. The settings for Rider One are:

CompuTrainer: The main CompuTrainer system (this should always be the left rider).
New: Create a new Rider.
Open: Open a saved Rider Data File (.rdf).
Com Port: Setup the Serial COM Port (refer to Test Comm Ports, page 11).

****

Saved Race: Uses a saved race to drive Rider One.
Open: Open a Saved Race File (.srf).

Setup Rider One as a CompuTrainer

1. Make sure CompuTrainer is check-marked. If Saved Race is check-marked, left-click CompuTrainer. The menu will close. Select Rider One again.
2. You should first create a Rider Data File by selecting **CompuTrainer** / **New** as described on page 14. If you've already done so, left click **Rider One** on the Setup Menu and left click **CompuTrainer** / **Open**.
3. Left-click to select the *Rider Data File (.rdf)* you want to establish as Rider One and left click **Open**.
4. Select **Rider One** / **CompuTrainer** / **Com Port**. Check-mark the com port (1-8) which was previously determined using *Test Comm Ports* as described on page 11 *(this setting will in most cases stay the same for every subsequent use and therefore should be a one time setting).*
5. Rider One is now setup as a live rider.

Setup Rider One as a Saved Race

1. Saved Races must be available to use Rider One / Saved Race. To setup Rider One as a Saved Race, left click on **Rider One** in the Setup Menu and left click **Saved Race**.
2. Select **Rider One** again and left click **Saved Race** / **Open**. An "Open Rider One Saved Race" window will open.
3. Left click to select the *Saved Race File (.srf)* you want to use and left click on **Open**. A dialog box will confirm opening the file.
4. Left Click **OK** to close and establish Rider One as a Saved Race.

Rider One Setup Notes

- When choosing a Rider Data File or a Saved Race File or when saving a Saved Race, notice the *Look In* or *Save In* window (see pictures on page 18) to be sure the path to your files point to the Challenge PC1 folder (or the folder created when the original files were copied onto your PC). It is advised to keep *all* Challenge PC1 files in this folder.
- Saved Races also contain course data needed to force you to use the original course the race was saved on. This happens regardless of the course selected in the Options / Course menu.
- If two Saved Races are selected (for Rider One and Two) that were saved using different courses, the program will force Rider One to CompuTrainer.
- Com Port settings for two separate CompuTrainers cannot be set to the same value.

Rider Two Setup

Rider Two has substantially more options than Rider One. Sub-options are only available when a parent option is check-marked. The parent option that gets check-marked becomes the "active" Rider Two.

The settings for Rider Two are:

Pacer: Computer driven opponent which uses a preset (adjustable) power setting.
Edit: Changes Pacer preset power (adjustable with +/- keys on Race Screen)

****

Second Trainer: Rider Two as a local, live rider on a Second CompuTrainer.
New: Creates a new Rider Data File (.rdf).
Open: Opens a saved Rider Data File (.rdf).
Com Port: Setup the Serial COM Port (refer to Test Comm Ports, page 11)

****

Saved Race: Rider Two using Saved Race File (.srf).
Open: Opens a Saved Race File (.srf).

****

Rider One Data: Rider Two using Rider One last race.
Rider Two Data: Rider Two using Rider Two last race.

****

Modem: Rider Two is a modem opponent.
Setup: Establish settings used during modem connection.

Setup Rider Two as a Pacer

What is a Pacer?

A Pacer is a computerized opponent that will go as fast as it can to use the power given to it to complete the race. You can preset the pacer with a fixed value using the *Pacer / Edit menu* and leave it there for the duration of the race, or you can use the **+/- keys** on the *Handlebar Controller,* to modify the pacer power during a race, thus changing it's speed.

To set Rider Two as a Pacer:

1. Left-click on **Rider Two** from the *Setup Menu* and left click to select **Pacer**.
2. Re-select **Rider Two** and left click **Edit** to adjust the power in the window using your PC keyboard to a watts setting you want the pacer to use -- up to 1500 watts.
3. Rider Two is now setup as a **Pacer**.

☆ ***Tip:*** *You can save the Pacer's Last Race. By changing the pacer power during a race and then saving Rider Two Last Race (using File / Save Rider Two As) and subsequently calling up this Saved Race, playback will repeat your modifications. This will allow you to, in effect, create a "Smart Pacer" for each course. To aid you when choosing a Saved Race, save these races using Pacer as part of the file name.*

Pacer Setup Notes

- A Pacer uses power differently than you do. You can't produce power at 100% efficiency - 100% of the time. The Pacer can. The Pacer may go slower than you up hills (where you can produce the highest powers), but it can fly past you going downhill just the same. Also, even on flats, if you try comparing 200 watts from the Pacer against your "200 watts", the Pacer will be faster. You would have to be 100% efficient (see SpinScan) to produce the same speed for the same power as a Pacer.
- If you set the Pacer to roughly match your "average watt value", then you will find you and the Pacer crossing the finish line at roughly the same time. Some adjustment to the average value will be needed to account for effieciency.

Setup Rider Two as a Second Trainer

If a Rider Data File has not been established, refer to page 14 for information on setting up a *New Rider* on the CompuTrainer. Setting up a *New Rider Two* is the same as setting up a *New Rider One.*

1 Left click **Rider Two** on the Setup Menu and left click **Second Trainer.**

2 Left click **Rider Two** again and left click **Second Trainer**/ **New** and create a new *Rider Data File (.rdf),* or **Second Trainer** / **Open** to select an already established Rider Data File.

3 Now Select **Rider Two** / **Second Trainer** / **Com Port**. Select the COM port (1-8) which was previously determined using *Test Comm Ports* as described on page 11 *(this setting will, in most cases, never change. It should therefore be a one-time setting*).

4 Rider Two is now setup as a live rider on a *Second CompuTrainer.*

Please Note: To start a head to head race against another CompuTrainer, both Riders must start the race by each pressing F1 on their Handlebar Controller.

Setup Rider Two as a Saved Race

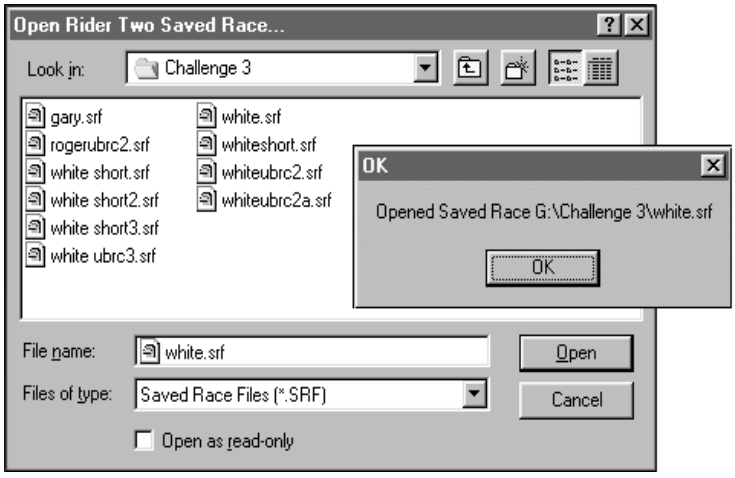
One of the most useful features of the CompuTrainer Challenge PC1 software is its ability to any rider's last race. All data is stored — as it was performed — as a Saved Race File (.srf). By recalling this race, you can compare and benchmark your performance improvements. Both Rider One and Rider Two can operate from a Saved Race File.

1 To setup Rider Two as a Saved Race, left click on **Rider Two** in the Setup Menu and left click **Saved Race**.

2 Select **Rider Two** again and left click **Saved Race** / **Open**. An Open Rider Two Saved Race window will open (fig 4).

3 Left click to select the *Saved Race File (.srf)* you want to use and left click on **Open**. A dialog box will open to confirm opening the file.

4 Left Click **OK** to close and establish Rider Two as a Saved Race.



(Fig.4) Opening a Saved Race

Saved Race Notes:

- Saved Race Files *(.srf)* must be available on your PC to use the Saved Race feature.
- Saved Race Files will force PC1 to change to the course stored in the Saved Race File regardless of the course selected in the Options menu.
- If Saved Races are selected for both Rider One and Rider Two, but each use different "course information", Rider One will be forced to CompuTrainer and Rider Two will be the Saved Race.

Setup Rider Two using Rider One Data (Racing Your Last Race)

Rider One Data is a temporary file created at the conclusion of Rider One's Last Race. This temporary file is erased at the end of each race and replaced with the new last race. It can be used only one time.

1. To setup Rider Two to use Rider One Data, left click on **Rider Two** and then left click on **Rider One Data**.
2. A dialog box will open with a message stating *Opponent is Last Rider One Race* along with an OK button.
3. Left click on **OK** to close the dialog box and establish Rider Two as Rider One Last Race Data.

Setup Rider Two using Rider Two Data (Racing Your Opponents Last Race)

Rider Two Data is a temporary file created at the conclusion of Rider Two's Last Race (regardless of opponent type). This temporary file is erased at the end of each race and replaced with the new last race. It can be used only one time.

1. To setup Rider two to use Rider Two Data, left click on **Rider Two** and then left click on **Rider Two Data**.
2. A dialog box will open with a message stating *Opponent is Last Rider Two Race* along with an OK button.
3. Left click on **OK** to close the dialog box and establish Rider Two as Rider Two Last Race Data.

Racing Your Last Race Notes

- Rider One Data and Rider Two Data will force PC1 to use the course stored in the data file regardless of the course file selected in the Options menu.
- When Rider One Data or Rider Two Data is selected, reseting the race without leaving the race screen will allow you to continuously run against this data as last collected.

Setup Rider Two as a Modem

Modem racing allows two live riders with CompuTrainer's —in two different locations – to race each other via a PC modem. To use this feature, both riders must use the same version of the software *(use Help - About Challenge PC in the Setup Menu to display current version)* and have modems attached to their PC's.

Current Limitations

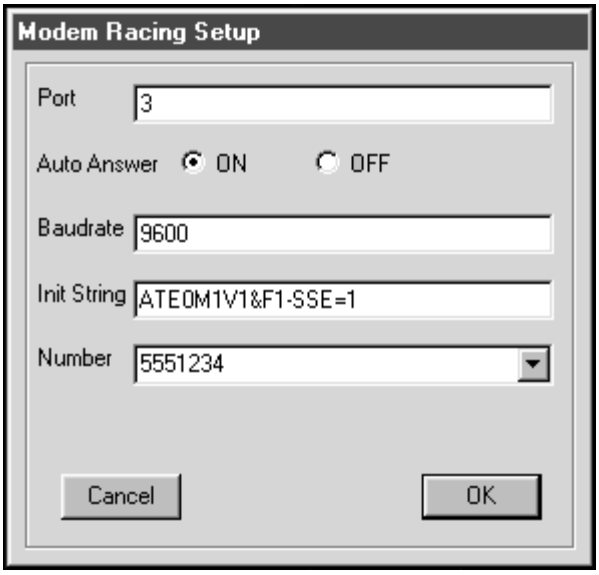
- The major problem with modem racing is keeping both riders synchronized throughout the race. Minor errors of this type may occur while racing but should not affect the outcome of the race. A great deal of thought has been put into this correcting this problem and a reasonable percent accuracy can be expected.
- There has been some interest in the possibility of Internet racing as opposed to using a direct dial up connection. Whether RacerMate should do such a thing will be determined by both cost and reliability. Cost to incorporate such a feature is quite high, and when asked, users indicate little interest to "pay" for such a feature. With that said, RacerMate will not attempt anything that provides the user anything less than 100% assurance that, a) the person on the other end is using the same "type" of trainer; b) that the results at the end of the race are beyond dispute; and c) that the cost to maintain such a feature does not take away from the more important things related to indoor training. Current technology and cost estimates make this feature possible, but potentially buggy. We will address this issue yearly in our development plans to see if it can be implemented.

Setup Rider Two as a Modem (cont.)

1. To setup a Modem race, left click **Rider Two** and then left click on **Modem**.
2. The menu will close, now left click again on **Rider Two** / **Modem** / **Setup**. A Modem Racing Setup window will appear *(see Fig. 5)*.
3. Position your mouse pointer into the box of the value to change and left click once. Now use your backspace or delete key along with the left and right arrow keys to position cursor and type in the correct value.

Modem Settings:

- ☐ **Port...** Set this value based upon the settings given for the modem during the *Test Comm Ports* program (see page 11).
- ☐ **Auto Answer...** This setting determines who will be the **Master** and who will be the **Slave** opponent. ***You must determine before a modem race begins who will be Master and who will be Slave.*** The **Master** will set his/her Auto Answer to **OFF** – this will be the one initiating the call. The **Slave** will set his/her Auto Answer to **ON** – this person will be receiving the call.
- ☐ **Baud rate...** This value can be set to the maximum value available for the modem installed on the computer. The minimum value can be no lower than 9600 baud.



(Fig.5) Modem Setup Window

- ☐ **Initialization String *(Init String)*...** The default initialization string will work with the majority of modems. The example initialization string (*fig. 5*) is for a Digital Simultaneous Voice and Data (DSVD) modem. This modem type allows the riders to communicate verbally while racing (both riders must have DSVD modems for this to function). Refer to the manual supplied with your modem for initialization string settings specific to it.
- ☐ **Number...** This will be the phone number dialed if *Auto Answer is set to OFF*. If you are the Slave (Auto Answer "ON"), no number needs to be entered. The last five phone numbers dialed will be stored for future recall. You can type a name at the end of the number *(i.e., 5551234 Jim)* to help associate the number to a person.

4. When the settings are complete, left click on **OK**. Rider Two is now setup as a Modem.

Modem Racing Notes

- The Master has control of the course and drafting. If the Slave has a course or drafting set *different* than that of the Master, the course will be transmitted via modem by the Master - *regardless of whether the Slave has the Course File (.crs) on his/her PC hard drive* - and drafting will be changed to that of the Master.
- Rolling Resistance (*calibration*) values will be displayed for both riders in the Course Anticipator / Zoom window. Both riders should calibrate to approximately the same value before racing.
- If both riders select Auto Answer ON or OFF, the race will not begin.
- Modem Racing works only with dial-up modems and NOT with broadband connections.

Race Options

Race Options include the following menu headings:

Course: Opens windows Open dialog box with .crs files (course files).
Drafting: When check marked, drafting is ON.
Metric: When check marked, Metric display is ON.
Handicap Mode: When check marked, Saved Race Handicapping is ON.
****
Window: Display options for Course Anticipator Zoom / Windowed SpinScan views.
None: Windowed views OFF (Key press window visible).
Course Zoom: Course Anticipator Zoom displayed at race start.
Bargraph SpinScan: Bargraph SpinScan displayed at race start.
Polar SpinScan: Polar SpinScan displayed at race start.
****
SpinScan: Options for Full Screen SpinScan.
Bargraph: Full Screen SpinScan in Bargraph Mode.
Polar: Full Screen SpinScan in Polar Mode.
****
Source: Setting a Full Screen SpinScan as a live or a saved (playback) session.
Real Time: Full Screen SpinScan as a live session (as you pedal).
****
Saved File: Plays back a Full Screen SpinScan from a saved file (.ss).
Open: Opens the saved SpinScan File (.ss).

Selecting a Course

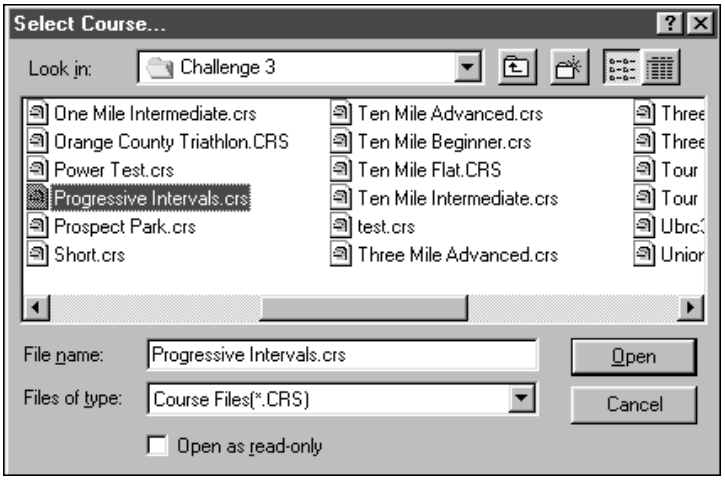
Courses in the Challenge PC1 software can be real road race courses, workout regimens (i.e., Progressive Intervals), or tests (i.e., Power Test) which have been stored as a .crs file (course file) on your hard drive. These files are simple text files and can be created using Windows™ Notepad. For details on creating Custom Courses using Notepad, see Appendix A at the rear of this manual.

1 To setup the Course you will be racing, left click on **Options** / **Course** and an Open Dialog box *Select Course…* will open (see fig. 6).

2 Left-click to choose (highlight) the course name you want to ride.

3 Left-click the **Open** button to confirm the selection.

4 Course selection is now complete.



(Fig. 6) Opening a Course

Setup for Drafting

Drafting allows a rider to pull in behind their opponent and reduce the overall workload to maintain a given speed. A reduction equivalent to a 10 mph tailwind will occur while drafting, so, a 25 mph rider going into a draft will only experience a 15 mph wind drag.

1 To turn drafting **ON**, left-click **Drafting** to check-mark this option.

2 To turn drafting **OFF**, left-click **Drafting** again to un-check this option.

Drafting Notes

- Drafting only occurs within a 10 foot window, which is between 6 and 16 feet behind the opponent.
- When approaching a leading rider at a speed faster than you would normally move into a draft, the drafting function will not function.
- Drafting functions (ON or OFF) are transmitted during a Modem connection by the Master rider's chosen setting.

Setup for Metric

When Metric is check-marked, all weights, speeds, and course lengths will be set to metric values. Rider Data Files (.rdf) allow input of weight in pounds *or* Kilograms, so a conversion of Lbs to Kgs will take place on the race screen if this option is selected.

1 To turn Metric **ON**, left click **Metric** to check-mark this option.

2 To turn Metric **OFF**, left-click **Metric** again to un-check this option.

Metric Notes

- When creating Rider Data Files, be sure to indicate whether the weight is in pounds (lbs.) or Kilograms (Kgs.)
- 1 kilogram = 2.205 pounds
- During a Modem Race, both riders can display different settings

Setup for Handicap Mode

Handicap Mode allows the *Challenge PC1 software* to modify a ***Saved Race*** to a level that allows you to maintain a close proximity to the opponent throughout the race – regardless of the comparative strength of both riders. The Watts and Average Watts values on the Race Screen will be replaced with percent values which can range from 0 - 200%. This will allow an increase and decrease of 100% in both directions where at 100% the Saved Race is being replaying exactly as it was recorded. During a race the software will automatically increase and decrease the percentage of the Saved Race values so that the competitive motivation is maintained.

1 To turn Handicapping **ON**, left-click **Handicap Mode** to check-mark this option.

2 To turn Handicapping **OFF**, left-click **Handicap Mode** again to un-check this option.

Handicap Notes

- Handicap Mode is available ONLY for Rider Two / Saved Race, Rider One Data, or Rider Two Data.
- Handicap Mode affects playback only. No changes are made to the Saved Race File.
- The finish time and avg. speed will represent changes made during the race.
- The AVG value will represent the average percent of "adjustment" made to the saved race.
- You can save a handicapped race the same as you would a normal race.

Setup for Full-Screen SpinScan

If you choose to use a *Full-Screen SpinScan* rather than race, be certain to left click **Rider One** / **Open** and *left click on your Rider Data File (.rdf)* before running the SpinScan program. A Full-Screen SpinScan session can be run in either the Bargraph version or the Polar Version.

1 To setup a **Full-Screen SpinScan** session, left-click **SpinScan** and then left-click the SpinScan type you want the Full-Screen SpinScan display to default to.

> ***Please Note:*** *Check-marking this option does not keep you from switching to the other SpinScan display option. This function only determines what the screen defaults to. Press the F2 key while viewing the SpinScan display to toggle between the two displays.*

Setup for Full-Screen SpinScan - Source

The source from which a SpinScan will run can be either a Real Time session (live, as you pedal), or from a saved source file (a previously saved session). The Full-Screen SpinScan will start based upon what setting is made in this option menu.

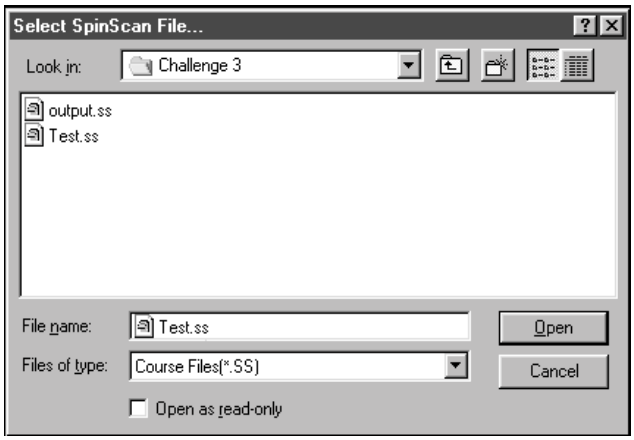
Real Time Session

1 To setup a **Real Time** session, left-click on the **Source** menu and then left-click **Real Time** option. When Start - SpinScan is selected, the SpinScan display will now function based upon a live rider pedaling.

Saved File Playback Session

1 To setup a **Saved File** SpinScan session, left-click on the **Source** menu and then left-click on **Saved File**. This check-marks and activates the **Open** sub-menu.

2 Then left-click **Open** and select the saved SpinScan file (.ss) you would like to playback (fig. 7). Once selected, left-click the Open button in the Select SpinScan File dialog window. Playback of this file will occur when you select Start - SpinScan.



(Fig. 7) Open a saved SpinScan file

Full-Screen SpinScan Notes

- Full-Screen SpinScan files will playback on both SpinScan display types.
- Multitasking within the Windows™ operating system is not available when using a Full-Screen SpinScan.
- SpinScan saved files are saved using the File / Save SpinScan Session sub-menu after a Real Time session is completed.
- When running either a Real Time or Saved SpinScan session, you can toggle between the Polar and Bargraph displays by using the **F2** key on the Handlebar Controller or the PC keyboard.
- When playing back a saved SpinScan session, the [SPACEBAR] of the PC keyboard starts and stops file playback.

Starting a Race

By now, if you've followed step by step, preliminary setup should be complete and you should be ready to begin a race. You should have now set up who Rider One will be; who Rider Two will be; chosen a course to ride; and set the various options that establish other parameters about the ride. You are now ready to start a race.

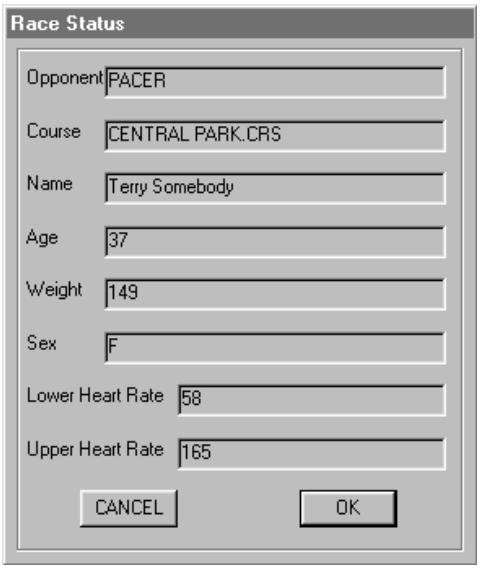
1 Left-click **Start** and then left-click **Race** from the Challenge PC1 menu.

2 A Race Status window will appear (see fig. 8). This will allow you to confirm the settings are correct for the race.

3 If the Race Staus information is correct, you can left-click **OK** to initate the Race Screen or press Cancel to make adjustments to your setup.

4 When on the Race Screen, press **F1** on the *Handlebar Controller* to begin the race.

☆ With twin Live Riders (2 CompuTrainer's), *both riders must press their respective F1 keys* to start the race.



(Fig. 8) Race Status Window

Race Start Details - Handlebar Controller Key Presses

When you start a race by pressing **F1**, a countdown begins *"Ready - Set - Go"* at which point the race begins. The timer and the performance data collection begins at this point.

A variety of Handlebar Controller key-press functions can occur while racing is under way. These are:

☐ Pressing **F1** again pauses the Race

☐ Pressing **F1** during a race to pause the race and then **F3** will enable the rolling calibration function. This is detailed in the rear of this manual; *Appendix B: Power Features*.

☐ Pressing **RESET** *before the race is over* will display "Reset, Are you Sure?" If you press **RESET** again the race will go back to the Start Line. If you press **F1** instead, the race will resume.

☐ Pressing **RESET** *after a racer is over* will display "Reset before Saving Race?" If you press **RESET** again you will loose your last performance data. If you press **F1** (Exit to Save), then you will exit the Race Screen where saving functions can occur.

☐ Pressing the **F2** key will scroll through the various Inset Window displays of SpinScan and Course Zoom.

☐ Pressing **F3** before the race begins, but with the Race Screen active, will enable the rolling calibration function of the Handlebar Controller. This detail is described in the rear of this manual; *Appendix B: Power Features*.

☐ Pressing the **+** or **-** key while racing a Pacer will adjust the Pacer's power setting if Rider Two is a Pacer.

The race timer runs totally dependant upon the frame rate capability of the personal computer. A frame rate check should be done to determine whether the PC is capable of running fast enough to maintain the adequate frame rate. Details on this are located in the Troubleshooting Q&A section at the rear of this manual.

Starting a Race - Modem Connection

Due to the nature of a Modem Race, some verbal communication between the two riders before the race will need to occur to *coordinate the start of the race*. This means making sure both of you are suited up, supplies poised, water bottles filled -- everything ready to go.

For complete details on setting up a modem race, go to page 19 - *Rider Two Setup as a Modem*.

1. To begin a Modem Race, the *Slave rider* (the one receiving the call) should left click **Start** / **Race** and then mount the bicycle and wait for the incoming call.
2. The Slave Rider will see the Race Screen before the connection takes place.
3. The Master rider will then left click **Start** / **Race** to start the dial-up program.
4. The Master rider will see a modem dialog before the connection takes place, but will not see the Race Screen until the connection takes place.
5. When both ends of the connection is complete, both riders must agree to begin the race; therefore, *two **F1** key presses* (once for each rider) are needed to begin a modem race.

Modem Connection Signals

The difference between a Modem connection and any other race start is the *Start Sign Banner*. During a modem connection it will display a connection signal dialog when any of the following is transmitted:

- **Master or Slave:** Whoever made the call is Master and the receiver is Slave.
- **Software Version Number:** Both riders ***must have*** the same build of the software.
- **Course Changed:** The Master has control of the course and transmits the course data regardless of whether the Slave has the course data on their PC.
- **Drafting Set to ON or OFF:** Master has control of Drafting option.
- **Opponent Pressed F1:** Whoever first presses F1 first transmits their "intent" to begin the race. When the opponent sees the *Opponent Pressed F1* communication, and then presses their **F1** key, the race begins.

Modem Racing Notes

- Due to potential errors in time lost and "data packets" getting lost in cyberspace, during a modem race, neither opponent can end the race early by pressing the **RESET** key or pause the race with the **F1** key. Each rider can cancel a race *only* by pressing the **ESC** key on their respective PC keyboard.
- The **F2** key will scroll through the SpinScan window options.
- Rolling Calibration values are transmitted, so make sure you note whether your opponent calibrated -- it could be the difference of you or them loosing the race.

Starting a Race - Two Saved Races

If you are going to compare two saved races, you can do so as long as both were created using the same course. Load a Saved Race as Rider One and load a Saved Race as Rider Two and when you select Start / Race the two riders will be ready to go.

- To start a head-to-head saved Race, use the **Space Bar** of the PC keyboard to start the race and pause the race.

Saving a Race Performance

After both you and your opponent cross the finish line, you can exit the race screen to save a race. With PC1, you can save both Rider One and Rider Two data -- even if Rider Two was a Pacer. The exact routine you follow will determine whether you save the race or delete the race, so follow these instructions closely.

1 After the race is over for both riders, press the **RESET** key one time.

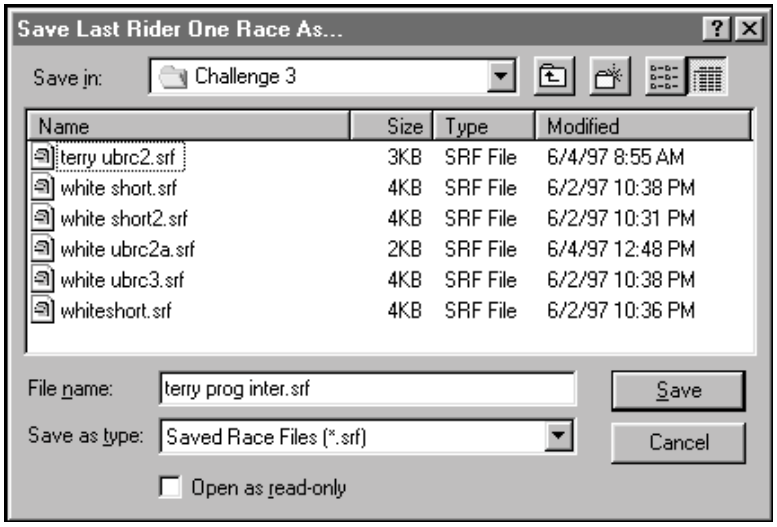
2 You will see a prompt to **Reset** or press **F1 to Exit and Save**.

> **Please Note:** If you press Reset at this point, the race data will be erased at the beginning of the next F1-Start Race.

3 Press **F1 - Exit to Save**. This will exit the Race Screen sending you back to the Challenge PC menu.

4 Left-click **File**, then **Save Last Race as: Rider One**, or **Rider Two Data**.

5 A Save window will appear (see Fig.9) to allow you to save your race.



(Fig. 9) Save Performace (.srf) Dialog

6 Type in a name for the file in the File name: section.

7 Left-click **Save** and a new dialog will appear confirming the file was saved.

Saved Race Notes

- You should save races with names you can easily recognize. You are allowed to use long file names, but you should try to limit the file name to about 18 charachters -- the maxuimum that shows within the "file name" section.
- You can save both riders from the last race before you start another race -- as long as it is done anytime before you start another race.
- If a problem occurs that keeps you from saving a race within the program (the selection is greyed out), you can browse the Challenge PC1 folder for the files Blue.RCE for Rider One and White.RCE for Rider Two. You can then just rename these files with .srf extensions and file name details using the Windows Rename function. To do this, left-click on the file once to highlight it, then a second time a second or so later. This will add the I-beam cursor and the name can now be changed.
- Saved Race Files contain course information to force the course information to match the performance data.
- Saved Race Files can be used also in conjunction with the CompuTrainer Coaching Software.
- Saved Race Files can be used for both Rider One and Rider Two at the same time. In this case you could compare the actions of two performaces.

Understanding SpinScan

SpinScan comes in two forms -- Bargraph and Polar. Both provide much the same information, but display it in different ways. The Bargraph version is the original version and due to its familiarity is the most popular. The Polar version on the otherhand, is being readily accepted among the engineering crowd as the most intuitive. The fact is: both are good for different reasons as you will soon see in the written description for both.

Figure 10 - The Bargraph Display

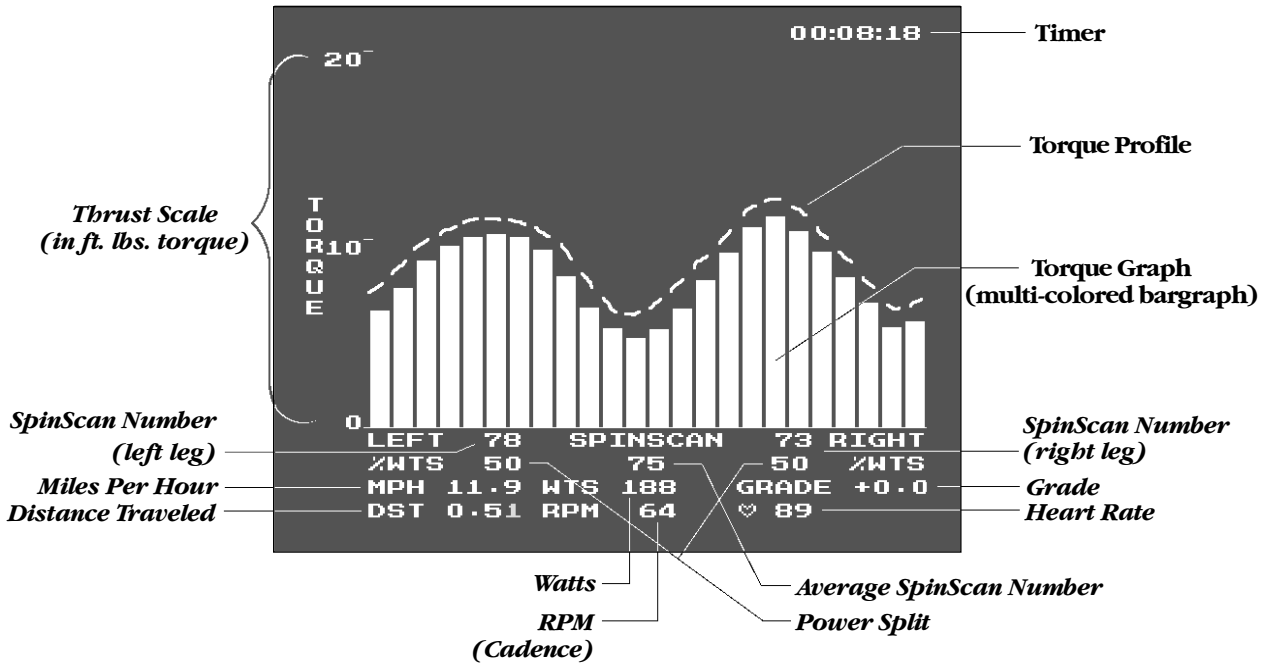
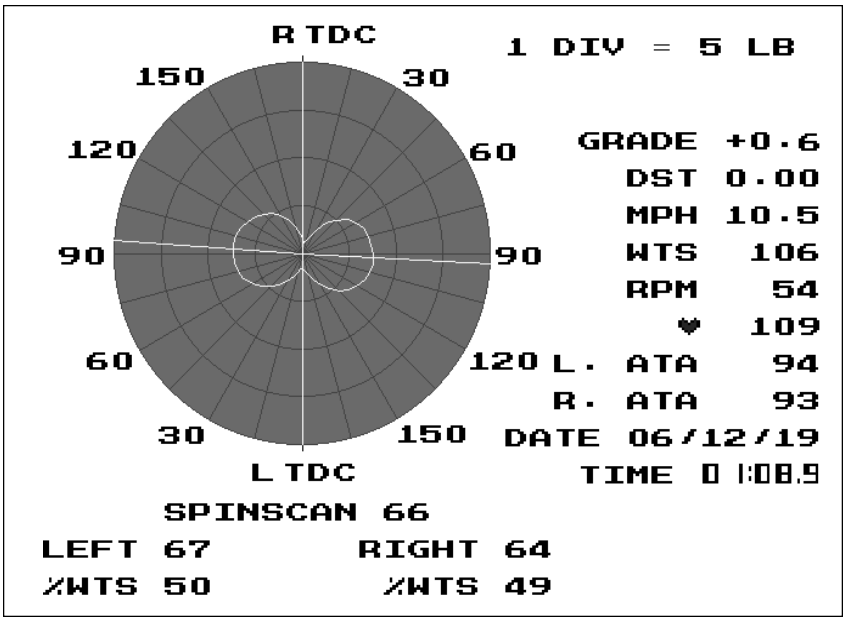


Figure 11 - The Polar Display



⇐ ***Thrust Scale Division Factor***
5 pounds or 10 pounds

⇐ ***Grade*** *(use +/- key)*
⇐ ***Distance***
⇐ ***Miles Per Hour***
⇐ ***Watts***
⇐ ***RPM***
⇐ ***Heart Rate***
⇐ ***Left Average Torque Angle***
⇐ ***Right Average Torque Angle***
⇐ ***Today's Date***
⇐ ***Timer***
⇐ ***Combined SpinScan Number***
⇐ ***Left / Right SpinScan Numbers***
Left / Right Power Split

SpinScan Definition

The SpinScan number is defined as: Average Torque divided by Maximum Torque multiplied by 100. In essence, the SpinScan numbers represent efficiency of the the muscle groups in the legs to produce power evenly through the stroke. The more effieciently you use the muscles in your legs to "pedal in circles", the higher the SpinScan values will become and the flatter (bargraph) or rounder (polar) the SpinScan Torque Profile will become. If your legs could produce power like an electric motor, the graphs would be perfectly flat (or round) and the SpinScan values would be 100, as in 100% efficient.

The Bargraph SpinScan *(see fig. 10)*

The Bargraph **Torque Graph** is a multicolored bar graph and represents one full 360 degree pedal stroke divided into 15 degree segments, 24 in all. The first bar is the *left leg* at Top Dead Center (TDC) and TDC for the *right leg* starts 180 degrees, or 12 bars, later in the center of the graph. The height of the bars are proportional to torque, showing road thrust in foot pounds. By referencing the weaker (lower) areas of the **Torque Graph** you can determine which muscle group(s) can best improve this weak area. Specifically training these muscle group(s) to "fill in" the weak area will thereby produce an overall "flat" SpinScan over time. A flatter **Torque Profile** along with higher **SpinScan Numbers** should equate to less fatigue for any single muscle group and improved overall endurance.

The Polar SpinScan *(see fig. 11)*

The **Polar SpinScan** works exactly the same as the Bargraph version, but instead of the **Torque Graph** being individual bars, which represent 15-degree increments, the Polar SpinScan shows a **Torque Graph** in a circular, or polar, pattern. The Thrust Scale will change from a 20-pound to a 40-pound scale should you exceed the outer division factor of 20 pounds.

The Polar version also adds **ATA** (Average Torque Angle), which is a visual representation of where the average torque is being applied. It represents how you use the "lever-arm" of your bike cranks. The longest, and most efficient "lever-arm" of a bicycle crank is while it is at 90-degrees from TDC. If the muscles are firing too early or too late, ATA will indicate this. Values too high, too low, or uneven may awaken the need to have an expert coach or exercise physiologist examine what you're doing.

Displayed Information

- ☐ A **Torque Graph** displaying power output to the road for one full crank revolution.
- ☐ A **Torque Profile** displaying a graphic representation of how power is being transferred to the road in 15 degree incremental changes.
- ☐ A **Thrust Scale** showing foot pounds thrust.
- ☐ The **SpinScan Numbers:** combined (average) and also separate for left and right leg.
- ☐ A **Power Split** displays power output differences between left and right leg in %.
- ☐ A **Grade** display which can be changed to increase and decrease load.
- ☐ **Watts** displayed to compare cadence, heart rate in relation to power output.
- ☐ **MPH, RPM** and **Distance** to use as comparison variables.
- ☐ **Heart Rate** is displayed to verify pedaling and equipment effects on heart rate.
- ☐ **Timer** is displayed to verify that data is being collected and to show time of test

Shown in the Polar Display Only

- ☐ **Left and Right ATA** (Average Torque Angle): displays the average point in degrees that represent efficient crank arm length usage.
- ☐ **Date** is shown so you know what day it is.

Using SpinScan

In order to understand how to use SpinScan, you must first understand what it displays and what it doesn't. The **Torque Graph** represents power output - *to the road* - of *both the right and left leg at the same point in time* - not individually. Because your legs are connected to one another through the crank arm and because the power output on CompuTrainer is calculated at the tire edge (the Load Generator Friction Roller in this case), each bar of the graph represents power for both the push of one leg and the pull of the other. We use the cadence sensor to determine crank position.

It is commonly known that the "push" muscle groups are stronger than the "pull" muscle groups in cycling. Taking this into consideration, SpinScan can accurately define the **Power Split** produced by both legs. This is due to the fact that most of the power produced in cycling occurs during the push (down-stroke) portion of the pedal stroke (using 5 of the 6 major muscle groups from about 45 to 120 degrees of the down-stroke). The muscle groups that can provide any appreciable power on an up-stroke pull will always be "shadowed" by the strongest muscle groups in the opposite down-stroke position and therefore don't affect the shape of, or the height of, the Torque Graph.

The interaction between muscle memory and equipment variables will determine what the **Torque Graph** looks like and changing any of these variables will likewise have some affect on the graph. For instance, if you consciously modify muscle coordination by pulling up before, or pushing forward at TDC (Top Dead Center), or pulling back at BDC (Bottom Dead Center), this will show dramatic changes in the **Torque Profile**. Likewise, equipment variables such as oval chain rings, clipless pedals, crank arm length changes, etc., will each have their own distinct effect on the **Torque Profile**. It has been demonstrated that an uneven **Power Split** can be compensated for by using different length crank arms, or pedal shims, while also having a positive effect on the **Torque Profile**.

What is an Optimum SpinScan?

We've been asked this question ever since the release of SpinScan in 1991. As a general rule, higher numbers are better than lower numbers. It has been our observation that roadies produce numbers in the 70's to mid 80's range, while mountain bikers may see much lower values (because they spend more time standing on the pedals). The main thing to consider is the type of cycling you do. Road Cyclists will be smoother than Mountain Bikers because they can stay in their saddle for most of the ride. There is no reason this should be the norm except for lack of training to pedal in circles under higher "hill climbing" loads. Try staying in the seat as long as you can while increasing the grade and eventually you will see these SpinScan numbers increase.

Making Your SpinScan Better

There is a trend these days to work on pulling the legs up with special cranks and clipless pedals to build muscle strength in the up-stroke. The fact is: most dead spots in the pedal stroke are at Top-Dead-Center and Bottom-Dead-Center. It is possible to combine the strength of two or three "equally weak" muscle groups to help fill in these areas. With the majority of power produced during a pedal-stroke being supplied by the largest and strongest muscle groups -- at the same point where you also have the most leverage to produce it -- concentrating only on the dead areas should perhaps be your goal.

Further SpinScan Tips

In the back of this manual (Appendix E) you will find a section containing SpinScan tips supplied by Coaches who use Computrainer. We will add more comments there, crediting those who submit them, as they are sent to RacerMate.

Necessary Connections and Settings

SpinScan requires an RPM signal to function and will not work without an RPM reading above 30 RPM; therefore, before using SpinScan, be sure you have correctly mounted the **Cadence Sensor** to the bike. For instructions on installing this sensor, see Page 13 of the *Pro Basic Stand-Alone Users Guide*. Though not seen on the Bargraph SpinScan Screen, *you must enter your correct weight into memory.* See Page 14 "Rider Data Files" for information on entering weight.

Starting a Full-Screen SpinScan Session

1. On the Challenge PC1 file menu, select **Start** / **SpinScan**.
2. Depending on what selection you made or last set in the Options / SpinScan sub-menu, either the Bargraph or Polar display will appear.
3. You can use the **F2 key** to switch the displays in real time, back and forth.
4. Mount the bike and start pedaling. *Above 30 RPM* the graph will appear.
5. Press **F1** to start the timer and data collection.

Note: Data collection will only occur when the timer is running.

Saving a Full-Screen SpinScan Session

1. Press the **F1** key to stop the timer
2. Press **ESC** on the PC keyboard to exit the SpinScan session.
3. From the Challenge PC1 menu, press **File** / **Save SpinScan Session**.
4. You will now be prompted to give a name to the file. When done, press **Save**.

Playing Back a Saved SpinScan Session

1. From the Challenge PC1 **Options** menu, choose **SpinScan** / **Source** / **Saved File**.
2. Then choose **SpinScan** / **Source** / **Saved File** / **Open**.
3. Select the file you want to play back.
4. After selecting the file, choose **Start** / **SpinScan**
5. Press the *PC keyboard* ***spacebar"*** to begin file playback. Press the **spacebar** again to pause the timer.
6. Press **F2** to switch between SpinScan screens.
7. Press **ESC** to exit the SpinScan screen.

Exiting the PC1 Software

To exit the Race Screen or SpinScan screen, press the **ESC**. Then choose either **File** / **Exit** or hit the **X** in the upper right hand corner of the Challenge PC1 menu.

Printing SnapShots

You can print snapshots of your SpinScan or Race Screen by pressing the "**P**" key from the PC keyboard while you are in the SpinScan or Racing Mode. This will use the default printer setting established in the Printers Control Panel of the Windows™ Operating System. This is most useful during SpinScan sessions to print before and after shots of your pedal stroke analysis.

Enhanced Graphics Mode

By default the PC1 software comes set to non-enhanced 8 bit graphics. If you are running a pretty good PC with a high-end video card, you can try the Enhanced Graphic mode. To do this requires changing a line in the Racer.ini from Enhance Graphics = False to Enhanced Graphics = True and then saving these changes. To edit the ini file, follow these steps:

1 Left-click Start and then Programs. Left-click Accesories and then Notepad.

2 With Notepad running, click on File, then Open.

3 Left-click the down arrow in the "Look in:" section and locate your Challenge PC1 folder. Left-click this folder to place it in the Look in: section.

4 By default Notepad looks only for "text files", but if you left-click on the down arrow in the "Files of type:" section and choose "All Files (*.*)", then all the files in the Challenge PC1 folder will appear.

5 The file **Racer.ini** will be among the files shown.

6 Left-click on **Racer.ini** to highlight it and place it in the "File name:" section.

7 Left-click the Open button to open this file in Notepad.

8 Locate the line that states Enhanced Graphics = and edit the True/False selection as needed.

9 When done, lift-click File, then Save and close out Notepad.

10 It is recommended to run the Frame Rate Check when you have done this to make sure the program can keep track of time correctly (see appendix D: Troubleshooting Q&A).

Creating Courses using Windows™ Notepad

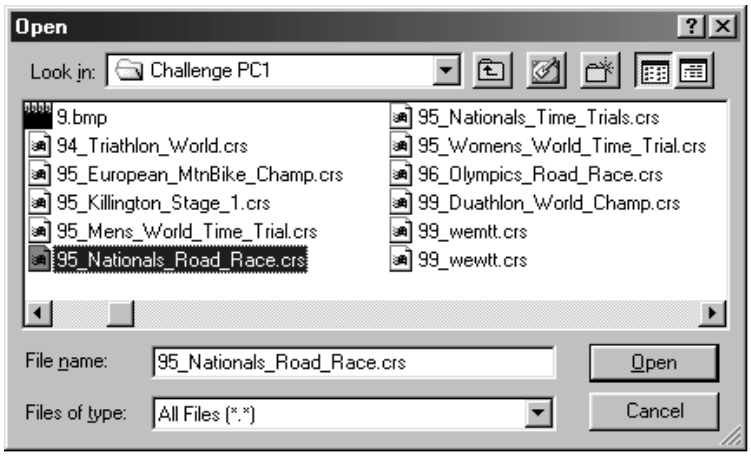
Notepad is a text editor supplied with Windows™, which can be used to create ASCII text files (a programming language). The course profiles within Challenge PC1 use ASCII text to provide the information needed to draw the course. You can create or edit course profiles with minimal computer skills by following these instructions.

1 Left-click Start and then Programs. Left-click Accessories and then Notepad.

2 With Notepad running, click on File, then Open (see fig. 12).

3 Left-click the down arrow in the "Look in:" section and locate your Challenge PC1 folder. Left-click it to place it in the Look in: section.

4 By default Notepad looks only for "text files", but if you left-click on the down arrow in the "Files of type:" section and choose "All Files (*.*)", then all the files in the Challenge PC1 folder will appear.



(Fig. 12) Open an existing course file

5 The files with a ".crs" extension (the last 3 characters in a file) will be the courses available to PC1. These can be opened and edited to make new courses.

6 Left-click on a course to highlight it and place it in the "File name:" section.

7 Left-click the Open button to open this file in Notepad.

Course Creation Details

Below is a view of a course opened in Windows™ Notepad. Details of the course construction are shown to the left of the display (see Fig. 13). We'll continue with editing a course to make it a new one, which is the easiest way to also make a new course.

Windows Title Bar →

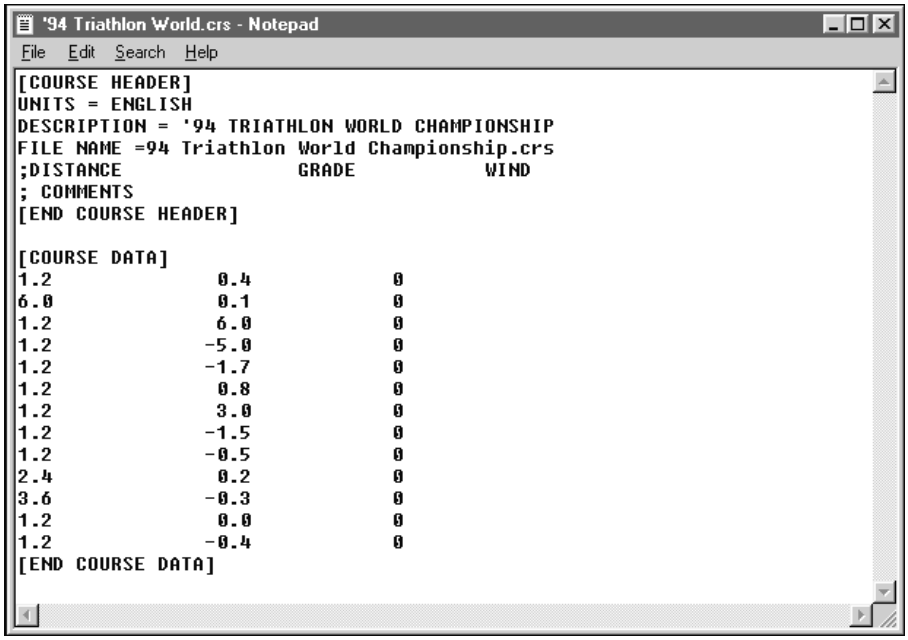
Notepad Menu →
Course Header, in brackets→
Units (English or Metric)→
Description (for Race Status)→
File Name (for saved files)→
Table description (for reference)→
Comments can go after semi-colon→
End Course Header (in brackets)→

Course Header (in brackets)→
Course Data (as many lines as you like)→

This data is what makes up the course as it is displayed on the course profile on the Race Screen. The first column represents the course leg lengths to the hundredth place if you desire. The second column represents the Grades (Minus symbol needed for negative grades, nothing for positive grades). The last column would be headwinds or tailwinds (again a Minus symbol for tailwinds and nothing for headwinds – and in whole numbers).

End Course Data (in brackets)→

Description of Course File Structure



(Fig. 13) Course Details

Using an Existing Course to make a New Course

Because course files must retain the format as shown on the course details image from the previous page, it is recommended to edit one of the pre-existing courses when making a new course. This will almost guarantee a usable course every time.

1 To create a new course from an existing course while in Notepad, first open a pre-existing course as described on the previous page.

2 Left click **File / Save As** from the menu.

3 Type a new name (with the .crs extension) for your new course in the *File name* area.

4 Choose All Files (*.*) in the *Save as type* area.

5 Left click **Save** to make a "carbon copy" of, and close, the first opened course.

6 Now you can proceed with changes to make it your new course.

☆ ***Tip:*** *To learn more about creating custom courses, open the customcrs.txt file which was copied into the Challenge PC1 folder. This too can be viewed using Notepad.*

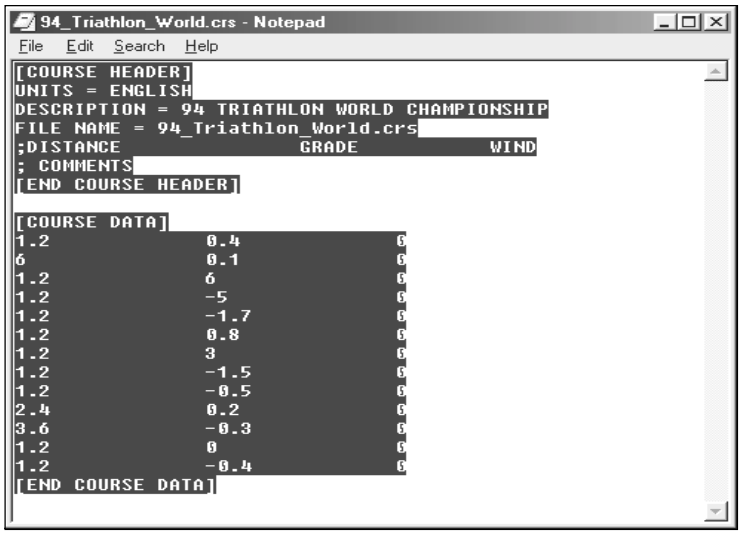
7 When finished creating a course, left click **File / Save** to save the new file changes.

Checking your New Course

The best way to check your course for hidden errors (as noted below in the Course Creation Notes) is to highlight the entire course when you are done with it as shown to the right. The highlighted areas should "hug" the text (see Fig. 14). You can do this as follows:

1 Left-click and hold the mouse button down in the left top corner of the Notepad window.

2 While holding the left mouse button down, drag diagonally accross the window to the bottom right corner of the Notepad window.



(Fig. 14) Highlighting a Course Profile to spot hidden characters

3 Release the mouse when the complete text is highlighted and make note of any areas that are highlighted beyond where there is text shown.

4 You can now highlight and delete these areas until the course looks like the example (Fig. 14).

Course Creation Notes

- There cannot be any blank lines between the Course Header and End Course Header secion and the Course Data and End Course Data section. Likewise, there cannot be any lines of data before the Course Header section or after the End Course Data section.
- There cannot be any missing data from any columns. If data is missing the program will not run the course.
- The *file name line* must match the same characters as shown in the Windows™ Title Bar.

The Race Screen & Rolling Resistance Calibration

The Rolling Calibration Program, which is described in detail in the Pro Basic Manual, assures that both the load felt by the rider and the display of watts is correct. If you need to run this procedure or you are unsure it is still correct, you can scroll through the Anticipator Zoom / SpinScan windows with the **F2** key until the *Course Anticipator Zoom* window displays. If a value appears to the right of the ***"C"*** in the top right-hand corner of this window this is the calibration factor for Rider One and the lower right-hand window will display the value for Rider Two. If the value appears as ***"U-200"***, the system is uncalibrated. Rolling Calibration can be done in Stand-Alone Mode or while connected to the PC1 software.

Rolling Resistance Calibration when the Race Screen is active and before a race begins

1. Press the **F3** key on the ***Handlebar Controller***. You can now use the **Handlebar Controller** to calibrate the CompuTrainer (see pages 14-15 of the Pro Basic Stand-Alone Users Guide for details).
2. When finished calibrating, press **F3** again and you will reconnect to the PC1 software *(the word PRO will reappear in the Handlebar Display).*

Rolling Resistance Calibration after a race has been started

1. Press the **F1** key first to pause the race
2. Now press **F3** to enter Rolling Resistance Calibration.
3. After completing the calibration procedure, press the **F3** key to save and return to race mode and **F1** to resume the race again with the new value.

Race Screen Rolling Resistance Calibration Notes

- You do not need to disconnect the Stereo Cable before running Rolling Resistance Calibration if a Race Screen is not displayed. The Handlebar Controller will be in Stand-Alone mode already.
- As of the writing of this guide, the CompuTrainer 3D software does NOT allow for calibration during the race. If you need to calibrate while using the 3D software, you will need to do so before you start a race, or by pausing a race and removing the Stereo Cable from the Handlebar Controller.

Setup Tips for your PC and CompuTrainer

- ☐ When possible, please refer to the PC Setup - Making Connections portion on page 9 of this Operation Manual along with the user's guides that came with your Personal Computer and related devices.
- ☐ When changing video cards in your PC, always change to a Standard VGA driver first.
- ☐ Be sure to install the ***DirectX*** program supplied on the Install CD-ROM or verify whether you have it on your PC already by running dxdiag.exe from the Run command line in the Windows Start menu.
- ☐ When running, DirectX takes control over most of the PC system resources. Shut down all running applications before using your External CompuTrainer software.

Communication Tips - Test Comm Ports

A CompuTrainer Pro with external CompuTrainer software uses *Serial Communication Ports* on the PC to transmit data to and from the PC and CompuTrainer. A problem with the communication path, either from the CompuTrainer to the PC serial port, or from the PC serial port to the CompuTrainer, can keep the two systems from "talking" to each other.

One problem with diagnosing serial port communication errors is the limited information provided by the computer as to which peripheral device is using which serial port. We have included within the Challenge PC1 software a test that will query the devices and report back to you those which pertain to the CompuTrainer software. Using *Test Comm Ports* will provide information needed for CompuTrainer setup, i.e., which CompuTrainer is connected to which Com port(s) and verify whether a modem exists and the com port for it. See Page 11 – Testing for Installed Components for further details on this test.

- ☐ Make sure the ***CompuTrainer*** is ***ON*** and the ***Stereo Cable*** is inserted into the ***PC Interface Module*** and ***Handlebar Controller*** when using the *Test Comm Ports* program.
- ☐ A Second CompuTrainer requires a second PC Interface Module in a separate serial port.

Things to look for if errors occur during Test Comm Ports:

No CompuTrainer(s) detected:

- ☐ The **Stereo Cable** is not plugged into the **Interface Module** or the **Ext. PC** connection on the **Handlebar Controller.**
- ☐ Check the **Stereo Cable** for shorts or breaks using troubleshooting sheets available on the CompuTrainer.com web site.
- ☐ Use Windows™ Device Manager to verify the existence of available serial ports. Run Add New Hardware Wizard to auto-detect uninstalled hardware.
- ☐ You may also find that you need to **ENABLE** the secondary serial port in your PC's BIOS/CMOS.

No Modem Detected:

- ☐ Verify a modem is installed in your PC.
- ☐ Run Add New Hardware Wizard to detect an uninstalled modem.

Troubleshooting CompuTrainer Challenge PC1

The CompuTrainer PC1 software runs on most low end PC's. Many problems end up being PC related and not software related. The following issues are the most frequently asked, but if you have any problems not addressed here -- don't hesitate to call technical support for help.

Q: I've just setup the software. Why won't the rider respond when I pedal?
A: If you ran the Test Comm Ports program supplied with the PC1 software and it found a CompuTrainer on a particular communication port... you must manually verify the COM PORT for Rider One or Rider Two is the same as what was found in the Test Comm. Ports test. If no CompuTrainer was found, refer to the PC Setup Tips, page35, for help on this.

Q: I noticed that the timer is running too slow. How can I fix this?
A: The timer runs based upon the frame rate capability of the PC video card. If the frame rates are too slow, then the timer will run slow. To run the frame rate test, do the following:
1 Open the PC1 software and setup a race.
2 When the Race Screen is showing, press the "**D**" key on the PC keyboard to display the frame rate in the left top "outside corner" of the SpinScan inset window. If this number is lower than 20, the frame rate is too slow.

Q: OK, the frame rates are too low -- Now what?
A: Chances are the Enhanced Graphic setting in the Racer.ini file is set to True. If so, change this setting to False by editing the Racer.ini line to Enhanced Graphics = False and save the changes. Then try checking the frame rate again. If this setting was already set to False (our default), then the video card, or drivers, may need to be be replaced or updated.

Q: Why, after I've selected the right communications ports in Rider One Setup, the software still doesn't respond?
A: Try checking for a PC1 Update on our web site and replace the executable file. When all else fails, we've had positive results by deleting the "Racer.ini" file. When this file is deleted, the program will create a new file, but you'll need to set up your rider data again. Also, extremely low frame rates can cause this too. Run the frame rate check as noted above.

The CompuTrainer SpinScan Feature
(by Bill Edwards, Ph.D.)

Pedaling Efficiency

Improvements in pedaling efficiency can make it possible to produce power with less muscle stress and less fatigue. Many of the world's greatest cyclists have worked hard to improve pedaling efficiency using sophisticated scientific measurements of pedal pressure. The SpinScan function provides a direct visual measure of pedaling efficiency, thereby allowing one to work on improving pedaling efficiency by the use of real-time biofeedback. One can actually see the immediate effects of modified recruitment patterns on pedaling efficiency.

Inefficient pedaling causes one to recruit a relatively few leg-muscle fibers at high intensity, whereas efficient pedaling technique spreads the load out over a great many muscle fibers at a much lower intensity. Muscle fibers fatigue very quickly at high intensity, whereas muscle fatigue occurs much more gradually at lower intensities. It therefore is an advantage to be able to produce power using lower average intensity.

The SpinScan Displays

There are two displays available in the SpinScan function:

(see fig. 13, page 31) BarGraph
(see fig. 14, page 31) Polar Plot

The bar chart displays the torque on the pedals as a function of position on the circle, starting with the left foot, and then the right foot. Using the bar chart display, the graph of inefficient pedaling can be displayed by "stomping" down hard on the pedals one at a time (right-left-right-left, etc.). You will see two distinct mountain peaks corresponding to the left and right feet pushing down the pedals. At the bottom of the chart you will see three efficiency numbers corresponding to the left foot, average of both feet, and right foot, respectively. These numbers represent the ratio of the average torque to the maximum torque applied to the pedals multiplied by 100.

If you next try rotating the pedals while keeping a constant light pressure on the bottoms of your feet all around the entire circle, the graph becomes flatter and the peaks less distinct, and you will feel less intense muscle stress. You should notice that the efficiency numbers displayed at the bottom of the chart have increased. At first, you may find it difficult to maintain this circular pedaling technique and increased efficiency for very long, but with constant practice it will become second nature. It just takes time for your muscle cell firing patterns to adapt and to "learn" the new technique.

The polar display shows the torque around the entire circle of the pedals. When "stomping" on the pedals one at a time, the display shows two distinct lobes (like an airplane propeller). With circular pedaling, the display becomes a nearly perfect circle, and the efficiency numbers will increase.

Another feature displayed on the polar graph is the angle of attack (the red lines). The angle of attack is the angle at which maximum torque is applied to each pedal. A good target for this angle is 90 degrees (i.e., when the pedal cranks are horizontal to the ground). However, this angle depends on saddle position and the degree to which one can recruit hamstrings versus quads in the power stroke. Sprinters normally prefer to have their saddles more forward, and tend to recruit more of the hamstring and hip flexor muscles. Their angle of attack will most likely be greater than 90 degrees. For road riders, the preferred angle of attack is closer to 90 degrees. For time trial bikes, the angle of attack is a compromise between loss of power at the pedals and the gain one can achieve by being more aerodynamic.

The CompuTrainer SpinScan Feature -- Continued
(by Bill Edwards, Ph.D.)

Using the SpinScan Function

Typical SpinScan efficiency numbers for cyclists range from as low as 50 percent or less up to as high as 85-90 percent. However, it is not productive to compare your efficiency numbers with those of other cyclists. What is productive is to start from where you are now, and work toward improving your efficiency from that starting point. Practice makes perfect.

A good way to begin is to try concentrating on improved efficiency by lightening up on the pedals for about 3-5 minutes at a time at first. Try imagining that you have eggshells under your feet and you mustn't crush them. You should be able to wiggle your feet around in your shoes while you are pedaling hard. If you try an experiment of using this technique while out on the road, you will notice that your speed on the bike will go up by 0.5-1.0 MPH with no additional stress. That is what you are looking for.

Be patient, because it takes time to get permanent results, but it's worth the effort!

PC1 Software Operaton - Keypad Shortcuts

STOP [RESET]	Stops or Resets a race before it is finished Exits Race Screen
START [F1]	Starts or pauses a started race or SpinScan session Displays Peak values during Pause Scrolls through Finish Results
DISPLAY [F2]	Scrolls through Anticipator / Course Zoom Window Scrolls through Windowed or Full Screen SpinScan display
SET [F3]	Enters Rolling Resistance Calibration from F1 paused state
[+]	Raises Pacer Power Raises Grade in SpinScan display
[-]	Lowers Pacer Power Lowers Grade in SpinScan display

PC1 Software Operaton - PC Keyboard Shortcuts

D key	Starts the Frame Rate Check
Spacebar	Starts and Stops “Saved File” races and SpinScan sessions
ESC	Exits the program

One Year Limited Warranty

RacerMate Electronic Components are warranted to the original purchaser for a one-year period from the original purchase date against defective material and workmanship. Any implied warranties are also limited in duration to one year from the original purchase date. Some states do now allow limitation on how long an implied warranty lasts, so the above limitations may not apply to you.

During the warranty period RacerMate will repair, or at its option replace any part that proves upon inspection to be defective. Products subject to improper installation, misuse, neglect, accident, alteration, or unauthorized repair shall be excluded from this warranty. To obtain warranty service, proof of original purchase date must be furnished.

RacerMate shall not be liable for shipping cost to the factory, consequential costs, expenses or damages incurred by the purchaser. Some states do not allow the exclusion of incidental or consequential damages so the above exclusion may not apply to you. This warranty gives you specific legal rights, and you may also have other rights that vary from state to state.

Lifetime Limited Warranty

RacerMate Training Stands are warranted to the original purchaser for a lifetime of service against defective material and workmanship.

During the warranty period RacerMate will repair, or at its option replace any part that proves upon inspection to be defective. Products subject to improper installation, misuse, neglect, accident, alteration, or unauthorized repair shall be excluded from this warranty. To obtain warranty service, proof of original purchase date must be furnished.

RacerMate shall not be liable for shipping cost to the factory, consequential costs, expenses or damages incurred by the purchaser. Some states do not allow the exclusion of incidental or consequential damages so the above exclusion may not apply to you. This warranty gives you specific legal rights, and you may also have other rights that vary from state to state.

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