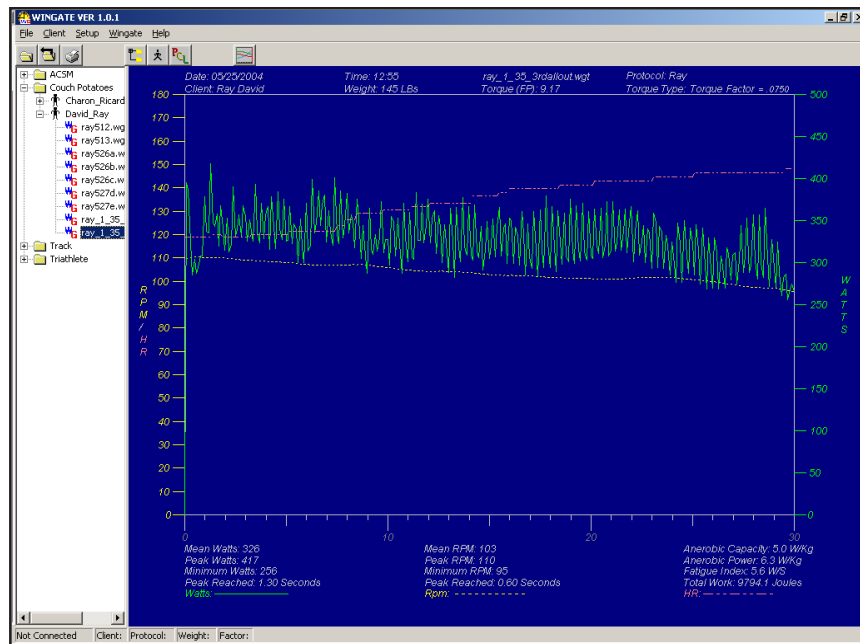# VELOtron

Bicycle Training Technology for World Class Performance

Wingate Software

Users Guide

Version 1.0

06/2010

Velotron Wingate Software
Users Guide

Table of Contents

Welcome! You are the owner of the RacerMate Velotron Wingate Software. The Velotron with the Wingate Software was designed to run accurate Wingate tests using the state-of-the-art Velotron. The software contains a powerful database for maintaining client records and performance files. All physics control of Velotron is PC controlled and run within the Wingate software; as such, it is recommended to have a sufficiently fast PC to run it. See the System Requirements page supplied with you Velotron for further information.

The Wingate test is used extensively to determine athlete potential as well as other indications of performance. There does not appear to be any true standardization of test protocols, so a software program for this application needs to be versatile enough for any and all applications. The Velotron Wingate software meets that need. Those conducting a Wingate test can set any range of protocol as well as any torque type (be it a percent of body weight or a known dropped weight) as required.

Please read through this and other accompanying operation manuals thoroughly to take full advantage of all the sophisticated capabilities your Velotron 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 may be offered over time. To access these updates you should periodically go to our web site at *www.velotron.com*. This is also a good resource for information on troubleshooting your Velotron and contacting technical support. Changes to the software will occur over time and these changes may not be represented in this manual. Be sure to read the software readme files and check for updated manuals on the Velotron web site to accompany any future software enhancements.

Thank you for purchasing the Velotron Wingate Software and please keep this manual in a safe place for quick reference!

Software Installation Procedure

Velotron ships 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 those stated here.

To Install:

1 Start Windows™ (if not already running).

2 Close all Windows™ programs to prevent possible problems.

3 Insert the Velotron 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 file for each version of Velotron software for up-to-the-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

Velotron software can be easily uninstalled. Doing so will remove the program files 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 user/client 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 Velotron Wingate program.

4 Click on the Uninstall link. Follow the instructions to complete the software removal.

5 To verify all files are removed, double-click My Computer. Double-click the drive you installed the software. Locate the Velotron Wingate 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.

Caution: Consult your doctor before beginning any exercise program

Real Time -- *Wingate Software connected to your Velotron feeding the data to the PC*

Step 1 -- Start the program by going to **Start - Programs - Velotron Wingate**. Left click **Wingate**.

Step 2 -- Select "**New Database**" in the **Client** menu. Create a Database name.

Step 3 -- Select "**New Client**" in the **Client** menu. Create a client. In the client window be sure to enter all the correct information as needed -- especially the weight, since this may be used for load calculations. Add comments as needed. You can also create a new database location for this client, or type in an existing database folder as seen in the Tree-View on the main screen.

> *Please Note: All database functions can be accomplished using Right-click mouse action on the Tree-View (left pane) in the Main Wingate screen For instance, to create a new database in the master database (by default c:\program files\wingate\data) right-click on the left pane below any preexisting database folders. The selection "Add Database" appears to allow you to add the database. Similarly, if you right-click on any existing database folder the menu "Add Client"; "Delete Database"; and "Rename Database" appear. Right-click on a client and "Edit client"; and "Delete Client" appear. Right click on a client's Wingate test results and "Plot"; "Export"; and "Delete" appear.*

Step 4 -- Select **"Create New Protocol"** from the **Wingate** Menu. Create a protocol as needed for the test you plan to conduct.

Step 5 -- Select **"Graph Scaling"** from the **Wingate** Menu. Edit the scale to an appropriate range.

Step 6 -- Make sure your Velotron is plugged into the PC and is turned on. Run the **Test Comm Ports** program from the **Setup** menu to determine what serial port your Velotron is connected to. With this information, verify the correct port was established in **Setup** - **Comm Port**.

Step 7 -- Select **"Load Client"** in the **Client** menu. Browse to the database folder where the client is you want to test.

Step 8 -- Select "**Load Protocol**" in the **Wingate** menu. Browse to the location and select the protocol you want to use.

Step 9 -- Select **"Run Wingate"** from the **Wingate** menu to launch the Wingate screen.

Step 10 -- The Velotron is now is "Warm-up mode." The client can warm-up using the preselected load -or- by using the Up/Down buttons on the Wingate Screen or those on the Velotron Handlebar Controller adjust the workload to suit the warm-up requirements. Due to x-axis scaling limitations there is only about 20 seconds of warm-up shown, but the warm-up period prior to starting the clock is open-ended.

Step 11 -- When the test is ready to start press the "**Start Wingate**" button to begin the test.

Step 12 -- At the end of the test a Save dialog will appear. Save the performance (the program will default to save to the location of the original client folder). When saved, a Plot of the performance will appear.

File Mode -- *Viewing Saved Performance Files.*

Step 1 -- In the Tree-View select the database and then client the performance file resides. Then right-click on the performance file. Choose **Plot**. A plot will appear in the right pane.

Exporting

Step 1 -- In the Tree-View select the database and then the client the performance file resides. Then right-click on the performance file. Choose **Export**. The program will export the performance file in comma separated text format into the same database folder the original performance file was found. The file will have the same file name, but with a TXT file extension. These files can be used with any spreadsheet program.

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PLEASE READ!
IMPORTANT INFORMATION

Software Release Information

Changes to Velotron software will inevitably occur and this manual may require changes with each release. These will be released in PDF format and posted on the Velotron web site as they occur.

Reporting Bugs

If you're reading this manual, you've got the awesome opportunity to improve this product. Please be assured that every attempt to debug this software was made before its release, but if you do find a bug -- PLEASE REPORT IT. This requires a dedicated analysis of the product to find problems if they exist. If you do find bugs, you should clearly record them and send a report -- preferably via e-mail -- to RacerMate. Bug reports should follow these guidelines:

End User Information	PC Information
Name	Processor Speed
Phone Number	System RAM (memory)
E-mail	Video Card Type (Brand)
	Video Card RAM (memory)
	Operating System

Bug Description

What it takes to duplicate the bug?

Is the bug repeatable or random?

What affect does the bug have on the PC; i.e., does the PC lockup, or can you escape from the program and retry without rebooting the PC?

After you have sent one bug report with the above information (in regard to your personal and PC information), subsequent reports need only have Bug Description. We'll keep track of everything else based upon your original report and your bug reports will be used to create a new version of the software. New versions will either be sent to you via e-mal or posted at:

www.velotron.com

Who to send reports to:

Send your bug reports to Roger Moore at roger@velotron.com and he will log them and start the work towards fixing the bug and/or determining whether the bug is system dependant or not. You can also call 800-522-3610, ext. 328 if the bug is hard to describe in an e-mail.

System Dependant Bugs

Some bugs are system dependant. In other words, they only occur on your PC. If this is the case, we will try as best we can to either duplicate the bug in house, or work with you to solve the problem on your PC. Please be aware that many bugs that occur are related to hardware drivers and not to the software per se. In these cases an upgrade to you PC may be recommended, but we will only recommend doing so after all options are exhausted.

Caution: Consult your doctor before beginning any exercise program

Step 1....Insert USB to Stereo

Before inserting the USB to Stereo adapter you should install the driver for it first. The driver is installed as part of the Wingate software setup, so if you have not installed the Wingate software yet, please do that before proceeding.

Plug the **USB to Stereo Adapter** into a free USB port on the PC. If you do not have an available USB port, you may need to purchase a USB Hub to add more USB ports.

USB to Stereo Adapter

PC's Without USB Ports

It is possible to have a PC without a USB port, but today is very uncommon. In this case you will likely have to install a USB if you have a desktop computer. On a laptop, you may need to consult a computer expert to determine your options, but it probably goes without saying if you don't have a USB port at all, the capability of the computer in general may be of greater concern. It may be woefully insufficient to run the software even if you added a USB port.

USB to Serial adapters

When using a USB to Serial Adapter with our older 9-PIN PC Serial Interface (obsoleted Fall 2008), if you encounter any problems with connectivity, 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: None

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

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Step 2....Plug the Stereo Cable Into PC Interface Module and Velotron Load Generator

Plug one end of the **Stereo Cable** into the jack on the **Interface Module** for the main Velotron. If a "Second Velotron" 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 **Velotron Load Generator - EXT. PC** jack.

Step 3....Disable or Prolong Computer Power Management

Computers generally look to see whether you are typing or moving the mouse to determine whether the computer is being used. Data streaming in and out of the computer though a serial port does not allow for the disablement of screen savers and power management schemes. We can disable the screen saver, but power management settings, which are also found in the screen-saver section of the Windows™ Display Properties (right-click the Windows™ desktop, then left-click Properties, then go to the Screen saver tab and then click on Power), must be disabled or extended by the user. It is advised to extend the duration prior to power management activation to a time period that is longer than you longest Velotron ride.

Step 4.....READY TO USE

All PC connections should now be complete. You can now use your Personal Computer with your Velotron. When a Race or Test Screen is showing, the Handlebar Controller will begin, pause, and end a race unless otherwise noted. Saving the race performance must be done from the PC.

Caution: Consult your doctor before beginning any exercise program

Testing for Installed Components

Velotron Wingate software includes a very useful tool to help determine what communications ports are functional and the devices that may be attached to them. The Velotron is communicating a message "I'm a Velotron" at all times, and this test looks for that message and displays the port the message came in on. Using this test will confirm whether the Velotron is communicating to the PC and what port settings will be needed for the Comm Port Setting menu.

> **Please be aware that this test will establish the first Velotron it sees as the main Velotron. In two Velotron setups, you may need to adjust the settings manually to accommodate two systems.**

When connecting two Velotrons, the software cannot determine the position for each Velotron (left and right). To determine which Velotron owns which COM port on the computer, plug in only the left Velotron and run the Test Comm Ports program. The COM port used by 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 the right side Velotron in *(both can now be inserted)* and rerun the test. The newly inserted Velotron 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 **Velotron(s) <u>ON</u>**. Be sure you have the **Stereo Cable(s)** inserted correctly into Load Generator(s) and USB to Stereo Adapter(s).

2 Double click the *Velotron Wingate* icon in the Velotron Wingate Program Group. The Wingate Setup Menu will open (below left): Choose **Setup** then **Comm Ports**.
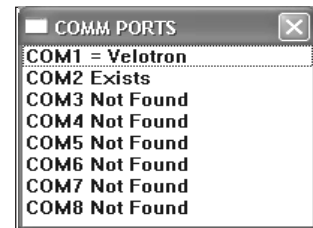
3 When the test is completed, a window like the one above (right) will display. Write the com port information displayed in the space provided at the bottom of this page for use in the software.

4 If no Velotron is found during this test, please refer to Appendix C - PC 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 confirm **Port** settings in the Comm Ports section of the Setup Menu. This test will establish the connection between the Velotron and the Wingate Software.*

Com Port Results

Com 1	Com 2	Com 3	Com 4
Com 5	Com 6	Com 7	Com 8

***Caution:** Consult your doctor before beginning any exercise program*

Velotron Wingate is a software tool designed specifically for coaches and research facilities. The Wingate test has been found useful in determining a person's fitness level. Velotron Wingate software will accept any form of "load type" a researcher may be familiar with. If you generally "drop a known weight" using a conventional ergometer, you can do that with Velotron Wingate Software. If you prefer using "percentage of body weight", you can do this as well. The software will do all the conversions and calculations for you.

The Wingate Test

It is assumed if you purchased this software you are familiar with the Wingate Test. It is also assumed you know how its use applies to your research. Because there are many realms of thought on what parameters to use for each area of research, we have no intent within the scope of this manual to educate the reader on who to conduct a Wingate test upon and how to analyze the results. Instead our goal will be to show you how to use this software to meet your research needs - regardless of what machine you have conducted Wingate tests on in the past.
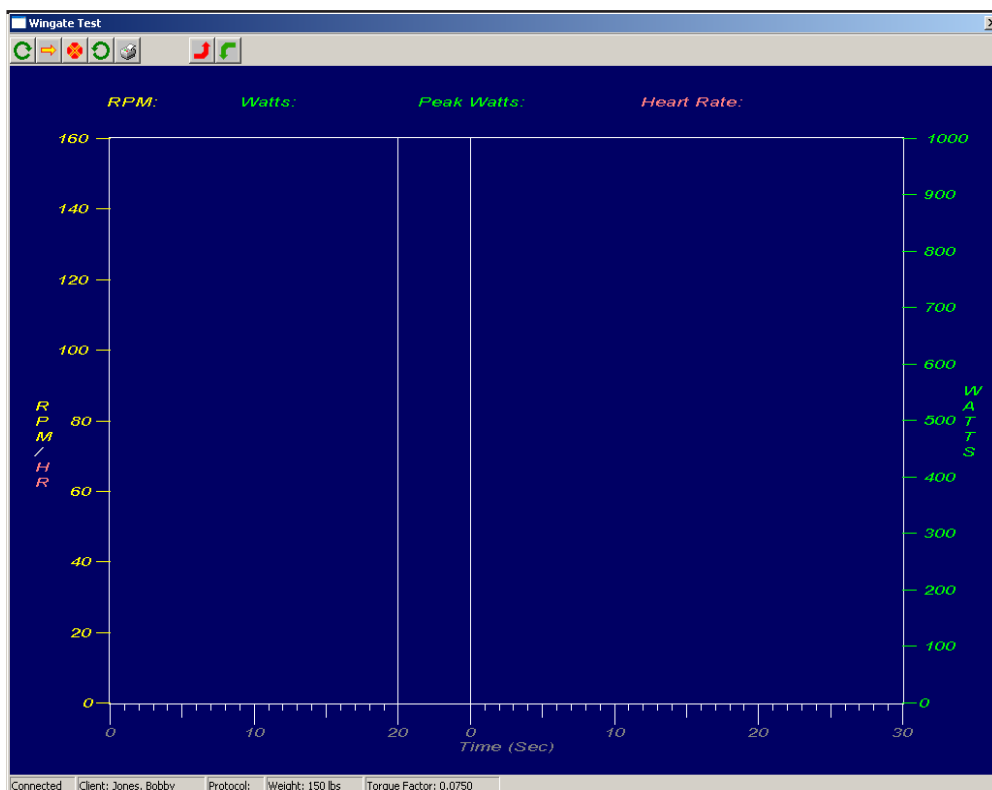
The Wingate Screen

1) Open-ended Warm-up phase with 20 second "lead-in" (adjustable) prior to Speed-Up phase.
2) Ability to adjust the load during warm-up (see "creating a New Protocol").
2) Visible Speedup phase with countdown to load increase.
3) Ability to proceed to next phase or Abort test if needed.
4) Adjustable y-axis scaling for increased data resolution.
5) On-screen display of RPM, Watts, Peak Watts and Heart Rate.
6) Results plot of either saved or unsaved performances after test.

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List of functions for Velotron Wingate Software:

☐ **Powerful Database function** - Unlimited database and client storage and creation. Immediate access to any database or client using an intuitive tree structure, or by use of more conventional drop-down menus.

☐ **Plot results** - Results will plot at the end of the test whether the performance file is saved or not. Easily plot any saved performance file from the Tree-View. Print any plot view for a hard copy of the results.

☐ **Data Displays** - Velotron Wingate software can display Anaerobic Power; Anaerobic Capacity; Fatigue Index; Total Work and other critical pieces of information. Y-axis scales can be changed to any range in both pre and post analysis.

☐ **Export** - Export performance to Comma Separated Value (*.txt) format for use in other applications that accept this file format.

☐ **Torque Types** - Select from 3 available torque functions: 1) Percentage of body weight, 2) Torque (in Newton-meters or Foot-pounds), and 3) Dropped Weight. Conversion routine allows quick check of each type relating to the other.

☐ **Print** - Print any plot of performance data -- or print an entire run of clients' results by sorting the list by any performance variable within the Wingate Results.csv file.

☐ **Protocols** - Create an unlimited variety of protocols for any test you may want to run. Protocols include warm-up workloads, variable speed-up durations, variable Wingate durations, and recovery workloads.

☐ **Cumulative Results** - Every test run on Velotron Wingate Software will be stored into the Wingate Results.csv file. This file can be sorted by any database, client, or performance variable for quick ranking of results and subsequent printing.

☐ **Two Versions Available** - Using your Standard Velotron you can run tests up to 1600 Watts at 160 RPM, or order the High Watt version to increase this range to 2300 Watts at 160 RPM. High Watt version requires new Bottom Bracket cartridge, Bottom Bracket Removal Tool and 85 tooth Front Sprocket (included).

Running the Wingate Software

☐ When first executing the software from the program shortcuts, you will be looking at the Menu screen where choices are made prior to beginning any test or analysis.

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The file menu structure is the map to using Velotron Wingate software. Each Menu heading has subheadings as shown below. Each menu and sub menu will be described in detail as you read this manual.
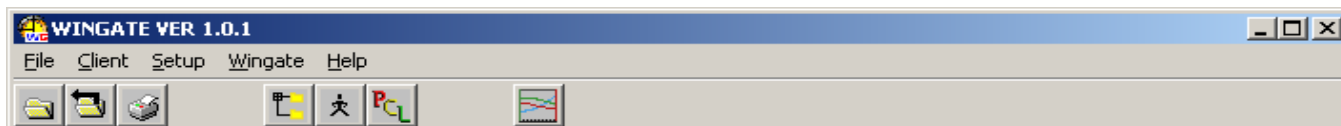
Menu Bar and Toolbar menu

File

      Open - *Opens a *.wgt file for viewing as a plot.*

      Print Setup - *Establish Printer Connections and settings.*

      Print - *Print and open plot screen.*

      Exit - *Exits the Wingate program.*

Client - *Selects and create new clients and databases.*

      New Database - *Create a new database parent for clients and performances.*

      New Client - *Create a new Client in an existing Database - or - a new Client <u>and</u> database.*

      Edit Client - *Edit an existing client record.*

      Load Client - *Load the client record for the next Wingate Test.*

      View All Clients' Results - *Views the Results.csv file (cumulative results).*

Setup - *Communications setting, Accuwatt testing, and Front sprocket settings.*

      Comm Port - *Set Comm Port for Velotron/Software communication.*

      Test Comm Ports - *Test Com's 1-8 for attached devices.*

      AccuWatt -- *Verification program to determine factory calibration values still exist.*

      Front Sprocket -- *If you are using the 85-tooth sprocket (High-Watt Wingate) set that here.*

Wingate - *Choices for new protocols and graph scaling.*

      Create New Protocol - *Create a new protocol for operating a Wingate Test.*

      Load Protocol - *Load a protocol for the next Wingate Test.*

      Edit Protocol - *allows you to edit an existing protocol and save changes.*

      Graph Scaling - *Establish y-axis scaling for RPM/Heart Rate and Wattage.*

      Run Wingate - *Starts Wingate Screen. Toolbar buttons are used hereon.*

Help

      Version Number/About Box - *display the current Wingate version information.*

Main Screen Toolbar Buttons

Load - Loads either a client file (*.clt) or a protocol (*.pcl) file in preparation for a Wingate test. The client name and protocol will each appear in the Main Screen status bar.

Load Last - Loads the very last used client and protocol in preparation for a Wingate test. The client name and protocol will each appear in the Main Screen Status Bar.

Print - Prints the plot selected from the Database and Client tree. If you have not used the print feature on this particular run, a Print Setup dialog will appear first.

Create New Database - Creates a new database. The new database will appear in the left pane Tree-View.

Create New Client - Creates a new client in either an existing database folder, or you can create a new client and database at the same time.

Create New Protocol - Creates a new protocol for use with the Wingate test.

Run Wingate - Launches Wingate Screen. If no client or protocol are selected, you will be prompted to select them before continuing.

Wingate Screen Toolbar Buttons

Start - Starts the Wingate Test. Data will begin to appear on the screen as the rider progresses towards the Speedup phase.

Next Phase - Proceed to the very next phase of the test from any phase. Allows you to skip the Warm-up phase or to end a long test early. Save dialog will still appear as needed.

Abort Wingate Test - Ends test. Use only if test should be aborted (nothing saved).

Reset - Resets Wingate Screen. By doing so you will be able start again from the beginning of the test.

Print - Prints the plot screen at the end of a Wingate Test. If you have not used the print feature on this particular run, a Print Setup dialog will appear first.

Load Up - Increases workload during Warm-Up phase and Recovery Phase. Handlebar Controller Up and Down arrow keys duplicate these keys.

Load Down - Decreases workload during Warm-Up phase and Recovery Phase. Handlebar Controller Up and Down arrow keys duplicate these keys.

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Wingate Main Screen Description
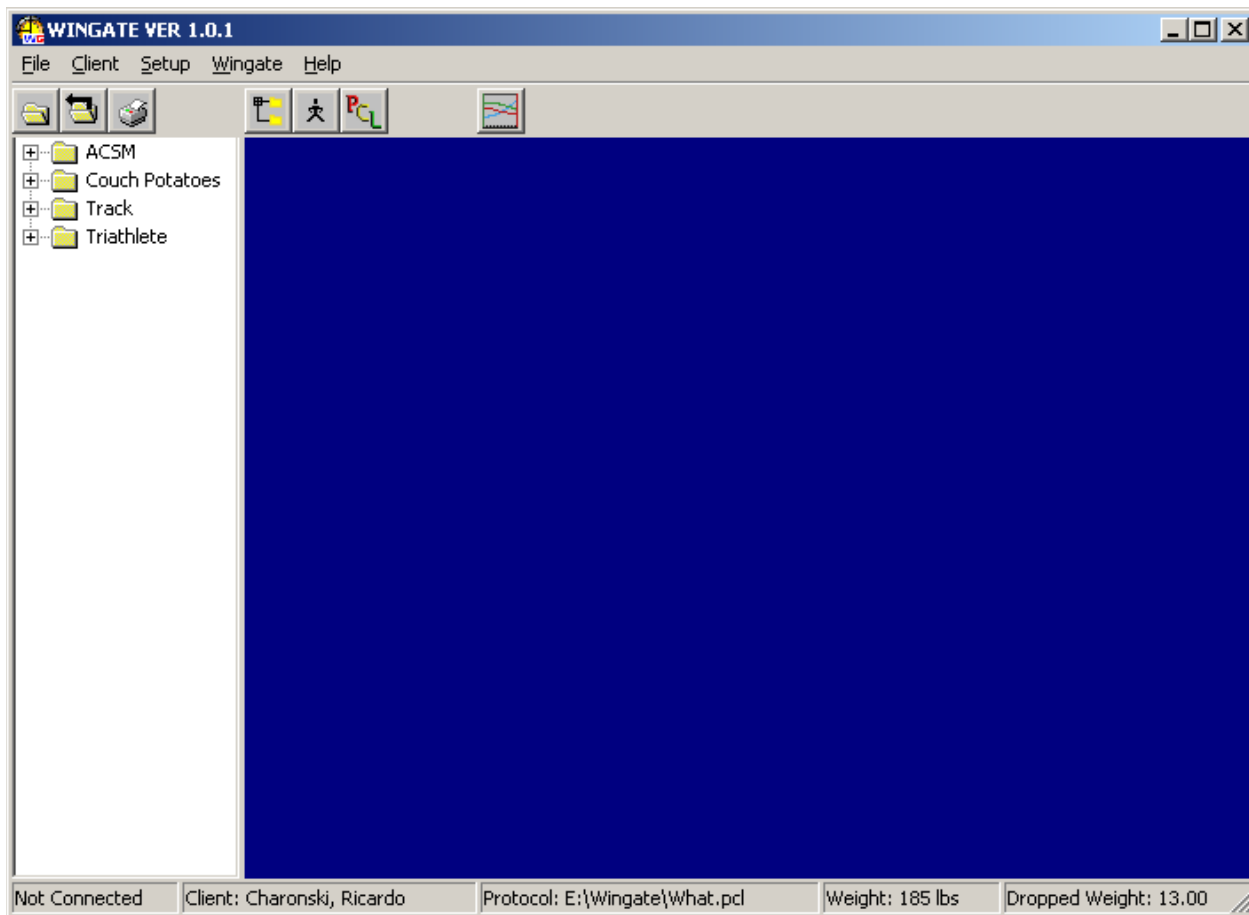
Main Wingate Screen

The Wingate screen is broken up into 5 distinct areas: 1) The File Menu is found at the top of the screen. 2) The Toolbars are found directly below the File Menu. 3) The Tree-View is in the left pane on screen. 4) The plot field is found in the right pane on the screen. 5) The Status Bar is found at the bottom of the Main Screen. The File Menu and Toolbar descriptions were described on the preceding pages of this manual.

Tree-View (left pane)

The Tree-View pane is a visual representation of the various databases and clients -- along with Wingate performance records. The Tree-View represents a "location" on the computer and can't be changed. This location, using the installation software default, is C:\Program Files\Wingate\Data and locating client records and database folders in any other location will preclude them from appearing in the Tree-View. Because the program looks at the Data subfolder of the Wingate program you do have the option *during the software installation* to locate the software in another path; for instance D:\Wingate. During any installation the Wingate program has a subfolder called "Data" that represents this left pane Tree-View.

> **Please Note:** *You can relocate databases, clients, and Wingate performance files in other locations, but you must then use the File Menu to allow browsing to these other locations*

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Tree-View - *Right-Click Functions*

The Tree-View pane also can be used for adding new databases and clients, as well as selecting performance files to plot from a client database. By clicking on the "+" sign next to any database you will see clients listed below it. By clicking on the "+" sign next to any client, the Wingate performance files for that client will be listed.

The following menus will appear using the "right-click" function of your PC mouse. Right-click on any database, client or performance record to display a menu and then left-click on the selection of choice.

Add Database   Right-click on any area of the left pane -- not already occupied by database or client text -- and the Add Database menu will appear.

   Add Database - this will display the Add Database dialog. When you have created a new database, the database parent folder will appear in the Tree-View.

Add Client
Delete Database
Rename Database

    Right-click on any database in the Tree-View and the following menu will appear.

   Add Client - this will add a client in the database folder you right-clicked on. You will also have the option to change the database location while adding a client folder.

   Delete Database - this will delete the database folder you right-clicked on. You will have the option to cancel this action.

   Rename Database - this will change the name of the database with no changes to the sub-folders.

Edit Client
Delete Client

    Right-click on any client in the Tree-View and the following menu will appear.

   Edit Client - this will open the Edit Client dialog to allow changes to the client file.

   Delete Client - this will delete the Client and any files located in the Client folder. You will have the option to cancel this action.

Plot
Export
Delete

    Right-click on any client performance in the Tree-View and the following menu will appear.

   Plot - this will open the plot of a client's Wingate performance in the right pane.

   Export - this will create a comma delimited export file in the client folder by the same name as the original, but with a *.txt file extension. You can use this export file in any program that accepts this format.

   Delete - this will delete the selected performance file.

Caution: Consult your doctor before beginning any exercise program

Right Pane

The right pane will be blank unless a performance file is selected for Plot (as shown below). The Plot of a performance file is described in detail further into this manual.
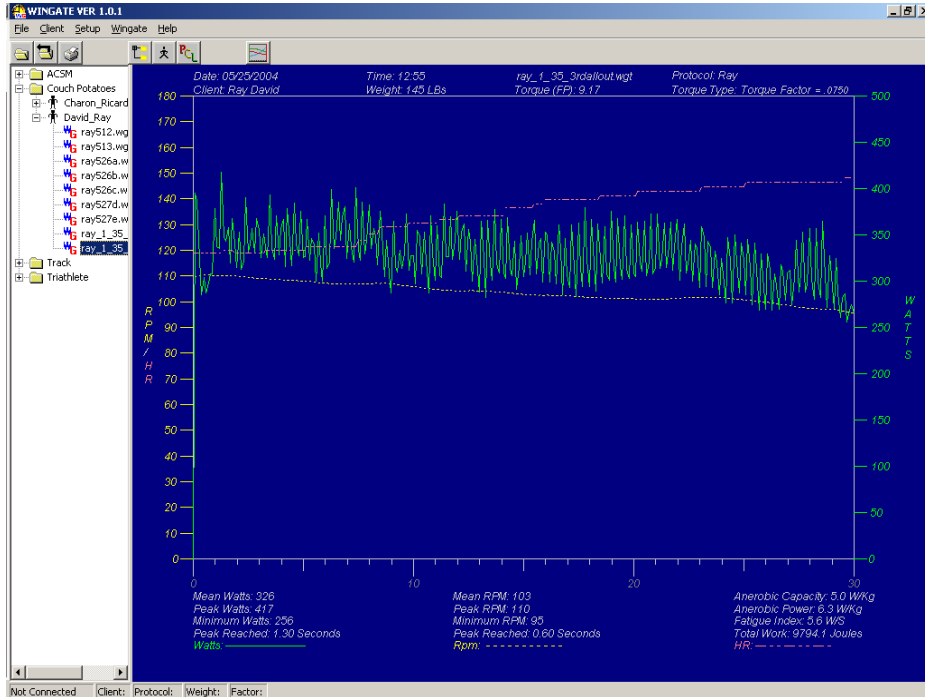
Main Screen with Plot View active

Status Bar

At the bottom of the Main Screen you will find the Status Bar. The Status Bar contains the following information:

Status Bar

Connection status - Connected means the Velotron is talking to the computer. Not Connected means a connection is not made, or the Velotron is turned off.

Client - This will show a client if one has been loaded using the **Load Client** menu or toolbar.

**Protocol -** This will show the protocol if one has been loaded using the **Load Protocol** menu or toolbar.

Weight - This will show the rider weight of the selected client in pounds or kilograms depending on the selection made in the Client Edit Screen.

Torque Type - This will show the Torque Type of the selected client.

Creating a New Database

Databases can be created one of three ways: 1) From the file menu, select Client - New Database; or 2) From the Toolbar, select Create New Database; or 3) Right-click the left pane and select Add Database. In all these cases the following dialog will appear:
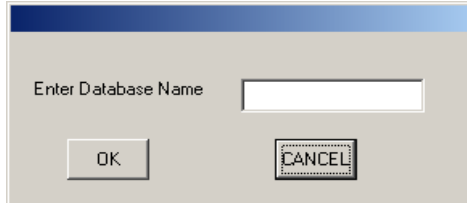

Add New Database Dialog

1 Type in the name of a Database and click OK. The new database will be added to the Data subfolder in the Wingate programs root folder and to the Tree-View.

Creating a New Client

Creating a new client can be done 3 ways: 1) From the file menu, select Create New Client; or 2) from the Toolbar select Create New Client; or 3) Right-click on an existing Database folder in the Tree-View and select Add Client. The latter (#3) guarantees the client will be created in the correct database. In all three cases the following dialog will appear:
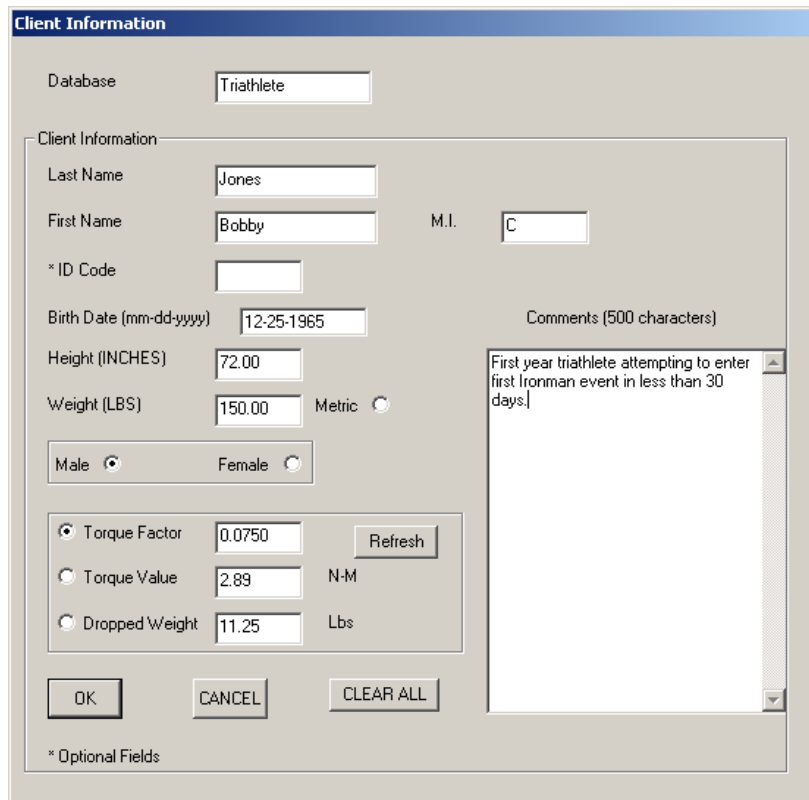
Client Dialog (New or Edit)

Caution: Consult your doctor before beginning any exercise program

Creating a New Client - *(Continued)*

The Client dialog is where you enter information about the client. You can use the *tab key* on the PC keyboard to progress through the list as follows:

Client Dialog

Database - Type in the name of the preferred database (if blank). If the database does not exist, the program will create it as well as the client information.

Last Name, First Name and M.I. (middle initial) - Type in the clients name, last name first, in the appropriate fields.

ID Code - This is not a required field, but may be helpful in your application when tying this client to another record keeping database.

Birth Date - Enter the client's birth date here. For example 08-07-1960 or 8/7/60.

Height - This value, as well as Weight, will change depending upon the Metric Selection. Inched or Centimeters can be used.

Weight - This value, as well as Height, will change depending upon the Metric Selection. Pounds or Kilograms can be used.

Metric - When selected this will change the display of the following information:
1) Height
2) Weight
3) Torque Value
4) Dropped Weight.

Male/Female - Select as required.

Torque Factor - This value is a decimal equivalent to a percent of body weight. 7.5% is presented as .075, etc.

Torque Value - This value is a decimal equivalent in foot pounds (FP) or Newton meters (Nm).

Dropped Weight - This value is a decimal equivalent to a dropped weight. 13 pounds is 13.0, etc. This value is in Pounds (Lbs) or Kilograms (Kgs)

Refresh button - Use this button to refresh the values shown in the three windows only if you type in a new value in one window and need to refresh the other two.

> **Please Note:** When you enter Client Weight, the data for Torque Factor, Torque Value, and Dropped Weight will change based upon the Torque Factor value. You can change the Dropped Weight or Torque Value and click refresh to see what this new value represents as a percentage of body weight.

Comments - Other information about the client can be added here as needed.

When finished, press **OK** to save; **Cancel** to exit without making changes; or **Clear All** to begin again.

Creating New Protocols

Creating a new Protocol can be done one of two ways: 1) From the file menu select Wingate - Create New Protocol; and 2) From the Toolbar select Create New Protocol. In both cases the following dialog will appear:

New Protocol Dialog

☐ **Protocol Name** - This will be the name the program uses to save the protocol by default, but you do have the option of typing in one name here and still changing the actual saved file name as seen by Windows™.

☐ **Warm-up Phase** - Enter a default value *(in watts)* for the Warm-up Phase and a Watt Increment value. The default Warmup value can be changed during the Warm-up Phase, but only in the increments selected here.

Please Note: The Warm-up Phase is open-ended; meaning, it has no timer or duration. When you select Run Wingate and enter the Wingate Screen you are in the Warm-up Phase. There is a 20 second "lead-in" on the Wingate Screen prior to the Speedup Phase, but this 20 seconds only begins when you press Start Wingate. You can eliminate or increase the on-screen "lead-in" by editing the Wingate.ini file as noted in the appendices.

☐ **Speedup Phase** - Enter a value *(in seconds)* for the Speedup Phase of the Wingate Test. This will determine the period of time between the Warm-up Phase and the Wingate Phase. Choose a time period the client has to reach speed before the "weight" drops. A countdown timer will appear on the screen counting backwards the amount of time entered here.

☐ **Wingate Phase** - Enter a value *(in seconds)* for the duration of the Wingate Phase. During this period the load applied to the Velotron will be based upon the values set in the Client file and will last as long as the test duration.

☐ **Recovery Phase** - Enter a default value for the Recovery Phase. The default Recovery value can be changed during the Recovery Phase, but only in the increments selected in the Warm-up Phase *(see above)*.

☐ **Description** - Enter a short description of what this test is being created for, as needed.

When finished entering data, press **OK** to save; **Cancel** to exit without making changes; or **Clear** to begin again.

Graph Scaling

The y-axis scaling on the Wingate Screen can be adjusted and it is advised to set the limits higher than the maximum potential of the client. This scale effects both the Wingate Screen and post Wingate plots, so it is possible to change the scale to *match the maximums once they are known* to achieve the highest resolution of data.

To change the Graph Scaling, go to the file menu **Wingate - Graph Scaling** and the following dialog appears:
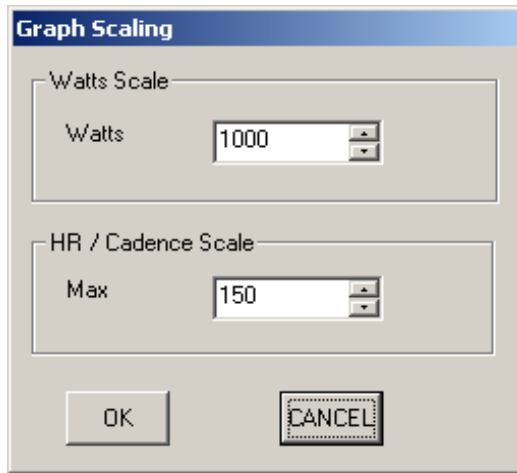
Graph Scaling

Watts Scale - This determines the y-axis for the Watts information *(shown in green on the Wingate Screen)*.

HR (Heart Rate)/Cadence (RPM) - This determines the y-axis for the Heart Rate information *(shown in Red)* and the Cadence information *(shown in yellow on the Wingate Screen)*. HR and Cadence share the same scale because they are similar in value.

Running a Wingate Test

To run a Wingate Test you must first create a Client Database, Client, and Protocol. When these have been created *(as described on the previous pages)* you are ready to run a Wingate Test.

Procedure

1 Select **Load Client** from the **Client** menu -or- by selecting the **Load** toolbar button and select *.clt from the *files of type* dialog. The client name will appear in the Main Screen Status Bar.

2 Select **Load Protocol** from the **Wingate** file menu -or- by selecting the **Load** toolbar button and select *.pcl in the *files of type* dialog. When selected the protocol name will appear in the Main Screen Status Bar.

3 Select **Run Wingate** from the Wingate file menu -or- the **Run Wingate** toolbar button. This will launch the Wingate Screen and set the parameters established in the client record and protocol file.

4 The client can now begin to warm up. The Velotron will be in the Warm-up Phase and load can be adjusted using the **Load Up** and **Load Down** toolbar buttons or the **Up/Down** arrow keys on the Velotron Handlebar Controller.

5 When the client has achieved the desired warm-up, the administrator of the test should indicate the beginning of the test to the client.

6 Press the **Start Wingate** button on the Wingate Screen to begin the test. The client will have 20 seconds *(default)* prior to the Speedup Phase to pedal, or the administrator may choose to have the client wait the 20 seconds before beginning to pedal or press the **Next Phase** toolbar button.

7 At the end of the 20 seconds the Speedup Phase will begin and a countdown will appear on the screen to indicate the time to Wingate Phase. At the end of the Speedup Phase the client should be at the required Cadence (as required by the administrator of the test).

8 During the Wingate Phase the client will pedal until the end of the test or until they can no longer pedal, at which time the test is complete. The administrator can wait the remaining time out, or click on the Next Phase button to close the session and produce the Save Dialog.
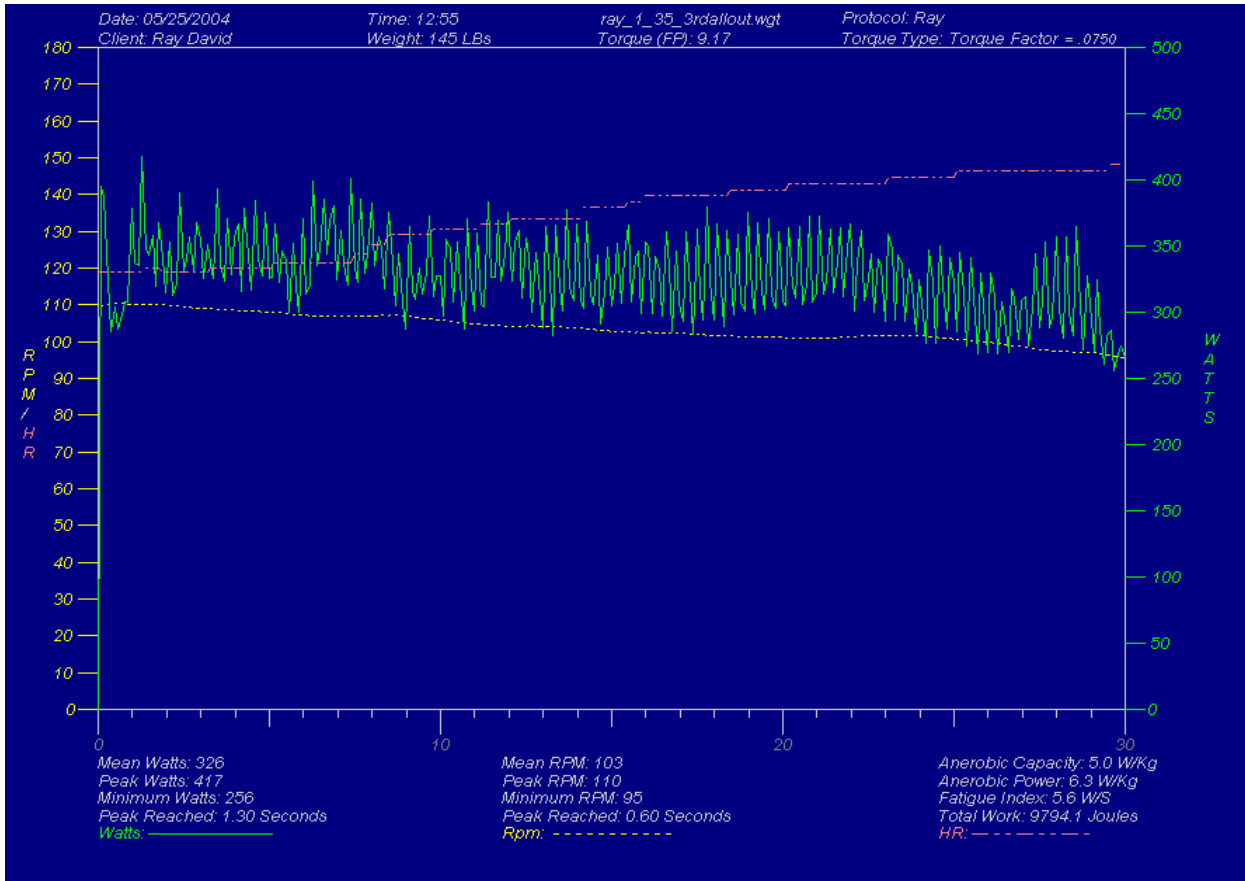
> **Please Note**: *If the test protocol is 60 seconds long, but the client only produces 15 seconds worth of data, it is advised to press the* **Next Phase** *button to end data collection. Otherwise there will be 45 seconds of "zero value data" that could affect calculations.*

9 When the Save Dialog appears, by default the performance will be stored in the client folder for whom the client file was selected. You can name the file anything you like within the long-file-name constraints of Windows™.

10 Once saved, the performance Plot Screen will appear and display the pertinent information required from this test. This plot will also occur even if you choose Cancel instead of Save.

Understanding The Plot

Date: 05/25/2004   Time: 12:55   ray_1_35_3rdallout.wgt   Protocol: Ray
Client: Ray David   Weight: 145 LBs   Torque (FP): 9.17   Torque Type: Torque Factor = .0750

Mean Watts: 326
Peak Watts: 417
Minimum Watts: 256
Peak Reached: 1.30 Seconds
Watts: _____

Mean RPM: 103
Peak RPM: 110
Minimum RPM: 95
Peak Reached: 0.60 Seconds
Rpm: - - - - - - - - - -

Anerobic Capacity: 5.0 W/Kg
Anerobic Power: 6.3 W/Kg
Fatigue Index: 5.6 W/S
Total Work: 9794.1 Joules
HR: — - - - - - - -

Wingate Plot Example

The Wingate Test is known practically around the world as the universally accepted test to determine anaerobic performance. The Velotron Wingate Plot of the of the client's performance provides data used to evaluate this anaerobic fitness in the client. Information such as Anaerobic Capacity, Anaerobic Power, and Fatigue Index are the main indicators of anaerobic fitness. Recent acceptance of "Total Work" warranted it inclusion in this software.

As was indicated in the software introduction *(on page 12)* it is not the intention of this manual to educate the reader on what the Wingate test results are, or how they are utilized. Rather, it is assumed you already know this. In the Appendices at the rear of this manual you will find definitions and charts if they are needed.

Printing Plot Data

You can print any plot being displayed by pressing the Print button. When doing so, make sure you set the printer to Landscape mode.

The Wingate Test

The Wingate test, introduced in the 1970's, has been used to measure short duration anaerobic power while cycling. Performed using a typical leg ergometer a resistance is set at 75 grams per kilogram of body weight and the test usually lasts 30 seconds. Using Velotron, you can choose percentage of body weight, a known weight, or a known torque value.

The test requires supramaximal effort for this 30 second period against a constant force (determined by the amount of weight calculated by the formula above). This force should yield the absolute maximal power and to also cause a noticeable development of fatigue with the test duration.

Due to the nature of the test, it is usually advised to encourage the client to continue to the end of the test. A personal "cheering section" is customary. It is also advised to "educate" the client to perform at a maximum even from the beginning of the test and not to store up energy for the end of the test. There should be a slight climb in RPM at the beginning of the test to a steady decay over time.

The Wingate test displays the following information:

☐   **Peak Power** - The highest mechanical power seen during the test.

☐   **Mean Power** - This represents the average mechanical power during the test.

☐   **Anaerobic Capacity** - This is Mean power divided by body weight. Shown as Watts per kilogram.

☐   **Anaerobic Power** - Peak Power divided by body weight. Shown as Watts per kilogram.

☐   **Fatigue Index** - Peak Watts minus Minimum Watts divided by test duration. Shown in Watts per second.

☐   **Total Work** - Average Watts time test duration. Shown in Joules

Optimal Load

The results of the Wingate test depend upon the Workload selected for each client. If the workload it too low the client will be able to maintain a high level of RPM during the entire test. If the workload is too high, the test may end prematurely. Each application has an optimal workload that should produce the best results in power output. The problem lies in how best to assess this optimum workload.

Due to the exhaustive nature of the test it could take many repeat tries to zero in on what should be the best setting for each client, but this would be a brutal trial and error attempt. Instead, it is assumed that a persons weight constitutes a similar relationship between muscle mass and total body mass and the following guidelines likely assume this. There are exceptions that should be noted for people with various muscular deficiencies and those in our population suffering from obesity and adjustments made to account for these.

Suggested Optimal Load

To allow comparisons to Wingate tests conducted on mechanically braked ergometers., the Velotron Wingate Test assumes the same geometry of a Monark™ ergometer in its calculations. The following are some of the suggested* workloads as if you were using that device (Inbar, Bar-Or, & Skinner, 1996) and can be applied to the Velotron Wingate Software.

Males	percent of body weight	Torque Factor
Sedentary	7.5%	.075
Active	9.8%	.098
Phys.Ed Students	8.7%	.087
Military	9.4%	.094

Females		
Sedentary	7.2%	.072
Active	9.5%	.095
Phys.Ed. Students	8.4$	.084
Military	9.1%	.091

Children (to age 14)		
Boys	5.0%	.050
Girls	4.7%	.047

*These figures are only a suggestion and RacerMate makes no claim to the validity of these figures.

The Warmup Period

The Wingate scale displays in seconds of time. A 20 minute warm-up (1200 seconds) when scaled next to a 5 second Speedup phase and 30 second Wingate Phase would offer very little screen real estate for the Wingate Phase. To minimize the problems related to switching screens from a warm-up screen to a Wingate screen, it was decided to remove the warm-up time period from the Protocol editor in favor of showing only a (default) 20 second lead-in of Warm-up Phase on the Wingate screen. This lead-in can be adjusted still, but has been relegated to the Wingate.ini file for editing. To edit the time period, or remove it altogether, edit the Wingate.ini as follows:

[options]
warm-up seconds=X (where X equals the time period of warm-up lead-in in seconds).

Warmup Period Notes

- It is advised not to exceed the duration of the Wingate Phase duration. Although doing so will not affect the test results, or the plot results, it my be harder to tell when the test is about to begin.

- If you set the warm-up period to zero and launch the Wingate Test, you will still be in the warm-up mode until the Start Wingate button is pressed.

The Wingate Results.csv file

At the conclusion of every successful Wingate test the Wingate results.csv file is updated with the same information as shown on each Wingate Plot screen. If you go to the **Client** menu **View All Clients Results** you will see what looks to be a spreadsheet format. If you click on the heading of any column in the table, this will sort that column either numerically of alphabetically. When sorted, press the **"P"** key to open a Print dialog to print the report.

Wingate Results Notes

- You can edit the Wingate Results.ini file to turn off, or on, some print fields, as needed.

- You should print in Landscape mode.

The HighWatt Wingate Version

The HighWatt Wingate Version includes an 85 tooth sprocket, which will need to be installed to provide a significant increase in Velotron flywheel speed. It is the increase of this flywheel speed that will allow the higher wattages to be reached. Any time you change the front sprocket on Velotron, you must edit the Front Sprocket setting to indicate what the new sprocket size is.

1 Open the Wingate Software

2 Go to the Setup menu.

3 Change the front sprocket setting from 62 to 85

4 Your Velotron will now be using the 85 tooth sprocket in its RPM calculations.

Caution: Consult your doctor before beginning any exercise program

Test - AccuWatt

AccuWatt confirms whether the Velotron is still calibrated and functioning as it was when it left the factory floor -- which will eliminate any doubt about the validity of a test. The factory calibration value must be entered using the Velotron Coaching Software prior to running this test to give AccuWatt its reference point (see the Factory Calibration documentation supplied with your Velotron). Once entered, the AccuWatt program will provide you with two pieces of data: 1) deviation from factory reading and 2) deviation from each previous run of the AccuWatt program.

Running the AccuWatt test

1 Go to **Setup\AccuWatt**

2 Accelerate to between *22 and 23 Miles Per Hour* and stop pedaling. It is important to stop all leg movement forward or backward during this portion of the test -- but do not unclip from the pedals.

3 When the speed decelerates to 22 MPH the test will begin and load will be applied. The results screen will then appear showing a pulse count, factory deviation, and successive deviation.

4 Further instructions are also shown on the screen prior to the test to aid in running more tests or to exit.

Please Note: Some deviation from the factory setting will occur and is normal. Typical deviation will be very small, less that 0.05%. To exceed the rated +/- 1.5% wattage accuracy established for Velotron, a change of almost +/- 2500 pulse counts must occur. Anything less than this is acceptable, but trends towards higher than normal pulse count errors may be cause for investigation.

Caution: Consult your doctor before beginning any exercise program

Setup Tips for your PC and Velotron

☐ 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.

☐ This application requires Microsoft DirectX. Be sure to install the **DirectX** program supplied on the Velotron Installation CD-ROM or verify whether you have a current version on your PC already. Do so 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 Velotron software.

Communication Tips - Test Comm Ports

A Velotron uses *Serial Communication* on the PC to transmit data to and from the PC and Velotron. A problem with the communication path between the Velotron and the USB to Stereo Adapter can keep the two systems from "talking" to each other.

One problem diagnosing communication errors is the limited information provided by the computer. We have included within the Velotron Wingate Software a test that will query the devices attached to your computer and report back to you those which pertain to the Velotron software. Using *Test Comm Ports* will provide information needed for Velotron setup, i.e., whether a Velotron is connected; what active Com port(s) exist; and the com port settings for each. See Page 11 – Testing for Installed Components for further details on this test.

☐ Make sure the **Velotron** is **ON** and the **Stereo Cable** is inserted into the **USB to Stereo Adapter** and **Load Generator** when using the *Test Comm Ports* program.

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

No Velotron(s) detected:

☐ The **Stereo Cable** is not plugged into the **USB to Stereo Adapter** or the **Ext. PC** connection on the **Velotron Load Generator.**

☐ Check the **Stereo Cable** for shorts or breaks using troubleshooting sheets available on the CompuTrainer.com web site (these are common to both Velotron and CompuTrainer).

☐ Use Windows™ Device Manager to verify the existence of available serial ports. Run Add New Hardware Wizard to auto-detect uninstalled hardware.

Caution: Consult your doctor before beginning any exercise program

Troubleshooting Q&A

Q: I've just setup the software. My Wingate Screen indicates there is No Communication"
A: Velotron Wingate uses serial communication to talk to a Velotron See the Serial Communications Tips found on page 30.

Q: Why, after I've selected the right communications port, but the software still doesn't respond?
A: First verify your computer meets minimum system requirements. 9 times out of 10 the problem turns out to be a woefully inadequate video card (not enough memory). If this appears to be OK, check that the newest and or correct video card drivers have been installed from the manufacturers web site.

Q: Why do you use a text file for your export instead of CSV?
A: CSV files will be associated to a spreadsheet program (if installed) automatically. You may want to edit these files outside a spreadsheet program (like in Notepad), and so by making them a text file you can right click on them and use the Open With program to open the file in the program of your choice.

Keyboard Shortcuts

On the Main Screen you have Alt-Menu functions available only

Handlebar Controller Shortcuts

F6 (Fn-F3) Key -   Brake Flywheel

Up /Down Keys -   Change load during Warmup Phase

Caution: Consult your doctor before beginning any exercise program

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