Wireless Raceclock Interface
User's Guide

For use with the Time Machine Sports Timing Systems

Developed and maintained by
Flying Feet Computers, Inc.
www.timemachine.org

INSTRUCTION TO THE USER

This equipment has been tested and found to comply with the limits for a class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

In order to maintain compliance with FCC regulations, shielded cables must be used with this equipment. Operation with non-approved equipment or unshielded cables is likely to result in interference to radio and TV reception. The user is cautioned that changes and modifications made to the equipment without the approval of manufacturer could void the user's authority to operate this equipment.

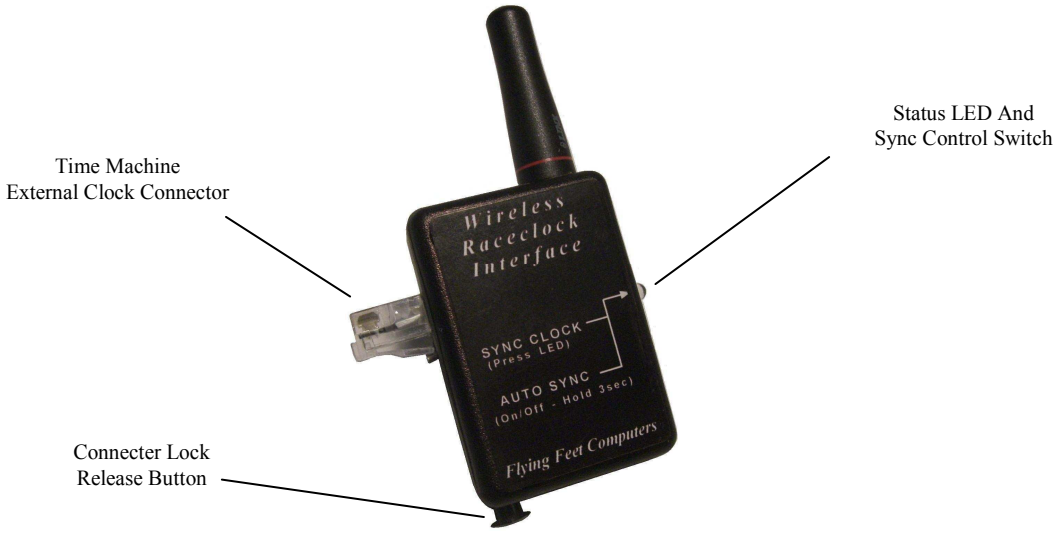
This Unit has been tested to comply with FCC standards. FOR HOME OR OFFICE USE.

Thank you for purchasing the Wireless Raceclock Interface for use with your Time Machine sports timer. The Wireless Raceclock Interface provides you with a convenient wireless link between your Time Machine and any LM-Series or XL-Series Raceclock equipped with a Wireless System Receiver. Please refer to the **Raceclock Wireless System Receiver User's Guide** for detailed information about programming and using the receiver unit. This wireless link will allow you control or synchronize one or more Raceclocks at distances up to 500 feet away from your Time Machine. The Wireless Raceclock Interface utilizes high quality RF technology and components to provide you with a reliable wireless solution to enhance your timing operation.

I. Description

The Wireless Raceclock Interface allows you to wirelessly control one or more Raceclocks from a single Time Machine. This gives you the ability to conveniently perform the following operations:

1. Synchronize one or more Raceclocks to a Time Machine's internal timeclock.
2. Synchronize any number of Raceclocks to each other using a Time Machine – independent of Raceclock location.
3. Pre-set Raceclock's display to any value or Clear the display.
4. Start the Raceclock's timer in either Count-Up or Count-Down direction and Stop the Raceclock.
5. Display Finish Times & Place#s from the Time Machine on the Raceclock – Either 1st thru 4th or 1st thru 10th place.



Wireless Raceclock Interface

The Wireless Raceclock Interface unit features a Status LED which doubles as a "Sync Control" Switch, an RJ11 Plug for connecting to the Time Machine's External Clock Port and a "Lock Release" Button to unlock the RJ11 Plug from the Time Machine's socket.

Power for the Wireless Raceclock Interface is supplied by the Time Machine over the data port, so no additional batteries are required. Since the unit is powered by the Time Machine, it will turn on whenever the Time Machine is turned on. It can also be "hot connected" to the Time Machine, which means it can be plugged in or removed while the Time Machine's power is on. The Wireless Raceclock Interface uses very little power, so its loading affect on the Time Machine's battery is negligible.

Finish Results Adapter

An optional "Finish Results" Adapter is available which allows you to send finish times and place numbers from the Time Machine and display the results on your Raceclock. This adapter provides a connection between the RS232 port of the Time Machine and the Wireless Raceclock Interface box.

The Time Machine can also be modified to allow Finish Results to be transmitted through the External Clock Port (in addition to Clock Times). In this case, the Finish Results Adapter would not be required for displaying finish result on your Raceclock.

Please see section IV for a complete description on displaying Finish Results data.

II. Installation

For Clock Control/Synchronization
(or Both Finish Results & Clock with TM modification)

The Wireless Raceclock Interface box simply plugs into the "External Clock" port of the Time Machine (See image to the left). The RJ11 "phone type" connector features a lock tab which secures the connection. When inserting the connector into the socket, make sure it is pushed in firmly enough to engage the locking tab.

To remove the Wireless Raceclock Interface, press the "Connector Lock Release Button" (located on the bottom of the enclosure) and pull it away from the Time Machine.

The Wireless Raceclock Interface can be installed or removed from the Time Machine at any time – regardless of whether the Time Machine's power is turned on or off.

For Finish Results Only

In order to display Finish Results from the Time Machine, the Finish Results Adapter will need to be plugged into the Time Machine's RS232 Port. In this case, the Wireless Raceclock Interface box plugs into the right input port of the Finish Results Adapter (see image to the left).

The left input port of the Finish Results Adapter is an extension of the Time Machine's RS232 port signals. This allow you to connect your computer interface cable to the Time Machine (and connect to your computer) while using the Wireless Raceclock Interface at the same time.

Note:
The Time Machine can be modified to allow both Finish Results and Clock data to be transmitted out the External Clock Port. Contact Flying Feet Computers if you are interested having this done.

III. Using the Wireless Raceclock Interface

When the Wireless Raceclock Interface is powered up, its Status LED will blink on and off 5 times to indicate that it is receiving power and the circuitry is functioning properly. After this initial power-up, the Status LED will illuminate whenever the Wireless Raceclock Interface is transmitting data – which only occurs when it receives data from the Time Machine.

To use the Wireless Raceclock Interface, simply perform some "timeclock" operation with the Time Machine. For example, if you pre-set the Time Machine's timeclock to some value (using the SET TIME key), then that same pre-set time will be transmitted over to the Raceclock's receiver and displayed on the Raceclock display. If you start the Time Machine's timer, then the Raceclock will start running synchronized to the Time Machine's timeclock. If you stop the Time Machine's timeclock, then the Raceclock will also stop.

Forcing a Synchronization

When the Time Machine is started, the Raceclock will synchronize to the Time Machine's timeclock. However, once the Raceclock has been initially "synced", its internal clock will run independent of the Time Machine. So if the Raceclock is stopped or if its timeclock is changed, then it will no longer stay synchronized to the Time Machine. If the user wanted to force a re-synchronization of the Raceclock without stopping and re-starting the Time Machine's timeclock, then this can easily be done by pressing and releasing the Status LED – which acts as a "Sync Clock" switch.

Note:
You will notice a delay of a few seconds from the moment that the Time Machine is started (or Sync Clock is pressed) until the Raceclock's display is synchronized. This delay is normal. It is due to a delay in the data output from the Time Machine's External Clock port along with a delay required to Clear, Pre-Set and Start the Raceclock. The Wireless System Receiver compensates for these delays to provide an accurate synchronization. The synchronization accuracy is typically within $1/100^{th}$ of a second.

Auto Synchronization

The Wireless Raceclock Interface can be placed in an "Auto-Sync" mode, which will cause it to continuously transmit clock synchronization signals whenever it receives timeclock data from the Time Machine. This occurs once per second when the Time Machine is running. If the Raceclock has not yet been synced, then it will synchronize to the Time Machine when it receives a "sync" signal. However, if after 10 minutes the Auto-Sync signals are still being transmitted, the Raceclock will re-synchronize to the Time Machine – therefore it automatically "re-syncs" every 10 minutes. The Auto-Sync mode is toggled on or off by pressing and holding the Sync Control switch until the LED illuminates (approx 3 seconds).

The Auto-Sync mode "status" is saved in memory - so the Wireless Raceclock Interface will continue to operate in whichever mode was last selected by the user. If "Auto-Sync" was last selected, then the Wireless Raceclock Interface will operate in the auto-sync mode each time it is used. If not, then the Status LED will need to be pressed to force a synchronization

Synchronizing Multiple Raceclocks Separated by Any Distance

The Auto-Sync mode can be very useful for synchronizing several Raceclocks spread out over long distances - such as in a marathon or half marathon course.

To accomplish this, the user would set up the Raceclocks along the course – each equipped with a Wireless System Receiver – and then just turn the power on each of the clocks. The user would then install the Wireless Raceclock Receiver into a Time Machine and start its timeclock at the beginning of the race (or pre-set the Time Machine to Time-of-Day if desired). With the Wireless Raceclock Interface setup in the Auto-Sync mode, it will transmit a "sync" signal once every second – which can be verified by observing the Status LED "flash on" once per second. The user would then simply move the Time Machine to within signal range of the Raceclocks and they will automatically sync up to the Time Machine's timeclock – and therefore be synced to each other. The signal range is typically 300 to 500 feet.

For example, the user could place the Time Machine in a vehicle and just drive by the Raceclocks. When a Raceclock receiver "sees" the sync signal, it will automatically synchronize the Raceclock to the Time Machine. This will effectively synchronize all of the Receclocks to each other to within approximately 0.02 seconds.

IV. Displaying Finish Results

The Wireless Raceclock Interface will transmit Finish Results whenever it receives finish result data from the Time Machine. The Time Machine transmits finish result data from its RS232 Port, therefore the Wireless Raceclock Interface needs to be connected to that port. However in order to connect to the proper RS232 pins, an adapter is required – the Finish Results Adapter. This adapter also extends the RS232 port signals so that they can still be used for connecting to a computer while the Wireless Raceclock Interface is connected. Refer to section II for installation instructions.

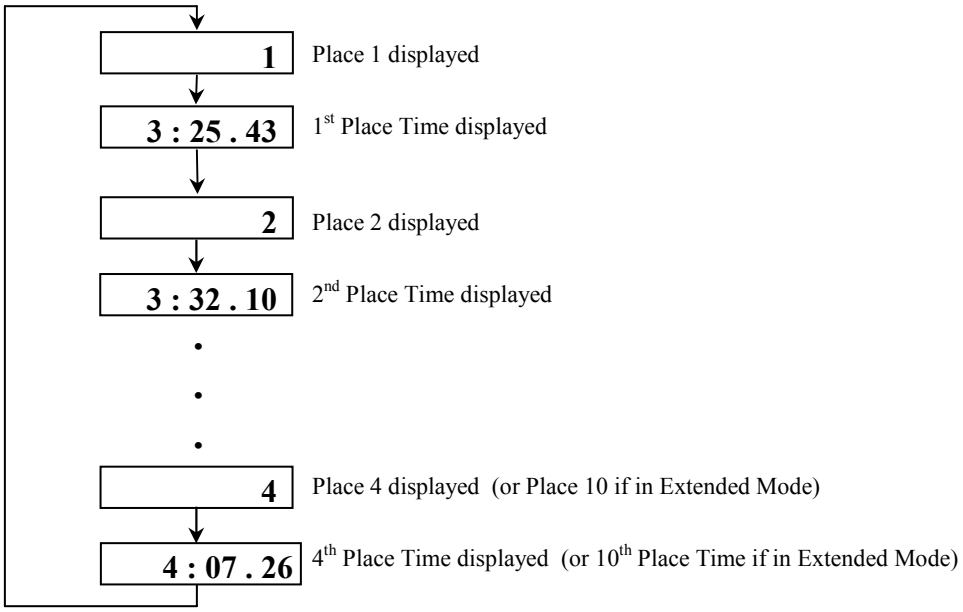
The Time Machine is also capable of transmitting finish result data out of its External Clock Port along with the timeclock data – however this would require a modification to the Time Machine's circuit board. Basically a pin on one of the components needs to be cut. If you are interested in having this modification made, please contact Flying Feet Computers. With this modification in place, the Wireless Raceclock Interface will transmit both Clock data and Finish Results to the Raceclock's receiver without having to move it from the External Clock Port to the RS232 Port. The Time Machine sends "timeclock data" when it is started and "finish results data" when the timing buttons are pressed – therefore when a finish occurs (1st place finish), the Wireless Raceclock Interface switches from sending "timeclock" data to sending "finish results" data.

Finish Results consist of Place Numbers and Finish Times and are they are displayed on the Raceclock in a sequential manner. Normally 1st place through 4th place results are displayed, however an "Extended Results" mode can be selected to display 1st place through 10th place if desired.

Displayed Results

After a first place finish occurs, the Time Machine sends finish results data to the Wireless Raceclock Interface and it transmits this data to the Raceclock receiver unit. At this point the Wireless Raceclock Interface enters into the "Finish Results" mode of operation. In this mode, it sends finish data to the receiver in sequential order.

The Raceclock then displays these results in sequential order as follows:



If fewer than four (or ten in Extended Mode) finishes have occurred, then once all of those results have been displayed, they will simply be repeated.

Extended Results Mode

The Wireless Raceclock Interface will typically transmit only 1st through 4th place results. However if the user prefers to display additional results, this can be done by entering into the Extended Results mode. The Extended Results mode is selected by pressing and holding the Status LED until it illuminates (approx 3 seconds). Once in this mode, the Wireless Raceclock Interface will transmit up to the 10th place result. If the user decides to go back to the normal "1st – 4th place" mode, then this can be done by pressing and holding the Status LED again. So pressing and holding the Status LED causes the Extended Results mode to toggle on or off.

The Extended Results mode "status" is saved in memory, so the Wireless Raceclock Interface will continue to operate in the last mode that was selected by the user. If "Extended Results" was last selected, then 1st-10th place will be displayed each time the Wireless Raceclock Interface transmits results. If "Normal Results" was last selected, then 1st-4th place will be displayed each time the Wireless Raceclock Interface transmits results.

Displaying 1/100 sec with XL-Series Raceclocks

If you are using an XL-Series Raceclock (LED type), then the "1/100sec display mode" will be controlled while displaying Finish Results. If the finish results are less than one hour, then it is assumed that the 6-digit Raceclock is displaying a "Minutes**:**Seconds**.**Hundredths" type of format. In this case, the Raceclock's "1/100sec display mode" is toggled when the Wireless Raceclock Interface begins transmitting results – allowing Minutes, Seconds and Hundredths to be displayed correctly. When the "displaying of results" is exited, the Raceclock's "1/100" is toggled once again to return it back to the "Minutes**:**Seconds**.**Hundredths" format. If the finish results are greater than one hour, then the 6-digit Raceclock format is assumed to be "Hours**:** Minutes**:**Seconds". In this case, the "1/100sec display mode" is not altered.

Exiting Display of Results

Once the display of finish results begins, it will continue indefinitely until exited by the user. To exit, simply press and release the Status LED. If the Wireless Raceclock Interface was connected to the Time Machine's "modified" External Clock port, then it will re-synchronize the Raceclock to the Time Machine's internal clock (assuming the Time Machine's clock is still running). If connected to the RS232 port via the Finish Results Adapter, then the Raceclock display will simply be Cleared.

V. Warranty Statement

The manufacturer warrants the original purchaser of the WIRELESS RACECLOCK INTERFACE (WRI) that it shall be free of defects resulting from faulty manufacturer of the product or its components for a period of one year from the date of sale. Defects covered by this warranty shall, at the option of the manufacturer, be corrected either by repair or by replacement. The replaced components will be warranted for the remainder of the original one year period.

The sole obligation of the manufacturer under this warranty is limited to repair or replacement of products pertaining to the WRI only, which prove to be defective within one year of purchase. The manufacturer shall not, in any event, be liable for any consequential damages or loss of profits of any kind resulting from the use of the WRI or the technical information enclosed in this document.

Please fill out the Product Registration Form and fax, email or mail it to Flying Feet Computers, Inc. This product must be registered within thirty (30) days from the date of purchase in order to activate your warranty coverage.

Product Registration Form

Please fill out the following information and fax, email or send it to:

Flying Feet Computers, Inc.
11112 204th Ave Ct. East
Bonney Lake, WA 98391
(800) 328-4070 ph.
(253) 863-1689 fax
www.timemachine.org

By sending this form back to us, we can let you know of additional products and upgrades as they become available. This form is also used to activate your warranty coverage.

Name	Company Name	
Phone#	Address	
Cell#	City	
Purchased From	State	Zip
Date Purchased	Email	