



The Leader in Event Critical Timing Electronics

***XLSCORE S4***  
***XL Professional Operation***  
***Software for PC's***  
  
***Owner's Manual***

Part No. 3124A Rev A.00

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*T i m i n g   S y s t e m s*

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## LIMITED WARRANTY

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To the original purchaser of this RaceAmerica product, RaceAmerica warrants it to be in good working order for a period of ninety (90) days from the date of purchase from RaceAmerica or an authorized RaceAmerica distributor. Should this product malfunction during the warranty period, RaceAmerica will, at its option, repair or replace it at no charge, provided the product has not been subjected to misuse, abuse, or alterations, modifications, and/or repairs not authorized by RaceAmerica.

Any product requiring Limited Warranty service during the warranty period should be returned to RaceAmerica with proof of purchase. If return of merchandise is by mail, the customer agrees to insure the product, prepay shipping charges, and ship the product to RaceAmerica, Inc., 280 Martin Avenue Unit 1, Santa Clara, CA 95050.

ALL EXPRESSED AND IMPLIED WARRANTIES FOR THIS PRODUCT ARE LIMITED IN DURATION TO THE ABOVE NINETY DAY PERIOD.

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## **THEORY OF OPERATION and OPERATIONAL CONSIDERATIONS**

XLSCORE S4 Software is the operational companion to the XL Professional four lane race timing hardware. The XLSCORE S4 Software runs on any PC wirelessly connected via a serial port to the XL Electronics Boxes. The software enables the PC to control all functions of the XL Professional S4 four lane Drag Timing System including system setup of printers, sensor alignment, starting tree selection, and running of races. The PC also acts as a display for race results for the race director in the tower.

During normal operation, the PC sends and receives information from the timing system and is required for the XL Professional S4 timing system to function. The XL Electronics Boxes manage all track activity, actual race timing, and send this information back to the PC via a Wireless Data Comm Link.

Races can be run as standalone races in either two lane or four lane formats. The timing system will automatically detect the presence of two or four lanes.

### **LOAD THE XLSCORE PC SOFTWARE**

The XL Timing System is controlled by software programs running in the PC or Laptop. Insert the **XLSCORE** Control and Display software into the PC and copy the following three files and one folder to a desired directory of the hard drive of the PC. The files and folder to copy are named:

xlscors4.exe  
commport.dll  
fileio.dll

Insure all three files reside in the same directory or the software will not function properly. No PC restart is required to use this software after loading.

NOTE: The Windows operating system running in the PC may be configured to display a subset of the files in a directory. These OS settings may

not display the .dll files in a directory and appear as if only one file exists. If the OS is configured in this manner, it must be reconfigured to properly display all three files, however, this reconfiguration is not required to run the XLSCORE software.

The PC is connected wirelessly to the XL systems via the RS232 port and the Wireless Network units. The XL Systems should be in a powered on state with the bottom two Yellow lights illuminated on both Trees (and possibly the Stage lamps if the emitters and sensors have not been aligned). Run the xlscors4.exe file to open the XLSCORE S4 software.

The XLSCORE S4 software loads the necessary files, then the configuration data is loaded, then stored, in a file named 'xls4data.cfg'. The XLSCORE S4 software attempts to locate the serial port of the PC connected to the XL Timing Systems. Once the auto-detect is complete, the Configuration Screen in Figure 1 is displayed.

### **SAVING PREVIOUS RACE DATA**

Race results displayed on the screen are saved in a file named results.dat each time a new race is started.

To save the previous race results, the user should move, rename or copy the following file:

results.dat

If the XLSCORE S4 software does not find this file in its folder, it will create a new file.

### **CONFIGURATION SETTINGS**

All timeslips printed by the XLSCORE S4 software contain a 2-line header centered at the top of each timeslip. The header is entered on the screen (figure 1) with a maximum of 35 characters per line allowed.

Generally, after printing the last line of the timeslip, printers require a 'form feed' command to eject the timeslip, however, some printers require line feeds to eject the timeslip out of the printer instead. The number of line feeds can be

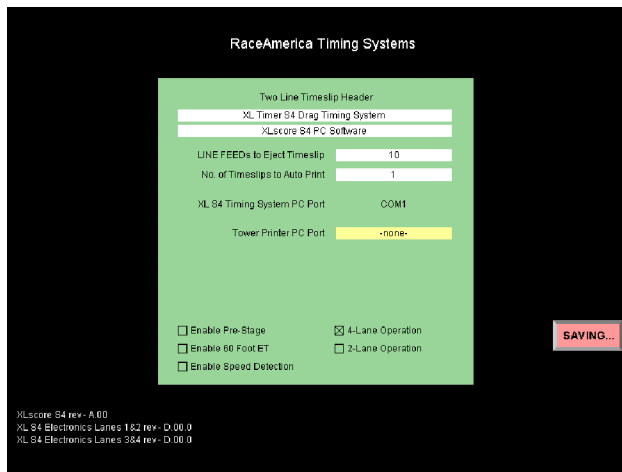


Figure 1 - Configuration Screen

entered in NO. OF LINE FEEDS TO EJECT TIMESLIP. Zero line feeds defaults to sending the 'form feed' command to the printers. Some experimentation may be required to match the number of line feeds required to the specific printer connected to the timing system or to the PC.

When a race has completed, XLSCORE S4 can automatically print up to nine timeslips by entering the desired quantity in NO. OF TIMESLIPS TO AUTO PRINT. Entering a zero disables this feature.

The serial port of the PC connected to the timing system is detected during startup of the XLSCORE S4 software, the port name will be displayed, or '-none-' if the timing system was not detected. Click the LOCATE XL BOX button to make another attempt at locating which PC Port is connected to the timing system and establish communications with the XL Electronics Boxes at the start line.

The lower left hand corner of the screen contains the revision levels of the XLscore S4 software and the revision levels of each XL Timing Box. If the PC was not able to communicate with one of the XL Timing Boxes, the revision level will appear as ???.???.? in place of the actual revision level. If one or both revision levels appear as ???.???.? in error, click on the LOCATE XL BOX button to re-locate the XL Timing Boxes and retrieve their revision levels.

Based on the number of XL Timing Boxes the PC was able to locate, the software selects the

number of lanes to be used as 4-LANE OPERATION or 2-LANE OPERATION. This selection cannot be changed by the user.

Remote printers are connected wirelessly to the PC and used as timeslip printers on the track. Local printers are connected directly to the PC in the tower.

Printers can be connected to the XL timing system as well as a local printer connected directly to the PC. The PC port is selected using a pulldown menu at the top of the screen titled LOCAL PRINTER PORT.

The local printer can be configured to print timeslips as well by using the pulldown menu at the top of the screen titled LOCAL PRINTER ASSIGNMENT.

Click the ENABLE PRE-STAGE box to turn on the Pre-Stage bulbs at the same time as the Stage bulbs for each lane.

Click the ENABLE 60 FT ETs box to enable the system to check for a proper alignment condition prior to allowing a race to start if the 60 Ft option is present.

Click the ENABLE SPEED DETECTION box to enable the system to check for a proper alignment condition prior to allowing a race to start if the Speed option is present.

After all selections have been made, click on the SAVE SETTINGS button to save the configuration information and continue or click on the QUIT button to end the software program

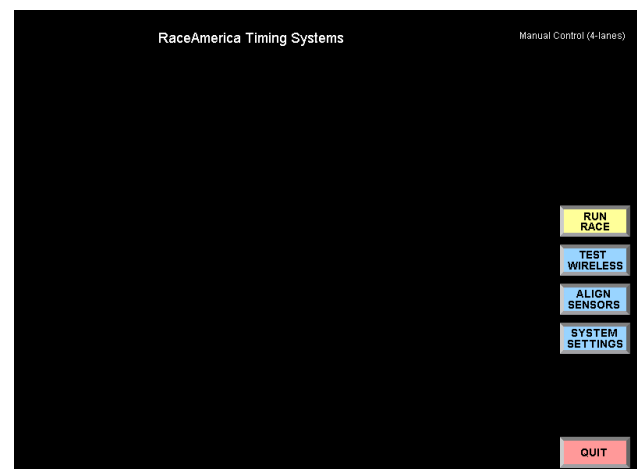


Figure 2 - Main Menu

without saving the configuration data displayed on the screen. **SAVE SETTINGS** turns off the bottom yellow lights on the Tree(s).

The Main Menu Screen shown in Figure 2 is then displayed on the PC and is used to test the wireless networks, align sensors, return to the system settings screen, and to run races.

For a detailed explanation of the information displayed by the XLSCORE S4 software screen used to perform these functions, review the **SCREEN DEFINITION** pages in this manual.

If there is no communication port on the PC configured for the XL Timing Systems, the Main Menu screen will disable several functions which require communications to the timing system.

### PRINTER CONFIGURATION

If a serial printer is connected to the XL system via wireless link network, it must be configured to 9600 baud, 8 bit data, no parity, and 1 stop bit.

If a serial printer is connected to the PC COM ports, it must also be configured to 9600 baud, 8 bit data, no parity, and 1 stop bit. Parallel printers connected to the LPT ports of the PC do not require baud rate settings.

### ALIGNMENT MODE

At this point the system is ready to check alignment of the IR Track Sensors and IR Beam

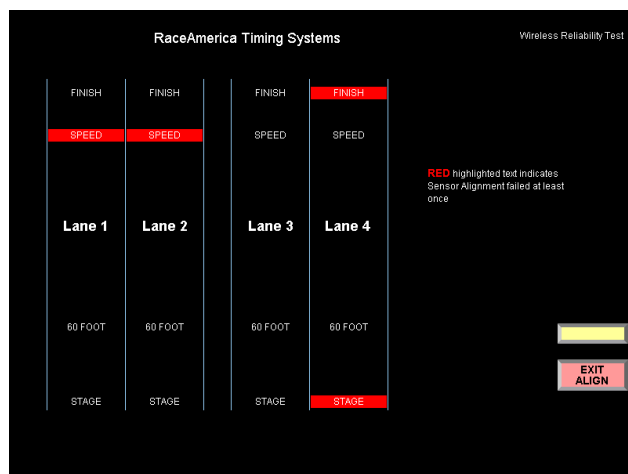


Figure 3 - Alignment Screen

Emitters to insure accurate race results and detection of the vehicles on the track.

To verify the alignment of the Sensor/Emitter pairs, click on the **ALIGN SENSORS** button for 60ft/Speed/Finish and the Alignment Screen shown in Figure 5 is displayed.

In alignment mode, the timing system is placed into a continuous monitor mode checking the alignment of all sensors and displaying the results on the PC screen updated approximately every second. When an IR Beam Emitter and IR Track Sensor are detected to be out of alignment, the position name (i.e. 60ft, Speed, etc.) will turn RED in the display. The corresponding light on the tree will also illuminate. If the sensor is intermittently out of alignment, the position name will alternate in color between RED and WHITE. If the sensor is way out of alignment, the position title will remain RED until alignment is established. Figure 3 illustrates Lanes 1&2 Speed IR Sensor/Emitter alignment has failed and Lanes 4 Stage and Finish have failures and require attention to continue racing or the XL Timing System will not start the tree.

While in alignment mode, the tree will also display the alignment status of all sensors. Left/right lights on the tree correspond to left/right sensors as follows (by lane):

Tree Light	Sensor
-----	-----
Left Stage	Left Stage
Left Upper Yellow	Left Finish
Left Middle Yellow	Left Speed
Left Bottom Yellow	Left 60ft
Left Red	Left Stage
Right Stage	Right Stage
Right Upper Yellow	Right Finish
Right Middle Yellow	Right Speed
Right Bottom Yellow	Right 60ft
Right Red	Right Stage

When a lamp is illuminated, the corresponding sensor is out of alignment. If the Rear Facing Lights option is installed, the tree can be helpful when aligning sensors downtrack. If no Rear Facing Lights option is installed, rotate

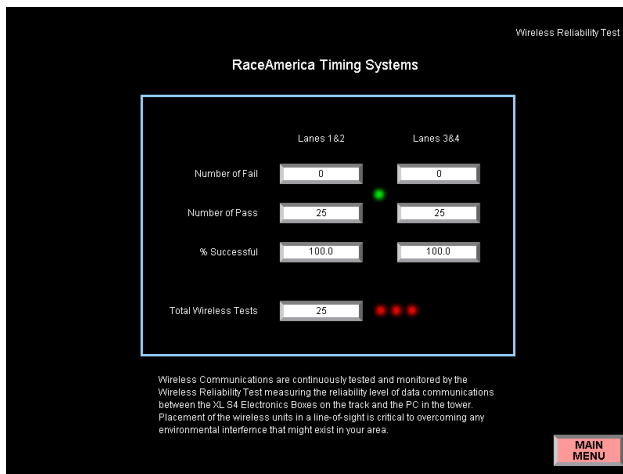


Figure 4 - Test Wireless Screen

the tree to face down the track. As alignment is corrected, the corresponding light goes out (if the tree was rotated to face downtrack, remember the corresponding lights will also be reversed from left to right).

To maximize the alignment of the emitter/sensor pairs, it is suggested to rotate the Beam Emitter slowly left and right until out of alignment, to detect the left/right limits of alignment. Using the PC screen or tree lights to establish these limits will help establish these limits. This technique will determine the maximum lateral detection angle. Rotating the Beam Emitter up and down until out of alignment determines the maximum vertical detection angle. Once these extremes are established, position the Beam Emitter in the center of the left/right detection angle and up/down detection angle. Repeat this same process with all other Beam Emitters and all Track Sensors. This will maximize the alignment accuracy.

Follow the following procedure to align the Stage/Guard Dual Beam starting line sensors. For each lane, block the Stage beam at the sensor side and align the Guard beam at the start line until the Stage light is illuminated on the tree. Rotate the Dual Beam sensor unit left and right to identify the extent of the adjustment and detection angles. Do the same with the Dual Beam Emitter units. Unblock the Stage beam and the Stage light will go out if both beams are aligned properly. Proper operation of a Dual Beam unit will illuminate the Stage light when the Stage beam is blocked.

Blocking both the Stage beam and the Guard beam will turn the Stage light off.

To exit the alignment screen, click on the EXIT ALIGN button. The program will return to the main menu ready to time and score the first race.

## WIRELESS TESTING

If the system is experiencing trouble with communications between the PC and XL boxes, click the TEST WIRELESS button to put the PC into a monitored wireless test mode.

The screen display (Figure 4) shows the test results. During the test, the sensor alignment function is active so interrupted beams will display on the Trees.

Any more than 1% failure rates should be cause to reposition the wireless link units for more optimal performance.

## RUNNING A RACE

The XLSCORES4 software program has been made simple to operate (Figure 5). One screen will provide all the normal race information.

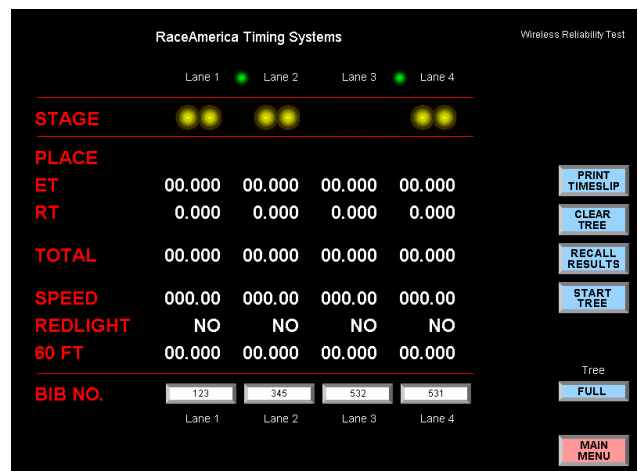


Figure 5 - Vehicles Staged

## STEP 1 - GETTING READY FOR THE NEXT RUN

The XLSCORE Software is very flexible. The system operates with racers in one to four lanes without the need to manually break the beams in the unused lane(s).

If desired, enter the Bib Numbers into the field at the bottom of the PC screen using the TAB key to move from one field to another. Up to 5 characters can be entered for the Bib number.

Click on the tree type button to toggle the starting tree type between PRO (where all 3 yellows illuminate at the same time then the green illuminates - 0.4 seconds), and FULL (where each yellow illuminates in sequence, then the green - 0.5 seconds).

If the 60FT or Speed Detection options are not connected to the system, the sensors for these options must be disabled to tell the timing system to skip testing for correct beam alignment at the start of each race.

NOTE: It is not necessary for Stage to be illuminated to start a race. If a vehicle is not properly staged when starting the tree, the timing system will start the ET timer when the Stage beam is interrupted (this will also stop the RT timer).

Figure 5 also shows green dots between the Lane 1/2 and Lane 3/4 column headings; this

means wireless communications is established between the PC and the particular XL Box. A red dot means no communication. The system will operate with only two lanes if two lane operation was indicated on the configuration screen.

## STEP 2 - STARTING A RACE

Click the CLEAR TREE button to clear the tree. Clicking on the START TREE button will cause the timing system to clear all previous race data and utilize the settings entered in STEP 1. This step is irreversible and previous race results cannot be recalled when starting the tree for the next race.

The timing system continuously checks all sensor alignments to best insure the equipment has not failed or been bumped out of alignment.

As the race begins (Figure 6), reaction times are measured by the timing system starting when the bottom yellow light is illuminated in each lane. When all lanes have started and their reaction times measured and stored (as well as any red light foul info).

As the race progresses, the 60FT times are measured, then the vehicle's speed, and the elapsed time for each lane if these options are present. When all lanes which broke the start beam cross the finish line, the PC updates with all measured statistics (Figure 7). The Finishing Order is

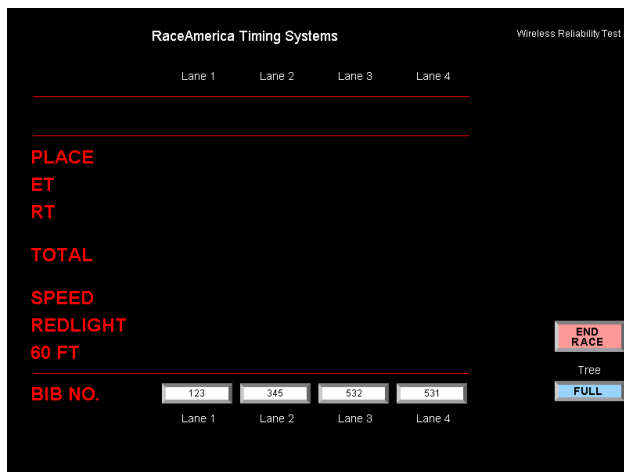


Figure 6 - Race under way

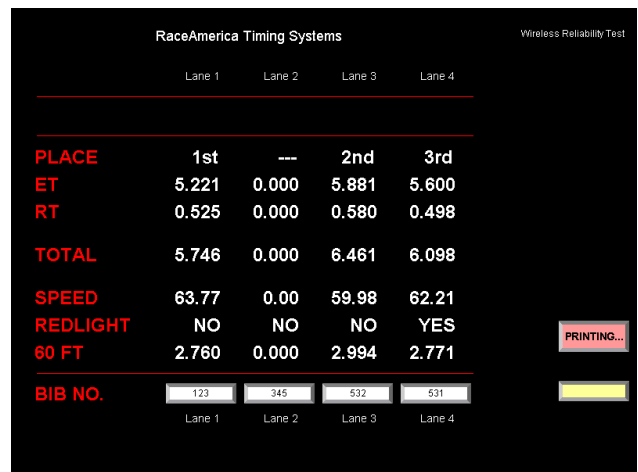


Figure 7 - Race over, Printing results

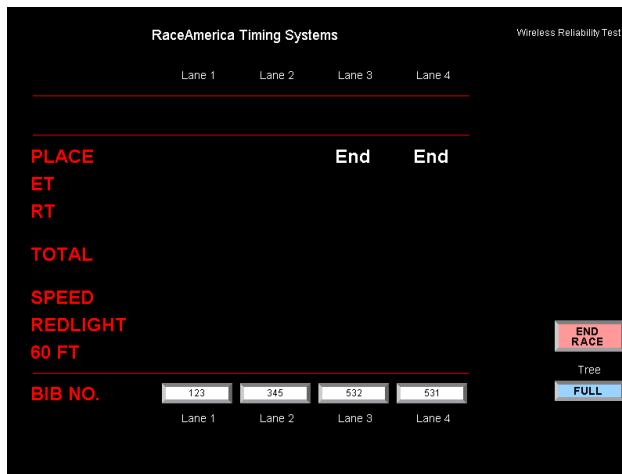


Figure 8 - Pressing END RACE will tell the system there is no more data coming.

displayed on the screen as well. Results are sent out to Scoreboards and Printers if Auto Print is enabled.

NOTE: If a vehicle in either lane 'breaks' the starting beam but is unable to cross the finish line and 'break' the finish beam, click on the END RACE button (Figure 8) to tell the timing system the race is over. It is not necessary to manually block the start or finish beams in the lane not starting or not finishing. All measured statistics will be updated on the PC based on how far the vehicles were able to progress down the track. (i.e. 60ft times will be reported if the vehicle 'breaks' the 60ft beam). Speeds cannot be reported unless both the Speed and Finish beams are broken by the vehicle.

Clicking on the PRINT TIMESLIP button prints a timeslip on all printers connected to the timing system and PC. Click on the PRINT TIMESLIP button for each additional timeslip to be printed. If a number was entered in the Configuration Screen to automatically print timeslips at the end of each race, timeslips are printed at this point and the number of copies are displayed during the printing process.

### STEP 3 - TREE OPERATION POST RACE

When the race is over, the trees are updated to show the finishing order with a green light illuminated in the winning lane, the green light plus bottom yellow for the 2nd place lane, the green and two bottom yellows for the 3rd place lane and the green plus all yellows for the 4th place lane. Results are based on total time (RT + ET).

While the trees are displaying race results, the stage lights and beams remain active to allow staging of the next set of vehicles. Clicking on the CLEAR TREE button clears the tree lights and enables the timing system for the next race. Clicking on the RECALL RESULTS button recalls the last race results to the tree and the PC.

### STEP 4 - BEAM ALIGNMENT ERRORS

If an out of alignment condition is detected after the START TREE button is pressed, the timing system aborts the starting of the trees and the PC displays the Alignment Screen shown in Figure 3. Make correction and restart.

NOTE: The 60FT and Speed sensors can be enabled or disabled to reflect the presence of track electronics at these positions on the track. Disabled sensors will not be tested before starting a race; however, will report a time if one is registered.

### RACE RESULTS FILE DEFINITION

Race results are saved to a file (results.dat), the data is stored in a tab delimited format. This format provides easy import into most spreadsheet software applications.

Once the race results data is imported into a spreadsheet, the data forms a multi-column representation of the race results displayed on the PC screen after each race. Each race adds four lines of information to the '.dat' file, **first lane 1 lane results are added, then lanes 2, 3, and 4 results are added.** Results for all lanes are added

irregardless if only one lane is used or only one lane finishes. If a lane is unable to finish, race results saved will consist of the stats measured by the timing system for each lane as far as the vehicle could progress. An example of this would be a vehicle in lane 2 starts, crosses the 60 foot point then stalls and is unable to finish. The reaction time, redlight info and 60 foot time will be saved. The elapsed time and vehicle speed will be zero. The saved race results for the other lanes will be the same as displayed on the PC screen after the race.

Race results for all lanes are saved with any unused lane(s) containing NO for redlight, zero for ET, RT, Speed, and 60 foot.

The following column definitions apply to the spreadsheet when importing the 'results.dat' file. Columns after the import of this file into a spreadsheet application are defined from left to right as:

Date and time stamp  
 Lane identification text  
 Bib number as entered on PC screen  
 Place  
 Elapsed time  
 Reaction time  
 Total time  
 Vehicle speed  
 Redlight as YES or NO  
 60 foot elapsed time

Initially the data is sorted by the Date/Time Stamp column, then by the Lane Identification column.

To view a driver's list of runs in a chronological order, sort by the Driver's Name column, then by Date/Time Stamp column.

NOTE: Many spreadsheet applications have preference settings which set the default for the Date/Time format giving the appearance of a shortened Date/Time stamp. The format of the Date/Time column is MM/DD/YY or DD/MM/YY for the date and HH:MM:SS AM/PM for the time. The time is acquired from the PC's date and time settings. If the date or time is logged incorrectly to the file, the problem is corrected by resetting the date or time in the PC operating system.

### TIMESLIPS

The first two lines of any timeslip can be changed to reflect the local race program information.

	LANE 1	LANE 2	LANE 3	LANE 4
PSGDRA				
Ken Crouch				
BIB NO.	12	34	56	78
PLACE	2nd	1st	3rd	4th
ET	12.789	12.856	13.941	13.967
RT	0.757	0.685	1.302	1.555
TOTAL	13.546	13.541	15.243	15.522
SPEED	22.24	21.91	27.69	8.76
REDLITE	NO	NO	NO	NO
60 FT	4.896	4.822	5.523	5.058

Timed by RaceAmerica Corporation  
[www.raceamerica.com](http://www.raceamerica.com)

Figure 9 - Sample Timeslip

## PC SCREEN DEFINITIONS

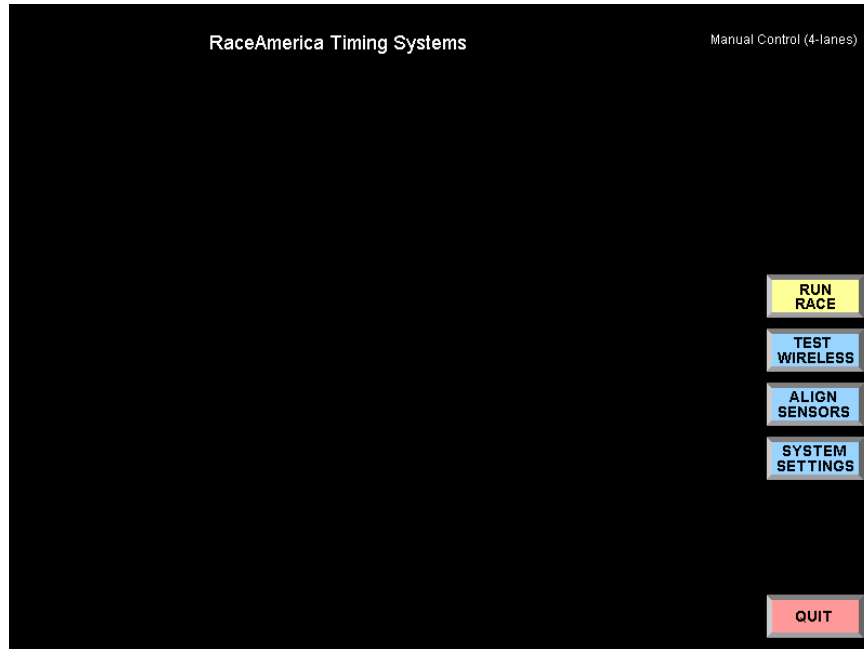


Illustration 1 - Main Menu Screen Definitions

RUN RACE

Run all races; manual entry of Bib numbers can be made

TEST WIRELESS

Test Wireless communications reliability

ALIGN SENSORS

Track electronics setup and realtime alignment test

SYSTEM SETTINGS

Configuration settings for the XLSCORE software and PC

QUIT

Exit the XLSCORE software program

## PC SCREEN DEFINITIONS

Wireless Status

Lanes Staged

Bib Numbers

	Lane 1	Lane 2	Lane 3	Lane 4
<b>STAGE</b>	●●	●●		●●
<b>PLACE</b>				
<b>ET</b>	00.000	00.000	00.000	00.000
<b>RT</b>	0.000	0.000	0.000	0.000
<b>TOTAL</b>	00.000	00.000	00.000	00.000
<b>SPEED</b>	000.00	000.00	000.00	000.00
<b>REDLIGHT</b>	NO	NO	NO	NO
<b>60 FT</b>	00.000	00.000	00.000	00.000
<b>BIB NO.</b>	123	345	532	531

Illustration 2 - Before a race; lanes 1, 2 & 4 staged

No racer Lane 2

Finishing Order

	Lane 1	Lane 2	Lane 3	Lane 4
<b>PLACE</b>	1st	---	2nd	3rd
<b>ET</b>	5.221	0.000	5.881	5.600
<b>RT</b>	0.525	0.000	0.580	0.498
<b>TOTAL</b>	5.746	0.000	6.461	6.098
<b>SPEED</b>	63.77	0.00	59.98	62.21
<b>REDLIGHT</b>	NO	NO	NO	YES
<b>60 FT</b>	2.760	0.000	2.994	2.771
<b>BIB NO.</b>	123	345	532	531

Illustration 3 - When displaying race results