RACE AMERICA

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Finish Order Scoreboard Owner's Manual

Models 6604 and 6804 - Rev C1

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PRODUCT OVERVIEW

The Model 6604 and 6804 Finish Order Scoreboards(6X04) are microprocessor controlled systems based upon the 7-segment format display digit using the latest technology Ultra-Bright LEDs. The display uses an RS232 serial link to receive data to be displayed. The 6X04 displays the finishing order by lane when connected to the RaceAmerica Timer S4 four lane drag timing system.

NOTE: THIS PRODUCT USES ULTRA-BRIGHT LED TECHNOLOGY. DUE TO THE BRIGHTNESS LEVEL OF THIS DISPLAY, CARE SHOULD BE TAKEN, AS WITH ANY BRIGHT LIGHTING SOURCE,TO AVOID PROLONGED VIEWING AT CLOSE RANGE AND SHORT DISTANCES. AS WITH ANY BRIGHT LIGHTING SOURCE, VISION MAY BE AFFECTED SHORT TERM SIMILAR TO FLASHBULBS ON CAMERAS.

PACKAGE COMPONENTS

1 - 6X04 Finish Order Display Unit
1 - Power Patch Cord
1 - Owner's Manual

Model 6X04 Available Options:

06-X100 RS232 Cable up to 100'
4500A Data Communication POD (for printers and displays greater than100ft from console)
07-3434 RS422 Cable (for use with PODs)
4520A Wireless Network Links (2 req'd)
6501A AC Power Adapter
6076A Heavy Duty Storage/Carry Case (8")
6075A Soft Side Case (8"0)

LOCAL REQUIREMENTS

Additional items required to operate the 6804 Series Digital Display and options:

1 - 12VDC automotive battery

Other options:
AC power source fo AC adapters

PRODUCT SPECIFICATIONS Model 6804

Display Type:	7-Segment
Digit Height:	Eight Inch Tall
Number of digits:	Four
Dimensions:	20-1/4" x 46-3/4" x 3"
Mounting:	Top 1/4" Eyelets - 30" c
Housing:	Powder coated aluminum
View Filter:	Red Transparent acrylic
View Range:	320' in full sun
Power Reqt:	11.5 to 12.6VDC/1A

PRODUCT SPECIFICATIONS Model 6604

Display Type:	7-Segment
Digit Height:	15" x 7.75
Number of digits:	Four
Dimensions:	64.1" x 22.3" x 4"
Mounting:	Ends 1/4"-20 bolt holes
Housing:	Powder coated aluminum
View Filter:	Red Transparent acrylic
View Range:	600' in full sun
Power Reqt:	11.5 to 12.6VDC/2A

POWER REQUIREMENTS

The Display can be powered by a 12VDC automotive battery or any 12VDC power source capable of 0.45 ampere current load maximum. Average power consumption is approximately 0.3 ampere. Maximum voltage should never exceed 13.2VDC at Power Input Connector.

PRODUCT SET-UP

Model 6804 Finish Order Scoreboard is designed to hang free using the top eyelets supplied with the display. A display stand is also available from RaceAmerica to hang the display at a good viewing level 40" above ground level.

The Model 6604 will require a more substantial mounting; the enclosure is provided with two hangers and numerous 1/4-20 blind mounting nuts on both sides.

STEP 1 - Configure the Display

The DIP Switches are located on the backside of the display. They are used to match the communications format and the display format to the data sent to the display from the timing system. To determine the correct switch settings, read the **DIP SWITCH SETTINGS** section of this manual. Switch settings have two positions, ON and OFF. The ON position is indicated on the DIP switch and is active when the switch button is moved to the right side when viewed from the back of the display. The Display is shipped from the factory to be viewed from the starting line with the left lane as #1 (all switches ON).

STEP 2 - Attach the Lane Number Panel

The Lane Number Panel attaches with the two eyebolts and washers. The display can be configured to be viewed from the starting line or the finish line. Coordinate the DIP Switch (#4) and the side of the lane number panel to be viewed based on which way it will face on the track. The eyebolts screw into the nuts in the top of the display. Use the eyebolts to hang the display.

STEP 3 - Connect the Interface Cable

The interface cable contains an RJ45 modular connector on both ends of the cable and is connected to the display using the SERIAL PORT connector on the back of the display. When inserting this connector, press inward until a click is heard to lock the cable in place. If the cable remains loose and no click is heard, carefully bend outward the locking tab on the RJ45 connector approximately 45 degrees from the connector body. Re-insert the cable into the serial port until the click is heard and the cable remains locked in place. To remove this cable, pinch the locking tab against the body of the RJ45 connector and pull the connector out.

If the Display is located more than 100' from the Timer S4 console, extended range communication PODs (Model 4500A) and cabling (07-3434) are required to be inserted between the Timer and Display. Check with the POD manual or RaceAmerica directly if there is a question about the proper data cabling. Additionally, wireless Data Comm Link units (Model 4520) can be used to avoid the need for data cable connections.

STEP 4 - Connect the Power

Power is supplied to the display through the 12VDC POWER INPUT connector located on the rear of the display. Connecting power to the display will set the display into a power-up self-test mode. Once the self-test has succesfully completed, the display is ready for use.

POWER-ON SELFTEST

When the 6X04 power source is connected, the display begins an internal self-test and and external visual check of the display elements.

The self-test begins by stepping through each segment of all four digits, one segment at a time . The self-test continues by sequentially illuminating each segment until all segments are on; then the four digits display four dashes, four ones, four twos, four threes and four fours in sequence. The self-test continues by drawing a square frame by sliding a small square from left to right, then down and right to left. The square then collapses and the revision level of the code running in the microprocessor is displayed. The display is now ready for use.

NOTE: IF SWITCH NUMBER 1 IS SET TO THE 'OFF' POSITION DURING THE POWER UP SELF-TEST, THE DISPLAY WILL CONTINUOUSLY LOOP ON THE SELF-TEST UNTIL SWITCH NUMBER 1 IS SET TO THE 'ON' POSITION.

OPERATION

The display automatically scores the finishing order when all lanes which start have finished. If a lane does not finish, the End Race button on the Timer S4 must be pressed to display the finishing order for the other lanes. The Display analyzes the finish data and shows the finish order based on ET unless there was a foul start (red-light) in which case red-lights go to the last position (multiple red-lights are ordered from 'best' to 'worst'). If a lane(s) do not start, a dash is displayed for the unused lane(s).

DIP Switch settings allow the display to automatically clear after thirty seconds or two minutes (see DIP switch #6). In either case, the display will update when new data is received.

The display automatically clears after 30 seconds or 2 minutes, selectable through DIP switches on the rear of the display.

The information displayed will be the same as printed on a timeslip and the same as displayed on the Trees.

The display automatically scores the finishing order of only the lanes used for the race. If only two lanes were used, the display indicates the lanes who finished and a dash is displayed for the unused lanes. The picture above indicates lane 4 finish and lane 2 finished second. Lanes 1 and 3 were not used during this race.

View when standing at the Start Line
Display located at the Finish Line

View when standing at the Finish Line
Display located at the Start Line

DIP SWITCH SETTINGS

The 6X04 can be configured for several different options. The eight DIP switches located on the back of the Display are numbered from 1 to 8 and can be switched ON or OFF. The ON position is indicated on the switch itself.

Display Orientation

Use the following settings depending on the placement of the Display and the resultant view location.

Switch	Facing Start	Facing Finish
1	ON	ON
2	ON	ON
3	ON	ON
4	ON	OFF
5	ON	ON
6	ON	ON
7	ON	ON
8	ON	ON

DIP SWITCH DEFINITIONS

A more complete discussion of each switch follows:

Display Hold Time

Switch number 6 determines the length of time to display the race results before clearing the display. When race results are displayed, the display will continue to display the results for either 30 seconds or 120 seconds. If the display is sent new race results prior to the 30 or 120 seconds expiring, the display will be updated with the new results and the display hold time timer is reset to 30 or 120 seconds.

Display Hold Time	6
30 seconds	ON
120 seconds	OFF

Baud Rate

Switches number 7 and 8 determine the baud rate. All communication from the Timer S4 with the 6X04 is at 9600 Baud. Switches 7 & 8 must be ON.

Stop Bits

Switch number 5 determines the number of stop bits used during communications to the Display. The Timer S4 outputs with one Stop Bit and Switch number 5 should be ON.

Stop Bits	5
1	ON
2	OFF

Display Orientation

Switch number 4 determines whether race results are displayed to be viewed from the starting line or the finish line. The following table is used to set the switches to select the desired display orientation.

Display Orientation	4
View from Finish	OFF
View from Start	ON

Diagnostic mode

Switch number 1 enables and disables the diagnostic capabilities of the Large Display. When enabled, the Display receives data and displays error codes when invalid data has been received. The following table is used to set switch number 1 to enable/disable the diagnostic feature:

Diagnostic Mode	1
Disabled	ON
Enabled	OFF

NOTE: IF SWITCH NUMBER 1 IS SET TO THE 'OFF' DURING THE POWER UP SELFTEST, THE DISPLAY WILL CONTINUOUSLY LOOP ON THE SELFTEST UNTIL SWITCH NUMBER 1 IS SET TO THE 'ON' POSITION.

DISPLAY MAINTENANCE

The model 6X04 Digital Display does not require any maintenance to maintain proper operation. If the display is to be used in rainy or wet conditions, it is suggested to protect the back panel from direct moisture by shielding the connection to power and the serial port.

To clean the red lens, use a non-abrasive cleaner on a soft cloth. This will keep the protective lens clean and maximize visibility and clarity of the digits. If the red lens is soiled with mud or dirt, gently remove the grit using a soft cloth being careful not to press when wiping to avoid scratching the red lens material.

SPARE PARTS

Further to minimize race program interruptions, RaceAmerica recommends some spare parts. While the Display may not shut down the racing action, a spare emitter/sensor pair and sensor cable should be available in the event of an unfortunate accident during a program. Related cables and PODs for the Display should be in considered. Contact RaceAmerica for availability and pricing of spares items.

SUPPORT AGREEMENTS

Support agreements are available from RaceAmerica providing Telephone Assistance on technical issues and operational questions, repair and/or replacement of hardware failures, Software and Firmware updates and bug reporting. Contact RaceAmerica for more information and pricing of Support Agreements.

PRODUCT REVISION HISTORY

A - Original release with 'A' style display enclosure and boards. (12/02)

B - 'B' level boards and 'C' style enclosure (powder coat, PEMs, full pane acrylic); new photos. (09/03)

C - Add 15" Model 6604 and wireless communication option (08/04).