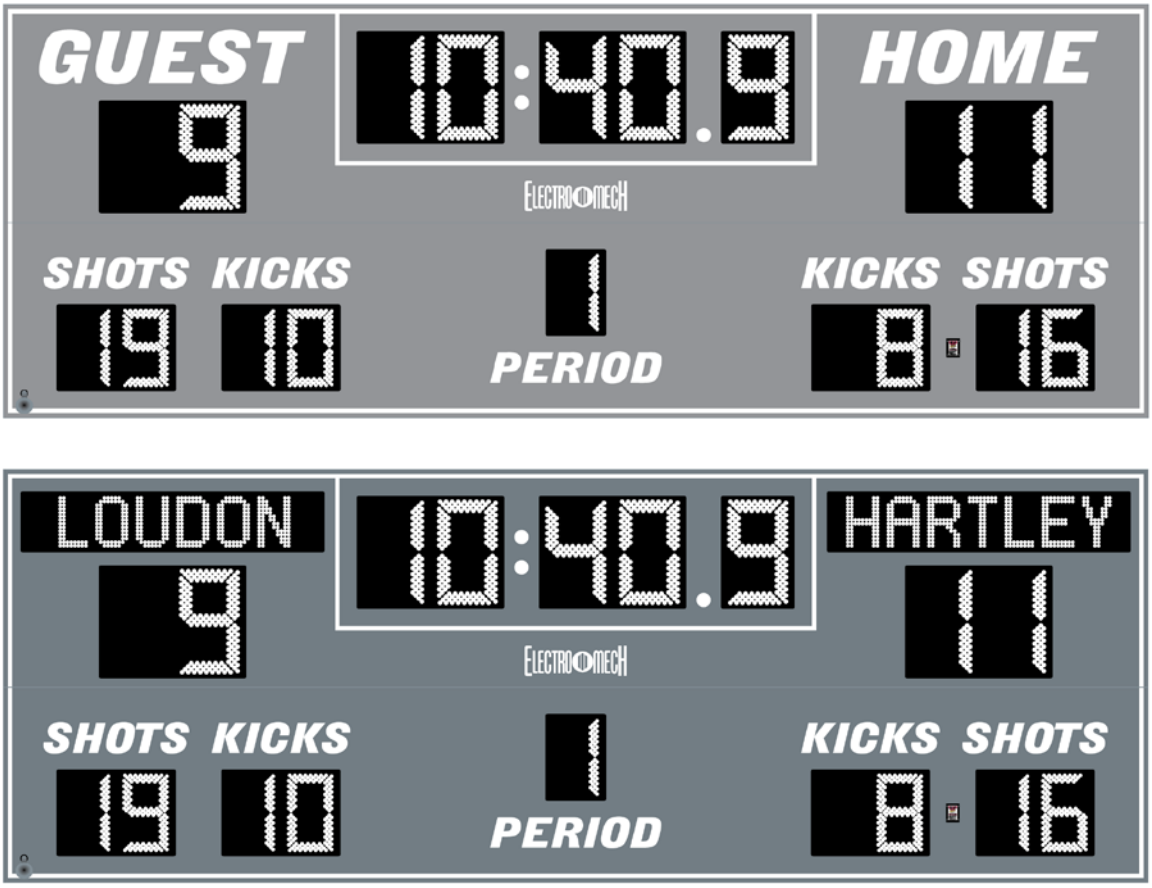
ELECTRO-MECH SCOREBOARD CO.



LX6545 SOCCER SCOREBOARD

OWNER'S HANDBOOK

Thank you for choosing an Electro-Mech Scoreboard for your athletic complex. We are confident that your new scoreboard will give many years of reliable service.

Revised: 2012-March-26

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SCOREBOARD SPECIFICATIONS

GENERAL: This scoreboard includes the scoreboard cabinets, mounting hardware, control console, 10 ft. stereo patch cable, and junction box.

DIMENSIONS: 22 ft. L x 8 ft. H x 6 in. D

WEIGHT: 550 lbs. (Top cabinet 300 lbs.; bottom cabinet 250 lbs.)

SCOREBOARD CONSTRUCTION: The outer frame is made from extruded aluminum. Internal structural parts may be extruded aluminum or formed from aluminum sheet. The face and back are made from aluminum sheet. The face and masks are finished with enamel paint. Black is the standard color. The captions and optional accent striping are vinyl.

DISPLAY: The LX6545 soccer scoreboard displays Guest and Home Scores to 99, Guest and Home Shots On Goal (SHOTS) to 99, Guest and Home Corner Kicks (KICKS) to 99, and Period to 4. The five-digit Track Clock shows MM:SS.t to 99:59.9; counts up or down; can have the Tenths of Seconds digit blanked; can show time of day; can show Segment Clock in Practice Segment Timer mode. Optional Electronic Team Names (ETNs) show up to 9 characters per Team (depending on the font selected).

DIGITS AND INDICATORS: Red or amber light emitting diodes (LEDs) mounted on printed circuit boards form the digits and indicators. The five-digit Track Clock and Scores use 24-inch tall digits. All other digits are 18 inches tall. The optional Electronic Team Names (ETNs) have an active display area of 11 inches x 67 inches (per team).

POWER REQUIREMENTS:
Scoreboard - 120 VAC, 3.1 A, 60 Hz, single phase
Scoreboard with ETNs - 120 VAC, 8.1 A, 60 Hz, single phase
Control Console - 120 VAC, 0.5 A, 60 Hz, single phase

SCOREBOARD ELECTRONICS: 100% solid state fully enclosed.

CONTROL CONSOLE: The control console features a microprocessor, 37-key sealed membrane keypad, an LCD display, and a 6-foot power cord. The console housing consists of ABS plastic base and top pieces with a steel back plate.

DATA CABLE: The optional data cable has two 22 AWG stranded copper conductors with semi-rigid PVC insulation. It also has a braided shield and a foil shield. The polyethylene jacket is rated at 300 volts. The cable is rated for direct burial and measures approximately 1/4-inch in diameter. This item is sold separately from the scoreboard.

JUNCTION BOX AND PATCH CABLE: A 4-1/4-inch x 2-1/4-inch x 2-inch junction box with a 1/4-inch stereo jack mounted on the face plate should be attached to the control cable at the point of operation. A 10-foot stereo patch cable connects the control console to the junction box.

SCORELINK RF MODEM SYSTEM: This optional accessory can be used in place of the control cable and junction box. Refer to the SCORELINK RF MODEM SYSTEM OWNER'S HANDBOOK for more information.

WARRANTY: Five-year limited warranty.

SCOREBOARD INSTALLATION

This part of the manual describes the mechanical and electrical installation of the scoreboard.

One of the items listed below must be purchased from Electro-Mech in order to complete the installation:

- Data cable (length dependent upon installation site layout)
- ScoreLink RF Modem System

Items not provided by Electro-Mech Scoreboard Company that are necessary for installation:

- Two posts (additional posts may be needed if an alternate configuration is specified)
- Power cable to connect the scoreboard to the power source
- A weatherproof power disconnect switch at the scoreboard
- Grounding hardware
- A grounded NEMA 5-15R 120 VAC receptacle for the control console at the scorekeeper's table.

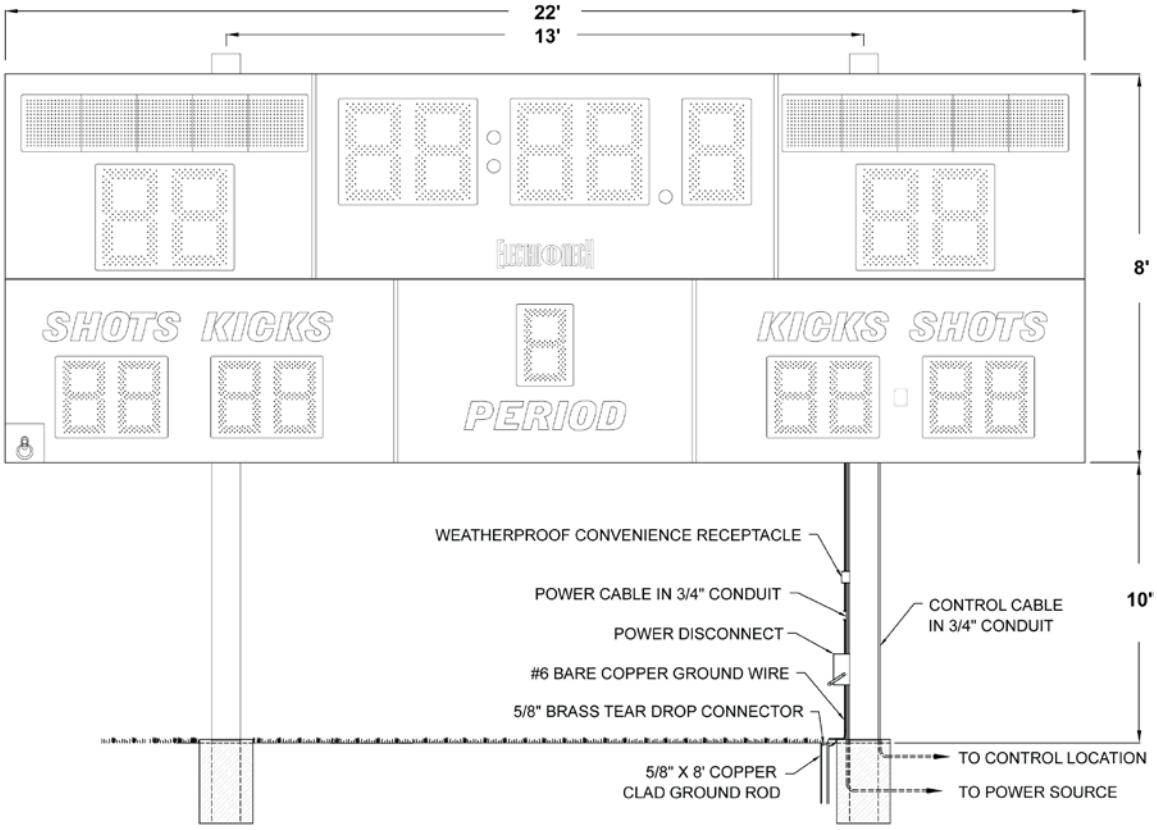
Electro-Mech Scoreboard Company performs installations in some areas. In other areas, we can help you contact an independent installer. In either case we will make every effort to answer your installation questions. Qualified personnel should perform the scoreboard installation. Consult national and local codes before beginning the installation.

MECHANICAL INSTALLATION

The mechanical installation includes installing the posts and mounting the scoreboard and the optional ID panels (if purchased) to the posts.

Post Installation

The scoreboard, in its standard configuration, mounts on two posts. Typically installers will use steel pipes or I-beams. In order to reduce the glare from the sun on the front of the scoreboard, position the posts so that the front of the scoreboard is angled away from the afternoon sun, if possible. The illustration on the following page shows the spacing of the posts for a Model LX6545 scoreboard. The mounting hardware will accommodate posts up to 7 inches outer diameter. Sink the posts in reinforced concrete footings. The specifications for the posts and concrete footings are dependent upon the expected local wind and soil conditions, the height of the scoreboard from the ground, and the local building codes. Electro-Mech Scoreboard Company assumes no responsibility for the installation of scoreboards by others.

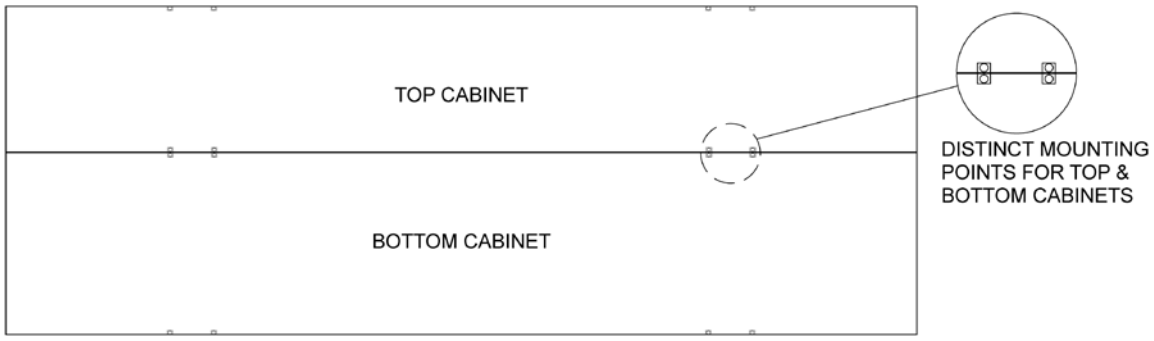


Model LX6545 Standard Post Spacing

Please verify post spacing with the manufacturer for customized packages.

Mounting The Scoreboard

The scoreboard is attached to the posts at eight points. Illustration below shows the location of the mounting points on the rear of the scoreboard.

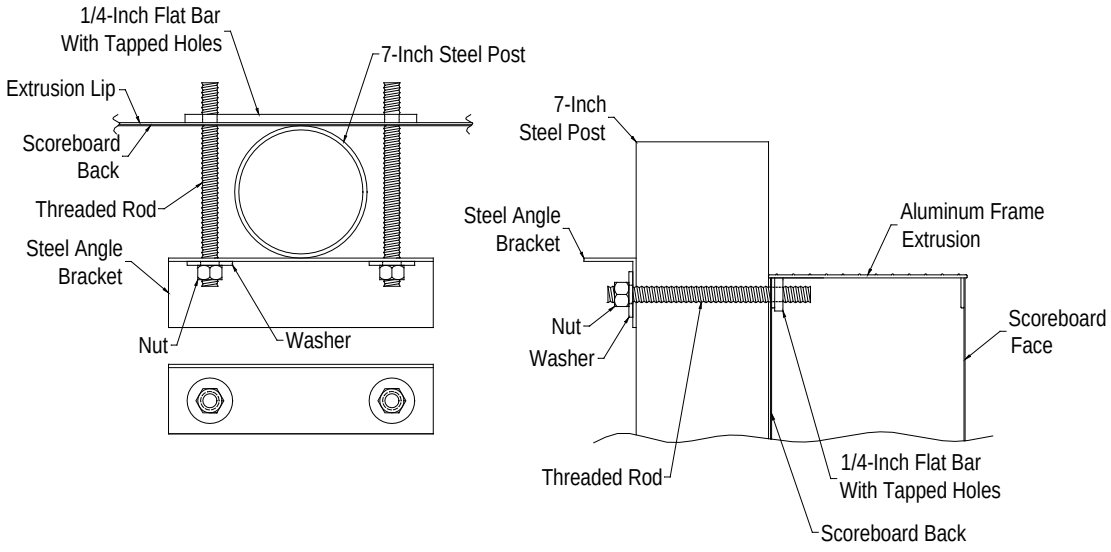


Mounting Points

MOUNTING HARDWARE

Eight sets of mounting hardware are provided to attach the scoreboard at these points. Additional hardware sets are provided to attach the optional ID panels (if ordered). A single set of mounting hardware consists of a steel angle bracket, two threaded rods, two washers, and two nuts. The drawing below shows an overhead cross section view and a side cross section view of the scoreboard attached to a post at a mounting point. A steel bar is riveted inside the scoreboard's aluminum extrusion frame. The bar has two tapped holes. The threaded rods screw into these tapped holes. The washers and nuts are used to clamp the steel angle bracket against the steel post and hold the scoreboard in place.

Overhead Cross Section View **Side Cross Section View**



Standard Mounting Method

The following steps describe how to mount the scoreboard on the posts:

1. Begin with the top piece -- the upper scoreboard cabinet if no ID panels are involved; the top ID panel if applicable.
2. Place the cabinet against the posts on the ground. Make sure the mounting points are aligned with the posts.
3. Screw the threaded rods into the tapped holes in the cabinet.
4. Place a steel angle bracket over the threaded rods at a mounting point.
5. Place a washer over each threaded rod.
6. Screw the nuts onto the threaded rods so that the bracket is loosely held in place.
7. Repeat steps 3 - 6 at the other mounting points.
8. Raise the cabinet into position and tighten the nuts to clamp it in place on the posts.
9. Repeat Steps 2 - 8 for the lower cabinet(s).

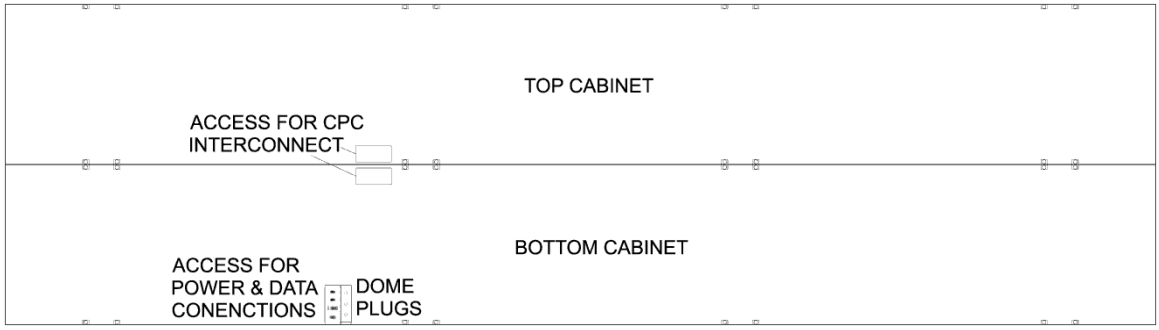
ELECTRICAL INSTALLATION

We recommend a qualified electrician perform the needed electrical connections to ensure proper operation of the scoreboard. These connections include grounding the scoreboard, connecting the scoreboard to a power source, installing data cable, and connecting the control console.

Ground Connection

The National Electrical Code **requires** a scoreboard (electric sign) to be grounded. Grounding the scoreboard helps the scoreboard electronics operate properly and helps minimize damage if it is struck by lightning. Metal posts do **not** provide an adequate ground path. The following steps describe how to ground the scoreboard:

1. Drive one or more 5/8-inch x 8-foot copper clad ground rods in the soil near the scoreboard.
2. Connect #6 bare copper wire to the ground rods using 5/8-inch brass tear drop connectors.
3. Remove the rear access panel and the dome plugs on the plate near the access panel. The drawing below shows typical locations of the access panel and the dome plugs.
4. Pass the ground conductor through the one of the knockouts in the plate near the access panel and connect it to the ground lug (**Ground**) on the chassis.

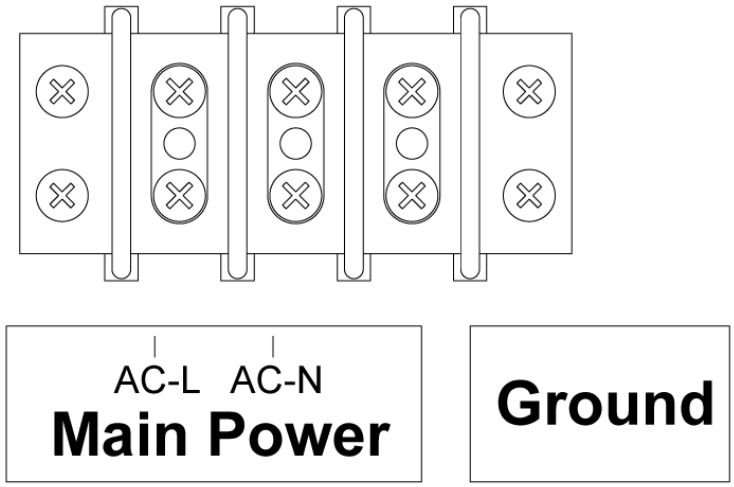


Rear Access Panel for Typical Two-Cabinet Scoreboard

Power Connections

The scoreboard requires 120 VAC, 60 Hz service at the scoreboard to operate properly. **Maximum power consumption of Model LX6545: 400 Watts (1050 Watts if Electronic Team Names are included).** Make sure the power cable is rated for this electrical load. Install the power cable in conduit. **Avoid** running the power cable in close proximity to the data cable. The following steps describe how to connect the scoreboard to the power source:

1. Feed the power cable through one of the knockouts in the plate near the access panel.
2. Crimp fork terminals to the power cable wires.
3. Connect the AC line wire and AC neutral wire to the **Main Power** terminal block on the chassis according to the illustration below.



Power Connections

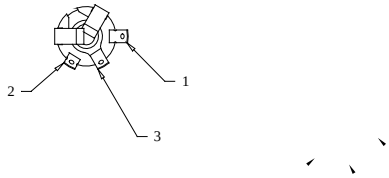
Install a power disconnect that isolates all current carrying conductors (not the ground conductor) on one of the posts below the scoreboard. If a secondary switch is installed near the scorekeeper's table, it should also isolate these conductors. Place the power disconnect in the **OFF** position between games to help protect the scoreboard from lightning damage. A power disconnect on the scoreboard post also provides a convenient way of turning the scoreboard off during maintenance or repairs.

ScoreLink RF Modem System

The SCORELINK RF MODEM SYSTEM is designed to eliminate the data cable between the scoreboard and the control console on Electro-Mech LED scoreboards. If you have purchased this accessory, disregard the section of this manual titled **Data Cable Installation**. Refer to the documentation provided with the ScoreLink system.

Data Cable Installation

The data cable connects the control console to the scoreboard. Install the data cable in conduit. If the cable is ever damaged, it is easier and less expensive to replace a cable in conduit. A small junction box with a 1/4-inch stereo jack mounted on the face plate is attached to the data cable at the point of operation of the scoreboard. This junction box should be securely mounted in a clean, dry area within ten feet of the rear of the control console. Most customers order the data cable with the junction box attached. Some customers prefer to attach the junction box after the cable is installed. Those customers must solder the data cable to the 1/4-inch stereo jack. The diagram below shows the connection points on the rear of the 1/4-inch stereo jack.

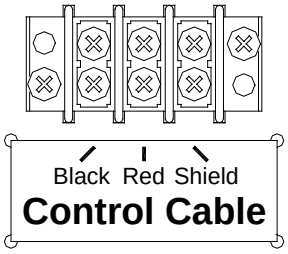


PIN 1 - BLACK WIRE
PIN 2 - RED WIRE
PIN 3 - SHIELD WIRE

1/4-inch Stereo Jack Wiring Diagram

The following steps describe how to connect the data cable to the scoreboard:

1. At the rear of the scoreboard feed the data cable through one of the knockouts.
2. Crimp fork terminals to the data cable wires and the shield.
3. Connect the data cable to the **Control Cable** terminal block on the chassis according to the diagram below.



Data Cable Wiring Diagram

4. Reinstall the access panel.

Control Console Connections

The 10 ft. stereo patch cable has a molded 1/4-inch stereo plug attached to each end. It is used to connect the control console to the junction box. The following steps describe how to connect the control console:

1. Plug one end of the patch cable into 1/4-inch stereo jack on the junction box.
2. Plug the other end into the 1/4-inch stereo jack mounted on the control console back plate.
3. Plug the control console power cord into a grounded NEMA 5-15R 120 VAC receptacle.

Control Console Safety Warning

This product is equipped with a 3-wire grounding type plug, a plug having a third (grounding) pin. This plug will only fit into a grounding-type power outlet. This is a safety feature. If you are unable to insert the plug into the outlet, contact a qualified electrician to replace your obsolete outlet. Do not defeat the purpose of the grounding-type plug.

SCOREBOARD OPERATION

SCOREBOARD STARTUP

1. Place the power disconnect for the scoreboard in the **ON** position.
2. Plug one end of the stereo data patch cable into 1/4-inch stereo jack on the junction box.
3. Plug the other end into the 1/4-inch stereo jack mounted on the control console back plate.
4. Plug the control console power cord into a grounded NEMA 5-15R 120 VAC receptacle.

GAME TIME OPERATION

The details of game time operation are covered in the documentation that ships with your scoreboard control console. You should reset the scoreboard each time it is turned on. Test out all the functions to ensure the scoreboard is operating properly.

SCOREBOARD SHUTDOWN

1. Place the power disconnect for the scoreboard in the **OFF** position.
2. Unplug the control console power cord.
3. Unplug the data patch cable.
4. Store the control console in a dry location. This unit is not waterproof.

Proper scoreboard shutdown will help protect the scoreboard and control console from power surges and lightning strikes.

SERVICING THE SCOREBOARD

While your scoreboard was designed for years of trouble-free operation, some problems may occasionally occur. Electro-Mech offers onsite service in some areas. In other cases, we can help you contact an independent service technician. Either way, we will make every effort to answer your questions. Our trained personnel are ready to assist you from Monday to Friday during the hours of 8 AM until 5 PM Eastern Standard Time. Our convenient toll free number is listed at the bottom of every page in this manual. Be sure to know your scoreboard model number when calling. Most replacement parts are available for immediate shipment. Damaged parts can usually be repaired at a significant cost savings.

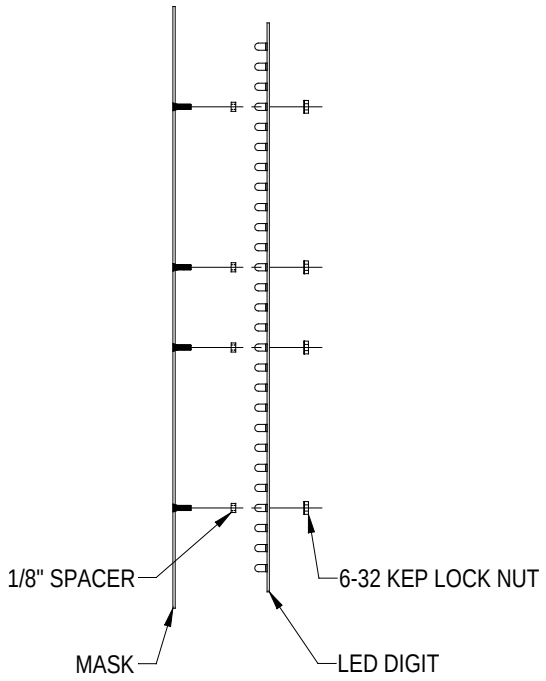
If the scoreboard turns on LEDs, but does not operate normally, make note of which functions are affected. If some LEDs either never turn on or always stay on, make note of their specific locations on the scoreboard. Refer to the COMPONENT REPLACEMENT section of this manual before changing parts.

COMPONENT REPLACEMENT

LED digits and indicators are serviced from the front of the scoreboard.

LED Digits And Indicators Replacement

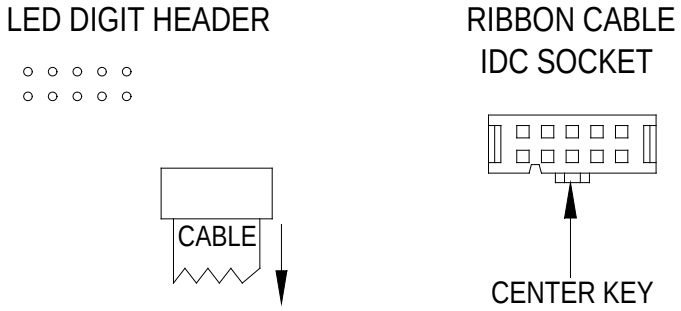
The LEDs that form digits and indicators are soldered on circuit boards mounted behind metal masks. Do not attempt to replace individual LEDs. In case of a malfunction, the entire LED circuit board must be removed. **To avoid damage to the LED driver PCB, always turn off the power to the scoreboard when removing or replacing LED digits and indicators**. The drawing below shows the components of a LED digit assembly. LED indicator assemblies are similar in construction.



LED Digit Assembly

The following steps describe how to replace a defective LED digit:

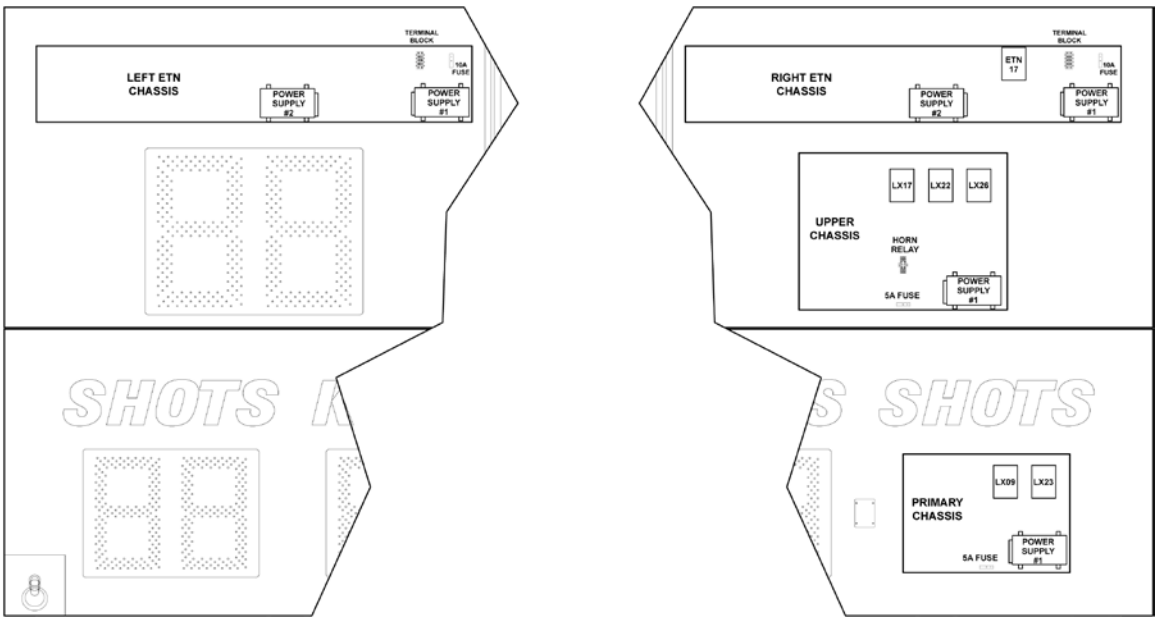
1. Remove the sheet metal screws that fasten the mask to the face of the scoreboard. **Caution: Support the mask with your hand before removing the last screw. The ribbon cable(s) that connects to the rear of the circuit board(s) is/are not designed to support the weight of the assembly.**
2. Disconnect the ribbon cable from the rear of the circuit board. For assemblies with two LED digits, it will be necessary to disconnect the ribbon cables from both circuit boards. The cables are labeled to indicate the proper circuit board connection. **Caution: Do not let the cable hang outside of the scoreboard. It is easily cut by sharp metal edges. Damage to the ribbon cable may create short circuit paths that will damage the LED driver PCB.**
3. Place the assembly on a flat surface and remove the 6-32 kep lock nuts that hold the defective circuit board in place.
4. Remove the circuit board from the assembly.
5. Align the mounting holes in the replacement LED digit circuit board with the threaded studs on the mask and install it on the mask using the 6-32 kep lock nuts.
6. Plug the ribbon cable onto the header on the back of the circuit board. Refer to the illustration below in order to plug the ribbon cable IDC connector onto the circuit board in the proper orientation.



LED Digit Ribbon Cable Connection Diagram

7. Reinstall the assembly using the sheet metal screws.

Power and driver logic components for the main scoreboard are located behind the right side Team Score digits and the Shots digits. The illustration on the following page shows the components with the digit mask removed. ETN power and driver logic components are located behind the two ETN displays.



Component Locations

LX Driver (and ETN Driver) Functions and Connections

LX DRIVER PCBs USED IN MODEL LX6545	
LX DRIVER	**FUNCTIONS CONTROLLED**
LX9	Guest and Home Shots On Goal, Period
LX23	Guest and Home Corner Kicks
LX17	Track Clock Minutes and Seconds
LX22	Guest and Home Scores
LX26	Track Clock Tenths of Seconds
ETN Driver	Electronic Team Names

LX9 CONNECTORS USED	
PCB JACK	**FUNCTION**
J2	ScoreLink Input
J3	Output Data
J4	Home (right) Shots Units
J5	Home (right) Shots Tens
J6	Guest (left) Shots Units
J7	DC Power Input
J9	Guest (left) Shots Tens
J10	Period
SHLD, RED, BLK	Input Data

LX23 CONNECTORS USED	
PCB JACK	**FUNCTION**
J3	Output Data
J4	Home (right) Kicks Units
J5	Home (right) Kicks Tens
J6	Guest (left) Kicks Units
J7	DC Power Input
J9	Guest (left) Kicks Tens
SHLD, RED, BLK	Input Data

LX17 CONNECTORS USED	
PCB JACK	**FUNCTION**
J3	Output Data
J4	Track Clock Minutes Units
J5	Track Clock Minutes Tens
J6	Track Clock Seconds Units
J7	DC Power Input
J9	Track Clock Seconds Tens
J15	Horn Relay
SHLD, RED, BLK	Input Data

LX22 CONNECTORS USED	
PCB JACK	**FUNCTION**
J3	Output Data
J4	Home (right) Score Units
J5	Home (right) Score Tens
J6	Guest (left) Score Units
J7	DC Power Input
J9	Guest (left) Score Tens
SHLD, RED, BLK	Input Data

LX26 CONNECTORS USED	
PCB JACK	**FUNCTION**
J3	Output Data
J7	DC Power Input
J9	Track Clock Tenths
SHLD, RED, BLK	Input Data

ETN DRIVER CONNECTORS USED	
PCB JACK	**FUNCTION**
J3	Output Data
J7	DC Power Input
J10	Left side bottom half ETN
J11	Left side top half ETN
J14	Right side bottom half ETN
J15	Right side top half ETN
SHLD, RED, BLK	Input Data

LX Driver (and ETN Driver) PCB Replacement

Electrical connections to the LX Driver and ETN Driver Printed Circuit Boards are made with ribbon cable polarized IDC sockets and locking ramp crimp terminal housings that mate with jacks on the PCB. Four machine screws are used to secure a Driver PCB inside the scoreboard.

1. Unplug the electrical connections from the PCB. Do not cut the plastic tie wraps around the ribbon cables.
2. Remove the four screws.
3. Remove the PCB from the scoreboard.
4. Insert the replacement PCB in the scoreboard.
5. Secure the PCB with the four screws.
6. Insert the plugs into the jacks on the module.

To avoid damage to the PCB, always turn off the power to the scoreboard when removing or replacing it.

LED Power Supply Module Replacement

The Model LX6545 uses Mean Well SP-320-24 power supply modules for the digits displays and Mean Well SP-320-5 power supply modules for the ETN displays. Replacement modules are available from Electro-Mech or through distributors of Mean Well power supplies. The SP-320-24 power supplies must be set to provide 18.9 VDC output, which is how they are configured when shipped from Electro-Mech. Connections are made to a set of screw terminals along the left side of the power supply as illustrated below:

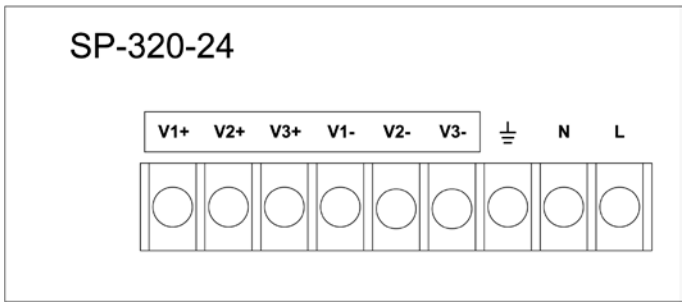


Figure 1 Power Module Screw Terminals

To avoid damage to the power supply module, always turn off the power to the scoreboard when removing or replacing it.

A fuse holder is mounted in the chassis next to each power supply and connected inline with the incoming 120 VAC line side of the power running from the Main Power terminal strip to each Mean Well power supply module. Fuses for SP-320-24 power supplies are 5 amp, 250 volt, 3AG style fuses, while fuses for the SP-320-5 are 10 amp, 250 volt, 3AD. Only replace fuses with fuses of the same type.

ELECTRO-MECH SCOREBOARD CO. FIVE-YEAR LIMITED WARRANTY

THE ELECTRICAL COMPONENTS OF ALL ELECTRO-MECH SCOREBOARDS ARE GUARANTEED FOR A PERIOD OF FIVE (5) YEARS FROM THE DATE OF INVOICE AGAINST DEFECTS IN WORKMANSHIP OR MATERIAL AND WILL BE REPLACED OR REPAIRED WITHOUT COST TO THE OWNER, PROVIDED THE EQUIPMENT OR PARTS ARE RETURNED POSTAGE-PAID TO THE FACTORY IN WRIGHTSVILLE, GEORGIA. SHIPPING BACK TO THE OWNER WILL BE VIA UPS GROUND SERVICE, EXCEPT WHEN AIR OR SPECIAL METHOD OF RETURN IS SPECIFIED BY THE OWNER, IN WHICH CASE SHIPPING WILL BE FREIGHT COLLECT.

EXCLUDED FROM THIS WARRANTY ARE FUSES.

THIS WARRANTY DOES NOT INCLUDE LABOR CHARGES INCURRED IN THE REMOVAL OF COMPONENT PARTS, SERVICE CALLS, OR DAMAGES RESULTING FROM IMPROPER INSTALLATION, IMPROPER OPERATION, OR PROBLEMS CAUSED BY ANY REPAIR, ALTERATION OR MODIFICATION OF THE SCOREBOARD NOT PERFORMED BY ELECTRO-MECH.

EQUIPMENT WHICH IS SUBJECTED TO ACCIDENT, NEGLECT, ABUSE, MISUSE, OR NATURAL DISASTERS, INCLUDING BUT NOT LIMITED TO FIRE, WIND, LIGHTNING, OR FLOOD, IS NOT COVERED BY THIS GUARANTEE.