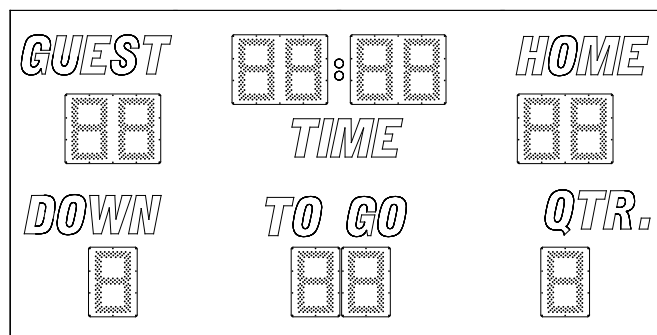
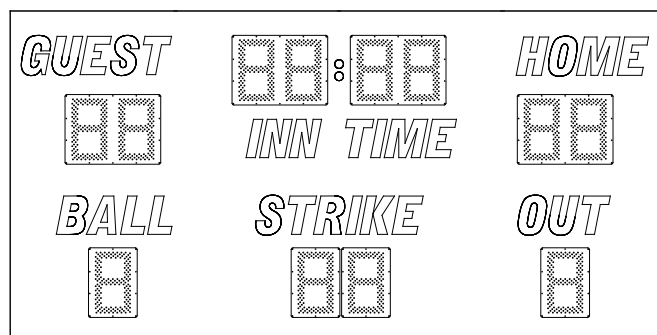

ELECTRO-MECH SCOREBOARD CO.



3450 MULTI-SPORT 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.

Rev. 4 Revised: 11/30/2007

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3450 MULTI-SPORT SCOREBOARD SPECIFICATIONS

GENERAL: This ETL listed scoreboard includes the scoreboard cabinet, a horn, mounting hardware, control console, 10 ft. extension cable, and junction box.

DIMENSIONS: 3450: 189" L x 95" H x 6" D, 3450 with a side sponsor panel: 285" L x 95" H x 6" D

WEIGHT: 3450: 337 lbs, 3450 with a side sponsor panel: 447 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 are white exterior grade vinyl. Some of the captions are mounted on reversible metal plates to change from football / soccer to baseball / softball use.

DISPLAY: The 3450 football scoreboard displays HOME and VISITOR scores to 99, INNING to 19, BALL, STRIKE, OUT, and TIME to 99 minutes (two digits for baseball / four digits for football). When used for football, DOWN replaces BALL, TO GO replaces STRIKE, QTR. replaces OUT.

DIGITS: Red light emitting diodes mounted on printed circuit boards form the 18" digits.

POWER REQUIREMENTS: **Scoreboard** - 120 VAC, 1.4 A, 60 Hz. **Control Console** - 120 VAC, 0.5 A, 60 Hz

SCOREBOARD ELECTRONICS: 100% solid state fully enclosed.

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

CONTROL CABLE: The 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 direct burial rated and measures approximately 1/4" in diameter. This item is sold separately from the scoreboard.

JUNCTION BOX AND EXTENSION CABLE: A 4 1/4" x 2 1/4" x 2" junction box with a 1/4" stereo jack mounted on the face plate is attached to the control cable at the point of operation. A 10 ft. extension cable connects the control console to the junction box.

SL-230 / 330 RF MODEM SYSTEM: This accessory can be used in place of control cable and junction box for this scoreboard. Refer to the SL-230 / 330 RF MODEM INSTALLATION MANUAL 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 in order to complete the installation:

- Control cable (length dependent upon installation site layout)
- SL-230 / 330 RF Modem System

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

- Two posts
- Power cable to connect the scoreboard to the power source
- Grounding hardware
- A grounded NEMA 5-15R 120 VAC receptacle for the control console at the scorekeeper's table.

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

- A weatherproof power disconnect at the scoreboard

Electro-Mech Scoreboard Company performs installations in some areas. In other areas, we can help you contact an independent installer. In areas in which installation service is not available from Electro-Mech Scoreboard Company, we will make every effort to answer your installation questions. Qualified personnel should perform the scoreboard installation. Consult national and local codes before installation.

MECHANICAL INSTALLATION

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

Post Installation

The scoreboard 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 mounting hardware will accommodate posts up to 7 inches outer diameter. Sink the posts in reinforced concrete footings. Figure 1 shows the spacing of the posts for the 3450 scoreboard. 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.

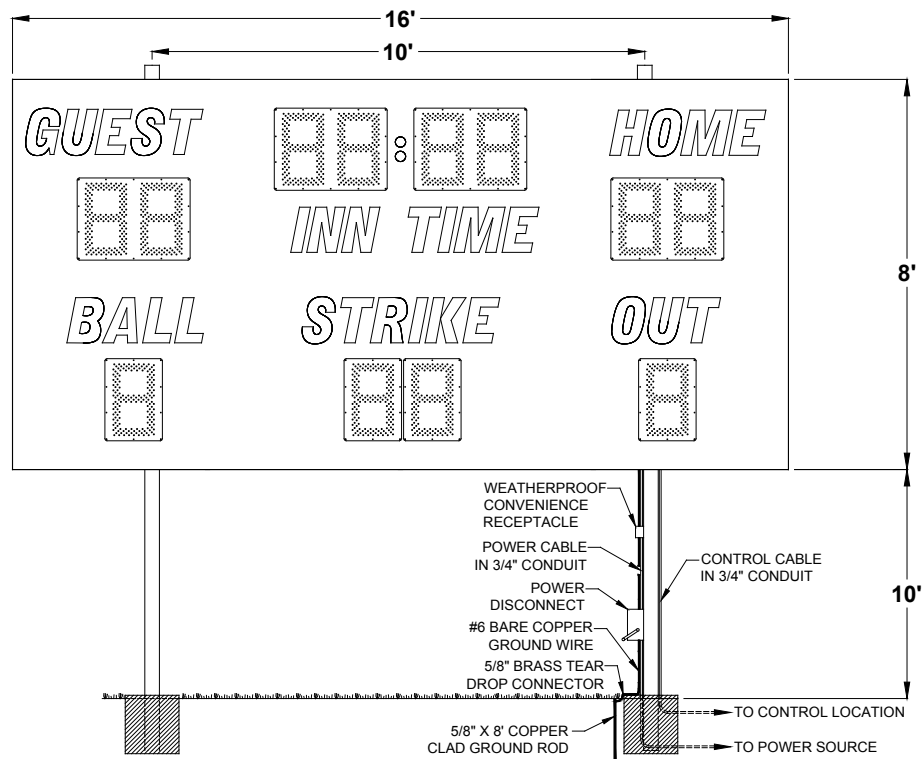


Figure 1 3450 Post Spacing

Figure 2 shows the spacing of the posts for a 3450 scoreboard with an optional side sponsor panel. The sponsor panel is built into the scoreboard cabinet.

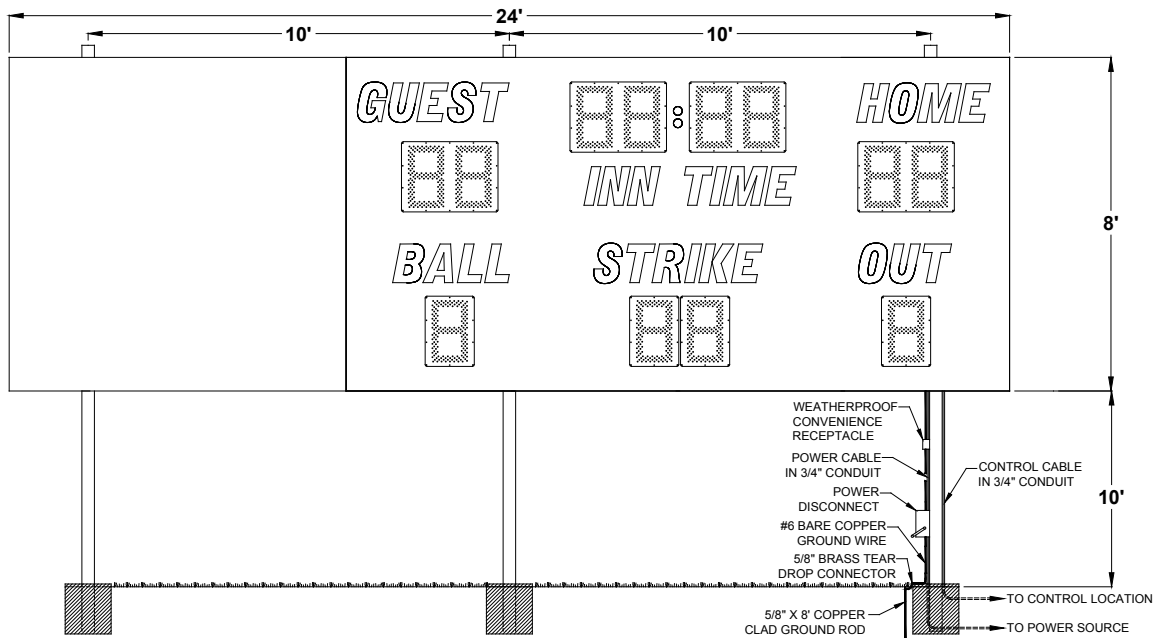


Figure 2 3450 with Optional Side Sponsor Panel Post Spacing

Figure 3 shows the spacing of the posts for a 3450 with an optional top sponsor panel. This panel is a separate unit that mounts on the same posts as the scoreboard.

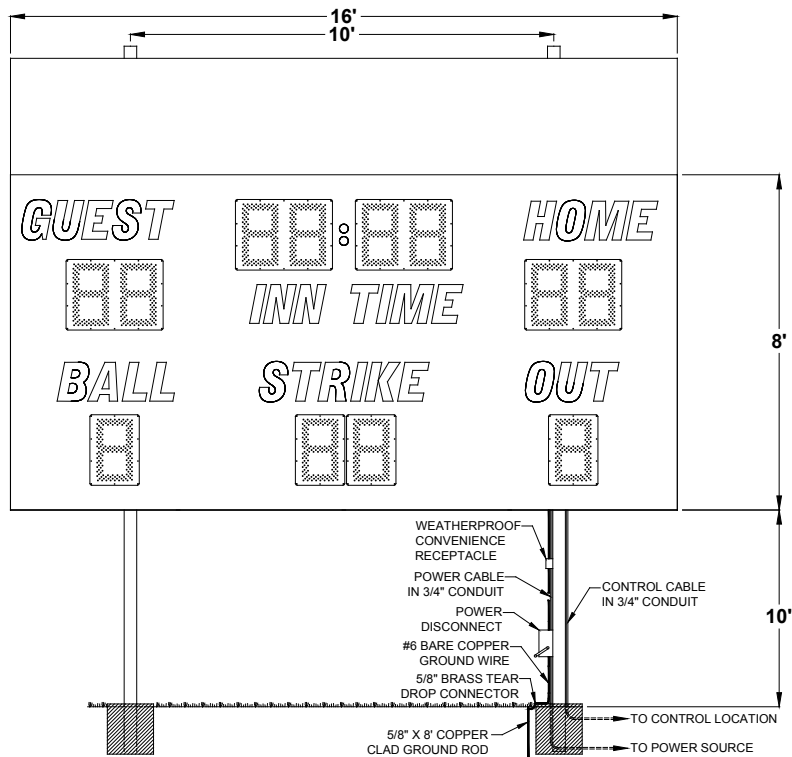


Figure 3 3450 with Top Sponsor Panel Post Spacing

Mounting The Scoreboard

The scoreboard is attached to the posts at four points. Figure 4 shows the location of the mounting points on the rear of the scoreboard.

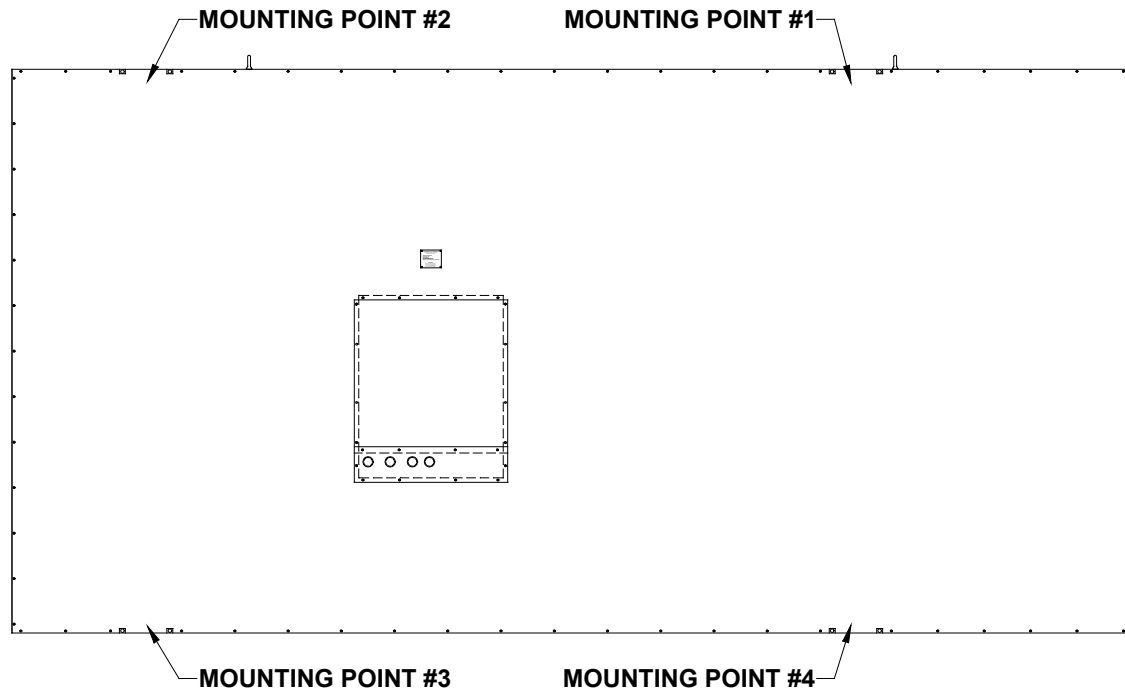


Figure 4 Mounting Points

MOUNTING HARDWARE

Four sets of mounting hardware are provided to attach the scoreboard at these points. Additional hardware sets are provided to attach the optional sponsor panels, if ordered. A single set of mounting hardware consists of a steel angle bracket, two threaded rods, two washers, and two nuts. Figure 5 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.

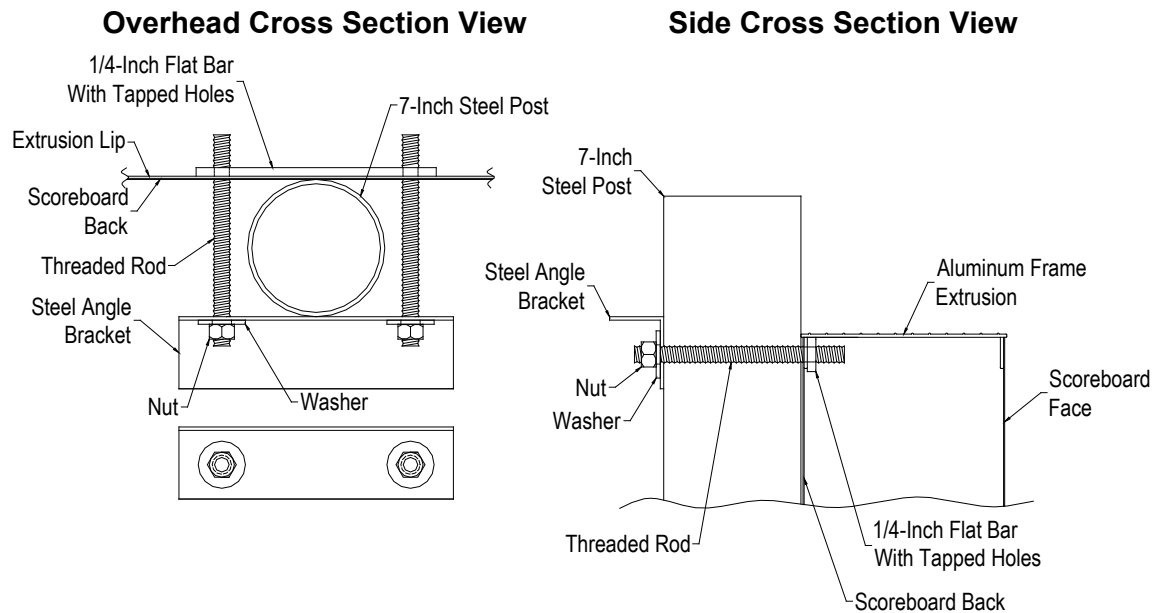


Figure 5 Standard Mounting Method

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

1. Place the scoreboard cabinet against the posts on the ground. Make sure the mounting points are aligned with the posts.
2. Screw the threaded rods into the tapped holes in the scoreboard.
3. Place a steel angle bracket over the threaded rods at a mounting point.
4. Place a washer over each threaded rod.
5. Screw the nuts onto the threaded rods so that the bracket is loosely held in place.
6. Repeat steps 3 - 6 at the other mounting points.
7. Raise the scoreboard into place and tighten the nuts to clamp the scoreboard in place on the posts.

Note: Be sure to leave enough space on the posts above the scoreboard for the optional top sponsor panel, if purchased.

Mounting The Optional Side Sponsor Panel

If you purchased the optional side sponsor panel, the scoreboard has been modified so that the sponsor panel bolts to the side of the scoreboard cabinet. Four bolts and washers are provided to attach the side sponsor panel to the scoreboard. The following steps describe how to attach the sponsor panel to the scoreboard and mount the optional side sponsor panels on the posts:

1. There are four small access panels on the rear of the side sponsor panel. Remove these access panels.
2. Position the sponsor panel next to the scoreboard.
3. Screw the threaded rods into the tapped holes at one of the sponsor panel mounting points.
4. Place a steel angle bracket over the threaded rods at the 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 point.
8. Place a washer over a bolt.
9. Insert the bolt into the top sponsor access panel opening and through the hole in the frame.
10. Screw the bolt into the tapped hole in the scoreboard cabinet.
11. Repeat steps 8-10 at the other three access panel openings.
12. Tighten the nuts to clamp the sponsor panel in place on the post.
13. Re-install the access panels.

Mounting The Optional Top Sponsor Panel

Additional hardware sets are provided to attach the optional top sponsor panels, if purchased. The following steps describe how to mount the top sponsor panel on the posts:

1. Raise the top sponsor panel in place above the scoreboard. Make sure the mounting points are aligned with the posts.
2. Screw the threaded rods into the tapped holes in the top sponsor panel.
3. Place a steel angle bracket over the threaded rods at a mounting point.
4. Place a washer over each threaded rod.
5. Screw a nut onto each threaded rod so that the bracket is loosely held in place.
6. Repeat steps 3 - 5 at the other mounting points.
7. Tighten the nuts to clamp it in place on the posts.

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 the horn, installing the SL-230 / 330 or the control 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 connect the scoreboard to the power source:

1. Drive one or more 5/8" x 8' copper clad ground rods in the soil near the scoreboard.
2. Connect #6 bare copper wire to the ground rods using 5/8" brass tear drop connectors.
3. Remove the rear access panel and the dome plugs on the plate below the access panel. Figure 6 shows the location of the access panel and the dome plugs.

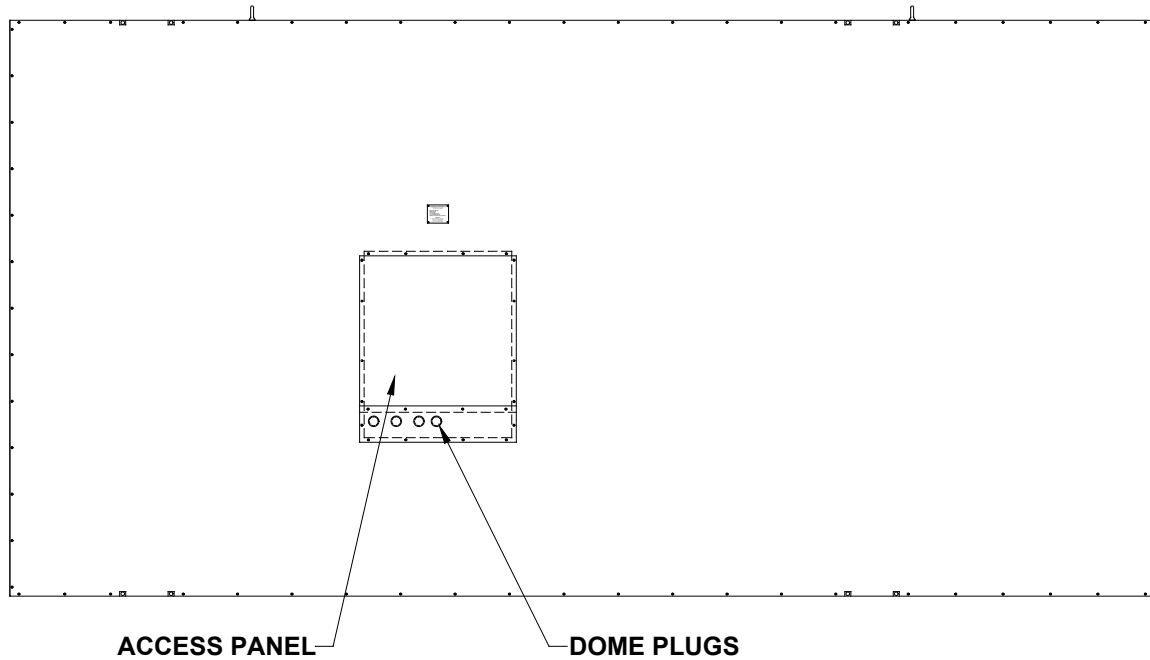


Figure 6 Rear Access Panel

4. Figure 7 shows the view behind the access panel.

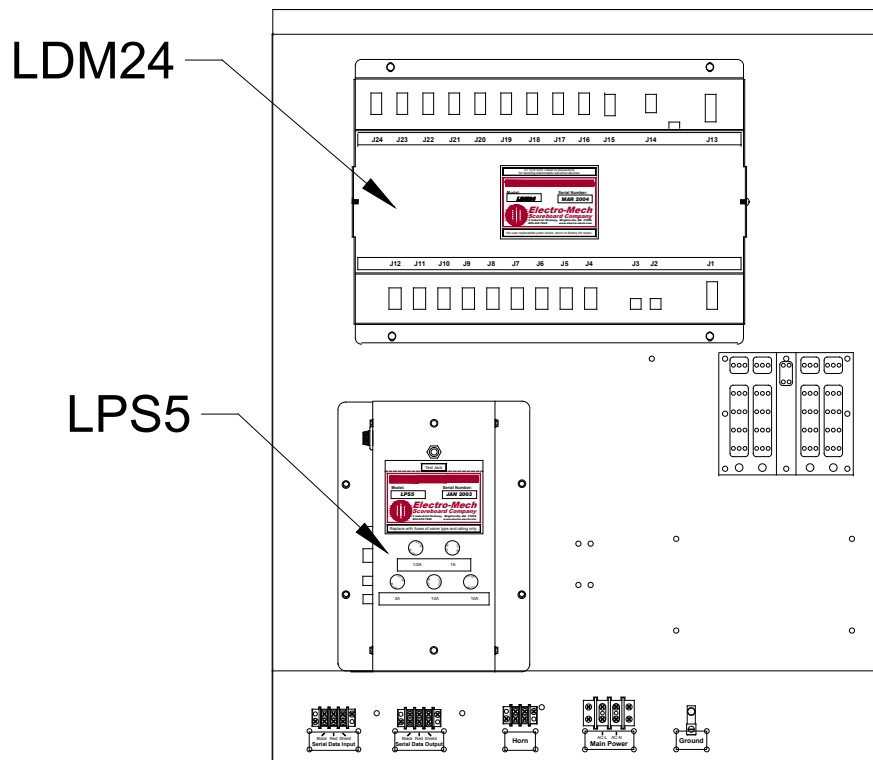


Figure 7 Access Panel Removed

5. Pass the ground conductor through the right hand hole in the plate below the access panel and connect it to the ground lug (**Ground**) on the junction chassis.

Power Connections

The scoreboard requires 120 VAC service at the scoreboard to operate properly. **Maximum power consumption of Model 3450: 168 Watts.** Make sure that power cable is rated for this electrical load. Install the power cable in conduit. **Avoid** running the power cable in close proximity to the control cable. The following steps describe how to connect the scoreboard to the power source:

1. Feed the power cable through the middle hole in the plate below 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 junction chassis according to Figure 8.

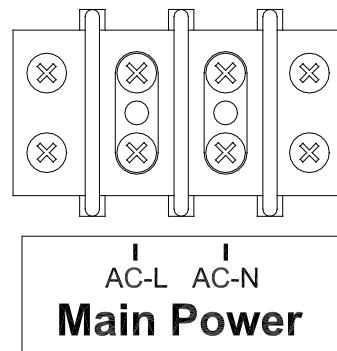


Figure 8 Power Connections

Install a power disconnect that isolates all current carrying conductors on one of the posts below the scoreboard (not the ground conductor). 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.

Horn Installation

The items provided to install the horn are the horn, the weatherproof back box, the mounting bolts, and the mounting bracket. Items which are not provided but are necessary for proper installation are $\frac{3}{4}$ " flexible conduit, a $\frac{3}{4}$ " right angle male conduit connector, a $\frac{3}{4}$ " straight male conduit connector, two wires, and four forked crimp terminals. The electrical requirements for the horn are 0.35 A 120 VAC. The horn assembly is mounted on top of the scoreboard. For scoreboards with top sponsor panels the horn assembly is mounted on top of the sponsor panel. At the mounting point a steel bar is riveted inside the scoreboard or sponsor panel's aluminum extrusion frame. The bar has a tapped hole. A mounting bolt is screwed into the tapped hole at the factory. The following steps describe the assembly and mounting of the horn:

1. Remove the mounting bolt from the scoreboard.
2. Cut a piece of $\frac{3}{4}$ " conduit of sufficient length to reach from the horn mounting point to one of the holes in the plate below the upper access panel.
3. Attach the $\frac{3}{4}$ " right angle male conduit connector to one end of the conduit and the $\frac{3}{4}$ " straight male conduit connector to the other end.
4. Cut two pieces of wire of approximately 7 feet longer than the conduit.
5. Push the wires through the conduit.
6. Push the end of the conduit with the right angle male conduit connector through the 2" diameter hole in mounting bracket.
7. The weatherproof back box has two threaded conduit holes. Screw the provided conduit plug into the hole near the word "TOP" inside the weatherproof back box.
8. Feed the wires through the other back box conduit hole and screw the right angle conduit connector to the back box.

9. Attach the weatherproof back box to the mounting bracket using the provided 8-32 x 1/2" Phillips head machine screws, #8 split-lock washers, and 8-32 hex nuts as shown in figure 9.

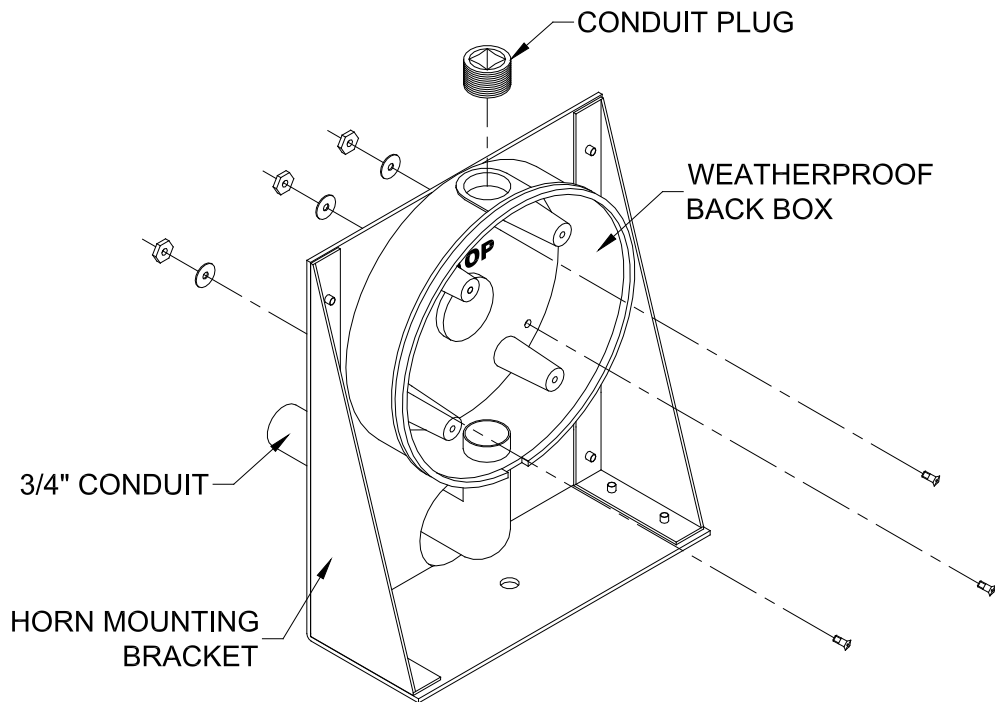


Figure 9 Back Box Mounting Points

10. Remove the horn signal mounting plate from the horn base by loosening the Phillips head screw on the base as seen in figure 10.

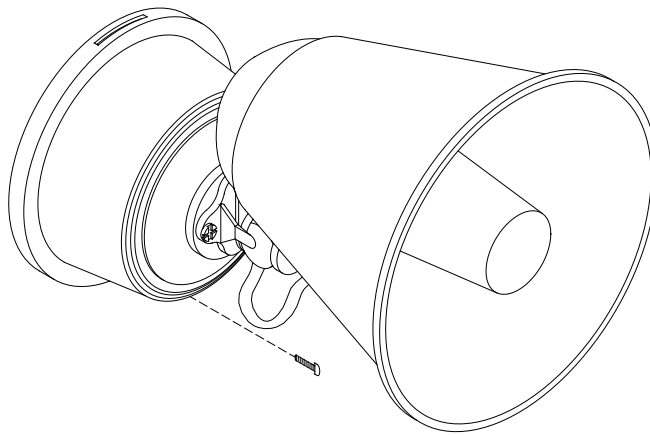


Figure 10 Horn Signal Mounting Plate Screw

11. The word "TOP" is stamped on the front side of the horn signal mounting plate. Pass the two wires that are inside the back box through the horn signal mounting plate center hole from the rear.
12. Align the horn signal mounting plate with the back box so that the word "TOP" on the horn signal mounting plate and the back box should be oriented in the same direction and the screw hole on the bottom edge of the horn signal mounting plate should be directly over the gap in the back box gasket as seen in figure 11.

13. Fasten the horn signal mounting plate with the four 8-32 x 7/16" machine screws that are provided with the back box.

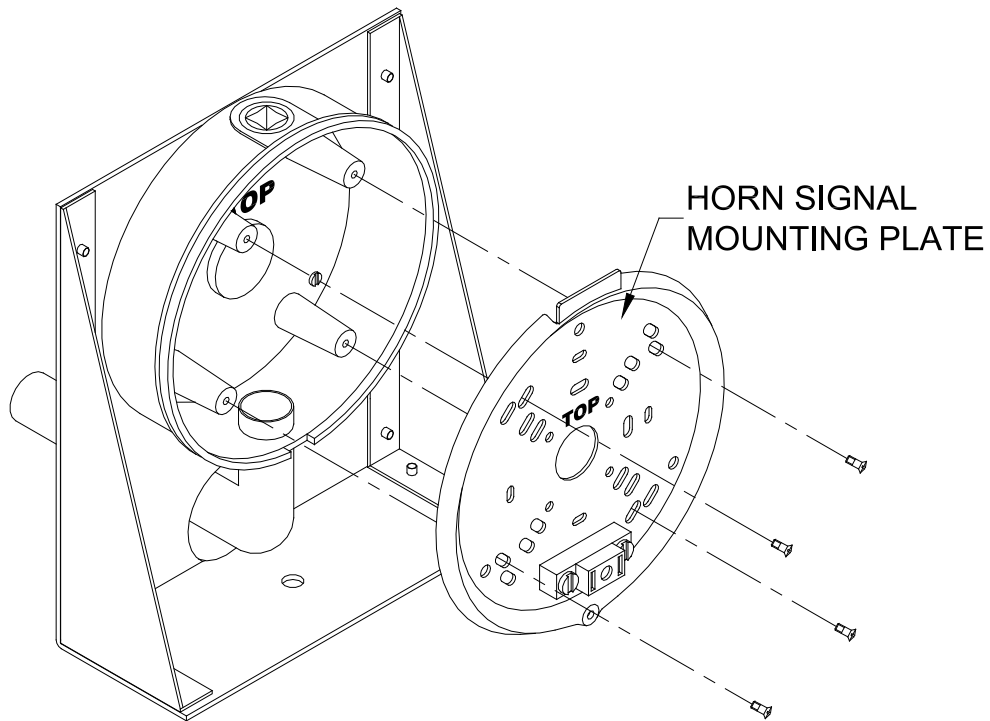


Figure 11 Horn Signal Mounting Plate Attachment

14. Crimp forked terminals on the ends of the two wires and attach them to the plug receptacle seen in figure 12.

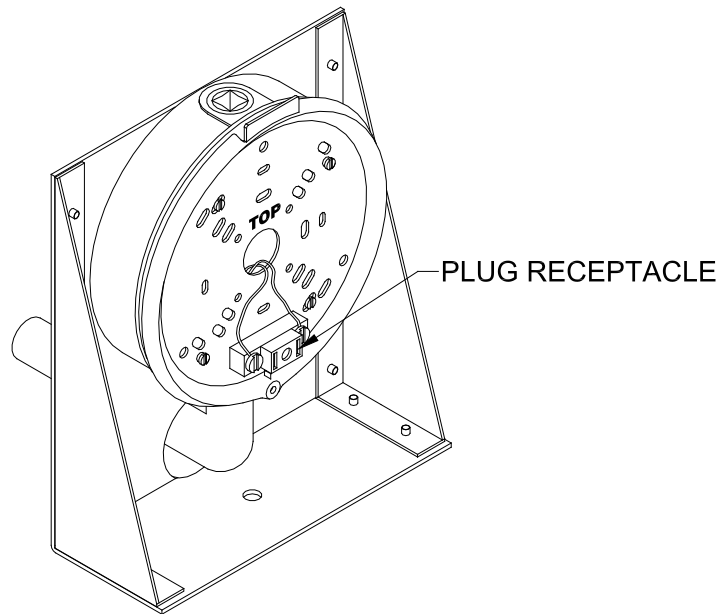


Figure 12 Plug Receptacle Wire Attachment

15. Slide the slot on the side of the horn base over the tab on the horn signal mounting plate and tighten the Phillips head screw on the other side of the horn base.
16. Fasten the horn assembly to the scoreboard using the mounting bolts from the scoreboard as seen in figure 13.

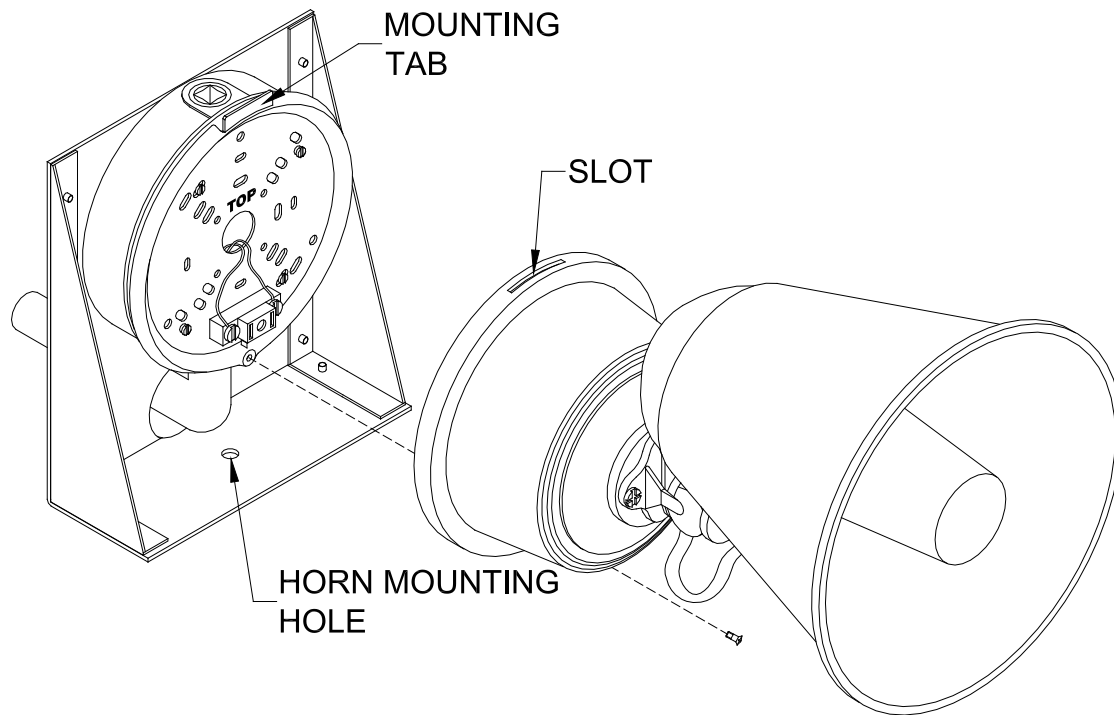


Figure 13 Horn Assembly and Mounting

17. Crimp forked terminals on the ends of the two wires that protrude out of the other end of the conduit.
18. Pass the wires through one of the holes in the plate below the upper access panel.
19. Fasten the conduit connector to the plate and connect the wires to the terminal block labeled **Horn**.
Connect the AC-L wire to the left terminal and the AC-N wire to the right terminal.

SL-230 / 330

The SL-230 / 330 RF MODEM SYSTEM is designed to eliminate the control cable between the scoreboard and the control console on Electro-Mech Scoreboard MM and MP series scoreboards as well as all LED scoreboards. If you have purchased this accessory, disregard the section of this manual titled **Control Cable Installation**. Refer to the installation manual provided for this product.

Serial Data Output Connections

Customers who have purchased a set of delay of game timers can provide one unit with serial data from this scoreboard. This connection is an alternative to providing a delay of game timer with serial data from the control console via the control cable or a SL-230 / 330 RF modem. Do not connect the second delay of game timer to this scoreboard. The following steps describe how to transmit serial data from this scoreboard to one delay of game timer:

1. At the rear of the scoreboard, feed data cable (same type of cable specified for control cable on page 3) through a hole in the plate below the access panel.
2. Crimp fork terminals to the cable wires and the shield.
3. Connect the cable to the terminal block labeled **Serial Data Output** on the junction chassis according to figure 14.

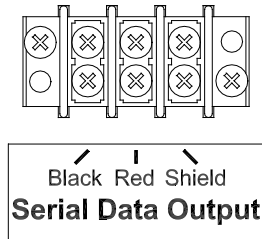


Figure 14 Serial Data Output Wiring Diagram

4. Remove the delay of game timer rear access panel.
5. Feed the cable through a hole in the plate below the access panel.
6. Crimp fork terminals to the cable wires and the shield.
7. Connect the cable to the terminal block labeled **Control Cable** on the delay of game timer junction chassis according to figure 15.

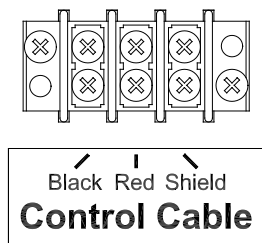


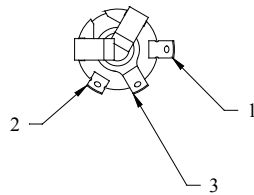
Figure 15 Control Cable Wiring Diagram

8. Reinstall the delay of game timer rear access panel.

Control Cable Installation

The control cable connects the scoreboard to the control console. Install the control 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" stereo jack mounted on the face plate is attached to the control 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 control cable with the junction box attached. Some customers prefer to attach the junction box after the cable is installed. Those customers must solder the control cable to the 1/4" stereo jack. Figure 16 shows the control cable wire connection points on the rear of the 1/4" stereo jack.

1/4" STEREO JACK



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

Figure 16 1/4" Stereo Jack Wiring Diagram

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

1. At the rear of the scoreboard feed the control cable one of the holes in the plate to the left of the access panel.
2. Crimp fork terminals to the control cable wires and the shield.
3. Connect the control cable to terminal block labeled **Control Cable** on the junction chassis according to figure 17.

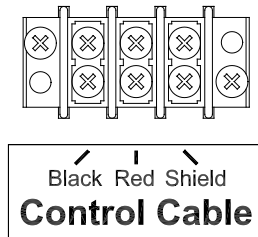


Figure 17 Control Cable Wiring Diagram

4. Reinstall the access panel.

Control Console Connections

The 10 ft. extension cable has two molded 1/4" stereo plugs attached to it. 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 extension cable into 1/4" stereo jack on the junction box.
2. Plug the other end into the 1/4" 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 extension cable into ¼" stereo jack on the junction box.
3. Plug the other end into the ¼" 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

This scoreboard is operated with a 37-key control console. Figure 18 shows the keypad layout on the control console.

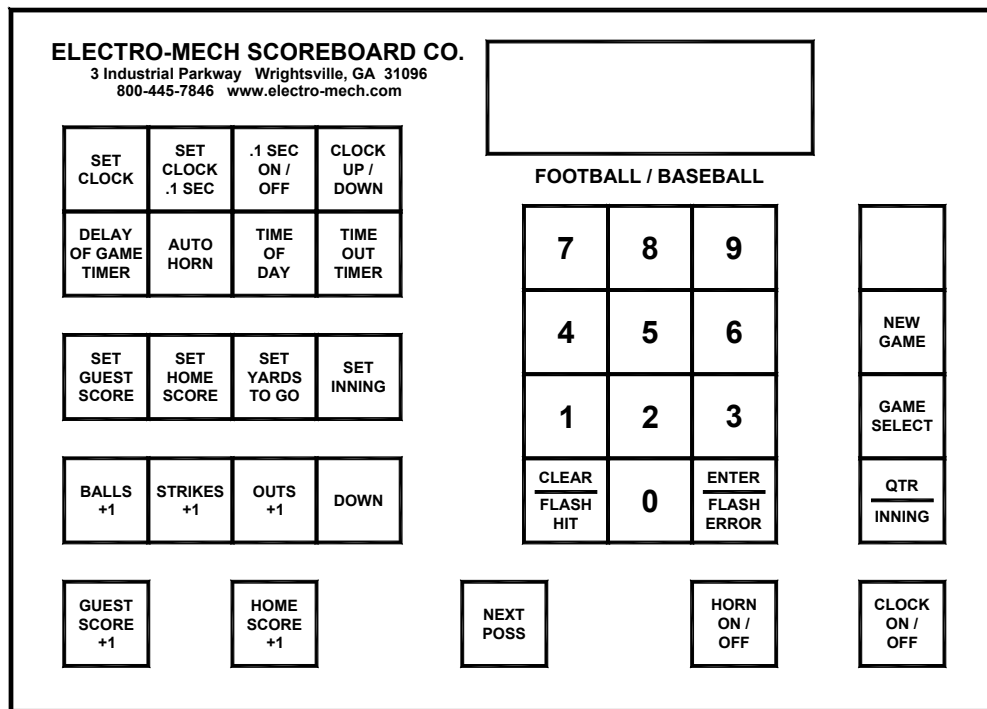


Figure 18 Keypad Layout

Immediately after the control console power cord is plugged into a 120 VAC source, the console LCD display will read:

```
ELECTRO-MECH VER
SCOREBOARD C04
```

After a few seconds the display will read:

```
00 D15:00 0 00
* FOOTBALL *
```

The scoreboard will display:

CLOCK – 15:00
GUEST SCORE – 0
HOME SCORE – 0

The control console LCD display shows the same information as the scoreboard. Note: In some functions a 0 will be blanked on the scoreboard, but not on the console. Because this console program is used for a number of models of scoreboards, some functions will appear on the console keypad that are not present on the scoreboard. Figure 19 explains the LCD display layout.

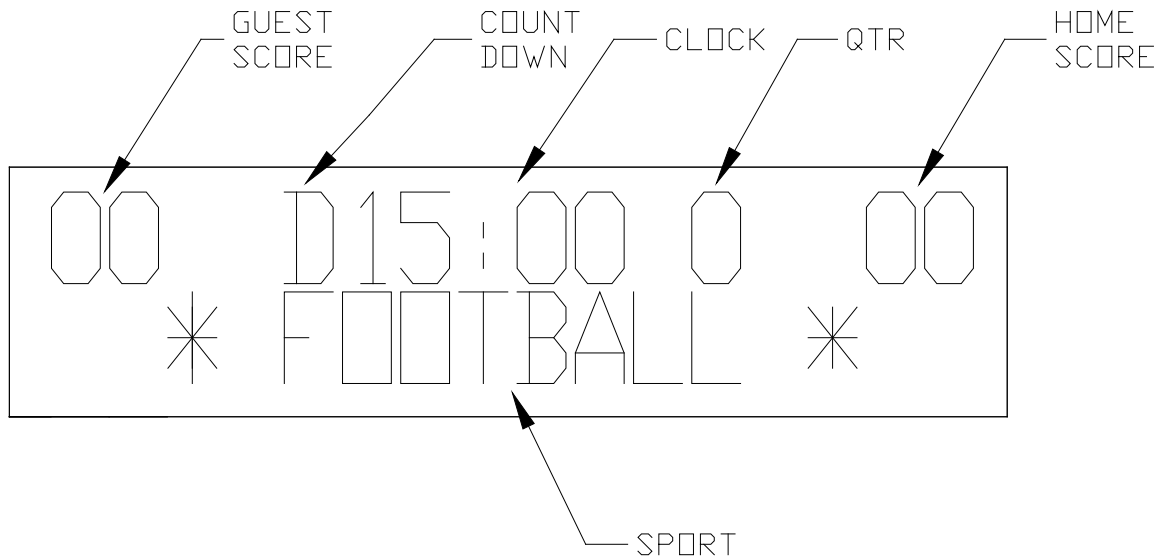


Figure 19 Control Console LCD Display

Control Console Key Functions

1. **SET CLOCK** – This key sets the time displayed on the scoreboard clock. Press [SET CLOCK]. The console LCD display will read:

```
00 D15:00 0 00
SET CLK <00:00>
```

Press the keypad numbers for the time, [ENTER]. Example: Press [SET CLOCK], [6], [0], [0], [0], [ENTER] on the control console. 60:00 will be displayed on the clock section of the scoreboard.

2. **SET CLOCK .1 SEC** – This key is used to set the scoreboard clock to a time less than one minute when tenth of a second accuracy is required. Press [SET CLOCK .1 SEC]. The console LCD display will read:

```
00 D15: 00 0 00
SET SEC <00.0>
```

Press the keypad numbers for the time, [ENTER]. Example: Press [SET CLOCK .1 SEC], [5], [3], [8], [ENTER] on the control console. 53.8 will be displayed on the clock section of the scoreboard.

3. **.1 SEC ON/OFF** – This key is used to enable or disable the display of tenths of seconds on the scoreboard. The use of this key has a visible effect on the scoreboard only if the game clock is less than one minute. This mode is enabled when the control console is turned on. If it is disabled, the LCD display on the control console will still show 1/10th second timing, but the scoreboard will not display it. To turn this function off, press [.1 SEC ON/OFF]. The console LCD display will read:

```
CLOCK   ON   <1>
.1 SEC  OFF  <0>
```

Press [0], [ENTER] on the control console.

4. **CLOCK UP/DOWN** – The clock can be set up to either count up or count down. The control console is set to the clock down mode when it is turned on. To make the clock count up, press [CLOCK UP / DOWN]. The console LCD display will read:

```
GAME    UP   <1>
CLOCK   DOWN <0>
```

Press [1], [ENTER] on the control console. The letter D in front of the game time on the console LCD will be replaced with the letter U to indicate that the clock is in the count up mode. To reset the clock to count down mode, press [CLOCK UP / DOWN], [0], [ENTER] on the control console.

5. **DELAY OF GAME TIMER** – The console is programmed to control a set of delay of game timers. The delay of game timer is preset to 30 seconds, but can be set to any time from 0 to 99 seconds. Changes to the delay of game timer time should be done prior to the start of a game. To change the delay of game timer time, press [SET DELAY OF GAME TIMER]. The console LCD display will read:

```
00 D15: 00 0 00
DELAY TIME1 <30>
```

Press the keypad numbers to set Delay of Game Timer, [ENTER]. The LCD display will then read:

```
00 D15: 00 0 00
DELAY TIME2 <05>
```

This will allow you to change the second reset time. To change this time, press the keypad numbers for the time, [ENTER].

6. **AUTO HORN** – This key allows the operator to control the end of period horn and the time out horn. The horn sounds for two seconds when the clock reaches 0:00 at the end of the period. The end of period horn can be disabled by pressing [AUTO HORN]. The console LCD display will read:

```
GAME PRESS<1>ON
HORN PRESS<0>OFF
```

Press [0], [ENTER] to disable the horn. The console LCD display will then read:

```
T-0 PRESS<1>ON
HORN PRESS<0>OFF
```

The time out horn is normally disabled. To enable the horn to sound at the end of the time out, press [1], [ENTER] on the control console.

7. **TIME OF DAY** – The time of day can be displayed on the clock section of the scoreboard. **THE GAME CLOCK WILL BE INOPERABLE UNTIL THE TIME OF DAY FUNCTION IS TURNED OFF.** To turn the time of day clock on, press [TIME OF DAY]. The console LCD display will read:

```
TIME OF  OFF <1>
DAY CLOCK OFF<0>
```

Press [1], [ENTER] on the control console. The console LCD display will then read:

```
00 C12:00 0 00
SET CLK <12:00>
```

Press the keypad numbers for the time, [ENTER]. The letter C will be displayed on the console LCD display to the left of the time to indicate that the time of day function is active. The scoreboard will display the time of day.

8. **TIME OUT TIMER** – To set the Time Out Timer, press [TIME OUT TIMER]. The console LCD display will read:

```
00 D15:00 0 00
SET T-0 <1:00>
```

Press the keypad numbers for the time, [ENTER]. After the ENTER key is pressed, the letter T is displayed to the left of the time on the LCD display and the Time Out Timer immediately begins to count down to 0. The scoreboard will not display the Time Out time. To exit the Time Out Timer function before 0, press [TIME OUT TIMER], [ENTER].

9. **SET GUEST SCORE** – To set the guest score, press [SET GUEST SCORE]. The console LCD display will read:

```
00 D15:00 0 00
GUEST SCORE <00>
```

Press the keypad numbers for the score, [ENTER]. EXAMPLE: To set the visitor score to 53, press [SET GUEST SCORE], [5], [3], [ENTER].

10. **SET HOME SCORE** – To set the home score, press [SET HOME SCORE]. The console LCD display will read:

```
00 D15:00 0 00
HOME SCORE <00>
```

Press the keypad numbers for the score, [ENTER]. EXAMPLE: To set the home score to 75, press [SET HOME SCORE], [7], [5], [ENTER].

11. **SET YARDS TO GO** – To set the yards to go, press [SET YARDS TO GO]. The console LCD display will read:

00	D15: 00	0	00
YARDS TO GO	<00>		

Press the keypad numbers for the yards to go, [ENTER]. EXAMPLE: To set the yards to go to 10, press [SET YARDS TO GO], [1], [0], [ENTER].

12. **SET INNING** – To set the inning, press [SET INNING]. The console LCD display will read:

00	D15: 00	0	00
SET INNING	<00>		

Press the keypad numbers for the innings [ENTER]. EXAMPLE: To set the inning to 3, press [SET INNING], [3], [ENTER].

13. **BALLS +1** – This key increments the Balls by 1.
14. **STRIKES +1** – This key increments the Strikes by 1.
15. **OUTS +1** – This key increments the Outs by 1.
16. **DOWN** – This key increments the DOWN by 1. If this key is pressed when DOWN displays 4, the digit will be blanked.
17. **GUEST SCORE +1** – This key increments the Guest score by 1.
18. **HOME SCORE +1** – This key increments the Home score by 1.
19. **HORN ON/OFF** – This key is used to turn the horn on and off.
20. **CLOCK ON/OFF** – This key is used to start and stop the clock.
21. **QTR / INNING** – This key is used to increment the quarter or inning (depending on console mode) by 1.
22. **GAME SELECT** – This key is used to select either football or baseball. The console will automatically come up in the football mode when it is first turned on. To select the baseball mode, press [GAME SELECT]. The console LCD display will read:

FOOTBALL	=	<0>
BASEBALL	=	<1>

Press [1], [ENTER] on the control console. The scoreboard will switch to the baseball mode.

23. **NEW GAME** – This key is used to reset all the scoreboard functions to their default settings. To reset the scoreboard, press [NEW GAME]. The console LCD display will read:

RESET	YES	<1>
SCOREBOARD	NO	<0>

Press [1], [ENTER] on the control console. The scoreboard will reset its functions.

24. **CLEAR / FLASH HITS** – The clear function deletes an incorrect numeric keypad entry. The flash hits function does not work with this scoreboard.
25. **ENTER / FLASH ERRORS** – The enter function is used after a numeric keypad entry. The flash errors function does not work with this scoreboard.

The NEXT POSS and DIMMER keys are not used with the 3450 scoreboard.

Hand Held Clock Control Unit Operation

The hand held clock control unit has an attached cable that is plugged into a jack on the control console back plate labeled **Clock Hand held**. It has one button that is used to toggle the clock on and off.

You should reset the scoreboard each time that it is turned on. Test out all the functions to ensure that 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 extension 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 Scoreboard Company offers onsite service in some areas. In other areas, we can help you contact an independent service technician. In areas in which service is not available from Electro-Mech Scoreboard Company, we will make every effort to answer your questions. Our trained personnel at Electro-Mech Scoreboard Company are ready to answer your questions from Monday to Friday during the hours of 8 AM to 5 PM Eastern Standard Time. Be sure to know your scoreboard model number when calling. Scoreboard replacement parts are always available. Damaged parts can usually be repaired at a significant cost savings. Our convenient toll free number is listed at the bottom of every page in this manual.

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 are serviced from the front of the scoreboard.

The LEDs that form digits 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 module, always turn off the power to the scoreboard when removing or replacing LED digits.** Figure 20 shows the components of a LED digit assembly.

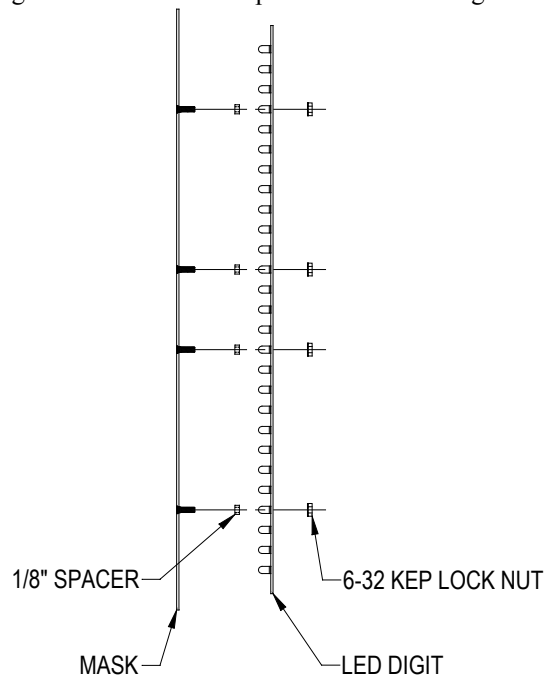


Figure 20 LED Digit Assembly

1. Remove the sheet metal screws that fasten the mask to the face of the scoreboard. **Caution: Support the mask before removing the last screw. The ribbon cable that connects to the rear of the circuit board is not designed to support the weight of the assembly.**
2. Disconnect the ribbon cable from the rear of the circuit board. **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 module.**

3. Place the assembly on a flat surface and remove the 6-32 kep lock nuts that hold the circuit board in place.
4. Remove the circuit board.
5. Align the mounting holes in the circuit board with the threaded studs on the mask and install the replacement digit on the mask.
6. Plug the ribbon cable onto the header on the back of the circuit board.

All other components are located behind the rear access panel. Figure 21 shows the view behind the access panel.

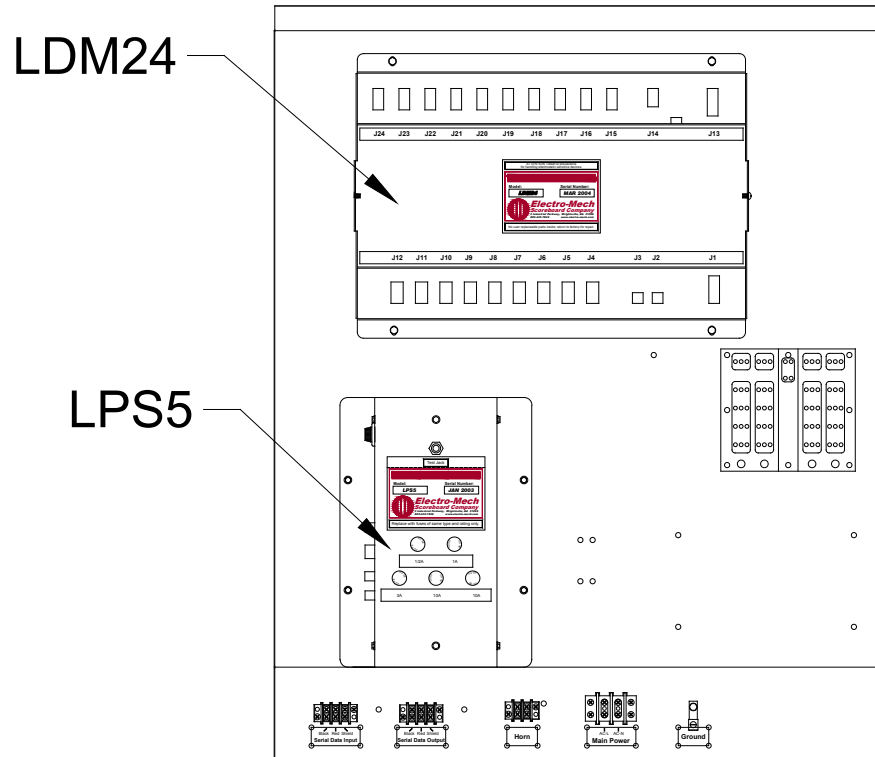


Figure 21 Access Panel Components

DRIVER MODULE JACK	FUNCTION
J1	DRIVER MODULE DC POWER INPUT #1
J2	SERIAL DATA INPUT
J3	SERIAL DATA OUTPUT
J4	CLOCK SECONDS UNITS DIGIT
J5	CLOCK SECONDS TENS DIGIT
J6	CLOCK MINUTES / INNING UNITS DIGIT
J7	HOME SCORE UNITS DIGIT
J8	HOME SCORE TENS DIGIT
J9	GUEST SCORE UNITS DIGIT
J10	YARDS TO GO UNITS / STRIKE DIGIT
J11	YARDS TO GO TENS DIGIT
J13	DRIVER MODULE DC POWER INPUT #2
J14	HORN RELAY CONTROL
J16	QTR. / OUT DIGIT
J17	CLOCK MINUTES / INNING TENS DIGIT
J19	DOWN / BALL DIGIT
J20	GUEST SCORE TENS DIGIT

Note: All other LDM24 jacks are unused.

LED Driver Module Replacement

Electrical connections to the LDM24 LED DRIVER MODULE are made with ribbon cable polarized IDC sockets and locking ramp crimp terminal housings that mate with jacks on the module. The module is secured inside the scoreboard with six machine screws.

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

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

LPS5 LED POWER SUPPLY MODULE FUNCTIONS

JACK	FUNCTION
J1	120 VAC INPUT
J2	20 VDC OUTPUT TO LED POWER INTERFACE BOARD
J3	SERIAL DATA INPUT / OUTPUT
J4	HORN CONTROL
J5	SERIAL DATA TEST JACK

A relay inside the LPS5 Power Supply Module isolates the LDM24 LED Driver Module from the control cable when the scoreboard is shut down. Connecting the control console to the test jack on the LPS5 Power Supply Module (J5) with the 10 ft. extension cable bypasses this relay. Figure 22 shows the location of the fuses in the LPS5 LED Power Supply Module. The table following the figure lists the fuse ratings, functions, and part numbers.

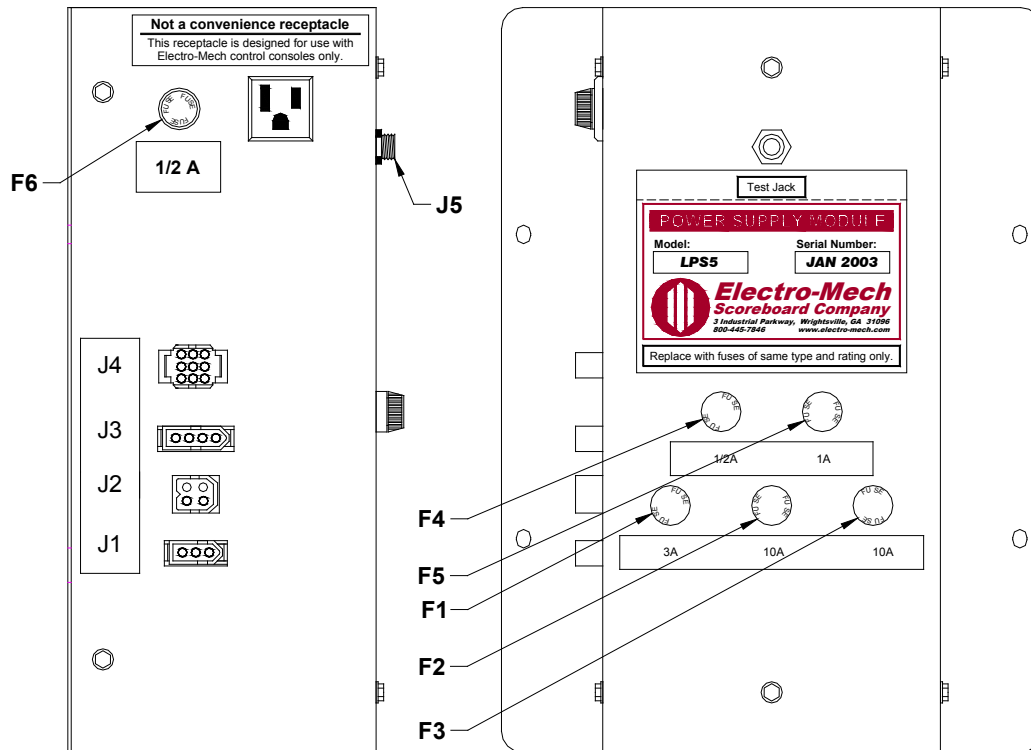


Figure 22 LPS5 Fuse Locations

LPS5 FUSES

FUSE	RATING	FUNCTION	BUSSMAN PART #
F1	3A 250V	TRANSFORMER PRIMARY	AGC-3
F2	10A 250V	LED POWER INTERFACE BOARD J1	AGC-10
F3	10A 250V	LED POWER INTERFACE BOARD J6	AGC-10
F4	1/2A 250V	SERIAL DATA ISOLATION RELAY	AGC-1/2
F5	1A 250V	HORN	AGC-1
F6	1/2A 250V	120 VAC ELECTRICAL RECEPTACLE	AGC-1/2

Note: Other manufacturers' fuses may be substituted for the Bussmann fuses.

LED Power Supply Module Replacement

Electrical connections to the LED Power Supply Modules are made with keyed plugs that mate with jacks on the left side of the module. The modules are secured inside the scoreboard with four machine screws each.

1. Disconnect the plugs from the jacks on the side of the module.
2. Remove the four screws.
3. Remove the module from the scoreboard.
4. Insert the replacement module in the scoreboard.
5. Secure the module with the four screws.
6. Insert the plugs into the jacks on the side of the module.

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

The LED Power Interface board distributes the output from the power supply modules to the LDM24 LED driver module and to some LED digits.

LED Power Interface Board Replacement

1. Unplug the wire assemblies from the jacks on the circuit board.
2. The circuit board is mounted on snap-in standoffs. Unseat the circuit board from the standoffs.
3. Press the replacement circuit board in place on the standoffs.
4. Plug the wire assemblies in the correct jacks on the circuit board. Each wire assembly is labeled to indicate the correct jack connection.

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, GA. 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 OTHER NATURAL DISASTERS, INCLUDING BUT NOT LIMITED TO FIRE, WIND, LIGHTNING, OR FLOOD, IS NOT COVERED BY THIS GUARANTEE.