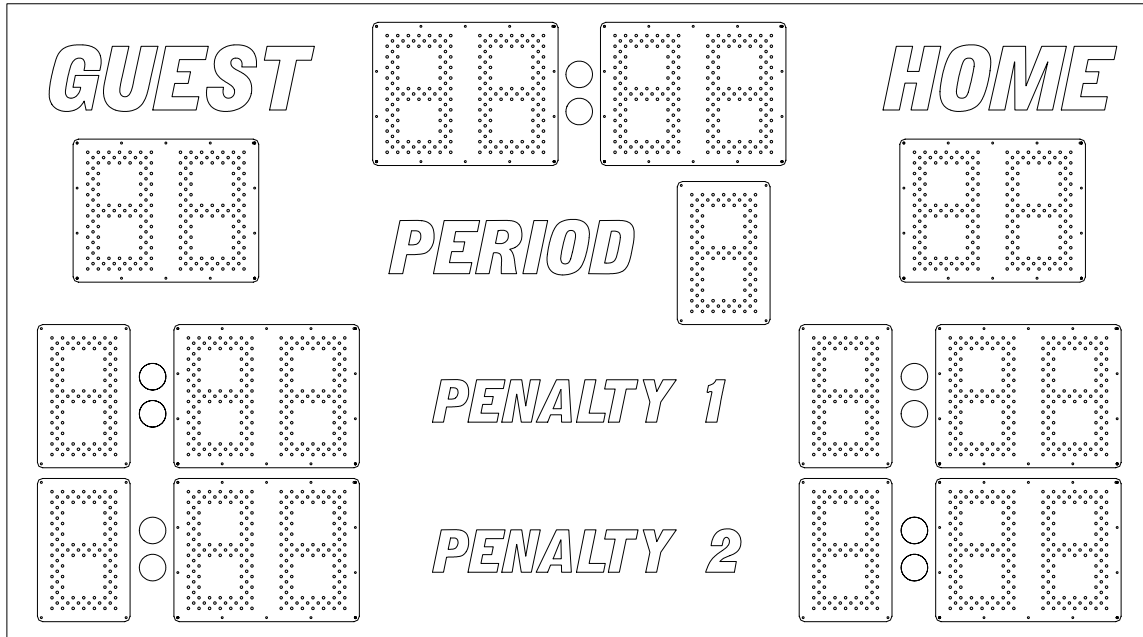# ELECTRO-MECH SCOREBOARD CO.

7860 HOCKEY 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. 1 Revised:04/28/06

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SCOREBOARD SPECIFICATIONS

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

DIMENSIONS: 9' L x 5' H x 6" D   (7860 with a side sponsor panel measures 13' L x 5' H x 6" D)

WEIGHT: 135 lbs   (7860 with a side sponsor panel weighs 165 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.

DISPLAY: The 7860 hockey scoreboard displays HOME and GUEST scores to 99, a clock that displays times between 0 and 99 minutes and 59 seconds (99:59), PERIOD to 4, two GUEST penalty timers and two HOME penalty timers that display times between 0 and 9 minutes and 59 seconds (9:59).

DIGITS: Red light emitting diodes mounted on printed circuit boards form the digits. The clock and score digits are 18" tall. All other digits are 15".

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 ¼" in diameter. This item is sold separately from the scoreboard.

JUNCTION BOX AND EXTENSION CABLE: A 4 ¼" x 2 ¼" x 2" junction box with a ¼" 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.

SCORELINK 300 RF MODEM SYSTEM: This accessory can be used in place of control cable and junction box for this scoreboard without internal modifications to the scoreboard or the control console. Refer to the SCORELINK 300 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 in order to complete the installation:

- Control cable (length dependent upon installation site layout)
- ScoreLink 300 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 top 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 4.5 inches outer diameter. Sink the posts in reinforced concrete footings. Figure 1 shows the spacing of the posts for a 7860 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.

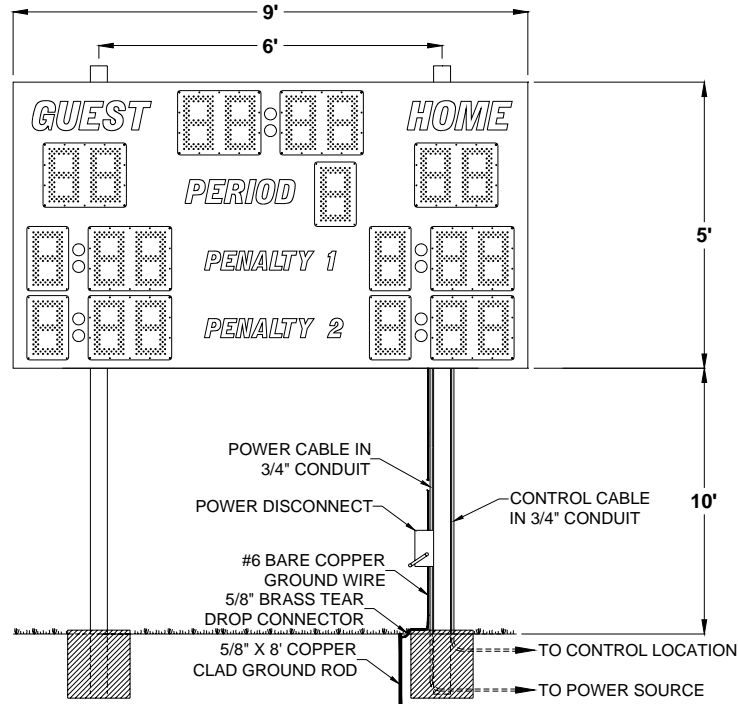**Figure 1 7860 Post Spacing**

Figure 2 shows the spacing of the posts for a 7860 scoreboard with an optional side sponsor panel. The sponsor panel is built into the scoreboard cabinet.
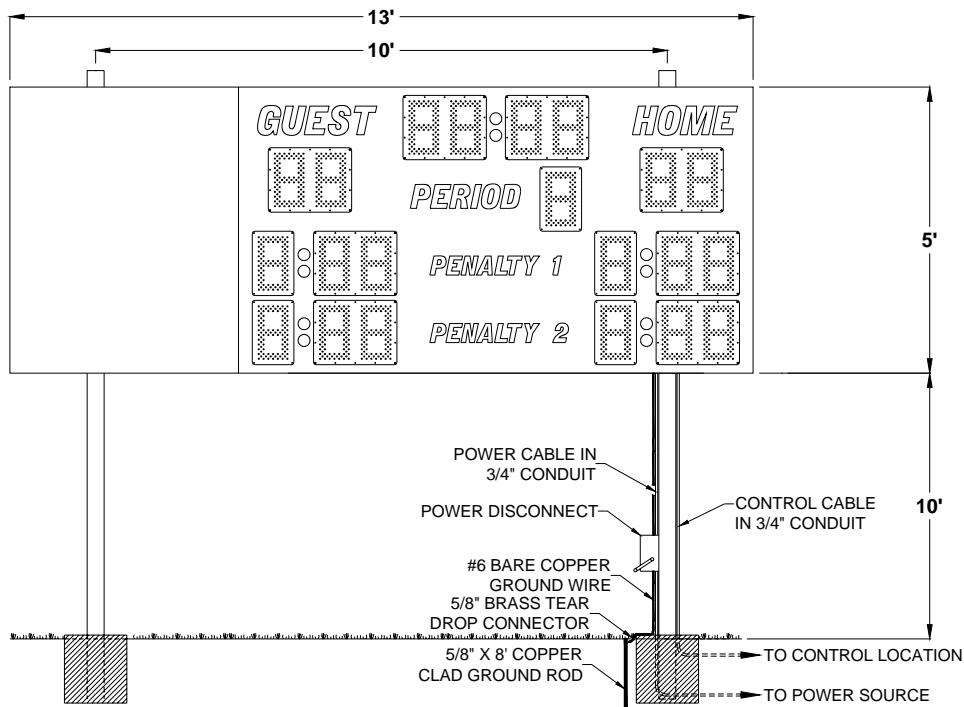
Figure 2 7860 with Side Sponsor Panel Post Spacing

Figure 3 shows the spacing of the posts for a 7860 scoreboard with an optional top sponsor panel. This panel is a separate unit that mounts on the same posts as the scoreboard.
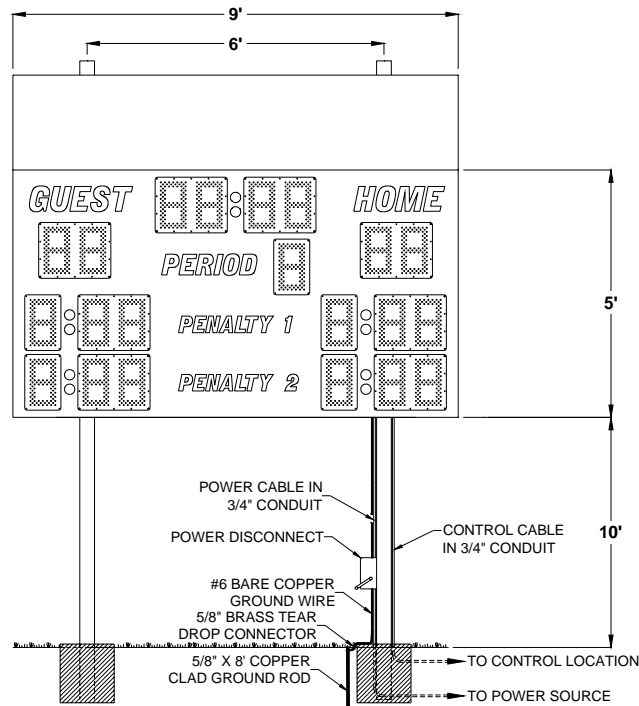

Figure 3 7860 with Top Sponsor Panel Post Spacing

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.
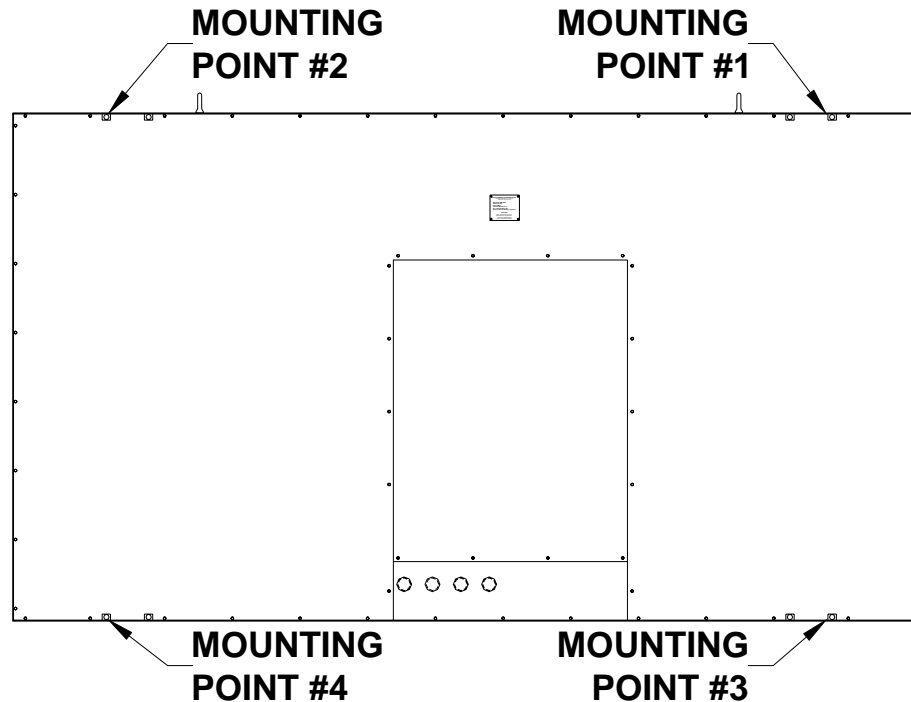
**MOUNTING
POINT #2**   **MOUNTING
POINT #1**

**MOUNTING
POINT #4**   **MOUNTING
POINT #3**

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 for the scoreboard consists of a steel angle bracket,
two threaded rods, two washers, and two nuts. A single set of mounting hardware for an
optional top sponsor panel consists of a steel angle bracket, two threaded rods, four
washers, and four 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.
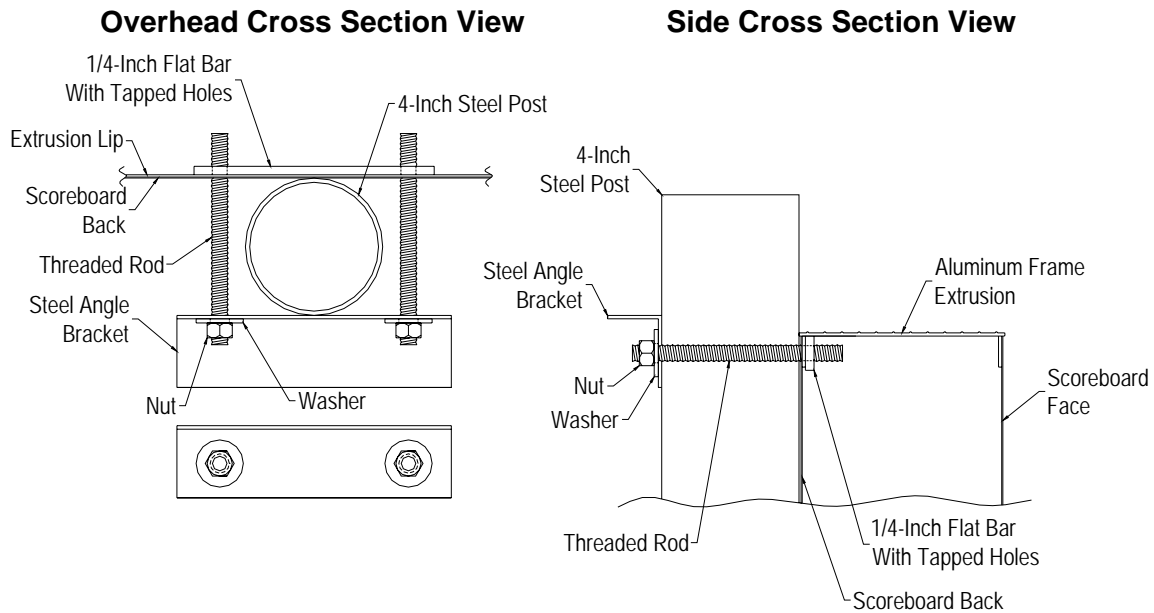
Overhead Cross Section View   **Side Cross Section View**

Figure showing mounting details with labels: 1/4-Inch Flat Bar With Tapped Holes, Extrusion Lip, Scoreboard Back, Threaded Rod, Steel Angle Bracket, Nut, Washer, 4-Inch Steel Post, Steel Angle Bracket, Nut, Washer, Aluminum Frame Extrusion, Scoreboard Face, Threaded Rod, 1/4-Inch Flat Bar With Tapped Holes, Scoreboard Back, 4-Inch Steel Post.

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 mounting point #1.
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 and SL-300 receiver, if purchased.

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. Place the threaded rods through the mounting holes in the top sponsor panel at one mounting point.
3. Place a washer over each threaded rod inside the frame of the top sponsor panel, and screw a nut onto each threaded rod behind the washers inside the frame of the top sponsor panel.
4. Place a steel angle bracket over the threaded rods at a mounting point.
5. Place a washer over each threaded rod.
6. Screw a nut onto each threaded rod so that the bracket is loosely held in place.
7. Repeat steps 2 - 6 at the other mounting points.
8. 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 ScoreLink 300 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.
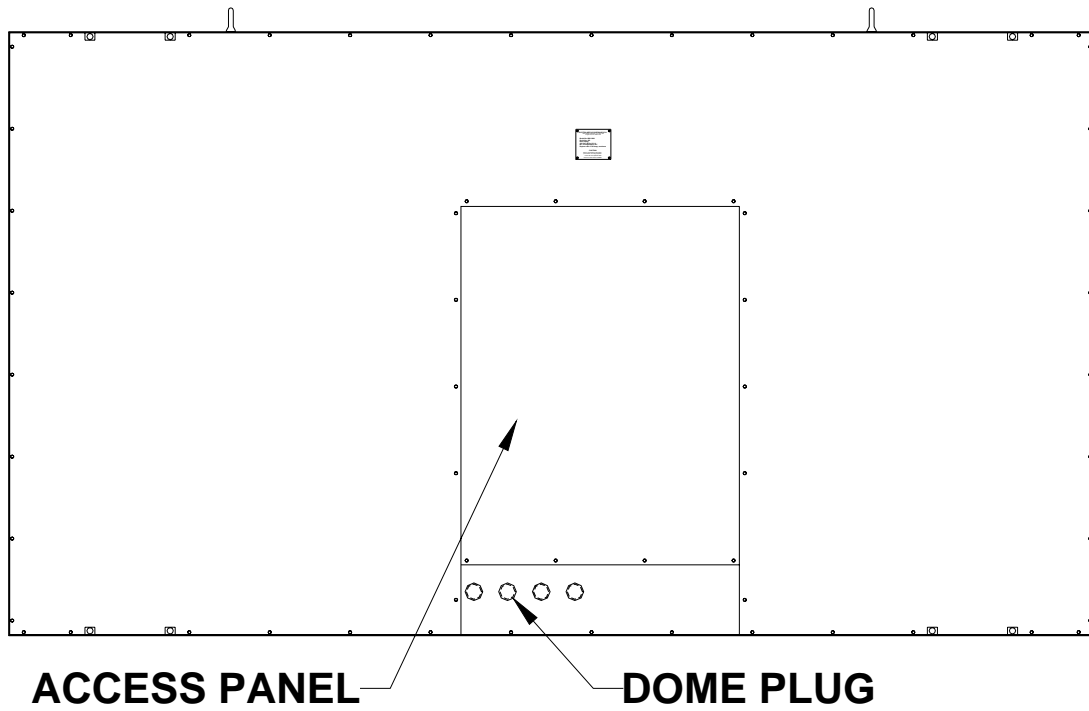
ACCESS PANEL   **DOME PLUG**

Figure 6 Rear Access Panel

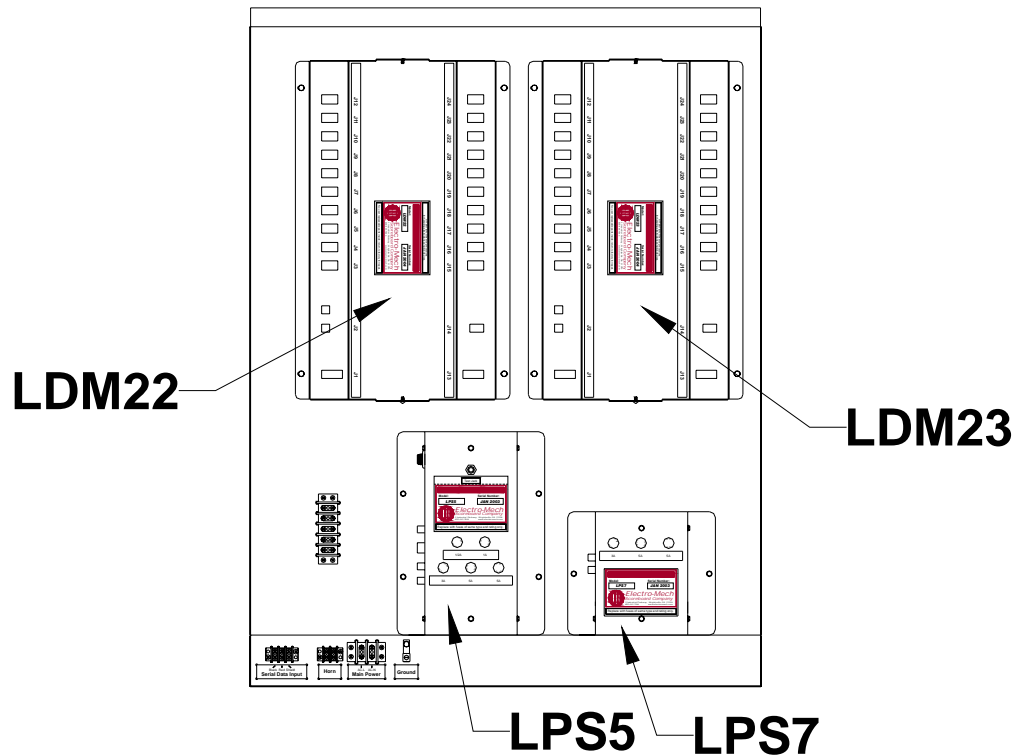4. Figure 7 shows the view behind the access panel.

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 7860: 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.
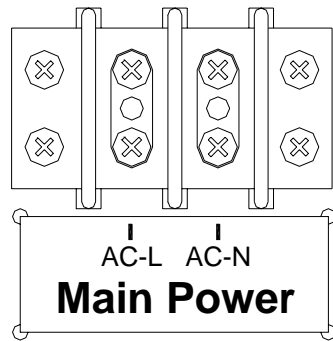
Figure 8 Power Connections

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.

ScoreLink 300

The ScoreLink 300 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 ScoreLink 300 RF MODEM SYSTEM OWNER'S HANDBOOK for installation instructions.

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 ¼" 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 ¼" stereo jack. Figure 9 shows the control cable wire connection points on the rear of the ¼" stereo jack.
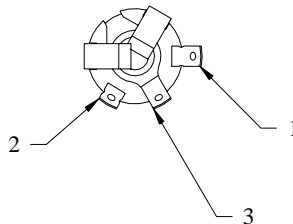
PIN 1 - BLACK WIRE
PIN 2 - RED WIRE
PIN 3 - SHIELD WIRE

Figure 9 ¼" 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 the left hole in the plate below the access panel.
2. Crimp fork terminals to the control cable wires and the shield.
3. Connect the control cable to the **Control Cable** terminal block on the junction chassis according to figure 10.
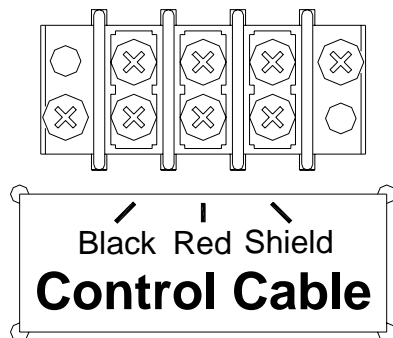

Black Red Shield

Control Cable

Figure 10 Control Cable Wiring Diagram

4. Reinstall the access panel.

Control Console Connections

The 10 ft. extension cable has two molded ¼" 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 ¼" stereo jack on the junction box or the ScoreLink 300 Transmitter, if purchased.
2. Plug the other end into the ¼" 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 or the ScoreLink 300 Transmitter, if purchased.
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.
5. If a ScoreLink 300 RF MODEM SYSTEM is installed with this scoreboard, plug the wall mount DC power supply into a grounded NEMA 5-15R 120 VAC receptacle and the male plug on the end of the attached cable into the Power jack on the Transmitter.

GAME TIME OPERATION

This scoreboard is operated with a 37-key control console. Figure 11 shows the keypad layout on the control console.

ELECTRO-MECH SCOREBOARD CO.
3 Industrial Parkway   Wrightsville, GA 31096
800-445-7846   www.electro-mech.com

HOCKEY

| SET CLOCK | SET CLOCK .1 SEC | .1 SEC ON / OFF | CLOCK UP / DOWN |
| SET DGT / SC | AUTO HORN | TIME OF DAY | TIME OUT TIMER |

| SET GUEST SCORE | SET HOME SCORE | GUEST GOAL | HOME GOAL |

| GUEST PENALTY CLOCK 1 | GUEST PENALTY CLOCK 2 | HOME PENALTY CLOCK 1 | HOME PENALTY CLOCK 2 |

7 8 9
4 5 6
1 2 3
CLEAR 0 ENTER

NEW GAME

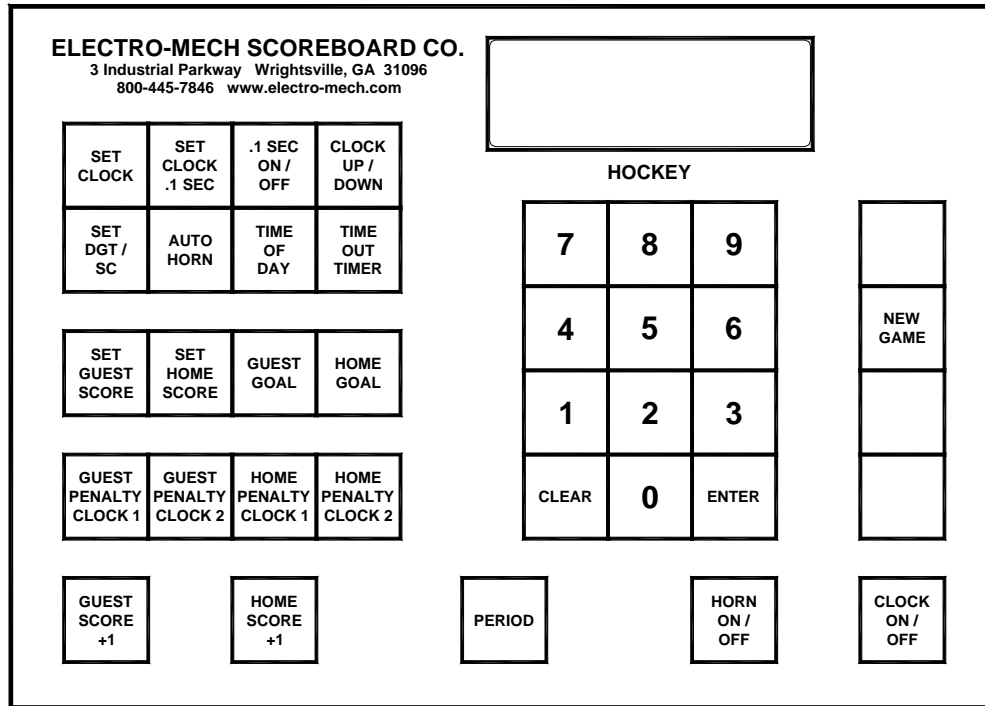| GUEST SCORE +1 | HOME SCORE +1 | PERIOD | HORN ON / OFF | CLOCK ON / OFF |

Figure 11 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  HL1
```

After a few seconds the display will read:

```
000  D15:00  0  000
        HOCKEY
```

The scoreboard will display:

CLOCK – 15:00
GUEST – 0
HOME – 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. The HOME and GUEST penalty clocks are not displayed on the console LCD display. Figure 12 explains the LCD display layout.
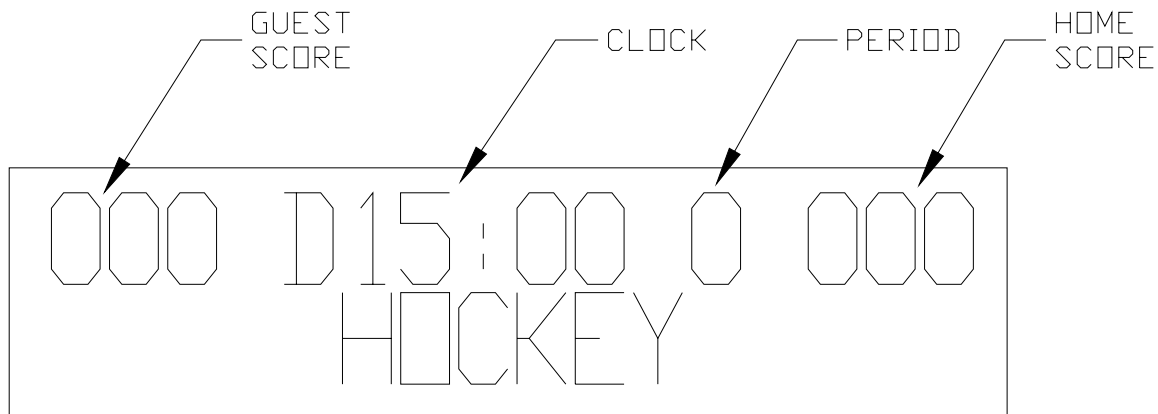
Figure 12 Control Console LCD Display

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:

```
000 D15:00 0 000
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:

```
000 D15:00 0 000
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:

```
000 D15:00 0 000
.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:

```
000 D15:00 0 000
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. **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-O  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.

6. **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   ON <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.

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

```
000 D15:00 0 000
SET T-□ <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.

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

```
000 D15:00 0 000
GUEST SCORE<000>
```

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

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

```
000 D15:00 0 000
HOME SCORE <000>
```

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

10. **GUEST GOAL** – This key is used to indicate that the guest team has scored a goal. After the [GUEST GOAL] is pressed, the console LCD will display the letter G (as shown below) and the guest goal light (if installed) will remain lit for approximately 5 seconds.

```
000 D15:00 0 000
 G   HOCKEY
```

11. **HOME GOAL** – This key is used to indicate that the home team has scored a goal. After the [GUEST GOAL] is pressed, the console LCD will display the letter G (as shown below) and the guest goal light (if installed) will remain lit for approximately 5 seconds.

```
000 D15:00 0 000
     HOCKEY   G
```

12. **GUEST PENALTY CLOCK 1** – This key sets the time for guest penalty clock 1. To set this timer, press [GUEST PENALTY CLOCK 1]. The console LCD display will read:

```
000 D15:00 0 000
G-PENALTY1<?: ??>
```

Press the keypad numbers for the time, [ENTER]. The console LCD display will then read:

```
000 D15:00 0 000
PLAYER NO.  <00>
```

Press the keypad numbers for the player number, [ENTER]. Note: Model 7860 will not display player numbers. EXAMPLE: To set the GUEST PENALTY CLOCK 1 to three minutes for player #14, press [GUEST PENALTY CLOCK 1], [3], [0], [0], [ENTER], [1], [4], [ENTER].

13. **GUEST PENALTY CLOCK 2** – This key sets the time for guest penalty clock 2. To set this timer, press [GUEST PENALTY CLOCK 2]. The console LCD display will read:

```
000 D15:00 0 000
G-PENALTY2<?: ??>
```

Press the keypad numbers for the time, [ENTER]. The console LCD display will then read:

```
000 D15:00 0 000
PLAYER NO.  <00>
```

Press the keypad numbers for the player number, [ENTER]. Note: Model 7860 will not display player numbers. EXAMPLE: To set the GUEST PENALTY CLOCK 2 to two minutes and 30 seconds for player #07, press [GUEST PENALTY CLOCK 2], [2], [3], [0], [ENTER], [0], [7], [ENTER].

14. **HOME PENALTY CLOCK 1** – This key sets the time for HOME penalty clock 1. To set this timer, press [HOME PENALTY CLOCK 1]. The console LCD display will read:

```
000 D15:00 0 000
H-PENALTY1<?:??>
```

Press the keypad numbers for the time, [ENTER]. The console LCD display will then read:

```
000 D15:00 0 000
PLAYER NO.  <00>
```

Press the keypad numbers for the player number, [ENTER]. Note: Model 7860 will not display player numbers. EXAMPLE: To set the HOME PENALTY CLOCK 1 to one minute for player #88, press [HOME PENALTY CLOCK 1], [1], [0], [0], [ENTER], [8], [8], [ENTER].

15. **HOME PENALTY CLOCK 2** – This key sets the time for HOME penalty clock 2. To set this timer, press [HOME PENALTY CLOCK 2]. The console LCD display will read:

```
000 D15:00 0 000
H-PENALTY2<?:??>
```

Press the keypad numbers for the time, [ENTER]. The console LCD display will then read:

```
000 D15:00 0 000
PLAYER NO.  <00>
```

Press the keypad numbers for the player number, [ENTER]. Note: Model 7860 will not display player numbers. EXAMPLE: To set the HOME PENALTY CLOCK 2 to 45 seconds for player #20, press [HOME PENALTY CLOCK 2], [4], [5], [ENTER], [2], [0], [ENTER].

16. **GUEST SCORE +1** – This key is used to increment the guest score by 1.

17. **HOME SCORE +1** – This key is used to increment the home score by 1.

18. **PERIOD** – This key is used to increment the period by 1.

19. **HORN ON/OFF** – This key is used to sound the horn for ½ second.

20. **CLOCK ON/OFF** – This key is used to start and stop the clock.

21. **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.

The SET DGT/SC key is not used with the 7860 scoreboard.

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. If a ScoreLink 300 RF MODEM SYSTEM is installed with this scoreboard, unplug
    the Transmitter's wall mount power supply.
5. Store the control console and ScoreLink 300 Transmitter in a dry location. These
    units are 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.

LED Digits Replacement

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 13 shows the components of a LED digit assembly.
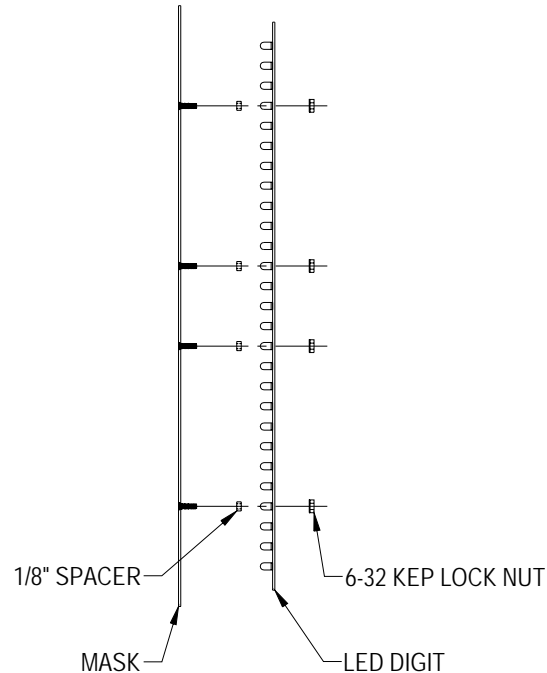
Figure 13 LED Digit Assembly

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 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. 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 module.
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.
7. Reinstall the assembly using the sheet metal screws.

All other components are located behind the rear access panel. Figure 14 shows the view behind the access panel.
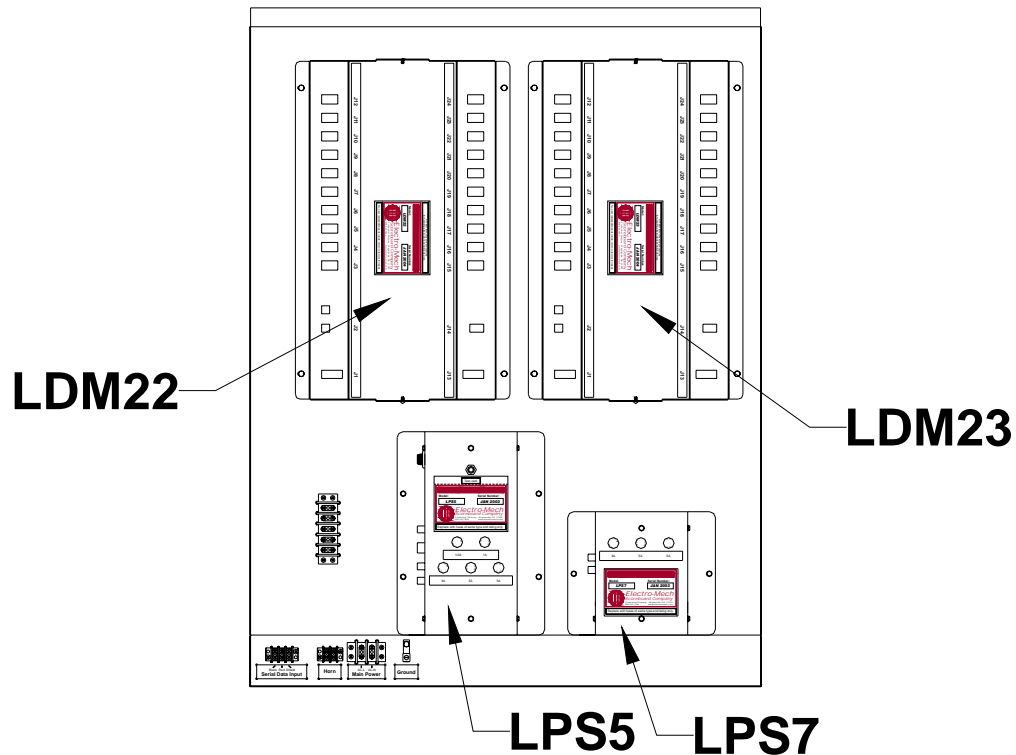
Figure 14 Access Panel Components

LDM22 LED DRIVER MODULE FUNCTIONS

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 UNITS DIGIT
J7	HOME SCORE UNITS DIGIT
J8	HOME SCORE TENS DIGIT
J9	GUEST SCORE UNITS DIGIT
J10	GUEST TIMER #1 SECONDS UNITS DIGIT
J11	GUEST TIMER #1 SECONDS TENS DIGIT
J12	GUEST TIMER #1 MINUTES UNITS DIGIT
J13	DRIVER MODULE DC POWER INPUT #2
J14	HORN RELAY CONTROL
J16	PERIOD DIGIT
J17	CLOCK MINUTES TENS DIGIT
J20	GUEST SCORE TENS DIGIT

Note: All other LDM22 jacks are unused.

LDM23 LED DRIVER MODULE FUNCTIONS

DRIVER MODULE JACK	FUNCTION
J1	DRIVER MODULE DC POWER INPUT #1
J2	SERIAL DATA INPUT
J3	SERIAL DATA OUTPUT
J4	GUEST TIMER #2 SECONDS UNITS
J5	GUEST TIMER #2 SECONDS TENS
J6	GUEST TIMER #2 MINUTES UNITS
J7	HOME TIMER #1 SECONDS UNITS
J8	HOME TIMER #1 SECONDS TENS
J9	HOME TIMER #1 MINUTES UNITS
J10	HOME TIMER #2 SECONDS UNITS
J11	HOME TIMER #2 SECONDS TENS
J12	HOME TIMER #2 MINUTES UNITS
J13	DRIVER MODULE DC POWER INPUT #2

Note: All other LDM23 jacks are unused.

LED Driver Module Replacement

Electrical connections to the LED driver modules are made with ribbon cable polarized IDC sockets and locking ramp crimp terminal housings that mate with jacks on the module. Four machine screws are used to secure a LED driver module inside the scoreboard.

1. Unplug the electrical connections from the module. Do not cut the plastic tie wraps around the ribbon cables.
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 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 DRIVER MODULE
J3	SERIAL DATA INPUT / OUTPUT
J4	HORN CONTROL
J5	SERIAL DATA TEST JACK

A relay inside the LPS5 Power Supply Module isolates the LDM22 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 15 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.
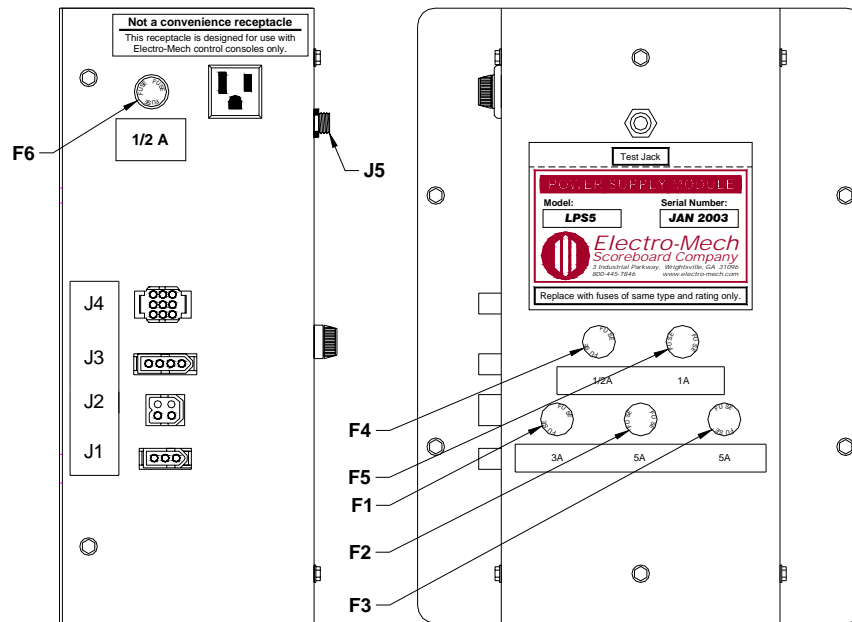

Figure 15 LPS5 Fuse Locations

LPS5 FUSES

FUSE	RATING	FUNCTION	BUSSMAN PART #
F1	3A 250V	TRANSFORMER PRIMARY	AGC-3
F2	5A 250V	DRIVER MODULE DC POWER INPUT #1	AGC-5
F3	5A 250V	DRIVER MODULE DC POWER INPUT #2	AGC-5
F4	½A 250V	SERIAL DATA ISOLATION RELAY	AGC-1/2
F5	1A 250V	HORN	AGC-1
F6	½A 250V	120 VAC ELECTRICAL RECEPTACLE	AGC-1/2

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

LPS7 LED POWER SUPPLY MODULE FUNCTIONS

JACK	FUNCTION
J1	120 VAC INPUT
J2	20 VDC OUTPUT TO LED POWER DRIVER MODULE

Figure 16 shows the location of the fuses in the LPS7 LED Power Supply Module. The table following the figure lists the fuse ratings, functions, and part numbers.
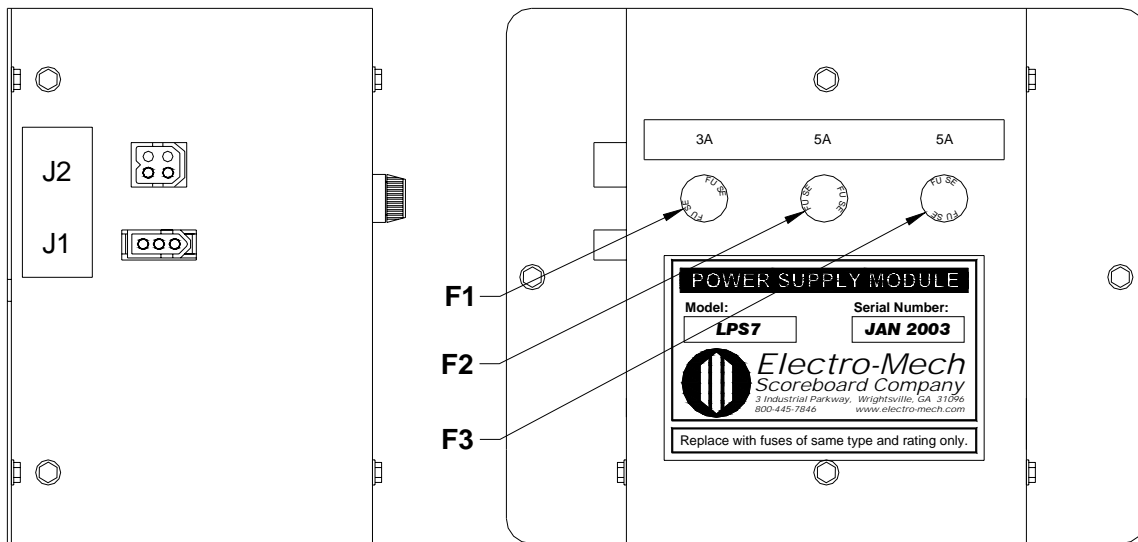
Figure 16 LPS7 Fuse Locations

LPS7 FUSES

FUSE	RATING	FUNCTION	BUSSMAN PART #
F1	3A 250V	TRANSFORMER PRIMARY	AGC-3
F2	5A 250V	DC POWER OUTPUT #1	AGC-5
F3	5A 250V	DC POWER OUTPUT #2	AGC-5

Note: Other manufacturer's 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. Four machine screws are used to secure a LED power supply module inside the scoreboard.

1. Disconnect the plugs from the jacks on the left 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.

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.