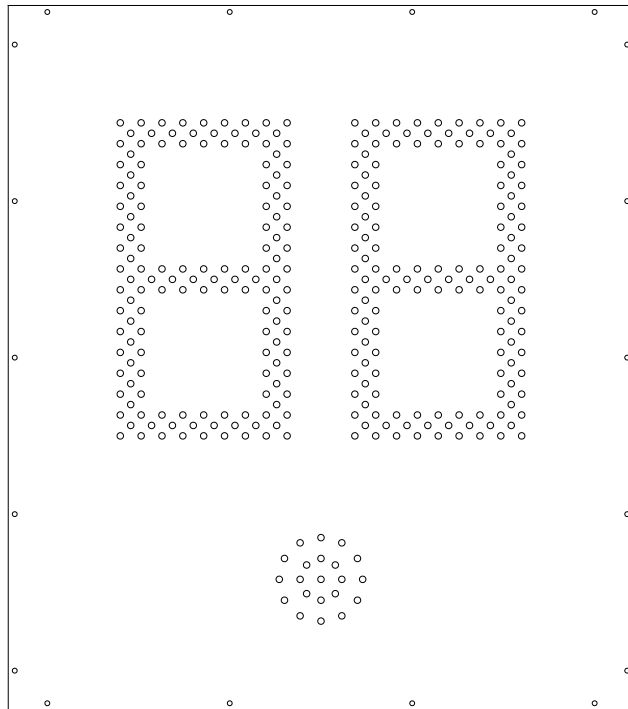


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## **ELECTRO-MECH SCOREBOARD CO.**



### **MODEL 2160 SHOT TIMER**

### **OWNER'S HANDBOOK**

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

Rev. 3 Revised: 08/28/2007

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## MODEL 2160 SHOT TIMER SPECIFICATIONS

**GENERAL:** Customers normally purchase a set of two shot timers. This ETL listed product includes the two shot timers, a hand held unit, two 10 ft. extension cables, and two junction boxes. It may be purchased with or without a control console.

**DIMENSIONS:** 24" L x 27" H x 6"

**WEIGHT:** 20 lbs

**CONSTRUCTION:** The outer frame is made from extruded aluminum. The face and back are made from aluminum sheet. The face is finished with enamel paint. Black is the standard face color. Limited mounting hardware is included.

**DISPLAY:** The model 2160 shot timer is a two digit counter which can be set from 1 to 99 seconds. It has an internal horn.

**DIGITS AND SYMBOLS:** Light emitting diodes mounted on printed circuit boards form the digits and symbols. The shot clock is formed with 12" red digits and the 4" goal light indicator is red.

**POWER REQUIREMENTS:** **Shot Timer** - 120 VAC, 0.3 A, 60 Hz. The shot timer has an attached 6 ft. power cord. **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. The cable 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.

## **SHOT TIMER INSTALLATION**

This part of the manual describes the mechanical and electrical installation of the shot timer.

One of the items listed below must be purchased in order to complete the installation:

- Control cable (length dependent upon installation site layout, but not to exceed 1000 feet between the console and the scoreboard)
- SL-230 / 330 RF Modem System

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

- Hardware to attach the shot timer to the wall or basketball goal.
- A grounded NEMA 5-15R 120 VAC receptacle for the control console at the scorekeeper's table.

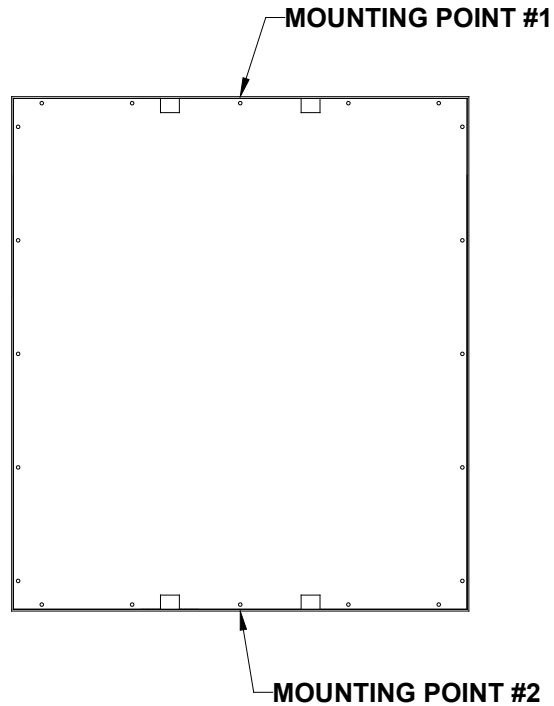
Electro-Mech Scoreboard Company performs installations in some areas. In other areas, we can help you contact an independent installer. In areas in which installation service is not available from Electro-Mech Scoreboard Company, we will make every effort to answer your installation questions. Qualified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

## **MECHANICAL INSTALLATION**

The mechanical installation includes mounting the shot timer on the wall or basketball goal. The shot timer can be mounted by using either the side or the rear cabinet mounting points.

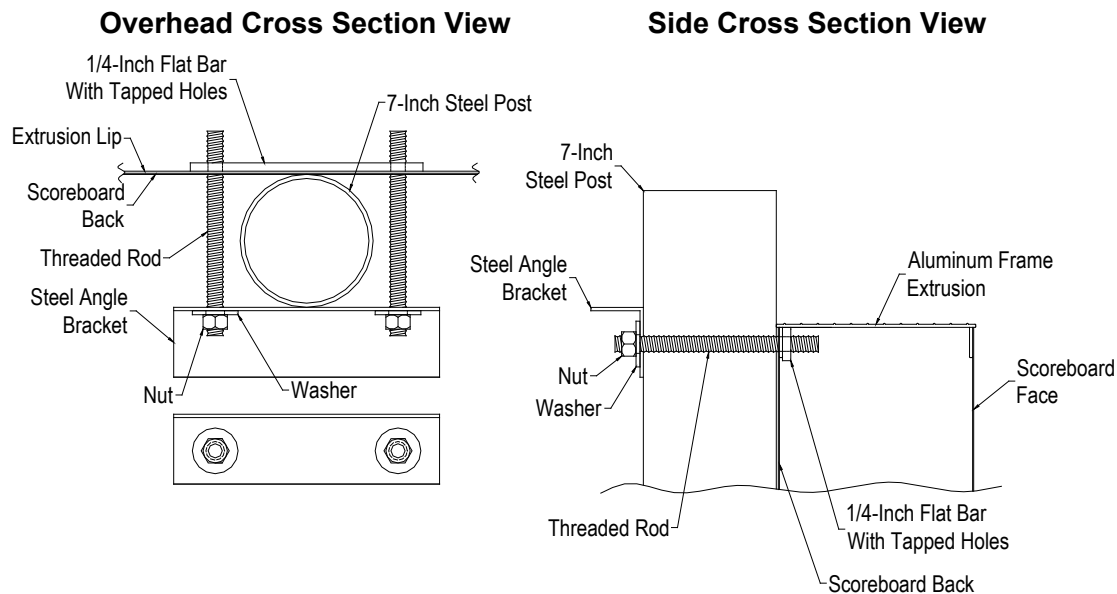
### **Rear Mounting Method**

This shot timer can be mounted in front of a single pole. The mounting points are located at the top and bottom edges of the rear side of the cabinet. Figure 1 shows the mounting points located on the rear of the shot timer.



**Figure 1 Rear Mounting Points**

Two sets of mounting hardware are provided for mounting the model 2160 to a pole. The mounting hardware will accommodate poles up to 7 inches outer diameter. A single set of mounting hardware consists of a steel angle bracket, two threaded rods, two washers, and two nuts. Figure 2 shows an overhead cross section view and a side cross section view of the shot timer attached to a pole 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.



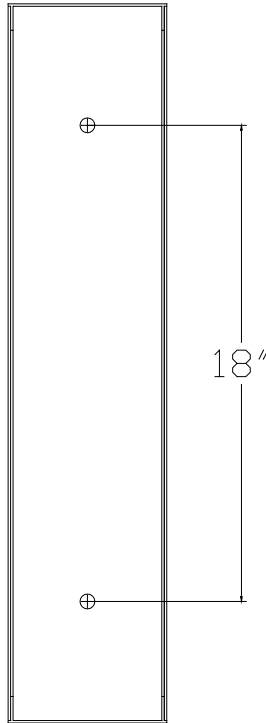
**Figure 2 Rear Mounting Method**

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

1. Screw the threaded rods into the tapped holes on the rear of the shot timer.
2. Raise the shot timer into place at the pole.
3. Place a steel angle bracket over the threaded rods at the top 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 bottom mounting point.
7. Tighten the nuts to clamp the shot timer in place on the posts.

### Side Mounting Method

Two 3/8" bolts and two washers are provided for each unit. The bolts and washers can be used to attach the shot timer to the customer's mounting hardware. There are two tapped holes are located on each side of the cabinet which accept the bolts. Figure 3 shows the mounting points located on one side of the shot timer. Identically spaced holes are located on the opposite side of the shot timer. **Be sure to mount the shot timer close enough to a wall receptacle so that you can plug in the 6 ft. power cord.**



**Figure 3 Model 2160 Mounting Points**

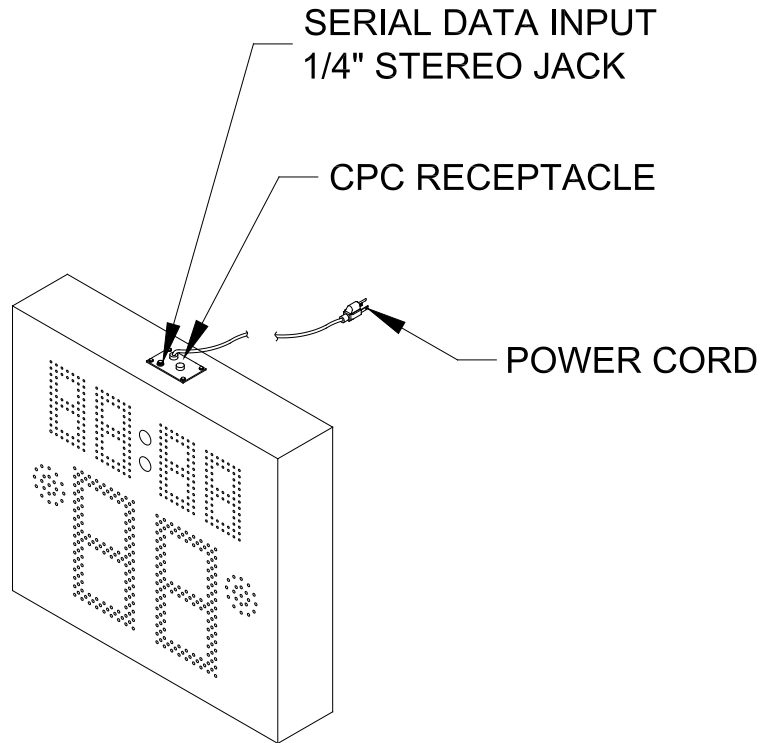
## **ELECTRICAL INSTALLATION**

We recommend a qualified electrician perform the needed electrical connections to ensure proper operation of the shot timer. These connections include connecting the shot timer to a power source, installing the SL-230 / 330 RF modems or the control cable, and connecting the control console.

### **Power Connection**

The shot timer requires 120 VAC service at the shot timer to operate properly.

**Maximum power consumption of Model 2160: 40 Watts.** The shot timer has a 6 ft. attached power cord located at the top of the cabinet. Plug the power cord into a grounded NEMA 5-15R receptacle. The receptacle should be controlled by a separate circuit breaker so that the shot timer can be turned off without turning off other electrical devices in the facility. Figure 4 shows the electrical connection points on the scoreboard. Units built before August 2007 do not have a CPC receptacle.



**Figure 4 Electrical Connection Points**

#### **SL-230 / 330**

The SL-230 / 330 RF MODEM SYSTEM is intended to eliminate the control cable between the scoreboard and the control console on indoor 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**. Two sets of transmitters and receivers programmed on different channels are required for this scoreboard. Refer to the installation manual provided for this product.

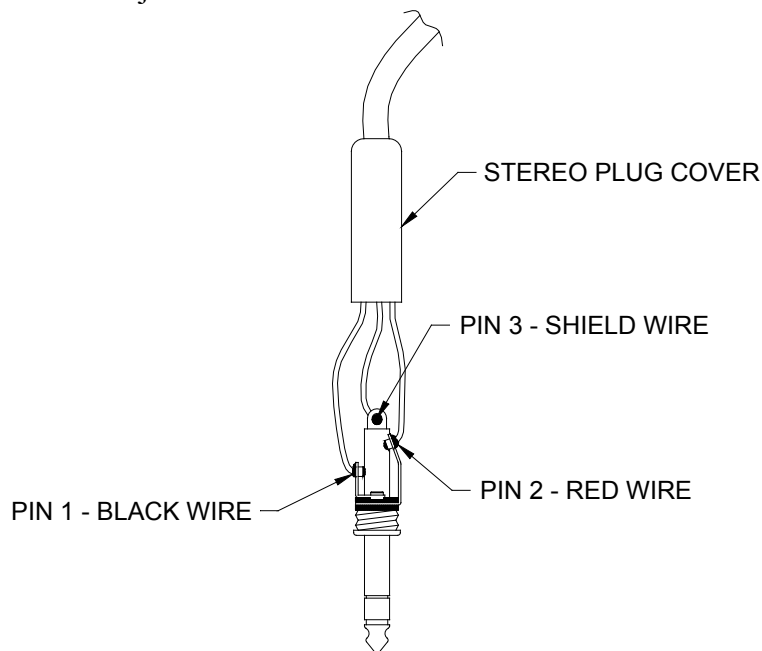


## Control Cable Installation

If the customer is operating a scoreboard with the same control console as the shot timer, he can install the control cable from the  $\frac{1}{4}$ " stereo jack mounted on the top of the shot timer to the shot timer output jack located on the right side of the scoreboard, or the serial data output jack located on the top of four sided LED scoreboard models, or to the control console. A connection to the control console is preferred.

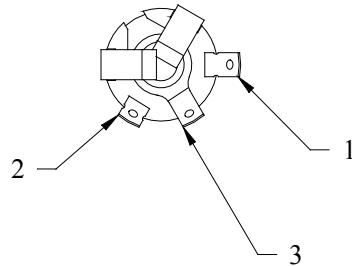
When connecting between the shot timer output jack of the of the scoreboard to the model 2160 shot timer, each end of the control cable has a  $\frac{1}{4}$ " stereo plug attached. When connecting between the control console and the model 2160 shot timer, the cable end that attaches to the scoreboard has a  $\frac{1}{4}$ " stereo plug attached and the other end has a small metal junction box with a  $\frac{1}{4}$ " stereo jack mounted on the face plate. The junction box should be securely mounted within 10 feet of the control console point of operation. A 10 ft. cable with  $\frac{1}{4}$ " stereo plugs attached to each end (called the extension cable) is provided to make the connection from the junction box the control console.

Most customers order the control cable with the proper connectors attached to each end when ordering the shot timer. Some customers prefer to attach the connectors after the cable is installed. The instructions below describe how to attach these connectors. All connections should be soldered. Splicing the cable is not recommended. Figure 5 shows the connection points to solder the  $\frac{1}{4}$ " stereo plug to the control cable. Unscrew the stereo plug cover from the plug body to expose the contact pins. Figure 6 shows the connection points to solder the control cable to the rear of  $\frac{1}{4}$ " stereo jack mounted on the face plate of the junction box.



**Figure 5  $\frac{1}{4}$ " Stereo Plug Wiring Diagram**

## 1/4" STEREO JACK



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

**Figure 6 1/4" Stereo Jack Wiring Diagram**

### Control Console Connections

The 10 ft. extension cable has two molded 1/4" stereo plugs attached to it. The following steps describe how to connect the control console:

1. Plug one end of the extension cable into the 1/4" stereo jack on the junction box.
2. Plug the other end into one of the four 1/4" stereo jacks mounted on the control console back plate.
3. Plug the control console power cord into a grounded NEMA 5-15R 120 VAC receptacle.
4. Plug the shot clock hand held remote into the RJ45 jack mounted on the control console back plate labeled **DGT/SC Hand held**.

### 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.

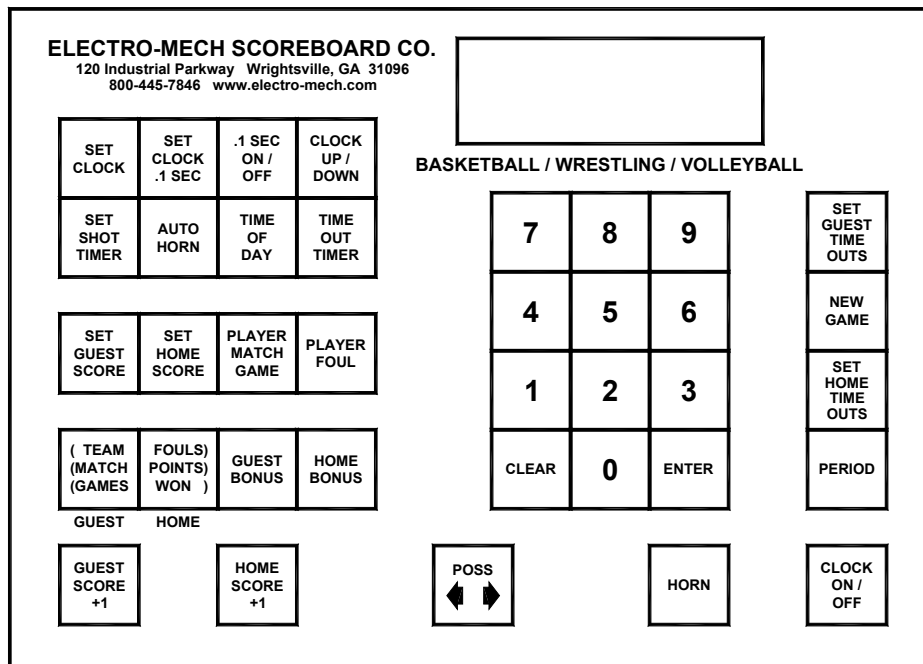
## SHOT TIMER OPERATION

### SHOT TIMER STARTUP

1. Place the circuit breaker for the shot timer in the **ON** position.
2. If the shot timer control cable is connected to the control console, plug one end of the extension cable into the ¼” stereo jack on the junction box and 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.
4. Plug the shot clock hand held remote into the RJ45 jack mounted on the control console back plate labeled **DGT/SC Hand held**.

### GAME TIME OPERATION

This shot timer is operated with a 37-key control console. Figure 7 shows the keypad layout on the control console.



**Figure 7 Keypad Layout**

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

```
ELECTRO-MECH 276
SCOREBOARD MPBWV
```

After a few seconds the display will read:

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

The shot timer will display 25 seconds.

### Control Console Key Functions

1. **SET SHOT TIMER** – The console is programmed with two timers. The timers should be set prior to the start of a game. The shot timer is preset to 25 seconds. The out of bounds timer is preset to 5 seconds. To change either one of these times, press [SET SHOT TIMER]. The console LCD display will read:

```
000 D15: 00 0 000
ST RESET  <25>
```

Press the keypad numbers to set shot timer, [ENTER]. The LCD display will then read:

```
00  D15: 00 0  00
ST  OB RESET <05>
```

Press the keypad numbers to set the out of bounds timer, [ENTER].

2. **CLOCK ON/OFF** – This key is used to start and stop the basketball game clock. **The clock must be on in order for the model 2160 to count down.**
3. **NEW GAME** – This key is used to reset all the shot timer functions to their default settings. To reset the shot timer, press [NEW GAME]. The console LCD display will read:

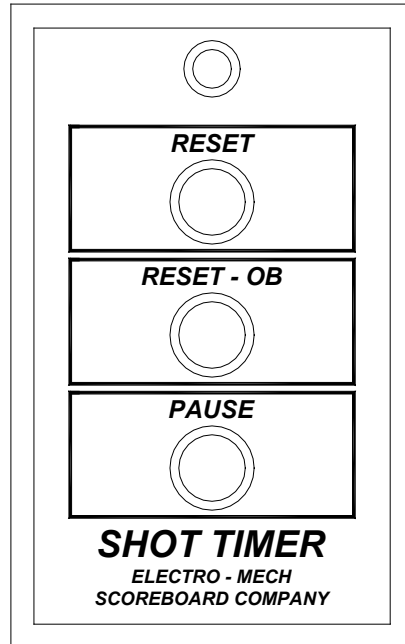
```
RESET  YES<1>
SCOREBOARD NO<0>
```

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

The other keys are not used with the model 2160 shot timer, but may be used for a compatible basketball scoreboard.

### Hand Held Shot Timer Control Unit Operation

The hand held shot timer control unit has an attached cable that is plugged into a jack on the control console back plate labeled **DGT/SC Hand held**. As seen in figure 8, it has three buttons. The operation of the buttons is described in the text below the figure.



**Figure 8 Hand Held Shot Timer Control Unit**

### **Shot Timer Button Functions**

The shot timer displays 25 seconds when the console is turned on or is reset for a new game.

1. **RESET** – This button is used to reset the shot timer to the time programmed in the console for ST RESET. The default time is 25 seconds.
2. **RESET-OB** – This button is used to reset the shot timer to the time programmed in the console as ST-OB RESET. The default time is 5 seconds.
3. **PAUSE** – This button is used to turn the delay of game timer digits on and off. The delay of game timer will initialize to 0 seconds when the digits are turned on.

### **Horn Operation**

The internal horn sounds for two seconds when the shot timer reaches 0 seconds.

### **Goal Light Indicator Operation**

The goal light indicator on the shot timer will illuminate when the game clock on the basketball scoreboard reaches 0 seconds.

## SHOT TIMER SHUTDOWN

1. Place the power disconnect for the shot timer in the **OFF** position.
2. Unplug the control console power cord.
3. If the shot timer control cable is connected to the control console, unplug the extension cable.
4. Store the control console in a dry location. This unit is not waterproof.

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

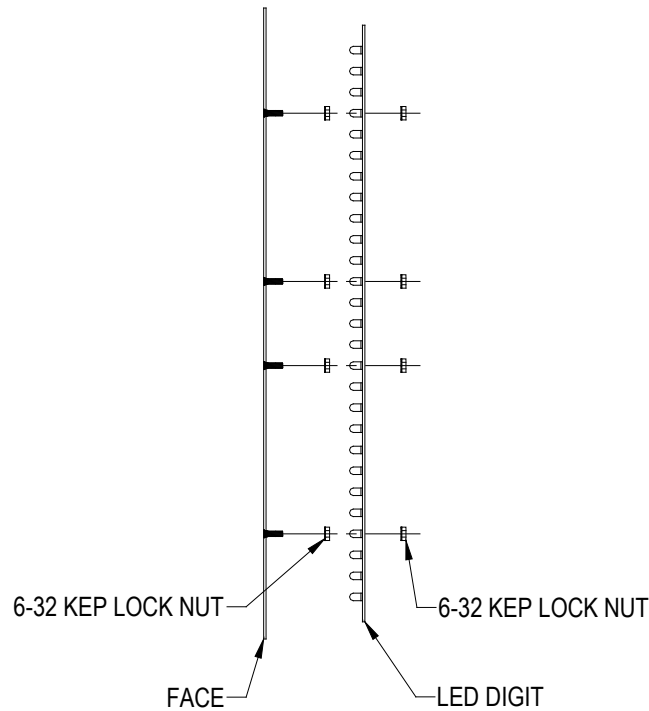
## SERVICING THE SHOT TIMER

While your shot timer 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 shot timer model number when calling. Shot timer 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.

## COMPONENT REPLACEMENT

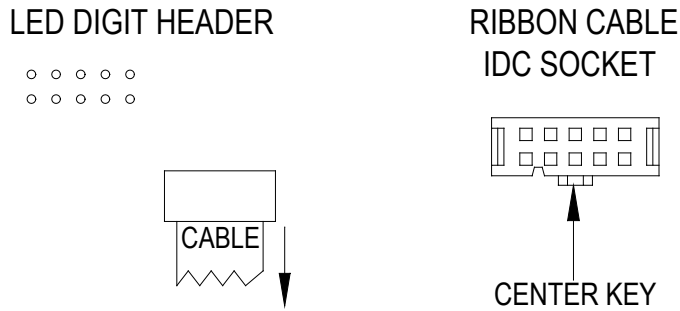
### LED Digits And Indicators Replacement

The LEDs that form digits are soldered on circuit boards mounted behind the shot timer face. 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 shot timer when removing or replacing LED digits.** Figure 9 shows the components of a LED digit assembly.



**Figure 9 LED Digit Assembly**

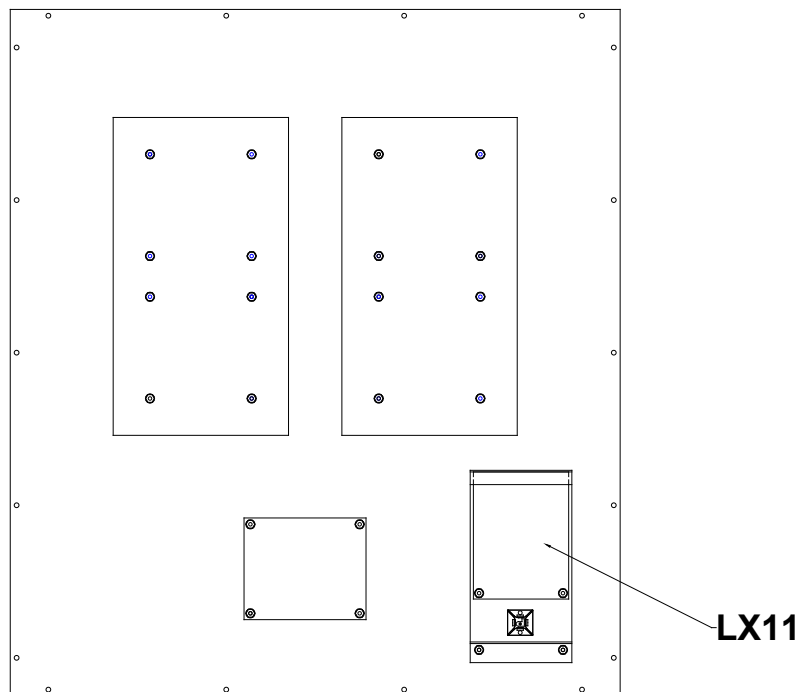
1. Remove the machine screws that fasten the face of the shot timer.
2. Disconnect the wires and cable from the jacks on the LX11 driver board and the ribbon cables from the IDC connectors on the LED digits and indicator.
3. Place the face assembly on a flat surface and remove the 6-32 kee lock nuts 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. Connect the wires and cable to the jacks on the LX11 driver board and the ribbon cables to the IDC connectors on the LED digits and indicator. Refer to figure 10 in order to plug the ribbon cable IDC connector onto the LED digits and indicator in the proper orientation.



CENTER KEY ON RIBBON CABLE IDC SOCKET  
MUST POINT IN THE SAME DIRECTION AS THE  
ARROW ON THE REAR OF THE LED DIGIT.

**Figure 10 LED Digit Ribbon Cable Connection Diagram**

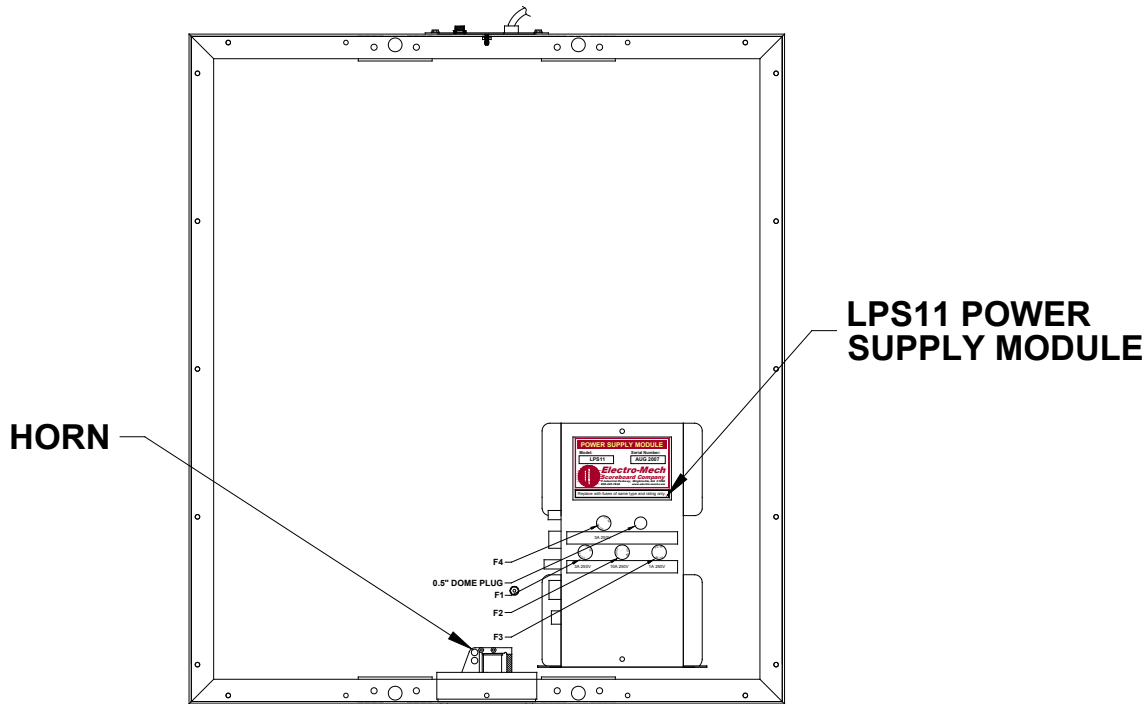
The LX11 driver board is mounted on the rear of the face panel as shown in figure 11.



**Figure 11 LX11 Driver Board Location**

The LPS11 Power Supply Module and the horn are mounted inside the 2160 cabinet as shown in figure 12.





**Figure 12 LPS11 Power Supply Module and Horn Locations**

Units built before August 2007 without a CPC receptacle on top of the cabinet had a LPS-130VA Power Supply Module installed.

### LX11 DRIVER BOARD FUNCTIONS

DRIVER MODULE JACK	FUNCTION #1
J1	DC POWER INPUT
J2	SERIAL DATA INPUT
J3	NOT USED
J4	SECONDS UNITS DIGIT
J5	SECONDS TENS DIGIT
J6	NOT USED
J8	GOAL LIGHT INDICATOR (h seg)
J9	NOT USED
J10	NOT USED
J15	HORN RELAY CONTROL

### LED Driver Module Replacement

Electrical connections to the LX11 DRIVER BOARD are made with ribbon cable polarized IDC sockets and locking ramp crimp terminal housings that mate with jacks on the circuit board. The circuit board is secured on a metal bracket with two retaining nuts.

1. Unplug the electrical connections from the module. Do not cut the plastic tie wraps around the ribbon cables.
2. Remove the two nuts.
3. Remove the circuit board from the metal bracket.
4. Insert the replacement circuit board on the metal bracket.
5. Secure the circuit board with the two nuts.
6. Insert the plugs into the jacks on the circuit board.

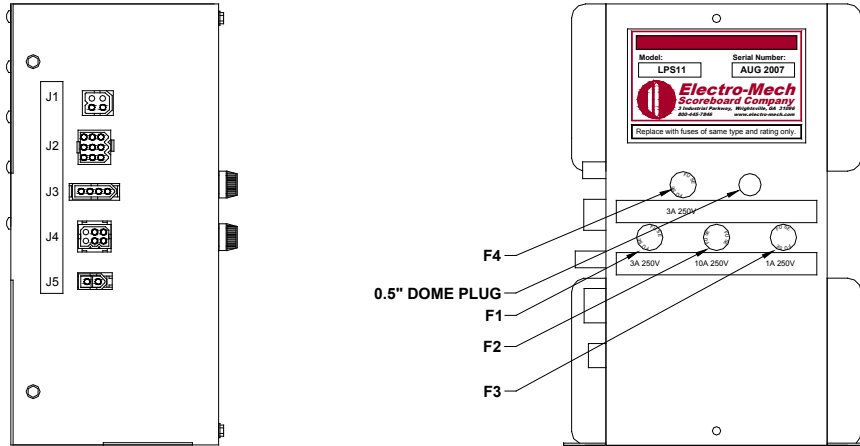
**To avoid damage to the LX11 driver board, always turn off the power to the scoreboard when removing or replacing it.**

JACK	FUNCTION
J1	NOT USED
J2	RELAYS CONTROL
J3	HORN CONTROL
J4	16 VDC TO LX11
J5	120 VAC INPUT

Figure 13 shows the location of the LPS11 Power Supply Module fuses and jacks. The table below figure 13 lists the fuse functions.

COVER EXTERIOR LEFT SIDE VIEW

COVER EXTERIOR FRONT VIEW



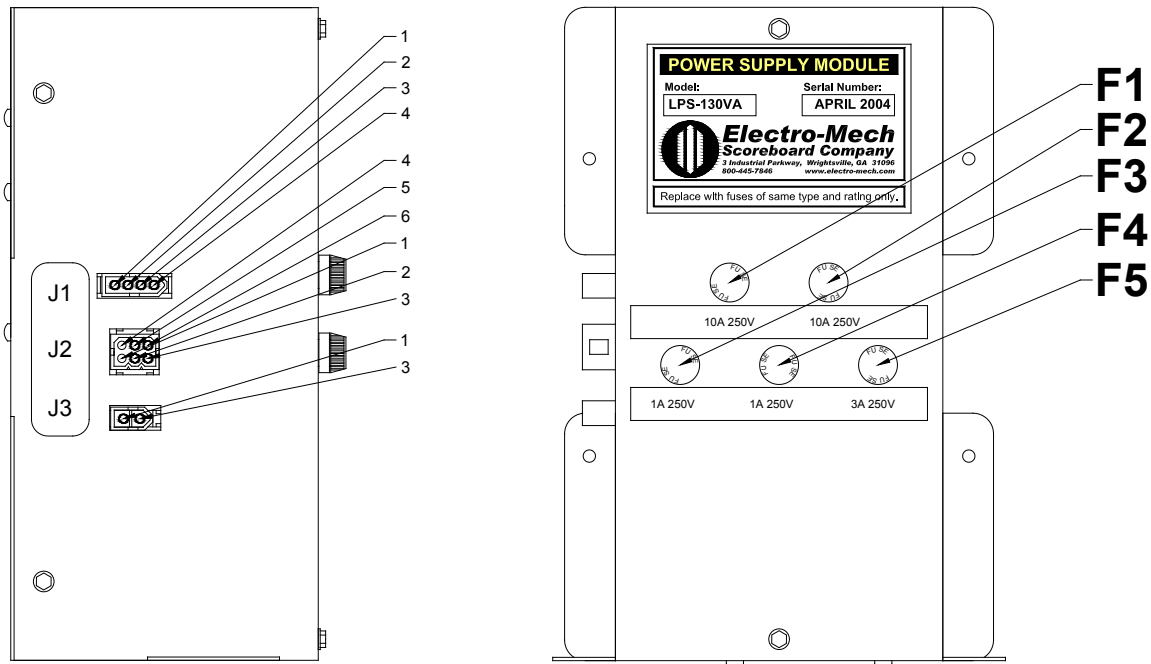
**Figure 13 LPS11 POWER SUPPLY MODULE**

**LPS11 FUSES**

FUSE	RATING	FUNCTION	BUSSMAN PART #
F1	3A 250V	MAIN AC POWER	AGC-3
F2	10A 250V	16 V OUTPUT	AGC-10
F3	1A 250V	HORN	AGC-1
F4	3A 250V	LED BACKBOARD LIGHTS	AGC-3

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

Figure 14 shows the location of the LPS-130VA Power Supply Module fuses and jacks. The table below figure 14 lists the fuse functions.



**Figure 14 LPS-130VA Power Supply Module**

#### LPS-130VA FUSES

FUSE	RATING	FUNCTION	BUSSMAN PART #
F1	10A 250V	LX11 DC POWER INPUT	AGC-10
F2	10A 250V	NOT USED	AGC-10
F3	1A 250V	NOT USED	AGC-1
F4	1A 250V	HORN	AGC-1
F5	3A 250V	MAIN AC POWER	AGC-3

#### LED Power Supply Module Replacement

Electrical connections to the LED POWER SUPPLY MODULE are made with keyed plugs that mate with jacks on the left side of the module. The module is secured inside the shot timer with machine screws.

1. Disconnect the plugs from the jacks on the module.
2. Remove the machine screws.
3. Remove the module from the shot timer.
4. Insert the replacement module in the shot timer.
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 shot timer when removing or replacing it.**

**Horn Replacement**

1. Remove the machine screws and nuts that fasten the horn to the bottom of the cabinet.
2. Pull the horn assembly out of the shot timer and cut the two wires leading up to the rear of the horn assembly.
3. Splice the new horn assembly wires to the two wires inside the shot timer.
4. Install the horn assembly and fasten it to the shot timer face using the machine screws and nuts.

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