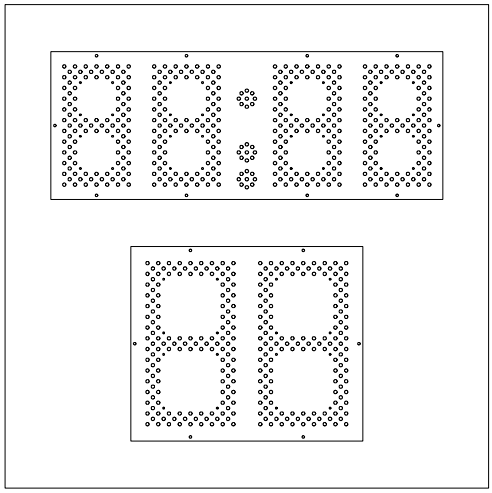
ELECTRO-MECH SCOREBOARD CO.



MODEL 2170 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. 4 Revised: 05/06/02

Electro-Mech Scoreboard Co. • #3 Industrial Parkway • Wrightsville, GA 31096
Phone: (800) 445-7846 • Fax (478) 864-0212 • Email: score@electro-mech.com

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MODEL 2170 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: 36.25" L x 36.25" H x 6"

WEIGHT: 48 lbs

CONSTRUCTION: The outer frame is made from extruded aluminum. Internal structural parts are formed from aluminum sheet. 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 2170 shot timer is a two digit counter which can be set from 1 to 99 seconds. It also displays the game time. 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, the game clock is formed with 9" green digits, and the colon / decimal symbols are green.

POWER REQUIREMENTS: Shot Timer - 120 VAC, 0.5 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, an attached 6 foot power cord, and either a lithium cell battery or two super capacitors to retain game information. 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. One length is required to run from each unit to the point of operation. This item is sold separately from the shot timer.

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 each control cable at the point of operation. A 10 ft. extension cable connects the control console to each junction box.

SCORELINK 200 RF MODEM SYSTEM: This accessory can be used in place of control cable and junction box for this shot timer without internal modifications to the shot timer or the control console. Refer to the SCORELINK 200 RF MODEM SYSTEM OWNER'S HANDBOOK 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)
- ScoreLink 200 RF Modem System (a transmitter and two receivers)

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. 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 1 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.**

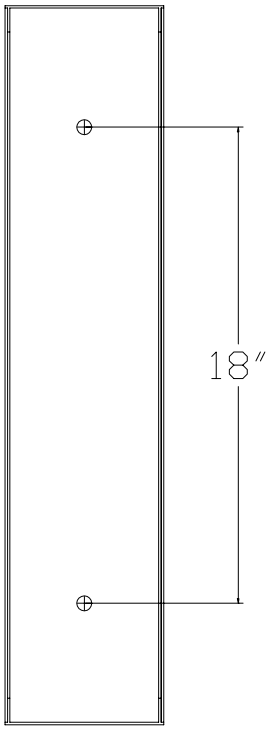


Figure 1 Model 2170 Mounting Points

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 ScoreLink 200 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 2170: 60 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.

ScoreLink 200

The ScoreLink 200 RF MODEM SYSTEM is intended to eliminate the control cable between the shot timer and the control console. If you have purchased this option, disregard the next section of this manual. Refer to the SCORELINK 200 RF MODEM SYSTEM OWNER'S HANDBOOK for installation instructions.

Control Cable Installation

The model 2170 shot timer is compatible with Electro-Mech Scoreboard Company scoreboard models MP-259, MP-269, MP-259/220, MP-269/220, MP-259/220-4S, MP-269/220-4S, 2350, 2370, 2550, 2557, 2570, 2650, 2655, 2770, 2350-4, 2650-4, and 2655-4. If the customer has one of these model scoreboards, the model 2170 shot timer can be operated with the same control console. If the customer does not have one of these models, the model 2170 shot timer must be operated with its own control console.
If the customer has one of the models listed above, he can install the control cable from the ¼" stereo jack mounted on the top of the shot timer to either the shot timer output jack located on the right side of the scoreboard (serial data output jack located on the top of models 2350-4, 2650-4, and 2655-4) listed above 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 listed scoreboards to the model 2170 shot timer, each end of the control cable has a ¼" stereo plug attached. When connecting between the control console and the model 2170 shot timer, the cable end that attaches to the scoreboard has a ¼" stereo plug attached and the other end has a small metal junction box with a ¼" 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 ¼" 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 2 shows the connection points to solder the ¼" stereo plug to the control cable. Unscrew the stereo plug cover from the plug body to expose the contact pins. Figure 3 shows the connection points to solder the control cable to the rear of ¼" stereo jack mounted on the face plate of the junction box.

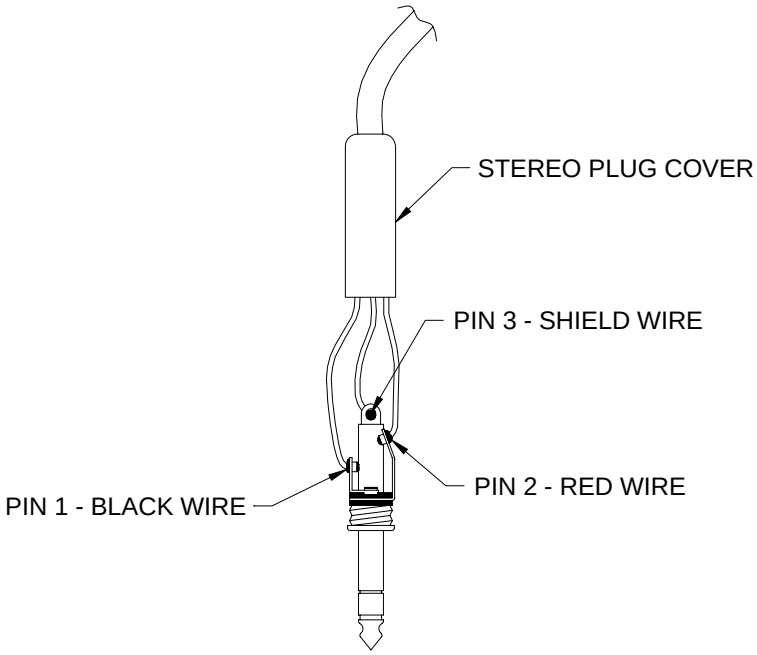
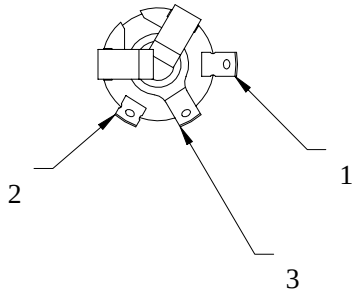


Figure 2 ¼" Stereo Plug Wiring Diagram

1/4" STEREO JACK



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

Figure 3 ¼" Stereo Jack Wiring Diagram

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 or ScoreLink 200 Transmitter. The following steps describe how to connect the control console:

1. Plug one end of the extension cable into the ¼" stereo jack on the junction box or the ScoreLink 200 Transmitter, if purchased.
2. Plug the other end into one of the four ¼" 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. Plug one end of the extension cable into the ¼"stereo jack on the junction box or the ScoreLink 200 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. Plug the shot clock hand held remote into the RJ45 jack mounted on the control console back plate labeled **DGT/SC Hand held**.
6. If a ScoreLink 200 RF MODEM SYSTEM is installed with this shot timer, 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 shot timer is operated with a 37-key control console**.** Figure 4 shows the keypad layout on the control console.

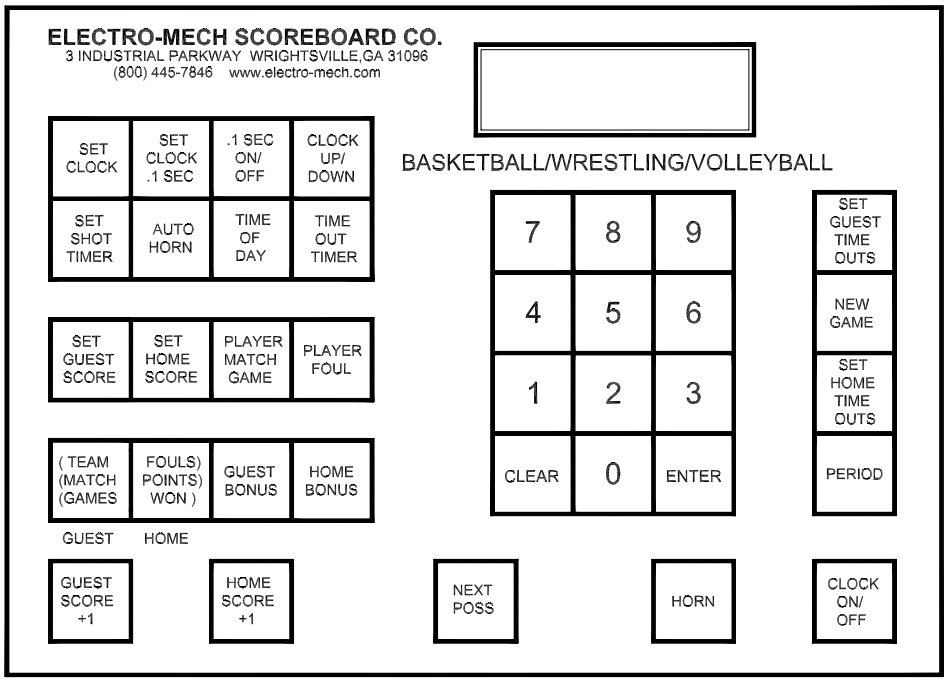


Figure 4 Keypad Layout

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

```
ELECTRO-MECH VER
 SCOREBOARD  B60
```

After a few seconds the display will read:

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

The shot timer will display the game time, but the shot clock digits will not illuminate at this time.

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 30 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    <30>
```

   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 2170 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 2170 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 5, it has three buttons. The operation of the buttons is described in the text below the figure.

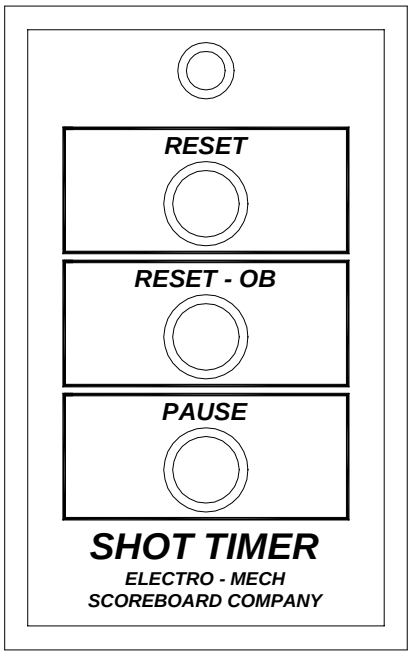


Figure 5 Hand Held Shot Timer Control Unit

Shot Timer Button Functions

1. **RESET –** This button is used to reset the model 2170 shot timer to the time programmed in the console for ST RESET. The default time is 30 seconds.

2. **RESET-OB –** This button is used to reset the model 2170 shot timer to the time programmed in the console as ST-OB RESET. The default time is 5 seconds. Press and hold this button to blank (turns the LEDs off) the model 2170 shot timer.

3. **PAUSE –** Press and hold this button to pause operation of the model 2170 shot timer.

Horn Operation

The internal horn sounds for two seconds when the shot timer 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. Unplug the extension cable.
4. If a ScoreLink 200 RF MODEM SYSTEM is installed with this shot timer, unplug the Transmitter's wall mount power supply.
5. Store the control console and ScoreLink 200 Transmitter is a dry location. These units are 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 metal mask. 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 6 shows the components of a LED digit assembly.

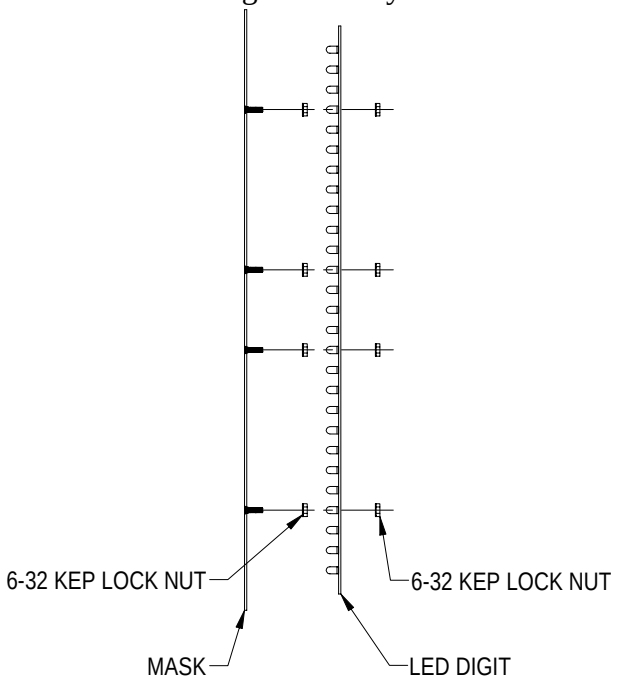


Figure 6 LED Digit Assembly

1. Remove the machine screws that fasten the mask to the face of the shot timer. **Caution: Support the mask with your hand 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 shot timer. 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. Refer to figure 7 in order to plug the ribbon cable IDC connector onto the circuit board in the proper orientation.

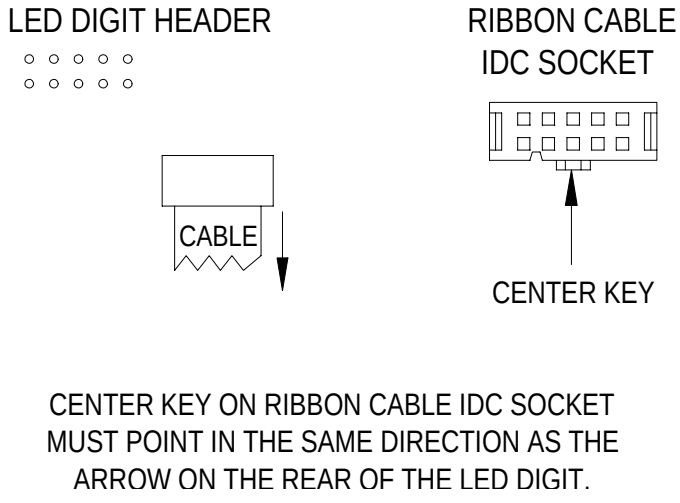


Figure 7 LED Digit Ribbon Cable Connection Diagram

All other components are located behind the face panel. Figure 8 shows the view behind the face panel.

Remove the LED digit assemblies. Remove the face panel to access the shot timer electronics. The panel is held in place by several hex head sheet metal screws. Remove the screws and disconnect the ribbon cables that are connected to the rear side of the LED digit printed circuit boards. Figure 8 shows the layout of the shot timer electronics behind the front panel.

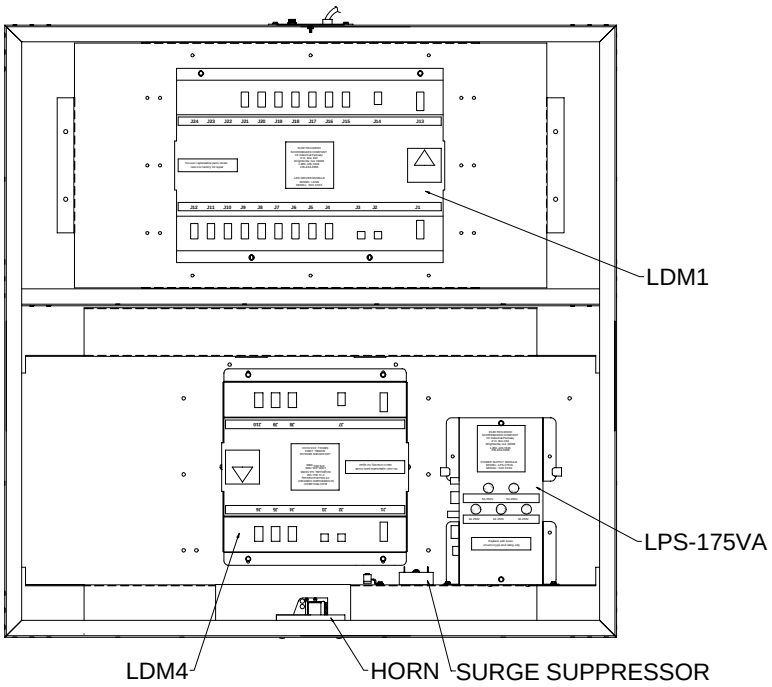


Figure 8 Shot timer Electronics

The LDM1 LED DRIVER MODULE operates the game clock functions. The LDM4 LED DRIVER MODULE operates the shot timer. The LPS-175VA POWER SUPPLY MODULE provides power to all the shot timer electronics. The SURGE SUPPRESSOR is used for surge protection.

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.

LDM1 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
J5	CLOCK SECONDS TENS
J6	CLOCK MINUTES UNITS
J7	NOT USED
J8	NOT USED
J9	NOT USED
J10	NOT USED
J11	NOT USED
J12	NOT USED
J13	DRIVER MODULE DC POWER INPUT #2
J14	NOT USED
J15	DECIMAL / COLON
J16	NOT USED
J17	CLOCK MINUTES TENS
J18	NOT USED
J19	NOT USED
J20	NOT USED
J21	NOT USED
J22	NOT USED
J23	NOT USED
J24	NOT USED

LDM4 LED DRIVER MODULE FUNCTIONS

DRIVER MODULE JACK	FUNCTION
J1	DRIVER MODULE DC POWER INPUT
J2	SERIAL DATA INPUT
J3	SERIAL DATA OUTPUT
J4	SHOT CLOCK SECONDS UNITS
J5	SHOT CLOCK SECONDS TENS
J6	NOT USED
J7	HORN RELAY CONTROL
J8	NOT USED
J9	NOT USED
J10	NOT USED

LED Driver Module Replacement

Electrical connections to a 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 shot timer with four machine screws.

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 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 module.

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

LPS-175VA LED POWER SUPPLY MODULE FUNCTIONS

JACK	FUNCTION
J1	120 VAC TO HORN
J2	16 VDC OUTPUT TO LDM4, HORN CONTROL
J3	NOT USED
J4	16 VDC OUTPUT TO LDM1
J5	120 VAC INPUT

Figure 9 shows the location of the fuses in the LPS-175VA LED Power Supply Module. The table following the figure lists the fuse ratings, functions, and part numbers.

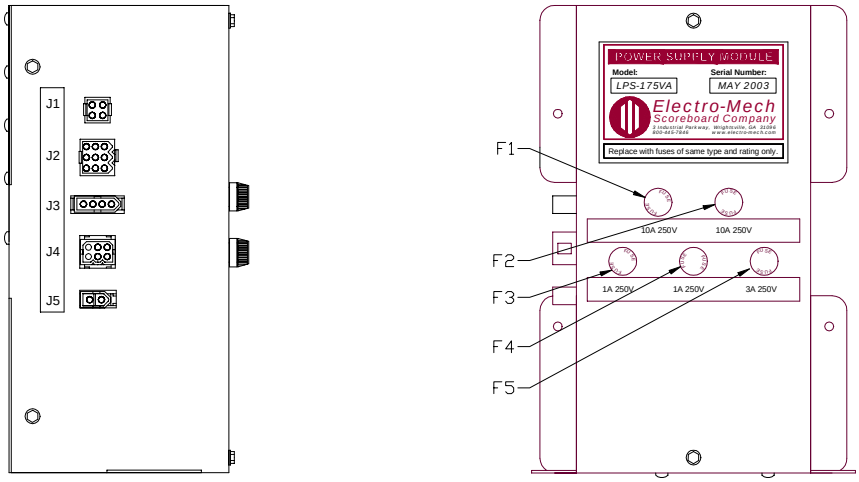


Figure 9 LPS-175VA POWER SUPPLY MODULE

LPS-175VA FUSES

FUSE	RATING	FUNCTION	BUSSMANN PART #
F1	10A 250V	DRIVER MODULE DC POWER INPUT #1	AGC-10
F2	10A 250V	DRIVER MODULE DC POWER INPUT #2	AGC-10
F3	1A 250V	HORN	AGC-1
F4	1A 250V	NOT USED	AGC-1
F5	3A 250V	MAIN AC POWER	AGC-3

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

LED Power Supply Module Replacement

Electrical connections to the LPS-175VA 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 two machine screws.

1. Disconnect the plugs from the jacks on the module.
2. Remove the two 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.

Surge Suppressor Replacement

The Surge Suppressor suppresses electrical surges. Electrical connections to the Surge Suppressor are made with ¼" quick disconnects that mate with ¼" tabs on the top of the unit. It is secured inside the shot timer with one machine screw.

1. Unplug the electrical connections from the Surge Suppressor.
2. Remove the screw.
3. Remove the unit from the shot timer.
4. Insert the replacement Surge Suppressor in the shot timer.
5. Secure the unit with the screw.
6. Plug the ¼" quick disconnects on the ¼" tabs on the top of the unit. The black wires should be connected to the ¼" tabs labeled L. The white wires should be connected to the ¼" tabs labeled N. The green wire should be connected to the ¼" tab labeled G. Figure 10 shows the top view of the Surge Suppressor.

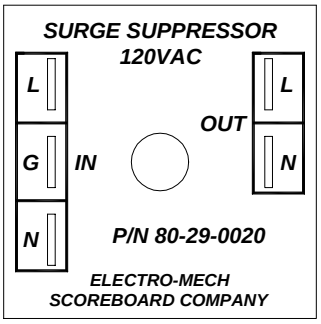


Figure 10 Surge Suppressor Terminals

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.