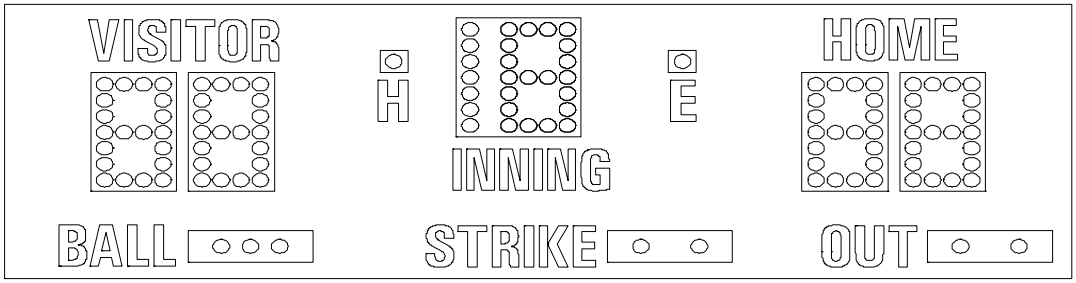
ELECTRO-MECH SCOREBOARD CO.



MM-170 BASEBALL 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.

Electro-Mech Scoreboard Co. • #3 Industrial Parkway • Wrightsville, GA 31096
Phone: (800) 445-7846 • Fax (912) 864-0212 • Email: score@electro-mech.com

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MM-170 BASEBALL SCOREBOARD SPECIFICATIONS

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

DIMENSIONS: 16' L x 5' H x 6" D (MM-170 with side sponsor panel measures 20' L x 5' H x 6" D)

WEIGHT: Approximately 350 lbs (MM-170 with side sponsor panel weighs 405 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 is finished with enamel paint. Black is the standard face color. White is the standard color for the captions. Mounting hardware is included.

DISPLAY: The MM-170 baseball scoreboard displays HOME and VISITOR scores to 99, INNINGS to 19, BALLS, STRIKES, OUTS, HIT and ERROR.

LAMP BANKS: A 4 x 7 matrix of lamps forms each 24" digit. A column of seven lamps forms the INNING tens digit. Three lamps form the BALL indicator, two lamps form the STRIKE indicator, two lamps form the OUT indicator, one bulb forms the hit (H) indicator, and one bulb forms the error (E) indicator. The scoreboard uses 15 watt 120 VAC frosted medium based appliance lamps (also known as 15A15IF lamps). Recessed aluminum reflectors provide crisp separation between each lamp. Expanded metal screens protect the lamps.

POWER REQUIREMENTS: Scoreboard - 120 VAC, 14.5 A, 60 Hz, 1740 watts maximum, (20 A service recommended). **Control Console** - 120 VAC, 0.5 A, 60 Hz

SCOREBOARD ELECTRONICS: 100% solid state fully enclosed within a plug in module.

CONTROL CONSOLE: The microprocessor control console is constructed of a rugged plastic housing with a metal back plate. It features a 15 key sealed membrane keypad, an attached 6 foot power cord, and a lithium cell battery backup to retain game information.

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 the scoreboard to the point of operation (conduit installation recommended).

JUNCTION BOX AND EXTENSION CABLE: A 4 ¼" x 2 ¼" x 2" junction box with a stereo jack mounted on the face is attached to the control cable at the point of operation. A ten foot extension cable connects the control console to the junction box.

WARRANTY: Five year limited warranty.

SCOREBOARD INSTALLATION

Installation of the MM-170 Scoreboard consists of positioning the posts, mounting the scoreboard cabinet on the posts, and making the proper electrical connections.

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

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

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

- A weatherproof power disconnect at the scoreboard
- A weatherproof NEMA 5-15R 120 VAC convenience receptacle at the scoreboard

While Electro-Mech Scoreboard Company does not perform installations, we will make every effort to answer your installation questions. Installation should be performed by qualified personnel. Consult national and local codes before installation.

POSITIONING THE POSTS

The scoreboard is designed to be mounted on two posts. We suggest that the front of the scoreboard should angled away from the afternoon sun, if possible. Typically installers will use steel pipes or I-beams. The mounting hardware will accommodate posts up to 4.5 inches outer diameter. We recommend that the posts are sunk in reinforced concrete footings. Figure 1 shows the spacing of the posts for a MM-170. It suggests one possible installation for a MM-170 in silty sand soil. **No dimensional data in this manual is intended to be specifications except the size of the scoreboard cabinet and the distance between the posts.** 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.

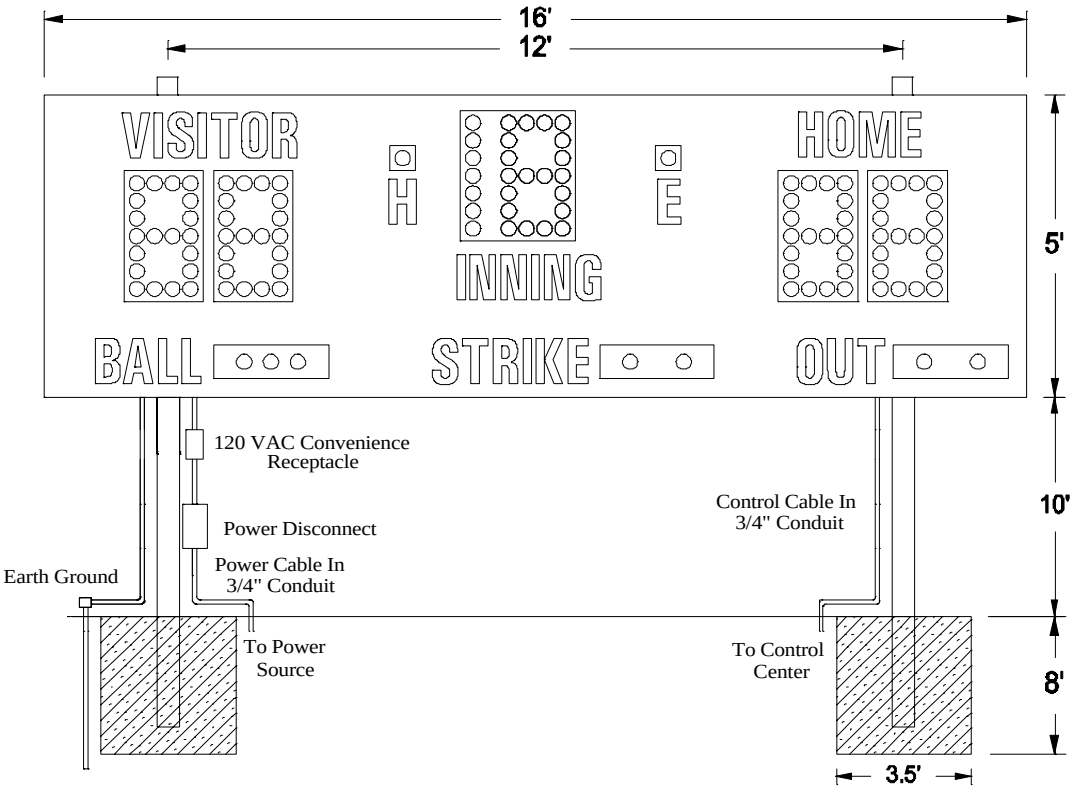

Figure 1 MM-170 Post Spacing

Figure 2 shows the spacing of the posts for a MM-170 with an optional side sponsor panel.

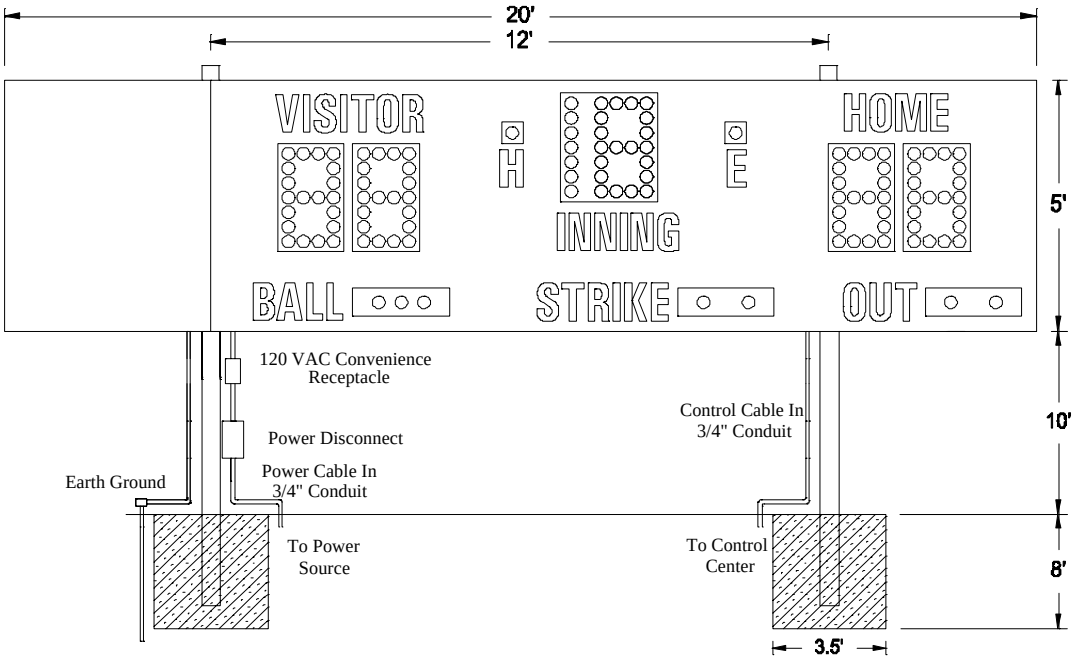

Figure 2 MM-170 with Optional Side Sponsor Panel Post Spacing

Figure 3 shows the spacing of the posts for a MM-170 with an optional top sponsor panel.

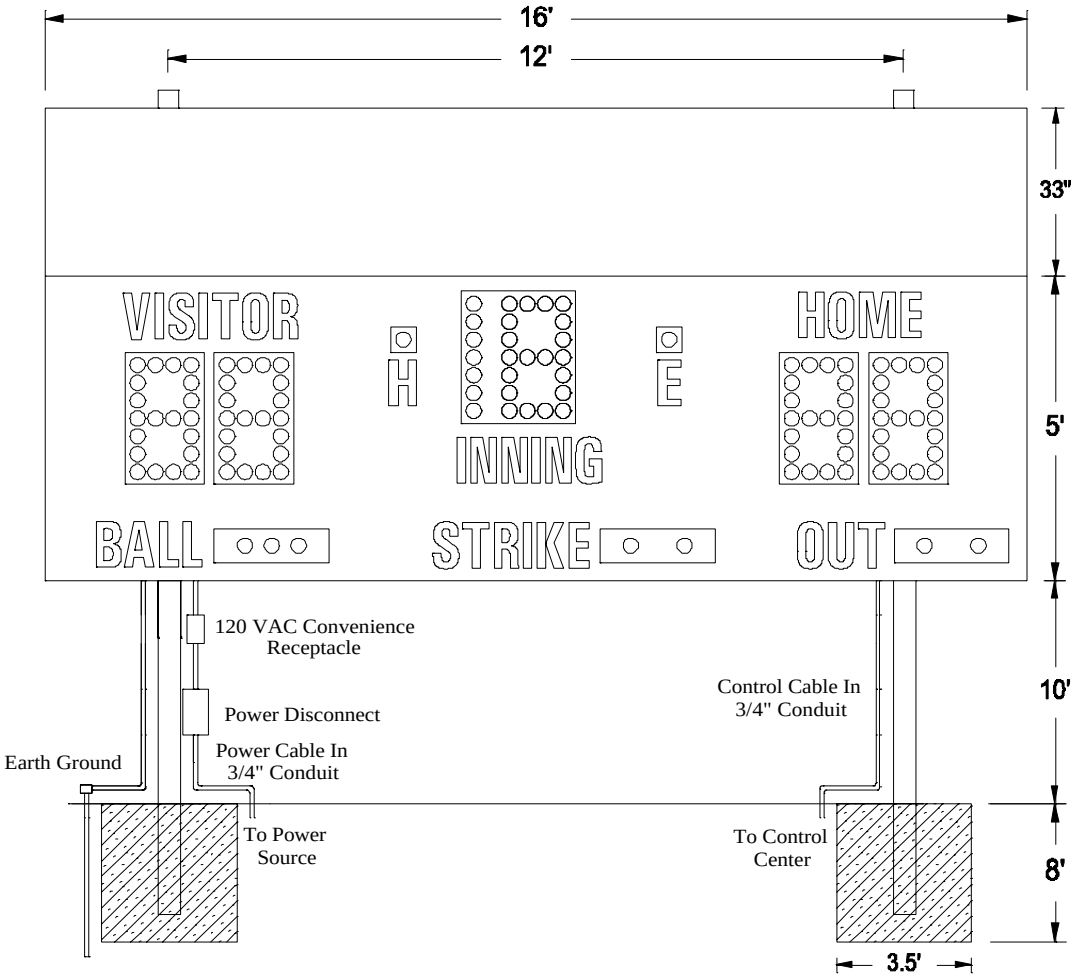

Figure 3 MM-170 with Optional Top Sponsor Panel Post Spacing

MOUNTING HARDWARE

Four sets of mounting hardware are provided to attach the scoreboard to the posts. Additional hardware sets are provided to attach the optional sponsor panels, if ordered. A mounting hardware set consists of a steel angle bracket, two threaded rods, two washers, and two nuts. Figure 4 shows an overhead cross section view and a side cross section view of the scoreboard attached to a post at a mounting point using the hardware. A steel bracket is riveted to the scoreboard's aluminum extrusion frame. The bracket 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.

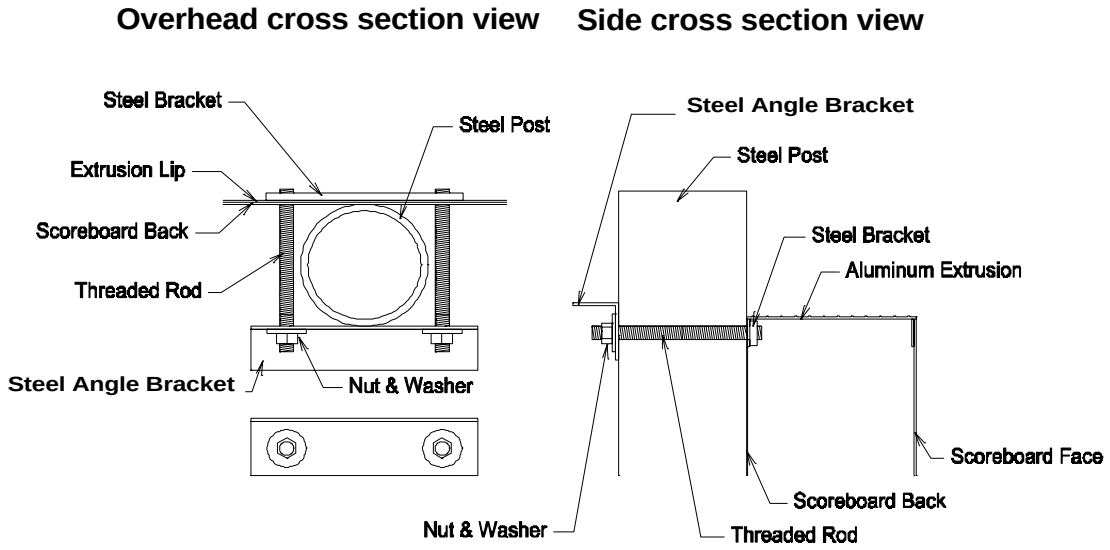

Figure 4 Standard Mounting Method

MOUNTING THE OPTIONAL TOP SPONSOR PANEL

The following steps describe how to mount the top sponsor panel on the posts:

1. Place the top sponsor panel 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 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 the nuts onto the threaded rods so that the bracket is **loosely** held in place.
6. Repeat steps 4 -6 at the other mounting points.
7. Raise the top sponsor panel into place and tighten the nuts to clamp it in place on the posts.

MOUNTING THE SCOREBOARD

The scoreboard is attached to the posts at four points. Figure 5 shows the location of the mounting points on the rear of the scoreboard.

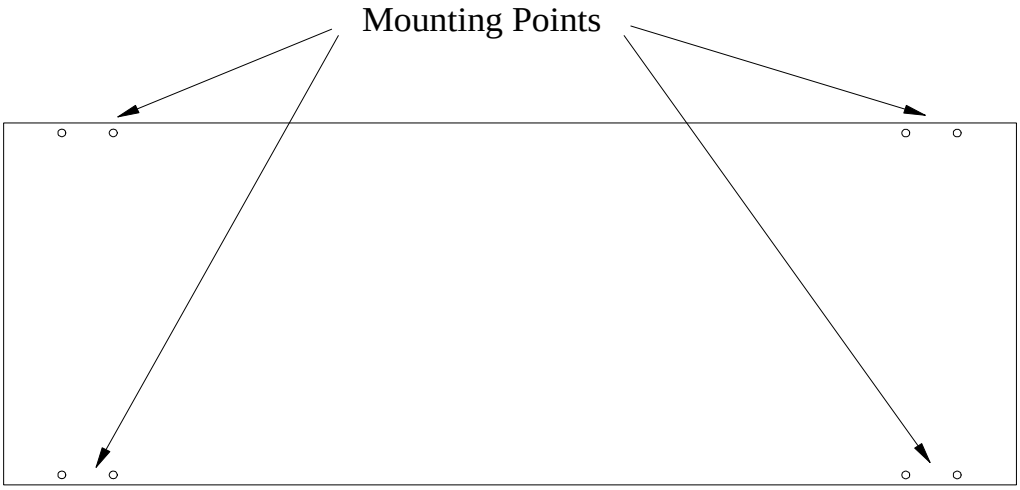

Figure 5 Mounting Points

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 4 -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.

ELECTRICAL CONNECTIONS

We recommend a qualified electrician perform the needed electrical connections to ensure proper operation of your scoreboard. These connections include grounding the scoreboard, connecting the scoreboard to a power source, installing 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 when they are placed in concrete. One method of grounding is to connect the scoreboard cabinet to one or more grounding rods which are driven into the ground near the scoreboard via a large gauge copper wire. The self tapping sheet metal screws on the back of the scoreboard cabinet provide a convenient connection point.

Connecting The Scoreboard To Your Power Source

The scoreboard requires 120 VAC service at the scoreboard to operate properly. **Maximum power consumption of Model MM-170: 1740 Watts.** Make sure that power cable is rated for this electrical load. Electro-Mech Scoreboard Company recommends that your power cable is installed in conduit. **Avoid** running your power cable in the close proximity to your control cable. The following steps describe how to connect the scoreboard to your power source:

1. Remove the hex head screws which hold the rear access panel in place (Figure 6).

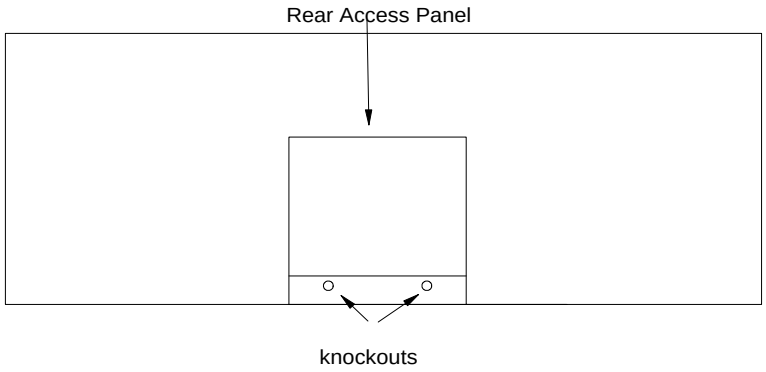

Figure 6 Rear Access Panel

Figure 7 shows the view behind the access panel.

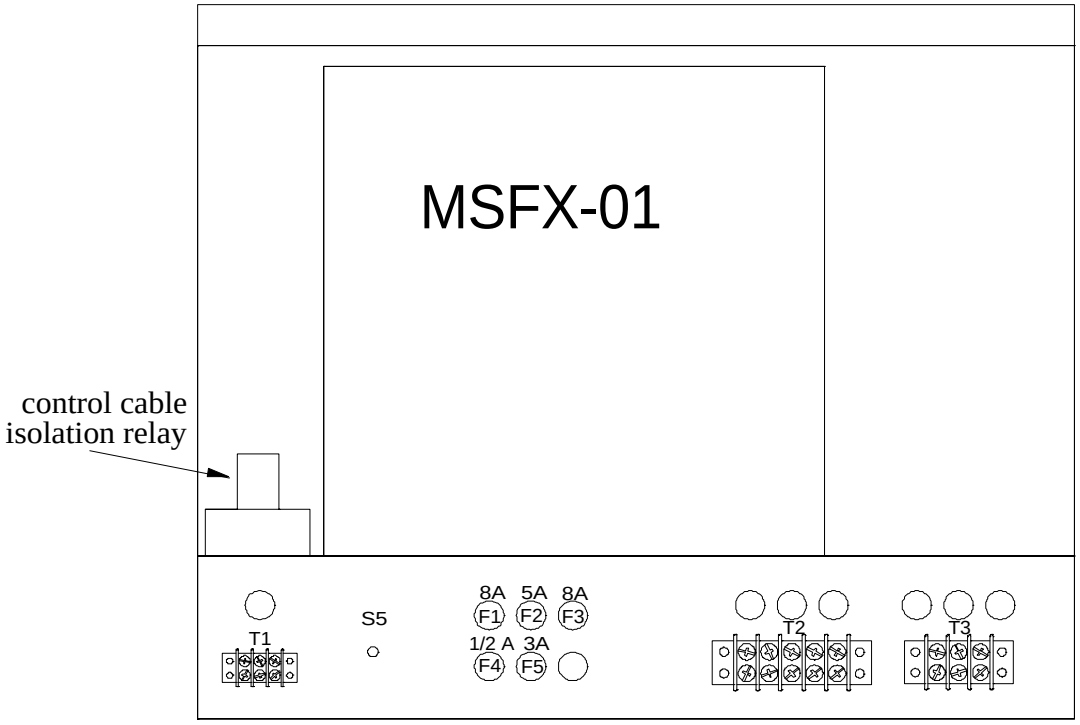

Figure 7 Access Panel Removed

2. Punch out the knockouts for the power and control cables.

3. Feed the power cable through a knockout.

4. Connect the AC line wire to position 2 and AC neutral wire to position 3 of terminal strip T3 on the junction chassis according to figure 8.

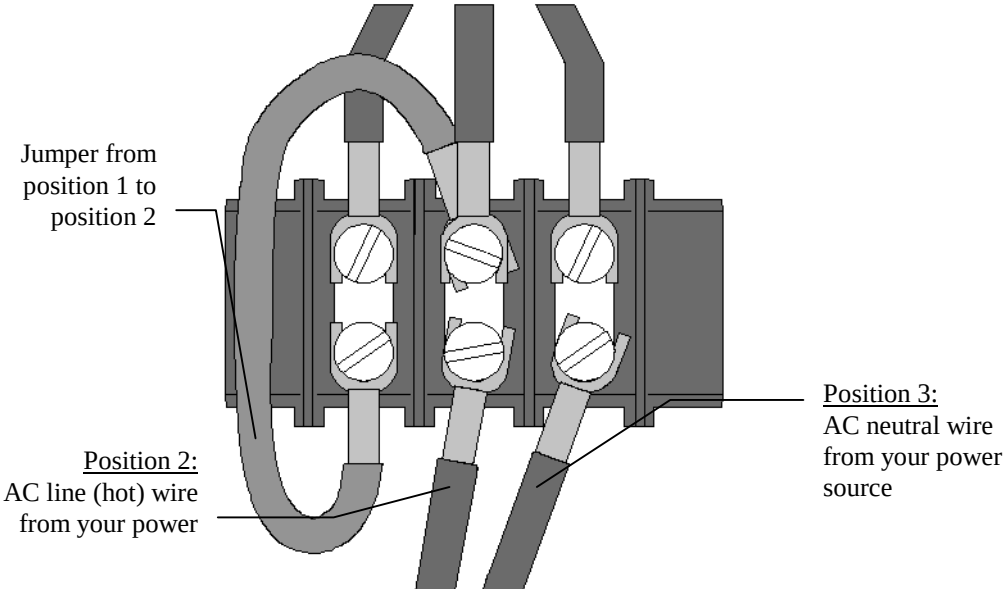

Figure 8 Power Connections

Electro-Mech Scoreboard Company suggests that you install a power cut-off switch and a NEMA 5-15R receptacle in a weatherproof box on the scoreboard post below the scoreboard. The cut-off switch provides a convenient way of turning the scoreboard off during maintenance or repairs. The NEMA 5-15R receptacle will allow a technician to easily plug in the control console and operate the scoreboard via the test jack S-5 (a valuable trouble-shooting aid).

ScoreLink 300

The SCORELINK 300 RF MODEM SET is intended to eliminate the control cable between the scoreboard and the control console on Electro-Mech Scoreboard MM and MP series scoreboards. If you have purchased this option, disregard the next section of this manual. Refer to the SCORELINK 300 RF MODEM SET OWNER'S HANDBOOK for installation instructions.

Installing The Control Cable

The control cable connects the scoreboard to the control console. While the control cable is direct burial rated, Electro-Mech Scoreboard Company recommends that it is installed in conduit to protect it from being cut. A small junction box with a stereo jack mounted on the faceplate 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 match their stereo jack to one of the stereo jacks in figure 9 in order to make the proper connections. These connections should be soldered.

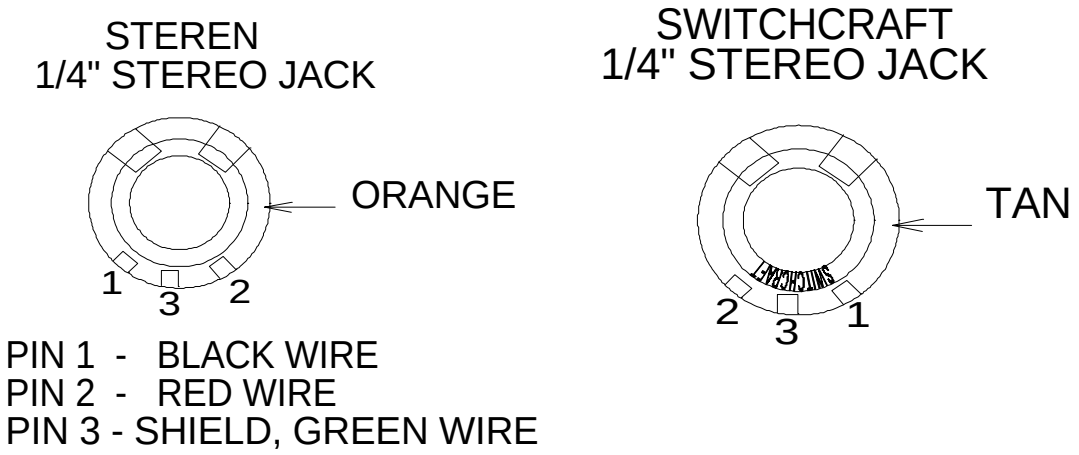

Figure 9 STEREO JACK WIRING DIAGRAM

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

1. At the rear of the scoreboard feed the control cable through one of the knockouts below the access panel.
2. Crimp fork terminals to the control cable wires and the shield.
3. Connect the control cable to terminal strip T1 (located to the left of the test jack S5) according to the diagram in figure 10.

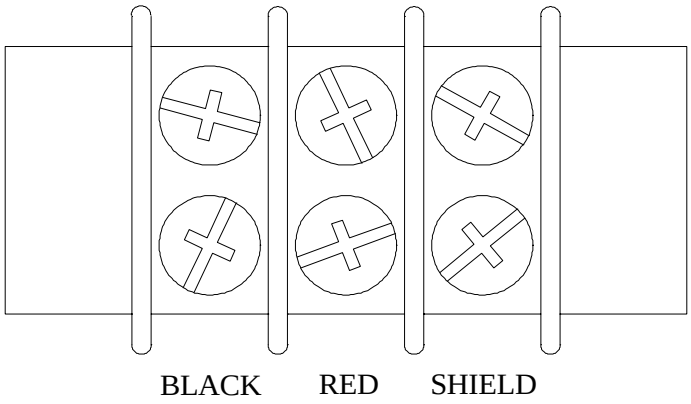

Figure 10 T1 WIRING DIAGRAM

Connecting The Control Console

The control console is normally connected to the junction box via the 10 ft. extension cable. This extra length of cable allows the scoreboard operator some mobility and the ability to store the control console after the game. The extension cable has two molded stereo plugs attached to it. One end of the extension cable is plugged into the junction box stereo jack and the other end is plugged into the stereo jack mounted on the control console back plate. The control console power cord is plugged into a grounded NEMA 5-15R 120 VAC receptacle.

SCOREBOARD OPERATION

The MM-170 Scoreboard is operated by the control console**. No scoreboard functions will operate without connecting the control console.** Figure 11 shows the keypad layout on your control console. The keypad functions are described in the text below the figure.

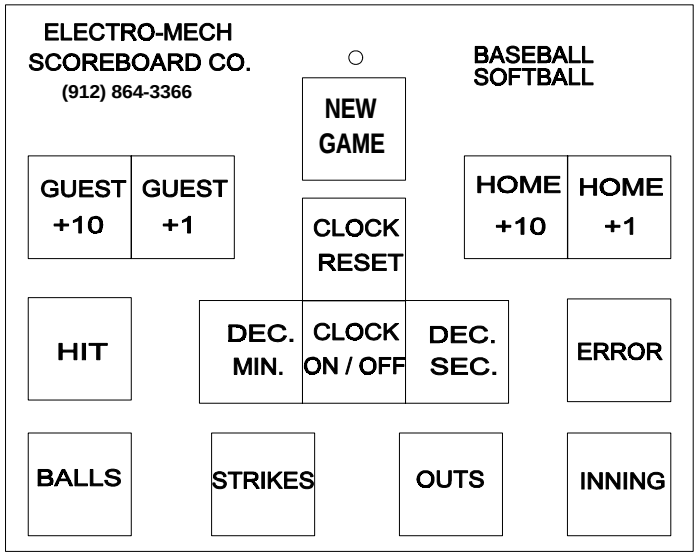

Figure 11 Keypad Layout

Control Console Key Functions

1. **GUEST +1** – This key increments the Guest score by 1.

2. **HOME +1** – This key increments the Home score by 1.

3. **GUEST +10** – This key increments the Guest score by 10.

4. **HOME + 10** – This key increments the Home scores by 10.

5. **INNING** – This key will increment the Inning by 1.

6. **BALLS** – This key will increment the Ball count by 1.

7. **STRIKES** – This key will increment the Strike count by 1.

8. **OUTS** – This key will increment the Out count by 1.

9. **NEW GAME** – This key can be used to reset all scoreboard functions. Press **NEW GAME** and, within two seconds, press **CLOCK RESET**. Guest and Home scores, Inning, Ball, Strike, and Out will be set to zero.

10. **CLOCK RESET** – This key is used only in conjunction with the **NEW GAME** key.

The DEC. MIN., DEC. SEC., and CLOCK ON/OFF keys are not used with the MM-170 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. **Electro-Mech Scoreboard Company strongly advises that you unplug the control console, disconnect the extension cable at the control console, and turn the power to the scoreboard off when the scoreboard is not in use**. **The control console can not turn the scoreboard off.** This action 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. 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, including lamps, are always available. Electro-Mech Scoreboard Company can repair the control console and plug in module at a significant savings when compared to the price of new units. Our convenient toll free number is listed at the bottom of every page in this manual.

As seen in figure 12, the plug in module MSFX-01, control cable isolation relay, fuses, connection points for the power and control cable, and a test jack are located behind the rear access panel.

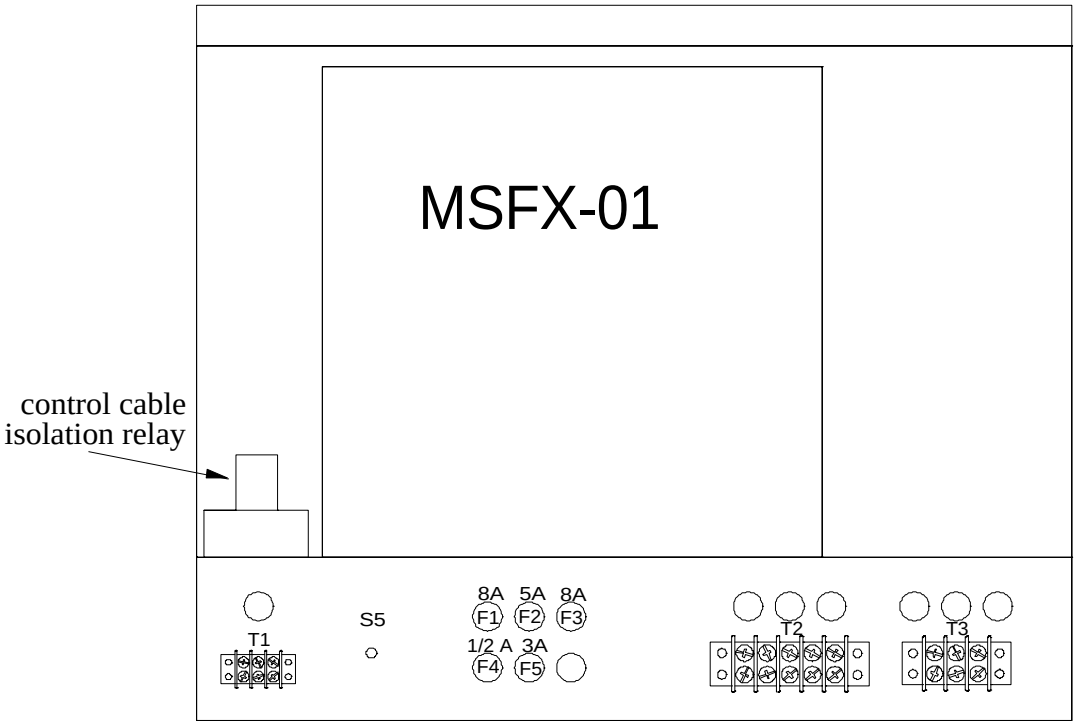

Figure 12 Rear Access Components

PLUG IN MODULE REPLACEMENT

The plug in module MSFX-01 performs all of the scoreboard functions. The module has four bottom plugs which mate with sockets in the scoreboard. A screw located at the top of the module holds it against the scoreboard cabinet. Simply remove the screw and pull the module upward to unseat the module. **To avoid damage to the plug in module, always turn off the power to the scoreboard when removing or replacing it**.

CONTROL CABLE ISOLATION RELAY REPLACEMENT

Some MM-170 scoreboards have a relay installed to isolate the control cable from the scoreboard between games. The relay plugs into a socket mounted next to the plug in module MSFX-01. A clip holds the relay in its socket during shipping. It is not necessary to reinstall the clip if the relay has been replaced. Do not substitute another relay for this part.

The relay is energized when power is applied to the scoreboard. It is possible to hear the relay contacts switch as power is supplied to the scoreboard. When the scoreboard is de-energized, the relay shorts the red and black wires from the control cable together and isolates them from the scoreboard. The relay can be bypassed two ways:

1. Connect the control console to the S-5 test jack using the 10 foot extension cable. It will be necessary to plug the control console power cord into a 120 VAC receptacle and temporarily disconnect the control cable from T-1.
2. Add a jumper between relay socket pins 5 and 8, add a jumper between relay socket pins 8 and 12, and unplug the relay from the socket. The relay socket pin numbers are on the socket. Figure 13 shows the socket pin numbers. Note: Bypassing the relay in this manner should be a temporary fix until the relay can be replaced.

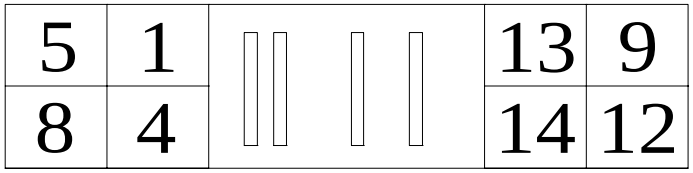

Figure 13 Relay Socket Pin Numbers

FUSES

FUSE	RATING	FUNCTION
F1	8 A 250V	HOME SCORE, ERROR
F2	5 A 250V	INNING
F3	8 A 250V	VISITOR SCORE, HIT
F4	1/2 A 250V	CONTROL LINE
F5	3 A 250V	BALLS, STRIKES, OUTS

CONNECTION POINTS

TERMINAL STRIP	FUNCTION
T-1	control cable connection
T-2	MOV (surge protection)
T-3	power cable connection
S-5	test jack

LAMP REPLACEMENT

Replacing lamps may be the only service you ever perform on your Electro-Mech scoreboard. The lamps are accessed by removing the protective mask covering each lamp bank. **To avoid damage to the plug in module, always turn off the power to the scoreboard when changing lamps**. We recommend using a felt pen or tape to mark lamps that will not light. This scoreboard uses 15 watt medium base lamps (also called 15A15 lamps). **Never replace these with higher wattage lamps.**

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 LAMPS, FUSES AND SOCKETS.

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.