

# Outdoor LED Modular Scoreboards

## Installation and Maintenance Manual

ED13084

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and All Sport® is a registered trademark of Daktronics, Inc.*

### Models

MS-2014-11

MS-2015-11

MS-2016-11

MS-2018-11

**ED13084**

**Product 1192**

**Rev 3 – 25 October 2002**

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**Note:** Please fill in the information below for your display, and use it as a reference when calling Daktronics for assistance.

Scoreboard Serial No. \_\_\_\_\_

Scoreboard Model No. \_\_\_\_\_

Date Installed \_\_\_\_\_



**DAKTRONICS**

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# Section 1: Introduction

## 1.1 How To Use This Manual

This manual explains the installation of Daktronics *Modular Scoreboard Models MS-2014-11, MS-2015-11, MS-2016-11, and MS-2018-11* and provides details for display maintenance. For other questions regarding the safety, installation, operation, or service of this system, contact Daktronics. Customer Service Help Desk telephone numbers are listed on the cover page of this manual.

### *Important Safeguards:*

1. Read and understand these instructions before installing your scoreboard.
2. Do not drop the control console or allow it to get wet.
3. Properly ground the scoreboard with a grounding electrode at the scoreboard location.
4. ***Disconnect power when not using the scoreboard.***
5. ***Disconnect power when servicing the scoreboard.***
6. Do not modify the scoreboard structure or attach any panels or coverings to the scoreboard without the express written consent of Daktronics, Inc.

**Figure 1** illustrates the Daktronics drawing numbering system. Daktronics identifies individual engineering drawings by the drawing number (7087-P08A-69945 in the example), which is located in the lower right corner of the drawing. This manual refers to drawings by the last set of digits and the letter preceding them. The example would be **Drawing A-69945**.

|                                      |                   |                |
|--------------------------------------|-------------------|----------------|
| DAKTRONICS, INC. BROOKINGS, SD 57006 |                   |                |
| PROJ: BASKETBALL                     |                   |                |
| TITLE: SEGMENTATION, 7 SEG BAR DIGIT |                   |                |
| DES. BY: BPETERSON                   | DRAWN BY: TNELSON | DATE: 8 JUL 01 |
| APPR. BY: AVB                        | 7087-P08A-69945   |                |
| SCALE: 1 = 4                         |                   |                |

**Figure 1:** Daktronics Drawing Label

Reference drawings are grouped and inserted in alphanumeric order in **Appendix A**.

The serial and model number of a Daktronics scoreboard can be found on the ID label, located on the display. This label will be similar to the one shown in **Figure 2**. When calling Daktronics Customer Service, please have this information available to ensure that your request is serviced as quickly as possible. For future reference, note your scoreboard model number, serial number, and installation date on the front page of this manual.

|   |   |                      |         |
|---|---|----------------------|---------|
|  | ASSY. NO.   |                      |         |
|   | SER. NO.  |                      |         |
|   | MFG. DATE   |                      |         |
|   | DAKTRONICS, INC.<br>331 32ND AVE.<br>P.O. BOX 5128<br>BROOKINGS, SD 57006 | PHONE 1-605-697-4000 | LL-2306 |

**Figure 2:** Scoreboard ID Label

## 1.2 Manual Overview

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This manual details outdoor modular scoreboards with LED digits. It is divided into the following sections:

- Section 1:** Contains an overview of the product, product safety information, and labeling and numbering descriptions.
- Section 2:** Contains a table listing all of the mechanical specifications, circuit specifications, and power requirements for each scoreboard module.
- Section 3:** Contains general mechanical installation information.
- Section 4:** Contains general electrical installation information.
- Section 5:** Contains information needed to service the scoreboards and troubleshoot problems.
- Appendix A:** Contains the engineering drawings referenced in this manual
- Appendix B:** Contains drawings, descriptions, and installation instructions for several scoreboard options.

## 1.3 Product Overview

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### Reference Drawings:

- Model Configurations, Hockey/Basketball ..... **Drawing A-156642**
- Layout View; MS-2016-11 ..... **Drawing A-175201**

The multisport scoreboards detailed in this manual – Models MS-2014-11, MS-2015-11, MS-2016-11, and MS-2018-11 – are part of a family of outdoor scoring and timing displays designed to offer simple installation, easy readability, and reliability. Microprocessor control assures consistent operation and accuracy. The scoreboards are illustrated in the model configurations and layout view drawings listed above.

Because this scoreboard series is based on a modular design, there can be any number of module and caption combinations. Some displays may utilize a single module, while others may consist of multiple modules arranged vertically. True multisport scoreboards, the displays in this series were originally created for outdoor basketball and hockey, but they can be configured for football, soccer, volleyball, lacrosse, field hockey, and other events.

The four displays are configured as follows:

- Models MS-2014-11 and MS-2018-11 consist of two powered sections with digits indicating clock/score and player/penalty, as well as an unpowered caption module. MS-2018-11 also features a second unpowered module that displays shots on goal.
- Model MS-2015-11 is a single powered section with digits indicating clock/score only.
- Model MS-2016-11 consists of three sections: an unpowered, single-line clock module, a single-line scoring module which contains the driver mechanism for the display, and an unpowered caption module designed to be placed between the two LED sections.

Each scoreboard in this series begins with a one- or two-line module – that is, a single row or two rows of 10" numeric digits. The boards use red-orange LEDs, or light emitting diodes, to illuminate the display. (LEDs are tiny, solid-state components that use a semiconductor chip to transform

electrical current into light. They are high-intensity, low-energy lighting units.) Because of their LED technology, the modular scoreboards consume little power, some barely more than a household lamp. Power usage for modules in this series ranges from 150 W to a maximum of 450 W.

Caption modules are unpowered units that attach to the top or bottom of a digit module. The caption modules in models MS-2014-11, MS-2016-11, and MS-2018-11 all contain permanent, 5" vinyl captions for the module mounted directly below it. (In MS-2014-11 and MS-2018-11, captions indicate player and penalty for both teams; MS-2016-11 captions indicate home and guest scoring and period.

Modular scoreboard installations may also contain optional ad panels, attachments which can be used to display sponsor names or other advertising messages.

The heavy-gauge aluminum cabinets for the displays have a 2'-4" display face, and they are 7" deep by 9'-0" long. Caption modules are also 9'-0" long, but they measure only 7" high. Refer to **Section 2.1** for a complete listing of weights, dimensions, and power specifications.

The modular scoreboards have been designed for use with the Daktronics All Sport® 5010 Control Console. The controllers use All Sport 5000 Series sport inserts (keyboard overlays), and the boards operate without modification on All Sport 5000 signal protocol.

### **Scoreboard Options**

The modular scoreboards have been designed with several standard options. Popular add-on features include a 12 V DC horn, and changeable captions. Guides for the changeable caption panels are already installed on the MS-2014-11 and MS-2018-11 scoring and caption modules; optional panels can be customized to display team names or for virtually any other purpose.

Another option for Model MS-2016-11 is the portable power pack, which permits operation of the scoreboard via battery. The power pack, self-contained and mounted on a wheeled cart, includes batteries, charger, and a 120 V AC power inverter. The power pack may be used in combination with another option, scoreboard radio control.

Each of the scoreboard options is illustrated and described in **Appendix B**.

## **1.4 Model Identification**

---

### **Reference Drawings:**

|  |                         |
|--|-------------------------|
| Model Configurations, Hockey/Basketball..... | <b>Drawing A-156642</b> |
| Layout View; MS-2016-11 .....                | <b>Drawing A-175201</b> |

Daktronics scoreboards are differentiated by their model numbers: For all scoreboards included in this manual, the two-letter prefix, **MS-**, identifies the model as a multisport display. The next four numbers identify the specific model.

Most Daktronics scoreboards also carry a two-number suffix that refers to indoor-outdoor status and power supply: **-11** and **-12** are outdoor displays, 120 V and 230 V respectively. The LED scoreboards in this manual are currently configured only as **-11** displays.

**Drawing A-156642** illustrates all two-line models included in this manual, and **Drawing A-175201** provides a layout view of Model MS-2016-11, which is comprised of single-line modules. Both drawings are located in **Appendix A**.

## **1.5 Product Safety Approval**

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Daktronics modular scoreboard modules are ETL-listed and tested to CSA standards. Contact Daktronics with any questions regarding the testing procedures.



## **Section 2: Specifications**

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The following table lists all of the mechanical specifications, circuit specifications, and maximum power requirements for each model in this manual. Models are listed in alphanumeric order.



## 2.1 Single-Section Scoreboards

Note: Signal wires must be a minimum of 22 AWG with shield.

| Module                              | Dimensions<br>(Height, Width, Depth)              | Weight<br>Uncrated              | Digit<br>Size   | Maximum<br>Wattage | Power    | Amps per<br>Line<br>(Single<br>Phase) | Driver<br>Number<br>and<br>Address |
|-------------------------------------|---|---------------------------------|-----------------|--------------------|----------|---------------------------------------|------------------------------------|
|                                     |   | Crated                          |                 |                    |          |                                       |                                    |
| MS-2014-11<br>Clock/Score Module    | H2'-4", W9'-0", D7"<br>(914 mm, 2743 mm, 178 mm)  | 75 lb (34 kg)<br>142 lb (64 kg) | 10"<br>(254 mm) | 150 W              | 120 V AC | 1.3 A                                 | A1 71                              |
| MS-2014-11<br>Player/Penalty Module | H2'-4", W9'-0", D7"<br>(914 mm, 2743 mm, 178 mm)  | 85 lb (39 kg)<br>161 lb (73 kg) | 10"<br>(254 mm) | 300 W              | 120 V AC | 2.5 A                                 | A2 72                              |
| MS-2014-11<br>Captions Module       | H7", W9'-0", D7"<br>(178 mm, 2743 mm, 178 mm)     | 25 lb (11 kg)<br>47 lb (21 kg)  | None            | Unpowered          |          |                                       |                                    |
| MS-2015-11<br>Clock/Score Module    | H2'-4", W9'-0", D7"<br>(914 mm, 2743 mm, 178 mm)  | 60 lb (27 kg)<br>114 lb (51 kg) | 10"<br>(254 mm) | 150 W              | 120 V AC | 1.3 A                                 | A1 71                              |
| MS-2016-11<br>Clock Module          | H1'-2", W9'-0", D7"<br>(356 mm, 2743, mm, 178 mm) | 30 lb (14 kg)<br>57 lb (26 kg)  | 10"<br>(254 mm) | 300 W              | 120 V AC | 1.3 A                                 | A1 13                              |
| MS-2016-11<br>Score Module          | H1'-2", W9'-0", D7"<br>(356 mm, 2743, mm, 178 mm) | 45 lb (20 kg)<br>86 lb (39 kg)  | 10"<br>(254 mm) | Unpowered          | 120 V AC | 1.3 A                                 | A1 13                              |
| MS-2016-11<br>Caption Module        | H7", W9'-0", D7"                                  | 25 lb (11 kg)<br>47 lb (21 kg)  | None            | Unpowered          |          |                                       |                                    |

| Module                              | Dimensions<br>(Height, Width, Depth)             | Weight                           | Digit<br>Size   | Maximum<br>Wattage | Power    | Amps per<br>Line<br>(Single<br>Phase) | Driver<br>Number<br>and<br>Address |
|-------------------------------------|--|----------------------------------|-----------------|--------------------|----------|---------------------------------------|------------------------------------|
|                                     |  | Uncrated                         |                 |                    |          |                                       |                                    |
| MS-2018-11<br>Clock/Score Module    | H2'-4", W9'-0", D7"<br>(914 mm, 2743 mm, 178 mm) | 75 lbs (34 kg)<br>142 lb (64 kg) | 10"<br>(254 mm) | 150 W              | 120 V AC | 2.5 A                                 | A1 71                              |
| MS-2018-11<br>Player/Penalty Module | H2'-4", W9'-0", D7"<br>(914 mm, 2743 mm, 178 mm) | 85 lb (39 kg)<br>161 lb (73 kg)  | 10"<br>(254 mm) | 300 W              | 120 V AC | 2.5 A                                 | A2 72                              |
| MS-2018-11<br>Captions Module       | H7", W9'-0", D7"<br>(178 mm, 2743 mm, 178 mm)    | 25 lb (11 kg)<br>47 lb (21 kg)   | None            | Unpowered          |          |                                       |                                    |
| MS-2018-11<br>Shots On Goal Module  | H1'-2", W9'-0", D7"<br>(356 mm, 2743 mm, 178mm)  | 45 lb (20 kg)<br>86 lb (38 kg)   | 10"<br>(254 mm) | Unpowered          |          |                                       |                                    |

# Section 3: Mechanical Installation

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## 3.1 Installation Overview

---

Mechanical installation involves the following procedures:

- Installing concrete footings and steel beams
- Attachment of the caption modules to the digit modules; and
- Mounting the digit modules to the mounting structure.

These steps are described in greater detail in the following sections.

## 3.2 Installing Concrete Footings and Steel Beams

---

### Reference Drawings:

|  |                         |
|--|-------------------------|
| Beam & Footing Recommendations, MS-2014-11 ..... | <b>Drawing A-165553</b> |
| Beam & Footing Recommendations, MS-2015-11 ..... | <b>Drawing A-165559</b> |
| Beam & Footing Recommendations, MS-2018-11 ..... | <b>Drawing A-165561</b> |
| Beam & Footing Recommendations, MS-2016-11 ..... | <b>Drawing A-175539</b> |

These drawings specify the number of beams and the recommended spacing between them. The drawings also indicate the size of beams required to support the scoreboard at different heights under various wind speed conditions. All of the beam specifications illustrate "W" shape steel beams (wide-flange I-beams). The first number indicates the front-to-rear depth of the beam, and the second number indicates the weight in pounds per foot of length.

Column and footing size dimensions provided with the drawings can help in estimating installation costs. *They are estimates only and are not intended for construction purposes.* Be sure that your installation complies with local building codes and is suitable for your particular soil and wind conditions.

The columns and footings and all connection details must be designed and certified by a professional engineer licensed to practice in the state in which scoreboard will be installed. ***Daktronics does not assume any liability for any installation derived from the information provided in this manual or for those designed and installed by others.***

## 3.3 Installing Caption Modules

---

### Reference Drawing:

|                             |                         |
|-----------------------------|-------------------------|
| Caption Module Detail. .... | <b>Drawing A-130840</b> |
|-----------------------------|-------------------------|

Attach the caption module to the digit module **before** attaching the digit module to the beam support.

The caption modules are attached to the top or bottom of a digit module with #10 machine screws. Refer to **Drawing A-130840**. With Models MS-2014-11 and MS-2018-11, attach the caption module to the top of the player/penalty module.

Before attaching the caption module, note its orientation. The top and bottom flanges for holding the caption panel are different sizes. Be sure the module is oriented so that the deeper flange, or guide, is toward the top.

The scoreboard modules are shipped with the 5" vinyl captions applied, but the displays are also equipped with the guides needed for use with the optional custom panels. To insert a caption panel, fit the top edge of the caption into the module's upper guide, and then slide the bottom edge under the lower flange. Refer to **Drawing A-130840**. The construction of the flanges allows the caption panels to be lifted out for changing, rather than having to slide them out one end.

The caption panels must be properly positioned in relation to the scoreboard digits for different activities. Refer to the scoreboard options in **Appendix B** for details on changeable captions.

### 3.4 Mounting Digit Modules

---

#### Reference Drawings:

|                                     |                         |
|-------------------------------------|-------------------------|
| Beam Mounting Procedure .....       | <b>Drawing A-128438</b> |
| Beam Mounting, Side View .....      | <b>Drawing A-128458</b> |
| Beam Mounting, Top View .....       | <b>Drawing A-129147</b> |
| Beam Mt., Rear, Vert. Display ..... | <b>Drawing A-129155</b> |

Scoreboard digit modules may be mounted directly to a wall, to universal mounting struts (channels), or to some other support structure. Modular construction permits varied configurations, and the unique requirements of each facility will determine the setup and anchoring method best suited for the display. This manual addresses only beam mounting.

Daktronics recommends using universal mounting struts, or channels. Use  $\frac{3}{8}$ " bolts through the holes in both ends of the module frame. For displays with multiple digit modules, mount the lowest module first and work upward.

#### ***Beam Mounting Digit Modules, Outdoors***

Because every display is different in terms of module configuration, scoreboard options, and environment, every installation will be unique. Such beam-mounted installations require that a qualified engineer provide specifications for both the reinforced concrete footings and the steel support beams. Two beams are required for each column of display modules, and they must be set 4'-6" apart, center to center. Installations of vertical displays are shown in **Drawing A-129155**, which specifies the overall space requirements for the scoreboards as well as their specific dimensions.

Each digit module has knockouts in both the rear and the end for power and signal entrance. Power and signal are brought into one module through these external knockouts, and connections to other modules are made internally.

Once the support beams have been installed, the scoreboard-mounting procedure is typically a five-step process. Refer to **Drawing A-128438** for notes and illustration of the basic procedure.

1. If you haven't already done so, attach the caption module to the top of the player/penalty module. Refer to **Section 3.3**. The caption module is fastened with screws to the top of the powered module, but it does not attach directly to the beam.

2. Begin the installation by attaching mounting brackets to the top and bottom of the lowest digit module (the player/penalty section in the MS-2014-11 display or the shots on goal section in the MS-2018-11). Fasten the brackets to the modules by inserting 10-24 x  $\frac{5}{8}$ " screws through the holes in each bracket and threading into the captivated nuts in the back of the module.
3. With the brackets attached, position the module against the beam and secure it with the 15"-long threaded rods and the other washers and nuts provided. These 1/2-13 x 15" threaded rods, or mounting bolts, do not go through the beam but pass along either side; no drilling is required. Refer to **Drawings A-128458** and **A-129147**. The square nuts go inside the bracket, and the hex nuts are used inside the rear mounting angles that straddle the back of each support beam. Tighten the assembly with a  $\frac{3}{4}$ " socket, taking care not to overtighten.

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☛ **Note: Overtightening can deform the brackets and angles.**

---

4. Position the clock/score module above the caption module. Attach the mounting brackets to the clock/score section as described in step 2, and then secure the module to the beams with bolts, washers, and nuts, as described in the step 3.
5. Join the caption and clock/score modules together at the ends by inserting screws up through the holes in the top of the lower module and into the captivated nuts in the bottom of the upper module.

For scoreboard models other than MS-2014-11, the building process continues in the same manner for any remaining modules. Caption modules are attached directly to their adjoining digit modules and do not accept beam mounting brackets. Refer to **Drawing A-128458**.





# Section 4: Electrical Installation

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## 4.1 Installation Overview

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Electrical installation consists of the following processes:

- Providing power and ground to a disconnect near the scoreboard;
- Routing power and ground from the main disconnect to the scoreboard power and signal termination points;
- Connecting the scoreboard ground to a grounding electrode at the scoreboard location;
- Routing control signal cable from the control location to the scoreboard location;
- Routing power and control signal cable into the initial module; and
- Making connections to the adjoining modules.

These steps are described in greater detail in the following sections.

**Note:** *Only qualified individuals should perform power routing and termination to the display. It is the responsibility of the electrical contractor to ensure that all electrical work meets or exceeds local and national codes.*

## 4.2 Power Requirements

---

### Reference Drawings:


|   |                         |
|---|-------------------------|
| Wide Driver, 16 Col Outdoor LED, Gen II ..... | <b>Drawing A-156313</b> |
| F. Assy, Player/Penalty, 2-Line Display ..... | <b>Drawing B-156419</b> |
| F. Assy, Score, 2-Line Display.....           | <b>Drawing B-156408</b> |
| F.Assy, MS-2015-11, 2'4" x 9'-0" .....        | <b>Drawing B-158079</b> |

The chart in **Section 2** lists circuit specifications and maximum power requirements for the modules described in this manual. Refer to the drawings listed above for assembly and hookup information.

Daktronics outdoor LED scoreboards have been designed for easy access to components, and the power and control signal hookup has been simplified. Front panels are removable to allow access to the digits, cabling, and other electronic components.

Proper power installation is imperative for proper display operation. The following subsections give details of display power installation.

### **Grounding**

 *Displays MUST be grounded according to the provisions outlined in Article 250 of the National Electrical Code®. Daktronics recommends a resistance to ground of 10 ohms or less.*

The display system *must* be connected to earth-ground. Proper grounding is necessary for reliable equipment operation. It also protects the equipment from damaging electrical disturbances and lightning. ***The display must be properly grounded or the warranty will be void.***

The material of an earth-ground electrode differs from region to region, and may vary according to conditions present at the site. Consult the National Electrical Code and any local electrical codes that may apply. The support structure of the display cannot be used as an earth-ground

electrode. The support is generally embedded in concrete, and if it is in earth, the steel is usually primed or it corrodes, making it a poor ground in either case.

### Branch Circuit Grounding

A grounding electrode at separate structures/displays will not be required where only one branch circuit supplies the structure and the branch circuit includes an equipment-grounding conductor for the parts of the equipment that do not carry current.

### Power Installation

There are two different considerations for power installation: installation with ground and neutral conductors provided, and installation with only a neutral conductor provided. These two power installations differ slightly, as described in the following subsections.

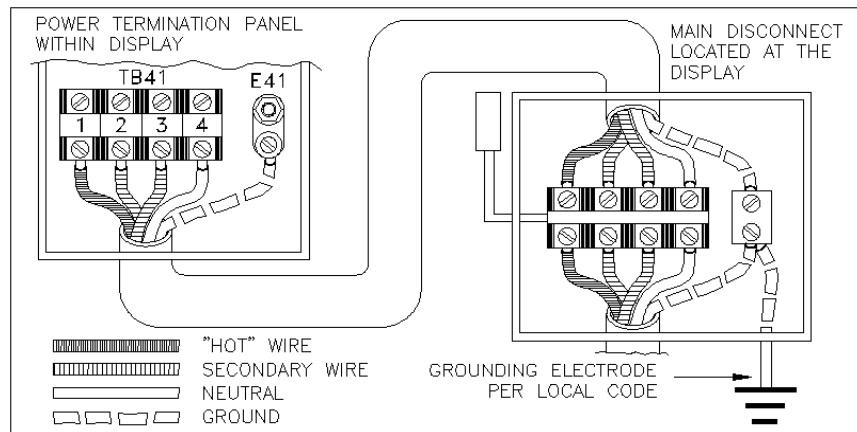
#### Installation with Ground and Neutral Conductors Provided

For this type of installation, the power cable *must* contain an isolated earth-ground conductor.

In this circumstance, *do not* connect neutral to ground at the disconnect or at the display. *This would violate electrical codes and void the warranty.*

Use a disconnect so that all hot lines and neutral can be disconnected. The National Electrical Code requires the use of a lockable power disconnect within sight of or at the display.

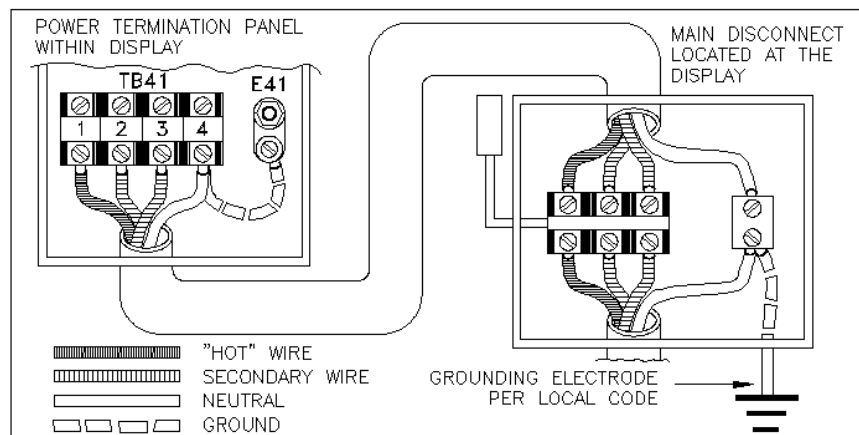
(Daktronics recommends a lockable, knife-switch disconnect at the scoreboard location so that power lines can be disconnected. Use a multi-conductor disconnect so that all hot lines and neutral can be disconnected. This is important in protecting the scoreboard against lightning.) The installation is detailed in **Figure 3**.



**Figure 3:** Installation with Ground and Neutral Provided

#### Installation with Only a Neutral Conductor Provided

Installations where no grounding conductor is provided must comply with Article 250-32 of the National Electrical Code. The hookup is illustrated in **Figure 4** at right. If the installation in question meets all of the requirements of Article 250-32, the following guidelines must be observed:



**Figure 4:** Installation with Only Neutral Provided

- Connect the grounding electrode cable at the local disconnect, never at the display entrance enclosure.
- Use a disconnect that opens all of the ungrounded phase conductors.
- In the display power enclosure, bond the neutral and the ground conductors.

### 4.3 Module Power and Signal Connection

---

#### Reference Drawings:

|  |                         |
|--|-------------------------|
| F. Assy, Score, 2-Line Display.....                      | <b>Drawing A-109114</b> |
| F. Assy, Player/Penalty .....                            | <b>Drawing A-125977</b> |
| Schematic; Gen II Outdoor LED, 16 Column Drvr.....       | <b>Drawing A-154330</b> |
| Schematic, Three Driver Gen II, 1 Master, 2 Slaves ..... | <b>Drawing A-156627</b> |

The MS-2014-11 and MS-2018-11 displays operate with a master-slave configuration. All power and signal is routed into the top module and to the master driver, which in turn delivers power and signal via interconnect harnesses to the slave units in lower sections.

Outdoor displays have a fully enclosed component tray which brings power and signal into the scoreboard. (The harsher environment and outdoor electrical hookup requirements mandate the use of this enclosure.) For access and connection, refer to the drawings listed above (or to individual component locations drawings), and follow this procedure:

1. Begin electrical installation by routing power and signal cables into the scoreboard from the rear of the clock/score section. There are two knockouts for conduit connection on the back panel. There are knockouts on the sides of the cabinet as well, if connection there is more desirable. Both cables terminate inside the driver enclosure.
2. To access the internal components, open the *Period* panel on the bottom row of the module and remove the cover from the driver enclosure.
3. Power terminates at the 120 V AC duplex receptacle in the driver tray. Refer to **Drawing A-154330** for wiring termination details.
4. The signal wires from the scoreboard controller connect directly to the signal surge arrestor (OP-1033-0114), which is located immediately below the master driver on the driver tray. The connection is illustrated in the *Clock/Score Section* detail on **Drawing A-156627**.

#### Connections Between Sections

---

☛ **Note: The power and signal interconnect harnesses referenced in the following section are factory-installed and in place. Only the final connection between scoreboard modules is required for field installation. This information is presented to document the complete installation procedure.**

---

There are several power and signal interconnect cables in the slave section of the scoreboard which must be connected to the master driver in the clock/score module, and this involves routing the cables through the 2" holes in the cabinets during scoreboard mounting. (If they are not already installed, insert 2" bushings into the cable holes in the modules.) Refer to the final assembly drawings listed at the beginning of this section.

To complete these connections, refer to the instructions on the following page.

Refer to **Drawing A-156627**, and follow these steps to complete the power and signal connections:

1. Open the access panels in both the top and bottom modules.
2. An 8' power and signal interconnect cable (0A-1192-1029) links the drivers in the player/penalty module. The cable connects the J42 jack on the A2 driver assembly to the P43 plug on the A3 driver tray. The plugs and jacks on the cable are connected to the mating connectors on the driver panel. For field connection, simply match the numbers on the plugs with the numbers on the jacks and insert. *The connectors are all "keyed" – they can fit into the jacks in one way only.* (☛ **Note:** This cable is factory-installed)
3. Next, in the player/penalty module, a 4' power and signal interconnect harness (0A-1192-1028) is connected to the P43 plug on the A2 driver assembly. Pull the cable up through the knockout in the top of the cabinet, through the caption module, and into the clock/score module. ☛ **Note:** This cable is factory-installed)
4. In the clock/score module, a second 4' harness (0A-1192-1028) is connected to J42 on the A1 driver assembly. Pull the cable down to the 2" knockout area, and connect the jack from this interconnect harness to the plug from the player/penalty module, which should have been pulled up and into the top module.
5. Replace covers and panels. If the bottom knockout in the player/penalty module has been removed, insert a 2" hole plug in the bottom hole of the lowest module
6. The MS-2018-11 has an additional shots on goal section that needs to be connected to the master driver. Route the digit harnesses from the shots on goal section to the player/penalty section above and plug the harness into the driver enclosure.

# Section 5: Maintenance and Troubleshooting

---



## IMPORTANT:

1. **Disconnect power before doing any repair or maintenance work on the display.**
2. **Permit only qualified service personnel to access internal display electronics.**
3. **Disconnect power when the display is not in use.**

## 5.1 Cabinet Specifications

---

### Reference Drawings:

|   |                         |
|---|-------------------------|
| Layout View, MS-2014 .....                    | <b>Drawing A-156514</b> |
| F. Assy, MS-2015-11 .....                     | <b>Drawing A-158196</b> |
| Layout View, MS-2018-11 .....                 | <b>Drawing A-163176</b> |
| F. Assy, Score, 2-Line Display .....          | <b>Drawing B-156408</b> |
| F. Assy, Player/Penalty, 2-Line Display ..... | <b>Drawing B-156419</b> |

Cabinets for the modules in this scoreboard series are of all-aluminum construction. The drawings referenced above give exact dimensions, screw and knockout locations, and other mechanical specifications.

## 5.2 Component Location and Access

---

### Reference Drawings:

|  |                         |
|--|-------------------------|
| Digit Service, Stackable Scoreboards ..... | <b>Drawing A-156994</b> |
| Component Locations; MS-2014-11 .....      | <b>Drawing A-175798</b> |
| Component Locations; MS-2015-11 .....      | <b>Drawing A-175799</b> |
| Component Locations; MS-2016-11 .....      | <b>Drawing A-175800</b> |
| Component Locations; MS-2018-11 .....      | <b>Drawing A-175801</b> |

The component locations drawings, **A-175798**, **A-175799**, **A-175800**, and **A-175801**, illustrate placement of all internal parts as well as the configuration of the face panels for each of the models in this series.

All of the modular scoreboards are front-access, meaning that all internal electronic components and digits can be reached by opening a face panel or a digit panel on the front of the display.

Digit panels have been simplified on the outdoor LED scoreboards. They are typically held in place on the scoreboard face by screws at the top and at the bottom of each panel. To remove a digit, simply unfasten the screws and carefully lift the unit from the board. You can then remove the signal harness from the connector on the back of the digit to completely free the component.

Remove a non-digit access panel the same way: unfasten the top, side or bottom screws holding it in place.

Component location varies with each scoreboard model, but drivers and power and signal components are typically mounted inside the scoreboard behind a digit panel.

☛ **Note: Disconnect power before servicing the display!** Disconnect power, too, when the display is not in use. Prolonged power-on may shorten the life of some electronic components.

### Replacing a Digit

**Drawing A-156994** shows the front view of a typical scoreboard module. The digit circuit board, the platform for the LEDs, is mounted on the front panel in each section.

In the case of a malfunctioning digit, do not attempt to remove individual LEDs. Replace the entire digit circuit board. The panels are easily removed for service access:

1. Open the digit panel as described in the preceding section.
2. Disconnect the power/signal connector from the back of the digit. Release the connector by squeezing together the locking tabs as you pull the connector free.
3. The digits are secured to the inside of the panel with screws, standoffs (spacers) and nuts. Remove the #8 nuts and lift the digit off the screws.
4. Position a new digit over the screws and tighten the nuts.
5. Reconnect the power/signal connector. ☛ **Note: This is a keyed connector – it will attach in one way only. Do not attempt to force the connection!**
6. Close and secure the digit panel and test the scoreboard.

## 5.3 LED Driver

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### Reference Drawings:

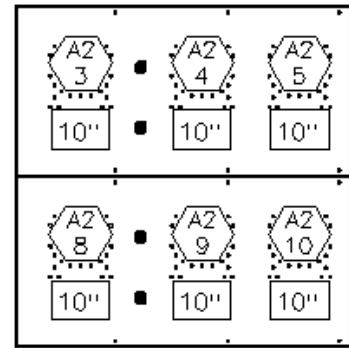
|   |                         |
|---|-------------------------|
| Wide Driver, 16 Col Outdoor LED, Gen II ..... | <b>Drawing A-156313</b> |
| Component Locations; MS-2014-11 .....         | <b>Drawing A-175798</b> |
| Component Locations; MS-2015-11 .....         | <b>Drawing A-175799</b> |
| Component Locations; MS-2016-11 .....         | <b>Drawing A-175800</b> |
| Component Locations; MS-2018-11 .....         | <b>Drawing A-175801</b> |

The task of switching LEDs on and off is performed by the LED driver. Refer to **Drawing A-156313**. Each driver has 19 connectors providing power and signal inputs/outputs to digits and indicators. The function of each of these connectors is as follows:

| Connector No. | Function                        |
|---------------|---------------------------------|
| 1 through 16  | Output to digits and indicators |
| 17            | Control signal and power input  |
| 18            | Control for horn                |
| 19            | Address                         |

Output connectors 1 through 16 each have nine pins. Pin 7 provides power to the digit or indicators wired to that connector. The other eight pins provide switching connections.

The component locations drawings, **A-175798**, **A-175799**, **A-175800**, and **A-175801**, specify the driver connectors controlling the digits – the digit designations – for each model. The connections are illustrated in the *Front View (Digit Designation) Detail* on each of the drawings. On the drawings, the numbers in hexagons in the top portion of each digit specify both the driver and the connector that must be plugged into that digit, as shown in **Figure 5** at right. The number in the rectangle at the bottom indicates digit size.



**Figure 5:** Digit Designation

### **Replacing a Driver**

Drivers are typically mounted inside the scoreboard immediately behind a digit, but location and mounting varies with the model of the scoreboard. Refer to the final assembly drawings for driver locations.

The master driver is mounted with a power supply, signal terminal block and a power receptacle. The slave modules in the Models MS-2014-11 and MS-2018-11 do not have signal terminal blocks. To remove a failed driver, follow these steps:

1. Open the digit panel or scoreboard face panel as described in **Section 5.2**, and remove the driver enclosure cover. (Remove the two screws on either side of the enclosure, and slide the cover panel down and off.)
2. Disconnect all connectors from the driver. Release each connector by squeezing together the locking tabs as you pull the connector free. **Note:** *These are keyed connectors and will attach in one way only. Do not attempt to force the connections.*
3. Remove the four wing nuts securing the driver to the driver tray.
4. Carefully lift the driver from the display and place it on a clean, flat surface.
5. Follow steps 1 through 4 in reverse order to attach a new driver.

## **5.4 Segmentation**

### **Reference Drawing:**

Digit Service, Stackable Scoreboards..... **Drawing A-156994**

In each digit, certain LEDs always go on and off together. These groupings of LEDs are referred to as *segments*. The *Digit Segments A-G* detail on **Drawing A-156994** shows which connector pin number is wired to each digit segment, as well as the wiring color code used throughout the display (illustrated at lower left on drawing).

## **5.5 Schematic**

### **Reference Drawing:**

Schematic; Gen II Outdoor LED, 16 Column DRVR ..... **Drawing A-154330**  
 Schematic; Three Driver, Gen II, 1 Master, 2 Slaves ..... **Drawing A-156627**

**Drawing A-154330** is the schematic diagram of the power and signal inputs and all wiring in Models MS-2015-11 and MS-2016-11. **Drawing A-156627** details the same information for MS-2014-11 and MS-2018-11 scoreboards.

**Disconnect power before servicing display!** Disconnect power, too, when the display is not in use. Prolonged power-on may shorten the life of some electronic components.

## 5.6 Troubleshooting

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This section lists some symptoms and problems that may be encountered with scoreboard operation. For these symptoms, possible cause and corrective actions are indicated. This list does not include every possible problem but does represent some of the more common situations that may occur.

For assistance with troubleshooting and to order replacement components, *contact your service provider first*. Your service provider may have spare equipment on hand and may provide same-day service in the event of an emergency. Your service provider may direct you to call Daktronics, or a service provider may not be applicable to your facility. In this event, feel free to call Daktronics.

For faster service, please note the make of your scoreboard and any possible assembly numbers, as noted on the scoreboard specifications sheet. If you need to order replacement components, it would be helpful to have a purchase order number or any other purchase information available at the time you call.

| Symptom/Condition                | Possible Cause  | Corrective Action   |
|----------------------------------|---|---|
| <i>Scoreboard will not light</i> | <ul style="list-style-type: none"> <li>▪ Console not connected or poor connection</li> <li>▪ No power to control console</li> <li>▪ No power to the scoreboard</li> <li>▪ Wrong code entered into All Sport</li> <li>▪ Broken wire or terminal in scoreboard</li> </ul> | <ul style="list-style-type: none"> <li>▪ Check signal cable.</li> <li>▪ Check power to console.</li> <li>▪ Check power to scoreboard.</li> <li>▪ Verify code to console.</li> <li>▪ Check wires and terminals.</li> </ul> |
| <i>Display is garbled</i>        | <ul style="list-style-type: none"> <li>▪ Internal driver logic malfunction</li> <li>▪ Control console malfunction</li> </ul>  | <ul style="list-style-type: none"> <li>▪ Check power.</li> <li>▪ Verify code to console.</li> </ul>   |
| <i>Digit will not light</i>      | <ul style="list-style-type: none"> <li>▪ Black wire to digit broken</li> <li>▪ Poor contact at driver connection</li> </ul>   | <ul style="list-style-type: none"> <li>▪ Verify power harness in display.</li> </ul>  |
| <i>Segment will not light</i>    | <ul style="list-style-type: none"> <li>▪ Broken LED or connection</li> <li>▪ Driver shift register failure</li> <li>▪ Broken wire between LED driver and digit/ poor contact at driver connector</li> </ul>   | <ul style="list-style-type: none"> <li>▪ Replace digit.</li> <li>▪ Replace driver.</li> <li>▪ Secure pins tightly in plugs.</li> </ul>  |
| <i>Segment stays lit</i>         | <ul style="list-style-type: none"> <li>▪ Driver shift register failure</li> <li>▪ Short circuit on digit</li> </ul>   | <ul style="list-style-type: none"> <li>▪ Replace driver.</li> <li>▪ Remove solder bridge.</li> </ul>  |



## 5.7 Replacement Parts

---

To prevent loss due to theft, Daktronics recommends purchasing a lockable cabinet to store manuals and replacement or spare parts. Refer to the appropriate supplementary manual for a complete list of replacement parts.

| Description                               | Part No.     |
|---|--------------|
| LED driver, 16-col, outdoor               | 0P-1192-0011 |
| Harness, address, 12-pin                  | 0A-1150-0064 |
| Horn, 12 V DC, 2 A                        | DS-1389      |
| Signal/surge arrestor                     | 0P-1033-0114 |
| Power supply, 24 V, 150 W, 86-132 V input | A-1720       |
| Terminal block, 3-pos                     | TB-1059      |
| Connector box, 2-screw type               | EC-1008      |
| Jack, power outlet, 3-pin, female         | J-1021       |
| Arrow indicators, penalty, red-orange LED | 0P-1192-0047 |
| Arrow indicators, penalty, amber LED      | 0P-1192-0090 |
| Digit, 10", red-orange LED, 7-seg         | 0P-1192-0045 |
| Digit, 10" ones, red-orange LED, 2-seg    | 0P-1192-0089 |
| Digit, "B" bonus indicator, amber LED     | 0P-1192-0091 |

## 5.8 Daktronics Exchange and Repair and Return Programs

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To serve customers' repair and maintenance needs, Daktronics offers both an Exchange Program and a Repair and Return Program.

Daktronics' unique Exchange Program is a quick, economical service for replacing key components in need of repair. If a component fails, Daktronics sends the customer a replacement, and the customer, in turn, sends the failed component to Daktronics. This not only saves money but also decreases scoreboard downtime. The company offers the service to qualified customers who follow the program guidelines explained below.

Daktronics provides these plans to ensure users get the most from their Daktronics products. Please call the Help Desk – (877) 605-1115 – if you have questions regarding the Exchange Program or any other Daktronics service.

When you call the Daktronics Help Desk, a trained service technician will work with you to solve the equipment problem. You will work together to diagnose the problem and determine which exchange

replacement part to ship. If, after you make the exchange, the equipment still causes problems, please contact our Help Desk immediately.

If the replacement part fixes the problem, package the defective part in the same box and wrapping in which the replacement part arrived, fill out and attach the enclosed UPS shipping document, and *RETURN THE PART TO DAKTRONICS*. In most circumstances, you will be invoiced for the replacement part at the time it is shipped. This bill is due when you receive it.

Daktronics expects immediate return of an exchange part if it does not solve the problem. The company also reserves the right to refuse equipment that has been damaged due to acts of nature or causes other than normal wear and tear.

*If the defective equipment is not shipped to Daktronics within 30 working days from the invoice date, it is assumed you are purchasing the replacement part, and you will be invoiced for it.* This second invoice represents the difference between the exchange price and the full purchase price of the equipment. The balance is due when you receive the second invoice. If you return the exchange equipment after 30 working days from the invoice date, you will be credited for the amount on the second invoice, minus a restocking fee.

**☺To avoid a restocking charge, please return the defective equipment within 30 days from the invoice date.**

Daktronics also offers a Repair and Return program for items not subject to exchange.

**Return Materials Authorization:** To return parts for service, contact your local representative prior to shipment to acquire a Return Material Authorization (RMA) number. If you have no local representative, call the Daktronics Help Desk for the RMA. This expedites repair of your component when it arrives at Daktronics.

**Packaging for Return:** Package and pad the item well so that it will not be damaged in shipment. Electronic components such as printed circuit boards should be installed in an enclosure or placed in an antistatic bag before boxing. Please enclose your name, address, phone number and a clear description of symptoms.

***This is how to reach us:***

***Mail:*** Customer Service  
Daktronics, Inc.  
P.O. Box 5128  
331 32nd Avenue  
Brookings, SD 57006

***Phone:*** Daktronics Help Desk: 1 (877) 605-1115 (toll free)  
or 1 (605) 697-4036

***Fax:*** 1 (605) 697-4444

***E-mail:*** [helpdesk@daktronics.com](mailto:helpdesk@daktronics.com)

# Appendix A: Reference Drawings

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## ***A Drawings***

|   |                  |
|---|------------------|
| Beam Mounting Procedure.....                            | Drawing A-128438 |
| Beam Mounting, Side View .....                          | Drawing A-128458 |
| Beam Mounting, Top View .....                           | Drawing A-129147 |
| Beam Mounting, Rear View, Vertical Display .....        | Drawing A-129155 |
| Caption Module Detail .....                             | Drawing A-130840 |
| Schematic; Gen II Outdoor LED, 16 Column DRVR.....      | Drawing A-154330 |
| Wide Driver, 16 Col Outdoor, Gen II.....                | Drawing A-156313 |
| Layout View, MS-2014-11 .....                           | Drawing A-156514 |
| Schematic, Three-Driver Gen II, 1 Master, 2 Slaves..... | Drawing A-156627 |
| Model Configurations, Hockey/Basketball .....           | Drawing A-156642 |
| Digit Service, Stackable Scoreboards .....              | Drawing A-156994 |
| F.Assy, MS-2015-11, .....                               | Drawing A-158196 |
| Layout View, MS-2018-11 .....                           | Drawing A-163176 |
| Beam & Footing Recommendations, MS-2014-11.....         | Drawing A-165553 |
| Beam & Footing Recommendations, MS-2015-11.....         | Drawing A-165559 |
| Beam & Footing Recommendations, MS-2018-11.....         | Drawing A-165561 |
| Layout View; MS-2016-11 .....                           | Drawing A-175201 |
| Beam & Footing Recommendations, MS-2016-11.....         | Drawing A-175539 |
| Component Locations; MS-2014-11 .....                   | Drawing A-175798 |
| Component Locations; MS-2015-11 .....                   | Drawing A-175799 |
| Component Locations; MS-2016-11 .....                   | Drawing A-175800 |
| Component Locations; MS-2018-11 .....                   | Drawing A-175801 |

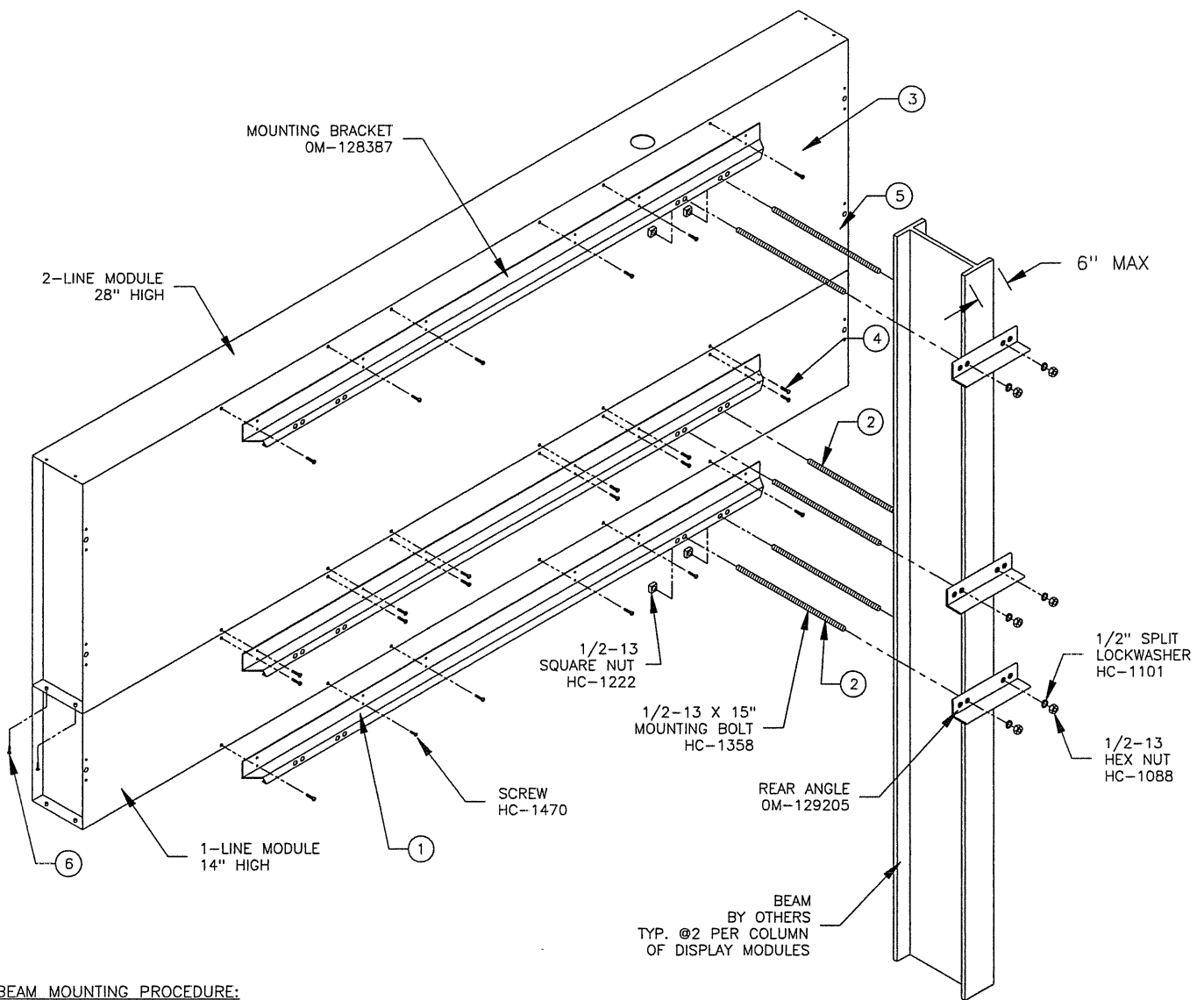
## ***B Drawings***

|  |                  |
|--|------------------|
| F. Assy, Score, 2-Line Display .....         | Drawing B-156408 |
| F. Assy, Player/Penalty, 2-Line Display..... | Drawing B-156419 |
| F. Assy, MS-2015-11, 2'-4" x 9'-0".....      | Drawing B-158079 |

## ***Options Drawings (located in Appendix B)***

|   |                  |
|---|------------------|
| Horn, 12 V DC w/Filter .....                    | Drawing A-111265 |
| Caption Module Detail .....                     | Drawing A-130840 |
| Layout View, MS-2014-11 .....                   | Drawing A-156514 |
| Installation, Portable Powered Scoreboards..... | Drawing A-166787 |





**BEAM MOUNTING PROCEDURE:**

THE CIRCLED NUMBERS IN THE DRAWING REFER TO THE STEPS OF THIS PROCEDURE.

ONLY ONE BEAM IS SHOWN, TWO BEAMS REQUIRED FOR EACH COLUMN OF DISPLAY MODULES. BEAMS MUST BE SET 4'-6" APART, CENTER TO CENTER.

1. ATTACH MOUNTING BRACKETS TO THE TOP AND BOTTOM OF THE LOWEST DISPLAY MODULE IN THE SYSTEM BY INSERTING SCREWS THROUGH THE HOLES IN THE BRACKET AND THREADING INTO THE CAPTIVATED NUTS IN THE BACK OF THE MODULE.
2. POSITION THAT MODULE AGAINST THE BEAMS AND SECURE TO THE BEAM WITH THE BOLTS, WASHERS, AND NUTS PROVIDED. THE SQUARE NUTS GO INSIDE THE BRACKET, AND THE HEX NUTS AND WASHERS ARE USED INSIDE THE REAR ANGLE AT THE BACK OF THE BEAM. USE A 3/4" SOCKET TO TIGHTEN. **CAUTION:** DO NOT OVERTIGHTEN AND DEFORM THE BRACKET OR ANGLES.
3. ATTACH THE UPPER MOUNTING BRACKET TO THE NEXT MODULE AND SET IT ON TOP OF THE FIRST MODULE.
4. INSTALL SCREWS THROUGH THE BRACKET TO SECURE THE BOTTOM OF THE SECOND MODULE.
5. SECURE THE UPPER BRACKET TO THE BEAMS WITH THE BOLTS, WASHERS, AND NUTS.
6. ATTACH THE MODULES TOGETHER AT THE ENDS BY INSERTING SCREWS UP THROUGH THE HOLES IN THE TOP OF THE LOWER MODULE INTO THE CAPTIVATED NUTS IN THE BOTTOM OF THE UPPER MODULE.
7. CONTINUE BUILDING UP IN THIS MANNER FOR ANY REMAINING MODULES IN THE SYSTEM. CAPTION MODULES ARE ATTACHED ONLY TO THE ADJACENT DIGIT MODULES, AND DO NOT ACCEPT BEAM MOUNTING BRACKETS.

SEE DRAWING 1153-R10A-128458 FOR A SIDE VIEW AND DETAILS.

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ:

TITLE: BEAM MOUNTING PROCEDURE

DES. BY: AVB

DRAWN BY: AVB

DATE: 28 FEB 00

REVISION

APPR. BY:

SCALE: 1=20

1153-R10A-128438

| REV. | DATE      | DESCRIPTION                       | BY  | APPR. |
|------|-----------|-----------------------------------|-----|-------|
| 01   | 19 APR 02 | CHANGED HC-1022 SCREW TO HC-1470. | MRB |       |

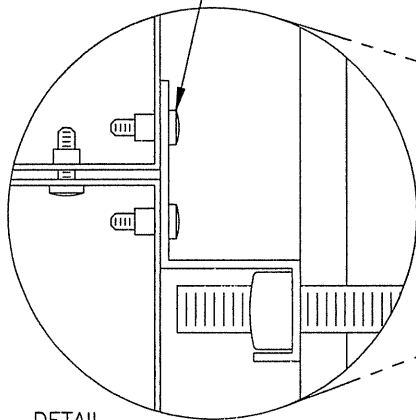
A TYPICAL INSTALLATION MAY BE MADE UP OF 1- & 2-LINE MODULES AND CAPTION MODULES. THEIR SPECIFIC LOCATIONS ARE DETERMINED BY THE SYSTEM SPECIFICATIONS. ONLY ONE OF EACH IS SHOWN HERE.

CAPTION MODULE  
7" HIGH

2-LINE MODULE  
28" HIGH

THESE SCREWS ARE USED TO SECURE THE BRACKETS TO THE BACK OF THE MODULES, AND TO JOIN MODULES TOGETHER AT THE ENDS.

10-24 X 5/8" SCREW  
HC-1470



DETAIL  
SCALE 1=2

1-LINE MODULE  
14" HIGH

1/2-13 SQUARE NUT  
HC-1222

MOUNTING BRACKET  
OM-128387

SUPPORT BEAM  
BY OTHERS  
MAX. 6" WIDE  
MAX. 13" DEEP

MOUNTING BOLTS DO NOT GO THROUGH THE BEAM, BUT PASS ALONG EITHER SIDE. NO DRILLING REQUIRED.

MOUNTING BOLT  
HC-1358

REAR ANGLE  
OM-129205

1/2-13 NUT  
HC-1088

1/2" SPLIT  
LOCKWASHER  
HC-1101

SEE DRAWING 1153-R10A-128438 FOR A VIEW FROM THE REAR OF THE DISPLAY, AND STEP BY STEP PROCEDURE.

SIDE VIEW

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ:

TITLE: BEAM MOUNTING, SIDE VIEW

DES. BY: AVB

DRAWN BY: A VANBEMMEL

DATE: 01 MAR 00

REVISION

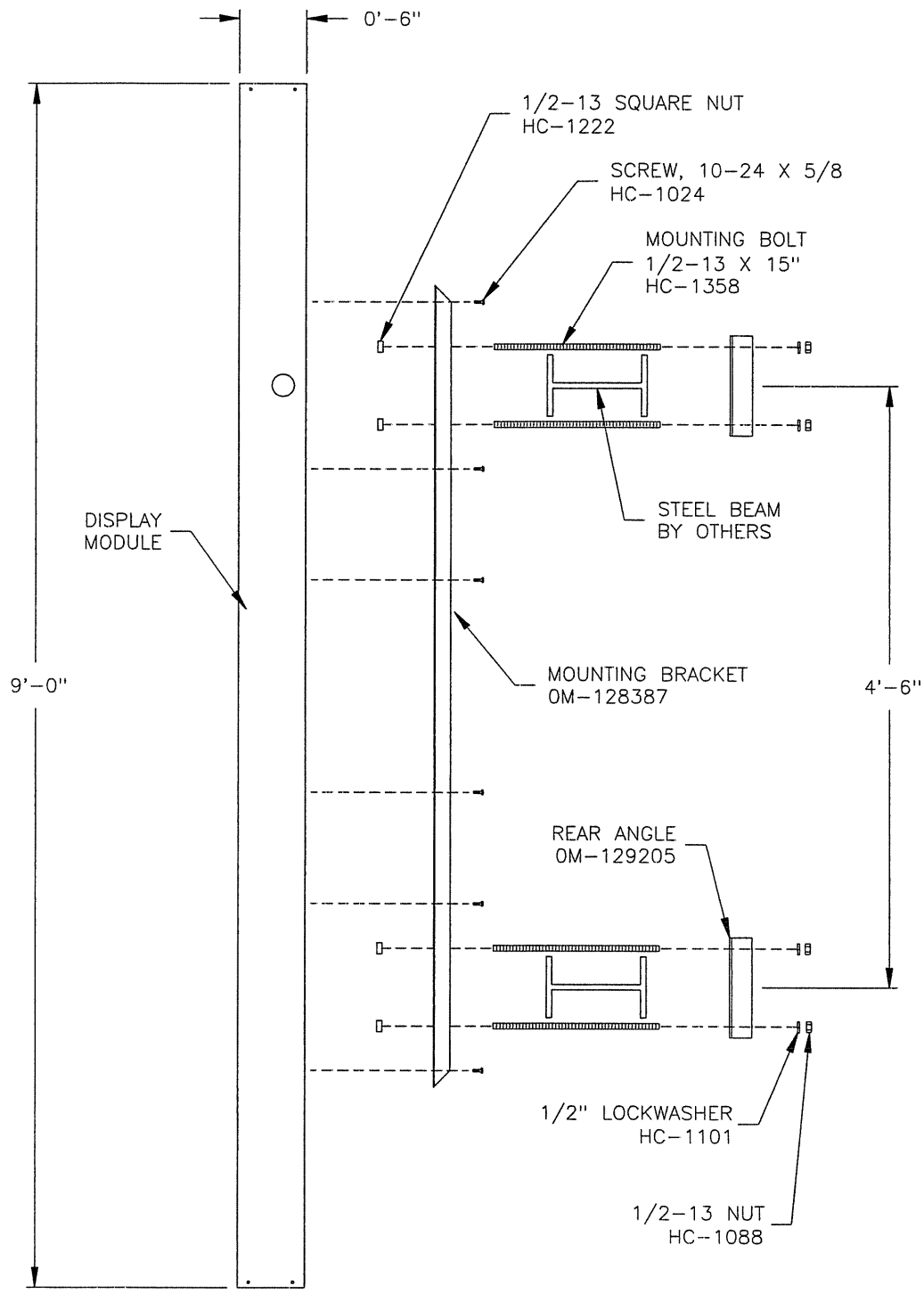
APPR. BY:

01

SCALE: 1=8

1153-R10A-128458

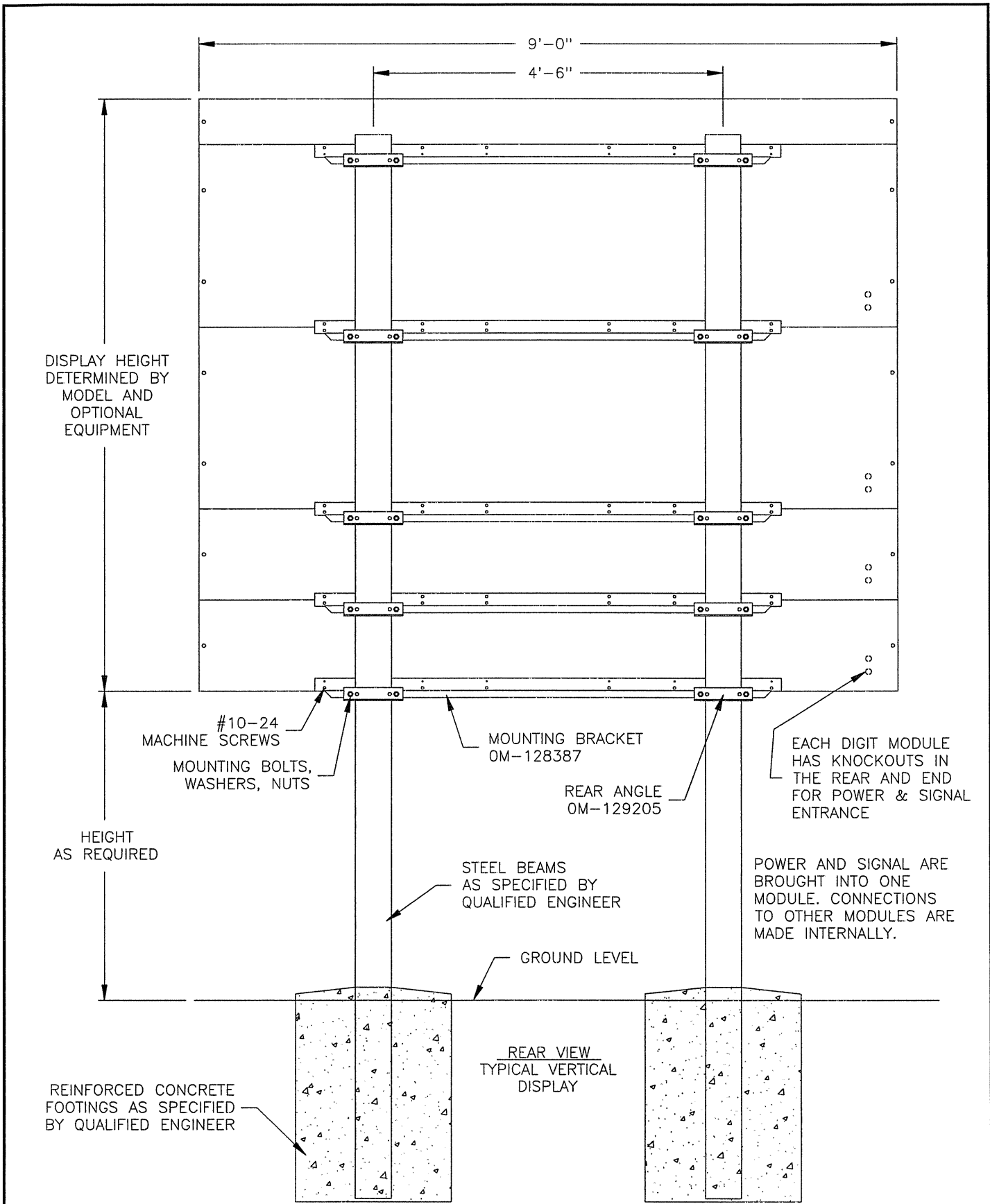
| REV. | DATE      | DESCRIPTION                       | BY  | APPR. |
|------|-----------|-----------------------------------|-----|-------|
| 01   | 19 APR 02 | CHANGED HC-1022 SCREW TO HC-1470. | MRB |       |



TOP VIEW

|                                      |             |                       |  |
|--------------------------------------|-------------|-----------------------|--|
| DAKTRONICS, INC. BROOKINGS, SD 57006 |             |                       |  |
| PROJ:                                |             |                       |  |
| TITLE: BEAM MOUNTING, TOP VIEW       |             |                       |  |
| DES. BY: AVB                         |             | DRAWN BY: A VANBEMMEL |  |
|                                      |             | DATE: 09 MAR 00       |  |
| REVISION                             | APPR. BY:   | 1153-R10A-129147      |  |
| 00                                   | SCALE: 1=15 |                       |  |

| REV. | DATE | DESCRIPTION | BY | APPR. |
|------|------|-------------|----|-------|
|      |      |             |    |       |



DISPLAY HEIGHT DETERMINED BY MODEL AND OPTIONAL EQUIPMENT

HEIGHT AS REQUIRED

#10-24 MACHINE SCREWS  
MOUNTING BOLTS, WASHERS, NUTS

MOUNTING BRACKET  
OM-128387

REAR ANGLE  
OM-129205

EACH DIGIT MODULE HAS KNOCKOUTS IN THE REAR AND END FOR POWER & SIGNAL ENTRANCE

STEEL BEAMS AS SPECIFIED BY QUALIFIED ENGINEER

POWER AND SIGNAL ARE BROUGHT INTO ONE MODULE. CONNECTIONS TO OTHER MODULES ARE MADE INTERNALLY.

GROUND LEVEL

REINFORCED CONCRETE FOOTINGS AS SPECIFIED BY QUALIFIED ENGINEER

REAR VIEW  
TYPICAL VERTICAL DISPLAY

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ:

TITLE: BEAM MOUNTING, REAR VIEW, VERTICAL DISPLAY

DES. BY: AVB

DRAWN BY: A VANBEMMEL

DATE: 10 MAR 00

REVISION

APPR. BY:

00

SCALE: 1=20

1153-R10A-129155

| REV. | DATE | DESCRIPTION | BY | APPR. |
|------|------|-------------|----|-------|
|      |      |             |    |       |



INSERT THE TOP OF THE CAPTION PANEL INTO THE UPPER GUIDE IN THE MODULE. LIFT, PRESS BACK, AND DROP INTO THE BOTTOM GUIDE

CAPTION MODULE  
7" HIGH

DIGIT MODULE  
14" OR 28" HIGH

ATTACH THE CAPTION MODULE TO THE TOP OR BOTTOM OF THE ADJACENT DIGIT MODULE, USING THE #10 SCREWS PROVIDED.

NOTE THAT THE UPPER GUIDE IS DEEPER THAN THE BOTTOM GUIDE.

BE SURE THAT THE MODULE IS ORIENTED CORRECTLY WHEN INSTALLING.

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: LED AQUATICS/TRACK DISPLAYS

TITLE: CAPTION MODULE DETAIL

DES. BY: AVB

DRAWN BY: A VANBEMMEL

DATE: 12 APR 00

REVISION

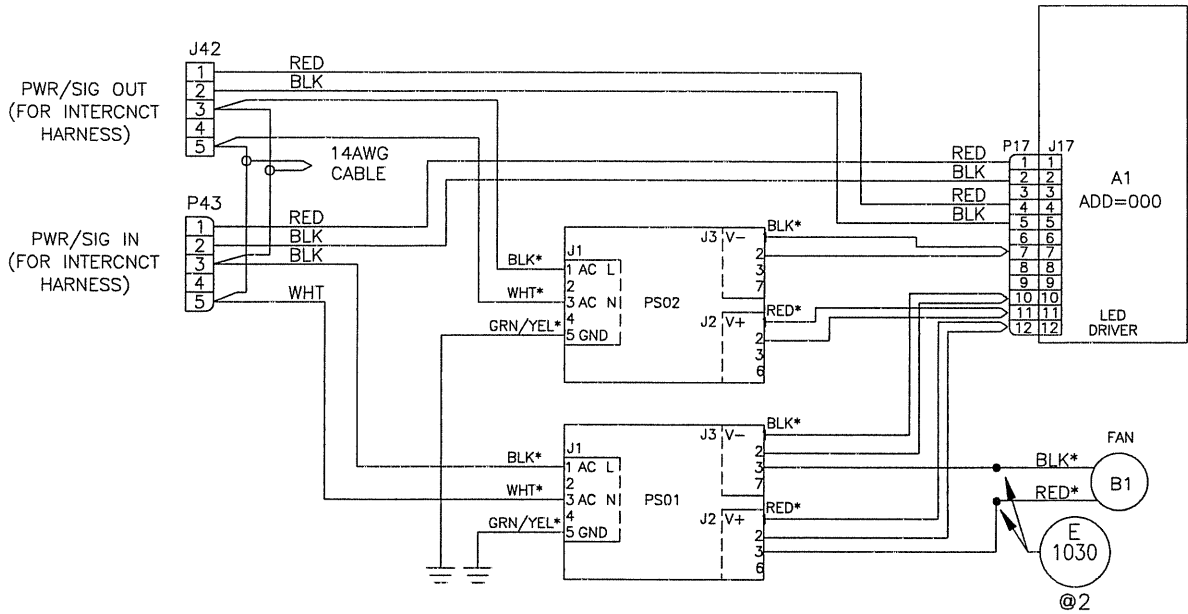
APPR. BY:

SCALE: 1=8

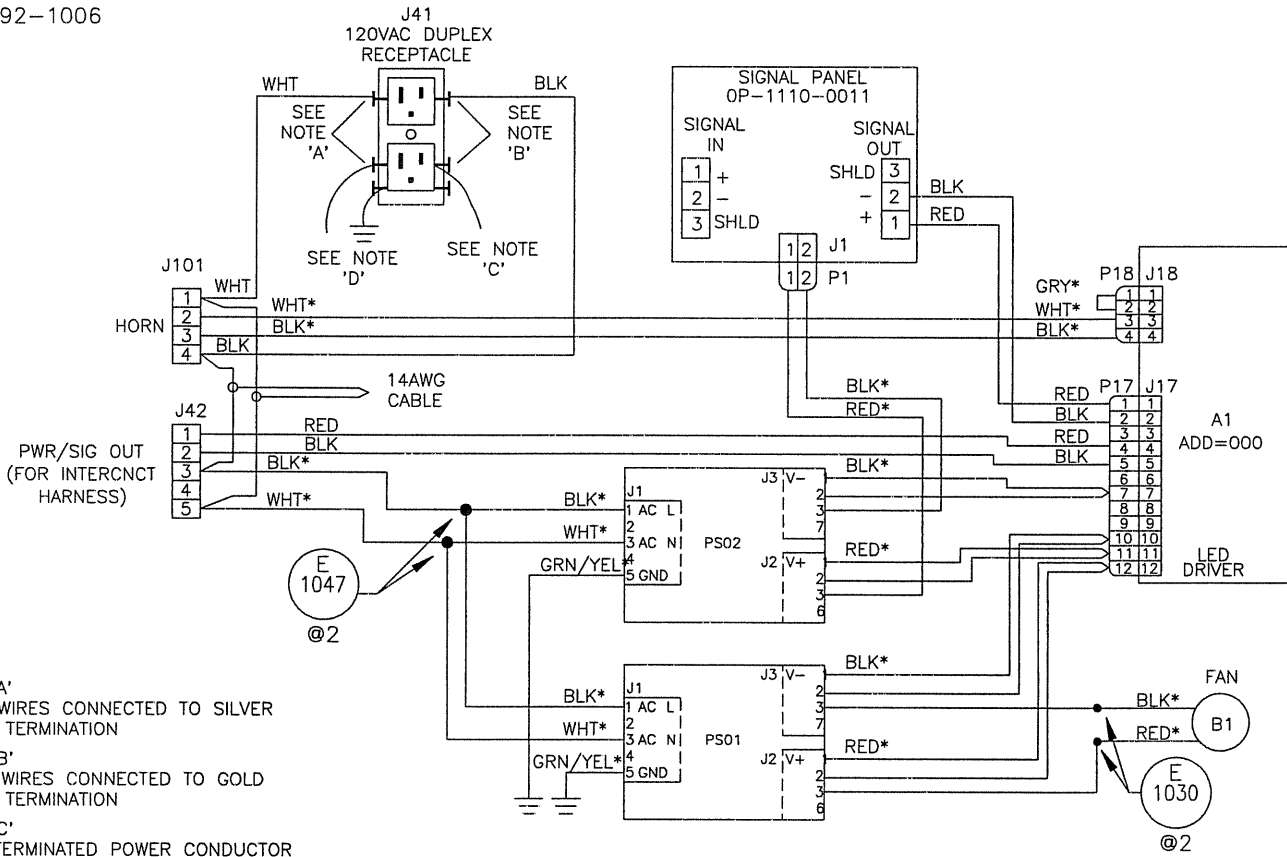
1153-R10A-130840

| REV. | DATE | DESCRIPTION | BY | APPR. |
|------|------|-------------|----|-------|
|      |      |             |    |       |

SLAVE CONFIGURATION  
OA-1192-1007



MASTER CONFIGURATION  
OA-1192-1006



- NOTES:  
 NOTE 'A'  
 WHITE WIRES CONNECTED TO SILVER SCREW TERMINATION  
 NOTE 'B'  
 BLACK WIRES CONNECTED TO GOLD SCREW TERMINATION  
 NOTE 'C'  
 FIELD TERMINATED POWER CONDUCTOR  
 NOTE 'D'  
 FIELD TERMINATED NEUTRAL AND GROUND CONDUCTOR

ALL POWER CONDUCTORS ARE 14AWG EXCEPT \* INDICATES 18AWG CONDUCTORS.

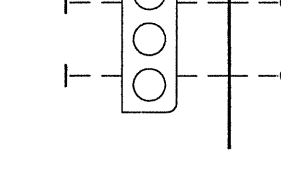
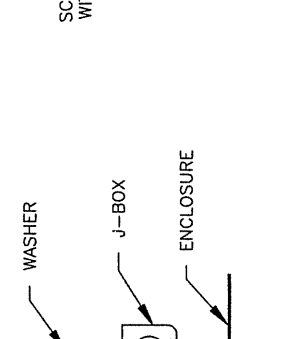
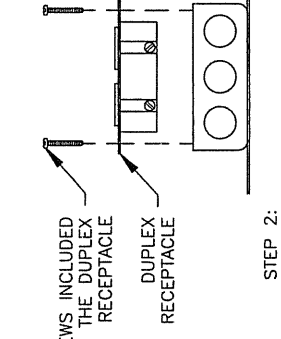
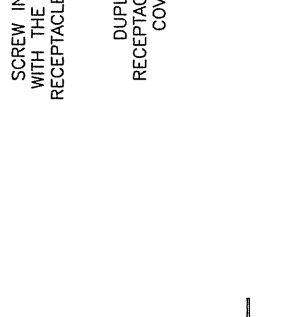
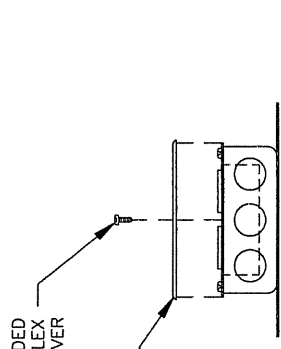
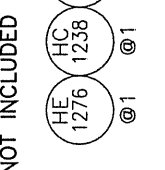
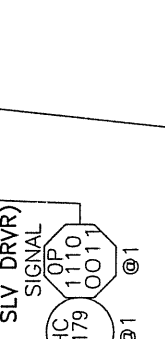
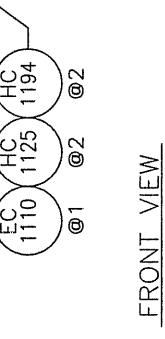
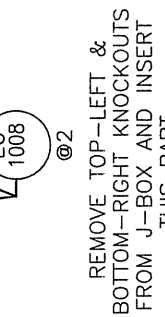
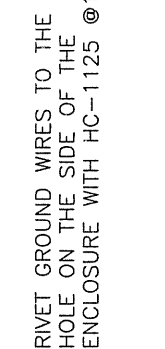
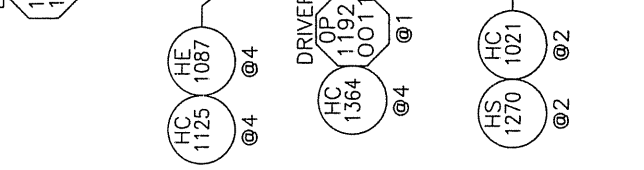
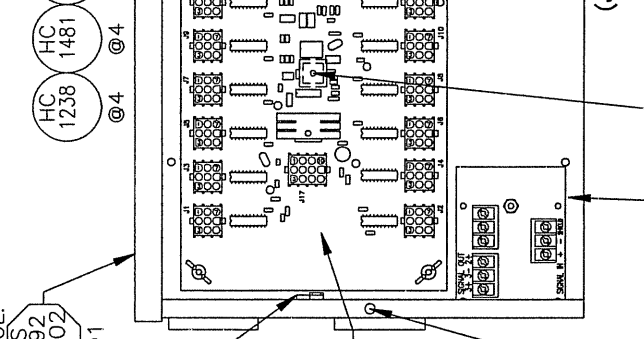
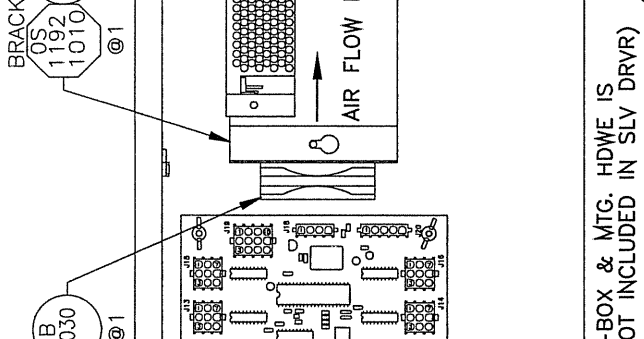
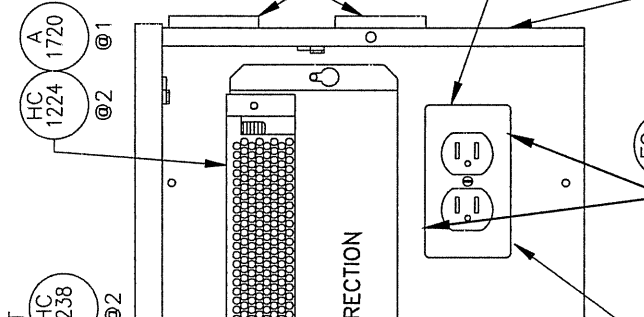
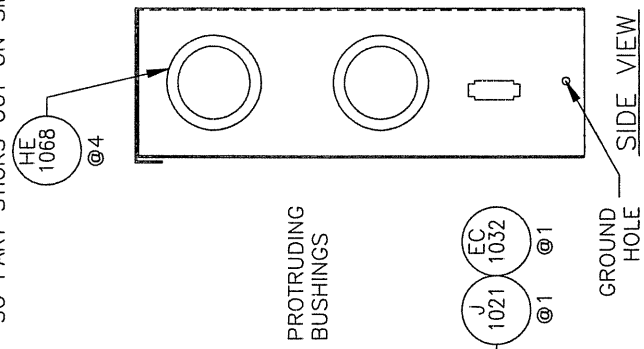
ALL SIGNAL CONDUCTORS ARE 22AWG CONDUCTORS.

REFERENCE DWG 1192-R06B-152269 FOR DETAILED CABLE ASSEMBLY DIAGRAM.

| REV. | DATE      | DESCRIPTION  | BY  | APPR. |
|------|-----------|--|-----|-------|
| 4    | 26 JUN 02 | CHANGED SIGNAL CONNECTION FOR CABLE COMING OUT OF J101-1 AND -2  | NMB |       |
| 03   | 14 MAY 02 | REMOVED P43 PWR/SIG INPUT FROM MASTER ASSY. REMOVED HORN FROM SLAVE ASSY. REDID ALL THE WIRING.                          | MWM |       |
| 02   | 15 JAN 02 | ADDED IWRES COMING FROM PS02 J3-3 AND J2-3 INTO THE SIGNAL PANEL   | NMB |       |
| 01   | 17 OCT 01 | UPDATED DWG TO SHOW FAN BUTT CONNECTORS UPDATED PWS CONNECTIONS. UPDATED TITLE. MOVED WHT & BLK TO NEW PINS ON J42 & P43 | MWM |       |

|   |                   |               |  |
|---|-------------------|---------------|--|
| DAKTRONICS, INC. BROOKINGS, SD 57006                  |                   |               |  |
| PROJ: OUTDOOR LED SCOREBOARDS                         |                   |               |  |
| TITLE: SCHEMATIC; GEN II OUTDOOR LED, 16 COLUMN DRV R |                   |               |  |
| DES. BY:  | DRAWN BY: CMCADAM | DATE: 13AUG01 |  |
| REVISION  | APPR. BY:         | SCALE: 1 = 1  |  |
| 1192-R03A-154330                                      |                   |               |  |

INSERT HEYCOS THROUGH INSIDE  
SO PART STICKS OUT ON SIDES



STEP 3:  
-USING THE SCREW INCLUDED WITH THE DUPLEX RECEPTACLE COVER (EC-1032), SCREW THE DUPLEX RECEPTACLE COVER TO THE DUPLEX RECEPTACLE.

STEP 2:  
-USING THE SCREWS INCLUDED WITH THE DUPLEX RECEPTACLE (J-1021), SCREW THE DUPLEX RECEPTACLE TO THE J-BOX.

DETAIL: A  
(ASSEMBLY OF DUPLEX RECEPTACLE)

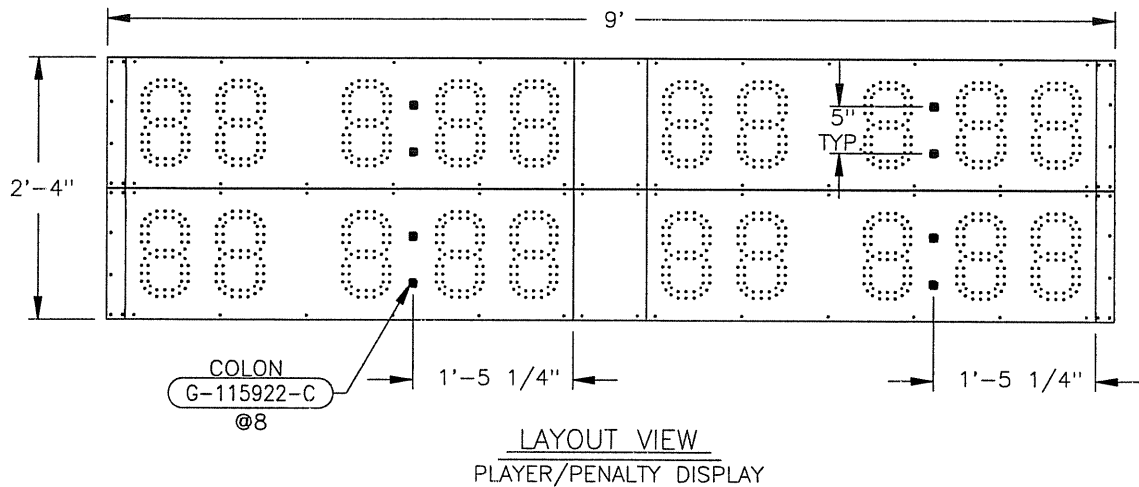
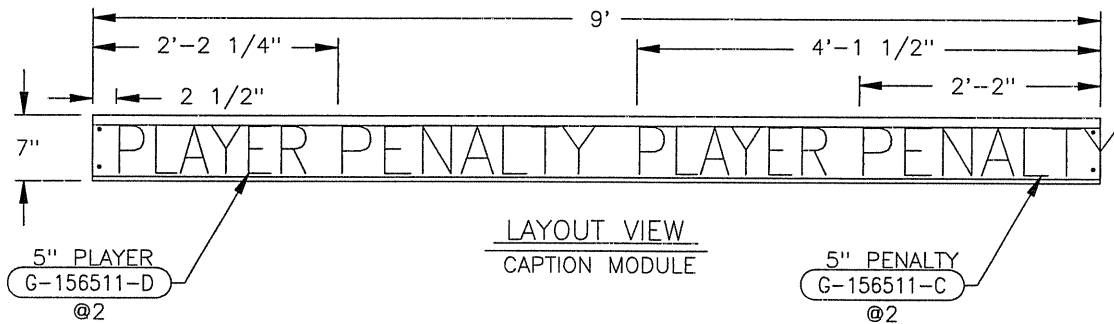
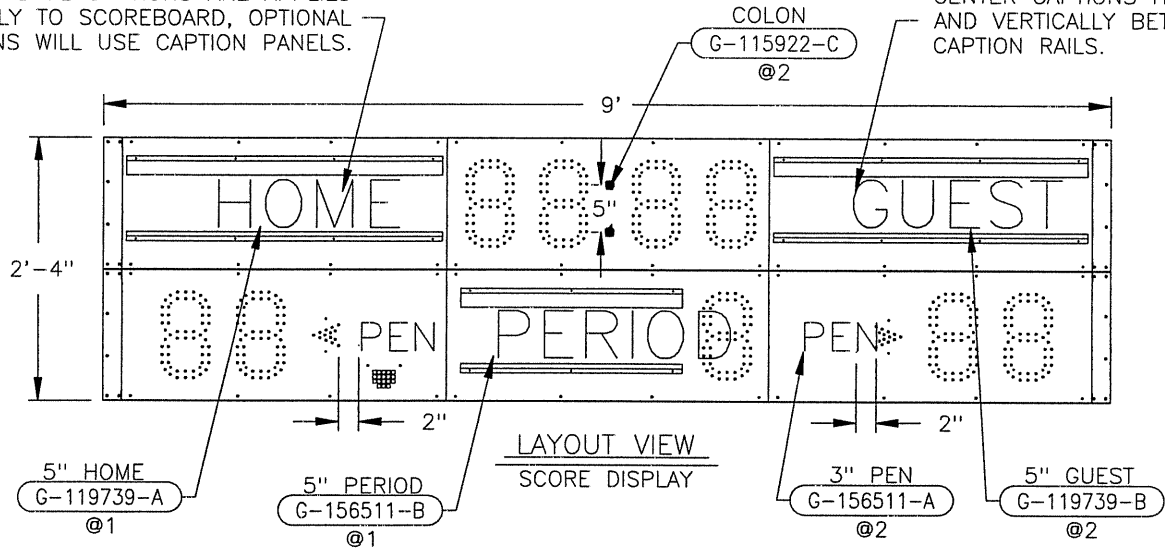
STEP 1:  
-RIVET J-BOX (EC-1110) TO ENCLOSURE USING HC-1125 RIVETS AND HC-1194 WASHERS.

|  |            |                    |  |               |
|--|------------|--------------------|--|---------------|
| DAKTRONICS, INC. BROOKINGS, SD 57006           |            |                    |  |               |
| PROJ: OUTDOOR LED SCOREBOARDS                  |            |                    |  |               |
| TITLE: WIDE DRIVER, 16 COL OUTDOOR LED, GEN II |            |                    |  |               |
| DES. BY: KBRICKER                              |            | DRAWN BY: KBRICKER |  | DATE: 24SEP01 |
| REVISION                                       | APPR. BY:  | 1192-E10A-156313   |  |               |
|  | SCALE: 1=5 |                    |  |               |

|      |         |                                      |       |       |
|------|---------|--------------------------------------|-------|-------|
| 05   | 11JUL02 | REPLACED OM-154139 WITH OS-1192-1010 | MCOPL |       |
| REV. | DATE    | DESCRIPTION                          | BY    | APPR. |

BASE CAPTIONS ARE APPLIED DIRECTLY TO SCOREBOARD, OPTIONAL CAPTIONS WILL USE CAPTION PANELS.

CENTER CAPTIONS HORIZONTALLY AND VERTICALLY BETWEEN CAPTION RAILS.

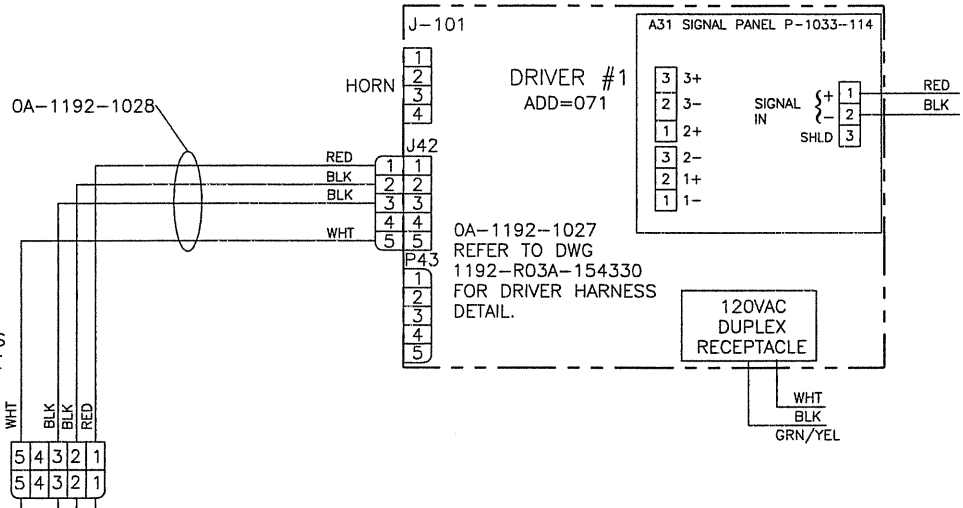


| REV. | DATE | DESCRIPTION | BY | APPR. |
|------|------|-------------|----|-------|
|      |      |             |    |       |

|                                      |           |                    |               |
|--------------------------------------|-----------|--------------------|---------------|
| DAKTRONICS, INC. BROOKINGS, SD 57006 |           |                    |               |
| PROJ: OUTDOOR LED DIGIT SCOREBOARDS  |           |                    |               |
| TITLE: LAYOUT VIEW, MS-2014          |           |                    |               |
| DES. BY: KBRICKER                    |           | DRAWN BY: KBRICKER | DATE: 28SEP01 |
| REVISION                             | APPR. BY: | 1192-E10A-156514   |               |
|                                      |           | SCALE: 1=20        |               |

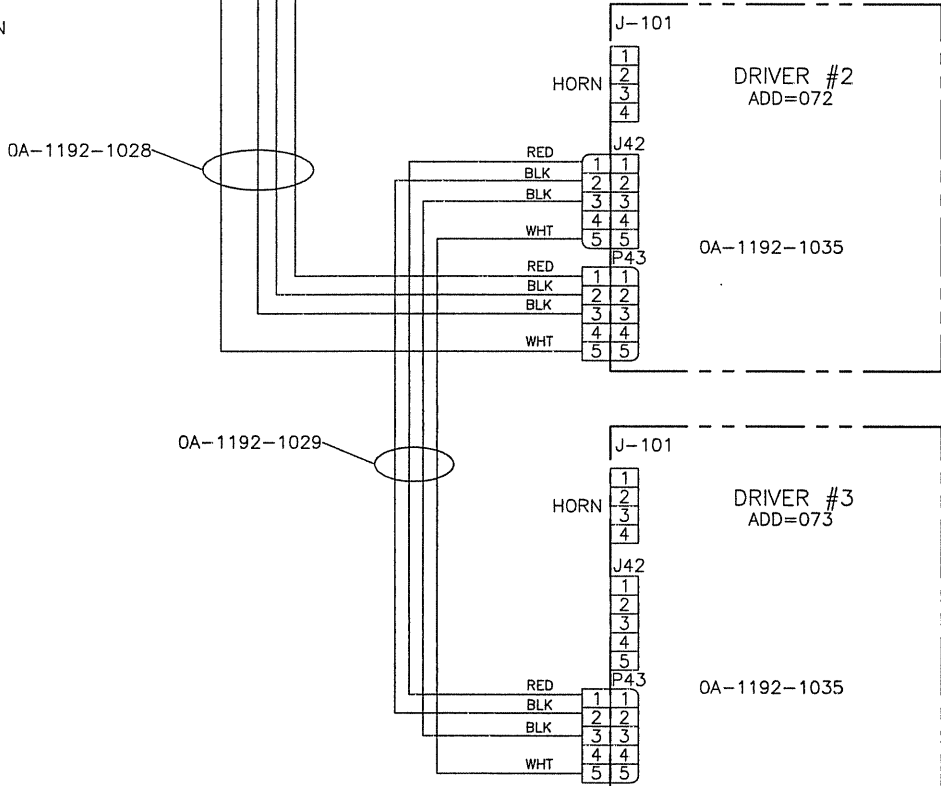
CLOCK/SCORE SECTION

NOTE:  
MAKE INTERCONNECT BETWEEN SECTIONS  
IN THE CLOCK,/SCORE SECTION. ROUTE  
HARNES FROM STATS SECTION  
TO CLOCK,/SCORE SECTION.



CAPTION/PANEL SECTION

STAT'S SECTION



DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: OUTDOOR LED DIGIT SCOREBOARD

TITLE: SCHEMATIC, THREE DRIVER GEN II, 1 MASTER, 2 SLAVES

DES. BY: HBONER

DRAWN BY: JSPAHR

DATE: 28 SEPT 01

| REV. | DATE    | DESCRIPTION   | BY  | APPR. |
|------|---------|---|-----|-------|
| 01   | 22OCT01 | MOVED HOT WIRE TO PIN 1, MOVED NEUTRAL TO PIN 2, MOVED BLACK SIGNAL TO PIN 3, MOVED WHITE SIGNAL TO PIN 5 | NMB | CMC   |

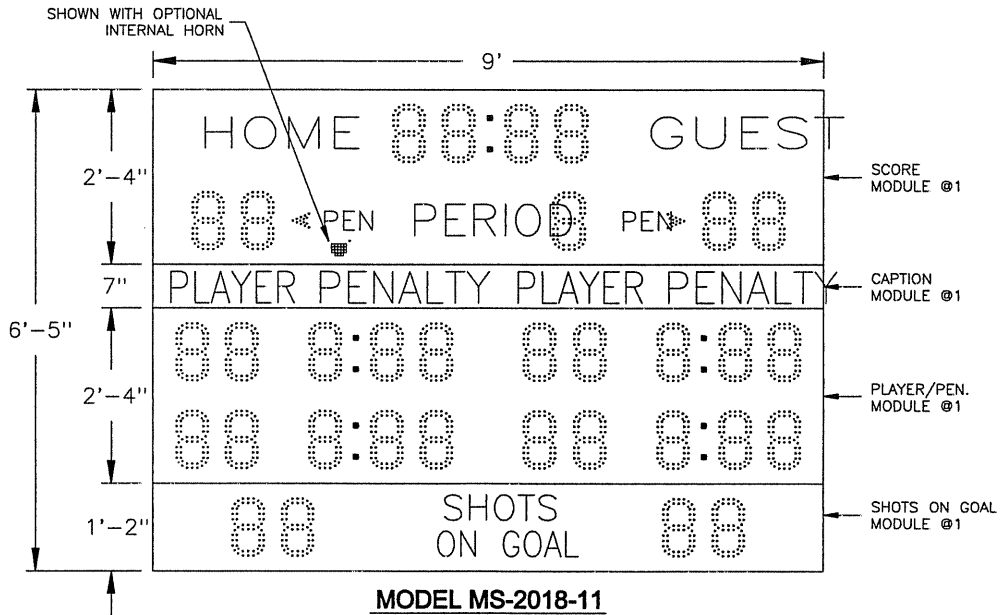
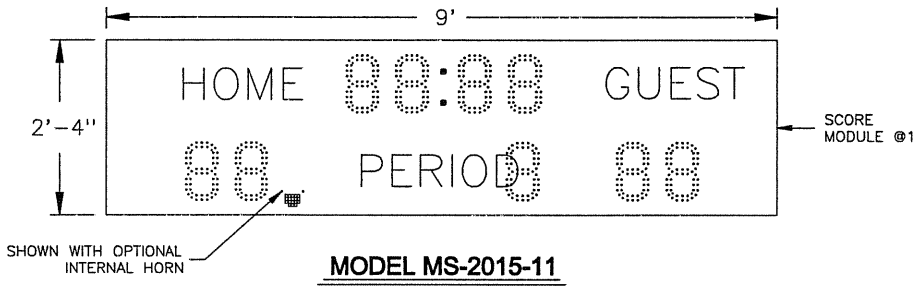
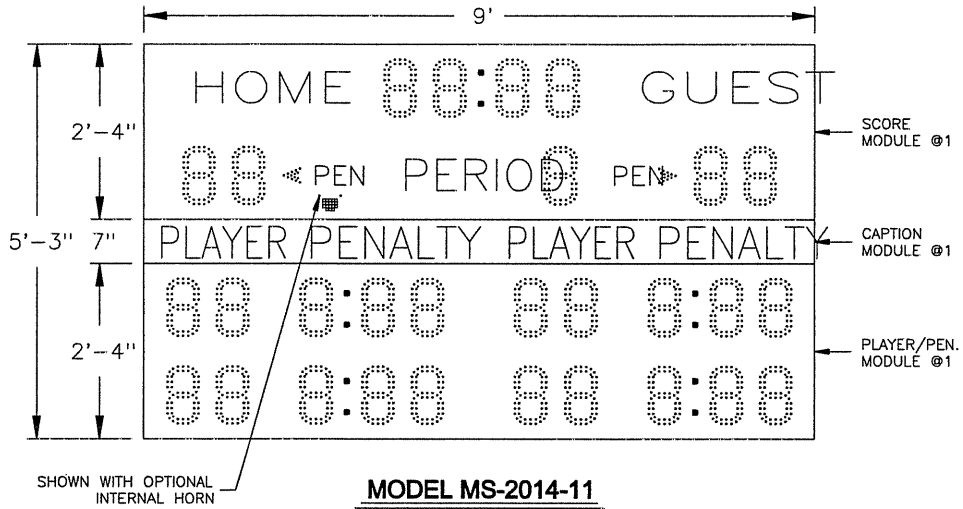
REVISION

APPR. BY:

SCALE: 1 = 1

1192-R03B-156627

## OUTDOOR HOCKEY/BASKETBALL MODELS



\* MORE MODELS WILL BE ADDED AS THEY BECOME AVAILABLE.

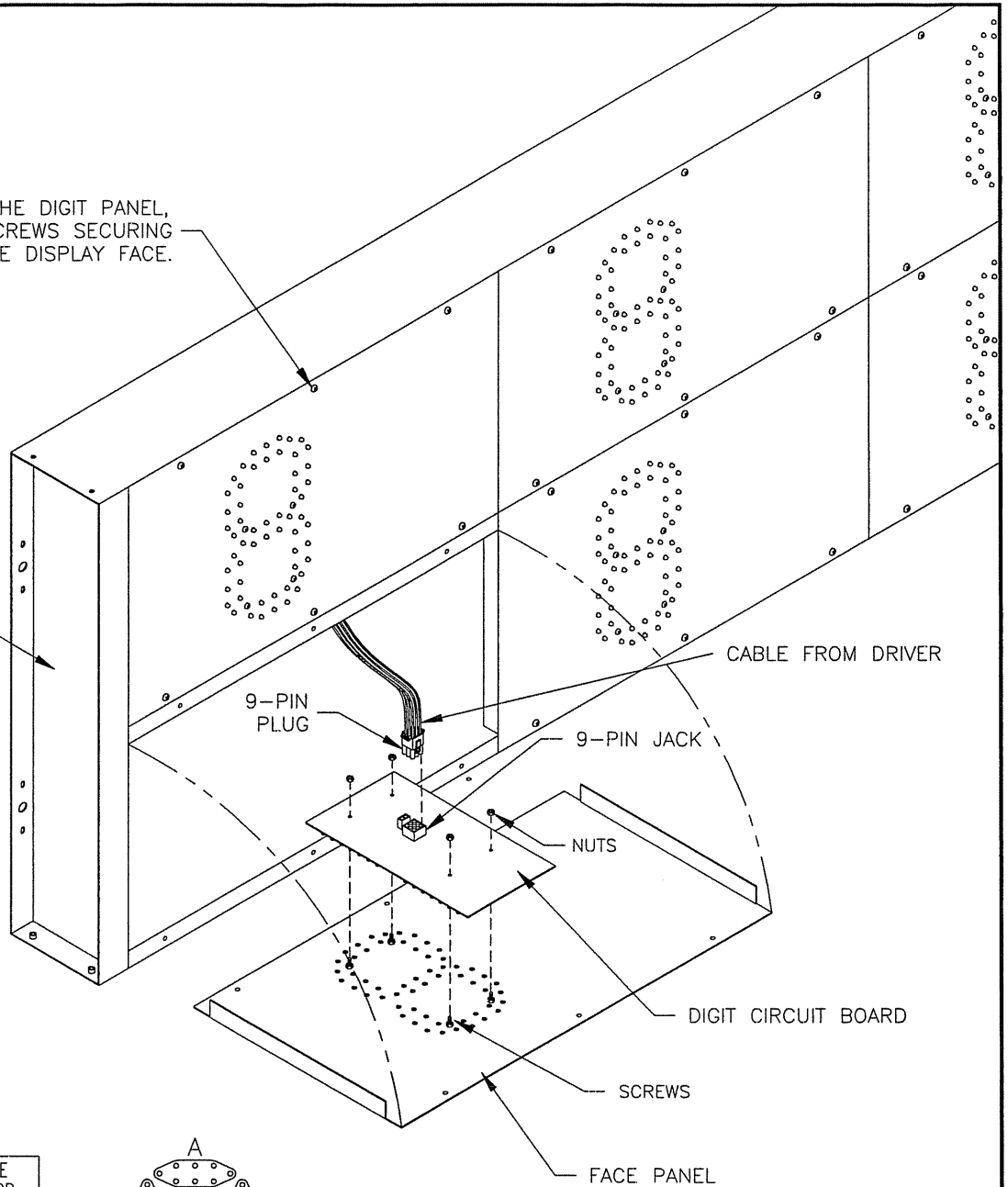
DAKTRONICS, INC. BROOKINGS, SD 57006

| REV. | DATE    | DESCRIPTION                        | BY  | APPR. |
|------|---------|------------------------------------|-----|-------|
| 02   | 22FEB02 | ADDED MS-2018-11 AND RESCALED DWG. | KJB |       |
| 01   | 15NOV01 | ADDED MS-2015-11.                  | KJB |       |

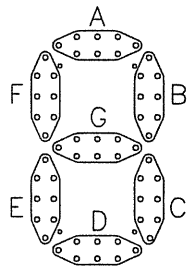
|  |                                  |
|--|----------------------------------|
| PROJ: OUTDOOR LED DIGIT SCOREBOARDS            |                                  |
| TITLE: MODEL CONFIGURATIONS, HOCKEY/BASKETBALL |                                  |
| DES. BY:                                       | DRAWN BY: KBRICKER DATE: 02OCT01 |
| REVISION                                       | APPR. BY:                        |
| SCALE: 1=20                                    | 1192-E10A-156642                 |

TO OPEN THE DIGIT PANEL,  
REMOVE THE SCREWS SECURING  
IT TO THE DISPLAY FACE.

DISPLAY MODULE



| DIGIT SEGMENT | CONNECTOR PIN NO. | WIRE COLOR |
|---------------|-------------------|------------|
| A             | 3                 | BROWN      |
| B             | 2                 | RED        |
| C             | 1                 | ORANGE     |
| D             | 6                 | TAN        |
| E             | 5                 | PINK       |
| F             | 4                 | BLUE       |
| G             | 9                 | VIOLET     |
| H             | 8                 | GRAY       |
| COMMON        | 7                 | BLACK      |



DIGIT SEGMENTS A-G  
SEGMENT H IS NOT USED  
IN THESE DIGITS.

10" DIGIT CIRCUIT BOARD ASSEMBLIES

| DESCRIPTION                    | PART NUMBER  |
|--------------------------------|--------------|
| DIGIT, 10" RED-ORANGE, OUTDOOR | 0P-1192-0045 |

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: OUTDOOR LED DIGIT SCOREBOARDS

TITLE: DIGIT SERVICE, STACKABLE SCOREBOARDS

DES. BY:

DRAWN BY: KBRICKER

DATE: 05OCT01

REVISION

APPR. BY:

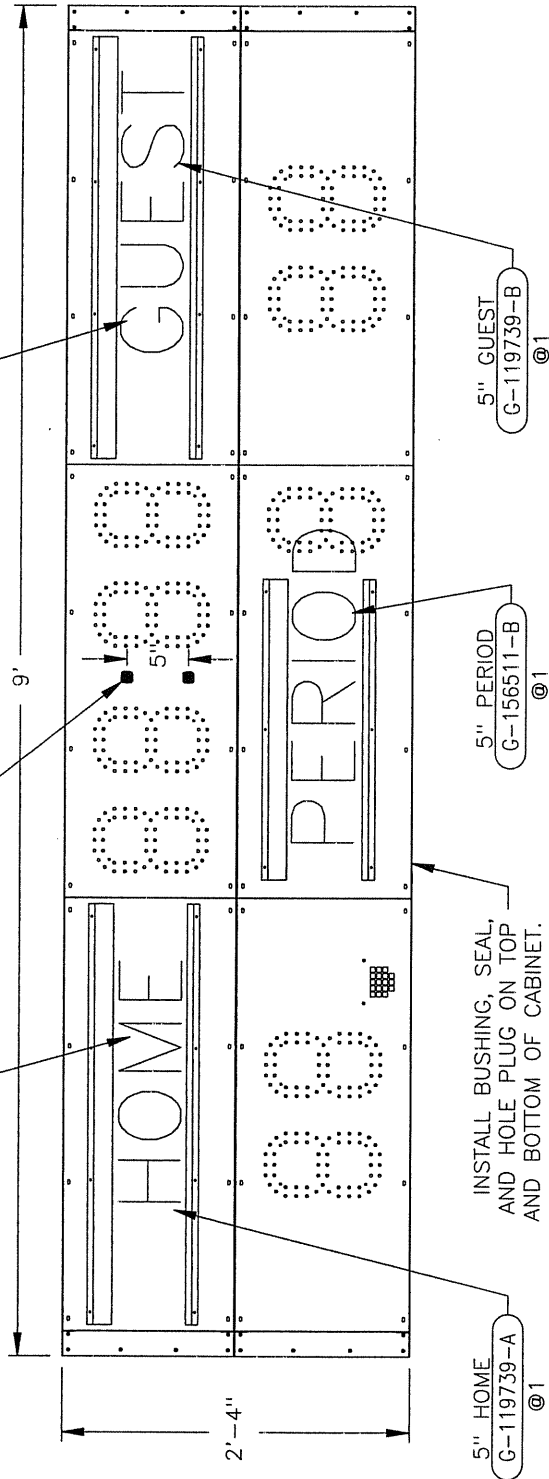
SCALE: 1=10

1192-E10A-156994

| REV. | DATE | DESCRIPTION | BY | APPR. |
|------|------|-------------|----|-------|
|      |      |             |    |       |

CENTER CAPTIONS HORIZONTALLY  
AND VERTICALLY BETWEEN  
CAPTION RAILS.

BASE CAPTIONS ARE APPLIED  
DIRECTLY TO SCOREBOARD, OPTIONAL  
CAPTIONS WILL USE CAPTION PANELS.



LAYOUT VIEW  
MS-2015-11

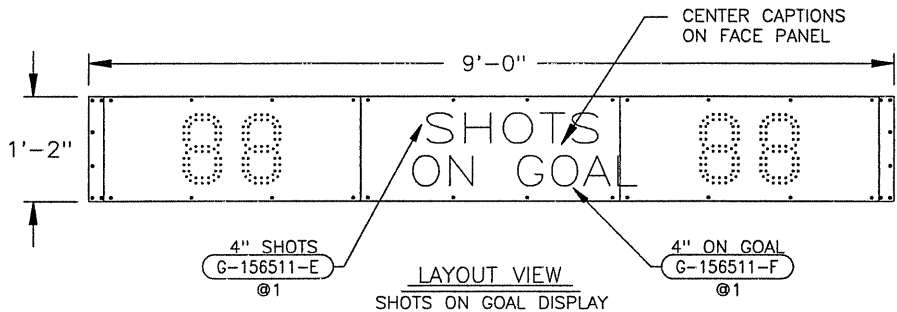
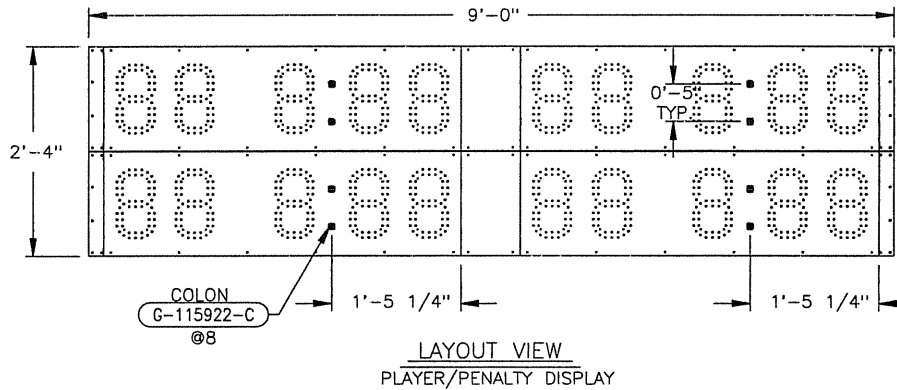
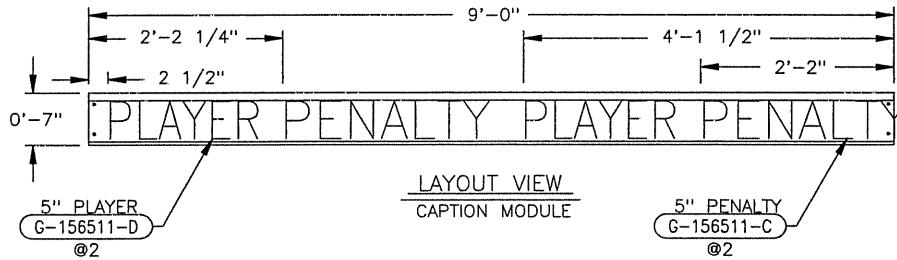
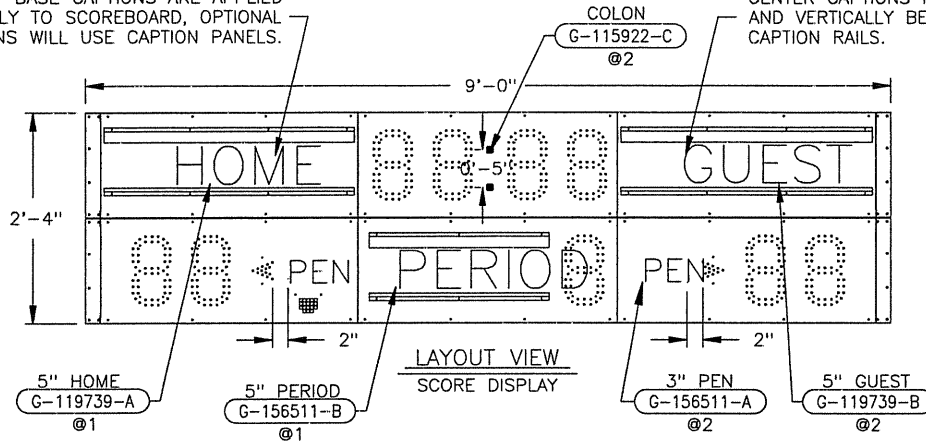
| REV. | DATE | DESCRIPTION | BY | APPR. |
|------|------|-------------|----|-------|
|      |      |             |    |       |

|                                      |             |                    |  |
|--------------------------------------|-------------|--------------------|--|
| DAKTRONICS, INC. BROOKINGS, SD 57006 |             |                    |  |
| PROJ: OUTDOOR LED DIGIT SCOREBOARDS  |             |                    |  |
| TITLE: F.ASSY, MS-2015-11            |             |                    |  |
| DES. BY: KBRICKER                    |             | DRAWN BY: KBRICKER |  |
| DATE: 30 OCT 01                      |             |                    |  |
| REVISION                             | APPR. BY:   | 1192-E10A-158196   |  |
|                                      | SCALE: 1=15 |                    |  |



BASE CAPTIONS ARE APPLIED DIRECTLY TO SCOREBOARD, OPTIONAL CAPTIONS WILL USE CAPTION PANELS.

CENTER CAPTIONS HORIZONTALLY AND VERTICALLY BETWEEN CAPTION RAILS.

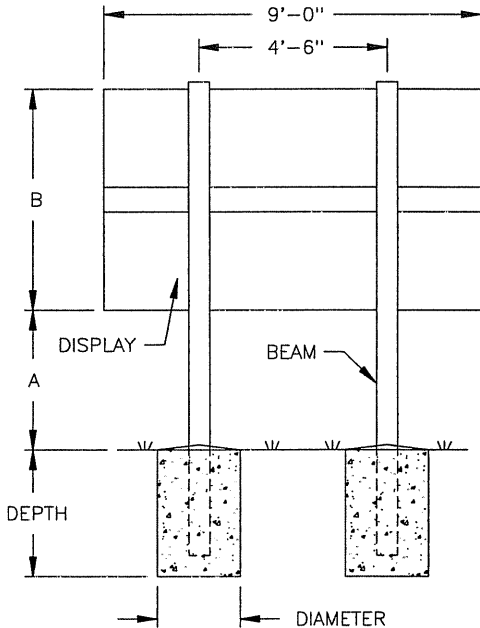


|                                      |             |                    |                 |
|--------------------------------------|-------------|--------------------|-----------------|
| DAKTRONICS, INC. BROOKINGS, SD 57006 |             |                    |                 |
| PROJ: OUTDOOR LED DIGIT SCOREBOARDS  |             |                    |                 |
| TITLE: LAYOUT VIEW, MS-2018-11       |             |                    |                 |
| DES. BY: KBRICKER                    |             | DRAWN BY: KBRICKER | DATE: 21 FEB 02 |
| REVISION                             | APPR. BY:   | 1192-E10A-163176   |                 |
|                                      | SCALE: 1=25 |                    |                 |

| REV. | DATE | DESCRIPTION | BY | APPR. |
|------|------|-------------|----|-------|
|      |      |             |    |       |

MODEL MS-2014-11

| VERTICAL DISTANCE (A) | AD PANEL HEIGHT | COMBINED HEIGHT (B) |         | DESIGN WIND VELOCITY |         |         |         |
|-----------------------|-----------------|---------------------|---------|----------------------|---------|---------|---------|
|                       |                 |                     |         | 70 MPH               | 80 MPH  | 90 MPH  | 100 MPH |
| 10'-0"                | NONE            | 5'-3"               | BEAM    | W10x12               | W10x15  | W10x15  | W6x15   |
|                       |                 |                     | FOOTING | 2'x4.3'              | 2'x4.8' | 2'x5.2' | 2'x5.7' |
|                       | 2'-4"           | 7'-7"               | BEAM    | W6x15                | W8x18   | W8x18   | W6x20   |
|                       |                 |                     | FOOTING | 2'x5.1'              | 2'x5.6' | 2'x6.1' | 2'x6.6' |
| 15'-0"                | NONE            | 5'-3"               | BEAM    | W8x18                | W6x20   | W6x20   | W8x24   |
|                       |                 |                     | FOOTING | 2'x5.0'              | 2'x5.5' | 2'x6.0' | 2'x6.4' |
|                       | 2'-4"           | 7'-7"               | BEAM    | W6x20                | W8x24   | W12x26  | W14x30  |
|                       |                 |                     | FOOTING | 2'x5.7'              | 2'x6.3' | 2'x6.8' | 2'x7.3' |
| 20'-0"                | NONE            | 5'-3"               | BEAM    | W12x26               | W12x26  | W14x30  | W14x30  |
|                       |                 |                     | FOOTING | 2'x5.5'              | 2'x6.1' | 2'x6.6' | 2'x7.1' |
|                       | 2'-4"           | 7'-7"               | BEAM    | W14x30               | W8x31   | W8x31   | W10x33  |
|                       |                 |                     | FOOTING | 3'x5.4'              | 2'x6.9' | 2'x7.5' | 2'x8.1' |



THE ABOVE TABLE USES THE STEEL INDUSTRY STANDARD NOMENCLATURE TO SPECIFY BEAMS. FOR EXAMPLE, FOR A BEAM DESIGNATED AS W12x40 (READ "W TWELVE BY FORTY"), "W" STANDS FOR "WIDE FLANGE", THE FIRST NUMBER (12) IS THE APPROXIMATE DEPTH DIMENSION IN INCHES (FRONT FACE TO BACK FACE), AND THE LAST NUMBER (40) IS THE WEIGHT IN POUNDS PER FOOT OF LENGTH.

THE WIDE FLANGES IN THE ABOVE TABLE WERE SIZED ACCORDING TO THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION'S LOAD & RESISTANCE FACTOR DESIGN SPECIFICATIONS (AISC LRFD 2ND EDITION) AND THE UNIFORM BUILDING CODE (UBC-97).

THE FOOTING DIMENSIONS GIVEN IN THE TABLE ARE BASED ON DRILLED (ROUND) PIER CONCRETE FOUNDATIONS. FOR EXAMPLE, FOR A FOOTING DESIGNATED AS 3'x9', THE FIRST NUMBER (3) IS THE DIAMETER IN FEET, AND THE LAST NUMBER (9) IS THE DEPTH IN FEET. THESE FOOTINGS WERE SIZED BASED ON THE WIND LOADS FROM UBC-97. THE ESTIMATED SOIL CONDITION IS CLASS 3 (SANDY GRAVEL). CLASS 3 HAS AN ALLOWABLE VERTICAL PRESSURE OF 2000 PSF AND A ALLOWABLE LATERAL PRESSURE OF 200 PSF/FT.

THE LOCALLY ADOPTED BUILDING CODE AND ACTUAL SITE CONDITIONS WILL GOVERN THE ACTUAL REQUIRED COLUMN AND FOOTING SIZES. THESE COLUMN AND FOOTING DIMENSIONS ARE PROVIDED TO ASSIST IN ESTIMATING INSTALLATION COSTS. THEY ARE ESTIMATES ONLY AND ARE NOT INTENDED FOR CONSTRUCTION PURPOSES. THE COLUMNS AND FOOTINGS AND ALL CONNECTION DETAILS MUST BE DESIGNED AND CERTIFIED BY A PROFESSIONAL ENGINEER LICENSED TO PRACTICE IN THE STATE THAT THE SIGN WILL BE INSTALLED IN. DAKTRONICS DOES NOT ASSUME ANY LIABILITY FOR ANY INSTALLATIONS DERIVED FROM THIS INFORMATION OR DESIGNED AND INSTALLED BY OTHERS.

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: OUTDOOR LED DIGIT SCOREBOARD

TITLE: BEAM & FOOTING RECOMENDATIONS, MS-2014-11

DES. BY:

DRAWN BY: KBRICKER

DATE: 16APR02

REVISION

APPR. BY:

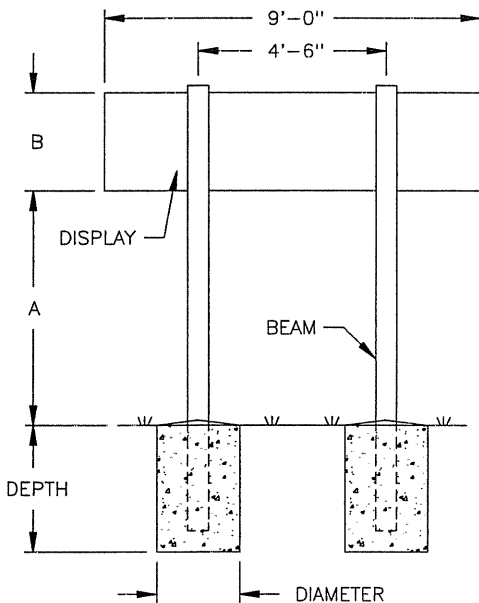
SCALE: 1=40

1192-R04A-165553

| REV. | DATE | DESCRIPTION | BY | APPR. |
|------|------|-------------|----|-------|
|      |      |             |    |       |

MODEL MS-2015-11

| VERTICAL DISTANCE (A) | AD PANEL HEIGHT | COMBINED HEIGHT (B) |         | DESIGN WIND VELOCITY |           |           |           |
|-----------------------|-----------------|---------------------|---------|----------------------|-----------|-----------|-----------|
|                       |                 |                     |         | 70 MPH               | 80 MPH    | 90 MPH    | 100 MPH   |
| 10'-0"                | NONE            | 2'-4"               | BEAM    | W6x9                 | W6x9      | W8x10     | W10x12    |
|                       |                 |                     | FOOTING | 2.0'x3.3'            | 2.0'x3.7' | 2.0'x4.0' | 2.0'x4.5' |
|                       | 2'-4"           | 4'-8"               | BEAM    | W10x12               | W10x12    | W10x15    | W6x15     |
|                       |                 |                     | FOOTING | 2.0'x4.2'            | 2.0'x4.6' | 2.0'x5.0' | 2.0'x5.4' |
| 15'-0"                | NONE            | 2'-4"               | BEAM    | W10x12               | W10x15    | W10x15    | W6x15     |
|                       |                 |                     | FOOTING | 2.0'x3.9'            | 2.0'x4.3' | 2.0'x4.7' | 2.0'x5.1' |
|                       | 2'-4"           | 4'-8"               | BEAM    | W6x15                | W8x18     | W6x20     | W6x20     |
|                       |                 |                     | FOOTING | 2.0'x4.8'            | 2.0'x5.3' | 2.0'x5.7' | 2.0'x6.2' |
| 20'-0"                | NONE            | 2'-4"               | BEAM    | W8x18                | W8x18     | W6x20     | W6x20     |
|                       |                 |                     | FOOTING | 2.0'x4.5'            | 2.0'x4.9' | 2.0'x5.4' | 2.0'x5.8' |
|                       | 2'-4"           | 4'-8"               | BEAM    | W8x24                | W12x26    | W12x26    | W14x30    |
|                       |                 |                     | FOOTING | 2.0'x5.3'            | 2.0'x5.8' | 2.0'x6.4' | 2.0'x6.9' |



THE ABOVE TABLE USES THE STEEL INDUSTRY STANDARD NOMENCLATURE TO SPECIFY BEAMS. FOR EXAMPLE, FOR A BEAM DESIGNATED AS W12x40 (READ "W TWELVE BY FORTY"), "W" STANDS FOR "WIDE FLANGE", THE FIRST NUMBER (12) IS THE APPROXIMATE DEPTH DIMENSION IN INCHES (FRONT FACE TO BACK FACE), AND THE LAST NUMBER (40) IS THE WEIGHT IN POUNDS PER FOOT OF LENGTH.

THE WIDE FLANGES IN THE ABOVE TABLE WERE SIZED ACCORDING TO THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION'S LOAD & RESISTANCE FACTOR DESIGN SPECIFICATIONS (AISC LRFD 2ND EDITION) AND THE UNIFORM BUILDING CODE (UBC-97).

THE FOOTING DIMENSIONS GIVEN IN THE TABLE ARE BASED ON DRILLED (ROUND) PIER CONCRETE FOUNDATIONS. FOR EXAMPLE, FOR A FOOTING DESIGNATED AS 3'x9', THE FIRST NUMBER (3) IS THE DIAMETER IN FEET, AND THE LAST NUMBER (9) IS THE DEPTH IN FEET. THESE FOOTINGS WERE SIZED BASED ON THE WIND LOADS FROM UBC-97. THE ESTIMATED SOIL CONDITION IS CLASS 3 (SANDY GRAVEL). CLASS 3 HAS AN ALLOWABLE VERTICAL PRESSURE OF 2000 PSF AND A ALLOWABLE LATERAL PRESSURE OF 200 PSF/FT.

THE LOCALLY ADOPTED BUILDING CODE AND ACTUAL SITE CONDITIONS WILL GOVERN THE ACTUAL REQUIRED COLUMN AND FOOTING SIZES. THESE COLUMN AND FOOTING DIMENSIONS ARE PROVIDED TO ASSIST IN ESTIMATING INSTALLATION COSTS. THEY ARE ESTIMATES ONLY AND ARE NOT INTENDED FOR CONSTRUCTION PURPOSES. THE COLUMNS AND FOOTINGS AND ALL CONNECTION DETAILS MUST BE DESIGNED AND CERTIFIED BY A PROFESSIONAL ENGINEER LICENSED TO PRACTICE IN THE STATE THAT THE SIGN WILL BE INSTALLED IN. DAKTRONICS DOES NOT ASSUME ANY LIABILITY FOR ANY INSTALLATIONS DERIVED FROM THIS INFORMATION OR DESIGNED AND INSTALLED BY OTHERS.

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: OUTDOOR LED DIGIT SCOREBOARD

TITLE: BEAM & FOOTING RECOMENDATIONS, MS-2015-11

DES. BY:

DRAWN BY: KBRICKER

DATE: 16APR02

REVISION

APPR. BY:

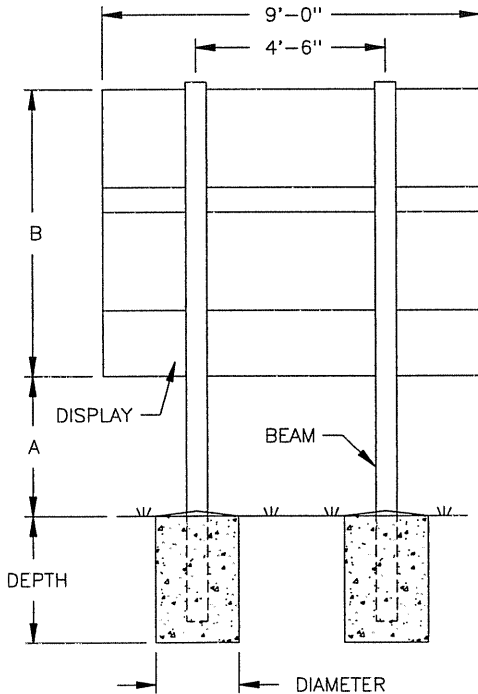
SCALE: 1=40

1192-R04A-165559

| REV. | DATE | DESCRIPTION | BY | APPR. |
|------|------|-------------|----|-------|
|      |      |             |    |       |

MODEL MS-2018-11

| VERTICAL DISTANCE (A) | AD PANEL HEIGHT | COMBINED HEIGHT (B) |         | DESIGN WIND VELOCITY |         |         |         |
|-----------------------|-----------------|---------------------|---------|----------------------|---------|---------|---------|
|                       |                 |                     |         | 70 MPH               | 80 MPH  | 90 MPH  | 100 MPH |
| 10'-0"                | NONE            | 6'-5"               | BEAM    | W10x15               | W6x15   | W6x15   | W8x18   |
|                       |                 |                     | FOOTING | 2'x4.7'              | 2'x5.2' | 2'x5.7' | 2'x6.1' |
|                       | 2'-4"           | 8'-9"               | BEAM    | W8x18                | W6x20   | W6x20   | W8x24   |
|                       |                 |                     | FOOTING | 2'x5.3'              | 2'x5.9' | 2'x6.4' | 2'x6.9' |
| 15'-0"                | NONE            | 6'-5"               | BEAM    | W6x20                | W6x20   | W8x24   | W12x26  |
|                       |                 |                     | FOOTING | 2'x5.3'              | 2'x5.9' | 2'x6.4' | 2'x6.9' |
|                       | 2'-4"           | 8'-9"               | BEAM    | W12x26               | W12x26  | W14x30  | W8x31   |
|                       |                 |                     | FOOTING | 2'x6.0'              | 2'x6.6' | 2'x7.2' | 2'x7.8' |
| 20'-0"                | NONE            | 6'-5"               | BEAM    | W12x26               | W14x30  | W8x31   | W8x31   |
|                       |                 |                     | FOOTING | 2'x5.9'              | 2'x6.5' | 2'x7.1' | 2'x7.7' |
|                       | 2'-4"           | 8'-9"               | BEAM    | W8x31                | W8x31   | W10x33  | W10x39  |
|                       |                 |                     | FOOTING | 2'x6.6'              | 2'x7.2' | 2'x7.9' | 2'x8.5' |



THE ABOVE TABLE USES THE STEEL INDUSTRY STANDARD NOMENCLATURE TO SPECIFY BEAMS. FOR EXAMPLE, FOR A BEAM DESIGNATED AS W12x40 (READ "W TWELVE BY FORTY"), "W" STANDS FOR "WIDE FLANGE", THE FIRST NUMBER (12) IS THE APPROXIMATE DEPTH DIMENSION IN INCHES (FRONT FACE TO BACK FACE), AND THE LAST NUMBER (40) IS THE WEIGHT IN POUNDS PER FOOT OF LENGTH.

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DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: OUTDOOR LED DIGIT SCOREBOARD

TITLE: BEAM & FOOTING RECOMENDATIONS, MS-2018-11

DES. BY:

DRAWN BY: KBRICKER

DATE: 16APR02

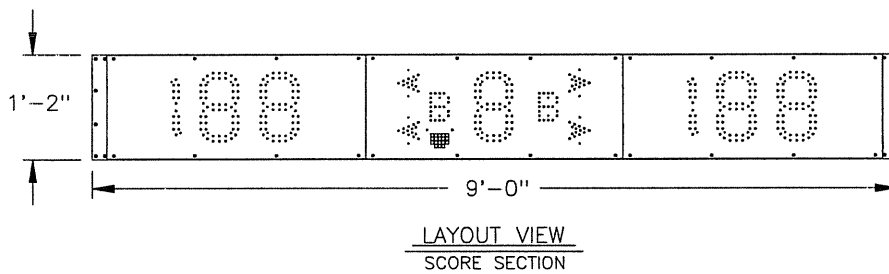
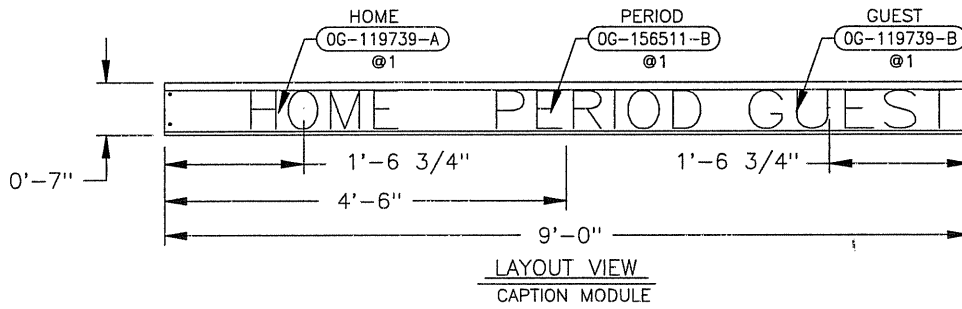
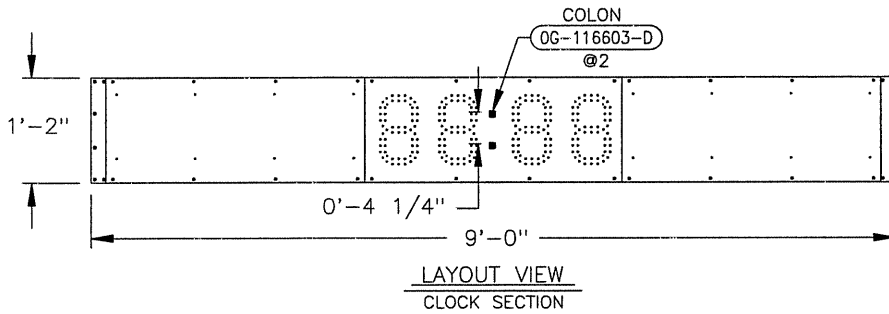
REVISION

APPR. BY:

SCALE: 1=40

1192-R04A-165561

| REV. | DATE | DESCRIPTION | BY | APPR. |
|------|------|-------------|----|-------|
|      |      |             |    |       |

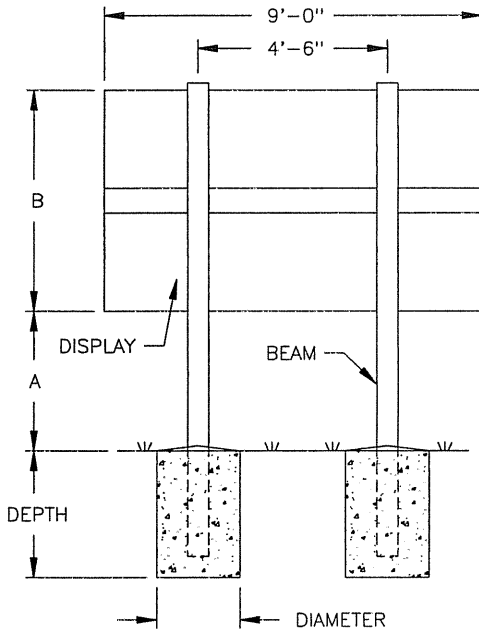


|  |             |                   |               |
|--|-------------|-------------------|---------------|
| THE CONCEPTS EXPRESSED AND DETAILS SHOWN ON THIS DRAWING ARE CONFIDENTIAL AND PROPRIETARY. DO NOT REPRODUCE BY ANY MEANS, INCLUDING ELECTRONICALLY WITHOUT THE EXPRESSED WRITTEN CONSENT OF DAKTRONICS, INC. COPYRIGHT 2002 DAKTRONICS, INC. |             |                   |               |
| DAKTRONICS, INC. BROOKINGS, SD 57006   |             |                   |               |
| PROJ: OUTDOOR LED SCOREBOARDS  |             |                   |               |
| TITLE: LAYOUT VIEW; MS-2016-11   |             |                   |               |
| DES. BY: MCOPLAN   |             | DRAWN BY: MCOPLAN | DATE: 19SEP02 |
| REVISION   | APPR. BY:   | 1192-E10A-175201  |               |
|  | SCALE: 1=25 |                   |               |

| REV. | DATE | DESCRIPTION | BY | APPR. |
|------|------|-------------|----|-------|
|      |      |             |    |       |

MODEL MS-2016-11

| VERTICAL DISTANCE (A) | AD PANEL HEIGHT | COMBINED HEIGHT (B) |         | DESIGN WIND VELOCITY |           |           |           |
|-----------------------|-----------------|---------------------|---------|----------------------|-----------|-----------|-----------|
|                       |                 |                     |         | 70 MPH               | 80 MPH    | 90 MPH    | 100 MPH   |
| 10'-0"                | NONE            | 2'-11"              | BEAM    | W6X9                 | W8X10     | W10X12    | W10X12    |
|                       |                 |                     | FOOTING | 2.5 X 4.0            | 2.5 X 4.0 | 2.5 X 4.1 | 2.5 X 4.4 |
|                       | 2'-4"           | 5'-3"               | BEAM    | W10X12               | W10X15    | W6X15     | W6X15     |
|                       |                 |                     | FOOTING | 2.5 X 4.1            | 2.5 X 4.5 | 2.5 X 4.9 | 2.5 X 5.3 |
| 15'-0"                | NONE            | 2'-11"              | BEAM    | W10X15               | W6X15     | W6X15     | W6X15     |
|                       |                 |                     | FOOTING | 2.5 X 4.0            | 2.5 X 4.4 | 2.5 X 4.8 | 2.5 X 5.2 |
|                       | 2'-4"           | 5'-3"               | BEAM    | W8X18                | W8X18     | W6X20     | W8X24     |
|                       |                 |                     | FOOTING | 2.5 X 4.7            | 2.5 X 5.2 | 2.5 X 5.7 | 2.5 X 6.1 |
| 20'-0"                | NONE            | 2'-11"              | BEAM    | W8X18                | W6X20     | W6X20     | W8X24     |
|                       |                 |                     | FOOTING | 2.5 X 4.6            | 2.5 X 5.0 | 2.5 X 5.5 | 2.5 X 5.9 |
|                       | 2'-4"           | 5'-3"               | BEAM    | W8X24                | W12X26    | W8X28     | W14X30    |
|                       |                 |                     | FOOTING | 2.5 X 5.3            | 2.5 X 5.8 | 2.5 X 6.3 | 2.5 X 6.8 |



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DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: OUTDOOR LED DIGIT SCOREBOARD

TITLE: BEAM & FOOTING RECOMENDATIONS, MS-2016-11

DES. BY: MCOPL/RNEYEN

DRAWN BY: MCOPLAN

DATE: 20SEP02

REVISION

APPR. BY:

SCALE: 1=40

1192-R04A-175539

| REV. | DATE | DESCRIPTION | BY | APPR. |
|------|------|-------------|----|-------|
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ENCLOSED 16 COLUMN MASTER LED DRIVER AND POWER/SIGNAL ENCLOSURE @1 (THE COVER HAS BEEN REMOVED TO SHOW COMPONENT DETAIL)

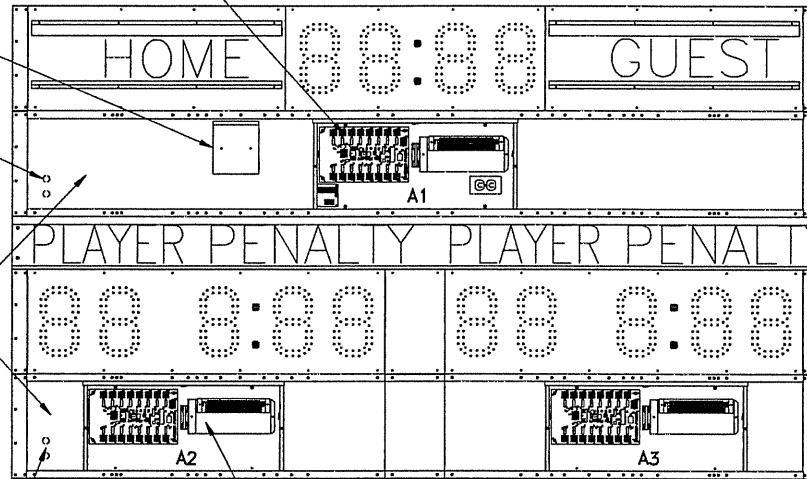
MS-2014-11

12V HORN ENCLOSURE

KNOCKOUTS FOR CONDUIT

NOTE THAT SEVERAL DIGIT PANELS HAVE BEEN REMOVED TO SHOW COMPONENTS.

KNOCKOUTS FOR CONDUIT

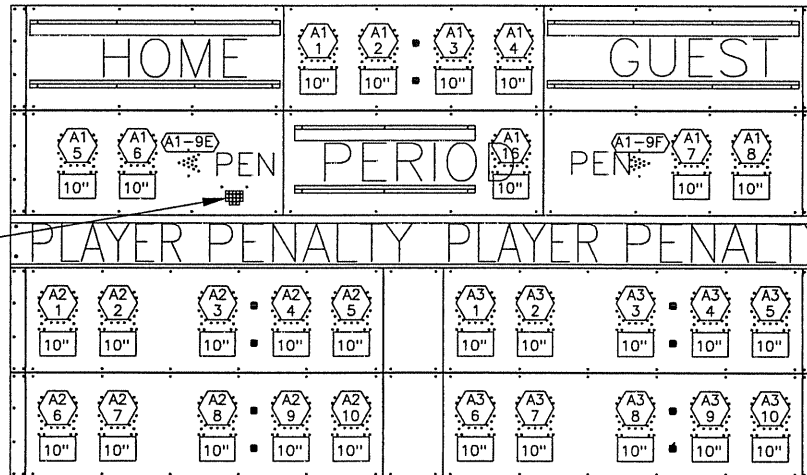


ENCLOSED 16 COLUMN SLAVE LED DRIVER AND POWER/SIGNAL ENCLOSURE @2 (THE COVER HAS BEEN REMOVED TO SHOW COMPONENT DETAIL)

FRONT VIEW  
(COMPONENT DETAIL)

12V HORN

- A1-9E = DRIVER CONNECTOR SEGMENT WIRED TO THAT DIGIT
- A1 5 = DRIVER CONNECTOR WIRED TO THAT DIGIT
- 15" = DIGIT SIZE

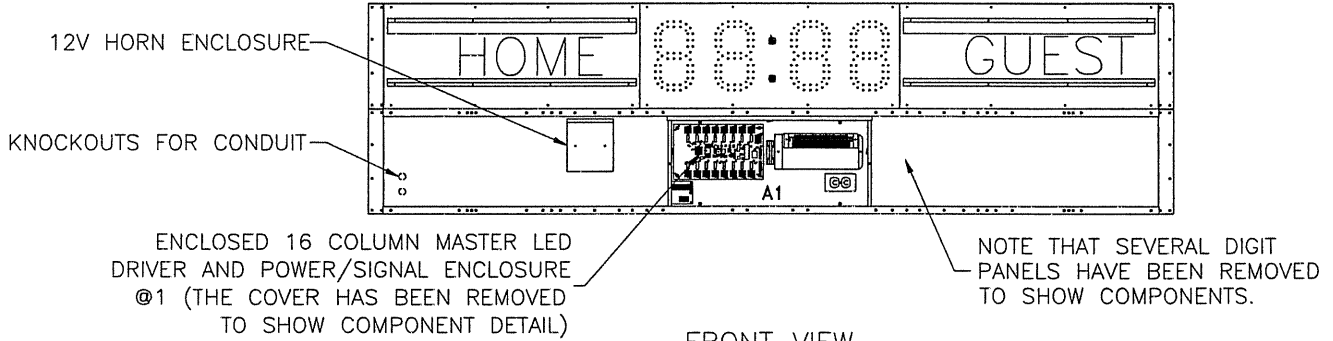


FRONT VIEW  
(DIGIT DESIGNATION)

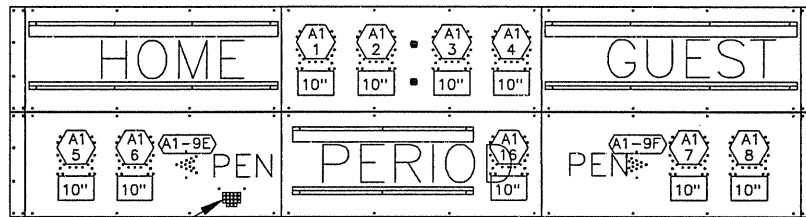
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| THE CONCEPTS EXPRESSED AND DETAILS SHOWN ON THIS DRAWING ARE CONFIDENTIAL AND PROPRIETARY. DO NOT REPRODUCE BY ANY MEANS, INCLUDING ELECTRONICALLY WITHOUT THE EXPRESSED WRITTEN CONSENT OF DAKTRONICS, INC. COPYRIGHT 2002 DAKTRONICS, INC. |  |                   |  |
| DAKTRONICS, INC. BROOKINGS, SD 57006   |  |                   |  |
| PROJ: OUTDOOR LED SCOREBOARDS  |  |                   |  |
| TITLE: COMPONENT LOCATIONS; MS-2014-11   |  |                   |  |
| DES. BY: MCOPLAN   |  | DRAWN BY: MCOPLAN |  |
| REVISION   |  | DATE: 26SEP02     |  |
| APPR. BY:  |  | 1192-E07A-175798  |  |
| SCALE: 1=25  |  |                   |  |

| REV. | DATE | DESCRIPTION | BY | APPR. |
|------|------|-------------|----|-------|
|      |      |             |    |       |

MS-2015-11



FRONT VIEW  
(COMPONENT DETAIL)



12V HORN

FRONT VIEW  
(DIGIT DESIGNATION)

(A1-9E) = DRIVER CONNECTOR SEGMENT WIRED TO THAT DIGIT

(A1 5) = DRIVER CONNECTOR WIRED TO THAT DIGIT

(15") = DIGIT SIZE

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DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: OUTDOOR LED SCOREBOARDS

TITLE: COMPONENT LOCATIONS; MS-2015-11

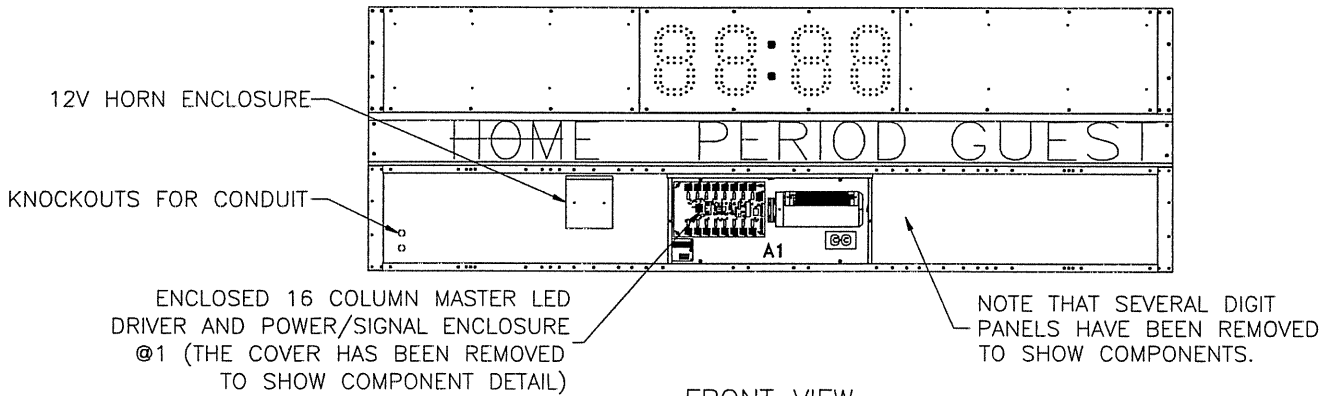
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REVISION APPR. BY: SCALE: 1=25 1192-E07A-175799

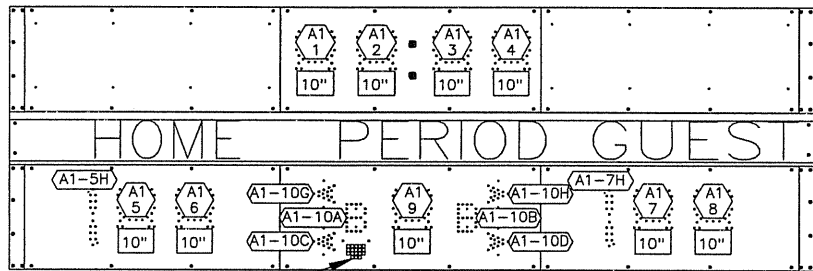
| REV. | DATE | DESCRIPTION | BY | APPR. |
|------|------|-------------|----|-------|
|      |      |             |    |       |



MS-2016-11



FRONT VIEW  
(COMPONENT DETAIL)



12V HORN

FRONT VIEW  
(DIGIT DESIGNATION)

- A1-10E = DRIVER CONNECTOR SEGMENT WIRED TO THAT DIGIT
- A1 5 = DRIVER CONNECTOR WIRED TO THAT DIGIT
- 15" = DIGIT SIZE

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DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: OUTDOOR LED SCOREBOARDS

TITLE: COMPONENT LOCATIONS; MS-2016-11

DES. BY: MCOPLAN DRAWN BY: MCOPLAN DATE: 26SEP02

REVISION APPR. BY: 1192-E07A-175800

SCALE: 1=25

| REV. | DATE | DESCRIPTION | BY | APPR. |
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MS-2018-11

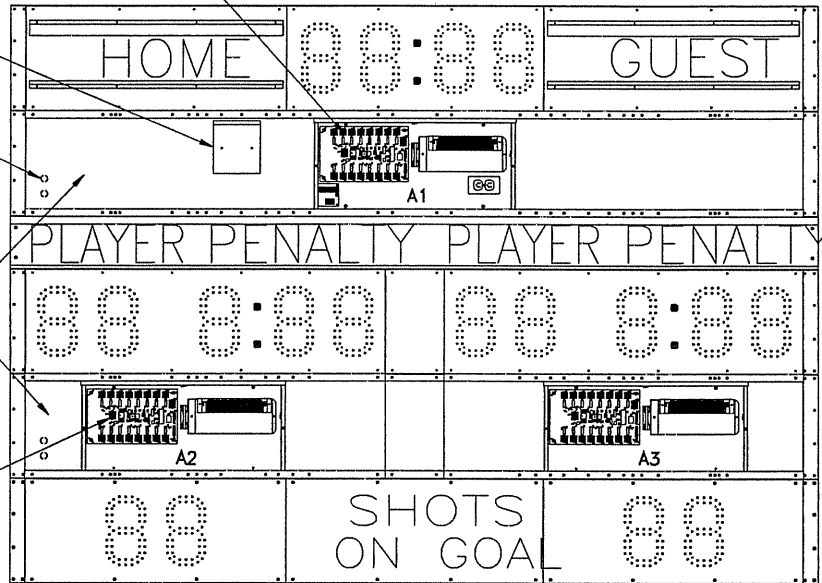
ENCLOSED 16 COLUMN MASTER LED DRIVER AND POWER/SIGNAL ENCLOSURE @1 (THE COVER HAS BEEN REMOVED TO SHOW COMPONENT DETAIL)

12V HORN ENCLOSURE

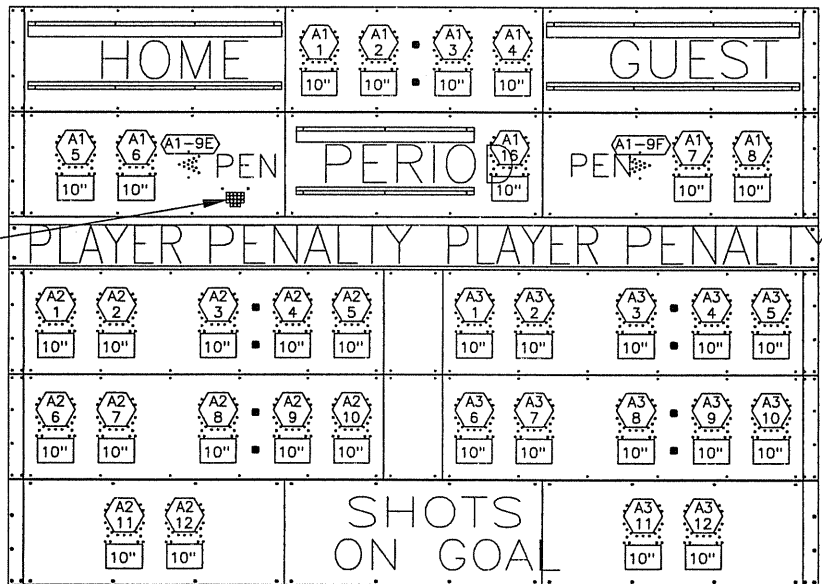
KNOCKOUTS FOR CONDUIT

NOTE THAT SEVERAL DIGIT PANELS HAVE BEEN REMOVED TO SHOW COMPONENTS.

ENCLOSED 16 COLUMN SLAVE LED DRIVER AND POWER/SIGNAL ENCLOSURE @2 (THE COVER HAS BEEN REMOVED TO SHOW COMPONENT DETAIL)



FRONT VIEW  
(COMPONENT DETAIL)



12V HORN

A1-9E = DRIVER CONNECTOR SEGMENT WIRED TO THAT DIGIT

A1 5 = DRIVER CONNECTOR WIRED TO THAT DIGIT

15" = DIGIT SIZE

FRONT VIEW  
(DIGIT DESIGNATION)

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DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: OUTDOOR LED SCOREBOARDS

TITLE: COMPONENT LOCATIONS; MS-2018-11

DES BY: MCOPLAN

DRAWN BY: MCOPLAN

DATE: 26SEP02

REVISION

APPR. BY:

SCALE: 1=25

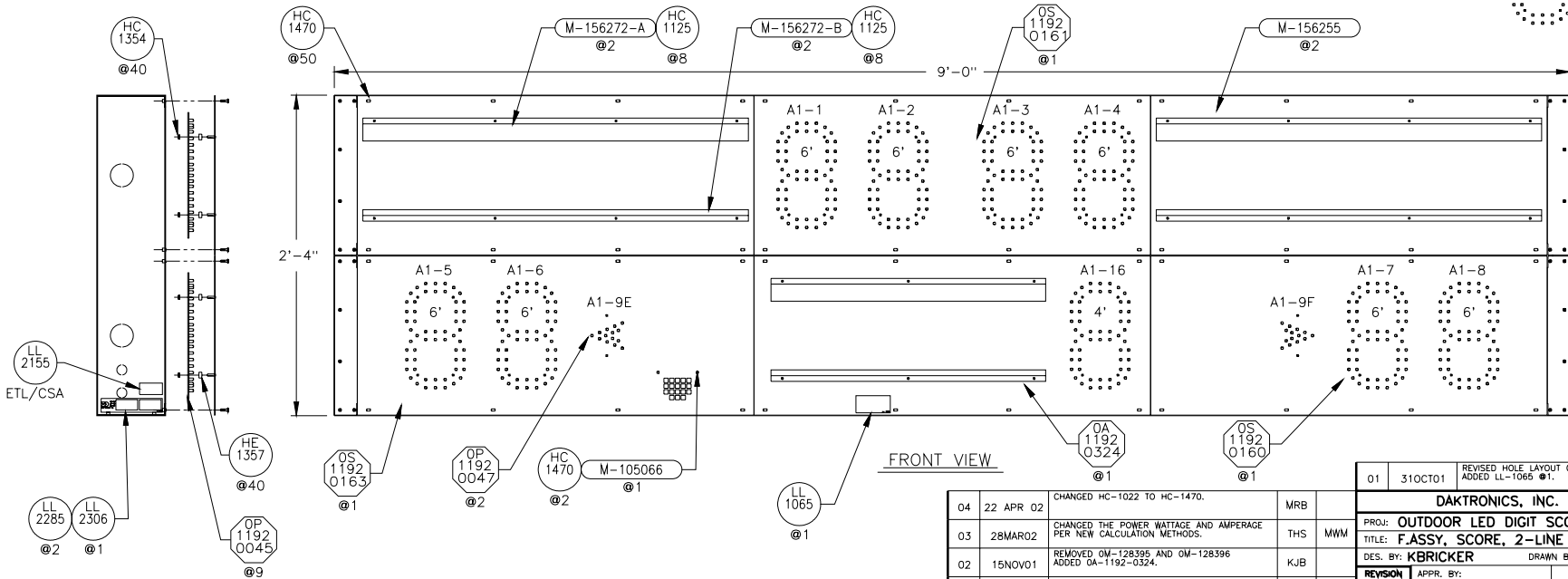
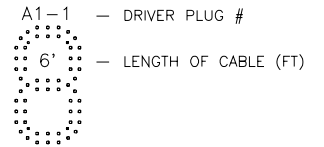
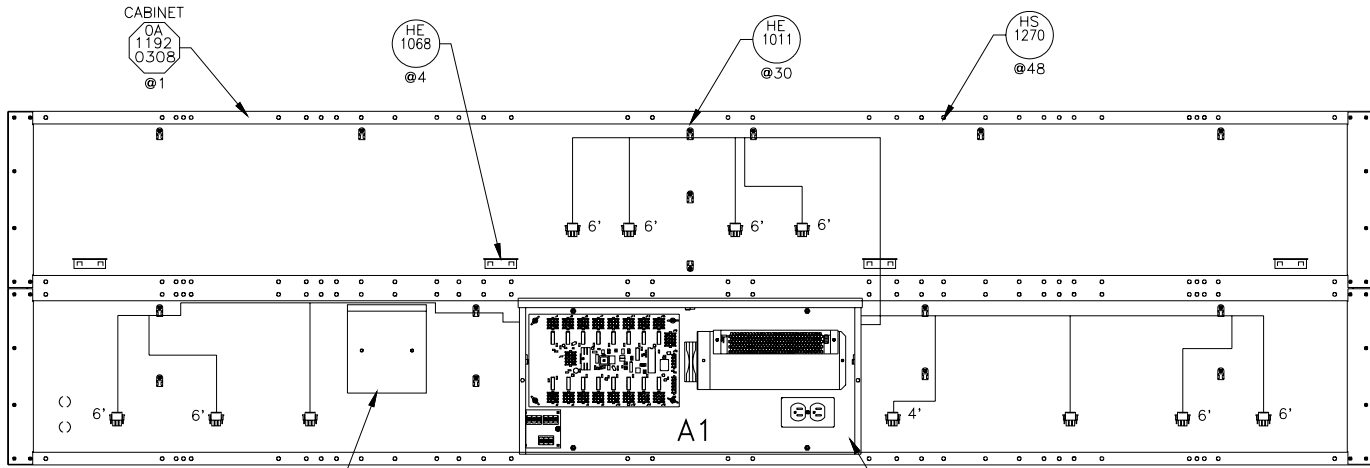
1192-E07A-175801

| REV. | DATE | DESCRIPTION | BY | APPR. |
|------|------|-------------|----|-------|
|      |      |             |    |       |

| SPECIFICATIONS       |
|----------------------|
| A1 ADDRESS 71        |
| AMPS: 1.3 AMPS       |
| MAX WATTS: 150 WATTS |

**NOTES:**

POWER/SIGNAL INTERCONNECT BETWEEN SECTION DISPLAYS TO BE MADE IN THIS SECTION. PULL UP POWER/SIGNAL INTERCONNECT FROM BOTTOM SECTIONS TO TOP SECTION.



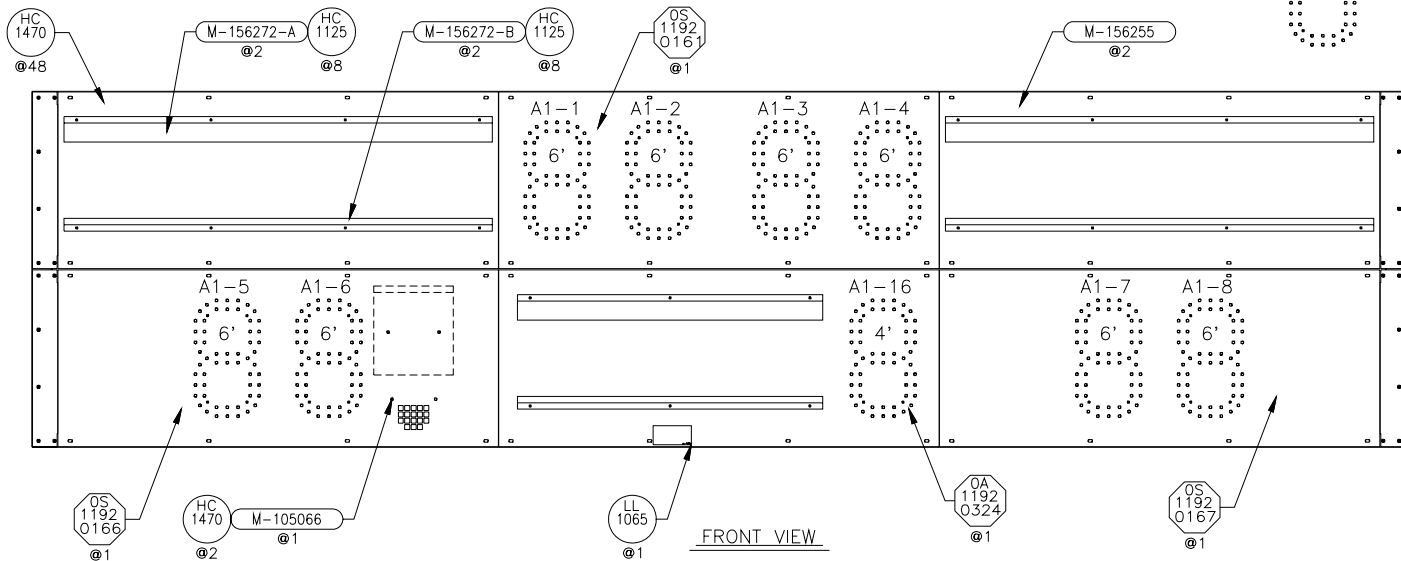
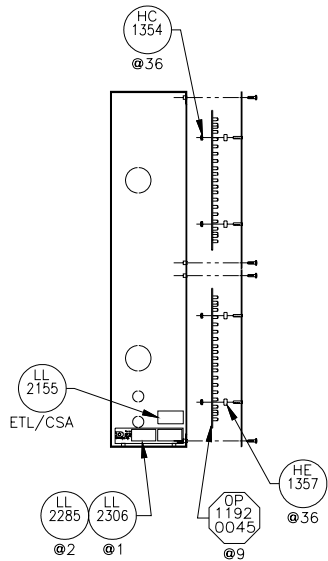
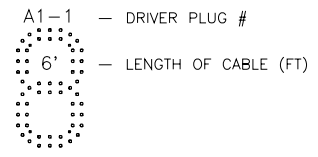
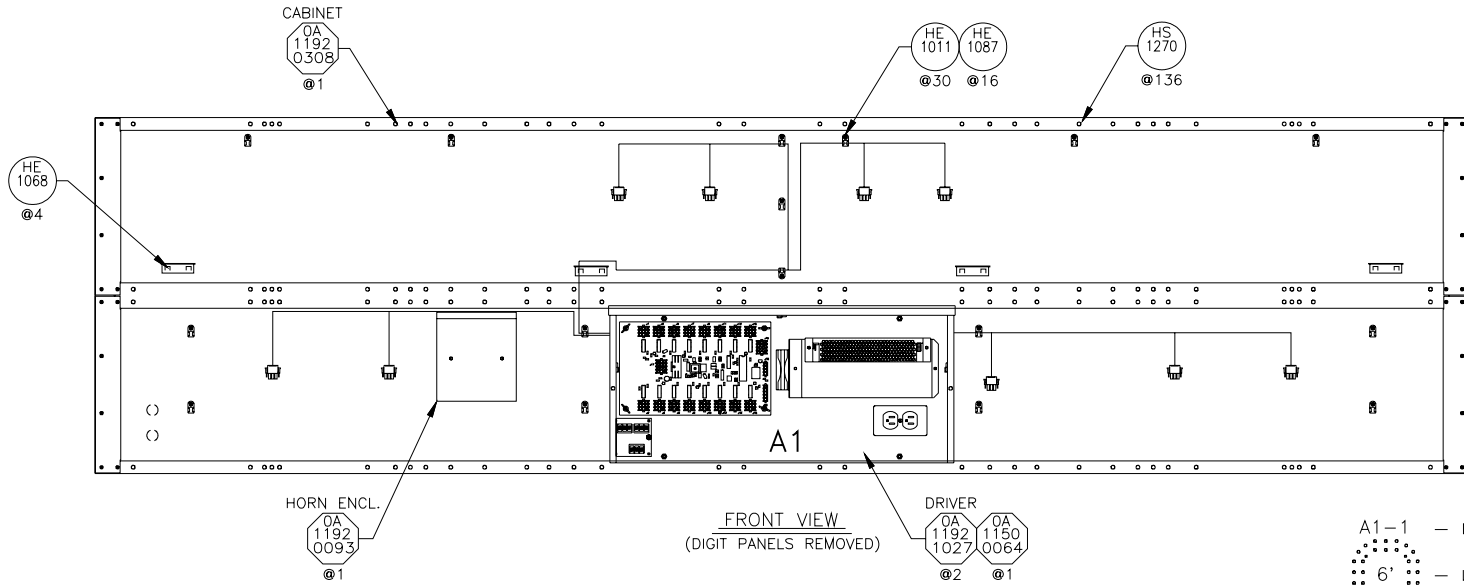
FRONT VIEW

| REV. | DATE      | DESCRIPTION   | BY  | APPR. |
|------|-----------|---|-----|-------|
| 04   | 22 APR 02 | CHANGED HC-1022 TO HC-1470.   | MRB |       |
| 03   | 28MAR02   | CHANGED THE POWER WATTAGE AND AMPERAGE PER NEW CALCULATION METHODS. | THS | MWM   |
| 02   | 15NOV01   | REMOVED OM-128395 AND OM-128396 ADDED OA-1192-0324.                 | KJB |       |

|   |         |   |     |                  |
|---|---------|---|-----|------------------|
| 01  | 31OCT01 | REVISED HOLE LAYOUT ON FACE PANELS. ADDED LL-1065 @1. | KJB |                  |
| <b>DAKTRONICS, INC. BROOKINGS, SD 57006</b> |         |   |     |                  |
| PROJ: OUTDOOR LED DIGIT SCOREBOARDS         |         |   |     |                  |
| TITLE: F.ASSY, SCORE, 2-LINE DISPLAY        |         |   |     |                  |
| DES. BY: KBRICKER                           |         | DRAWN BY: KBRICKER                                    |     | DATE: 25SEP01    |
| REVISION                                    |         | APPR. BY:   |     | 1192-E10B-156408 |
| SCALE: 1=10                                 |         |   |     |                  |



| SPECIFICATIONS |           |
|----------------|-----------|
| A1 ADDRESS     | 71        |
| AMPS           | 1.3 AMPS  |
| MAX WATTS      | 150 WATTS |



SIDE VIEW

FRONT VIEW

| REV. | DATE      | DESCRIPTION   | BY     | APPR. | REV. | DATE    | DESCRIPTION  | BY  | APPR. |
|------|-----------|---|--------|-------|------|---------|--|-----|-------|
| 03   | 22 APR 02 | CHANGED HC-1022 TO HC-1470.   | MRB    |       | 01   | 15NOV01 | REMOVED QM-128396 AND QM-128396, ADDED OA-1192-0324. | KJB |       |
| 02   | 28MAR02   | CHANGED THE POWER WATTAGE AND AMPERAGE PER NEW CALCULATION METHODS. | THS    | MWM   |      |         |  |     |       |
| 04   | 26 APR 02 | CHANGED ADDRESS FROM 72 TO 71.                                      | TWEBER |       |      |         |  |     |       |

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: OUTDOOR LED DIGIT SCOREBOARDS

TITLE: F.ASSY, MS-2015-11, 2'-4" x 9'-0"

DES. BY: KBRICKER DRAWN BY: KBRICKER DATE: 29OCT01

REVISION APPR. BY: SCALE: 1=10 1192-E10B-158079



# Appendix B: Scoreboard Options

---

## **Changeable Team Name Caption Installation**

|                               |                         |
|-------------------------------|-------------------------|
| Layout View, MS-2014-11 ..... | <b>Drawing A-156514</b> |
| Caption Module Detail .....   | <b>Drawing A-130840</b> |

## **12 V DC Horn**

|                             |                         |
|-----------------------------|-------------------------|
| Horn, 12 V DC w/Filter..... | <b>Drawing B-111265</b> |
|-----------------------------|-------------------------|

## **Portable Power Pack**

|   |                         |
|---|-------------------------|
| Installation, Portable Powered Scoreboards..... | <b>Drawing A-166787</b> |
|---|-------------------------|





INSERT THE TOP OF THE CAPTION PANEL INTO THE UPPER GUIDE IN THE MODULE. LIFT, PRESS BACK, AND DROP INTO THE BOTTOM GUIDE

CAPTION MODULE  
7" HIGH

DIGIT MODULE  
14" OR 28" HIGH

ATTACH THE CAPTION MODULE TO THE TOP OR BOTTOM OF THE ADJACENT DIGIT MODULE, USING THE #10 SCREWS PROVIDED.

NOTE THAT THE UPPER GUIDE IS DEEPER THAN THE BOTTOM GUIDE.

BE SURE THAT THE MODULE IS ORIENTED CORRECTLY WHEN INSTALLING.

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: LED AQUATICS/TRACK DISPLAYS

TITLE: CAPTION MODULE DETAIL

DES. BY: AVB

DRAWN BY: A VANBEMMEL

DATE: 12 APR 00

REVISION

APPR. BY:

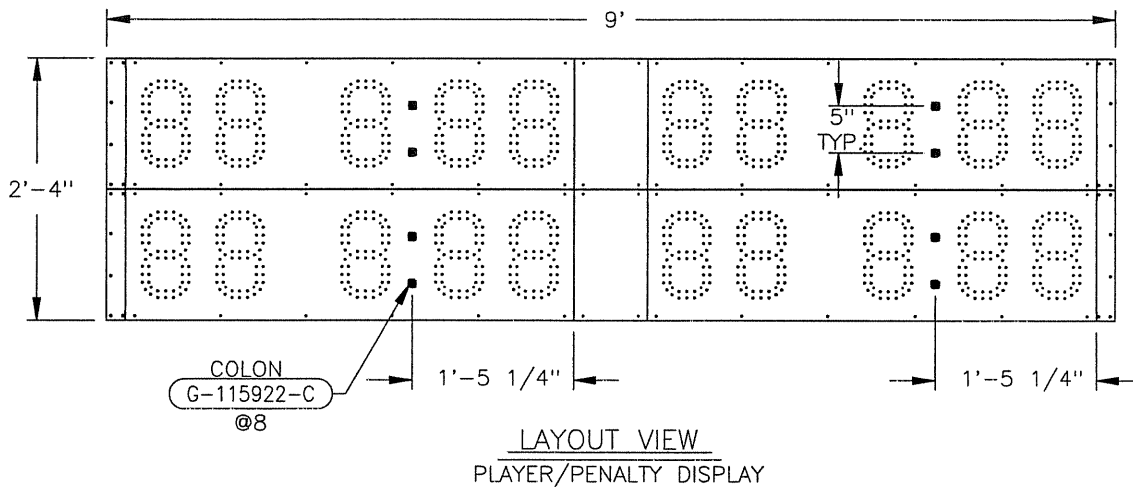
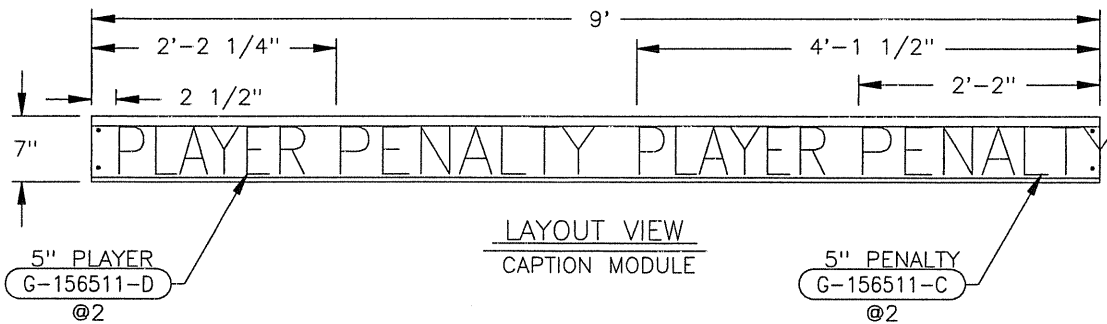
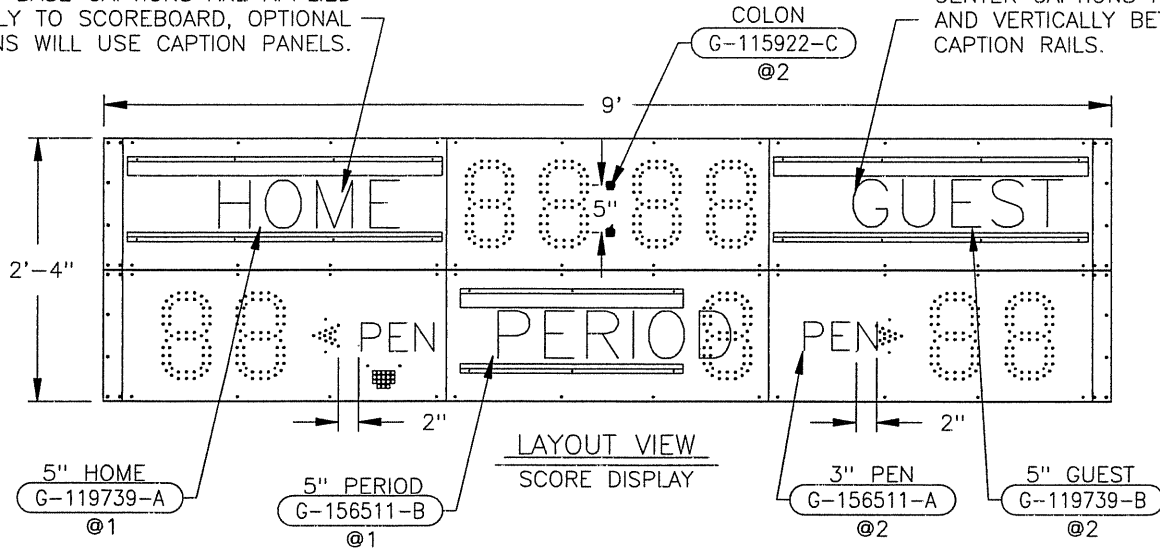
SCALE: 1=8

1153-R10A-130840

| REV. | DATE | DESCRIPTION | BY | APPR. |
|------|------|-------------|----|-------|
|      |      |             |    |       |

BASE CAPTIONS ARE APPLIED DIRECTLY TO SCOREBOARD, OPTIONAL CAPTIONS WILL USE CAPTION PANELS.

CENTER CAPTIONS HORIZONTALLY AND VERTICALLY BETWEEN CAPTION RAILS.



DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: OUTDOOR LED DIGIT SCOREBOARDS

TITLE: LAYOUT VIEW, MS-2014

DES. BY: KBRICKER

DRAWN BY: KBRICKER

DATE: 28SEP01

REVISION

APPR. BY:

SCALE: 1=20

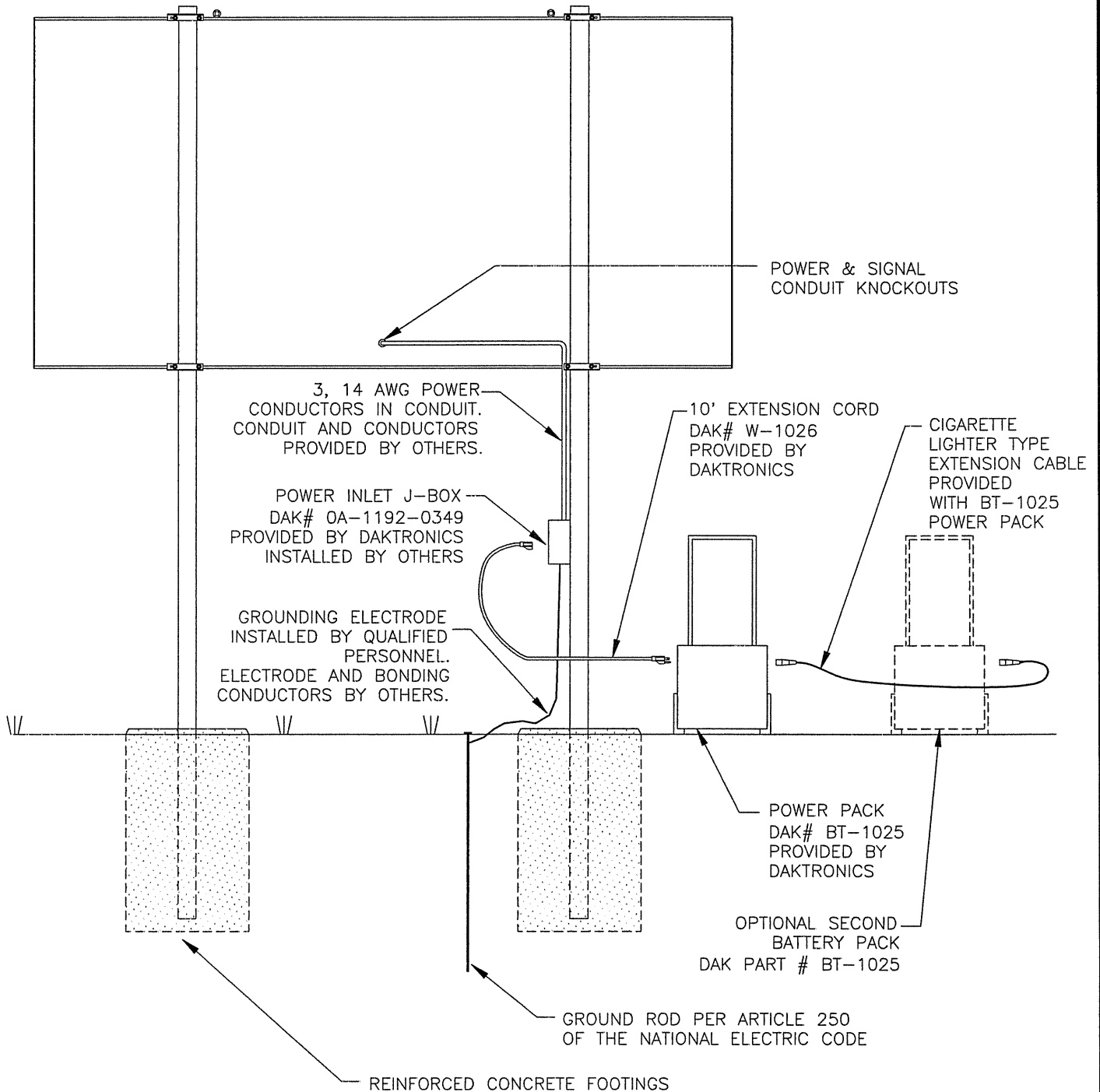
1192-E10A-156514

| REV | DATE | DESCRIPTION | BY | APPR |
|-----|------|-------------|----|------|
|     |      |             |    |      |

**\*\* NOTE \*\***

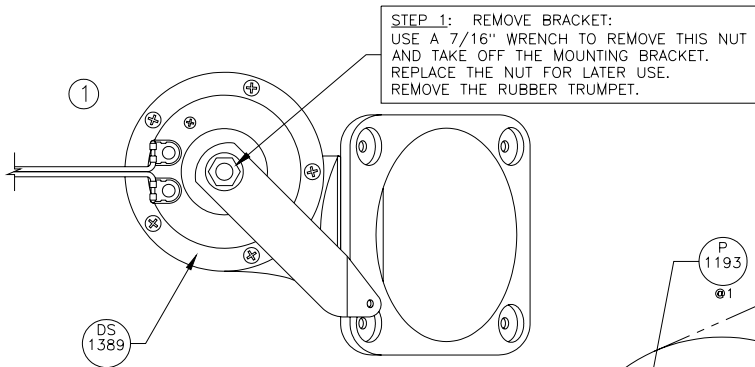
1. ALL ELECTRICAL INSTALLATIONS MUST MEET LOCAL AND NATIONAL ELECTRICAL CODES. INSTALLATION MUST BE PERFORMED BY QUALIFIED PERSONNEL
2. BE SURE TO CHARGE BATTERIES IN POWER PACK COMPLETELY BEFORE FIRST USE.
3. CHARGE BATTERY COMPLETELY AFTER EACH USE
4. POWER PACK INTENDED FOR TEMPORARY POWER FOR SCOREBOARDS, DO NOT LEAVE OUTSIDE, STORE IN A COOL, DRY AREA.

**REAR VIEW**

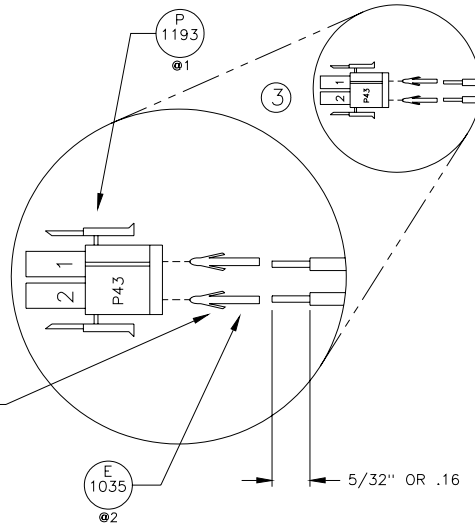


|  |             |                   |  |
|--|-------------|-------------------|--|
| THE CONCEPTS EXPRESSED AND DETAILS SHOWN ON THIS DRAWING ARE CONFIDENTIAL AND PROPRIETARY. DO NOT REPRODUCE BY ANY MEANS, INCLUDING ELECTRONICALLY WITHOUT THE EXPRESSED WRITTEN CONSENT OF DAKTRONICS, INC. COPYRIGHT 2002 DAKTRONICS, INC. |             |                   |  |
| DAKTRONICS, INC. BROOKINGS, SD 57006   |             |                   |  |
| PROJ:  |             |                   |  |
| TITLE: INSTALLATION, PORTABLE POWERED SCOREBOARDS  |             |                   |  |
| DES. BY: EBRÁVEK   |             | DRAWN BY: EBRÁVEK |  |
|  |             | DATE: 4 JUNE 02   |  |
| REVISION   | APPR. BY:   | 1192-E07A-166787  |  |
|  | SCALE: 1=40 |                   |  |

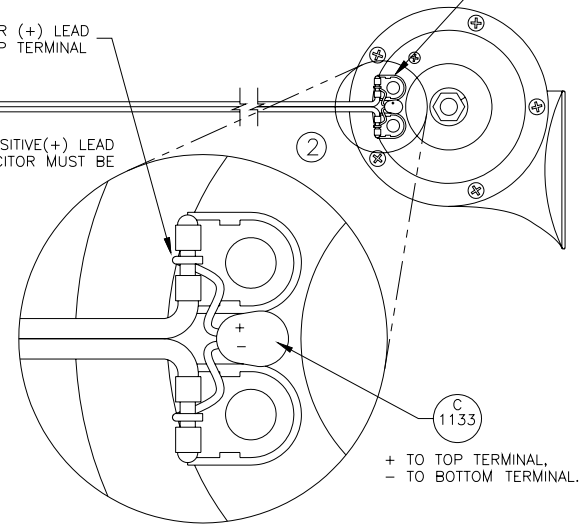
| REV | DATE | DESCRIPTION | BY | APPR. |
|-----|------|-------------|----|-------|
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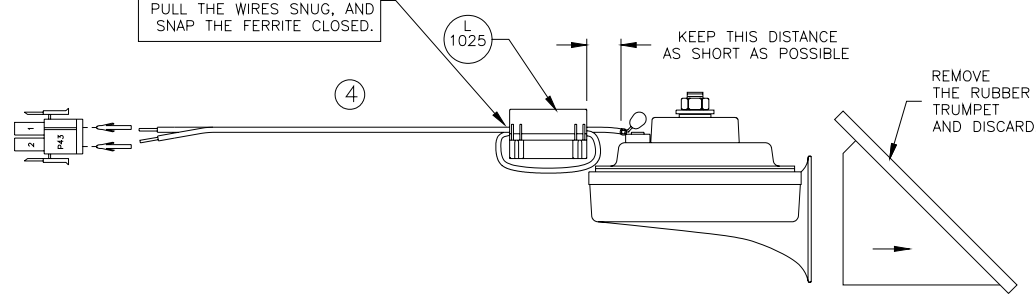
STEP 2: KEEPING LEADS AS SHORT AS POSSIBLE, SOLDER CAPACITOR LEADS TO THE TERMINALS ON THE HORN. NOTE POLARITY. SEE DETAIL.



SOLDER (+) LEAD TO THE TOP TERMINAL  
 WIRE TO POSITIVE(+) LEAD FROM CAPACITOR MUST BE TO PIN 1.



STEP 4: LOOP THE CORD THROUGH THE FERRITE, PULL THE WIRES SNUG, AND SNAP THE FERRITE CLOSED.



|    |         |  |     |      |           |  |     |                                      |  |
|----|---------|--|-----|------|-----------|--|-----|--------------------------------------|--|
|    |         |  |     | 3    | 16 JAN 02 | CHANGED DRAWING SIZE FROM B TO A. ADDED PLUG TO THE END OF WIRE IN STEP 3.                 | NMB | DAKTRONICS, INC. BROOKINGS, SD 57006 |  |
| 06 | 06MAR02 | UPDATED STEP PROCEDURE TO ASSEMBLY HORN                      | NMB | 2    | 23 MAY 00 | CHANGED POLARIZATION INSTRUCTIONS TO ORIENT CAPACITOR TO THE WIRE.                         | AVB | PROJ:                                |  |
| 05 | 13FEB02 | UPDATED SPELLING, CHANGED NOTES FOR WIRES GOING TO CAPACITOR | NMB | 01   | 23 MAR 99 | ADDED NOTE TO REMOVE RUBBER TRUMPET. ADD NOTE TO MAKE A BLACK STRIPE ON THE NEGATIVE WIRE. | AVB | TITLE: HORN, 12V DC W/ FILTER        |  |
| 04 | 07FEB02 | CHANGED CABLE CONNECTION NOTES                               | THS | REV. | DATE      | DESCRIPTION  | BY  | APPR.                                | DES. BY: AVB DRAWN BY: A VANBEMMEL DATE: 19 JAN 99 |
|    |         |  |     |      |           |  |     | REVISION                             | SCALE: 1=2   |
|    |         |  |     |      |           |  |     | 1072-E10B-111265                     |  |