

# Generation III Stackable LED Scoreboards

## Display Manual

ED-14091

Rev 5- 23 March 2012

# DAKTRONICS

Models			
	FB-2006		MS-2016
	MS-2014		MS-2017
	MS-2015		MS-2018



*Please fill in the information below for your display; use it  
for reference when calling Daktronics for assistance.*

*Display Serial No.* \_\_\_\_\_

*Display Model No.* \_\_\_\_\_

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

## **DAKTRONICS, INC.**

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# Section 1: Introduction

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This manual explains the installation and maintenance of the Stackable Outdoor Scoreboards. If you have other questions regarding the safety, installation, operation, or service of these systems, contact Daktronics. Customer Service Help Desk telephone numbers are listed on the cover page of this manual.

## 1.1 How to Use This Manual

### *K Important Safeguards:*

- Read and understand these instructions before installing the scoreboard.
- Do not drop the control console or allow it to get wet.
- Be sure the scoreboard is properly grounded with a ground electrode at the scoreboard location.
- *Disconnect power to the scoreboard when it is not in use.*
- *Disconnect power when servicing the scoreboard.*
- Do not modify the scoreboard structure or attach any panels or coverings to the scoreboard without the written consent of Daktronics, Inc.

**Figure 1** illustrates the Daktronics drawing numbering system. Daktronics identifies individual engineering drawings by their 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 their last set of numbers 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 02	
APPR. BY: AVB	7087-P08A-69945
SCALE: 1 = 4	

**Figure 1:** Daktronics Drawing Label

Reference drawings in this manual are grouped and inserted in alphanumeric order in **Appendix A: Reference Drawings**.

Listed below are a number of drawing types commonly used by Daktronics, along with the information that each is likely to provide.

- **System Riser Diagrams:** overall system layout from control room to display, power, and phase requirements.
- **Shop Drawings:** fan locations, transformer locations, mounting information, power and signal entrance points, and access method (front or rear).
- **Schematics:** power wiring, signal wiring, panelboard or power termination panel assignments, signal termination panel assignments, and transformer assignments.

- **Final Assembly:** component locations, part numbers, display dimensions, and assembly/disassembly instructions.

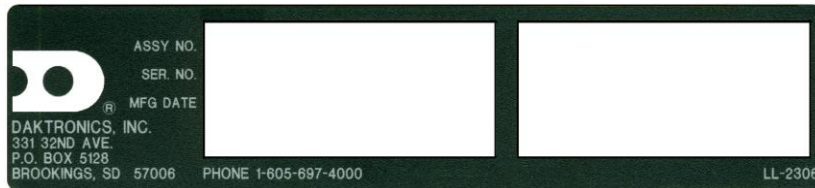
All references to drawing numbers, appendices, figures, or other manuals are presented in **bold** typeface, as in this example. “Refer to **Drawing A-114667** for the location of the driver enclosure.” Additionally, any drawings referenced within a particular subsection are listed at the beginning of that subsection in the following manner:

**Reference Drawing:**

Shop Drawing; 16 High 2 ½" Small Matrix..... **Drawing A-114667**

Daktronics identifies manuals by their ED (engineering document) number, which is located on the cover page of the manual. For example, this manual would be referred to as **ED-14091**.

The serial and model numbers of a Daktronics scoreboard can be found on the ID label on the display. The 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.



**Figure 2:** Scoreboard ID Label

Daktronics displays are built for long life and require little maintenance. However, from time to time, certain display components will have to be replaced. The Replacement Parts List in **Section 5** provides the names and part numbers of components that may require replacement during the life of this display.

Following the Replacement Parts List is an explanation of Daktronics exchange and replacement programs. Refer to these instructions if you must replace or repair any display component.

## 1.2 Daktronics Nomenclature

To fully understand some Daktronics drawings, such as schematics, it is necessary to know how various components are labeled in those drawings. You will find this information useful when trying to communicate maintenance or troubleshooting efforts.



The label “A” on a drawing item typically denotes an assembly. An assembly can be a single circuit board or a collection of components that function together, usually mounted on a single plate or in a single enclosure.

In addition, the following labeling formats might be found on various Daktronics drawings:

- “TB \_\_” denotes a termination block for power or signal cable.
- “F \_\_” denotes a fuse.
- “E \_\_” denotes a grounding point.
- “J \_\_” denotes a power or signal jack.
- “P \_\_” denotes a power or signal plug for the opposite jack.

Finally, Daktronics part numbers are commonly found on drawings. Those part numbers can be used when requesting replacement parts from Daktronics Customer Service. Take note of the following part number formats. (Not all possible formats are listed here.)

- “0P- \_\_\_\_\_ - \_\_\_\_\_” denotes an individual circuit board, such as a driver board.
- “0A- \_\_\_\_\_ - \_\_\_\_\_” denotes an assembly, such as a circuit board and the plate or bracket to which it is mounted. A collection of circuit boards working as a single unit may also carry an assembly label.
- “W- \_\_\_\_\_” denotes a wire or cable. Cables may also carry the assembly numbering format in certain circumstances. This is especially true for ribbon cables.
- “F- \_\_\_\_\_” denotes a fuse.
- “T- \_\_\_\_\_” denotes a transformer.
- “PR- \_\_\_\_\_ - \_” denotes a specially ordered part.
- “M- \_\_\_\_\_” denotes a metal part, and “0M- \_\_\_\_\_” typically denotes a fabricated metal assembly.

## 1.3 Manual Overview

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 various scoreboard options.

## 1.4 Product Overview

### Reference Drawings:

Layout View; MS-2015-11-21, G3 .....	<b>Drawing A-189437</b>
Layout View; MS-2014-11-21, G3 .....	<b>Drawing A-189446</b>
Layout View; MS-2018-11-21, G3 .....	<b>Drawing A-189492</b>
Layout View, MS-2016-11-21, G3 .....	<b>Drawing A-202065</b>
Layout View, MS-2017-11-21, G3 .....	<b>Drawing A-213041</b>
Layout View, FB-2006-11-21, G3 .....	<b>Drawing A-221063</b>

The scoreboards detailed in this manual are part of a family of outdoor scoring and timing displays designed to offer simple installation and easy reliability.

Microprocessor control assures consistent operation and accuracy. The scoreboards are illustrated in the Reference 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.

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

The four basic displays described in this manual are configured as follows:

- Models MS-2014 and MS-2018 consist of two powered sections with digits indicating clock/score and player/penalty, as well as an unpowered caption panel. MS-2018 also features an unpowered panel that shows shots on goal.
- Model MS-2015 is a single powered section with digits indicating clock/score only.
- Model MS-2016 is a three-section display with game time digits as well as digits indicating home score, period, and guest score.
- Model MS-2017 is a three-section display with game time digits as well as digits indication home & guest score, period, foul information, player foul information, possession and bonus..
- Model FB-2006 is a three-section display with powered clock/score and statistics sections as well as an unpowered caption panel.

Each scoreboard on this series begins with a one- or two-line section, which means the section either has a single row or two rows of 10" numeric digits. The boards use either red or amber LEDs (light emitting diode) 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 the stackable sections in this series ranges from 150 W to a maximum of 450 W.

Caption sections are unpowered units that attach to the top or bottom of a digit section. The caption sections in models MS-2014 and MS-2018 indicate PLAYER and PENALTY for both teams and use permanent, 5" vinyl captions for the digit mounted directly below it. The caption section in model FB-2006 indicates DOWN, yards TO GO, BALL ON and QTR (quarter) for the digit section mounted directly below it as well. Stackable scoreboard installations may also contain optional ad panels, attachments which can be used to display sponsor names or other advertising messages.

The stackable 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 stackable 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 and MS-2018 scoring and caption sections; optional panels can be customized to display team names or for virtually any other purpose.

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

## 1.5 Model Identification

### Reference Drawings:

Layout View; MS-2015-11-21, G3.....	<b>Drawing A-189437</b>
Layout View; MS-2014-11-21, G3.....	<b>Drawing A-189446</b>
Layout View; MS-2018-11-21, G3.....	<b>Drawing A-189492</b>
Layout View, MS-2016-11-21, G3.....	<b>Drawing A-202065</b>
Layout View, MS-2017-11-21, G3.....	<b>Drawing A-214362</b>
Layout View, FB-2006-11-21, G3 .....	<b>Drawing A-221063</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 **-21** are outdoor, 120 V AC displays, respectively. The LED scoreboards in this manual are currently configured as **-11** or **-21** displays.

Reference drawings are found at the end of this manual in **Appendix A: Reference Drawings**.

## **1.6 Product Safety Approval**

Daktronics stackable scoreboards are ETL-listed and tested to CSA standards. Contact Daktronics with any questions regarding the testing procedures.

## **Section 2: Specifications**

---

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



## 2.1 Model FB-2006-11/21

Model	Section	Dimensions (Height, Width, Depth)		Weight Uncrated (Crated)	Digit Size  Digit Color	Maximum Wattage	Power	Amps per Line (Single Phase)	Driver Number and Address
FB-2006	Clock/Score	H2'-4"	711 mm	60 lb 27 kg	10"	300 W	120 V AC	2.5 A	A1 12
		W9'-0"	2743 mm	(114 lb 52 kg)	-11 red -21 amber				
		D7"	178 mm						
	Captions	H7"	178 mm	25 lb 11 kg	None	Unpowered			
		W9'-0"	2743 mm	(47 lb 21 kg)					
		D7"	178 mm						
Statistics	H1'-2"	356 mm	42 lb 19 kg	10"	300 W	120 V AC	2.5 A	A1 12	
	W9'-0"	2743 mm	(86 lb 39 kg)	-11 red -21 amber					
	D7"	178 mm							

## 2.2 Models MS-2014 and MS-2015

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

Model	Section	Dimensions (Height, Width, Depth)		Weight Uncrated (Crated)	Digit Size  Digit Color	Maximum Wattage	Power	Amps per Line (Single Phase)	Driver Number and Address
MS-2014	Clock/Score	H2'-4"	914 mm	75 lb 34 kg	10"	300 W	120 V AC	2.5 A	A1 71
		W9'-0"	2743 mm	(142 lb 64 kg)	-11 red -21 amber				
		D7"	177 mm						
MS-2014	Player/Penalty	H2'-4"	914 mm	85 lb 39 kg	10"	600 W	120 V AC	5.0 A	A2 72 A3 73
		W9'-0"	2743 mm	(161 lb 73 kg)	-11 red -21 amber				
		D7"	177 mm						
MS-2014	Captions	H7"	177 mm	25 lb 11 kg	N/A	Unpowered			
		W9'-0"	2743 mm	(47 lb 21 kg)					
		D7"	177 mm						
MS-2015	Clock/Score	H2'-4"	914 mm	60 lb 27 kg	10"	300 W	300 V AC	2.5 A	A1 71
		W9'-0"	2743 mm	(114 lb 51 kg)	-11 red -21 amber				
		D7"	177 mm						



## 2.3 Model MS-2016

Model	Section	Dimensions (Height, Width, Depth)		Weight Uncrated (Crated)	Digit Size  Digit Color	Maximum Wattage	Power	Amps per Line (Single Phase)	Driver Number and Address
MS-2016	Clock	H1'-2"	356 mm	45 lb 20 kg	10"	Unpowered			
		W9'-0"	2743 mm	(86 lb 39 kg)	-11 red -21 amber				
		D7"	177 mm						
Captions	H7"	177 mm	25 lb 11 kg	None	Unpowered				
	W9'-0"	2743 mm	(47 lb 21 kg)						
	D7"	177 mm							
Score/Period	Score/Period	H1'-2"	356 mm	45 lb 20 kg	10"	300 W	120 V AC	2.5 A	A1 13
		W9'-0"	2743 mm	(86 lb 39 kg)	-11 red -21 amber				
		D7"	177 mm						

## 2.4 Model MS-2017

Model	Section	Dimensions (Height, Width, Depth)		Weight Uncrated (Crated)	Digit Size Digit Color	Maximum Wattage	Power	Amps per Line (Single Phase)	Driver Number and Address
MS-2017	Score/Period	H1'-2" W9'-0" D7"	356 mm 2743 mm 177 mm	75 lb 34 kg (142 lb 64 kg)	10" -11 red -21 amber	300 W	120 V AC	2.5 A	A1 17
	Clock	H1'-2" W9'-0" D7"	356 mm 2743 mm 177 mm	75 lb 34 kg (142 lb 64 kg)	10" -11 red -21 amber				
	Fouls/Player Fouls	H1'-2" W9'-0" D7"	356 mm 2743 mm 177 mm	75 lb 34 kg (142 lb 64 kg)	10" -11 red -21 amber				
	Captions	H7" W9'-0" D7"	178 mm 2743 mm 177 mm	45 lb 20 kg (86 lb 39 kg)	10" -11 red -21 amber	Unpowered			

## 2.5 Model MS-2018

Model	Section	Dimensions (Height, Width, Depth)		Weight Uncrated (Crated)	Digit Size  Digit Color	Maximum Wattage	Power	Amps per Line (Single Phase)	Driver Number and Address	
MS-2018	Clock/Score	H2'-4"	914 mm	75 lb 34 kg	10"	300 W	120 V AC	2.5 A	A1 71	
		W9'-0"	2743 mm	(142 lb 64 kg)	-11 red -21 amber					
		D7"	177 mm							
	Player/Penalty	H2'-4"	914 mm	85 lb 39 kg	10"	600 W	120 V AC	5.0 A	A2 72	
		W9'-0"	2743 mm	(161 lb 161 kg)	-11 red -21 amber					
		D7"	177 mm							
	Captions	H7"	177 mm	25 lb 11 kg	None	Unpowered				
		W9'-0"	2743 mm	(47 lb 21 kg)						
		D7"	177 mm							
	Shots on Goal	H1'-2"	356 mm	45 lb 20 kg	10"	Unpowered				
		W9'-0"	2743 mm	(86 lb 39 kg)	-11 red -21 amber					
		D7"	177 mm							



## Section 3: Mechanical Installation

---

Mechanical Installation involves installing concrete footings and steel beams, attaching the caption sections to the digit sections, and mounting the digit modules to the structure. These steps are described in the following sections.

### 3.1 Installing Beams and Footings

#### Reference Drawings:

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**  
Beam & Footing Recommendations, MS-2016-11 ..... **Drawing A-175539**  
Beam & Footing Recommendations, MS-2017-11 ..... **Drawing A-214370**  
Beam & Footing Recommendations, FB-2006-11/21 .. **Drawing A-221087**

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.*

### 3.2 Installing Captions Modules

#### Reference Drawing:

Caption Module Detail..... **Drawing A-130840**

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 No.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. With model FB-2006-11, attach the caption module to the top of the statistics 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.

### 3.3 Mounting Digit Modules

#### Reference Drawings:

Beam Mounting Procedure .....	<b>Drawing A-194664</b>
Beam Mounting, Side View .....	<b>Drawing A-194671</b>
Beam Mounting, Top View .....	<b>Drawing A-194674</b>
Beam Mt., Rear, Vert. Display .....	<b>Drawing A-194677</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, Outdoor

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-194677**, 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-194664** 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 (MS-2014-11) or to the top of the statistics module (FB-2006-11.) 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, the shots on goal section in the MS-2018-11 or the statistics digit section in the FB-2006-11). Fasten the brackets to the modules by inserting 10-24 x 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-194671** and **A-194674**. 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 3/4" socket, taking care not to over tighten.
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-194671**.





# Section 4: Electrical Installation

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Electrical installation consists of the following process:

- 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.

***K 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.***

## 4.1 Power

The charts in **Section 2** list circuit specifications and power requirements for the sections listed in this manual. Refer to the following sections for details of display power installation.


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 digits, cabling, and other electronic components.

Correct power installation is imperative for proper display operation. The subsections that follow give details of display power installation. Only qualified individuals should attempt to complete the electrical installation; untrained personnel should not attempt to install these displays or any of the electrical components. Improper installation could result in serious damage to the equipment and could be hazardous to personnel.

### Grounding

#### Reference Drawing:

Schematic; Gen III Outdoor LED,  
16 Column Drvr ..... **Drawing A-177931**

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

*The contractor performing the electrical installation can verify ground resistance. Daktronics Sales and Service personnel can also provide this service.*

The display system *must* be connected to an earth electrode installed at the display. 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.*** Refer to the schematic, **Drawing A-177931**, for information on where to connect the grounding wire. The connection is illustrated in the "Pwr In" detail of the *Master Configuration* portion of the schematic.

The material for 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.

## **Power Installation**

There are two 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 paragraphs:

### ***Installation with Ground and Neutral Conductors Provided***

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

Under 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.

### ***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. If the installation in question meets all of the requirements of Article 250-32, the following guidelines must be observed:

- Connect the grounding electrode cable at the local disconnect, never at the display driver/power enclosure.
- Use a disconnect that opens all of the ungrounded phase conductors.

## 4.2 Power and Signal Connection

### Reference Drawings:

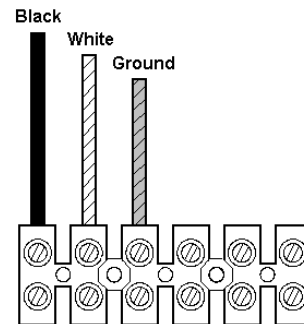
Schematic, Gen III Outdoor LED, 16 Column Driver.....	<b>Drawing A-177931</b>
Driver; Gen III LED, 16 Col Master .....	<b>Drawing A-178197</b>

Route power and signal cables into the scoreboard from the rear. There are two knockouts for conduit connection in the back. All power and signal wiring terminates at the driver enclosure. **Drawing A-178197** illustrates the 16-column driver used in Daktronics outdoor LED scoreboards.

To gain access to the driver enclosure, open the access door or digit panel and remove the cover from the enclosure. Refer to the component locations drawings for the access location for your scoreboard.

Connect power and signal cables at the appropriate locations on the driver enclosure panel, shown in **Drawings A-178197** and **A-177931**.

The conventional power termination panel has been eliminated from Daktronics outdoor scoreboards; the power feeder circuit connects directly to a terminal block in the driver enclosure, as shown in **Figure 3**. The terminal block is located in the lower right corner of the enclosure. Connect the power wires as shown in the illustration. Refer to the driver engineering drawing and the schematics listed at the beginning of this section for additional wiring details. The schematics include a detailed illustration of the power termination.



**Figure 3: Power Terminal Block**

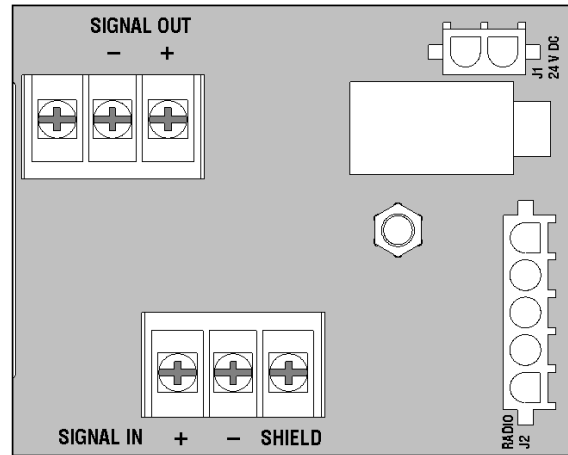
**K Note:** *Driver enclosures in some earlier Daktronics scoreboards included a 120 V power receptacle. There is no 120 V receptacle in Generation III displays. If you want power to operate the control console at the scoreboard for troubleshooting, Daktronics recommends that you have the installation electrician provide a 120 V outlet close to the disconnect box specifically for this purpose.*

Route signal cabling to the signal surge arrestor card in the upper left corner of the driver enclosure. The connections are labeled to permit easy installation.

At the Signal In terminal block on the printed circuit board (PCB), connect the red signal wire to the positive terminal, the black to the negative terminal, and the shield (silver) wire to the shield terminal.

*It is important that the shield wire is properly connected to the shield terminal on the signal surge arrester card.* **Figure 4** on the previous page illustrates the PCB and the terminal blocks.

For signal cable, Daktronics recommends, as a minimum, single-pair, shielded cable, 22 AWG (Daktronics part number W-1077). Two-pair shielded cable (Daktronics part W-1234) is preferred.



**Figure 4:** Signal Surge Arrester Card

## Connections Between Sections

**K 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.*

Models MS-2014 and MS-2018 have been configured to operate with a master/slave driver system. Master and slave drivers function identically, but slave drivers lack the power terminal block and signal surge arrester card. The two drivers have been designed to simply plug into each other via an interconnect harness, the slave receiving redriven power and signal from the master driver. Larger scoreboards can have as many drivers as they require.

All driver interconnect harnesses are factory installed. No additional connection is necessary (The harness emerges from the bottom of the master driver enclosure, and the J42 jack from the master is connected to the slave's P43 plug.). Likewise, signal cables from drivers to digit also have been factory-installed, and no additional connection is necessary.

For access and connection, refer to the component locations drawings and follow this procedure:

1. Begin electrical installation by routing power and signal cables into the scoreboard through the rear of the clock/score section. There are two knockouts for conduit connection on the back panel. There are knockouts on the side 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 section and remove the cover from the driver enclosure.

3. Power terminates at the power terminal block in the driver tray. Refer to **Drawing A-177931** for wiring termination details.
4. The signal wires from the scoreboard controller connect directly to the signal surge arrestor card, which is located on the lower left side of the master driver on the driver tray. Refer to **Drawing A-178197** for the exact location.

There are also several power and signal interconnect cables in the slave sections of the scoreboards that must be connected to the master driver in the clock/score module. This involves routing the cables through the 2" holes in the cabinets during scoreboard mounting. To complete these connections, refer to the following instructions.

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* (**K Note: This cable is factory-installed**).
3. Next, in the player/penalty section, 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.  
( **K 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 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 NOTES:**

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

## **5.1 Cabinet Specifications**

Cabinets for Daktronics outdoor LED scoreboards are constructed of heavy-gauge aluminum. Dimensions and weights for each model are listed in the chart in **Section 2**. Removable panels for digits and indicators and for component access are detailed in each model's component locations drawing, listed in **Section 5.2** below.

## **5.2 Component Location and Access**

### **Reference Drawings:**

Component Locations; MS-2015-11/-21, G3 .....	<b>Drawing A-189417</b>
Component Locations; MS-2014-11/-21, G3 .....	<b>Drawing A-189532</b>
Component Locations; MS-2018-11/-21, G3 .....	<b>Drawing A-189535</b>
Component Locations; MS-2016-11/-21, G3 .....	<b>Drawing A-202250</b>
Component Locations; MS-2017-11/-21, G3 .....	<b>Drawing A-214362</b>
Component Locations; FB-2006-11/-21, G3 .....	<b>Drawing A-221085</b>

The component locations drawings illustrate placement of all internal parts as well as the configuration of the face panels for each of the models in this series.

For front-access scoreboards, all internal electronic components and digits can be reached by opening a face panel, an access door, or a digit panel on the front of the display.

To remove a digit, simply unfasten the screws and carefully lift the unit from the board. You can then remove the 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 an access panel or a digit.

**K 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

### Reference Drawings:

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

Digit Assemblies; Gen III LED Digits..... **Drawing B-177679**

The digit circuit board, the platform for the LEDs, is mounted to the back of the digit panel. Refer to **Drawings A-156994 and B-177679** for details. Do not attempt to remove individual LEDs. In the case of a malfunctioning board, replace the entire face panel.

To remove a scoreboard digit, follow these steps:

1. Open the face 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 fixed machine screws, spacers, and push nuts.
4. Remove the nuts and lift the digit off the standoff screws. (The push nuts can be removed in several ways, but Daktronics recommends using a  $\frac{9}{32}$ " nut driver.)
5. Position a new digit over the screws and tighten the nuts.
6. Reconnect the power/signal connector.  
**K Note:** *This is a keyed connector. It will attach in one way only. Do not attempt to force the connection!*
7. Close and secure the digit panel and test the scoreboard.

## 5.3 LED Drivers

In the scoreboard, the LED drivers perform the task of switching digits on and off. Refer to **Drawing A-178197**. Each driver has up to 19 connectors providing power and signal inputs to the circuit and outputs to the digits and indicators. The connectors function as shown in the table at right.

16-Column LED Driver	
Connector No.	Function
1 – 16	Output to digits and indicators
17	Power and signal input
18	Relay
19	Address
20	Protocol



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

For the scoreboard to receive signal and function properly, the driver must be set to the correct address. This address is set with jumper wires in a 12-pin plug which mates with a jack on the driver. Refer to **Drawing A-115078** for a listing of the wire/pin connections for driver addresses 1 – 128.

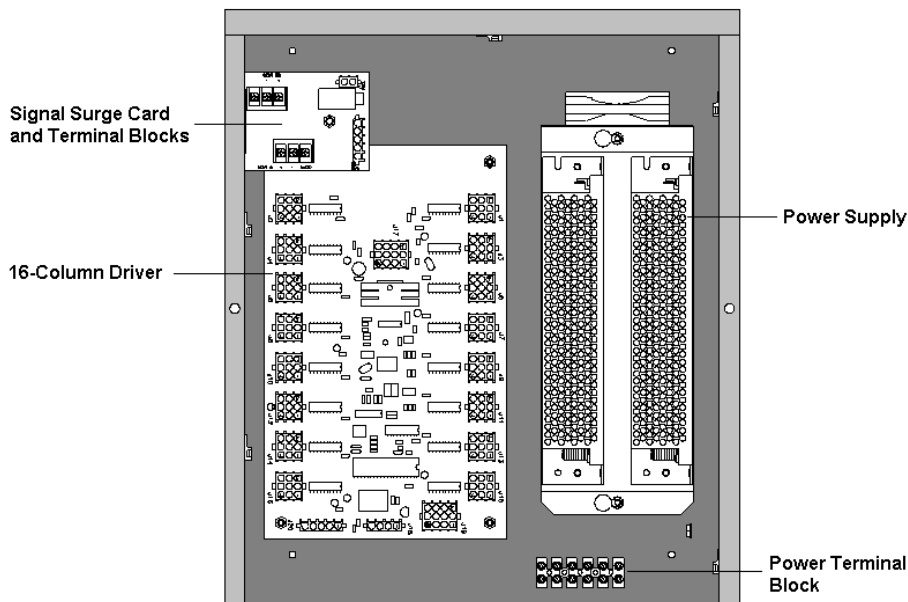
## Replacing a Driver

Drivers are typically mounted inside the scoreboard and immediately behind a digit, but location and mounting varies with the model of the scoreboard. Refer to the component locations drawings at the beginning of this section for the location of your scoreboard driver. All scoreboards in this manual are front-accessible.

Each driver is enclosed with a power supply and signal terminal block. Before a failed driver can be reached, the enclosure must be accessed.

Follow the steps below to remove a driver.

1. Open the digit panel or scoreboard face panel as described in **Section 5.2**.
2. Remove the cover from the driver enclosure.
3. Disconnect all connectors from the driver. Release each connector by squeezing together the locking tabs as you pull the connector free.  
*K Note: When reconnecting, remember that these are keyed connectors and will attach in one way only. Do not attempt to force the connections.*
4. Remove the screws, nuts, or wing nuts securing the driver to the inside of the enclosure. Refer to **Figure 5**.
5. Carefully lift the driver from the display and place it on a clean, flat surface.



**Figure 5:** 16 Column Driver Enclosure

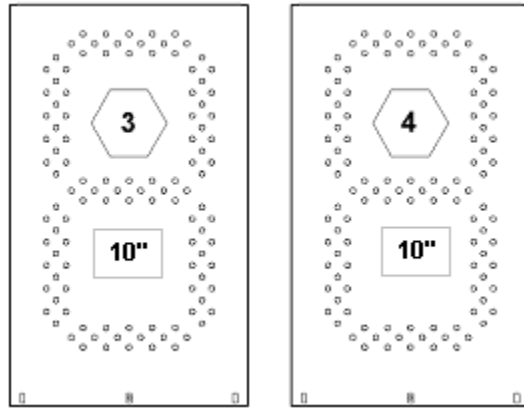
## 5.4 Segmentation and Digit Designation

### 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).

The component locations drawings in **Section 5.2** specify the driver connectors controlling the digits. Numbers displayed in hexagons in the upper half of each digit, as shown in **Figure 6**, indicate which connector is wired to that digit. (The lower number in the square indicates nominal digit size.) The drawings listed at the beginning of this section also indicate digit designation and specify the harnesses used for each of the digit/driver connections.



**Figure 6:** Digit Designation

## 5.5 Lightning Protection

The use of a disconnect near the scoreboard to completely cut all current-carrying lines significantly protects the circuits against lightning damage. The National Electrical Code also requires the disconnect. In order for this system to provide protection, the power *must* be disconnected when the scoreboard is not in use. The control console should also be disconnected from power and from the signal junction box when the system is not in use. The same surges that may damage the scoreboard's driver can also damage the console's circuit.

## 5.6 Troubleshooting

This section lists potential problems with the scoreboard and indicates possible causes and corrective actions. This list does not include every possible problem, but does represent some of the more common situations that may occur.

Symptom/Condition	Possible Cause
<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> </ul>
<i>Garbled display</i>	<ul style="list-style-type: none"> <li>• Internal driver logic malfunction</li> <li>• Control console malfunction</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> <li>• Driver malfunction</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 driver and digit</li> <li>• Poor contact at driver connector</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>
<i>Date appears in the wrong place on the scoreboard</i>	<ul style="list-style-type: none"> <li>• Incorrect address settings on drivers (consult tables and set correct addresses)</li> </ul>

## 5.7 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-1110-0011
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 LED	0P-1192-0249

(Continued on next page)

(Continued from previous page)

Description	Part No.
Arrow indicators, penalty, amber LED	0P-1192-0250
Digit, 10", red LED, 7-seg	0P-1192-0251
Digit, 10" ones, amber LED, 2-seg	0P-1192-0252
Digit, 10" amber LED, 2 segment	0P-1192-0288
Digit, 10" red LED, 2 segment	0P-1192-0287
Possession indicator, red LED	0P-1192-0249
Possession indicator, amber LED	0P-1192-0250
Bonus indicator, red LED	0P-1192-0289
Bonus indicator, amber LED	0P-1192-0290
Breakout board	0P-1192-0019

## 5.8 Daktronics Exchange and Repair and Return Programs

### Exchange Program

The Daktronics Exchange Program is a service for quickly replacing key components in need of repair. If a component fails, Daktronics sends a replacement part to the customer who, in turn, returns the failed component to Daktronics. This decreases equipment downtime. Customers who follow the program guidelines explained below will receive this service.

#### Before Contacting Daktronics

Display Serial Number: \_\_\_\_\_

Display Model Number: \_\_\_\_\_

Job/Contract Number: \_\_\_\_\_

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

Daktronics Customer ID Number: \_\_\_\_\_

To participate in the Exchange Program, follow these steps:

#### 1. Call Daktronics Customer Service.

Market Description	Customer Service Number
Schools (including community/junior colleges), religious organizations, municipal clubs and community centers	877-605-1115

Universities and professional sporting events, live events for auditoriums and arenas
--

866-343-6018
--------------

2. **When the exchange part is received, mail the old part to Daktronics.**  
If the replacement part fixes the problem, send in the problem part being replaced.
  - a. Package the old part in the same shipping materials in which the replacement part arrived.
  - b. Fill out and attach the enclosed UPS shipping document.
  - c. Ship the part to Daktronics.
  
3. **The defective or unused parts must be returned to Daktronics within 5 weeks of initial order shipment.**  
If any part is not returned within five (5) weeks, a non-refundable invoice will be presented to the customer for the costs of replenishing the exchange parts inventory with a new part.

Daktronics reserves the right to refuse parts that have been damaged due to acts of nature or causes other than normal wear and tear.

## Repair & Return Program

For items not subject to exchange, Daktronics offers a Repair & Return Program. To send a part for repair, follow these steps:

1. **Call or fax Daktronics Customer Service:**  
Refer to the appropriate market phone number in the chart on the previous page.  
**Fax:** 605-697-4444
  
2. **Receive a case number before shipping.**  
This expedites repair of the part.
  
3. **Package and pad the item carefully to prevent damage during shipment.**  
Electronic components, such as printed circuit boards, should be placed in an antistatic bag before boxing. Daktronics does not recommend using packing 'peanuts' when shipping.
  
4. **Enclose:**
  - name
  - address
  - phone number
  - the case number
  - a clear description of symptoms

***Shipping Address***

Daktronics Customer Service  
[Case #]  
201 Daktronics Drive, Dock E  
Brookings, SD 57006

**Daktronics Warranty and Limitation of Liability**

The Daktronics Warranty and Limitation of Liability is located in **Appendix C**. The Warranty is independent of Extended Service agreements and is the authority in matters of service, repair, and display operation.

## Appendix A: Reference Drawings

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<i>Drawing Title</i>	<i>Drawing Number</i>
Caption Module Detail .....	A-130840
Digit Service, Stackable Scoreboards .....	A-156994
Beam and Footing Recommendations, MS-2014 .....	A-165553
Beam and Footing Recommendations, MS-2015 .....	A-165559
Beam and Footing Recommendations, MS-2018 .....	A-165561
Beam and Footing Recommendations, MS-2016 .....	A-175539
Digit Assemblies; Gen III LED Digits .....	B-177679
Schematic; Gen III Outdoor LED, 16 Col Drvr.....	A-177931
Driver; Gen III Outdoor LED, 16 Col Master.....	A-178197
Component Locations; MS-2015, G3 .....	A-189417
Layout View; MS-2015, G3.....	A-189437
Layout View; MS-2014, G3.....	A-189446
Layout View; MS-2018, G3.....	A-189492
Component Locations; MS-2014, G3 .....	A-189532
Component Locations; MS-2018, G3 .....	A-189535
Beam Mounting, Procedure.....	A-194664
Beam Mounting Side View .....	A-194671
Beam Mounting, Top View .....	A-194674
Beam Mounting, Rear View, Vertical Display.....	A-194677
Layout View; MS-2016-11, G3 .....	A-202065
Component Locations; MS-2016-11/-21, G3.....	A-202250
Layout View; MS-2017-11, G3 .....	A-213041
Component Locations; MS-2017-11/-21, G3.....	A-214362
Beam and Footing Recommendations, MS-2017 .....	A-214370
Layout View; FB-2006-11, G3 .....	A-221063
Component Locations; FB-2006-11/-21, G3 .....	A-221085
Beam and Footing Recommendations, FB-2006-11/-21.....	A-221087





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.

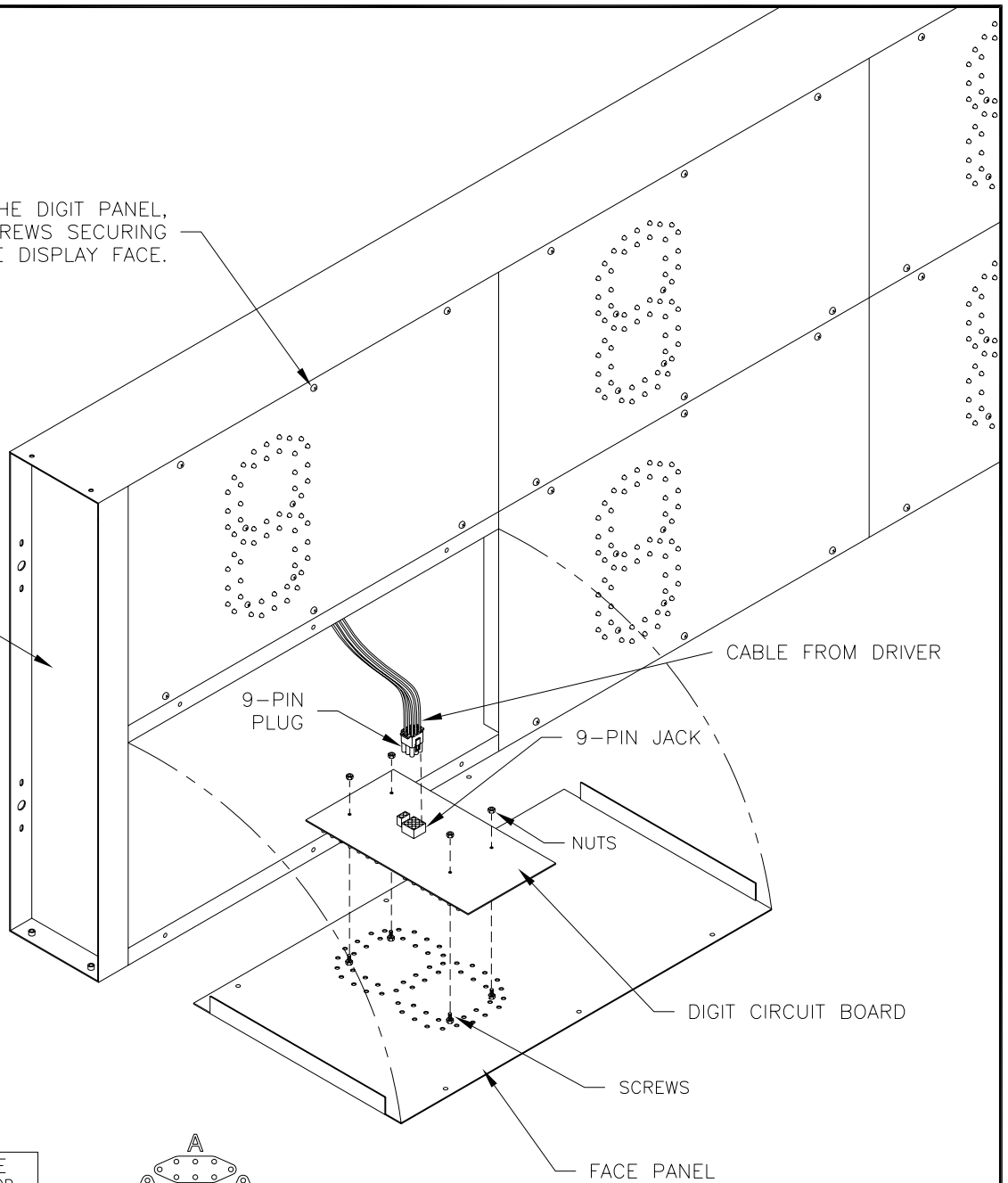
BE SURE THAT THE MODULE IS ORIENTED CORRECTLY WHEN INSTALLING.

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	

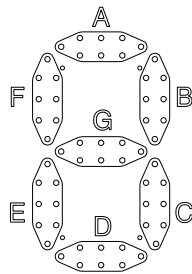
REV.	DATE	DESCRIPTION	BY	APPR.

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

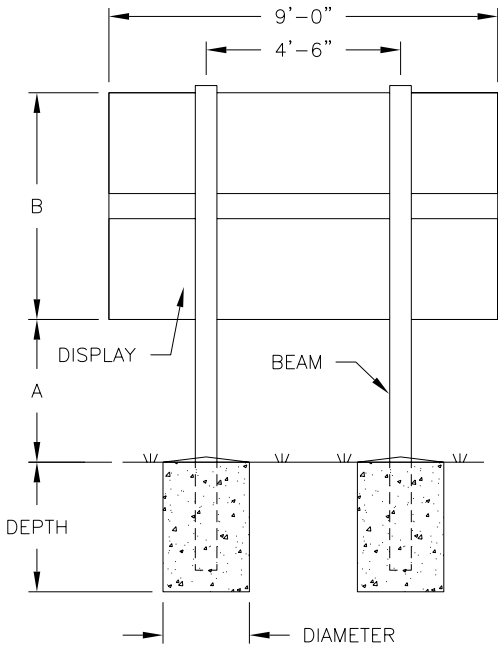
APPR. BY:

SCALE: 1=10

1192-E10A-156994

REV.	DATE	DESCRIPTION	BY	APPR.

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).

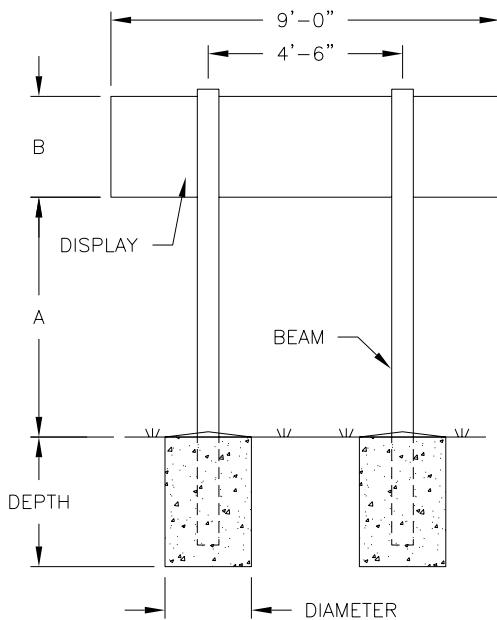
THE FOOTING DIMENSIONS GIVEN IN THE TABLE ARE BASED ON DRILLED (ROUND) PIER CONCRETE FOUNDATIONS. FOR EXAMPLE, FOR A FOOTING DESIGNATED AS 3'x9', THE FIRST NUMBER (3) IS THE DIAMETER IN FEET, AND THE LAST NUMBER (9) IS THE DEPTH IN FEET. THESE FOOTINGS WERE SIZED BASED ON THE WIND LOADS FROM UBC-97. 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:	1192-R04A-165553	
	SCALE: 1=40		

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 FOOTING	W6x9 2.0'x3.3'	W6x9 2.0'x3.7'	W8x10 2.0'x4.0'	W10x12 2.0'x4.5'
	2'-4"	4'-8"	BEAM FOOTING	W10x12 2.0'x4.2'	W10x12 2.0'x4.6'	W10x15 2.0'x5.0'	W6x15 2.0'x5.4'
15'-0"	NONE	2'-4"	BEAM FOOTING	W10x12 2.0'x3.9'	W10x15 2.0'x4.3'	W10x15 2.0'x4.7'	W6x15 2.0'x5.1'
	2'-4"	4'-8"	BEAM FOOTING	W6x15 2.0'x4.8'	W8x18 2.0'x5.3'	W6x20 2.0'x5.7'	W6x20 2.0'x6.2'
20'-0"	NONE	2'-4"	BEAM FOOTING	W8x18 2.0'x4.5'	W8x18 2.0'x4.9'	W6x20 2.0'x5.4'	W6x20 2.0'x5.8'
	2'-4"	4'-8"	BEAM FOOTING	W8x24 2.0'x5.3'	W12x26 2.0'x5.8'	W12x26 2.0'x6.4'	W14x30 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.

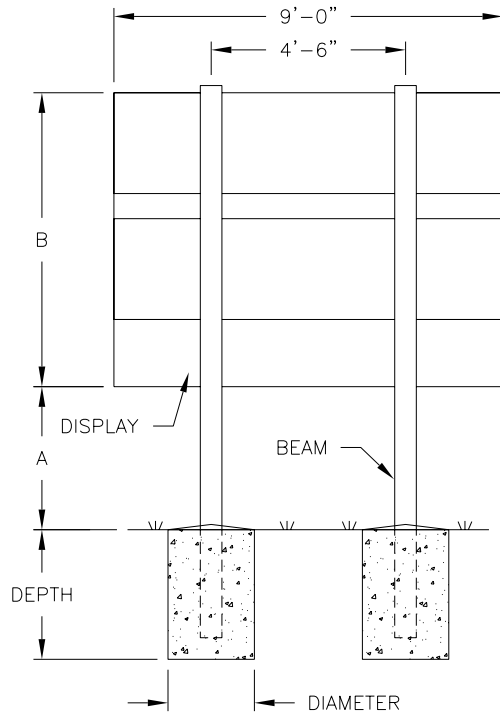
THE LOCALLY ADOPTED BUILDING CODE AND ACTUAL SITE CONDITIONS WILL GOVERN THE ACTUAL REQUIRED COLUMN AND FOOTING SIZES. THESE COLUMN AND FOOTING DIMENSIONS ARE PROVIDED TO ASSIST IN ESTIMATING INSTALLATION COSTS. THEY ARE ESTIMATES ONLY AND ARE NOT INTENDED FOR CONSTRUCTION PURPOSES. THE COLUMNS AND FOOTINGS 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:	1192-R04A-165559	
	SCALE: 1=40		

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 FOOTING	W10x15 2'x4.7'	W6x15 2'x5.2'	W6x15 2'x5.7'	W8x18 2'x6.1'
	2'-4"	8'-9"	BEAM FOOTING	W8x18 2'x5.3'	W6x20 2'x5.9'	W6x20 2'x6.4'	W8x24 2'x6.9'
15'-0"	NONE	6'-5"	BEAM FOOTING	W6x20 2'x5.3'	W6x20 2'x5.9'	W8x24 2'x6.4'	W12x26 2'x6.9'
	2'-4"	8'-9"	BEAM FOOTING	W12x26 2'x6.0'	W12x26 2'x6.6'	W14x30 2'x7.2'	W8x31 2'x7.8'
20'-0"	NONE	6'-5"	BEAM FOOTING	W12x26 2'x5.9'	W14x30 2'x6.5'	W8x31 2'x7.1'	W8x31 2'x7.7'
	2'-4"	8'-9"	BEAM FOOTING	W8x31 2'x6.6'	W8x31 2'x7.2'	W10x33 2'x7.9'	W10x39 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.

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-2018-11

DES. BY:

DRAWN BY: KBRICKER

DATE: 16APR02

REVISION

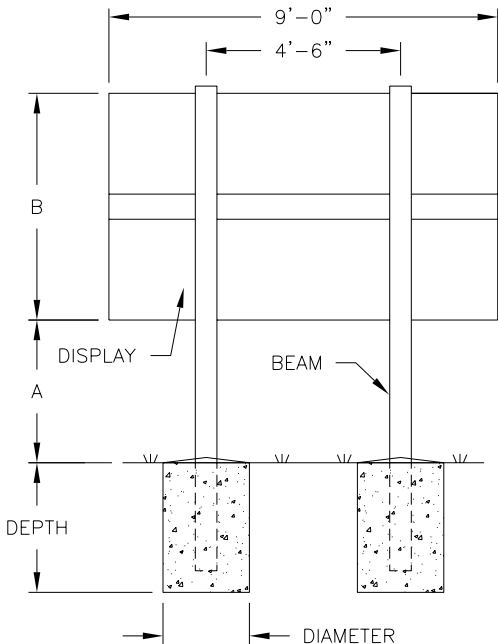
APPR. BY:

SCALE: 1=40

1192-R04A-165561

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
15'-0"	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
20'-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
10'-0"	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
15'-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
20'-0"	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



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.

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DAKTRONICS, INC. BROOKINGS, SD 57006

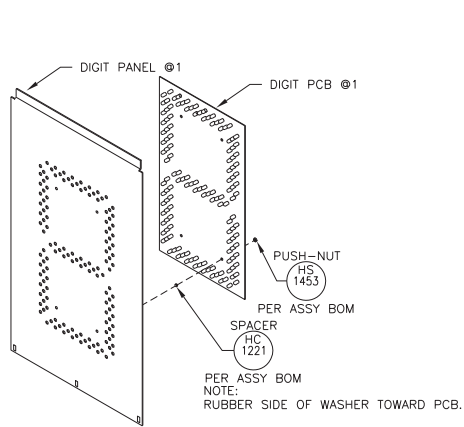
PROJ: OUTDOOR LED DIGIT SCOREBOARD

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

DES. BY: MCOPL/RNEYEN DRAWN BY: MCOPLAN DATE: 20SEP02

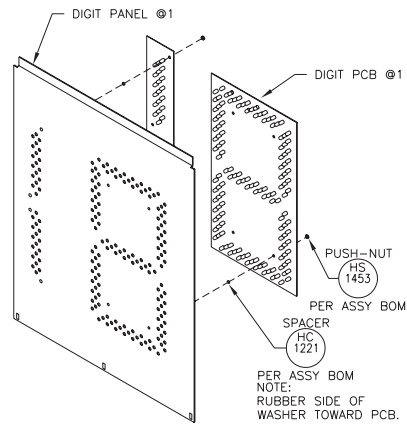
REVISION	APPR. BY:	1192-R04A-175539
00	SCALE: 1=40	

REV.	DATE	DESCRIPTION	BY	APPR.



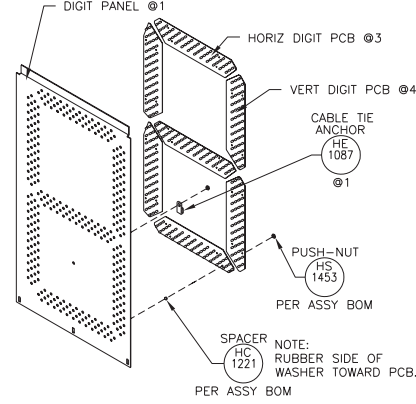
DETAIL: A

REFER TO THIS DETAIL FOR THE FOLLOWING RED, GRN, AND AMBER LED DIGIT ASSEMBLY SIZES:  
 -5", 7", 10", 15", 18", SMALL FB IND, AND LARGE FB IND (NOTE THAT THE FB INDICATORS DO NOT LOOK LIKE THE DIGIT IN THE ABOVE DETAIL. THESE INDICATORS ARE ASSEMBLED WITH THE SAME METHOD AS THE DIGIT SHOWN IN THE ABOVE DETAIL.)



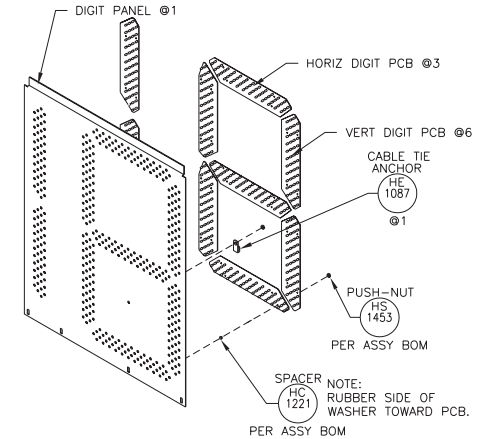
DETAIL: B

REFER TO THIS DETAIL FOR THE FOLLOWING RED, GRN, AND AMBER LED DIGIT ASSEMBLY SIZES:  
 -15"+1, AND 18"+1



DETAIL: C

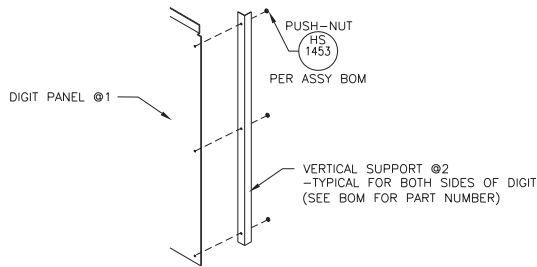
REFER TO THIS DETAIL FOR THE FOLLOWING RED, GRN, AND AMBER LED DIGIT ASSEMBLY SIZES:  
 -24", 24" WIDE, 30", 30" WIDE, 36", 42", 48", 60"



DETAIL: D

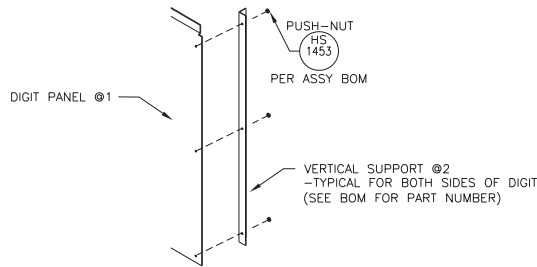
REFER TO THIS DETAIL FOR THE FOLLOWING RED, GRN, AND AMBER LED DIGIT ASSEMBLY SIZES:  
 -24"+1, 30"+1, 36"+1

NOTE: IN SOME APPLICATIONS, THE LED DIGIT PCB MAY BE MOUNTED DIRECTLY TO THE FACE PANEL OF THE SCOREBOARD INSTEAD OF THE LED DIGIT PANEL. THE SAME HARDWARE WILL BE USED TO INSTALL THE LED DIGIT PCB. THE LED SCOREBOARD FACE PANEL CAN BE SUBSTITUTED FOR THE LED DIGIT PANEL IN ALL DETAILS.



DETAIL: E

REFER TO THIS DETAIL FOR THE FOLLOWING RED, GRN, AND AMBER LED DIGIT ASSEMBLY SIZES:  
 48", AND 48"+1



DETAIL: F

REFER TO THIS DETAIL FOR THE FOLLOWING RED, GRN, AND AMBER LED DIGIT ASSEMBLY SIZES:  
 -30", 30"+1, AND 30" WIDE.

DESIGNED BY	MCOPLAN
CHECKED BY	MCOPLAN
DATE	30OCT02
SCALE	1=6

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DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: OUTDOOR LED SCOREBOARDS

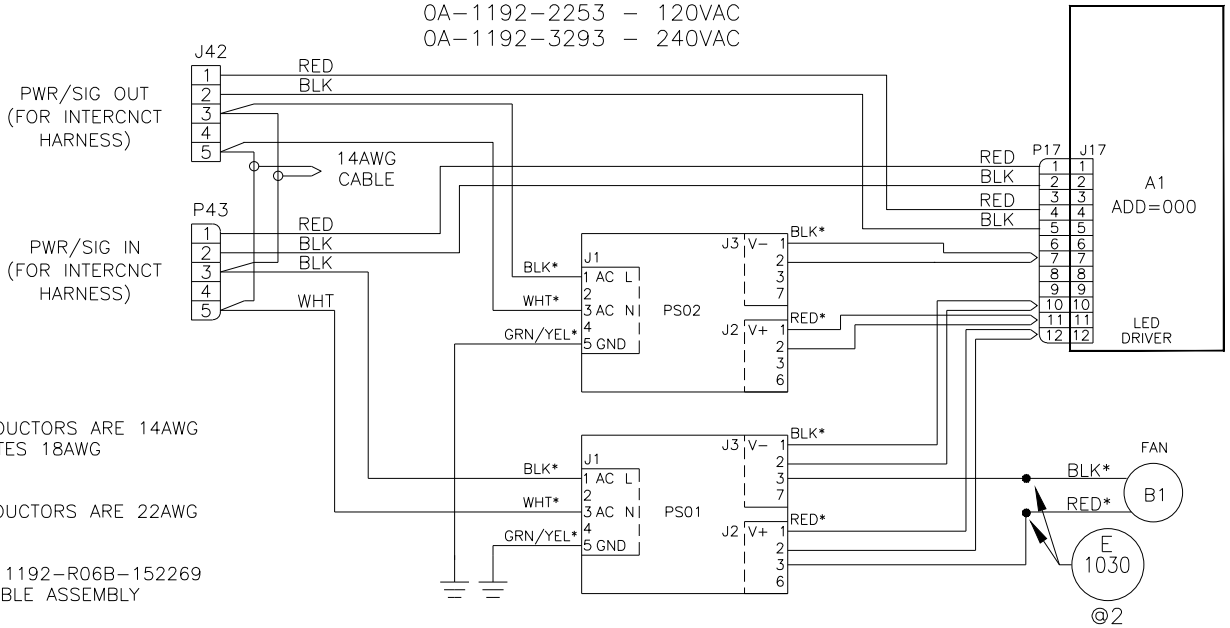
TITLE: DIGIT ASSEMBLIES: GEN III LED DIGITS

DES. BY: MCOPLAN DRAWN BY: MCOPLAN DATE: 30OCT02

REV.	DATE	DESCRIPTION	BY	APPR.
06	16 APR 08	REMOVE WIRING DETAIL	KZB	

REVISION 06 APPR. BY: SCALE: 1=6 1192-E10B-177679

SLAVE CONFIGURATION  
 0A-1192-2253 - 120VAC  
 0A-1192-3293 - 240VAC

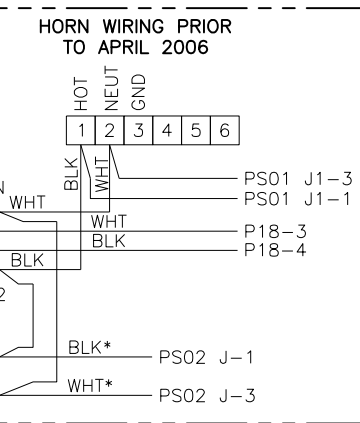
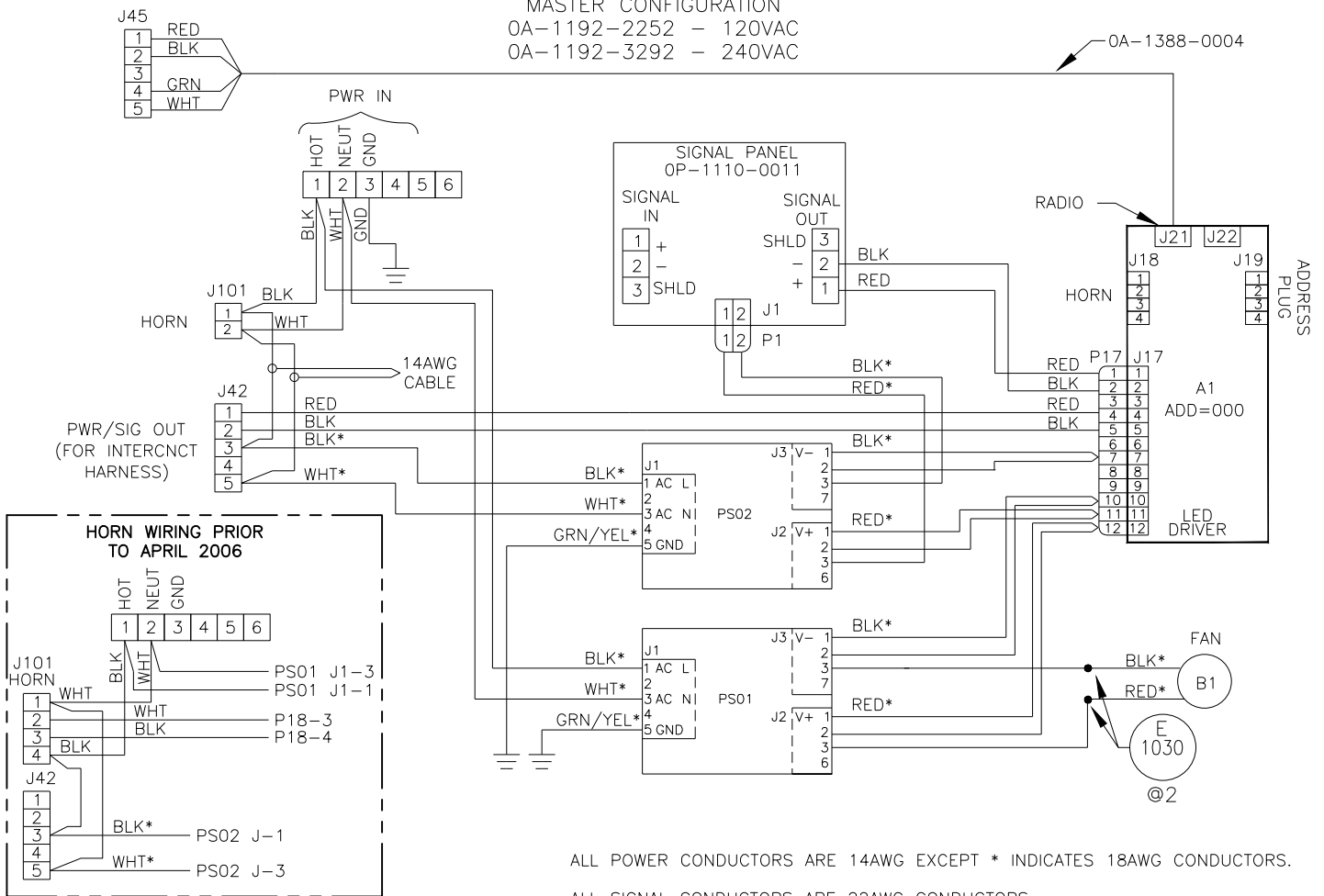


ALL POWER CONDUCTORS ARE 14AWG EXCEPT \* INDICATES 18AWG CONDUCTORS.

ALL SIGNAL CONDUCTORS ARE 22AWG CONDUCTORS.

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

MASTER CONFIGURATION  
 0A-1192-2252 - 120VAC  
 0A-1192-3292 - 240VAC



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

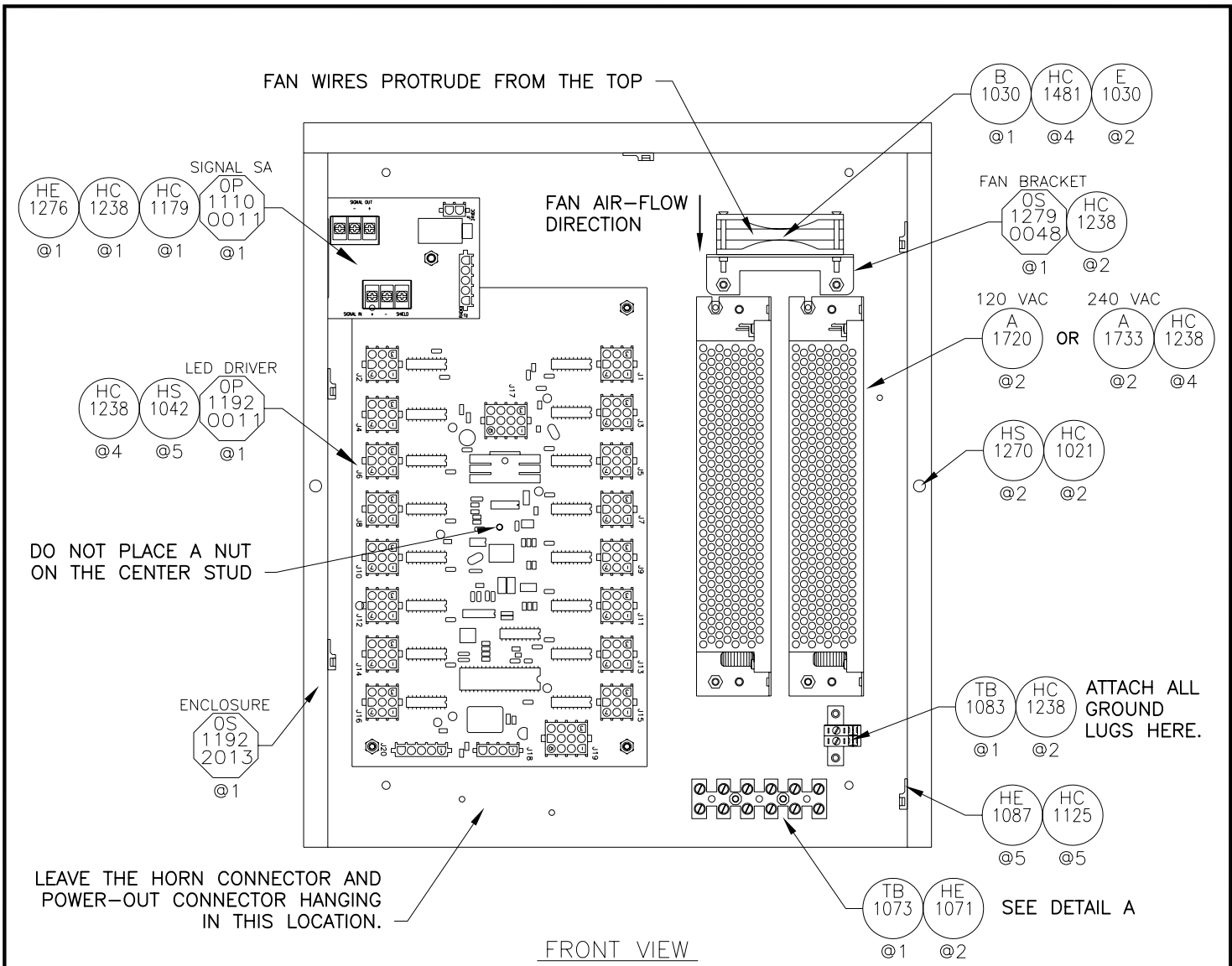
ALL SIGNAL CONDUCTORS ARE 22AWG CONDUCTORS.

REFERENCE DWG 1192-R06B-178207 FOR DETAILED CABLE ASSEMBLY DIAGRAM.

		THE CONCEPTS EXPRESSED AND DETAILS SHOWN ON THIS DRAWING ARE CONFIDENTIAL AND PROPRIETARY. DO NOT REPRODUCE BY ANY MEANS WITHOUT THE EXPRESSED WRITTEN CONSENT OF DAKTRONICS, INC. COPYRIGHT 2010 DAKTRONICS, INC.	
BROOKINGS, SD 57006		DO NOT SCALE DRAWING	
PROJ: OUTDOOR LED SCOREBOARD			
TITLE: SCHEMATIC: GEN III OUTDOOR LED- 16 COLUMN DRV			
DESIGN: MMILLER		DRAWN: MMILLER	
DATE: 05 NOV 02		SCALE: 1 = 1	
SHEET	REV	JOB NO:	FUNC-TYPE-SIZE
04	1192	R-03-A	177931

REV 04	DATE: 10 JAN 11	ADDED RADIO HARNESS 0A-1388-0004.	BY: SMB
REV 03	DATE: 15 SEP 06	MODIFIED J101 BLK WIRE TO PIN-1 WHT WIRE TO PIN-2	BY: SJC
REV 02	DATE: 20 MAR 06	ADD 240VAC PART NUMBERS ADD NEW HORN CARD	BY: KZB
REV 01	DATE: 10 DEC 02	ADDED BLOCKS 5 AND 6 TO PWR IN	BY: AJL

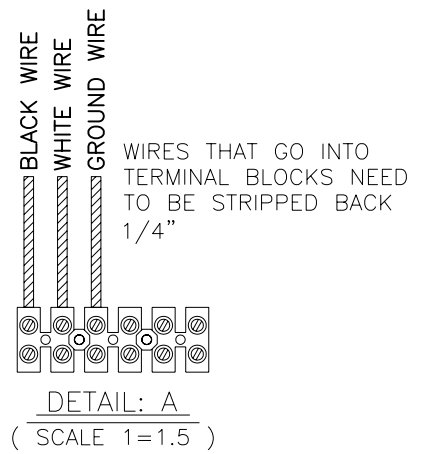




FRONT VIEW

NOTES:

- NOTE THAT WIRES PROTRUDE FROM THE FAN ON ONE OF THE FOUR SIDES. WHEN MOUNTING THE FAN TO THE POWER SUPPLY BRACKET, MAKE SURE THE FAN WIRES PROTRUDE FROM THE TOP.
- THE FAN AIR-FLOW SHOULD BLOW AIR ONTO THE POWER SUPPLIES.
- SEE DRAWING A-178206 FOR LABELING.



REV.	DATE	DESCRIPTION	BY	APPR.
10	09 FEB 06	ADDED .141 HOLES @2 FOR TB-1007	CAC	
09	01AUG05	ADDED 240 VAC POWER SUPPLY	TAJ	
08	24MAY04	ADDED TB-1083 TO DRIVER ASSEMBLY	MCOPL	
07	19 APR 04	CHANGED WIRE STRIP LENGTH FROM 1/8" TO 1/4" PER ECO-40503	RWD	
06	16 SEPT 03	ADDED NOTE TO STRIP WIRE 1/8" PER ECO 41476	RWD	
05	14JUL03	REPLACED OLD BLOCK OF TB-1073 WITH NEW BLOCK OF TB-1073	MCOPL	
04	30JAN03	CHANGED MOUNTING METHODS FOR THE POWER SUPPLIES AND FAN, CHANGED THE MOUNTING HARDWARE ON SEVERAL COMPONENTS	MCOPL	
03	03JAN03	ADDED HC-1202 @1 AND HC-1354 @1	MCOPL	
02	30DEC02	CHANGED BLOCK OF OP-1110-0011	MCOPL	
01	04DEC02	REPLACED TB-1072 WITH TB-1073, ADDED NOTES AND DETAIL A	MCOPL	

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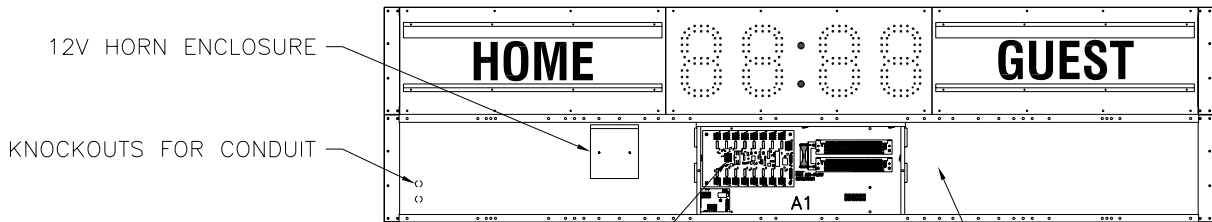
**DAKTRONICS, INC. BROOKINGS, SD 57006**

PROJ: OUTDOOR LED SCOREBOARDS  
 TITLE: DRIVER; GEN III OUTDOOR LED, 16 COL MASTER  
 DES. BY: MCOPLAN DRAWN BY: MCOPLAN DATE: 08NOV02

REVISION 10 APPR. BY: SCALE: 1=4

**1192-E10A-178197**

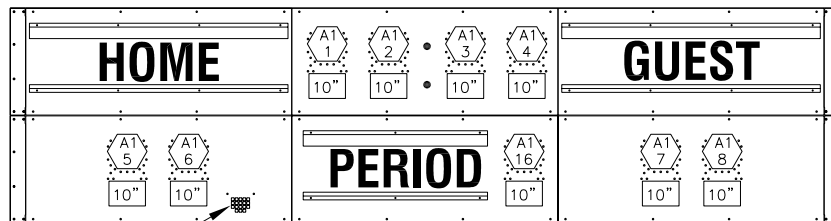
MS-2015-11/-21



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

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

FRONT VIEW  
 (COMPONENT DETAIL)



12V HORN

FRONT VIEW  
 (DIGIT DESIGNATION)

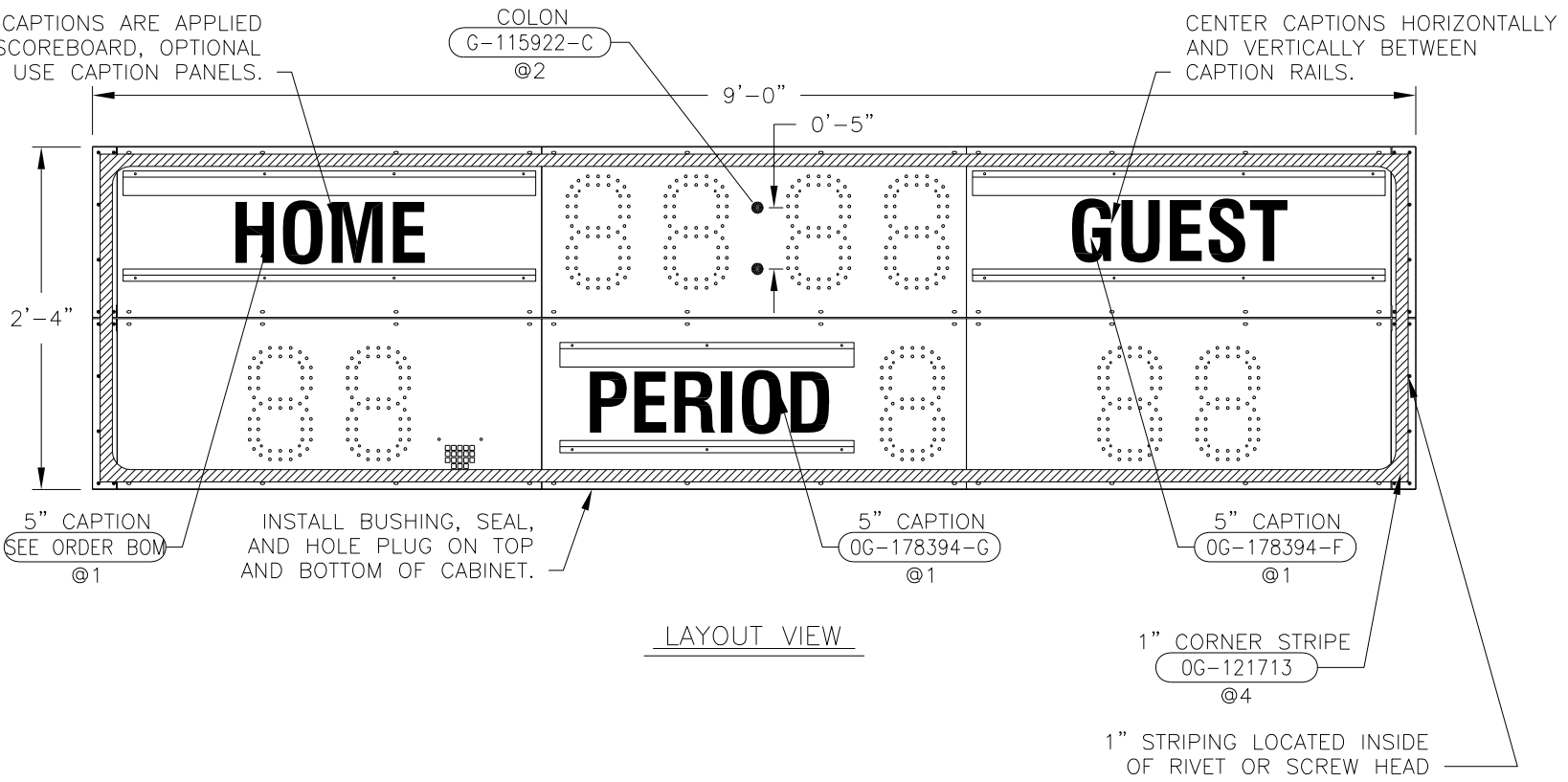
- A1-9E = DRIVER CONNECTOR SEGMENT WIRED TO THAT DIGIT
- A1 5 = DRIVER CONNECTOR WIRED TO THAT DIGIT
- 15" = DIGIT SIZE

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 2003 DAKTRONICS, INC.			
DAKTRONICS, INC. BROOKINGS, SD 57006			
PROJ: OUTDOOR LED SCOREBOARDS			
TITLE: COMPONENT LOCATIONS; MS-2015-11/-21, G3			
DES. BY: MCOPLAN		DRAWN BY: MCOPLAN	
		DATE: 02JUN03	
REVISION	APPR. BY:	1192-R08A-189417	
	SCALE: 1=25		

REV.	DATE	DESCRIPTION	BY	APPR.

REV.	01	03 DEC 09	ADDED STRIPING TO SCOREBOARD
DATE			
DESCRIPTION			
BY	JTL		
APPR.			

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



LAYOUT VIEW

NOTE: CAPTION PART NUMBERS LISTED ON THIS DRAWING ARE FOR WHITE VINYL CAPTIONS. COLORED CAPTION NUMBERS MAY BE SUBSTITUTED BY ADDING ANOTHER PART LETTER. FOR EXAMPLE, "-B" FOR WHITE CAPTION AND "-BB" FOR A COLORED CAPTION.

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 2003 DAKTRONICS, INC.

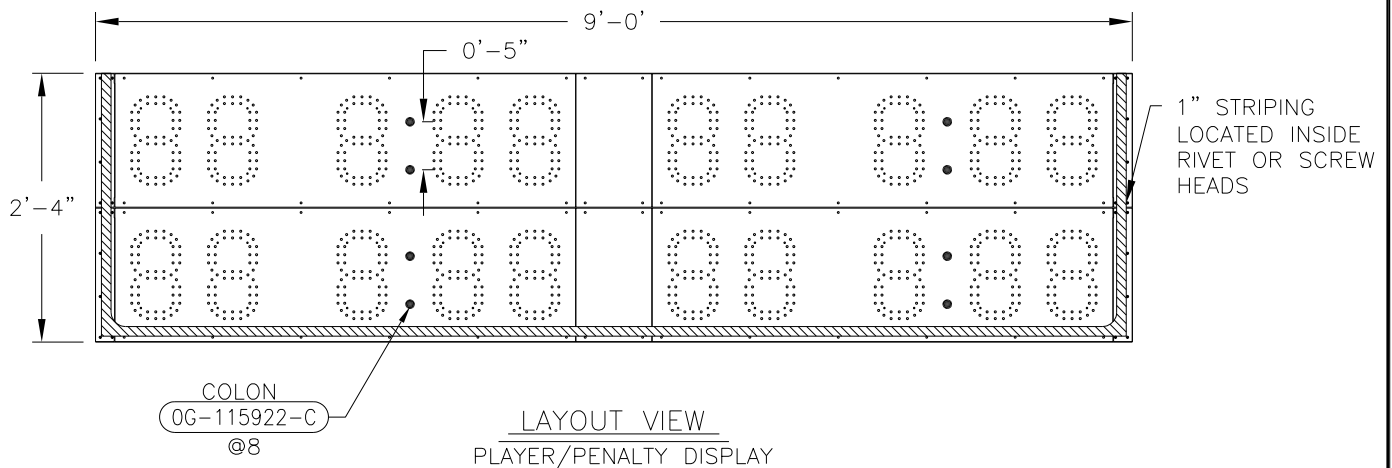
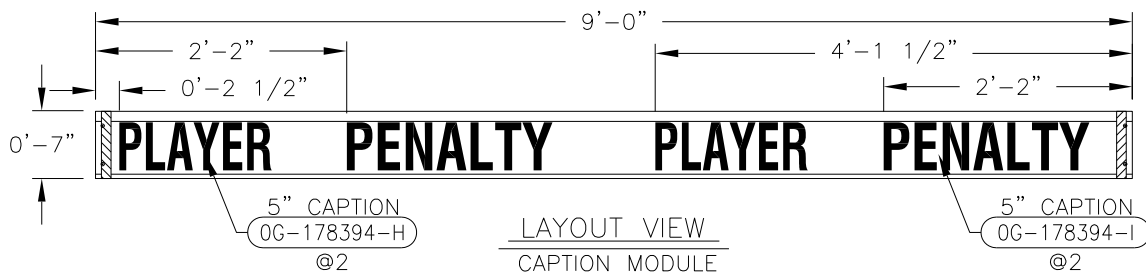
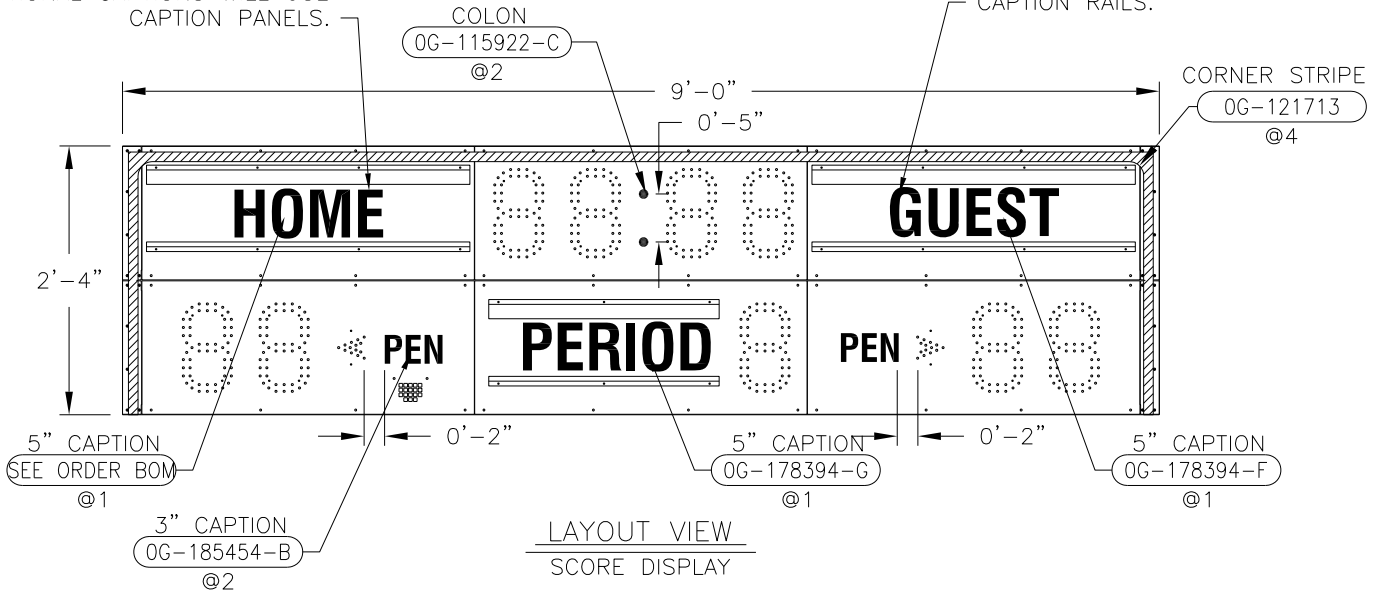
PROJ: OUTDOOR LED DIGIT SCOREBOARDS  
 DAKTRONICS, INC. BROOKINGS, SD 57006

TITLE: LAYOUT VIEW: MS-2015-11/-21- G3  
 DES. BY: MCOPLAN DRAWN BY: MCOPLAN DATE: 02JUN03

REVISION 01  
 APPR. BY: SCALE: 1=15  
 1192-E10A-189437

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

CENTER CAPTIONS HORIZONTALLY AND VERTICALLY BETWEEN CAPTION RAILS.



NOTE: CAPTION PART NUMBERS LISTED ON THIS DRAWING ARE FOR WHITE VINYL CAPTIONS. COLORED CAPTION NUMBERS MAY BE SUBSTITUTED BY ADDING ANOTHER PART LETTER. FOR EXAMPLE, "-B" FOR WHITE CAPTION AND "-BB" FOR A COLORED CAPTION.

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DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: OUTDOOR LED DIGIT SCOREBOARDS

TITLE: LAYOUT VIEW- MS-2014-11/-21- G3

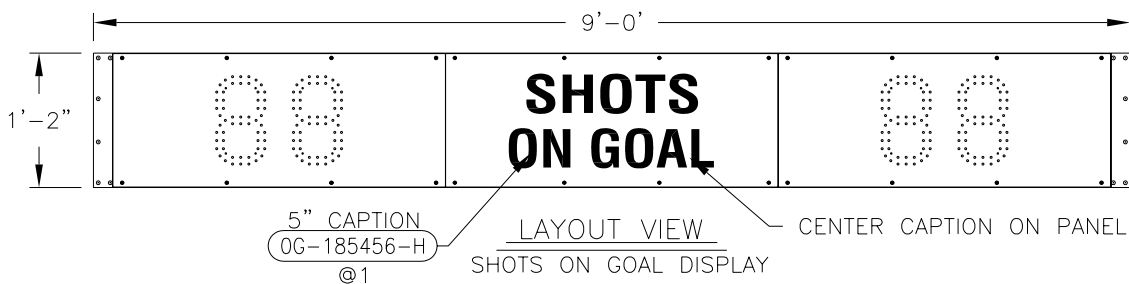
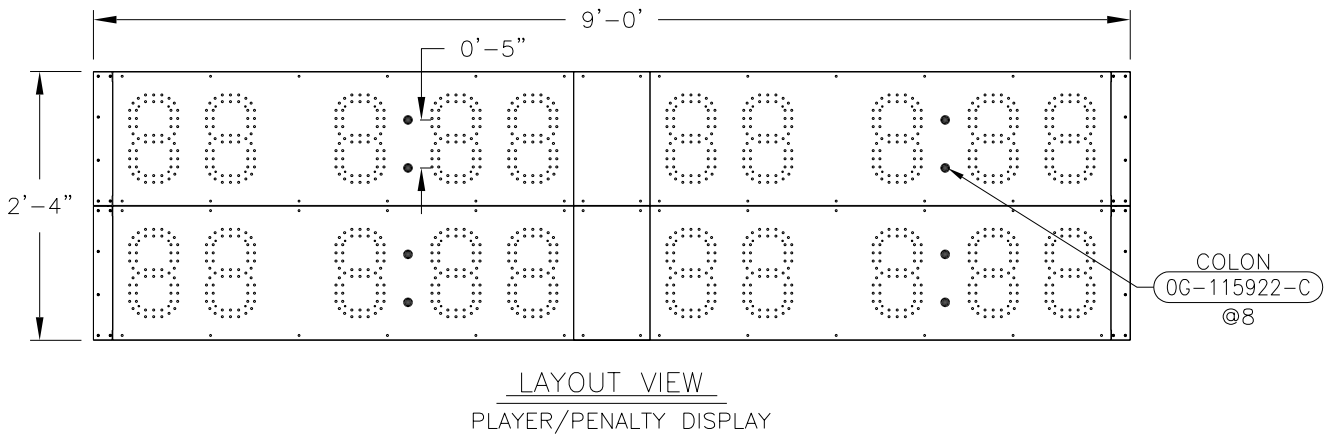
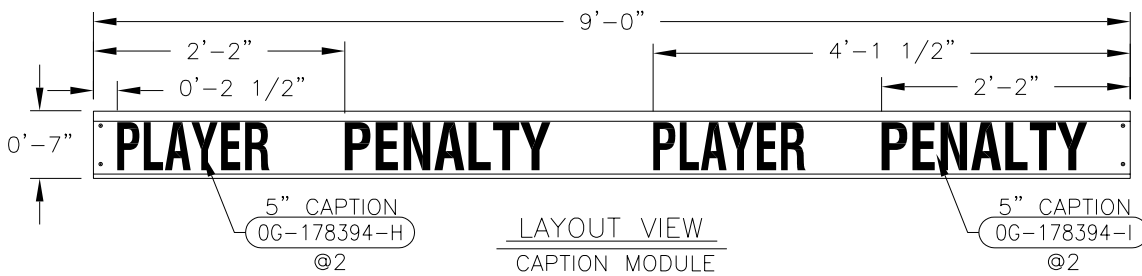
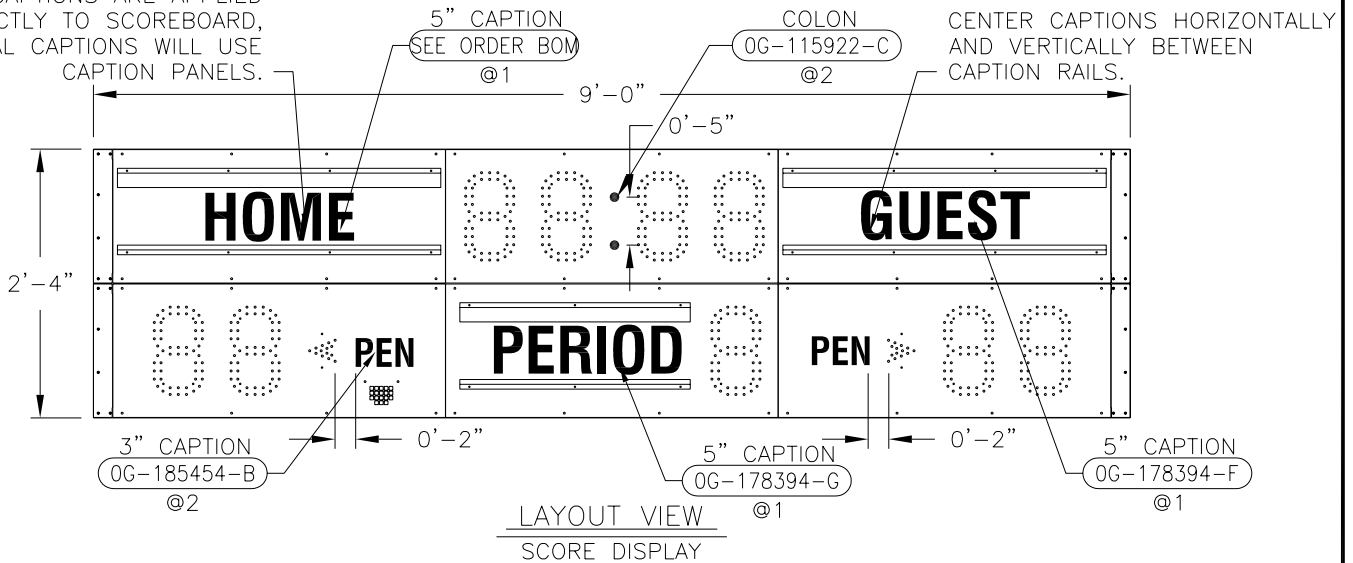
DES. BY: MCOPLAN DRAWN BY: MCOPLAN DATE: 02JUN03

REVISION 01 APPR. BY: SCALE: 1=20

1192-E10A-189446

REV.	DATE	DESCRIPTION	BY	APPR.
01	03 DEC 09	ADDED STRIPING TO SCOREBOARD	JTL	

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



NOTE: CAPTION PART NUMBERS LISTED ON THIS DRAWING ARE FOR WHITE VINYL CAPTIONS. COLORED CAPTION NUMBERS MAY BE SUBSTITUTED BY ADDING ANOTHER PART LETTER. FOR EXAMPLE, "-B" FOR WHITE CAPTION AND "-BB" FOR A COLORED CAPTION.

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 2003 DAKTRONICS, INC.

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: OUTDOOR LED DIGIT SCOREBOARDS

TITLE: LAYOUT VIEW, MS-2018-11/-21, G3

DES. BY: MCOPLAN

DRAWN BY: MCOPLAN

DATE: 02JUN03

REVISION

APPR. BY:

00

SCALE: 1=20

1192-E10A-189492

REV.	DATE	DESCRIPTION	BY	APPR.

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

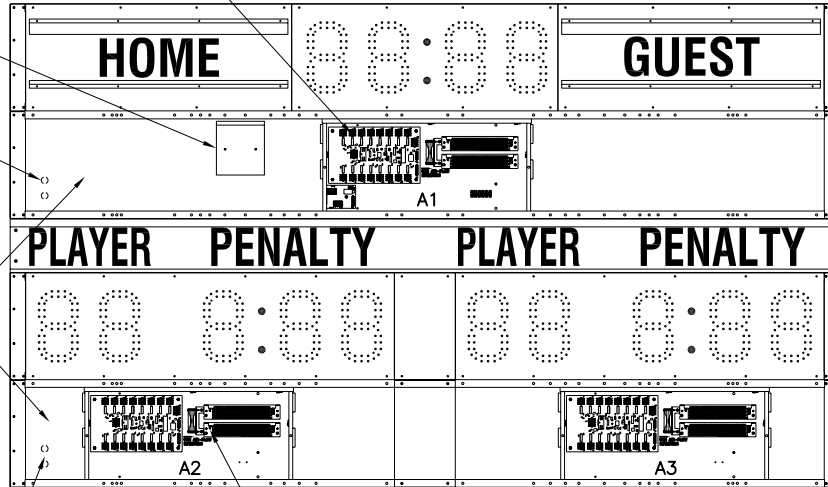
MS-2014-11/-21

12V HORN ENCLOSURE

KNOCKOUTS FOR CONDUIT

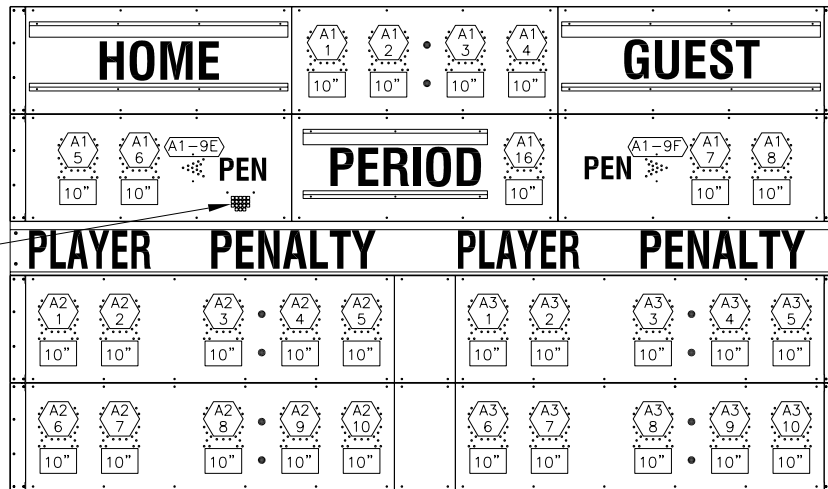
NOTE THAT SEVERAL DIGIT PANELS HAVE BEEN REMOVED TO SHOW COMPONENTS.

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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DAKTRONICS, INC. BROOKINGS, SD 57006			
PROJ: OUTDOOR LED SCOREBOARDS			
TITLE: COMPONENT LOCATIONS; MS-2014-11/-21, G3			
DES. BY: MCOPLAN		DRAWN BY: MCOPLAN	
		DATE: 03JUN03	
REVISION	APPR. BY:	1192-R08A-189532	
	SCALE: 1=25		

REV.	DATE	DESCRIPTION	BY	APPR.

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

MS-2018-11/-21

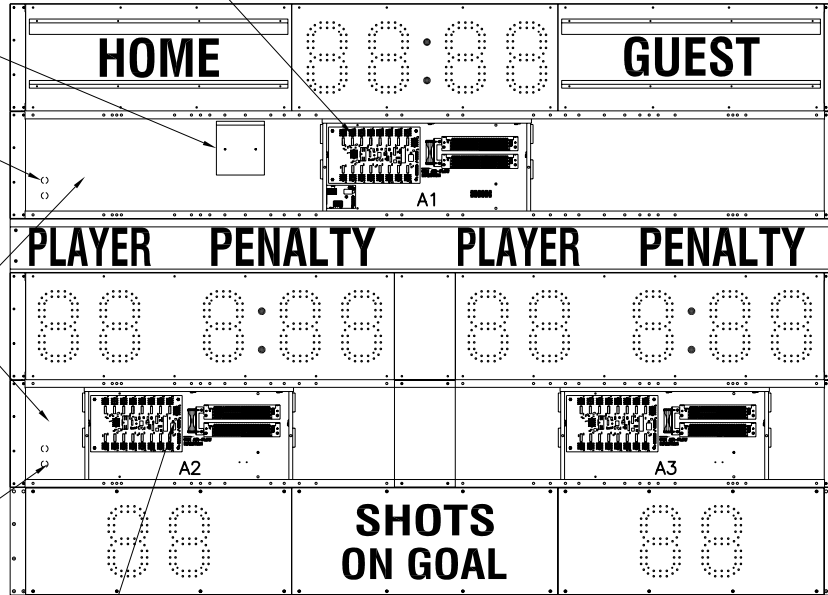
12V HORN ENCLOSURE

KNOCKOUTS FOR CONDUIT

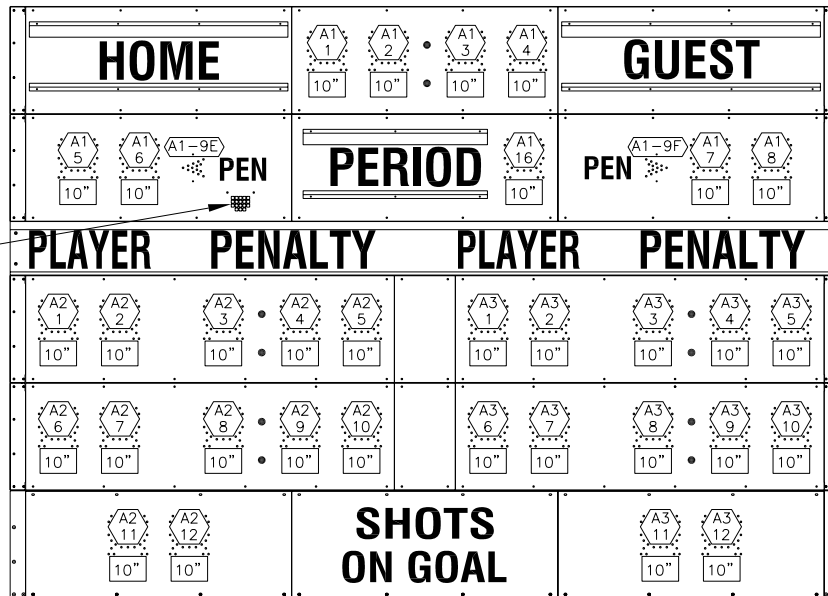
NOTE THAT SEVERAL DIGIT PANELS HAVE BEEN REMOVED TO SHOW COMPONENTS.

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)



FRONT VIEW  
(DIGIT DESIGNATION)

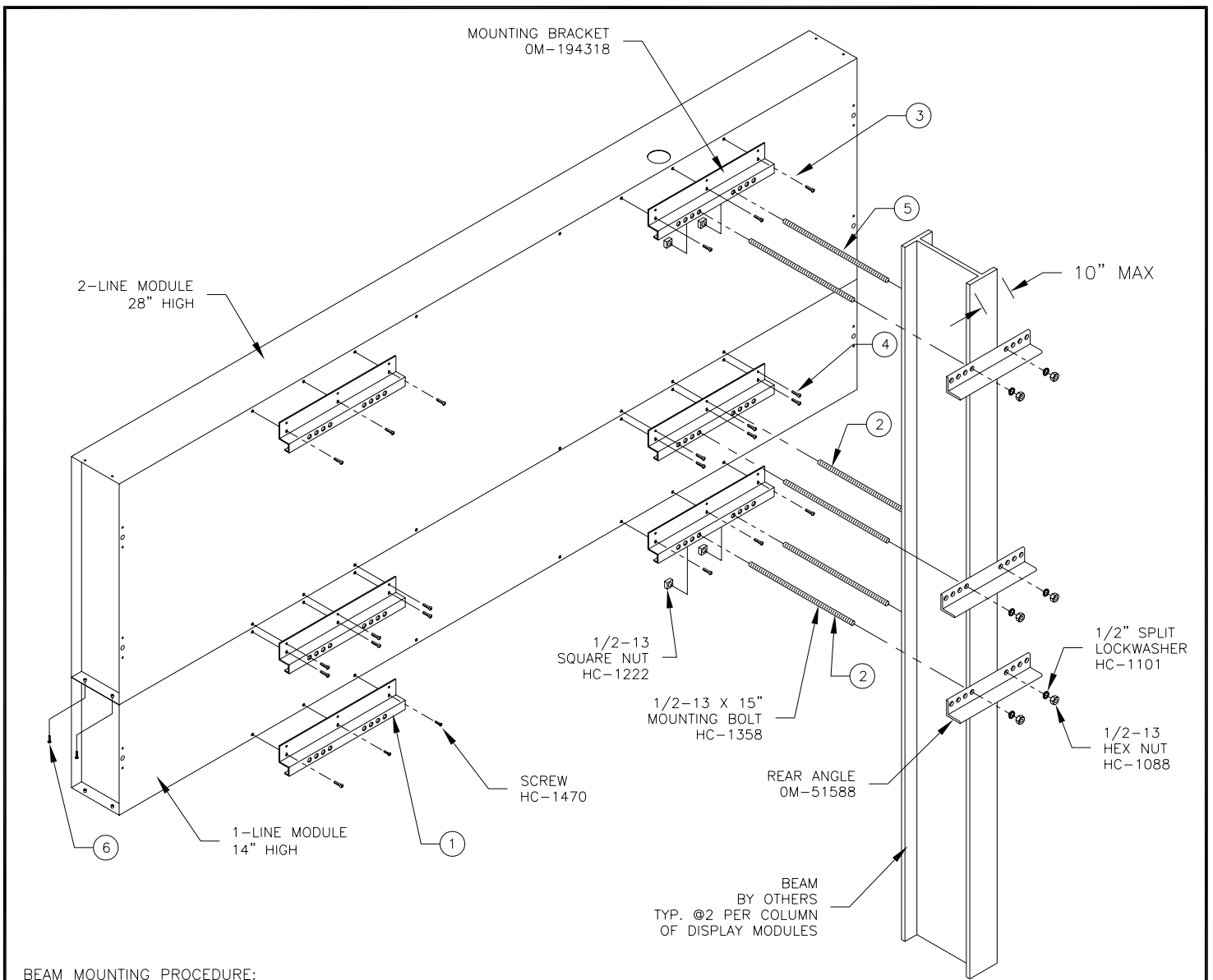
A1-9E = DRIVER CONNECTOR SEGMENT WIRED TO THAT DIGIT

A1 5 = DRIVER CONNECTOR WIRED TO THAT DIGIT

15" = DIGIT SIZE

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 2003 DAKTRONICS, INC.			
DAKTRONICS, INC. BROOKINGS, SD 57006			
PROJ: OUTDOOR LED SCOREBOARDS			
TITLE: COMPONENT LOCATIONS; MS-2018-11/-21, G3			
DES. BY: MCOPLAN		DRAWN BY: MCOPLAN	
		DATE: 03JUN03	
REVISION	APPR. BY:	1192-R08A-189535	
	SCALE: 1=25		

REV.	DATE	DESCRIPTION	BY	APPR.



**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-194671 FOR A SIDE VIEW AND DETAILS.

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DAKTRONICS, INC. BROOKINGS, SD 57006			
PROJ: LED AQUATICS SCOREBOARDS			
TITLE: BEAM MOUNTING PROCEDURE			
DES. BY: A VANBEMMEL		DRAWN BY: M LEOPOLD	
DATE: 11 AUG 03			
REVISION	APPR. BY:	1153-R10A-194664	
00	SCALE: 1=20		

REV.	DATE	DESCRIPTION	BY	APPR.



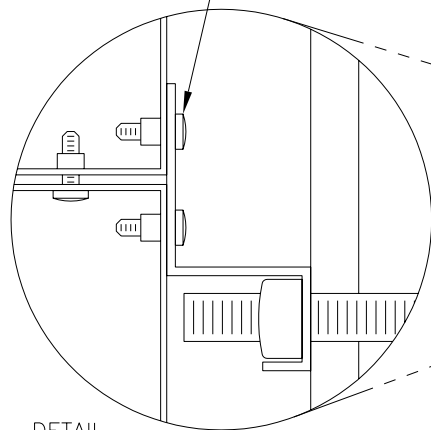
A TYPICAL INSTALLATION MAY BE MADE UP OF 1- & 2-LINE MODULES AND CAPTION MODULES. THEIR SPECIFIC LOCATIONS ARE DETERMINED BY THE SYSTEM SPECIFICATIONS. ONLY ONE OF EACH IS SHOWN HERE.

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-194318

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-51588

1/2-13 NUT  
HC-1088

1/2" SPLIT  
LOCKWASHER  
HC-1101

SEE DRAWING 1153-R10A-194664 FOR A VIEW FROM THE REAR OF THE DISPLAY, AND STEP BY STEP PROCEDURE.

SIDE 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 2003 DAKTRONICS, INC.

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: LED AQUATICS SCOREBOARDS

TITLE: BEAM MOUNTING, SIDE VIEW

DES. BY: A VANBEMMEL

DRAWN BY: M LEOPOLD

DATE: 11 AUG 03

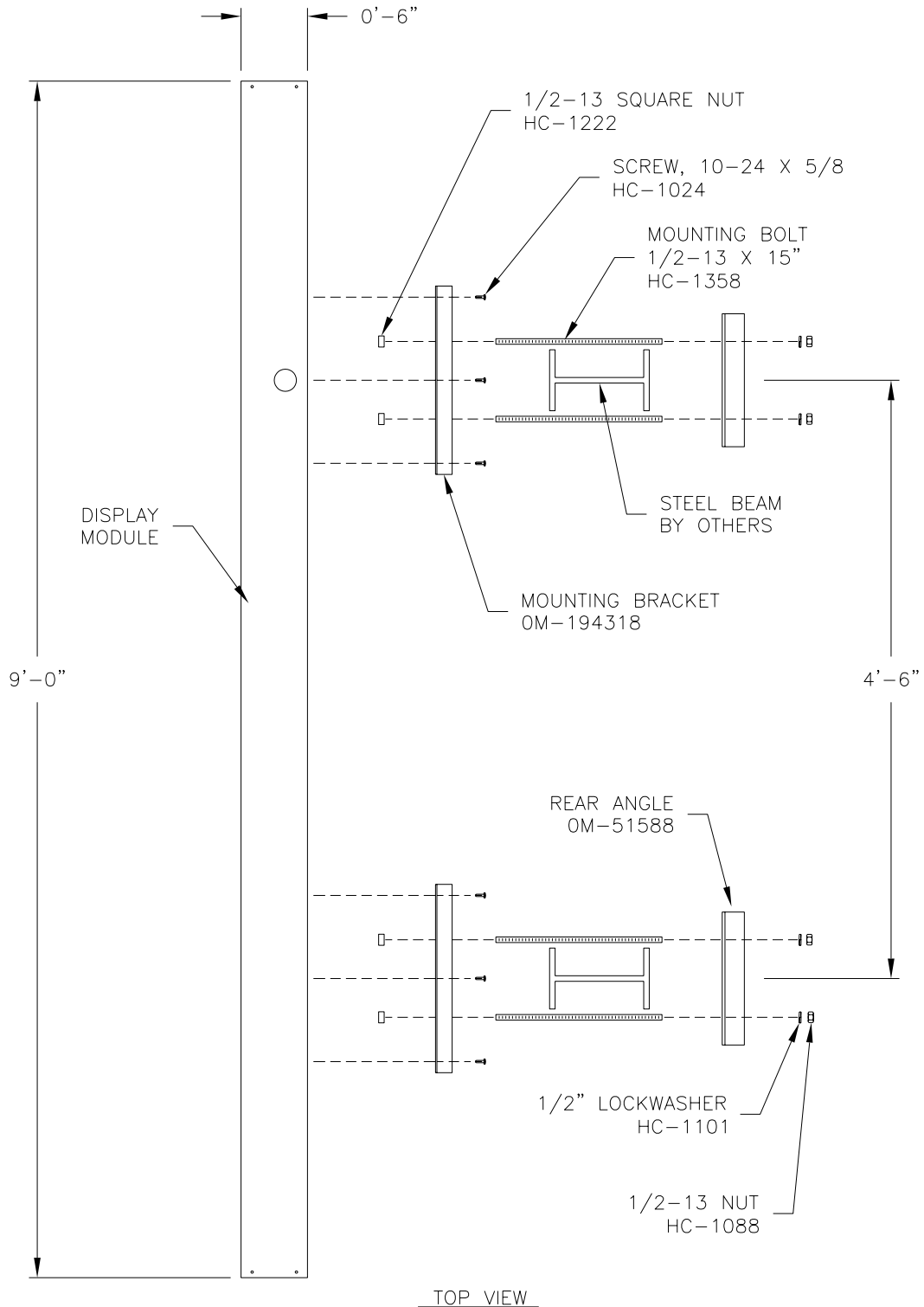
REVISION

APPR. BY:

SCALE: 1=8

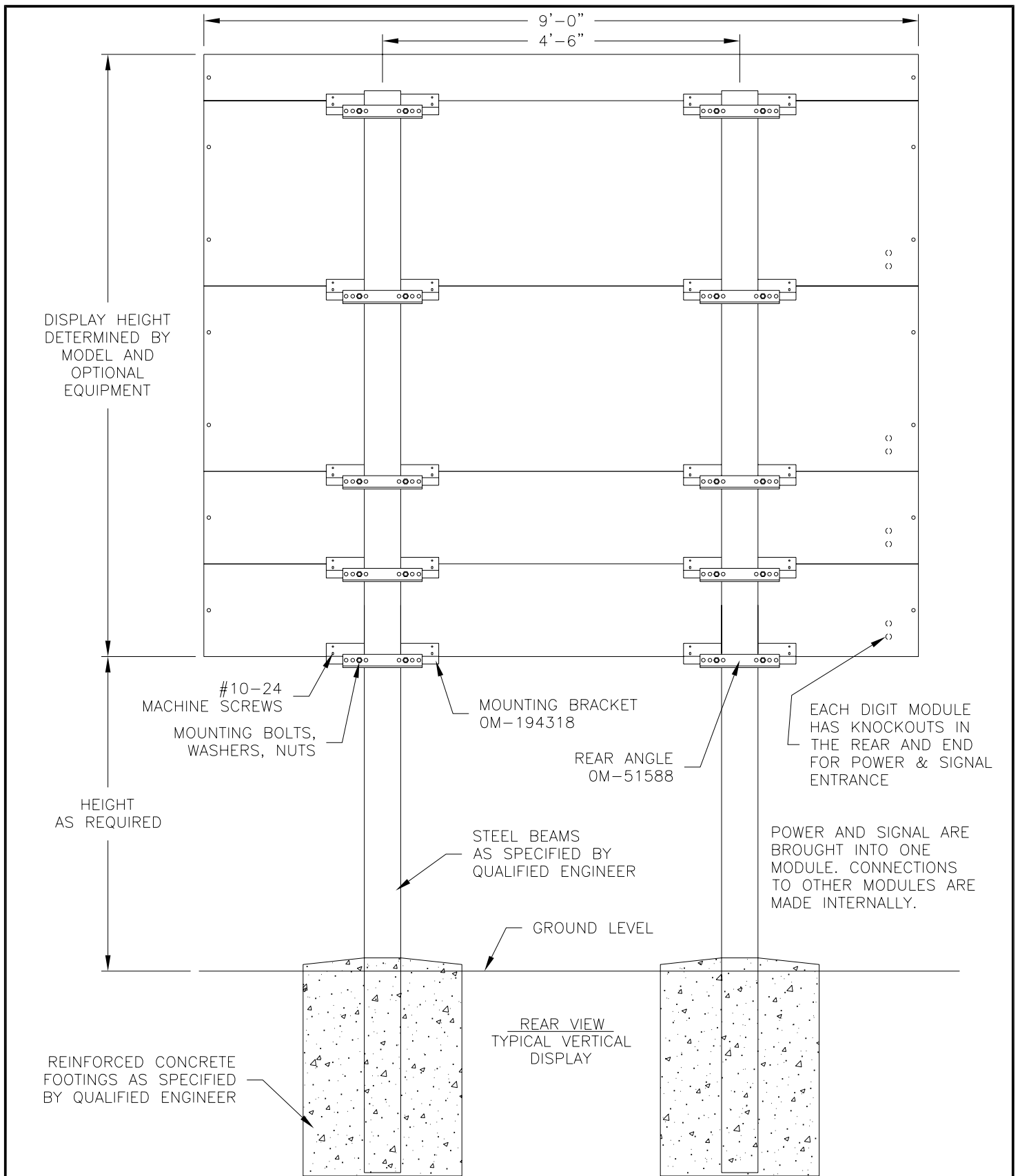
1153-R10A-194671

REV.	DATE	DESCRIPTION	BY	APPR.
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DAKTRONICS, INC. BROOKINGS, SD 57006			
PROJ: LED AQUATICS SCOREBOARDS			
TITLE: BEAM MOUNTING, TOP VIEW			
DES. BY: A VANBEMMEL		DRAWN BY: M LEOPOLD	
		DATE: 11 AUG 03	
REVISION	APPR. BY:	1153-R10A-194674	
00	SCALE: 1=15		

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 2003 DAKTRONICS, INC.

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: LED AQUATICS SCOREBOARDS

TITLE: BEAM MOUNTING, REAR VIEW, VERTICAL DISPLAY

DES. BY: A VANBEMMEL

DRAWN BY: M LEOPOLD

DATE: 11 AUG 03

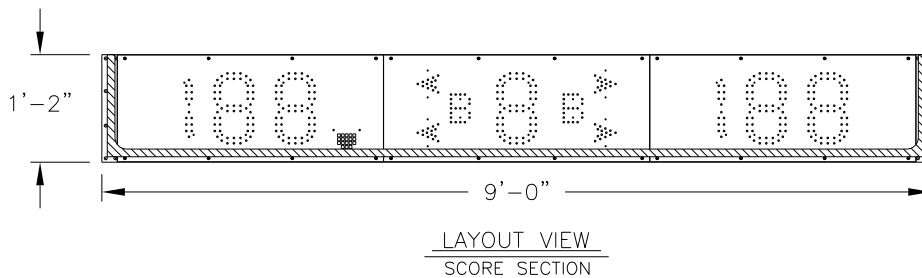
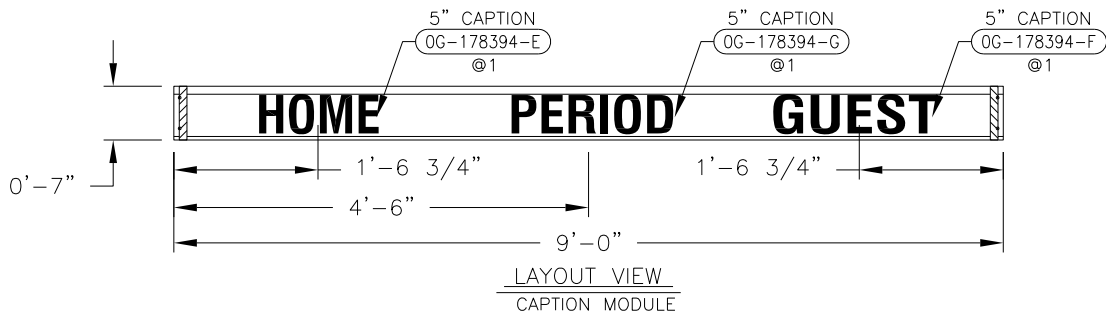
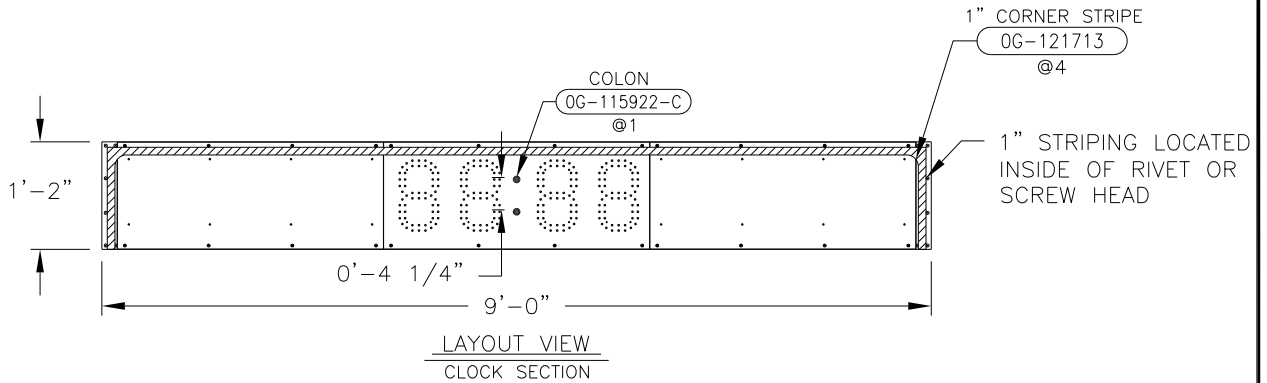
REVISION

APPR. BY:

SCALE: 1=20

1153-R10A-194677

REV.	DATE	DESCRIPTION	BY	APPR.
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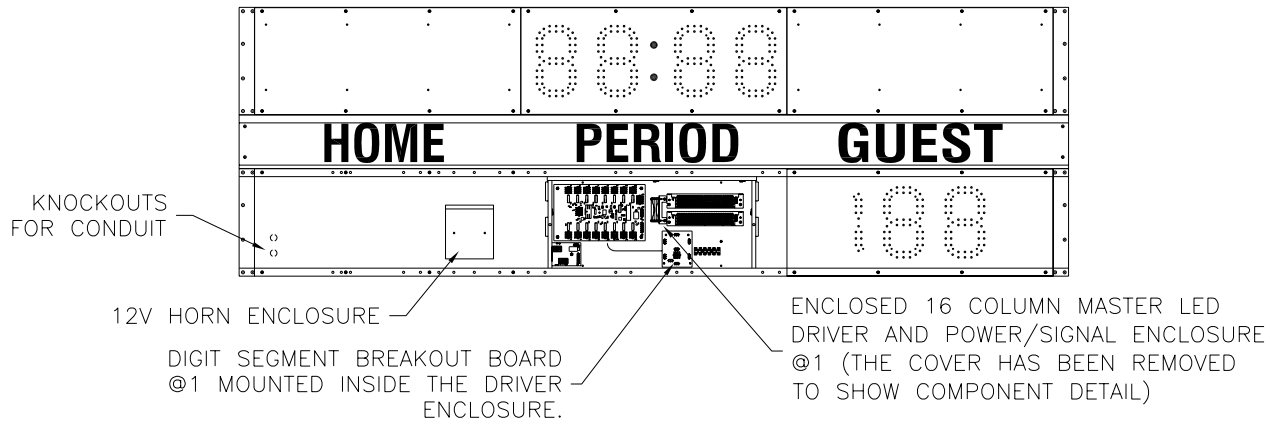


THE CONCEPTS EXPRESSED AND DETAILS SHOWN ON THIS DRAWING ARE CONFIDENTIAL AND PROPRIETARY. DO NOT REPRODUCE BY ANY MEANS, INCLUDING ELECTRONICALLY WITHOUT THE EXPRESSED WRITTEN CONSENT OF DAKTRONICS, INC. COPYRIGHT 2003 DAKTRONICS, INC.

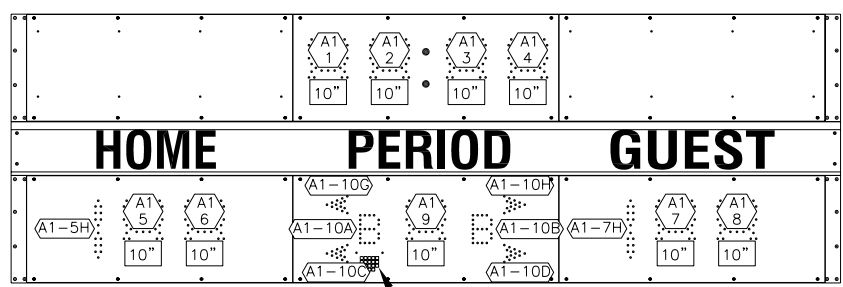
03	03 DEC 09	ADDED STRIPING TO SCOREBOARD	JTL	
02	4/24/07	REPLACED OG-116603-D TO OG-115922-C AND FIXED QTY, ECO 56330	JTK	
01	14NOV05	MOVED HORN LOCATION PER ECO-48694	TAJ	
REV.	DATE	DESCRIPTION	BY	APPR.

DAKTRONICS, INC. BROOKINGS, SD 57006	
PROJ: OUTDOOR LED SCOREBOARDS	
TITLE: LAYOUT VIEW: MS-2016-11- G3	
DES. BY: MCOPLAN	DRAWN BY: MCOPLAN
DATE: 06JAN04	
REVISION	APPR. BY:
03	SCALE: 1=25
1192-E10A-202065	

MS-2016-11/-21



FRONT VIEW  
 (COMPONENT DETAIL)  
 (NOTE THAT SEVERAL DIGIT  
 PANELS HAVE BEEN REMOVED  
 TO SHOW COMPONENTS.)

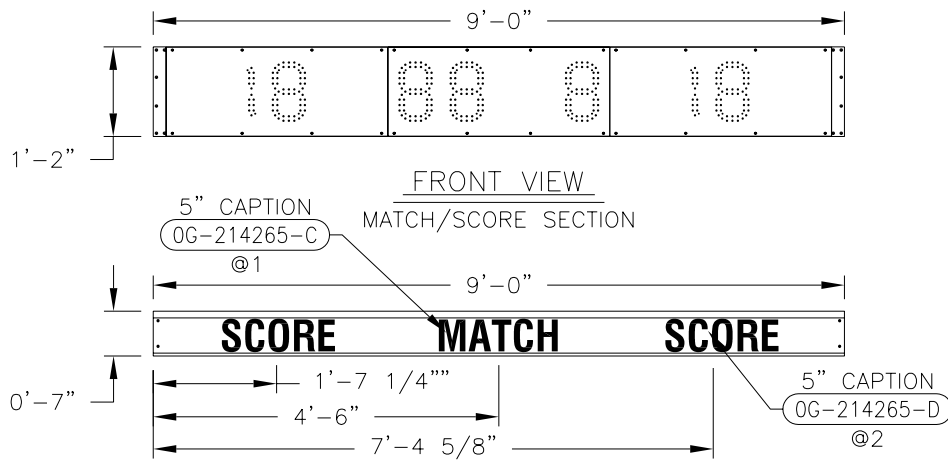
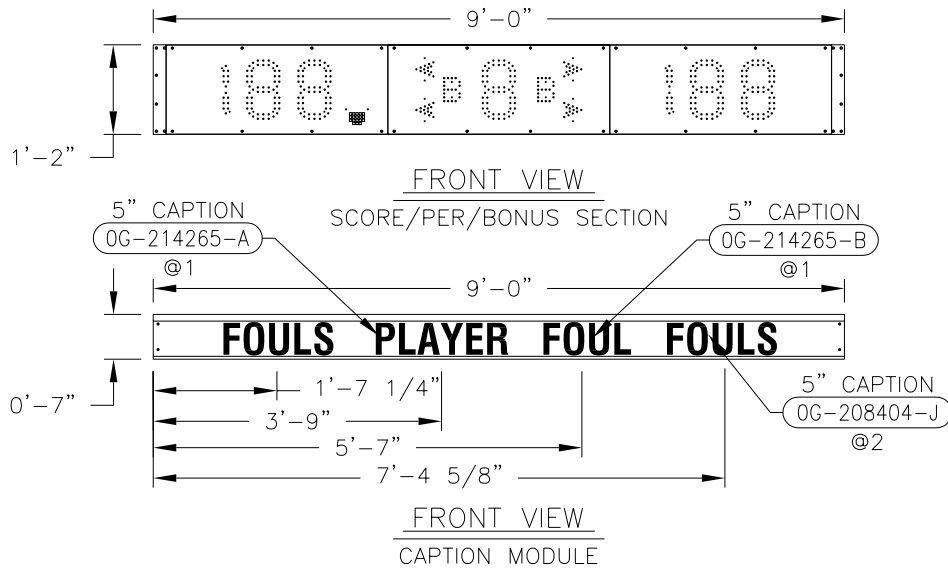
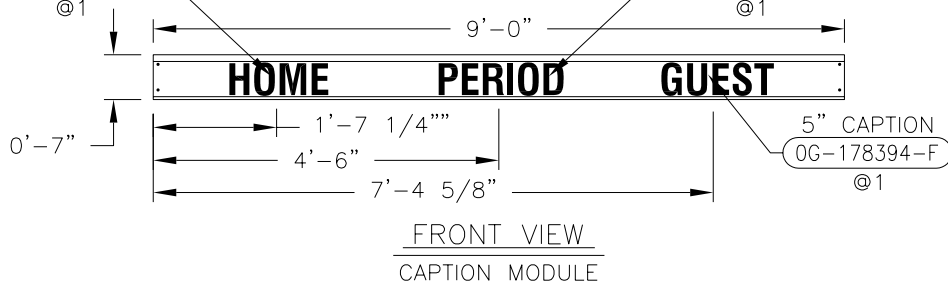
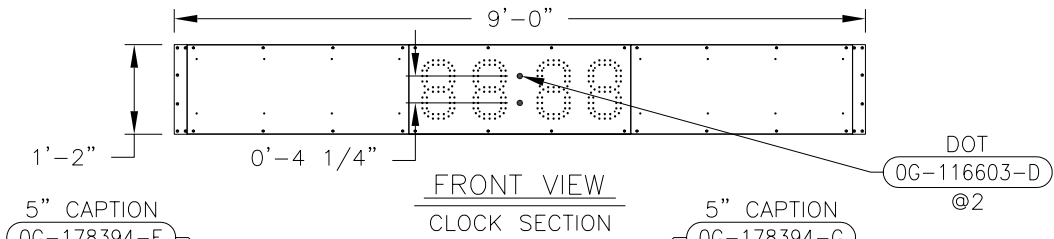


12V HORN  
FRONT VIEW  
 (DIGIT DESIGNATION)

- 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-2016-11/-21, G3			
DES. BY: MCOPLAN		DRAWN BY: MCOPLAN	
		DATE: 08JAN04	
REVISION	APPR. BY:	1192-R08A-202250	
00	SCALE: 1=25		

REV.	DATE	DESCRIPTION	BY	APPR.



NOTE: CAPTION PART NUMBERS LISTED ON THIS DRAWING ARE FOR WHITE VINYL CAPTIONS. COLORED CAPTION NUMBERS MAY BE SUBSTITUTED BY ADDING ANOTHER PART LETTER. FOR EXAMPLE, "-B" FOR WHITE CAPTION AND "-BB" FOR A COLORED CAPTION.

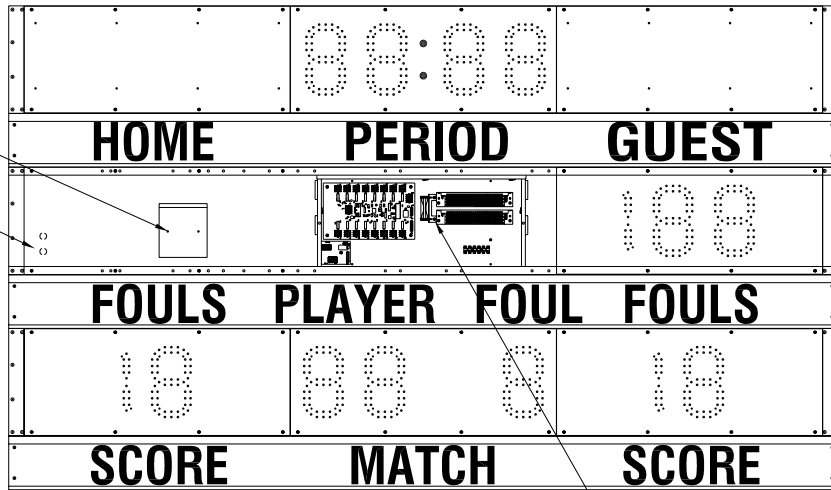
FRONT VIEW  
CAPTION MODULE

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 2004 DAKTRONICS, INC.			
DAKTRONICS, INC. BROOKINGS, SD 57006			
PROJ: OUTDOOR LED SCOREBOARDS			
TITLE: LAYOUT VIEW; MS-2017-11/-21, G3			
DES. BY: MCOPLAN		DRAWN BY: MCOPLAN	
		DATE: 03JUN04	
REVISION	APPR. BY:	1192-E10A-213041	
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REV.	DATE	DESCRIPTION	BY	APPR.

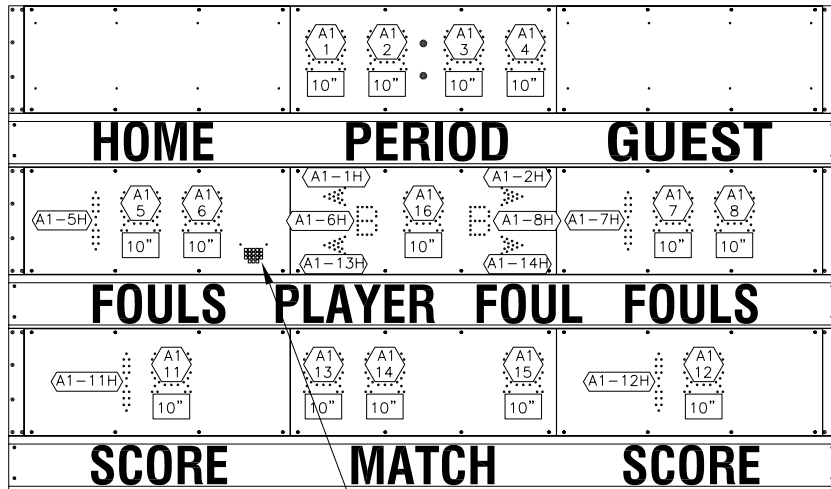
MS-2017-11/-21

12V HORN ENCLOSURE  
KNOCKOUTS FOR CONDUIT



FRONT VIEW  
(COMPONENT DETAIL)  
(NOTE THAT SEVERAL DIGIT PANELS HAVE BEEN REMOVED TO SHOW COMPONENTS.)

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



12V HORN  
FRONT VIEW  
(DIGIT DESIGNATION)

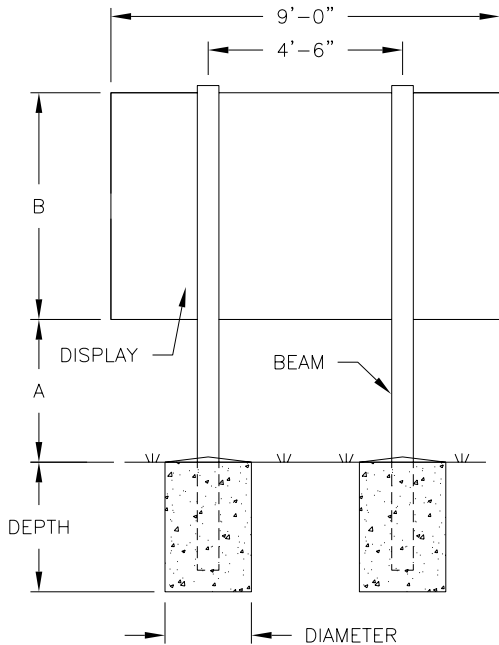
- A1-9E = DRIVER CONNECTOR SEGMENT WIRED TO THAT DIGIT
- A1 5 = DRIVER CONNECTOR WIRED TO THAT DIGIT
- 15" = DIGIT SIZE

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DAKTRONICS, INC. BROOKINGS, SD 57006			
PROJ: OUTDOOR LED SCOREBOARDS			
TITLE: COMPONENT LOCATIONS; MS-2017-11/-21, G3			
DES. BY: MCOPLAN		DRAWN BY: MCOPLAN	
		DATE: 02JUN04	
<b>REVISION</b>	APPR. BY:	1192-R08A-214362	
00	SCALE: 1=25		

REV.	DATE	DESCRIPTION	BY	APPR.

MODEL MS-2017

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	W10X15	W6X15	W6X15	W8X18
			FOOTING	3.0 X 4.3	3.0 X 4.7	3.0 X 5.2	3.0 X 5.5
15'-0"	2'-4"	7'-7"	BEAM	W8X18	W6X20	W6X20	W8X24
			FOOTING	3.0 X 4.9	3.0 X 5.4	3.0 X 5.9	3.0 X 6.4
20'-0"	NONE	5'-3"	BEAM	W6X20	W8X24	W12X26	W12X26
			FOOTING	3.0 X 4.9	3.0 X 5.4	3.0 X 5.9	3.0 X 6.3
10'-0"	2'-4"	7'-7"	BEAM	W12X26	W14X30	W12X30	W8X31
			FOOTING	3.0 X 5.6	3.0 X 6.1	3.0 X 6.7	3.0 X 7.2
15'-0"	NONE	5'-3"	BEAM	W14X30	W8X31	W8X31	W10X33
			FOOTING	3.0 X 5.5	3.0 X 6.0	3.0 X 6.6	3.0 X 7.1
20'-0"	2'-4"	7'-7"	BEAM	W8X31	W10X33	W10X39	W10X39
			FOOTING	3.0 X 6.2	3.0 X 6.8	3.0 X 7.4	3.0 X 8.0



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.

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DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: OUTDOOR LED DIGIT SCOREBOARD

TITLE: BEAM & FOOTING RECOMENDATIONS, MS-2017-11

DES. BY: MCOPL/RNEYEN DRAWN BY: MCOPLAN DATE: 03JUN04

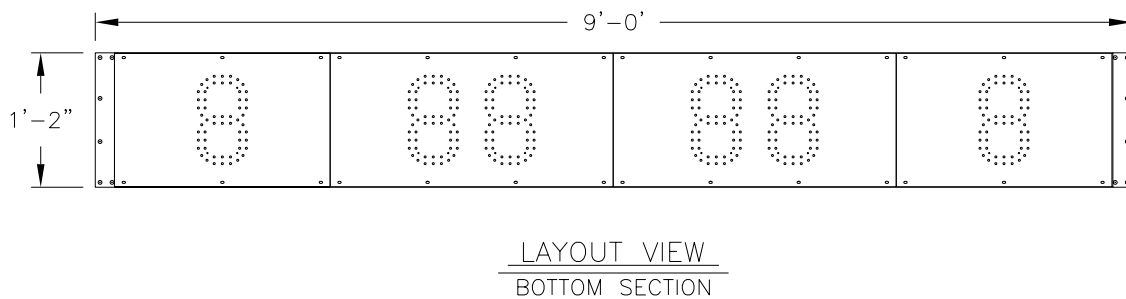
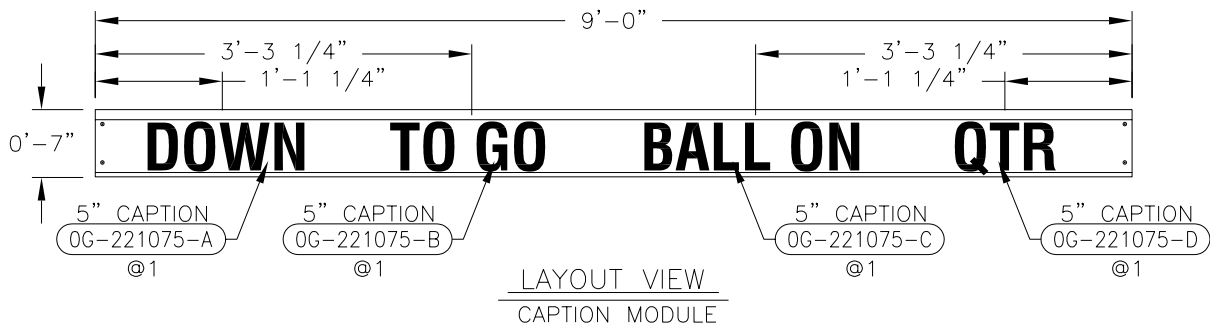
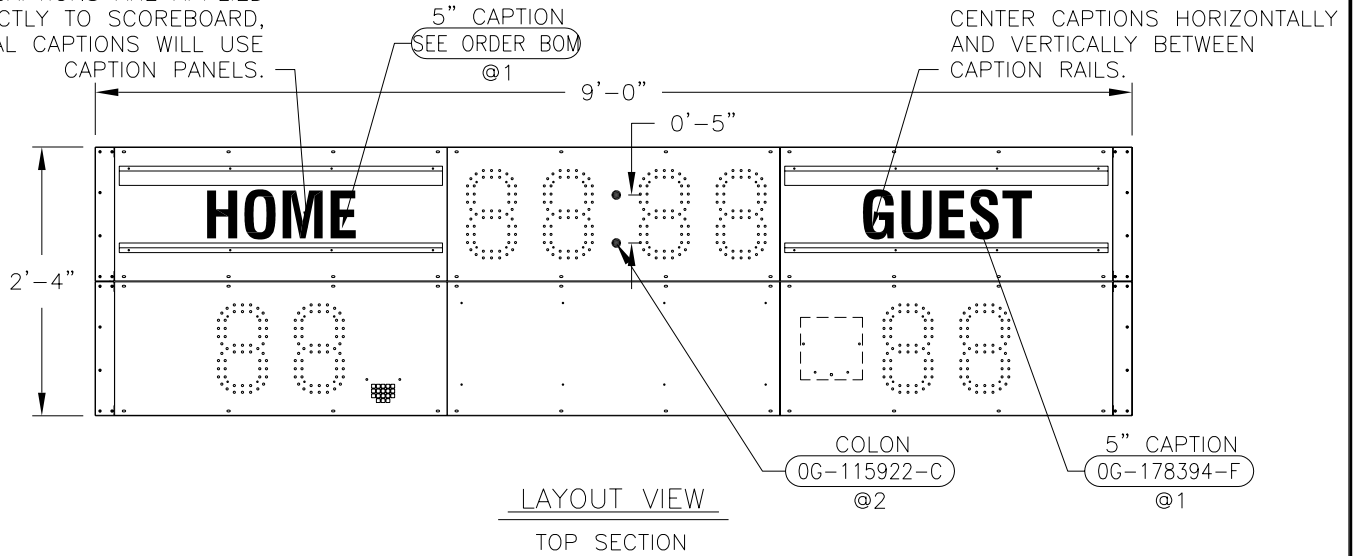
REVISION 00 APPR. BY: SCALE: 1=40

1192-R04A-214370

REV.	DATE	DESCRIPTION	BY	APPR.



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

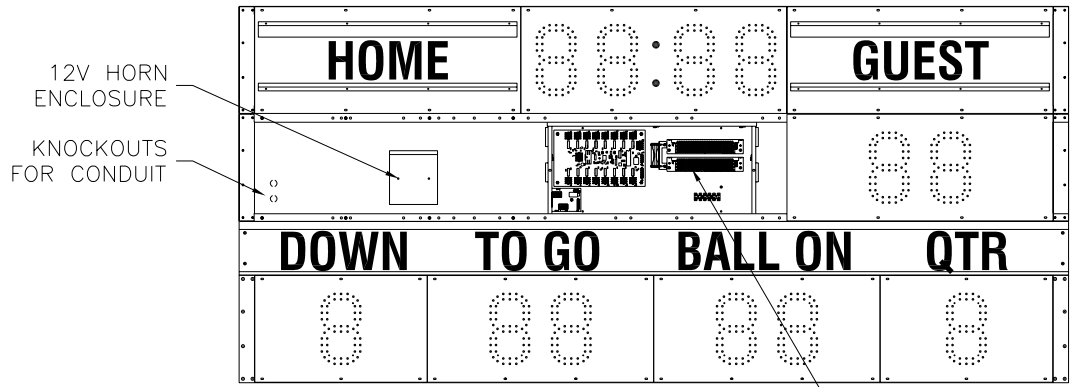


NOTE: CAPTION PART NUMBERS LISTED ON THIS DRAWING ARE FOR WHITE VINYL CAPTIONS. COLORED CAPTION NUMBERS MAY BE SUBSTITUTED BY ADDING ANOTHER PART LETTER. FOR EXAMPLE, "-B" FOR WHITE CAPTION AND "-BB" FOR A COLORED CAPTION.

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DAKTRONICS, INC. BROOKINGS, SD 57006			
PROJ: OUTDOOR LED DIGIT SCOREBOARDS			
TITLE: LAYOUT VIEW, FB-2006-11/-21, G3			
DES. BY: MCOPLAN		DRAWN BY: MCOPLAN	
DATE: 11AUG04			
REVISION	APPR. BY:	1192-E10A-221063	
01	SCALE: 1=20		

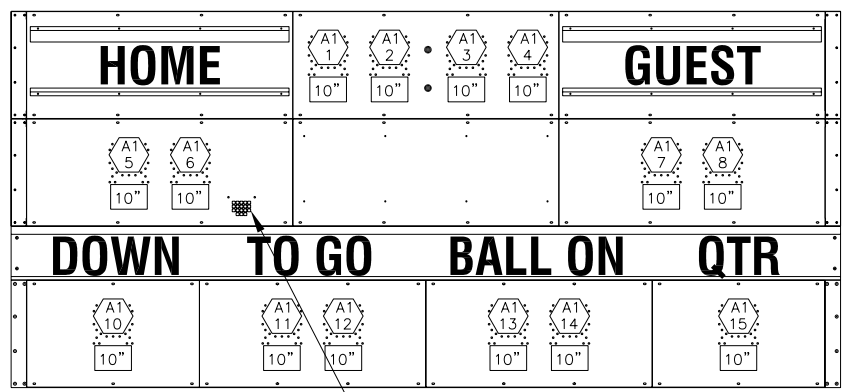
01	18APR06	ADDED RADIO BRACKET	TAJ	
REV.	DATE	DESCRIPTION	BY	APPR.

FB-2006-11/-21



FRONT VIEW  
 (COMPONENT DETAIL)  
 (NOTE THAT SEVERAL DIGIT PANELS HAVE BEEN REMOVED TO SHOW COMPONENTS.)

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



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; FB-2006-11/-21, G3

DES. BY: MCOPLAN

DRAWN BY: MCOPLAN

DATE: 11AUG04

REVISION

APPR. BY:

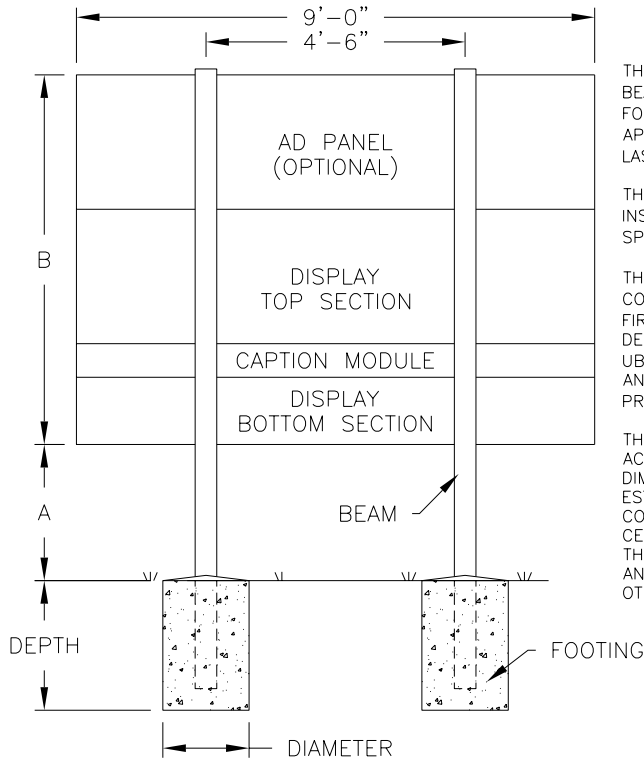
SCALE: 1=25

1192-R08A-221085

REV.	DATE	DESCRIPTION	BY	APPR.

MODEL FB-2006-11/-21

VERTICAL DISTANCE (A)	AD PANEL HEIGHT	COMBINED HEIGHT (B)		DESIGN WIND VELOCITY			
				70 MPH	80 MPH	90 MPH	100 MPH
10'-0"	NONE	4'-1"	BEAM	W10X12	W10X15	W10X15	W10X15
			FOOTING	3.0 X 3.9	3.0 X 4.3	3.0 X 4.7	3.0 X 5.1
	2'-4"	6'-5"	BEAM	W6X15	W8X18	W6X20	W6X20
			FOOTING	3.0 X 4.6	3.0 X 5.1	3.0 X 5.5	3.0 X 6.0
15'-0"	NONE	4'-1"	BEAM	W8X18	W6X20	W6X20	W8X24
			FOOTING	3.0 X 4.6	3.0 X 5.1	3.0 X 5.5	3.0 X 5.9
	2'-4"	6'-5"	BEAM	W12X26	W12X26	W12X26	W14X30
			FOOTING	3.0 X 5.2	3.0 X 5.8	3.0 X 6.3	3.0 X 6.8
20'-0"	NONE	4'-1"	BEAM	W12X26	W14X30	W14X30	W8X31
			FOOTING	3.0 X 5.1	3.0 X 5.6	3.0 X 6.1	3.0 X 6.6
	2'-4"	6'-5"	BEAM	W8X31	W8X31	W10X33	W10X39
			FOOTING	3.0 X 5.9	3.0 X 6.5	3.0 X 7.0	3.0 X 7.6



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.

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DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: OUTDOOR LED DIGIT SCOREBOARD

TITLE: BEAM & FOOTING RECOMENDATIONS, FB-2006-11/-21

DES. BY: MCOPL/JBRIGG DRAWN BY: MCOPLAN DATE: 11AUG04

REVISION 00 APPR. BY: SCALE: 1=40

1192-R04A-221087

REV.	DATE	DESCRIPTION	BY	APPR.

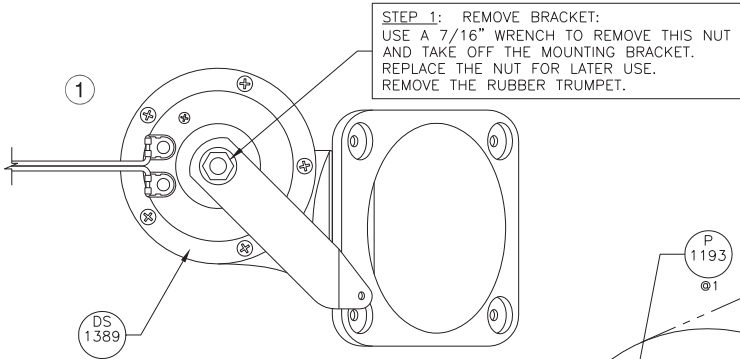


# Appendix B: Scoreboard Options

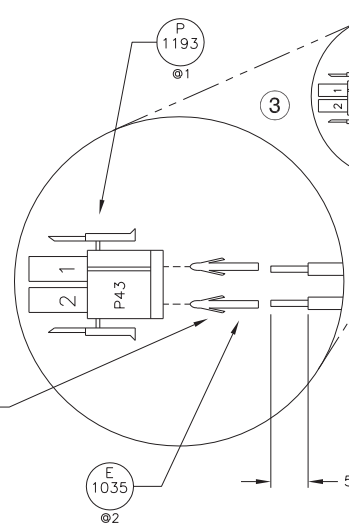
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<i>Drawing Title</i>	<i>Drawing Number</i>
Horn, 12 V DC w/Filter.....	B-111265
Caption Module Detail .....	A-130840





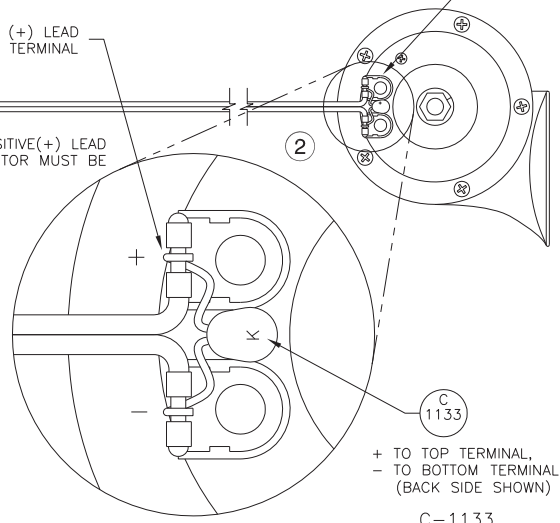
STEP 2: KEEPING LEADS AS SHORT AS POSSIBLE, SOLDER CAPACITOR LEADS TO THE TERMINALS ON THE HORN. NOTE POLARITY. SEE DETAIL.



STEP 3: CRIMP ON MALE PINS E-1035 AND PLUG INTO M-N-L CONNECTOR.

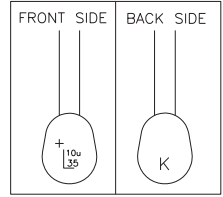
SOLDER (+) LEAD TO THE TOP TERMINAL

WIRE TO POSITIVE(+) LEAD FROM CAPACITOR MUST BE TO PIN 1.

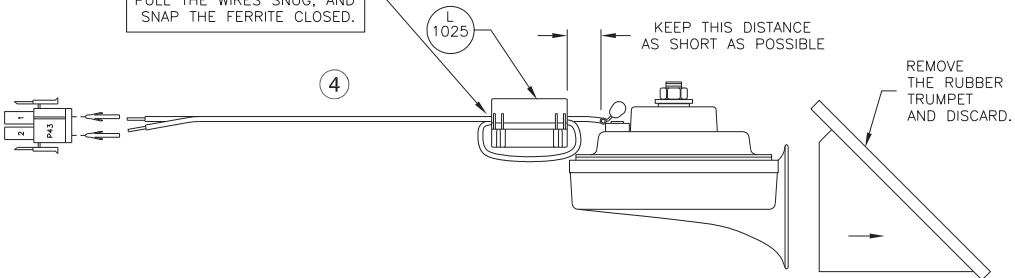


+ TO TOP TERMINAL,  
- TO BOTTOM TERMINAL.  
(BACK SIDE SHOWN)

C-1133



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



07	11 JUL 07	CREATED C-1133 CAPTION	AMG		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	07
										APPR. BY:	
										SCALE:	1=2
										1072-E10B-111265	

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.



## **Appendix C: Daktronics Warranty and Limitation of Liability**

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**DAKTRONICS  
WARRANTY AND LIMITATION OF LIABILITY**

This Warranty and Limitation of Liability (the "Warranty") sets forth the warranty provided by Daktronics with respect to the Equipment. By accepting delivery of the Equipment, Purchaser agrees to be bound by and accept these terms and conditions. All defined terms within the Warranty shall have the same meaning and definition as provided elsewhere in the Agreement.

DAKTRONICS WILL ONLY BE OBLIGATED TO HONOR THE WARRANTY SET FORTH IN THESE TERMS AND CONDITIONS UPON RECEIPT OF FULL PAYMENT FOR THE EQUIPMENT.

**1. Warranty Coverage**

A. Daktronics warrants to the original end-user that the Equipment will be free from Defects (as defined below) in materials and workmanship for a period of one (1) year (the "Warranty Period"). The warranty period shall commence on the earlier of: (i) four weeks from the date that the equipment leaves Daktronics' facility; or (ii) Substantial Completion as defined herein. The warranty period shall expire on the first anniversary of the commencement date.

"Substantial Completion" means the operational availability of the Equipment to the Purchaser in accordance with the Equipment's specifications, without regard to punch-list items, or other non-substantial items which do not affect the operation of the Equipment.

B. Daktronics' obligation under this Warranty is limited to, at Daktronics' option, replacing or repairing, any Equipment or part thereof that is found by Daktronics not to conform to the Equipment's specifications. Unless otherwise directed by Daktronics, any defective part or component shall be returned to Daktronics for repair or replacement. Daktronics may, at its option, provide on-site warranty service. Daktronics shall have a reasonable period of time to make such replacements or repairs and all labor associated therewith shall be performed during regular working hours. Regular working hours are Monday through Friday between 8:00 a.m. and 5:00 p.m. at the location where labor is performed, excluding any holidays observed by either Purchaser or Daktronics.

C. Daktronics shall pay ground transportation charges for the return of any defective component of the Equipment. If returned Equipment is repaired or replaced under the terms of this warranty, Daktronics will prepay ground transportation charges back to Purchaser; otherwise, Purchaser shall pay transportation charges to return the Equipment back to the Purchaser. All returns must be pre-approved by Daktronics before shipment. Daktronics shall not be obligated to pay freight for any unapproved return. Purchaser shall pay any upgraded or expedited transportation charges.

D. Any replacement parts or Equipment will be new or serviceably used, comparable in function and performance to the original part or Equipment, and warranted for the remainder of the Warranty Period. Purchasing additional parts or Equipment from the Seller does not extend this Warranty Period.

E. Defects shall be defined as follows. With regard to the Equipment (excepting LEDs), a "Defect" shall refer to a material variance from the design specifications that prohibit the Equipment from operating for its intended use. With respect to LEDs, "Defects" are defined as LED pixels that cease to emit light. The limited warranty provided by Daktronics does not impose any duty or liability upon Daktronics for partial LED pixel degradation. Nor does the limited warranty provide for the replacement or installation of communication methods including but not limited to, wire, fiber optic cable, conduit, trenching, or for the purpose of overcoming local site interference radio equipment substitutions.

THIS LIMITED WARRANTY IS THE ONLY WARRANTY APPLICABLE TO THE EQUIPMENT AND REPLACES ALL OTHER WARRANTIES OR CONDITIONS, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OR CONDITIONS OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. SPECIFICALLY, EXCEPT AS PROVIDED HEREIN, THE SELLER UNDERTAKES NO RESPONSIBILITY FOR THE QUALITY OF THE EQUIPMENT OR THAT THE EQUIPMENT WILL BE FIT FOR ANY PARTICULAR PURPOSE FOR WHICH PURCHASER MAY BE BUYING THE EQUIPMENT. ANY IMPLIED WARRANTY IS LIMITED IN DURATION TO THE WARRANTY PERIOD. NO ORAL OR WRITTEN INFORMATION, OR ADVICE GIVEN BY THE COMPANY, ITS AGENTS OR EMPLOYEES, SHALL CREATE A WARRANTY OR IN ANY WAY INCREASE THE SCOPE OF THIS LIMITED WARRANTY.

THIS LIMITED WARRANTY IS NOT TRANSFERABLE.

**2. Exclusion from Warranty Coverage**

The limited warranty provided by Daktronics does not impose any duty or liability upon Daktronics for:

A. Any damage occurring, at any time, during shipment of Equipment unless otherwise provided for in the Agreement. When returning Equipment to Daktronics for repair or replacement, Purchaser assumes all risk of loss or damage, and agrees to use any shipping containers that might be provided by Daktronics and to ship the Equipment in the manner prescribed by Daktronics;

B. Any damage caused by the unauthorized adjustment, repair or service of the Equipment by anyone other than personnel of Daktronics or its authorized repair agents;

C. Damage caused by the failure to provide a continuously suitable environment, including, but not limited to: (i) neglect or misuse, (ii) a failure or sudden surge of electrical power, (iii) improper air conditioning or humidity control, or (iv) any other cause other than ordinary use;

D. Damage caused by fire, flood, earthquake, water, wind, lightning or other natural disaster, strike, inability to obtain materials or utilities, war, terrorism, civil disturbance or any other cause beyond Daktronics' reasonable control;

E. Failure to adjust, repair or replace any item of Equipment if it would be impractical for Daktronics personnel to do so because of connection of the Equipment by mechanical or electrical means to another device not supplied by Daktronics, or the existence of general environmental conditions at the site that pose a danger to Daktronics personnel;

F. Any statements made about the product by salesmen, dealers, distributors or agents, unless such statements are in a written document signed by an officer of Daktronics. Such statements as are not included in a signed writing do not constitute warranties, shall not be relied upon by Purchaser and are not part of the contract of sale;

G. Any damage arising from the use of Daktronics products in any application other than the commercial and industrial applications for which they are intended, unless, upon request, such use is specifically approved in writing by Daktronics; or

H. Any performance of preventive maintenance.

### 3. **Limitation of Liability**

Daktronics shall be under no obligation to furnish continued service under this Warranty if alterations are made to the Equipment without the prior written approval of Daktronics.

It is specifically agreed that the price of the Equipment is based upon the following limitation of liability. In no event shall Daktronics (including its subsidiaries, affiliates, officers, directors, employees, or agents) be liable for any special, consequential, incidental or exemplary damages arising out of or in any way connected with the Equipment or otherwise, including but not limited to damages for lost profits, cost of substitute or replacement equipment, down time, lost data, injury to property or any damages or sums paid by Purchaser to third parties, even if Daktronics has been advised of the possibility of such damages. The foregoing limitation of liability shall apply whether any claim is based upon principles of contract, tort or statutory duty, principles of indemnity or contribution, or otherwise.

In no event shall Daktronics be liable to Purchaser or any other party for loss, damage, or injury of any kind or nature arising out of or in connection with this Warranty in excess of the purchase price of the Equipment actually delivered to and paid for by the Purchaser. The Purchaser's remedy in any dispute under this Warranty shall be ultimately limited to the Purchase Price of the Equipment to the extent the Purchase Price has been paid.

### 4. **Assignment of Rights**

The Warranty contained herein extends only to the original end-user (which may be the Purchaser) of the Equipment and no attempt to extend the Warranty to any subsequent user-transferee of the Equipment shall be valid or enforceable without the express written consent of Daktronics.

### 5. **Dispute Resolution**

Any dispute between the parties will be resolved exclusively and finally by arbitration administered by the American Arbitration Association ("AAA") and conducted under its rules, except as otherwise provided below. The arbitration will be conducted before a single arbitrator. The arbitration shall be held in Brookings, South Dakota. Any decision rendered in such arbitration proceedings will be final and binding on each of the parties, and judgment may be entered thereon in any court of competent jurisdiction. This arbitration agreement is made pursuant to a transaction involving interstate commerce, and shall be governed by the Federal Arbitration Act.

### 6. **Governing Law**

The rights and obligations of the parties under this warranty shall not be governed by the provisions of the United Nations Convention on Contracts for the International Sales of Goods of 1980. Both parties consent to the application of the laws of the State of South Dakota to govern, interpret, and enforce all of Purchaser and Daktronics rights, duties, and obligations arising from, or relating in any manner to, the subject matter of this Warranty, without regard to conflict of law principles.

### 7. **Availability of Extended Service Agreement**

For Purchaser's protection, in addition to that afforded by the warranties set forth herein, Purchaser may purchase extended warranty services to cover the Equipment. The Extended Service Agreement, available from Daktronics, provides for electronic parts repair and/or on-site labor for an extended period from the date of expiration of this warranty. Alternatively, an Extended Service Agreement may be purchased in conjunction with this warranty for extended additional services. For further information, contact Daktronics Customer Service at 1-800-DAKTRONics (1-800-325-8766).