LED Tennis Scoreboards
5” and 10” Numeric Digit

Installation and Maintenance Manual

ED-12420 ***Rev 8 – 08 August 2006***

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Table of Contents

Section 1: Introduction

1.1 How to Use This Manual

This manual is designed to explain installation and maintenance of Daktronics LED tennis scoreboards. The manual is divided into five main sections:

Introduction, which offers basic explanations and provides a brief overview.

Mechanical Installation, which details techniques for proper mounting of the scoreboards.

Electrical Installation, which shows the method for completing power and control signal connections to the scoreboards.

Maintenance and Troubleshooting, which highlights some of the common problems encountered with scoreboard operation.

Appendix, which contains engineering drawings, system risers and schematics that detail the components of the scoreboards referenced in this manual.

For questions regarding the safety, installation, operation or service of these systems, please refer to the telephone numbers listed on the cover page and in **Section 4.9** of this manual.

Important Safeguards:

1. Read and understand these instructions before installing.
2. Do not drop the scoreboard controller or allow it to get wet.
3. Disconnect power to the scoreboard when it is not in use.
4. Disconnect power when servicing the scoreboard.
5. Do not modify the scoreboard structure or attach any panels or coverings to the scoreboard without the express written consent of Daktronics, Inc.

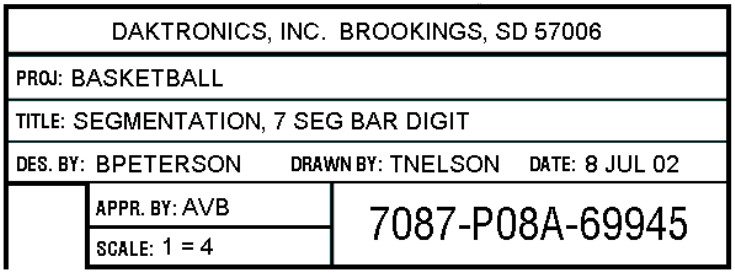


Figure 1: *Daktronics Drawing Label*

Figure 1 illustrates the Daktronics drawing numbering system. Daktronics identifies individual drawings with a number (7087-P08A-69945 in the example), which is located in the bottom right corner of each drawing. This manual refers to drawings

by the last set of digits and the letter preceding them. The example would be **Drawing A-69945.**

Reference drawings in this manual are grouped and inserted in alphanumeric order in the **Appendix.**

All references to drawing numbers, appendices, figures or other manuals are presented in **bold** typeface, as in the following example: “Attach the universal channel struts to the wall. Refer to **Drawing A-130545** for the attachment procedure.” In addition, any drawings referenced within a particular subsection are listed at the beginning of that subsection in the following manner:

Reference Drawing:

Vertical Wall Mount..... **Drawing A-130545**

1.2 Product Overview

Reference Drawings:

Mechanical Specs, TN-2007-11..... **Drawing A-134720**
Mechanical Specs, TN-2008-11..... **Drawing A-137943**
Mechanical Specs, TN-2009-11..... **Drawing A-135208**
Mechanical Specs, TN-2007-9..... **Drawing A-139417**
Mechanical Specs, TN-2008-9..... **Drawing A-139420**
Mechanical Specs, TN-2016-11..... **Drawing A-176684**

The LED tennis scoreboards are part of a modular system of scoring and timing displays created by Daktronics. The displays are configured for both outdoor and indoor courtside use. Featuring highly visible 5" and 10" fixed digits, the boards use light emitting diodes to illuminate the display. (Light emitting diodes, or LEDs, are tiny, solid-state lighting units.)

Scoreboards in the tennis series use both red and red-orange LEDs. On the outdoor models the digits are red-orange. Indoor scoreboards make use of red LEDs and have a flat face for better display. Use of LEDs also achieves a much wider viewing angle than standard lamp displays. Refer to **Drawings A-134720**, **A-137943**, **A-135208,**
A-139417, **A-139420 and A-176684.**

The four models in the tennis series are:

- **TN-2007:** a two-line, three-set and game total scoreboard.
- **TN-2008:** a two-line, five-set and game total scoreboard.
- **TN-2009:** a single-line auxiliary module for displaying team scores.
- **TN-2016**: a two-line, three-set only scoreboard for individual courtside use.

Both TN-2007 and TN-2008 can be set up for singles or doubles matches. The scoreboards display single-game scores to 99 and set scores to 9. The team score module, TN-2009, displays home and guest match totals (or total team points) up to 9. The courtside scoreboard, TN-2016, displays set scores up to 9.

The displays are manufactured for both outdoor and indoor settings and operate on a 120 V AC power supply. Because of their LED technology, the Daktronics tennis scoreboards consume little power – a maximum of 150 W.

Caption modules, which hold changeable captions for different events, are unpowered units that attach to the top or bottom of a digit module. The scoreboards come equipped with team name captions and individual acrylic letters for player names; guides on the boards can accommodate up to seven letters per player name.

Daktronics tennis scoreboards may also contain optional advertising or identification panels, attachments which can be used to display sponsor names or other advertising messages.

The aluminum cabinets for the TN-2007 and TN-2008 have display faces measuring 28" high and 108" long. The caption module adds 7" to the height of each scoreboard, and the optional ad panel measures 14" in height. The scoreboards have a front-to-back depth of 6".

Dimensions for the auxiliary team scoring module, TN-2009, are the same as for the ad panels, 14x108x6".

The courtside scoreboard, TN-2016, has a displays face measuring 21" high and 24" wide, with a front-to-back depth of 6".

The set and game displays each have a mounting weight of about 100 pounds, and the advertising/ID panel, if attached, adds 35 pounds. The auxiliary team score unit weighs about 45 pounds, and the courtside display weighs about 30 pounds.

1.3 Model Identification

Daktronics tennis scoreboards are differentiated by their model numbers: TN-2000 designates the Daktronics line of tennis scoreboards. TN-2007 is the basic, two-line LED model, which is configured with two digits per line for the game score and three for the set scores; TN-2008 incorporates two extra digits per line to display a five-set total. TN-2009 is a single-line, two-digit module, intended for use as an auxiliary board with one of the other tennis displays. TN-2016 is a two-line LED model, configured with three digits for the set scores.

Most Daktronics scoreboards also carry a two-number suffix that refers to indoor-outdoor status, power supply and digit type and color: -13 and -14 are indoor displays, 120 V and 230 V respectively with PanaView digits; -15 and -16 are indoor displays, 120 V and 230 V respectively with UniView digits; -11 and -12 are outdoor displays, 120 V and 230 V respectively with red PanaView digits and -21 and -22 are outdoor scoreboards, 120 V and 230 V with amber PanaView digits.

1.4 System Layout

Reference Drawing:
System Riser, Tennis, Single Court..... **Drawing A-252412**

The Daktronics LED tennis Single court scoreboards can be interfaced with the RC-100 controller or the All Sport 5010 controller. If your board does not include Team Name Message Centers (TNMCs) it will interface with the RC-100 controller. If your board uses TNMCs, it will interface with the All Sport 5010 controller. **Drawing A-252412** illustrates a typical layout with the RC-100 control console. (Refer to **Section 3: Electrical Installation** in this manual, for further description of power and signal routing.)

Identify your controller and refer to the operator's manual for information on its operation, scoreboard-controller layout, and the controller's scoreboard output. If your controller is in the All Sport 5000 series, refer to **ED-11976**. For an RC-100 controller, refer to **ED-15133**.

Section 2: Mechanical Installation

2.1 Installation Overview

Mechanical installation involves the following procedures:

- Attachment of the caption module to the scoring, or digit, module.
- Mounting the digit module to a wall or mounting structure.

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

2.2 Installing Caption Modules

Reference Drawing:

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

Attach the caption module and the optional advertising panels to the digit module **before** attaching the digit module to a wall or beams.

Caption modules are attached to the top or bottom of a digit module with #10 machine screws. Refer to **Drawing A-130840**. 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.

To insert a caption panel, fit the top edge of the caption into the module's upper guide; lift the panel slightly, pressing back, then drop it into the bottom guide. The construction of the flanges allows the caption panels to be lifted out for changing, rather than having to slide them out one end.

Note: Because they are movable, the caption panels must be properly positioned in relation to the scoreboard digits for different events.

2.3 Lifting the Scoreboard

Reference Drawings:

Lifting the Scoreboard.....**Drawing A-44548**

Daktronics scoreboards and message centers are shipped equipped with eyebolts that are used to lift the displays. The eyebolts are located along the top of the cabinet for each scoreboard or scoreboard section.

Daktronics strongly recommends using a spreader bar, or lifting bar, to lift the display. Using a spreader bar ensures that the force on the eyebolts is straight up, minimizing lifting stress. Lifting methods are shown in the illustration below and in **Drawing A-44548**.

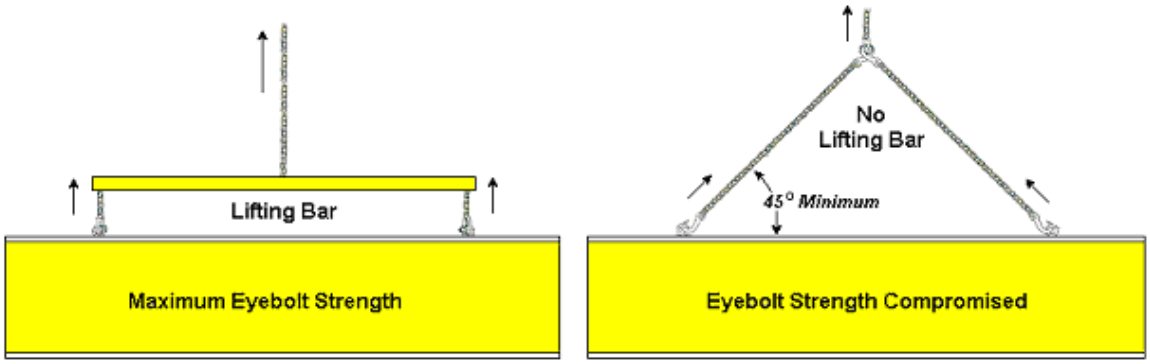


Figure 2: Lifting the Scoreboard

Figure 2 above illustrates both the preferred method (left example) and an alternative method (right example) for lifting a scoreboard. When lifting the display:

- Use a spreader bar.
- Use every lifting point provided.

Take special care to ensure the rated load of the eyebolts is not exceeded. Refer to **ED-7244**, **Eyebolts**, to determine allowable loads and load angles for the lifting hardware. **ED-7244** is located in the **Appendix** of this manual.

Avoid using other lifting methods. Cables and chains attached to the eyebolts and directly to a center lifting point, as show in the right-hand example in **Figure 2**, can create a dangerous lateral force on the eyebolts and may cause the eyebolts to fail. Daktronics scoreboards use $^{1}/_{2}$" and $^{5}/_{8}$" shoulder-type eyebolts mounted to a $^{1}/_{8}$" aluminum plate or steel nut plate, but exceeding load angles or weight limits could cause the bolts to pull out or the scoreboard cabinet to buckle. In either circumstance, the result would be serious damage to the scoreboard. If you must use this method, ensure a minimum angle between the chain and scoreboard of at least 45°.

Note: Daktronics assumes no liability for scoreboard damage resulting from incorrect setup or incorrect lifting methods.

Eyebolts are intended for lifting only. Do not attempt to permanently support the display by the eyebolts.

In typical multi-section installations, the lower scoreboard section is installed first and secured to the support beams, and then the upper section is placed atop or above the lower section and attached to the beams. There may be cables extending from the top of the lower section. Guide these cables into the hole in the bottom of the upper section for later connection.

If the lift eyebolts are removed, plug the holes with bolts and the rubber sealing washers that were removed with the eyebolts. Apply silicone or another waterproof sealant to the eyebolt openings. Inspect the top and sides of the display for any other holes or openings that may allow moisture to enter the display, and plug and seal those openings as well.

2.4 Mounting Scoreboard Digit Modules

Reference Drawings:

Beam Mounting, Top View.....**Drawing A-129147**
Rear View, Beam Mounting,
TN-2007 or TN-2008 .....**Drawing A-134556**
Beam Mounting, Side view,
TN-2007, TN-2008 .....**Drawing A-134759**
Beam Mounting Procedure,
TN-2007, TN-2008 .....**Drawing A-134762**
Vertical Wall Mount.....**Drawing A-130545**
Beam Mounting Procedure; TN-2016-11.....**Drawing A-175677**
Beam Mounting; Side View, TN-2016-11 .....**Drawing A-175696**
Beam and Footing Recommendations,
TN-2016-11 .....**Drawing A-175784**

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.

For wall-mounted installations, Daktronics recommends using universal mounting struts, or channels. Use $^{3}/_{8}$" bolts through the holes in both ends of the module frame. For displays with multiple digit modules (such as a combined player scoring module and a team score module), mount the lowest module first and work upward. Flush wall mounting requires standard bolts and anchors, which can be found in most hardware stores.

Before installing any wall anchors or a mounting structure, determine where all of the mounting holes will be located on the display modules. Holes provided on the modules should be convenient for most installations.

Wall Mounting, Outdoors or Indoors

Use this method when the scoreboard is a single digit module or when the display includes individual and team score modules joined at top and bottom:

1. Attach the universal channel struts to the wall. Refer to **Drawing A-130545** for the attachment procedure.

2. Attach the caption module to the digit module before attaching the digit module to the wall. (See Section 2.2.)

3. Use $^{3}/_{8}$" bolts to attach the modules to the struts. Mount the lowest module first, and then mount any additional modules, working upward.

Beam Mounting, Outdoors, Single Display

Use this method when the scoreboard is mounted individually, not within a whole display system. Refer to Drawings **A-175677, A-175696**, and **A-175784** for further information.

1. Attach the mounting brackets to the rear of the display using the included $^{1}/_{4}$" hardware. Holes are provided in the mounting brackets and in the back of the display.

2. Position the display against the beams and secure to the beam with the $^{1}/_{2}$" 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.

   Note: Overtightening can deform the brackets and angles!

Beam Mounting, Outdoors, Multiple Displays

Daktronics LED tennis scoreboards are most frequently displayed as freestanding units, mounted on steel beams. 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 scoreboard or module combination, and they must be set 4'6" apart, center-to-center. The typical vertical installation is shown in **Drawing A-134556,** which also specifies the overall dimensions and space requirements for the scoreboard modules.

Once the support beams have been installed, the scoreboard-mounting procedure (located on the following page) is typically a six-step process. Refer to **Drawings A-134762** and **A-134759.**

Note: Overtightening can deform the brackets and angles!

If it is not already attached, set the caption module atop the digit module, and secure the two together with screws. The fasteners are inserted up through the top of the digit module and threaded into the captivated nuts in the bottom of the caption module. (The caption module is attached directly to its adjoining digit module and does not accept beam-mounting brackets.)

If an optional ad or ID panel is used, attach mounting brackets to the top and bottom of the rear of the panel.

1. Secure the mounting brackets of the ad panel module to the beams with bolts, washers and nuts.

2. Join the scoring/caption module and ad panel 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. Refer to **Drawing A-134759** for a side view and details of the module-joining and beam-attachment processes.

Section 3: Electrical Installation

3.1 Installation Overview

Electrical installation involves the following procedures:

- Routing power and control signal cable into the scoreboard.
- Making connections to an adjoining module.

These steps are described in greater detail in the sections that follow.

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.

3.2 Grounding

DISPLAYS MUST BE GROUNDED according to the provisions detailed in Articles 250 and 600 of the National Electrical Code. Failure to follow correct grounding procedures will void the scoreboard warranty.

Proper grounding is necessary for reliable equipment operation. It also protects the equipment from damaging electrical disturbances and lightning.

The steel support structure for the scoreboard cannot be used as grounding. The support is generally embedded in concrete, and if it is set in earth, the steel is either primed or it corrodes, making it a poor ground. Use one ground rod at each scoreboard support column.

The power cable must contain a separate earth-ground conductor. When a separate ground conductor is used, do not connect neutral to ground at the disconnect or at the scoreboard. Doing so would violate electrical codes and void the warranty.

3.3 Connecting Power and Signal, Models TN-2007, TN-2008, and TN-2009

Reference Drawings:

System Riser, Tennis, Single Court.....**Drawing A-252412**
Component Locations, TN-2007-11.....**Drawing A-137948**
Component Locations, TN-2008-11.....**Drawing A-137957**
Component Locations,
TN-2009-9, TN-2009-11.....**Drawing A-160937**

The Daktronics tennis scoreboards have been designed for easy access to components, and the power and control signal hookup has been simplified. Front panels are removable to allow access to the digits, cabling and other electronic components. Refer to the system riser, **Drawing A-252412**, for an overall view of

the electrical system, and to **Drawings A-137948**, **A-137957**, and **A-160937** for location of the scoreboards' internal electrical components.

3.4 Connecting Power and Signal, Model TN-2016

Reference Drawings:

Component Locations, TN-2016-11 ..... **Drawing A-175623**
System Riser, Tennis, Single Court ..... **Drawing A-252412**
Schematic; Gen III Outdoor LED,
16 Column Driver ..... **Drawing A-177931**
Component Locations; TN-2016-11, G3 ..... **Drawing A-195593**

The Daktronics tennis scoreboards have been designed for easy access to components, and the power and control signal hookup has been simplified. Front panels are removable to allow access to the digits, cabling and other electronic components. Refer to the system riser, **Drawing A-252412**, for an overall view of the electrical system. Refer to **Drawing A-175623** for location of the scoreboards' internal electrical components on old displays and **Drawings A-177931** and **A-195593** on new Gen III displays.

3.5 Power, Models TN-2007, TN-2008, and TN-2009

Reference Drawings:

Components, 2/4 Pos.
Power and Signal Entrance ..... **Drawing A-125977**
System Riser, Tennis, Single Court ..... **Drawing A-252412**
Component Locations, TN-2007-11 ..... **Drawing A-137948**
Component Locations, TN-2008-11 ..... **Drawing A-137957**
Schematic; TN-2007, TN-2008, TN 2009..... **Drawing A-160881**
Component Locations, TN-2009-9, TN-2009-11..... **Drawing A-160937**
Schematic; 120 V AC Single Driver..... **Drawing A-189621**

Each tennis scoreboard requires a 120 V AC, 20-amp branch circuit in conduit, the conduit and conductors to be sized by the customer. Maximum power consumption for the scoreboard is 100 watts.

Power Installation

Typically, the installation process begins by routing power from the power source to a fused disconnect located near the scoreboard. Refer to **Drawing A-252412**and **A-125977**.

Refer to **Drawings A-137948**, **A-137957**, and **A-160937** to determine where the power and signal cable will be brought into the display. There are power and signal knockouts in both the back and end panels of the scoreboard cabinets. Power and signal are brought into the displays through these external knockouts.

Power terminates at the power and signal entrance enclosure inside the display. Refer to the schematics, **Drawings A-160881** and **A-189621**, for details on the wiring connections.

The electrical installation process typically involves these steps:

1. Begin by opening the left access panel of the module, and determine which knockouts will be used.

2. Remove the covers from the load center and driver enclosure.

3. Remove the selected knockouts and run the power conduit into the cabinet and connect the 120 V wires to the load center terminal block.

4. Connect the power cable to 120 V AC power, and connect signal cabling to the signal junction box.

5. Replace covers and panels.

3.6 Power, Model TN-2016

Reference Drawings:

Schematic; Gen II Outdoor LED,
16 Column Drvr ..... **Drawing A-154330**
Component Locations, TN-2016-11..... **Drawing A-175623**
System Riser, Tennis, Single Court..... **Drawing A-252412**
Schematic; Gen III Outdoor LED,
16 Column Driver..... **Drawing A-177931**
Component Locations; TN-2016-11, G3..... **Drawing A-195593**

Each tennis scoreboard requires a 120 V AC, 20-amp branch circuit in conduit, the conduit and conductors to be sized by the customer. Maximum power consumption for the scoreboard is 100 W.

Power Installation

Typically, the installation process begins by routing power from the power source to a fused disconnect located near the scoreboard. Refer to **Drawing A-252412**.

Refer to **Drawings A-175623** or **A-195593** to determine where the power and signal cable will be brought into the display. There are power and signal knockouts in both the back and end panels of the scoreboard cabinets. Power and signal are brought into the display through these external knockouts.

Power terminates at the power and signal entrance enclosure inside the display. Refer to the schematics **Drawings A-154330** and **A-177931,** for details on the wiring connections.

The electrical installation process typically involves these steps:

1. Begin by opening the left access panel of the module, and determine which knockouts will be used.

2. Remove the covers from the load center and driver enclosure.

3. Remove the selected knockouts and run the power conduit into the cabinet and connect the 120 V wires to the load center terminal block.

4. Connect the power cable to 120 V AC power, and connect signal cabling to the signal junction box.

5. Replace covers and panels.

3.7 Signal

Signal for the scoreboards travels directly from the controller, typically a RC-100 controller. The signal for these scoreboards requires no signal wire, because it is a wireless radio signal.

3.8 Power Disconnect

Power to the display should be routed through a fused disconnect switch capable of opening all ungrounded power conductors. The National Electrical Code requires a means of disconnect visible (in a direct line of sight) from the display. This requirement protects workers by keeping the disconnecting means within view while they are servicing the display. An exception to this requirement is the type of disconnect which may be locked in the open position, and that may be located elsewhere. Daktronics recommends providing a lockable disconnect switch (knife switch) at the display location so that all power lines can be completely disconnected.

Note: Use a multi-connector disconnect so that all hot lines and the neutral line can be disconnected. Power conductors from the disconnect to the display should be routed through conduit in agreement with local code.

Section 4: Display Maintenance and Troubleshooting

Important Notes:

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

4.1 Cabinet Specifications

Reference Drawings:

Mechanical Specs, TN-2007-11 .....**Drawing A-134720**
Mechanical Specs, TN-2008-11 .....**Drawing A-137943**
Mechanical Specs, TN-2007-9 .....**Drawing A-139417**
Mechanical Specs, TN-2008-9 .....**Drawing A-139420**
Mechanical Specs, TN-2016-11 .....**Drawing A-176684**

Cabinets for the Daktronics tennis scoreboards are of all-aluminum construction. The drawings referenced above, **A-134720**, **A-135208**, **A-137943**, **A-139417**, **A-139420** and **A-176684**, give exact dimensions, screw locations, weights, and other mechanical specifications. The illustrations include details for the three- and five-set, two-line scoreboards (TN-2007 and TN-2008), the one-line auxiliary scoring module (TN-2009), the courtside two-line, set only scoreboard (TN2016), and for the optional advertising or identification panels that may also be attached to the display.

4.2 Opening the Scoreboard

All internal electronic components and digits can be reached by opening the digit panel on the front of the display. Release the screws securing the top and bottom of the digit panel to the front of the cabinet, and carefully remove the panel.

4.3 LED Driver, Models TN-2007, TN-2008, and TN-2009

Reference Drawing:

LED Driver II, 16 Column .....**Drawing A-119205**

The task of switching LEDs on and off is performed by the LED driver. Refer to **Drawing A-119205**. Each driver has 19 connectors providing power and signal inputs/outputs to digits and indicators. The function of each of these connectors is as follows:

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

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

4.4 Outdoor LED Driver, Model TN-2016

Reference Drawing:

16 or 8 Column Outdoor LED Driver.....**Drawing A-150423**

The task of switching LEDs on and off is performed by the LED driver. Refer to **Drawing A-150423**. Each driver has 19 connectors providing power and signal inputs/outputs to digits and indicators. The function of each of these connectors is as follows:

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

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

4.5 Segmentation and Digit Designation

Reference Drawings:

Digit Service ..... **Drawing A-130891**
Component Locations,
TN-2007-11 (incl. TN-2007-09) ..... **Drawing A-137948**
Component Locations,
TN-2008-11 (incl. TN-2008-09) ..... **Drawing A-137957**
Component Locations,
TN-2009-9, TN-2009-11 ..... **Drawing A-160937**
Component Locations, TN-2016-11..... **Drawing A-175623**
Component Locations; TN-2016-11, G3..... **Drawing A-195593**

In each digit, certain LEDs always go on and off together. These groupings of LEDs are referred to as segments. **Drawing A-130891** shows which connector pin number is wired to each digit segment and the wiring color code used throughout the display (illustrated at lower left on drawing).

The component location drawings for the scoreboards, **Drawings A-137948**, **A-137957**, **A-160937**, **A-175623** and **A-195593** specify the driver connectors controlling the digits. Numbers shown in hexagons in the upper half of each digit indicate which connector is wired to that digit.

4.6 Component Location and Access

Reference Drawings:

Digit Service ..... **Drawing A-130891**
Component Locations, TN-2007-11
(incl. TN-2007-09)..... **Drawing A-137948**
Component Locations, TN-2008-11
(incl. TN-2008-09)..... **Drawing A-137957**
Component Locations,
TN-2009-9, TN-2009-11 ..... **Drawing A-160937**
Component Locations, TN-2016-11..... **Drawing A-175623**
Component Locations; TN-2016-11, G3..... **Drawing A-195593**

As noted previously, all digits and display electronics are front-access. **Drawings A-137948**, **A-137957**, **A-130891**, **A-160937, A-175623** and **A-195593** illustrate front views of scoreboard modules.

The digit circuit board, the platform for the LEDs, is mounted on the front panel in each section. The drivers are located on the left side of each module (typically behind the second panel), and the load center is immediately to the left of the driver.

Replacing a Digit

To remove a scoreboard digit, refer to **Drawing A-130891,** and follow these steps:

1. Open the digit panel as described in **Section 4.2**.

2. Disconnect the power/signal connector from the back of the digit. The connector is released by squeezing together the locking tabs as the connector is pulled free.

3. The digits are secured to the inside of the panel with screws, standoffs and nuts. Remove the #8 nuts and lift the digit off the screws.

4. Position a new digit over the screws and tighten the nuts.

5. Reconnect the power/signal connector.

6. **Note:** This is a keyed connector B 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.

Replacing a Driver

Each driver is enclosed with a transformer and signal terminal block. Before a failed driver can be reached, the enclosure must be accessed. Refer to **Drawing A-137948, A-137957, 160937** and **A-175623**; follow these steps:

1. Open the digit panel as described in **Section 4.2**.

2. Remove the cover from the driver enclosure.
   Disconnect all connectors from the driver. Each connector is released by squeezing together the locking tabs as the connector is pulled free.
   Note: These are keyed connectors and will attach in one way only. Do not attempt to force the connections.

3. Remove the screws securing the driver to the inside of the enclosure.

4. Lift the driver from the display.

5. Follow steps 1 through 5 in reverse order to attach a new driver.

4.7 Schematic, Models TN-2007, TN-2008, and TN-2009

Reference Drawing:

Schematic; Gen II Outdoor LED,
16 Column Drvr .....**Drawing A-154330**
Schematic; TN-2007, TN-2008, TN 2009 .....**Drawing A-160881**
Schematic; 120 V AC Single Driver .....**Drawing A-189621**

Drawing A-160881 illustrates the schematic diagram of the power and signal inputs and all wiring in the Daktronics LED tennis scoreboards. Input schematics for 120 V scoreboards are shown in the lower left portion of the drawing. **Drawing A-154330** illustrates the schematic

diagram of the power and signal inputs for a multiple driver Daktronics LED tennis scoreboard and **Drawing A-189621** illustrates inputs for a single driver scoreboard.

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.

4.8 Schematic, Model TN-2016

Reference Drawing:

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

Drawing A-177931 illustrates the schematic diagram of the power and signal inputs and all wiring in the Daktronics LED tennis scoreboards. Input schematics for 120 V scoreboards are shown in the lower left portion of the drawing.

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.

4.9 Troubleshooting

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

Symptom/Condition	Possible Cause
Scoreboard will not light	▪ Console not connected or poor connection ▪ No power to control console ▪ No power to the scoreboard ▪ Driver fuse blown ▪ Main fuse blown
Garbled display	▪ Internal driver logic malfunction ▪ Control console malfunction
Digit will not light	▪ Black wire to digit broken ▪ Poor contact at driver connection. ▪ Driver malfunction
Segment will not light	▪ Broken LED or connection ▪ Driver shift register failure ▪ Broken wire between lamp driver and digit ▪ Poor contact at driver connector.
Segment stays lit	▪ Driver shift register failure ▪ Short circuit on digit
Date appears in the wrong place on the scoreboard	▪ Incorrect address settings on drivers (consult tables and set correct addresses)

4.10 Replacement Parts List

This list includes commonly needed replacement parts. Refer to the drawings in **Appendix A** for additional part and component numbers.

Description	Gen II Part Numbers	Gen III Part Numbers
Digit, 10" red, coated, outdoor	0P-1192-0049	0P-1192-0265
Digit, 10" red, coated, outdoor	NA	0P-1192-0266
Digit, 10" red, coated, indoor	0P-1150-0227	0P-1150-0240
Digit, 5” red, coated, outdoor	0P-1150-0170	0P-1192-0284
Digit, 5” amber, coated, outdoor	NA	0P-1192-0285
Red Arrow, outdoor	NA	0P-1192-0249
Amber Arrow, outdoor	NA	0P-1192-0250
Red Arrow, indoor	NA	0P-1150-0185
LED Driver II	0P-1150-0127	0P-1150-0127
Transformer, 16V SEC	T-1066	T-1066
Outdoor LED Driver	0A-1192-0011	0A-1192-0011
Power Supply	A-1720	A-1720
Junction box; phone jack	0A-1009-0038	0A-1009-0038
Address plug, 12-pin	0A-1150-0064	0A-1150-0064

To prevent loss due to theft, Daktronics recommends purchasing a lockable cabinet to store manuals and replacement or spare parts.

Daktronics Exchange and Repair & Return Programs

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

Exchange Program

Daktronics unique Exchange Program is a quick, economical service for replacing key parts in need of repair. If a part requires repair or replacement, Daktronics sends the customer a replacement, and the customer sends the problem part to Daktronics. This not only saves money, but also decreases display downtime.

To participate in the Exchange Program, follow these steps.

1. **Call the local Daktronics representative or the Daktronics Customer Call Center:** 877-605-1115 (toll-free) or 605-697-4036. Choose option 2 to have a Customer Service Coordinator order a new part.

2. **When the new exchange part is received, mail the old part to Daktronics.**
   If the replacement part fixes the problem, send in the problem part, which is 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. **You will be billed for the replacement part immediately, unless you have a qualifying service agreement in place.**
   In most circumstances, you will be invoiced for the replacement part at the time it is shipped. This bill, which represents the exchange price, is due when you receive it.

4. **You must send the problem part to Daktronics within 30 days.**
   If you do not ship it to Daktronics within 30 working days from the invoice date, Daktronics assumes you are purchasing the replacement part outright with no exchange. You will therefore be invoiced for the replacement part at the full purchase price, with the balance due upon receipt. The second invoice represents the difference between the exchange price (billed previously) and the full purchase price of the part. If you return the exchange equipment after 30 working days from the invoice date, you will be credited for the amount on the second invoice, minus a restocking fee.

   Note: Second invoice policies also apply to customers with qualifying service agreements in place.

   To avoid a restocking charge, return the part, which has been replaced within 30 days of the invoice date.

5. **If the replacement part does not solve the problem, return the part within 30 working days or you will be billed for it at full purchase price.**
   If, after you make the exchange, the equipment still causes problems, please contact our Customer Call Center immediately. Daktronics expects *immediate return* of an exchange part if it does not solve the problem. The company also reserves the right to refuse parts that have been damaged due to acts of nature or causes other than normal wear and tear.

Repair and Return Program

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

1. **Call your local Daktronics representative or the Daktronics Customer Call Center:** 877-605-1115 (toll-free) or 605-697-4036.

2. **Receive a Return Materials Authorization (RMA) number before shipping.** This expedites repair of your 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.

4. **Enclose:**
   - your name
   - address
   - phone number
   - the RMA number
   - a clear description of symptoms

How to reach us

Mail: Customer Service, Daktronics Inc.
PO Box 5128
331 32nd Ave
Brookings, SD 57006

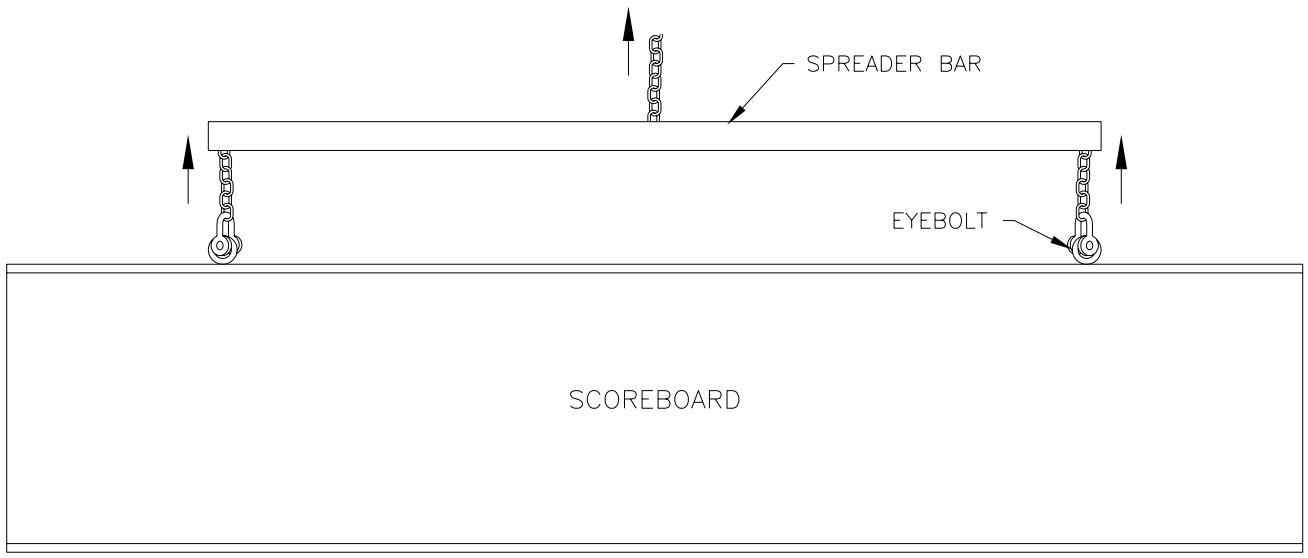
Phone: Daktronics Customer Call Center:
877-605-1115 (toll-free) or 605-697-4036

Fax: 605-697-4444

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

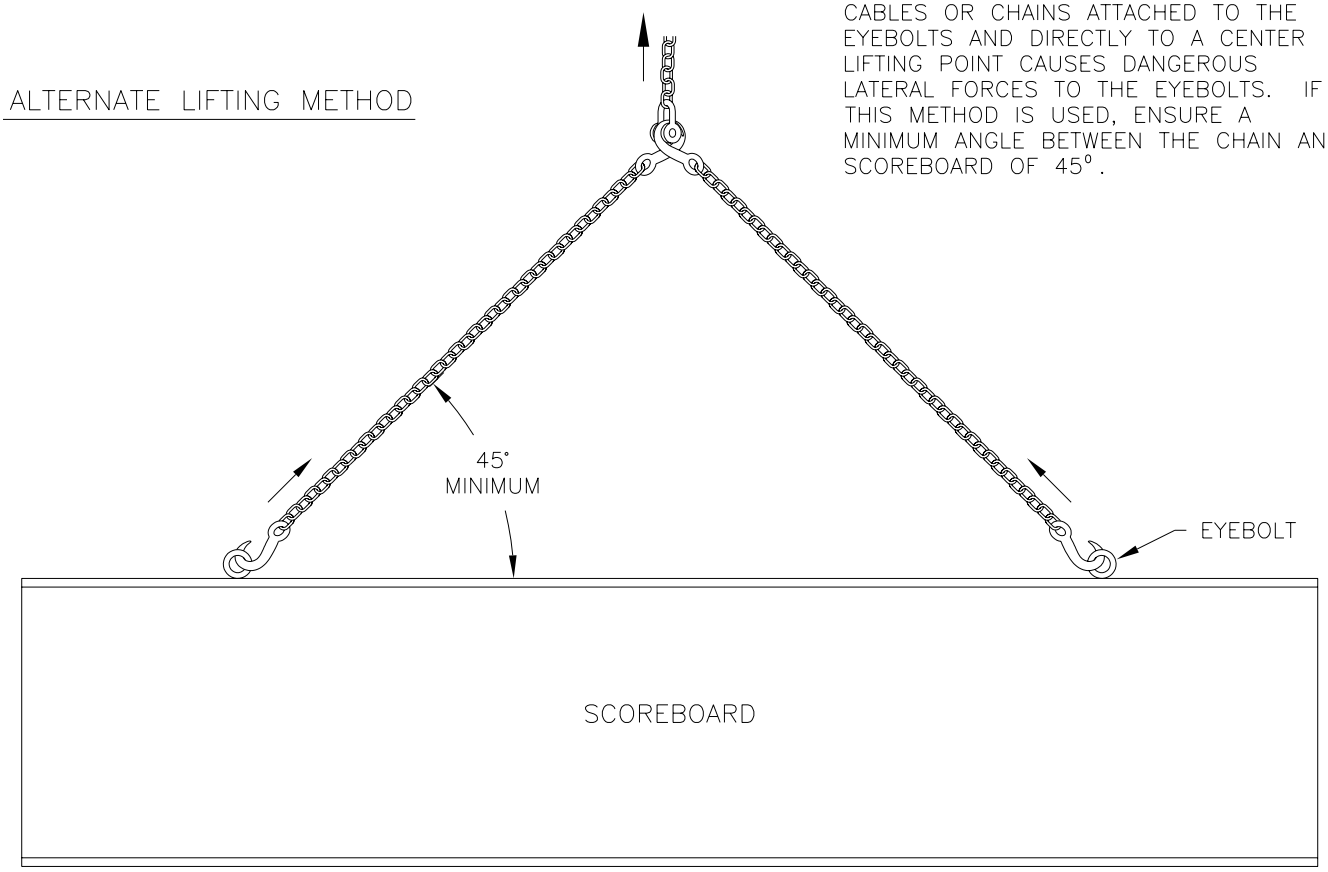


PREFERRED LIFTING METHOD

USE A SPREADER BAR SO THAT THE FORCE ON THE EYEBOLTS IS STRAIGHT UP.

ALTERNATE LIFTING METHOD

CABLES OR CHAINS ATTACHED TO THE EYEBOLTS AND DIRECTLY TO A CENTER LIFTING POINT CAUSES DANGEROUS LATERAL FORCES TO THE EYEBOLTS. IF THIS METHOD IS USED, ENSURE A MINIMUM ANGLE BETWEEN THE CHAIN AND SCOREBOARD OF 45°.



DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: OUTDOOR SCOREBOARDS

TITLE: LIFTING SCOREBOARD

DES. BY: DRAWN BY: AVB DATE: 12SEP90

REVISION 01 | APPR. BY: | SCALE: NONE | 1091-R10A-44548

REV.	DATE	DESCRIPTION	BY	APPR.
01	17 MAY 01	ADDED MINIMUM ANGLE TO ALTERNATE LIFTING METHOD; CHANGED CORRECT TO PREFERRED METHOD AND WRONG TO ALTERNATE METHOD	TWEBER	

J17

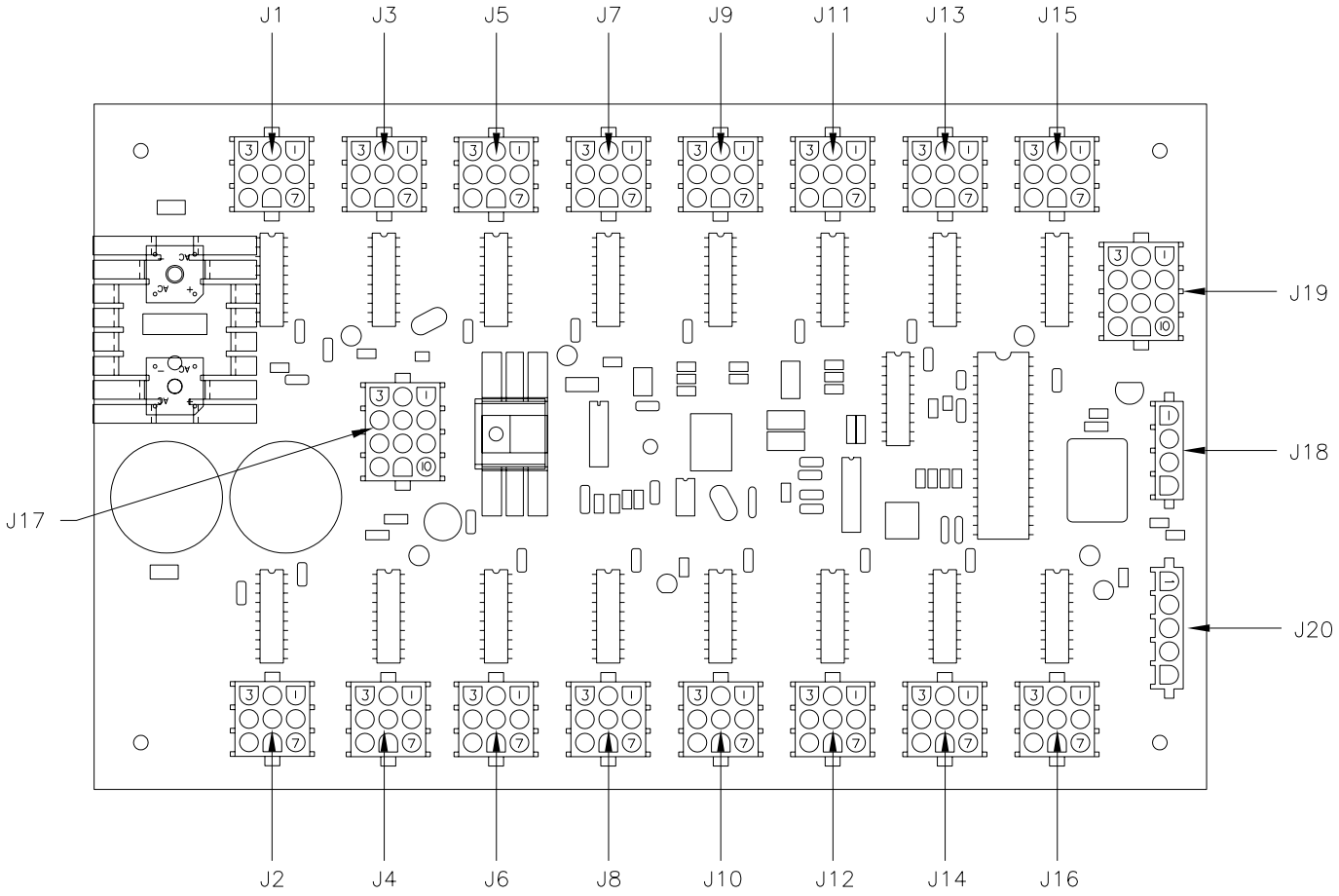
PIN	FUNCTION
1	SIGNAL IN +
2	SIGNAL IN −
3	GND
4	SIGNAL OUT +
5	SIGNAL OUT −
6	16V AC IN
7	GND
8	EARTH
9	16V AC IN
10	GND
11	+VCC +
12	+VBB +

J18

PIN	FUNCTION
1	AUTO HORN K1 OUT
2	K1 IN, 16V DC (−)
3	120V HOT IN
4	120V SWITCHED OUT

J19

PIN	FUNCTION
1	GND
2	SW0−N
3	SW1−N
4	GND
5	SW2−N
6	SW3−N
7	GND
8	SW4−N
9	SW5−N
10	GND
11	SW6−N
12	SW7−N



J1 THROUGH J16

PIN	FUNCTION
1	SEGMENT C (−)
2	SEGMENT B (−)
3	SEGMENT A (−)
4	SEGMENT F (−)
5	SEGMENT E (−)
6	SEGMENT D (−)
7	COMMON (+)
8	SEGMENT H (−)
9	SEGMENT G (−)

J20

PIN	FUNCTION
1	GND−N
2	PR0−N
3	PR1−N
4	PR2−N
5	PR3−N (TOD)

REV.	DATE	DESCRIPTION	BY	APPR.
01	20 OCT 03	UPDATED J20 PIN OUT CHART	MWM	

DAKTRONICS, INC. BROOKINGS, SD 57006

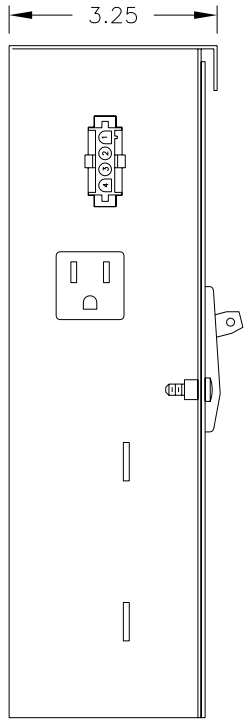
PROJ:

TITLE: LED DRIVER II, 16 COLUMN

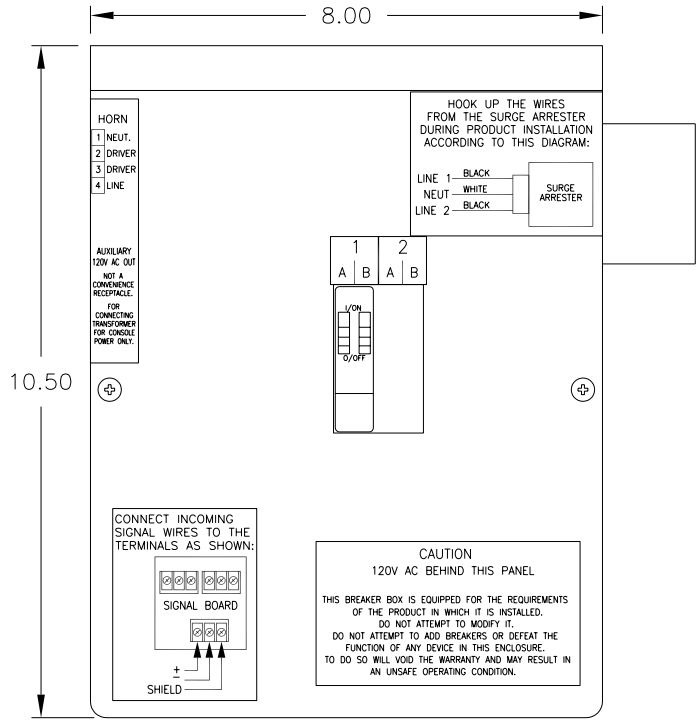
DES. BY: DRAWN BY: MJORDAN DATE: 26 JUL 99

REVISION 01 APPR. BY: SCALE: 1=2

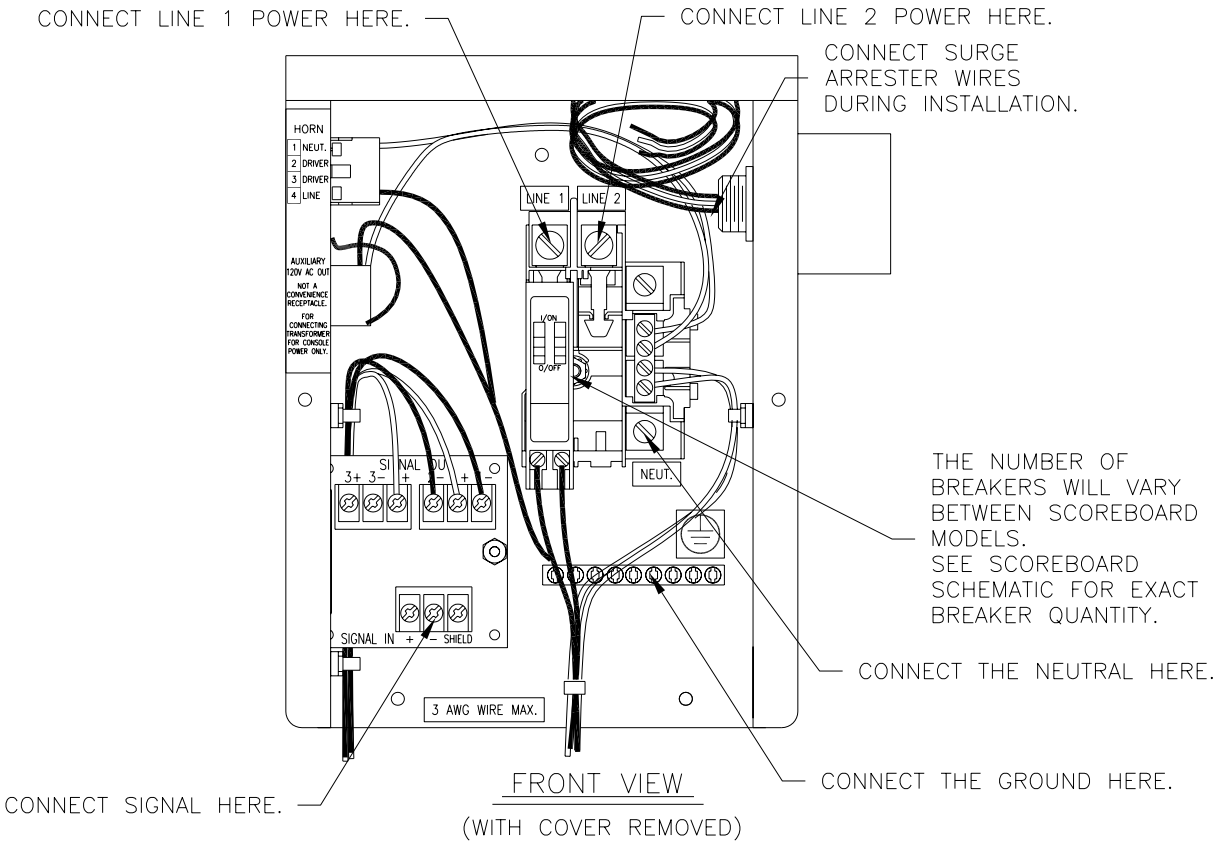
1150-R04A-119205



LEFT SIDE



FRONT VIEW



FRONT VIEW
(WITH COVER REMOVED)

REV.	DATE	DESCRIPTION	BY	APPR.
01	17JAN01	ADDED TB-1037 AND REMOVED GROUND LUG	MCOPL	

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: OUTDOOR INCANDESCENT SCOREBOARDS

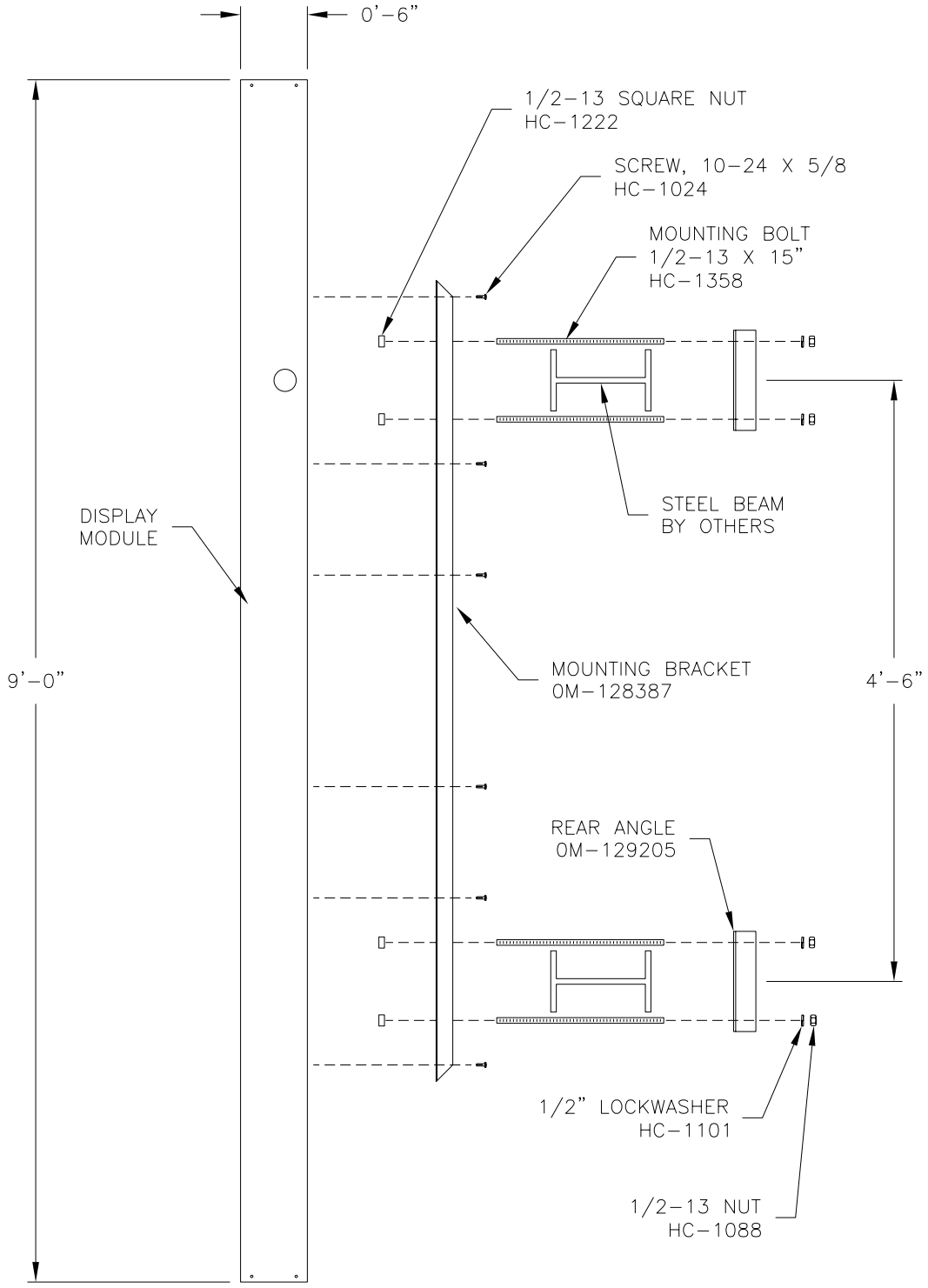
TITLE: COMPONENTS, 2/4 POS, POWER AND SIGNAL ENTRANCE

DES. BY: BPETERSON DRAWN BY: BPETERSON DATE: 04JAN00

REVISION APPR. BY:

SCALE: 1=3

1091-E10A-125977



TOP VIEW

REV.	DATE	DESCRIPTION	BY	APPR.

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ:

TITLE: BEAM MOUNTING, TOP VIEW

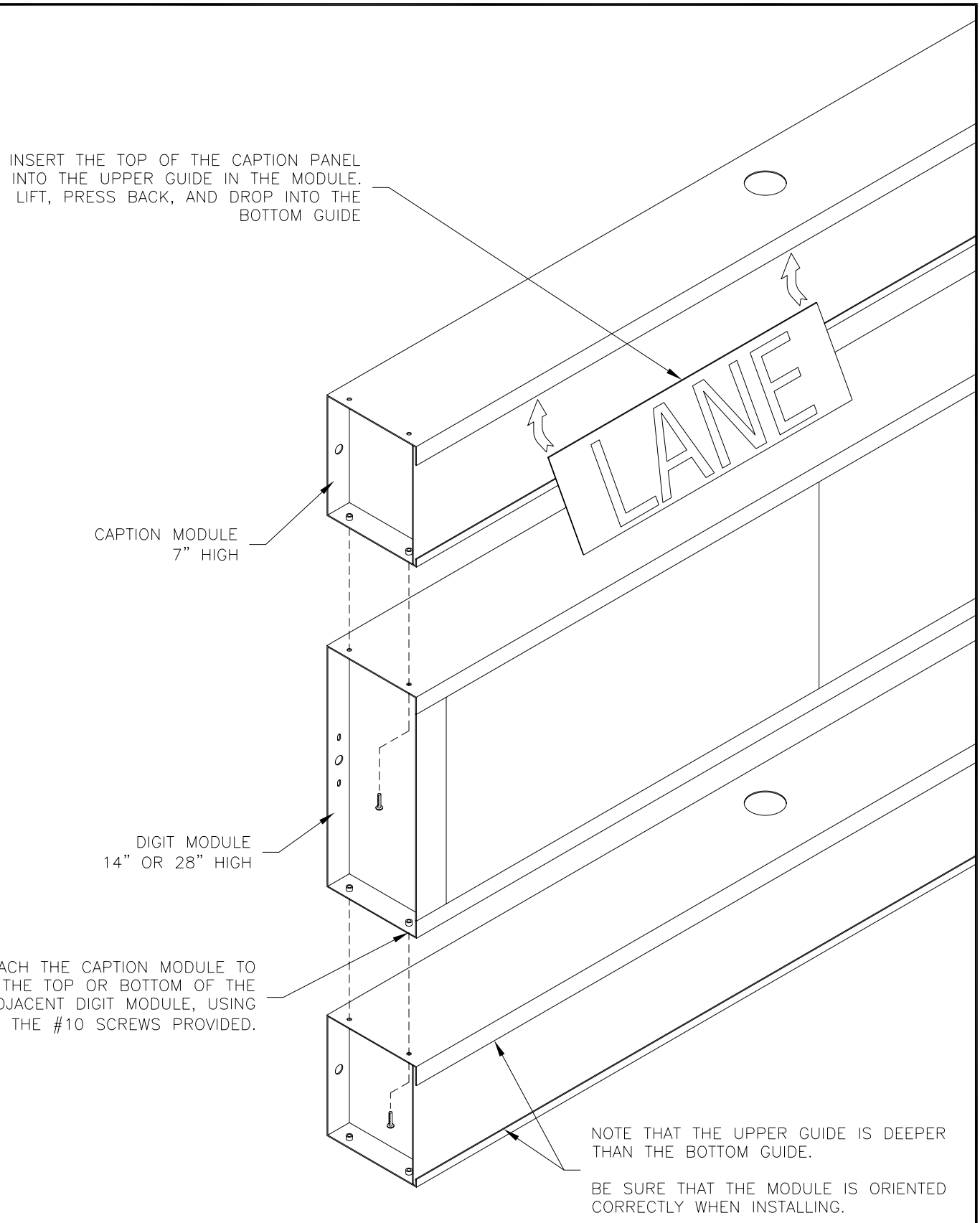
DES. BY: AVB DRAWN BY: A VANBEMMEL DATE: 09 MAR 00

REVISION 00

APPR. BY:

SCALE: 1=15

1153-R10A-129147



REV.	DATE	DESCRIPTION	BY	APPR.

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: LED AQUATICS/TRACK DISPLAYS

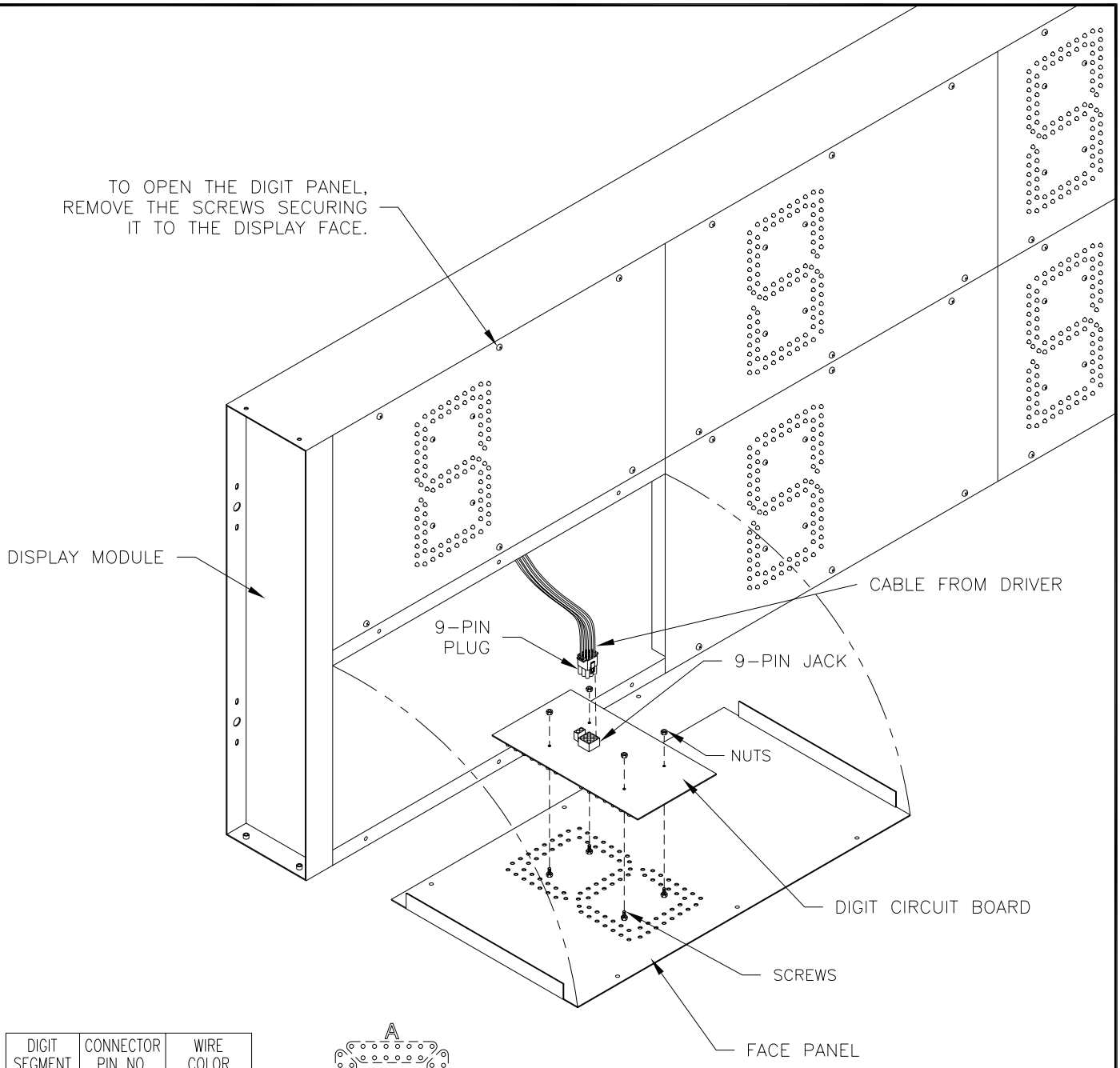
TITLE: CAPTION MODULE DETAIL

DES. BY: AVB DRAWN BY: A VANBEMMEL DATE: 12 APR 00

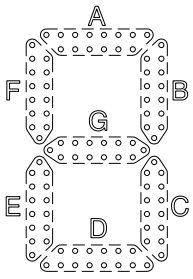
REVISION APPR. BY:

SCALE: 1=8

1153-R10A-130840



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-1150-0172
DIGIT, 10" RED, INDOOR	0P-1150-0173
DIGIT, 10" AMBER, INDOOR	0P-1150-0174

REV.	DATE	DESCRIPTION	BY	APPR.

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: LED SWIM/TRACK DISPLAYS

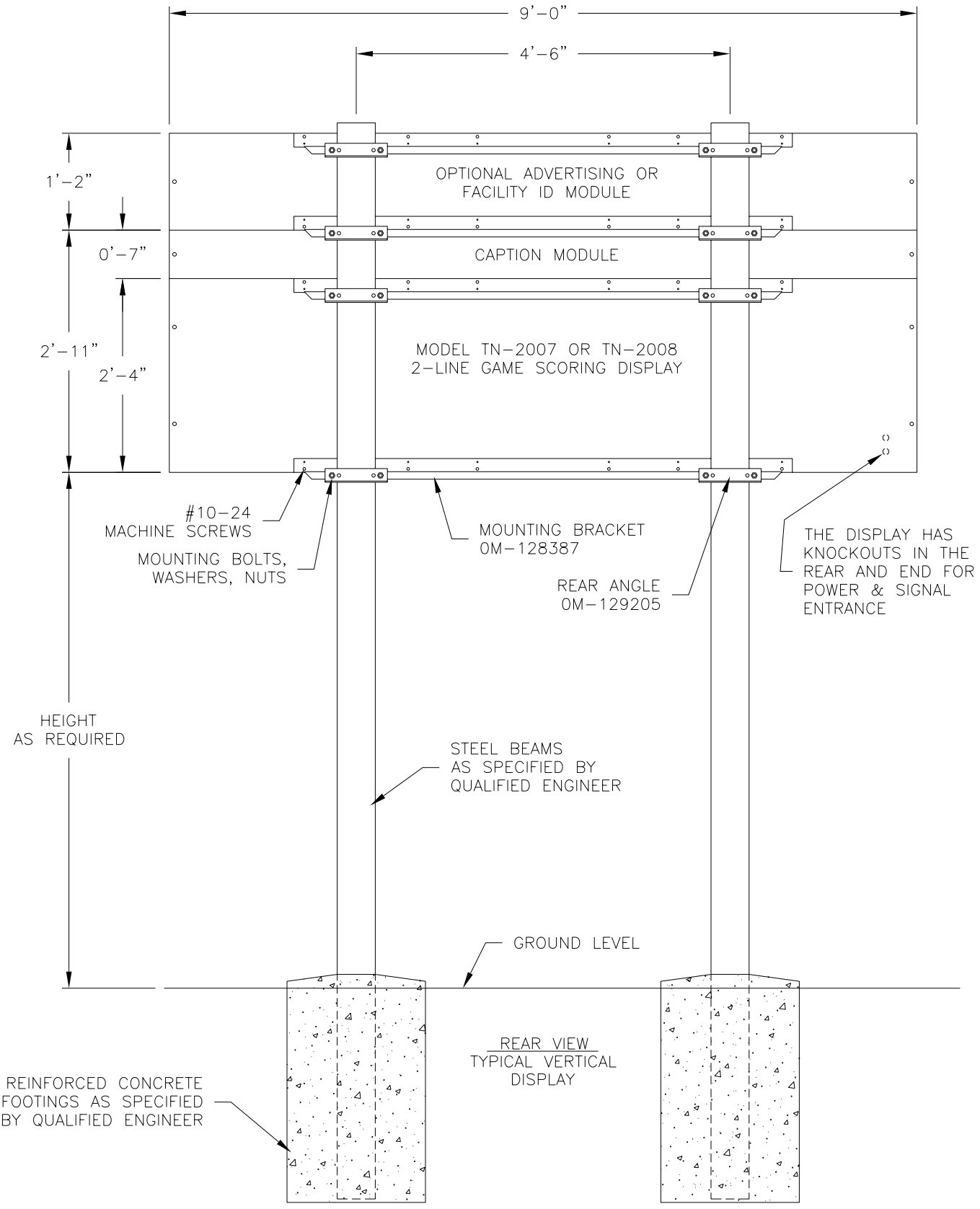
TITLE: DIGIT SERVICE

DES. BY: AVB DRAWN BY: A VANBEMMEL DATE: 14 APR 00

REVISION APPR. BY:

SCALE: 1=10

1153-R10A-130891



REV.	DATE	DESCRIPTION	BY	APPR.

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: TENNIS SCOREBOARDS

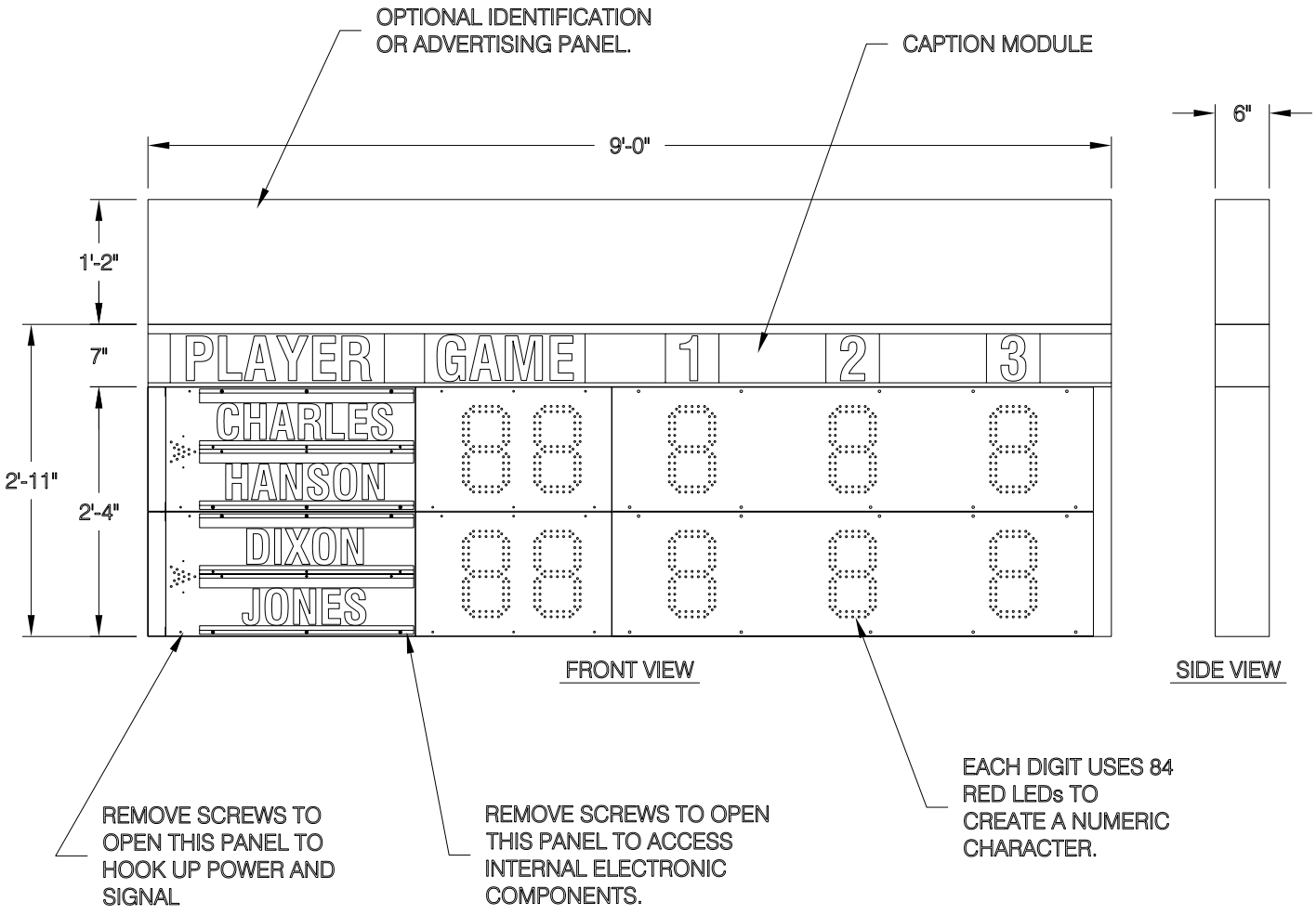
TITLE: REAR VIEW, BEAM MOUNTING, TN–2007 OR TN–2008

DES. BY: AVB DRAWN BY: A VANBEMMEL DATE: 06 JUL 00

REVISION APPR. BY:

SCALE: 1=20

1164-R10A-134556



PLAYERS' NAMES ARE SPELLED OUT USING CHANGEABLE LETTERS. GUIDES WILL ACCOMMODATE UP TO 7 LETTERS PER PLAYER NAME.

LETTERS ARE 0.10" THICK CLEAR ACRYLIC WITH LETTER PRINTED EITHER BLACK OR WHITE, TO CONTRAST WITH THE COLOR OF THE SCOREBOARD.

WEIGHT:
APPROXIMATELY 100 LBS WITHOUT OPTIONAL ID/AD PANEL.
OPTIONAL ID/AD PANEL WEIGHS APPROXIMATELY 35 LBS.

DISPLAY CABINET IS MADE OF 0.063" ALUMINUM.

POWER REQUIREMENT: 120V AC, 200W

REV.	DATE	DESCRIPTION	BY	APPR.
03	15SEP03	ADDED SERVE INDICATORS TO DISPLAY	MCOPL	
02	30 JUN 03	CHANGED DIGIT TO GEN 3 PATTERN INCREASED POWER REQUIREMENT TO 200W	MGL	
01	15 FEB 02	REMOVED 10 DEGREE DIGIT SLANT; REDUCED QUANTITY OF LED'S PER DIGIT FROM 98 TO 84.	TWEBER	

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ:

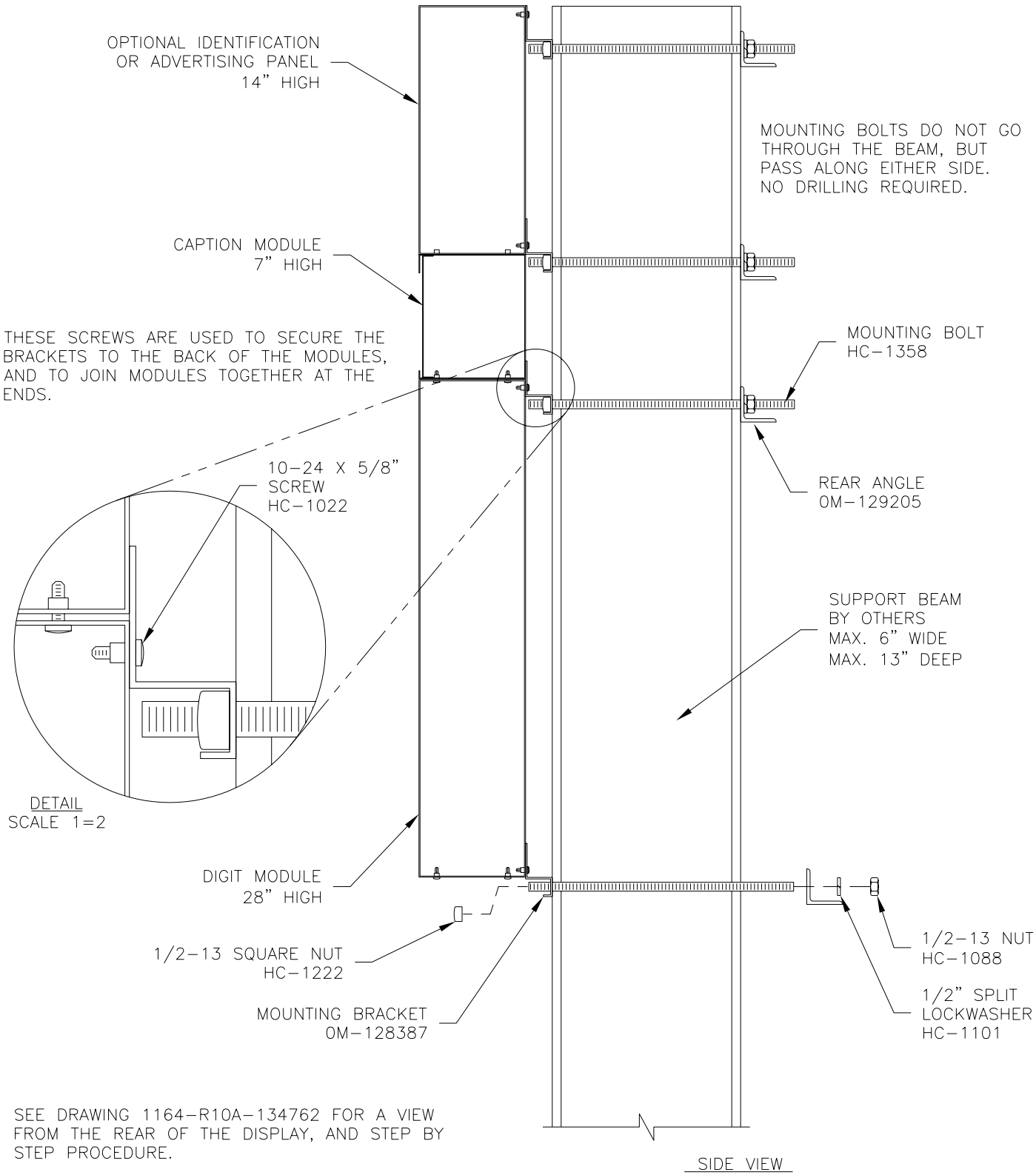
TITLE: MECHANICAL SPECS, TN-2007-11

DES. BY: AVB DRAWN BY: A VANBEMMEL DATE: 10 JUL 00

REVISION 03 APPR. BY:

SCALE: 1=20

1164-R08A-134720



SEE DRAWING 1164-R10A-134762 FOR A VIEW FROM THE REAR OF THE DISPLAY, AND STEP BY STEP PROCEDURE.

REV.	DATE	DESCRIPTION	BY	APPR.
1	09 NOV 00	REMOVED SCREW FROM UPPER POSITION IN THE DETAIL.	AVB	

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: TENNIS SCOREBOARDS

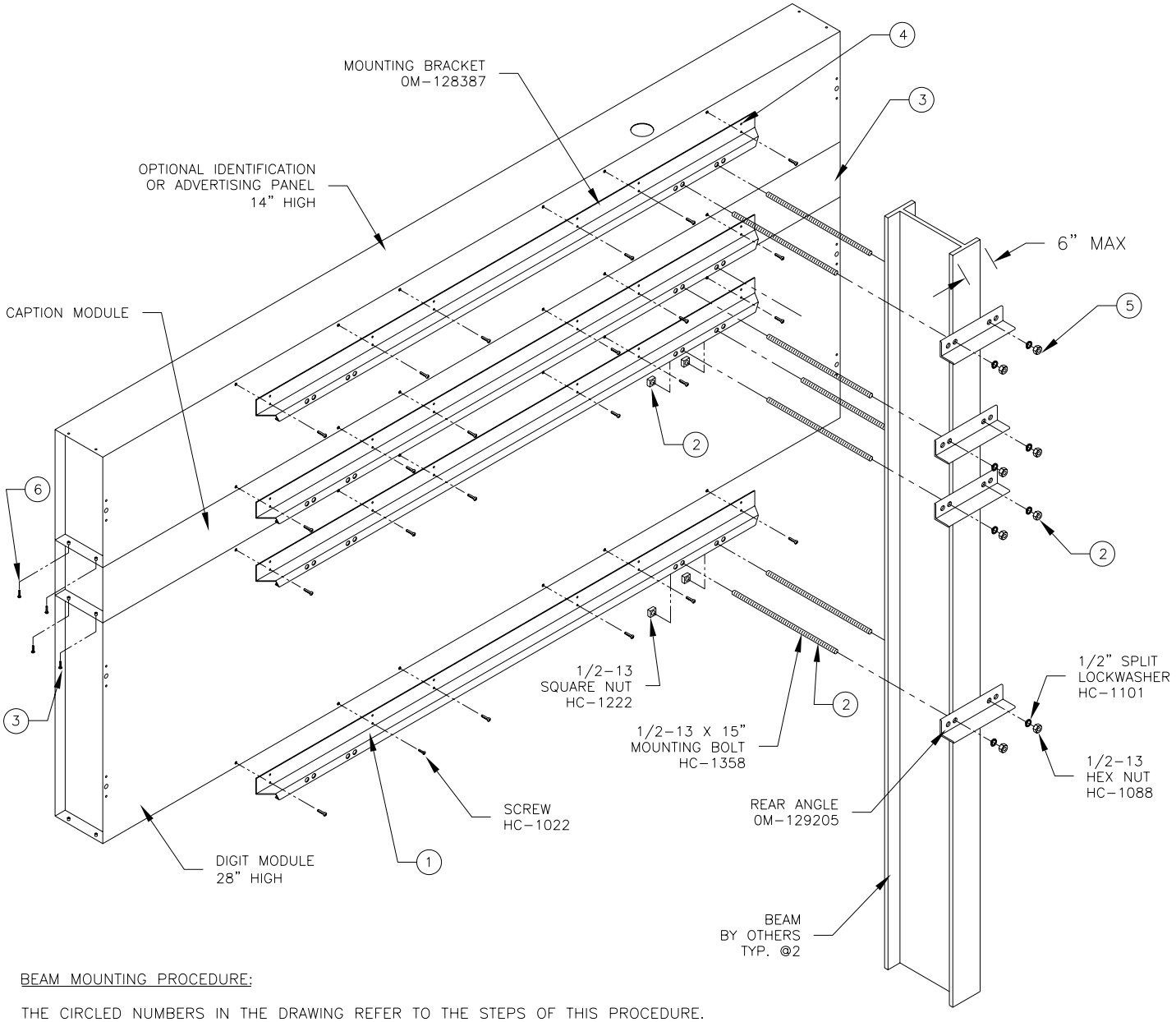
TITLE: BEAM MOUNTING, SIDE VIEW, TN-2007, TN-2008

DES. BY: AVB DRAWN BY: A VANBEMMEL DATE: 11 JUL 00

REVISION APPR. BY:

SCALE: 1=8

1164-R10A-134759



BEAM MOUNTING PROCEDURE:

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

ONLY ONE BEAM IS SHOWN, TWO BEAMS REQUIRED. BEAMS MUST BE SET 4'-6" APART, CENTER TO CENTER.

1. ATTACH MOUNTING BRACKETS TO THE TOP AND BOTTOM OF THE DIGIT MODULE BY INSERTING SCREWS THROUGH THE HOLES IN THE BRACKET AND THREADING INTO THE CAPTIVATED NUTS IN THE BACK OF THE MODULE.

2. POSITION THE DIGIT 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. SET THE CAPTION MODULE ATOP THE DIGIT MODULE IF IT IS NOT ALREADY ATTACHED. SECURE THE TWO MODULES TOGETHER WITH SCREWS INSERTED UP THROUGH THE TOP OF THE DIGIT MODULE AND THREADED INTO THE CAPTIVATED NUTS IN THE BOTTOM OF THE CAPTION MODULE.

4. IF THE OPTIONAL AD PANEL IS USED, ATTACH MOUNTING BRACKETS TO THE TOP AND BOTTOM OF THE REAR OF THE PANEL.

5. SECURE THE MOUNTING BRACKETS ON THE AD PANEL TO THE BEAM USING THE SQUARE NUTS, MOUNTING BOLTS, REAR ANGLES, LOCKWASHERS AND HEX NUTS.

6. ATTACH THE AD PANEL TO THE CAPTION MODULE AT THE ENDS BY INSERTING SCREWS UP THROUGH THE HOLES IN THE TOP OF THE CAPTION MODULE INTO THE CAPTIVATED NUTS IN THE BOTTOM OF THE AD PANEL.

SEE DRAWING 1164-R10A-134759 FOR A SIDE VIEW AND DETAILS.

REV.	DATE	DESCRIPTION	BY	APPR.

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ:

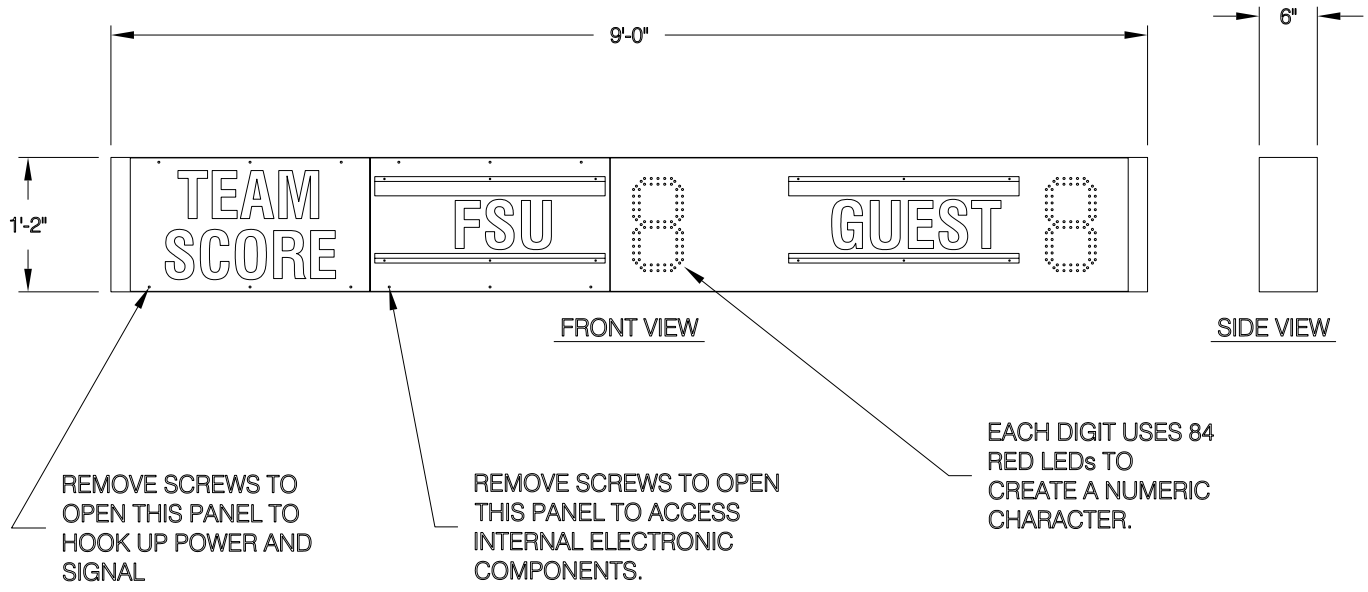
TITLE: BEAM MOUNTING PROCEDURE, TN-2007, TN-2008

DES. BY: AVB DRAWN BY: AVB DATE: 11 JUL 00

REVISION APPR. BY:

SCALE: 1=20

1164-R10A-134762



WEIGHT: APPROXIMATELY 45 LBS.

DISPLAY CABINET IS MADE OF 0.063" ALUMINUM.

POWER REQUIREMENT: 120V AC, 200W

REV.	DATE	DESCRIPTION	BY	APPR.
02	30 JUN 03	CHANGED DIGIT TO GEN 3 PATTERN INCREASED POWER REQUIREMENT TO 200W	MGL	
01	15 FEB 02	REMOVED 10 DEGREE DIGIT SLANT; REDUCED QUANTITY OF LED'S PER DIGIT FROM 98 TO 84.	TWEBER	

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ:

TITLE: MECHANICAL SPECS, TN-2009-11

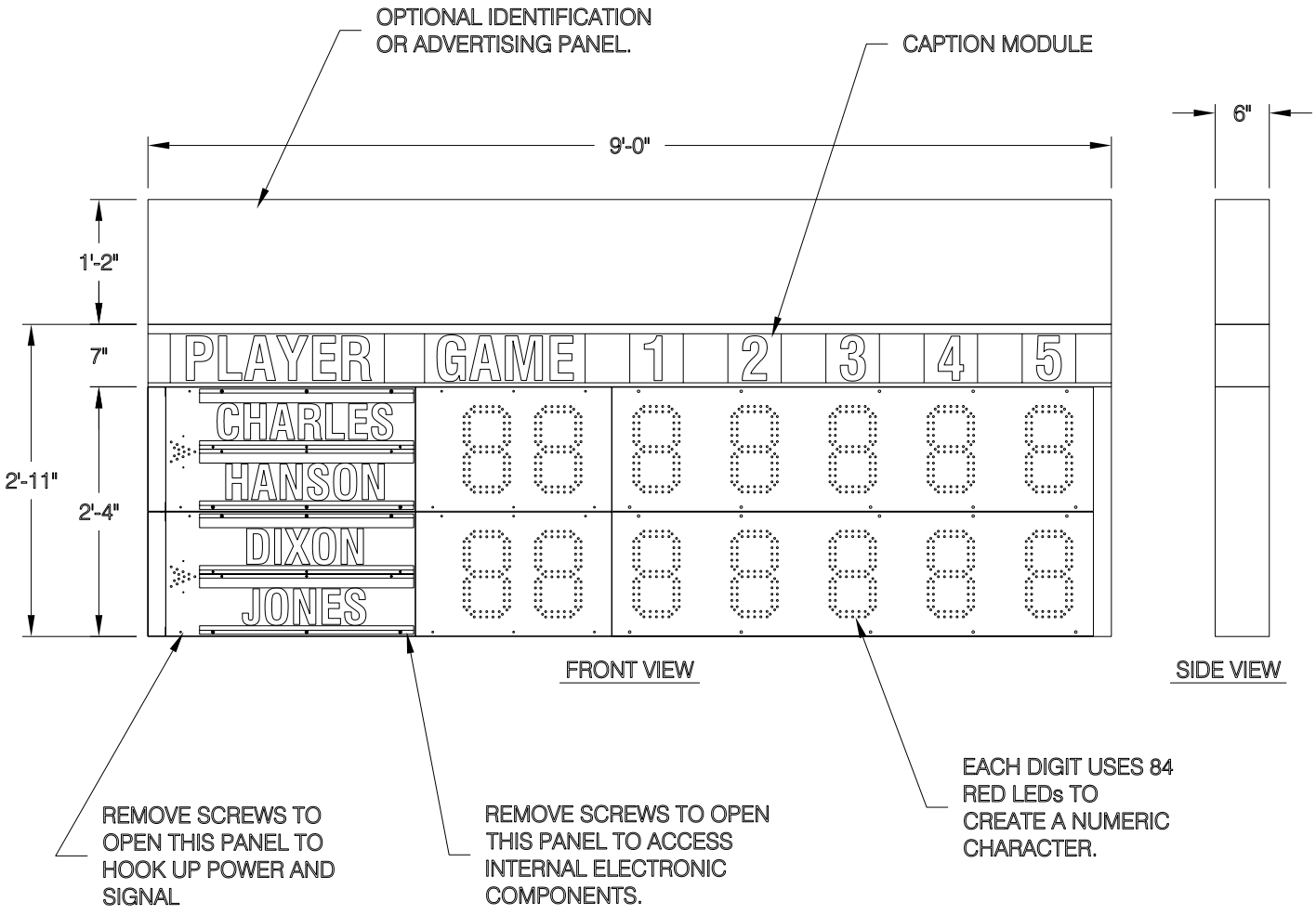
DES. BY: AVB DRAWN BY: A VANBEMMEL DATE: 17 JUL 00

REVISION 02

APPR. BY:

SCALE: 1=20

1164-R08A-135208



PLAYERS' NAMES ARE SPELLED OUT USING CHANGEABLE LETTERS. GUIDES WILL ACCOMMODATE UP TO 7 LETTERS PER PLAYER NAME.

LETTERS ARE 0.10" THICK CLEAR ACRYLIC WITH LETTER PRINTED EITHER BLACK OR WHITE, TO CONTRAST WITH THE COLOR OF THE SCOREBOARD.

WEIGHT:
APPROXIMATELY 100 LBS WITHOUT OPTIONAL ID/AD PANEL.
OPTIONAL ID/AD PANEL WEIGHS APPROXIMATELY 35 LBS.

DISPLAY CABINET IS MADE OF 0.063" ALUMINUM.

POWER REQUIREMENT: 120V AC, 200W

REV.	DATE	DESCRIPTION	BY	APPR.
03	15SEP03	ADDED SERVE INDICATORS TO DISPLAY	MCOPL	
02	30 JUN 03	CHANGED DIGIT TO GEN 3 PATTERN INCREASED POWER REQUIREMENT TO 200W	MGL	
01	15 FEB 02	REMOVED 10 DEGREE DIGIT SLANT; REDUCED QUANTITY OF LED'S PER DIGIT FROM 98 TO 84.	TWEBER	

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ:

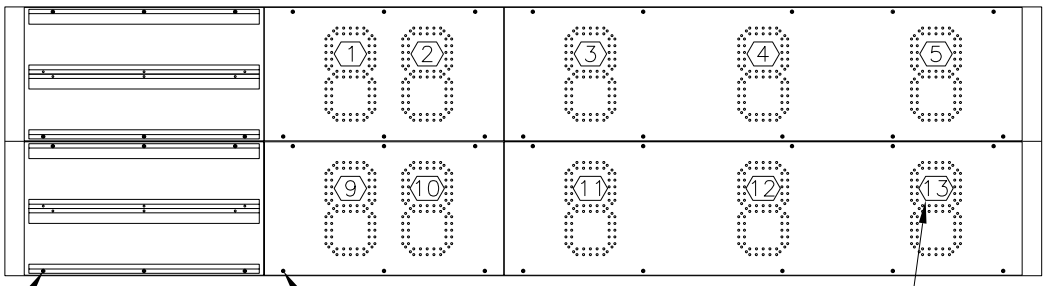
TITLE: MECHANICAL SPECS, TN-2008-11

DES. BY: AVB DRAWN BY: A VANBEMMEL DATE: 30 AUG 00

REVISION 03 APPR. BY:

SCALE: 1=20

1164-R08A-137943

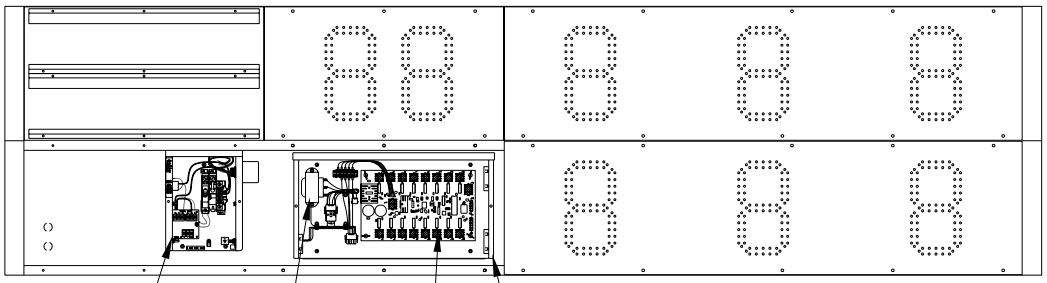


FRONT VIEW

REMOVE SCREWS TO OPEN THIS PANEL TO HOOK UP POWER AND SIGNAL.

REMOVE SCREWS TO OPEN THIS PANEL TO ACCESS INTERNAL ELECTRONIC COMPONENTS.

NUMBERS ON DIGITS INDICATE WHICH DRIVER CONNECTOR IS WIRED TO THAT DIGIT.



LOAD CENTER

T1
TRANSFORMER

A1
DRIVER

DRIVER ENCLOSURE

FRONT VIEW

SHOWN WITH PANELS AND ENCLOSURE COVERS REMOVED

REV.	DATE	DESCRIPTION	BY	APPR.
03	30 JUN 03	CHANGED DIGIT TO GEN 3 PATTERN	MGL	
02	09 OCT 02	REMOVED PART NUMBERS BLOCK FROM DWG	MCOPL	
01	03 OCT 00	ADDED INFORMATION ABOUT TN-2007-9	DJW	

DAKTRONICS, INC. BROOKINGS, SD 57006

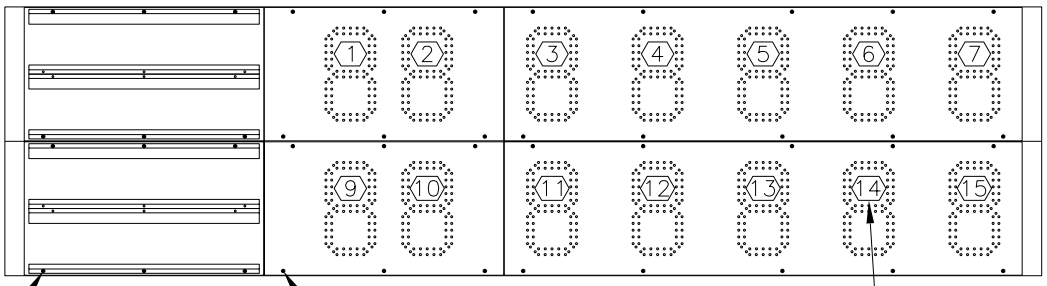
PROJ: TENNIS SCOREBOARDS

TITLE: COMPONENT LOCATIONS, TN-2007-11, TN-2007-9

DES. BY: AVB DRAWN BY: A VANBEMMEL DATE: 30 AUG 00

REVISION 03 | APPR. BY: | SCALE: 1=20

1164-R04A-137948

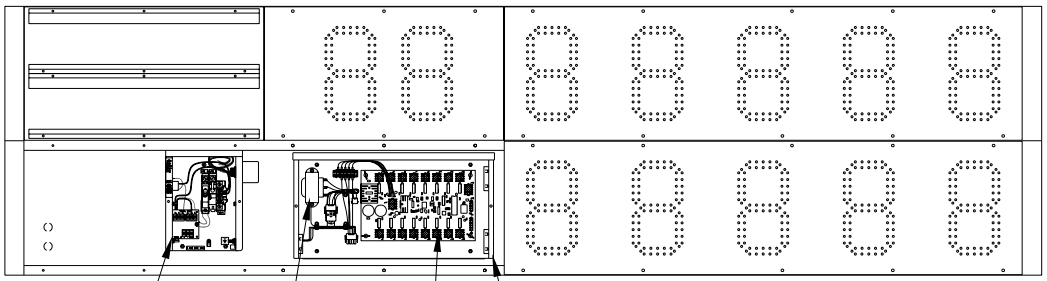


FRONT VIEW

REMOVE SCREWS TO OPEN THIS PANEL TO HOOK UP POWER AND SIGNAL.

REMOVE SCREWS TO OPEN THIS PANEL TO ACCESS INTERNAL ELECTRONIC COMPONENTS.

NUMBERS ON DIGITS INDICATE WHICH DRIVER CONNECTOR IS WIRED TO THAT DIGIT.



FRONT VIEW

SHOWN WITH PANELS AND ENCLOSURE COVERS REMOVED

REV.	DATE	DESCRIPTION	BY	APPR.
03	30 JUN 03	CHANGED DIGIT TO GEN 3 PATTERN	MGL	
02	09 OCT 02	REMOVED PART NUMBERS BLOCK FROM DWG	MCOPL	
01	03 OCT 00	ADDED INFORMATION ABOUT TN-2008-9.	DJW	

DAKTRONICS, INC. BROOKINGS, SD 57006

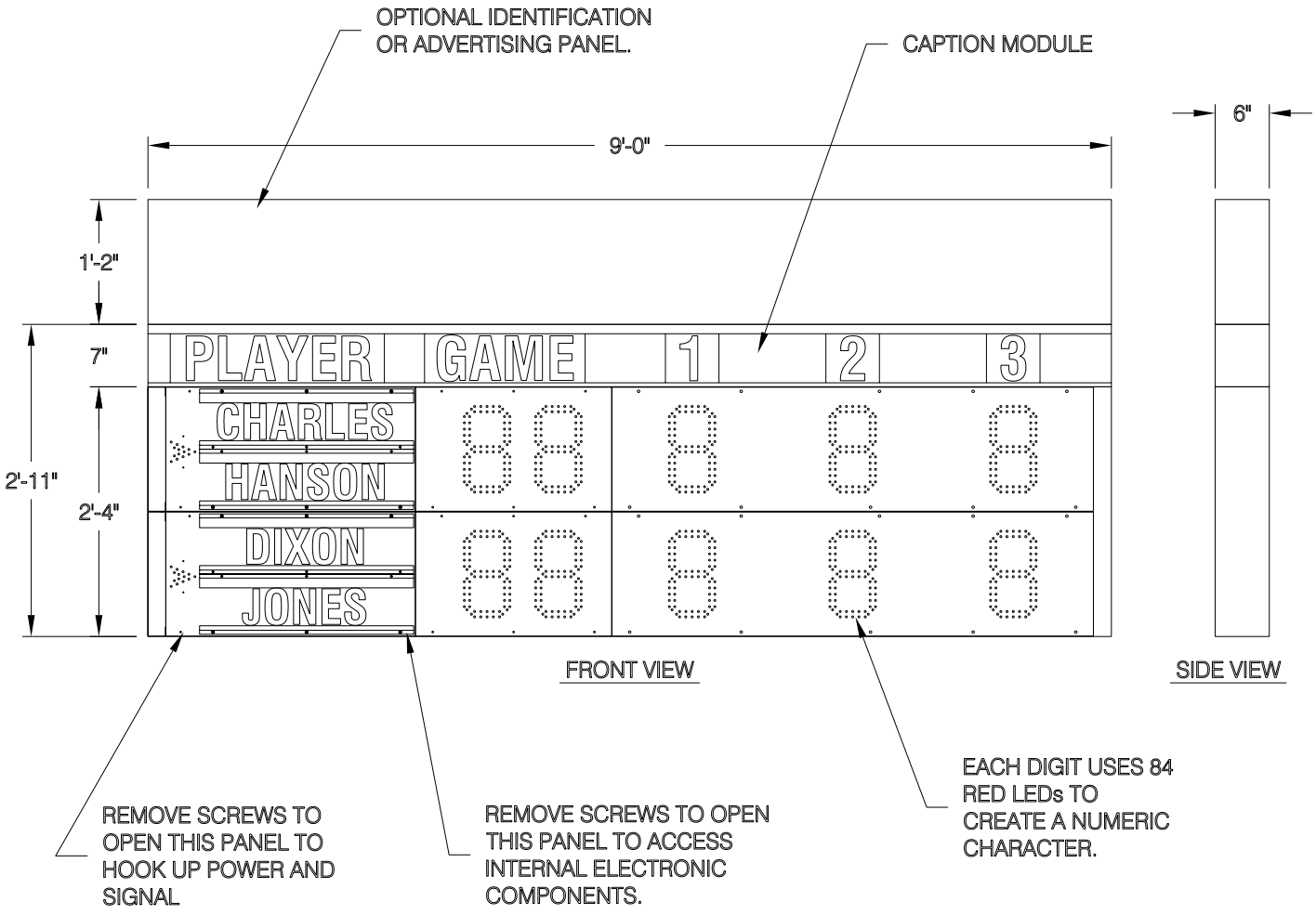
PROJ: TENNIS SCOREBOARDS

TITLE: COMPONENT LOCATIONS, TN-2008-11, TN-2008-9

DES. BY: AVB DRAWN BY: A VANBEMMEL DATE: 30 AUG 00

REVISION 03 | APPR. BY: | SCALE: 1=20

1164-R04A-137957



PLAYERS' NAMES ARE SPELLED OUT USING CHANGEABLE LETTERS. GUIDES WILL ACCOMMODATE UP TO 7 LETTERS PER PLAYER NAME.

LETTERS ARE 0.10" THICK CLEAR ACRYLIC WITH LETTER PRINTED EITHER BLACK OR WHITE, TO CONTRAST WITH THE COLOR OF THE SCOREBOARD.

WEIGHT:
APPROXIMATELY 100 LBS WITHOUT OPTIONAL ID/AD PANEL.
OPTIONAL ID/AD PANEL WEIGHS APPROXIMATELY 35 LBS.

DISPLAY CABINET IS MADE OF 0.063" ALUMINUM.

POWER REQUIREMENT: 120V AC, 200W

REV.	DATE	DESCRIPTION	BY	APPR.
02	15SEP03	ADDED SERVE INDICATORS TO DISPLAY	MCOPL	
01	30 JUN 03	CHANGED DIGIT TO GEN 3 PATTERN INCREASED POWER REQUIREMENT TO 200W	MGL	

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ:

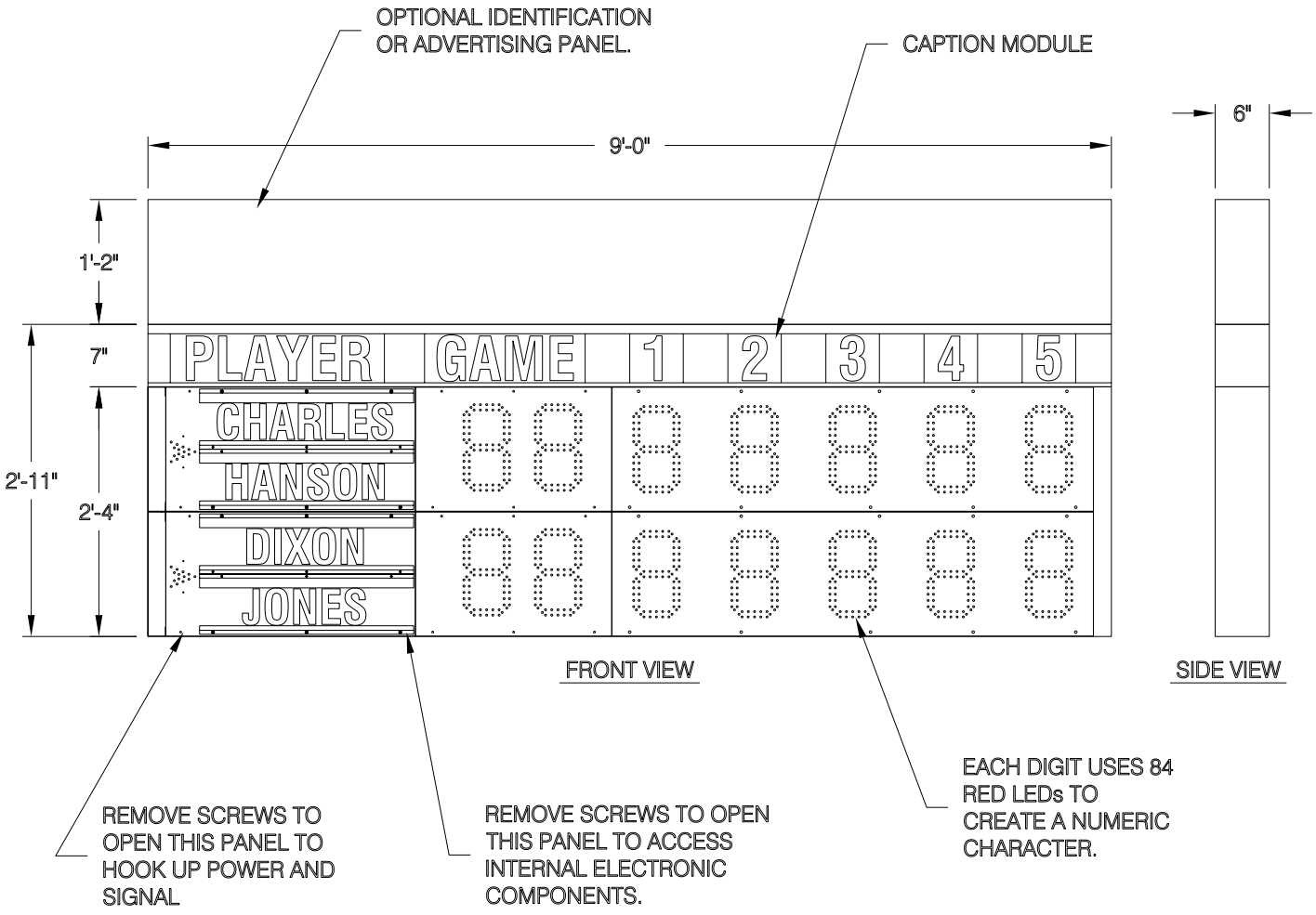
TITLE: MECHANICAL SPECS, TN-2007-9

DES. BY: AVB DRAWN BY: DWEIBEL DATE: 03 OCT 00

REVISION 02 APPR. BY:

SCALE: 1=20

1164-R08A-139417



PLAYERS' NAMES ARE SPELLED OUT USING CHANGEABLE LETTERS. GUIDES WILL ACCOMMODATE UP TO 7 LETTERS PER PLAYER NAME.

LETTERS ARE 0.10" THICK CLEAR ACRYLIC WITH LETTER PRINTED EITHER BLACK OR WHITE, TO CONTRAST WITH THE COLOR OF THE SCOREBOARD.

WEIGHT:
APPROXIMATELY 100 LBS WITHOUT OPTIONAL ID/AD PANEL.
OPTIONAL ID/AD PANEL WEIGHS APPROXIMATELY 35 LBS.

DISPLAY CABINET IS MADE OF 0.063" ALUMINUM.

POWER REQUIREMENT: 120V AC, 200W

REV.	DATE	DESCRIPTION	BY	APPR.
02	15SEP03	ADDED SERVE INDICATORS TO DISPLAY	MCOPL	
01	30 JUN 03	CHANGED DIGIT TO GEN 3 PATTERN INCREASED POWER REQUIREMENT TO 200W	MGL	

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ:

TITLE: MECHANICAL SPECS, TN-2008-9

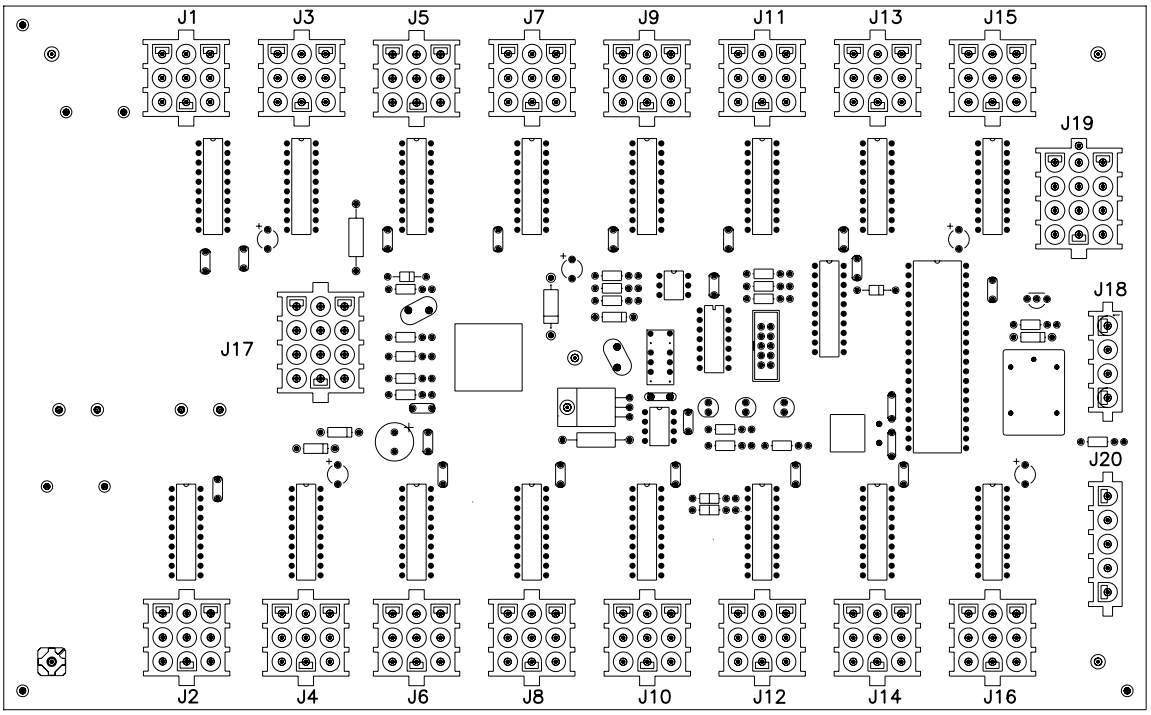
DES. BY: AVB DRAWN BY: DWEIBEL DATE: 03 OCT 00

REVISION 02 APPR. BY:

SCALE: 1=20

1164-R08A-139420

OP-1192-0011 16 COLUMN OR OP-1192-0012 8 COLUMN
LED DRIVER



J17 MAIN	
PIN	FUNCTION
1	SIG-P
2	SIG-N
3	SIG2-P
4	CLOUT-P
5	CLOUT-N
6	16VAC-N
7	GND-N
8	EARTH-N
9	16VAC-P
10	GND-N
11	+24VDC(9-16)
12	+24VDC(1-8)

J1-16 DIGIT	
PIN	FUNCTION
1	SEGC-N
2	SEGB-N
3	SEGA-N
4	SEGF-N
5	SEGE-N
6	SEGD-N
7	+VCC-P
8	SEGH-N
9	SEGG-N

J19 ADDRESS	
PIN	FUNCTION
1	GND-N
2	ADD0-N
3	ADD1-N
4	GND-N
5	ADD2-N
6	ADD3-N
7	GND-N
8	ADD4-N
9	ADD5-N
10	GND-N
11	ADD6-N
12	ADD7-N

J18 RELAY	
PIN	FUNCTION
1	HORNOUT-N
2	AUXOUT-N
3	120SW-P
4	120SW-N

J20 PROTOCOL	
PIN	FUNCTION
1	GND-N
2	PR0-N
3	PR1-N
4	PR2-N
5	TOD-N

NOTE

-WITH NO ADDRESS PINS SELECTED THE DRIVER WILL DEFAULT TO A/S 4000 PROTOCOL

-GREEN LED INDICATES THE DRIVER HAS POWER

-RED LED WILL BE ON OR BLINKING WHEN THE DRIVER IS RECEIVING SIGNAL

-AMBER LED INDICATES LED DRIVER STATUS, LED WILL BE BLINKING TO INDICATE THAT THE DRIVER IS RUNNING, IF THE LED IS OFF OR ON SOLID ALL OF THE TIME, THEN THE DRIVERS CPU IS NOT FUNCTIONING AND MAY NEED TO BE RESET OR REPLACED.

-REFER TO DRAWINGS A-115078 & A-115079 FOR J19 ADDRESS SETTINGS FOR THIS DRIVER.

-REFER TO DRAWING A-115081 FOR J20 PROTOCOL SETTINGS FOR THIS DRIVER.

-REDRIVE CIRCUIT IS PROCESSOR REFRESHED (REFER TO DWG A-128429 FOR FURTHER INFORMATION ON THE CURRENT LOOP REDRIVE CIRCUIT SPECIFICATIONS)

REV.	DATE	DESCRIPTION	BY	APPR.

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ:

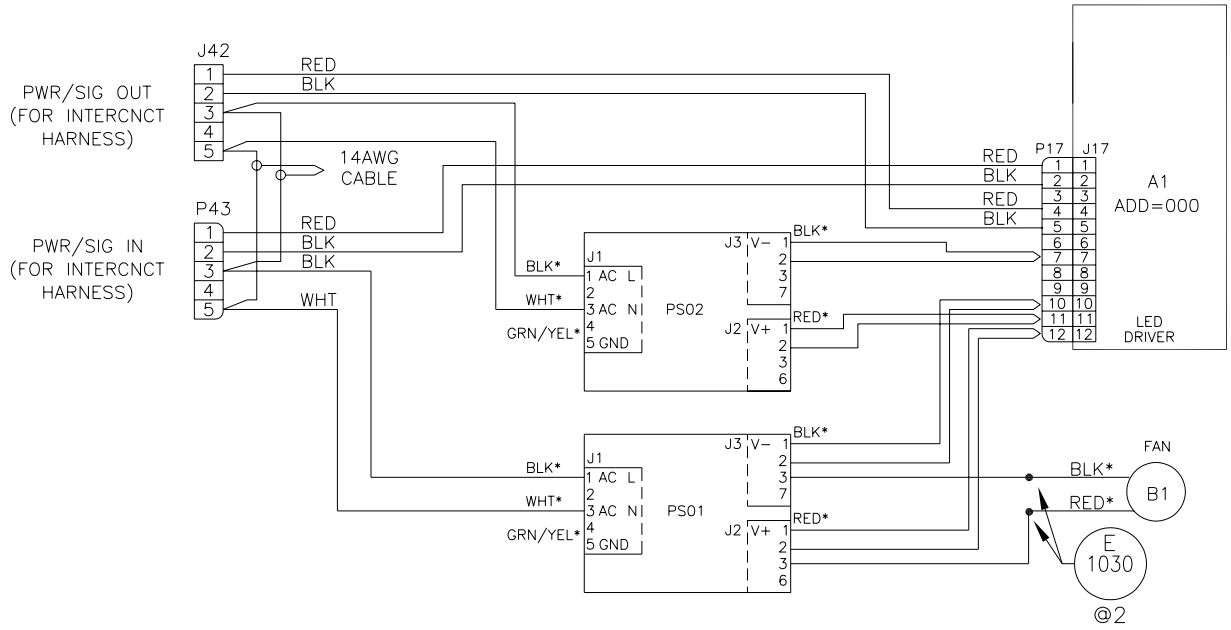
TITLE: 16 OR 8 COLUMN OUTDOOR LED DRIVER

DES. BY: EB DRAWN BY: NWRIEDT DATE: 13 JUN 01

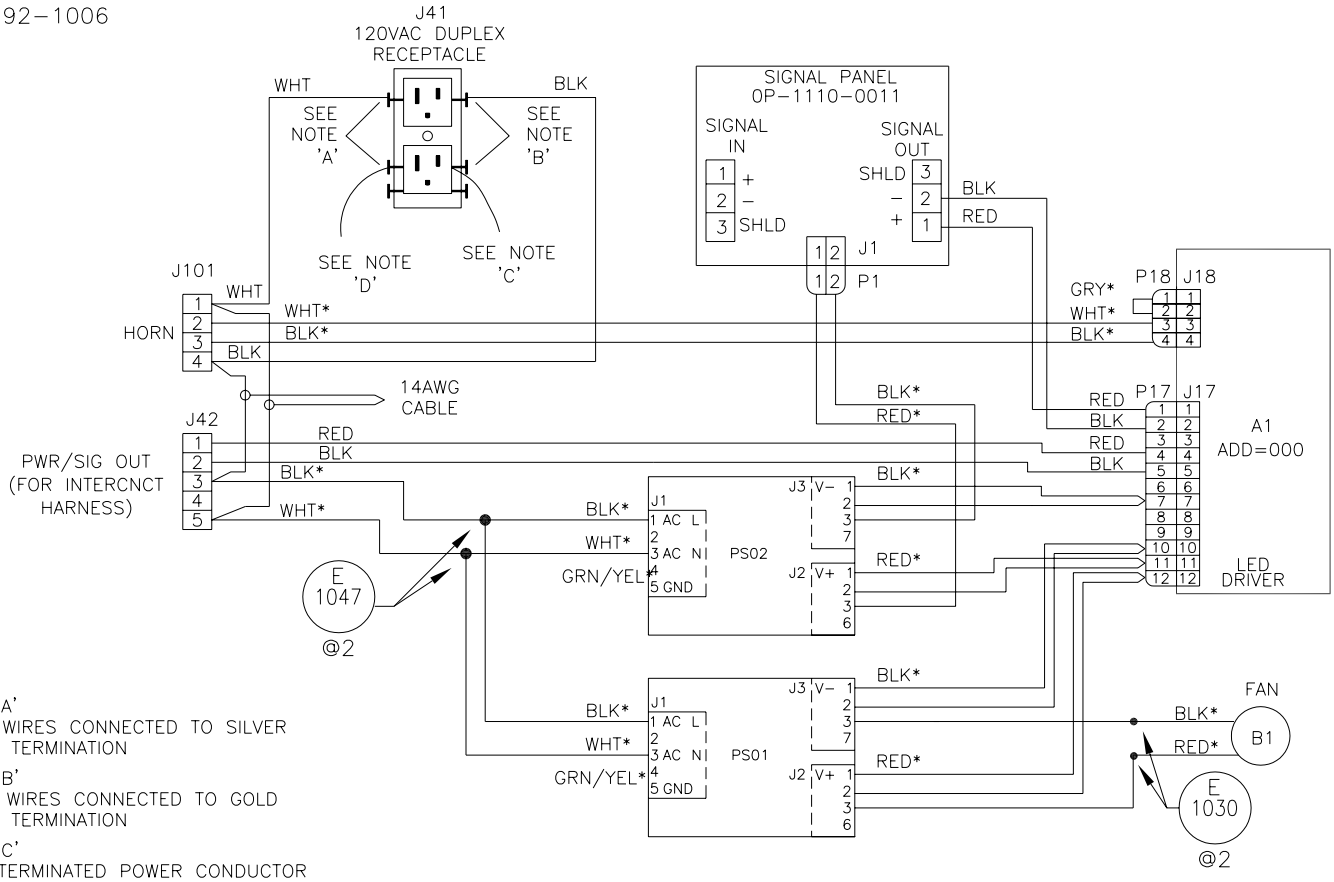
REVISION 00 | APPR. BY: | SCALE: 1=2

1192-R07A-150423

SLAVE CONFIGURATION
0A-1192-1007



MASTER CONFIGURATION
0A-1192-1006



NOTES:

NOTE 'A'
WHITE WIRES CONNECTED TO SILVER SCREW TERMINATION

NOTE 'B'
BLACK WIRES CONNECTED TO GOLD SCREW TERMINATION

NOTE 'C'
FIELD TERMINATED POWER CONDUCTOR

NOTE 'D'
FIELD TERMINATED NEUTRAL AND GROUND CONDUCTOR

ALL POWER CONDUCTORS ARE 14AWG EXCEPT * INICATES 18AWG CONDUCTORS.

ALL SIGNAL CONDUCTORS ARE 22AWG CONDUCTORS.

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

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

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: OUTDOOR LED SCOREBOARDS

TITLE: SCHEMATIC; GEN II OUTDOOR LED, 16 COLUMN DRVR

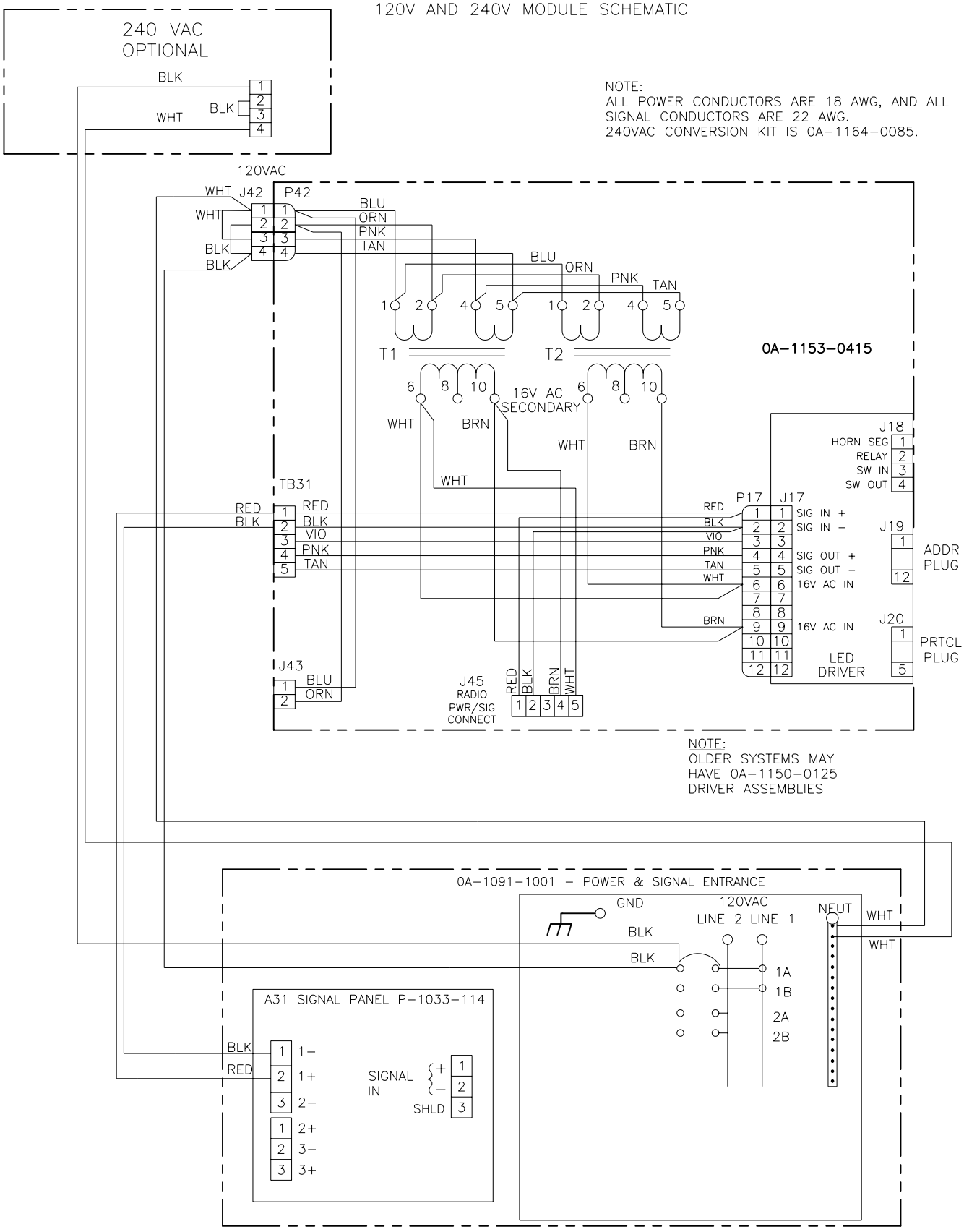
DES. BY: DRAWN BY: CMCADAM DATE: 13AUG01

REVISION APPR. BY:

SCALE: 1=1

1192-R03A-154330

120V AND 240V MODULE SCHEMATIC



REV.	DATE	DESCRIPTION	BY	APPR.
02	29 NOV 04	REVISED TO INCLUDE 240VAC CONVERSION	CJP	
01	18 JUN 03	UPDATED THE DRIVER DETAIL TO SHOW 2XMFR ASSEMBLY	JJC	MWM

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: TENNIS SCOREBOARDS

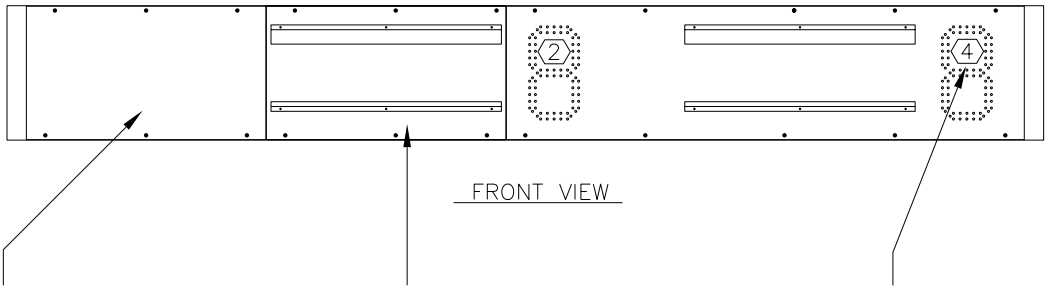
TITLE: SCHEMATIC; TN-2007, TN-2008, TN-2009

DES. BY: MMILLER DRAWN BY: MMILLER DATE: 03 JAN 02

REVISION 02 APPR. BY:

SCALE: 1=1

1164-R03A-160881

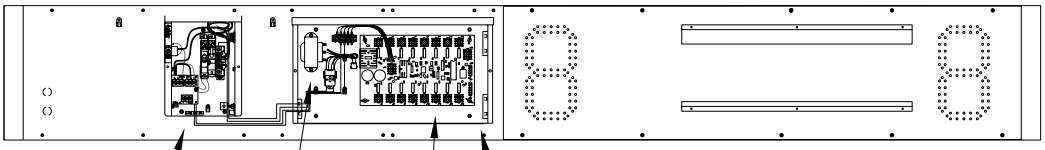


FRONT VIEW

REMOVE SCREWS TO OPEN THIS PANEL TO HOOK UP POWER AND SIGNAL.

REMOVE SCREWS TO OPEN THIS PANEL TO ACCESS INTERNAL ELECTRONIC COMPONENTS.

NUMBERS ON DIGITS INDICATE WHICH DRIVER CONNECTOR IS WIRED TO THAT DIGIT.



LOAD CENTER

A1
DRIVER

DRIVER ENCLOSURE

T1
TRANSFORMER

FRONT VIEW

SHOWN WITH PANELS AND ENCLOSURE COVERS REMOVED

REV.	DATE	DESCRIPTION	BY	APPR.
02	30 JUN 03	CHANGED DIGIT TO GEN 3 PATTERN	MGL	
01	09 OCT 02	REMOVED PART NUMBERS BLOCK FROM DWG	MCOPL	

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: TENNIS SCOREBOARDS

TITLE: COMPONENT LOCATIONS, TN-2009-9, TN-2009-11

DES. BY: A VANBEMMEL DRAWN BY: MMILLER DATE: 04 JAN 02

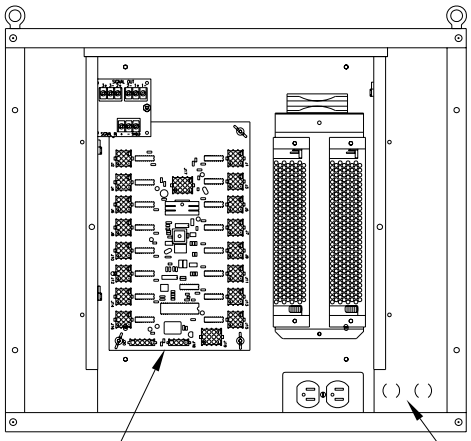
REVISION 02

APPR. BY: A VANBEM

SCALE: 1=20

1164-R04A-160937

TN–2016–11

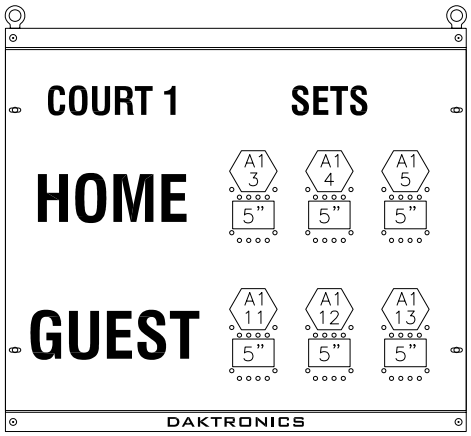


ENCLOSED 16 COLUMN LED DRIVER AND POWER/SIGNAL ENCLOSURE. (THE COVER HAS BEEN REMOVED TO SHOW THE COMPONENT DETAIL).

KNOCKOUT FOR 1/2" CONDUIT

FRONT VIEW

DISPLAY IS SHOWN WITH THE FACE PANEL REMOVED



FRONT VIEW

DISPLAY IS SHOWN WITH THE FACE PANEL ATTACHED

A1 1 = LED DRIVER NUMBER & LED DRIVER CONNECTOR WIRED TO THAT DIGIT.

24" = DIGIT SIZE

ATTACHED FACE PANELS REMOVED TO SHOW LED DRIVER AND THE POWER AND SIGNAL ENCLOSURE

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: OUTDOOR LED SCOREBOARDS

TITLE: COMPONENT LOCATIONS; TN–2016–11

DES. BY: MCOPLAN DRAWN BY: MCOPLAN DATE: 23SEP02

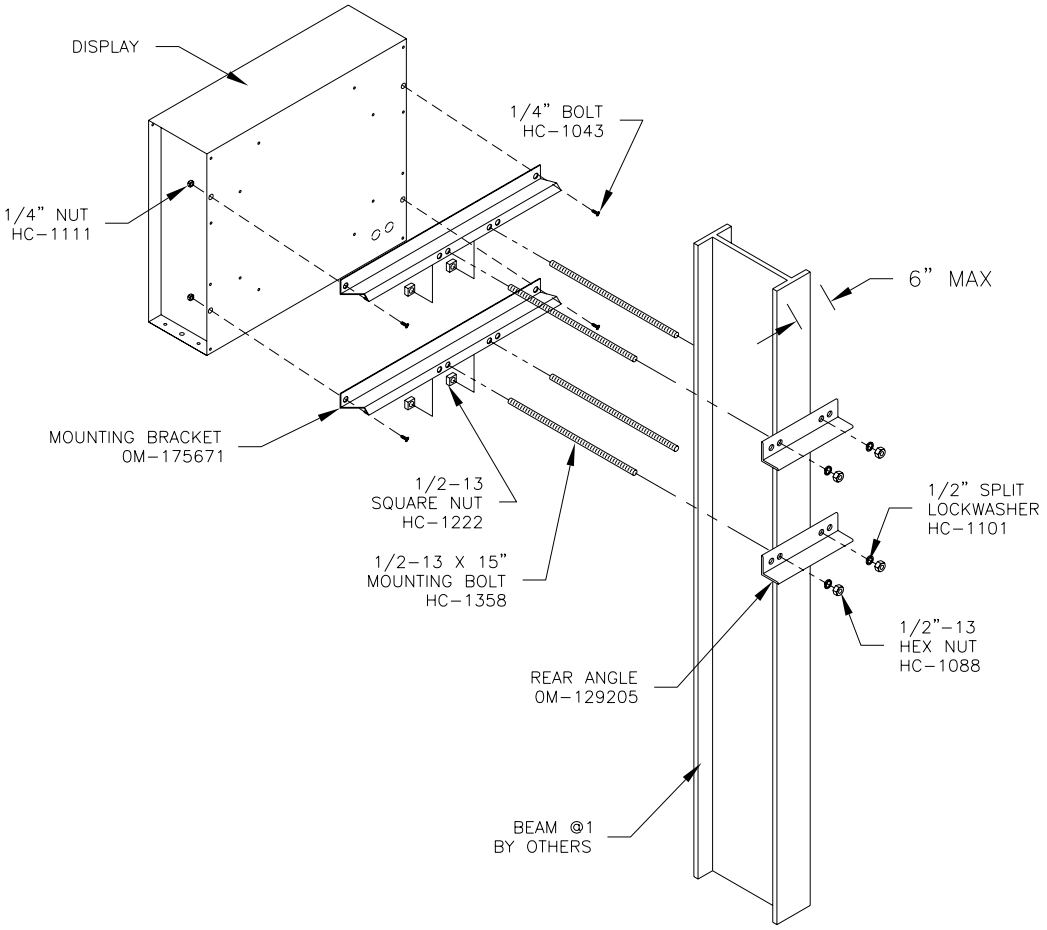
REV.	DATE	DESCRIPTION	BY	APPR.

REVISION 00

APPR. BY:

SCALE: 1=10

1164-E07A-175623



BEAM MOUNTING PROCEDURE:

1. ATTACH THE MOUNTING BRACKETS @2 TO THE REAR OF THE DISPLAY USING THE INCLUDED 1/4" HARDWARE. HOLES ARE PROVIDED IN THE MOUNTING BRACKETS AND IN THE BACK OF THE DISPLAY.

2. POSITION THE DISPLAY (WITH ATTACH MOUNTING BRACKETS) AGAINST THE BEAMS AND SECURE TO THE BEAM WITH THE 1/2" 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.

SEE DRAWING 1192-R10A-175696 FOR A SIDE VIEW AND DETAILS.

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: OUTDOOR LED SCOREBOARDS

TITLE: BEAM MOUNTING PROCEDURE; TN-2016-11

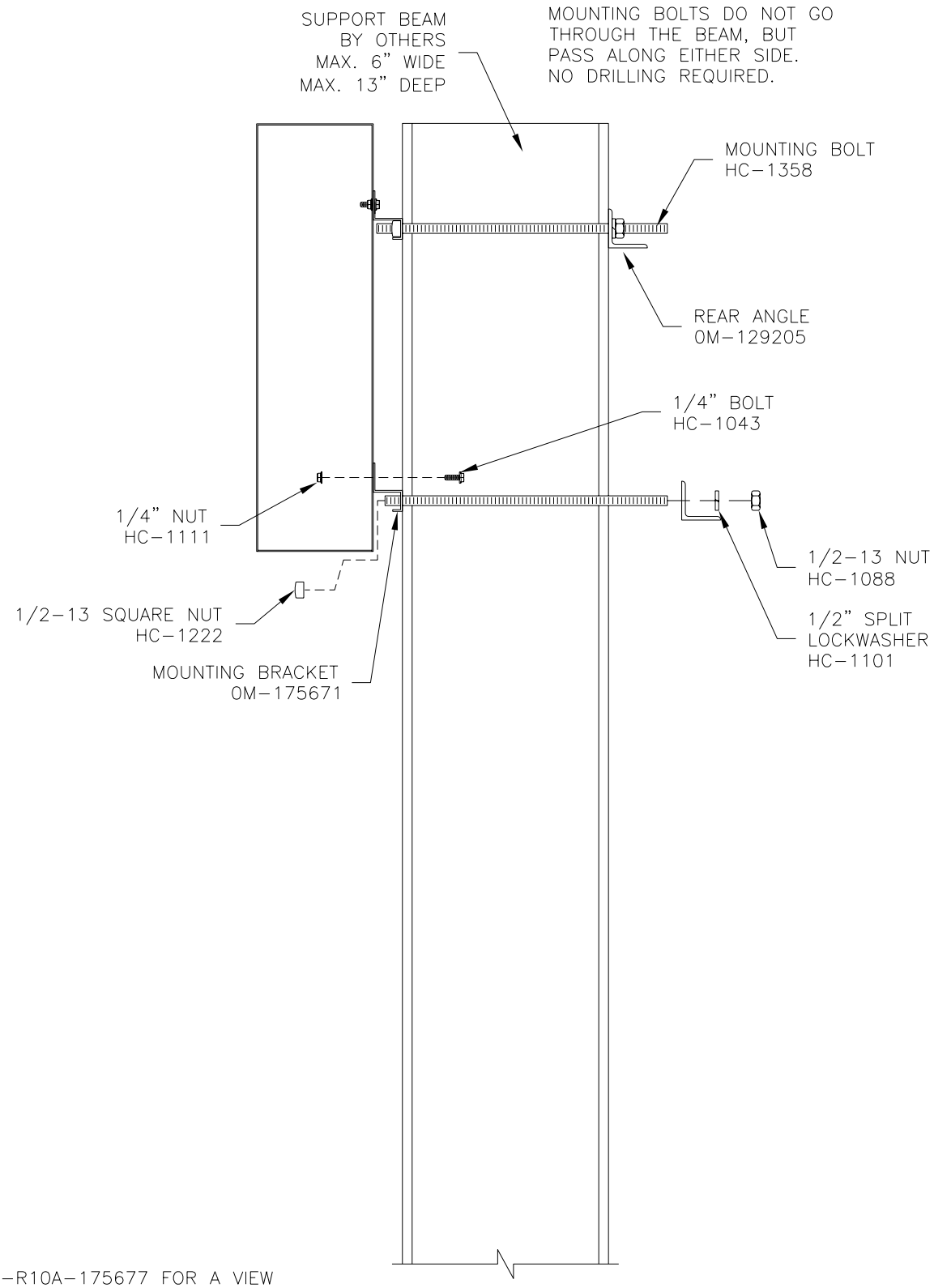
DES. BY: MCOPLAN DRAWN BY: MCOPLAN DATE: 24SEP02

SCALE: 1=20

1164-R10A-175677

REV.	DATE	DESCRIPTION	BY	APPR.

REVISION



SIDE VIEW

SEE DRAWING 1192-R10A-175677 FOR A VIEW FROM THE REAR OF THE DISPLAY, AND STEP BY STEP PROCEDURE.

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: OUTDOOR LED SCOREBOARDS

TITLE: BEAM MOUNTING; SIDE VIEW, TN-2016-11

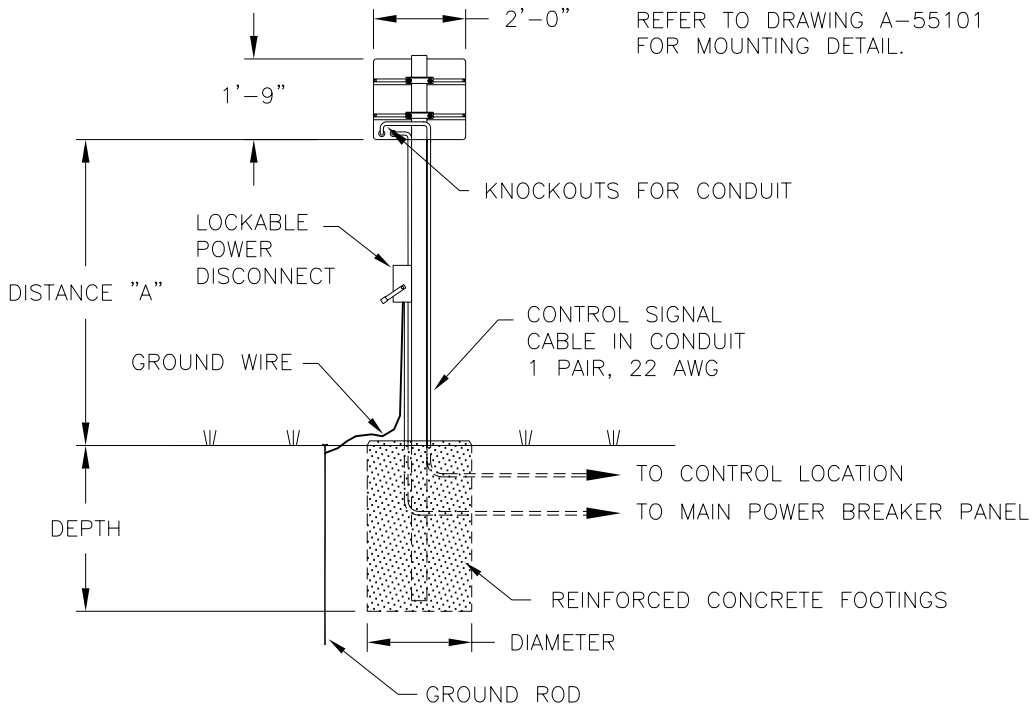
DES. BY: MCOPLAN DRAWN BY: MCOPLAN DATE: 24SEP02

REV.	DATE	DESCRIPTION	BY	APPR.
REVISION				

APPR. BY:

SCALE: 1=8

1164-R10A-175696



REAR VIEW

MODEL TN–2016–11					
DISTANCE "A" (SEE FIGURE)	TOTAL DISPLAY SIZE		DESIGN WIND VELOCITY		
			70 MPH	80 MPH	100 MPH
10'–0"	2'–0" x 1'–9"	BEAM *FOOTING*	HSS4X4X3/16 *2.0X4.0*	HSS4X4X3/16 *2.0X4.0*	HSS4X4X3/16 *2.0X4.0*
12'–0"	2'–0" x 1'–9"	BEAM *FOOTING*	HSS4X4X3/16 *2.0X4.0*	HSS4X4X3/16 *2.0X4.0*	HSS4X4X3/16 *2.0X4.0*
14'–0"	2'–0" x 1'–9"	BEAM *FOOTING*	HSS4X4X3/16 *2.0X4.0*	HSS4X4X3/16 *2.0X4.0*	HSS4X4X1/4 *2.0X4.0*

FOOTING = DIAMETER X DEPTH

FOOTING DIMENSIONS ARE SUGGESTIONS ONLY, PROVIDED TO ASSIST WITH ESTIMATING INSTALLATION COSTS AND ARE NOT INTENDED FOR CONSTRUCTION PURPOSES.

FOOTING DIMENSIONS ARE BASED ON ASSUMED SOIL BEARING PRESSURE OF 2000 LB/FT^2

ACTUAL FOOTING DEPTH AND DIAMETER FOR A PARTICULAR INSTALLATION MUST BE DETERMINED BY A QUALIFIED STRUCTURAL ENGINEER, USING DATA FROM A SOIL SAMPLE TEST AT THE SITE.

DAKTRONICS, INC. IS NOT RESPONSIBLE FOR STRUCTURES DESIGNED AND INSTALLED BY OTHERS.

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: OUTDOOR LED SCOREBOARDS

TITLE: BEAM AND FOOTING RECOMMENDATIONS; TN–2016–11

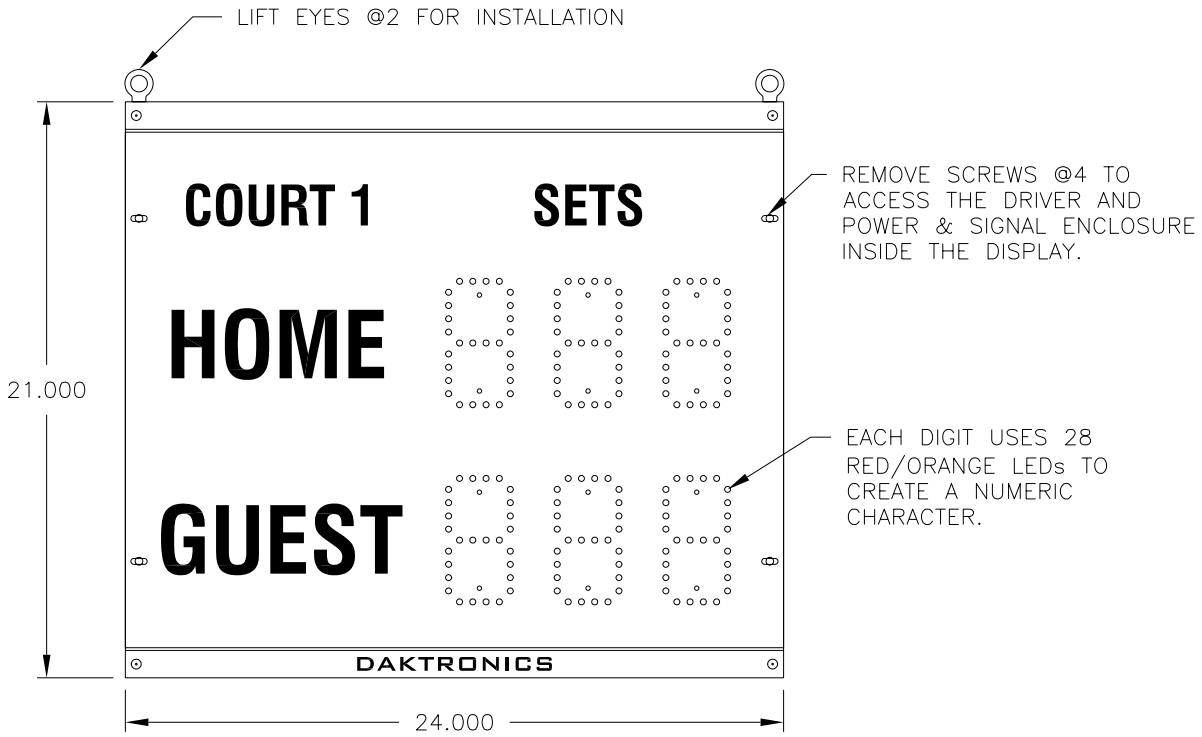
DES. BY: MCOPL/RNEYEN DRAWN BY: MCOPLAN DATE: 25SEP02

REVISION APPR. BY:

SCALE: 1=50

1192-R10A-175784

REV.	DATE	DESCRIPTION	BY	APPR.



FRONT VIEW

NOTES:

WEIGHT: APPROXIMATELY 30 LBS.

DISPLAY CABINET CONSTRUCTED OF 0.063" ALUMINUM.

POWER REQUIREMENT: 120V AC, 300W

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: TENNIS SCOREBOARDS

TITLE: MECHANICAL SPECS; TN-2016-11

DES. BY: MCOPLAN DRAWN BY: MCOPLAN DATE: 09OCT02

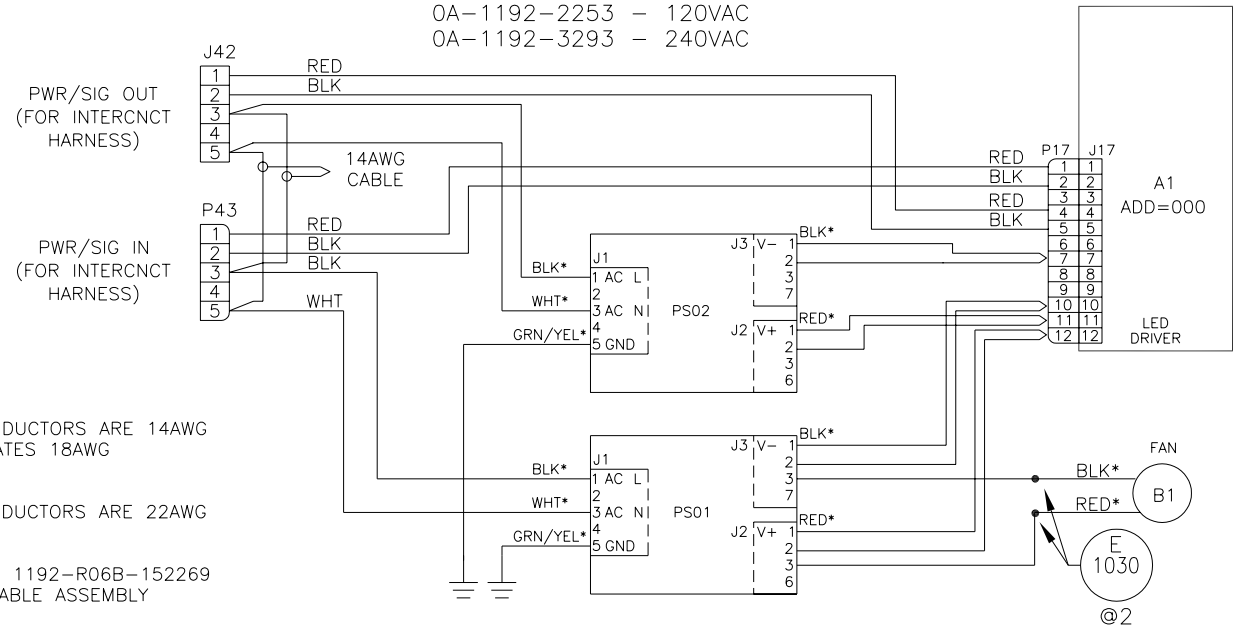
SCALE: 1=7

1164-R08A-176684

REV.	DATE	DESCRIPTION	BY	APPR.

REVISION APPR. BY:

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

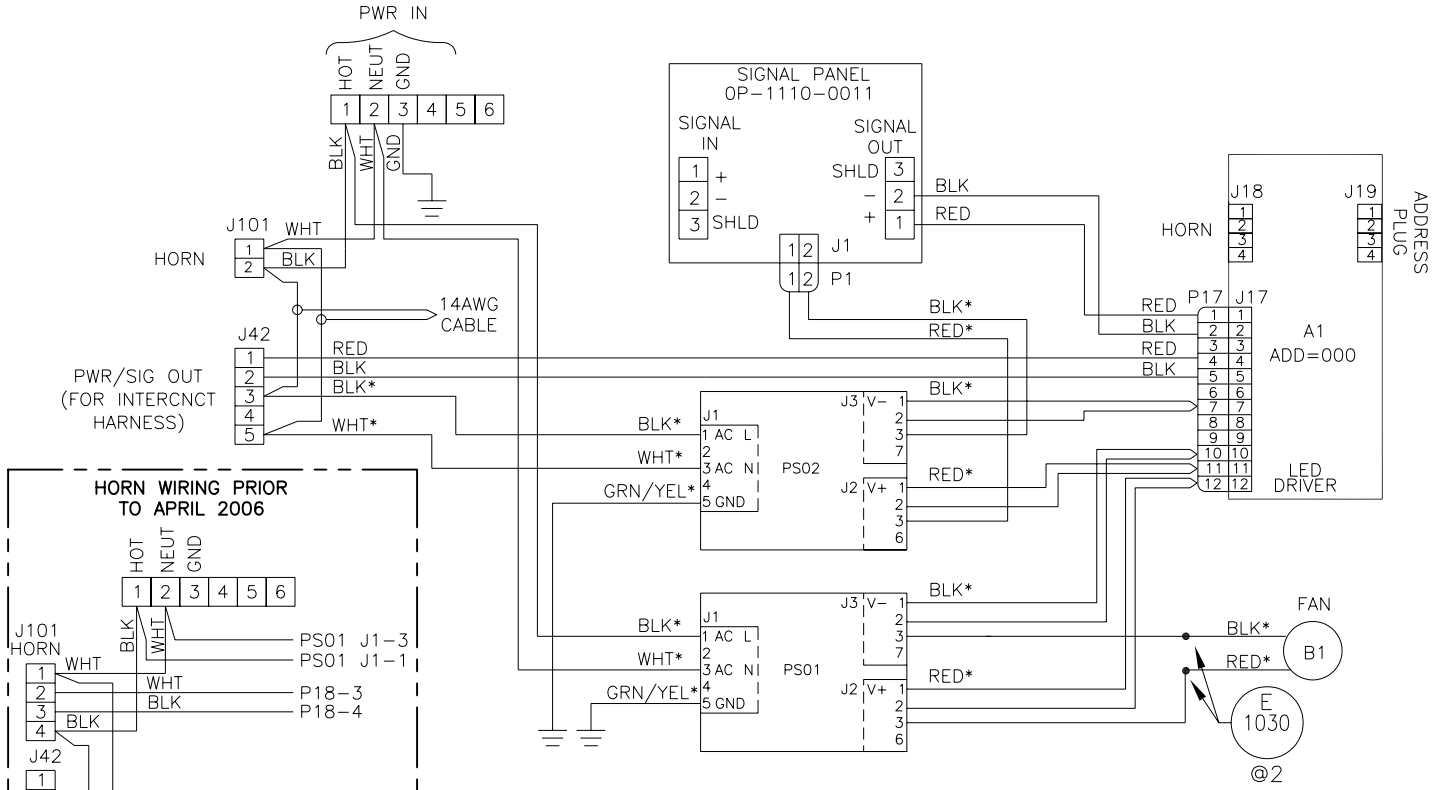


ALL POWER CONDUCTORS ARE 14AWG EXCEPT * INDICATES 18AWG CONDUCTORS.

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.

DAKTRONICS, INC. BROOKINGS, SD 57006

REV.	DATE	DESCRIPTION	BY	APPR.
02	20 MAR 06	ADD 240VAC PART NUMBERS ADD NEW HORN CARD	KZB	MWM
01	10 DEC 02	ADDED BLOCKS 5 AND 6 TO PWR IN	AJL	MWM

PROJ: OUTDOOR LED SCOREBOARD

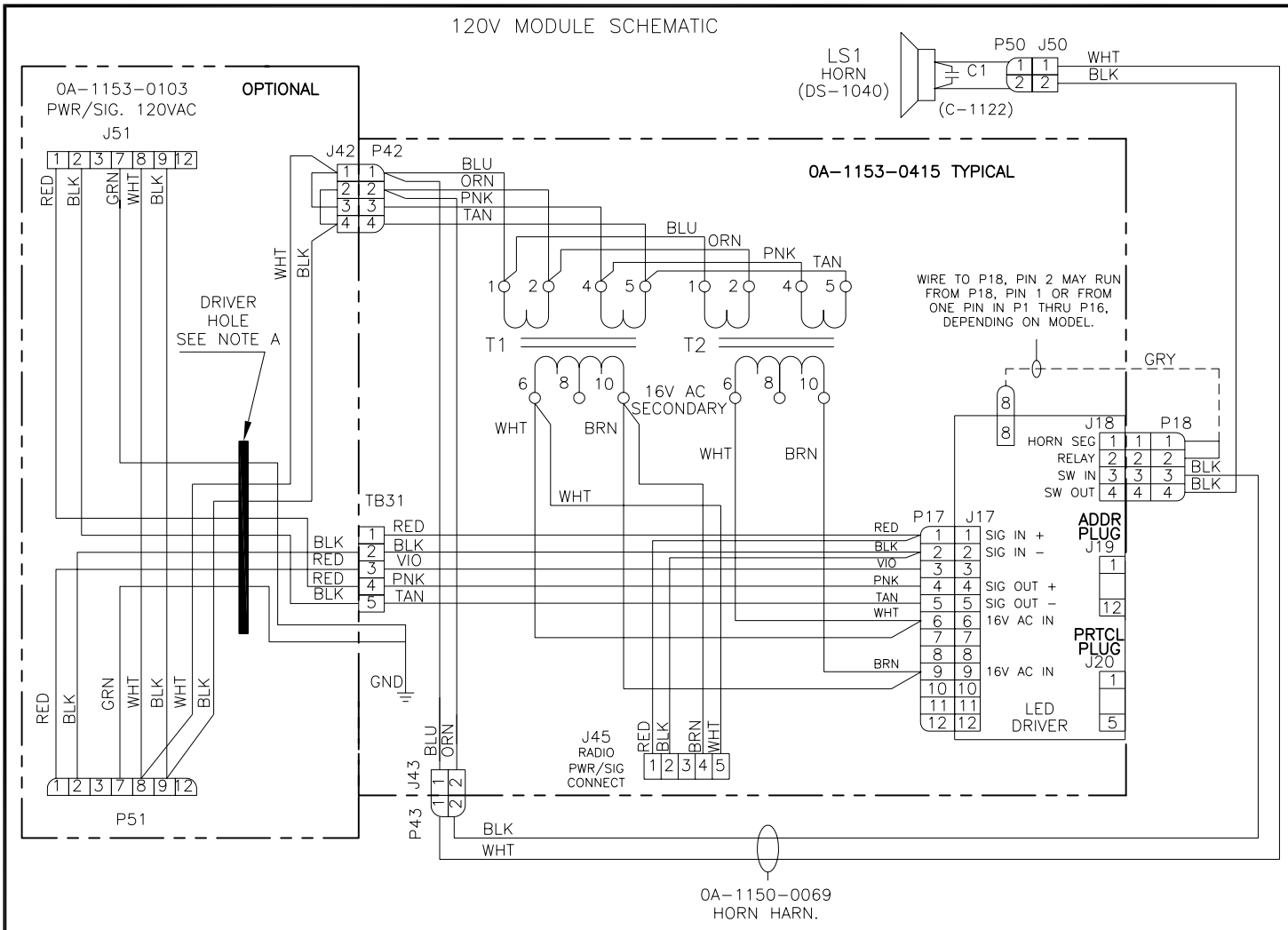
TITLE: SCHEMATIC; GEN III OUTDOOR LED, 16 COLUMN DRVR

DES. BY: MMILLER DRAWN BY: MMILLER DATE: 05 NOV 02

REVISION 02 APPR. BY:

SCALE: 1=1

1192-R03A-177931



NOTES:

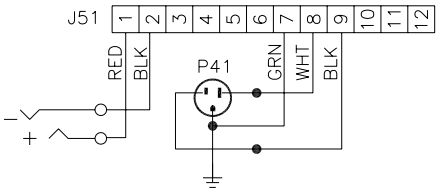
ALL DRIVERS USED IN THIS SETUP MUST HAVE A PROTOCOL PLUG (P20) AND AN ADDRESS PLUG (P19).

HORN AND HORN HARNESS SHOWN ARE OPTIONAL. CHECK ASSEMBLY PACKET TO SEE IF THE OPTION IS REQUIRED.

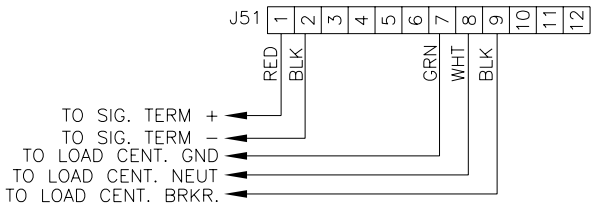
NOTE A:

PUT WIRES THROUGH THE DRIVER HOLE TO GET FROM THE J51 AND P51 TO 0A-1153-0415

120V INPUT SCHEMATIC



LOAD CENTER INPUT SCHEMATIC
J51



DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: LED AQUATICS

TITLE: SCHEMATIC; 120VAC SINGLE DRIVER

DES. BY: MMILLER DRAWN BY: MMILLER DATE: 10 JUN 03

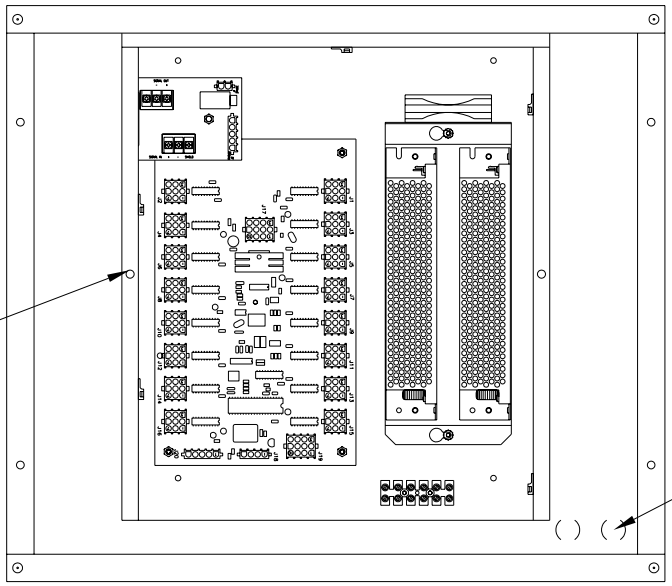
REVISION 01 | APPR. BY: | SCALE: NONE

1153-R03A-189621

REV.	DATE	DESCRIPTION	BY	APPR.
01	20 APR 06	ROUTED WIRES THROUGH DRIVER HOLE WIRED GROUND FROM J-51 AND P-51 TO 0A-1153-0415	CJG	

TN-2016-11

ENCLOSED 16 COLUMN LED DRIVER AND POWER/SIGNAL ENCLOSURE. (THE DISPLAY FACE PANEL AND THE ENCLOSURE COVER HAVE BEEN REMOVED TO SHOW THE COMPONENT DETAIL.)

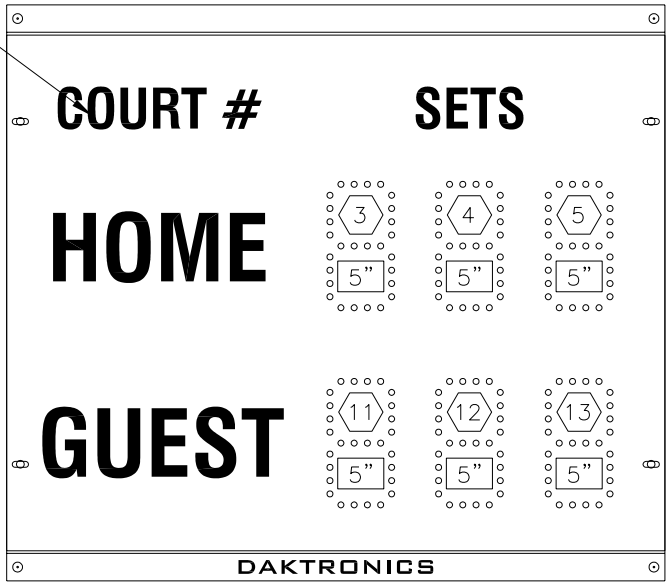


KNOCKOUTS FOR CONDUIT

FRONT VIEW

DISPLAY FACE PANEL HAS BEEN REMOVED

OPTIONAL COURT NUMBER CAPTION (SEE ORDER BOM FOR DETAILS)



FRONT VIEW

⟨1⟩ = LED DRIVER CONNECTOR WIRED TO THAT DIGIT.

[5"] = DIGIT SIZE

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: OUTDOOR TENNIS SCOREBOARDS

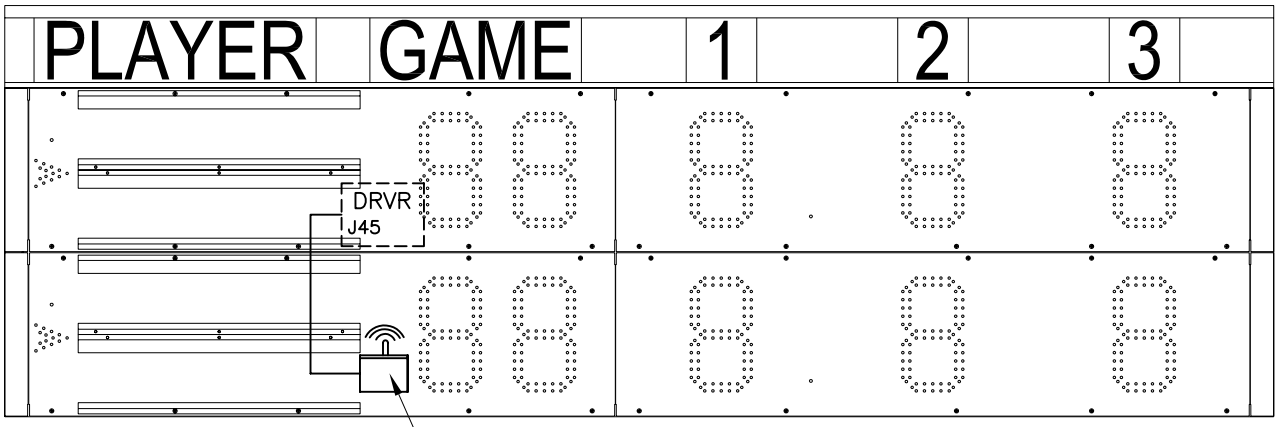
TITLE: COMPONENT LOCATIONS; TN-2016-11, G3

DES. BY: MCOPLAN DRAWN BY: MCOPLAN DATE: 25AUG03

REVISION 00 APPR. BY: SCALE: 1=7

1164-R08A-195593

REV.	DATE	DESCRIPTION	BY	APPR.



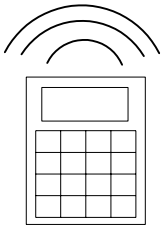
0A-1110-0035
FUNCTION SETTING = 2

NOTE: RC-100 SCOREBOARD RECEIVER BASE STATION IS LOCATED BEHIND THE FRONT ACCESS PANEL OF DISPLAY.

NOTE:
THE WIRELESS BASE STATION COMES PRE-SET TO CHANNEL 1. HOWEVER, CHANNELS 1-15 CAN BE USED.

FUNCTION TABLE

FUNCTION NUMBER	DESCRIPTION
0	DEFAULT FUNCTION (LAST POWER UP FUNCTION)
1	CAN HAND HELD (JUDGES) CONSOLE
2	**BASEBALL/TENNIS SCOREBOARD CONTROLLER (ALLSPORT)**
3	DATATIME/DATAMASTER DISPLAY CONTROL



0A-1110-0033
INSERT: LL-2607 (TENNIS) CODE 08

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: TENNIS SCOREBOARDS

TITLE: SYSTEM RISER; TENNIS; SINGLE COURT

DES. BY: DRAWN BY: TJOHNSON DATE: 29AUG05

REVISION 00 | APPR. BY: | SCALE: NONE

1164-R01A-252412

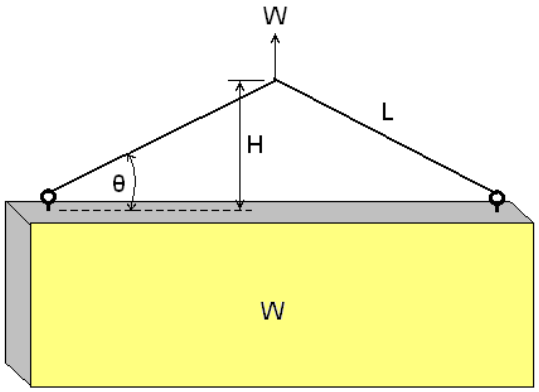
REV.	DATE	DESCRIPTION	BY	APPR.

Appendix B: Eyebolts

Eyebolts

Almost every display that leaves Daktronics is equipped with eyebolts for lifting the display. There are two standard sizes of eyebolts: ½″ and ⅝″.

Load Increase Factor: The load increases as the lift angle (θ) decreases. The allowable load on the eyebolts also decreases with the lift angle due the bending stress on the eyebolts. In sum, the smaller the angle between the cable and the top of the display, the lighter the sign must be to safely lift it. *Do NOT attempt to lift the display when the lift angle is less than 30 degrees.*



W= Weight of sign or Section

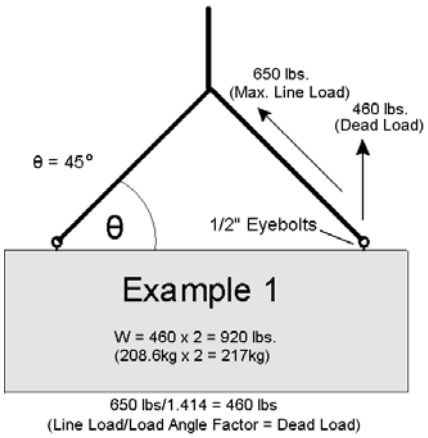
H= Distance between top of sign and lift point

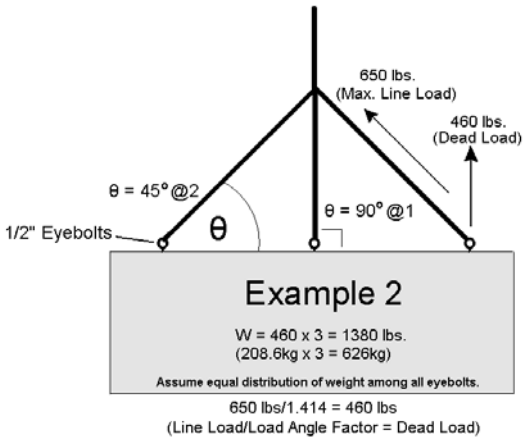
L= Length of cable on one side

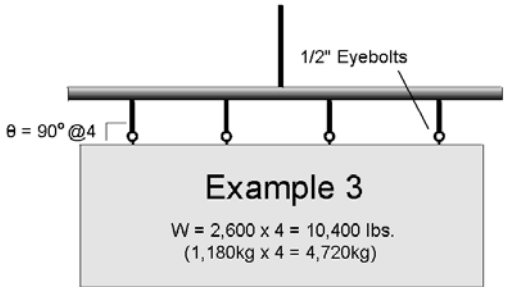
θ = Angle between sign and cable

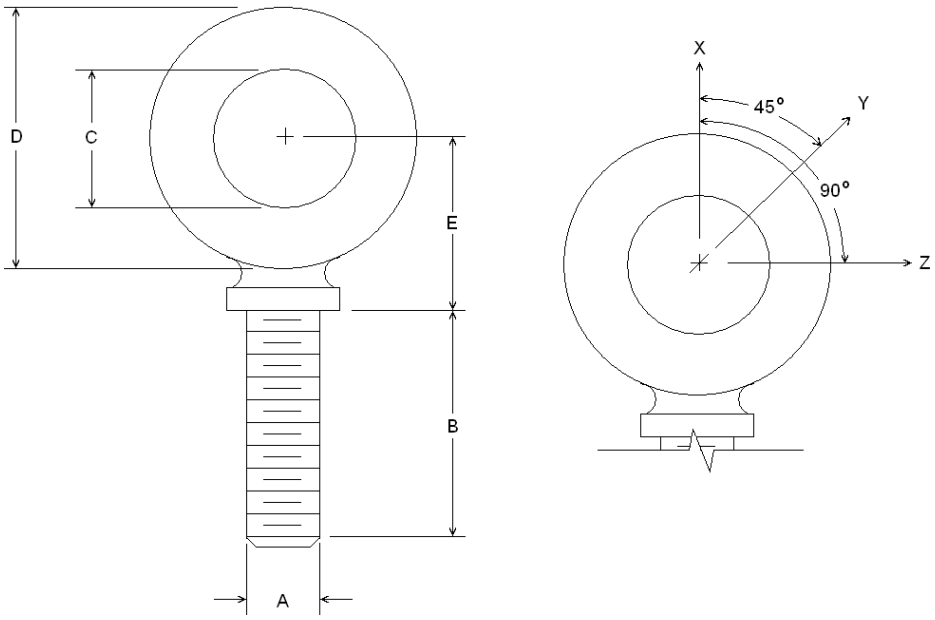
Horizontal Angle	Load Angle Factor (L/H)
90	1.00
60	1.155
50	1.305
45	1.414
30	2.00

	½"		⅝"	
θ	Line Load	Weight/ Anchor	Line Load	Weight/ Anchor
90	2600	2600	4000	4000
60	1500	1299	3300	2858
45	650	460	1000	707
30	520	260	800	400









A	B	C	D	E	No.	Min. Proof Load (lbs.)	Min. Break Load (lbs.)	Stocked	Min. Eff. Thrd. Length	Line Loads		
										Wx	Wy	Wz
1/4	1	3/4	1-3/16	25/32	21	600	2,000	Blank 1/4-20	7/8	400	100	80
3/8	1-1/4	1	1-21/32	1-3/16	23	2,100	5,000	Blank 3/8-16	1-1/8	1,400	350	250
1/2	**1-1/2**	**1-3/16**	**2-1/16**	**1-13/32**	**25**	**3,900**	**9,200**	**Blank 1/2-13**	**1-11/32**	**2,600**	**650**	**520**
9/16	1-5/8	1-9/32	2-13/16	1-17/32	26	4,500	11,830	Blank 9/16-12	1-3/8	3,000	750	600
5/8	**1-3/4**	**1-3/8**	**2-1/2**	**1-11/16**	**27**	**6,000**	**14,700**	**Blank 5/8-11**	**1-9/16**	**4,000**	**1,000**	**800**
3/4	2	1-1/2	2-13/16	1-13/16	28	9,000	21,700	Blank 3/4-10	1-5/8	6,000	1,500	1,200
7/8	2-1/4	1-11/16	3-1/4	2-1/16	29	10,000	30,000	Blank 7/8-9	1-13/16	6,600	1,670	1,330
1	2-1/2	1-13/16	3-9/16	2-5/16	30	12,000	39,400	Blank 1-8	2-1/16	8,000	2,000	1,600
1-1/2	3-1/2	2-9/16	5-1/2	3-5/32	34	27,000	91,300	Blank 1-1/2-6	3	17,800	4,500	3,600

A. Do not use eyebolts on angular lifts unless absolutely necessary. For angular lifts, the shoulder pattern eyebolt is preferred.

B. Load should always be applied to eyebolts in the plane of the eye, not at some angle to this plane.

C. Shoulder eyebolts must be properly seated (should bear firmly against the mating part), otherwise the working loads must be reduced to those indicated for regular eyebolts. A washer or spacer may be required to put the plane of the eye in the direction of the load when the shoulder is seated.

D. No load greater than the safe working load listed in the data table should be used.

E. To obtain the greatest strength from the eyebolt, it must fit reasonably tight in its mounting hole to prevent accidental unscrewing due to twist of cable.

F. Eyebolts should never be painted or otherwise coated when used for lifting. Such coatings may cover potential flaws in the eyebolt.

G. To attain the safe working loads listed for regular eyebolts, 90% of the thread length must be engaged.

Appendix C: Daktronics Warranty and Limitations of Liability

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 FINTESS 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 1-877-605-1116.