

# Daktronics LED Tennis Scoreboards

## Display Manual

*ED-13890*

*Rev 8 – 6 January 2006*

# DAKTRONICS

**ED-13890**  
**Product 1164-99**  
**Rev 8 – 6 January 2006**

*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 of **Daktronics LED Tennis Scoreboards**, including **Models TN-2010, TN-2011, TN-2018, TN-2029, TN-2032, TN-2037 and TN-2042**. The manual also provides details for display maintenance. For 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

### *Important Safeguards:*

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

**Figure 1**, below, illustrates the Daktronics drawing numbering system. Daktronics identifies individual engineering drawings by the drawing number (7087-P08A-69945 in the example), which is located in the lower right corner of the drawing. This manual refers to drawings by 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 are grouped and inserted in alphanumeric order in **Appendix A**. Listed below are a number of drawing types commonly used by Daktronics, along with the information 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, panel board or power termination panel assignments, signal termination panel assignments, and transformer assignments.

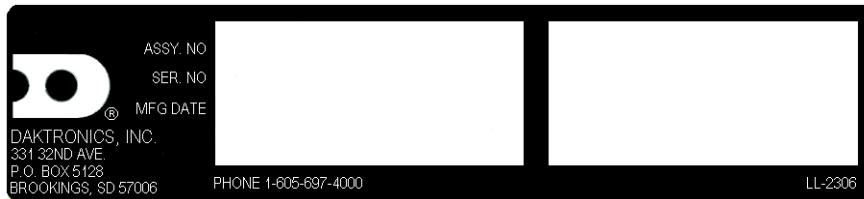
- **Final Assembly:** component locations, part numbers, display dimensions, and assembly/disassembly instructions.

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 each manual by assigning an engineering document number, or ED number, which is located on the cover page. This manual, for example, would be referred to as **ED-13890**.



**Figure 2:** *Daktronics Identification Label*

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 second page of this manual.

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 names and part numbers of components that may require replacement because of wear, damage, or failure.

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 you are communicating with Daktronics about the product for maintenance or troubleshooting efforts and while reading this manual.

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 “OS- \_\_\_\_\_” typically denotes a fabricated metal assembly

## 1.3 Manual Overview

This manual details the TN-2010, TN-2011, TN-2018, TN-2029, TN-2032, TN-2037 and TN-2042 tennis scoreboards. It is divided into the following sections:

- |                    |  |
|--------------------|--|
| <b>Section 1:</b>  | Provides an overview of the product, product safety information, and labeling and numbering descriptions.    |
| <b>Section 2:</b>  | Provides a general description of the displays and contains complete technical specifications.               |
| <b>Section 3:</b>  | Contains mechanical installation information.  |
| <b>Section 4:</b>  | Contains electrical installation information.  |
| <b>Section 5:</b>  | Contains scoreboard service information and explains the Daktronics Exchange and Repair and Return Programs. |
| <b>Section 6:</b>  | Gives detailed information about the operation and maintenance of the team name message centers (TNMCs).     |
| <b>Appendix A:</b> | Contains all engineering drawings referenced in the manual.  |
| <b>Appendix B:</b> | Contains information about eyebolts and scoreboard lifting.  |

The various sections in this manual contain model-specific information, including dimensions, digit configuration, and power requirements. The scoreboard engineering drawings, located in **Appendix A**, also list dimensions, weight, and mounting instructions for each display. Additionally, the scoreboard model number and electrical requirements can be found on a label on the display entrance panel.



## Section 2: Display Overview and Specifications

---

Daktronics outdoor LED tennis scoreboards are part of a family of scoring and timing displays designed to offer easy installation, readability, and reliability. Microprocessor control assures consistent operation and accuracy. Daktronics scoreboard models are identified using a series number. This manual contains installation and maintenance information regarding the TN-2010, TN-2011, TN-2018, TN-2029, TN-2032, TN-2037 and TN-2042 tennis scoreboards.

Featuring large, highly visible 10" or 15" digits, the scoreboard uses light emitting diodes for illumination. (Light emitting diodes, or 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, Daktronics scoreboards consume little power, some barely more than a household lamp. All of the tennis displays in this manual may be configured with either amber or red PanaView<sup>®</sup> LED digits. The suffix after the model number of the scoreboard determines the display's digit color, -11 for red, and -21 for amber digits.

The models may be described as follows:

- **TN-2010:** Doubles scoreboard with four matrix team name message centers programmable for displaying the names of current players; digits and indicators include sets, games, and points for both sides, previous sets and serve.
- **TN-2011:** Combines TN-2010 with a time of day and match time clock section. The timing section includes an optional logo/sponsor panel.
- **TN-2018:** Multiple-play scoreboard that displays Home and Guest team score and match information for six courts. For each court, the TN-2018 displays Home and Guest game score, serve indicators, set scores for three sets, and court number. Home and Guest information on each court is displayed on five LED digits.
- **TN-2029:** Multiple-play scoreboard that displays Home and Guest team score and match information for six courts. For each court, the TN-2029 displays Home and Guest game score, serve indicators, set scores for three sets, and court number. Home and Guest information on each court is displayed on five LED digits.
- **TN-2032:** Multiple-play scoreboard that displays Home and Guest Team Score and match information for six courts. TN-2032 displays Home and Guest serve indicators, set scores for three sets, and court number. Home and Guest information on each court is displayed on three LED digits.

- **TN-2037:** Multiple-play scoreboard that displays Home and Guest Team Score and match information for three courts. TN-2037 displays Home and Guest serve indicators, set scores for three sets, and court number. Home and Guest information on each court is displayed on three LED digits.
- **TN-2042:** Multiple-play scoreboard that displays Home and Guest Team Score and match information for six courts. TN-2042 displays Home and Guest serve indicators, set scores for three sets, and court number. Home and Guest information on each court is displayed on three LED digits.

Daktronics TN-2018, TN-2029, TN-2032 and TN-2037 tennis scoreboards are designed for use with the All Sport® 1600 or 5000 Series controllers. The TN-2010, TN-2011 and TN-2042 require an All Sport 5000 control console because they contain programmable message centers. Each console uses keyboard overlays (sport inserts) for game control, and the scoreboards operate without modification on All Sport 5000 signal protocol. For operating instructions, refer to the appropriate control console manual, listed below.

- **ED-12462:** All Sport 1600 Series Control Console Operation Manual
- **ED-11976:** All Sport 5000 Series Control Console Operation Manual

These displays can also be operated using DakTennis™ software. Daktronics DakTennis software is a full-featured software application for receiving, editing, and displaying information about tennis matches. It comes complete with switch boxes that allow data to be sent right from courtside. For further details regarding the operation of DakTennis software, refer to the DakTennis Software Operation manual, **ED-12098**.

## 2.1 Product Safety Approval

Daktronics scoreboards and timing displays are ETL listed, tested to CSA standards and CE labeled for outdoor use. Contact Daktronics with any questions regarding testing procedures.

## 2.2 LED Tennis Display Specifications

Model	No of Sections	Dimensions (H, W, D)	Weight (Crated)	Digit Size/ Color	Captions	Max Wattage	Circuit	Amps (Per Line)	Driver Number and Address
<b>TN-2010</b>	1 Section	H6'-6", W16'-0", D6" (1981 mm, 4877 mm, 152 mm)	650 lb 295 kg  (1235 lb) (560 kg)	15" (381 mm)  -11: red -21: amber	<ul style="list-style-type: none"> <li>▪ Serve 3" (76 mm)</li> <li>▪ All other captions 4" (102 mm)</li> </ul>	600 W	120 V AC	5.0 A	A1 10 A2 11 TNMC1 221 TNMC2 222 TNMC3 221 TNMC4 222
<b>TN-2011</b>	2 Sections	H8'-6", W16'-0", D6" (2591 mm, 4877 mm, 152 mm)	820 lb (372 kg)  (1558 lb) (707)	15" (381 mm)  -11: red -21: amber	<ul style="list-style-type: none"> <li>▪ Serve 3" (76 mm)</li> <li>▪ All other captions 4" (102 mm)</li> </ul>	900 W	120 V AC	7.5 A	<i>Top section only</i> A1 10 A2 11 TNMC1 221 TNMC2 222 TNMC3 221 TNMC4 222
	Top	H6'-6", W16'-0", D6" (1981 mm, 4877 mm, 152 mm)	650 lb 295 kg  (1235 lb) (560 kg)						
	Bottom	H2'-0", W16'-0", D8" (619 mm, 4877 mm, 152 mm)	170 lb 77 kg  (323 lb) (147 kg)						NA

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Model	No of Sections	Dimensions (H, W, D)	Weight (Crated)	Digit Size/ Color	Captions	Max Wattage	Circuit	Amps (Per Line)	Driver Number and Address
<b>TN-2018</b>	3 Total	H10'-6", W27'-0", D8" (3197 mm, 8221 mm, 203 mm)	1175 lb 533 kg  (2233 lb) 1013 lb)	15" (680 mm)  -11: red -21: amber	<ul style="list-style-type: none"> <li>▪ Top team names 10" (257 mm)</li> <li>▪ Lower team names 8" (203 mm)</li> <li>▪ All other captions 6" (152 mm)</li> </ul>	780 W	120 V AC	6.5 A	A1 11
	Top	H1'-10", W27'-0", D8" (558 mm, 8221 mm, 203 mm)	350 lb 159 kg  (665 lb) (302 kg)						A2 11
	Middle, bottom (each)	H4'-4", W27'-0", D8" (1319 mm, 8221 mm, 203 mm)	825 lb 375 kg  (1568 lb) (712 kg)						A3 11
<b>TN-2029</b>	3 Total	H8'-11", W20'-0", D8" (2718 mm, 6096 mm, 203 mm)	900 lb 408 kg  (1710 lb) (776 kg)	10" (254 mm)  -11: red -21: amber	<ul style="list-style-type: none"> <li>▪ Top team names 10" (257 mm)</li> <li>▪ Lower team names 8" (203 mm)</li> <li>▪ All other captions 6" (152 mm)</li> </ul>	780 W	120 V AC	6.5 A	A4 11
	Top	H1'-7", W20'-0", D8" (483 mm, 6096 mm, 203 mm)	160 lb 73 kg  (304 lb) (138 kg)						A5 11
	Middle, bottom (each)	H3'-8", W20'-0", D8" (1118 mm, 6096 mm, 203 mm)	370 lb 168 kg  (703 lb) (319 kg)						A6 11
									A7 74

(Continued on next page)

(Continued from preceding page)

Model	No of Sections	Dimensions (H, W, D)	Weight (Crated)	Digit Size/ Color	Captions	Max Wattage	Circuit	Amps (Per Line)	Driver Number and Address
<b>TN-2032</b>	1 section	H 8'-5", W 19'-0", D 8" (2565 mm, 5791 mm, 203 mm)	970 lbs 440 kg  (1475 lbs) (670 kg)	15" (680mm)  -11: red -21: amber	<ul style="list-style-type: none"> <li>▪ Top team names 10" (257 mm)</li> <li>▪ Lower team names 8" (203 mm)</li> <li>▪ All other captions 6" (152 mm)</li> </ul>	480 W	120 V AC	4.0 A	A1 11 A2 11 A3 11 A4 11 A5 11 A6 11 A7 74
<b>TN-2037</b>	1 section	H 6'-3", W 19'-0", D 8" (1905 mm, 5791 mm, 203 mm)	850 lbs 386 kg  (1200 lbs) (544 kg)	15" (680 mm)  -11: red -21: amber	<ul style="list-style-type: none"> <li>▪ Top team names 10" (257 mm)</li> <li>▪ Lower team names and court numbers 8" (203 mm)</li> <li>▪ Set numbers 6" (152 mm)</li> </ul>	1200 W	120 V AC	10.0 A	A1 11 A2 11 A3 11 A4 74
<b>TN-2042</b>	3 total	H 12'-7", W 20'-0", D 8" (1600 mm, 6096 mm, 203 mm))	1020 lbs 3835kg (2295 lbs) (1041kg)	10" (254 mm)  -11: red	<ul style="list-style-type: none"> <li>• All captions are 6" (152 mm)</li> </ul>	4200 W	120 V AC	35 A	A1 11 A2 12 A3 13 A4 14 A5 15 A6 16 A7 20
	Top	H 5'-3" x W 20' 0", D 8" (1118 mm, 6096 mm, 203 mm)	300 lbs 450 kg (945 lbs) (429 kg)	-12: amber					
	Middle, bottom (each)	H 3'-8" x W 20' 0", D 8" (1118 mm, 6096 mm, 203 mm)	300 lbs 450 kg (675 lbs) (306 kg)						



## Section 3: Mechanical Installation

### 3.1 Scoreboard Protective Devices

**Note:** Some owners install devices to protect the display from projectiles. Daktronics must approve scoreboard protection devices not provided by Daktronics prior to installation. Failure to follow this approval procedure will void the scoreboard warranty.

Daktronics makes optional devices available, including screens and netting, to help protect the scoreboard from damage due to normal ball impact.

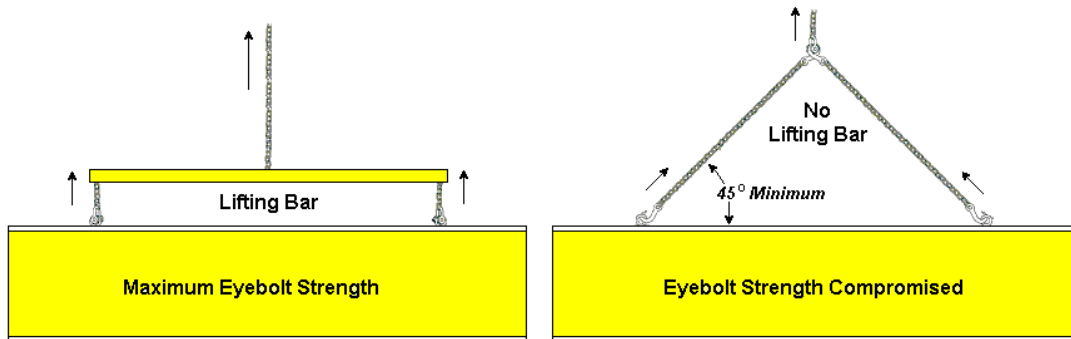
### 3.2 Lifting the Scoreboard

**Reference Drawing:**

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

Larger Daktronics displays like the Model TN-2018, TN-2029, TN-2032, TN-2037 and TN-2042 tennis scoreboard are shipped equipped with eyebolts that are used for lifting, two for each section of the display. The eyebolts are located along the top of the cabinet of 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 following illustration, **Figure 3**, and in **Drawing A-44548**.



**Figure 3:** *Lifting the Scoreboard*

The drawing 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 not to exceed the rated load of the eyebolts. Refer to **ED-7244: Eyebolts**, to determine allowable loads and load angles for the lifting hardware. **ED7244** is located in **Appendix B** of this manual.

Avoid using other lifting methods. Cables and chains attached to the eyebolts and directly to a center lifting point, as shown in the right-hand example in **Figure 4**, 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.

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

In installations in which an ad panel or some other scoreboard section may be added to the base display, the lower scoreboard section is installed first and secured to the support beams, and the upper section is then 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 installers remove the lift eyebolts when the display is permanently mounted, 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. Failure to do this could potentially cause wiring and corrosion problems in the future.

### 3.3 Scoreboard Mounting

**Reference Drawings:**

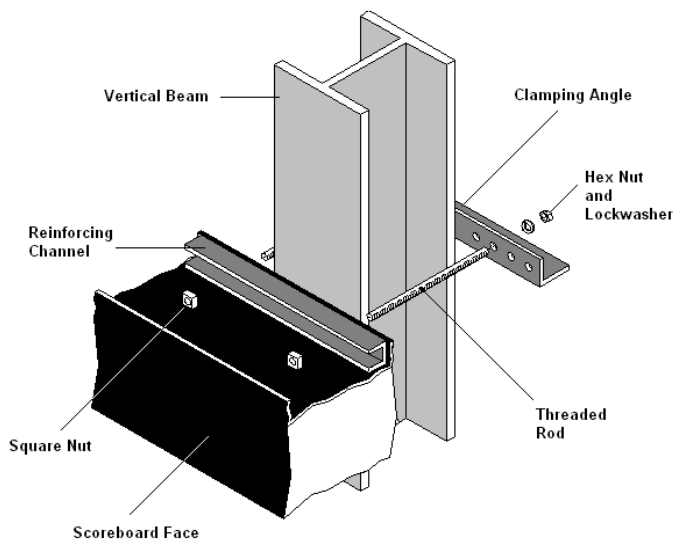
Scoreboard Mounting .....	<b>Drawing A-55101</b>
Shop Dwg, TN-2032 .....	<b>Drawing B-157568</b>
Shop Dwg, TN-2011 & TN-2010, LED .....	<b>Drawing B-189028</b>
Shop Dwg, TN-2018 .....	<b>Drawing B-202354</b>
Shop Dwg, TN-2029-(11/21) w/ ID Panels.....	<b>Drawing B-221501</b>

All of the tennis scoreboard models described in this manual mount to vertical beams as part of an outdoor support structure. The display is secured to the structure using clamps attached with Grade 5 hardware.



**Note:** Take care during the installation process to ensure the drain holes in the bottom or the bottom angles of the scoreboard/display are not covered by the mounting structure. *If they are covered,*  $\frac{3}{8}$ " holes must be drilled through the mounting structure in the same spot as the original holes.

Refer to **Drawings A-55101, B-157568, B-189028, B-202354 and B-221501** for mounting information. **Drawing B-189028** contains detailed footing and beam information for models TN-2010 and TN-2011. **Drawing B-202354** contains detailed footing and beam information for model TN-2018, **Drawing B-221501** for model TN-2029 and **Drawing B-157568** for model TN-2032. Each section of the scoreboard attaches at the top and the bottom to all the beams. The drawings also show top and side views of the scoreboard secured to the beams. Note that the  $\frac{1}{2}$ " threaded rods *do not* pass through the flanges of the beams, but instead run along both sides of each beam.



**Figure 4: Beam Mounting**

Follow this procedure for each section of the scoreboard:

1. Use the mounting channel to determine which hole combination should be used. Be sure to keep the bolts as close to the beam as possible.
2. Using the mounting channel as a template, drill  $\frac{9}{16}$ " holes in the upper and lower rear flange of the scoreboard.
3. Place  $\frac{1}{2}$ " square nuts inside the channel and thread the bolts through. Refer to **Figure 4** and to **Drawings A-55101, B-157568, B-189028, B-202354 and B-221501**.
4. Slide clamping angles over the ends of the rods and loosely install the split lock washers and  $\frac{1}{2}$ " hex nuts.
5. Make final adjustments in the positioning of the scoreboard. Tighten the bolts in the mounting clamps.

6. Make sure that the threaded rods are perpendicular to the scoreboard, and tighten all of the  $\frac{1}{2}$ " nuts.

## Section 4: Electrical Installation

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Electrical installation consists of the following processes:

- Providing power and ground to a disconnect near the scoreboard
- Routing power and ground from the main disconnect to the scoreboard driver/power enclosure
- Connecting the scoreboard ground to a grounding electrode at the display location
- Routing the control signal cable from the control location to the display location

**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

#### Reference Drawings:

Schematic; 6 Court Tennis w/ Top Score .....	<b>Drawing B-181793</b>
Schematic; TN-2010 & TN-2011 .....	<b>Drawing B-185759</b>
Schematic; TN-2037-11, -21 .....	<b>Drawing B-193461</b>

Daktronics outdoor LED scoreboards have been designed for easy access to components, and the power and control signal hookup has been simplified. All four tennis scoreboards described in this manual are accessible from the front only. Internal components are serviced by removing the face panels or digit panels on the front of the scoreboard. To remove a panel, loosen the screws, slide the panel upward on the keyhole opening, and lift off. Some panels may be hinged and require only the removal of screws.

Correct power installation is imperative for proper display operation. The subsections that follow give details of 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.

Daktronics tennis scoreboards require one dedicated 120 V circuit for incoming power.

**WARNING** It is critical that the scoreboard circuit be fused at 15 A, and that all conductors used must be designed to pass a 15 A current in normal operation. Failure to meet wiring and over current protection device requirements is a violation of the National Electrical Code<sup>®</sup> and will void the scoreboard warranty.

All power conductors are 14 AWG, except where 18 AWG wiring is called out on the schematic. All signal conductors are 22 AWG. For more information on power requirements, refer to **Drawings B-181793, B-185759 or B-193461**.

Refer to the schematic drawings listed above and to the table in **Section 2** to determine circuit specifications and power requirements for individual displays.

## 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.

**Note:** The display must be properly grounded, or the warranty will be void.

Refer to the schematic, **Drawing A-177931**, for information on connecting 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.

**Note:** Connecting the neutral to ground at the disconnect 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:**

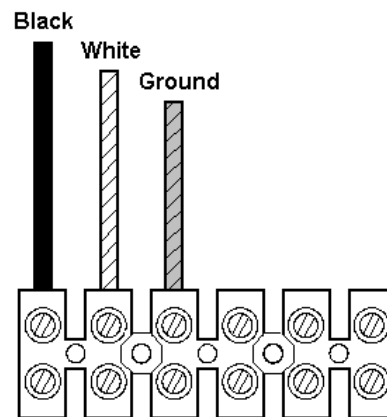
Driver; Gen III Outdoor LED, 16 Col Master .....	<b>Drawing A-178197</b>
Component Layout, TN-2018-11/-21 .....	<b>Drawing A-182506</b>
Component Layout, TN-2032-11/-21 .....	<b>Drawing A-183714</b>
Component Locations; TN-2011-11/-21.....	<b>Drawing A-188217</b>
Component Layout, TN-2037-11/-21 .....	<b>Drawing A-193974</b>
Component Locations, TN-2029-11/21.....	<b>Drawing A-221340</b>
Schematic; 6 Court Tennis w/ Top Score .....	<b>Drawing B-181793</b>
Schematic; TN-2010 & TN-2011 .....	<b>Drawing B-185759</b>
Schematic; TN-2037-11, -21 .....	<b>Drawing B-193461</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 face or digit panel and remove the cover from the enclosure. Refer to the component layout drawings for each of the scoreboards.

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

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 5**. The terminal block is located in the lower right corner of the enclosure.



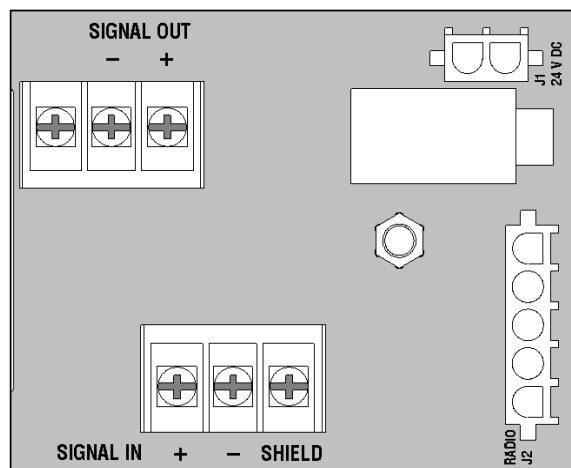
**Figure 5: Power Terminal Block**

Connect the power wires as shown in the illustration. Refer the schematics listed at the beginning of this section for additional wiring details. The schematics include a detailed illustration of the power termination.

**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 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 arrestor card.* **Figure 6** illustrates the printed circuit board and the terminal blocks.



**Figure 6:** Signal Surge Arrestor Card

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.

For additional information on signal connection, refer to the All Sport 5000 Series control console operation manual, **ED-11976**.

## Radio Control Option

### Reference Drawing:

Radio Receiver Option; Tennis Scoreboards..... **Drawing A-182349**

Radio control is an option with all Daktronics outdoor LED scoreboards, the system providing display control via a 2.4 GHz, extra-high frequency FM signal.

The radio transmitter and receiver are not standard equipment. This setup requires a control console such as the All Sport, equipped with radio output. The display receives control signal via a radio receiver mounted internally to the front panel. The receiver plugs into the power terminal block in the driver/power enclosure. Refer to **Drawing A-182349** for more information about the radio receiver.

For additional information about this option, contact your Daktronics representative; for complete information on radio communications, refer to the All Sport 5000 Series control console operation manual, **ED-11976**.





# Section 5: Scoreboard Maintenance and Troubleshooting

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### **IMPORTANT NOTES:**

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

## 5.1 Cabinet Specifications

### Reference Drawings:

F. Assy, TN-2018-11 or -21 .....	<b>Drawing B-181618</b>
Final Assembly, TN-2032-11 or -21 .....	<b>Drawing B-183598</b>
F. Assy, TN-2010, TN-2011-11/-21 .....	<b>Drawing B-184884</b>
F. Assy; TN-2037-11/-21 .....	<b>Drawing B-193860</b>
F. Assy, TN-2029-11/21 .....	<b>Drawing B-221312</b>
F. Assy, TN-2042-11/21 .....	<b>Drawing B-258520</b>

Cabinets for Daktronics outdoor LED scoreboards are constructed of heavy-gauge aluminum. Exact dimensions and weights are listed in the chart in **Section 2**. Removable panels for component access for model TN-2018 are indicated on **Drawing B-181618**, for the model TN-2029 on **Drawing B-221312**, for the model TN-2032 on **Drawing B-183598** and for the model TN-2037 on **Drawing B-193860**. **Drawing B-184884** illustrates both the hinged access panels and digit panels for models TN-2010 and TN-2011.

## 5.2 Component Location and Access

### Reference Drawings:

Component Layout TN-2018-11 or -21 .....	<b>Drawing A-182506</b>
Component Layout TN-2032-11 or -21 .....	<b>Drawing A-183714</b>
Component Locations, TN-2011-11/-21 .....	<b>Drawing A-188217</b>
Component Layout, TN-2037-11/-21 .....	<b>Drawing A-193974</b>
Component Locations, TN-2029-11/21 .....	<b>Drawing A-221340</b>
Component Locations, TN-2042-11/21 .....	<b>Drawing A-259122</b>

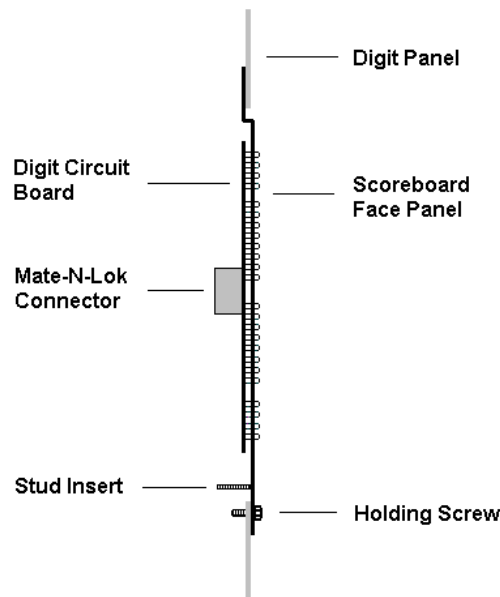
The tennis scoreboards described in this manual are all *front-access* displays. Internal components are serviced by opening or removing panels on the front of the display. Some panels are hinged; to open these, simply remove the panel screws. Other face panels may be removed by loosening the screws and sliding the panel upward on a keyhole opening, and lifting it off. Some components may be located directly behind a digit or digits, and service may require the removal of one or more digit panels.

For most Daktronics outdoor scoreboards, digit panels have been simplified. They are held in place on the display face by an offset flange across the top and by a single screw at the bottom. (Larger digits may have two screws.)

Refer to **Figure 7** at right. Open the scoreboard with care. Hold the digit panel in place by putting hand pressure on it while removing the screw, and carefully lift it from the board, sliding it down and out. If the panel is not held in place, it will drop immediately when the screw is removed, possibly damaging LEDs or the digit harness.

Refer to the component layout drawings listed at the beginning of this section for internal component location information.

**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.



**Figure 7: LED Digit Panel (Not to Scale)**

## Replacing a Digit

### Reference Drawing:

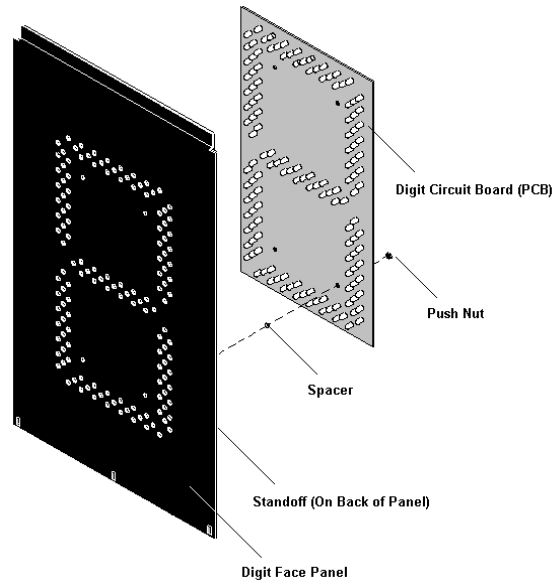
Digit Assemblies; Gen III LED Digits ..... **Drawing B-177679**

The digit circuit board, the platform for the LEDs, is mounted to the back of the digit panel. See **Figure 8** below. Do not attempt to remove individual LEDs. In the case of a malfunctioning board, replace the entire digit panel.

## Replacing a Driver

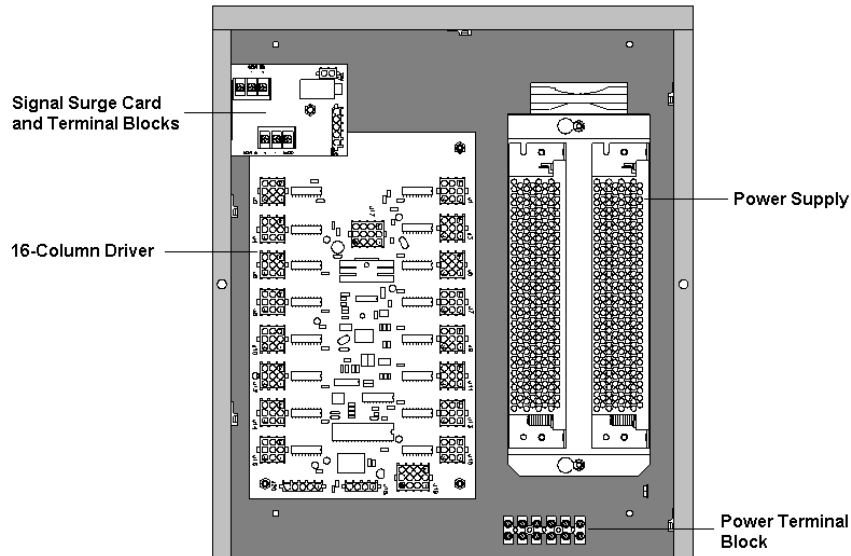
Drivers are typically mounted inside the scoreboard and immediately behind a digit, but location and mounting varies with the model of the scoreboard. For the location of your scoreboard driver, refer to the component locations drawings in your scoreboard manual.

Each driver is enclosed with a power supply and signal terminal block. To reach a failed driver, you must open the driver enclosure. Follow these steps:



**Figure 8: Digit Assembly**

1. Open the digit panel or scoreboard face panel as described in the previous section.
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.  
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 9** below.



**Figure 9: 16 Column Driver Enclosure**

5. Carefully lift the driver from the display and place it on a clean, flat surface.
6. Follow steps 1 through 5 in reverse order to attach a new driver.

## 5.3 Schematics

### Reference Drawings:

- Schematic; Gen III Outdoor LED, 16 Column Drvr ..... **Drawing A-177931**
- Schematic; 6 Court Tennis w/ Top Score..... **Drawing B-181793**
- Schematic; TN-2010 & TN-2011 ..... **Drawing B-185759**
- Schematic; TN-2037-11, -21 ..... **Drawing B-193461**

**Drawing B-181793** is the schematic diagram for the models TN-2018, TN-2029 and TN-2032 tennis scoreboards. **Drawing B-185759** is the schematic for models TN-2010 and TN-2011. The schematic for model TN-2037 is shown on **Drawing B-193461**. Also listed is the schematic for the 16-column driver used in the displays. All three schematics include power and signal inputs.

## 5.4 LED Drivers

### Reference Drawings:

- Driver; Gen III Outdoor LED, 16 Col Master ..... **Drawing A-178197**
- Address Table, 1 Through 128..... **Drawing A-115078**

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 follows:

<b>16-Column LED Driver</b>	
<i>Connector No.</i>	<i>Function</i>
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.

## 5.5 Segmentation and Digit Designation

### Reference Drawings:

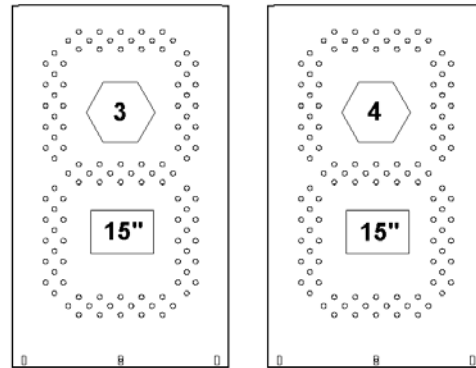
Segmentation, 7 Segment Bar Digit .....	<b>Drawing A-38532</b>
Digit Designation; TN-2018-11 or -21 .....	<b>Drawing A-182059</b>
Pre-Paint Assy, TN-2032-11 or -21 .....	<b>Drawing B-183613</b>
Component Locations, TN-2011-11/-21 .....	<b>Drawing A-188217</b>
Component Layout, TN-2037-11/-21 .....	<b>Drawing A-193974</b>
Component Locations; TN-2029-11/21 .....	<b>Drawing A-221340</b>
Component Locations; TN-2042-11/21 .....	<b>Drawing A-259122</b>

In each digit, certain LEDs always go on and off together. These groupings of LEDs are referred to as *segments*. **Drawing A-38532** illustrates digit segmentation. The drawing also details which connector pin is wired to each digit segment and the wiring color code used throughout the display.

**Drawings A-182059, A-188217, A-221340, B-183613 and B-193974**

provide the digit designation information for the tennis scoreboards.

Numbers displayed in hexagons in the upper half of each digit, as shown in **Figure 10**, indicate the digit designation, that is, which connector is wired to that digit. (The lower number in the square indicates nominal digit size.)



**Figure 10: Digit Designation**

## 5.6 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 it. 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.

## 5.7 Troubleshooting

Daktronics scoreboards require little maintenance. However, from time to time, a display may malfunction, and certain display components will have to be repaired or replaced. The table on the following page provides a list of problems common to most LED displays and specifies corrective actions.

The Replacement Parts List in **Section 5.8** includes part numbers of components it may be necessary to reorder during the life of your display. Most scoreboard components have a white label that lists the part number. Refer to the Replacement

Part List and the drawings in this manual to obtain the correct replacement part number for any damaged component.

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> <li>▪</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>

For troubleshooting assistance and to order replacement components, *contact your service provider first*. Your service provider may have the appropriate part or assembly on hand and, in an emergency, may be able to provide same-day service.

Your scoreboard service may advise you to call Daktronics directly, or your facility may not have an area or regional service provider. In service, note any problem-area assembly numbers, as shown on the scoreboard final assembly drawing. If you need to order replacement components, it would be helpful those instances, feel free to call the Daktronics Help Desk at 877-605-1115. For faster, have a purchase order number or other purchase information available at the time you call.

## 5.8 Replacement Parts

The Daktronics parts list, located on the following page, includes components used by the model TN-2018 tennis scoreboards. Some part numbers are listed on the final assembly engineering drawings in **Appendix A**.

Description	Part Number
Assembly, driver, 16-column, LED, outdoor, Gen III, master	0A-1192-2252
<ul style="list-style-type: none"> <li>▪ Driver, 16-col, LED, outdoor</li> </ul>	0P-1192-0011

*(Continued on following page)*

(Continued from previous page)

Description	Part Number
▪ Fan, 32 cfm, 24 V DC, 3.15" sq	B-1030
▪ Power supply, 24 V, 150 W, 86-132 V input	A-1720
▪ Surge board with radio connection (optional)	0P-1110-0011
Assembly, wide driver, 16-column, LED, Gen III, slave	0A-1192-2437
Digit, 15", 7-seg outdoor LED, red	0A-1192-2223
Digit, 15", 7-seg outdoor LED, amber	0A-1192-2224
Arrow, 3", red	0P-1192-0249
Arrow, 3", amber	0P-1192-0250
Digit, 10", Red	0P-1192-0251
Digit, 10", Amber	0P-1192-0252

## 5.9 Daktronics Exchange and Repair and Return Programs

Daktronics recommends that each customer keep an inventory of essential parts in case problems arise. If equipment fails, the customer's local service technician can get the equipment operational again with spare parts kept on hand.

For specific repair information for your Daktronics scoreboard, refer to the warranty in the original purchase packet shipped with the display. Unless specifically stated in the warranty agreement, *the warranty does not cover on-site labor.*

To meet customer repair and maintenance needs, Daktronics offers two options: Rapid Parts Exchange Program and a Repair and Return Program.

Daktronics' unique Rapid Parts exchange program is a quick, economical service for replacing key components in need of repair. If a component fails, Daktronics sends the customer a replacement, and the customer, in turn, sends the failed component to Daktronics. This not only saves money but also decreases scoreboard downtime. Under normal circumstances, Daktronics sends a reconditioned replacement part within 24 hours. In urgent situations, Daktronics ships using the fastest method available.

Daktronics provides these plans to ensure users get the most from their scoreboards and components. The company offers the service to qualified customers who follow the program guidelines explained below. Please call the Help Desk – 877-605-1115 – if you have questions regarding the Exchange Program or any other Daktronics service.

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

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

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

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

If you do not ship the defective equipment to Daktronics within 30 working days from the invoice date, Daktronics assumes you are purchasing the replacement part outright (with no exchange), and you will be invoiced for it. This second invoice represents the difference between the exchange price and the full purchase price of the equipment. The balance is due when you receive the second invoice.

If you return the exchange equipment after 30 working days from the invoice date, you will be credited for the amount on the second invoice, minus a restocking fee.

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

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

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

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

This is how to reach us:

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

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

**Fax:** 605-697-4444

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



## **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.



## Section 6: Team Name Message Center Maintenance

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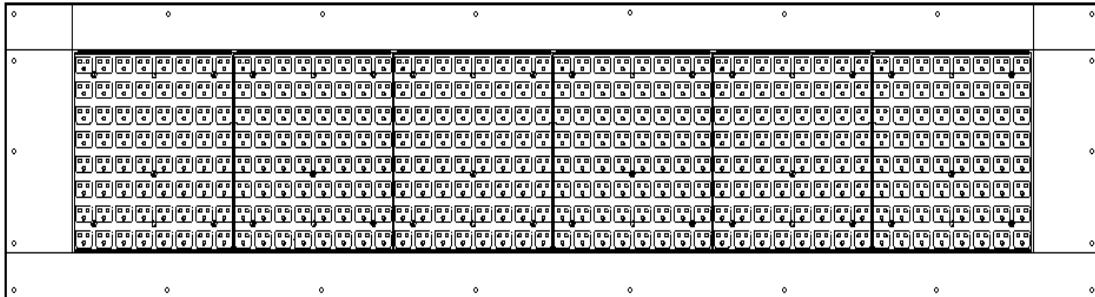


### IMPORTANT NOTES:

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

### 6.1 Team Name Message Center System Overview

Team name message centers (TNMCs) are available in two sizes: an 8x32 matrix model with four 8x8-pixel modules, and an 8x48 model comprised of six 8x8 modules. **Figure 11**, below, illustrates the larger unit. Light emitting diodes (LEDs) – tiny, solid-state lighting units – illuminate the displays.



*Figure 11: 8x48 Team Name Message Center*

The message centers feature an array of red or amber LEDs, and they are capable of displaying characters up to 10" high. Pixels in the red TNMC consist of a three-LED cluster, while amber TNMCs use four-LEDs per pixel.

The four-module TNMC measures approximately 1'-4" tall by 4' wide, while the six-module TNMC measures approximately 1'-4" by 6' wide; both have an in-cabinet depth of about 5". The smaller units weigh about 80 pounds per pair, and the larger TNMC sets add about 120 pounds to scoreboard weight.

TNMCs are typically installed in pairs. Although the message centers customarily are used for team names (home and guest), they are programmable and can display any type of caption. Characters are shown on a single line, and either single- or double-stroke fonts may be used for the caption or name.

## 6.2 Maintenance and Troubleshooting Overview

Standard Daktronics outdoor LED scoreboards typically are front-accessible, but some models may be ordered with rear service access. For that reason, Daktronics team name message centers have been designed so that they may be accessed from both the front *and* rear for easy maintenance and repair of internal components.

This section provides the following TNMC information:

- **Signal Routing Summary:** provides a basic explanation of signal travel through the TNMC display.
- **Power Routing Summary:** provides a basic explanation of power travel through the display.
- **Service and Diagnostics:** provides instructions for removing various display components and explains the functions of circuit board connectors as well as the meanings of diagnostic LEDs.
- **Maintenance:** lists a number of steps to take to keep the team name message centers in safe, working order.
- **Troubleshooting:** lists possible display malfunctions and suggests a number of causes and corrections for each malfunction.
- **Replacement Parts List:** includes the part description and number of display components that may have to be replaced during the life of this display.

## 6.3 Signal Summary

### Reference Drawings:

Schematic, Red TNMC, Gen IV .....	<b>Drawing A-252681</b>
Schematic; Amber TNMC, Gen IV .....	<b>Drawing A-252645</b>
Component Locations; 832/848 Red/Amb LED TNMC, G4.....	<b>Drawing A-257029</b>

Refer to your schematic, **A-252681** or **A-252645**, for complete information on TNMC signal routing. **Drawing A-257029** indicates the locations of the internal electronic components. From signal input from the All Sport controller, routing can be summarized as follows:

- Data from the display controller travels via cable harness into the scoreboard.
- The signal then travels through the driver/power enclosure to the J1 connector on the current loop interface card.

- Data exits at J42 via current loop harness, and connects with P43 at the TNMC controller assembly. An interconnect harness carries the signal to the first module, and the signal relays from module to module, in daisy-chain style, until it reaches the last module on the message center.

## 6.4 Power Summary

### Reference Drawings:

Schematic, Red TNMC, Gen IV .....	<b>Drawing A-252681</b>
Schematic; Amber TNMC, Gen IV .....	<b>Drawing A-252645</b>
Component Locations; 832/848 Red/Amb LED TNMC, G4 .....	<b>Drawing A-257029</b>

Refer to your schematic, **A-252681** or **A-252645**, for complete information on TNMC power routing. **Drawing A-257029** indicates the locations of the internal electronic components. Note that amber TNMCs always contain two power supplies, while red TNMCs require only a single power supply.

Power routing for the display can be summarized as follows:

- Incoming power terminates at the terminal block in the scoreboard driver enclosure. Using the same harness and J42-P43 connections as signal, power is then routed to the TNMC controller where it then travels to both the power supply assembly and to a transformer on the controller tray.
- From the power supply assembly, power is relayed to the first module, and then from module to module.
- While the modules draw their power directly from the power supply assemblies (9 V for red LED modules, 12 V for amber), the TNMC controller itself receives 16 V power from the transformer.

## 6.5 Service and Diagnostics

The following subsections address servicing of these display components:

- TNMC Controller
- Modules and Drivers
- Power Supplies

The subsections also address diagnostic LEDs and signal/power connectors found on the TNMC controller.

**Warning: Disconnect power before servicing internal components!**

## TNMC Controller

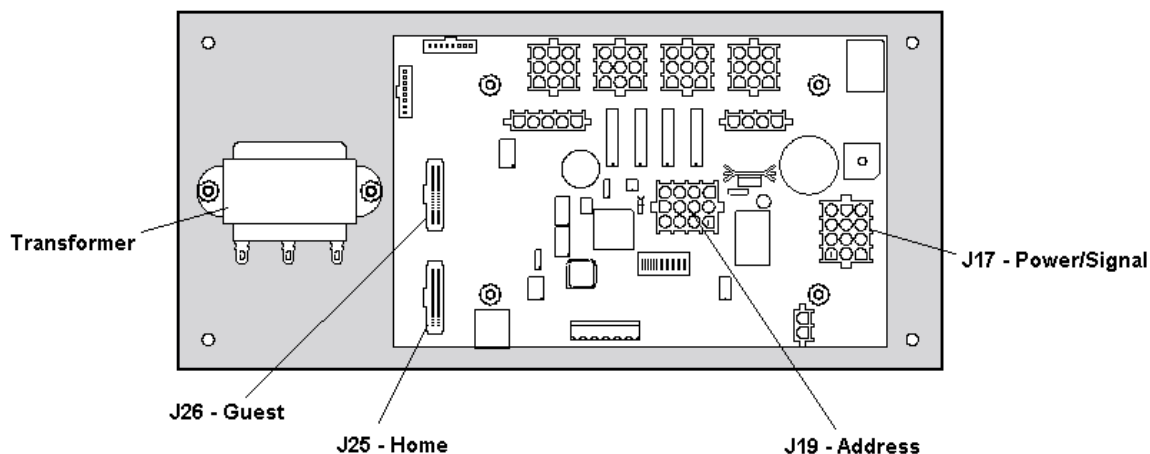
### Reference Drawings:

Component Locations; 832/848

Red/Amb LED TNMC, G4 ..... **Drawing A-257029**

4 Column MASC LED Driver Specifications ..... **Drawing A-166216**

The TNMC controller, located on the rear-access panel, receives signal directly from the control console and sends data to the modules. Refer to the signal summary in **Section 6.3** for more information and to **Drawing A-257029** for the location of the controller board in the TNMC. The controller itself is detailed in **Drawing A-166216**, and **Figure 12** below illustrates a typical controller assembly. The card and transformer are mounted to a tray, which in turn is mounted to the back panel of the TNMC cabinet.



**Figure 12: TNMC Controller Assembly**

**Note:** That connectors **J25** and **J26** control **Home** and **Guest** display. When the ribbon cable is plugged is plugged into **J25**, the TNMC sends home team information to the matrix display. In the opposite message center, the signal cable would be plugged into the **J26** connector, and guest information would be displayed. (Switching the cables reverses the information each message center receives.)

**J19** is the connector for the address plug. The address setting for TNMCs will always be 221. (There may be other settings if the TNMCs are used to display messages other than team names.)

## Diagnostic LEDs

### Reference Drawing:

4 Column MASC LED Driver Specifications ..... **Drawing A-166216**

There are seven diagnostic LEDs located on the TNMC controller, six indicating when the controller is receiving signal, and the seventh indicating power status. Four of the LEDs, those indicating CAN and RS-232 signal functions, are not used with the TNMC controller.

The following table explains the operation and functions of each of the diagnostic LEDs.

LED	Color	Function	Operation	Summary
DS1	Red	CL signal	Steady on or blinking	DS1 will be on or blinking when the driver is receiving signal and off when there is no signal with CL (current loop).
DS2	Green	CL signal	Steady on or blinking	DS2 will be on or blinking when the driver is receiving signal and off when there is no signal with CL (current loop).
DS3 <i>(Not used with TNMC functions)</i>	Red	CAN signal	Steady on or blinking	DS3 will be blinking when the driver is receiving signal and on when there is no signal with CAN (controller area network).  If there is no CAN device connected to TB1, both DS3 and DS4 will be on and steady.
DS4 <i>(Not used with TNMC functions)</i>	Green	CAN signal	Steady on or blinking	DS4 will be blinking when the driver is receiving signal and on when there is no signal with CAN (controller area network).  If there is no CAN device connected to TB1, both DS3 and DS4 will be on and steady.
DS5 <i>(Not used with TNMC functions)</i>	Red	RS-232 signal	Steady on or blinking	DS5 will be on or blinking when the driver is receiving signal and off when there is no signal with RS-232.
DS6 <i>(Not used with TNMC functions)</i>	Green	RS-232 signal	Steady on or blinking	DS6 will be on or blinking when the driver is receiving signal and off when there is no signal with RS-232.
DS7	Green	Power	Steady on	DS7 when on and steady indicates the driver has power.

## Removing/Changing the Controller

### Reference Drawings:

Exploded Front View; Single Panel Module..... **Drawing B-126111**

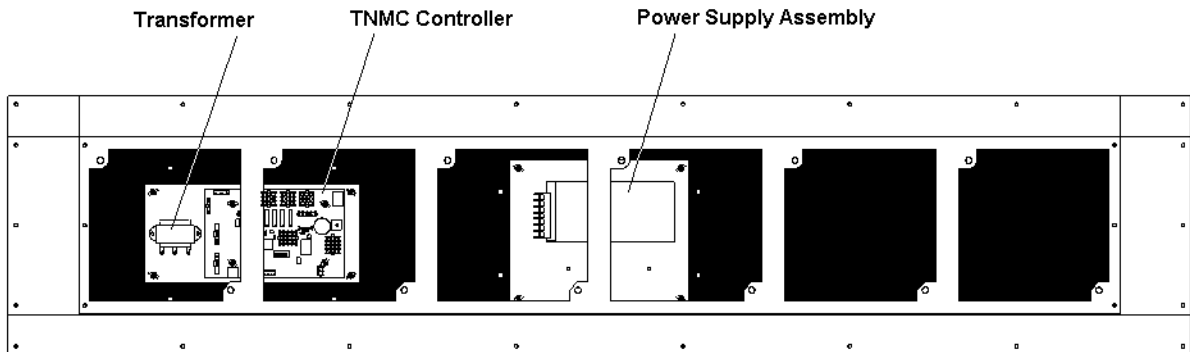
Exploded Rear View; Single Panel Module ..... **Drawing B-126112**

Component Locations; 832/848

Red/Amb LED TNMC, G4 ..... **Drawing A-257029**

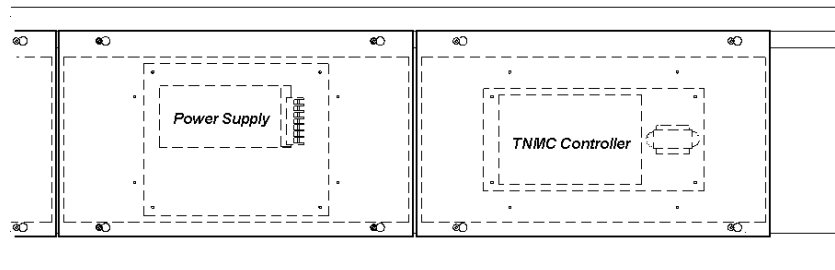
**Drawing A-257029** indicates the location of the TNMC controller for each of the TNMC models. **Figure 13** below illustrates a typical TNMC layout. Complete the following steps to remove the controller from the display.

1. To access the controller from the front, unlatch the latch fasteners on the front face the LED module. Refer to **Drawings B-126111** and **B-126112**. (The fasteners are referred to as “latch plugs” on the drawings). One latch fastener is centered below the top row of pixels and one is centered above the bottom row. They may be slightly hidden by the louvers.



**Figure 13:** TNMC Internal Components (Modules Removed)

2. Using a  $\frac{7}{32}$ " nut driver, turn each fastener a quarter-turn. Turn the top latch clockwise and the bottom latch counterclockwise. Carefully remove the module and detach the ribbon cables. It may be helpful to label the cables so you will know which cable goes to which connector when reattaching.



**Figure 14:** TNMC Rear Access



**Note:** To access the controller from the rear of the TNMC, as shown in Figure 14 above, remove the appropriate rear-access panel from the TNMC by loosening all four of the screws. Slide the access panel sideways to the larger part of the keyhole and carefully lift it off the TNMC. Take care not to drop the panel, and remember that the module controller is attached to the panel.

2. Disconnect power from J17.
3. Remove all power and signal connections from the board. Release “locked” connectors by squeezing together the tabs, and then carefully pulling them from the jack. Label the cables, indicating which cable was removed from which connector; the labeling will be helpful when you replace the board.
4. Remove the four nuts holding the board in place.
5. Follow the previous steps in reverse order to install a new controller board.

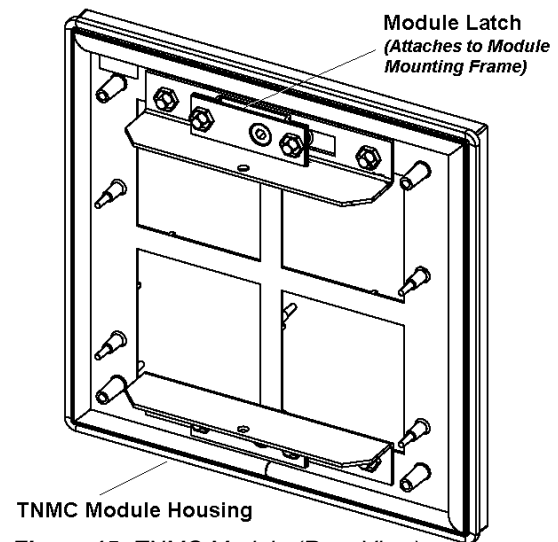
## Modules and Drivers

### Reference Drawings:

- Exploded Front View; Single Panel Module.....**Drawing B-126111**  
 Exploded Rear View; Single Panel Module .....**Drawing B-126112**

The module and driver board are a single, functional unit. To remove a module, complete the following steps:

1. The modules are attached to an internal frame called the module mounting panel. Find the latch-access fasteners (referred to as “latch plugs” on the drawings) on the front of the module. One is centered below the top row of pixels and one is centered above the bottom row. (They may be slightly hidden by the louvers.)
2. Unlatch the latch fasteners, illustrated in **Figure 15**, by turning them a quarter-turn using a  $\frac{7}{32}$ " nut driver. Turn the top latch clockwise and the bottom latch counterclockwise.



**Figure 15: TNMC Module (Rear View)**

Carefully remove the module and detach the ribbon cables. Label the cables, indicating which cable was removed from which connector; the labeling will be helpful when you replace the board.

If you are accessing the unit from the rear, follow this procedure:

1. Remove the rear access panel (explained in preceding subsection.)
2. While holding onto the module, push it out and turn it in such a manner (generally a sideways, diagonal turn) that it will fit through the frame opening.
3. Then pull the module back through the opening in the frame. Carefully disconnect the ribbon cables. Once again, label the cables, indicating which cable was removed from which connector; the labeling will be helpful when reconnecting.

When installing a module, reverse the previous steps and take note of the following points:

- Weatherstripping on the back edge of the module must be intact and in good condition to prevent water from seeping into the display.
- Module latches must be fully engaged to create a watertight seal around the edge of the module. The module should be firmly seated against the display when the latches are fully engaged.

Each module assembly contains a module housing (containing LEDs and the driver board) and a louver assembly. **Drawings B-126111** and **B-126112** illustrate the various module components.

Individual components such as louvers can be removed for service, but Daktronics recommends that the module be kept intact and that the entire assembly be sent in for repair or replacement.

## Power Supplies

### Reference Drawings:

- Schematic, Red TNMC, Gen IV ..... **Drawing A-252681**
- Schematic; Amber TNMC, Gen IV ..... **Drawing A-252645**

The red-LED TNMC uses a single power supply assembly to power all modules in the 8x32 and 8x48 models. The amber TNMC uses a dual power supply assembly to power all modules in the 8x32 or 8x48 models. Refer to **Drawings A-252681** and **A-252645**.

## Removing/Changing a Power Supply

Complete the following steps to remove a power supply from the display:

1. See the directions in the preceding **Module and Drivers** subsection for information on how to access the component from the front or rear.
2. Disconnect all the wires connected to the power supply.
3. Remove the hardware holding the power supply in place to free the unit.
4. Follow these steps in reverse order to install a new power supply.

## Weatherstripping

To ensure that the display is waterproof, weatherstripping has been installed around the entire display and around each module. It is important that the weatherstripping is attached properly at all times, or water may leak into the display and damage the components.

## 6.6 TNMC Display Maintenance

Complete a yearly inspection to maintain safe and dependable display operation. This inspection should address the following issues:

- **Loose Hardware**  
Verify that fasteners, such as bolts and rivets, have not come loose. Check and tighten or replace fasteners as required.
- **Excessive Dust Buildup**  
Occasionally, it may be necessary to vacuum the inside of the display cabinet to remove dust/dirt buildup that may interfere with airflow.
- **Water Intrusion – Water Stain Marks**  
Water can enter the display where weatherstripping has come loose or deteriorated; where fasteners have come loose, allowing gaps in the panels; or where moisture may be entering around hardware. Check electronic components for corrosion.
- **Corrosion**  
Check the paint, and look for possible corrosion, especially at footings, structural tie points, and ground rods and other types of grounding electrodes.

**If you notice any of the preceding conditions, make repairs or take corrective action immediately.**

## 6.7 Troubleshooting

This subsection contains some symptoms that may be encountered in the displays. This list does not include every possible symptom, but does represent common situations that may occur.

Symptom/Condition	Possible Cause/Remedy
<i>One or more LEDs on a single module fails to light.</i>	<ul style="list-style-type: none"><li>■ Check/replace the ribbon cables on the module.</li><li>■ Replace the module.</li></ul>
<i>One or more LEDs on a single module fails to turn off.</i>	<ul style="list-style-type: none"><li>■ Check/replace the ribbon cables on module.</li><li>■ Replace the module.</li></ul>

*(Continued on next page)*

(Continued from preceding page)

Symptom/Condition	Possible Cause/Remedy
<i>A section of the display is not working; the section extends all the way to the right side of the display.</i>	<ul style="list-style-type: none"> <li>▪ Replace the first module/driver on the left side of the first module that is not working.</li> <li>▪ Replace the second module that is not working.</li> <li>▪ Replace the power supply assembly on the first module that is not working.</li> <li>▪ Replace the ribbon cable.</li> </ul>
<i>One row of modules does not work or is garbled.</i>	<ul style="list-style-type: none"> <li>▪ Replace the first module.</li> <li>▪ Replace the controller.</li> </ul>
<i>A group of modules that share the same power supply assembly fails to work.</i>	<ul style="list-style-type: none"> <li>▪ Replace the power supply assembly.</li> </ul>
<i>Entire display fails to work.</i>	<ul style="list-style-type: none"> <li>▪ Check for proper line voltage into the power termination panel.</li> <li>▪ Check/replace the ribbon cable from the controller to the modules.</li> <li>▪ Check the voltage settings on the power supplies.</li> <li>▪ Check/replace the signal cable to the controller.</li> <li>▪ Replace the controller.</li> </ul>

## 6.8 Initialization Information at Startup

Every time the display is powered up, the display will run through an initialization during which it will test all LEDs and addresses. First, the message center will display the proper address number. When completed, the initialization test will display Home and Guest in the appropriate location. If the entire TNMC display fails at startup, signal may not be properly connected, or the address plug may not be connected to the J17 jack on the TNMC controller card. Check both connections in the event of a failure.

## 6.9 Replacement Parts List

The following table contains some of the TNMC components that may have to be replaced over the life of a display. Many of the components within the display itself also have attached part number labels.

Part Description	Part Number
Controller assy; 832/848, LED TNMC, G3	0A-1152-2549
<ul style="list-style-type: none"> <li>▪ Driver (only); MASC, 4-col, LED, coated</li> </ul>	0P-1192-0068
<ul style="list-style-type: none"> <li>▪ Transformer; 115/230 V pri, 16 V sec @ 2 A</li> </ul>	T-1063
Module, TNMC; amber LED (4A, 8x8, coated, Type 2)	0A-1208-3005
Module, TNMC; red LED (3R, 8x8, coated, Type 2)	0A-1208-3006
Power supply assy; amber LED TNMC, G3	0A-1192-2551
<ul style="list-style-type: none"> <li>▪ Power supply (only); amber LED TNMC, G3; 12 V, 8.5 A, 85-265 V AC</li> </ul>	A-1555
Power supply assy; red LED TNMC, G3	0A-1192-2550
<ul style="list-style-type: none"> <li>▪ Power supply (only); red LED TNMC, G3; 9 V, 17 A, 85-265 V AC</li> </ul>	A-1633
Cable assy; 20-pos ribbon, 18", dual row (module to module)	W-1387
Cable assy; 20-pos ribbon, 30" (TNMC controller to first module)	0A-1000-0017
Electrical contact cleaner/lubricant (CaiLube <sup>®</sup> )	CH-1019

Part numbers for each complete team name message center assembly are as follows:

Assembly	Part Number
Amber LED TNMC, 832	0A-1192-2555
Red LED TNMC, 832	0A-1192-2554
Amber LED TNMC, 848	0A-1192-2553
Red LED TNMC, 848	0A-1192-2552

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

Refer to **Section 5.9** for information on the Daktronics Exchange and Repair and Return programs.



# Appendix A: Reference Drawings

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The drawing number is located in the label in the bottom right corner of each drawing.  
Drawings in this manual are identified by the last set of digits and the letter preceding them.

## **A Drawings**

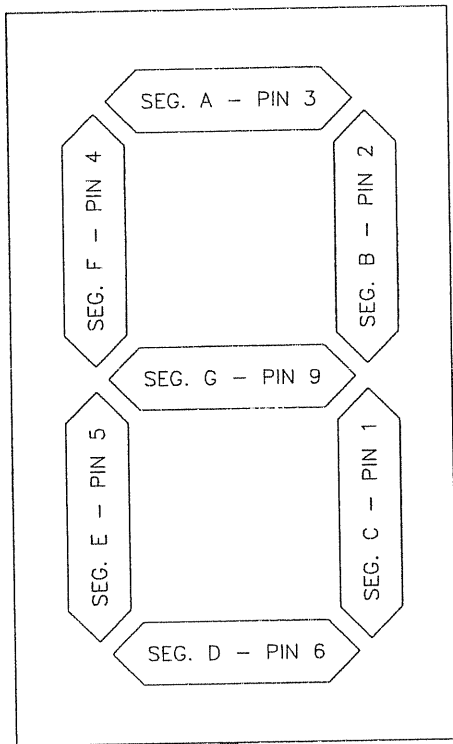
Segmentation, 7 Segment Bar Digit .....	Drawing A-38532
Lifting Scoreboard .....	Drawing A-44548
Scoreboard Mounting .....	Drawing A-55101
Address Table, 1 Through 128.....	Drawing A-115078
4 Column MASC LED Driver Specifications.....	Drawing A-166216
Schematic; Gen III Outdoor LED, 16 Column Drvr .....	Drawing A-177931
Driver; Gen III Outdoor LED, 16 Col Master.....	Drawing A-178197
Digit Designation; TN-2018-11 or -21 .....	Drawing A-182059
Radio Receiver Option; Tennis Scoreboards.....	Drawing A-182349
Component Layout, TN-2018-11/-21.....	Drawing A-182506
Component Layout, TN-2032-11/-21.....	Drawing A-183714
Red LED TNMC, G3.....	Drawing A-187661
1.5" Amber LED TNMC, G3 .....	Drawing A-187662
Component Locations; 832/848 Red/Amb LED TNMC, G3.....	Drawing A-187987
Component Locations; TN-2011-11/-21.....	Drawing A-188217
Component Layout, TN-2037-11/-21.....	Drawing A-193974
Component Locations, TN-2029-11/21 .....	Drawing A-221340
Schematic; Amber TNMC, Gen IV .....	Drawing A-252645
Schematic; Red TNMC, Gen IV .....	Drawing A-252681
Component Locations; 832/848 Red/Amb LED TNMC, G4.....	Drawing A-257029
Component Locations; TN-2042-11/-21.....	Drawing A-259122

## **B Drawings**

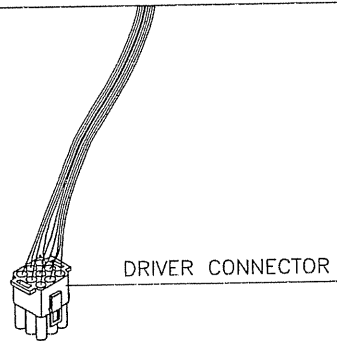
Exploded View; Single Panel Module.....	Drawing B-126111
Exploded Rear View; Single Panel Module.....	Drawing B-126112
Shop Dwg, TN-2032 .....	Drawing B-157568
Digit Assemblies; Gen III LED Digits .....	Drawing B-177679
F. Assy, TN-2018-11 or -21.....	Drawing B-181618
Schematic; 6 Court Tennis w/ Top Score.....	Drawing B-181793
Final Assembly, TN-2032-11/2-1.....	Drawing B-183598
Pre-Paint Assembly, TN-2032.....	Drawing B-183613
F. Assy, TN-2010, TN-2011-11/-21 .....	Drawing B-184884
Schematic; TN-2010 & TN-2011 .....	Drawing B-185759
Shop Dwg, TN-2011 & TN-2010, LED .....	Drawing B-189028
Schematic; TN-2037-11, -21 .....	Drawing B-193461
F. Assy; TN-2037-11/-21 .....	Drawing B-193860
Shop Dwg, TN-2018 .....	Drawing B-202354
F. Assy, TN-2029-11/21 .....	Drawing B-221312
Shop Dwg, TN-2029-(11/21) W/ ID Panels .....	Drawing B-221501
F. Assy; TN-2042-11/-21 .....	Drawing B-258520



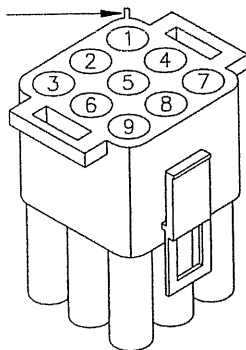




7 SEGMENT BAR DIGIT  
FRONT VIEW



CONNECTOR PIN NUMBERING  
NOTE SPLINE NEAR NO. 1



COLOR CODE		
PIN NO.	WIRE COLOR	DRIVER SEGMENT
1	ORN	C
2	RED	B
3	BRN	A
4	BLU	F
5	PNK	E
6	TAN	D
7	BLK	COM.
8	GRY	H
9	VIO	G

NOTE: "H" SEGMENT, GRAY WIRE IS NOT USED ON 7 SEGMENT BAR DIGIT.

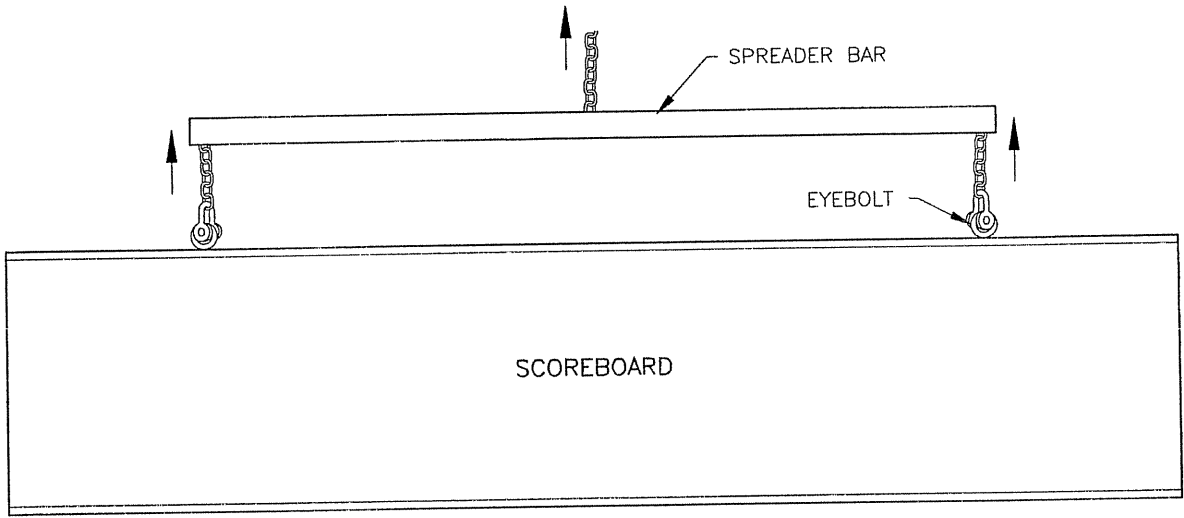
THE CONCEPTS EXPRESSED AND DETAILS SHOWN ON THIS DRAWING ARE CONFIDENTIAL AND PROPRIETARY. DO NOT REPRODUCE BY ANY MEANS, INCLUDING ELECTRONICALLY WITHOUT THE EXPRESSED WRITTEN CONSENT OF DAKTRONICS, INC. COPYRIGHT 2003 DAKTRONICS, INC.

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ:	BASKETBALL
TITLE:	SEGMENTATION, 7 SEGMENT BAR DIGIT
DES. BY:	DRAWN BY: HEIDERSCHIEDT DATE: 5 JUN 89
REVISION	APPR. BY: AVB
02	SCALE: 1=4

1009-R04A-38532

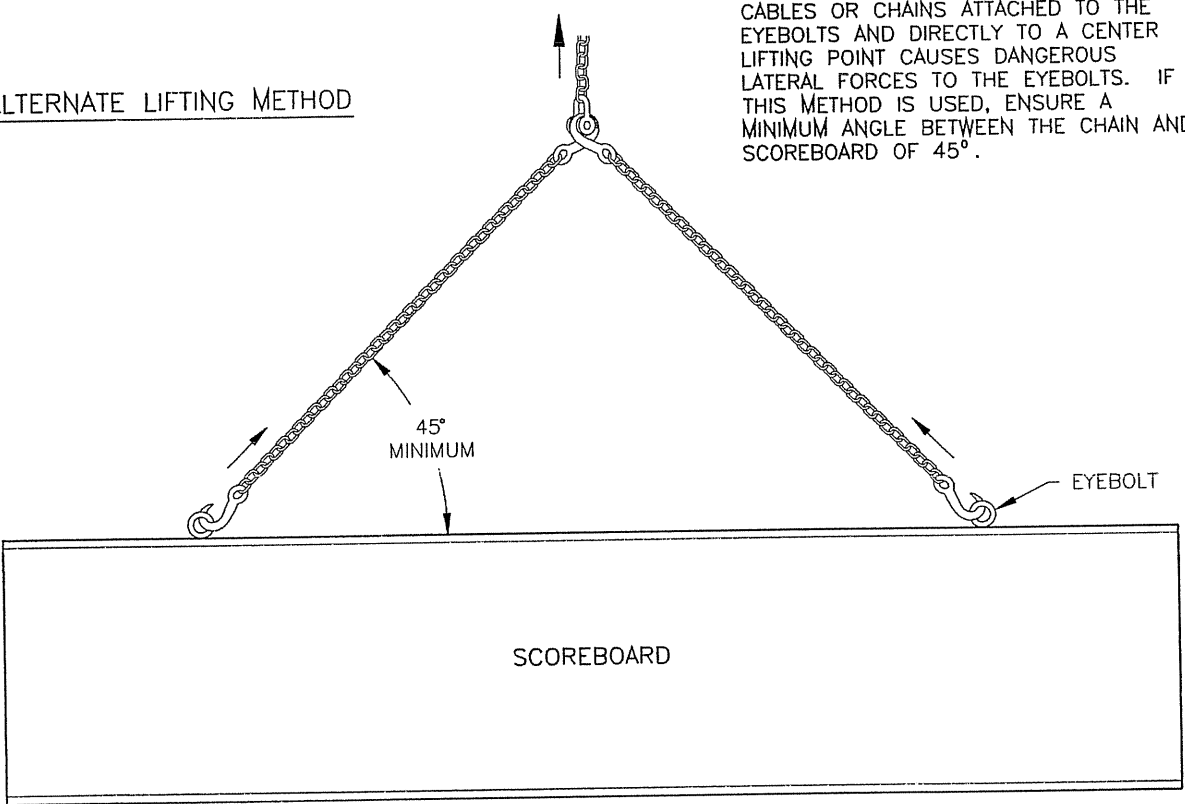
REV.	DATE	DESCRIPTION	BY	APPR.
2	30 APR 97	ADDED SEGMENT DESIGNATIONS TO DIGIT FIGURE.	AVB	AVB
1	2 JAN 92	CHANGED FROM B-SIZE TO A-SIZE DWG.	C FICK	



PREFERRED LIFTING METHOD

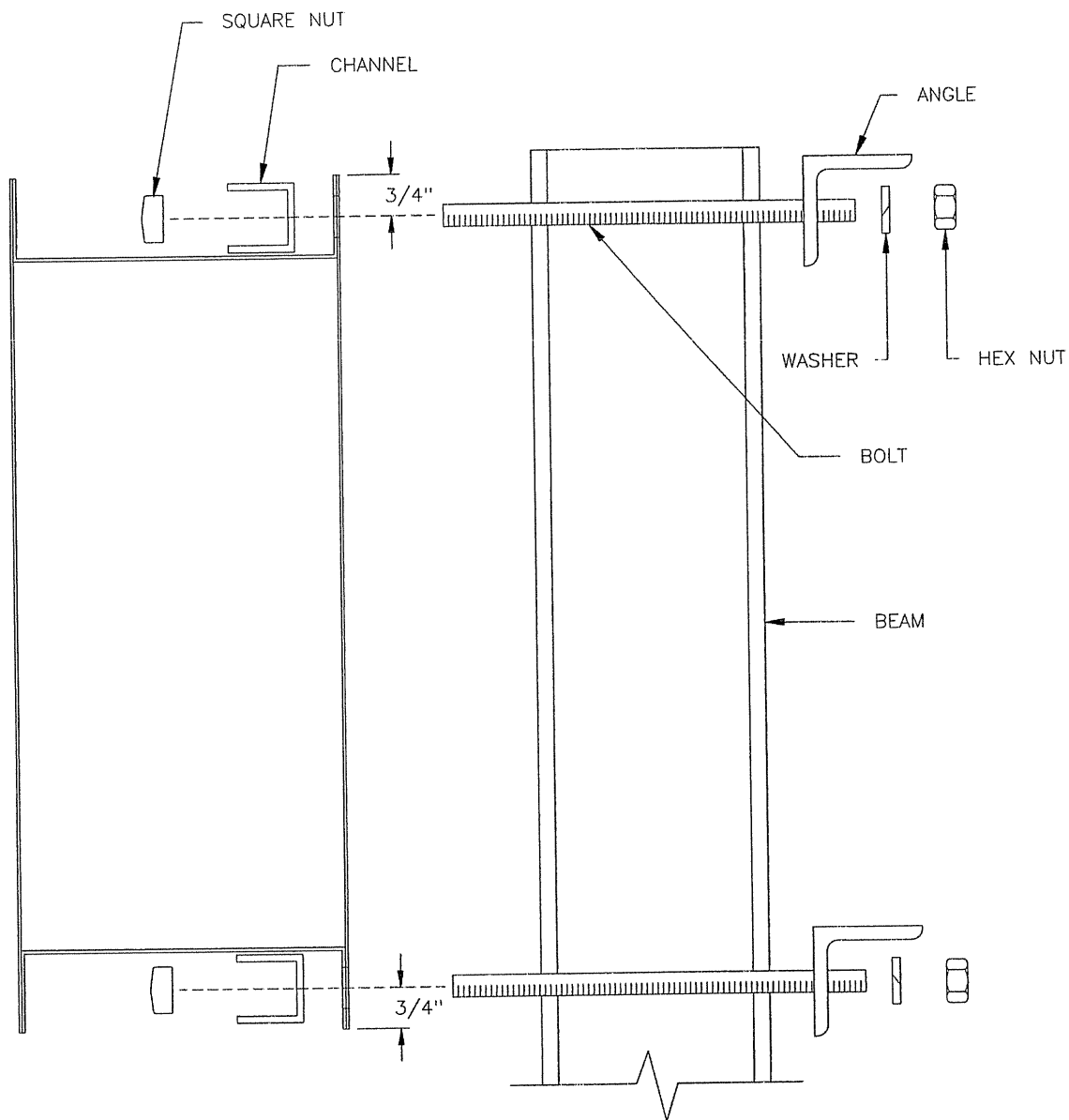
USE A SPREADER BAR SO THAT THE FORCE ON THE EYEBOLTS IS STRAIGHT UP.

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	APPR. BY:	1091-R10A-44548		
SCALE: NONE				
1	17 MAY 01	ADDED MINIMUM ANGLE TO ALTERNATE LIFTING METHOD; CHANGED CORRECT TO PREFERRED METHOD AND WRONG TO ALTERNATE METHOD	TWEBER	
REV.	DATE	DESCRIPTION	BY	APPR.



MOUNTING INSTRUCTIONS:

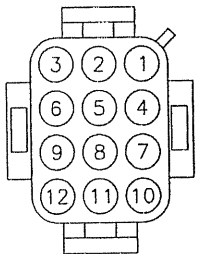
1. USE THE MOUNTING CHANNEL TO DETERMINE WHICH HOLE COMBINATION SHOULD BE USED. BE SURE TO KEEP THE BOLTS AS CLOSE TO THE BEAM AS POSSIBLE.
2. USING THE MOUNTING CHANNEL AS A TEMPLATE, DRILL 9/16" HOLES IN THE UPPER AND LOWER REAR FLANGE OF SCOREBOARD WHERE THE SUPPORTS WILL GO.
3. PLACE SQUARE NUTS INSIDE CHANNEL AND THREAD BOLTS THROUGH.
4. LIFT SCOREBOARD INTO POSITION WITH BOLTS STILL IN PLACE.
5. PLACE MOUNTING ANGLES OVER EACH PAIR OF BOLTS AND SECURE WITH LOCK WASHERS AND HEX NUTS.
6. WHEN SCOREBOARD IS ADJUSTED TO FINAL DESIRED POSITION, TIGHTEN HEX NUTS FIRMLY.

DAKTRONICS, INC. BROOKINGS, SD 57006			
PROJ: OUTDOOR SCOREBOARDS			
TITLE: SCOREBOARD MOUNTING			
DES. BY:		DRAWN BY: A VANBEMMEL	
		DATE: 10FEB93	
REVISION	APPR. BY:	1091-R10A-55101	
	SCALE: NONE		

REV.	DATE	DESCRIPTION	BY	APPR.

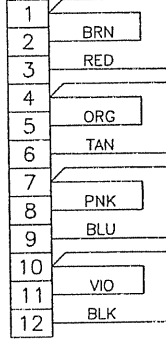
KEY: 0 = WIRE NOT CONNECTED 1 = WIRE IS CONNECTED

DECIMAL ADDRESS	PIN 12	PIN 11	PIN 9	PIN 8	PIN 6	PIN 5	PIN 3	PIN 2
1	0	0	0	0	0	0	0	1
2	0	0	0	0	0	0	0	1
3	0	0	0	0	0	0	0	1
4	0	0	0	0	0	0	1	0
5	0	0	0	0	0	0	1	0
6	0	0	0	0	0	0	1	0
7	0	0	0	0	0	0	1	0
8	0	0	0	0	0	0	1	0
9	0	0	0	0	0	0	1	0
10	0	0	0	0	0	0	1	0
11	0	0	0	0	0	0	1	0
12	0	0	0	0	0	0	1	0
13	0	0	0	0	0	0	1	0
14	0	0	0	0	0	0	1	0
15	0	0	0	0	0	0	1	0
16	0	0	0	0	0	0	1	0
17	0	0	0	0	0	0	1	0
18	0	0	0	0	0	0	1	0
19	0	0	0	0	0	0	1	0
20	0	0	0	0	0	0	1	0
21	0	0	0	0	0	0	1	0
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23	0	0	0	0	0	0	1	0
24	0	0	0	0	0	0	1	0
25	0	0	0	0	0	0	1	0
26	0	0	0	0	0	0	1	0
27	0	0	0	0	0	0	1	0
28	0	0	0	0	0	0	1	0
29	0	0	0	0	0	0	1	0
30	0	0	0	0	0	0	1	0
31	0	0	0	0	0	0	1	0
32	0	0	0	0	0	0	1	0
33	0	0	0	0	0	0	1	0
34	0	0	0	0	0	0	1	0
35	0	0	0	0	0	0	1	0
36	0	0	0	0	0	0	1	0
37	0	0	0	0	0	0	1	0
38	0	0	0	0	0	0	1	0
39	0	0	0	0	0	0	1	0
40	0	0	0	0	0	0	1	0
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42	0	0	0	0	0	0	1	0
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44	0	0	0	0	0	0	1	0
45	0	0	0	0	0	0	1	0
46	0	0	0	0	0	0	1	0
47	0	0	0	0	0	0	1	0
48	0	0	0	0	0	0	1	0
49	0	0	0	0	0	0	1	0
50	0	0	0	0	0	0	1	0
51	0	0	0	0	0	0	1	0
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55	0	0	0	0	0	0	1	0
56	0	0	0	0	0	0	1	0
57	0	0	0	0	0	0	1	0
58	0	0	0	0	0	0	1	0
59	0	0	0	0	0	0	1	0
60	0	0	0	0	0	0	1	0
61	0	0	0	0	0	0	1	0
62	0	0	0	0	0	0	1	0
63	0	0	0	0	0	0	1	0
64	0	0	0	0	0	0	1	0
65	0	0	0	0	0	0	1	0
66	0	0	0	0	0	0	1	0
67	0	0	0	0	0	0	1	0
68	0	0	0	0	0	0	1	0
69	0	0	0	0	0	0	1	0
70	0	0	0	0	0	0	1	0
71	0	0	0	0	0	0	1	0
72	0	0	0	0	0	0	1	0
73	0	0	0	0	0	0	1	0
74	0	0	0	0	0	0	1	0
75	0	0	0	0	0	0	1	0
76	0	0	0	0	0	0	1	0
77	0	0	0	0	0	0	1	0
78	0	0	0	0	0	0	1	0
79	0	0	0	0	0	0	1	0
80	0	0	0	0	0	0	1	0
81	0	0	0	0	0	0	1	0
82	0	0	0	0	0	0	1	0
83	0	0	0	0	0	0	1	0
84	0	0	0	0	0	0	1	0
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87	0	0	0	0	0	0	1	0
88	0	0	0	0	0	0	1	0
89	0	0	0	0	0	0	1	0
90	0	0	0	0	0	0	1	0
91	0	0	0	0	0	0	1	0
92	0	0	0	0	0	0	1	0
93	0	0	0	0	0	0	1	0
94	0	0	0	0	0	0	1	0
95	0	0	0	0	0	0	1	0
96	0	0	0	0	0	0	1	0
97	0	0	0	0	0	0	1	0
98	0	0	0	0	0	0	1	0
99	0	0	0	0	0	0	1	0
100	0	0	0	0	0	0	1	0
101	0	0	0	0	0	0	1	0
102	0	0	0	0	0	0	1	0
103	0	0	0	0	0	0	1	0
104	0	0	0	0	0	0	1	0
105	0	0	0	0	0	0	1	0
106	0	0	0	0	0	0	1	0
107	0	0	0	0	0	0	1	0
108	0	0	0	0	0	0	1	0
109	0	0	0	0	0	0	1	0
110	0	0	0	0	0	0	1	0
111	0	0	0	0	0	0	1	0
112	0	0	0	0	0	0	1	0
113	0	0	0	0	0	0	1	0
114	0	0	0	0	0	0	1	0
115	0	0	0	0	0	0	1	0
116	0	0	0	0	0	0	1	0
117	0	0	0	0	0	0	1	0
118	0	0	0	0	0	0	1	0
119	0	0	0	0	0	0	1	0
120	0	0	0	0	0	0	1	0
121	0	0	0	0	0	0	1	0
122	0	0	0	0	0	0	1	0
123	0	0	0	0	0	0	1	0
124	0	0	0	0	0	0	1	0
125	0	0	0	0	0	0	1	0
126	0	0	0	0	0	0	1	0
127	0	0	0	0	0	0	1	0
128	0	0	0	0	0	0	1	0



ADDRESS PLUG  
WIRE SIDE

WIRING DIAGRAM  
ADDRESS PLUG  
WITH ALL WIRES  
CONNECTED



REV.	DATE	DESCRIPTION	BY	APPR.

DAKTRONICS, INC. BROOKINGS, SD 57006			
PROJ:			
TITLE:	ADDRESS TABLE, 1 THROUGH 128		
DES. BY:	AVB	DRAWN BY:	A VANBEMMEL
		DATE:	28 APR 99
REVISION	APPR. BY:	1150-R04A-115078	
		SCALE:	NONE

OP-1192-0067 UNCOATED OR OP-1192-0068 COATED  
4 COLUMN MASC LED DRIVER

J-27 RS232 COM	
PIN	FUNCTION
1	RX-P
2	TX-P
3	GND-N
4	+12V -P
5	DCD-P
6	RESET-P

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

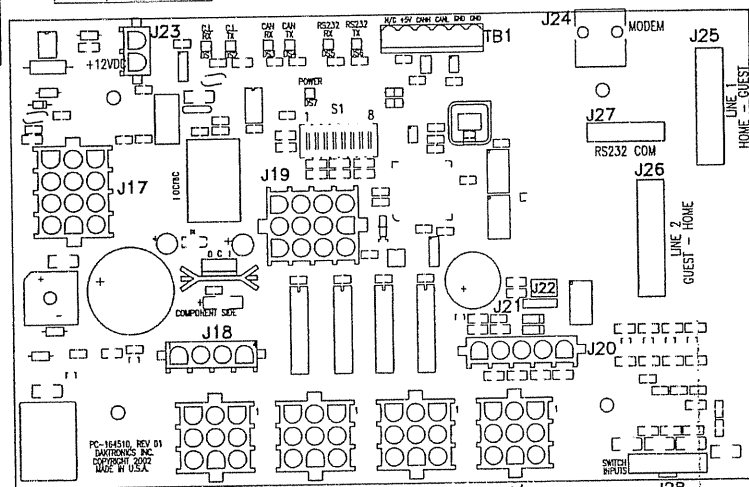
TB1 CAN	
PIN	FUNCTION
1	N/C
2	+5V-P
3	CANH-P
4	CANL-P
5	GND-N
6	GND-N

J24	
PIN	FUNCTION
1	MODEM_RTS-P
2	MODEM_RESET-P
3	MODEM_TX-P
4	GND-N
5	MODEM_RX-P
6	MODEM_DCD-P

J23 +12VDC	
PIN	FUNCTION
1	+12VDC-P
2	GND-N

J17 MAIN	
PIN	FUNCTION
1	CLIN-P
2	CLIN-N
3	232IN-P
4	CLOUT-P
5	CLOUT-N
6	16VAC-P
7	GND-N
8	N/C
9	16VAC-N
10	GND-N
11	N/C
12	+VBB-P

J18 RELAY	
PIN	FUNCTION
1	HORNOUT-N
2	AUXOUT2-N
3	120SW1-N
4	120SW1-P



J25			
FUNCTION	PIN	PIN	FUNCTION
L1 ID0-P	1	20	RED1-P
L1 ID1-P	2	19	GRN1-P
GND-N	3	18	L1_LATCH-P
GND-N	4	17	L1_DIM-P
GND-N	5	16	RED2-P
GRN2-P	6	15	RED3-P
GND-N	7	14	L1_CLK-P
GND-N	8	13	GRN3-P
L1 ID2-P	9	12	RED4-P
L1 ID3-P	10	11	GRN4-P

J26			
FUNCTION	PIN	PIN	FUNCTION
L2 ID0-P	1	20	RED1-P
L2 ID1-P	2	19	GRN1-P
GND-N	3	18	L2_LATCH-P
GND-N	4	17	L2_DIM-P
GND-N	5	16	RED2-P
GRN2-P	6	15	RED3-P
GND-N	7	14	L2_CLK-P
GND-N	8	13	GRN3-P
L2 ID2-P	9	12	RED4-P
L2 ID3-P	10	11	GRN4-P

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

J20 PROTOCOL	
PIN	FUNCTION
1	GND
2	PRO-N
3	PR1-N
4	PR2-N
5	PR3-N

J21 ISP	
PIN	FUNCTION
1	VFP-P
2	BKD-P
3	GND-N
4	RESET-P

J22 ISP	
PIN	FUNCTION
1	BKD-P
2	GND-N
3	N/C
4	RESET-P
5	VFP-P
6	+5V-P

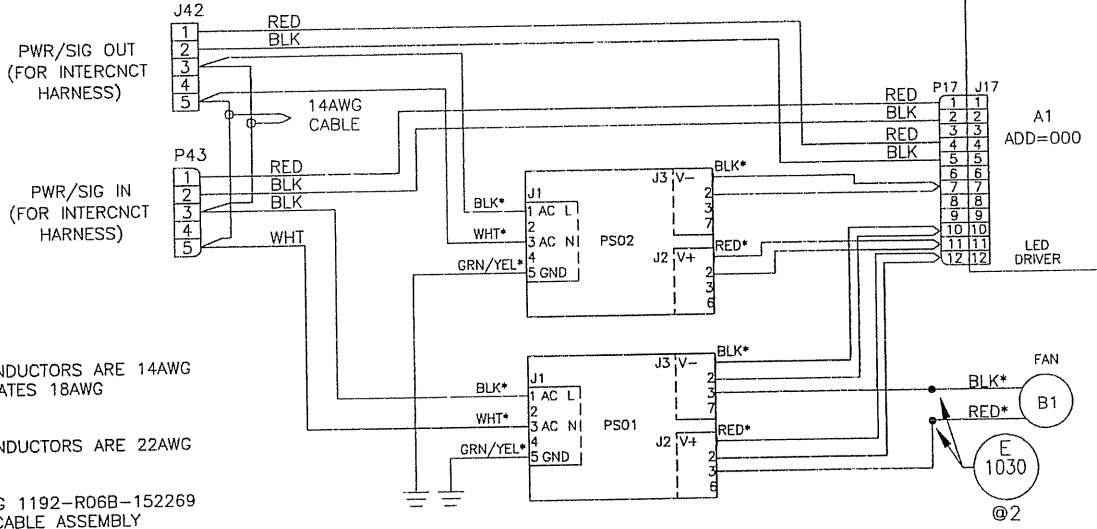
J28 SWITCH	
PIN	FUNCTION
1	SWITCH1-P
2	SWITCH1-N
3	SWITCH2-P
4	SWITCH2-N
5	SWITCH3-P
6	SWITCH3-N
7	SWITCH4-P
8	SWITCH4-N

NOTE:

- RED LED CL RX WILL BE ON OR BLINKING WHEN THE DRIVER IS RECEIVING SIGNAL AND OFF WHEN THERE IS NO SIGNAL WITH CL
- GREEN LED CL TX WILL BE ON OR BLINKING WHEN THE DRIVER IS RECEIVING SIGNAL AND OFF WHEN THERE IS NO SIGNAL WITH CL
- RED LED CAN RX WILL BE BLINKING WHEN THE DRIVER IS RECEIVING SIGNAL AND ON WHEN THERE IS NO SIGNAL WITH CAN
- GREEN LED CAN TX WILL BE BLINKING WHEN THE DRIVER IS RECEIVING SIGNAL AND ON WHEN THERE IS NO SIGNAL WITH CAN
- IF THERE IS NOT A CAN DEVICE CONNECTED TO TB1, CAN RX AND TX LEDS WILL BE ON AND STEADY.
- RED LED RS232 RX WILL BE ON OR BLINKING WHEN THE DRIVER IS RECEIVING SIGNAL AND OFF WHEN THERE IS NO SIGNAL WITH RS232
- GREEN LED RS232 TX6 WILL BE ON OR BLINKING WHEN THE DRIVER IS RECEIVING SIGNAL AND OFF WHEN THERE IS NO SIGNAL WITH RS232
- GREEN LED POWER INDICATES THE DRIVER HAS POWER

3	27 NOV 04	UPDATE DRIVER J-27 FOR CORRECT PIN OUT	DMD	DAKTRONICS, INC. BROOKINGS, SD 57006		
2	16 MAY 03	UPDATE DRIVER FOR LATEST REVISION OF MASC DRIVER.	CJB	PROJ:	4 COLUMN MASC LED DRIVER SPECIFICATIONS	
1	06JUN02	ADDED LED LABELS ADDED NEW NOTES	JJS	DES. BY:	DRAWN BY: JSPAHR	DATE: 29 APR 02
REV.	DATE	DESCRIPTION	BY	APPR.	REVISION	APPR. BY:
					03	SCALE: 1=2
						1192-R07A-166216

SLAVE CONFIGURATION  
OA-1192-2253

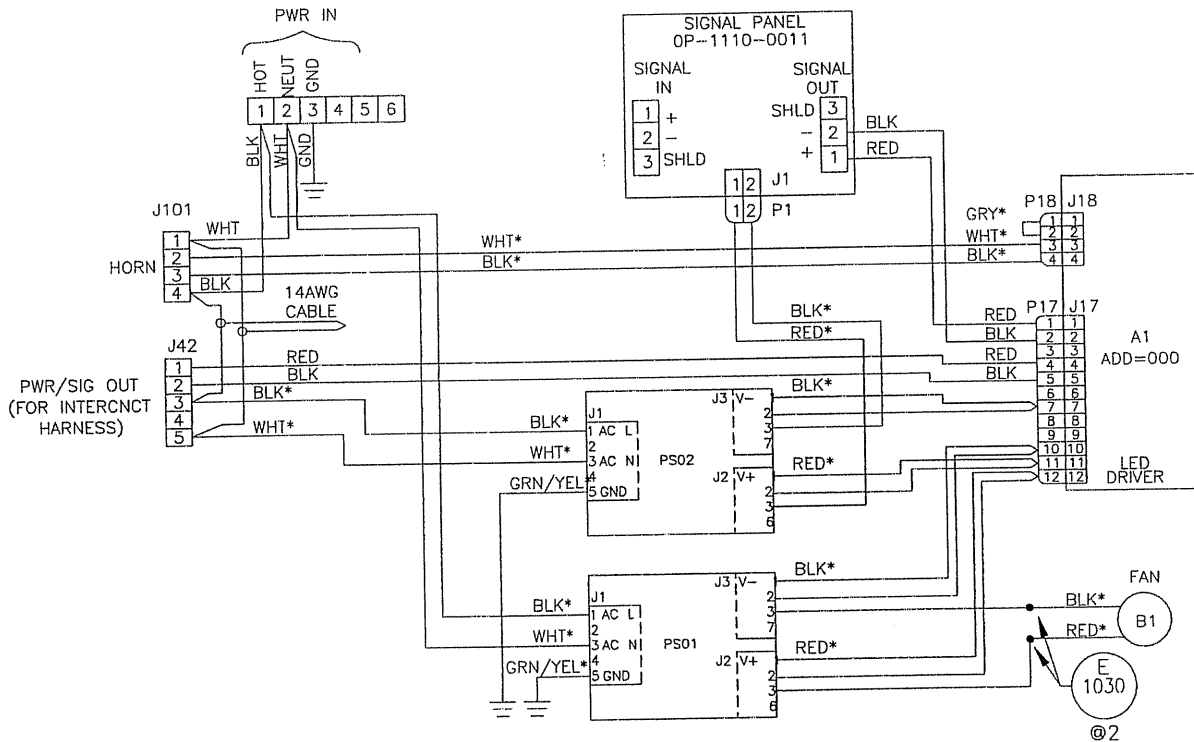


ALL POWER CONDUCTORS ARE 14AWG EXCEPT \* INDICATES 18AWG CONDUCTORS.

ALL SIGNAL CONDUCTORS ARE 22AWG CONDUCTORS.

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

MASTER CONFIGURATION  
OA-1192-2252



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.

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DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: OUTDOOR LED SCOREBOARD

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

DES. BY: MILLER

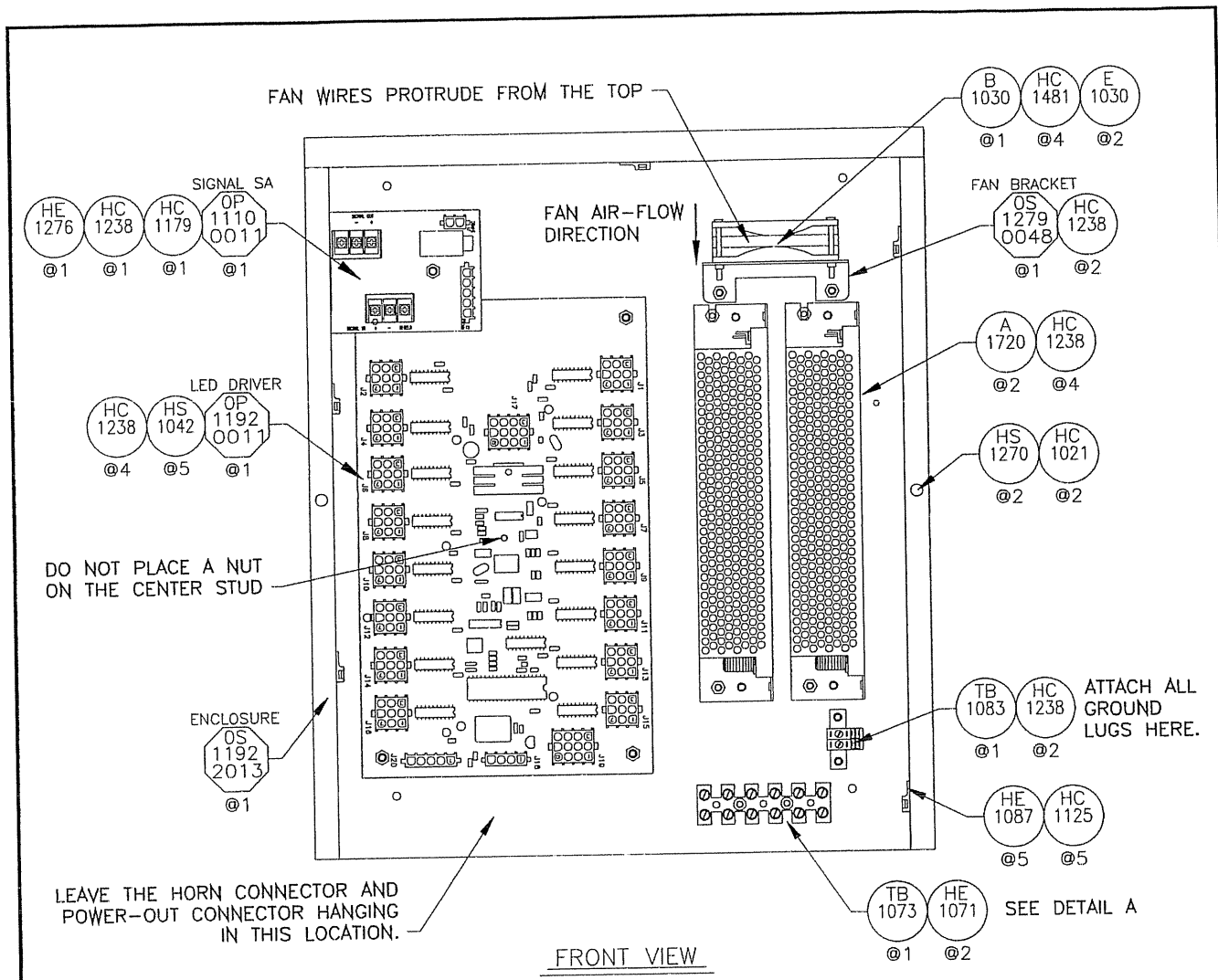
DRAWN BY: MILLER

DATE: 05 NOV 02

01	10 DEC 02	ADDED BLOCKS 5 AND 6 TO PWR IN	AJL	MWM
REV.	DATE	DESCRIPTION	BY	APPR.

REVISION	APPR. BY:
01	SCALE: 1=1

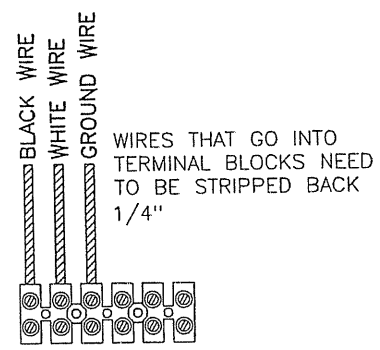
1192-R03A-177931



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.



DETAIL: A  
( SCALE 1=1.5 )

REV.	DATE	DESCRIPTION	BY	APPR.
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 08 APPR. BY: SCALE: 1=4

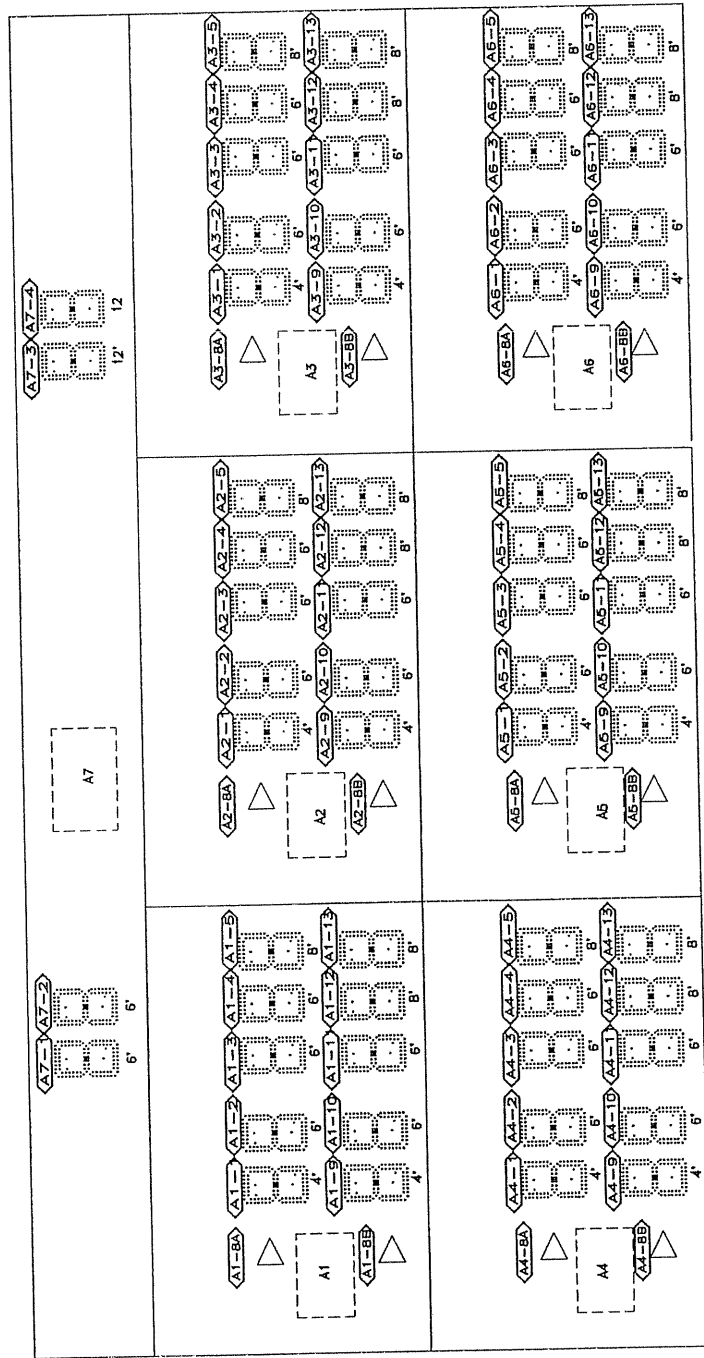
1192-E10A-178197

DIGIT HARNESS  
 OA-1171-4003 - 4' DIGIT HARNESS @ 12  
 OA-1171-4004 - 6' DIGIT HARNESS @ 32  
 OA-1171-4005 - 8' DIGIT HARNESS @ 18  
 OA-1171-4013 - 12' DIGIT HARNESS @ 2  
 OA-1171-4070 - 8' HARN. 9 PIN TO (2) 4 PIN @ 6

POWER & SIGNAL HARNESS  
 OA-1054-0125 - 18 AWG LACE HARNESS @ 32'  
 NOTE: RUN HARNESS PER SCHEMATIC AND CUT TO LENGTH.  
 OA-1192-1033 - 22' PWR/SIG INTCT HARNESS @ 1

OTHER ITEMS NEEDED  
 A-1192-2252 - MASTER GEN III DRIVER @ 6  
 A-1192-2437 - SLAVE GEN III WIDE DRIVER @ 1

FRONT VIEW



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DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: TENNIS SCOREBOARDS

TITLE: DIGIT DESIGNATION; TN-2018-11 OR -21

DES. BY: MILLER

DRAWN BY: MILLER

DATE: 23 JAN 03

REVISION

APPR. BY:

SCALE: NONE

1164-R01A-182059

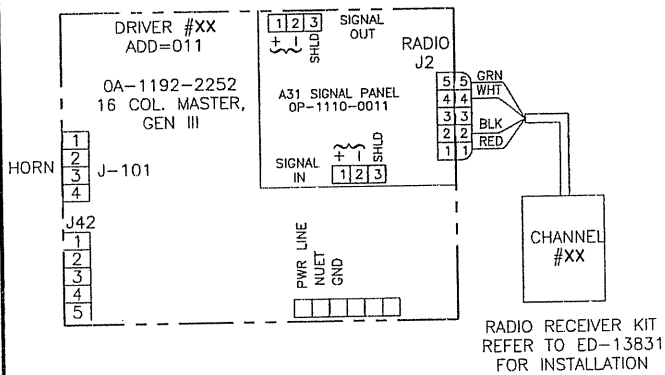
REV.	DATE	DESCRIPTION	BY	APPR.



RADIO RECEIVER OPTION.  
 USE OA-1110-0032 GEN V RECEIVER KIT.

GEN III OUTDOOR RECEIVER KIT WAS OA-1110-0007  
 GEN III INDOOR RECEIVER KIT WAS OA-1110-0006

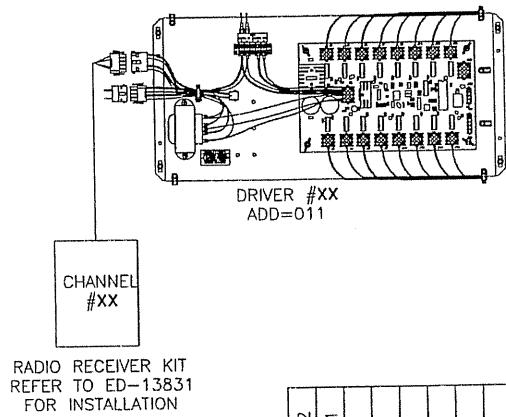
OUTDOOR SCOREBOARD



RADIO RECEIVER KIT  
 REFER TO ED-13831  
 FOR INSTALLATION

11	PIN 12	PIN 11	PIN 9	PIN 8	PIN 6	PIN 5	PIN 3	PIN 2
	0	0	0	0	1	0	1	1

INDOOR SCOREBOARD



RADIO RECEIVER KIT  
 REFER TO ED-13831  
 FOR INSTALLATION

11	PIN 12	PIN 11	PIN 9	PIN 8	PIN 6	PIN 5	PIN 3	PIN 2
	0	0	0	0	1	0	1	1

USE REFERENCE DRAWING TO INSTALL THE RADIO RECEIVER NEAR THE DRIVER LOCATION. NOTE THAT 1 RADIO RECEIVER GOES NEXT TO EACH COURT DRIVER. SET CHANNEL NUMBER OF EACH RADIO RECEIVER PER BELOW"

- COURT 1 = BROADCAST 1, CHANNEL 1
- COURT 2 = BROADCAST 1, CHANNEL 2
- COURT 3 = BROADCAST 1, CHANNEL 3
- COURT 4 = BROADCAST 1, CHANNEL 4
- COURT 5 = BROADCAST 1, CHANNEL 5
- COURT 6 = BROADCAST 1, CHANNEL 6

COURT X = CHANNEL X

NO RADIO RECEIVER REQUIRED FOR ANY SLAVE DRIVERS.

THE CONCEPTS EXPRESSED AND DETAILS SHOWN ON THIS DRAWING ARE CONFIDENTIAL AND PROPRIETARY. DO NOT REPRODUCE BY ANY MEANS, INCLUDING ELECTRONICALLY WITHOUT THE EXPRESSED WRITTEN CONSENT OF DAKTRONICS, INC. COPYRIGHT 2002 DAKTRONICS, INC.

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: TENNIS SCOREBOARD

TITLE: RADIO RECEIVER OPTION; TENNIS SCOREBOARDS

DES. BY: MILLER

DRAWN BY: MILLER

DATE: 30 JAN 03

REVISION

APPR. BY:

02

SCALE: NONE

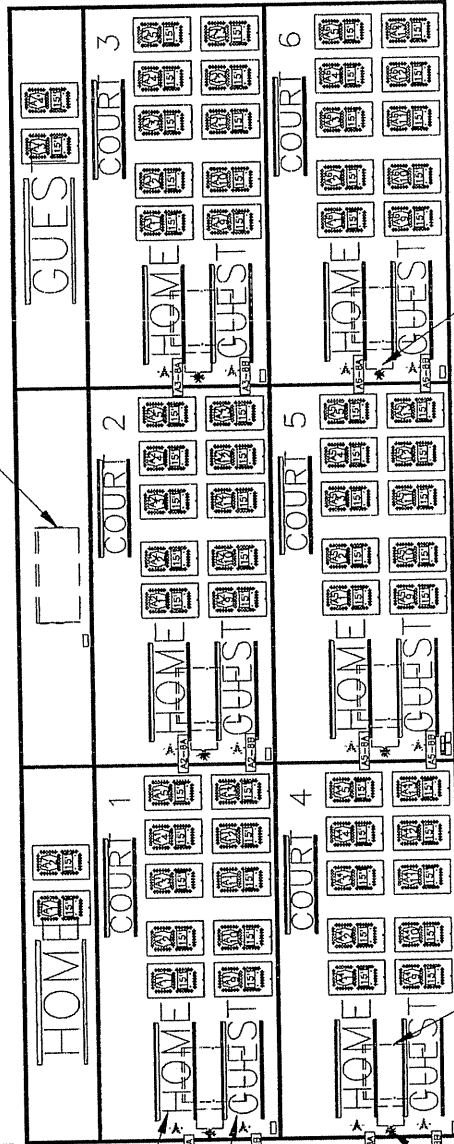
1164-R01A-182349

REV	DATE	DESCRIPTION	BY	APPR.
02	09 SEP 04	ADDED ADDRESS TABLES UPDATED TO GEN V	RT	
01	31 JUL 03	UPDATED DWG TO GEN IV RADIO KIT.	TLH	MWM

TN-2018-11/-21

ENCLOSED 16 COLUMN  
SLAVE DRIVER

27'-0"



OPTIONAL RADIO  
RECEIVER @6

ENCLOSED 16 COLUMN LED  
DRIVER AND POWER/SIGNAL  
TERMINATION.

LOCATION OF ANTENNA  
OF OPTIONAL RADIO  
RECEIVER.

FRONT VIEW

TEAM NAME CAN BE  
USED INSTEAD OF  
HOME CAPTION.

CAPTIONS OTHER THAN  
GUEST CAN BE USED

10'-6"

(A7) = LED DRIVER NUMBER  
= PLUG ON DRIVER CONNECTED TO THAT DIGIT

(15) = DIGIT SIZE

NOTES:

- DRIVERS ARE LOCATED BEHIND HINGED ACCESS DOORS THAT ARE ACCESSED FROM THE FRONT WITH 1/4" TURN HARDWARE

THE CONCEPTS EXPRESSED AND DETAILS SHOWN ON THIS DRAWING ARE CONFIDENTIAL AND PROPRIETARY. DO NOT REPRODUCE BY ANY MEANS, INCLUDING ELECTRONICALLY WITHOUT THE EXPRESSED WRITTEN CONSENT OF DAKTRONICS, INC. COPYRIGHT 2002 DAKTRONICS, INC.

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: TENNIS SCOREBOARDS

TITLE: COMPONENT LAYOUT, TN-2018-11/-21

DES BY: KBRICKER

DRAWN BY: KBRICKER

DATE: 03FEB03

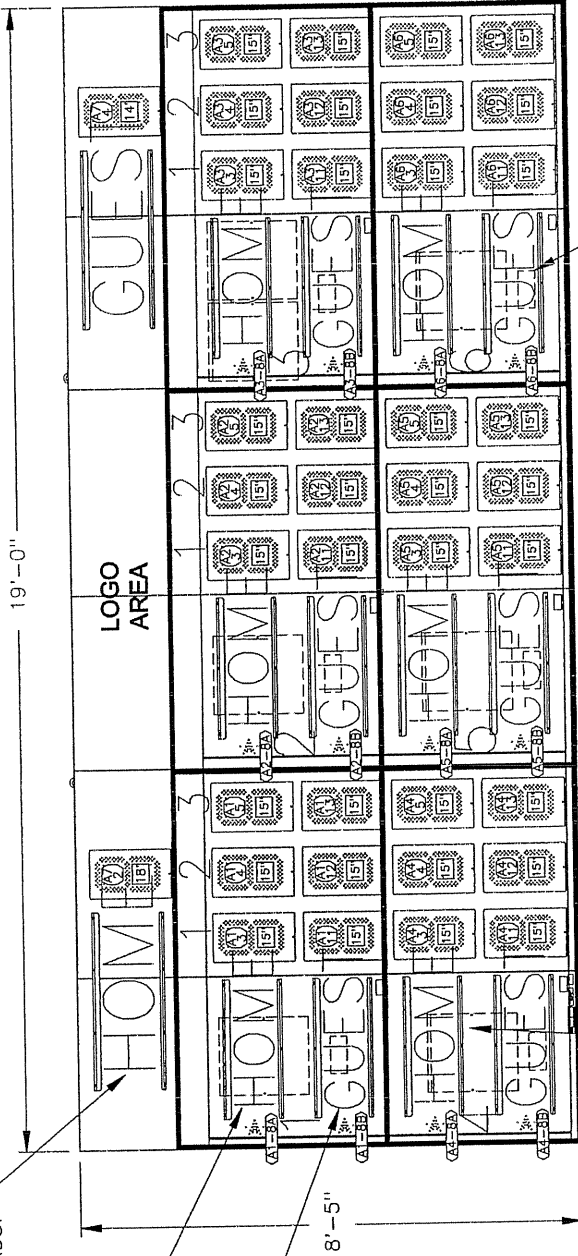
REV	DATE	DESCRIPTION	BY	APPR.
01	23 FEB 04	CHANGED 'VISITORS' CAPTIONS TO 'GUEST' & REMOVED POS CAPTIONS & RAILS (1-6)	CAC	

REVISION	APPR. BY:
01	

SCALE: 1=50

1164-E10A-182506

**TN-2032-11/-21**



CAPTIONS APPLIED EITHER DIRECTLY ON BOARD OR ON REMOVABLE PLACARDS.

TEAM NAME OR NICKNAME CAN BE USED INSTEAD OF HOME CAPTIONS.

CAPTAINS OTHER THAN GUEST CAN BE USED

ENCLOSED 16 COLUMN LED DRIVER AND POWER SIGNAL TERMINATION

\*\*OPTIONAL\*\* RADIO RECEIVER @6

FRONT VIEW

+ = LOCATION OF OPTIONAL RADIO ANTENNA

(A) = LED DRIVER NUMBER

(1) = PLUG ON DRIVER CONNECTED 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: TENNIS SCOREBOARDS

TITLE: COMPONENT LAYOUT, TN-2032-11/-21

DES. BY: KBRICKER

DRAWN BY: KBRICKER

DATE: 19FEB03

REVISION

APPR. BY:

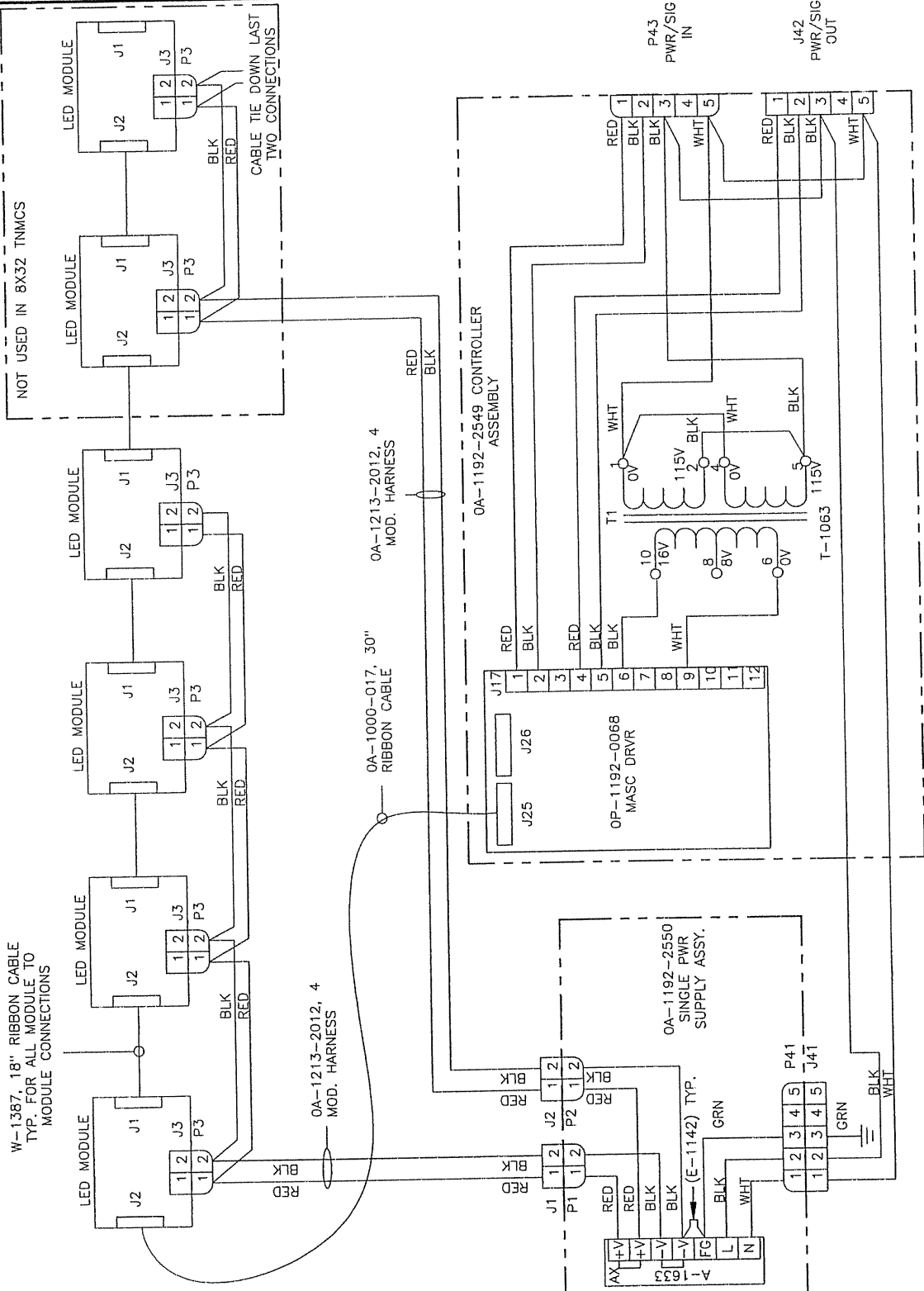
02

SCALE: 1=35

1164-E10A-183714

REV	DATE	DESCRIPTION	BY	APPR
02	23 FEB 04	CHANGED 'VISITORS' CAPTIONS TO 'GUEST' & REMOVED PLUS SIGNS	CAC	
01	07MAY03	UPDATED DIGIT SIZE.	KJB	

OA-1192-2554 - 8X32 RED LED TNMC, GEN III  
 OA-1192-2552 - 8X48 RED LED TNMC, GEN III



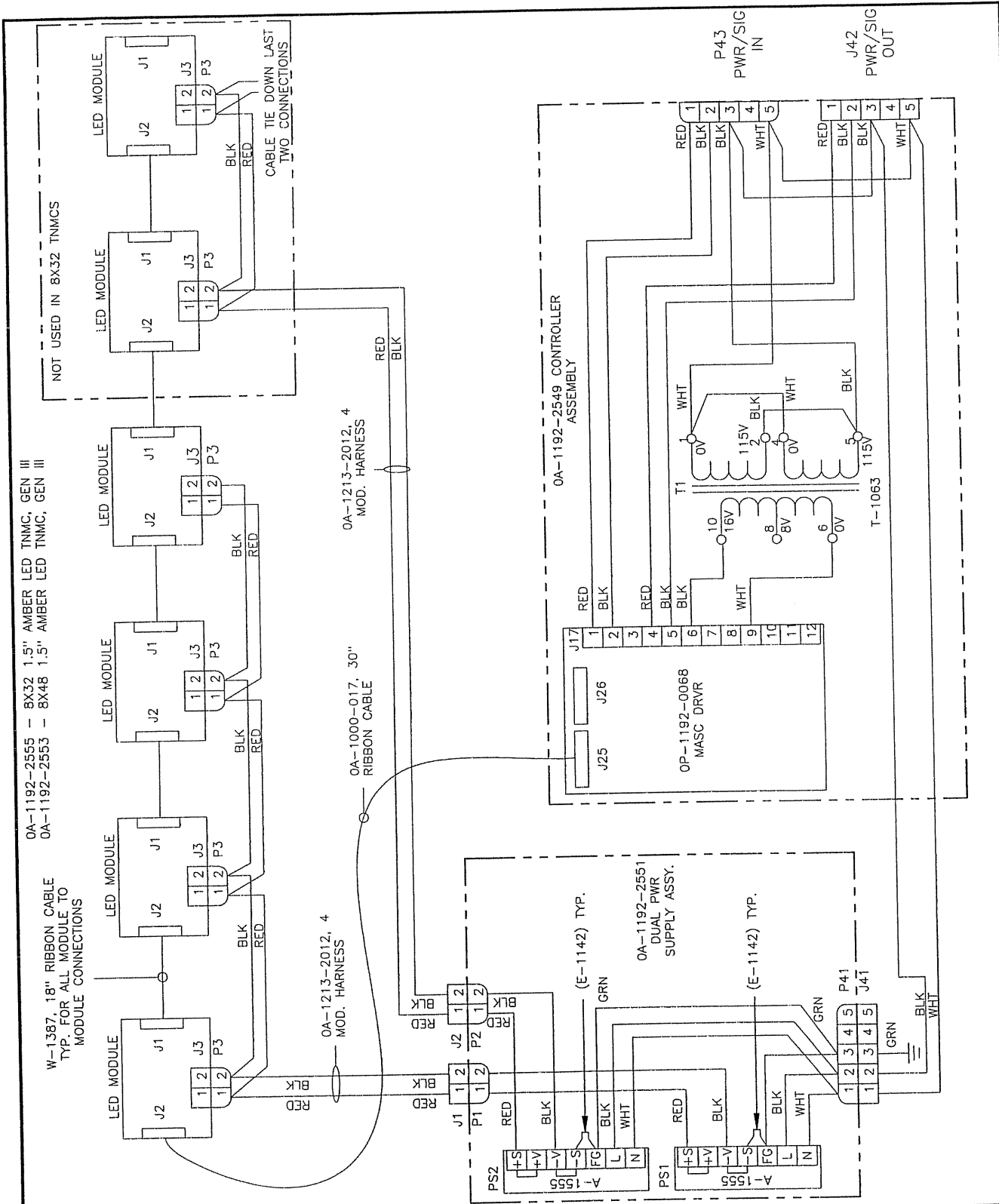
THE CONCEPTS EXPRESSED AND DETAILS SHOWN ON THIS DRAWING ARE CONFIDENTIAL AND PROPRIETARY. DO NOT REPRODUCE BY ANY MEANS, INCLUDING ELECTRONICALLY WITHOUT THE EXPRESSED WRITTEN CONSENT OF DAKTRONICS, INC. COPYRIGHT 2003 DAKTRONICS, INC.

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: OUTDOOR LED DIGIT SCOREBOARDS  
 TITLE: SCHEMATIC; RED LED TNMC, GEN III  
 DES. BY: MMILLER DRAWN BY: MMILLER DATE: 21 APR 03

REVISION APPR. BY: 1192-R03A-187661  
 SCALE: NONE

REV.	DATE	DESCRIPTION	BY	APPR.



OA-1192-2555 - 8X32 1.5" AMBER LED TNMC, GEN III  
 OA-1192-2553 - 8X48 1.5" AMBER LED TNMC, GEN III

W-1387, 18" RIBBON CABLE  
 TYP. FOR ALL MODULE TO  
 MODULE CONNECTIONS

NOT USED IN 8X32 TNMCS

CABLE TIE DOWN LAST  
 TWO CONNECTIONS

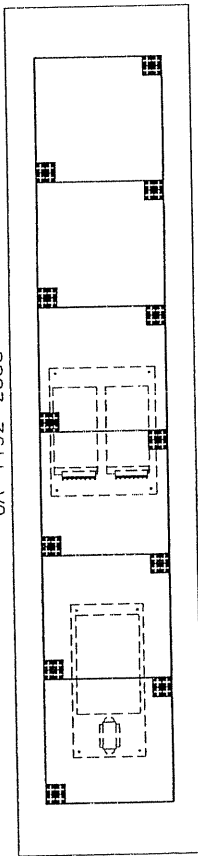
THE CONCEPTS EXPRESSED AND DETAILS SHOWN ON THIS DRAWING ARE CONFIDENTIAL AND PROPRIETARY. DO NOT REPRODUCE BY ANY MEANS, INCLUDING ELECTRONICALLY WITHOUT THE EXPRESSED WRITTEN CONSENT OF DAKTRONICS, INC. COPYRIGHT 2003 DAKTRONICS, INC.

DAKTRONICS, INC. BROOKINGS, SD 57006

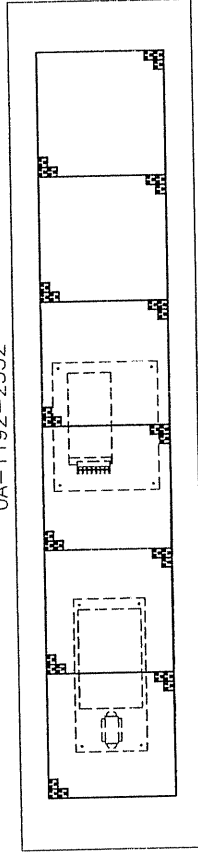
PROJ: OUTDOOR LED DIGIT SCOREBOARDS	
TITLE: SCHEMATIC; 1.5" AMBER LED TNMC, GEN III	
DES. BY: MILLER	DRAWN BY: MILLER
DATE: 01 MAY 03	
REVISION	APPR. BY:
SCALE: NONE	1192-R03A-187662

REV	DATE	DESCRIPTION	BY	APPR.

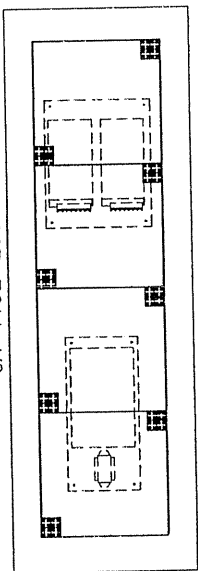
848 AMBER LED TNMC  
OA-1192-2553



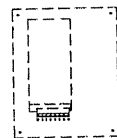
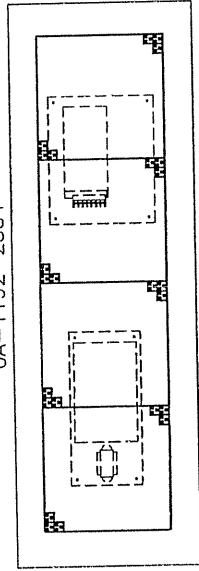
848 RED LED TNMC  
OA-1192-2552



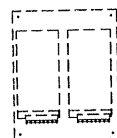
832 AMBER LED TNMC  
OA-1192-2555



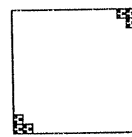
832 RED LED TNMC  
OA-1192-2554



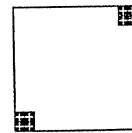
SINGLE POWER SUPPLY ASSEMBLY  
OA-1192-2550  
USED IN RED LED TNMCs



DOUBLE POWER SUPPLY ASSEMBLY  
OA-1192-2551  
USED IN AMBER LED TNMCs



RED LED TNMC MODULE  
OA-1208-3006  
USED IN RED LED TNMCs



AMBER LED TNMC MODULE  
OA-1208-3005  
USED IN AMBER LED TNMCs



TNMC CONTROLLER  
OA-1192-2549  
USED IN RED & AMBER LED TNMCs

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DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: OUTDOOR LED SCOREBOARDS

TITLE: COMPONENT LOCATIONS; 832/842 RED/AMB LED TNMC, G3

DES. BY: MCOPLAN

DRAWN BY: MCOPLAN

DATE: 01MAY03

REVISION

APPR. BY:

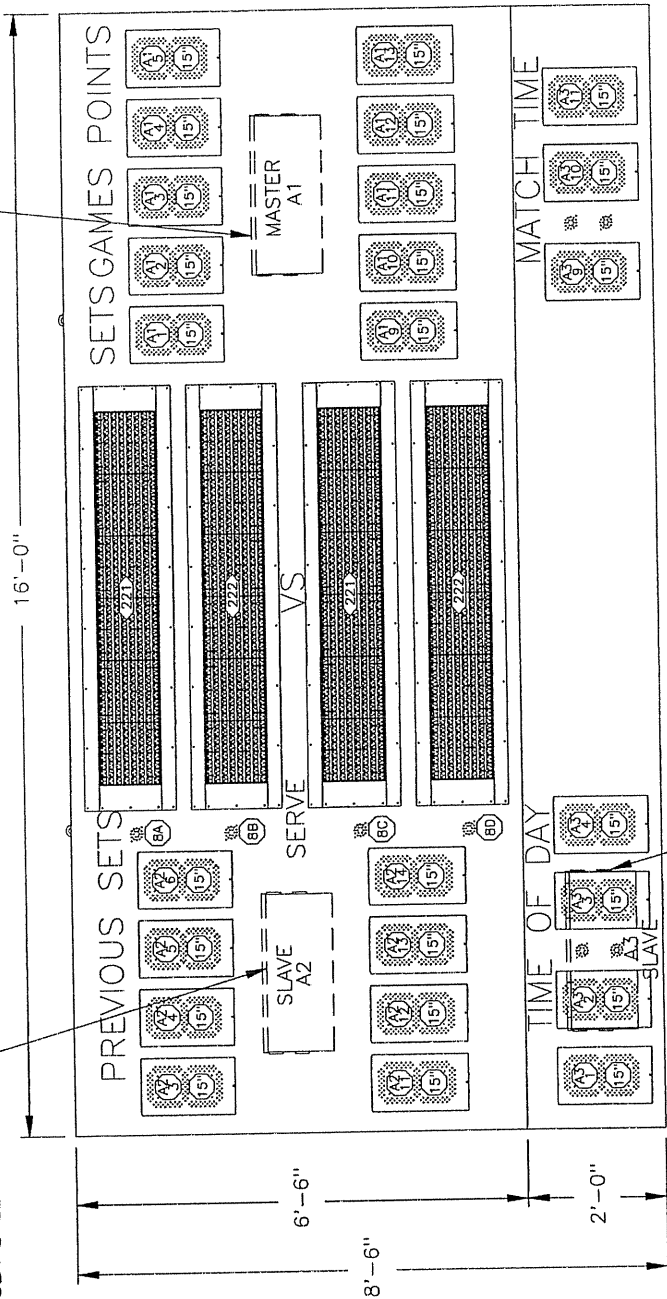
SCALE: 1=15

1192-R08A-187987

REV.	DATE	DESCRIPTION	BY	APPR.

ENCLOSED 16 COLUMN MASTER LED DRIVER. POWER/SIGNAL TERMINATIONS.

TN-2011-11/-21



ENCLOSED 16 COLUMN SLAVE LED DRIVER.

ENCLOSED 16 COLUMN SLAVE DRIVER.

NOTES:

⊗15 = DIGIT SIZE

⊗A2/3 = LED DRIVER NUMBER AND CONNECTOR WIRED TO THAT DIGIT

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DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: TENNIS SCOREBOARDS

TITLE: COMPONENT LOCATIONS, TN-2011-11/-21

DES. BY: KBRICKER

DRAWN BY: KBRICKER

DATE: 07MAY03

REVISION

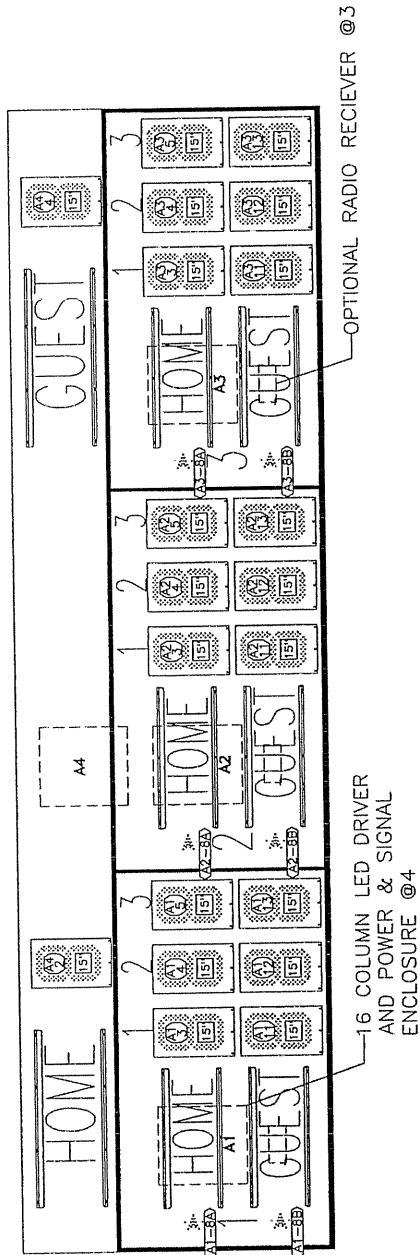
APPR. BY:

SCALE: 1=30

1164-E10A-188217

REV	DATE	DESCRIPTION	BY	APPR.

TN-2037-11/-21



FRONT VIEW

+ = LOCATION OF OPTIONAL RADIO ANTENNA

(A4) = LED DRIVER NUMBER

(1) = PLUG ON DRIVER CONNECTED TO THAT DIGIT

15' = DIGIT SIZE

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DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: TENNIS SCOREBOARDS

TITLE: COMPONENT LAYOUT, TN-2037-11/-21

DES. BY: MCOPLAN

DRAWN BY: MCOPLAN

DATE: 04AUG03

REV	DATE	DESCRIPTION	BY	APPR.
01	23 FEB 04	CHANGED 'VISITORS' CAPTIONS TO 'GUEST' & REMOVED PLUS SIGNS	CAC	

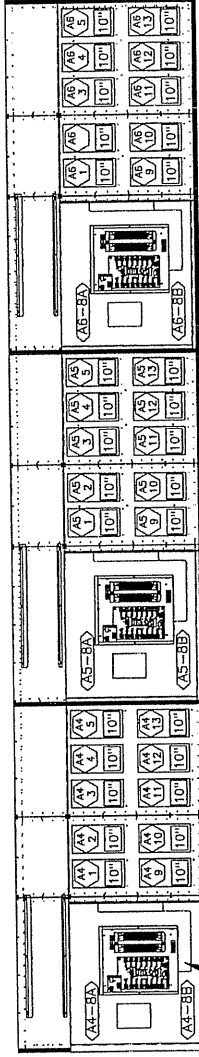
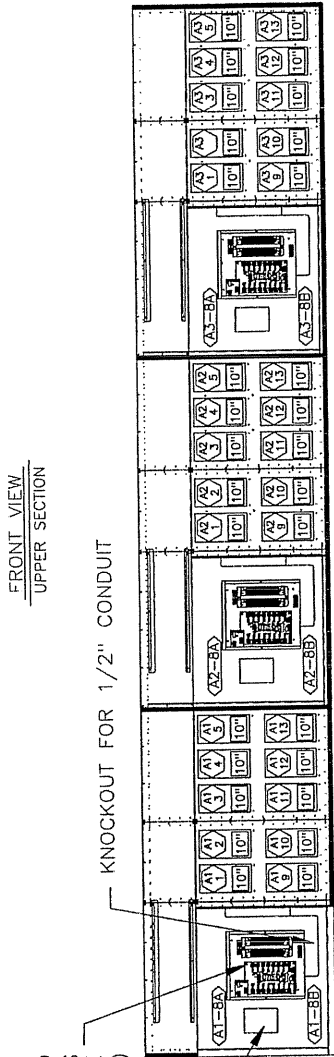
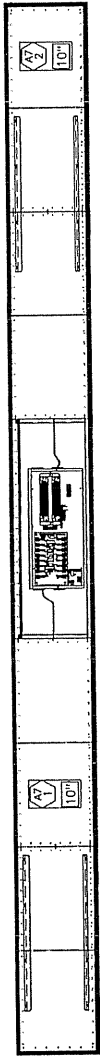
REVISION 01

APPR. BY:

SCALE: 1=35

1164-R08A-193974







ENCLOSED 16 COLUMN LED DRIVER. (THE COVER IS OPENED TO SHOW THE LED DRIVER.)

KNOCKOUT FOR 1/2" CONDUIT

LOCATION OF OPTIONAL RADIO RECEIVER KIT (TYP.)

POWER & SIGNAL ENTRANCE

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

 = DIGIT SIZE

HINGED ACCESS DOORS OPENED TO SHOW LED DRIVER AND POWER AND SIGNAL ENTRANCE.

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DAKTRONICS, INC. BROOKINGS, SD 57006

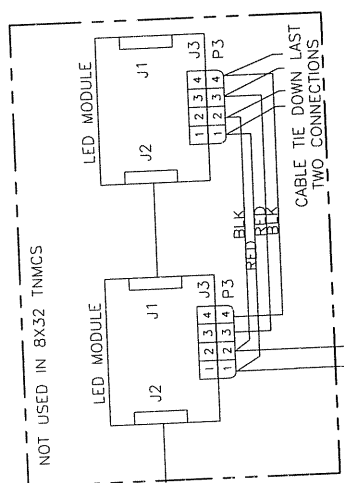
PROJ: TENNIS SCOREBOARDS  
 TITLE: COMPONENT LOCATIONS, TN-2029-11/21  
 DES. BY: KBRICKER DRAWN BY: CCAIN DATE: 13 AUG 04

REVISION 00 APPR. BY: SCALE: 1=40

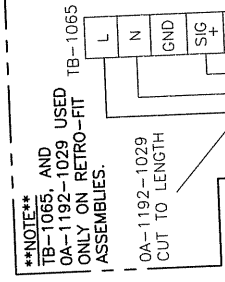
1164-E10A-221340

REV	DATE	DESCRIPTION	BY	APPR.



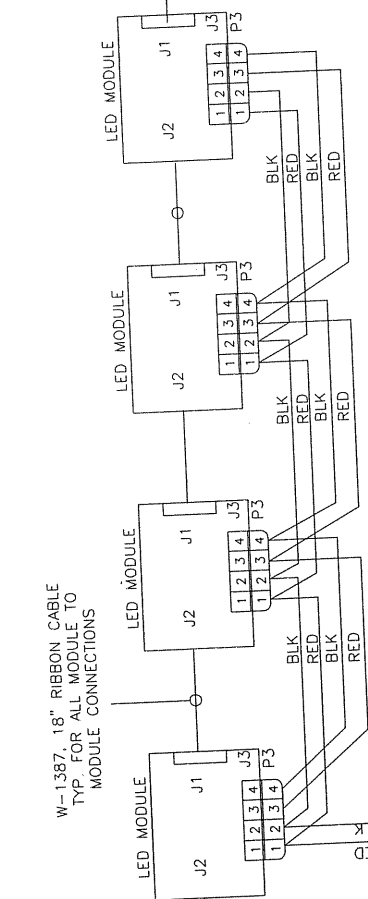


W-1387, 18" RIBBON CABLE  
TYP. FOR ALL MODULE TO  
MODULE CONNECTIONS



\*\*NOTE\*\*  
TB-1065, AND  
OA-1192-1029 USED  
ONLY ON RETRO-FIT  
ASSEMBLIES.

OA-1192-1029  
CUT TO LENGTH

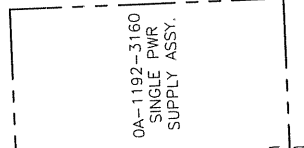
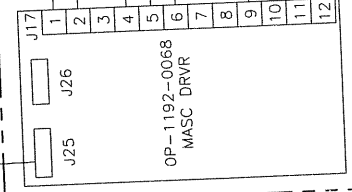


OA-1192-1332, 4  
MOD. HARNESS

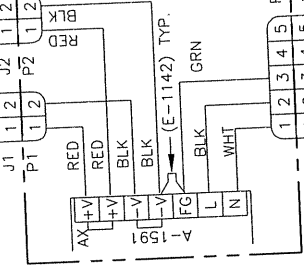
OA-1000-0017, 30"  
RIBBON CABLE

OA-1192-1332, 4  
MOD. HARNESS

OA-1192-2549  
CONTROLLER  
ASSEMBLY



OA-1192-3160  
SINGLE PWR  
SUPPLY ASST.



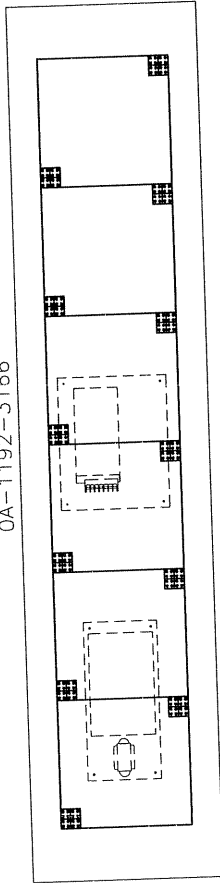
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DAKTRONICS, INC. BROOKINGS, SD 57006

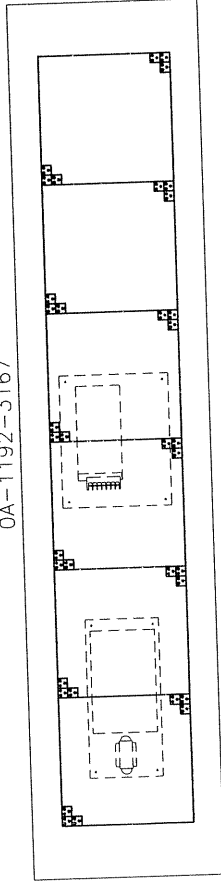
PROJ:	OUTDOOR LED SCOREBOARDS
TITLE:	SCHEMATIC; RED TNMC GEN IV
DES. BY:	DDINING
DATE:	30 AUG 05
REVISION:	00
APPR. BY:	
SCALE:	1192-R01A-252681

REV.	DATE	DESCRIPTION	BY	APPR.
01	01 DEC 05	CHANGE POWER HARNESS TO MOD FROM 2 PIN TO 4 PIN	SJC	

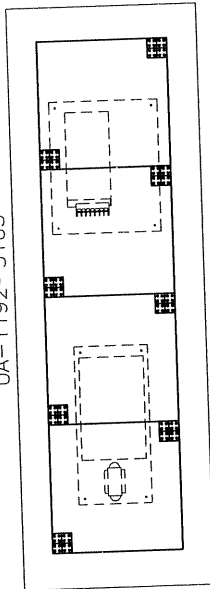
848 AMBER LED TNMC  
OA-1192-3166



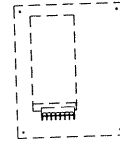
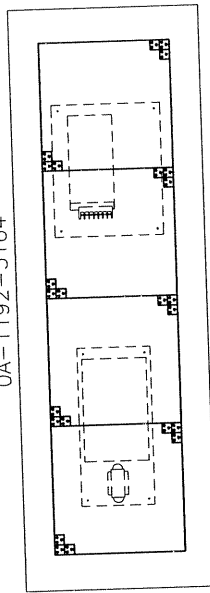
848 RED LED TNMC  
OA-1192-3167



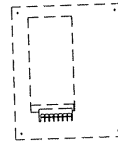
832 AMBER LED TNMC  
OA-1192-3165



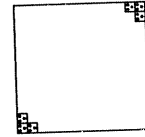
832 RED LED TNMC  
OA-1192-3164



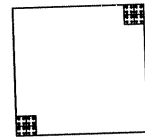
SINGLE POWER SUPPLY ASSEMBLY  
OA-1192-3160  
USED IN RED LED TNMCs



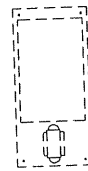
SINGLE POWER SUPPLY ASSEMBLY  
OA-1192-3161  
USED IN AMBER LED TNMCs



RED LED TNMC MODULE  
OA-1208-4000  
USED IN RED LED TNMCs



AMBER LED TNMC MODULE  
OA-1208-4001  
USED IN AMBER LED TNMCs



TNMC CONTROLLER  
OA-1192-2549  
USED IN RED & AMBER LED TNMCs

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DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: OUTDOOR LED SCOREBOARDS

TITLE: COMPONENT LOCATIONS; 832/842 RED/AMB LED TNMC, G4

DES. BY: KBRICKER

DRAWN BY: KBRICKER

DATE: 08NOV05

REVISION

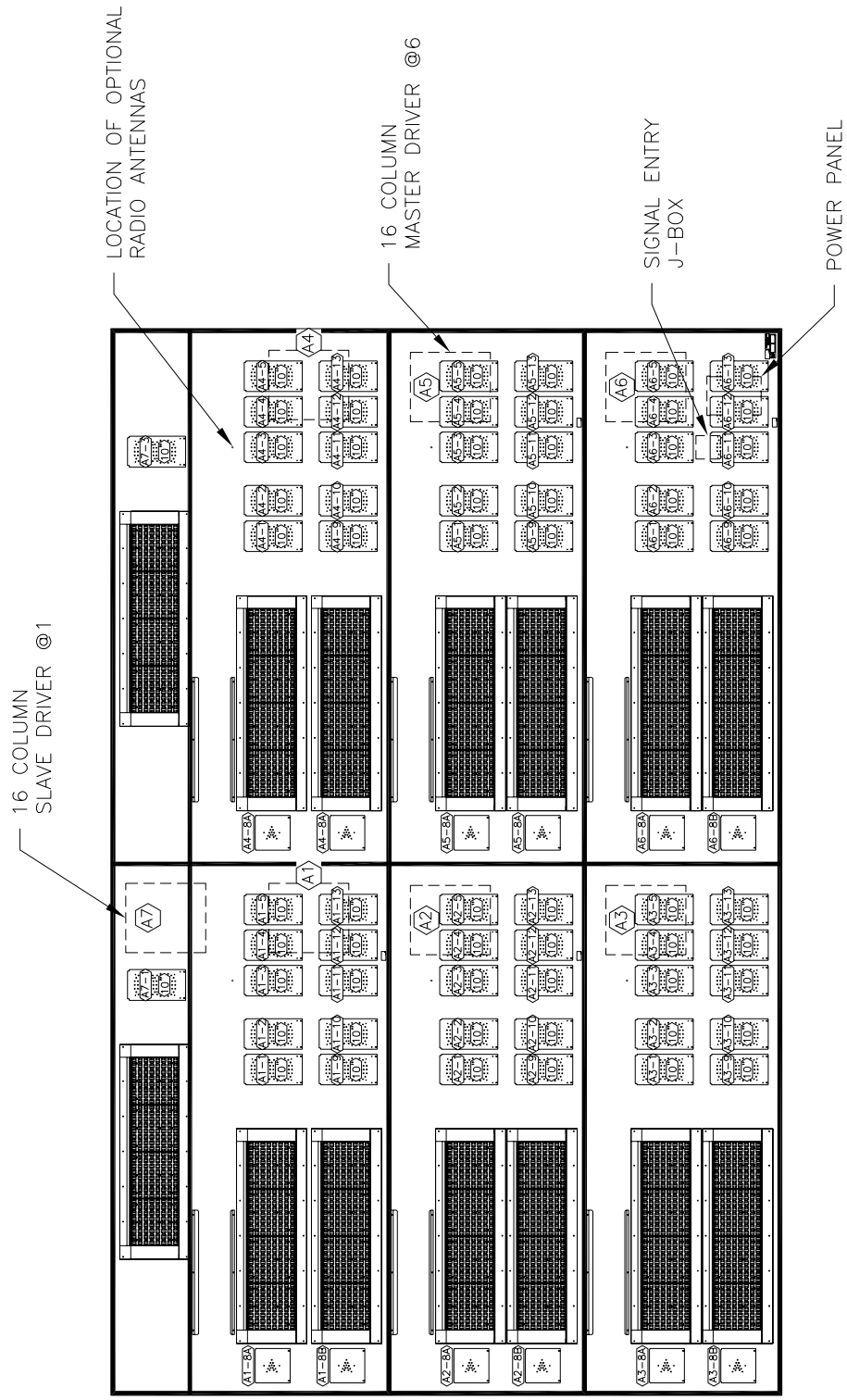
APPR. BY:

00

SCALE: 1=15

1192-R08A-257029

REV.	DATE	DESCRIPTION	BY	APPR.



A6-1 = LED DRIVER NUMBER & LED DRIVER CONNECTOR WIRED TO THAT DIGIT.  
10" = DIGIT SIZE

FRONT VIEW  
 TN-2042-11/21

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DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: OUTDOOR TENNIS SCOREBOARDS

TITLE: COMPONENT LOCATION; TN-2042-11/21, G4

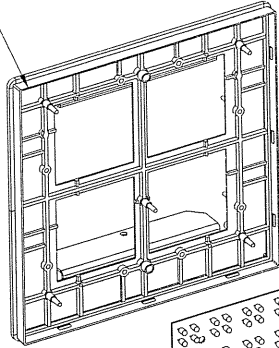
DES. BY: KBRICKER DRAWN BY: KBRICKER DATE: 09DEC05

REV.	DATE	DESCRIPTION	BY	APPR.
00				

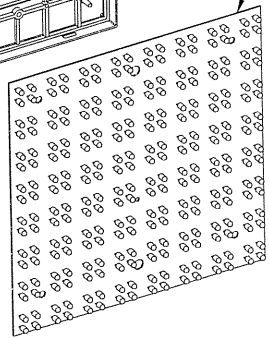
REVISION	APPR. BY:
00	
	SCALE: 1=40

1164-E10A-259122

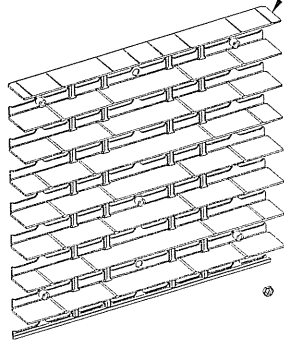
PLASTIC HOUSING WITH WEATHERSTRIPPING FOR WATERPROOFING



SINGLE LED AND DRIVER PANEL



LOUVER



LATCH ACCESS PLUG Ø2 FOR FRONT AND REAR MODULE ACCESS AND WATERPROOFING

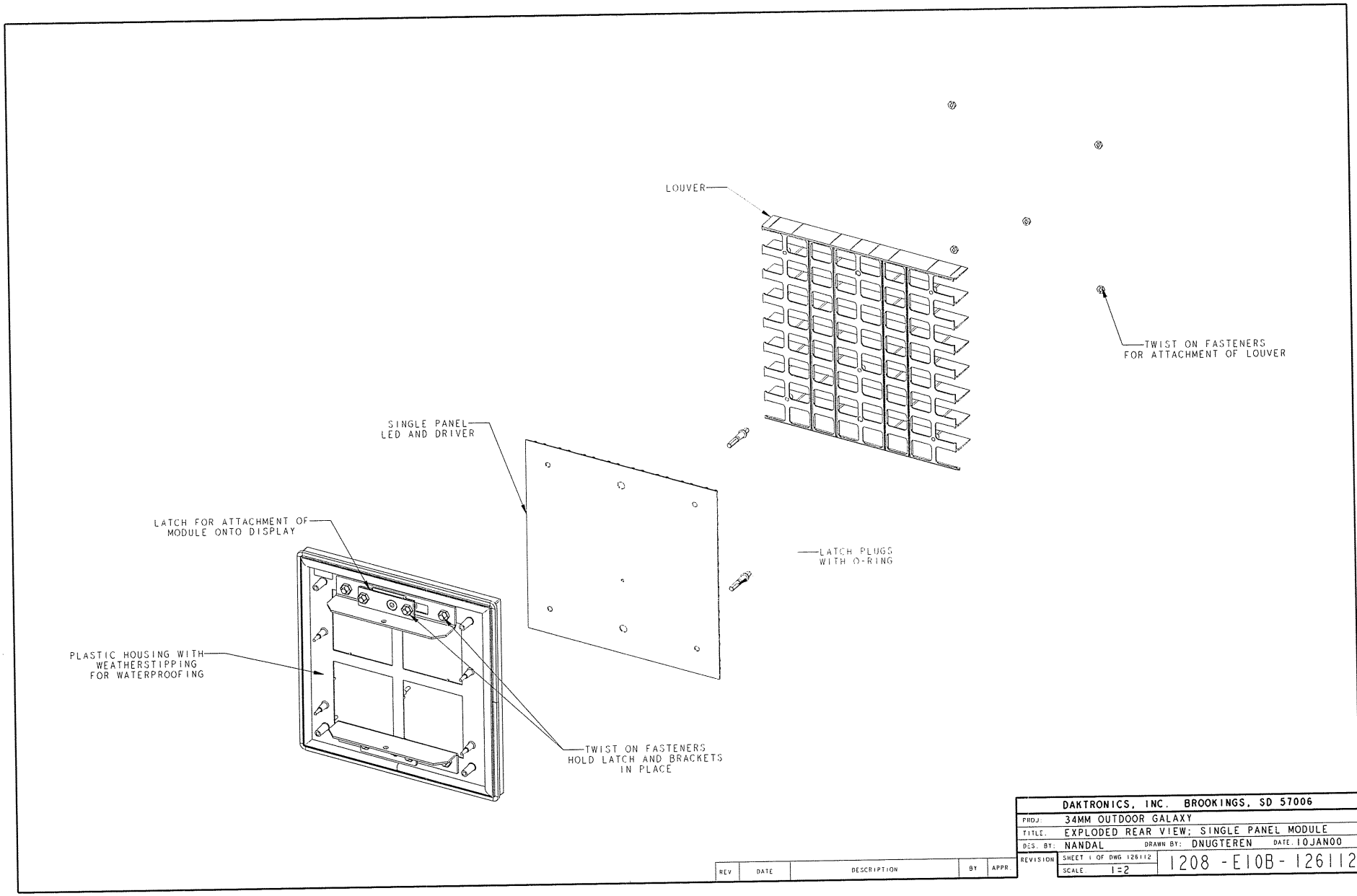


TWIST ON FASTENERS Ø5 FOR ATTACHMENT OF LOUVER



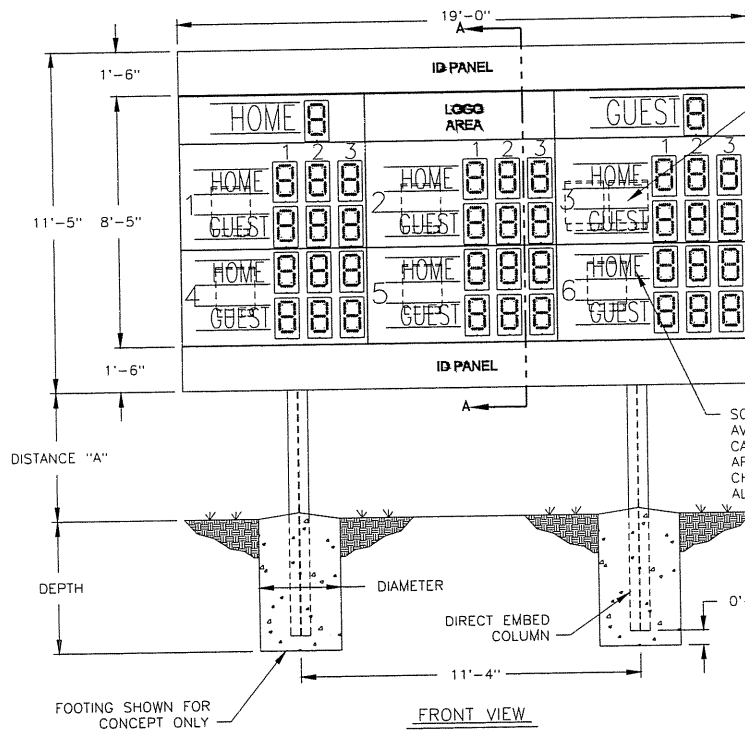
DAKTRONICS, INC. BROOKINGS, SD 57006			
PROJ:	34MM OUTDOOR GALAXY		
TITLE:	EXPLODED FRONT VIEW, SINGLE PANEL MODULE		
DES. BY:	NANDAL	DRAWN BY:	DNUGTEREN
		DATE:	10JAN00
REVISION	SHEET 1 OF DWG 126111	1208-E10B-126111	
	SCALE: 1=2		

REV.	DATE	DESCRIPTION	BY	APPR



DAKTRONICS, INC. BROOKINGS, SD 57006	
PROJ:	34MM OUTDOOR GALAXY
TITLE:	EXPLODED REAR VIEW; SINGLE PANEL MODULE
DES. BY:	NANDAL
DRAWN BY:	DNUGTEREN
DATE:	10 JAN 00
REVISION	SHEET 1 OF DWG 126112
SCALE	1=2
1208 - E10B - 126112	

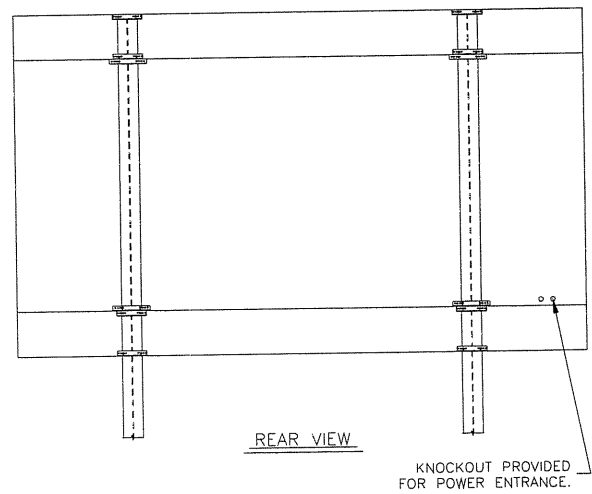
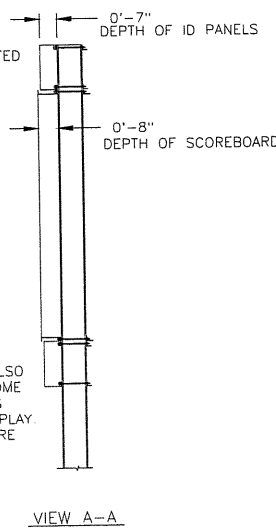
REV	DATE	DESCRIPTION	BY	APPR.



INTERNALLY MOUNTED DRIVER @7 BY DAKTRONICS.

1" STRIPE BY DAKTRONICS

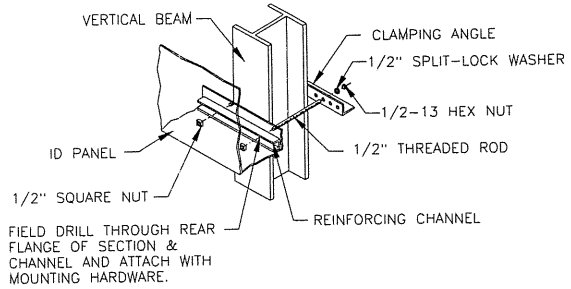
SCHOOL NAME CAPTION ALSO AVAILABLE INSTEAD OF HOME CAPTION. BASE CAPTIONS APPLIED DIRECTLY TO DISPLAY. CHANGEABLE PLACARDS ARE ALSO AVAILABLE.



OUTDOOR LED TENNIS SCOREBOARD*			
DISTANCE "A" (SEE FIGURE)	TOTAL DISPLAY SIZE		DESIGN WIND VELOCITY ASCE-7 ( 100 MPH )
10'-0"	11'-5" x 19'-0"	BEAM FOOTING	W8x31 2.0' x 8.5'
12'-0"	11'-5" x 19'-0"	BEAM FOOTING	W10x33 2.0' x 9.0'
14'-0"	11'-5" x 19'-0"	BEAM FOOTING	W10x39 2.0' x 9.25'

FOOTING = DIAMETER X DEPTH

\* FOOTING DIMENSIONS & COLUMN SIZES ARE SUGGESTIONS ONLY. PROVIDED TO ASSIST WITH ESTIMATING INSTALLATION COSTS AND ARE NOT INTENDED FOR CONSTRUCTION PURPOSES. FOOTING DIMENSIONS ARE BASED ON ASSUMED VERTICAL SOIL BEARING PRESSURE OF 2000 LB/FT. ACTUAL FOOTING DEPTH AND DIAMETER & COLUMN SIZES INSTALLATION MUST BE DETERMINED BY A QUALIFIED, STATE LICENSED, STRUCTURAL ENGINEER. OWNER (CUSTOMER) IS RESPONSIBLE FOR INSTALLATION & ADEQUACY OF STRUCTURE AND FOOTINGS. DAKTRONICS, INC. IS NOT RESPONSIBLE FOR STRUCTURES DESIGNED AND INSTALLED BY OTHERS.



MOUNTING HARDWARE SUPPLIED BY DAKTRONICS

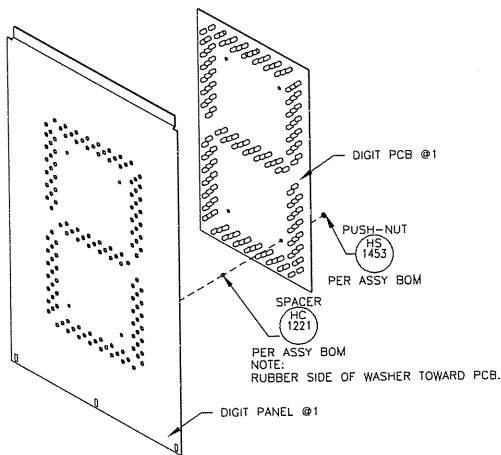
- NOTES:**
- REFER TO DAKTRONICS PROPOSAL DRAWING FOR ADDITIONAL DISPLAY SPECIFICATIONS.
  - DISPLAY SECTIONS ARE ALL ALUMINUM CONSTRUCTION.
  - SCOREBOARD IS FRONT SERVICE ACCESSIBLE FOR DIGITS AND ELECTRONICS.
  - LIFT EYES PROVIDED IN TOP OF EACH SECTION BY DAKTRONICS.
  - ALL SIGNAL CABLE SUPPLIED BY DAKTRONICS. ALL POWER CABLE SUPPLIED BY CUSTOMER'S INSTALLATION CONTRACTOR. ALL CONDUIT AND LABOR TO PULL POWER AND SIGNAL CABLE SUPPLIED BY CUSTOMER'S INSTALLATION CONTRACTOR.
  - INSTALLATION CONTRACTOR IS RESPONSIBLE FOR ANY TEMPORARY BRACING USED IN THE INSTALLATION OF SYSTEM.
  - ALL WORK TO BE DONE IN ACCORDANCE WITH OSHA AND ALL LOCAL CODES THAT APPLY.
  - FOOTING DESIGN, STRUCTURAL DESIGN, FABRICATION AND CERTIFICATION RESPONSIBILITY OF THE CUSTOMER.
  - CAPTION RAILS PROVIDED FOR OPTIONAL CHANGEABLE PLACARDS.
  - OPTIONAL RADIO CONTROLLERS ARE ALSO AVAILABLE.
  - DISPLAY WILL BE SHIPPED IN THREE (3) SECTIONS.
  - APPROXIMATE DISPLAY WEIGHTS ARE AS FOLLOWS:

TOP ID PANEL	50 LBS
SCBD SECTION	775 LBS
BTM ID PANEL	50 LBS
	875 LBS

REV.	DATE	DESCRIPTION	BY	APPR.
04	23 FEB 04	CHANGED 'VISITORS' CAPTIONS TO 'GUEST'	CAC	
03	08JAN03	ADDED WEIGHT ESTIMATE TABLE. REVISED FRONT VIEW OF DISPLAY. MOVED DRAWING FROM 1157 TO 1164 DIRECTORY. UPDATED TITLE DESCR.	KJB	
02	02 JUL 02	REPLACED W12X26 WITH W10X39	JEP	
01	15MAY02	REPLACED SCHOOL NAME WITH HOME CAPTION. ADDED NOTE REGARDING CAPTIONS.	KJB	

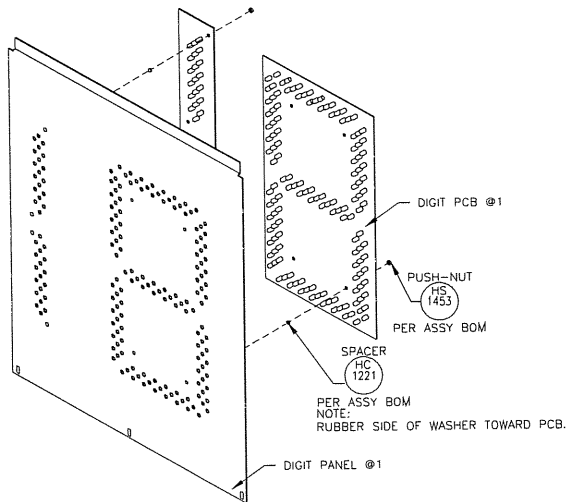
DAKTRONICS, INC. BROOKINGS, SD 57006	
PROJ: OUTDOOR TENNIS DISPLAYS	
TITLE: SHOP DWG, TN-2032-(11/21) W/ID PANELS	
DES. BY: KBRICKER	DATE: 17OCT01
REVISION 04	APPR. BY: KBRICKER
SCALE: 1/4"=1'	1164-E10B-157568





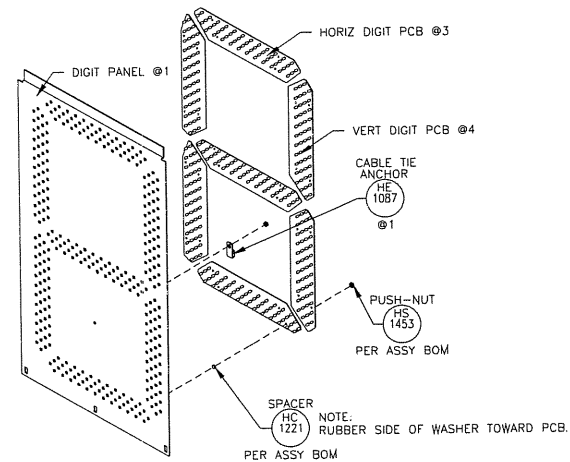
DETAIL: A

REFER TO THIS DETAIL FOR THE FOLLOWING RED/ORG, 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.)



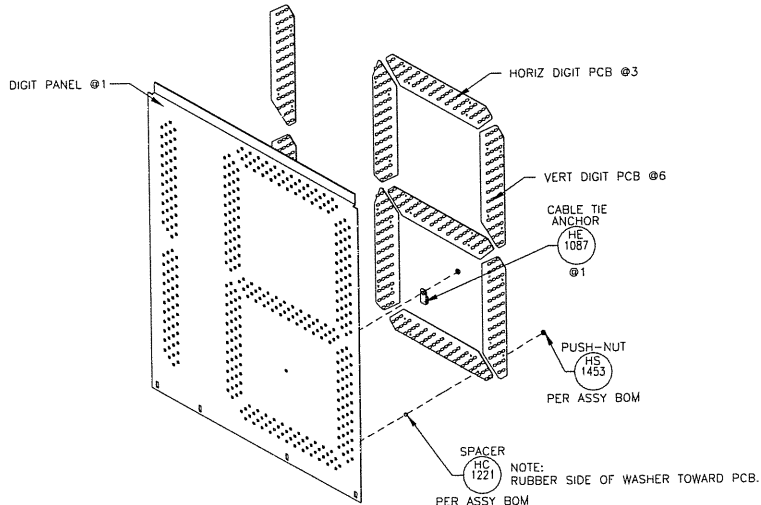
DETAIL: B

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



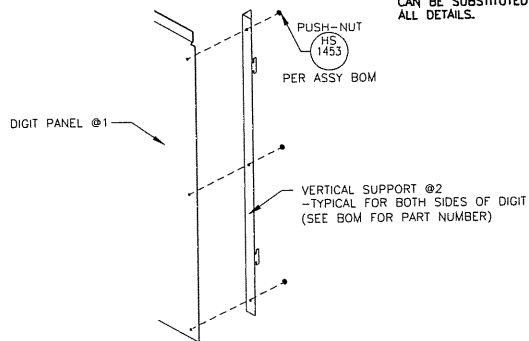
DETAIL: C

REFER TO THIS DETAIL FOR THE FOLLOWING RED/ORG, GRN, AND AMBER LED DIGIT ASSEMBLY SIZES:  
 -24", 24" WIDE, 30", 30" WIDE, 36", 42", AND 48"  
 \*SEE ALSO DETAIL F FOR HARNESS CONNECTIONS.



DETAIL: D

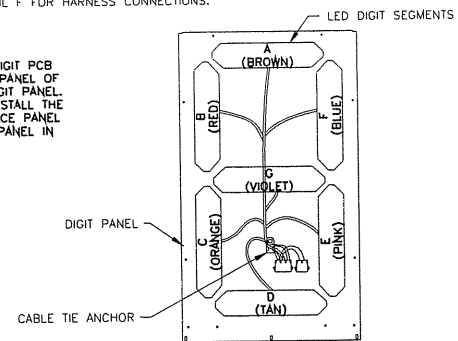
REFER TO THIS DETAIL FOR THE FOLLOWING RED/ORG, GRN, AND AMBER LED DIGIT ASSEMBLY SIZES:  
 -24"+1, 30"+1, 36"+1, 42"+1, AND 48"+1  
 \*\*SEE ALSO DETAIL F FOR HARNESS CONNECTIONS.



DETAIL: E

REFER TO THIS DETAIL FOR THE FOLLOWING RED/ORG, GRN, AND AMBER LED DIGIT ASSEMBLY SIZES:  
 -30", 30"+1, 30" WIDE, 48", AND 48"+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.



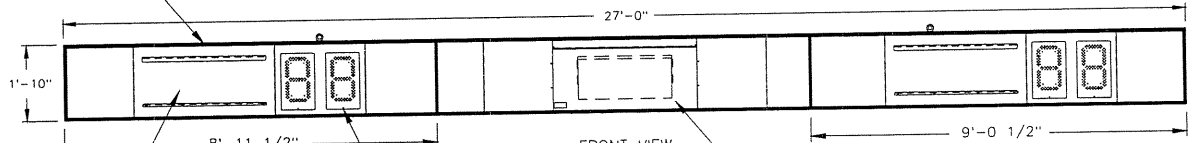
DETAIL: F  
 DIGIT REAR VIEW

REFER TO THIS DETAIL WHEN ASSEMBLING INDIVIDUAL SEGMENTED LED DIGITS SUCH AS IN DETAILS C AND D. ATTACH LED DIGIT SEGMENT HARNESS (SEE BOM FOR PART NUMBER) AS SHOWN ABOVE. WHEN ATTACHING LED DIGIT SEGMENT HARNESS, MATCH THE COLORED HARNESS TO THE CORRESPONDING LED DIGIT SEGMENTS AS SHOWN ABOVE AND CABLE TIE WHERE NEEDED USING CABLE TIES AND CABLE TIE ANCHOR. TRY TO BUNDLE CABLES TOGETHER TO MAKE HARNESS LOOK LIKE ABOVE WHEN COMPLETE.

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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		DATE: 30OCT02	
REVISION	APPR. BY:	1192-E10B-177679	
SCALE: 1=6			

REV.	DATE	DESCRIPTION	BY	APPR.
03	01JAN03	CHANGE LETTER FOR VIOLET TO G ON DETAIL F	CME	
02	31 DEC 02	ADDED HARNESS TO DETAIL "F" TO SHOW HOW TO CABLE TIE.	CJB	
01	03 DEC 02	REPLACED SPACER HC-1376 WITH HC-1221	ATB	

OPTIONAL 1" STRIPE ALL AROUND UPPER SECTION



FRONT VIEW  
UPPER SECTION

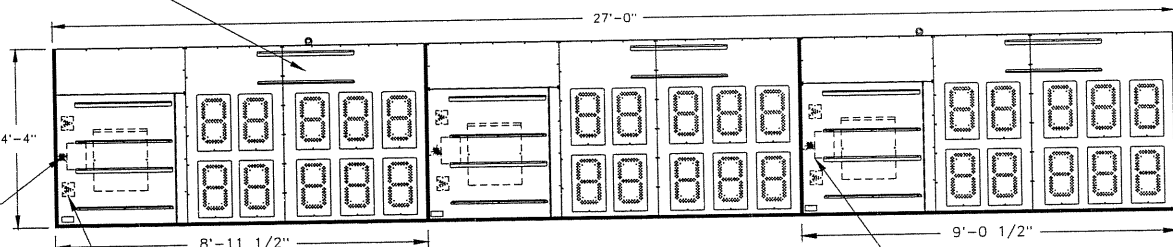
A7: ADDRESS  
OA 1150  
0064  
@1  
SEE DETAIL A: DWG B-124194

15" DIGIT RED/ORG  
OA 1192 / HC 1186  
2223 @64  
OR  
15" DIGIT AMBER SCREWS  
OA 1192 / HC 1186  
2224 @64 @192

CHECK BOM TO SEE IF CAPTIONS ARE APPLIED DIRECTLY TO SCOREBOARD

ADDRESS SETTINGS.	
ADDRESS PLUG:	0A-1150-0064
DRIVER A7:	074
<b>NOTES:</b>	
REFER TO DWG A-11507B FOR ADDRESS PLUG CONFIGURATIONS	
ADDRESS FOR DRIVERS 1 - 6 WILL BE ADDED WITH CONTROL OPTION KIT.	

LOCATION OF RADIO ANTENNA



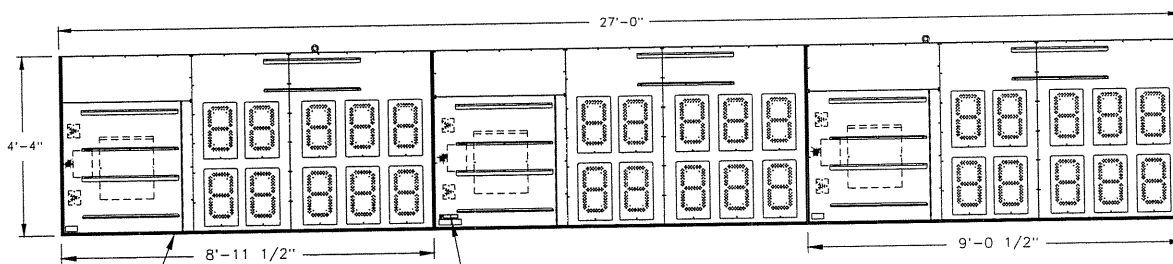
FRONT VIEW  
MIDDLE SECTION

3" ARROW RED/ORG  
OP 1192 / HC 1020  
0249 @12  
OR  
3" ARROW AMBER SCREW  
OP 1192 / HC 1020  
0250 @12  
NUT  
HC 1082 @24  
RUBBER SPACER  
HC 1221 @24  
RUBBER SIDE OF WASHER TOWARDS ARROW PCB

(OPTIONAL) RADIO RECEIVER  
OA 1110  
0007  
@6

TN-2018-11	
SPECIFICATIONS	
MODEL:	TN-2018-11
VOLTS:	120 VAC
AMPS:	6.5 A
MAX WATTS:	780 WATTS

TN-2018-21	
SPECIFICATIONS	
MODEL:	TN-2018-21
VOLTS:	120 VAC
AMPS:	6.5 A
MAX WATTS:	780 WATTS



FRONT VIEW  
LOWER SECTION

CAUTION CONTROL SPECIFICATION LABELS  
LL 1065 @7  
LL 2155 @1  
LL 2034 @1  
LL 2306 @1  
LL 2285 @2

OPTIONAL 1" STRIPE AROUND LEFT/RIGHT/BOTTOM OF MIDDLE AND LOWER SECTIONS

**NOTES:**

- REFER TO DWG A-182349 FOR RADIO SETTINGS IF RADIO CONTROL WAS ORDERED.
- REFER TO DWG-187212 FOR DAK TENNIS CONTROL CONFIGURATION IF ORDERED.

0A-1164-0093...F.ASSY, TN-2018-11, G3  
0A-1164-0046...F.ASSY, TN-2018-21, G3

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DAKTRONICS, INC. BROOKINGS, SD 57006

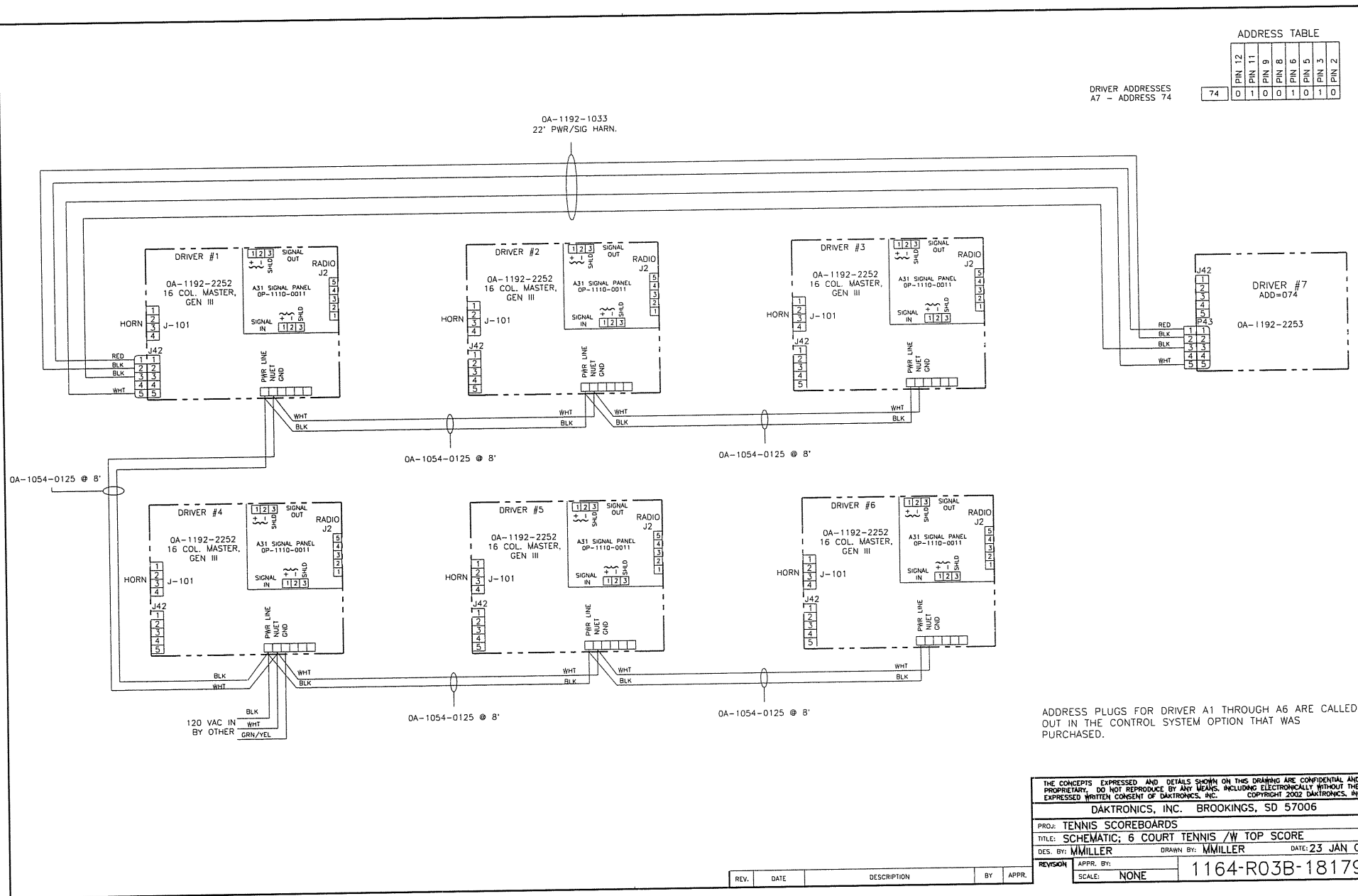
PROJ:	TENNIS SCOREBOARDS
TITLE:	F.ASSY, TN-2018-11 /-21, G3
DES. BY:	KBRICKER
DRAWN BY:	KBRICKER
DATE:	22JAN03
REVISION	APPR. BY:
03	SCALE: 1=35
1164-E10B-181618	

REV.	DATE	DESCRIPTION	BY	APPR.
03	11 AUG 04	ADDED F.ASSY NUMBER FOR -11 MODEL	KJB	
02	17 JUNE 03	REMOVED RAILS @6	CAC	
01	21 APR 03	REMOVED ADDRESS HARNESSES 1-6 IN TEXT.	TAS	MWM

ADDRESS TABLE

PIN 12	1
PIN 11	0
PIN 9	0
PIN 8	0
PIN 6	1
PIN 5	0
PIN 3	1
PIN 2	0

DRIVER ADDRESSES  
A7 - ADDRESS 74



ADDRESS PLUGS FOR DRIVER A1 THROUGH A6 ARE CALLED OUT IN THE CONTROL SYSTEM OPTION THAT WAS PURCHASED.

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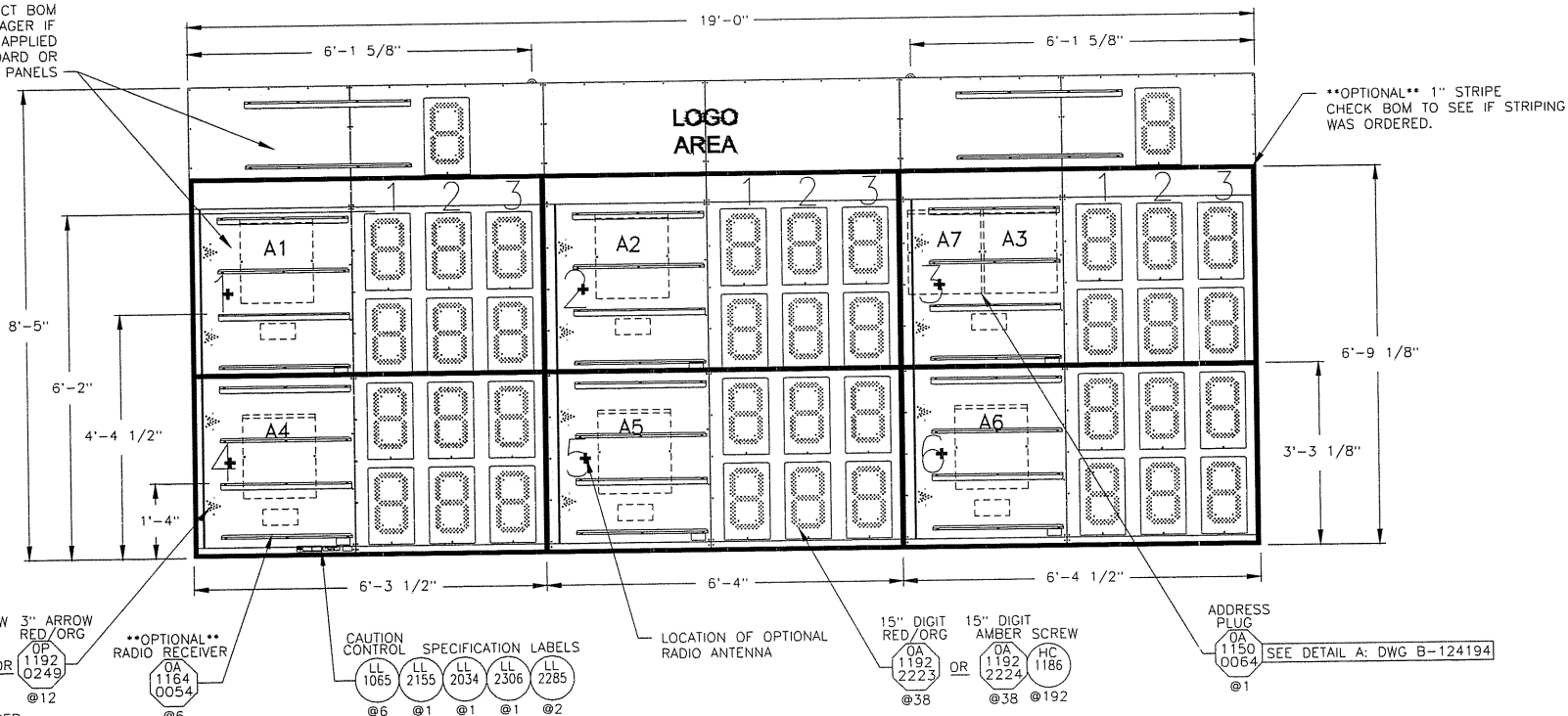
DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: TENNIS SCOREBOARDS  
 TITLE: SCHEMATIC; 6 COURT TENNIS /W TOP SCORE  
 DES. BY: MILLER DRAWN BY: MILLER DATE: 23 JAN 03

REVISION APPR. BY: SCALE: NONE 1164-R03B-181793

REV.	DATE	DESCRIPTION	BY	APPR.

CHECK PROJECT BOM OR PROJECT MANAGER IF BASE CAPTIONS ARE APPLIED DIRECTLY TO BOARD OR REMOVABLE PANELS



RUBBER WASH NUT SCREW 3" ARROW 3" ARROW  
 HC 1221 HC 1082 HC 1020 OP 1192 0250 OR OP 1192 0249  
 @24 @24 @24 @12 @12  
 RUBBER SIDE OF WASHER TOWARDS ARROW PCB

\*\*OPTIONAL\*\* RADIO RECEIVER  
 OA 1164-0054 @6

CAUTION CONTROL SPECIFICATION LABELS  
 LL 1065 LL 2155 LL 2034 LL 2306 LL 2285  
 @6 @1 @1 @1 @2

LOCATION OF OPTIONAL RADIO ANTENNA

15" DIGIT RED/ORG 15" DIGIT AMBER SCREW  
 OA 1192-2223 OR OA 1192-2224 HC 1186  
 @38 @38 @192

ADDRESS PLUG  
 OA 1150-0064 @1 SEE DETAIL A: DWG B-124194

LAYOUT VIEW

NOTES:

- DIMENSIONS TO STRIPE ARE TO THE CENTER OF THE STRIPE.
- REFER TO DWG A-182349 FOR RADIO SETTINGS IF RADIO CONTROL WAS ORDERED.
- REFER TO DWG-187212 FOR DAK TENNIS CONTROL CONFIGURATION IF ORDERED.

BASE CAPTIONS:			
NUMBER:	CAPTION:	HEIGHT:	QUANTITY:
OG-183659-A	1 2 3	6"	@3
OG-178404-A	1 2 3	8"	@1
OG-178404-B	4 5 6	8"	@1

OTHER CAPTIONS MAY BE APPLIED TO PANELS OR DIRECTLY TO BOARD.

ADDRESS SETTINGS:	
ADDRESS PLUG:	OA-1150-0064
DRIVER A7:	074
NOTES: REFER TO DWG A-115078 FOR ADDRESS PLUG CONFIGURATION	
ADDRESS FOR DRIVERS 1-6 WILL BE ADDED WITH CONTROL OPTION KIT.	

TN-2032-11	
SPECIFICATIONS	
MODEL:	TN-2032-11
VOLTS:	120 VAC
AMPS:	4.0 A
MAX WATTS:	480 WATTS

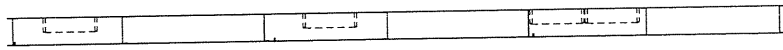
TN-2032-21	
SPECIFICATIONS	
MODEL:	TN-2032-21
VOLTS:	120 VAC
AMPS:	4.0 A
MAX WATTS:	480 WATTS

OA-1164-0055...F.ASSY, TN-2032-11  
 OA-1164-0066...F.ASSY, TN-2032-21

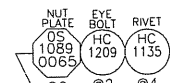
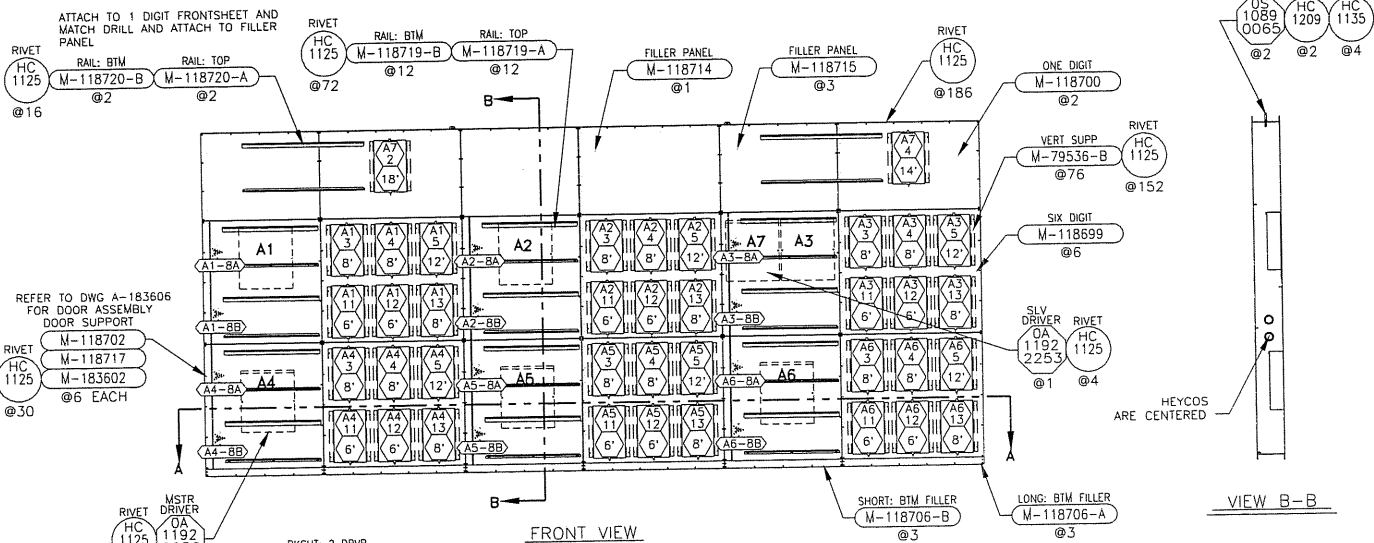
THE CONCEPTS EXPRESSED AND DETAILS SHOWN ON THIS DRAWING ARE CONFIDENTIAL AND PROPRIETARY. DO NOT REPRODUCE BY ANY MEANS, INCLUDING ELECTRONICALLY WITHOUT THE EXPRESS WRITTEN CONSENT OF DAKTRONICS, INC.  
 DAKTRONICS, INC. BROOKINGS, SD 57006

REV.	DATE	DESCRIPTION	BY	APPR.
03	060CT03	REVISED LOCATIONS OF RETAINERS TO FIT 8" COURT CAPTION BETWEEN RAALS.	KJB	
02	23 APR 03	REMOVED ADDRESS HARNESSES 1 - 6 IN TEXT.	TAS	MWM
01	17APR03	ADDED PACKET NUMBER FOR AMBER DISPLAY.	KJB	

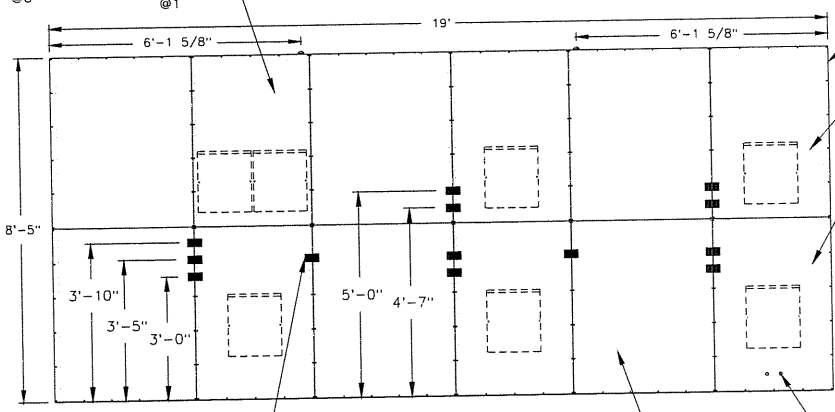
PROJ:	TENNIS SCOREBOARD		
TITLE:	F.ASSY, TN-2032-11/-21		
DES. BY:	KBRICKER	DRAWN BY:	KBRICKER
DATE:	19FEB03		
REVISION	03	APPR. BY:	1=25
SCALE:	1164-E10B-183598		



VIEW A-A



VIEW B-B



NOTES:

ALL WIRES MUST BE LOCATED AT LEAST 1/2" FROM THE BOTTOM OF THE SCOREBOARD OR ANY HORIZONTAL SURFACE WHERE WATER MAY COLLECT AROUND THE WIRES.

- A2 = DRIVER
- 1 = DRIVER PLUG NUMBER
- 12' = 9 TO 9 PIN DIGIT HARNESS LENGTH

HARNESS ROUTING LEGEND

INTERCONNECT CABLE LABELING LABEL PLUGS AND JACKS AS SHOWN

MASTER DRIVER A1	P3 } -0A-1171-4005 = 8' 9W TO 9W 02 - 3	DIGIT	
	P4 } -0A-1171-4015 = 12' 9W TO 9W 01 - 4		
	P5 } -0A-1171-4015 = 12' 9W TO 9W 01 - 5		
	P11 } -0A-1171-4004 = 8' 9W TO 9W 02 - 11		
	P12 } -0A-1171-4005 = 8' 9W TO 9W 01 - 12		
MASTER DRIVER A2	P13 } -0A-1171-4005 = 8' 9W TO 9W 01 - 13	DIGIT	
	P8 } -0A-1171-4070 = 8' 9W TO 4W 01 - 8A		
	P8 } -0A-1171-4070 = 8' 9W TO 4W 01 - 8B		
MASTER DRIVER A3	P3 } -0A-1171-4005 = 8' 9W TO 9W 02 - 3		DIGIT
	P4 } -0A-1171-4015 = 12' 9W TO 9W 01 - 4		
	P5 } -0A-1171-4015 = 12' 9W TO 9W 01 - 5		
	P11 } -0A-1171-4004 = 8' 9W TO 9W 02 - 11		
	P12 } -0A-1171-4005 = 8' 9W TO 9W 01 - 12		
MASTER DRIVER A4	P13 } -0A-1171-4005 = 8' 9W TO 9W 01 - 13	DIGIT	
	P8 } -0A-1171-4070 = 8' 9W TO 4W 01 - 8A		
	P8 } -0A-1171-4070 = 8' 9W TO 4W 01 - 8B		
MASTER DRIVER A5	P3 } -0A-1171-4005 = 8' 9W TO 9W 02 - 3		DIGIT
	P4 } -0A-1171-4015 = 12' 9W TO 9W 01 - 4		
	P5 } -0A-1171-4015 = 12' 9W TO 9W 01 - 5		
	P11 } -0A-1171-4004 = 8' 9W TO 9W 02 - 11		
	P12 } -0A-1171-4005 = 8' 9W TO 9W 01 - 12		
MASTER DRIVER A6	P13 } -0A-1171-4005 = 8' 9W TO 9W 01 - 13	DIGIT	
	P8 } -0A-1171-4070 = 8' 9W TO 4W 01 - 8A		
	P8 } -0A-1171-4070 = 8' 9W TO 4W 01 - 8B		
SLAVE DRIVER A7	P2 } -0A-1171-4017 = 18' 9W TO 9W 01 - 2		DIGIT
	P4 } -0A-1171-4015 = 14' 9W TO 9W 01 - 4		

NOTES:

0A-1164-0031.....PRE-PAINT ASSY, TN-2032

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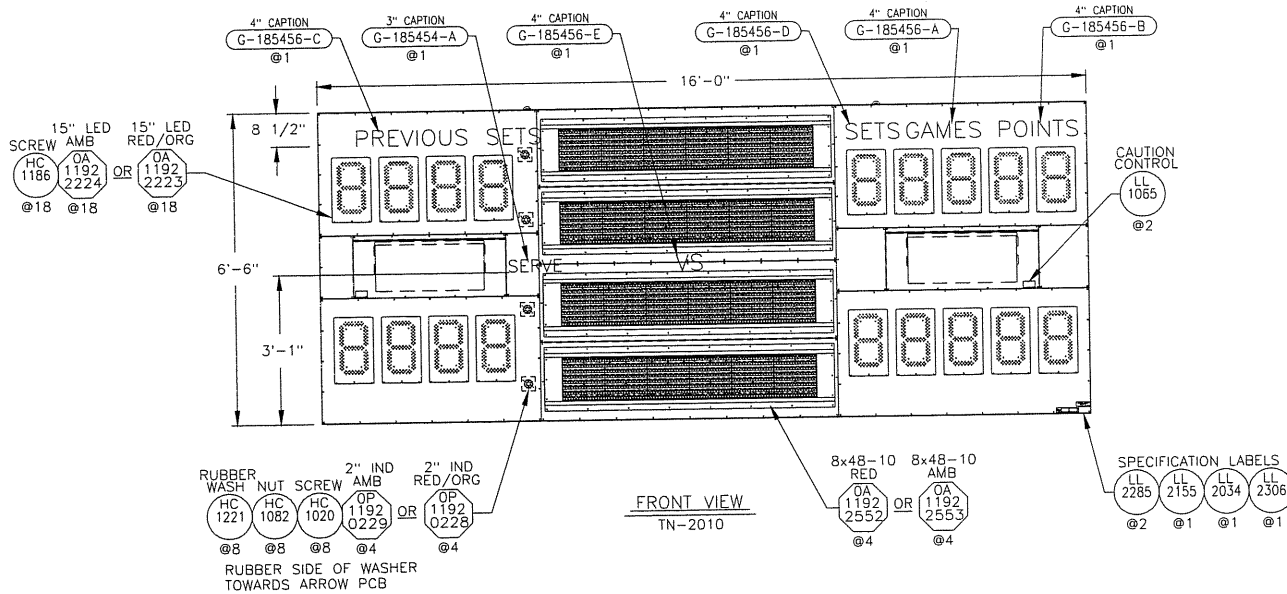
PROJ: TENNIS SCOREBOARD

TITLE: PRE-PAINT ASSY, TN-2032

DES. BY: KBRICKER DRAWN BY: KBRICKER DATE: 18FEB03

REVISION 01 APPR. BY: 1164-E10B-183613

REV.	DATE	DESCRIPTION	BY	APPR.
01	060CT03	REVISED LOCATIONS OF RETAINERS TO FIT 8" COURT CAPTION BETWEEN RAILS.	KJB	



FRONT VIEW  
TN-2010

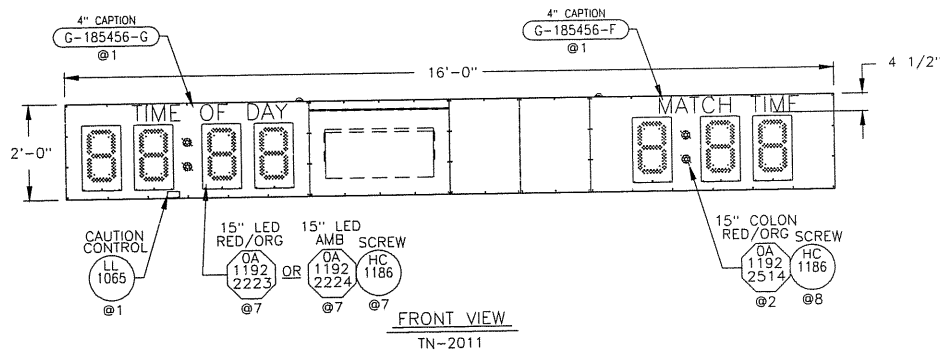
TN-2010-11
SPECIFICATIONS.
MODEL: TN-2010-11
VOLTS: 120 VAC
AMPS: 5.0 A
MAX WATTS: 600 WATTS

TN-2010-21
SPECIFICATIONS.
MODEL: TN-2010-21
VOLTS: 120 VAC
AMPS: 5.0 A
MAX WATTS: 600 WATTS

TN-2011-11
SPECIFICATIONS.
MODEL: TN-2011-11
VOLTS: 120 VAC
AMPS: 7.5 A
MAX WATTS: 900 WATTS

**TN-2010: SCORING SECTION ALONE**

**TN-2011: SCORING SECTION AND CLOCK SECTION**



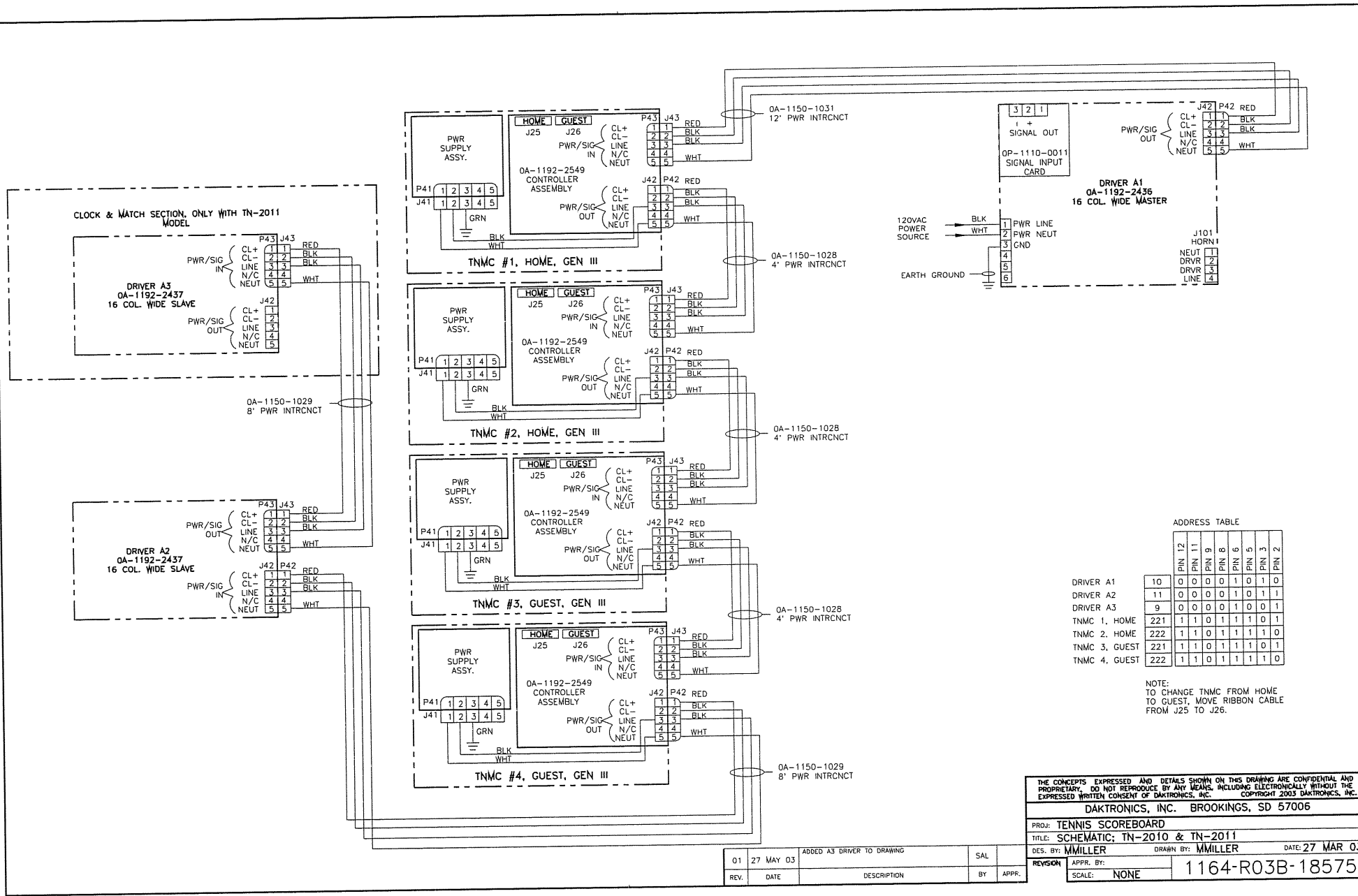
FRONT VIEW  
TN-2011

**NOTES:**

- OA-1164-0059....F.ASSY, TN-2011-11
- OA-1164-0069....F.ASSY, TN-2011-21
- OA-1164-0070....F.ASSY, TN-2010-11
- OA-1164-0071....F.ASSY, TN-2010-21

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DAKTRONICS, INC. BROOKINGS, SD 57006	
PROJ: TENNIS SCOREBOARDS	
TITLE: F.ASSY, TN-2010, TN-2011-11/-21	
DES. BY: KBRICKER	DATE: 24MAR03
REVISION	APPR. BY: 1164-E10B-184884
SCALE: 1=30	

REV.	DATE	DESCRIPTION	BY	APPR.
01	04 JUNE 03	UPDATED DIGT HOLES DUE TO ECO 39312	CAC	



ADDRESS TABLE

	PIN 12	PIN 11	PIN 9	PIN 8	PIN 6	PIN 5	PIN 3	PIN 2
DRIVER A1	10	0	0	0	0	1	0	1
DRIVER A2	11	0	0	0	0	1	0	1
DRIVER A3	9	0	0	0	0	1	0	1
TNMC 1, HOME	221	1	1	0	1	1	1	0
TNMC 2, HOME	222	1	1	0	1	1	1	0
TNMC 3, GUEST	221	1	1	0	1	1	1	0
TNMC 4, GUEST	222	1	1	0	1	1	1	0

NOTE:  
TO CHANGE TNMC FROM HOME  
TO GUEST, MOVE RIBBON CABLE  
FROM J25 TO J26.

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: TENNIS SCOREBOARD  
TITLE: SCHEMATIC; TN-2010 & TN-2011  
DES. BY: MILLER DRAWN BY: MILLER DATE: 27 MAR 03

01	27 MAY 03	ADDED A3 DRIVER TO DRAWING	SAL	
REV.	DATE	DESCRIPTION	BY	APPR.

REVISION APPR. BY: SCALE: NONE 1164-R03B-185759

MODEL: TN-2011						
VERTICAL DISTANCE (A)	AD PANEL HEIGHT	COMBINED HEIGHT (B)	DESIGN WIND VELOCITY			FOOTING
			70 MPH	80 MPH	100 MPH	
10 FT	NONE	8'-6"	BEAM W12X15	W12X16	W12X20	
	2 FT	10'-6"	FOOTING 2.6X6.0	2.6X6.0	2.6X7.0	
			BEAM W12X15	W12X16	W12X20	
12 FT	NONE	8'-6"	BEAM W12X15	W12X16	W12X20	
	2 FT	10'-6"	FOOTING 2.6X7.0	2.6X7.0	2.6X7.0	
			BEAM W12X15	W12X16	W12X20	
14 FT	NONE	8'-6"	BEAM W12X15	W12X16	W12X20	
	2 FT	10'-6"	FOOTING 2.6X7.0	2.6X7.0	2.6X7.0	
			BEAM W12X15	W12X16	W12X20	

MODEL: TN-2010						
VERTICAL DISTANCE (A)	AD PANEL HEIGHT	COMBINED HEIGHT (B)	DESIGN WIND VELOCITY			FOOTING
			70 MPH	80 MPH	100 MPH	
10 FT	NONE	6'-6"	BEAM W12X15	W12X16	W12X20	
	2 FT	8'-6"	FOOTING 2.6X6.0	2.6X6.0	2.6X7.0	
			BEAM W12X15	W12X16	W12X20	
12 FT	NONE	6'-6"	BEAM W12X15	W12X16	W12X20	
	2 FT	8'-6"	FOOTING 2.6X6.0	2.6X6.0	2.6X7.0	
			BEAM W12X15	W12X16	W12X20	
14 FT	NONE	6'-6"	BEAM W12X15	W12X16	W12X20	
	2 FT	8'-6"	FOOTING 2.6X6.0	2.6X6.0	2.6X7.0	
			BEAM W12X15	W12X16	W12X20	

**A NOTE ABOUT BEAM NOMENCLATURE:**

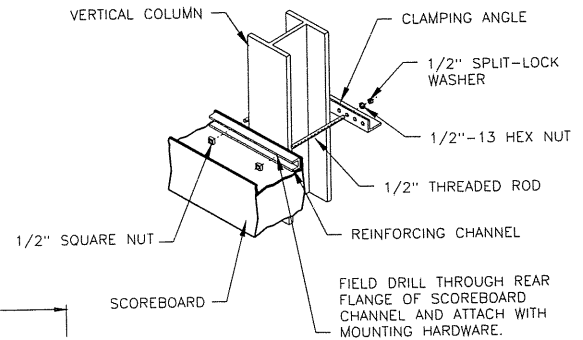
For a typical beam, W12x30 for example, "W" stands for "Wide-Flange Beam". The first number (12) is the approximate front to rear dimension of the beam in inches. The second number (30) is the weight per foot in pounds. This numbering is standard in the steel industry. Widths vary from 4 to 8 inches in this chart.

FOOTING = DIAMETER X DEPTH

FOOTING DIMENSIONS ARE SUGGESTIONS ONLY, PROVIDED TO ASSIST WITH ESTIMATING INSTALLATION COSTS, AND ARE NOT INTENDED FOR CONSTRUCTION PURPOSES. COLUMNS AND FOOTINGS MUST BE DESIGNED BY A STATE LICENSED ENGINEER. DAKTRONICS DOES NOT ASSUME LIABILITY FOR ANY INSTALLATIONS DERIVED FROM THIS INFORMATION OR DESIGNED AND INSTALLED BY OTHERS.

**ASSUMPTIONS:**

UBC97 CODE  
EXPOSURE=C  
IMPORTANCE FACTOR=1.0  
SOIL CLASS 4 (200PSF/FT X 2)  
A992 STEEL WIDE FLANGES



**SCOREBOARD MOUNTING KIT**  
PROVIDED BY DAKTRONICS

INTERNAL MASTER DRIVER, POWER/SIGNAL TERMINATIONS. BY DAKTRONICS.

**NOTES:**

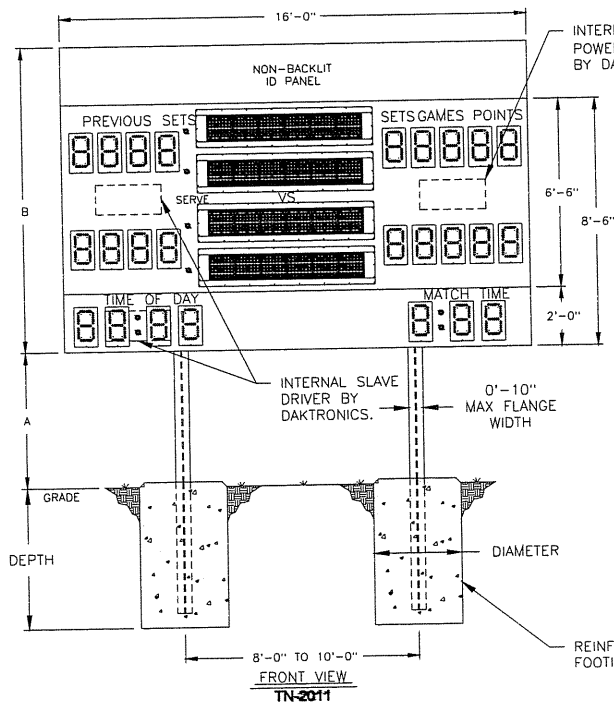
1. DISPLAYS ARE MADE OF ALL ALUMINUM CONSTRUCTION.
2. DISPLAYS ARE FRONT ACCESS FOR ALL ELECTRONICS. POWER AND SIGNAL TO BE ROUTED THROUGH THE REAR OF THE DISPLAY CABINET.
3. REMOVABLE LIFT EYES ARE PROVIDED IN EACH SECTION. FILL LIFT EYE HOLE WITH SILICONE AFTER DISPLAYS HAS BEEN SECURED TO BEAMS.
4. APPROXIMATE WEIGHT OF TENNIS DISPLAYS.  
TN-2011 = 820 lbs.  
TN-2010 = 630 lbs.
5. ASSUME UBC 97 CODE, I=1.0, EXP C, SOIL CLASS 4

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DAKTRONICS, INC. BROOKINGS, SD 57006

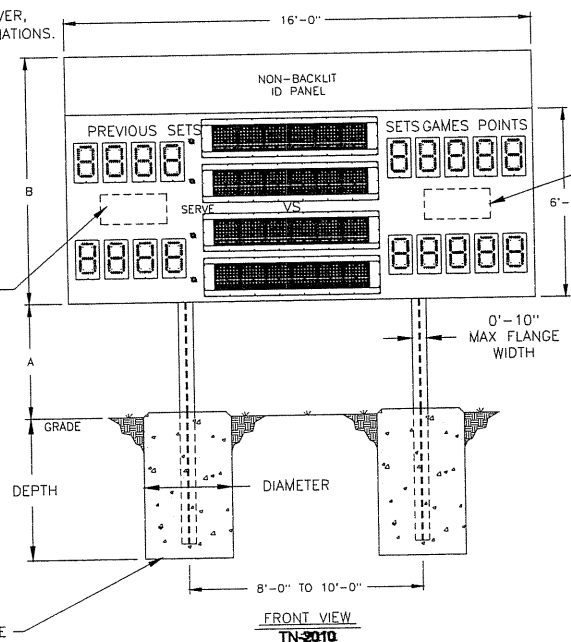
PROJ: TENNIS SCOREBOARDS  
TITLE: SHOP DWG. TN-2011 & TN-2010, LED  
DES. BY: KBRICKER DRAWN BY: KBRICKER DATE: 22MAY03

REVISION 00 APPR. BY: SCALE: 1=50 1164-E10B-189028



INTERNAL MASTER DRIVER, POWER/SIGNAL TERMINATIONS. BY DAKTRONICS.

INTERNAL SLAVE DRIVER BY DAKTRONICS.



REV.	DATE	DESCRIPTION	BY	APPR.



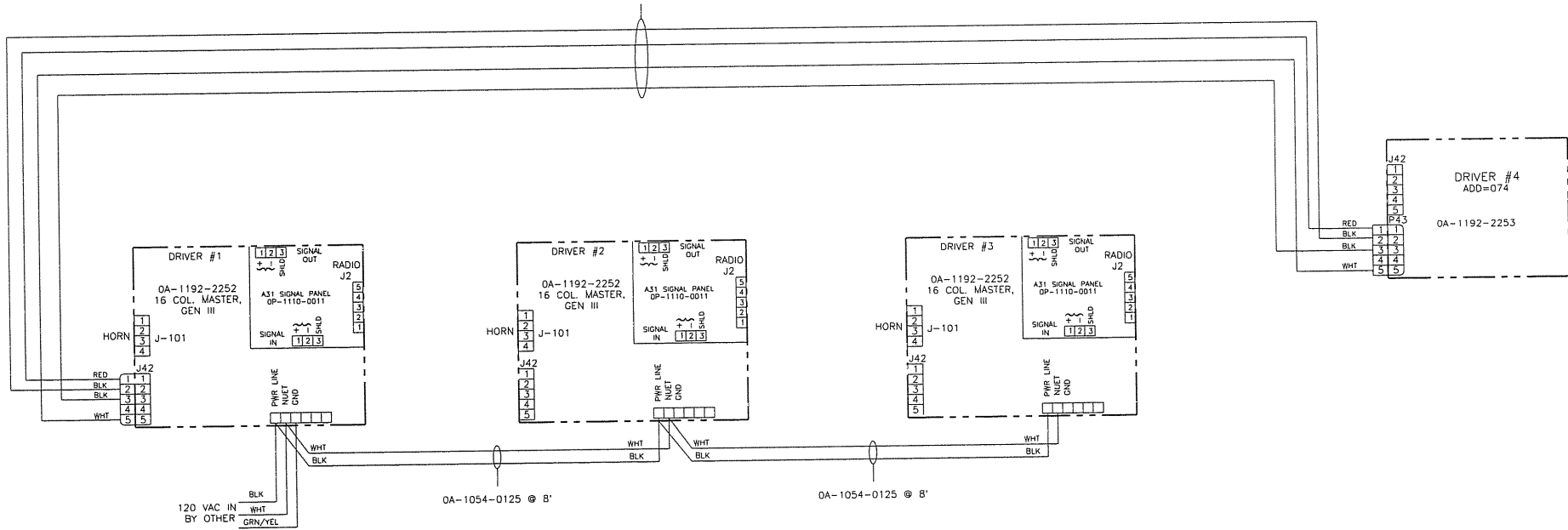
ADDRESS TABLE

PIN 12	PIN 11	PIN 9	PIN 8	PIN 6	PIN 5	PIN 3	PIN 2
0	1	0	0	1	0	1	0

DRIVER ADDRESSES  
A7 - ADDRESS 74

74

OA-1192-1033  
22' PWR/SIG HARNS.



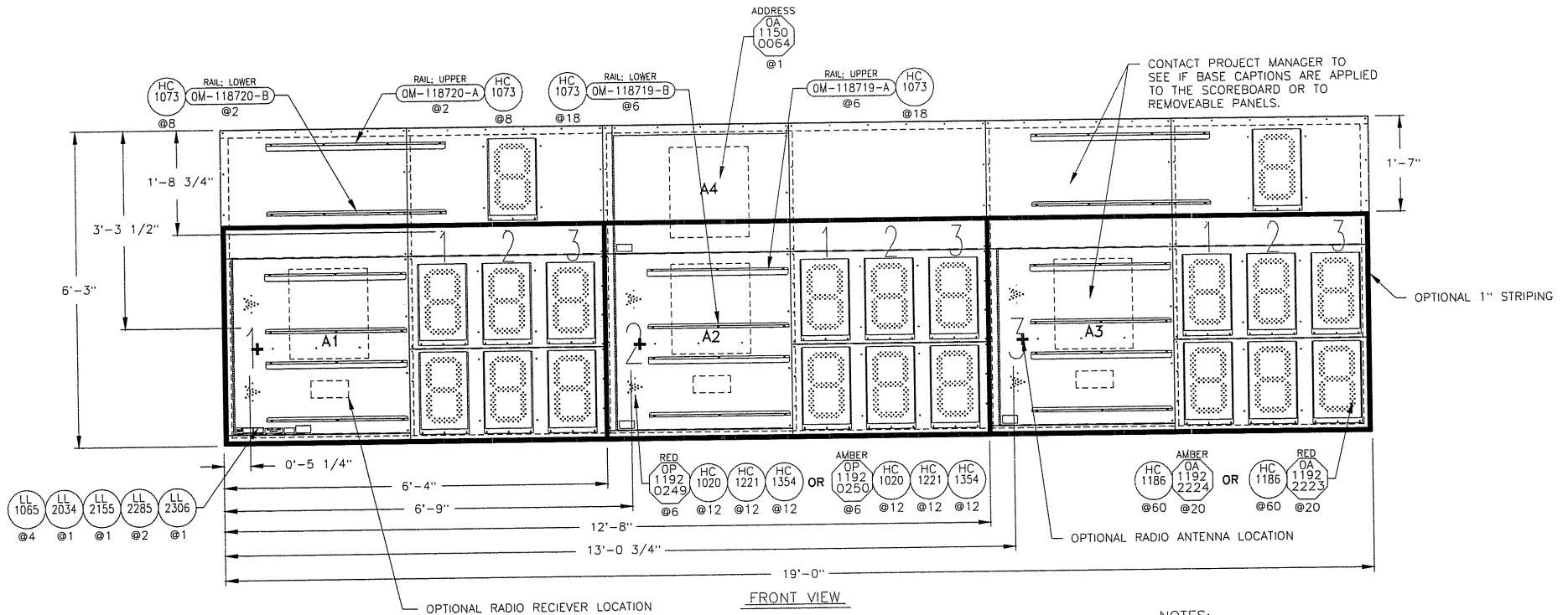
ADDRESS PLUGS FOR DRIVER A1 THROUGH A3 ARE CALLED OUT IN THE CONTROL SYSTEM OPTION THAT WAS PURCHASED.

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.

DAKTRONICS, INC. BROOKINGS, SD 57006  
 PROJ: TENNIS SCOREBOARDS  
 TITLE: SCHEMATIC; TN-2037-11,-21  
 DES. BY: THENDRI DRAWN BY: THENDRI DATE: 29 JUL 03

REVISION 00 APPR. BY: NWM SCALE: NONE 1164-R03B-193461

REV.	DATE	DESCRIPTION	BY	APPR.



FRONT VIEW

NOTES:

1. DIMENSIONS TO STRIPE ARE TO THE CENTER OF THE STRIPE.
2. REFER TO DWG A-182349 FOR RADIO SETTINGS IF RADIO CONTROL WAS ORDERED.
3. REFER TO DWG-187212 FOR DAK TENNIS CONTROL CONFIGURATION IF ORDERED.

BASE CAPTIONS:			
NUMBER:	CAPTION:	HEIGHT:	QUANTITY:
OG-183659-A	1 2 3	6"	@3
OG-178404-A	1 2 3	8"	@1

OTHER CAPTIONS MAY BE APPLIED TO PANELS OR DIRECTLY TO BOARD.

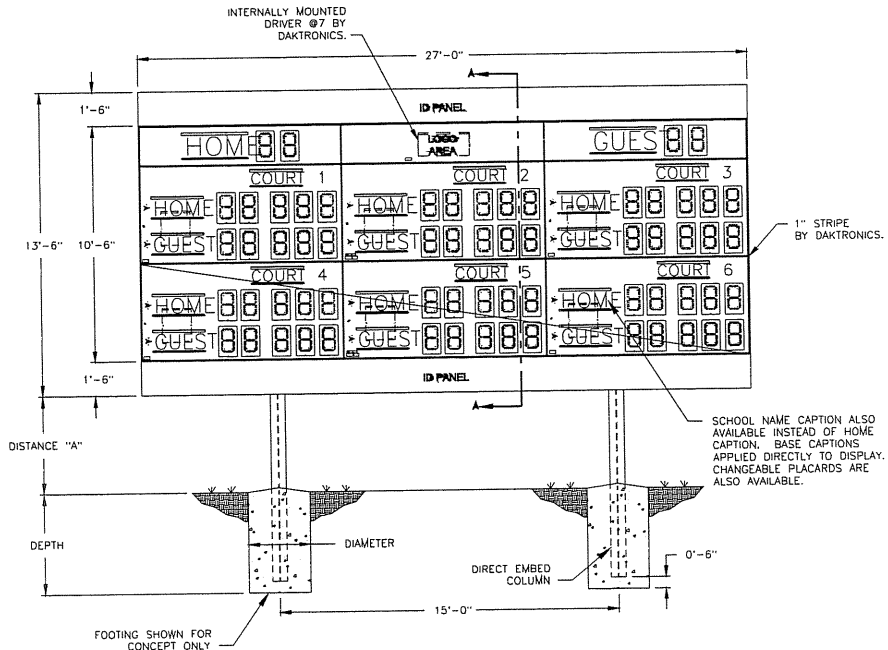
ADDRESS SETTINGS:	
ADDRESS PLUG:	OA-1150-0064
DRIVER A4:	074
NOTES:	
REFER TO DWG A-115078 FOR ADDRESS PLUG CONFIGURATION	
ADDRESS FOR DRIVERS 1-3 WILL BE ADDED WITH CONTROL OPTION KIT.	

TN-2037-11	
SPECIFICATIONS	
MODEL:	TN-2037-11
VOLTS:	120 VAC
AMPS:	10.0
MAX WATTS:	1200

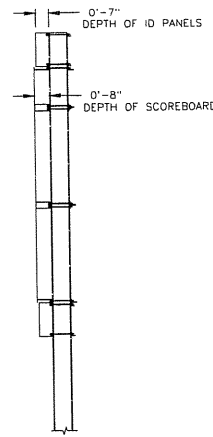
TN-2037-21	
SPECIFICATIONS	
MODEL:	TN-2037-21
VOLTS:	120 VAC
AMPS:	10.0
MAX WATTS:	1200

REV.	DATE	DESCRIPTION	BY	APPR.
01	06OCT03	UPDATED OPTIONAL STRIPE FROM 3/4" TO 1" WIDE.	KJB	

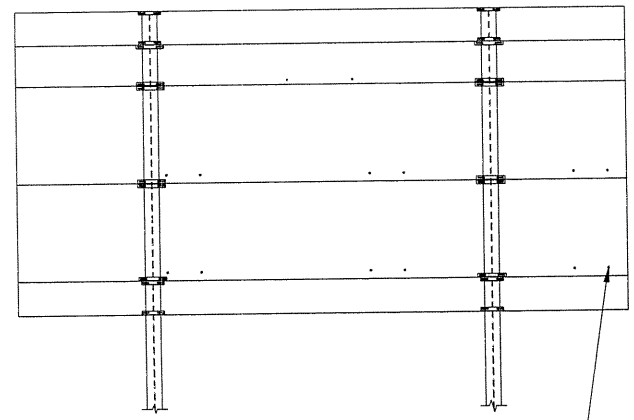
OA-1164-0079...F.ASSY, TN-2037-11	
OA-1164-0080...F.ASSY, TN-2037-21	
THE CONCEPTS EXPRESSED AND DETAILS SHOWN ON THIS DRAWING ARE CONFIDENTIAL AND PROPRIETARY. DO NOT REPRODUCE BY ANY MEANS, INCLUDING ELECTRONICALLY WITHOUT THE EXPRESSED WRITTEN CONSENT OF DAKTRONICS, INC. COPYRIGHT 2003 DAKTRONICS, INC.	
DAKTRONICS, INC. BROOKINGS, SD 57006	
PROJ: TENNIS SCOREBOARDS	
TITLE: F. ASSY, TN-2037-11/-21	
DES. BY: MCOPLAN	DRAWN BY: MCOPLAN
DATE: 01AUG03	
REVISION	APPR. BY:
01	SCALE: 1=20
1164-E10B-193860	



FRONT VIEW



VIEW A-A



REAR VIEW

OUTDOOR LED TENNIS SCOREBOARD* ASCE7					
DISTANCE "A" (SEE FIGURE)	TOTAL DISPLAY SIZE		DESIGN WIND VELOCITY		
			90 MPH	100 MPH	120 MPH
10'-0"	13'-6"	BEAM	W12x53	W14x61	W16x77
	27'-0"	FOOTING	3.0' x 10.9'	3.0' x 11.8'	3.0' x 14.7'
12'-0"	13'-6"	BEAM	W14x61	W16x67	W16x89
	27'-0"	FOOTING	3.0' x 11.3'	3.0' x 12.4'	3.0' x 16.5'
14'-0"	13'-6"	BEAM	W12x65	W18x76	W18x97
	27'-0"	FOOTING	3.0' x 11.7'	3.0' x 13.1'	3.0' x 16.5'

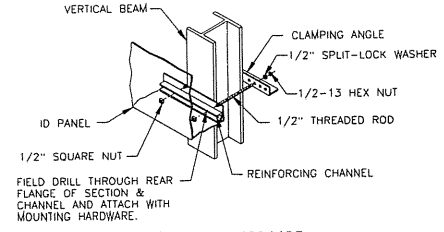
FOOTING = DIAMETER X DEPTH

\* FOOTING DIMENSIONS & COLUMN SIZES ARE SUGGESTIONS ONLY. PROVIDED TO ASSIST WITH ESTIMATING INSTALLATION COSTS AND ARE NOT INTENDED FOR CONSTRUCTION PURPOSES.

FOOTING DIMENSIONS ARE BASED ON ASSUMED VERTICAL SOIL BEARING PRESSURE OF 2000 LB/FT.

ACTUAL FOOTING DEPTH AND DIAMETER & COLUMN SIZES INSTALLATION MUST BE DETERMINED BY A QUALIFIED, STATE LICENSED, STRUCTURAL ENGINEER. OWNER (CUSTOMER) IS RESPONSIBLE FOR INSTALLATION & ADEQUACY OF STRUCTURE AND FOOTINGS.

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



MOUNTING HARDWARE SUPPLIED BY DAKTRONICS

- NOTES:**
- REFER TO DAKTRONICS PROPOSAL DRAWING FOR ADDITIONAL DISPLAY SPECIFICATIONS.
  - DISPLAY SECTIONS ARE ALL ALUMINUM CONSTRUCTION.
  - SCOREBOARD IS FRONT SERVICE ACCESSIBLE FOR DIGITS AND ELECTRONICS.
  - LIFT EYES PROVIDED IN TOP OF EACH SECTION BY DAKTRONICS.
  - ALL SIGNAL CABLE SUPPLIED BY DAKTRONICS. ALL POWER CABLE SUPPLIED BY CUSTOMER'S INSTALLATION CONTRACTOR. ALL CONDUIT AND LABOR TO PULL POWER AND SIGNAL CABLE SUPPLIED BY CUSTOMER'S INSTALLATION CONTRACTOR.
  - INSTALLATION CONTRACTOR IS RESPONSIBLE FOR ANY TEMPORARY BRACING USED IN THE INSTALLATION OF SYSTEM.
  - ALL WORK TO BE DONE IN ACCORDANCE WITH OSHA AND ALL LOCAL CODES THAT APPLY.
  - FOOTING DESIGN, STRUCTURAL DESIGN, FABRICATION AND CERTIFICATION RESPONSIBILITY OF THE CUSTOMER.
  - CAPTION RAILS PROVIDED FOR OPTIONAL CHANGEABLE PLACARDS.
  - OPTIONAL RADIO CONTROLLERS ARE ALSO AVAILABLE.
  - DISPLAY WILL BE SHIPPED IN FIVE (5) SECTIONS.
  - APPROXIMATE DISPLAY WEIGHTS ARE AS FOLLOWS:

TOP ID PANEL	70 LBS
SCBD SECTION	1420 LBS
BTM ID PANEL	70 LBS
	1560 LBS

REV.	DATE	DESCRIPTION	BY	APPR.
02	25 FEB 04	ADDED COLUMN AND FOOTING SIZES	JLB	
01	23 FEB 04	CHANGED 'VISITORS' CAPTIONS TO 'GUEST'	CAC	

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DAKTRONICS, INC. BROOKINGS, SD 57006

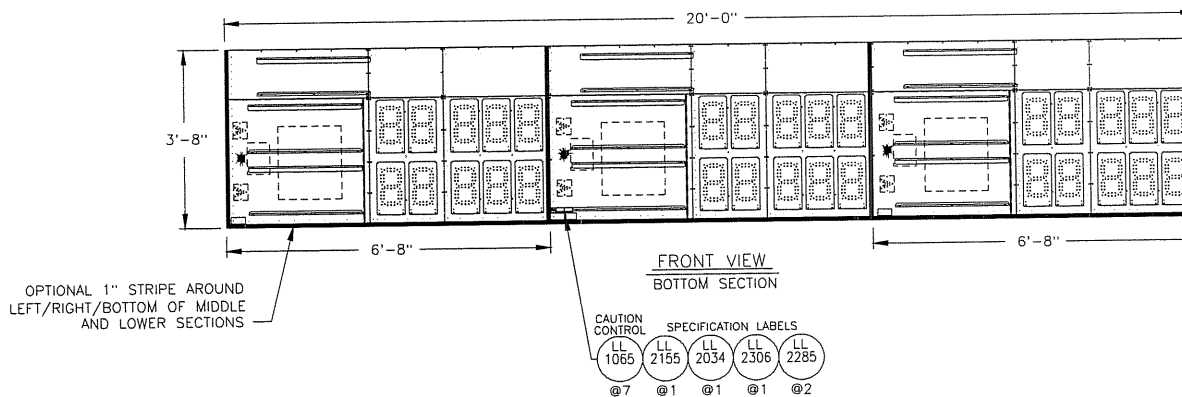
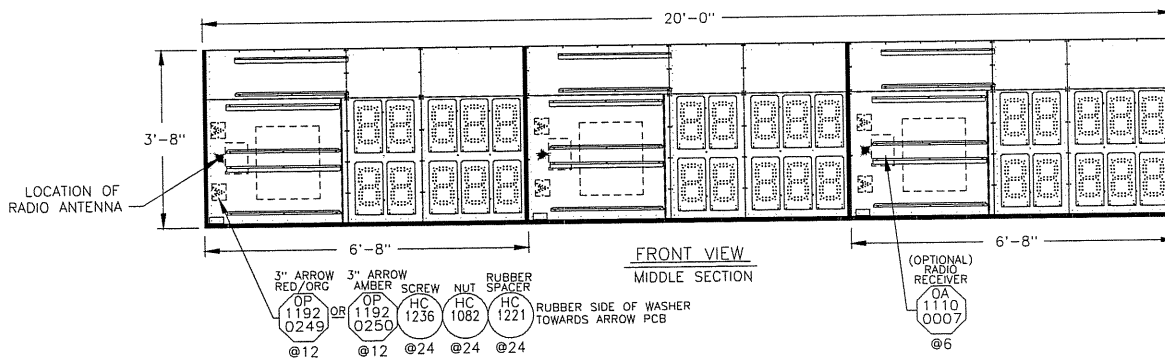
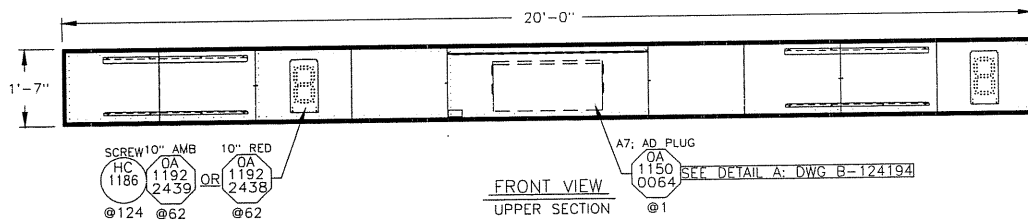
PROJ: OUTDOOR TENNIS DISPLAYS

TITLE: SHOP DWG, TN-2018-(11/21) W/ID PANELS

DES. BY: KBRICKER DRAWN BY: KBRICKER DATE: 1/9/04

REVISION APPR. BY: 1164-E10B-202354

SCALE: 3/16" = 1'



ADDRESS SETTINGS:	
ADDRESS PLUG:	0A-1150-0064
DRIVER A7:	074
NOTES:	
REFER TO DWG A-115078 FOR ADDRESS PLUG CONFIGURATIONS	
ADDRESS FOR DRIVERS 1 - 6 WILL BE ADDED WITH CONTROL OPTION KIT.	

TN-2029-11	
SPECIFICATIONS	
MODEL:	TN-2029-11
VOLTS:	120 VAC
AMPS:	6.5 A
MAX WATTS:	780 WATTS

TN-2029-21	
SPECIFICATIONS	
MODEL:	TN-2029-21
VOLTS:	120 VAC
AMPS:	6.5 A
MAX WATTS:	780 WATTS

**NOTES:**

- REFER TO DWG A-182349 FOR RADIO SETTINGS IF RADIO CONTROL WAS ORDERED.
- REFER TO DWG-187212 FOR DAK TENNIS CONTROL CONFIGURATION IF ORDERED.

0A-1164-0097....F.ASSY, TN-2029-11. G3  
 0A-1164-0098....F.ASSY, TN-2029-21. G3

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DAKTRONICS, INC. BROOKINGS, SD 57006

PROD: TENNIS SCOREBOARDS

TITLE: F. ASSY, TN-2029-11/21

DES. BY: KBRICKER

DRAWN BY: CCAIN

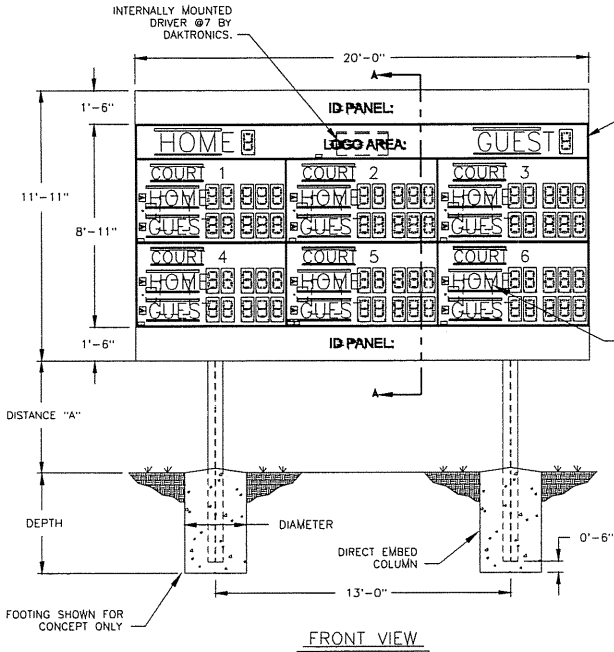
DATE: 13 AUG 04

REVISION  
00

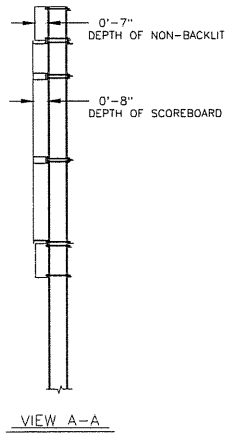
APPR. BY:  
SCALE: 1=30

1164-E10B-221312

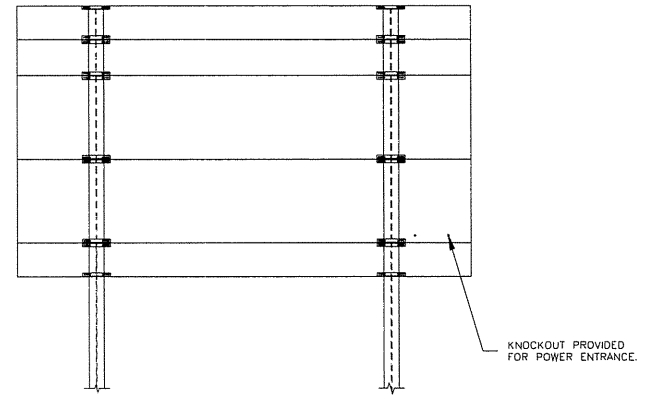
REV.	DATE	DESCRIPTION	BY	APPR.
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FRONT VIEW



VIEW A-A



REAR VIEW

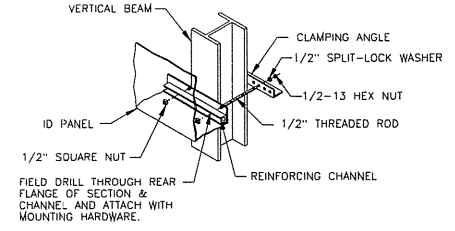
OUTDOOR LED TENNIS SCOREBOARD* ASCE7					
DISTANCE "A" (SEE FIGURE)	TOTAL DISPLAY SIZE		DESIGN WIND VELOCITY		
			90 MPH	100 MPH	120 MPH
10'-0"	11'-11" x 20'-0"	BEAM	W14x43	W14x48	W12x58
		FOOTING	3.0' x 9.3'	3.0' x 10.0'	3.0' x 11.6'
12'-0"	11'-11" x 20'-0"	BEAM	W14x48	W12x53	W14x61
		FOOTING	3.0' x 9.7'	3.0' x 10.5'	3.0' x 12.0'
14'-0"	11'-11" x 20'-0"	BEAM	W12x53	W12x58	W12x72
		FOOTING	3.0' x 10.0'	3.0' x 10.8'	3.0' x 12.7'

FOOTING = DIAMETER X DEPTH

\* FOOTING DIMENSIONS & COLUMN SIZES ARE SUGGESTIONS ONLY, PROVIDED TO ASSIST WITH ESTIMATING INSTALLATION COSTS AND ARE NOT INTENDED FOR CONSTRUCTION PURPOSES. FOOTING DIMENSIONS ARE BASED ON ASSUMED VERTICAL SOIL BEARING PRESSURE OF 2000 LB/FT.

ACTUAL FOOTING DEPTH AND DIAMETER & COLUMN SIZES INSTALLATION MUST BE DETERMINED BY A QUALIFIED, STATE LICENSED, STRUCTURAL ENGINEER. OWNER (CUSTOMER) IS RESPONSIBLE FOR INSTALLATION & ADEQUACY OF STRUCTURE AND FOOTINGS.

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



MOUNTING HARDWARE SUPPLIED BY DAKTRONICS

- NOTES:**
- REFER TO DAKTRONICS PROPOSAL DRAWING FOR ADDITIONAL DISPLAY SPECIFICATIONS.
  - DISPLAY SECTIONS ARE ALL ALUMINUM CONSTRUCTION.
  - SCOREBOARD IS FRONT SERVICE ACCESSIBLE FOR DIGITS AND ELECTRONICS.
  - LIFT EYES PROVIDED IN TOP OF EACH SECTION BY DAKTRONICS.
  - ALL SIGNAL CABLE SUPPLIED BY DAKTRONICS. ALL POWER CABLE SUPPLIED BY CUSTOMER'S INSTALLATION CONTRACTOR. ALL CONDUIT AND LABOR TO PULL POWER AND SIGNAL CABLE SUPPLIED BY CUSTOMER'S INSTALLATION CONTRACTOR.
  - INSTALLATION CONTRACTOR IS RESPONSIBLE FOR ANY TEMPORARY BRACING USED IN THE INSTALLATION OF SYSTEM.
  - ALL WORK TO BE DONE IN ACCORDANCE WITH OSHA AND ALL LOCAL CODES THAT APPLY.
  - FOOTING DESIGN, STRUCTURAL DESIGN, FABRICATION AND CERTIFICATION RESPONSIBILITY OF THE CUSTOMER.
  - CAPTION RAILS PROVIDED FOR OPTIONAL CHANGEABLE PLACARDS.
  - OPTIONAL RADIO CONTROLLERS ARE ALSO AVAILABLE.
  - DISPLAY WILL BE SHIPPED IN FIVE (5) SECTIONS.
  - APPROXIMATE DISPLAY WEIGHTS ARE AS FOLLOWS:

TOP ID PANEL	45 LBS
SCBD SECTION	550 LBS
BOTTOM ID PANEL	45 LBS
	640 LBS

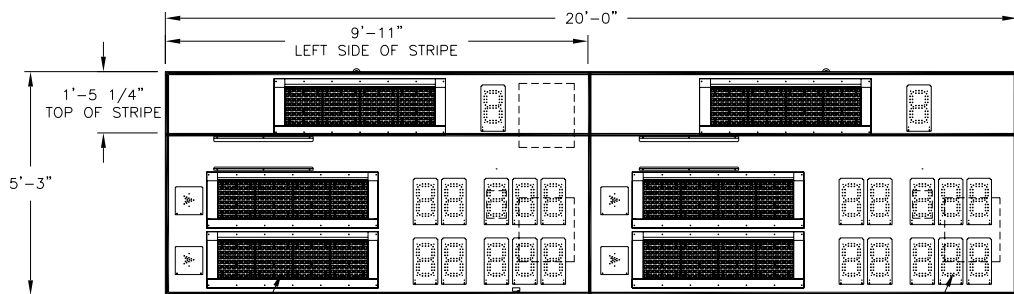
THE CONCEPTS EXPRESSED AND DETAILS SHOWN ON THIS DRAWING ARE CONFIDENTIAL AND PROPRIETARY. DO NOT REPRODUCE BY ANY MEANS, INCLUDING ELECTRONICALLY WITHOUT THE EXPRESSED WRITTEN CONSENT OF DAKTRONICS, INC. COPYRIGHT 2004 DAKTRONICS, INC.

DAKTRONICS, INC. BROOKINGS, SD 57006

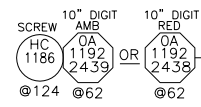
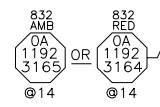
PROJ: OUTDOOR TENNIS DISPLAYS  
 TITLE: SHOP DWG, TN-2029-(11/21) W/ ID PANELS  
 DES. BY: KBRICKER DRAWN BY: CCAIN DATE: 17 AUG 04

REVISION APPR. BY: SCALE: 3/16"=1' 1164-E10B-221501

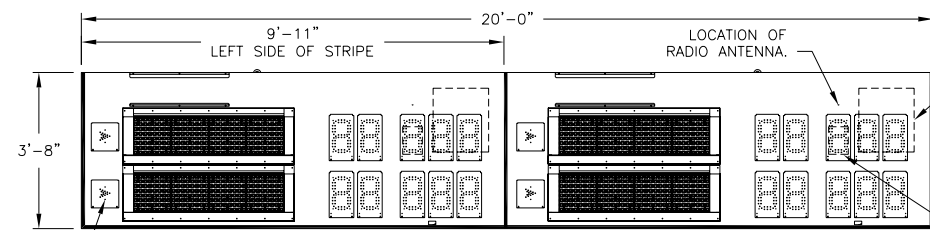
REV.	DATE	DESCRIPTION	BY	APPR.
00				



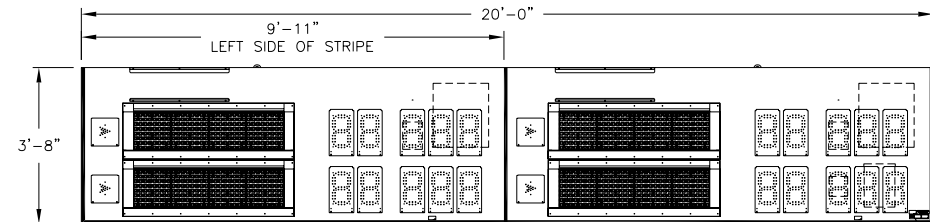
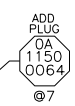
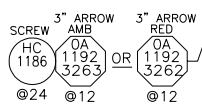
FRONT VIEW  
UPPER SECTION



OPTIONAL 1" STRIPE IS FLUSH WITH EDGE OF CABINET ON ALL SIDES.



FRONT VIEW  
MIDDLE SECTION



FRONT VIEW  
BOTTOM SECTION



OPTIONAL 1" STRIPE AROUND LEFT/RIGHT/BOTTOM OF MIDDLE AND BOTTOM SECTIONS.

ADDRESS SETTINGS:
ADDRESS PLUG: OA-1150-0064
NOTES:
REFER TO DWG: B-258273 FOR ADDRESS PLUG CONFIGURATIONS

SCHEMATIC DWG: TOP SECTION  
1164-R03B-255701

SCHEMATIC DWG: MID SECTION  
1164-R03B-255813

SCHEMATIC DWG: BTM SECTION  
1164-R03A-255797

DIGIT DESIG. DWG: TN-2042  
1164-R03A-255786

TN-2042-11
SPECIFICATIONS
MODEL: TN-2042-11
VOLTS: VOLTS: 120/240 VAC
AMPS: 35 A
MAX WATTS: 4200 WATTS

TN-2042-21
SPECIFICATIONS
MODEL: TN-2042-21
VOLTS: VOLTS: 120/240 VAC
AMPS: 35 A
MAX WATTS: 4200 WATTS

NOTES:  
-REFER TO DWG A-182349 FOR RADIO SETTINGS IF RADIO CONTROL WAS ORDERED.  
-REFER TO DWG-258273 FOR DAK TENNIS CONTROL CONFIGURATION IF ORDERED.

OA-1164-0104...F.ASSY; TN-2042-11  
OA-1164-0105...F.ASSY; TN-2042-21

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DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: OUTDOOR TENNIS SCOREBOARDS  
TITLE: F.ASSY; TN-2042-11/21

DES. BY: KBRICKER DRAWN BY: KBRICKER DATE: 02DEC05

REVISION 00 APPR. BY: SCALE: 1=35 1164-E10B-258520

REV.	DATE	DESCRIPTION	BY	APPR.

# Appendix B: Eyebolts

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Eyebolts ..... ED7244

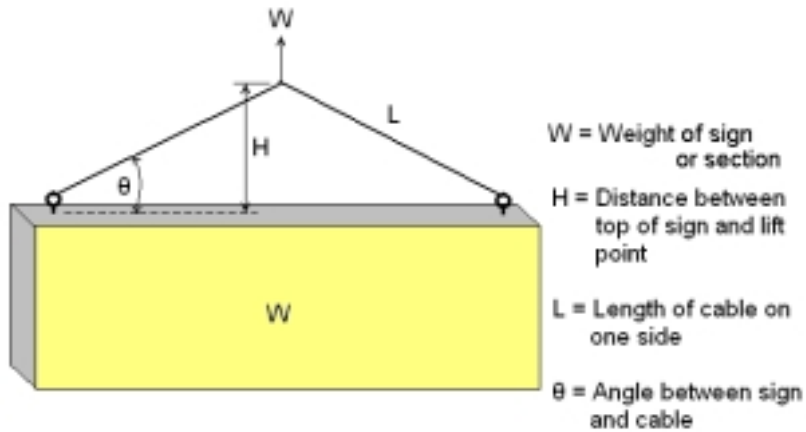




# Eyebolts

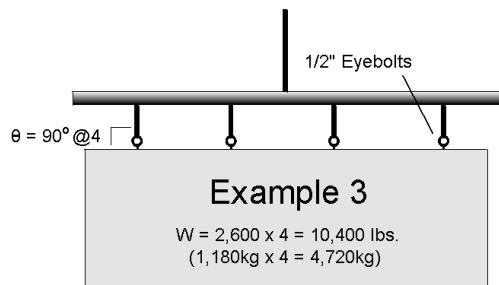
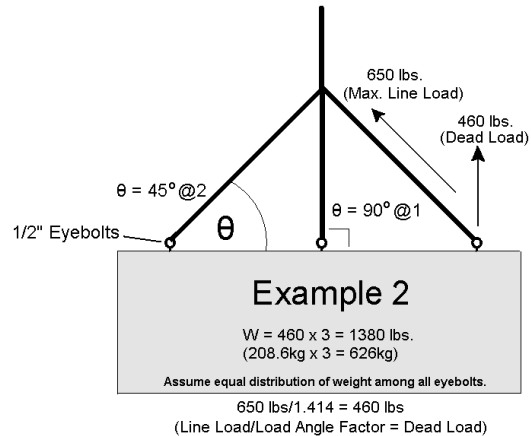
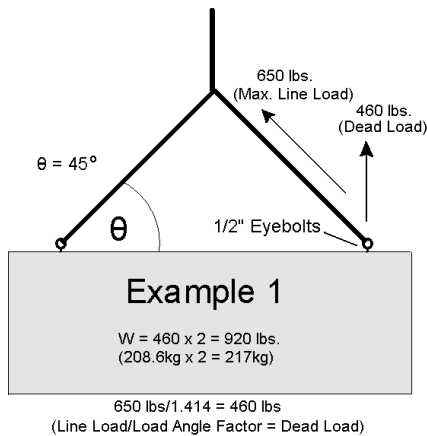
Almost every display that leaves Daktronics is equipped with eyebolts for lifting the display. There are two standard sizes of eyebolts: 1/2" and 5/8".

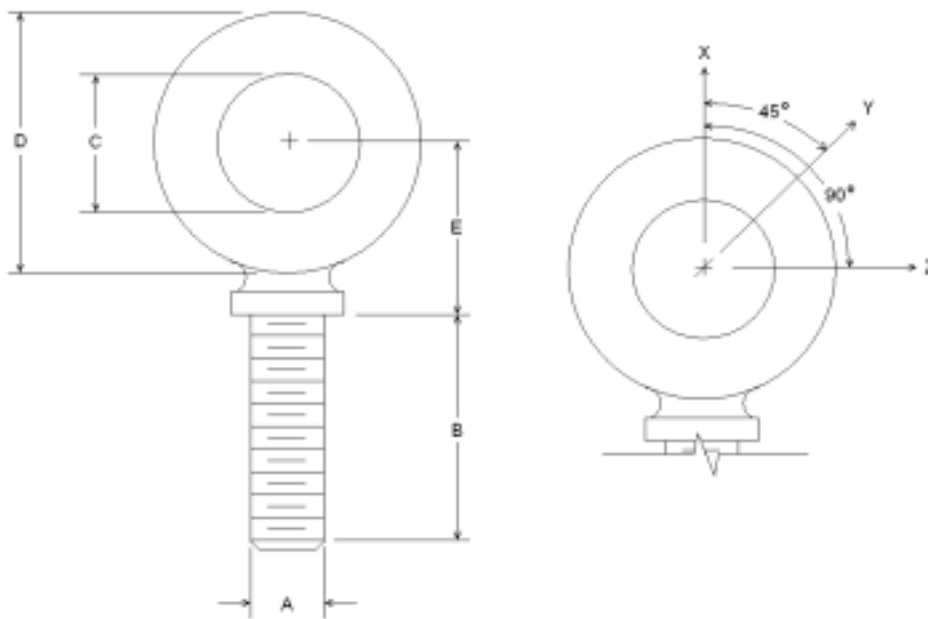
**Load Increase Factor:** The load increases as the lift angle ( $\theta$ ) decreases. The allowable load on the eyebolts also decreases with the lift angle due the bending stress on the eyebolts. In sum, the smaller the angle between the cable and the top of the display, the lighter the sign must be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



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

$\theta$	1/2"		5/8"	
	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
<b>1/2</b>	<b>1-1/2</b>	<b>1-3/16</b>	<b>2-1/16</b>	<b>1-13/32</b>	<b>25</b>	<b>3,900</b>	<b>9,200</b>	<b>Blank 1/2-13</b>	<b>1-11/32</b>	<b>2,600</b>	<b>650</b>	<b>520</b>
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
<b>5/8</b>	<b>1-3/4</b>	<b>1-3/8</b>	<b>2-1/2</b>	<b>1-11/16</b>	<b>27</b>	<b>6,000</b>	<b>14,700</b>	<b>Blank 5/8-11</b>	<b>1-9/16</b>	<b>4,000</b>	<b>1,000</b>	<b>800</b>
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**

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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 1-877-605-1116.