

# FB-2350 Series Multi-Section LED Football Scoreboards

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## Display Manual

ED-14129

Rev 4 – 4 August 2010

# DAKTRONICS

Models			
	FB-2351		FB-2355
	FB-2352		FB-2356
	FB-2353		FB-2357
	FB-2354		FB-2358



*Please fill in the information below to use 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 FB-2350 line of multi-section LED football scoreboards and provides details for maintenance and troubleshooting. For additional information regarding the safety, installation, operation, or service of this system, refer to the telephone numbers listed in **Section 5.14**. This manual is not specific to a particular installation.

**Important Safeguards:**

- Please read and understand all instructions before beginning the installation process.
- Do not drop control equipment or allow it to get wet.
- Do not disassemble control equipment or electronic controls of the display; failure to follow this safeguard will make the warranty null and void.
- Disconnect display power when not in use or when servicing.
- Disconnect display power before servicing power supplies to avoid electrical shock. Power supplies run on high voltage and may cause physical injury if touched while powered.
- Do not modify the scoreboard structure or attach any panels or coverings to the scoreboard without the express written consent of Daktronics, Inc.

Project-specific information takes precedence over any other general information found in this manual.

## 1.1 Resources

**Figure 1** illustrates a Daktronics drawing label. The drawing number is located in the lower-right corner of a drawing. This manual refers to drawings by listing the last set of digits and the letter preceding them. In the example, the drawing would be referred to as **Drawing C-325405**.

THE CONCEPTS EXPRESSED AND DETAILS SHOWN IN THIS DRAWING ARE CONFIDENTIAL AND PROPRIETARY. DO NOT REPRODUCE BY ANY MEANS, INCLUDING ELECTRONICALLY, WITHOUT THE EXPRESSED WRITTEN CONSENT OF DAKTRONICS, INC. COPYRIGHT 2008 DAKTRONICS, INC.			
<b>DAKTRONICS, INC. BROOKINGS, SD 57006</b>			
PROJ: <b>DAKTRONICS UNIVERSITY</b>			
TITLE: <b>SYSTEM RISER DIAGRAM</b>			
DES. BY: <b>AORMESH</b>		DRAWN BY: <b>AORMESH</b>	
		DATE: <b>15 JAN 08</b>	
REVISION	APPR BY-	<b>14963-R01C-325405</b>	
<b>00</b>	SCALE: <b>NONE</b>		

*Figure 1: Daktronics Drawing Label*

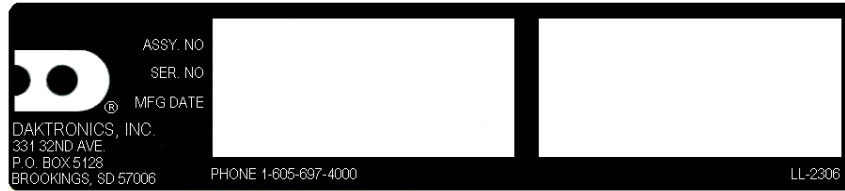
**Reference Drawing:**

System Riser Diagram ..... **Drawing C-325405**

Daktronics identifies manuals by the DD or ED number located on the cover page of each manual. For example, this manual would be referred to as **ED-14129**.

## 1.2 Daktronics Nomenclature

Serial and model numbers can be found on the ID label on the display as shown in **Figure 2**.



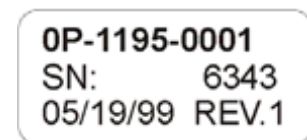
**Figure 2:** Scoreboard ID Label

Please list the model number, display serial number, and the date this display became operational in the blanks provided on the second page of this manual. When calling Daktronics customer service, please have this information available to ensure the request is serviced as quickly as possible.

Most components within this display carry a white label that lists the part number of the unit. If a component is not found in the Replacement Parts List in **Section 5.13**, use the label to order a replacement. **Figure 3** illustrates a typical label. The part number is in bold.

<b>Main Component Labels</b>	
<b>Part Type</b>	<b>Part Number</b>
Individual circuit board	<b>0P-XXXX-XXXX</b>
Assembly; a collection of circuit boards	<b>0A-XXXX-XXXX</b>
Wire or cable	<b>W-XXXX</b>
Fuse	<b>F-XXXX</b>
Transformer	<b>T-XXXX</b>
Metal part	<b>M-XXX</b>
Fabricated metal assembly	<b>0S-XXXXXX</b>
Specially ordered part	<b>PR-XXXXX-X</b>

<b>Accessory Labels</b>	
<b>Component</b>	<b>Label</b>
Termination block for power or signal cable	<b><u>TBXX</u></b>
Grounding point	<b><u>EXX</u></b>
Power or signal jack	<b><u>JXX</u></b>
Power or signal plug for the opposite jack	<b><u>PXX</u></b>



**Figure 3:** Typical Label

Following the Replacement Parts List is the Daktronics Exchange Policy and the Repair & Return Program. Refer to these instructions if replacing or repairing any display component.



### 1.3 Model Number

Daktronics scoreboards are differentiated by their model numbers and two-letter prefixes for each sport. Most Daktronics scoreboards also carry a two-number suffix that refers to the type of power supply and digit color. Refer to the following tables:

<b>FB</b>	Football	<b>-11</b>	120 V, with red digits
		<b>-21</b>	120 V, with amber digits
		<b>-12</b>	240 V, with red digits
		<b>-22</b>	240 V, with amber digits

The FB-2350 product line is composed of 8 separate scoreboard models with various options.

**FB-2350** (or **FB-235X**) – This is often used when options are unknown and is not specific to any particular model.

*Front Access Models:*

- FB-2351** – Includes TNMCs and vinyl captions
- FB-2352** – Includes TNMCs and backlit captions
- FB-2355** – Includes all vinyl captions
- FB-2356** – Includes all backlit captions

*Rear Access Models:*

- FB-2353** – Includes TNMCs and vinyl captions
- FB-2354** – Includes TNMCs and backlit captions
- FB-2357** – Includes all vinyl captions
- FB-2358** – Includes all backlit captions

### 1.4 Scoreboard Controllers

Daktronics outdoor scoreboards are designed for use with the All Sport® 5000 series control consoles. This console uses keyboard overlays (sport inserts) to control numerous sports and scoreboard models. Refer to the following manual for operating instructions:

- **All Sport 5000 Series Control Console Operation Manual (ED-11976)**

This control console manual is available online at [www.daktronics.com/manuals](http://www.daktronics.com/manuals).

### 1.5 Product Safety Approval

Daktronics outdoor scoreboards are ETL listed and tested to CSA standard for outdoor use. Contact Daktronics with any questions regarding testing procedures.



## Section 2: Specifications

The chart on the following pages details all of the mechanical specifications, circuit specifications and power requirements for each display in this manual. Models are listed in alphanumeric order.

**Notes:**

- 1) All displays require a 120 V AC, 15 A circuit. Displays with a 240 V A C power requirement are also available.
- 2) Signal wire must be minimum of 22 AWG with shield. Daktronics recommends W-1234.
- 3) TNMC LEDs are the same color as the LED digits on the scoreboard. Backlit captions use 15 watt 120 V AC florescent bulbs.

Model & Options	Number of Sections	Dimensions: Height, Width, Depth	Weight:	Watts	Amps 120 / 240 V AC	Driver # & Address
<b>FB-2355</b> <b>FB-2357</b> (vinyl captions)	2 Total	H 10'-0", W 36'-0", D 8" (3048 mm, 10973 mm, 203 mm)	2200 lb (998 kg)	600 W	5 A / 2.5 A	A1 12
	Top	H 6'-6", W 36'-0", D 8" (1981 mm, 10973 mm, 203 mm)				A2 15
	Bottom	H 3'-6", W 36'-0", D 8" (1067 mm, 10973 mm, 203 mm)				
<b>FB-2351</b> <b>FB-2353</b> (TNMCs)	(same)	(same)	2400 lb (1089 kg)	1200 W	10 A / 5 A	A1 12 A2 15 TNMC 221
<b>FB-2356</b> <b>FB-2358</b> (Backlit Captions)	(same)	(same)	2280 lb (1034 kg)	1170 W	9.75 A (120 V AC only)	A1 12 A2 15
<b>FB-2352</b> <b>FB-2354</b> (TNMC & Backlit Captions)	(same)	(same)	2440 lb (1107 kg)	2370 W	120/240V AC 10 A - high leg	A1 12 A2 15 TNMC 221



## Section 3: Mechanical Installation

Mechanical installation consists of installing concrete footing and steel beams and mounting the scoreboard and accompanying ad panels to the beams.

### 3.1 Footings & Beams

**Drawing A-191329** in **Appendix A** shows the recommended number of beams and spacing between them. The drawing also indicates the size of beams required to support the scoreboard at different heights and at various wind speeds.

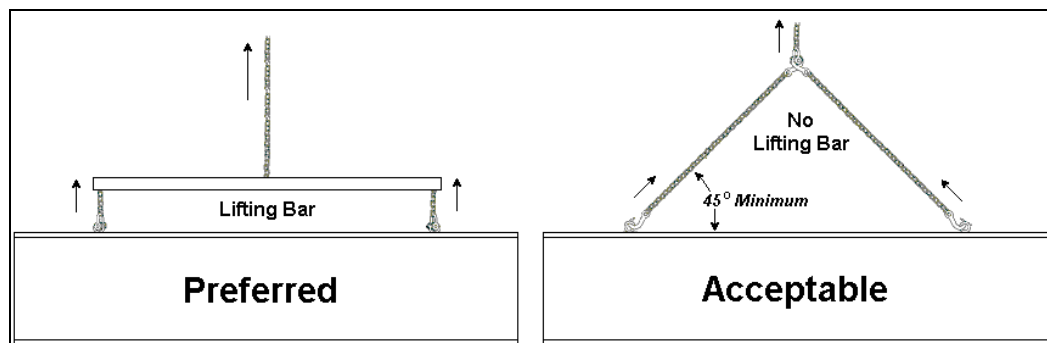
The column and footing size dimensions are to assist with estimating installation costs. They are estimates only and are not intended for actual construction purposes. Be sure that the installation complies with local building codes and is suitable for the particular soil and wind conditions. The columns, footings, and all connection details must be designed and certified by a professional engineer licensed to practice in the state of the scoreboard installation.

**Note:** Daktronics does not assume any liability for any installation derived from the information provided in this manual or installations designed and installed by others.

### 3.2 Lifting the Scoreboard

Larger scoreboard sections and message centers are shipped equipped with eyebolts used to lift them. The eyebolts are located along the top of the cabinet for each scoreboard or scoreboard section. Daktronics scoreboards use  $\frac{1}{2}$ " and  $\frac{5}{8}$ " shoulder-type eyebolts mounted to a  $\frac{1}{8}$ " aluminum plate or steel nut plate.

**Daktronics strongly recommends using a spreader bar, or lifting bar, to lift the display.** Spreader bars ensure the force on the eyebolts remains straight up, minimizing lifting stress.



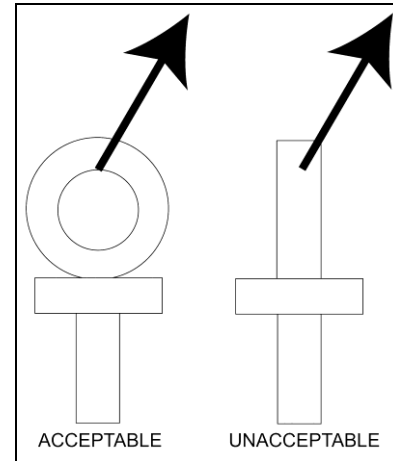
**Figure 4:** Lifting Methods

**Figure 4** illustrates the preferred scoreboard lifting method on the left and an acceptable alternative lifting method on the right. When lifting the display:

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

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. The smaller the angle between the cable and the top of the display, the lighter the sign must be to safely lift it. If this method must be used, ensure a minimum angle between the chain and scoreboard of at least 45 degrees.

Do NOT attempt to lift the display if the angle is less than 45 degrees. Exceeding load angles or weight limits could cause the bolts in the scoreboard cabinet to buckle, resulting in serious damage to the scoreboard or injury to personnel. Also, loads should be applied directly in the plane of the eyebolt as shown in **Figure 5**.



**Figure 5:** Eyebolt Plane Load

**Note:** Daktronics assumes no liability for damages resulting from incorrect setup or lifting methods. Eyebolts are intended for lifting only. Do not attempt to permanently support the display by the eyebolts.

If installers remove the eyebolts, plug the holes with bolts and the rubber washers that are used with the eyebolts. Apply silicone or another waterproof sealant to the eyebolt openings. Also 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.

### 3.3 Scoreboard Mounting

In typical multi-section installations, the lower scoreboard is installed first and secured to the support beams. The upper section is then placed atop or above the lower section and attached to the beams. There are 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. Refer to **Section 4.5** for more information on the power/signal connections between sections.

Scoreboard models in the FB-2350 product line are typically mounted in one of two ways:

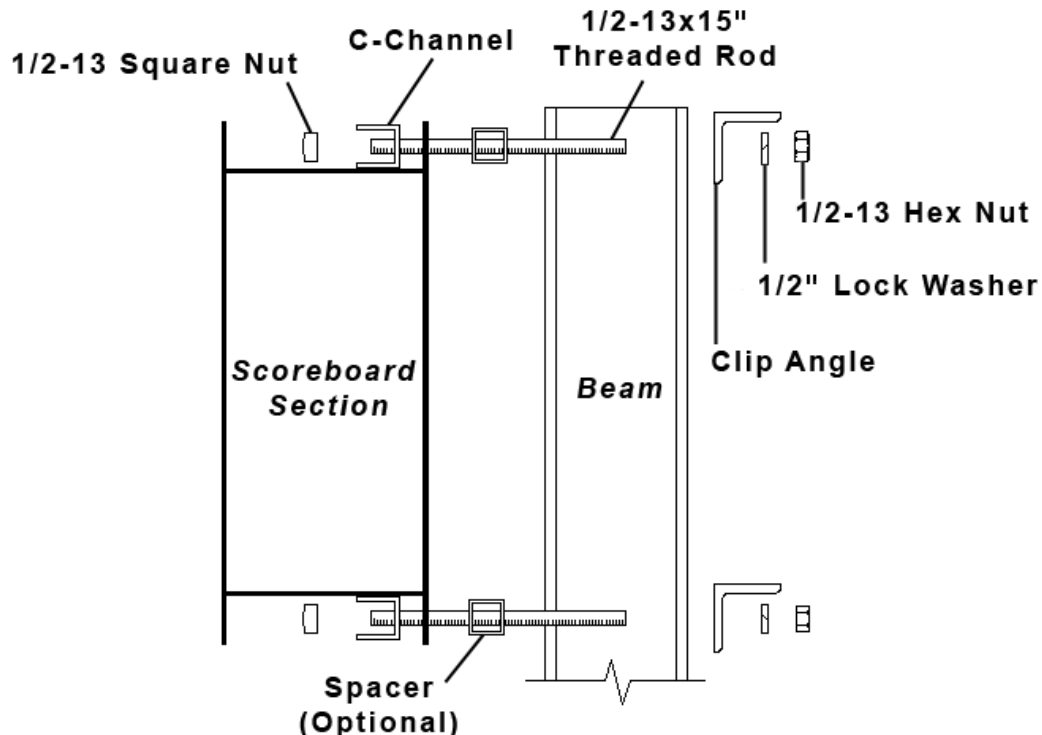
- 1) clamped to vertical beams using mounting angles and long, threaded rods or
- 2) permanently welded to tubular horizontal supports.

## Clamping to Verticals

An inverted channel mounting installation uses C-channels; clip angles; 1/2-13" threaded rods; and 1/2" square nuts, hex nuts, lock washers, and optional spacers. Refer to **Figure 6** and **Drawing A-55101** in **Appendix A**.

Mount the scoreboard as follows:

1. Place the C-channel against the upper and lower rear flanges of the scoreboard.
2. Use the width of the beam to determine the appropriate hole combination to use for the bolts. The bolts should be kept as close to the beam as possible.
3. With the C-channel as a template, use a 9/16" bit to drill holes in the upper and lower rear flanges of the scoreboard cabinet where the bolts will pass through.
4. Place the 1/2" square nuts inside the C-channel and thread the 1/2-13" rods through the C-channel, rear flange of the scoreboard cabinet, and spacer (if used).
5. Lift the scoreboard into position with the bolts still in place. Position the scoreboard at the front of the beams with the threaded rods extending from the rear flanges.
6. With the threaded rod straddling the beams, place mounting angles over each pair of bolts and secure with 1/2" lock washers and hex nuts.
7. Make final adjustments in the positioning of the scoreboard.
8. Make sure that the threaded rods are perpendicular to the scoreboard, and tighten all of the 1/2" hex nuts.



**Figure 6:** C-channel Mounting Method, Side View

## Welding to Horizontals

Figure 7 and Drawing A-83301 in Appendix A illustrate the mounting of the display to horizontal tubing. Steel clip angles are first bolted to the back of each scoreboard section. These clip angles are then welded on three sides to a horizontal tube, which itself has been welded to the support beams.

1. Visually check the display structure before beginning the installation process.
  - Ensure that the structure will provide a straight and square mounting frame for the scoreboard/display.
  - Check to ensure the mounting frame will not give way at unsupported points after the scoreboard/display is mounted. If any problems are noted, take corrective action immediately.
2. Bolt the clip angles to the rear of the scoreboard sections with  $\frac{1}{2}$ " hardware. Refer to project-specific shop drawings for exact locations of the clip angles.
3. Lift the display section into position. Refer to Section 3.2.
4. Adjust the clip angles as needed so that they are firmly against the horizontal tube. During the installation of the first section, carefully monitor the horizontal and vertical straightness of the display. If the mounting structure does not provide a straight or square mounting surface, it will be necessary to place shims between the display section and the mounting surface to ensure straightness.
5. Weld the three edges of each clip angle that are in contact with the horizontal tube.

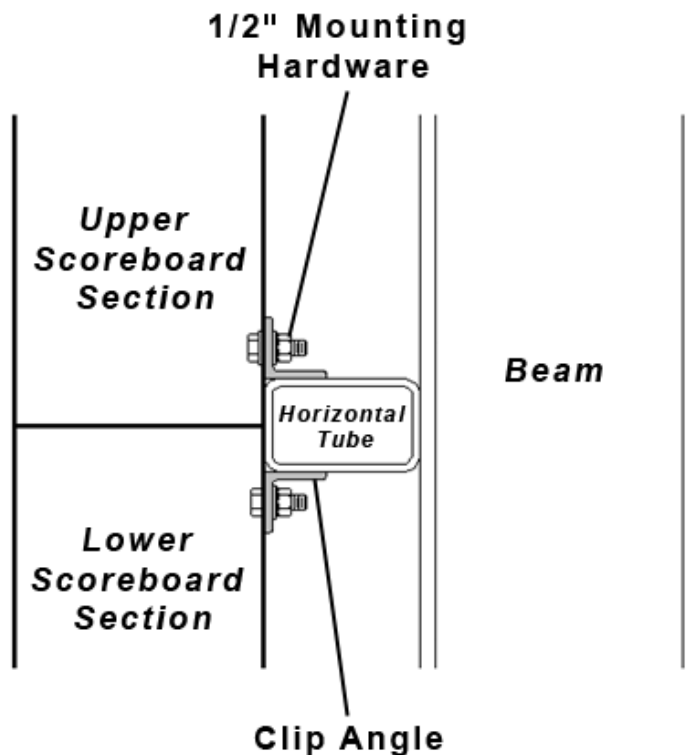
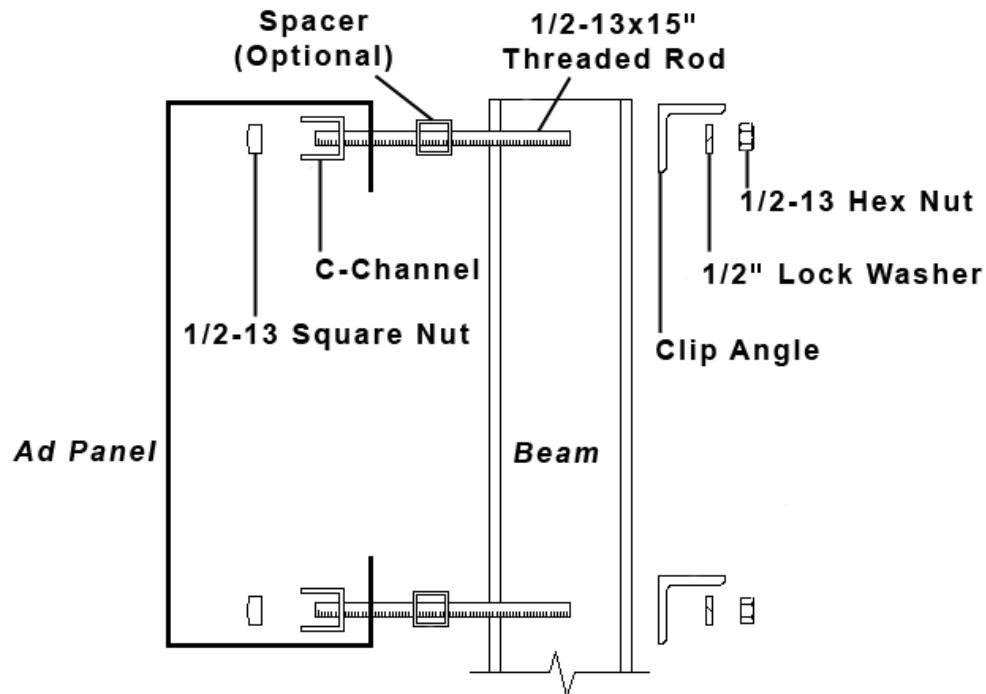


Figure 7: Scoreboard Mounting Detail, Side View



### 3.4 Ad Panel Mounting

The installation uses C-channels; clip angles; 1/2-13" threaded rods; and 1/2" square nuts, hex nuts, lock washers, and optional spacers similar to the clamping mounting method above. Refer to **Figure 8** and **Drawing A-52187** in **Appendix A**.



**Figure 8:** Ad Panel Mounting with C-channel, Side View

Mount the ad panel(s) as follows:

1. Use the width of the beam to determine which hole combination to use for the bolts. Be sure to keep the bolts as close to the beam as possible.
2. Using the clip angle as a template, use a  $\frac{9}{16}$ " bit to drill holes in the upper and lower rear flange of the ad panel where the C-channel supports will be placed.
3. Position the C-channel *inside* the ad panel cabinet along the upper and lower rear flanges as shown in **Figure 8**.
4. Place 1/2" square nuts inside the channel and thread the 1/2-13" rods through the C-channel, rear flange of the ad panel, and spacer (if used).
5. Lift the ad panel into position with the rods still in place.
6. With the threaded rod straddling the beams, place mounting angles over the ends of each pair of bolts and secure with 1/2" lock washers and hex nuts.
7. Make final adjustments in the positioning of the ad panel.
8. Make sure that the threaded rods are perpendicular to the ad panel, and tighten all of the 1/2" hex nuts.

Some ad panels have back sheets that must be removed before the display can be installed. After marking and drilling holes in the upper and lower rear flanges of the ad panel, remove the back sheets above and below the hole locations. Position the C-channel inside the cabinet and attach the square nuts to the threaded rods as described above. Be sure to replace the back sheets after placing the square nuts inside the channel and threading the rods through the holes in both the upper and lower rear flanges.

### 3.5 Scoreboard Protective Devices

Daktronics makes optional protective devices, including screens and netting, to help prevent damage to the scoreboard due to normal ball impacts.

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

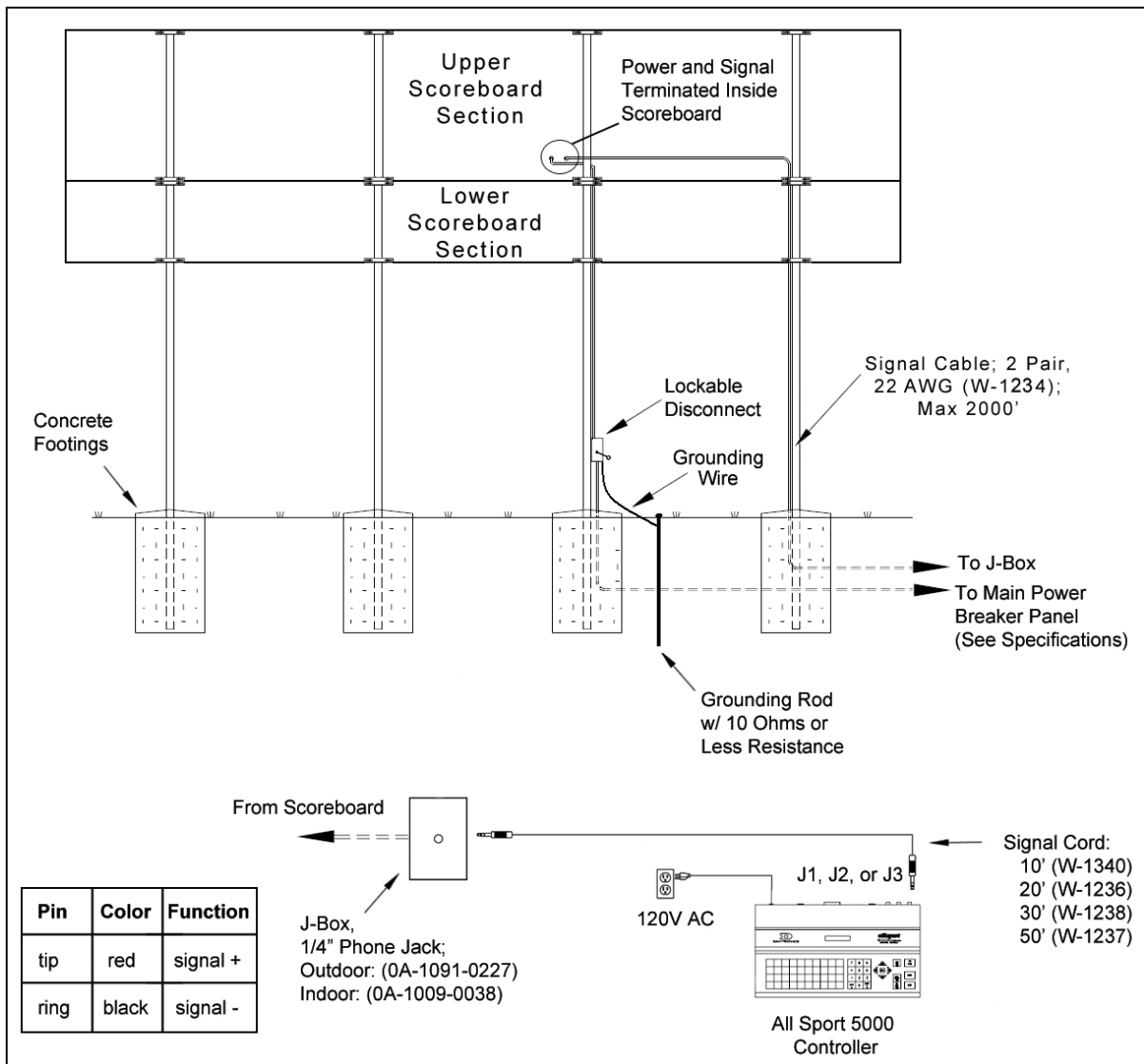
## Section 4: Electrical Installation

**CAUTION:** Only qualified individuals should terminate power and signal cable and access the electrical components of the display and its associated equipment. It is the responsibility of the electrical contractor to ensure that all electrical work meets or exceeds local and national codes.

Daktronics engineering staff must approve all changes or the warranty will be void.

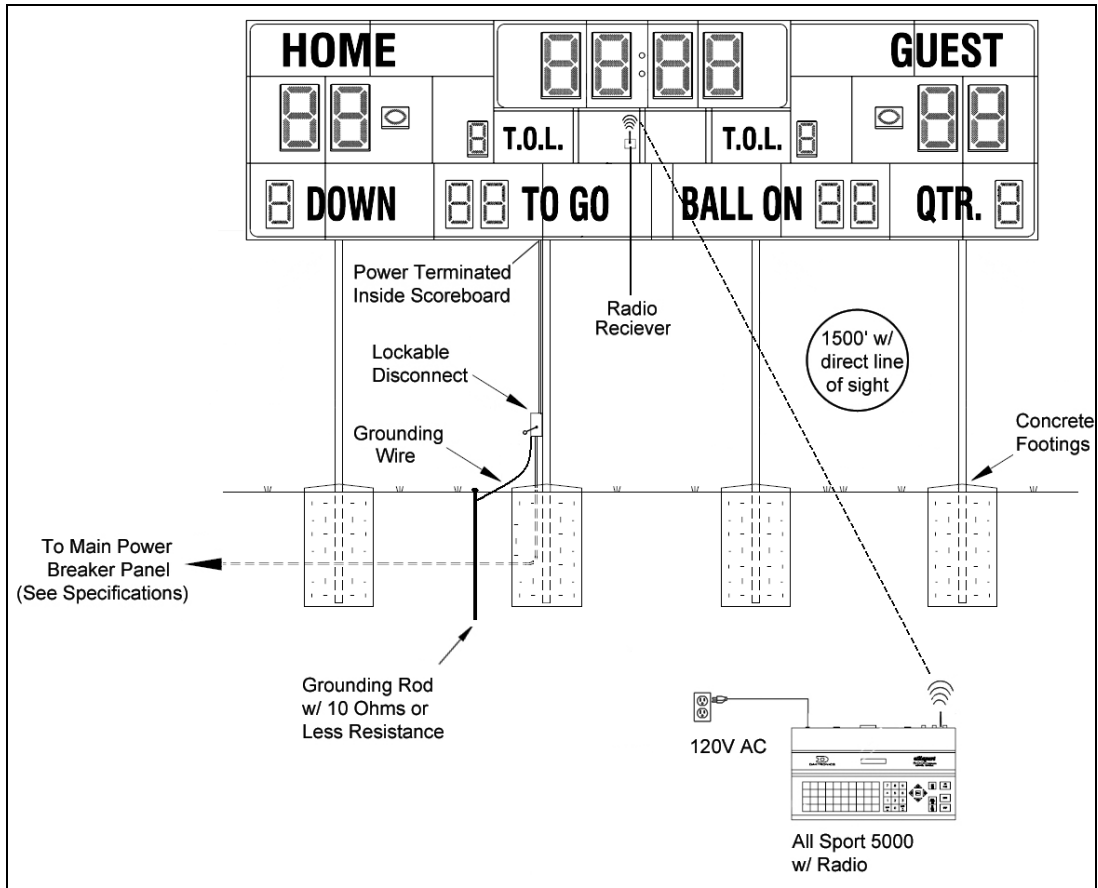
### 4.1 Installation Overview

The diagram shown in **Figure 9** illustrates a typical wired setup between a multi-section outdoor scoreboard and controller. Daktronics part numbers are shown in parentheses.



**Figure 9:** Wired Installation

The diagram shown in **Figure 10** illustrates a typical wireless setup between a multi-section outdoor scoreboard and controller. Daktronics part numbers are shown in parentheses.



**Figure 10:** Wireless Installation

## 4.2 Power

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

Multi-section outdoor scoreboards require a dedicated 120 V, 240 V, or 120/240 V split phase circuit for incoming power (refer to the Specifications in **Section 2**).

**WARNING:** It is critical that 120 V scoreboard circuits be fused at 15 A and that all conductors used must be designed to pass a 15 A current in normal operation. For 240 V scoreboards, consult local electrical codes. Failure to meet wiring and overcurrent protection device requirements will void the scoreboard warranty.

## Grounding

The display must be properly grounded according to local and national codes or the warranty will be void. Proper grounding is necessary for reliable equipment operation and protects the equipment from damaging destructive disturbances and lightning.

Daktronics recommends a resistance-to-ground of 10 ohms or less. The electrical contractor performing the electrical installation can verify ground resistance. Daktronics Sales and Service personnel can also provide this service.

The display system must be earth-ground. The material for an earth-ground electrode differs from region to region and may vary according to conditions present at the site. Consult local and national electrical codes.

Daktronics does not recommend using the support structure as an earth-ground electrode; concrete, primer, corrosion, and other factors make the support structure a poor ground.

**Note:** The support structure may be used as an earth-ground electrode only if designed to do so. A qualified inspector must approve the support structure and grounding methods.

There are two types of 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. In this circumstance, do not connect neutral to ground at the disconnect or at the display as this would violate electrical codes and void the warranty.

Use a disconnect so that all ungrounded lines 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.

## Connection

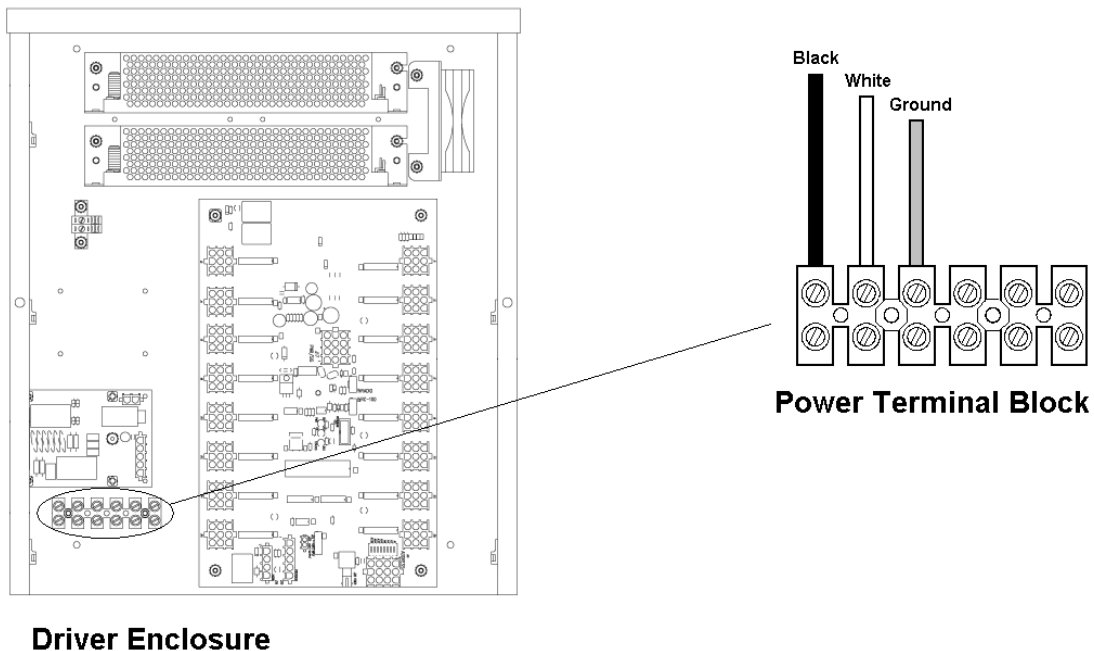
Both power and signal cabling is routed via conduit into the scoreboard from the rear. Installers will be responsible for drilling holes into the back sheet of the scoreboard to allow entrance of power/signal wires. Note that systems with radio control do not require external signal wiring.

In the FB-2350 series, the power/signal termination is located between the T.O.L. digits in the upper scoreboard section. All power and signal wiring terminates at the master driver enclosure (with the exception of models FB-2352 and FB-2354, discussed below).

1. Look for a warning label similar to **Figure 11** to locate the appropriate front or rear access panel to the driver enclosure.
2. Loosen the screws or latches to open the access panel. Front panels are hinged and swing open. Rear access panels can be lifted up and out over the screws through keyholes.
3. Loosen the screws securing the metal cover of the driver enclosure, and lift the cover up and out over the screws through keyholes to expose the driver components.
4. Connect the appropriate wires coming through the rear of the scoreboard to the power terminal block, as shown in **Figure 12**.
5. Reattach the metal driver enclosure cover and secure the access panel.



**Figure 11: Power Warning Label**



**Figure 12: Driver Enclosure & Power Terminal Block**

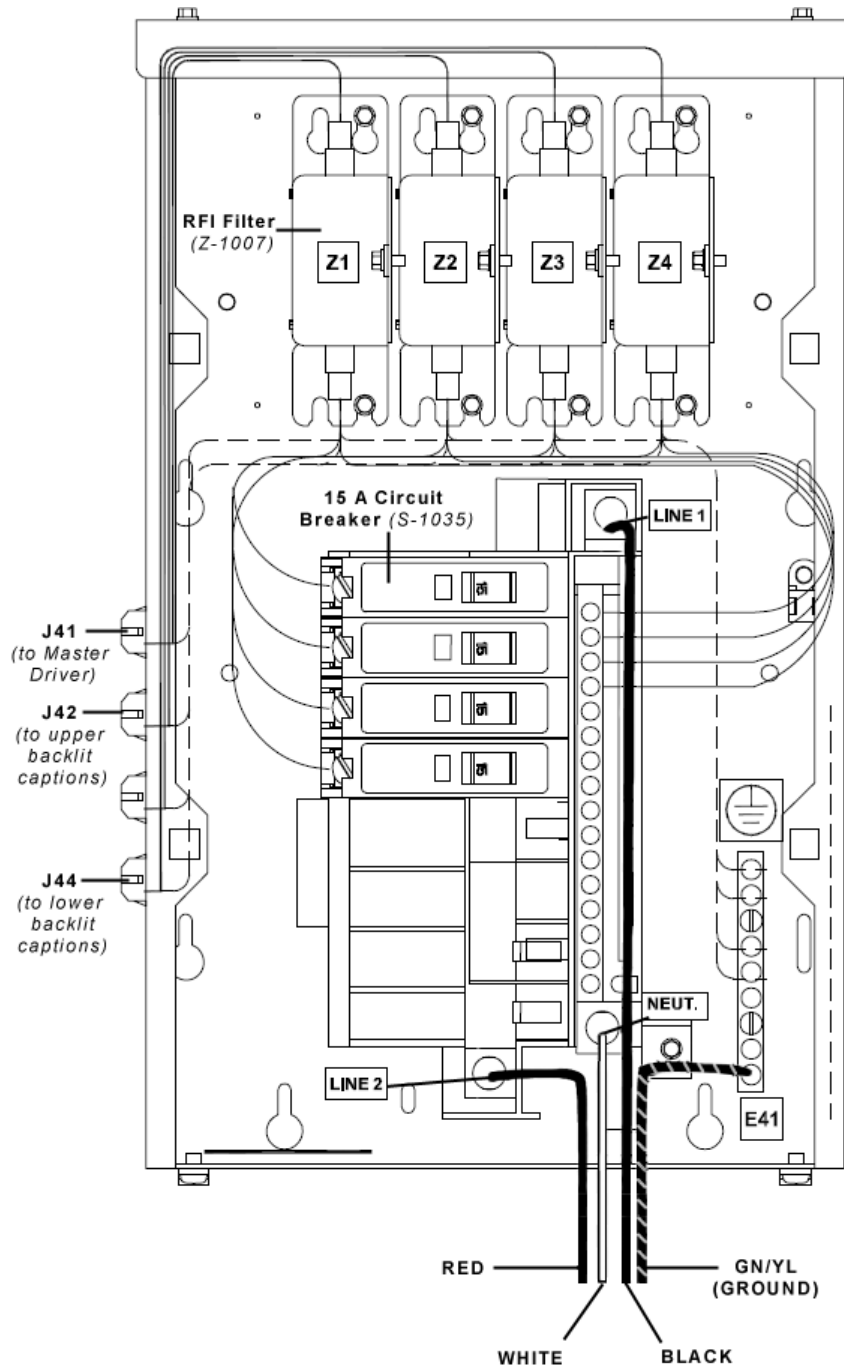
**Note:** If a power receptacle is needed to operate the control console at the scoreboard for troubleshooting, Daktronics recommends that an installation electrician provides a 120 V outlet close to the disconnect box specifically for this purpose.

### **FB-2352 & FB-2354 Power Connection**

Models FB-2352 & FB-2354 have a built-in breaker for power termination. Refer to **Figure 13**.

1. Route the power cables via conduit into rear of scoreboard.
2. Look for a warning label similar to **Figure 11** to locate the appropriate front or rear access panel to the power breaker enclosure.
3. Loosen the screws or latches to open the access panel. Front panels are hinged and swing open. Rear access panels can be lifted up and out over the screws through keyholes.
4. Route the power cables up through the bottom of the enclosure.
5. Use a flathead screwdriver to rotate the two latches  $\frac{1}{4}$  turn, and then remove the enclosure cover.

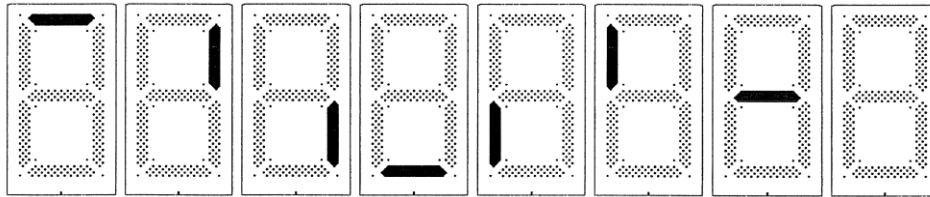
6. Connect the power cables as follows:
  - neutral (white) wire to NEUT.
  - live wires to LINE 1 (black) and LINE 2 (red)
  - ground wire (green/yellow) to the grounding buss bar, E41
7. Reattach the metal enclosure cover and secure the access panel.



**Figure 13:** FB-2352 & FB-2354 Power Termination (120/240 V)

## 4.3 Power-On Self-Test (POST)

The scoreboard performs a self-test each time that power is turned on and the control console is powered off or not attached to the scoreboard. If the control console is attached and powered on, the self-test does not run, and data from the control console is displayed on the scoreboard after a brief period of time. Each scoreboard self-test pattern will vary depending on the scoreboard model, the number of drivers and types of digits. **Figure 14** shows an example of the LED bar test pattern that each digit performs.



**Figure 14:** Digit Segment POST

### Radio Settings

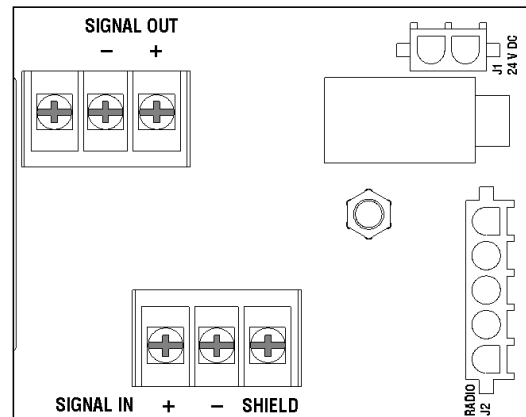
If a radio receiver is installed, the radio Broadcast and Channel settings will be displayed in the clock digits during the POST. These values must match the settings in the control console (refer to the manual listed in **Section 1.4**). Refer to **Section 5.9** for more information on radio installations.

## 4.4 Signal Connection

For wired setups, route signal cable through the rear of the scoreboard via conduit to the signal surge arrestor card (**Figure 15**), located just above the power termination block in the driver enclosure.

At the SIGNAL IN terminal block, connect the red signal wire to the positive terminal and the black wire to the negative terminal.

**Note:** Be sure to properly connect the shield (silver) wire to the SHIELD terminal.



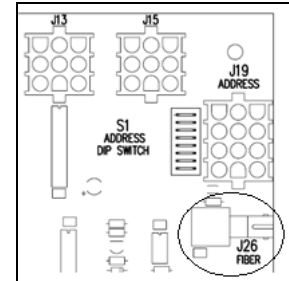
**Figure 15:** Signal Surge Arrestor Card

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



## Fiber Optic

Another common signal communication method is fiber optic cabling. A minimum cabling of multi-mode, 62.5/125 um, and 2-core fiber cable is recommended (Daktronics part number W-1242). See **Figure 16** for the location of the fiber connector on a 16-column driver. This method requires a signal converter between the All Sport console's scoreboard output and the fiber optic cable (not provided by Daktronics).



**Figure 16:** Driver Fiber Connection Location

## Multiple Driver Connections

Models in the FB-2350 scoreboard line require multiple drivers in each scoreboard section, and use a master/slave driver system. Master and slave drivers function identically, but slave units lack the power termination block and signal surge suppression card. When one section has multiple drivers, they simply plug into one another, and this is done at the factory.

## 4.5 Power/Signal Connections Between Sections

A six-cable harness extends from the middle of the lower (statistics) section. Before the upper (clock/score) section is mounted in place, these cables must be routed through the entrance hole in the bottom channel of the upper section.

After the clock/score section has been secured to the mounting structure, open the appropriate front or rear access panel to reach to the master driver enclosure, remove the enclosure cover, and then connect each 9-pin plug to their matching jacks on the driver.

**Note:** Models FB-2352 & FB-2354 will also have a 3-pin plug (P44) to connect to the power breaker enclosure (J44). Refer to **Figure 13**.

## 4.6 Lightning Protection

The use of a disconnect near the scoreboard to completely cut all current-carrying lines significantly protects the circuits against lightning damage. 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 circuitry.



# Section 5: Scoreboard Troubleshooting

## IMPORTANT NOTES:

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

For assistance in the maintenance of team name message centers (TNMCs) or other optional scoreboard message centers, refer to **Section 6** or the service manual that accompanies those units.

## 5.1 Troubleshooting Table

The table below lists potential problems with the scoreboard and indicates possible causes and corrective actions. This list does not include every symptom that may be encountered, but it does present several of the most common situations that may occur.

Many of the solutions offered below provide references to other sections within this manual or to supplemental product manuals with further detail on how to fix the problem.

If a problem occurs that is not listed or that cannot be resolved using the solutions in the following table, contact Daktronics using the information provided in **Section 5.14**.

Problem	Possible Cause	Solution/Items to Check
Scoreboard doesn't light and console doesn't work	No power to the scoreboard	Check that the main circuit breaker for the scoreboard is on.
		Check that the scoreboard is receiving the correct 120 (or 240) V AC power (see <b>Section 2</b> ).
	No power to console	Ensure the console is plugged into a 120 (or 240) V AC power supply.
		Swap the console with one known to work correctly, and enter the proper sport code and/or radio settings to test. Replace console if necessary.
Scoreboard digits don't light, but console works	No wired signal from console	Check that the scoreboard is receiving the correct 120 (or 240) V AC power (see <b>Section 2</b> ).
		Check that the red DS2 LED on the driver lights up when sending commands from the control console (see <b>Section 5.8</b> ).
	No radio signal from console	Cycle power to the scoreboard and watch for radio receiver broadcast/channel settings (see <b>Section 5.9</b> ).

Problem	Possible Cause	Solution/Items to Check
		Check that the green POWER and amber RADIO IN RANGE indicators on the radio receiver in the scoreboard light up when the control console is powered on (see <b>Section 5.9</b> ). Keep the console between 20 to 1500 feet from the scoreboard.
		Move the console 20-30 feet from the scoreboard and test again. Verify that both the console and scoreboard antennae are securely tightened and in a vertical position.
		Replace the radio receiver.
	No signal to driver	Check that the scoreboard is receiving the correct 120 (or 240) V AC power (see <b>Section 2</b> ).
		Check that the red DS2 LED on the driver lights up when sending commands from the control console (see <b>Section 5.8</b> ).
		Swap the driver with one known to work correctly and with the same part number to verify the problem. Replace if necessary ( <b>Section 5.8</b> ).
No power to driver	Check that the green DS1 LED on the driver is always lit up when the scoreboard is powered on (see <b>Section 5.8</b> ).	
Scoreboard digits light, but not in the correct order	Incorrect sport code	Ensure the correct sport code is being used for the scoreboard model. Refer to the operation manual for the console being used (see <b>Section 1.4</b> ).
	Incorrect driver address	Check that the scoreboard driver(s) are set to the correct address(es) (see <b>Section 5.8</b> ).
Scoreboard digits light, console works, but no display on scoreboard	No wired signal from console	(See solution on previous page)
	No radio signal from console	(See solution on previous page)
	Bad/damaged field wiring	Check that the red DS2 LED on the driver lights up when sending commands from the control console (see <b>Section 5.8</b> ).
Scoreboard works, but some LEDs always stay on	Short in digit, segment, or indicator circuit	Swap the digit/segment/indicator with one known to work correctly to verify the problem. Replace if necessary (see <b>Sections 5.4-5.6</b> ).

Problem	Possible Cause	Solution/Items to Check
Scoreboard works, but some LEDs do not light or they blink	Bad connection	Verify the Mate-N-Lok connector on the back of the digit circuit board is secure (see <b>Section 5.2</b> ). Verify power/signal interconnect(s) between scoreboard sections properly connected (see <b>Section 4.5</b> )
	Bad digit or driver	Swap the digit/driver with one known to work correctly to verify the problem. Replace if necessary (see <b>Sections 5.4-5.6</b> for digits or <b>Section 5.8</b> for drivers).
Scoreboard works, but some digits do not light	Bad digit or driver	(see solution above)
	Incorrect sport code	(see solution on previous page)
	Incorrect driver address	(see solution on previous page)
	Wrong console controlling scoreboard	Another console's radio signal could be transmitting to the scoreboard. An example would be football and baseball scoreboards that are within 1500 feet of each other (see <b>Section 5.9</b> ).
	Radio interference	There may be other radio transmissions in the area that overpower the console. If it is not possible to disable the interfering device, it may be necessary to run a wired signal connection instead.

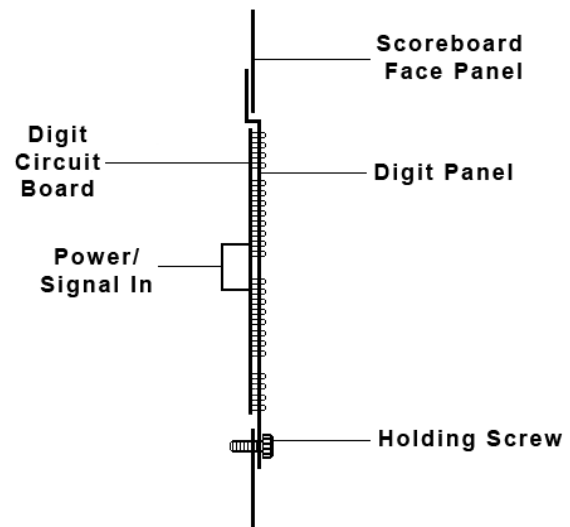
## 5.2 Component Access

All internal electronic components are reached by opening an access door or a digit panel on the display.

Digit panels are held in place on the scoreboard face by an offset flange across the top and by screws at the bottom, as shown in **Figure 17**.

To open a digit panel:

1. Hold the digit panel in place by putting hand pressure on it and remove the holding screws.
2. Carefully lift the panel away from the scoreboard, sliding it out and down.



**Figure 17:** LED Digit Panel

**Note:** If the panel is not held in place when the screws are removed, it could drop and possibly damage LEDs or the digit harness.

With a non-digit access panel, simply remove the top, side and bottom screws holding it in place. Some panels are hinged and swing open when the screws are removed or loosened. Rear access panels can be lifted up and out over the screws through keyholes.

**Note:** When closing the access panel, make sure all latches/screws are holding the door firmly in place to prevent moisture and debris from entering the scoreboard.

## 5.3 Component Locations

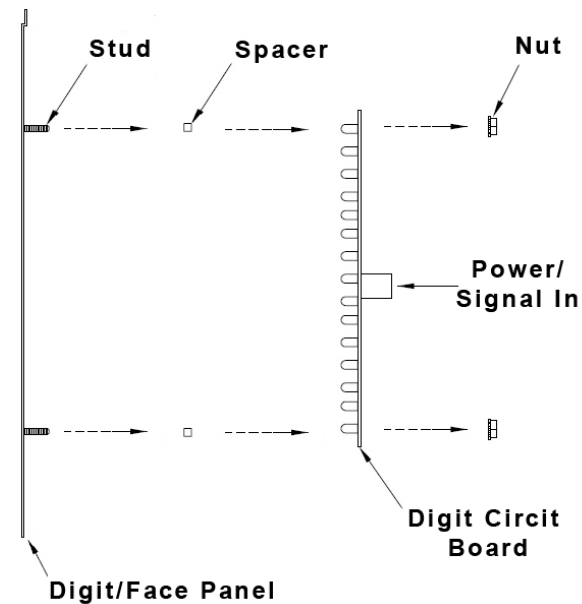
Refer to **Drawing A-195428** in **Appendix A** for component locations.

## 5.4 Replacing Digits

LEDs are embedded in a circuit board that is mounted to the back of the digit panel, as shown in **Figure 18**. Do not attempt to remove individual LEDs. In the case of a malfunctioning LED or digit segment, replace the entire digit circuit board.

To replace a digit circuit board:

1. Open the digit panel as described in **Section 5.2**.
2. Disconnect the power/signal plug from the back of the digit by squeezing together the locking tabs and pulling the connector free.
3. Use a  $\frac{9}{32}$ " nut driver to remove the nuts securing the digits to the inside of the panel, and then lift the digit off the standoff studs.
4. Position a new digit over the studs, making sure the rubber side of the rubber-backed spacer is facing the digit circuit board.
5. Tighten the nuts.
6. Reconnect the power/signal connector.



**Figure 18:** Digit Assembly

**Note:** This is a keyed connector and it will attach in one way only. Do not attempt to force the connection.

7. Close and secure the digit panel, then power up and test the scoreboard to see if changing the digit has resolved the problem.

## 5.5 Replacing Digit Segments

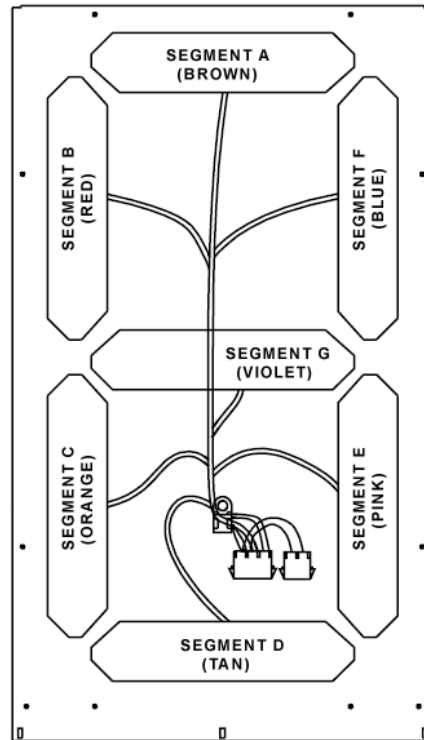
Some larger digits (24"/36") are constructed with individual circuit board segments. As with smaller digits, the digit segment circuit boards are mounted to the back of a digit panel (**Figure 19**). It may be possible to make repairs by removing just the defective segment. Do not attempt to remove individual LEDs.

To replace a digit segment:

1. Open the digit panel as described in **Section 5.2**.
2. Disconnect the 2- or 4-pin power/signal connector from the back of the digit segment by squeezing together the locking tabs and pulling the connector free.
3. The digit segments are secured to the inside of the panel with fixed machine screws, spacers, and push nuts. The push nuts can be removed in several ways, but a  $9/32$ " nut driver is recommended. Remove the nuts and lift the segment off the standoff studs.
4. Position a new segment over the screws and tighten the nuts.
5. Reconnect the power/signal connector.

**Note:** This is a keyed connector and it will attach in one way only. Do not attempt to force the connection.

6. Close and secure the digit panel, then power up and test the scoreboard to see if changing the digit segment has resolved the problem.



**Figure 19:** Digit Segments & Panel (Rear View)

## 5.6 Replacing Colons, Decimals & Indicators

Colons, decimals, and other indicators are replaced in the same manner as a digit segment.

## 5.7 Power Supplies

Scoreboards with 16-column driver enclosures require a dual power supply assembly.

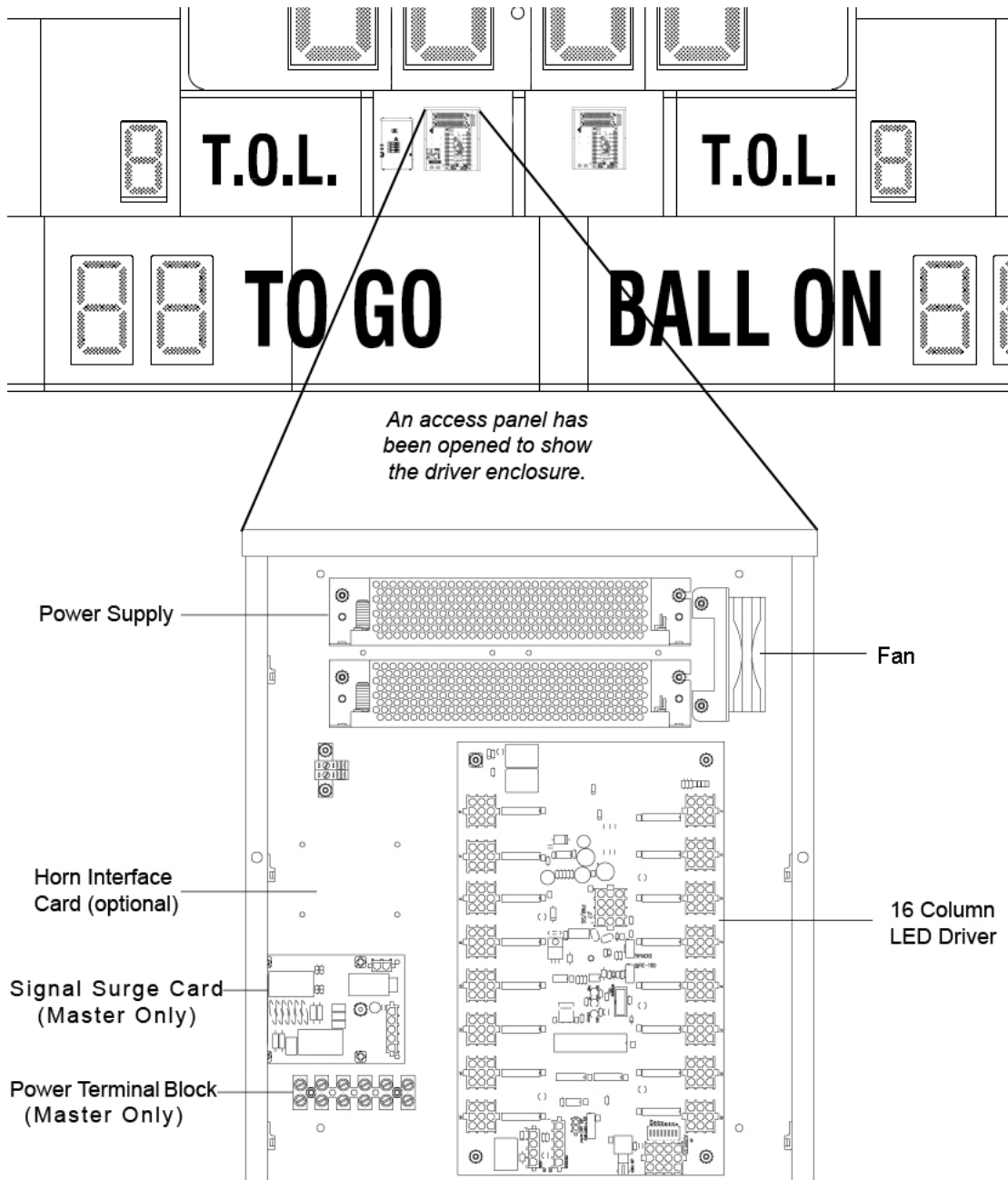
### Replacing a Power Supply

To remove a power supply:

1. Open the access panel as described in **Section 5.2**.
2. Remove the metal cover from the driver enclosure.
3. Locate and disconnect all wires connected to the power supply (**Figure 20**).
4. Use a  $9/32$ " nut driver to remove the hardware securing the power supply.
5. Fasten the new power supply in place and reconnect all wires.

## 5.8 LED Drivers

The LED drivers perform the task of switching digits on and off within the scoreboard. LED drivers are located inside of a driver enclosure. Refer to **Figure 20** to view the location and components of a driver enclosure.



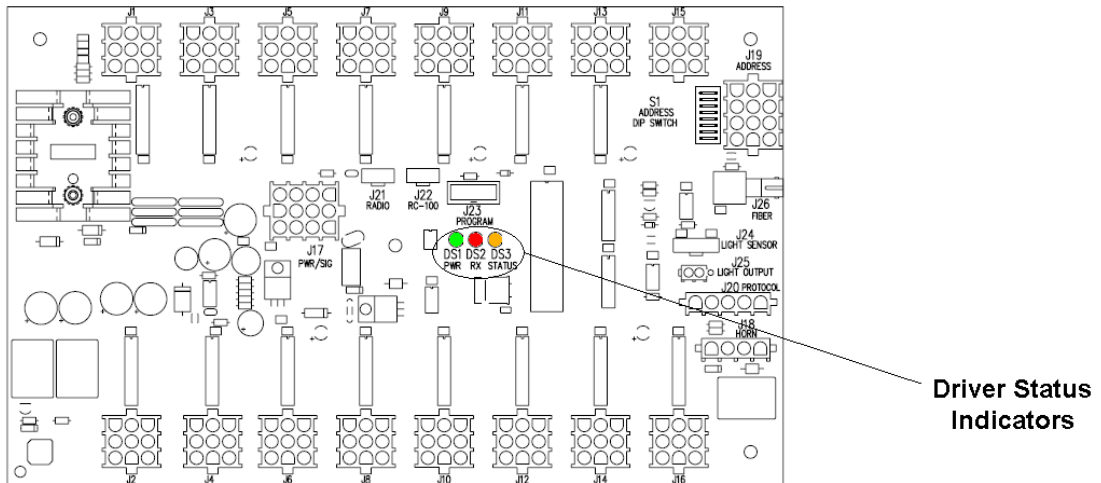
**Figure 20:** Driver Enclosure Location & Components



When troubleshooting driver problems, three LEDs labeled **DS1**, **DS2**, and **DS3** in **Figure 21**, provide the following diagnostic information:

LED	Color	Function	Operation	Summary
DS1	Green	Power	Steady on	DS1 will be on and steady to indicate the driver has power.
DS2	Red	Signal RX	Steady on or blinking	DS2 will be on or blinking when the driver is receiving a signal and off when there is no signal.
DS3	Amber	Status	Blinking	DS3 will be blinking at one second intervals to indicate the driver is running.

**Note:** While it is necessary to have the scoreboard powered on to check the LED indicators, always disconnect scoreboard power before servicing.



**Figure 21:** Driver Status Indicators

### Replacing a Driver

1. Open a digit or access panel as described in **Section 5.2**.
2. Remove the metal cover from the driver enclosure.
3. Disconnect all connectors from the driver by squeezing together the locking tabs and pulling the connectors free.

**Note:** It may be helpful to label the cables to know which cable goes to which connector when reattaching the driver.

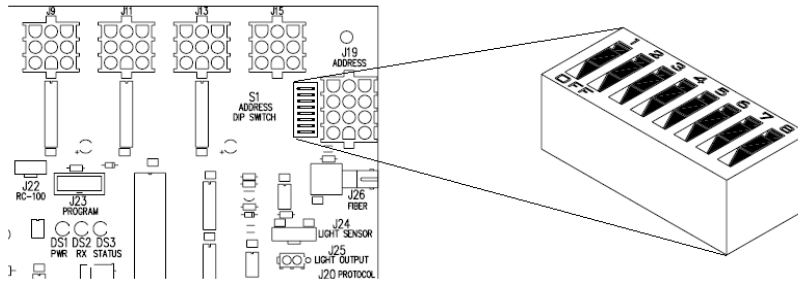
4. Remove the screws or nuts securing the driver to the inside of the enclosure.
5. Carefully lift the driver from the display and place it on a clean, flat surface.
6. Position a new driver over the screws and tighten the nuts.
7. Reconnect all power/signal connectors.

**Note:** The connectors are keyed and will attach in one way only. Do not attempt to force the connections.

8. Ensure the driver is set to the correct address (refer to **Setting the Driver Address**).
9. Close and secure the digit panel, then power up and test the scoreboard to see if changing the driver has resolved the problem.

## Setting the Driver Address

Since the same LED drivers can be used for many scoreboard models, each driver must be set to receive the correct signal input, or address, for the model being used. Addresses are set through the S1 dip switch on the driver (**Figure 22**) using a pen or small, pointed object.



**Figure 22:** Driver Address Dip Switch

All of the scoreboards in this manual must have the master driver (A1) set to “13” and the slave driver (A2) set to “15”. Refer to **Drawing A-290261** in **Appendix A** for addressing information for driver addresses 1 – 128.

Another method of setting the driver address using the J19 address plug is available. 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. When using an address plug, it will not be possible to set the address with the S1 dip switch.

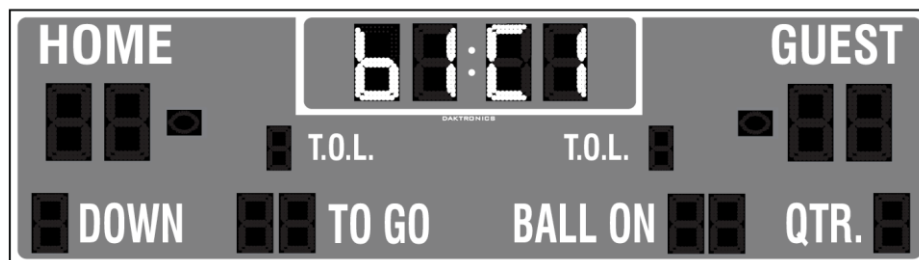
## Multiple Drivers

All of the scoreboards in this manual have multiple drivers and operate using a master/slave driver configuration. If it appears as though only a certain group of digits on the scoreboard is not functioning, there may be a problem with the slave driver(s) or the power/signal connection from the other driver(s).

## 5.9 Radio Connections

To determine the settings for radio connections between the scoreboard and control console:

1. Cycle power to the scoreboard.
2. After approximately seven seconds, the radio settings will be displayed in the clock digits (**Figure 23**).



**Figure 23:** Radio Settings (Clock)

The first values are the broadcast settings (“b1”), and the second are the channel settings (“C1”). These values must match the settings within the console.

**Note:** If these settings do not appear, the radio receiver may need to be repaired/replaced.

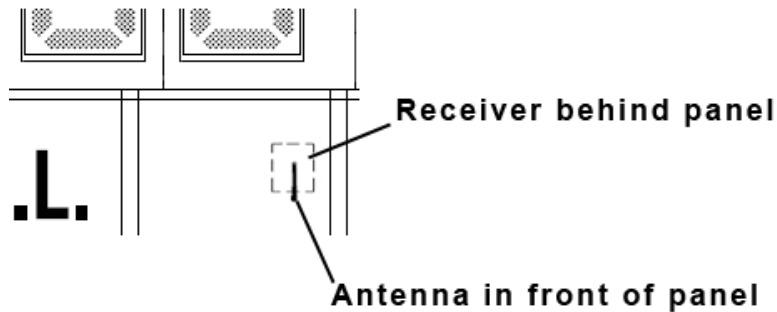
To make sure the current radio settings match the receiver in the scoreboard, refer to the operation manual of the particular control console being used (see **Section 1.4**).

## Radio Interference

If it has been determined that a nearby scoreboard’s radio signal is interfering, the broadcast and channel settings of the radio receiver inside the scoreboard(s) must be changed.

For more information, refer to the **Gen V Radio Installation Manual ED-13831**, available online at [www.daktronics.com/manuals](http://www.daktronics.com/manuals).

1. To locate the radio receiver, look for the antenna on the front of the scoreboard between the T.O.L. digits (**Figure 24**).

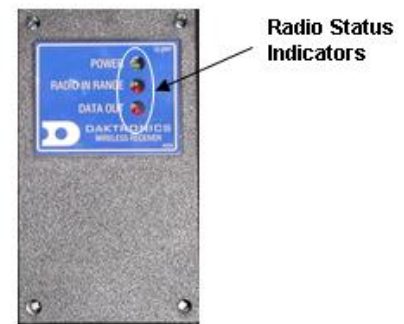


**Figure 24:** Radio Receiver Location

2. Open the access panel to which the receiver is attached as described in **Section 5.2**.
3. The radio receiver has a plastic cover. Three status indicator LEDs are visible (**Figure 25**).

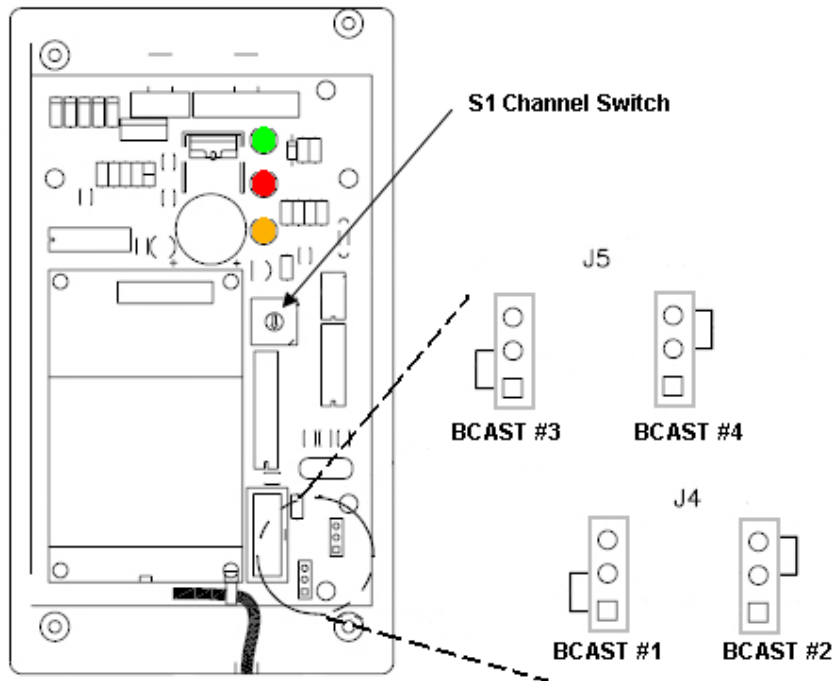
**Note:** While it is necessary to have the scoreboard powered on to check the LED indicators, always disconnect scoreboard power before servicing.

4. Remove the four screws using a #2 Philips screwdriver and lift off the cover.
5. Inside the receiver are a channel switch (S1) and two broadcast jacks (J4, J5) with a jumper.



**Figure 25:** Radio Receiver w/ Cover

**Figure 26** shows the different configurations for the small jumper wire that sets the radio broadcast (BCAST) mode. Move the jumper wire to the desired broadcast location.



**Figure 26:** Radio Receiver w/o Cover

6. Use a small flathead screwdriver to set the S1 switch to the desired channel (1-8).
7. Screw the cover back on and securely close the access panel.
8. Enter the correct sport code and new radio settings into the console to test the radio control (refer to the appropriate scoreboard controller manual).

## 5.10 Trumpet Horns

For scoreboards that include clocks and have trumpet horns installed, refer to the **Trumpet Horn Installation Manual ED-10006**, available online at [www.daktronics.com/manuals](http://www.daktronics.com/manuals).

## 5.11 Segmentation and Digit Designation

In each digit, certain LEDs always go on and off together. These groupings of LEDs are called segments. **Drawing A-38532** in **Appendix A** details which connector pin is wired to each digit segment and the wiring color code used throughout the display.

**Drawing A-195428** in **Appendix A** also specifies the driver connectors controlling the digits. Numbers shown in hexagons in the upper half of each digit indicate which connector is wired to that digit.

## 5.12 Schematics

For advanced scoreboard troubleshooting and repair, it may be necessary to consult the schematic drawings. These drawings, located in **Appendix A**, show detailed power and signal wiring diagrams of internal display components such as drivers and transformers as well as optional components like TNMCs/backlit captions, radio receivers, and trumpet horns. Use the following table to determine the driver schematics for a particular model:

### 16 Column Driver (x 2)

Model	Schematic Drawing #
FB-2351 FB-2353	<b>A-824826</b>
FB-2352 FB-2354	<b>C-859571</b>
FB-2355 FB-2357	<b>A-180637 (120 V AC)</b> <b>A-324504 (240 V AC)</b>
FB-2356 FB-2358	<b>TBD</b>

## 5.13 Replacement Parts

Refer to the following table for common Daktronics scoreboard replacement parts:

Description	Location	Daktronics Part #
J-Box, 1/4" phone, Indoor	Signal	0A-1009-0038
J-Box, 1/4" Phone, outdoor	Signal	0A-1091-0227
12V DC trumpet horn, AS5000; Outdoor (120 V)	Scoreboard	0A-1091-1213
12V DC trumpet horn, AS5000; Outdoor (240 V)	Scoreboard	0A-1092-3455
Signal surge board	Driver enclosure	0P-1110-0011
Digit, 18", 7-seg outdoor LED, red	Scoreboard	0P-1192-0202
Digit segment, 24" outdoor LED, red (vertical)	Scoreboard	0P-1192-0204
Digit segment, 24" outdoor LED, red (horizontal)	Scoreboard	0P-1192-0205
Digit segment, 36" outdoor LED, red (vertical)	Scoreboard	0P-1192-0208
Digit segment, 36" outdoor LED, red (horizontal)	Scoreboard	0P-1192-0209
Digit, 18", 7-seg outdoor LED, amber	Scoreboard	0P-1192-0216
Digit segment, 24" outdoor LED, amber (vertical)	Scoreboard	0P-1192-0218
Digit segment, 24" outdoor LED, amber (horizontal)	Scoreboard	0P-1192-0219
Digit segment, 36" outdoor LED, amber (vertical)	Scoreboard	0P-1192-0222
Digit segment, 36" outdoor LED, amber (horizontal)	Scoreboard	0P-1192-0223
Indicator, colon/decimal,2", red	Scoreboard	0A-1192-3313
Indicator, colon/decimal,2", amber	Scoreboard	0A-1192-3314

Description	Location	Daktronics Part #
Small LED football indicator, red	Scoreboard	0A-1192-2237
Small LED football indicator, amber	Scoreboard	0A-1192-2238
Driver, 16 col, outdoor, LED	Driver enclosure	0P-1192-0383
Power supply, 24 V, 150W (120 V AC)	Driver enclosure	A-1720
Power Supply; 24 V, 150W (240 V AC)	Driver enclosure	A-1733
Fan, 32 cfm, 24 V DC, 3.15 sq. in	Driver enclosure	B-1030
15 W Spiral Compact Fluorescent Lamp	Backlit Captions	DS-1563
Plug, 1/4" phone	Signal	P-1003
Signal cord; 1/4" phone 20'	Signal	W-1236
Signal cord; 1/4" phone 50'	Signal	W-1237
Signal cord; 1/4" phone 30'	Signal	W-1238
RFI Filter	FB-2352 & FB-2354 Breaker Box	Z-1007

## 5.14 Daktronics Exchange and Repair & Return Programs

### Exchange Program

The Daktronics Exchange Program is a quick, economical service for replacing key components in need of repair. If a component fails, Daktronics sends a replacement part to the customer who, in turn, returns the failed component to Daktronics. This not only saves money but also decreases equipment downtime. Customers who follow the program guidelines explained below will receive this service.

### *Before Contacting Daktronics*

Identify these important numbers:

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

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

Contract Number: \_\_\_\_\_

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

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

To participate in the Exchange Program, follow these steps.

#### 1. Call Daktronics Customer Service.

Market Description	Customer Service Number
Schools (primary through community/junior colleges), religious organizations, municipal clubs and community centers	877-605-1115
Universities and professional sporting events, live events for auditoriums and arenas	866-343-6018

2. **When the new exchange part is received, mail the old part to Daktronics.**  
If the replacement part fixes the problem, send in the problem part which is being replaced.
  - a. Package the old part in the same shipping materials in which the replacement part arrived.
  - b. Fill out and attach the enclosed UPS shipping document.
  - c. Ship the part to Daktronics.
3. A charge will be made for the replacement part immediately, unless a qualifying service agreement is in place. In most circumstances, the replacement part will be invoiced at the time it is shipped.

If the failed part or replacement part is not returned to Daktronics within 3 weeks of the ship date, Daktronics will assume that the customer is purchasing the replacement part and will send an invoice for the value of the new sale part. If the part or parts are returned within 2 weeks of the second invoice date, Daktronics will credit the customer for the second invoice.

If after 2 weeks Daktronics has still not received the parts back, the customer must pay the second invoice and will not be credited for the return of the failed part. Daktronics reserves the right to refuse parts that have been damaged due to acts of nature or causes other than normal wear and tear.

## **Repair & Return Program**

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

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

### *Shipping Address*

Daktronics Customer Service  
RMA #  
201 Daktronics Drive, Dock E  
Brookings, SD 57006

**Fax:** 605-697-4444

### **Daktronics Warranty and Limitation of Liability**

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



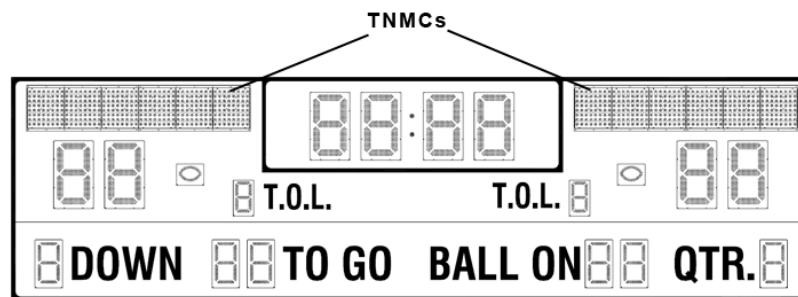
## Section 6: Team Name Message Center Troubleshooting & Maintenance

### IMPORTANT NOTES:

1. Always disconnect scoreboard power before doing any repair/maintenance work on the message centers.
2. Permit only qualified service personnel to access internal display electronics.
3. Disconnect power when not using the scoreboard.

### 6.1 Team Name Message Center System Overview

Team name message centers (TNMCs) use amber or red LEDs to display team names (home and guest) in place of vinyl captions (**Figure 27**). TNMCs for FB-2350 scoreboards are available with 8x48 pixel dimensions. Characters are shown on one line using single- or double-stroke fonts up to 20" (508 mm) high.



**Figure 27:** Team Name Message Centers

Matrix Size	# of modules	Pixel Spacing	Active Display Area	Weight*
8x48	6	64 mm (2.5")	20" x 120" (508 mm x 3048 mm)	100 lb (45 kg)

\* TNMCs are typically installed in pairs; double this value to find the total added weight.

### 6.2 Initialization Information at Startup

Every time the display is powered up and there is no All Sport<sup>®</sup> signal present, the display will run through an initialization process, during which it will test all LEDs and addresses. First, the message center will display the proper address number.

If the entire TNMC display fails at startup, power may not be properly connected, or the address setting may not be correct on the TNMC driver. Check both in the event of a failure.

## 6.3 TNMC Troubleshooting Table

The table below lists potential problems with the display and indicates possible causes and corrective actions. This list does not include every symptom that may be encountered, but it does present several of the most common situations that may occur.

Many of the solutions offered below provide references to other sections within this manual with further detail on how to fix the problem.

If a problem occurs that is not listed or that cannot be resolved using the solutions in the following table, contact Daktronics using the information provided in **Section 5.14**.

Symptom/Condition	Possible Remedy
One or more LEDs on a single module fails to light	Check/replace the ribbon cables on the module.
	Replace the module. See <b>Section 6.7</b> .
One or more LEDs on a single module fails to turn off	Check/replace the ribbon cables on module.
	Replace the module. See <b>Section 6.7</b> .
A section of the display not working; section extends all the way to the right side of the display	Check/replace the ribbon cables running to the first module that is not working.
	Replace the first module/driver on the left side of the first module that is not working. See <b>Section 6.7</b> .
	Replace the second module that is not working. See <b>Section 6.7</b> .
	Replace the power supply assembly of the first module that is not working. See <b>Section 6.8</b> .
One row of modules does not work or is garbled	Replace the first module. See <b>Section 6.7</b> .
	Replace the TNMC driver. See <b>Section 6.6</b> .
A group of modules that share the same power supply assembly fails to work	Replace the power supply assembly. See <b>Section 6.8</b> .
Entire display fails to work	Check for proper line voltage into the power termination panel.
	Check/replace the ribbon cable from the TNMC driver to the modules.
	Check the voltage settings on the power supplies.
	Check/replace the signal cable to the driver.
	Repair/replace the driver. See <b>Section 6.6</b> .

## 6.4 Power & Signal Summary

Refer to **Drawings B-188553** or **B-190140** in **Appendix A** to view detailed schematics about power and signal routing for red and amber TNMC cabinets, respectively.

Signal routing for the TNMC can be summarized as follows:

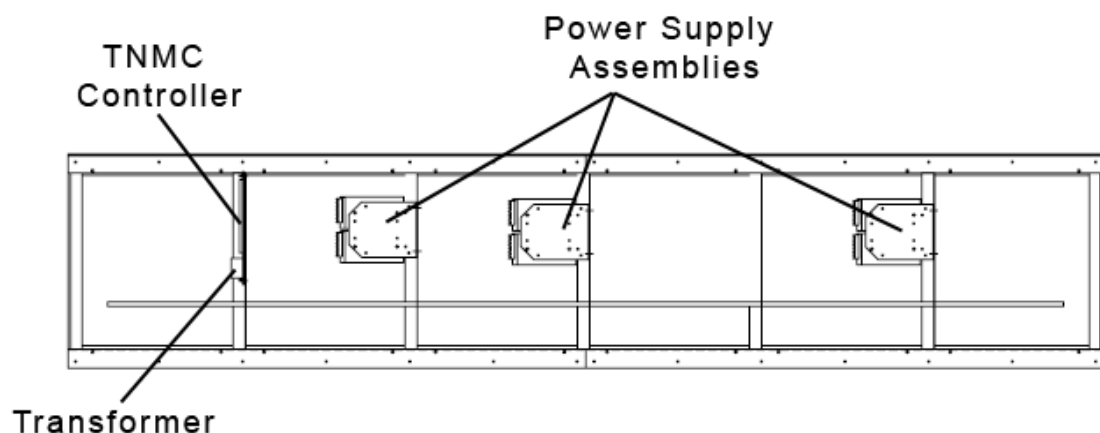
1. Data from the All Sport<sup>®</sup> controller travels via cable harness into the scoreboard.
2. The signal travels to the driver/power enclosure through the J1 connector on the signal surge arrestor card.
3. Data exits at J42 via current loop harness, and connects with P43 at the TNMC driver assembly. A power/signal interconnect (ribbon cable) 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.

Power routing for the TNMC can be summarized as follows:

1. 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 driver where it then travels to the power supply assembly.
2. From the power supply assembly, power is relayed to the first module, and then from module to module.
3. The modules draw their power directly from three power supply assemblies with 12 V per power supply for red LED modules and 24 V for amber, while the TNMC driver receives 16 V power from a transformer on the driver tray.

## 6.5 Component Locations & Access

**Figure 28** illustrates the component locations of an 8x48-64mm TNMC. Refer also to **Drawings B-219923** and **B-219932** in **Appendix A** to view component locations for red and amber TNMC cabinets, respectively. TNMC cabinets have been designed so that they may be accessed from both the front and rear.

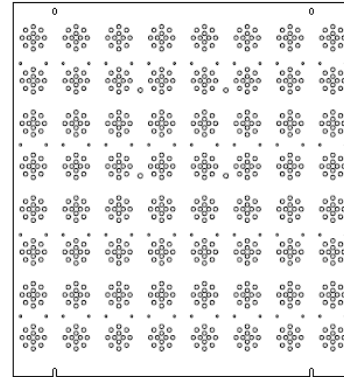


**Figure 28:** 8x48-64mm TNMC Cabinet with Modules Removed

## Front Access

1. Use a Philips screwdriver to remove the four screws securing the module face panel to the TNMC cabinet (**Figure 29**).
2. Carefully remove the module from the face of the message center.

**Note:** Do not hang the module by its power/signal cable!



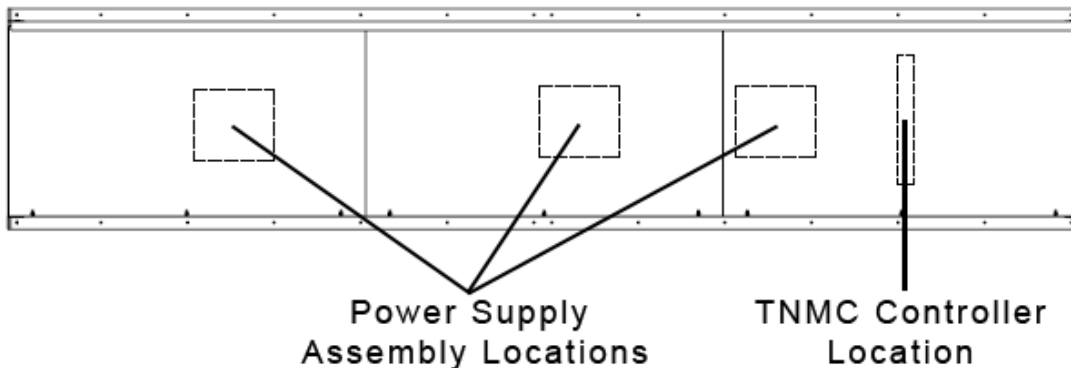
**Figure 29:** TNMC Module, Front View

## Rear Access

1. To access the internal components from the rear, remove the appropriate rear-access panel from the TNMC by loosening the three bottom screws.
2. Slide the access panel up to the larger part of the keyhole and carefully lift it out and then down away from the TNMC cabinet.

**Note:** Be careful when removing and handling the access panels as internal TNMC components may still be attached to them.

The TNMC driver will always be located behind the first access panel on the right, along with one power supply assembly. An additional power supply assembly is located behind each of the other two access panels. Refer to **Figure 30**.



**Figure 30:** TNMC Cabinet Rear Access Panels

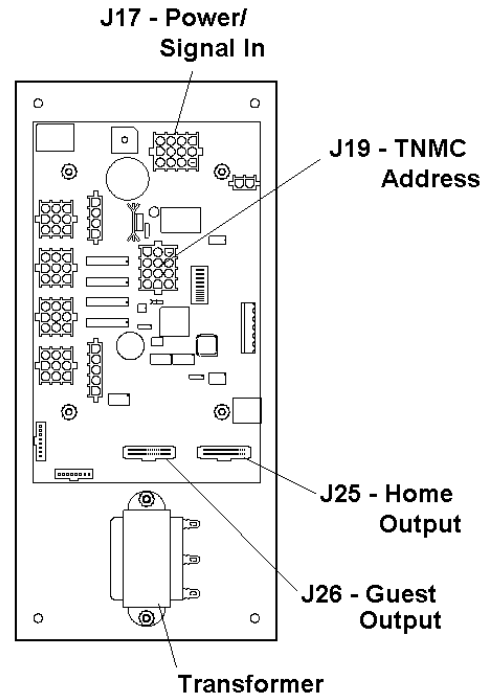
## 6.6 TNMC Drivers

The TNMC driver receives signal from the control console via a signal surge arrestor card and sends data to the modules. Refer to **Section 6.4** for more information on signal routing.

**Figure 31** illustrates a TNMC control assembly with a 4-column MASC driver. In **Appendix A**, refer to **Drawings A-166216** and **A-165028** for more information about the driver.

Connectors J25 and J26 control Home and Guest displays. When the ribbon cable is plugged into J25, the TNMC displays home team information. In the opposite message center, the signal cable should be plugged into the J26 connector to display guest information.

J19 is the connector for the address plug. The address setting for a TNMC will always be 221. (There may be other settings if the TNMC is used to display messages other than team names.) Refer to **Drawing A-115079** in **Appendix A** for addressing information.



**Figure 31:** TNMC Control Assembly (4 Column MASC Driver)

### Diagnostic LEDs

The following table explains the functions of the primary diagnostic LEDs on the 4 Column MASC drivers:

LED Name	Color	Illumination Summary
(CL) RX	Red	Steady on or blinking when the driver is receiving signal and off when there is no signal
(CL) TX	Green	Steady on or blinking when the driver is transmitting and off when there is no signal
Power	Green	Steady on to indicate the driver has power
Status	Amber	Blinking to indicate driver is running

### Replacing a Driver

1. Access the internal components using the appropriate **Front/Rear Access** method described in **Section 6.5**.
2. Disconnect all power and signal connectors from the driver by squeezing together the locking tabs and pulling the connectors free.

**Note:** It may be helpful to label the cables to know which cable goes to which connector when reattaching a driver.

3. Remove the four nuts holding the driver in place.
4. Position a new driver over the screws and tighten the nuts.
5. Reconnect all power/signal connectors.
6. Ensure the driver is set to the correct address for the TNMC function.
7. Power up and test the scoreboard message center to see if changing the driver has resolved the problem.

## 6.7 Modules

Each module assembly is made up of a module face plate, 16 LED segments, and a driver. Individual components 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.

### Replacing Modules

1. Follow the steps in the **Front Access** method described in **Section 6.5**.
2. Carefully disconnect any signal ribbon cables from the INPUT (J2) and OUTPUT (J1) jacks as well as the power cable from J11 on the module driver.
3. Reconnect all power and signal cables to the replacement module.
4. Securely fasten the module face plate to the TNMC cabinet with the four screws.
5. Power up and test the scoreboard message center to see if changing the module has resolved the problem.

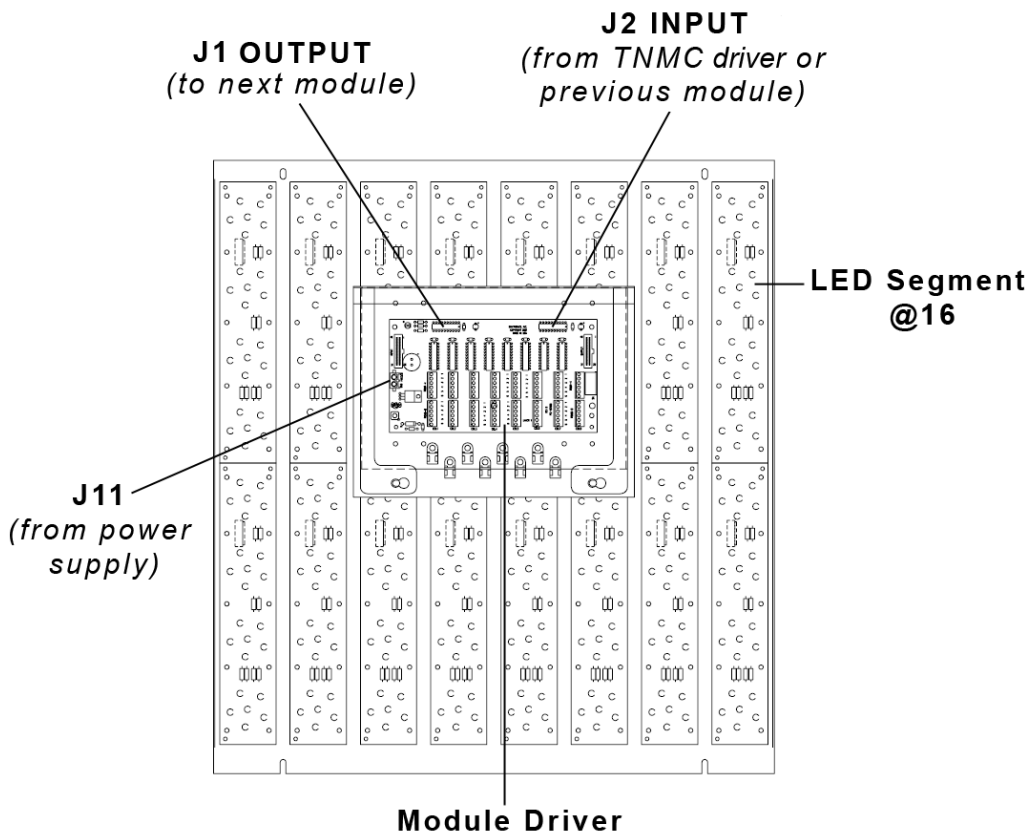


Figure 32: TNMC Module, Rear View

## 6.8 Power Supplies

Power supply configurations will vary depending on the number and/or color of modules.

### Replacing a Power Supply

To remove a power supply from the display:

1. Access the internal components using the appropriate **Front/Rear Access** method described in **Section 6.5**.
2. Disconnect all the wires connected to the power supply.
3. Use a 9/32" nut driver to remove the hardware securing the power supply.
4. Fasten the new power supply in place and reconnect all wires.

## 6.9 TNMC 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:** It may be necessary to occasionally 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 weather-stripping 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.

**Note:** If any of the preceding conditions are discovered, make the necessary repairs or take corrective action immediately.

## 6.10 Replacement Parts List

The following tables contain TNMC components that may have to be replaced. Many of the components within the display itself have attached part number labels.

Part Description	Part Number
Ribbon Cable, 30" (TNMC driver to first module)	0A-1000-0017
Ribbon Cable, 36" (module to module)	0A-1000-0018
TNMC Driver Assembly	0A-1152-2549
TNMC Driver Assembly (240 V)	0A-1192-3388
▪ 4-col MASC Driver	0A-1192-0068
▪ Transformer; 115/230 V pri, 16 V sec @ 2 A	T-1063
Power Supply Assembly; Amber TNMC	0A-1192-2551

<b>Part Description</b>	<b>Part Number</b>
▪ Power Supply; 12 V, 8.5 A, 85-265 V AC	A-1555
Power Supply Assembly; Red TNMC	0A-1192-2655
▪ Power Supply; 12 V, 8.5 A, 85-265 V AC	A-1555
Red 8x8-2.5" LED Module Assembly	0A-1192-2673
Amber 8x8-2.5" LED Module Assembly	0A-1192-2674
Final Assembly; 8X48-2.5" (64 mm) Red TNMC	0A-1192-2871
Final Assembly; 8X48-2.5" (64 mm) Amber TNMC	0A-1192-2872

See **Section 5.14** for information on Daktronics Exchange and Repair and Return program.



## Section 7: Additional Scoreboard Options

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### 7.1 Trumpet Horns

Trumpet horn options are available for installation only on scoreboards that have clocks. There are two types of trumpet horns:

- Internally mounted 120 V trumpet horn
- Externally mounted 12 V DC trumpet horn

For additional information about this option, contact a Daktronics representative; for complete information on setting up a Trumpet Horn, refer to the **Trumpet Horn Installation Manual (ED-10006)**, available online at [www.daktronics.com/manuals](http://www.daktronics.com/manuals).

### 7.2 Radio Control

Radio control is an option for all Daktronics outdoor LED scoreboards. The system provides scoreboard control via a 2.4 GHz, extra-high frequency FM signal.

The radio transmitter and receiver are not standard. This setup requires a control console equipped with radio output as well as a radio receiver plugged into the power terminal block in the driver/power enclosure and mounted internally to the front panel of the scoreboard.

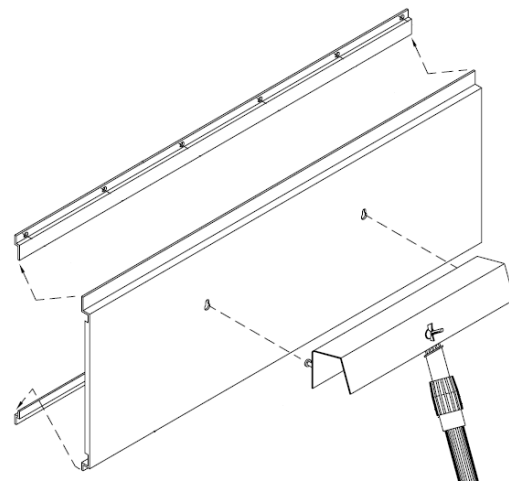
For additional information about this option, contact a Daktronics representative; for complete information on setting up radio communication control, refer to the **Gen V Radio Installation Manual (ED-13831)**, available online at [www.daktronics.com/manuals](http://www.daktronics.com/manuals).

### 7.3 Changeable Caption Kits

Caption kits contain hardware for one caption only and consist of an upper caption retainer, a lower caption retainer, a changeable caption panel and screws.

The standard HOME and GUEST captions are applied directly to the face of the scoreboard. Team name captions are on changeable panels that fit into retainers mounted above and below the HOME and GUEST captions. If these retainers are not already present, attach the retainers included with the caption kit.

Other caption kits are available to show different information for different sports.



**Figure 33:** Changing Scoreboard Captions

To install a changeable panel:

1. Insert the screws on the caption changing pole (Daktronics part # 0F-1091-0099) into the keyholes on the panel.
2. Lift the panel all the way up into the upper retainer and then insert the bottom of the panel into the lower retainer (**Figure 33**).
3. Take the screws on the caption changing pole out of the keyholes.

Reverse this procedure to remove the caption panel.

The caption changer pole is extendable. Loosen the ring tightener and extend the pole to the desired length, and then tighten the ring before lifting the caption.

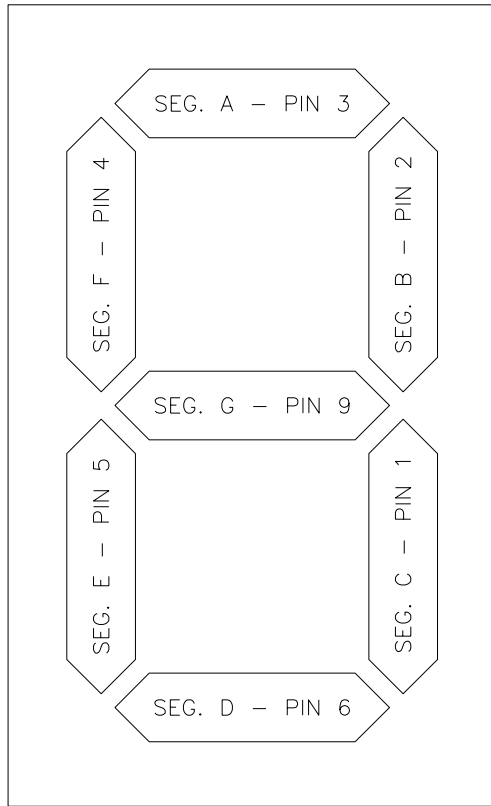
**CAUTION:** The aluminum caption changer can conduct electricity. Do not use it within 20-feet of power lines. Also be careful when using the caption changer in high or gusting winds. Wind may catch the panel and unhook it from the changer or make it difficult to maintain a grip on the pole. Hold the pole tightly in windy conditions.

## Appendix A: Reference Drawings

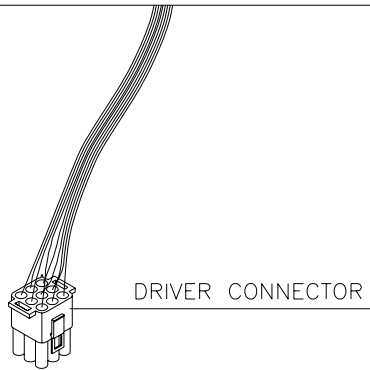
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Segmentation, 7 Segment Bar Digit .....	Drawing A-38532
Ad Panel Mounting.....	Drawing A-52187
Scoreboard Mounting .....	Drawing A-55101
Steel Clip Angle Mounting.....	Drawing A-83301
Address Table, 1 Through 128 .....	Drawing A-115078
Address Table, 129 Through 255 .....	Drawing A-115079
Schematic, Multipurpose LED DRVR .....	Drawing A-165028
4 Column MASC LED Driver Specifications .....	Drawing A-166216
Schematic; Gen III & Gen IV O.D. LED, 2 Drvr Display.....	Drawing A-180637
Schematic; 2.5" Red/Org, LED TNMC, Gen III.....	Drawing B-188553
Schematic; 2.5" Amber LED TNMC, Gen III.....	Drawing B-190140
Installation Specifications; FB-2350.....	Drawing A-191329
Component Locations: FB-235X-11/-31 .....	Drawing A-195428
F. Assy, 8x48-2.5" LED TNMC, Red.....	Drawing B-219923
F. Assy, 8x48-2.5" LED TNMC, Amber .....	Drawing B-219932
Specifications; LED Driver IV, 16 Col .....	Drawing A-288137
Address Table 1; GEN IV Driver Address Dip Switch.....	Drawing A-290261
Schematic; 240V GEN IV Outdoor LED, 16 COL Driver .....	Drawing A-324504
Schematic, FB-235X-11/21, Gen IV .....	Drawing A-824826
Schematic, FB-2352, FB-2354-11/21 Gen IV .....	Drawing C-859571





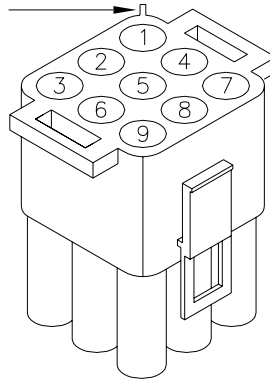
7 SEGMENT BAR DIGIT  
FRONT VIEW



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

CONNECTOR PIN NUMBERING

NOTE SPLINE NEAR NO. 1



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

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DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: BASKETBALL

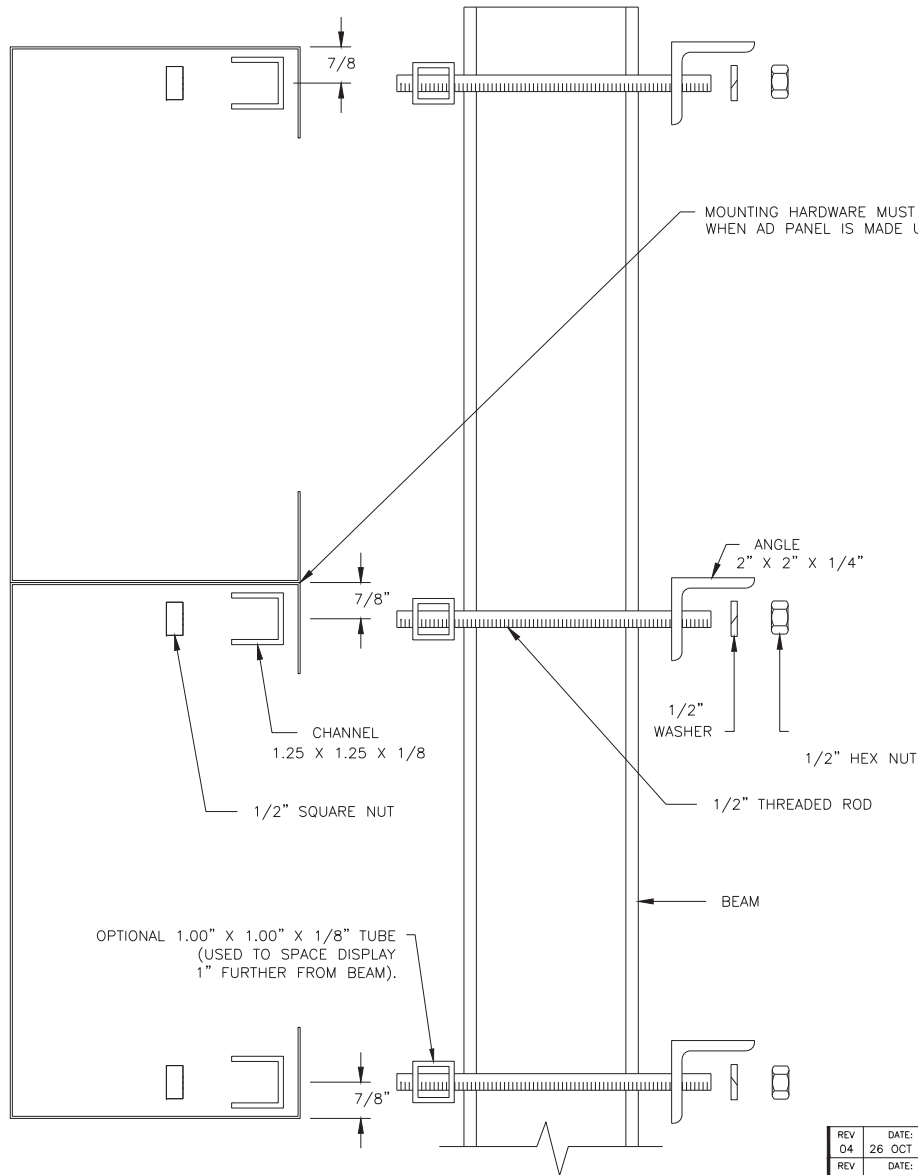
TITLE: SEGMENTATION, 7 SEGMENT BAR DIGIT

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	



MOUNTING HARDWARE MUST BE USED AT ALL AD PANEL SPLICES WHEN AD PANEL IS MADE UP OF MULTIPLE SECTIONS

MOUNTING INSTRUCTIONS:

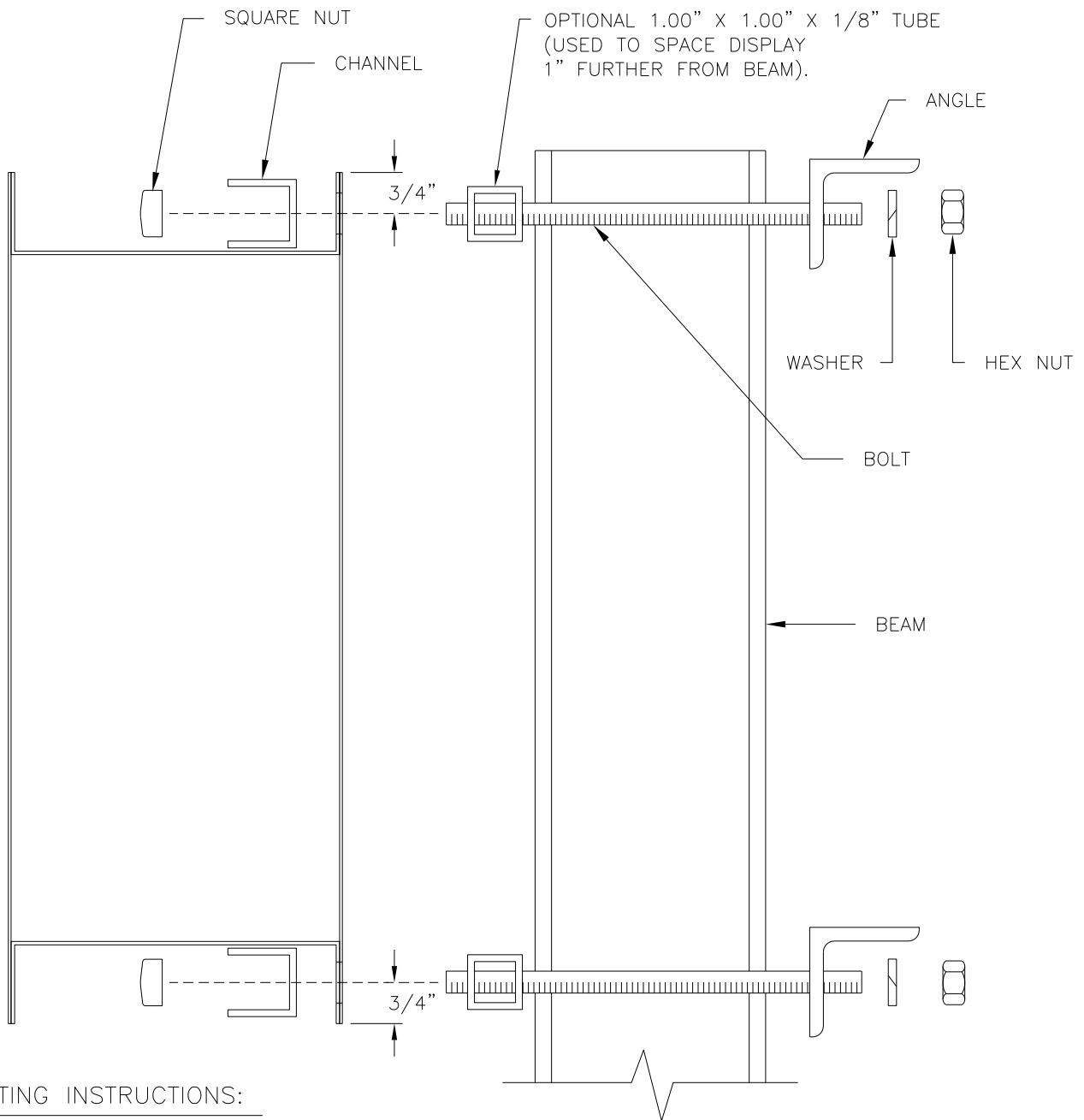
1. USE THE MOUNTING CHANNEL TO DETERMINE WHICH HOLE COMBINATION SHOULD BE USED. BE SURE TO KEEP THE BOLTS AS CLOSE TO THE BEAM AS POSSIBLE.
2. USING THE MOUNTING CHANNEL AS A TEMPLATE, DRILL 9/16" HOLES IN THE UPPER AND LOWER REAR FLANGE OF AD PANEL WHERE THE SUPPORTS WILL GO.
3. PLACE SQUARE NUTS INSIDE CHANNEL AND THREAD BOLTS THROUGH.
4. LIFT AD PANEL 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 PANEL IS ADJUSTED TO FINAL DESIRED POSITION, TIGHTEN HEX NUTS FIRMLY.

MOUNTING INSTRUCTIONS: FOR AD PANELS WITH BACKSHEETS.

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 AD PANEL WHERE THE SUPPORTS WILL GO.
3. REMOVE BACKSHEETS IN AREAS ABOVE AND BELOW HOLES DRILLED IN STEP 2.
4. PLACE SQUARE NUTS INSIDE CHANNEL AND THREAD BOLTS THROUGH.
5. REPLACE BACKSHEETS REMOVED IN STEP 3.
6. LIFT AD PANEL INTO POSITION WITH BOLTS STILL IN PLACE.
7. PLACE MOUNTING ANGLES OVER EACH PAIR OF BOLTS AND SECURE WITH LOCK WASHERS AND HEX NUTS.
8. WHEN PANEL IS ADJUSTED TO FINAL DESIRED POSITION, TIGHTEN HEX NUTS FIRMLY.

REV 04	DATE: 26 OCT 11	ADDED NOTE FOR USING MOUNTING HARDWARE AT AD PANEL SPLICES	BY: MBC
REV 03	DATE: 12 APR 10	ADDED 1" TUBE SPACER	BY: KDD
REV 02	DATE: 13 AUG 97	INCLUDED INSTRUCTIONS FOR AD PANELS WITH BACKSHEETS	BY: JAA
REV 01	DATE: 26 MAY 93	ADDED DESCRIPTION TEXT TO PARTS.	BY: MGG

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PROJ: OUTDOOR INCANDESCENT SCOREBOARDS TITLE: AD PANEL MOUNTING		
DESIGN:	DRAWN: MGUNDESON	DATE: 09 JUL 92
SCALE: NONE		
SHEET	REV	JOB NO.
	04	P1091
		FLUNC-TYPE-SIZE
		R-10-B
		52187

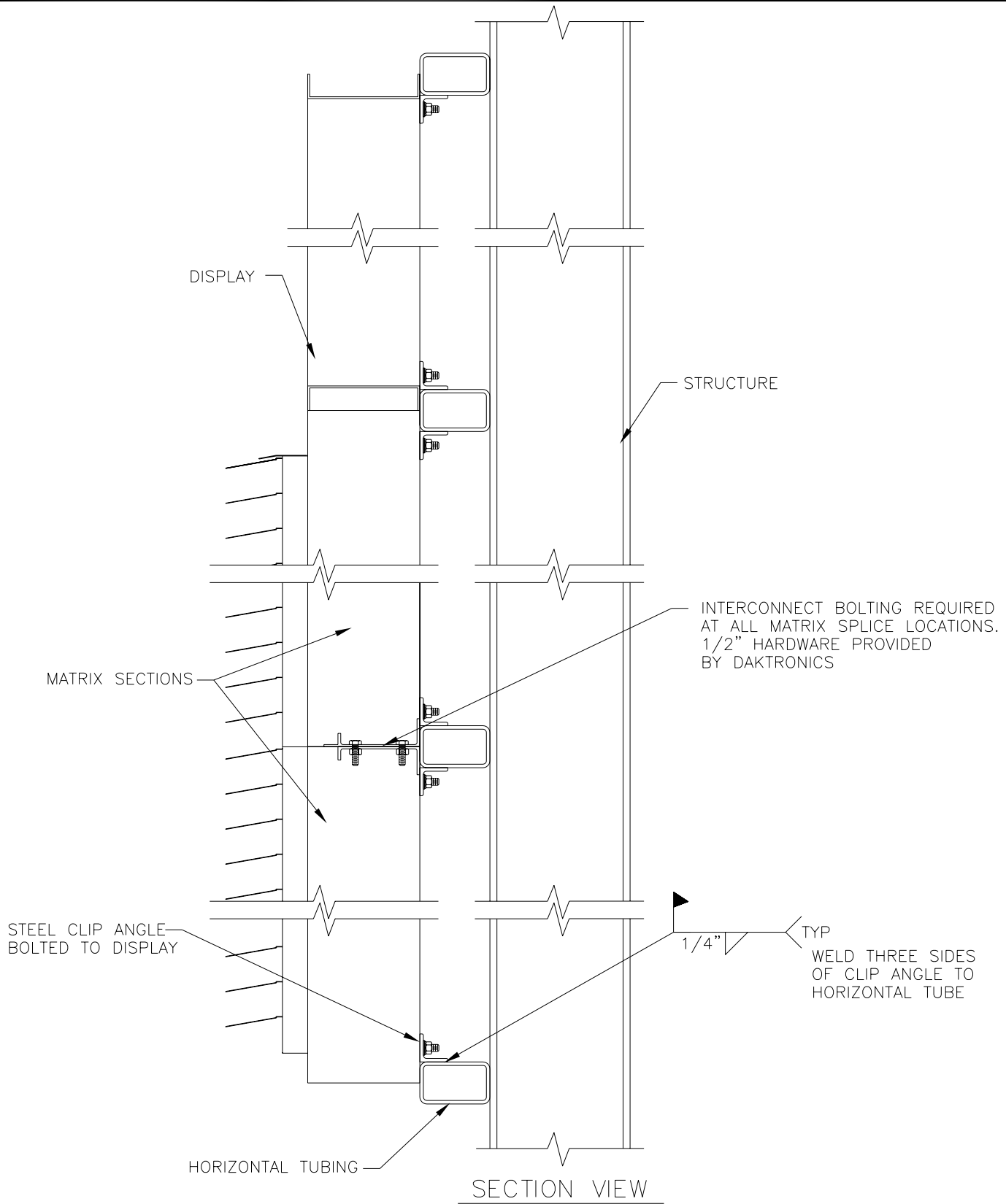


MOUNTING INSTRUCTIONS:

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.

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

01	12 APR 10	ADDED 1" TUBE SPACER	KDD	
REV.	DATE	DESCRIPTION	BY	APPR.



MOUNTING INSTRUCTIONS:

1. LIFT DISPLAY SECTION INTO POSITION.
2. ADJUST CLIP ANGLES AS NEEDED, SO THEY ARE FIRMLY AGAINST HORIZONTAL TUBE.
3. BOLT ANY MATRIX SPLICES.
4. WELD THE THREE SIDES OF EACH CLIP ANGLE THAT ARE IN CONTACT WITH THE HORIZONTAL TUBE.

<b>DAKTRONICS, INC. BROOKINGS, SD 57006</b>			
PROJ: <b>OUTDOOR SCOREBOARDS</b>			
TITLE: <b>STEEL CLIP ANGLE MOUNTING</b>			
DES. BY: <b>BPETER</b>		DRAWN BY: <b>BPETER</b>	
		DATE: <b>30JAN97</b>	
<b>REVISION</b>	APPR. BY:	<b>1173-E07A-83301</b>	
	SCALE: <b>1=10</b>		

REV.	DATE	DESCRIPTION	BY	APPR.
1	09OCT97	ADDED MATRIX SPLICE DETAIL ADDED NOTE 3	BDP	



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	1	0
3	0	0	0	0	0	0	1	1
4	0	0	0	0	0	1	0	0
5	0	0	0	0	0	1	0	1
6	0	0	0	0	0	1	1	0
7	0	0	0	0	0	1	1	1
8	0	0	0	0	1	0	0	0
9	0	0	0	0	1	0	0	1
10	0	0	0	0	1	0	1	0
11	0	0	0	0	1	1	1	1
12	0	0	0	0	1	1	0	0
13	0	0	0	0	1	1	0	1
14	0	0	0	0	1	1	1	0
15	0	0	0	0	1	1	1	1
16	0	0	0	1	0	0	0	0

DECIMAL ADDRESS	PIN 12	PIN 11	PIN 9	PIN 8	PIN 6	PIN 5	PIN 3	PIN 2
33	0	0	1	0	0	0	0	1
34	0	0	1	0	0	0	1	0
35	0	0	1	0	0	0	1	1
36	0	0	1	0	0	1	0	0
37	0	0	1	0	0	1	0	1
38	0	0	1	0	0	1	1	0
39	0	0	1	0	0	1	1	1
40	0	0	1	0	1	0	0	0
41	0	0	1	0	1	0	0	1
42	0	0	1	0	1	0	1	0
43	0	0	1	0	1	0	1	1
44	0	0	1	0	1	1	0	0
45	0	0	1	0	1	1	0	1
46	0	0	1	0	1	1	1	0
47	0	0	1	0	1	1	1	1
48	0	0	1	1	0	0	0	0

DECIMAL ADDRESS	PIN 12	PIN 11	PIN 9	PIN 8	PIN 6	PIN 5	PIN 3	PIN 2
65	0	1	0	0	0	0	0	1
66	0	1	0	0	0	0	1	0
67	0	1	0	0	0	0	1	1
68	0	1	0	0	0	1	0	0
69	0	1	0	0	0	1	0	1
70	0	1	0	0	0	1	1	0
71	0	1	0	0	0	1	1	1
72	0	1	0	0	1	0	0	0
73	0	1	0	0	1	0	0	1
74	0	1	0	0	1	0	1	0
75	0	1	0	0	1	0	1	1
76	0	1	0	0	1	1	0	0
77	0	1	0	0	1	1	0	1
78	0	1	0	0	1	1	1	0
79	0	1	0	0	1	1	1	1
80	0	1	0	1	0	0	0	0

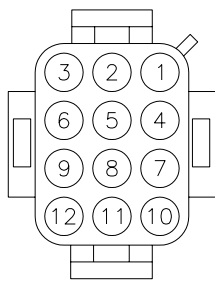
DECIMAL ADDRESS	PIN 12	PIN 11	PIN 9	PIN 8	PIN 6	PIN 5	PIN 3	PIN 2
97	0	1	1	0	0	0	0	1
98	0	1	1	0	0	0	1	0
99	0	1	1	0	0	0	1	1
100	0	1	1	0	0	1	0	0
101	0	1	1	0	0	1	0	1
102	0	1	1	0	0	1	1	0
103	0	1	1	0	0	1	1	1
104	0	1	1	0	1	0	0	0
105	0	1	1	0	1	0	0	1
106	0	1	1	0	1	0	1	0
107	0	1	1	0	1	0	1	1
108	0	1	1	0	1	1	0	0
109	0	1	1	0	1	1	0	1
110	0	1	1	0	1	1	1	0
111	0	1	1	0	1	1	1	1
112	0	1	1	1	0	0	0	0

DECIMAL ADDRESS	PIN 12	PIN 11	PIN 9	PIN 8	PIN 6	PIN 5	PIN 3	PIN 2
17	0	0	0	1	0	0	0	1
18	0	0	0	1	0	0	1	0
19	0	0	0	1	0	0	1	1
20	0	0	0	1	0	1	0	0
21	0	0	0	1	0	1	0	1
22	0	0	0	1	0	1	1	0
23	0	0	0	1	0	1	1	1
24	0	0	0	1	1	0	0	0
25	0	0	0	1	1	0	0	1
26	0	0	0	1	1	0	1	0
27	0	0	0	1	1	0	1	1
28	0	0	0	1	1	1	0	0
29	0	0	0	1	1	1	0	1
30	0	0	0	1	1	1	1	0
31	0	0	0	1	1	1	1	1
32	0	0	1	0	0	0	0	0

DECIMAL ADDRESS	PIN 12	PIN 11	PIN 9	PIN 8	PIN 6	PIN 5	PIN 3	PIN 2
49	0	0	1	1	0	0	0	1
50	0	0	1	1	0	0	1	0
51	0	0	1	1	0	0	1	1
52	0	0	1	1	0	1	0	0
53	0	0	1	1	0	1	0	1
54	0	0	1	1	0	1	1	0
55	0	0	1	1	0	1	1	1
56	0	0	1	1	1	0	0	0
57	0	0	1	1	1	0	0	1
58	0	0	1	1	1	0	1	0
59	0	0	1	1	1	0	1	1
60	0	0	1	1	1	1	0	0
61	0	0	1	1	1	1	0	1
62	0	0	1	1	1	1	1	0
63	0	0	1	1	1	1	1	1
64	0	1	0	0	0	0	0	0

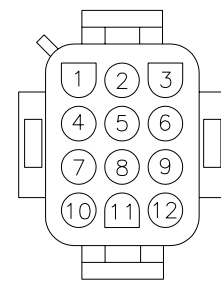
DECIMAL ADDRESS	PIN 12	PIN 11	PIN 9	PIN 8	PIN 6	PIN 5	PIN 3	PIN 2
81	0	1	0	1	0	0	0	1
82	0	1	0	1	0	0	1	0
83	0	1	0	1	0	0	1	1
84	0	1	0	1	0	1	0	0
85	0	1	0	1	0	1	0	1
86	0	1	0	1	0	1	1	0
87	0	1	0	1	0	1	1	1
88	0	1	0	1	1	0	0	0
89	0	1	0	1	1	0	0	1
90	0	1	0	1	1	0	1	0
91	0	1	0	1	1	0	1	1
92	0	1	0	1	1	1	0	0
93	0	1	0	1	1	1	0	1
94	0	1	0	1	1	1	1	0
95	0	1	0	1	1	1	1	1
96	0	1	1	0	0	0	0	0

DECIMAL ADDRESS	PIN 12	PIN 11	PIN 9	PIN 8	PIN 6	PIN 5	PIN 3	PIN 2
113	0	1	1	1	0	0	0	1
114	0	1	1	1	0	0	1	0
115	0	1	1	1	0	0	1	1
116	0	1	1	1	0	1	0	0
117	0	1	1	1	0	1	0	1
118	0	1	1	1	0	1	1	0
119	0	1	1	1	0	1	1	1
120	0	1	1	1	1	0	0	0
121	0	1	1	1	1	0	0	1
122	0	1	1	1	1	0	1	0
123	0	1	1	1	1	0	1	1
124	0	1	1	1	1	1	0	0
125	0	1	1	1	1	1	0	1
126	0	1	1	1	1	1	1	0
127	0	1	1	1	1	1	1	1
128	1	0	0	0	0	0	0	0



ADDRESS PLUG  
WIRE SIDE

WIRING DIAGRAM  
ADDRESS PLUG  
WITH ALL WIRES  
CONNECTED



BOTTOM VIEW

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ:  
TITLE: ADDRESS TABLE, 1 THROUGH 128  
DES. BY: AVB DRAWN BY: A VANBEMMEL DATE: 28 APR 99

REVISION 01 APPR. BY: SCALE: NONE 1150-R04A-115078

REV.	DATE	DESCRIPTION	BY	APPR.
01	08 MAR 05	ADDED BOTTOM VIEW	KQB	

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
129	1	0	0	0	0	0	0	1
130	1	0	0	0	0	0	1	0
131	1	0	0	0	0	0	1	1
132	1	0	0	0	0	1	0	0
133	1	0	0	0	0	1	0	1
134	1	0	0	0	0	1	1	0
135	1	0	0	0	0	1	1	1
136	1	0	0	0	1	0	0	0
137	1	0	0	0	1	0	0	1
138	1	0	0	0	1	0	1	0
139	1	0	0	0	1	0	1	1
140	1	0	0	0	1	1	0	0
141	1	0	0	0	1	1	0	1
142	1	0	0	0	1	1	1	0
143	1	0	0	0	1	1	1	1
144	1	0	0	1	0	0	0	0

DECIMAL ADDRESS	PIN 12	PIN 11	PIN 9	PIN 8	PIN 6	PIN 5	PIN 3	PIN 2
161	1	0	1	0	0	0	0	1
162	1	0	1	0	0	0	1	0
163	1	0	1	0	0	0	1	1
164	1	0	1	0	0	1	0	0
165	1	0	1	0	0	1	0	1
166	1	0	1	0	0	1	1	0
167	1	0	1	0	0	1	1	1
168	1	0	1	0	1	0	0	0
169	1	0	1	0	1	0	0	1
170	1	0	1	0	1	0	1	0
171	1	0	1	0	1	0	1	1
172	1	0	1	0	1	1	0	0
173	1	0	1	0	1	1	0	1
174	1	0	1	0	1	1	1	0
175	1	0	1	0	1	1	1	1
176	1	0	1	1	0	0	0	0

DECIMAL ADDRESS	PIN 12	PIN 11	PIN 9	PIN 8	PIN 6	PIN 5	PIN 3	PIN 2
193	1	1	0	0	0	0	0	1
194	1	1	0	0	0	0	1	0
195	1	1	0	0	0	0	1	1
196	1	1	0	0	0	1	0	0
197	1	1	0	0	0	1	0	1
198	1	1	0	0	0	1	1	0
199	1	1	0	0	0	1	1	1
200	1	1	0	0	1	0	0	0
201	1	1	0	0	1	0	0	1
202	1	1	0	0	1	0	1	0
203	1	1	0	0	1	0	1	1
204	1	1	0	0	1	1	0	0
205	1	1	0	0	1	1	0	1
206	1	1	0	0	1	1	1	0
207	1	1	0	0	1	1	1	1
208	1	1	0	1	0	0	0	0

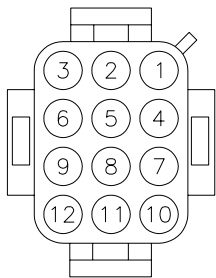
DECIMAL ADDRESS	PIN 12	PIN 11	PIN 9	PIN 8	PIN 6	PIN 5	PIN 3	PIN 2
225	1	1	1	0	0	0	0	1
226	1	1	1	0	0	0	1	0
227	1	1	1	0	0	0	1	1
228	1	1	1	0	0	1	0	0
229	1	1	1	0	0	1	0	1
230	1	1	1	0	0	1	1	0
231	1	1	1	0	0	1	1	1
232	1	1	1	0	1	0	0	0
233	1	1	1	0	1	0	0	1
234	1	1	1	0	1	0	1	0
235	1	1	1	0	1	0	1	1
236	1	1	1	0	1	1	0	0
237	1	1	1	0	1	1	0	1
238	1	1	1	0	1	1	1	0
239	1	1	1	0	1	1	1	1
240	1	1	1	1	0	0	0	0

DECIMAL ADDRESS	PIN 12	PIN 11	PIN 9	PIN 8	PIN 6	PIN 5	PIN 3	PIN 2
145	1	0	0	1	0	0	0	1
146	1	0	0	1	0	0	1	0
147	1	0	0	1	0	0	1	1
148	1	0	0	1	0	1	0	0
149	1	0	0	1	0	1	0	1
150	1	0	0	1	0	1	1	0
151	1	0	0	1	0	1	1	1
152	1	0	0	1	1	0	0	0
153	1	0	0	1	1	0	0	1
154	1	0	0	1	1	0	1	0
155	1	0	0	1	1	0	1	1
156	1	0	0	1	1	1	0	0
157	1	0	0	1	1	1	0	1
158	1	0	0	1	1	1	1	0
159	1	0	0	1	1	1	1	1
160	1	0	1	0	0	0	0	0

DECIMAL ADDRESS	PIN 12	PIN 11	PIN 9	PIN 8	PIN 6	PIN 5	PIN 3	PIN 2
177	1	0	1	1	0	0	0	1
178	1	0	1	1	0	0	1	0
179	1	0	1	1	0	0	1	1
180	1	0	1	1	0	1	0	0
181	1	0	1	1	0	1	0	1
182	1	0	1	1	0	1	1	0
183	1	0	1	1	0	1	1	1
184	1	0	1	1	1	0	0	0
185	1	0	1	1	1	0	0	1
186	1	0	1	1	1	0	1	0
187	1	0	1	1	1	0	1	1
188	1	0	1	1	1	1	0	0
189	1	0	1	1	1	1	0	1
190	1	0	1	1	1	1	1	0
191	1	0	1	1	1	1	1	1
192	1	1	0	0	0	0	0	0

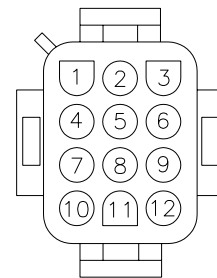
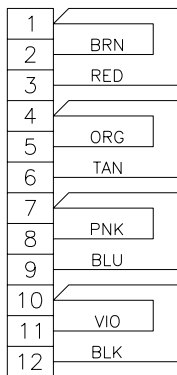
DECIMAL ADDRESS	PIN 12	PIN 11	PIN 9	PIN 8	PIN 6	PIN 5	PIN 3	PIN 2
209	1	1	0	1	0	0	0	1
210	1	1	0	1	0	0	1	0
211	1	1	0	1	0	0	1	1
212	1	1	0	1	0	1	0	0
213	1	1	0	1	0	1	0	1
214	1	1	0	1	0	1	1	0
215	1	1	0	1	0	1	1	1
216	1	1	0	1	1	0	0	0
217	1	1	0	1	1	0	0	1
218	1	1	0	1	1	0	1	0
219	1	1	0	1	1	0	1	1
220	1	1	0	1	1	1	0	0
221	1	1	0	1	1	1	0	1
222	1	1	0	1	1	1	1	0
223	1	1	0	1	1	1	1	1
224	1	1	1	0	0	0	0	0

DECIMAL ADDRESS	PIN 12	PIN 11	PIN 9	PIN 8	PIN 6	PIN 5	PIN 3	PIN 2
241	1	1	1	1	0	0	0	1
242	1	1	1	1	0	0	1	0
243	1	1	1	1	0	0	1	1
244	1	1	1	1	0	1	0	0
245	1	1	1	1	0	1	0	1
246	1	1	1	1	0	1	1	0
247	1	1	1	1	0	1	1	1
248	1	1	1	1	1	0	0	0
249	1	1	1	1	1	0	0	1
250	1	1	1	1	1	0	1	0
251	1	1	1	1	1	0	1	1
252	1	1	1	1	1	1	0	0
253	1	1	1	1	1	1	0	1
254	1	1	1	1	1	1	1	0
255	1	1	1	1	1	1	1	1



ADDRESS PLUG  
WIRE SIDE

WIRING DIAGRAM  
ADDRESS PLUG  
WITH ALL WIRES  
CONNECTED



BOTTOM VIEW

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ:

TITLE: ADDRESS TABLE, 129 THROUGH 255

DES. BY: AVB

DRAWN BY: A VANBEMMEL

DATE: 28 APR 99

REVISION

APPR. BY:

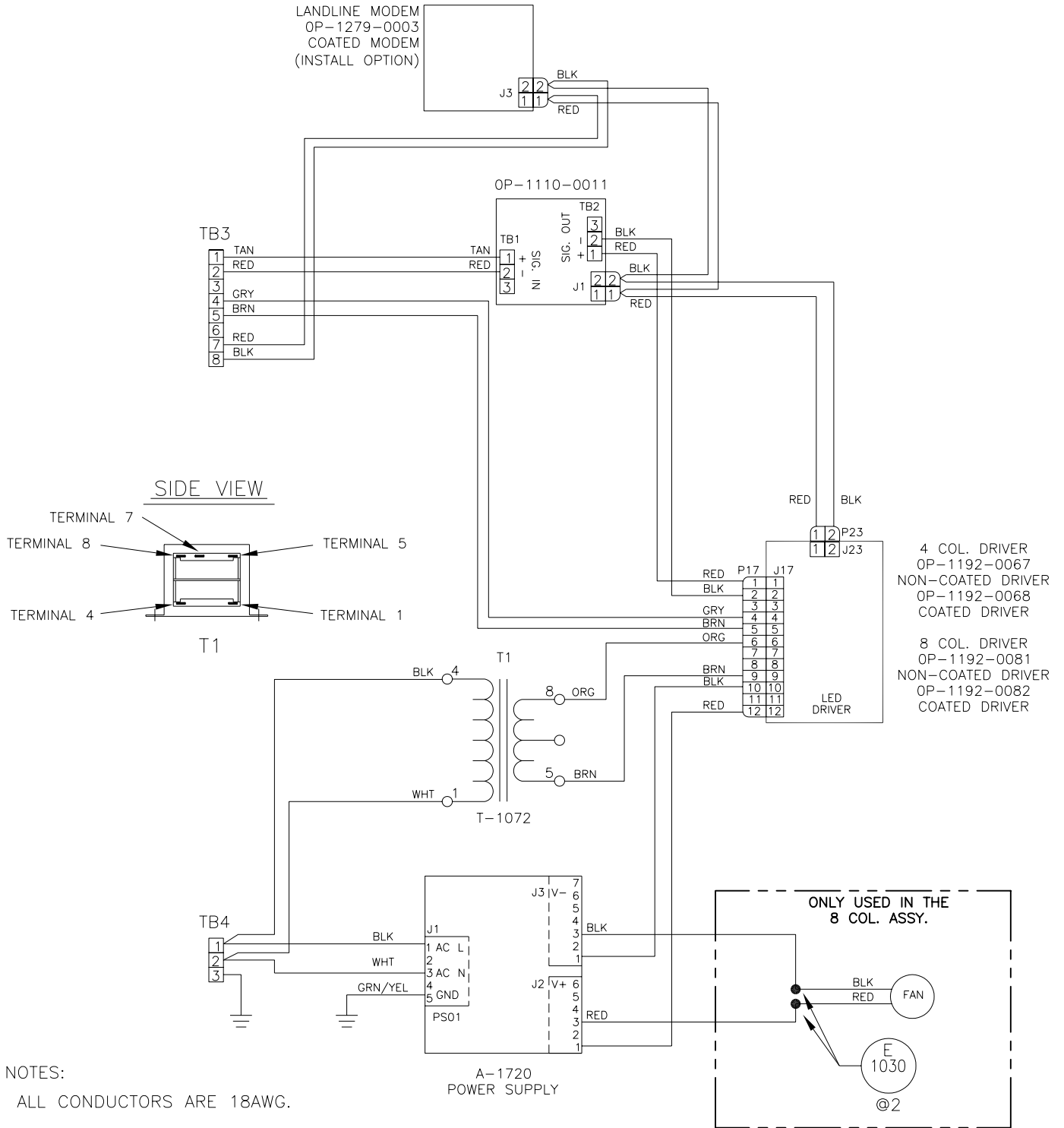
SCALE: NONE

01

1150-R04A-115079

REV.	DATE	DESCRIPTION	BY	APPR.
01	08 MAR 05	ADDED BOTTOM VIEW	KQB	

LANDLINE MODEM  
OP-1279-0003  
COATED MODEM  
(INSTALL OPTION)



4 COL. DRIVER  
OP-1192-0067  
NON-COATED DRIVER  
OP-1192-0068  
COATED DRIVER

8 COL. DRIVER  
OP-1192-0081  
NON-COATED DRIVER  
OP-1192-0082  
COATED DRIVER

NOTES:  
ALL CONDUCTORS ARE 18AWG.

A-1720  
POWER SUPPLY

08	17 DEC 03	CHANGED WIRE COLORS OF T1 CONNECTIONS. ADDED SIDE VIEW OF T1.	JBS	
07	29 APR 03	ADDED T1, FOR TIMING.	TAS	MWM
06	24 FEB 03	CHANGED J3 ON POWER SUPPLY TO 7 PINS PER ECO-27985.	AVB	
05	14 JAN 03	CHANGED THE BLU TEXT TO RED ON TB3 CONNECTOR	CME	
04	24 OCT 02	CHANGED 12V DC WIRING CONNECTIONS FROM MASC DRIVER TO SIGNAL SURGE PROTECTOR, LANDLINE MODEM AND TERMINAL BLOCK	JBS	
03	29MAY02	MOVED WIRES GOING INTO PIN 6 & 9 OF P17 TO PIN 10 & 12 OF P17	NMB	
02	06 MAY 02	CHANGED WIRE COLORS FOR TB3 CONNECTIONS	MWM	
01	24APR02	ADDED TB3-7 & 8 CONNECTIONS TO 4 COL. LED DRIVER. ADDED P22 AND J22 ALSO.	THS	
REV.	DATE	DESCRIPTION	BY	APPR.

0A-1279-0086  
MULTI PURPOSE HARNESS ASSY.

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DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: DATA TIME LED DISPLAYS

TITLE: SCHEMATIC; MULTIPURPOSE LED DRVR

DES. BY: MMILLER

DRAWN BY: MMILLER

DATE: 08 APR 02

REVISION

APPR. BY:

08

SCALE: 1=1

1279-R03A-165028

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

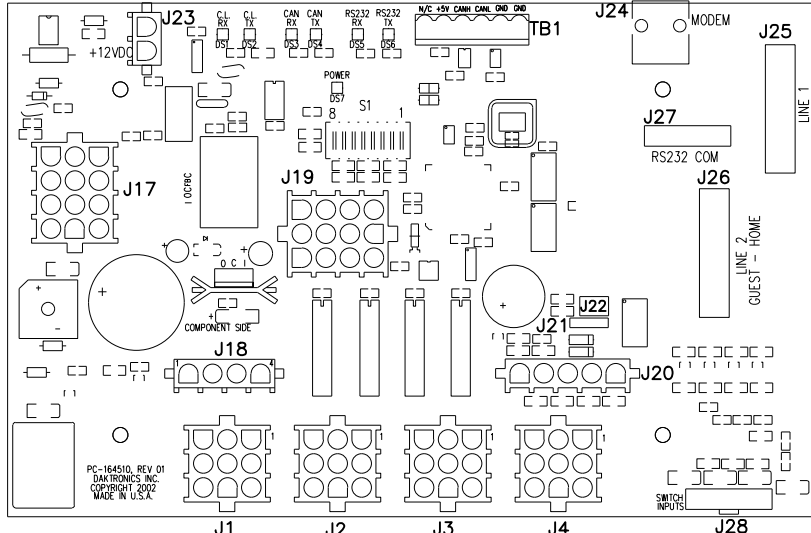
TB1 CAN	
PIN	FUNCTION
1	N/C
2	+5V-P
3	CANH-P
4	CANL-P
5	GND-N
6	GND-N

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	SEGF-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

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

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

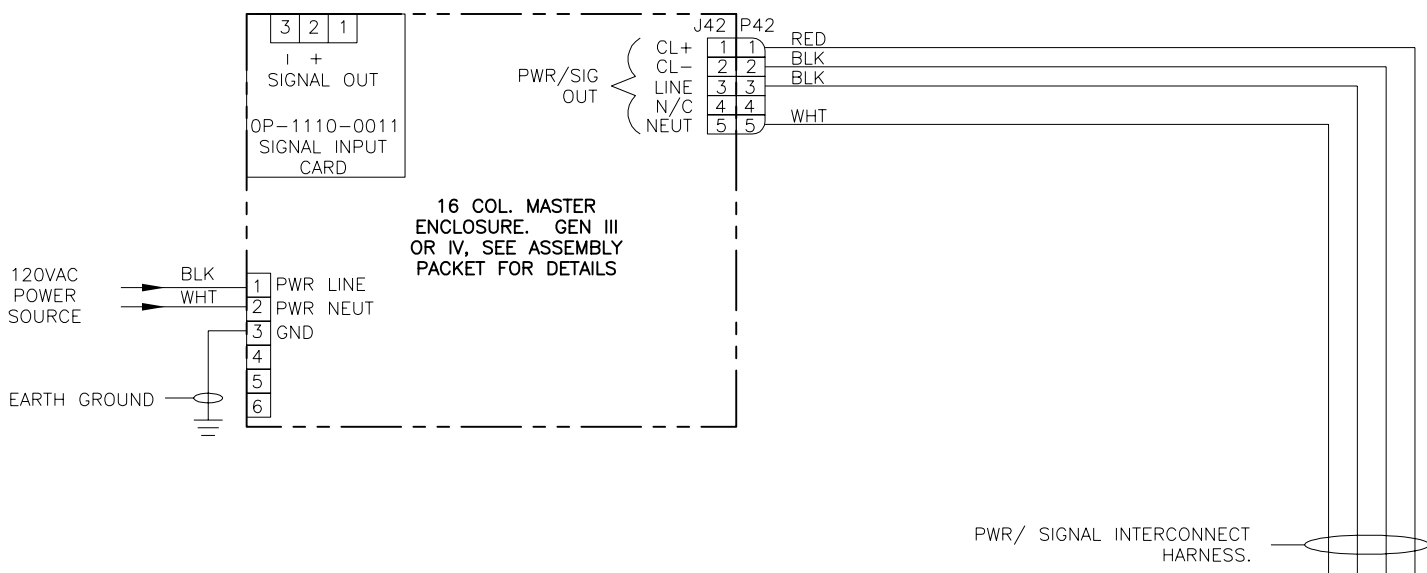
NOTE:

- 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

REV	DATE:	CORRECTED S1 PINOUT	BY:
04	01 FEB 13		RBN
3	27 NOV 04	UPDATE DRIVER J-27 FOR CORRECT PIN OUT	BY:
2	16 MAY 03	UPDATE DRIVER FOR LATEST REVISION OF MASC DRIVER.	BY:
1	06 JUN 02	ADDED LED LABELS ADDED NEW NOTES	BY:

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	<p>DO NOT SCALE DRAWING</p>	
<p>PROJ: <b>OUTDOOR LED SCOREBOARDS</b></p>		
<p>TITLE: <b>4 COLUMN MASC LED DRIVER SPECIFICATIONS</b></p>		
DESIGN:	DRAWN: JSPAHR	DATE: 29 APR 02
SCALE: 1=2		
SHEET	REV	JOB NO:
	04	P 1192
		FUNC -TYPE-SIZE
		R - 07 - A
		<b>166216</b>

REV.	01	20 FEB 03	CORRECTED SPELLING ON NEUT ADDED 18 COL. WIDE PART NUMBERS.	DESCRIPTION	BY	MMM	APPR.
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PWR/SIG INTERCONNECT HARNESS

PART NUMBER	LENGTH
0A-1192-1028	4'
0A-1192-1029	8'
0A-1192-1030	10'
0A-1192-1031	12'
0A-1192-1032	16'
0A-1192-1033	22'
0A-1192-1034	26'
0A-1192-1083	30'
0A-1192-1084	35'

THIS SCHEMATIC REPRESENTS THE INTERCONNECT OF THE MASTER DRIVER TO OTHER DRIVERS/TNMC'S IN A MULTI DRIVER SCOREBOARD CONFIGURATION. SEE THE PRE-PAINT ASSEMBLY DRAWING AND/OR THE FINAL ASSEMBLY DRAWING FOR THE PART NUMBERS OF THE INTERCONNECT HARNESSES NEEDED AND INSTALLATION INSTRUCTIONS.

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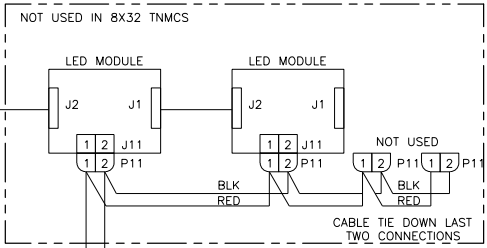
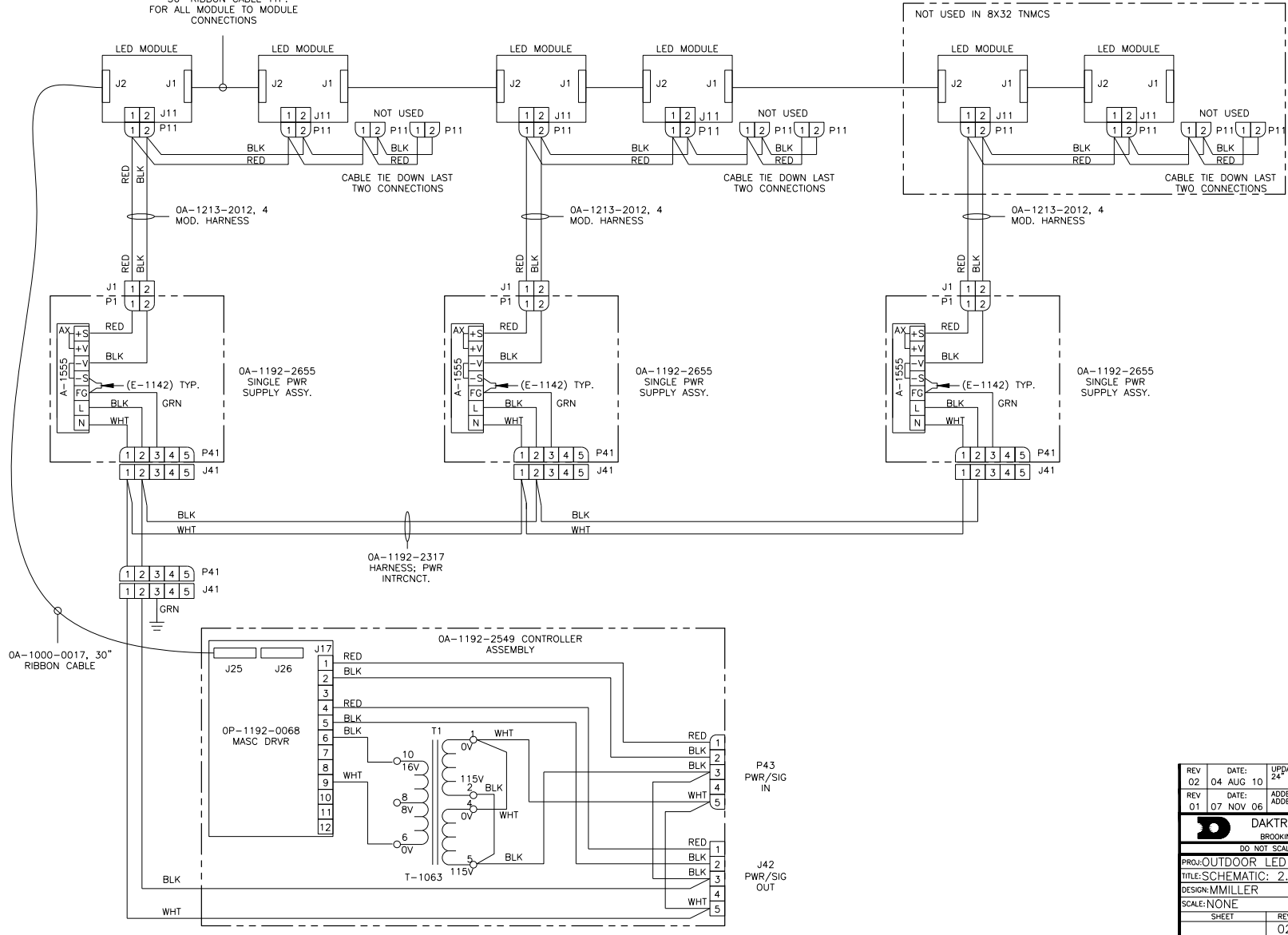
PROJ: OUTDOOR LED SCOREBOARDS  
 TITLE: SCHEMATIC; GEN III & IV O.D. LED, 2 DRYR DISPLAY  
 DES. BY: MILLER  
 DRAWN BY: MILLER  
 DATE: 03 JAN 02

REVISION 01  
 APPR. BY: NONE  
 SCALE: NONE  
 1192-R10A-180637

DAKTRONICS, INC. BROOKINGS, SD 57006

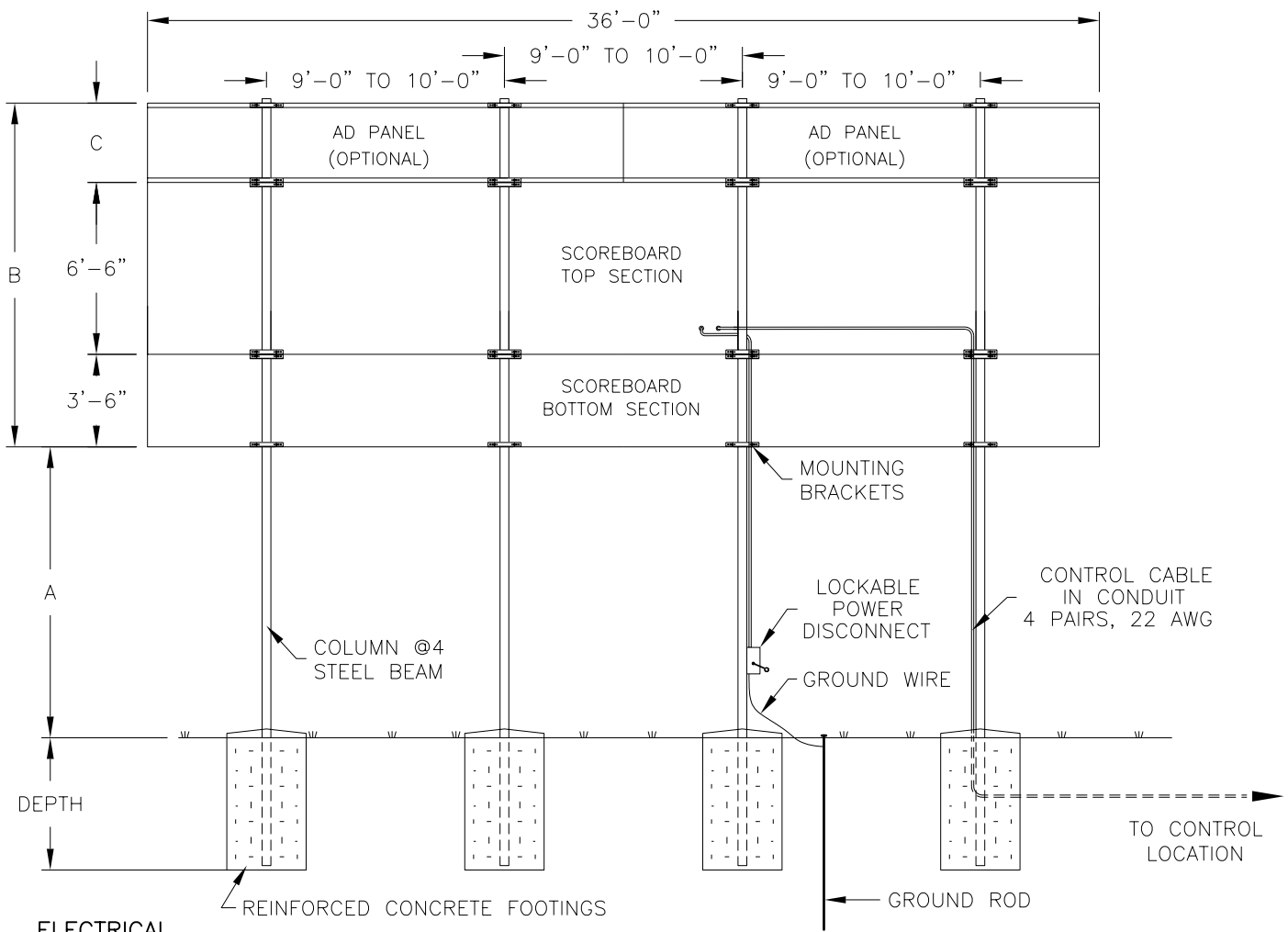
OA-1192-2653 - 8X32 2.5" RED LED TNMC, GEN III & GEN IV  
 OA-1192-2575 - 8X48 2.5" RED LED TNMC, GEN III & GEN IV

OA-1000-0018  
 36" RIBBON CABLE TYP.  
 FOR ALL MODULE TO MODULE  
 CONNECTIONS



REV 02	DATE: 04 AUG 10	UPDATED LABEL AND CHANGED OA-1000-0018 FROM 24" TO 36"	BY: JJD
REV 01	DATE: 07 NOV 06	ADDED 64 MM TO THE TITLE BLOCK AND ADDED GEN IV TO THE DESCRIPTION	BY: SAL
<b>DAKTRONICS, INC.</b> BROOKINGS, SD 57006 DO NOT SCALE DRAWING		THE CONCEPTS EXPRESSED AND DETAILS SHOWN ON THIS DRAWING ARE CONFIDENTIAL AND PROPRIETARY. DO NOT REPRODUCE BY ANY MEANS WITHOUT THE EXPRESSED WRITTEN CONSENT OF DAKTRONICS, INC. COPYRIGHT 2010 DAKTRONICS, INC.	
<b>PROJ: OUTDOOR LED DIGIT SCOREBOARDS</b> <b>TITLE: SCHEMATIC: 2.5" / 64MM RED/ORG - TNMC GEN III AND IV</b> DESIGN: MMILLER      DRAWN: MMILLER      DATE: 13 MAY 03			
SCALE: NONE			
SHEET	REV 02	JOB NO: 1192	FLUNC-TYPE-SIZE R-03-B
			188553





**ELECTRICAL**

**REAR VIEW**

POWER CABLE MUST HAVE A SEPERATE GROUND CONDUCTOR. SCOREBOARD MUST BE CONNECTED TO A GROUND ROD AT SCOREBOARD LOCATION.

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 LICENCED ENGINEER. DAKTRONICS DOES NOT ASSUME ANY LIABILITY FOR ANY INSTALLATIONS DERIVED FROM THIS INFORMATION OR DESIGNED AND INSTALLED BY OTHERS.

**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 5 to 10 inches in this chart.

MODELS FB-2350						
VERTICAL DISTANCE (A)	AD PANEL HEIGHT (C)	COMBINED HEIGHT (B)		DESIGN WIND VELOCITY		
				70 MPH	80 MPH	100 MPH
10 FT	NONE	10'-0"	BEAM	W12X26	W8X28	W10X33
			FOOTING	3.0X7.2	3.0X7.9	3.0X9.4
	2 FT	12'-0"	BEAM	W14X30	W10X33	W10X39
			FOOTING	3.0X7.9	3.0X8.7	3.0X10.3
	4 FT	14'-0"	BEAM	W10X33	W10X39	W10X45
			FOOTING	3.0X8.5	3.0X9.4	3.0X11.1
14 FT	NONE	10'-0"	BEAM	W14W30	W8X31	W10X39
			FOOTING	3.0X7.5	3.0X8.3	3.0X9.8
	2 FT	12'-0"	BEAM	W10X33	W10X39	W12X45
			FOOTING	3.0X8.2	3.0X9.0	3.0X10.7
	4 FT	14'-0"	BEAM	W10X39	W14X43	W14X53
			FOOTING	3.0X8.8	3.0X9.7	3.0X11.5
18 FT	NONE	10'-0"	BEAM	W8X31	W10X33	W14X43
			FOOTING	3.0X7.9	3.0X8.7	3.0X10.2
	2 FT	12'-0"	BEAM	W10X39	W10X39	W12X50
			FOOTING	3.0X8.5	3.0X9.4	3.0X11.1
	4 FT	14'-0"	BEAM	W12X40	W10X45	W12X53
			FOOTING	3.0X9.1	3.0X10.0	3.0X11.9

FOOTING = DIAMETER X DEPTH

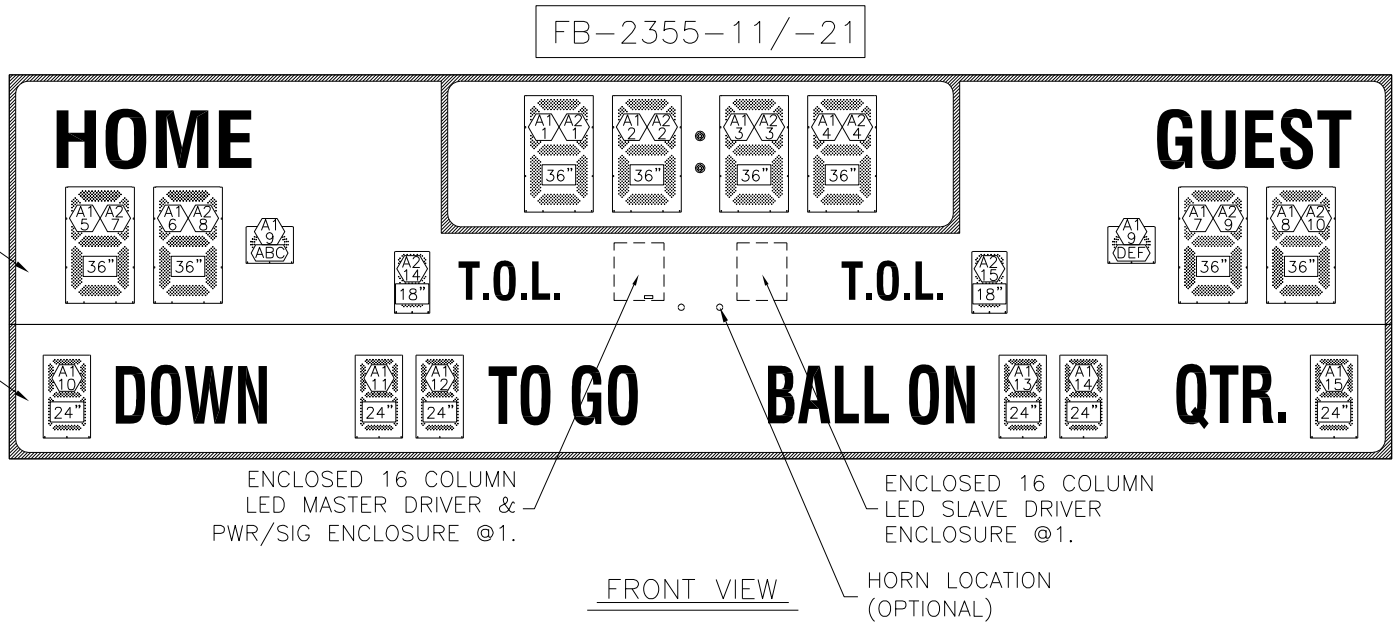
\*UBC 97 CODE, EXP C, IMPORTANCE = 1.0 SOIL CLASS 4 (150pcf/ft X 2 LATERAL SOIL BEARING)

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DAKTRONICS, INC. BROOKINGS, SD 57006			
PROJ: OUTDOOR INTEGRATED SCOREBOARDS			
TITLE: INSTALLATION SPECIFICATIONS; FB-2350			
DES. BY: RNEYEN/MCOPLA		DRAWN BY: MCOPLAN	
		DATE: 20AUG03	
REVISION	APPR. BY:	1157-R08A-191329	
00	SCALE: 1=80		

REV.	DATE	DESCRIPTION	BY	APPR.



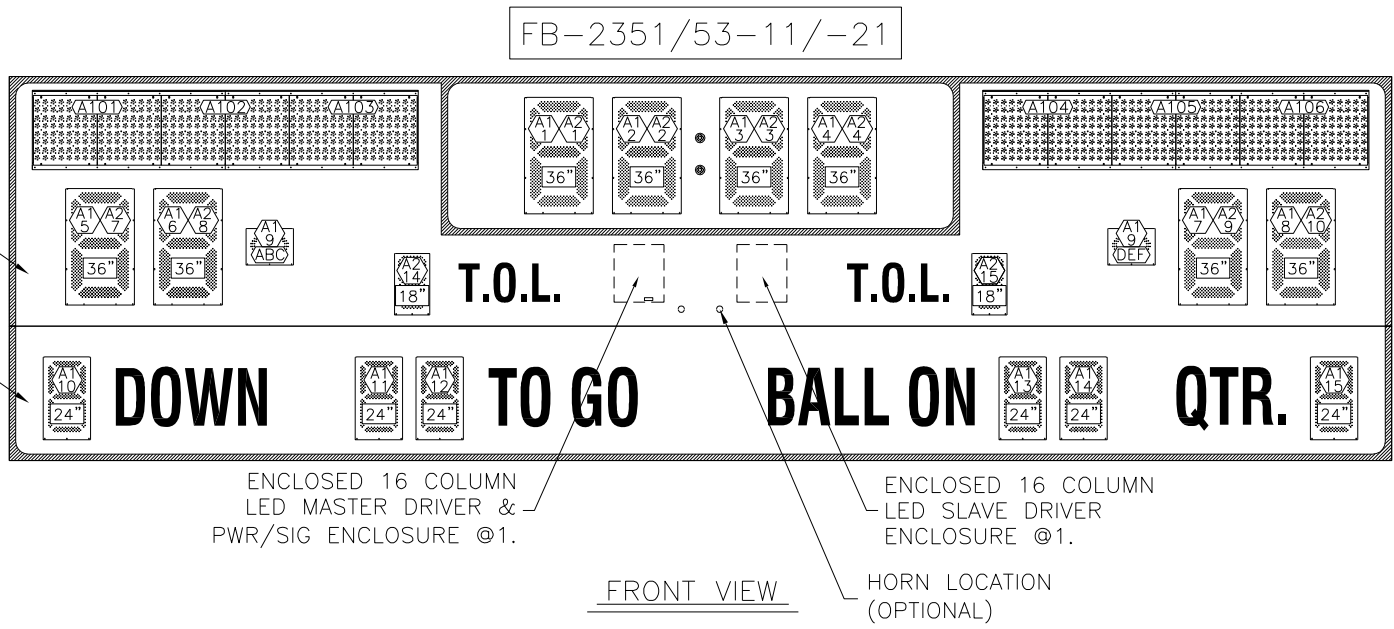
REV.	DATE	DESCRIPTION	BY	APPR.
02	16 APR 09	UPDATED MODEL NOMENCLATURE AND UPDATED DIGIT DESIGNATIONS	MRH	
01	13MAY04	UPDATED MODEL NOMENCLATURE.	KJB	



ENCLOSED 16 COLUMN  
LED MASTER DRIVER &  
PWR/SIG ENCLOSURE @1.

ENCLOSED 16 COLUMN  
LED SLAVE DRIVER  
ENCLOSURE @1.

HORN LOCATION  
(OPTIONAL)



ENCLOSED 16 COLUMN  
LED MASTER DRIVER &  
PWR/SIG ENCLOSURE @1.

ENCLOSED 16 COLUMN  
LED SLAVE DRIVER  
ENCLOSURE @1.

HORN LOCATION  
(OPTIONAL)

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

= SEGMENT DESIGNATIONS

= DIGIT SIZE

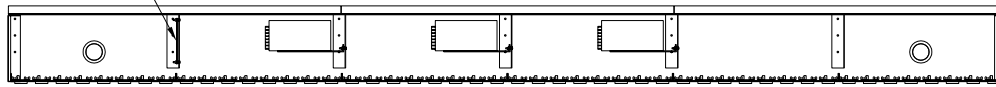
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PROJ: OUTDOOR LED SCOREBOARDS  
DAKTRONICS, INC. BROOKINGS, SD 57006

TITLE: COMPONENT LOCATIONS: FB-235X-11/-21 - G3  
DES. BY: MCOPLAN  
DRAWN BY: MCOPLAN  
DATE: 21AUG03

REVISION 02  
APPR. BY: 1192-R08A-195428  
SCALE: 1=60

LOCATION OF MDC

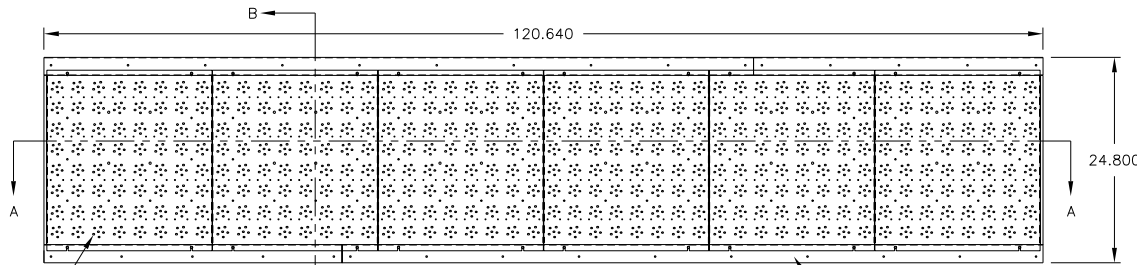


VIEW A-A

	221	1	1	0	1	1	1	0	1
		PN 12	PN 11	PN 9	PN 8	PN 6	PN 5	PN 3	PN 2

SET AD PLUG TO 221

APPLY A BEAD OF SILICONE TO THE TOP OF SHROUD TO PREVENT WATER FROM ENTERING SHELL BETWEEN SPOT-WELDED PARTS



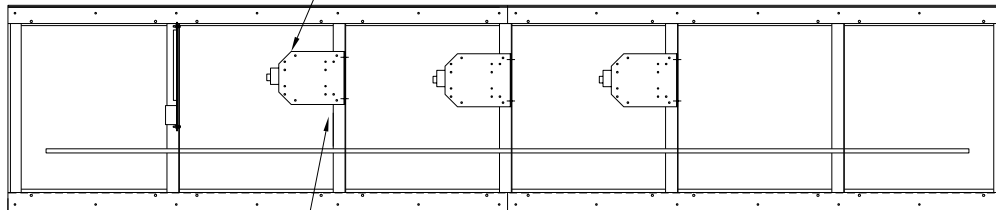
FRONT VIEW

8x8-2.5" RED/ORG MOD  
OA 1192 2673  
@6

RIVET  
HC 1125  
@28

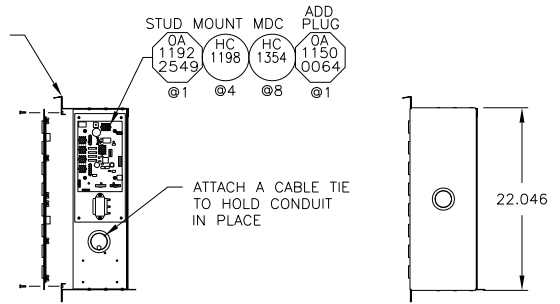
USE HOLES TO ATTACH SHELL TO THE TNMC SECTION OF THE SCOREBOARD, ATTACH WITH RIVETS.

MOUNT POWER SUPPLY SO IT CAN BE SERVICED FROM THE FRONT OR REAR BASED ON SCOREBOARD ACCESS. SEE F.ASSY DWG OF SCOREBOARD. (REAR ACCESS SHOWN)



FRONT VIEW (SHOWN WITH FRONT OPEN)

STUD MOUNT POWER SUPPLY  
HC 1198 HC 1354 OA 1192 2655  
@6 @12 @3



VIEW B-B

SIDE VIEW

STUD MOUNT MDC ADD PLUG  
OA 1192 2549 HC 1198 HC 1354 OA 1150 0064  
@1 @4 @8 @1

ATTACH A CABLE TIE TO HOLD CONDUIT IN PLACE

22.046

SCHEMATIC: 8x48-2.5" LED TNMC  
1192-R03B-188553

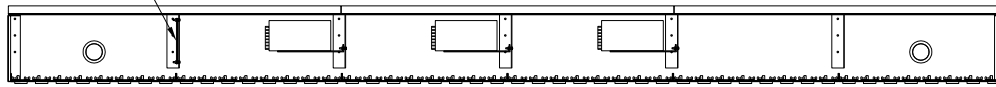
PRE-PAINT ASSY: 8x48-2.5" LED TNMC  
1192-E10B-219768

OTHER ASSY PACKETS NOT SHOWN:  
.0A-1192-0391..PRE-PAINT ASSY, 8x48-2.5" LED TNMC

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DAKTRONICS, INC. BROOKINGS, SD 57006			
PROJ: OUTDOOR LED DIGIT SCOREBOARDS			
TITLE: F. ASSY, 8X48-2.5" LED TNMC, RED			
DES. BY: KBRICKER	DRAWN BY: CCAIN	DATE: 29 JUL 04	
REVISION	APPR. BY:	SCALE: 1=15	
00		1192-E10B-219923	

REV.	DATE	DESCRIPTION	BY	APPR.

LOCATION OF MDC

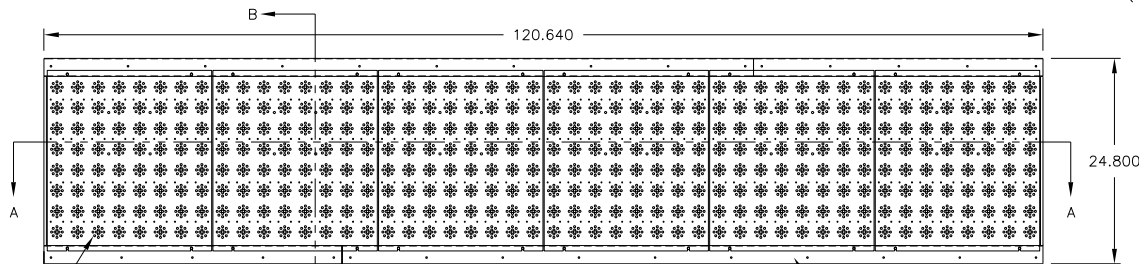


VIEW A-A

	PIN 12	PIN 11	PIN 9	PIN 8	PIN 6	PIN 5	PIN 3	PIN 2
221	1	1	0	1	1	1	0	1

SET AD PLUG TO 221

APPLY A BEAD OF SILICONE TO THE TOP OF SHROUD TO PREVENT WATER FROM ENTERING SHELL BETWEEN SPOT-WELDED PARTS. (POST-PAINT)



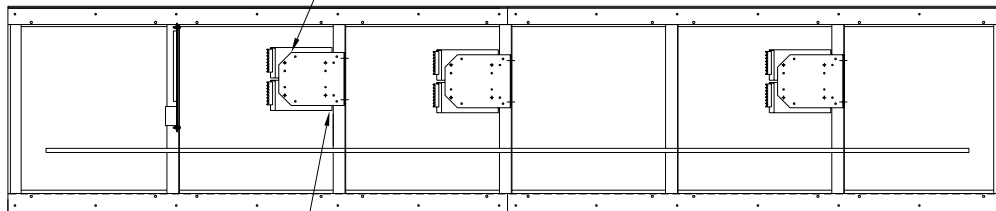
FRONT VIEW

8x8-2.5" AMB MOD  
OA 1192 2674  
@6

RIVET  
HC 1125  
@28

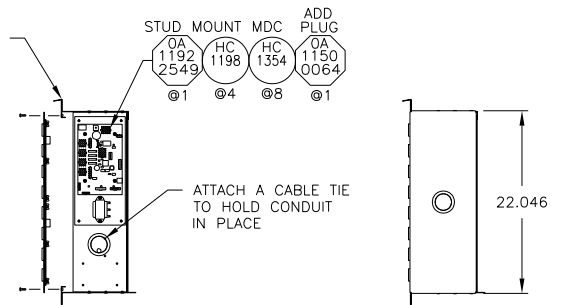
USE HOLES TO ATTACH SHELL TO THE TNMC SECTION OF THE SCOREBOARD, ATTACH WITH RIVETS.

MOUNT POWER SUPPLY SO IT CAN BE SERVICED FROM THE FRONT OR REAR BASED ON SCOREBOARD ACCESS. SEE F.ASSY DWG OF SCOREBOARD. (REAR ACCESS SHOWN)



FRONT VIEW (SHOWN WITH FRONT OPEN)

STUD MOUNT POWER SUPPLY  
HC 1198 HC 1354 OA 1192 2551  
@6 @12 @3



VIEW B-B

SIDE VIEW

SCHEMATIC: 8x48-2.5" AMBER LED TNMC  
1192-R03B-190140

PRE-PAINT ASSY: 8x48-2.5" LED TNMC  
1192-E10B-219768

OTHER ASSY PACKETS NOT SHOWN:  
OA-1192-0391..PRE-PAINT, 8x48-2.5" LED TNMC

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DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: OUTDOOR LED DIGIT SCOREBOARDS

TITLE: F. ASSY, 8X48-2.5" LED TNMC, AMBER

DES. BY: KBRICKER DRAWN BY: CCAIN DATE: JUL 29 04

REVISION	APPR. BY:	1192-E10B-219932
00	SCALE: 1=15	

REV.	DATE	DESCRIPTION	BY	APPR.

LED DRIVER IV  
 OP-1192-0383, 16 COL  
 OP-1192-0384, 16 COL, AC

REFER TO DWGS  
 A-115078 & A-115079  
 FOR ADDRESS SETTINGS

REFER TO DWGS  
 A-290261 & A-290689

S1 ADDRESS  
 DIP SWITCH PACKAGE

**J1-16 DIGIT JACKS**

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

**J17 PWR/SIG**

PIN	FUNCTION
1	SIG-P
2	SIG-N (232-IN)
3	SIG 2-P(232-GND)
4	CLOUT-P
5	CLOUT-N
6	16VAC-N
7	GND-N
8	EARTH-N
9	16VAC-P
10	GND-N
11	+VDD-P
12	+VBB-P

**J22 RC-100 RADIO**

PIN	FUNCTION
1	+UNREG-P
2	GND-N
3	GND-N
4	RX_INPUT-P

**J21 2.4GHz RADIO**

PIN	FUNCTION
1	+UNREG-P
2	GND-N
3	GND-N
4	RX_INPUT-P

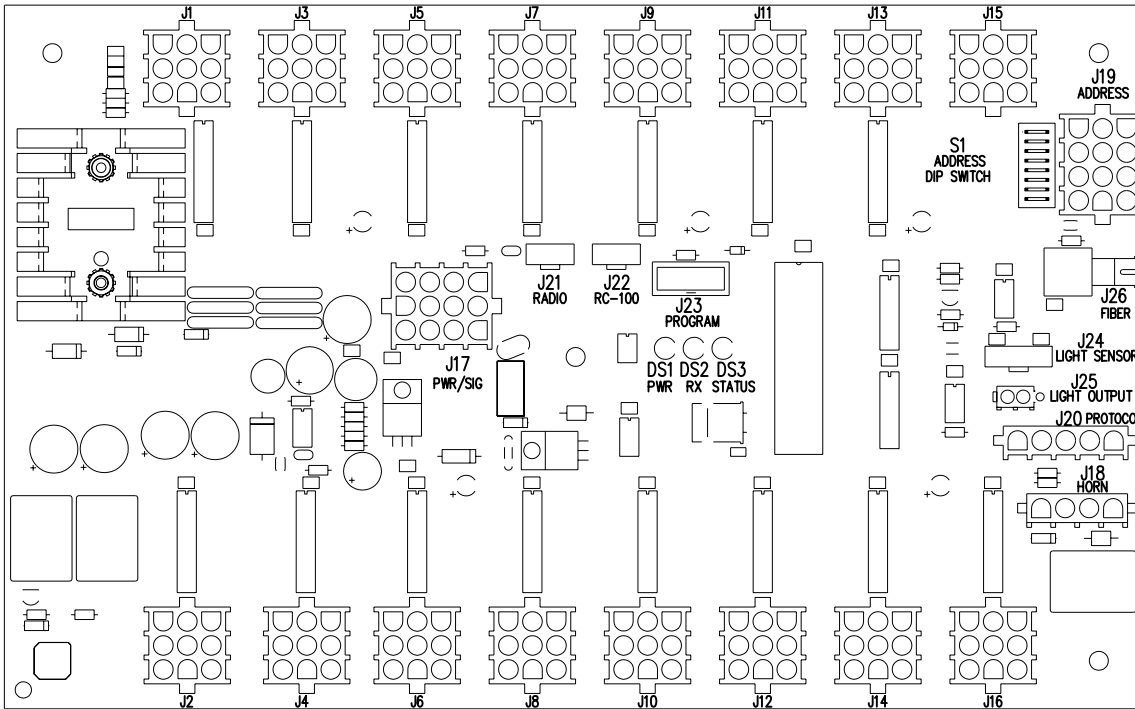
**J23 PROGRAM**

PIN	FUNCTION
1	DATA
2	/RESET
3	N/C
4	GND-N
5	CLK
6	GND-N
7	N/C
8	+5V-P
9	N/C
10	+5V-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

SW #	FUNCTION
1	ADD0
2	ADD1
3	ADD2
4	ADD3
5	ADD4
6	ADD5
7	ADD6
8	ADD7



**J26 FIBER RX**

PIN	FUNCTION
1	N/C
2	+5V-P
3	GND-N
4	N/C
5	N/C
6	RX_INPUT-P
7	GND-N
8	N/C

**J24 LIGHT SENSOR**

PIN	FUNCTION
1	LIGHT_IN-P
2	LIGHT_IN-N
3	+5V-P
4	GND-N
5	GND-N
6	N/C

**J25 LIGHT OUT- NEXT DRIVER**

PIN	FUNCTION
1	LIGHT_OUT-P
2	LIGHT_OUT-N

REFER TO DWG A-115081  
 FOR PROTOCOL SETTINGS

**J20 PROTOCOL**

PIN	FUNCTION
1	GND-N
2	PRO-N
3	PR1-N
4	PR2-N
5	PR3-N (TOD)

**J18 HORN**

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

**NOTES:**

- WITH NO ADDRESS SELECTED, DRIVER WILL DEFAULT TO A/S 4000 PROTOCOL.
- GREEN LED DS1 INDICATES THAT THE DRIVER HAS POWER.
- RED LED DS2 WILL FLICKER WHEN THE DRIVER RECEIVES SIGNAL.
- AMBER LED DS3 WILL BLINK WHEN THE DRIVER IS RUNNING.
- IF DS3 IS ON OR OFF CONTINUOUSLY THE MICROCONTROLLER IS NOT WORKING.
- REFER TO DRAWING A-128429 FOR CURRENT LOOP REDRIVE SPECIFICATIONS.
- REFER TO DRAWING A-115081 FOR J20 PROTOCOL SETTINGS.
- REFER TO DRAWINGS A-115078,115079 FOR J19 ADDRESS SETTINGS.

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DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: \_\_\_\_\_  
 TITLE: SPECIFICATIONS; LED DRIVER IV, 16 COL  
 DES. BY: \_\_\_\_\_ DRAWN BY: DULSCHM DATE: 09 OCT 06

REVISION 02 APPR. BY: \_\_\_\_\_ SCALE: 1 = 2

1192-R04A-288137

REV.	DATE	DESCRIPTION	BY	APPR.
02	30 NOV 06	ADDED ADDRESS SWITCH S1 TO DRAWING	DJU	
01	26 OCT 06	RESIZED TEXT SO THAT IT WAS EASIER TO READ, AND CLARIFIED FUNCTIONS OF EACH JACK.	AFL	

DIP SWITCH ADDRESS SETTING	
DECIMAL ADDRESS	SW 8 SW 7 SW 6 SW 5 SW 4 SW 3 SW 2 SW 1
01	0 0 0 0 0 0 0 1
02	0 0 0 0 0 0 1 0
03	0 0 0 0 0 0 1 1
04	0 0 0 0 0 1 0 0
05	0 0 0 0 0 1 0 1
06	0 0 0 0 0 1 1 0
07	0 0 0 0 0 1 1 1
08	0 0 0 0 1 0 0 0
09	0 0 0 0 1 0 0 1
10	0 0 0 0 1 0 1 0
11	0 0 0 0 1 0 1 1
12	0 0 0 0 1 1 0 0
13	0 0 0 0 1 1 0 1
14	0 0 0 0 1 1 1 0
15	0 0 0 0 1 1 1 1
16	0 0 0 1 0 0 0 0

DIP SWITCH ADDRESS SETTING	
DECIMAL ADDRESS	SW 8 SW 7 SW 6 SW 5 SW 4 SW 3 SW 2 SW 1
33	0 0 0 1 0 0 0 1
34	0 0 0 1 0 0 0 0
35	0 0 0 1 0 0 1 1
36	0 0 0 1 0 0 0 0
37	0 0 0 1 0 0 1 0
38	0 0 0 1 0 0 1 1
39	0 0 0 1 0 0 1 1
40	0 0 0 1 0 1 0 0
41	0 0 0 1 0 1 0 1
42	0 0 0 1 0 1 1 0
43	0 0 0 1 0 1 1 1
44	0 0 0 1 0 1 1 0
45	0 0 0 1 0 1 1 0
46	0 0 0 1 0 1 1 0
47	0 0 0 1 0 1 1 1
48	0 0 0 1 1 0 0 0

DIP SWITCH ADDRESS SETTING	
DECIMAL ADDRESS	SW 8 SW 7 SW 6 SW 5 SW 4 SW 3 SW 2 SW 1
65	0 1 0 0 0 0 1 1
66	0 1 0 0 0 0 1 0
67	0 1 0 0 0 0 1 1
68	0 1 0 0 0 1 0 0
69	0 1 0 0 0 1 0 1
70	0 1 0 0 0 1 1 0
71	0 1 0 0 0 1 1 1
72	0 1 0 0 1 0 0 0
73	0 1 0 0 1 0 0 1
74	0 1 0 0 1 0 1 0
75	0 1 0 0 1 0 1 1
76	0 1 0 0 1 1 0 0
77	0 1 0 0 1 1 0 1
78	0 1 0 0 1 1 1 0
79	0 1 0 0 1 1 1 1
80	0 1 0 1 0 0 0 0

DIP SWITCH ADDRESS SETTING	
DECIMAL ADDRESS	SW 8 SW 7 SW 6 SW 5 SW 4 SW 3 SW 2 SW 1
97	0 1 1 0 0 0 1 1
98	0 1 1 0 0 0 1 0
99	0 1 1 0 0 0 1 1
100	0 1 1 0 0 1 0 0
101	0 1 1 0 0 1 0 1
102	0 1 1 0 0 1 1 0
103	0 1 1 0 0 1 1 1
104	0 1 1 0 1 0 0 0
105	0 1 1 0 1 0 0 1
106	0 1 1 0 1 0 1 0
107	0 1 1 0 1 0 1 1
108	0 1 1 0 1 1 0 0
109	0 1 1 0 1 1 0 1
110	0 1 1 0 1 1 1 0
111	0 1 1 0 1 1 1 1
112	0 1 1 1 0 0 0 0

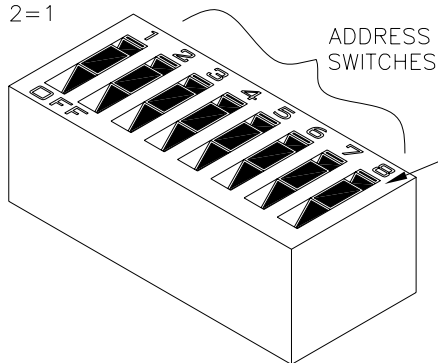
DIP SWITCH ADDRESS SETTING	
DECIMAL ADDRESS	SW 8 SW 7 SW 6 SW 5 SW 4 SW 3 SW 2 SW 1
17	0 0 0 1 0 0 0 1
18	0 0 0 1 0 0 1 0
19	0 0 0 1 0 0 1 1
20	0 0 0 1 0 1 0 0
21	0 0 0 1 0 1 0 1
22	0 0 0 1 0 1 1 0
23	0 0 0 1 0 1 1 1
24	0 0 0 1 1 0 0 0
25	0 0 0 1 1 0 0 1
26	0 0 0 1 1 0 1 0
27	0 0 0 1 1 0 1 1
28	0 0 0 1 1 1 0 0
29	0 0 0 1 1 1 0 1
30	0 0 0 1 1 1 1 0
31	0 0 0 1 1 1 1 1
32	0 0 1 0 0 0 0 0

DIP SWITCH ADDRESS SETTING	
DECIMAL ADDRESS	SW 8 SW 7 SW 6 SW 5 SW 4 SW 3 SW 2 SW 1
49	0 0 1 1 0 0 0 1
50	0 0 1 1 0 0 1 0
51	0 0 1 1 0 0 1 1
52	0 0 1 1 0 1 0 0
53	0 0 1 1 0 1 0 1
54	0 0 1 1 0 1 1 0
55	0 0 1 1 0 1 1 1
56	0 0 1 1 1 0 0 0
57	0 0 1 1 1 0 0 1
58	0 0 1 1 1 0 1 0
59	0 0 1 1 1 0 1 1
60	0 0 1 1 1 1 0 0
61	0 0 1 1 1 1 0 1
62	0 0 1 1 1 1 1 0
63	0 0 1 1 1 1 1 1
64	0 1 0 0 0 0 0 0

DIP SWITCH ADDRESS SETTING	
DECIMAL ADDRESS	SW 8 SW 7 SW 6 SW 5 SW 4 SW 3 SW 2 SW 1
81	0 1 0 1 0 0 0 1
82	0 1 0 1 0 0 1 0
83	0 1 0 1 0 0 1 1
84	0 1 0 1 0 1 0 0
85	0 1 0 1 0 1 0 1
86	0 1 0 1 0 1 1 0
87	0 1 0 1 0 1 1 1
88	0 1 0 1 1 0 0 0
89	0 1 0 1 1 0 0 1
90	0 1 0 1 1 0 1 0
91	0 1 0 1 1 0 1 1
92	0 1 0 1 1 1 0 0
93	0 1 0 1 1 1 0 1
94	0 1 0 1 1 1 1 0
95	0 1 0 1 1 1 1 1
96	0 1 1 0 0 0 0 0

DIP SWITCH ADDRESS SETTING	
DECIMAL ADDRESS	SW 8 SW 7 SW 6 SW 5 SW 4 SW 3 SW 2 SW 1
113	0 1 1 1 0 0 0 1
114	0 1 1 1 0 0 1 0
115	0 1 1 1 0 0 1 1
116	0 1 1 1 0 1 0 0
117	0 1 1 1 0 1 0 1
118	0 1 1 1 0 1 1 0
119	0 1 1 1 0 1 1 1
120	0 1 1 1 1 0 0 0
121	0 1 1 1 1 0 0 1
122	0 1 1 1 1 0 1 0
123	0 1 1 1 1 0 1 1
124	0 1 1 1 1 1 0 0
125	0 1 1 1 1 1 0 1
126	0 1 1 1 1 1 1 0
127	0 1 1 1 1 1 1 1
128	1 0 0 0 0 0 0 0

S1-ADDRESS DIP SWITCH  
SCALE 2=1



NOTES:

0 = OFF, 1 = ON.

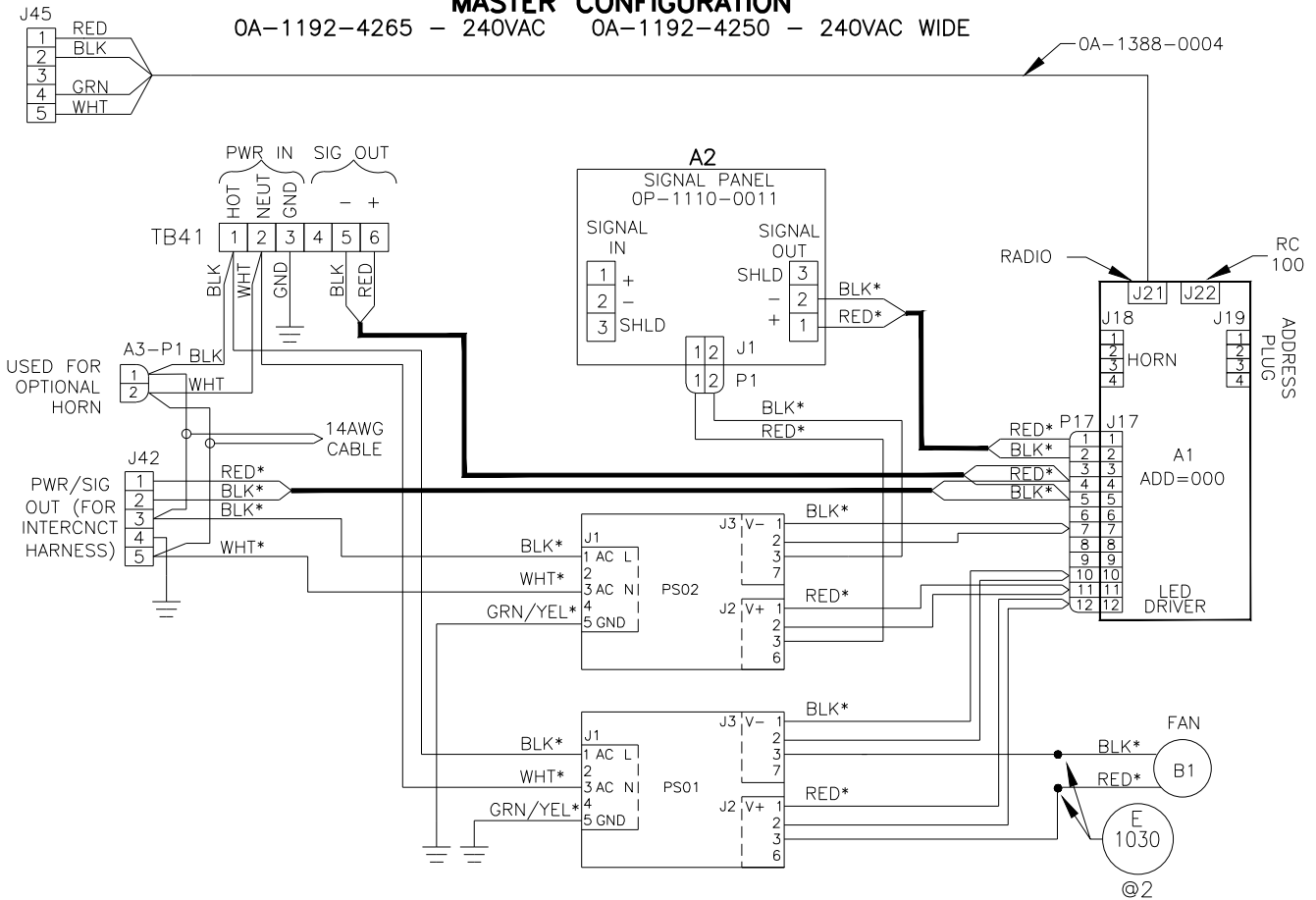
TO TURN SWITCH ON, PRESS DOWN ON THE TOP SIDE OF THE SWITCH ROCKING IT TO THE OTHER POSITION.

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DAKTRONICS, INC. BROOKINGS, SD 57006			
PROJ: OUTDOOR LED SCOREBOARDS			
TITLE: ADDRESS TABLE 1; GEN IV DRIVER ADDRESS DIP SWITCH			
DES. BY: MMILLER		DRAWN BY: MMILLER	DATE: 16 NOV 06
REVISION	APPR. BY:	1192-R10A-290261	
00	SCALE: 1 = 1		

REV.	DATE	DESCRIPTION	BY	APPR.

## MASTER CONFIGURATION

0A-1192-4265 - 240VAC    0A-1192-4250 - 240VAC WIDE

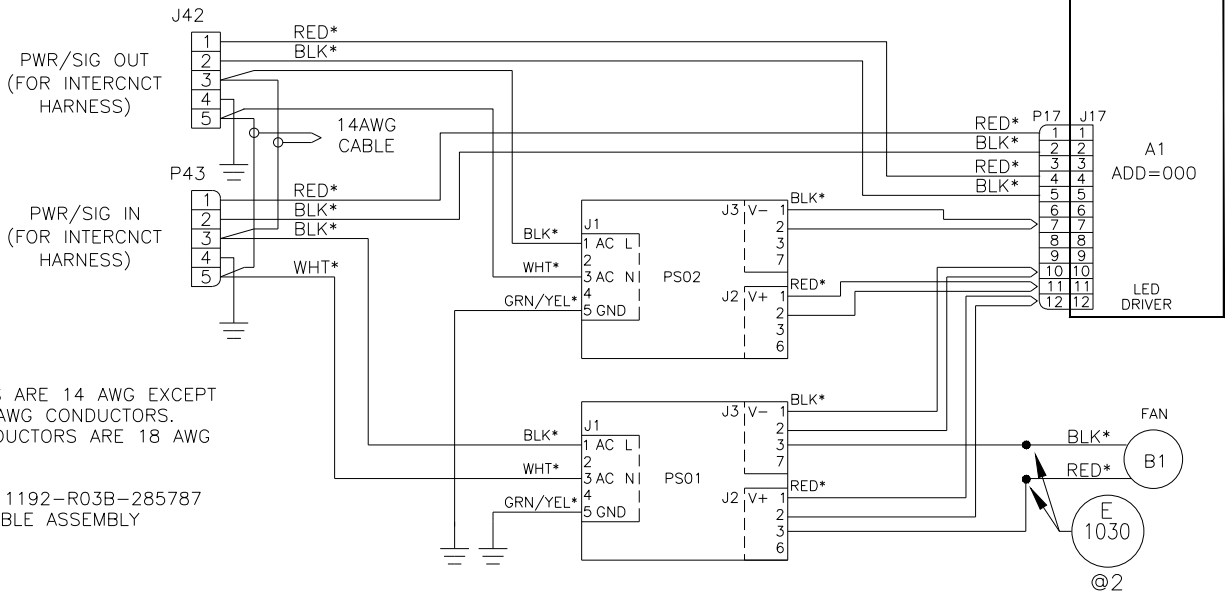


ALL CONDUCTORS ARE 14 AWG EXCEPT \* INDICATES 18AWG CONDUCTORS.  
ALL SIGNAL CONDUCTORS ARE ALSO 18 AWG CONDUCTORS.

REFERENCE DWG 1192-R03C-285776 FOR DETAILED CABLE ASSEMBLY DIAGRAM.

## SLAVE CONFIGURATION

0A-1192-4266 - 240VAC    0A-1192-4251 - 240VAC WIDE

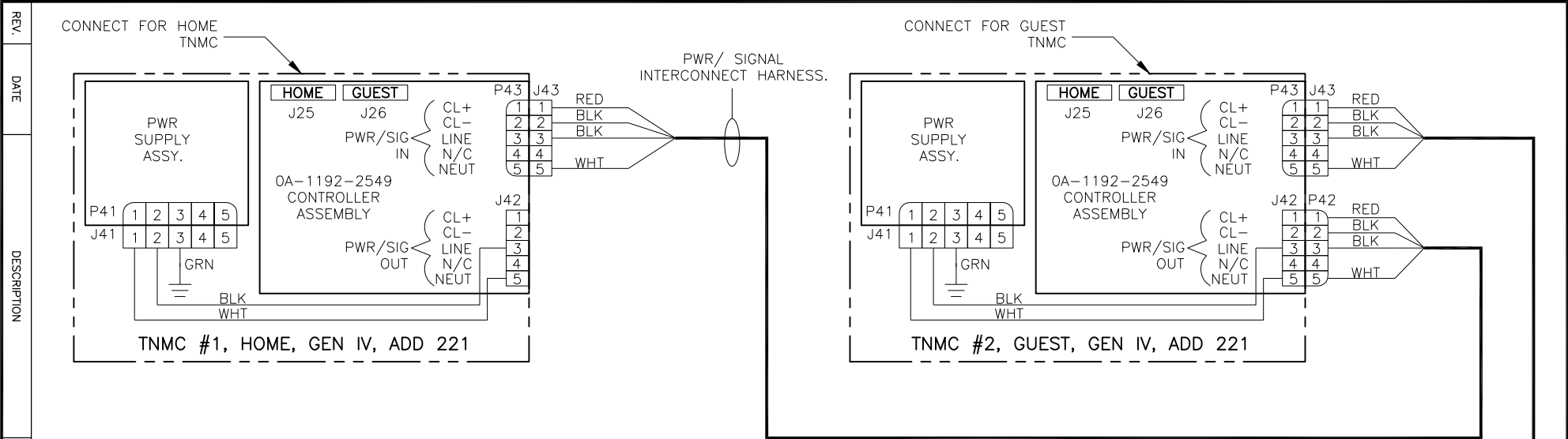


ALL CONDUCTORS ARE 14 AWG EXCEPT  
\* INDICATES 18 AWG CONDUCTORS.  
ALL SIGNAL CONDUCTORS ARE 18 AWG  
CONDUCTORS.

REFERENCE DWG 1192-R03B-285787  
FOR DETAILED CABLE ASSEMBLY  
DIAGRAM.

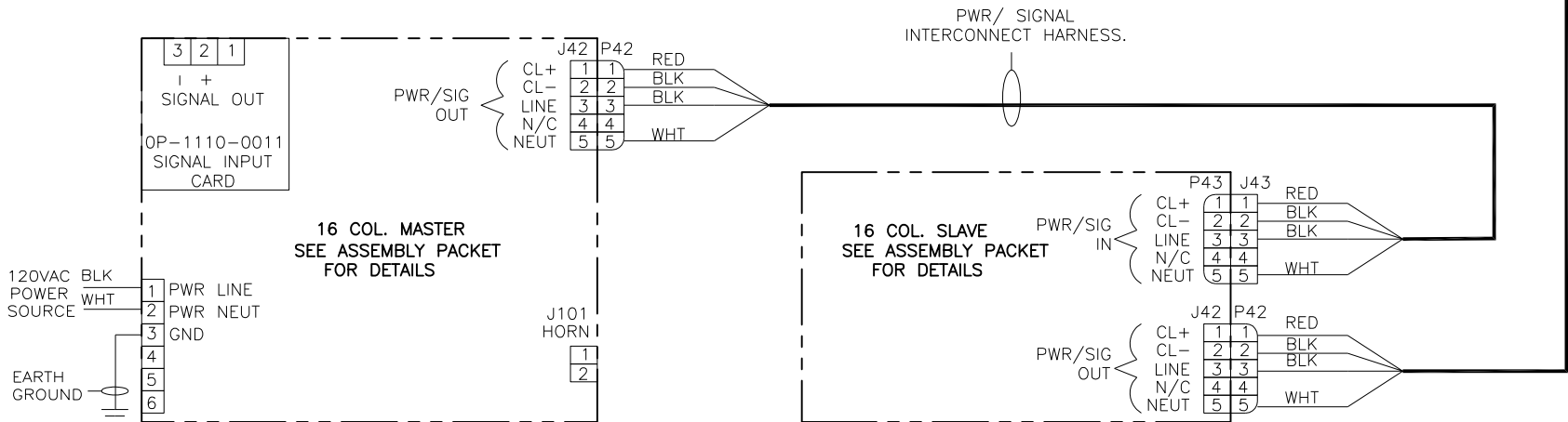
	<b>DAKTRONICS, INC.</b> BROOKINGS, SD 57006		THE CONCEPTS EXPRESSED AND DETAILS SHOWN ON THIS DRAWING ARE CONFIDENTIAL AND PROPRIETARY. DO NOT REPRODUCE BY ANY MEANS WITHOUT THE EXPRESSED WRITTEN CONSENT OF DAKTRONICS, INC. COPYRIGHT 2011 DAKTRONICS, INC.	
	DO NOT SCALE DRAWING			
PROJ: OUTDOOR LED SCOREBOARDS TITLE: SCHEMATIC: 240V GEN IV OUTDOOR LED- 16 COL DRIVER				
DESIGN:	DRAWN: AGEWERT		DATE: 05 NOV 07	
SCALE: NONE				
SHEET	REV	JOB NO:	FUNC-TYPE-SIZE	324504
01	04 JUN 08	02	P1192	R-03-A

REV	DATE:	REMOVED 240V HORN CARD FROM SCHEMATIC, WILL BE PART OF AN OPTIONAL 240V HORN KIT	BY:	
02	01 AUG 11		MWM	
REV	DATE:	UPDATED LABELS	BY:	
01	04 JUN 08		NLH	



REV.	
DATE	
DESCRIPTION	
BY	
APPR.	

PWR/ SIGNAL INTERCONNECT HARNESS.



THIS SCHEMATIC REPRESENTS THE INTERCONNECT OF THE MASTER DRIVER TO THE OTHER DRIVERS/TNMC'S IN A MULTI DRIVER SCOREBOARD CONFIGURATION. SEE THE PRE-PAINT ASSEMBLY DRAWING AND/OR THE FINAL ASSEMBLY DRAWING FOR THE PART NUMBERS OF THE INTERCONNECT HARNESSES NEEDED AND INSTALLATION INSTRUCTIONS.

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 2009 DAKTRONICS, INC.

PROJ: OUTDOOR LED SCOREBOARDS  
 TITLE: SCHEMATIC, FB-235X-11/21, GEN IV  
 DES. BY: MILLER  
 DRAWN BY: MHAHLIK  
 DATE: 2 APR 09

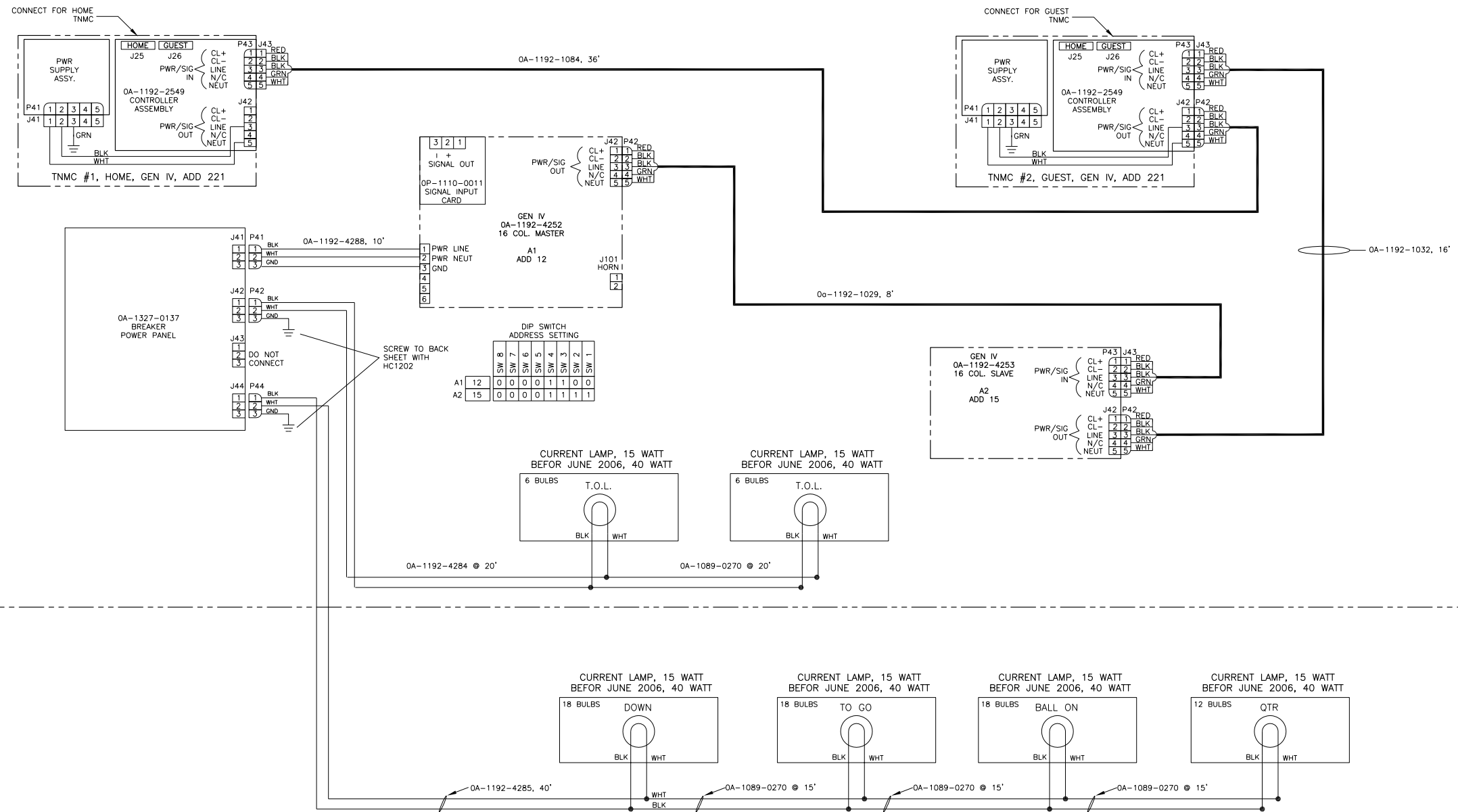
REVISION 00  
 APPR. BY: NONE  
 SCALE: NONE

1157-R03A-824826

DAKTRONICS, INC. BROOKINGS, SD 57006







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DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: OUTDOOR LED SCOREBOARDS

TITLE: SCHEMATIC, FB-2352, FB-2354-11/21 GEN IV

DES. BY: DDINING DATE: 11 JUN 09

REVISION APPR. BY: SCALE: NONE 1192-R03C-859571

REV.	DATE	DESCRIPTION	BY	APPR.
00				



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

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## DAKTRONICS WARRANTY AND LIMITATION OF LIABILITY

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

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

### 1. Warranty Coverage

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

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

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

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

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

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

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

THIS LIMITED WARRANTY IS NOT TRANSFERABLE.

### 2. Exclusion from Warranty Coverage

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

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

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

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

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

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

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

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

H. Any performance of preventive maintenance.

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

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

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

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

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

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

### **5. Dispute Resolution**

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

### **6. Governing Law**

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

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

For Purchaser's protection, in addition to that afforded by the warranties set forth herein, Purchaser may purchase extended warranty services to cover the Equipment. The Extended Service Agreement, available from Daktronics, provides for electronic parts repair and/or on-site labor for an extended period from the date of expiration of this warranty. Alternatively, an Extended Service Agreement may be purchased in conjunction with this warranty for extended additional services. For further information, contact Daktronics Customer Service at 1-877-605-1116.