Daktronics Tuff Sport®
Volleyball
LED Scoreboards

Display Manual

ED-13515 ***Rev 4 – 16 July 2012***

DAKTRONICS

Model	
	VB-2101

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DAKTRONICS

ED-13515
Product 1237
Rev 4 – 16 July 2012

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

Scoreboard Serial No. _____

Scoreboard Model No. _____

Date Installed _____

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Section 1: Introduction

This manual explains the installation and maintenance of Daktronics Tuff Sport® Indoor Volleyball LED Scoreboards. For additional information regarding the safety, installation, operation, or service of these displays, refer to the telephone numbers listed in **Section 4.8**. 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 Scoreboard Controllers

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

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

The control console manual is available online at www.daktronics.com/manuals.

1.2 Scoreboard Label

Serial and model numbers of a Daktronics scoreboard can be found on the ID label on the display, similar to that shown in **Figure 1**.

Figure 1: *Display 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.

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 indoor-outdoor status, power supply, and digit color.

VB	Volleyball

-13	indoor scoreboards, 120 V, PanaView® digits
-14	indoor scoreboards, 230 V, PanaView® digits
-15	indoor scoreboards, 120 V, UniView® digits
-16	indoor scoreboards, 230 V, UniView® digits

1.4 Resources

Figure 2 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**.

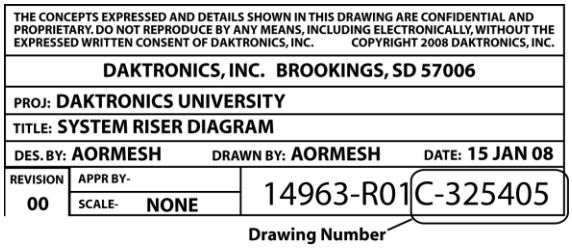


Figure 2: *Daktronics Drawing Label*

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-13515**.

1.5 Daktronics Nomenclature

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 4.7,** use the label to order a replacement. **Figure 3** illustrates a typical label. The part number is in bold.

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

Accessory Labels	
Component	***Label***
Termination block for power or signal cable	**TBXX**
Grounding point	**EXX**
Power or signal jack	**JXX**
Power or signal plug for the opposite jack	**PXX**

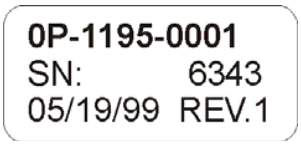


Figure 3: *Typical Label*

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.

1.6 Product Safety Approval

Daktronics Tuff Sport scoreboards are ETL-listed, tested to CSA standards and CE-labeled for indoor use. Contact Daktronics with any questions regarding the testing procedures.

1.7 Specifications

The chart below details all of the mechanical specifications, circuit specifications, and power requirements for each display in this manual.

Notes:

1) All displays require a 120 VAC, 15 A circuit. Displays with a 230 VAC power requirement are also available.

2) Values in [Brackets] indicate scoreboards with Team Name Message Centers (TNMCs).

Model	Dimensions: Height, Width, Depth	Uncrated Weight	Watts	Amps 120/230 VAC	Driver # & Address
VB-2101	4'-0" H, 10'-0" W, 6" D (1219 mm, 3048 mm, 152 mm)	150 lb 68 kg [165 lb 75 kg]	200 W [300 W]	1.7/0.9 A [2.5/1.3 A]	A1 17

Section 2: Mechanical Installation

Mechanical installation consists of lifting and permanently mounting the scoreboard. **Drawing A-170489** in **Appendix A** shows the recommended number and spacing of wall anchors for scoreboard mounting.

Be sure that the installation complies with local building codes.

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.

2.1 Lifting the Scoreboard

Most Daktronics Tuff Sport scoreboards are shipped equipped with at least one eyebolt for lifting, as well as pre-drilled holes along the top and bottom of each cabinet for wall attachment. Eyebolts are located along the top of the cabinet for each scoreboard or scoreboard section. Daktronics indoor scoreboards use $^{3}/_{8}$" eyebolts.

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.

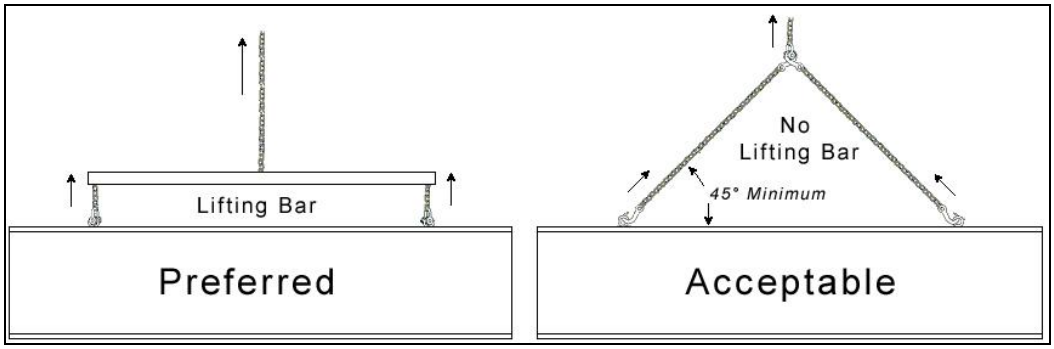


Figure 4: *Lifting Methods*

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°.

Do NOT attempt to lift the display if the angle is less than 45°.

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**.

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 without the suspension mounting kit (see **Section 2.3**).

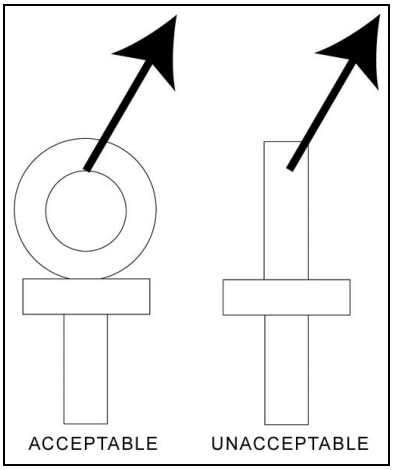


Figure 5: *Eyebolt Plane Load*

2.2 Scoreboard Mounting

1. Use the eyebolts at the top of the scoreboard frame to lift the display into position for mounting.
2. Secure the display to the wall by attaching mounting hardware through all holes on the top and bottom rear flanges of the display to a pre-drilled hole in the wall (**Figure 6**).

For mounting locations, weights and hardware suggestions, refer to **Drawing A-170489** in **Appendix A**.

Due to the variety of wall materials used in sports facilities, Daktronics cannot anticipate a user's individual installation needs or provide mounting hardware suitable for every installation. Choose a method of installation that will safely support the weight of the display.

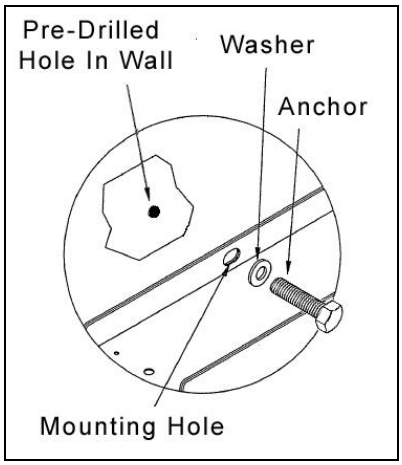


Figure 6: *Wall Mounting*

2.3 Suspension Mounting Kit

One of several mounting options with the Tuff Sport scoreboards is a suspension lift eye installation, which requires a special mounting kit (part # 0A-1237-0016). Contact Daktronics about any installation that involves permanently suspending the scoreboard.

1. Secure the mounting angle with the $^{3}/_{8}$" nut to each side of the scoreboard with the included screws. Install the eyebolts into the nut on the mounting angle.
2. Attach suspension cables to the eyebolt using a shackle and pin (all of this equipment is provided by others).

Notes:

1) Daktronics recommends that two cables be used at each end of the scoreboard.
2) Cables and hardware must be specified by a licensed engineer.
3) Do not attach suspension hardware to ad panels – attach to top of scoreboard.
4) This installation method must not be used to support scoreboard with message centers and/or backlit ad panels attached.
5) The total weight of scoreboard and accessories must not exceed 500 lb (223 kg).

Similar to the eyebolts used to lift the scoreboard, the suspension eyebolts have a maximum angle at which they can safely support the display. The ideal angle is perpendicular to the top of the scoreboard, but this angle may extend up to 30° out to either side of the display.

Refer to **Drawing A-148644** in **Appendix B** for more information.

2.4 Corner Mounting

Certain scoreboard models may be mounted in a corner, rather than flat against the wall, using a special mounting bracket kit. For more information on the corner mounting option, refer to **Drawing A-150831** in **Appendix B**.

2.5 Ad Panel Mounting

Refer to **Drawing A-147668** in **Appendix B** for typical ad panel mounting (similar to **Scoreboard Mounting** shown above) or **Drawing A-156134** for instructions on mounting ad panels directly to the top or bottom of a scoreboard.

2.6 Scoreboard Protective Devices

Daktronics Tuff Sport displays have been designed so that a normal basketball or volleyball impact will not damage the LEDs or display cabinet, reducing the need for protective devices. Some users, however, may still wish to have additional protection from other projectiles, and in these cases, Daktronics can provide optional protective devices. Refer to the **Protective Screen Installation Instructions (ED-5423)**, available online at www.daktronics.com/manuals for more information about installing protective devices.

> **Note:** 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 3: Electrical Installation

CAUTION: Only qualified individuals should 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.

3.1 Installation Overview

Refer to **Drawings A-124686**, **A-124688**, **A-125415**, and **A-125417** in **Appendix A** for power and signal layouts.

> **Note:** Control signal cable and some junction boxes are not provided as part of this system and can be purchased locally or from Daktronics.

3.2 Power

Each scoreboard features a 120 VAC power cord with a three-prong plug. Install a grounded receptacle near the equipment so that the power cord can easily reach it. The control console requires a 120 VAC receptacle and uses less than 1 A of power.

Displays operating on 230 VAC are also available, and they are shipped equipped with a universal power plug.

Grounding

Connect the scoreboard to earth ground. Proper grounding assures reliable equipment operation and protects the equipment against damaging electrical 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 grounding connection on the power cord's three-prong plug connects to the shell of the scoreboard.

> **Note:** The customer must properly ground the outlet according to local and national codes. Failure to ground the outlet voids the warranty for the scoreboard.

3.3 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.

Radio Settings

If a radio receiver is installed (see **Section 5.3**), the radio broadcast settings ("b1") and the channel settings ("C1") will be displayed in the clock digits during the POST. These values must match the settings in the control console (refer to the appropriate control console manual listed in **Section 1.1**).

3.4 Scoreboard Signal Connection

Signal installation (for systems without radio control) requires routing control cable from the scoreboard control console to a signal junction box (J-box) near the display. Refer to **Drawing A-28124** and **Drawing A-125316** in **Appendix A** for signal wire connection.

1. At a minimum, use a paired, 22 AWG shielded cable (Daktronics part # W-1077) and connect the cable to a dual 1/4" J-box at the control console end.

   Using a dual J-box for separate Main and Auxiliary scoreboards lets operators control several displays with one controller, and they can also switch jacks to control individual boards using multiple controllers.

2. Route the cable from the J-box on the control console end to a J-box near the display.
3. Install the 1/4" phone plug (Daktronics part # 0L-40683) to the scoreboard end of the cable. Be sure to connect the cable shielding only in the J-box on this end.
4. Insert the plug into the Signal In (J31) jack located on the top of the scoreboard.
5. Connect a signal cable from the J-box to the J1, J2, or J3 jack on the back of the All Sport 5000 console.

   If using a Main Clock Start/Stop Switch (0A-1166-0003), connect it to the J7 jack on the All Sport 5000 console.

Section 4: Scoreboard Troubleshooting

IMPORTANT NOTES:

1. **Disconnect power before doing any repair work on the scoreboard.**

2. **Allow only qualified service personnel access to internal display electronics.**

3. **Disconnect power when not using the scoreboard.**

4.1 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 4.8**.

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 120 (or 230) VAC power.
	No power to console	Ensure the console is plugged into a 120 (or 230) VAC power supply.
		Swap the console with one known to work correctly, and enter the proper sport code 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 120 (or 230) VAC power.
		Check that the red DS2 LED on the driver lights up when sending commands from the control console (see **Section 4.4**).
	No radio signal from console	Cycle power to the scoreboard and watch for radio receiver broadcast/ channel settings (see **Section 3.3**).
		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. Keep the console between 20 to 500 feet from the scoreboard.

Problem	Possible Cause	Solution/Items to Check
		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 120 (or 230) VAC power.
		Check that the red DS2 LED on the driver lights up when sending commands from the control console (see **Section 4.4**).
		Swap the driver with one known to work correctly and with the same part number to verify the problem. Replace if necessary (see **Section 4.4**).
	No power to driver	Check that the green DS1 LED on the driver is always lit up when the scoreboard is powered on (see **Section 4.4**).
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 control console operation manual (see **Section 1.1**).
	Incorrect driver address	Check that the scoreboard driver(s) are set to the correct address(es) (see **Section 4.4**).
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 wiring	Check that the red DS2 LED on the driver lights up when sending commands from the control console (see **Section 4.4**).
Scoreboard works, but some LEDs always stay on	Short in digit or indicator circuit	Swap the digit/indicator with one known to work correctly to verify the problem. Replace if necessary (see **Section 4.3**).
Scoreboard works, but some LEDs do not light or they blink	Bad connection	Verify the power/signal connector on the back of the digit circuit board is secure (see **Section 4.3**).
	Bad digit or driver	Swap the digit/driver with one known to work correctly to verify the problem. Replace if necessary (see **Section 4.3** for digits or **Section 4.4** for drivers).

Problem	Possible Cause	Solution/Items to Check
Scoreboard works, but some digits do not light	Bad digit or driver	(see solution on previous page)
	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.
	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.

4.2 Component Location & Access

All Tuff Sport indoor displays are front-access scoreboards, meaning that internal electronic components and digits are reached by opening a face panel, an access door, or a digit panel on the front of the display.

Digit panels are typically held in place on the scoreboard face by two screws. To remove a digit, simply unfasten the screws and carefully lift it from the cabinet. The power/signal plug can then be removed from the connector on the back of the digit to completely free the digit and access internal components.

Remove non-digit access panels by unfastening the top, side or bottom screws holding it in place. Some panels are hinged and swing open when the screws are removed or loosened.

Drivers and power and signal components are typically mounted inside the scoreboard behind a digit panel. Refer to **Drawing A-170492** in **Appendix A** for component layouts and access locations.

4.3 Replacing Digits

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

The process of replacing digits varies by whether it is a PanaView digit or UniView digit (**Figure 7**).

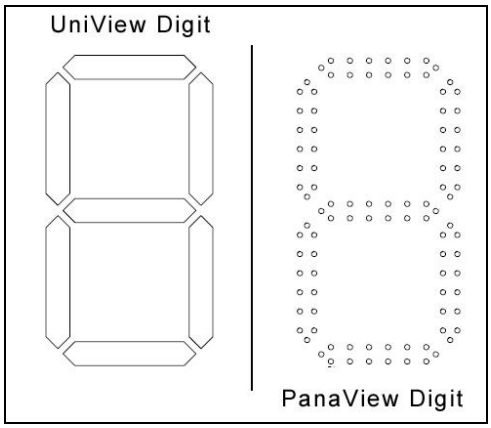


Figure 7: *Digit Types*

PanaView

To replace a PanaView digit circuit board (**Figure 8**):

1. Open the digit panel as described in **Section 4.2**.
2. Disconnect the power/signal connector from the back of the digit by squeezing together the locking tabs and pulling the connector free.
3. Use a $^{9}/_{32}$" nut driver to remove the nuts securing the digits to the inside of the panel, and then lift the digit off the stud inserts.
4. Position a new digit over the studs (making sure the small plastic spacers are still in place) 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. Secure the digit panel to the display with the two screws, then power up and test the display to see if changing the digit has resolved the problem.

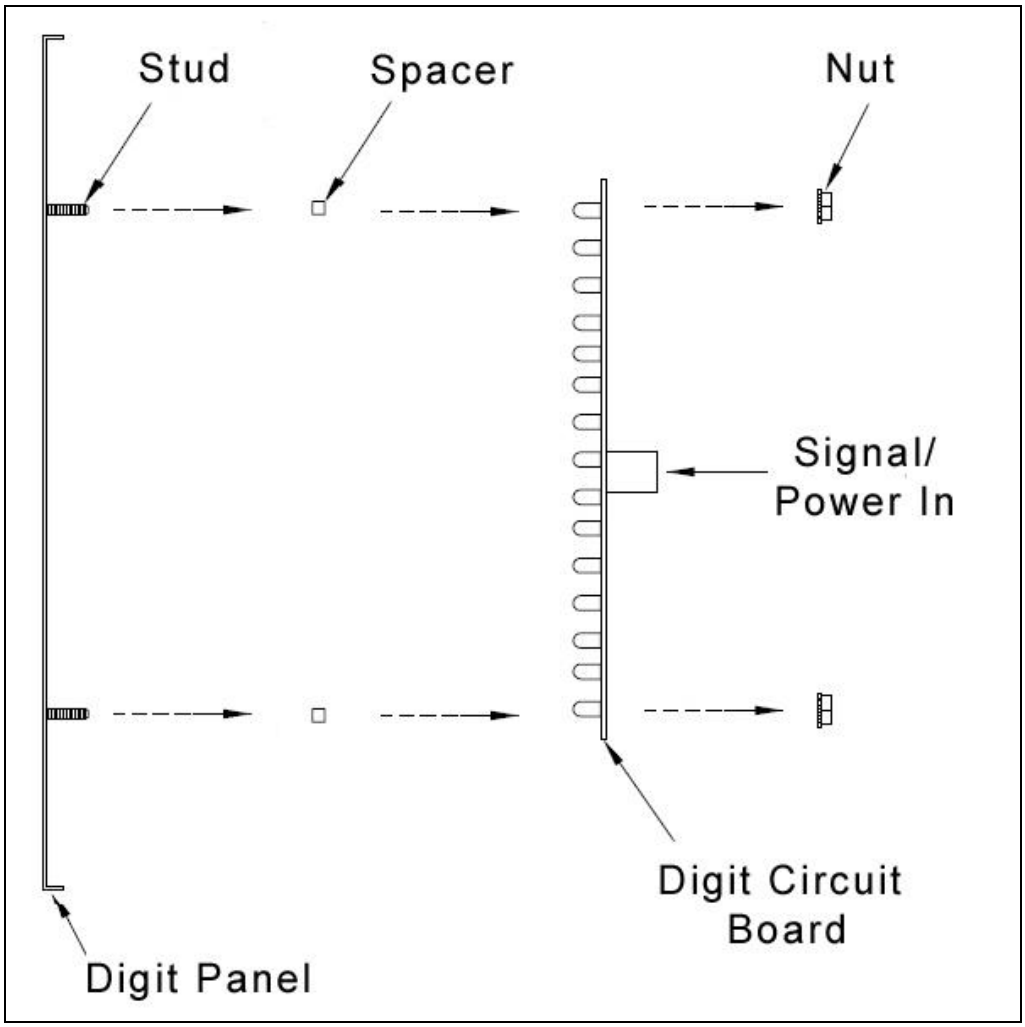


Figure 8: *PanaView Digit Assembly*

UniView

To replace a UniView digit circuit board (**Figure 9**):

1. Open the digit panel as described in **Section 4.2**.
2. Disconnect the power/signal connector from the back of the digit by squeezing together the locking tabs and pulling the connector free.
3. Use a $^{9}/_{32}$" nut driver to remove the nuts securing the digits to the aluminum standoffs, and then lift the digit off the standoff/diffuser assembly.
4. Position a new digit over the standoffs, and tighten the nuts. It may be necessary to also tighten the standoffs if they became loose while removing 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. Secure the digit panel to the display with the two screws, then power up and test the display to see if changing the digit has resolved the problem.

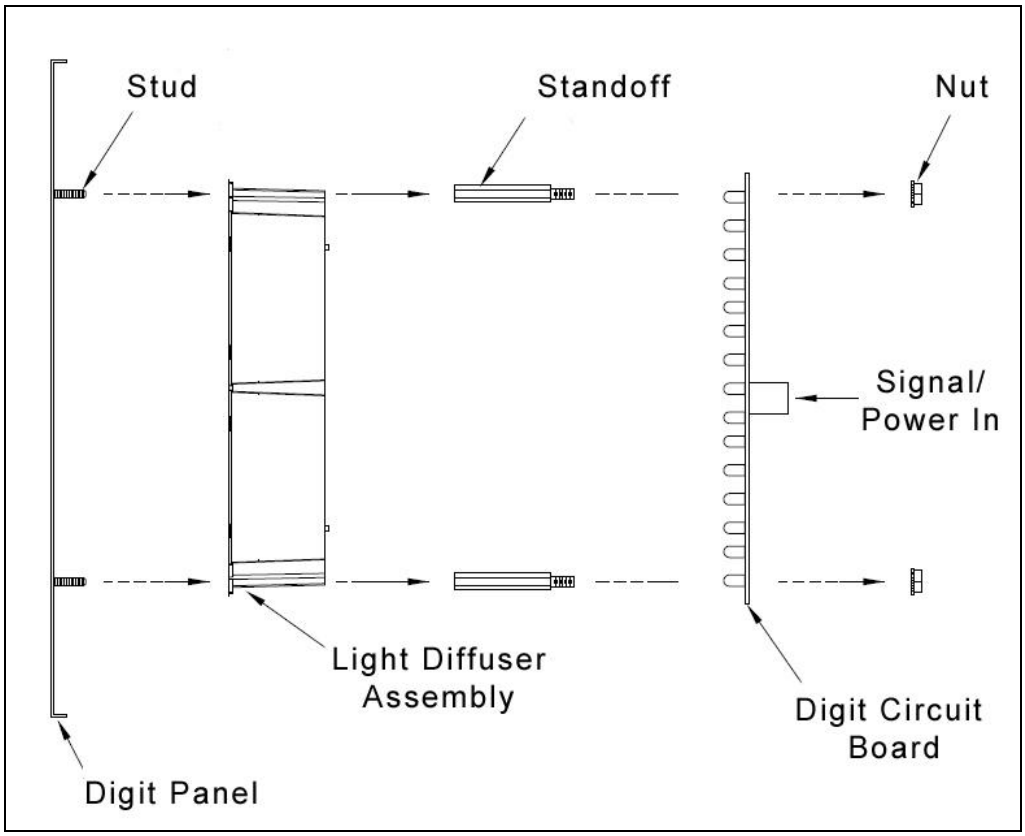


Figure 9: *UniView Digit Assembly*

4.4 LED Drivers

In each scoreboard, one or more LED drivers perform the task of switching LEDs on and off. LED drivers are located inside of a driver enclosure. Refer to **Figure 10** to view the location and components of a Tuff Sport driver enclosure.

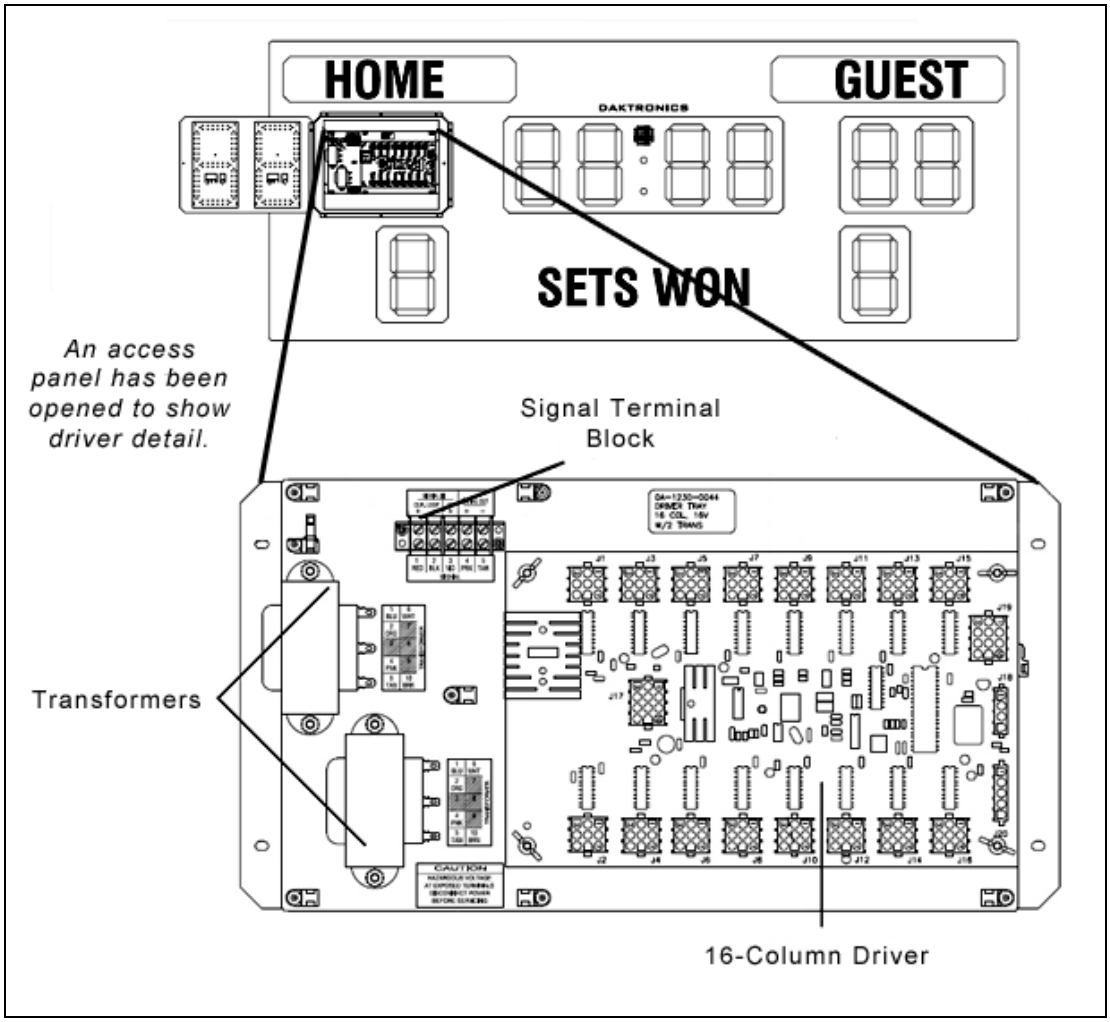


Figure 10: *Driver Enclosure Location & Components*

The Tuff Sport scoreboards in this manual use 16-column drivers (**Figure 10**). Each driver has numerous connectors providing power and signal inputs and outputs to the scoreboard digits and indicators:

Connector #	Function
1-16	Output to digits and indicators
17	Control signal
18	Control for horn
19	Address

Refer to **Drawing A-126174** in **Appendix A** for detailed driver pin out/switch specifications. When troubleshooting driver problems, three LEDs labeled **DS1**, **DS2**, and **DS3**, 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 driver status indicators, always disconnect scoreboard power before servicing.

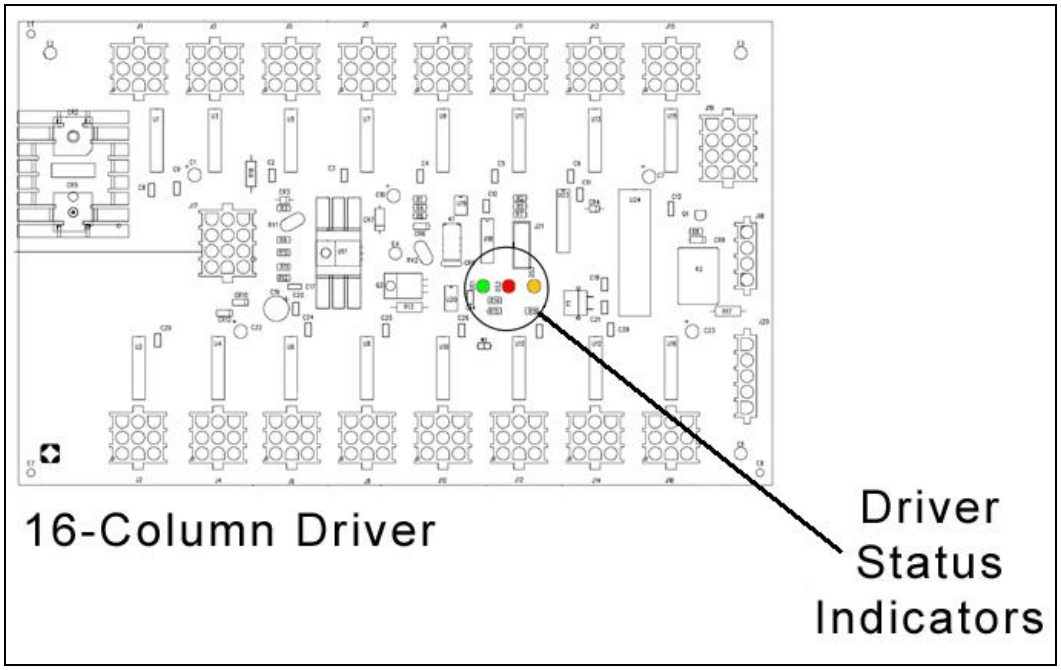


Figure 11: *Driver Status Indicators*

Replacing a Driver

If the driver status indicators do not appear to be working correctly, it may be necessary to replace the driver.

1. Open the digit panel or scoreboard face panel as described in **Section 4.2**.
2. 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.

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

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

7. Ensure the driver is set to the correct address (refer to **Setting the Driver Address**).
8. Close and secure the access 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. This address is set with jumper wires in a 12-pin plug which mates with jack J19 on the driver (**Figure 12**).

Note: The scoreboards in this manual must be set to address 17. Refer to **Drawing A-115078** in **Appendix A** for more information on addressing.

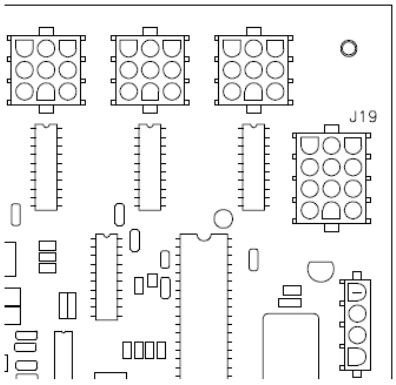


Figure 12: *Address Jack J19*

4.5 Segmentation & 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-170492 in **Appendix A** 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.

4.6 Schematics

For advanced scoreboard troubleshooting and repair, it may be necessary to consult the schematic drawings. **Drawing A-158348** in **Appendix A** shows detailed power and signal wiring diagrams of internal display components.

4.7 Replacement Parts List

Refer to the following table for Daktronics scoreboard replacement parts.

Description	Daktronics Part #
Horn, 120V with capacitor	0A-1152-0332
Main clock, start/stop switch	0A-1166-0003
LED driver, 16-column	0P-1150-0126
PanaView Digit, 13” red LED, 7-seg	0P-1230-0052
PanaView Digit, 13” amber LED, 7-seg	0P-1230-0053
UniView Digit, 13” Red LED, 7-seg	0P-1230-0027
UniView Digit, 13” Amber LED, 7-seg	0P-1230-0028
UniView Colon, Amber	0P-1230-0069
PanaView Colon, Amber	0P-1230-0071
Transformer, 120P/16S, 6.3 A	T-1066
Cable, 20' phone plug	W-1236
Cable, 50' phone plug	W-1237
Cable, 30' phone plug	W-1238
Cable, 10' phone plug	W-1340

4.8 Daktronics Exchange and Repair & Return Programs

Exchange Program

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

Before Contacting Daktronics

Identify these important numbers:

Display Serial Number: _____
Display Model Number:_____
Job/Contract Number: _____
Date Installed: _____
Daktronics Customer ID Number: _____

To participate in the Exchange Program, follow these steps.

1. **Call Daktronics Customer Service.**

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

2. **When the new exchange part is received, mail the old part to Daktronics.**
   If the replacement part fixes the problem, send in the problem part being replaced.
   a. Package the old part in the same shipping materials in which the replacement part arrived.
   b. Fill out and attach the enclosed UPS shipping document.
   c. Ship the part to Daktronics.

3. **The defective or unused parts must be returned to Daktronics within 5 weeks of initial order shipment.**

   If any part is not returned within five (5) weeks, a non-refundable invoice will be presented to the customer for the costs of replenishing the exchange parts inventory with a new part.

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

Repair & Return Program

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

1. **Call or fax Daktronics Customer Service:**
   Refer to the appropriate market number in the chart listed on the previous page.
   Fax: 605-697-4444

2. **Receive a case number before shipping.**
   This expedites repair of the part.

3. **Package and pad the item carefully to prevent damage during shipment.**
   Electronic components, such as printed circuit boards, should be placed in an antistatic bag before boxing. Daktronics does not recommend using packing 'peanuts' when shipping.

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

Shipping Address

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

Daktronics Warranty and Limitation of Liability

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

Section 5: Scoreboard Options

5.1 Horns

Daktronics Tuff Sport scoreboards are equipped with a 120 VAC vibrating horn mounted behind the scoreboard face. The horn sounds automatically when the period clock counts down to zero, or when manually triggered by the operator using the control console.

Installation of an optional 12 VDC horn is detailed in **Drawing A-148960** in **Appendix B**. Louder trumpet horns are also available. Contact Daktronics for information and pricing.

Adjusting Horn Volume

CAUTION: The scoreboard horn is a 120 VAC device. Turn off the power to the scoreboard before adjusting the horn.

The volume for the electronic, buzzer-type horn is set at its maximum level at the factory. If the horn is too loud, reduce its volume by adjusting the setscrew mounted in the front of the horn. A plastic tip on the screw touches the horn's diaphragm, reducing the volume. Turn the screw clockwise and test the volume by operating the horn from the scoreboard control console. Continue adjusting and testing until the desired volume level is obtained.

Note that with the noise of spectators, the horn will not seem as loud as when it is being tested in an empty area, so be sure to set the volume according to the acoustics of the facility.

5.2 Visual Horn Indicator (VHI)

In addition to the horn, Daktronics offers a visual horn indicator (VHI) that lights up when the buzzer sounds. To install the VHI, users must tap into the existing horn wiring to provide power and signal. For more information about installing the VHI option, including details on the inputs, outputs, and switches of a shot clock relay board that controls when the VHI should be turned on, refer to the **VHI (ED-13397)** or **BB-2133 (ED-13806) Installation Instructions**, both available online at www.daktronics.com/manuals.

5.3 Radio Control

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

The radio transmitter and receiver are not standard equipment. This setup requires a control console equipped with a radio transmitter as well as a radio receiver plugged into 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)** or the **Gen VI Radio Installation Manual (DD2362277)**, both available online at www.daktronics.com/manuals.

5.4 Changeable Captions

Team name and statistics 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 standard captions. If these retainers are not already present, attach the retainers included with the caption kit.

Caption kits are also available for certain statistics display models to switch between basketball, volleyball, wrestling, and hockey modes.

Refer to **Drawing A-150021** in **Appendix B** for changeable caption installation instructions.

5.5 Team Name Message Centers

Refer to **Section 6** for more information about Team Name Message Centers.

Section 6: TNMC 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 Display Overview

Team Name Message Centers (TNMCs) are programmable LED displays that allow users to show custom Home and Guest names or messages of ~15 characters on the scoreboard in place of static vinyl captions. TNMCs are typically ordered factory-installed, but they may also be field-mounted after the scoreboard is in place. Characters are shown on one line using single- or double-stroke fonts.

Primary matrix size is 8x48 with 0.75" pixel spacing. **Figure 13** shows an example of TNMCs.

Figure 13: *Volleyball Scoreboard with TNMCs*

Matrix Size	Number of Modules	Pixel Spacing	Active Display Area	Weight*
8x48	3	19 mm (0.75")	6" x 36" (152 mm x 914 mm)	15 lb (7 kg)

** Weight shown is for a pair of displays.*

6.2 Initialization Information at Startup

Every time the display is powered up and there is no All Sport® 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 display fails at startup, power may not be properly connected, or the address setting may not be correct on the display driver. Check both in the event of a failure.

6.3 Display 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 4.8**.

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 **Section 6.7)**.
One or more LEDs on a single module fails to turn off	Check/replace the ribbon cables on module.
	Replace the module (see **Section 6.7**).
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 on the left side of the first module that is not working (see **Section 6.7**).
	Replace the second module that is not working (see **Section 6.7**).
	Replace the power supply assembly on the first module that is not working (see **Section 6.8**).
One row of modules does not work or is garbled	Replace the first module (see **Section 6.7**).
	Replace the display driver (see **Section 6.6**).
A group of modules that share the same power supply assembly fails to work	Replace the power supply assembly (see **Section 6.8**).
Entire display fails to work	Check for proper line voltage into the power termination panel.
	Check/replace the ribbon cable from the display 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 **Section 6.6**).

6.4 Power & Signal Summary

Reference Drawings:

Schematic: 3/4" and 1" DC TNMC's ..... **Drawing B-146975**

Refer to **Drawing B-146975** in **Appendix B** for detailed schematics about display power and signal routing.

Display signal routing can be summarized as follows:

1. Data from the All Sport® controller travels via signal cable (or radio) into the scoreboard.
2. The signal then travels through the driver, typically re-driven from the driver TB-31 to the current loop interface (CLI) cards located on the right-hand module of each display.
3. A ribbon cable harness carries the signal to the first LED module, and the signal relays from module to module via ribbon cable in daisy-chain style until it reaches the last module in the display.

Display power routing can be summarized as follows:

1. Incoming power from the power cord terminates at the main scoreboard LED driver tray.
2. Using interconnect harnesses, the power is passed from the driver tray to the Home display power supply, and then to the Guest display power supply.
3. Power from the power supplies is relayed to all display modules.
4. The modules draw their power directly from the power supply assemblies; the display driver receives power out from the first module via ribbon cable.

6.5 Component Locations & Access

Reference Drawings:

Installation, 6" Amber 8x48 TNMC..... **Drawing A-148701**

To access the internal components of the display, simply remove the two screws on either side of the face panel that secure it to the scoreboard. Carefully remove the face panel from the scoreboard, as there will be several cables connected to it.

Drawing A-148701 in **Appendix B** provides a detailed view of each display component and the connections between them.

6.6 Display Drivers

Reference Drawings:

A/S 5000 Capable TNMC Shift Card; Specifications ..... **Drawing A-123794**

Display drivers, also known as controllers or shift cards, use a 12-pin plug that mates with jack J4 to set the address. For TNMCs, the address plug is set to 1 (221). Pin 11 on the address plug selects whether the display shows Guest (default) or Home data. Refer to **Drawing A-123794** in **Appendix B** for addressing information.

Figure 14 illustrates some of the primary jacks and indicators of a display driver.

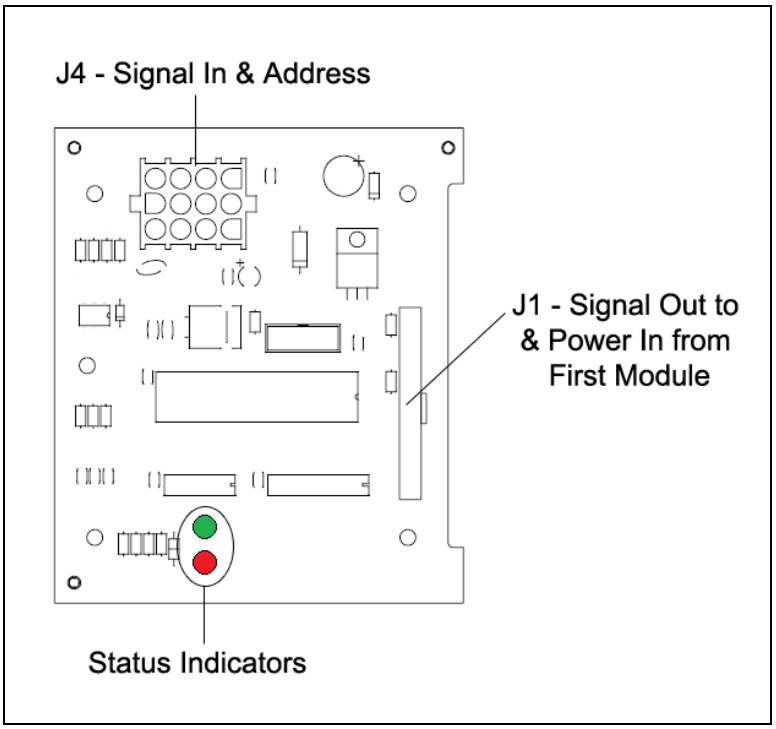


Figure 14: *Display Driver*

Diagnostic LEDs

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

LED Name	Color	Illumination Summary
DS1 PWR	Green	Steady on or blinking when the driver has power
DS2 RX	Red	Steady on or blinking when the driver is receiving and off when there is no current loop (CL) signal

Replacing a Driver

1. Access the internal components as 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 screws securing the driver to the module. This will be the right-most module, when viewing the display from the front.
4. Position a new driver over the standoffs on the module and tighten the screws.
5. Reconnect all power/signal connectors.
6. Power up and test the scoreboard/display to see if the problem has been resolved.

Refer to **Figure 15** for an overview of driver (and module) replacement.

6.7 Modules

Display modules consist of LEDs embedded in a circuit board. One or more circuit boards are mounted to the back of a display face panel. Do not attempt to remove individual LEDs. In the case of malfunctioning LEDs, replace the entire module circuit board.

Replacing Modules

1. Access the internal components as described in **Section 6.5**.
2. Carefully disconnect all ribbon cables 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.

3. Remove the nuts securing the module circuit board to the face panel. If a display driver is attached to the module, remove it along with the screws and standoffs.
4. Position a new module on the front of the face panel and reconnect all ribbon cables.
5. Reattach the module to the face panel. If a display driver was previously removed from the module, reattach it at this time too.
6. Power up and test the scoreboard/display to see if the problem has been resolved.

Refer to **Figure 15** for an overview of module (and driver) replacement.

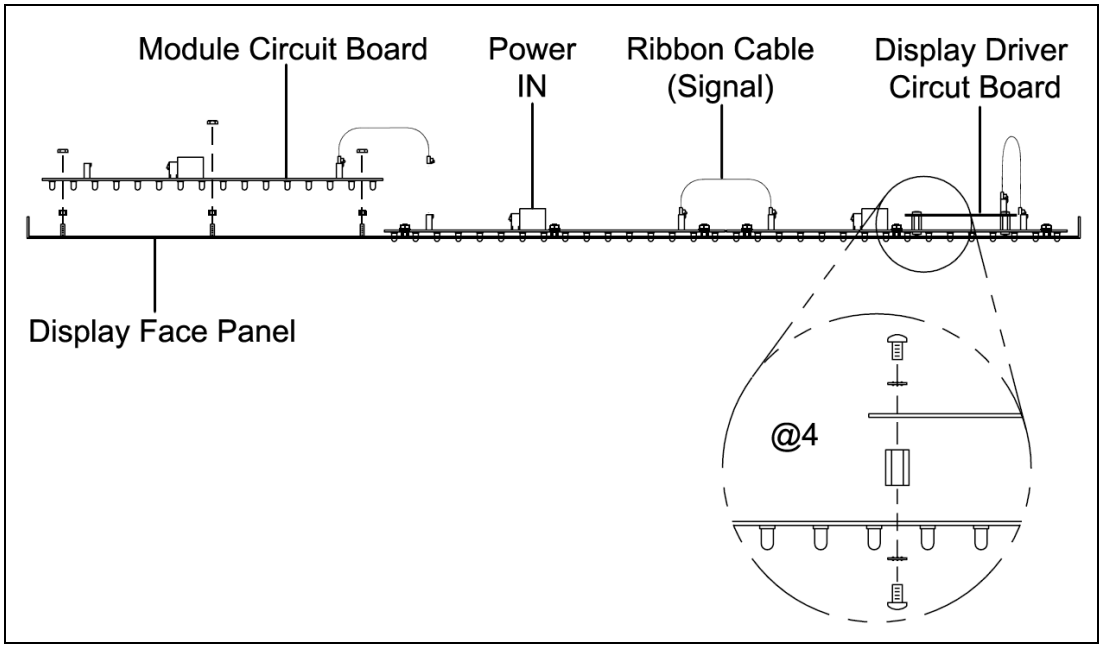


Figure 15: *Replacing a Module or Driver, Top View*

6.8 Power Supplies

Replacing a Power Supply

1. Access the internal components as described in **Section 6.5**.
2. Remove the two screws securing the power supply bracket, and remove it from the display cabinet.
3. Disconnect all the wires connected to the power supply.

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

4. Remove the three screws securing the power supply to the bracket, and attach the new power supply to it.
5. Reconnect all wires, and mount the power supply bracket inside the display cabinet.

6.9 Display Maintenance

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

- **Loose Hardware**: Verify that fasteners, such as bolts and rivets, have not come loose. Check and tighten or replace fasteners as required.
- **Excessive Dust Buildup:** It may be necessary to occasionally vacuum the inside of the display cabinet to remove dust/dirt buildup that may interfere with airflow.
- **Corrosion:** Check the paint, and look for possible corrosion

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 table contains display components that may have to be replaced. Many of the components within the display itself have attached part number labels.

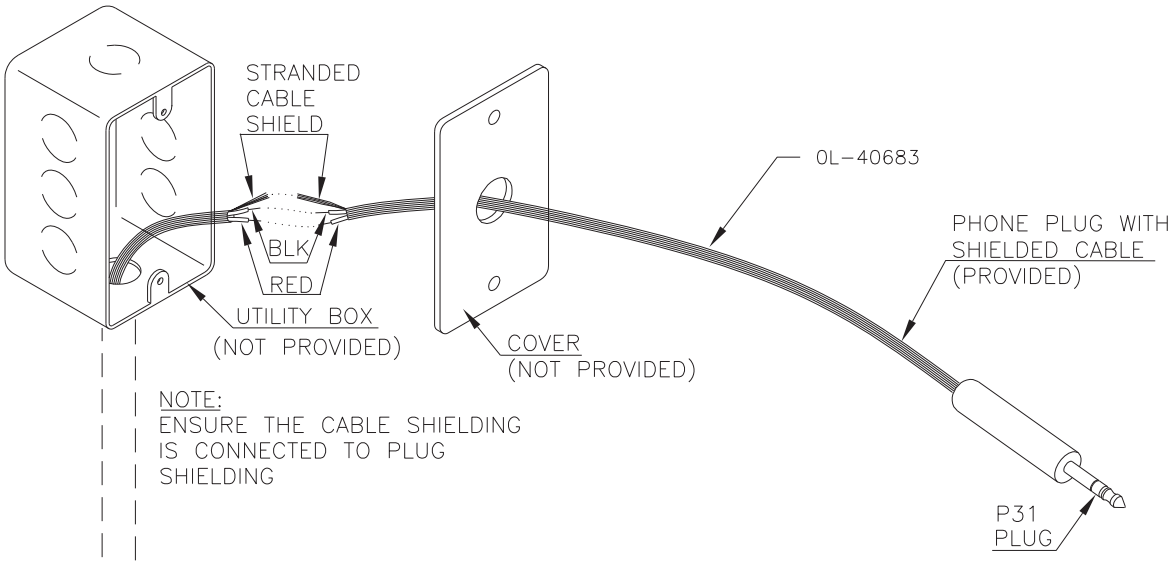
Part Description	Part Number
Indoor TNMC Card	0P-1150-0206
Module; 8x16, Amber	0P-1186-0112
Power Supply; 5V @ 10A, 85-264VAC	A-1568
Cable; 18 pos, Ribbon, 6"	W-1320

See **Section 4.8** for information on Daktronics Exchange and Repair and Return program.

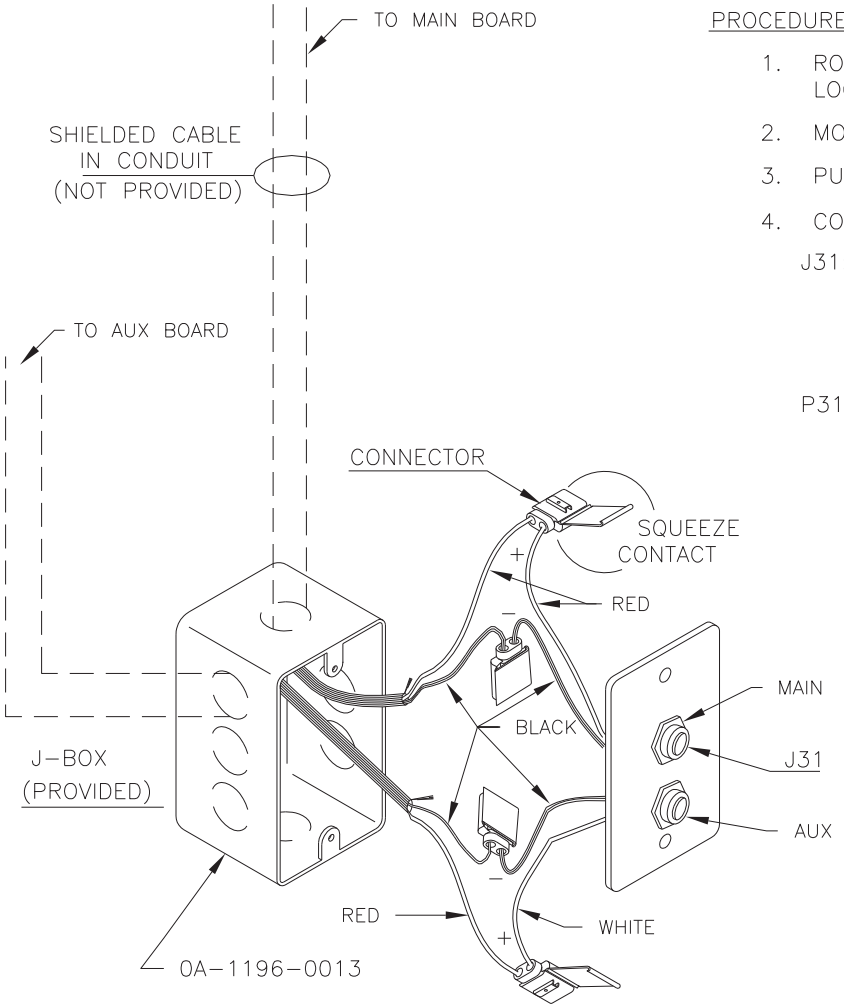
Appendix A: Reference Drawings

Drawing Title	*Drawing Number*
Signal Connection; Installation	**A-28124**
Segmentation, 7 Segment Bar Digit	**A-38532**
Address Table, 1 Through 128	**A-115078**
Block Diagram: AS5000 BB- VB and WR #1	**A-124686**
Block Diagram: AS5000 BB- VB and WR #3	**A-124688**
Schematic; Dual 1/4" Phone J-box w/Shunt Jack	**A-125316**
Block Diagram- A/S 3000 or 5000 BB- VB and WR #2	**A-125415**
Block Diagram: A/S 3000 or 5000 BB- VB and WR #4	**A-125417**
16 Column LED Driver II Specifications	**A-126174**
Schematic- 16V 1 Driver- 120 or 230VAC	**A-158348**
Mechanical Spec- VB-2101	**A-170489**
Electrical and Signal Spec- VB-2101	**A-170492**

DISPLAY LOCATION



NOTE:
ENSURE THE CABLE SHIELDING IS CONNECTED TO PLUG SHIELDING



PROCEDURE

1. ROUTE CONDUIT BETWEEN CONTROL AND DISPLAY LOCATIONS.
2. MOUNT BOXES.
3. PULL CABLE THROUGH CONDUIT.
4. CONNECT CABLE TO J31 AND P31

   J31: USE CONNECTORS PROVIDED. INSERT WIRES INTO CONNECTOR AND SQUEEZE CONTACT DOWN WITH PLIERS. SNAP PLASTIC COVER SHUT.

   P31: CONNECT WIRES TO CABLE AS FOLLOWS:

   J31 RED TO P31 RED (+)

   J31 BLK TO P31 BLK (–)

   J31 SHIELD TO P31 SHIELD

NOTE!!

DO NOT CONNECT CABLE SHIELD AT CONTROL CONSOLE END

CONTROL LOCATION

REV.	DATE	DESCRIPTION	BY	APPR.
05	30 JUL 03	BOLD FACED GROUNDING NOTE	TLH	
04	17 JUN 03	CHANGED GROUDING PROCEDURES	JJC	MWM
3	17 JAN 02	ADDED AUX TO J-BOX	JJS	
2	25 MAR 92	CHANGED WHITE TO RED	JTC	
1	05 NOV 91	REDREW ON A-SIZE ON ACAD.	JLH	

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: BASKETBALL

TITLE: SIGNAL CONNECTION; INSTALLATION

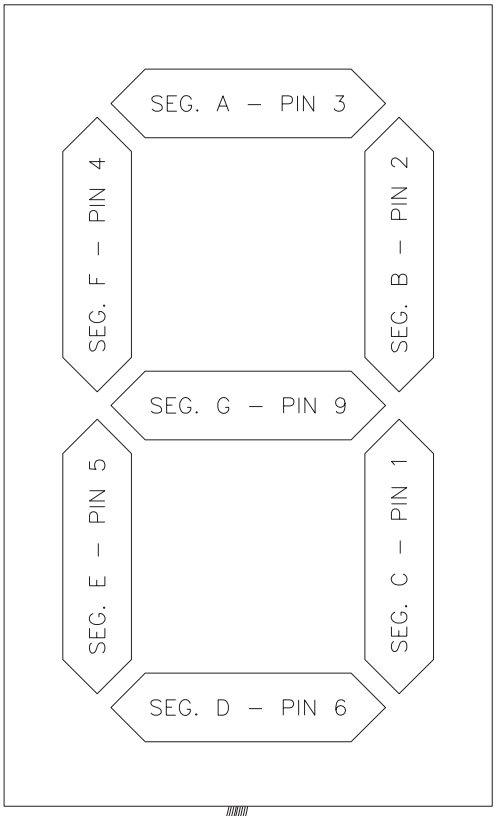
DES. BY: AVB DRAWN BY: MHART DATE: 15SEP86

REVISION 05

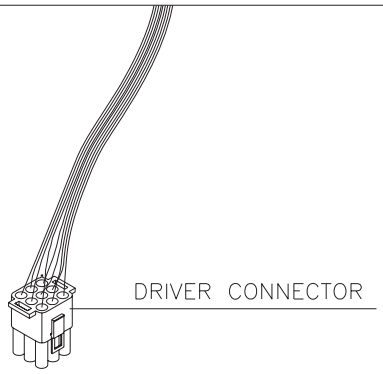
APPR. BY: AVB

SCALE: NONE

1009-R10A-28124

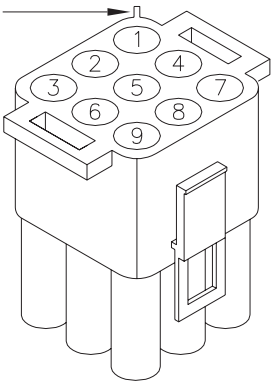


7 SEGMENT BAR DIGIT
FRONT VIEW



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

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	

PROJ: BASKETBALL
TITLE: SEGMENTATION, 7 SEGMENT BAR DIGIT
DES. BY: DRAWN BY: HEIDERSCHEIDT DATE: 5 JUN 89
REVISION 02
APPR. BY: AVB
SCALE: 1=4
1009-R04A-38532

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	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
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
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
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
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
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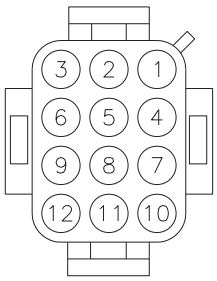
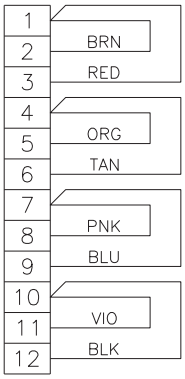
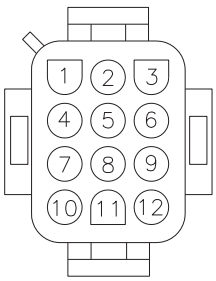


ADDRESS PLUG
WIRE SIDE

WIRING DIAGRAM

ADDRESS PLUG
WITH ALL WIRES
CONNECTED





BOTTOM VIEW

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

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ:

TITLE: ADDRESS TABLE, 1 THROUGH 128

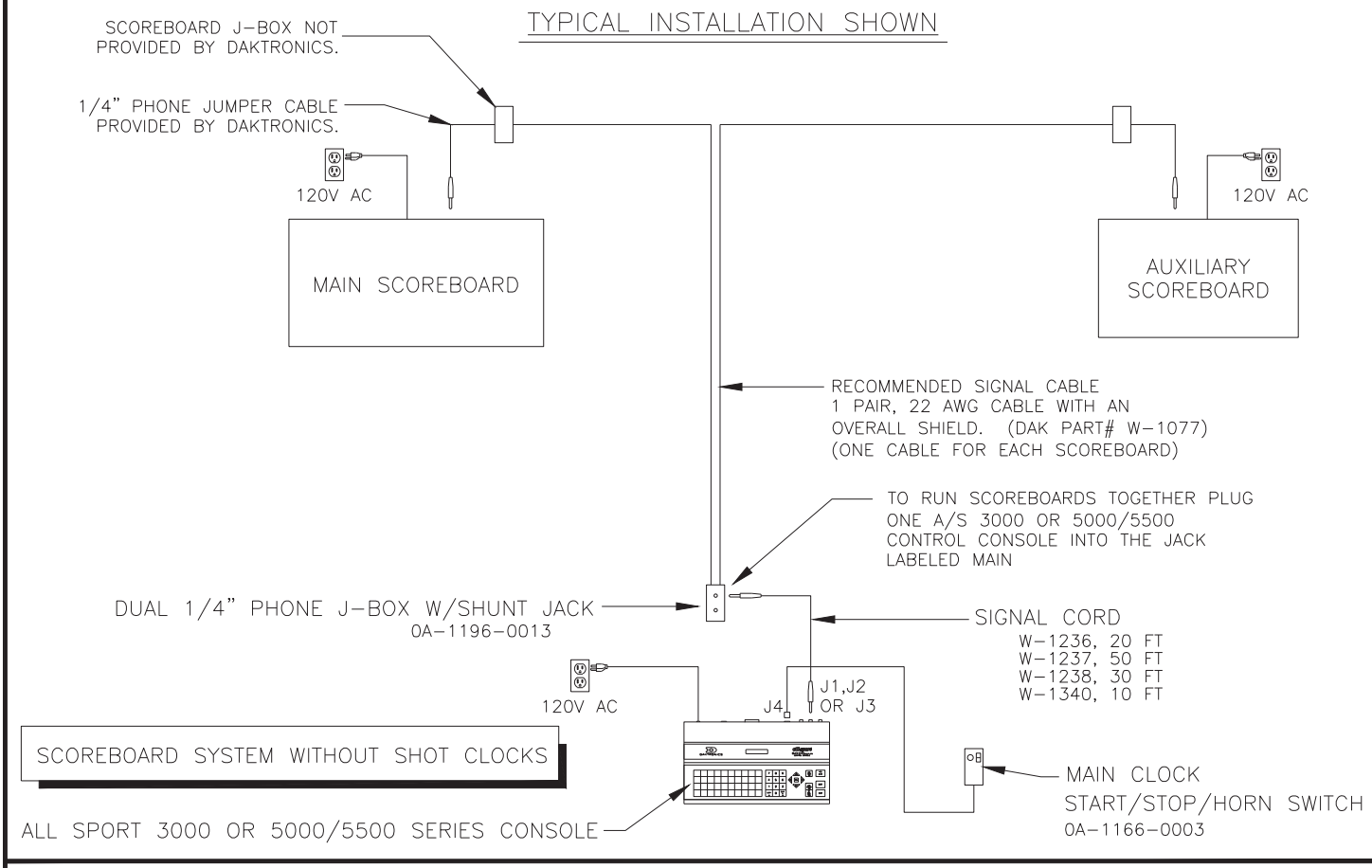
DES. BY: AVB DRAWN BY: A VANBEMMEL DATE: 28 APR 99

REVISION 01 APPR. BY:

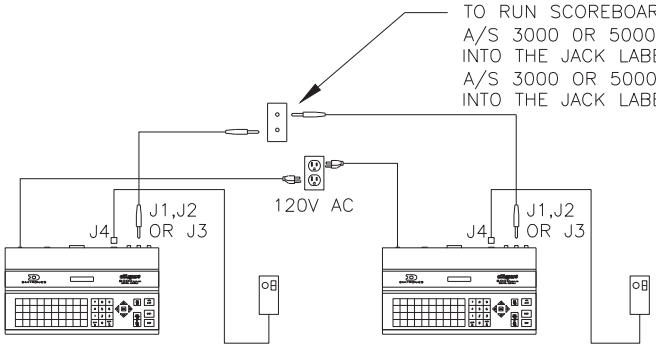
SCALE: NONE

1150-R04A-115078

TYPICAL INSTALLATION SHOWN

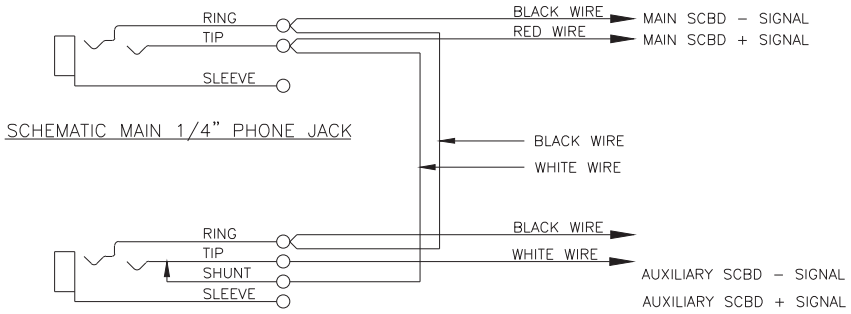


SEPARATE SCOREBOARD CONTROL



0A-1196-0013 J-BOX

TYPICAL 0A-1196-0013 J-BOX WIRING



REV	DATE:		BY:
02	17 AUG 11	UPDATED THE BOARDER AND TITLE BLOCK UPDATED TEXT TO INCLUDE 5500 SERIES	JJL
01	26 APR 00	ADDED A/S 3000	DKD

DAKTRONICS, INC.
BROOKINGS, SD 57006

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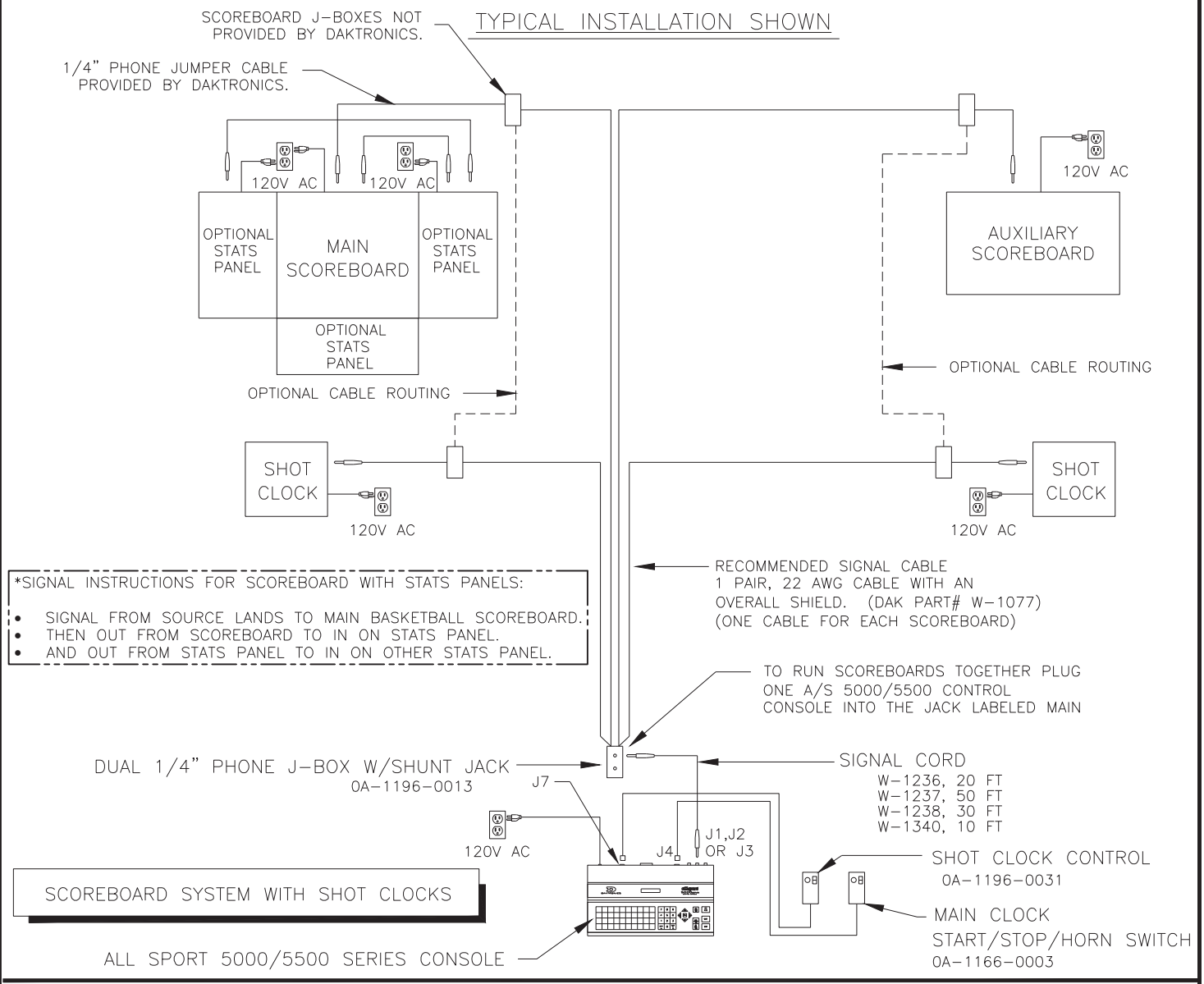
PROJ: ALL SPORT 5000/5500

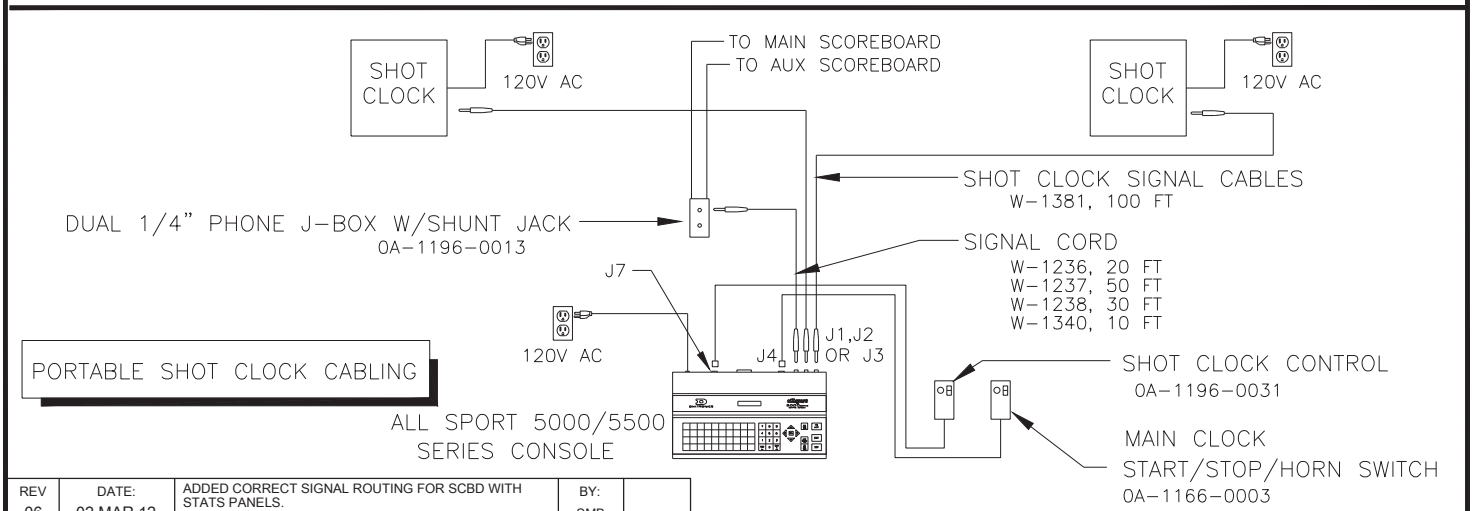
TITLE: BLOCK DIAGRAM: AS5000 BB- VB AND WR #1

DESIGN: | DRAWN: E BRAVEK | DATE: 29 NOV 99

SCALE: NONE

SHEET	REV	JOB NO:	FUNC-TYPE-SIZE	
	02	P1196	R-04-A	124686





REV	DATE:		BY:	
06	02 MAR 12	ADDED CORRECT SIGNAL ROUTING FOR SCBD WITH STATS PANELS.	SMB	
REV	DATE:		BY:	
5	17 AUG 11	UPDATED THE BOARDER AND TITLE BLOCK. UPDATED DRAWING TO INCLUDE 5500 SERIES	JJL	
4	17 JAN 02	CHANGED 0A-1166-0004 TO 0A-1196-0031	JJS	
3	06 SEP 01	ADDED BOTTOM OPTIONAL STATS PANEL TO MAIN BOARD, AND ADDED SIGNAL CABLES TO AND FROM OPTIONAL STATS PANELS.	NW	
2	14 DEC 00	ADDED 120VAC TO SIDE BOARDS OF MAIN SCOREBOARD	NSW	
1	29 DEC 99	ADDED SHOT CLOCK REMOTE START/STOP TO TOP A/S5000 CONTROLLER	EB	

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BROOKINGS, SD 57006
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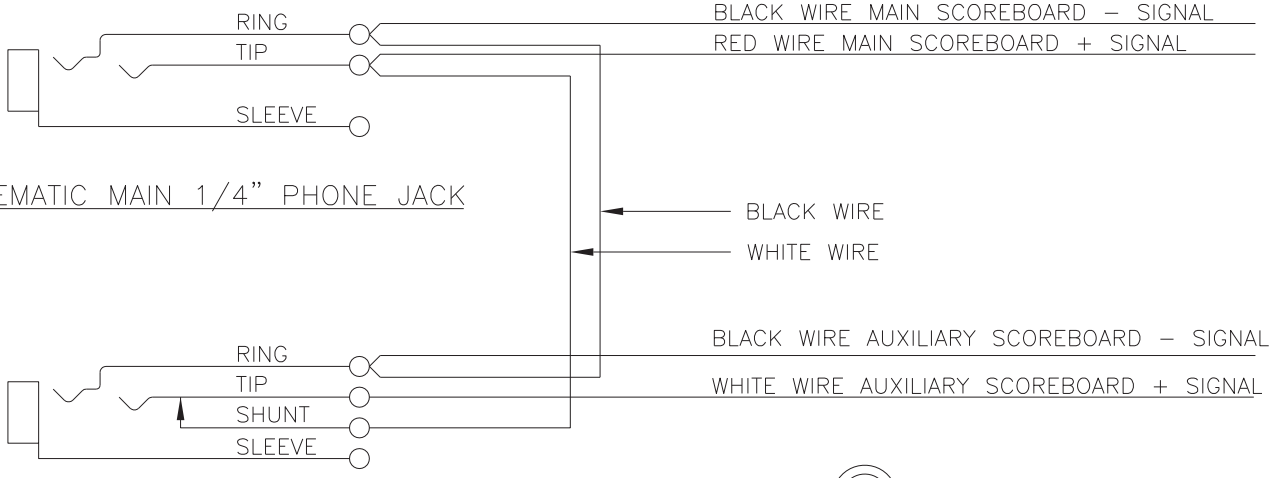
PROJ: ALL SPORT 5000/5500
TITLE: BLOCK DIAGRAM: AS5000 BB- VB AND WR #3
DESIGN: | DRAWN: E BRAVEK | DATE: 29 NOV 99
SCALE: NONE

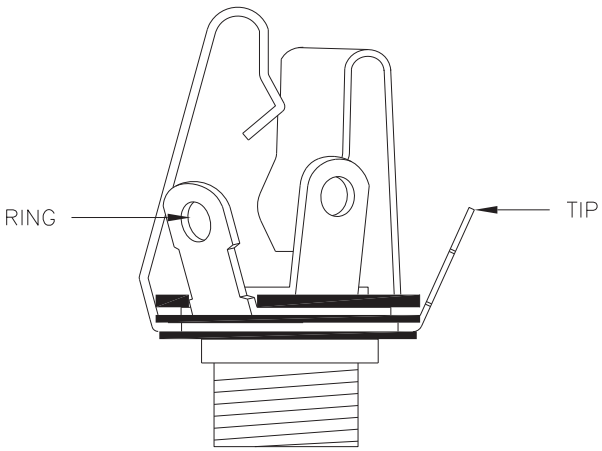
SHEET	REV	JOB NO:	FUNC-TYPE-SIZE	
	06	P1196	R-04-A	124688



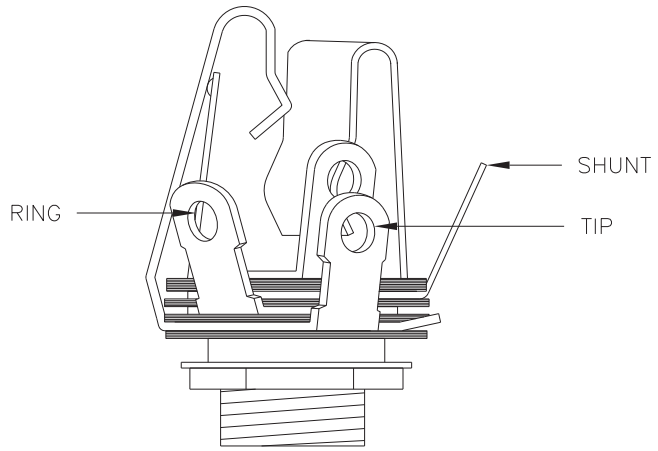
SCHEMATIC MAIN 1/4" PHONE JACK

SCHEMATIC AUXILIARY 1/4" PHONE JACK

0A–1196–0013



MAIN
PHONE JACK
J–1003



AUXILIARY
PHONE JACK
J–1131

REV.	DATE	DESCRIPTION	BY	APPR.

DAKTRONICS, INC. BROOKINGS, SD 57006

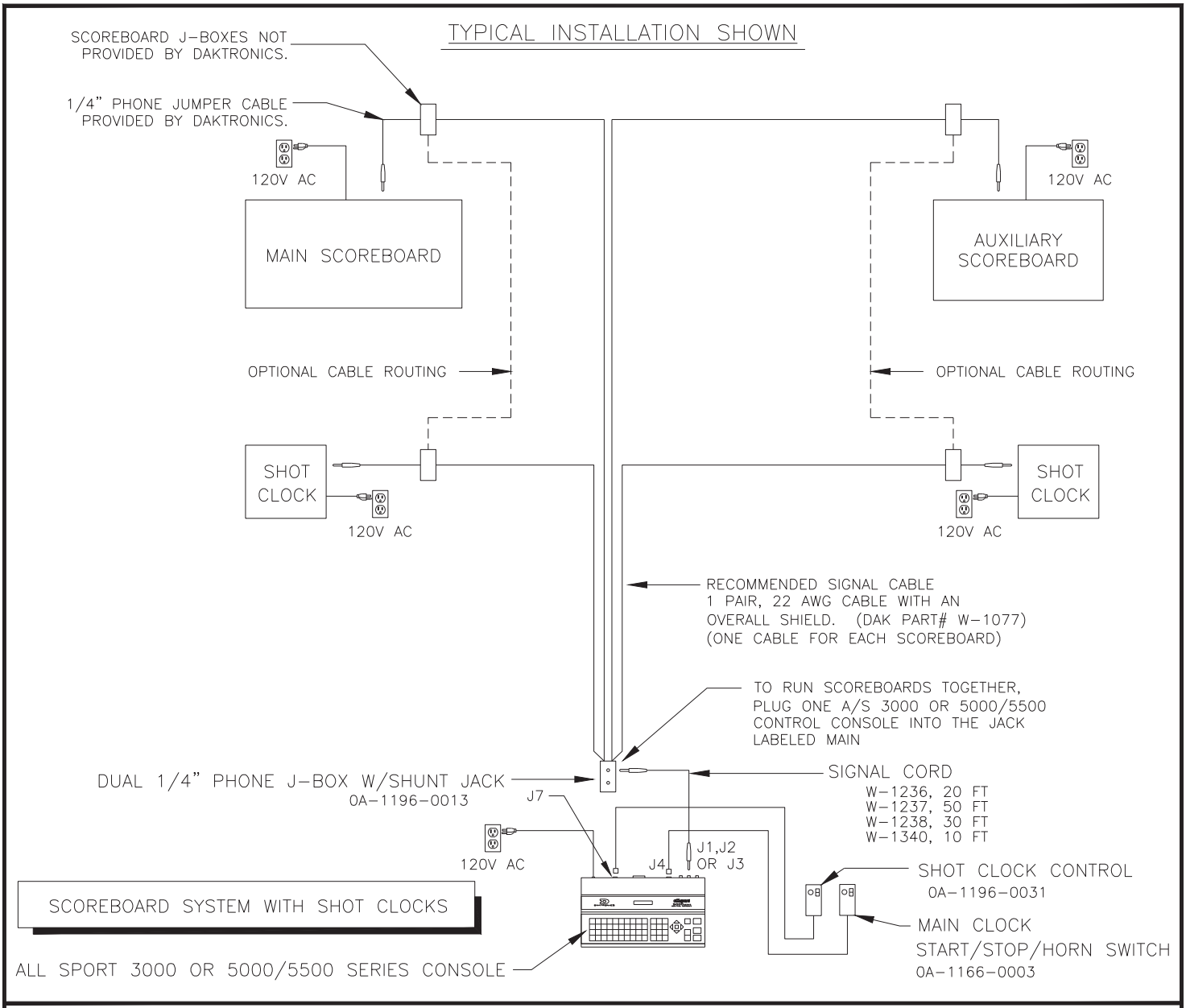
PROJ:

TITLE: SCHEMATIC; DUAL 1/4" PHONE J–BOX W/SHUNT JACK

DES. BY: E BRAVEK DRAWN BY: E BRAVEK DATE: 15 DEC 99

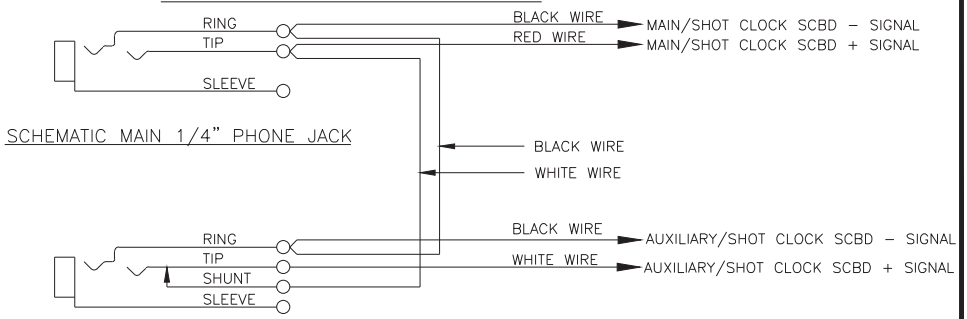
REVISION 00 | APPR. BY: | SCALE: NONE

1196-R03A-125316



0A-1196-0013 J-BOX

TYPICAL 0A-1196-0013 J-BOX WIRING



REV	DATE:		BY:
04	24 AUG 11	UPDATED TEXT TO INCLUDE 5500 SERIES UPDATED TITLE BLOCK	JJL
3	17 JAN 02	CHANGED 0A-1166-4 TO 0A-1196-31	JJS
02	26 APR 00	ADDED A/S 3000	DKD
1	29 DEC 99	ADDED SHOT CLOCK REMOTE START STOP TO A/S 5000 CONTROLLER	EB

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BROOKINGS, SD 57006
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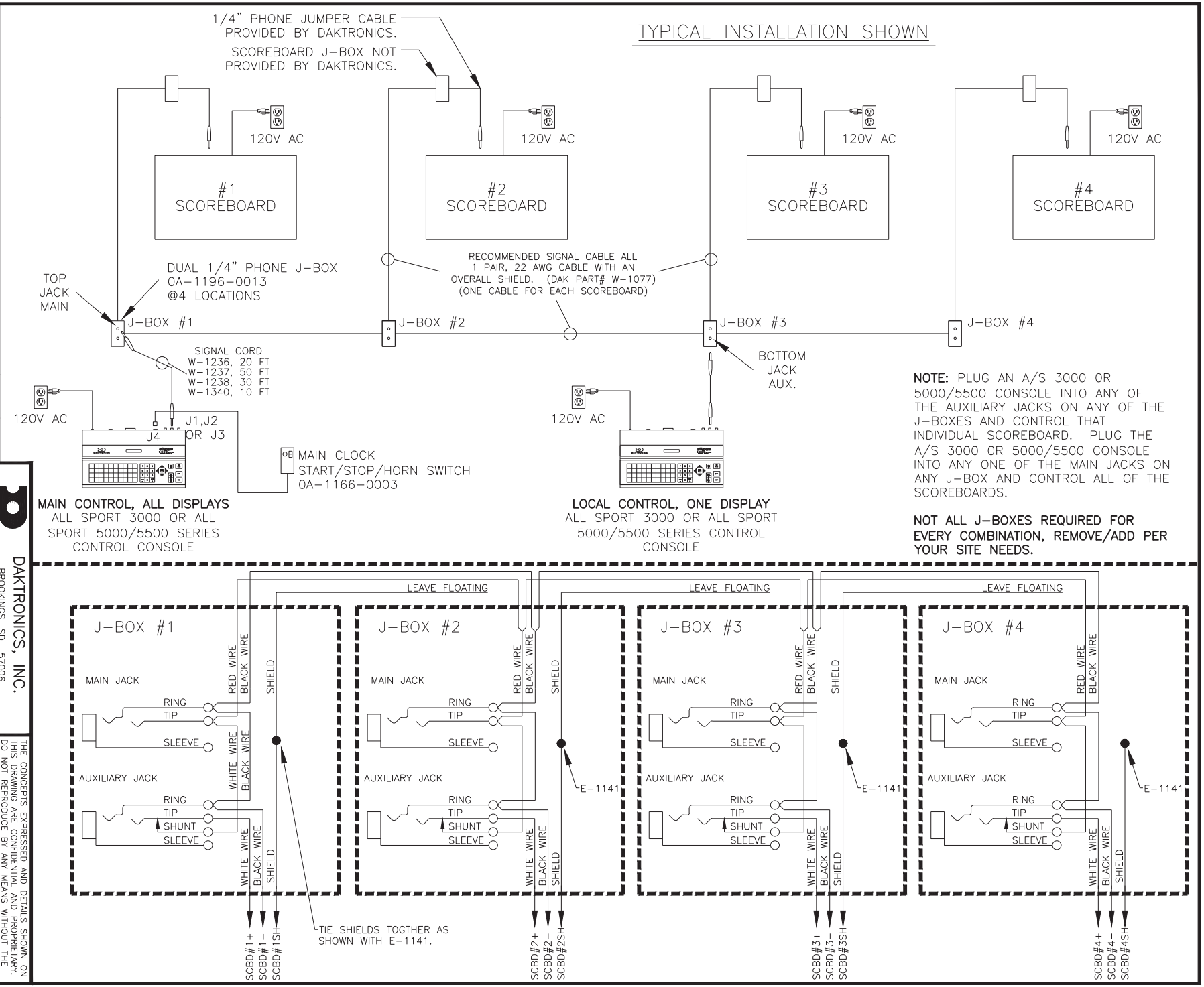
PROJ: ALL SPORT 5000/5500
TITLE: BLOCK DIAGRAM- A/S 3000 OR 5000 BB- VB AND WR #2
DESIGN:
DRAWN: E BRAVEK
DATE: 15 DEC 99
SCALE: NONE

SHEET	REV	JOB NO:	FUNC-TYPE-SIZE	
	04	P1196	R-04-A	125415



04	24 AUG 11	UPDATED DRAWING TO INCLUDE 5500 SERIES UPDATED TITLE BLOCK
03	18 DEC 08	UPDATED DRAWING WITH PROPER SHIELDING
02	31 JAN 07	UPDATED DRAWING TO SHOW SECOND ALL SPORT
01	26 APR 00	ADDED A/S 3000

04	24 AUG 11	JJL
03	18 DEC 08	DKD
02	31 JAN 07	MWM
01	26 APR 00	DKD

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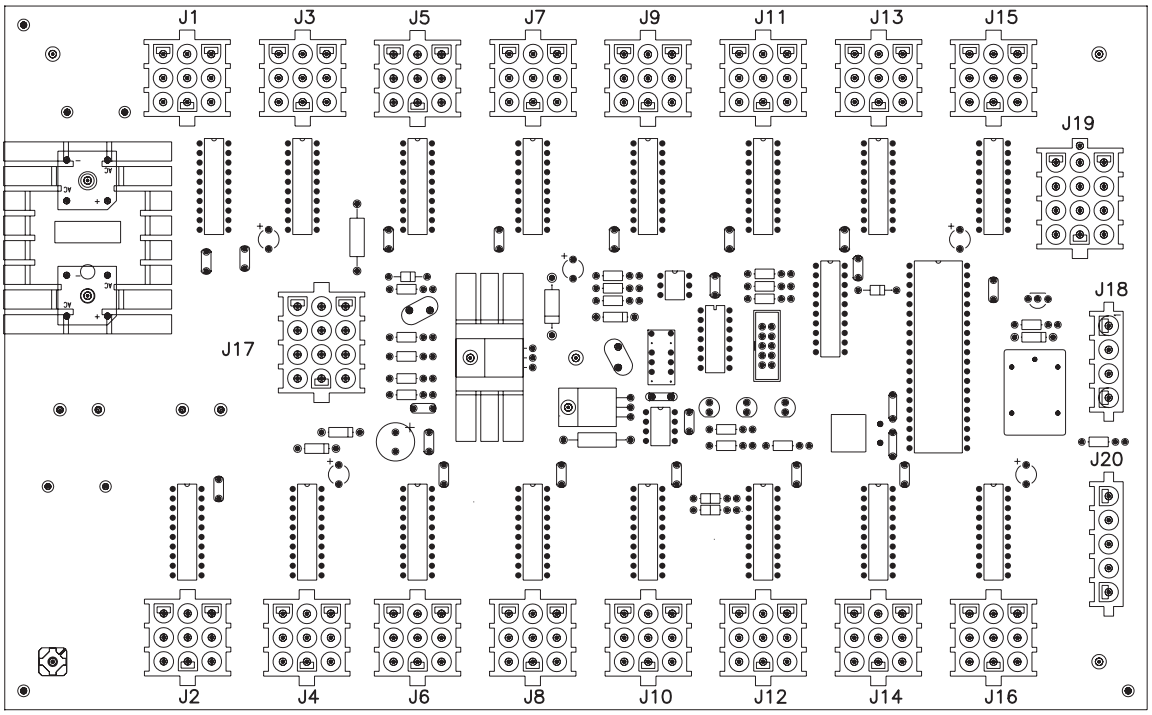
PROJ: ALL SPORT 5000/5500
TITLE: BLOCK DIAGRAM: A/S 3000 OR 5000 BB- VB AND WR #4
DESIGN: EBRAVEK
DRAWN: EBRAVEK
DATE: 24 JAN 00
SCALE: NONE

SHEET	REV	JOB NO:	FUNC-TYPE-SIZE
	04	P1196	R-01-A

12541 7

OP-1150-0126 UNCOATED OR 0P-1150-0127 COATED
16 COLUMN LED DRIVER II



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

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

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

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

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

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

-GREEN LED INDICATES THE DRIVER HAS POWER

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

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

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

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

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

REV.	DATE	DESCRIPTION	BY	APPR.
01	2 OCT 00	UPDATED NOTES SECTION	NSW	

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ:

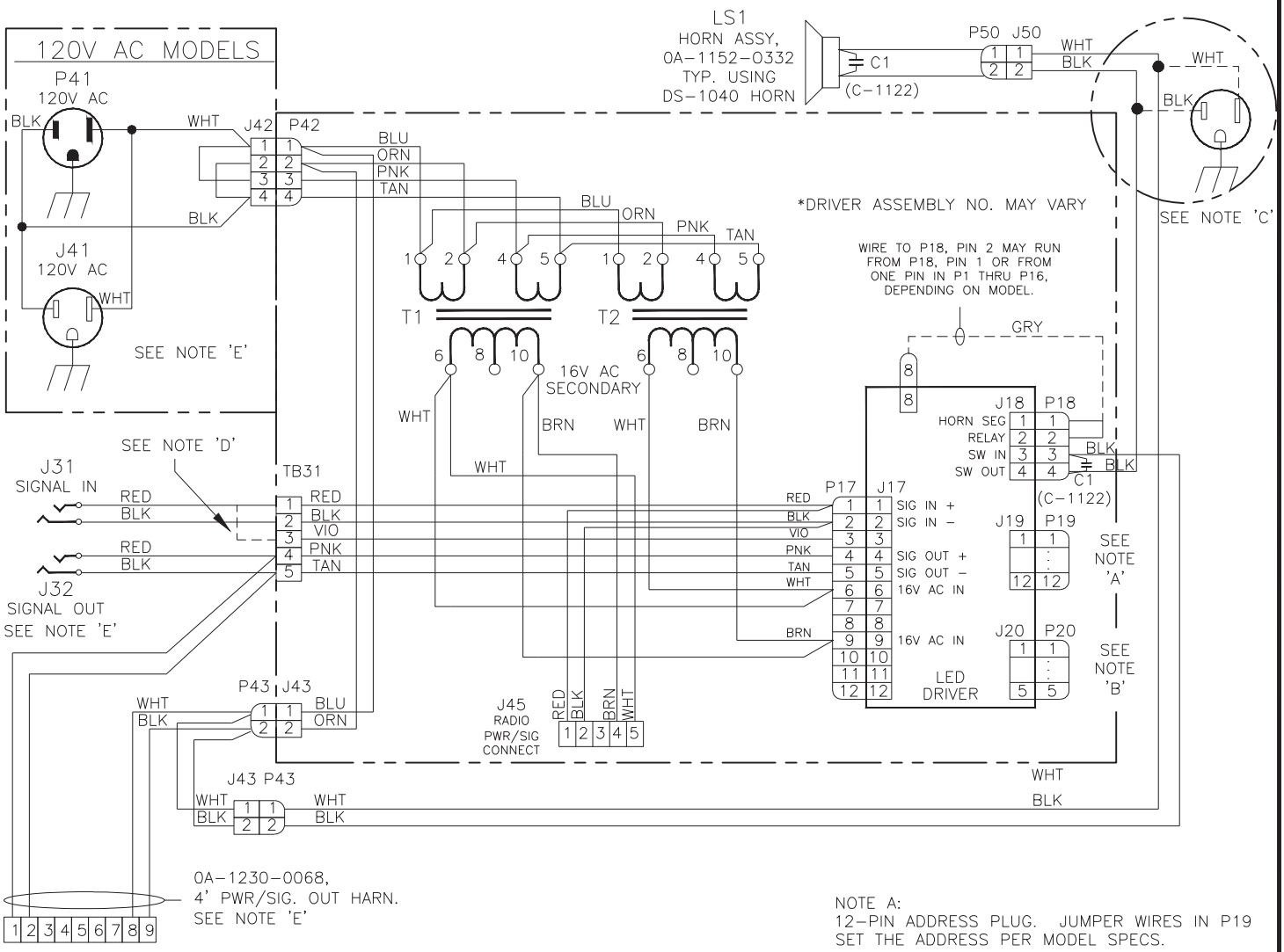
TITLE: 16 COLUMN LED DRIVER II SPECIFICATIONS

DES. BY: EB DRAWN BY: EBRAVEK DATE: 11 JAN 00

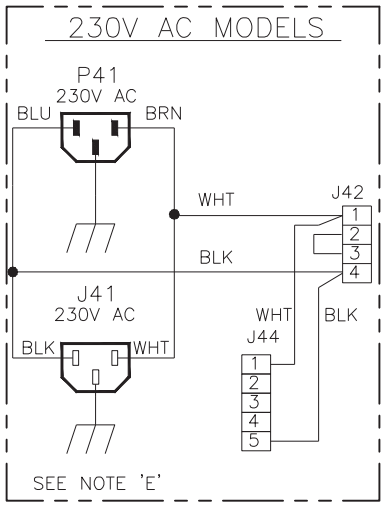
REVISION 01 APPR. BY: SCALE: 1=2

1150-R07A-126174

120V AND 230VAC MODELS



230V AC MODELS



120V AC MODELS

SPECIFICATION LABEL DATA
MODEL NO: (PER ORDER)
VOLTS: 120 VAC, SINGLE PHASE
WATTS: 200
AMPS: 1.7

230V AC MODELS

SPECIFICATION LABEL DATA
MODEL NO: (PER ORDER)
VOLTS: 230 VAC, SINGLE PHASE
WATTS: 200
AMPS: .9

NOTE A:
12-PIN ADDRESS PLUG. JUMPER WIRES IN P19 SET THE ADDRESS PER MODEL SPECS.

NOTE B:
5-PIN PROTOCOL PLUG. JUMPER WIRES IN P20 SET THE PROTOCOL PER SYSTEM SPECS.

NOTE 'C':
J-1041 @1 & E-1047 @2, USED FOR EXTERNAL HORN APPLICATIONS. NOT AVAILABLE ON SOME MODELS.

NOTE D:
FOR SWIM SYSTEMS CONTROLLED BY POWER TIME.

NOTE 'E':
NOT USED IN SOME MODELS.

REV	DATE:		BY:
05	13 FEB 03	MOVED TAP 8 TO A DOUBLE CRIMP ON TAP 10 ON TRANSFORMER T1 CONNECTED TO J45. UPDATED TITLE TO SAY 230VAC ALSO	CME
04	15 APR 02	ADDED 4' PWR/SIG OUT HARN. THAT IS IN SOME TUFF SPORT MODELS.	MWM
03	23 JAN 02	CHANGED TITLE FROM SCHEMATIC, 16V LED DRVR TO SCHEMATIC, 16V 1 DRIVER, 120 VAC	ALG
02	17 DEC 01	CHANGED DRIVER BLOCK LAYOUT.	MWM
01	11 NOV 01	UPDATED NOTES AND 230V POWER BLOCK	MWM

REV	DATE:		BY:
07	01 JUN 11	ADDED CAP DETAIL ON P18 AT DRIVER LOCATION FOR THE HORN HARNESS. UPDATED LS1 TEXT	MWM
06	11 JAN 05	ADDED WIRE COLORS TO 230V PLUG PER ECO# 042552	RT

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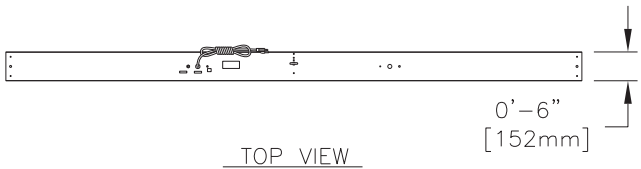
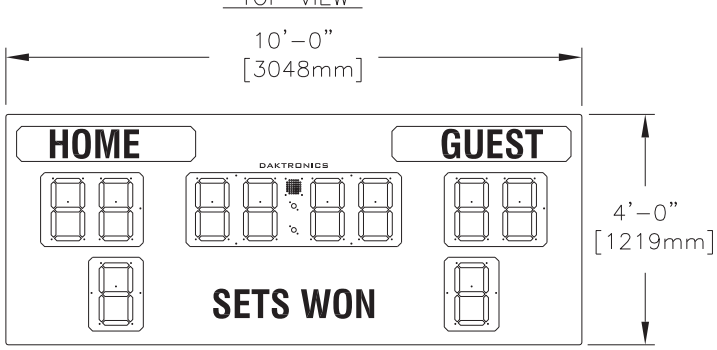
PROJ: INDOOR UNIFORM LED DIGIT
TITLE: SCHEMATIC- 16V 1 DRIVER- 120 OR 230VAC
DESIGN: MMILLER | DRAWN: MMILLER | DATE: 02 NOV 01
SCALE: 1=1

SHEET	REV	JOB NO:	FUNC-TYPE-SIZE	
	07	P1230	R-03-A	158348

VB–2101

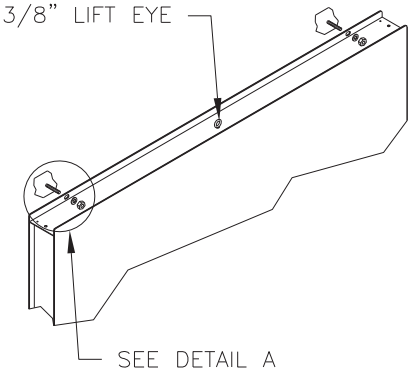


TOP VIEW

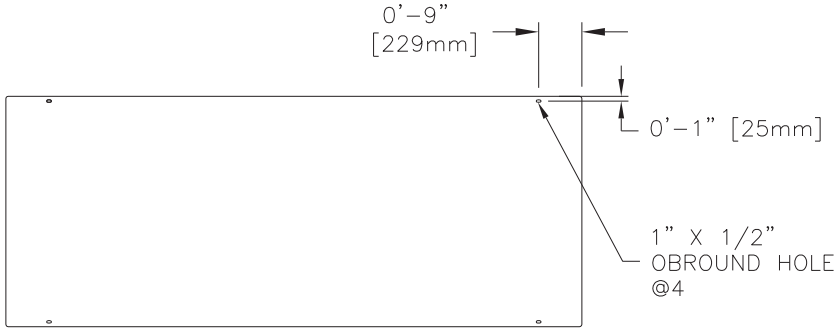


FRONT VIEW

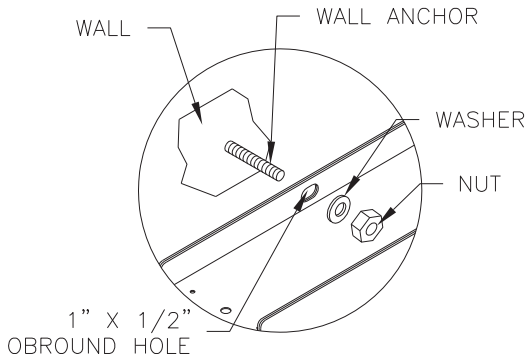
SIDE VIEW



WALL MOUNTING DETAIL



REAR VIEW



DETAIL: A
(SCALE 1=10)

NOTES:

1. USE APPROPRIATE WALL ANCHORS FOR TYPE OF WALL.

2. LIFT EYE IS FOR TEMPORARY USE WHILE LIFTING SCOREBOARD DURING INSTALLATION. DO NOT USE LIFT EYE FOR PERMANENT SUSPENSION.

3. SEE DRAWING 1237–R10A–148644 FOR OPTIONAL PERMANENT SUSPENSION OF THE SCOREBOARD.

4. THE SCOREBOARD IS SHOWN WITH UNIVIEW™ DIGIT TECHNOLOGY. SEE DRAWING A–158550 FOR MORE DETAILS.

WEIGHTS	
SHIPPING WEIGHT	MOUNTING WEIGHT
240 LBS (109 KG)	150 LBS (68 KG)

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DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: TUFF SPORT™ SCOREBOARDS

TITLE: MECHANICAL SPEC– VB–2101

DES. BY: B PETERSON DRAWN BY: AGIBSON DATE: 02 JUL 02

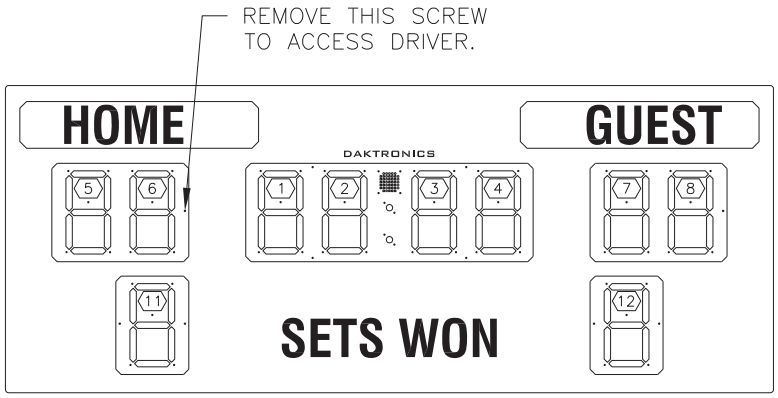
REVISION 01 | APPR. BY: | SCALE: 1=40

1237-E10A-170489

REV.	DATE	DESCRIPTION	BY	APPR.
01	05 APR 10	REPLACED "GAMES WON" CAPTION WITH "SETS WON"	SAG	

VB–2101

DIGIT, SIGNAL AND POWER SPECIFICATIONS:



FRONT VIEW

NOTES:

1. USE MINIMUM OF 24AWG, SHIELDED, TWO CONDUCTOR CABLE FOR SIGNAL TERMINATION.

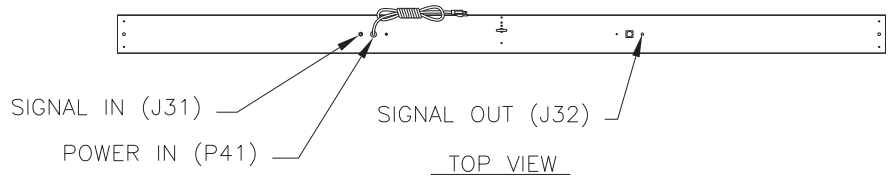
2. THE NUMBER LISTED BY EACH DIGIT INDICATES THE LED DRIVER AND DIGITDESIGNATION IN RELATION TO THE LED DRIVER.

3. DO NOT WORK ON ENERGIZED DISPLAY UNLESS YOU ARE A CERTIFIED ELECTRICIAN OR DIRECTED BY DAKTRONICS.

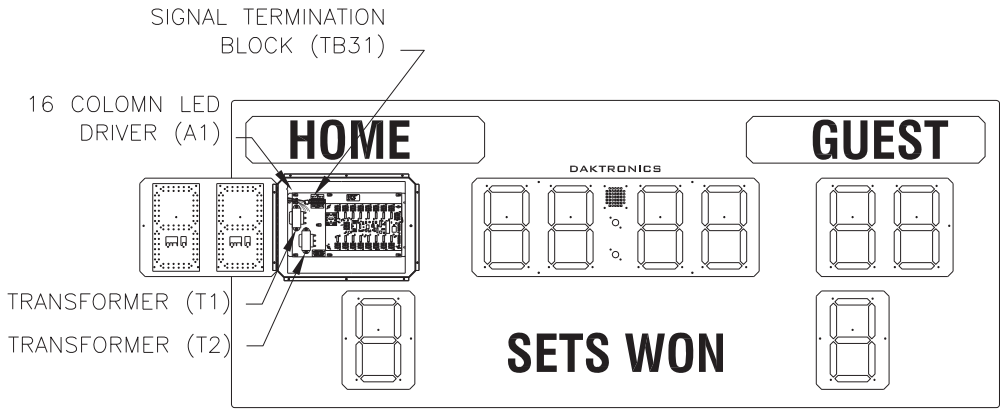
4. THE SCOREBOARD IS SHOWN WITH UNIVIEW DIGIT TECHNOLOGY. SEE DRAWING A–158550 FOR MORE DETAILS.

ADDRESS INFORMATION	
DRIVER:	A1
ADDRESS:	17

COMPONENT LOCATION:



TOP VIEW



FRONT VIEW

DIGITS:

CLOCK: 13" AMBER
SCORE: 13" RED
GAMES WON: 13"AMBER

TUFF SPORT™, & UNIVIEW™ ARE TRADEMARKS OF DAKTRONICS

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DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: TUFF SPORT™ SCOREBOARDS

TITLE: ELECTRICAL AND SIGNAL SPEC– VB–2101

DES. BY: B PETERSON DRAWN BY: AGIBSON DATE: 02 JUL 02

REVISION 01 | APPR. BY: | SCALE: 1=30

1237-E10A-170492

REV.	DATE	DESCRIPTION	BY	APPR.
01	05 APR 10	REPLACED "GAMES WON" CAPTION WITH "SETS WON"	SAG	

Appendix B: Scoreboard Options

Drawing Title	*Drawing Number*
A/S 5000 Capable TNMC Shift Card; Specifications	**A-123794**
Schematic: 3/4" and 1" DC TNMC's	**B-146975**
Advertising/Identification Display Mounting	**A-147668**
Suspension Lift Eye Installation	**A-148644**
Installation, 6" Amber 8x48 TNMC	**A-148701**
12V DC Horn Option Installation	**A-148960**
Changeable Team Name Caption Installation	**A-150021**
Corner Mounting	**A-150831**
ID or Ad Panel Mounting to Scoreboard	**A-156134**

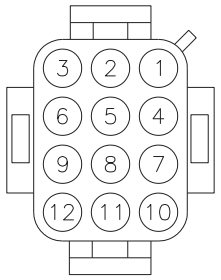
KEY: 0 = WIRE NOT CONNECTED 1 = WIRE IS CONNECTED TO ANY GROUND PIN (4,7,10)

J4 ADDRESS AND NAME SWAP SELECT JACK

SEE NOTE BELOW →

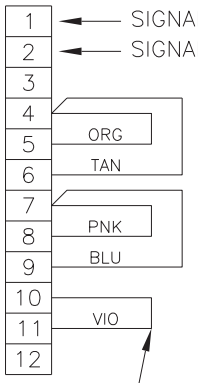
DECIMAL ADDRESS	PIN 9	PIN 8	PIN 6	PIN 5
1 (221)	0	0	0	1
2 (222)	0	0	1	0
3 (223)	0	0	1	1
4 (224)	0	1	0	0
5 (225)	0	1	0	1
6 (226)	0	1	1	0
7	0	1	1	1
8	1	0	0	0
9	1	0	0	1
10	1	0	1	0
11	1	0	1	1
12	1	1	0	0
13	1	1	0	1
14	1	1	1	0
15	1	1	1	1

NAME SELECT	PIN 11
BOTH HOME & GUEST	0
HOME/GUEST ONLY	1



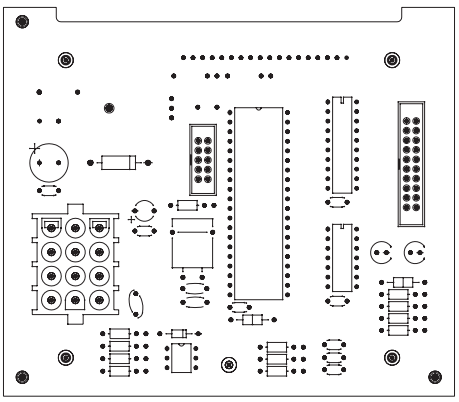
ADDRESS PLUG
WIRE SIDE

WIRING DIAGRAM
ADDRESS PLUG WITH ALL WIRES CONNECTED

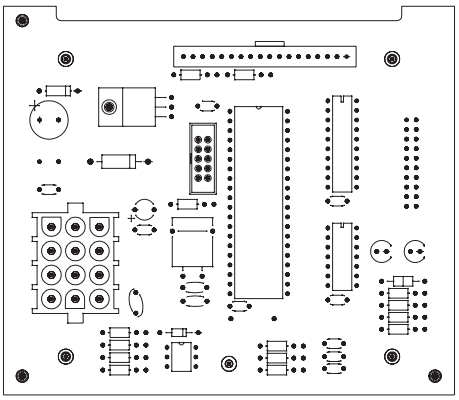


TEAM NAME SWAP PINS 10−11

OP−1176−0011; 1 1/2" & 2 1/2"
OUTDOOR TEAM NAME MESSAGE CENTER SHIFT CARD



OP−1150−0132; 1" & 3/4"
INDOOR INCANDESCENT AND LED TEAM NAME MESSAGE, CENTER SHIFT CARD



NOTES

−WITH NO ADDRESS PINS SELECTED THE TNMC SHIFT CARD WILL DEFAULT TO A/S 4000 PROTOCOL

−NAME SWAP PIN WORKS FOR EITHER A/S 4000 OR A/S 5000 PROTOCOL

−# (###) THE NUMBER IN PARENTHESIS IS THE ADDRESS OF THE DATA RECEIVED FROM THE A/S 5000 SERIES CONSOLE
−# (###) THE NUMBER BEFORE THE PARENTHESIS IS THE PHYSICAL ADDRESS SET BY THE JUMPERS ON THE J4 ADDRESS PINS

−CARD RECEIVES POWER FROM THE MODULE THAT IT IS PLUGGED INTO.

−GREEN LED INDICATES THAT THE CARD HAS POWER

−RED LED WILL BE ON OR BLINKING WHEN THE CARD IS RECEIVING SIGNAL.

−OP−1176−0011, OUTDOOR TEAM NAME CARD SHIFTS FROM LEFT TO RIGHT (HOME SIDE TO GUEST SIDE) NAME SWAP PIN CHANGES CARD FROM DEFAULTING TO HOME TO DEFAULTING TO GUEST SIDE DATA.

−OP−1150−0132, INDOOR TEAM NAME CARD SHIFTS FROM RIGHT TO LEFT (GUEST SIDE TO HOME SIDE), NAME SWAP PIN CHANGES CARD FROM DEFAULTING TO GUEST TO DEFAULTING TO HOME SIDE DATA.

REV.	DATE	DESCRIPTION	BY	APPR.
01	2 OCT 00	EDITED TEXT "HOME ONLY" TO "HOME/GUEST ONLY"	NSW	

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ:

TITLE: A/S 5000 CAPABLE TNMC SHIFT CARD; SPECIFICATIONS

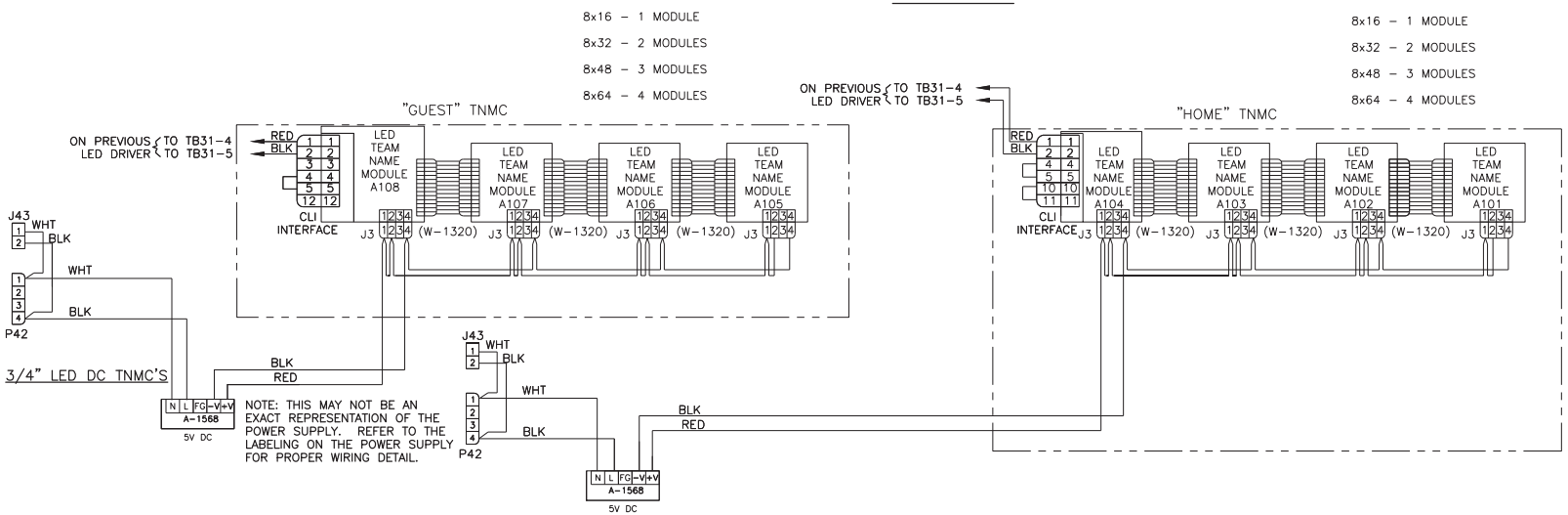
DES. BY: EB DRAWN BY: E BRAVEK DATE: 08 NOV 99

REVISION 01 APPR. BY:

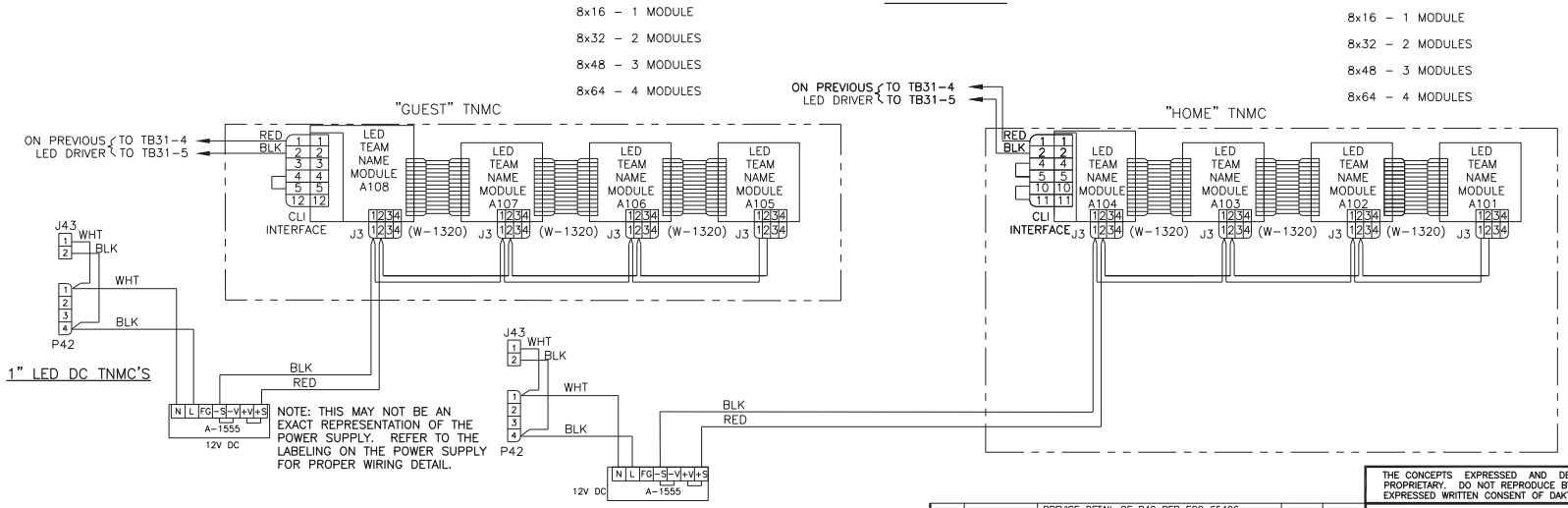
SCALE: NONE

1150-R04A-123794

REAR VIEW



REAR VIEW



REV.	DATE	DESCRIPTION	BY	APPR.
03	29 DEC 08	PREVISE DETAIL OF P42 PER ECO 65496. MOVED PIN 2 TO PIN 4. ORIGNAL CHANGE WAS MADE ON 5 OCT 04	DKD	
02	06 AUG 03	CHANGED TO B SIZE DWG ADDED 3RD MODULE TO SHOW 8X64 CONFIGURATION	TLH	MWM
01	25 JUN 03	SWAPPED N & L ON A-1568 PER ECO #31661	RASMUS	CMC

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DAKTRONICS, INC. BROOKINGS, SD 57006

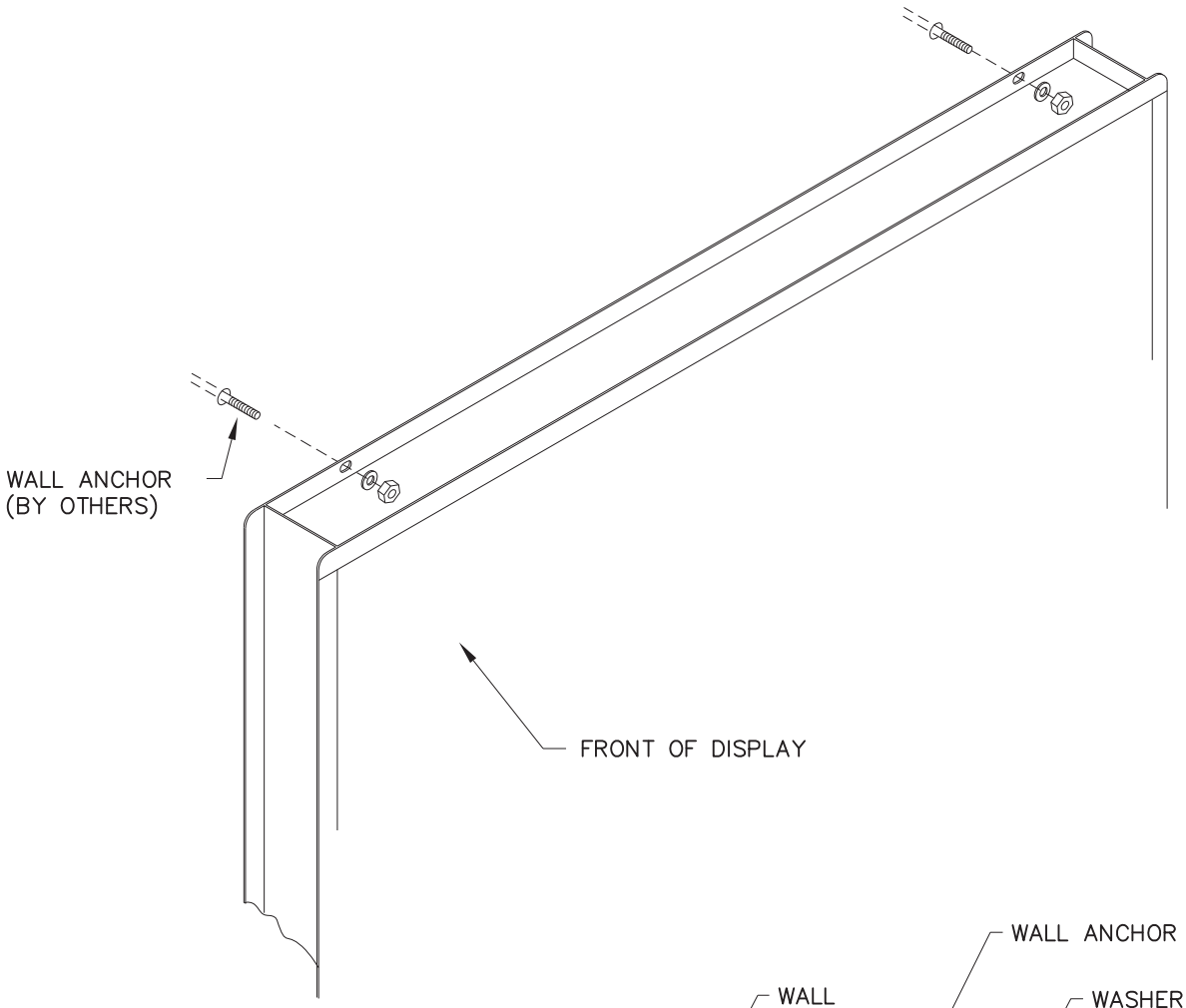
PROJ:

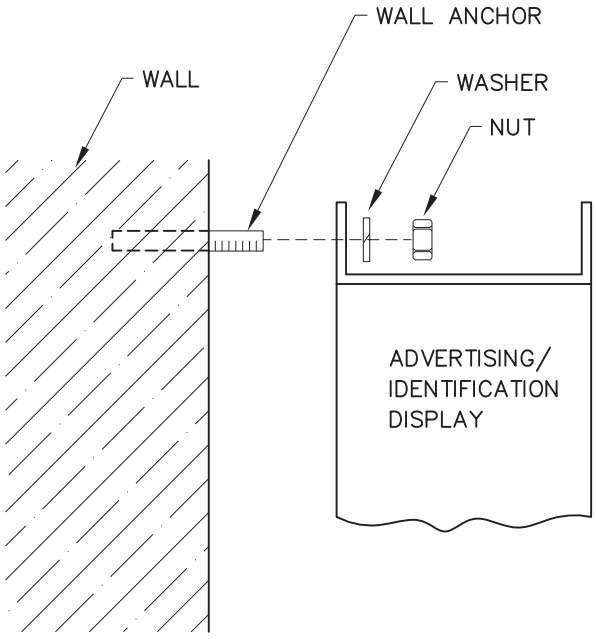
TITLE: SCHEMATIC: 3/4" AND 1" DC TNMC'S

DES. BY: DRAWN BY: JSPAHR DATE: 29 MAR 01

REVISION 03 | APPR. BY: | SCALE: NONE

1152-R03B-146975





ATTACH THE DISPLAY TO THE WALL USING MOUNTING LOCATIONS PROVIDED.

QUANTITY AND POSITION OF MOUNTING LOCATIONS WILL VARY WITH MODEL.

USE THE APPROPRIATE ANCHORS FOR THE TYPE OF WALL.

REV.	DATE	DESCRIPTION	BY	APPR.

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ:

TITLE: ADVERTISING/IDENTIFICATION DISPLAY MOUNTING

DES. BY: JANDRE DRAWN BY: JANDRE DATE: 16APR01

REVISION APPR. BY:

SCALE: NONE

1009-R10A-147668

MOUNT THE ANGLE (WITH 3/8" NUT) UNDER THE OVERHANG AT THE TOP OF THE SCOREBOARD. USE ONE ANGLE AT EACH END OF THE SCOREBOARD. SECURE WITH SCREWS INTO THE THREADED INSERTS MOUNTED IN THE SIDE OF THE SCOREBOARD.

INSTALL THE EYEBOLTS IN THE NUTS MOUNTED IN THE ANGLES.

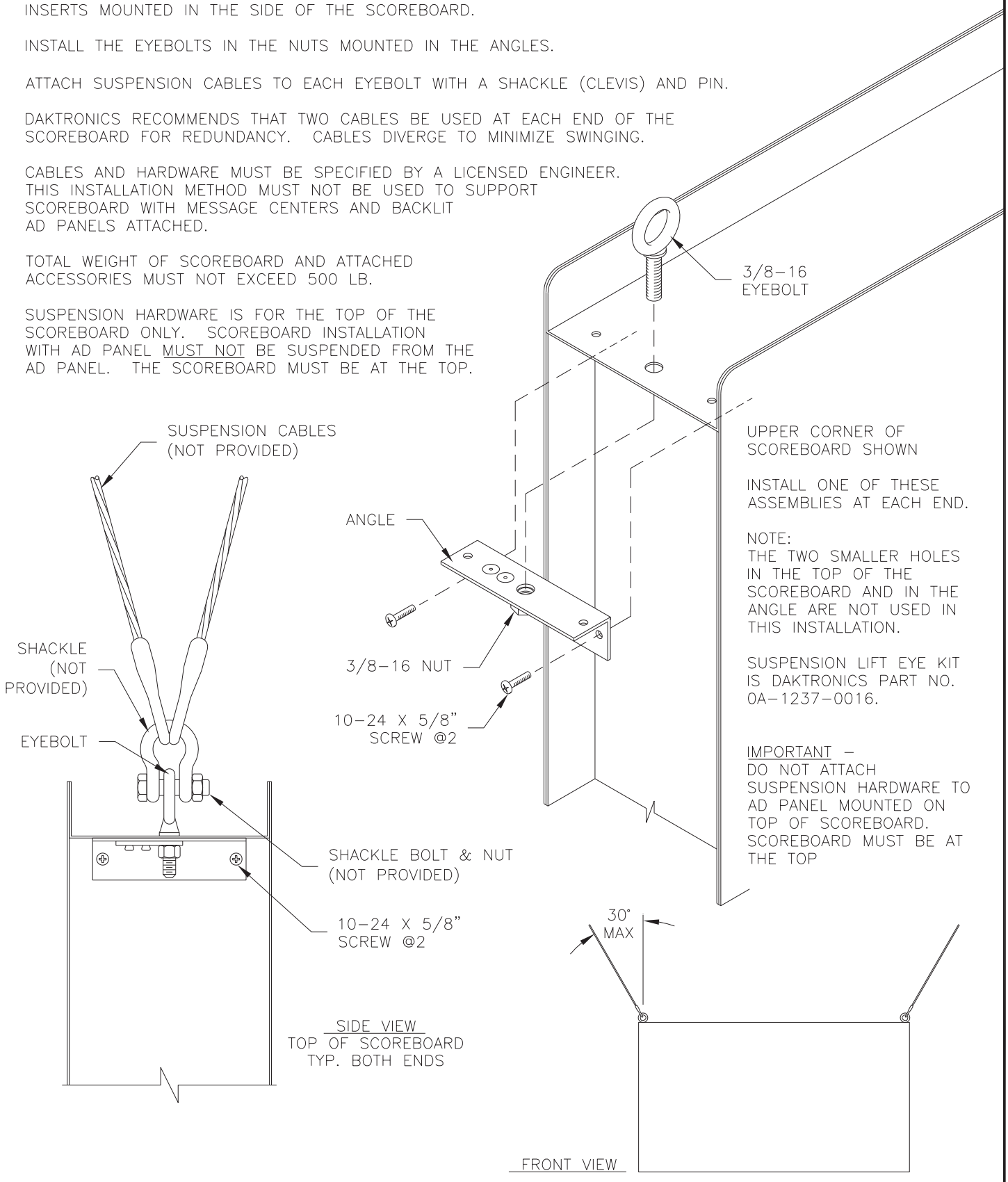
ATTACH SUSPENSION CABLES TO EACH EYEBOLT WITH A SHACKLE (CLEVIS) AND PIN.

DAKTRONICS RECOMMENDS THAT TWO CABLES BE USED AT EACH END OF THE SCOREBOARD FOR REDUNDANCY. CABLES DIVERGE TO MINIMIZE SWINGING.

CABLES AND HARDWARE MUST BE SPECIFIED BY A LICENSED ENGINEER. THIS INSTALLATION METHOD MUST NOT BE USED TO SUPPORT SCOREBOARD WITH MESSAGE CENTERS AND BACKLIT AD PANELS ATTACHED.

TOTAL WEIGHT OF SCOREBOARD AND ATTACHED ACCESSORIES MUST NOT EXCEED 500 LB.

SUSPENSION HARDWARE IS FOR THE TOP OF THE SCOREBOARD ONLY. SCOREBOARD INSTALLATION WITH AD PANEL MUST NOT BE SUSPENDED FROM THE AD PANEL. THE SCOREBOARD MUST BE AT THE TOP.



UPPER CORNER OF SCOREBOARD SHOWN

INSTALL ONE OF THESE ASSEMBLIES AT EACH END.

NOTE:
THE TWO SMALLER HOLES IN THE TOP OF THE SCOREBOARD AND IN THE ANGLE ARE NOT USED IN THIS INSTALLATION.

SUSPENSION LIFT EYE KIT IS DAKTRONICS PART NO. 0A–1237–0016.

IMPORTANT –
DO NOT ATTACH SUSPENSION HARDWARE TO AD PANEL MOUNTED ON TOP OF SCOREBOARD. SCOREBOARD MUST BE AT THE TOP

REV.	DATE	DESCRIPTION	BY	APPR.
03	23 OCT 02	REVERSED ORIENTATION OF NUT PLATE	AVB	
02	01 NOV 01	ADDED NOTES ABOUT NOT SUSPENDING FROM AN AD PANEL.	AVB	
01	27 SEP 01	ADDED KIT PART NUMBER AND NOTE THAT SHACKLE IS NOT PROVIDED.	AVB	

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ:

TITLE: SUSPENSION LIFT EYE INSTALLATION

DES. BY: AVB DRAWN BY: A VANBEMMEL DATE: 09 MAY 01

REVISION

APPR. BY:

SCALE: 1=4

1237-R10A-148644

TNMC INSTALLATION INSTRUCTIONS

1. REMOVE THE HOME/GUEST FACE PANELS FROM THE DISPLAY.
   REFERENCE FIGURE 1

2. MOUNT THE POWER SUPPLY ASSEMBLY TO THE BACK OF THE TNMC PAN WITH HC-1470 SCREWS. THE WIRES ARE ALREADY CONNECTED TO THE POWER SUPPLY. REFERENCE FIGURE 2

3. ROUTE THE 5V DC WIRES FROM THE POWER SUPPLY THROUGH THE OPENING TO THE TNMC LOCATIONS. ROUTE THE 120V POWER INTERCONNECT CABLE BETWEEN THE POWER SUPPLIES AND CONNECT. ROUTE THE POWER INPUT CABLE FROM THE HOME TNMC'S POWER SUPPLY TO THE 2-PIN PLUG AT THE DRIVER.
   REFERENCE FIGURE 3

4. INSTALL THE SIGNAL HARNESS. ROUTE THE SIGNAL HARNESS FROM TB-31 AT THE DRIVER TO THE TNMC LOCATIONS. REFERENCE FIGURE 3

5. CONNECT THE POWER AND SIGNAL TO THE TNMCS. REFERENCE FIGURE 3

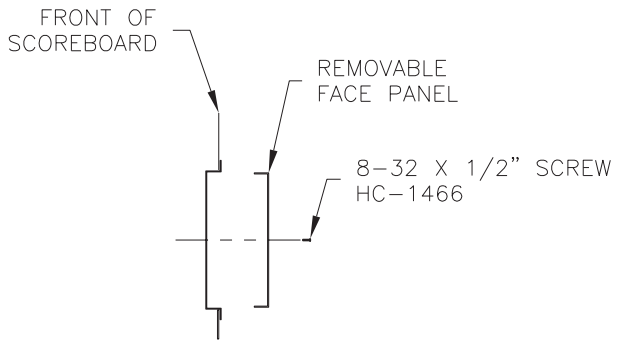


FIGURE 1

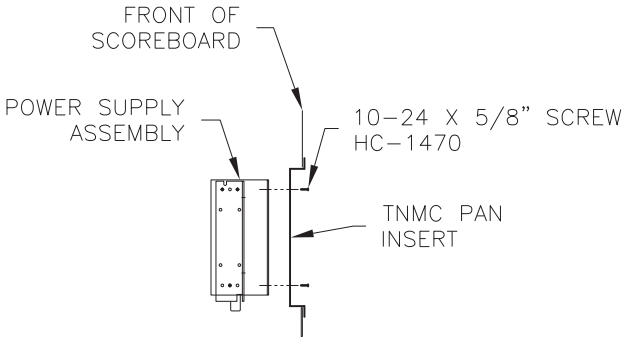


FIGURE 2

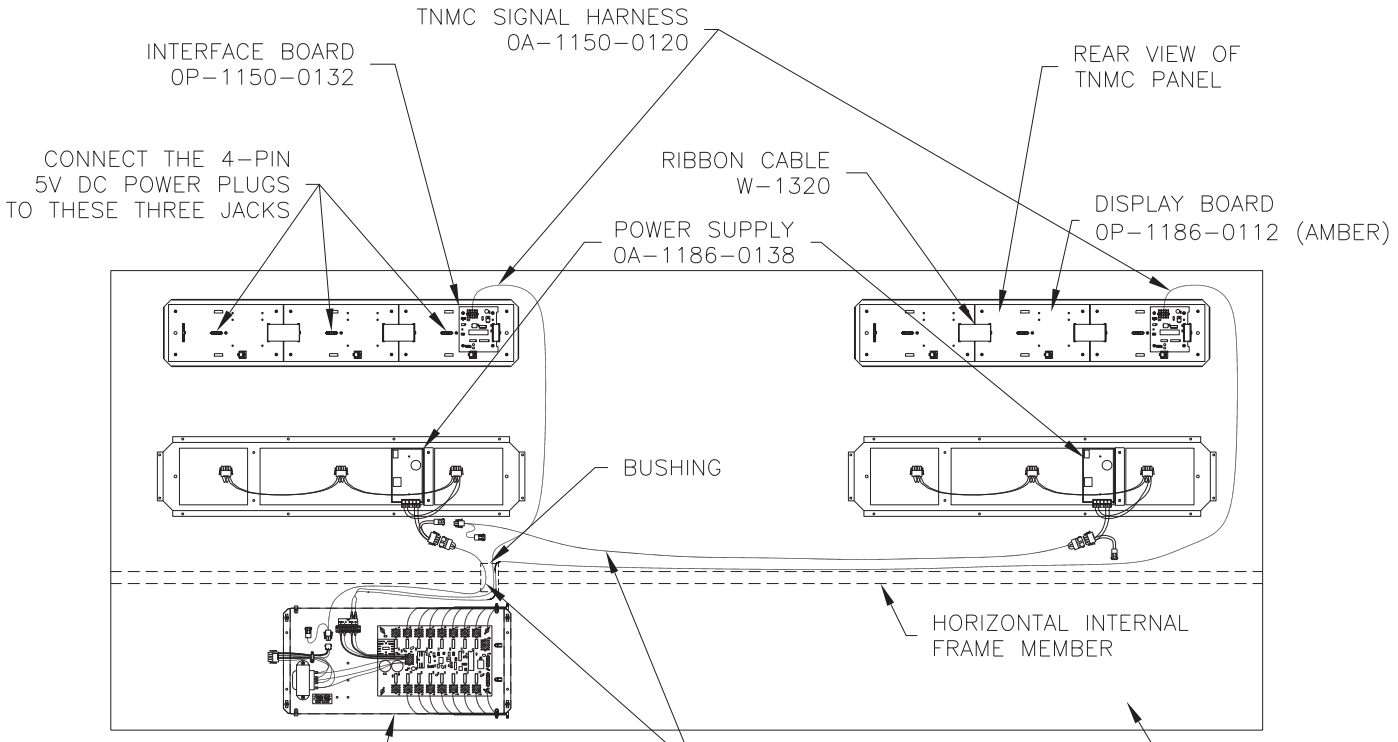
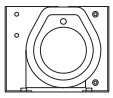


FIGURE 3

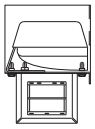
DAKTRONICS, INC. BROOKINGS, SD 57006			
PROJ: TUFF SPORT SCOREBOARDS			
TITLE: INSTALLATION, 6" AMBER 8X48 TNMC			
DES. BY: E REBHAHN	DRAWN BY: E REBHAHN	DATE: 10 MAY 01	
REVISION	APPR. BY:	SCALE: 1=20	1237-E10A-148701

REV.	DATE	DESCRIPTION	BY	APPR.

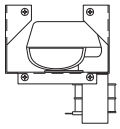
12V DC HORN
IN BRACKET:



TOP VIEW



SIDE VIEW



FRONT VIEW

12V DC HORN OPTION INSTALLATION PROCEDURE

REMOVE THE FOUR SCREWS SECURING THE CLOCK PANEL. DISCONNECT THE PLUGS AT THE BACK OF THE DIGITS, AND UNPLUG THE EXISTING BUZZER TYPE HORN.

REMOVE THE SCREWS THAT ATTACH THE BUZZER HORN TO THE CLOCK PANEL.

MOUNT THE 12V DC HORN TO THE CLOCK PANEL USING THE SCREWS PROVIDED WITH IT. IF MOUNTING HORN IN A UNIVIEW APPLICATION, THE TRANSFORMER WILL HIT THE DIGITS SO NOTE THE FOLLOWING. CUT THE CABLE TIE OFF THE TRANSFORMER HARNESS AND REMOVE TRANSFORMER FROM HORN ASSEMBLY (SAVE HC-1470 SCREWS AS THEY WILL BE REUSED). IN ALTERNATE TRANSFORMER LOCATION MARKED BELOW, DRILL 0.203" (13/64") HOLES @2 IN BACKSHEET FOR TRANSFORMER. USING HC-1470 @2 (SAVED FROM ABOVE) AND HC-1243 @2 (FORWARDED WITH HORN ASSEMBLY), MOUNT TRANSFORMER TO BACKSHEET. MOUNT HORN ASSEMBLY TO CLOCK PANEL AS PREVIOUSLY NOTED.

TAKE THE HORN INTERFACE CARD, WITH HARNESSES CONNECTED TO IT, AND USE THE TAPE TO SECURE IT TO THE BACKSHEET. MAKE SURE IT IS AN OPEN SPOT SO IT DOESN'T GET TOUCHED WHEN THE PANEL IS PLACED BACK ON.

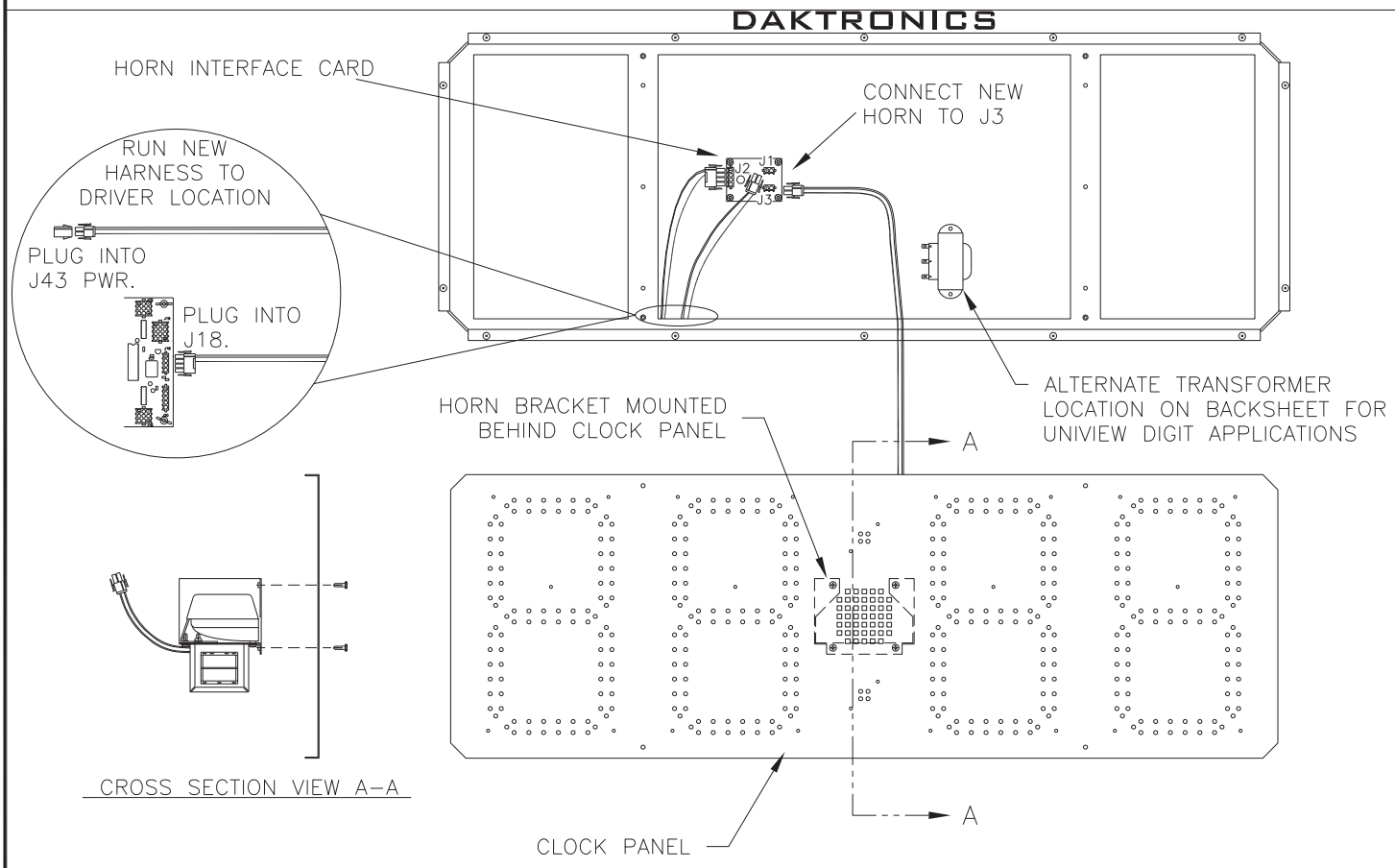
RUN THE TWO NEW HARNESSES TO THE DRIVER. DISCONNECT EXISTING PLUG IN J18 ON DRIVER. CONNECT NEW ONE. DISCONNECT EXISTING PLUG IN THE J43 POWER JACK ON DRIVER TRAY HARNESS THAT WAS FOR THE OLD HORN, AND PLUG IN THE NEW ONE.

CONNECT THE 2-PIN PLUG FROM THE HORN ASSEMBLY TO J3 ON THE HORN INTERFACE CARD.

PLUG THE DIGIT CABLES INTO THE BACKS OF THE DIGITS AND RE-INSTALL THE CLOCK PANEL.

TEST THE HORN BY OPERATING THE SCOREBOARD AND PRESSING THE HORN BUTTON ON THE CONTROL CONSOLE.

FRONT OF SCOREBOARD, CLOCK AREA:



CROSS SECTION VIEW A-A

REV.	DATE	DESCRIPTION	BY	APPR.
03	07 JAN 10	UPDATED INSTALL DRAWING WITH HORN INTERFACE CARD DETAILS AND STEPS.	MWM	
02	20 JUN 06	UPDATED COLON AND HORN LAYOUT. REPLACED UNIVIEW DIGITS WITH PANAVIEW TO SHOW HORN MOUNTING. ADDED UNIVIEW HORN MTG NOTES.	JLF	CW
01	20 JUN 02	CHANGED DIGITS TO UNIVIEW.	ALG	

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DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: TUFF SPORT™ INDOOR SCOREBOARDS

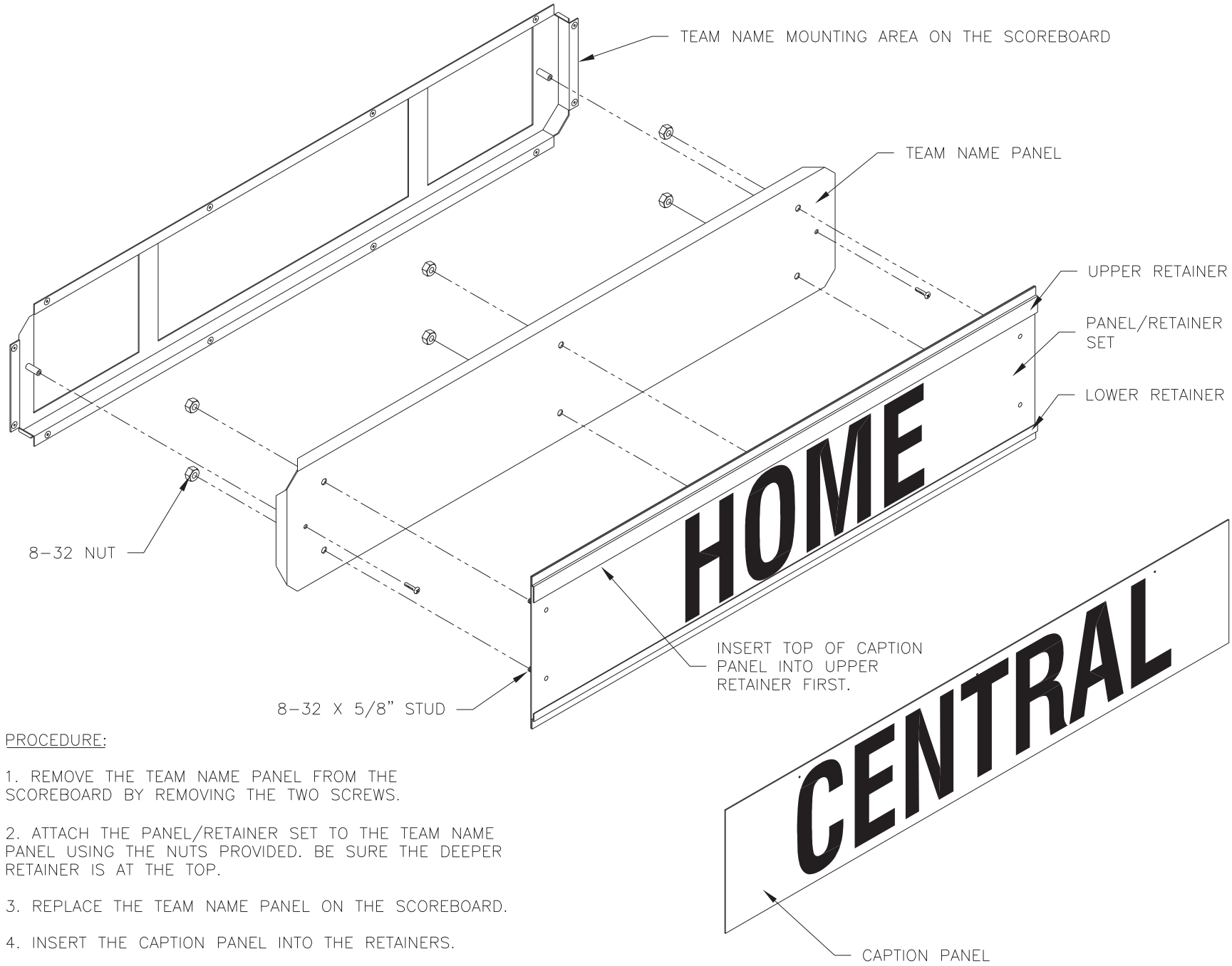
TITLE: 12V DC HORN OPTION INSTALLATION

DES. BY: AVB DRAWN BY: A VANBEMMEL DATE: 16 MAY 01

REVISION 03 | APPR. BY: | SCALE: 1=10

1237-R10A-148960

REV.	DATE	DESCRIPTION	BY	APPR.
01	20 MAY 02	REPLACED THE 6-32 X 3/8" FLAT HEAD SCREW @4 WITH 8-32 X 5/8" STUD @6.	JJS	



PROCEDURE:

1. REMOVE THE TEAM NAME PANEL FROM THE SCOREBOARD BY REMOVING THE TWO SCREWS.

2. ATTACH THE PANEL/RETAINER SET TO THE TEAM NAME PANEL USING THE NUTS PROVIDED. BE SURE THE DEEPER RETAINER IS AT THE TOP.

3. REPLACE THE TEAM NAME PANEL ON THE SCOREBOARD.

4. INSERT THE CAPTION PANEL INTO THE RETAINERS.

DAKTRONICS, INC. BROOKINGS, SD 57006

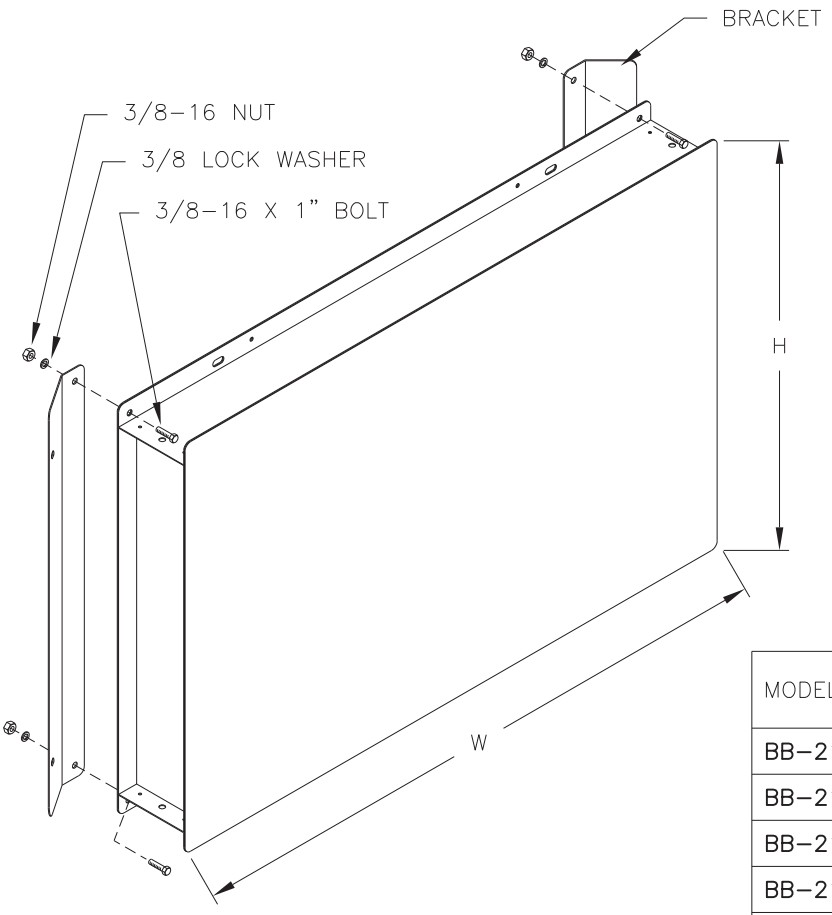
PROJ: TUFF SPORT SCOREBOARDS

TITLE: CHANGEABLE TEAM NAME CAPTION INSTALLATION

DES. BY: AVB DRAWN BY: A VANBEMMEL DATE: 06 JUN 01

REVISION 01 APPR. BY: SCALE: 1=8

1237-E10A-150021

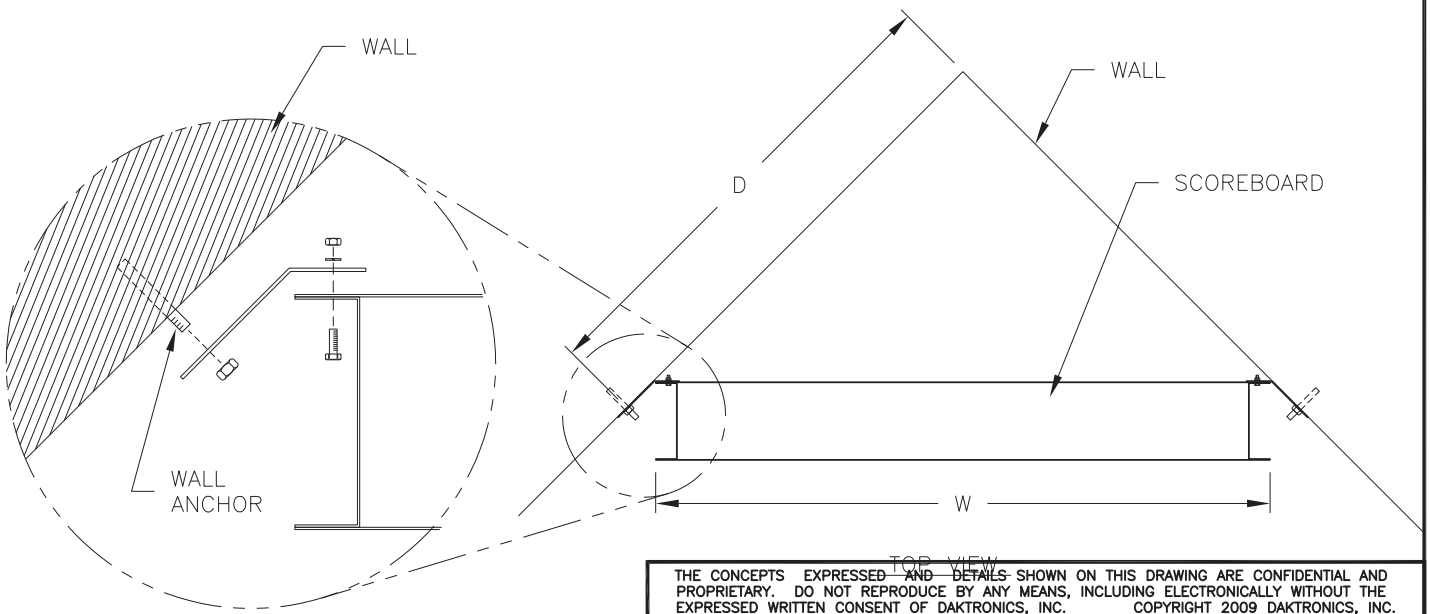


ATTACH THE BRACKETS TO THE BACK OF THE SCOREBOARD USING THE 3/8" HARDWARE PROVIDED.

DRILL HOLES IN THE WALL AT THE APPROPRIATE DISTANCE FROM THE CORNER (DIMENSION D) FOR THE WALL ANCHORS.

MOUNT THE BRACKETS TO THE WALL USING WALL ANCHORS SUITABLE TO THE WALL MATERIALS IN THE FACILITY.

MODEL NO.	HEIGHT DIM. H	WIDTH DIM. W	DISTANCE DIM D
BB–2101/3101	4'–0"	8'–0"	5'–11 1/4"
BB–2103/3103	6'–0"	8'–0"	5'–11 1/4"
BB–2105/3105	4'–0"	10'–0"	7'–4 1/16"
BB–2107/3107	6'–0"	10'–0"	7'–4 1/16"
BB–2142/3142	3'–0"	6'–6"	4'–10 3/8"
BB–2121/3121	2'–6"	10'–0"	7'–4 1/16"



TOP VIEW

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DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: TUFF SPORT SCOREBOARDS

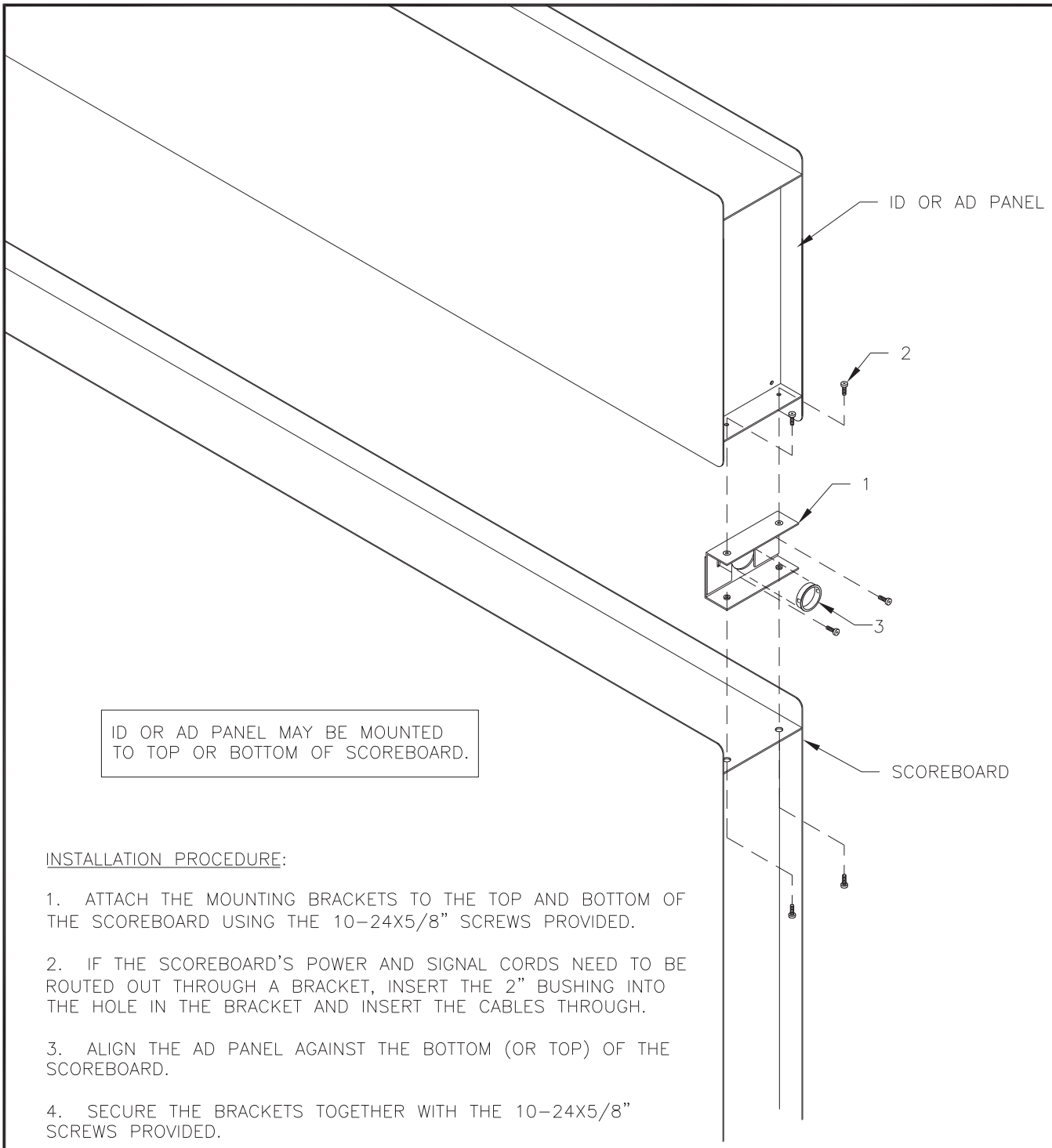
TITLE: CORNER MOUNTING

DES. BY: AVB DRAWN BY: A VANBEMMEL DATE: 22 JUN 01

REVISION 01 | APPR. BY: | SCALE: 1=15

1237-R10A-150831

REV.	DATE	DESCRIPTION	BY	APPR.
01	28JAN10	ADD ALL 3xxx MODELS NUMBERS AND ADD BB–2142/3142 AND BB–2121/3131 AND THEIR RESPECTIVE REQUIRED DIMENSIONS	LMIX	



ID OR AD PANEL MAY BE MOUNTED TO TOP OR BOTTOM OF SCOREBOARD.

INSTALLATION PROCEDURE:

1. ATTACH THE MOUNTING BRACKETS TO THE TOP AND BOTTOM OF THE SCOREBOARD USING THE 10-24X5/8" SCREWS PROVIDED.

2. IF THE SCOREBOARD'S POWER AND SIGNAL CORDS NEED TO BE ROUTED OUT THROUGH A BRACKET, INSERT THE 2" BUSHING INTO THE HOLE IN THE BRACKET AND INSERT THE CABLES THROUGH.

3. ALIGN THE AD PANEL AGAINST THE BOTTOM (OR TOP) OF THE SCOREBOARD.

4. SECURE THE BRACKETS TOGETHER WITH THE 10-24X5/8" SCREWS PROVIDED.

	DESCRIPTION	PART NUMBER	QTY
1.	MOUNTING BRACKETS	0S-1237-0058	2
2.	SCREW, 10-24x5/8	HC-1022	12
3.	BUSHING, 2.0 ø	HE-1051	2

REV.	DATE	DESCRIPTION	BY	APPR.
02	18 JUL 06	REPLACED 0M-150458 BRKT WITH 0M-278266-A AND 0M-278266-B BRKTS	KAS	
01	20 JAN 03	REPLACED HC-1470 WITH HC-1022 RIVETS	RJC	

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: TUFF SPORT SCOREBOARDS

TITLE: ID OR AD PANEL MOUNTING TO SCOREBOARD

DES. BY: BPETERSON DRAWN BY: JJSYRSTAD DATE: 20 SEP 01

REVISION 02 | APPR. BY: | SCALE: NONE

1237-R04A-156134

Appendix C: Daktronics Warranty and Limitation of Liability

DAKTRONICS
WARRANTY AND LIMITATION OF LIABILITY

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

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

1. **Warranty Coverage**

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

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

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

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

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

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

THIS LIMITED WARRANTY IS THE ONLY WARRANTY APPLICABLE TO THE EQUIPMENT AND REPLACES ALL OTHER WARRANTIES OR CONDITIONS, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OR CONDITIONS OF MERCHANTABILITY AND 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;

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

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

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

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

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

H. Any performance of preventive maintenance.

3. Limitation of Liability

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

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

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

4. Assignment of Rights

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

5. Dispute Resolution

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

6. Governing Law

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

7. Availability of Extended Service Agreement

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