MS-2013 Portable LED Scoreboard

Display Manual

ED-13145 ***Rev 10 – 15 June 2016***

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DAKTRONICS

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DAKTRONICS, INC.

Table of Contents

Section 1: Introduction

This manual outlines specifications, installation, and operating procedures for the Daktronics portable LED scoreboard model MS-2013. For additional information regarding the safety, installation, operation, or service of this system, refer to the telephone numbers listed in **Section 7**. Project-specific information takes precedence over any other general information found in this manual.

IMPORTANT SAFEGUARDS

- Read and understand all instructions before beginning the installation process.
- Toggle the power switch to "OFF" when not using the scoreboard.
- Disconnect the batteries and turn the power switch "OFF" when servicing the scoreboard.
- Do not modify the scoreboard structure or attach any panels or coverings to the scoreboard without the express written consent of Daktronics.
- Do not disassemble control equipment or electronic controls of the display; failure to follow this safeguard will make the warranty null and void.
- Do not drop control equipment or allow it to get wet.

1.1 Specifications Label

Power specifications as well as serial and model number information can be found on an ID label on the display, similar to the one shown in **Figure 1**.

Figure 1: *Specifications Label*

Please have the assembly number, model number, and the date manufactured on hand when calling Daktronics customer service to ensure the request is serviced as quickly as possible. Knowing the facility name and/or job number will also be helpful.

1.2 Scoreboard Controllers

The MS-2013 scoreboard is designed for use with the battery-powered RC-100 handheld controller. The MS-2013 may also be controlled via an All Sport® 1600 series control console, which may be equipped with an optional radio transmitter and powered by its own battery pack for an alternate wireless scoring solution. Both controllers use keyboard overlays (sport inserts) to control multiple sports. Refer to the following manuals for operating instructions:

- **All Sport 1600 Series Control Console Operation Manual (ED-12462)**
- **Remote Control System RC-100 All Sport Operation Manual (ED-15133)**

These control console manuals are available online at www.daktronics.com/manuals.

1.3 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-1007804**. Any drawings referenced in a particular section are listed at the beginning of it as shown below:

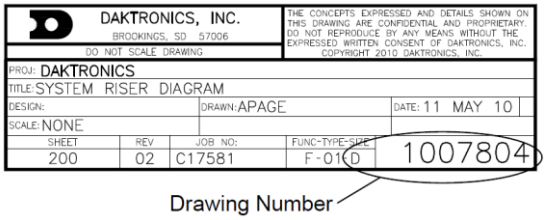


Figure 2: *Daktronics Drawing Label*

Reference Drawing:

System Riser Diagram.....**C-1007804**

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-13145**.

1.4 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 6.7,** use the label to order a replacement. **Figure 3** illustrates a typical label. The part number is in bold.

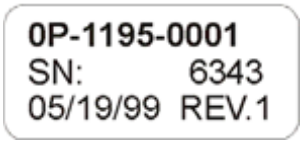


Figure 3: *Typical Label*

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**

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.

1.5 Product Safety Approval

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

Section 2: Specifications

The table below lists all of the mechanical specifications, circuit specifications, and power requirements for the MS 2013.

Dimensions (Height, Width, Depth)	*Scoreboard Only:* 2'-10" H x 4'-4" W x 8" D (864 mm, 1.32 m, 203 mm) *With Cart (minimized for transport/storage):* 3'-4" H x 4'-7" W x 2'-6" D (1.02 m, 1.4 m, 762 mm) *With Cart (maximized for display operation):* 5'-2" H x 4'-7" W x 3'-7" D (1.57 m, 1.4 m, 1.09 m)
Weight w/ Batteries & Cart	150 lb (68 kg)
Digit Size	10" (254 mm)
Digit Color	Red
Watts	300 W
Power	120 VAC or 24 V battery
Batteries	Lead Acid 2 @ 12 V (each) 28 Amp/Hours
Amps per Line (Single Phase)	2.5 A
Driver Number & Address	A1 – 11

Note: Batteries require 12 hours to fully recharge and can operate for up to 14 hours of normal use.

Section 3: Mechanical Installation

Mechanical installation involves assembly of the cart. The scoreboard itself requires no assembly or permanent installation. Some assembly is required, however, for certain scoreboard options.

3.1 Cart Assembly

Reference Drawings:

Mechanical Specifications, MS-2013 ..... **A-159886**
Cart Assembly **A-159889**

The display cart (**Figure 4**) comes standard with two wheels, but may use four if ordered. Cart assembly requires the following pieces of hardware:

- T-stands @ 2
- Axle tubes @ 4
- 10" wheels @ 2 (or 4)
- 5/8"-11 x 4" bolts @ 2 (or 4)
- 5/8" flat washers @ 8 (or 16)
- 5/16" diameter pins with clips @ 6

A 15/16" wrench is needed to attach the wheels.

Refer to **Drawing A-159889** in **Appendix A** and the following instructions to assemble the cart:

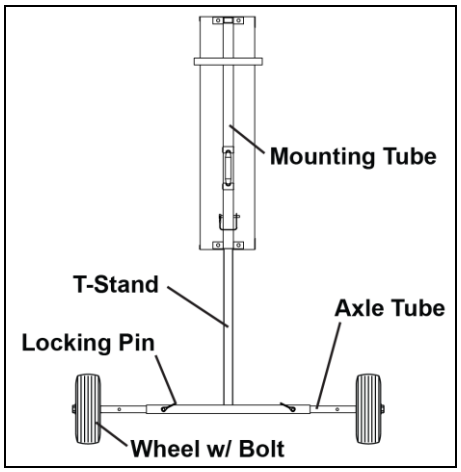


Figure 4: *Cart Assembly, Side View*

1. Insert the axle tubes into the T-stands, and secure them with pins and retaining clips.
2. Mount the scoreboard by inserting the two T-stands into the larger tube attachments on the sides of the scoreboard, and secure the stands with pins and retaining clips. (The tubes mounted on either side of the scoreboard are permanent attachments; do not remove them during cart disassembly.)
3. Mount the first wheel to one end of the T-stand, using washers as spacers, and secure the wheel with an axle bolt. Add flat washers as needed until the wheel is snug but still rolls freely. Repeat the process for the second wheel; tighten the bolts with a 15/16" wrench.

   Note: Two more optional wheels may be installed on the opposite T-stand.

3.2 Adjusting the Cart

Drawing A-159886 in **Appendix A** shows the two axle positions that may be used with the cart. The extended axle position provides maximum stability and is recommended for any situation in which the scoreboard is raised. Use the narrow axle position (and lowest height) to move the scoreboard through doorways and for storage. The drawing also illustrates front profiles of the scoreboard in transport position and at maximum viewing height.

There are three height-adjustment holes in the support tubes on the sides of the scoreboard. Raise the scoreboard for viewing by removing the pins and retaining clips, sliding the scoreboard upward on the T-stands and reinserting the pins in the appropriate holes.

Lower the scoreboard for storage or transportation. It may be helpful to have one person lift the scoreboard while another person adjusts the locking pins.

Caution! Do not raise the scoreboard in high winds or transport the scoreboard in the raised position. These actions increase the likelihood of tipping over and damaging the scoreboard.

3.3 Optional Equipment Installation

Reference Drawings:

Caption Kits

The MS-2013 is shipped as a generic multisport scoreboard with a standard clock/score caption arrangement. The face of the scoreboard displays game time, home and guest scoring, and period. Four optional caption kits give the scoreboard added versatility:

- Custom Team Names
- Baseball/Softball Mode
- Segment Timing Mode
- Volleyball Mode

The aluminum caption panels are applied to the scoreboard face with hook-and-loop fastener strips. They can be easily removed and replaced for various events, leaving the hook strips attached to the face of the scoreboard. Refer to **Drawing A-159890** in **Appendix A** for an illustration of the various caption configurations.

Ad Panel

A custom advertising/school logo panel may be added to the MS-2013. Threaded inserts in the top of the scoreboard cabinet allow attachment using only three screws. The 12" H x 52" W (305 mm, 1.32 m) aluminum panel runs the full width of the scoreboard. **Drawing A-160057** in **Appendix A** illustrates the ad panel installation.

Scoreboard Cover

The aluminum cover protects the MS-2013 during transportation and storage. Flanges on the cover fit into slots on either side of the scoreboards, and the cover simply slides into place using handles on the front. **Drawing A-160060** in **Appendix A** illustrates the cover installation.

> **Note:** If a radio antenna is installed on the face of the scoreboard it is highly recommended to remove the antenna before installing or removing the cover. Refer to **Section 4.3** for more information about radio installations.

Section 4: Electrical Operation

The MS-2013 can be powered by two different electrical systems: a standard 120 VAC power source and/or enclosed lead-acid batteries.

4.1 Power & Signal Access

Power and control connections for the MS-2013 are located in a compartment on the rear of the scoreboard (**Figure 5**).

To open the rear compartment, turn the adjustable latch a quarter-turn to the left. To close, shut the access door and turn the latch to the right. If the latch will not engage because it is too tight, make several turns to the left, and then turn back to the right to latch and tighten.

The compartment is also designed for storage of the control equipment. The compartment door can be closed with the power and signal cords extending through the slot below the door.

> **Note:** If the scoreboard came with a 100' (30.5 m) signal cable, there will be two hooks on the rear of the scoreboard which the cable may be wrapped around for storage.

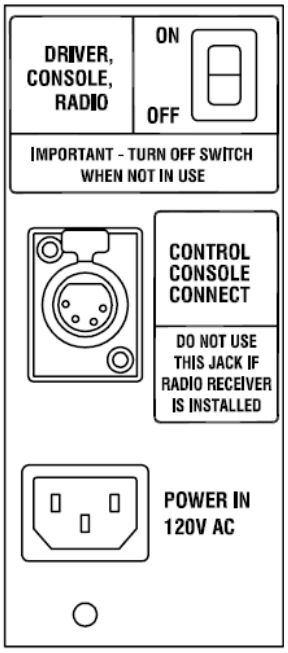


Figure 5: *Control Panel*

4.2 Power

Reference Drawings:

Schematic: MS-2013-11 ..... **A-158030**
Electrical Specifications, MS-2013 ..... **A-159887**
Battery Service, MS-2013 ..... **A-159891**

Power for the scoreboard is provided in two ways: via standard 120 VAC line, or by means of two sealed lead-acid DC batteries. Daktronics supplies two 12 V batteries, rated at 28 ampere hours (A/H) as original equipment. Refer to **Section 5** for information on battery care and use of the on-board battery charger.

The provided 8' (2.4 m) 120 VAC power cord plugs directly into the **POWER IN 120V AC** receptacle, located in the rear compartment on the back panel of the scoreboard (**Figure 5**). Any time 120 VAC power is connected, the internal charger operates; however, the system will not overcharge the batteries. When the power cord is not connected, the system runs on battery power.

The MS-2013 is shipped ready for use. The battery charger is factory-mounted in the scoreboard, and all internal wiring is in place and connected to the driver and batteries.

The **ON/OFF** control switch (**Figure 5**) activates power to the internal scoreboard components, as well as to the radio receiver or control console.

- Turn the switch to **ON** for scoreboard operation.
- At all other times, keep the switch in the **OFF** position.

Whether or not the scoreboard is operational, its batteries will continue to discharge any time the switch is in the **ON** position. ***Leaving the switch ON when the unit is not in use could completely discharge and damage the batteries.***

Refer to **Drawing A-159887** in **Appendix A** for component locations and illustrations of internal and external wiring. **Drawing B-158030** provides a detailed wiring schematic of internal scoreboard components for advanced troubleshooting.

Daktronics recommends that the scoreboard remains plugged in to a 120 VAC power source during storage. Battery life is enhanced by keeping the batteries fully charged. Typically, batteries will be fully charged in about 12 hours and will give about 14 hours performance on a full charge.

4.3 Signal

Reference Drawings:

System Riser Diagrams- MS-2013-11 ..... **A-160237**

The MS-2013 can receive control signal three different ways, described below. Refer also to **Drawing A-160237** in **Appendix A** for diagrams of each of these control setups.

- **Setup 1 (Standard):** A wireless RC-100 handheld controller communicates with a radio base station installed inside the scoreboard.

- **Setup 2 (Optional):** A 4-pin cable connects the scoreboard directly to the All Sport. The cable transmits signal output to the scoreboard and power input to the controller.

- **Setup 3 (Optional):** A control console equipped with radio transmitter and its own battery pack or a separate power cord communicates with a radio receiver installed inside the scoreboard.

Connecting Signal Cable

If the scoreboard was ordered with a wired control console, simply plug the signal cable into the jack labeled **CONTROL CONSOLE CONNECT** (**Figure 5**) Attach the mating plug to the modified power cord from the All Sport controller. Extension cables are also available from Daktronics if more than the 100' (30.5 m) of control cable provided is needed.

Base Station & Radio Receiver Installation

Reference Drawings:

Radio Receiver Installation, MS-2013 ..... **A-160015**
Base Station: Outdoor Installation **A-236394**
System Riser Diagram: RC-100- MS-2013 ..... **A-244926**
Installation Drawing; Outdoor Scbd Gen VI Radio Receiver **A-1109181**

The RC-100 base station and All Sport radio receiver are typically held in place with adhesive-backed, hook-and-loop fastener strips, and when ordered as original equipment may already be installed. The only installation required is attachment of the radio antenna, which may have been shipped separately to prevent damage.

If the base station or receiver is not already installed:

1. Access the inside of the scoreboard by removing the three (3) screws securing the rear access panel and swinging it open.
2. Position the unit inside the scoreboard so the antenna connector can extend through the hole in the upper-right corner on the front of the scoreboard.
3. Remove the backing from the fastener strips on the unit.
4. Insert the antenna jack through the hole, and then firmly press the unit against the interior front panel, sticking the fastener's adhesive to the sheet metal.
5. Route and connect the cable protruding from the bottom of the unit to the mating 6-pin jack directly on the LED driver.

   Note: For models built prior to April 2015, the radio cable will connect to the 5-pin jack labeled "J45" coming from the LED driver.

6. Close and secure the rear access panel.
7. From the front face of the scoreboard, note that the antenna connector now protrudes through the panel.
   a. Install and tighten the lock washer and nut on the antenna connector.
   b. Mount the external antenna on the connector, turning the nut on the antenna until it is snug.
   c. Rotate the antenna so that it is pointing straight upward (it should look like a capital "L" when viewed from the side).

Setting the Base Station Function

The base station is preset to Function 2 or 5, Channel 1. If the default settings do not appear to work, refer to **Drawings A-236394** and **A-244926** for instruction on changing these settings. For more information, refer to the RC-100 manual listed in **Section 1.1**.

Setting the Radio Receiver Channel

The radio receiver is preset to Channel 1. If there are other scoreboards in the facility operating with radio signal, each scoreboard receiver must be set to a different channel number (typically starting with 1 and numbering consecutively). Refer to **Drawing A-1109181**.

Refer to the **Gen VI Radio Installation Manual** (**DD2362277**) for more information. This manual is available online at www.daktronics.com/manuals.

4.4 Power-On Self-Test (POST)

The scoreboard performs a self-test each time that power is turned on and the control console is powered off or not attached to the scoreboard. If the control console is attached and powered on, the self-test does not run, and data from the control console is displayed on the scoreboard after a brief period of time. Each scoreboard self-test pattern will vary depending on the scoreboard model, the number of drivers, and types of digits. **Figure 6** shows an example of the LED bar test pattern that each digit performs.

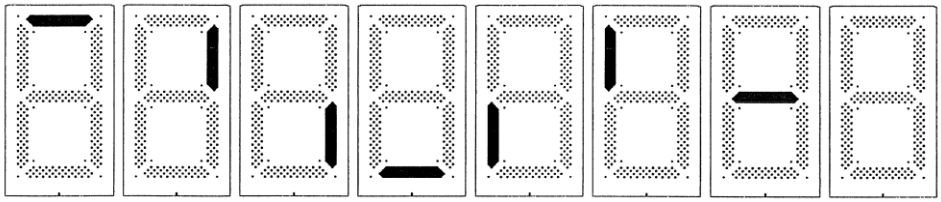
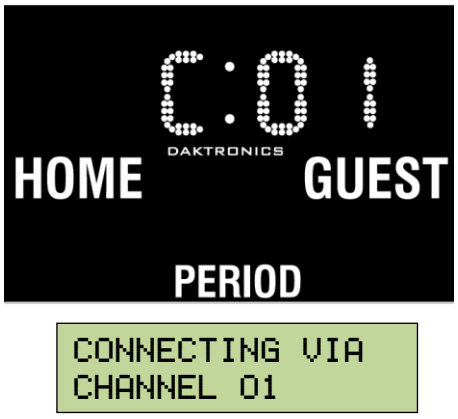


Figure 6: *Digit Segment POST*

Radio Settings

With an RC-100 base station installed, the channel settings ("C 01") will be displayed in the clock digits (**Figure 7**) during the POST. If an All Sport radio receiver is installed, both the broadcast setting ("b1") and the channel setting ("C1") will be displayed. These values must match the settings in the controller (refer to appropriate manual in **Section 1.1**).

RC-100 (Channel)



All Sport Radio (Broadcast & Channel)

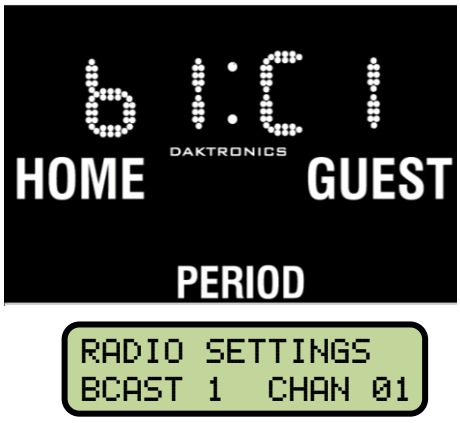


Figure 7: *Radio Settings*

Section 5: Battery Care & Charging

This section describes care and operation of the MS-2013 on-board battery charging system.

5.1 On-Board Charger

Reference Drawing:

Electrical Specifications. MS-2013 ..... **A-159887**

On a full charge, the two internal batteries provide enough power for approximately 14 hours of normal operation. Keeping the batteries charged will help extend their life. Be sure that the batteries are fully charged before storing the scoreboard during the off-season; storing the scoreboard with a discharged battery can contribute to early battery failure. Daktronics recommends keeping the scoreboard plugged in to a 120 VAC receptacle during storage.

The Marinco ChargePro model 28210 on-board battery charger is designed both to recharge the batteries of the scoreboards and to extend battery life in applications where scoreboard and batteries are stored for long periods of time. The charger is located in the cabinet interior, attached to the left side of the scoreboard back sheet (as viewed with the rear access panel open). The charger is connected to the transformer next to the driver enclosure, and to the batteries. Refer to **Drawing A-159887** in **Appendix A**.

Note: Displays built before August 2015 were shipped with the ChargePro model 2607, which varies from the details provided below. For more information, visit www.marinco.com/en/2607a.

Charger Power Specifications	
Outputs: two individual isolated outputs with a combined rating as follows: • When bulk charging: • When absorption charging: • When float charging:	 • 8-10.5 A at 14.3 VDC • 3-10 A at 14.3 VDC • 0-3 A at 13.3 VDC
Maximum recommended battery size: • For recharging:	 • Up to 120 A/H
Input: • Rated AC voltage • Current draw	 • 120 VAC, 50-60 Hz • 2.5 A at full output

The ChargePro 28210 charger, shown in **Figure 8**, is a 2 bank, 10 A, 12/24 VDC output charger with an input of 120 VAC. It is microprocessor controlled and has a maintenance mode that will keep the batteries fully charged. The charger is fully automatic and can be connected to the twin 12 V lead-acid batteries indefinitely without risk of overcharging. The 28 A/H batteries provided with the display will typically be fully recharged after about 12 hours.

Figure 8: *ChargePro Charger*

The ChargePro 28210 charger is a four-stage, "smart" charger with "Sense Send" technology that senses the power needs of each battery and sends the correct charge regardless of Serial or Parallel output connections. If the batteries have discharged unequally, the charger will send more power to the battery that needs it, resulting in faster charging.

The charge cycle is as follows:

A) Soft Start – Charger verifies connections are good and the battery is capable of accepting a charge. Batteries with very low voltage (near dead) will be slowly charged to not harm the battery. When the battery voltage reaches 10 V for 30 seconds, the charger switches to the next stage.

B) Bulk Stage – the charger uses constant current and charges the battery to 14.3 V. When the battery holds the voltage of 14.3 V for 30 seconds, the charger switches to the next stage.

C) Absorption Stage - the charger uses constant voltage to charge the battery until the charge current drops just below the rated current for 30 seconds. At this point the charger will switch to the next stage.

D) Float Stage – the charger finishes the charge cycle by keeping the battery at 13.3 V for a period of time and determines the battery is charged and shuts down.

E) Maintenance – the charger will monitor the battery and if the battery voltage drops below 12.8 V or if 14 days have passed since the last charge the charge cycle will start automatically.

Unlike most automotive "trickle" chargers, the unit will not boil off the electrolyte in a lead-acid battery when left unattended.

To operate the charger, simply plug the scoreboard's power cord into a standard 120 VAC, 60 Hz outlet. Red and green LED indicators on the charger, visible through holes on the exterior back panel, indicate the recharging status. A label at this location also describes charging levels.

> **Note:** When the batteries are connected, they will continuously supply power to the driver, even if the digits are blank. Make sure that the unit is switched **ON** only during an event or when testing. At all other times, the switch should be in the **OFF** position.

The table below describes how the charger indicators operate:

Scoreboard	Operating Condition
Soft Start / Bulk Charge  Red ON  Green OFF	Charger is in the "Soft Start" or "Bulk Stage" and the battery is being charged. If the red LED stays on for more than 24 hours, refer to the **Charger Troubleshooting Table**.
Absorption Charge  Red ON  Green ON	Charger is in the "Absorption Stage" and delivering constant voltage to the battery. If both LEDs stay on longer than 24 hours, refer to the **Charger Troubleshooting Table**.
Float Charge  Red OFF  Green ON	The charger has moved to the "Float Stage" and is topping off the charge to the battery and keeping the battery ready to use. The green light indicates your battery is ready to use. If the green LED stays on and the battery is known to be low, refer to the **Charger Troubleshooting Table**.
Maintenance	The charger will monitor the battery, and if the battery voltage drops below 12.8 V for 30 seconds or if 14 days have passed since the last charge, the charge cycle will start automatically and will switch back to "Bulk Stage".

Operation

If the ChargePro encounters a DC overload (excessive demand), it will reduce its output voltage to a safe level to prevent damage. If the positive and negative connectors are touched together, creating a short, the charger will instantly reduce its output voltage to nearly 0 V. When the overload is removed, the charger automatically resumes normal operation.

If the in-line 10 A, 32 VDC fuse in either cable blows due to improper connection to a battery, replace the fuse with an identical 10 A fuse only (Daktronics part # F-1006). Never replace a blown fuse with a higher-value fuse.

The charger is waterproof, but the AC plug and DC bolt-type connectors should be kept dry. It is normal for the charger to become warm during operation; consequently, it should not contact any surface other than the scoreboard cabinet.

Charger Troubleshooting Table

Problem	Cause	Solution
It seems to take a long time to recharge the batteries in hot weather.	The charger has overheated due to poor air circulation and has reduced its output.	Consider moving the display to a shaded location.
Red LED stays on for more than 24 hours.	One or more defective or damaged cells	Load test the battery and replace if necessary (see **Section 6.5**).
	Charger has reduced its output voltage below the normal level due to a DC overload or a DC short.	Remove the source of the overload or short. Disconnect the charger's black (negative) terminal from the battery. Reapply AC power and only the green LED should light up.
	Extremely low AC voltage at the battery charger	Apply a higher AC voltage source or reduce the length of the extension cord.
		Check battery manufacturer's specs on battery charging.
Both the red and green LEDs stay on for more than 24 hours.	On-board DC systems are drawing between 1.5 – 3.5 A.	Turn off all DC equipment while charging.
	One or more defective or damaged cells.	Load test the battery and replace if necessary (see **Section 6.5**).
	Extremely low AC voltage at the battery charger	Apply a higher AC voltage source or reduce the length of the extension cord.
		Check battery manufacturer's specs on battery charging.
Green LED stays on when the battery is known to be low.	Open DC output fuse.	Replace DC output fuse with a 10 amp fuse.
	Faulty or contaminated terminal connections.	Clean and tighten or repair all terminal connections.
	One or more defective or damaged cells.	Load test the battery and replace if necessary (see **Section 6.5**).
Neither of the LEDs turn on when the AC power is applied	No AC power available at the charger	Connect AC power or reset the AC breaker on the main panel
	Component failure	Go to www.marinco.com - under the Resources tab, refer to FAQ section.

Radio Interference

The on-board battery charger generates and can radiate radio frequency energy. The equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to FCC rules, Part 15.

With proper installation, there should be no interference with any radio communications, either with the scoreboard's own receiver or other radio-controlled devices in the immediate area. However, if it is determined that this device may be the cause of radio interference, try to correct the interference with one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment to an AC outlet on a circuit different from the receiver.

5.2 Battery & Charging Safety

Note: The following lists are general safety instructions when working with lead-acid batteries. Some of the safety considerations are not applicable to the sealed batteries provided with the MS-2013 as those batteries are self-contained and cannot be opened, and they are safer than automotive batteries that require servicing. Exercise caution, however, when working with any lead-acid battery.

Personal Safety Precautions

- Someone should be within range of your voice or close enough to come to your aid when you work near a lead-acid battery.
- Have plenty of fresh water and soap nearby in case battery acid contacts your skin, clothing, or eyes.
- Wear complete eye protection and clothing protection. Avoid touching your eyes while working near the battery.
- If battery acid does contact skin or clothing, wash immediately with soap and water. If you get acid in your eye, immediately flood the eye with running cold water for at least 10 minutes, and get medical attention immediately.
- NEVER smoke or allow a spark or flame near the battery.
- Be extra cautious while servicing the scoreboard to reduce the risk of dropping a tool onto the battery. It might spark or short-circuit the battery or another electrical part, which could cause an explosion.
- Remove all personal metal items such as rings, watches, and other jewelry when working with a lead-acid battery. A lead-acid battery can produce a short-circuit current high enough to weld a ring or similar item to metal, causing severe burns.
- Use the charger for charging LEAD-ACID batteries only. It is not intended to recharge common dry cell batteries, which may burst and cause injury to people and damage to property.
- NEVER charge a frozen battery.

DC Connection Precautions

1. Check the polarity markings on the battery.
2. Attach the positive ring terminals (red or white wires with fuse) from each cable on the charger to the positive (+) terminals of the batteries.
3. Attach the negative ring terminals (black wires) from each cable on the charger to the negative (-) terminals of the batteries.
4. When disconnecting the charger, first disconnect (unplug) the AC power cord, then remove the negative ring terminal from the battery's negative (-) terminal, and remove the positive ring terminals last.

Section 6: Scoreboard Troubleshooting

IMPORTANT NOTES:

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

6.1 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 7**.

Problem	Possible Cause	Solution/Items to Check
Scoreboard doesn't light and console doesn't work	No power to the scoreboard	Flip power switch ON.
		Check that the scoreboard is receiving 120 VAC power.
		There may be a problem with the batteries/charger. Refer to the **Charger Troubleshooting Table** in **Section 5**.
	No power to console	Ensure the console is plugged into the J31 jack labeled **CONTROL CONSOLE CONNECT** or a 120 VAC power supply.
		Exchange the console with a working one, and enter the correct sport code and/or radio settings to test. Replace console if necessary.
Scoreboard digits don't light, but console works	No wired signal from console	Check that the scoreboard is receiving 120 VAC or battery power.
		Check that the red DS5 (or DS2) LED on the driver lights up when sending commands from the control console (see **Section 6.4**).
	No radio signal from console	Cycle power to the scoreboard and watch for radio settings (see **Section 4.4**).

Problem	Possible Cause	Solution/Items to Check
		Check that the green POWER and amber RADIO IN RANGE indicators on the radio receiver in the scoreboard light up when the control console is powered on. Keep the console between 20-30' (6-9 m) from the scoreboard.
		Move the console 20-30' (6-9 m) from the scoreboard and test again. Verify that both the console and scoreboard antennas are securely tightened and in a vertical position.
		Replace the radio receiver.
	No signal to driver	Check that the scoreboard is receiving 120 VAC or battery power.
		Check that the red DS2 (or DS2) LED on the driver lights up when sending commands from the control console (see **Section 6.4**).
		Exchange the driver with a working one of the same part #. Replace if necessary (**Section 6.4**).
	No power to driver	Check that the red DS8 (or green DS1) LED on the driver is always lit up when the scoreboard is powered on (see **Section 6.4**).
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 appropriate control console manual.
	Incorrect driver address	Check that the scoreboard driver is set to the correct address (see **Section 6.4**)
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 field wiring	Check that the red DS5 (or DS2) LED on the driver lights up when sending commands from the control console (see **Section 6.4**)
Scoreboard works, but some LEDs always stay on	Short in digit circuit	Exchange the digit with a working one of the same part # to verify the problem. Replace if necessary (see **Section 6.3**).
Scoreboard works, but some LEDs do not light or they blink	Bad connection	Verify the connector on the back of the digit circuit board is secure (see **Section 6.3**).

Problem	Possible Cause	Solution/Items to Check
	Bad digit or driver	Exchange the digit/driver with a working one of the same part # to verify the problem. Replace if necessary (see **Section 6.3** for digits or **Section 6.4** for drivers).
Scoreboard works, but some digits do not light	Bad digit or driver	(see solution above)
	Incorrect sport code	(see solution on previous page)
	Incorrect driver address	(see solution on previous page)
	Wrong console controlling scoreboard	Another console's radio signal could be transmitting to the scoreboard. An example would be football and baseball scoreboards that are within 1500' (457 m) of each other.
	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.

6.2 Component Location & Access

Reference Drawing:

Electrical Specifications, MS-2013..... **A-159887**

In the MS-2013, the entire back panel is hinged on the right side (as viewed from the rear). To gain access to the internal scoreboard components, simply remove the three screws securing the back panel to the scoreboard cabinet, and swing it open. **Drawing A-159887** in **Appendix A** illustrates the back panel open and all of the internal components exposed.

> **Note:** Disconnect power before servicing the scoreboard! Also turn power OFF when the scoreboard is not in use. In addition to discharging the scoreboard batteries, prolonged power-on may shorten the life of some electronic components.

6.3 Replacing Digits

LEDs are embedded in a circuit board that is mounted to the back of a single face panel, as shown in **Figure 9**. Do not attempt to remove individual LEDs. In the case of a malfunctioning LED or digit segment, replace the entire digit circuit board.

To replace a digit circuit board:

1. Open the back panel as described in **Section 6.2**.
2. Disconnect the power/signal plug from the back of the digit by squeezing together the locking tabs and pulling the connector free.
3. Use a $^{9}/_{32}$" nut driver to remove the nuts securing the digits to the inside of the panel, and then lift the digit off the standoff studs.
4. Position a new digit over the studs, making sure the rubber side of the rubber-backed spacer is facing the digit circuit board.
5. Tighten the nuts.
6. Reconnect the power/signal connector.

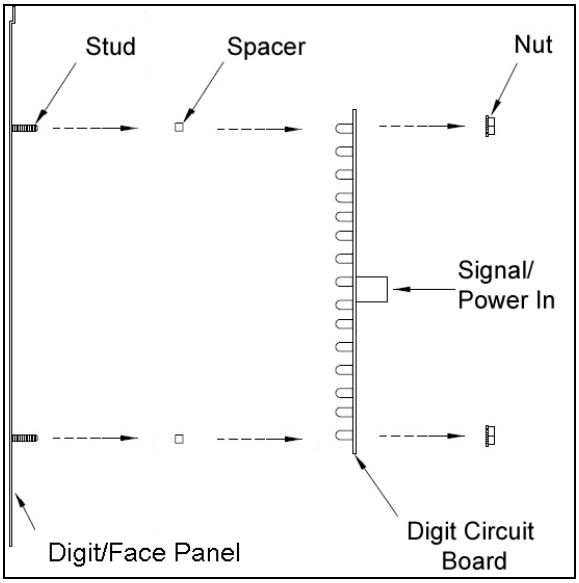


Figure 9: *Digit Assembly*

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

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

Segmentation & Digit Designation

Reference Drawings:

Segmentation, 7 Segment Bar Digit **A-38532**
Electrical Specifications, MS-2013 ..... **A-159887**

In each digit, certain LEDs always go on and off together. These groups 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 scoreboard.

Drawing A-159887 in **Appendix A** indicates the driver connectors controlling the digits. The numbers shown in the upper half of a digit indicate which driver connector is wired to it.

6.4 LED Driver

Reference Drawings:

Specifications; LED Driver IV, 16 Col **A-288137**
Specifications; Gyrus LED Driver, 16 Col **A-3071833**

The LED driver performs the task of switching digits on and off within the scoreboard. LED drivers are located inside of a driver enclosure. Refer to **Drawing A-159887** in **Appendix A** to view the location and components of the driver enclosure.

When troubleshooting driver problems, several LEDs provide diagnostic information. The number of LEDs and their function depends on the driver type.

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

16-Column "Gyrus" Drivers

LED	Function	Operation	Summary
DS1	Radio/ RS-232 RX	Blinking or off	DS1 will be blinking when the driver is receiving radio signal and off when there is no signal.
DS2	Status	Blinking	DS2 will be blinking at one second intervals to indicate the driver is running.
DS5	Signal RX	Blinking or off	DS5 will be blinking when the driver is receiving current loop signal and off when there is no signal.
DS8	Power	Steady on	DS8 will be on and steady to indicate the driver has power.

For detailed descriptions and pin-outs of the driver jacks, refer to **Drawing A-3071833**

16-Column Drivers (prior to April 2015)

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.

For detailed descriptions and pin-outs of the driver jacks, refer to **Drawing A-288137**.

Replacing a Driver

1. Open the back panel as described in **Section 6.2**.
2. Remove the metal cover of the driver enclosure to expose the driver components.
3. Disconnect all connectors from the driver by squeezing together the locking tabs and pulling the connectors free. It may be helpful to label the cables to know which cable goes to which connector when reattaching the driver.
4. Remove the nuts securing the driver to the inside of the enclosure.
5. Carefully lift the driver from the display and place it on a clean, flat surface.
6. Position a new driver over the screws and tighten the nuts.
7. Reconnect all power/signal connectors. Note that the connectors are keyed and will attach in one way only. Do not attempt to force the connections.
8. Ensure the driver is set to the correct address (refer to **Setting the Driver Address**).
9. Close and secure the back 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.

The MS-2013 will always be set to address 11.

Addresses are set through the S2 (L) and S3 (H) rotary switches on the driver (**Figure 10**) using a small flathead screwdriver. For address 11, set the H switch to "0" and the L switch to "B".

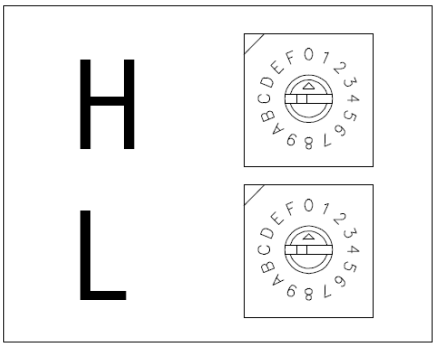


Figure 10: *Driver Address Dials*

Note: For models built prior to April 2015, the driver address was set via the S1 dip switch (**Figure 11**) using a pen or small, pointed object. For address 11, set switches 1, 2, and 4 to ON.

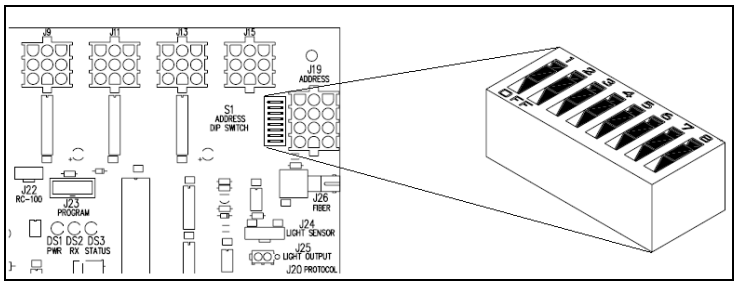


Figure 11: *Driver Address Dip Switch (prior to April 2015)*

6.5 Replacing Batteries

Reference Drawings:

Battery Service, MS-2013 ..... **A-159891**

As the batteries age, they may lose capacity to sufficiently operate the scoreboard, even on a full charge. When replacement becomes necessary, Daktronics recommends the same brand battery installed as original equipment. Similar batteries may be used as long as they meet the specifications for the scoreboard. If a different brand must be used, be sure that the terminals are oriented the same as in the original to ensure a proper connection. Refer to **Section 6.7** for Daktronics replacement part numbers for batteries and fuses.

Drawing A-159891 in **Appendix A** illustrates battery service. Mounting brackets hold the batteries in place at the bottom of the scoreboard. The bracket is designed to hold batteries measuring 7" high, 6.5" wide, and 5" deep (178 mm, 165 mm, 127 mm). The bracket will not support a battery of different dimensions.

To replace the batteries:

1. Open the back panel as described in **Section 6.2**.
2. Use a $^{3}/_{8}$" socket or nut driver to unfasten the four nuts securing each battery bracket to the scoreboard studs and remove the brackets.
3. Remove the screws securing the wires to the battery terminals.
4. Remove the battery from the scoreboard.
5. Reverse the procedure to install new batteries.

Important Notes:

- During service, do not allow the battery terminals to touch any metal surface. When reinstalling, make sure the terminal wires are connected correctly. Improper connection may result in injury or damage to scoreboard components.
- The batteries in these products contain lead. Do not dispose of the batteries in a municipal waste system at the end of their useful life. Doing so may be a violation of local, state, or federal environmental regulations. Please return the batteries to a battery recycling center or battery retailer.

6.6 Horn

Reference Drawing:

Electrical Specifications, MS-2013 ..... **A-159887**

A 12 V buzzer horn is mounted in the upper-left corner of the front face panel (as viewed from the front). **Drawing A-159887** in **Appendix A** shows the horn location from the front as well as when accessing internal components from the rear.

To replace a horn, simply disconnect the cable running to it, and then remove the single nut and washer holding the horn to the mounting bracket (**Figure 12**).

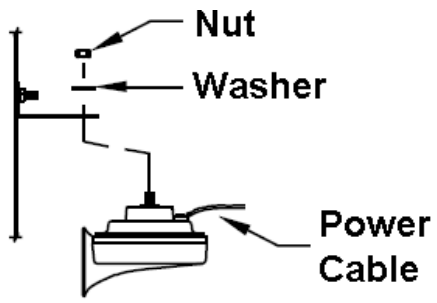


Figure 12: *Horn Mounting Detail, Side View*

Note: The horn volume is set at maximum during manufacturing and is not adjustable.

6.7 Replacement Parts

Refer to the following table for standard and optional replacement parts.

Description	Daktronics Part No.
12 VDC Horn Assembly	0A-1072-0023
Driver, 16-col outdoor LED	0A-1782-0100
Battery Monitor (Circuit Board)	0P-1192-0097
Digit, 10" red, 7-segment	0P-1192-0251
Battery; 12V, 28 A/H sealed lead-acid (Power Sonic Model PS12280)	BT-1023
Battery Charger; dual 12 or 24V, 3 A (ChargePro Model 28210)	BT-1053
Fuse, AGC-10, 10A, 250 V glass tube	F-1006
Fuse, MDL-7, 7.5 A, 250 V glass tube	F-1031
Washer, 1/2" flat ***(prior to June 2016)***	HC-1095
Wheel Bolt, 1/2 -13 x 3 1/2" ***(prior to June 2016)***	HC-1363
Washer 5/8" flat	HC-1846
Locking Pin	HS-1207
Wheel Bolt, 5/8 -11 x 4”	HC-3223756
Wheel, 10x1.75, semi-pneumatic, 1/2" axle ***(prior to June 2016)***	RA-1007
Wheel, 10" x 3.5", 5/8" axle	RA-3223755
Transformer, sec. 24 V @4A, pri. 115/230V, 50/60 Hz	T-1043
Power cord, 360º rotating, 8'	W-1181
Fuse holder	X-1287

Section 7: Daktronics Exchange and Repair & Return Programs

7.1 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 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.

7.2 Repair & Return Program

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

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

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

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

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

Shipping Address

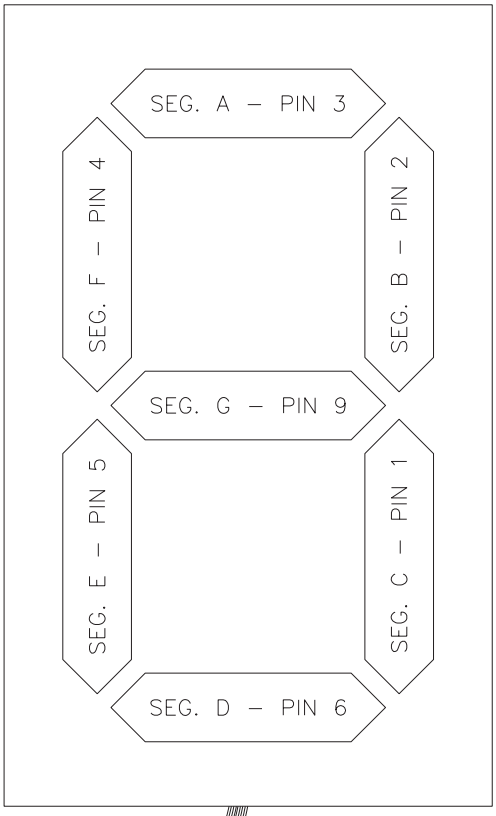
Daktronics Customer Service
[Case #]
201 Daktronics Drive, Dock E
Brookings, SD 57006

7.3 Daktronics Warranty and Limitation of Liability

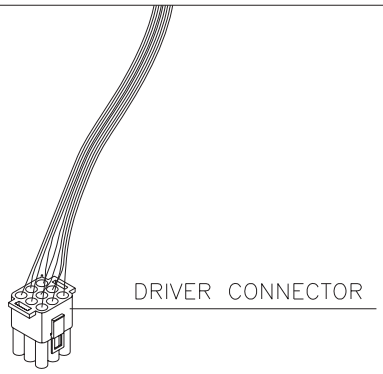
The Daktronics Warranty and Limitation of Liability is located in **Appendix B**. The Warranty is independent of Extended Service agreements and is the authority in matters of service, repair, and display operation.

Appendix A: Reference Drawings

Drawing Title	*Drawing Number*
Segmentation, 7 Segment Bar Digit	**A-38532**
Schematic: MS-2013-11	**B-158030**
Mechanical Specifications, MS-2013	**A-159886**
Electrical Specifications, MS-2013	**A-159887**
Cart Assembly, MS-2013	**A-159889**
Caption Options, MS-2013	**A-159890**
Battery Service, MS-2013	**A-159891**
Radio Receiver Installation- MS-2013	**A-160015**
Ad Panel Installation, MS-2013	**A-160057**
Cover Installation- MS-2013	**A-160060**
System Riser Diagrams- MS-2013-11	**A-160237**
Base Station: Outdoor Installation	**A-236394**
System Riser Diagram: RC-100- MS-2013	**A-244926**
Specifications; LED Driver IV, 16 Col	**A-288137**
Installation Drawing; Outdoor Scbd Gen VI Radio Receiver	**A-1109181**
Specifications; Gyrus LED Driver, 16 Col	**A-3071833**



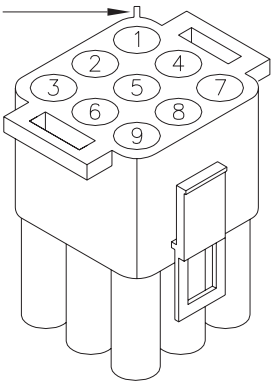
7 SEGMENT BAR DIGIT
FRONT VIEW



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

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

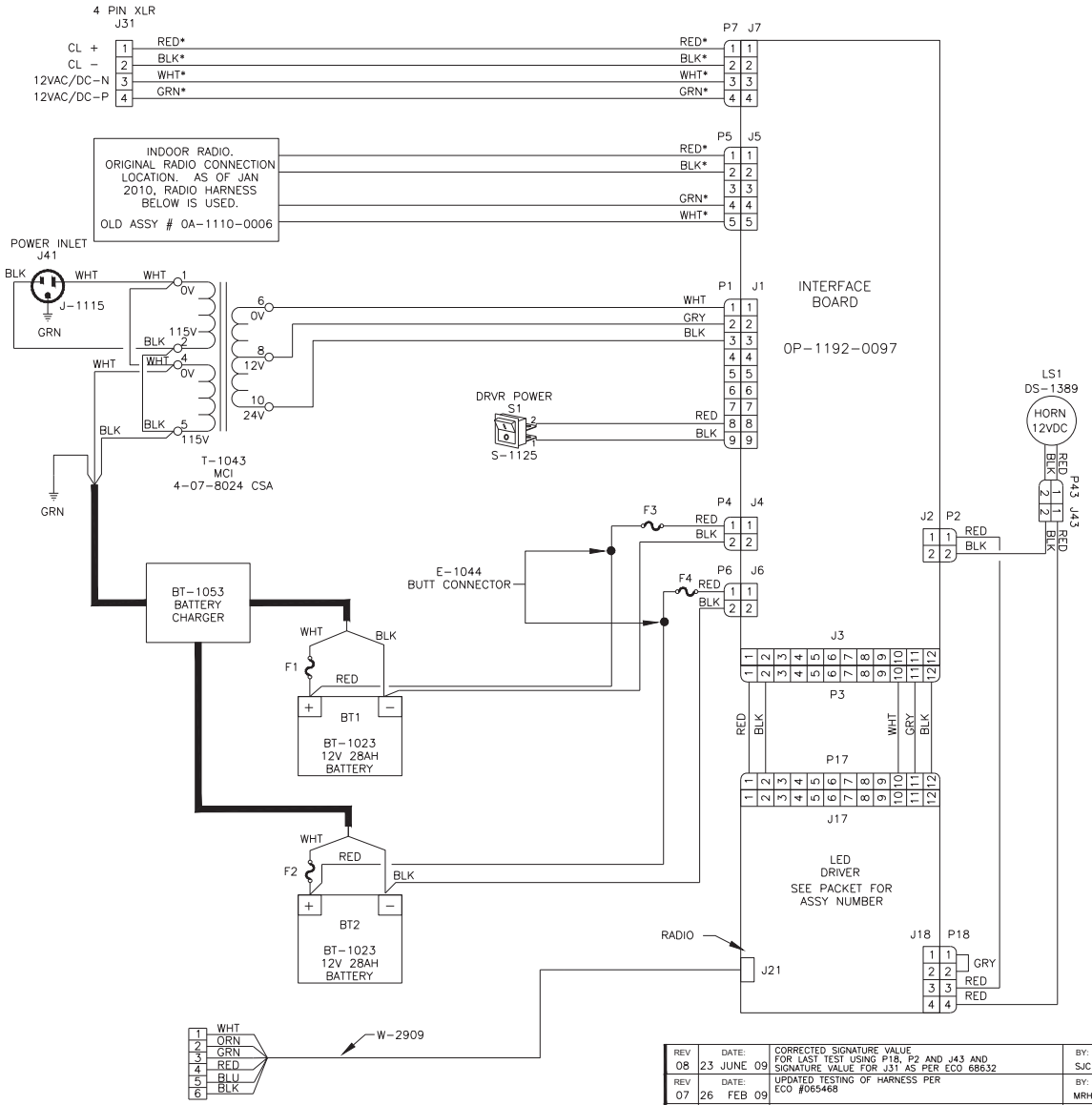
CONNECTOR PIN NUMBERING
NOTE SPLINE NEAR NO. 1



DAKTRONICS, INC. BROOKINGS, SD 57006

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

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	



NOTE:

ALL CONDUCTORS ARE 18 AWG EXCEPT * INDICATES 22 AWG CONDUCTORS AND THE INLINE FUSES, F3 AND F4 WHICH ARE 14AWG.

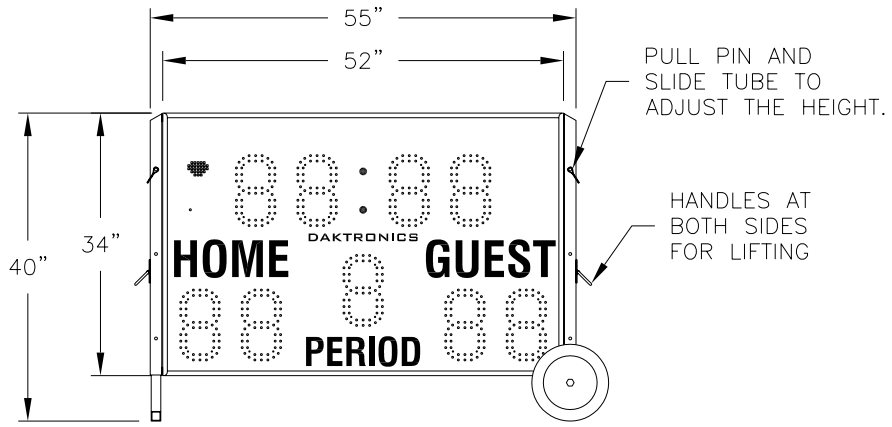
BATTERY TERMINALS MAY BE LOCATED IN ON DIFFERENT SIDES OF THE BATTERY DEPENDING ON MANUFACTURE OR HOW THE BATTERY IS INSTALLED. VERIFY THE POLARITY ON THE BATTERY BEFORE CONNECTING THE HARNESS.

F1 AND F2 ARE PROVIDED WITH THE BATTERY CHARGER, BT−1053. REPLACE WITH F−1006 (10 AMP, AGC) FUSE. F3 AND F4 ARE INLINE FUSE WITH 14 AWG WIRES. REPLACE WITH F−1031 (7.5 AMP, MDL) FUSE.

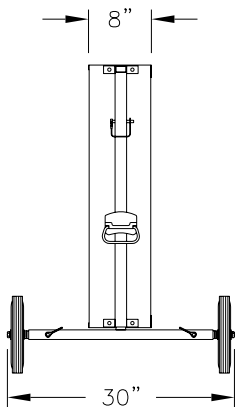
REV	DATE:	
14	02 OCT 15	REMOVED SIGNATURE TEST FROM DWG. TEST IS IN GLOVIA ROUTING. BY: SJC
13	23 JUNE 15	CHANGED BATTERY CHARGER PART # FROM BT-1022 TO BT-1053 BY: SJC
12	9 MAR 15	REPLACED 0A-1388-0004 WITH W-2909, REMOVED PART NUMBERS FROM LED DRIVER BY: RAA
11	19 FEB 15	PER EC-16946, CORRECTED SWITCH NUMBER NOTATION ON DRIVER POWER SWITCH BY: ZSW
10	09 OCT 12	ADDED SOME RADIO GENERATION NOTES TO THE TWO LOCATIONS. BY: MWM
9	10 JAN 11	ADDED RADIO HARNESS 0A−1388−0004. BY: SMB
08	23 JUNE 09	CORRECTED SIGNATURE VALUE FOR LAST TEST USING P18, P2 AND J43 AND SIGNATURE VALUE FOR J31 AS PER ECO 68632 BY: SJC
07	26 FEB 09	UPDATED TESTING OF HARNESS PER ECO #065468 BY: MRH
06	05 SEP 07	CHANGED S1 PER ECO−059091. BY: AMG
05	16 MAY 07	NEW LED DRIVER IN ALL SHIPPMENTS AFTER MAY 2007. 0P−1192−0383 BY: MWM
04	26 JUL 04	REPLACED 0P−1192−0048 WITH 0P−1192−0097 BY: JMC

PROJ: OUTDOOR LED SCOREBOARDS
TITLE: SCHEMATIC: MS−2013−11
DESIGN: EBRAVEK | DRAWN: EBRAVEK | DATE: 29 NOV 01
SCALE: 1=1

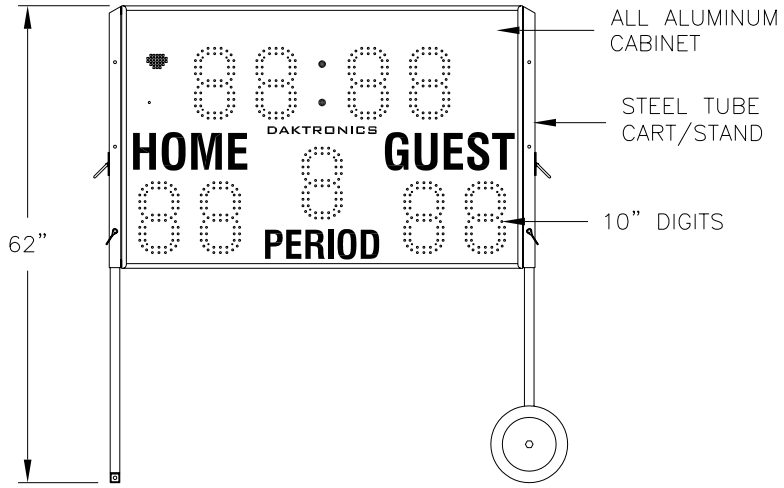
SHEET	REV	JOB NO:	FUNC-TYPE-SIZE	
	14	P1192	R-03-B	158030



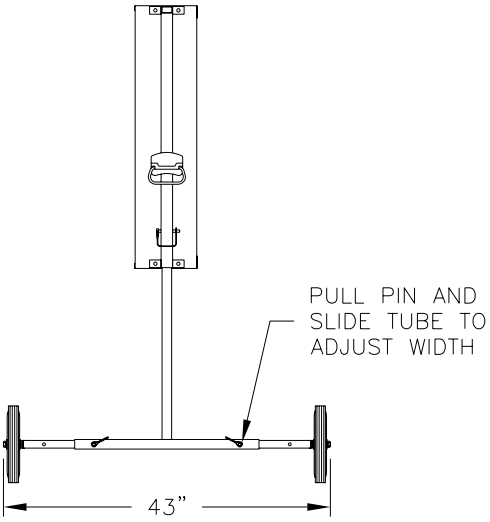
FRONT VIEW
TRANSPORT HEIGHT POSITION



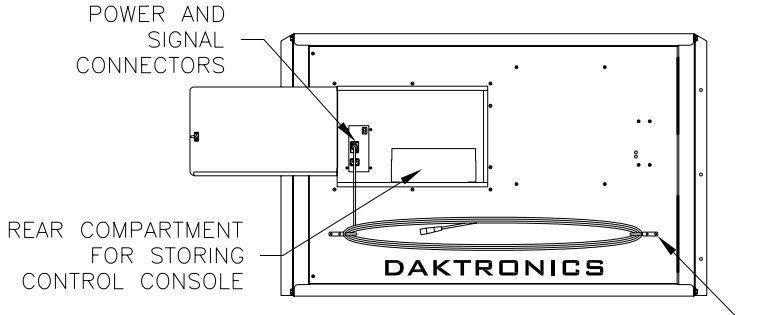
SIDE VIEW
NARROW AXLE POSITION



FRONT VIEW
MAXIMUM VIEWING HEIGHT POSITION



SIDE VIEW
EXTENDED AXLE POSITION



REAR VIEW

WEIGHT: 150 LB [68 KG], INCLUDING CART.
APPROXIMATE DIMENSIONS ARE SHOWN.

USE NARROW AXLE POSITION AND LOWEST HEIGHT TO MOVE SCOREBOARD THROUGH DOORWAYS AND FOR STORAGE.

USE EXTENDED AXLE POSITION FOR MORE STABILITY IN LIGHT WINDS. DO NOT USE THE SCOREBOARD IN HIGH WINDS.

REV.	DATE	DESCRIPTION	BY	APPR.
02	26 FEB 07	MOVED COMPARTMENT ON REAR VIEW DOWN 4"	MJK	
01	17 FEB 03	MIRRORED LOCATION OF HORN FROM THE RIGHT SIDE TO THE LEFT SIDE OF THE DISPLAY	TWEBER	

DAKTRONICS, INC. BROOKINGS, SD 57006

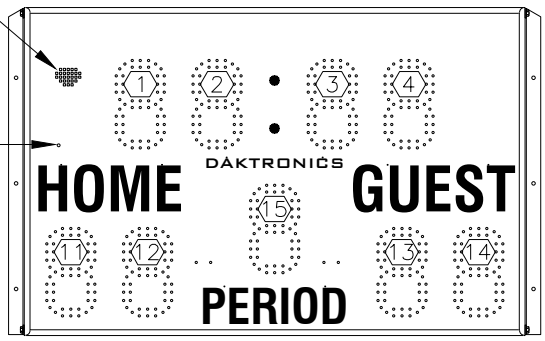
PROJ:

TITLE: MECHANICAL SPECIFICATIONS, MS-2013

DES. BY: AVB DRAWN BY: A VANBEMMEL DATE: 11 DEC 01

REVISION 02 | APPR. BY: | SCALE: 1=25

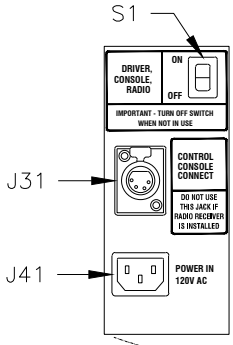
1192-R04A-159886

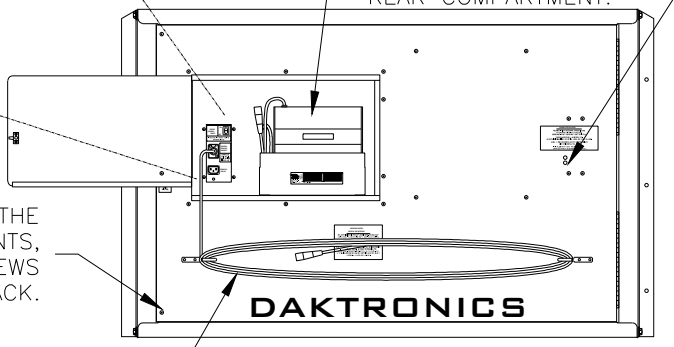


FRONT VIEW
DRIVER ASSIGNMENTS

④ THE NUMBER IN EACH DIGIT INDICATES THE DRIVER PLUG NO. WIRED TO THAT DIGIT.

THE DRIVER IS SET TO ADDRESS NO. 11.





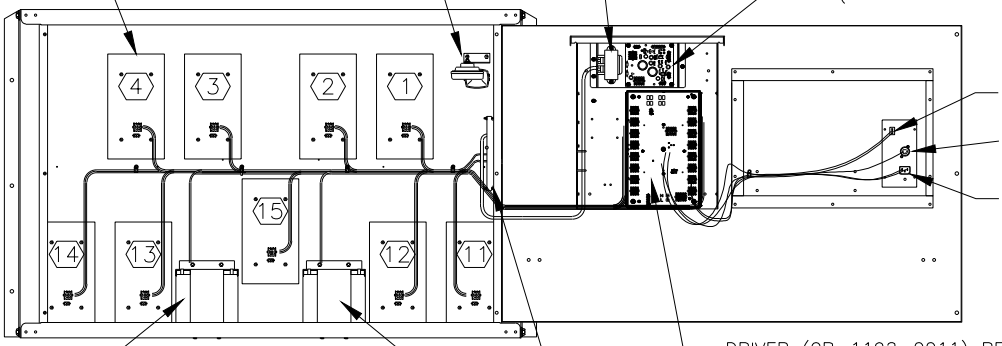
CHARGE STATUS LIGHTS
RED ONLY – HIGH CHARGE
RED & GREEN – MEDIUM CHARGE
GREEN ONLY – FLOAT CHARGE

TO GAIN ACCESS TO THE INTERNAL COMPONENTS, REMOVE THE 3 SCREWS SECURING THE BACK.

100 FOOT SIGNAL CABLE PROVIDED WITH MS-2013 (0A-1166-0022)

REAR VIEW
WITH BACK SHEET CLOSED

POWER REQUIREMENT: 120V AC, 100 WATTS.
MS-2013 CAN OPERATE ON 120V AC POWER OR INTERNAL 12 VOLT BATTERIES.
BATTERIES CAN OPERATE THE MS-2013 FOR UP TO 14 HOURS OF NORMAL USE. RECHARGE BATTERIES IMMEDIATELY AFTER EACH USE. THE CHARGER IS OPERATING WHENEVER THE 120V AC POWER IS CONNECTED. THE SYSTEM WILL NOT OVERCHARGE THE BATTERIES.



REAR VIEW
WITH BACK SHEET OPEN
DRIVER COVER IS REMOVED.

DRIVER (0P-1192-0011) BEFORE JUNE 2007
AFTER JUNE 2007, 0P-1192-0383
AFTER APRIL 2015, 0A-1782-0100

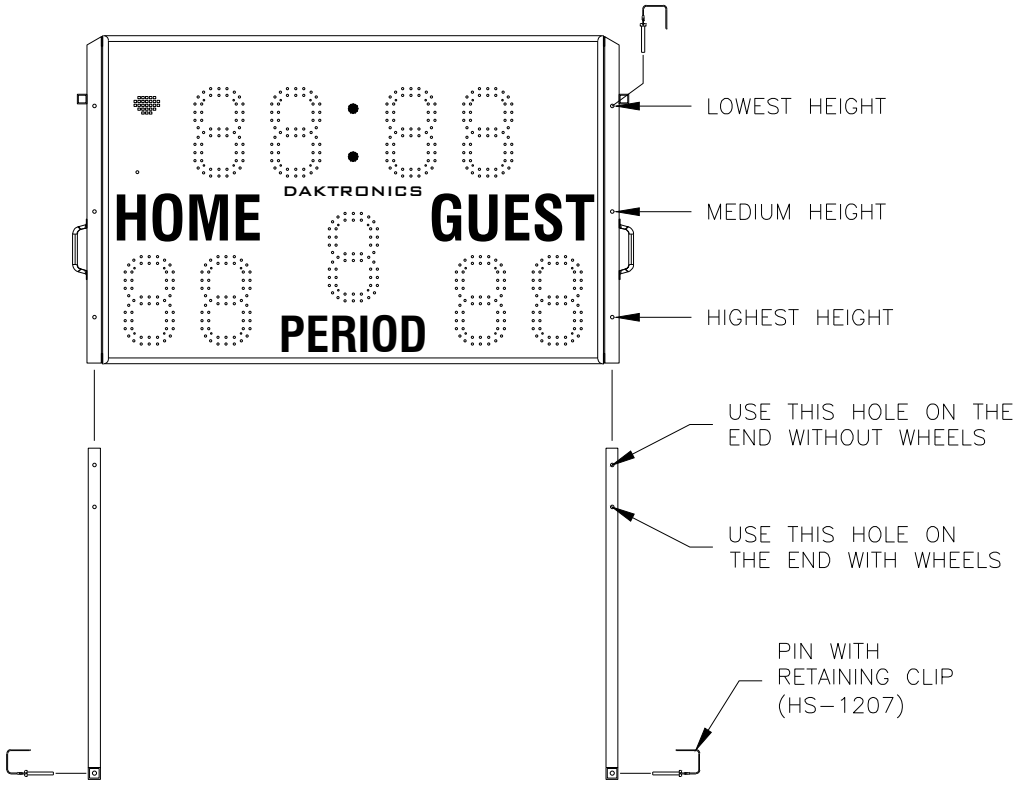
04	26 FEB 07	MOVED COMPARTMENT ON REAR PANEL DOWN 4"	MJK
03	17 FEB 03	MIRRORED THE LOCATION OF THE HORN FROM THE RIGHT SIDE TO THE LEFT SIDE OF THE DISPLAY	TWEBER
02	03 JAN 02	ROTATED BATTERY ORIENTATION 90°. ADDED SOME PART NUMBERS TO DESCRIPTIONS.	AVB
01	18 DEC 01	CHANGED DRIVER ASSIGNMENT NUMBERS FOR SCORES AND PERIOD.	AVB

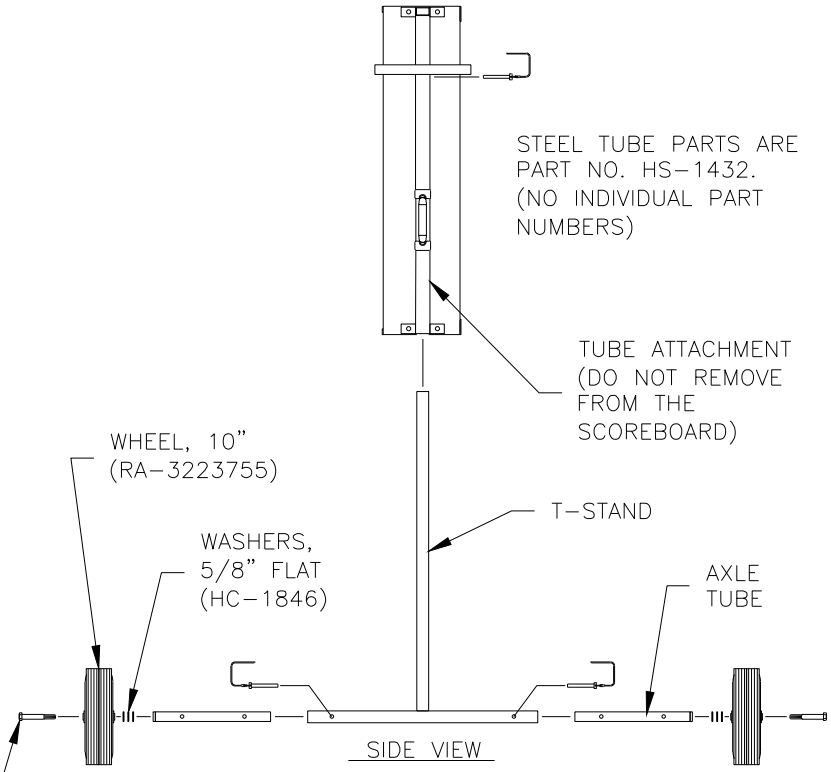
08	10 OCT 15	UPDATED BATTERY CHARGER MOUNTING LOCATION UPDATE BATTERY CHARGER PART NUMBER TO BT-1053	RDF
07	10 APR 15	UPDATED DETAILS TO SHOW NEW LED DRIVER, 0A-1782-0100	KCS
06	16 MAY 07	UPDATED DETAILS TO SHOW NEW LED DRIVER, 0P-1192-0383	MWM
05	03 APR 07	REPLACED OBSOLETE PART 0P-1192-0048 WITH 0P-1192-0097	JWC

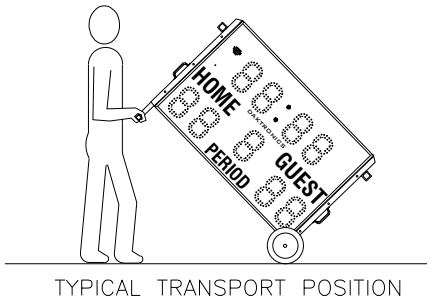
DAKTRONICS, INC.
BROOKINGS, SD 57006
DO NOT SCALE DRAWING

PROJ: SCOREBOARDS
TITLE: ELECTRICAL SPECIFICATIONS- MS-2013
DESIGN: AVB | DRAWN: A VANBEMMEL | DATE: 11 DEC 01
SCALE: 1=20

SHEET	REV	JOB NO:	FUNC-TYPE-SIZE	
	08	P1192	R-04-A	159887







TYPICAL TRANSPORT POSITION

MS-2013 CART PARTS PROVIDED INCLUDE: TWO TUBE ATTACHMENTS (ALREADY ATTACHED TO THE SCOREBOARD), TWO T-STANDS, FOUR AXLE TUBES, TWO WHEELS, SIX PINS, TWO BOLTS, 8 WASHERS.

INSERT THE AXLE TUBES INTO THE T-STANDS, INSERT PINS AND SECURE WITH THE CLIPS.

INSERT THE T-STAND INTO THE TUBE ATTACHMENT, INSERT PINS AND SECURE WITH THE CLIPS.

MOUNT THE WHEELS TO THE T-STAND ON ONE END USING THE WASHERS AS A SPACER AND SECURE WITH THE BOLTS. ADD WASHERS UNTIL WHEELS ARE SNUG BUT ROLL FREELY. TIGHTEN WITH A 15/16" WRENCH.

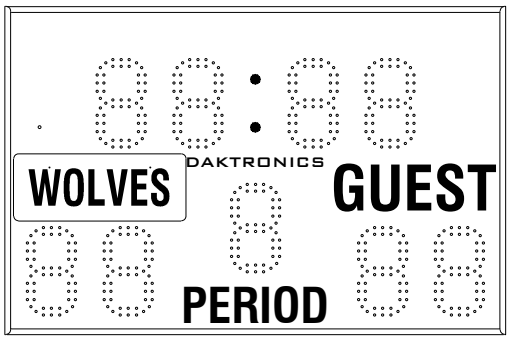
ADDITIONAL WHEELS MAY BE INSTALLED ON THE OTHER END. CONTACT DAKTRONICS FOR ADDITIONAL WHEEL KIT ASSEMBLY.

LOWER THE SCOREBOARD FOR TRANSPORTING AND RAISE IT FOR VIEWING. EXTEND THE AXLES FOR INCREASED STABILITY IN WINDS. DO NOT USE THE SCOREBOARD IN HIGH WINDS. DO NOT TRANSPORT THE SCOREBOARD IN THE RAISED POSITION.

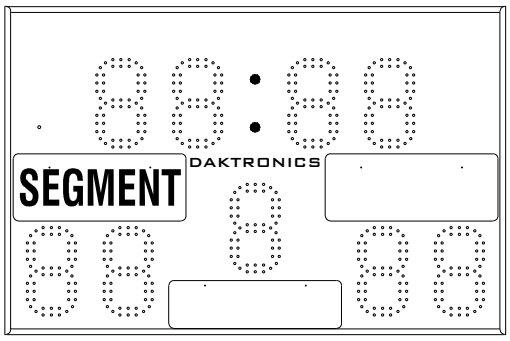
REV	DATE:		BY:	
02	7 JUN 16	PER EC-21467 - UPDATED WHEELS, WASHERS, BOLTS, AND UPDATED NOTES SECTION.	RDF	
01	17 FEB 03	MIRRORED THE LOCATION OF THE HORN FROM THE RIGHT SIDE TO THE LEFT SIDE OF THE DISPLAY	TWEBER	

THIRD ANGLE PROJECTION

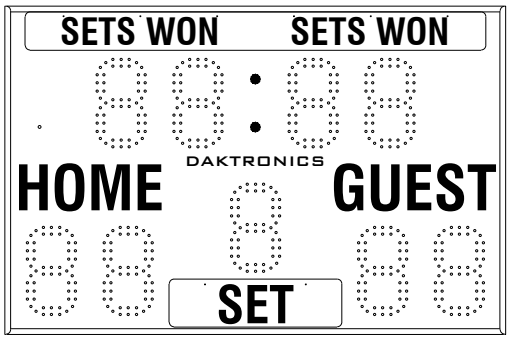
PROJECT:	OUTDOOR LED DIGIT SCOREBOARDS			
TITLE:	CART ASSEMBLY- MS-2013			
DATE: 11 DEC 01	DIM UNITS: INCHES [MILLIMETERS]		SHEET	REV
SCALE: 1 = 20	DO NOT SCALE DRAWING			02
DESIGN: AVB	JOB NO.	FUNC - TYPE - SIZE	159889	
DRAWN: AVB	P1192	E - 10 - A		



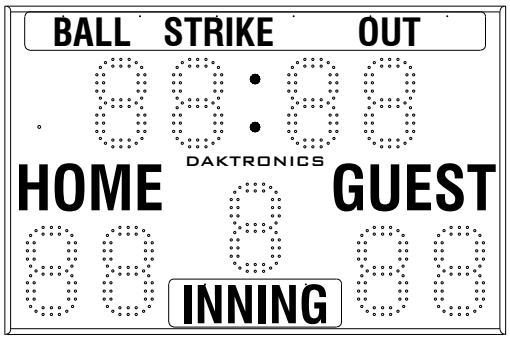
CLOCK/SCORE MODE
OPTIONAL TEAM NAME



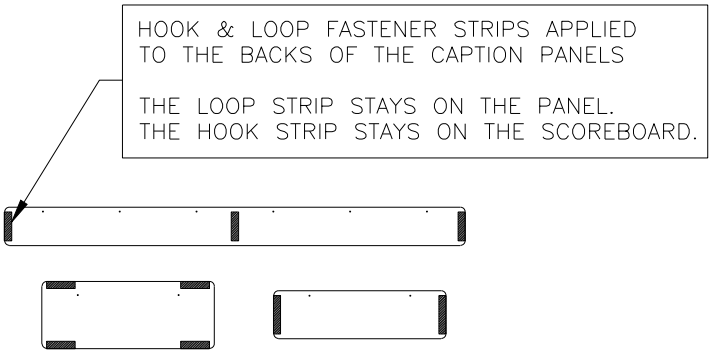
SEGMENT TIMNG MODE



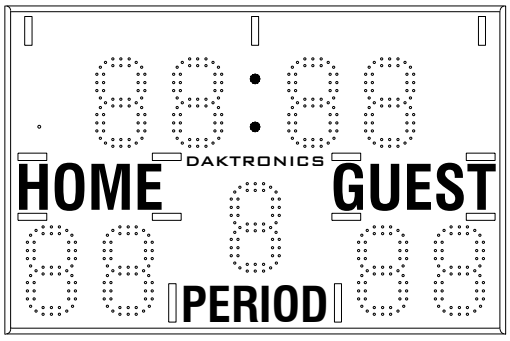
VOLLEYBALL MODE



BASEBALL/SOFTBALL MODE



REAR VIEW OF CAPTION PANELS



REMOVE THE BACKING FROM THE FASTENER STRIPS ON THE BACK OF THE CAPTION PANEL.

POSITION THE PANEL ON THE SCOREBOARD AND PRESS IN PLACE.

THE PANEL CAN BE REMOVED, LEAVING THE HOOK STRIPS ATTACHED TO THE SCOREBOARD, AS SHOWN ABOVE, AT RIGHT.

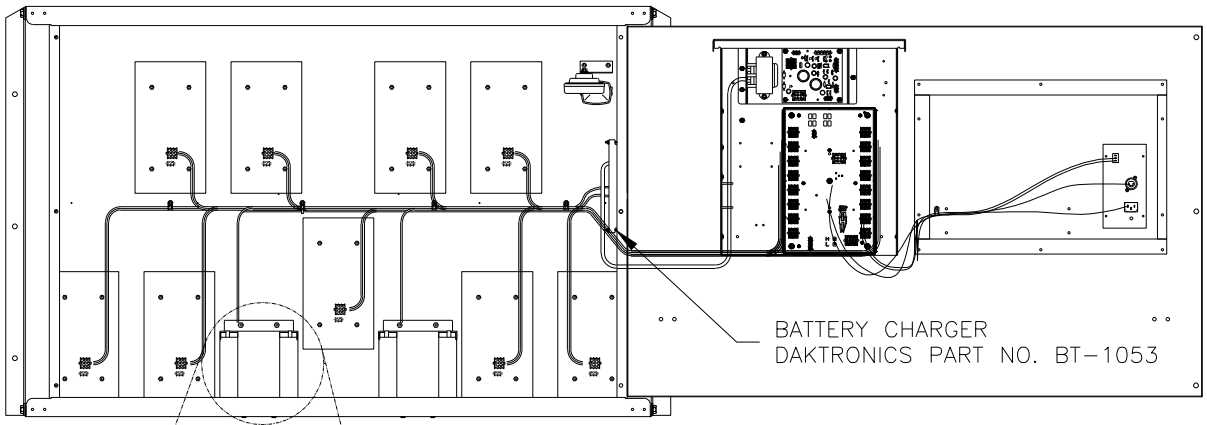
REV	DATE:		BY:
01	17 JUL 14	REPLACED 'GAMES WON' AND 'GAME' WITH 'SETS WON' AND 'SET' REMOVED 'INTERVAL' CAPTION	KDD

DAKTRONICS, INC.
BROOKINGS, SD 57006

DO NOT SCALE DRAWING

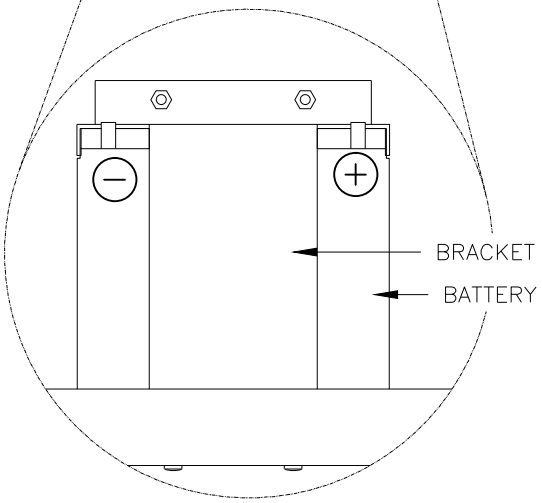
PROJ: OUTDOOR LED DIGIT SCOREBOARDS
TITLE: CAPTION OPTIONS- MS-2013
DESIGN: AVB | DRAWN: A VANBEMMEL | DATE: 10 DEC 01
SCALE: 1=20

SHEET	REV	JOB NO:	FUNC-TYPE-SIZE	
	01	P1192	R-08-A	159890

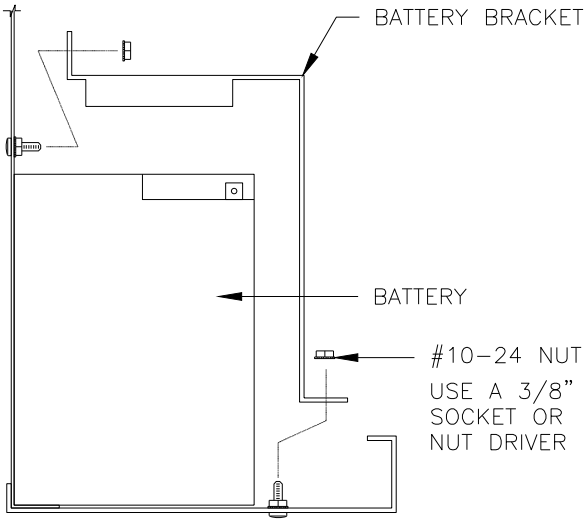


REAR VIEW
WITH BACK SHEET OPEN

BATTERY PERFORMANCE WILL DETERIORATE WITH AGE AND USE. MAXIMIZE BATTERY LIFE BY KEEPING BATTERIES FULLY CHARGED WHEN NOT IN USE. IT IS RECOMMENDED THAT THE MS-2013 BE LEFT PLUGGED IN TO 120V AC POWER WHEN IT IS STORED, IF POSSIBLE. OTHERWISE, CHARGE BATTERIES FOR AT LEAST 12 HOURS BEFORE STORING.



REAR VIEW



SIDE VIEW
BATTERY AND BRACKET ASSEMBLY

TO REPLACE THE BATTERIES, OPEN THE BACK SHEET AND REMOVE THE SCREWS SECURING THE WIRES TO THE BATTERY TERMINALS.

REMOVE THE BATTERY BRACKETS BY REMOVING THE NUTS THAT SECURE THE BRACKETS TO THE STUDS. THERE ARE FOUR NUTS PER BRACKET. REMOVE THE BATTERY FROM THE MS-2013 AND INSTALL NEW BATTERY. INSTALLATION IS THE REVERSE OF REMOVAL.

DO NOT ALLOW BATTERY TERMINALS TO CONTACT ANY METAL SURFACE. BE SURE THE WIRES ARE CONNECTED CORRECTLY. IMPROPER CONNECTION CAN RESULT IN INJURY OR DAMAGE TO COMPONENTS.

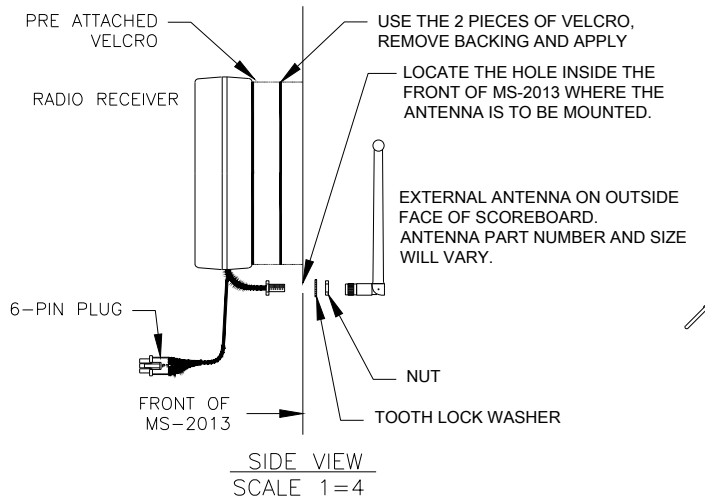
THE BATTERY IS DAKTRONICS PART NUMBER BT-1023 (PANASONIC PART NUMBER LCX-1228P). RATING IS 12 VOLTS, 28 AMP-HOURS. IF USING A DIFFERENT BATTERY, BE SURE THAT TERMINALS ARE ORIENTED THE SAME TO ENSURE PROPER CONNECTION. BRACKET WILL NOT FIT A BATTERY OF DIFFERENT DIMENSIONS.

05	20 OCT 15	UPDATED BATTERY CHARGER MOUNTING LOCATION, UPDATE BATTERY CHARGER PART NUMBER TO BT-1053	RDF	
04	10 APR 15	UPDATED VIEWS WITH NEW LED DIGIT DRIVER 0A-1782-0100	KCS	
03	26 FEB 07	MOVED POWER SIGNAL COMPARTMENT DOWN 4"	MJK	
02	17 FEB 03	MIRRORED THE LOCATION OF THE HORN FROM THE RIGHT SIDE TO THE LEFT SIDE OF THE DISPLAY	TWEBER	
01	03 JAN 02	ROTATED ORIENTATION OF THE BATTERIES BY 90 DEGREES.	AVB	

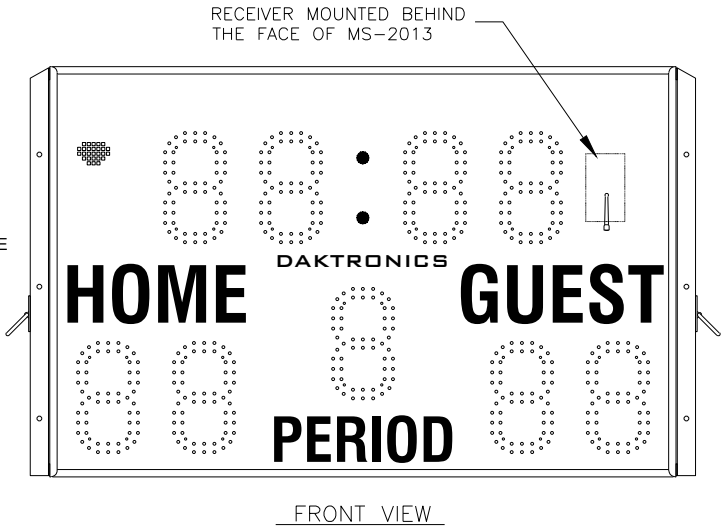
DAKTRONICS, INC.
BROOKINGS, SD 57006
DO NOT SCALE DRAWING

PROJ: SCOREBOARDS
TITLE: BATTERY SERVICE- MS-2013
DESIGN: AVB | DRAWN: A VANBEMMEL | DATE: 11 DEC 01
SCALE: 1=16

SHEET	REV	JOB NO:	FUNC-TYPE-SIZE	
	05	P1192	R - 04 - A	159891



SIDE VIEW
SCALE 1=4

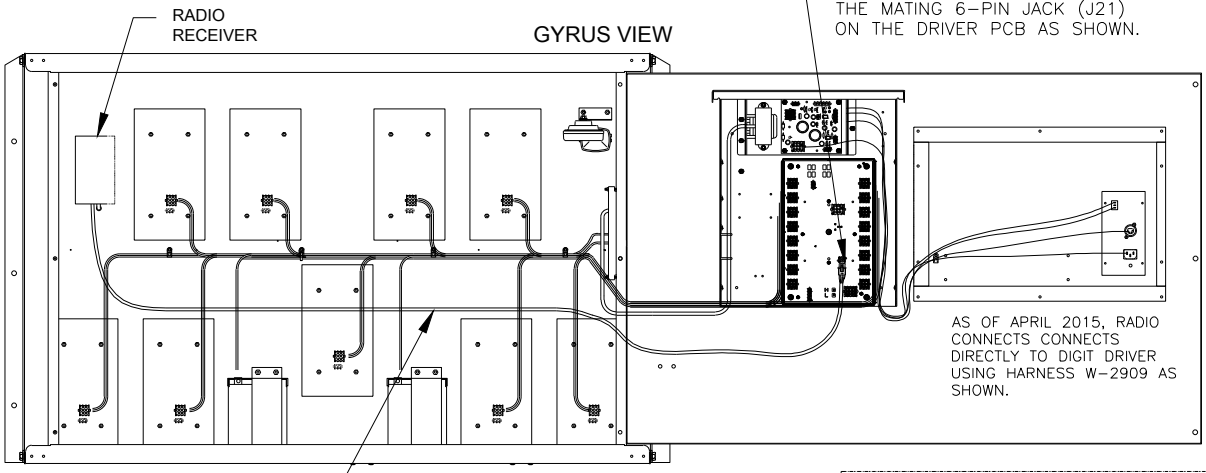


FRONT VIEW

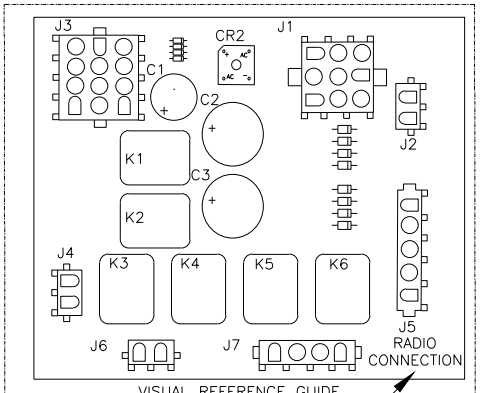
NOTES:

IF THERE ARE TO BE MULTIPLE SCOREBOARD RECEIVERS AND MULTIPLE CONTROL CONSOLES OPERATING IN THE AREA, REFER TO RADIO INSTALLATION MANUAL(S) TO CHANGE THE CHANNEL NUMBER ON THE RECEIVER PRIOR TO INSTALLING.

REMOVE THE THREE SCREWS SECURING THE BACK OF THE MS-2013, AND SWING IT OPEN.



REAR VIEW
WITH BACK OPEN

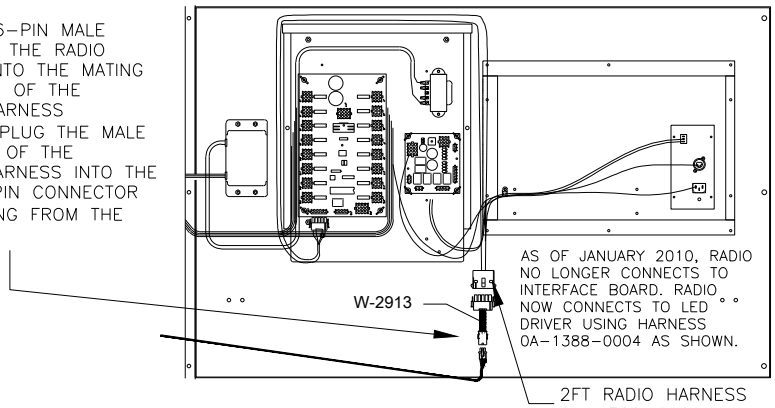


VISUAL REFERENCE GUIDE

J5 NO LONGER USED

LEGACY VIEW

PLUG THE 6-PIN MALE PLUG FROM THE RADIO RECEIVER INTO THE MATING 6-PIN JACK OF THE ADAPTOR HARNESS (W-2913). PLUG THE MALE 5-PIN END OF THE ADAPTER HARNESS INTO THE MATING 5-PIN CONNECTOR (J45) COMING FROM THE DRIVER.



REAR VIEW
OPEN BACK DOOR ONLY

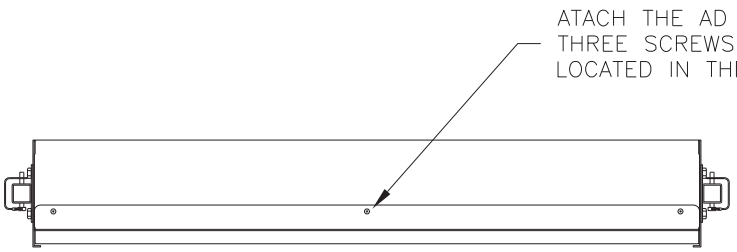
REV	DATE:		BY:
05	09 OCT 12	UPDATED TEXT TO REMOVE ANY REFERENCE DRAWINGS AND INSTEAD INSTRUCT TO REFER TO THE RADIO INSTALL MANUAL	MWM
04	8 FEB 10	ADDED DETAILS DEPICTING NEW CONNECTION FROM RADIO TO DRIVER USING 0A-1192-2436 HARNESS.	EJS
REV 03	DATE: 26 FEB 07	MOVED POWER SIGNAL COMPARTMENT DOWN 4"	BY: MJK
REV 02	DATE: 16 MAY 03	ADDED VISUAL DIAGRAM FOR THE RADIO CONNECTOR. MOVED POWER/SIGNAL CABLE TO THE WRITE LOCATION	BY: SAL
REV 01	DATE: 17 FEB 03	MIRRORED LOCATION OF HORN FROM THE RIGHT SIDE TO THE LEFT SIDE OF THE DISPLAY.	BY: TWEBER

REV	DATE:		BY:
07	10 OCT 15	UPDATED BATTERY CHARGER MOUNTING LOCATION	RDF
06	2 MAR 15	UPDATED VIEWS WITH GYRUS DRIVER AND HARNESS. ADDED LEGACY VIEW	KCS

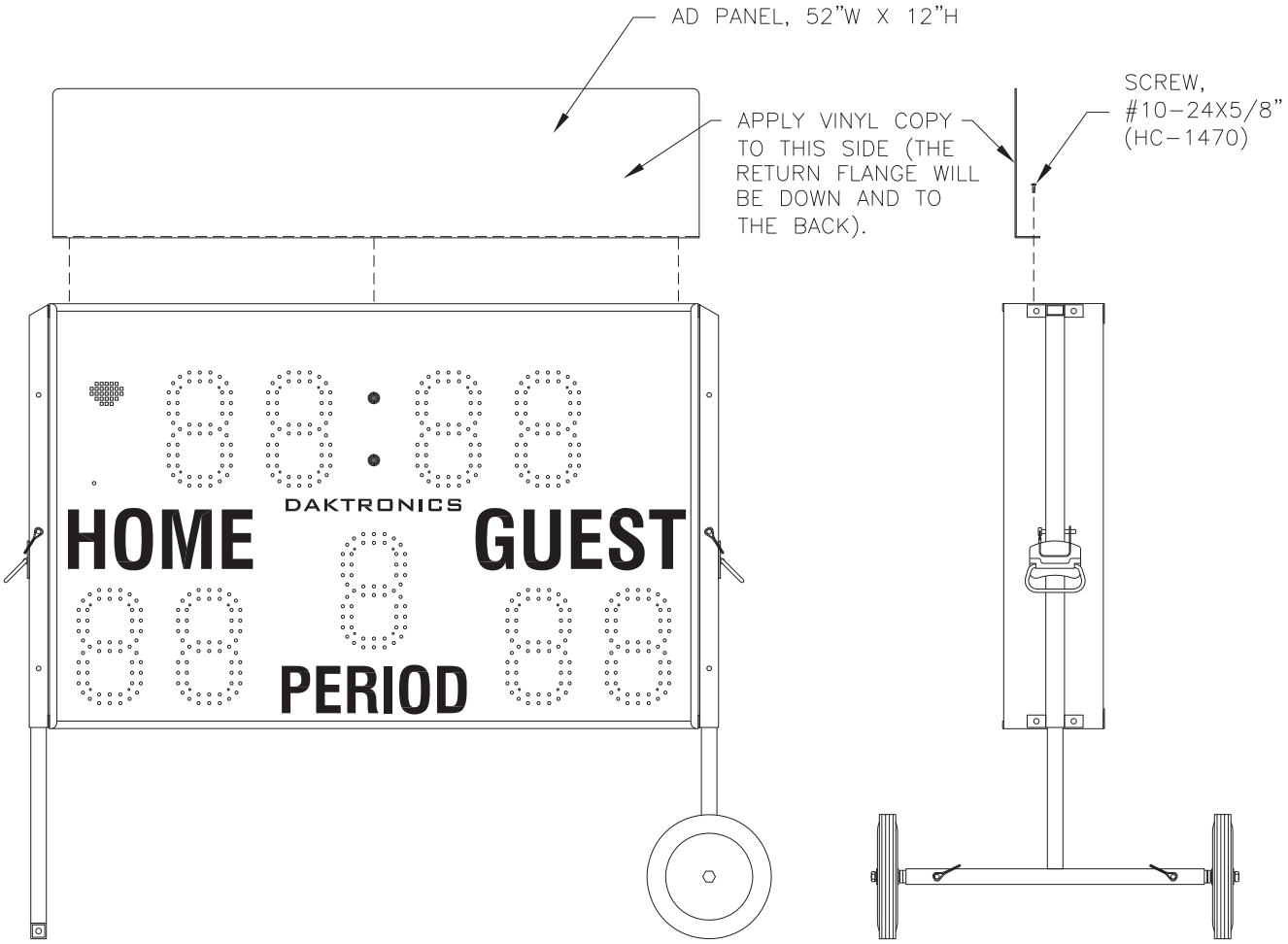
DAKTRONICS, INC.
BROOKINGS, SD 57006
DO NOT SCALE DRAWING

PROJ:
TITLE: RADIO RECEIVER INSTALLATION- MS-2013
DESIGN: AVB | DRAWN: A VANBEMMEL | DATE: 12 DEC 01
SCALE: 1=16

SHEET	REV	JOB NO:	FUNC-TYPE-SIZE	
	07	P1192	R-10-A	160015



TOP VIEW



FRONT VIEW

SIDE VIEW

REV.	DATE	DESCRIPTION	BY	APPR.
02	17 FEB 03	MIRRORED LOCATION OF HORN FOR THE RIGHT SIDE TO THE LEFT SIDE OF THE DISPLAY	TWEBER	
01	26AUG02	ADDED NOTE FOR VINYL APPLICATION	MCOPL	

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ:

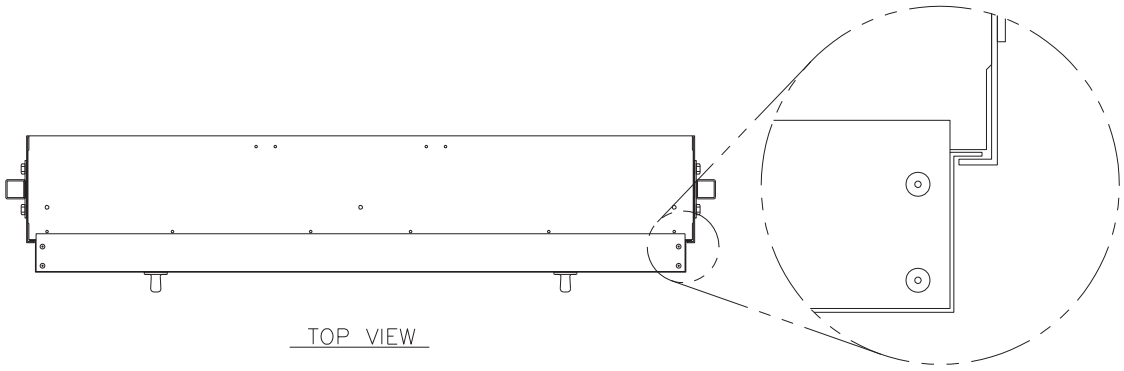
TITLE: AD PANEL INSTALLATION, MS-2013

DES. BY: AVB DRAWN BY: A VANBEMMEL DATE: 12 DEC 01

REVISION 02 APPR. BY:

SCALE: 1=15

1192-R10A-160057



TOP VIEW

NOTES:

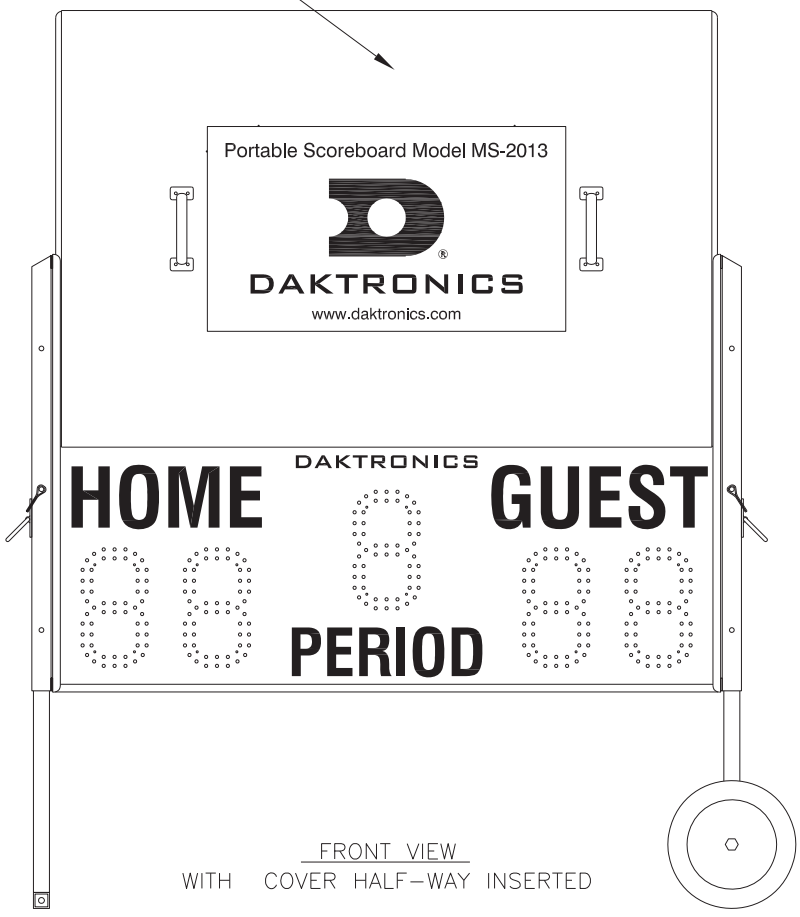
IF INSTALLED WITH THE RADIO ANTENNA, IT IS HIGHLY RECOMMENDED TO REMOVE THE ANTENNA BEFORE INSTALLING OR REMOVING THE COVER.

THE COVER IS DESIGNED TO PROTECT THE MS–2013 DURING TRANSPORTATION AND STORAGE.

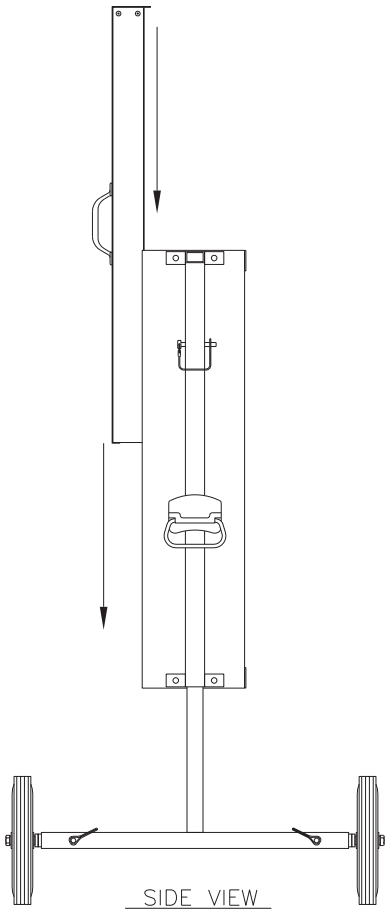
LOWER THE MS–2013 TO ITS LOWEST HEIGHT.
USING THE HANDLES ON THE FRONT OF THE COVER, RAISE THE COVER ABOVE THE TOP OF THE MS–2013.

ENGAGE THE FLANGES ON THE SIDES OF THE COVER INTO THE SLOTS AT EITHER SIDE OF THE FRONT OF THE MS–2013. LOWER THE COVER UNTIL ITS TOP RESTS AGAINST THE TOP OF THE MS–2013.

OPTIONAL FRONT COVER
0A–1192–1092



FRONT VIEW
WITH COVER HALF–WAY INSERTED



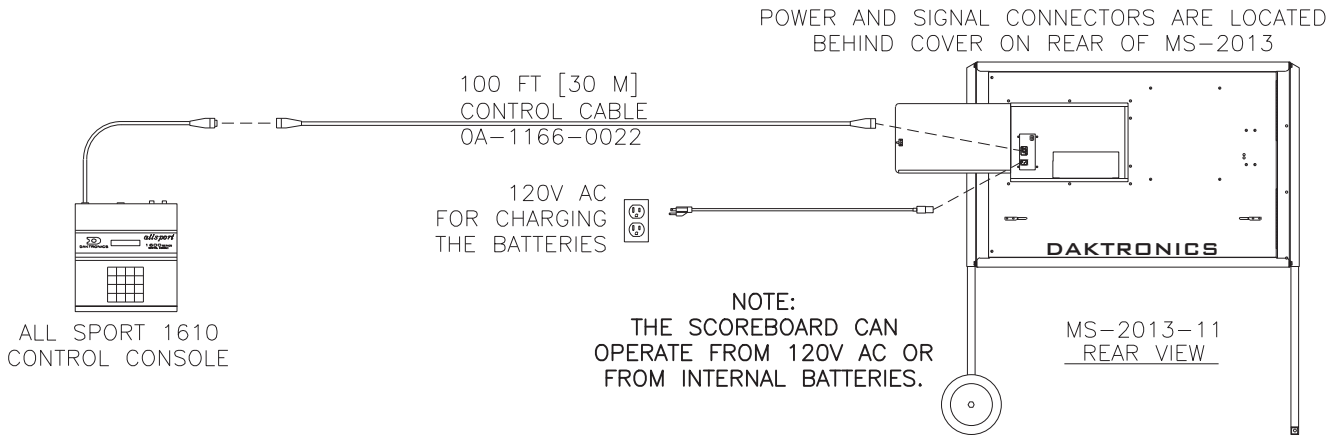
SIDE VIEW

DAKTRONICS, INC. BROOKINGS, SD 57006

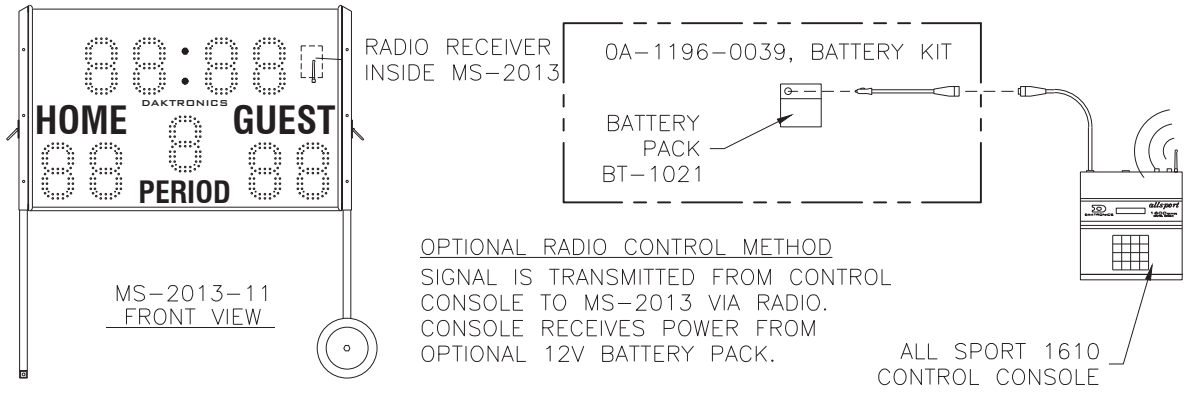
PROJ: OUTDOOR LED DIGIT SCOREBOARDS
TITLE: COVER INSTALLATION– MS–2013
DES. BY: AVB DRAWN BY: A VANBEMMEL DATE: 12 DEC 01
REVISION 02 APPR. BY: SCALE: 1=15
1192-R10A-160060

REV.	DATE	DESCRIPTION	BY	APPR.
02	10 DEC 08	CORRECTED THE NOTE.	VAS	
01	09 DEC 08	ADDED NOTE FOR REMOVAL OF THE RADIO ANTENNA BEFORE THE COVER INSTALLATION OR REMOVAL.	VAS	

ALL SPORT 1600, CABLE CONNECTION

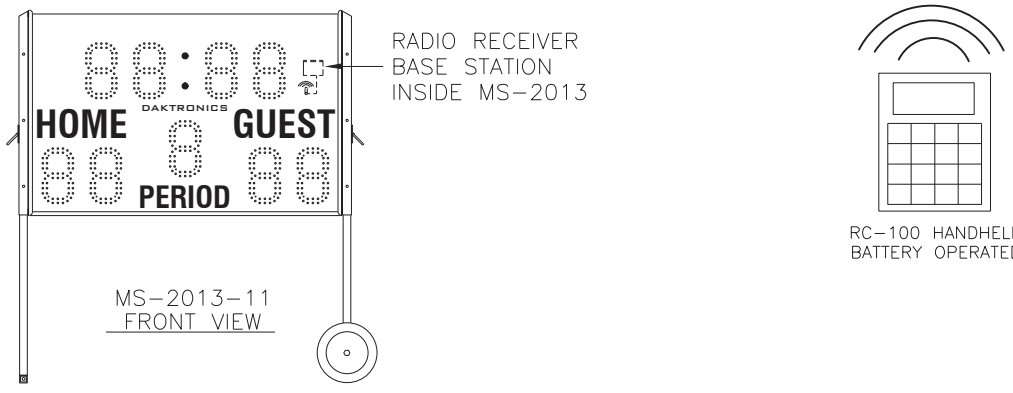


ALL SPORT 1610R5 RADIO CONTROL.



RC-100 RADIO CONTROL.

REFER TO DRAWING
1110-R01A-244926 FOR DETAILS
ON THIS SETUP.



03	8 FEB 10	MOVED RADIO DETAIL TO CORRECT PLACE ON SCOREBOARD.	EJS
02	16 MAY 07	UPDATED RISER TO SHOW RC-100 CONTROL SYSTEM	MWM
01	26 FEB 07	MOVED POWER SIGNAL COMPARTMENT ON REAR DOWN 4"	MJK

DAKTRONICS, INC.
BROOKINGS, SD 57006
DO NOT SCALE DRAWING

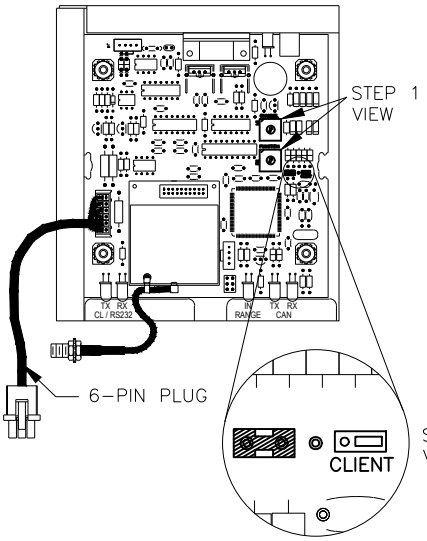
PROJ:
TITLE: SYSTEM RISER DIAGRAMS- MS-2013-11
DESIGN: AVB | DRAWN: A VANBEMMEL | DATE: 17 DEC 01
SCALE: 1=32

SHEET	REV	JOB NO:	FUNC-TYPE-SIZE	
	03	P1192	R-04-A	160237

TOP VIEW

BASE STATION VIEW WITH FUNCTION SETTINGS CHART

STEP 1
USING A SMALL FLAT HEAD SCREW DRIVER OR YOUR FINGERS CHANGE THE SWITCHES TO THE DESIRED CHANNEL AND FUNCTION NUMBER. (REFER TO STEP 1 VIEW AND CHART FOR CHANNEL SELECTION.)
STEP 2
NOTE THE CHANNEL NUMBER SET FOR THIS UNIT.
STEP 3
BASE STATION IS SET IN FACTORY FOR SERVER MODE.
FOR CLIENT MODE, SET JUMPERS TO RIGHT MOST POSITION.



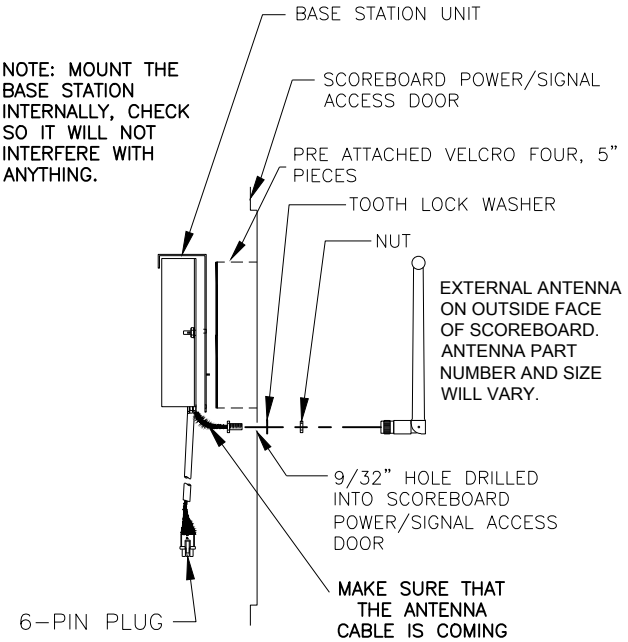
STEP 1 CHART

FUNCTION SETTING	FUNCTION (SERVER MODE)
0	DEFAULT FUNCTION (LAST POWER UP FUNCTION)
1	CAN HANDHELD JUDGES CONSOLE
2	ALL SPORT SCBD CONTROLLER – GEN I
3	DATA TIME MASTER DISPLAY CONTROLLER
5	ALL SPORT SCBD CONTROLLER – GEN II
F	RESET MEMORY/TEST
4, 6-E	RESERVED

SIDE VIEW

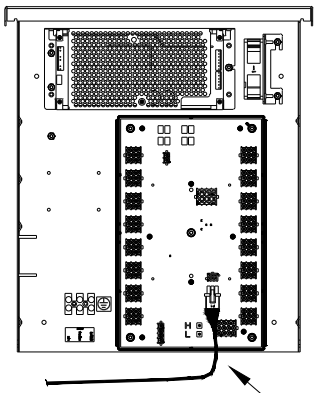
BASE STATION MOUNTING DETAILS FOR MOST OUTDOOR SCOREBOARDS

NOTE: MOUNT THE BASE STATION INTERNALLY, CHECK SO IT WILL NOT INTERFERE WITH ANYTHING.

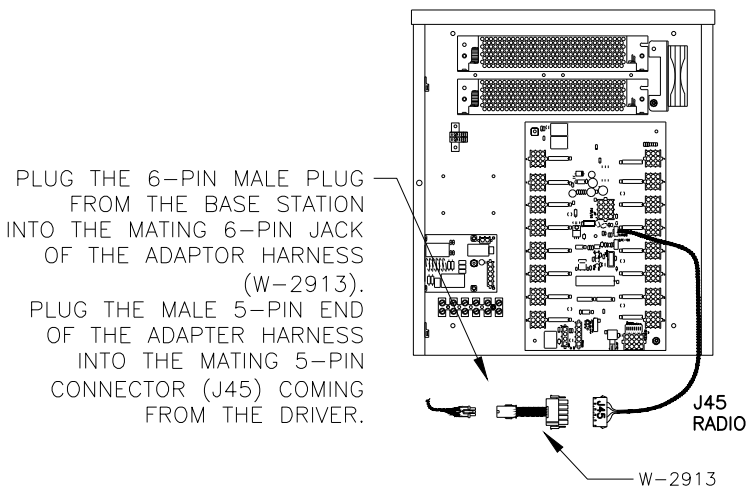


CONNECTING THE BASE STATION WIRE HARNESS
FRONT VIEW OF DRIVER ENCLOSURE; LID REMOVED

GYRUS VIEW



LEGACY VIEW



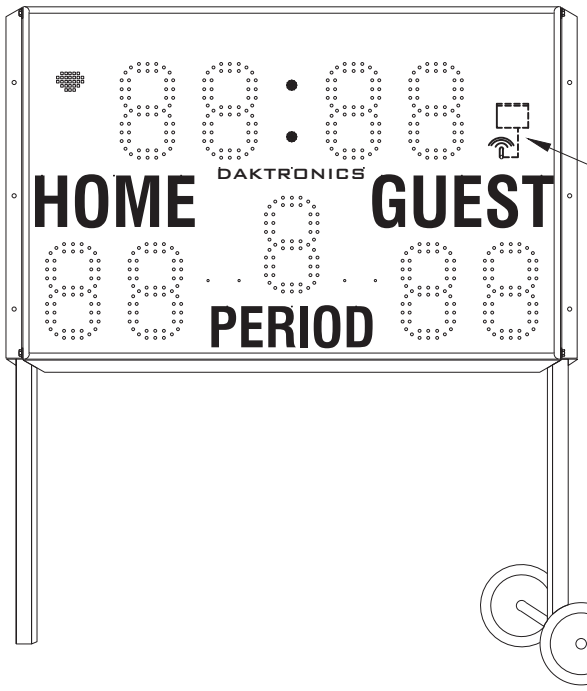
03	18 FEB 15	REMOVED "BEFORE JAN 2007" VIEW ADDED NEW GYRUS VIEW UPDATED BASE STATION VIEWS	BJG
02	23 AUG 11	ADDED NEW DETAIL TO DRAWING UPDATED TITLE BLOCK AND FUNCTION CHART	JJL
01	18 JUNE 08	ADDED STEP 1.4 AND DETAIL	AMG

DAKTRONICS, INC.
BROOKINGS, SD 57006
DO NOT SCALE DRAWING

PROJ: RC-100
TITLE: BASE STATION: OUTDOOR INSTALLATION
DESIGN: MMILLER | DRAWN: APAGE | DATE: 11 MAR 05
SCALE: 1=7

SHEET	REV	JOB NO:	FUNC-TYPE-SIZE	
	03	P1110	E-07-A	236394

NOTE: THIS DETAIL SHOWS A MS-2013. ACTUAL RC-100 SCOREBOARD RECEIVER BASE STATION MAY BE IN A DIFFERENT LOCATION DEPENDING ON DISPLAY TYPE.



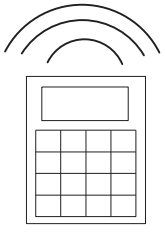
0A-1110-0035
FUNCTION SETTING = 5

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

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

FUNCTION TABLE

FUNCTION NUMBER	DESCRIPTION	
0	DEFAULT FUNCTION (LAST POWER UP FUNCTION)	
1	CAN HAND HELD (JUDGES) CONSOLE	
2	MS-2013 SCOREBOARD CONTROLLER GEN I (ALLSPORT)	USE BEFORE V2.2 ON HANDHELD UNIT
3	DATATIME/DATAMASTER DISPLAY CONTROL	
5	MS-2013 SCOREBOARD CONTROLLER GEN II (ALLSPORT)	USE AFTER V2.2 ON HANDHELD UNIT



0A-1110-0053
INSERT: LL-2613 (CLOCK/SCORE) CODE 01
INSERT: 0G-239304 (VOLLEYBALL) CODE 02
INSERT: LL-2605 (BASEBALL) CODE 03

REV	DATE:		BY:	
05	27 APR 12	UPDATED RC-100 HANDHELD PART NUMBER UPDATED BOARDER AND TITLE BLOCK	JFL	
04	8 FEB 10	MOVED RADIO DETAIL TO CORRECT PLACE ON SCOREBOARD.	EJS	
03	16 MAY 07	ADDED BASEBALL INSERT TO DRAWING	MWM	
02	15 JAN 07	ADDED FUNCTION 5 GEN II	JRA	JRA
01	18 JUL 05	MODIFIED TEXT	CMG	

DAKTRONICS, INC.
BROOKINGS, SD 57006
DO NOT SCALE DRAWING

PROJ: RADIO LINK
TITLE: SYSTEM RISER DIAGRAM: RC-100- MS-2013
DESIGN: KBIERBA | DRAWN: KBIERBA | DATE: 11 JUN 05
SCALE: NONE

SHEET	REV	JOB NO:	FUNC-TYPE-SIZE	
	05	P1110	R-01-A	244926

LED DRIVER IV
0P-1192-0383, 16 COL
0P-1192-0384, 16 COL, AC

J1-16 DIGIT JACKS

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

J17 PWR/SIG

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

J22 RC-100 RADIO

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

J21 2.4GHz RADIO

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

J23 PROGRAM

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

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

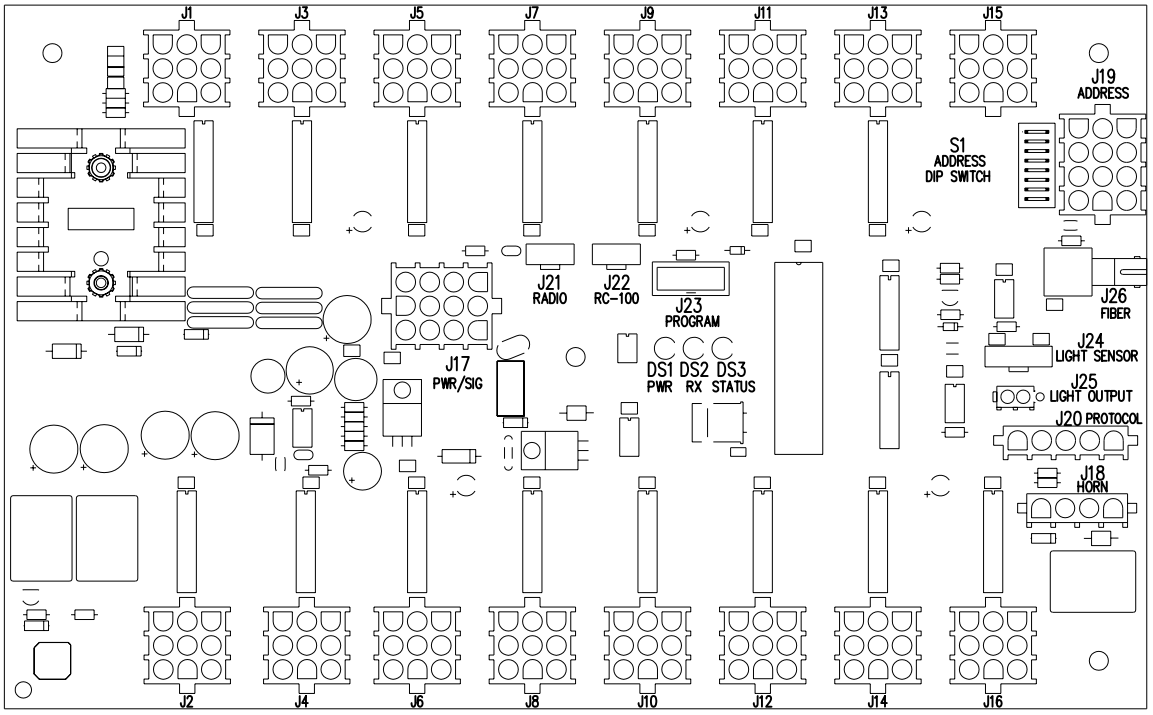
J19 ADDRESS

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

REFER TO DWGS
A-290261 & A-290689

S1 ADDRESS DIP SWITCH PACKAGE

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



J26 FIBER RX

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

J24 LIGHT SENSOR

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

J25 LIGHT OUT- NEXT DRIVER

PIN	FUNCTION
1	LIGHT_OUT-P
2	LIGHT_OUT-N

REFER TO DWG A-115081
FOR PROTOCAL SETTINGS

J20 PROTOCOL

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

J18 HORN

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

NOTES:

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

DAKTRONICS, INC. BROOKINGS, SD 57006

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

PROJ:
TITLE: SPECIFICATIONS; LED DRIVER IV, 16 COL
DES. BY: DRAWN BY: DULSCHM DATE: 09 OCT 06
REVISION 02 APPR. BY:
SCALE: 1 = 2
1192-R04A-288137

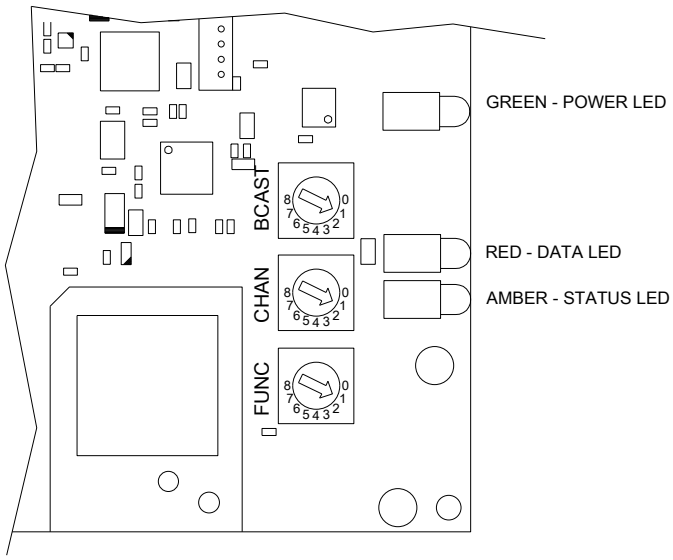
OUTDOOR SCOREBOARDS ONLY

RADIO PREPARATION

- RADIO SETTING FROM FACTORY IS F=1, B=1, C=1. IF THIS SETTING IS FINE FOR YOUR FACILITY LAYOUT, INSTALL RADIO INTO DISPLAY.

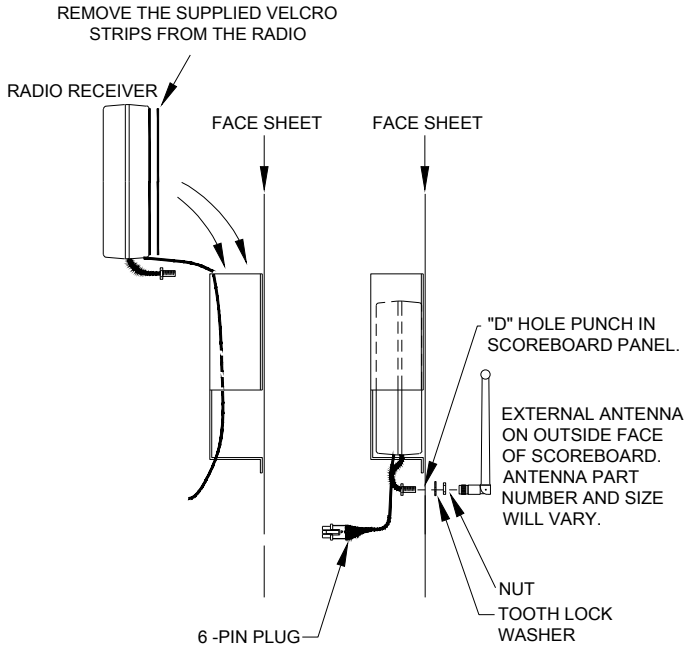
OR

OPEN RADIO CASE BY REMOVING 4 PHILIPS HEAD SCREWS.
ALWAYS LEAVE FUNCTION = 1, BUT CHANGE THE CHANNEL AND BCAST DIALS AS NEEDED. USE SMALL FLAT HEAD SCREW DRIVER.



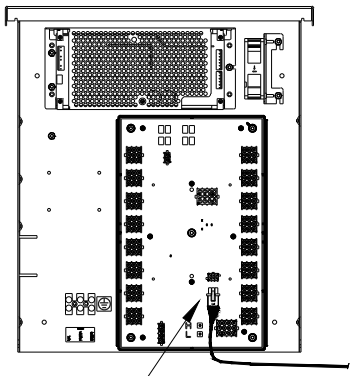
MOUNTING RADIO RECEIVER IN MOST OUTDOOR SCOREBOARDS.

NEAR THE PRIMARY DRIVER ENCLOSURE WILL BE A RADIO BRACKET BOLTED TO A FACE SHEET. THIS POCKET WILL HOLD THE RADIO RECEIVER AND ALLOW YOU TO ROUTE THE CABLING DOWN AND OVER TO THE DRIVER ENCLOSURE.



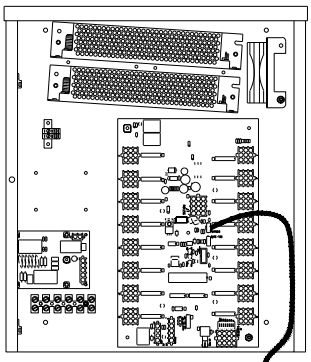
PRIMARY DRIVER ENCLOSURE, LOCATION VARIES PER SCOREBOARD MODEL.

GYRUS VIEW



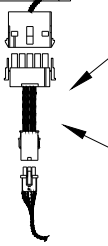
PLUG THE 6-PIN MALE PLUG FROM THE RADIO RECIEVER INTO THE MATING 6-PIN JACK (J21) ON THE DRIVER PCB AS SHOWN.

LEGACY VIEW



PLUG THE 6-PIN MALE PLUG FROM THE RADIO RECEIVER INTO THE MATING 6-PIN JACK OF THE ADAPTOR HARNESS (W-2913). PLUG THE MALE 5-PIN END OF THE ADAPTER HARNESS INTO THE MATING 5-PIN CONNECTOR (J45) COMING FROM THE DRIVER.

CONNECTOR LABELED "J45"



W-2913

REV	DATE:		BY:
03	18 FEB 15	ADDED GYRUS VIEW UPDATED RADIO RECEIVER AND LEGACY VIEWS	BJG
02	26 NOV 14	ADDED "REMOVE VELCRO" NOTES	KDD
01	27 MAR 14	PER EC-13907, ADDED OUTDOOR SCBD ONLY NOTE	KDD

DAKTRONICS, INC.
BROOKINGS, SD 57006
DO NOT SCALE DRAWING

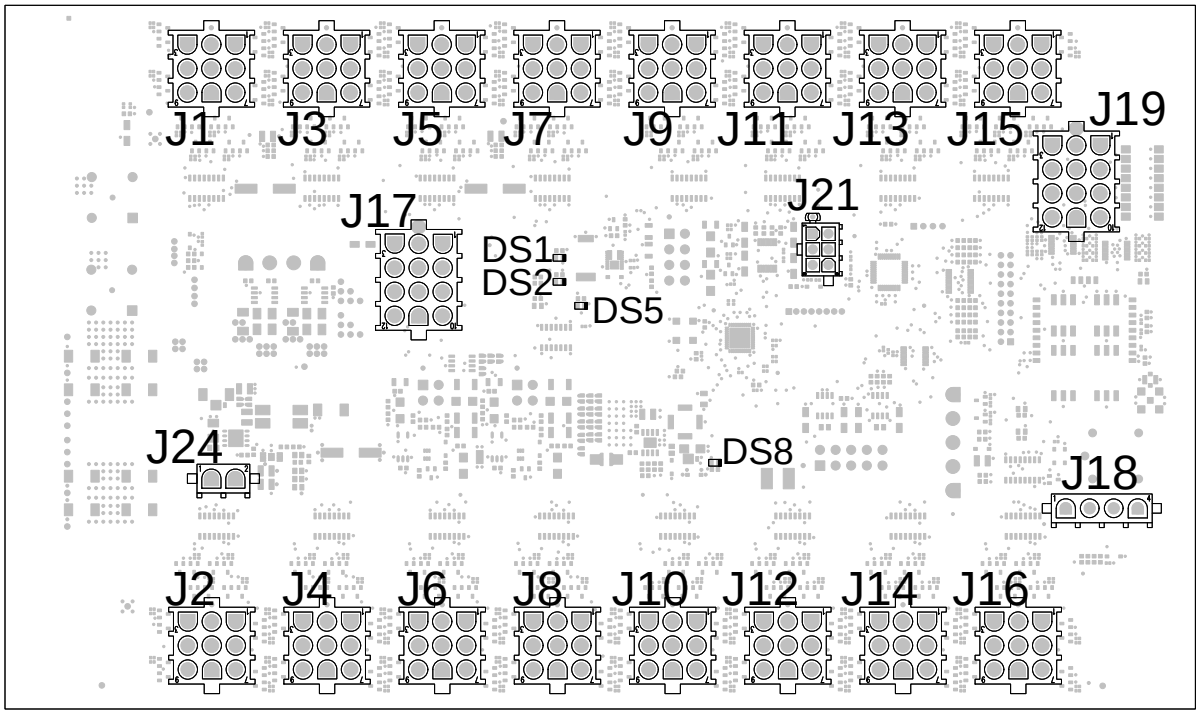
PROJ: ALL SPORT RADIO
TITLE: INSTALLATION DRAWING; OUTDOOR SCBD GEN VI RADIO RECEIVER
DESIGN: MMILLER | DRAWN: MMILLER | DATE: 07 AUG 12
SCALE: NONE

SHEET	REV	JOB NO:	FUNC-TYPE-SIZE	
	03	P1110	F - 01 - A	1109181

J1-16: Digit Jacks	
Pin	**Function**
1	SEG_C
2	SEG_B
3	SEG_A
4	SEG_F
5	SEG_E
6	SEG_D
7	+VCC
8	SEG_H
9	SEG_G

J17: Power / Signal	
Pin	**Function**
1	CL_IN_1-P
2	CL_IN_1-N
3	LEGACY_232_IN-P
4	CL_OUT-P
5	CL_OUT-N
6	LEGACY_AC_IN1
7	GND
8	CHGND
9	LEGACY_AC_IN2
10	GND
11	+VUNREG_1_IN
12	+VUNREG_2_IN

J19: Address	
Pin	**Function**
1	GND
2	AD00
3	AD01
4	GND
5	AD02
6	AD03
7	GND
8	AD04
9	AD05
10	GND
11	AD06
12	AD07



J24: Power Input	
Pin	**Function**
1	+12V
2	GND

J21: Comm	
Pin	**Function**
1	+12V
2	RS232_TX-P
3	BOOT0
4	CL_RADIO_RX-P
5	RS232_RX-P
6	GND

J18: Horn	
Pin	**Function**
1	HORN_OUT-N
2	AUX_OUT-N
3	RELAY_COM
4	RELAY_NO

Notes:
- Protocols are auto-detected

Indicators:
- DS8 = Power
- DS1 = RS-232 Status (Radio)
  - BLINK = Comm Detected
  - OFF = No Comm
- DS2 = Heartbeat (Run)
  - 1 sec. Blink = OK
- DS5 = Current Loop Receive
  - ON = OK
  - OFF = Disconnected

Reference Drawings
- A-128429 for current loop re-drive specifications
- B-1198765 for Switch Address Settings

DAKTRONICS, INC.
BROOKINGS, SD 57006

DO NOT SCALE DRAWING

PROJECT	.				
TITLE	SPECIFICATIONS; GYRUS LED DRIVER, 16 COL				
DESIGN	.			SHEET	1 OF 1
DRAWN	DULSCHM			SCALE	1 = 2
DATE	28 MAY 15	JOB NUMBER	FUNC-TYPE-SIZE	3071833	
REV	00	P1192	R - 04 - A		

Appendix B: Daktronics Warranty and Limitation of Liability

DAKTRONICS WARRANTY & 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 and End User agree to be bound by and accept these terms and conditions. Unless otherwise defined herein, all 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 (the "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 End User 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. This Warranty does not include on-site labor charges to remove or install these components. 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 Daktronics.

C. Daktronics shall pay ground transportation charges for the return of any defective component of the Equipment. All such items shall be shipped by End User DDP Daktronics designated facility. If returned Equipment is repaired or replaced under the terms of this Warranty, Daktronics will prepay ground transportation charges back to End USer and shall ship such items DDP End User's designated facility; otherwise, End User shall pay transportation charges to return the Equipment back to the End User and such Equipment shall be shipped Ex Works Daktronics designated facility. All returns must be pre-approved by Daktronics before shipment. Daktronics shall not be obligated to pay freight for any unapproved return. End User 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 the 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. Unless otherwise expressly provided, this Warranty does not impose any duty or liability upon Daktronics for partial LED pixel degradation. Notwithstanding the foregoing, in no event does this Warranty include LED pixel degradation caused by UV light. This Warranty does not 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.

EXCEPT AS OTHERWISE EXPRESSLY SET FORTH IN THIS WARRANTY, TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, DAKTRONICS DISCLAIMS ANY AND ALL OTHER PROMISES, REPRESENTATIONS AND WARRANTIES APPLICABLE TO THE EQUIPMENT AND REPLACES ALL OTHER WARRANTIES OR CONDITIONS, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTIES OR CONDITIONS OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR ACCURACY OR QUALITY OF DATA. OTHER ORAL OR WRITTEN INFORMATION OR ADVICE GIVEN BY DAKTRONICS, ITS AGENTS OR EMPLOYEES, SHALL NOT 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

This Warranty does not impose any duty or liability upon Daktronics for any:

A. 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, End User assumes all risk of loss or damage, agrees to use any shipping containers that might be provided by Daktronics, and to ship the Equipment in the manner prescribed by Daktronics;

B. damage caused by: (i)the improper handling, installation, adjustment, use, repair, or service of the Equipment,or (ii) any physical damage which includes, but is not limited to, missing, broken, or cracked components resulting from non-electrical causes; altered, scratched, or fractured electronic traces; missing or gauged solder pads; cuts or clipped wires; crushed, cracked, punctured, or bent circuit boards; or tampering with any electronic connections, provided that such damage is not caused by personnel of Daktronics or its authorized repair agents;

C. damage caused by the failure to provide a continuously suitable environment, including, but not limited to: (i) neglect or misuse; (ii) improper power including, without limitation, a failure or sudden surge of electrical power; (iii) improper air conditioning, humidity control, or other environmental conditions outside of the Equipment's technical specifications such as extreme temperatures, corrosives and metallic pollutants; or (iv) any other cause other than ordinary use;

DAKTRONICS

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. statements made about the product by any salesperson, dealer, distributor or agent, 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 End User and are not part of the contract of sale;

G. 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;

H. replenishment of spare parts. In the event the Equipement was purchased with a spare parts package, the parties acknowledge and agree that the spare parts package is designed to exhaust over the life of the Equipment, and as such, the replenishment of the spare parts package is not included in the scope of this Warranty;

I. security or functionality of the End User's network or systems, or anti-virus software updates;

J. performance of preventive maintenance;

K. third-party systems and other ancillary equipment, including without limitation front-end video control systems, audio systems, video processors and players, HVAC equipment, batteries and LCD screens;

L. incorporation of accessories, attachments, software or other devices not furnished by Daktronics; or

M. paint or refinishing the Equipment or furnishing material for this purpose.

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 claims asserting or based on (a) loss of use of the facility or equipment; lost business, revenues, or profits; loss of goodwill; failure or increased cost of operations; loss, damage or corruption of data; loss resulting from system or service failure, malfunction, incompatibility, or breaches in system security; or (b) 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, injury to property or any damages or sums paid 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 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. The End User'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 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. 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. The parties consent to the application of the laws of the State of South Dakota to govern, interpret, and enforce each of the parties' 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.

6. Availability of Extended Service Agreement

For End User's protection, in addition to that afforded by the warranties set forth herein, End User 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).

DAKTRONICS