Please fill in the information below to use for reference when calling Daktronics for assistance.

Display Serial No. _____________________________________________

Display Model No. _____________________________________________

Date Installed _______________________________________________
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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.

Important Safeguards:
- Please read and understand all instructions before beginning the installation process.
- Do not drop control equipment or allow it to get wet.
- Do not disassemble control equipment or electronic controls of the display; failure to follow this safeguard will make the warranty null and void.
- 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, Inc.

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

1.1 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 http://www.daktronics.com/manuals.

1.2 Scoreboard Label

The serial and model numbers of a Daktronics scoreboard can be found on the ID label on the display as shown in Figure 1.

Figure 1: Scoreboard ID Label

Please list the model number, display serial number, and the date this display became operational in the blanks provided on the second page of this manual. When calling Daktronics customer service, please have this information available to ensure the request is serviced as quickly as possible.
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-325405.

Reference Drawing:
System Riser Diagram.........................................................................................................................C-325405

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

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

<table>
<thead>
<tr>
<th>Accessory Labels</th>
<th>Label</th>
</tr>
</thead>
<tbody>
<tr>
<td>Termination block for power or signal cable</td>
<td>TBXX</td>
</tr>
<tr>
<td>Grounding point</td>
<td>EXX</td>
</tr>
<tr>
<td>Power or signal jack</td>
<td>JXX</td>
</tr>
<tr>
<td>Power or signal plug for the opposite jack</td>
<td>PXX</td>
</tr>
</tbody>
</table>

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.
## Section 2: Specifications

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

<table>
<thead>
<tr>
<th><strong>Dimensions (Height, Width, Depth)</strong></th>
<th>Display Only: 2'-10&quot; H x 4'-4&quot; W x 8&quot; D (864 mm, 1321 mm, 203 mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>With Cart: 5'-2&quot; H x 4'-4&quot; W x 8&quot; D (1575 mm, 1321 mm, 203 mm)</td>
</tr>
<tr>
<td><strong>Weight w/ Batteries &amp; Cart</strong></td>
<td>150 lb (68 kg)</td>
</tr>
<tr>
<td><strong>Digit Size</strong></td>
<td>10&quot; (254 mm)</td>
</tr>
<tr>
<td><strong>Digit Color</strong></td>
<td>Red</td>
</tr>
<tr>
<td><strong>Watts</strong></td>
<td>100 W</td>
</tr>
<tr>
<td><strong>Power</strong></td>
<td>120 VAC or 24 V battery</td>
</tr>
<tr>
<td><strong>Batteries</strong></td>
<td>2 @ 12 V (each)</td>
</tr>
<tr>
<td><strong>Amps per Line (Single Phase)</strong></td>
<td>1 A</td>
</tr>
<tr>
<td><strong>Driver Number &amp; Address</strong></td>
<td>A1 – 11</td>
</tr>
</tbody>
</table>

**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, as shown in Figure 4, comes standard with two wheels, but may use four if ordered. Open the cart kit and verify the following pieces are included:

- T-stands @ 2
- Axle tubes @ 4
- 10" wheels @ 2 (or 4)
- 1/2"-13 x 3 1/2" bolts @ 2 (or 4)
- 1/2" flat washers @ 2 (or 4)
- 5/16" diameter pins with clips @ 6

A 3/4" wrench will be needed to attach the wheels.

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

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 a washer as a spacer, and secure the wheel with an axle bolt. Repeat the process for the second wheel, and tighten the bolts with a 3/4" 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 Options, MS-2013 ................................................................. \( \text{A-159890} \)
- Cover Installation- MS-2013 ................................................................. \( \text{A-160060} \)
- Ad Panel Installation, MS-2013 ............................................................ \( \text{A-160057} \)

**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.

**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.

**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, 1321 mm) aluminum panel runs the full width of the scoreboard. Drawing A-160057 in Appendix A illustrates the ad panel installation.
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.

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 Panasonic® batteries (Model LC-X1228P), 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:**

- Radio Receiver Installation, MS-2013 ................................................................. A-160015
- System Riser Diagrams- MS-2013-11 ................................................................. A-160237
- Installation: Outdoor- Gen V Radio Receiver ..................................................... A-203543
- 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 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

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 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).

Note: The RC-100 base station is installed in a similar way to a radio receiver. Refer to Drawing A-244926 for additional details.

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).

- For Gen V radio receivers, refer to Drawing A-203543.
- For Gen VI radio receivers, refer to Drawing A-1109181.

Refer to the Gen V Radio Installation Manual (ED-13831) or the Gen VI Radio Installation Manual (DD2362277) for more information. Both manuals are available online at http://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](image)

**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) and All Sport Radio (Broadcast & Channel)](image)

**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 Guest® ChargePro 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 right 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.

<table>
<thead>
<tr>
<th>Charger Power Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outputs: two individual isolated outputs with a combined rating as follows:</td>
</tr>
<tr>
<td>• When charging:</td>
</tr>
<tr>
<td>• When maintaining</td>
</tr>
<tr>
<td>Maximum recommended battery size:</td>
</tr>
<tr>
<td>• For recharging:</td>
</tr>
<tr>
<td>• Maintenance only</td>
</tr>
<tr>
<td>Input:</td>
</tr>
<tr>
<td>• Rated AC voltage</td>
</tr>
<tr>
<td>• Current draw</td>
</tr>
</tbody>
</table>

The charger, shown in Figure 8, 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 scoreboard will typically be fully recharged after about 12 hours.

The ChargePro is a three-stage, "smart" charger, and its regulated output recharges the battery in the safest, fastest way possible. Once a battery has been recharged, the ChargePro supplies just enough electricity to compensate for the charge a battery loses during storage. Unlike most automotive "trickle" chargers, the unit will not boil off the electrolyte in a lead-acid battery when left unattended.

Figure 8: ChargePro Charger
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:

<table>
<thead>
<tr>
<th>Scoreboard</th>
<th>Operating Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High Charge</strong></td>
<td>When just the red LED is on, it indicates that the batteries are discharged and the charger is recharging them at the <strong>BULK</strong> rate of 6 A (stage 1).</td>
</tr>
<tr>
<td>![Red ON]</td>
<td>While the red LED is on, the voltage measured (with the charger on) should be 11.8–14 V.</td>
</tr>
<tr>
<td>![Green OFF]</td>
<td>If the red LED stays on for more than 48 hours, refer to the <strong>Charger Troubleshooting Table</strong>.</td>
</tr>
<tr>
<td><strong>Medium Charge</strong></td>
<td>When both the green and the red LEDs are on, the unit is charging at an <strong>ABSORPTION</strong> rate of 2-6 A (stage 2). This mode of charging gradually &quot;tops off&quot; the batteries and reduces harmful sulfating.</td>
</tr>
<tr>
<td>![Red ON]</td>
<td>While both LEDs are on, the voltage measured (with the charger on) should be approximately 14 V.</td>
</tr>
<tr>
<td>![Green ON]</td>
<td>If both LEDs stay on longer than 48 hours, refer to the <strong>Charger Troubleshooting Table</strong>.</td>
</tr>
<tr>
<td><strong>Float Charge</strong></td>
<td>When just the green LED is on, the unit is charging at a <strong>FLOAT</strong> rate of less than 2 A (stage 3). The batteries are now 90 percent charged and ready for use.</td>
</tr>
<tr>
<td>![Red OFF]</td>
<td>This &quot;float&quot; charging current will gradually decrease to as low as 0.1 A over the next day as the batteries reach 100 percent charge. They will now be kept at full charge without overcharging.</td>
</tr>
<tr>
<td>![Green ON]</td>
<td>If the green LED stays on and the battery is known to be low, refer to the <strong>Charger Troubleshooting Table</strong>.</td>
</tr>
</tbody>
</table>
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**

<table>
<thead>
<tr>
<th>Problem</th>
<th>Cause</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>The charger does not seem to be charging.</td>
<td>• One or more defective/damaged cells</td>
<td>• Test batteries and replace if necessary (see Section 6.5).</td>
</tr>
<tr>
<td></td>
<td>• One or more loose wire connections</td>
<td>• Check and tighten all connections.</td>
</tr>
<tr>
<td></td>
<td>• Charger has reduced its output voltage due to a DC overload or a DC short.</td>
<td>• Remove the source of the overload or short.</td>
</tr>
<tr>
<td></td>
<td>• The internal AGX 15 A DC output fuse has blown.</td>
<td>• Contact Daktronics Customer Service for replacement.</td>
</tr>
<tr>
<td>It seems to take a long time to recharge the batteries in hot weather.</td>
<td>• The charger has overheated due to poor air circulation and has reduced its output.</td>
<td>• Consider moving the scoreboard to a shaded location.</td>
</tr>
<tr>
<td>The red LED is always on. or The green LED never comes on.</td>
<td>• A dead short or an overload</td>
<td>Perform charger test: 1. Unplug the AC cord.</td>
</tr>
<tr>
<td></td>
<td>• One or more bad cells in battery</td>
<td>2. Remove the black charger output wire from the battery.</td>
</tr>
<tr>
<td></td>
<td>• Too many batteries, or battery is too large</td>
<td>3. When AC power is reapplied, only the green LED should turn on. If not, replace the charger.</td>
</tr>
<tr>
<td></td>
<td>• A heavy DC load on the battery while charging</td>
<td></td>
</tr>
<tr>
<td>The green LED says on, but the batteries do not charge.</td>
<td>• Check charger’s output fuses.</td>
<td>• If connections are good, contact Daktronics Customer Service for replacement.</td>
</tr>
<tr>
<td>Both the red and green LEDs stay on all the time.</td>
<td>• The battery is damaged or unable to reach full charge.</td>
<td>• Check electrolyte. Test/replace the battery (see Section 6.5).</td>
</tr>
<tr>
<td>Condition</td>
<td>Action</td>
<td></td>
</tr>
<tr>
<td>-----------------------------------------------</td>
<td>------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>A DC component is continuously drawing 3 A</td>
<td>Disconnect any accessories while charging. If conditions on board force</td>
<td>charging stage for several days, battery damage may occur.</td>
</tr>
<tr>
<td>or more, holding the charger in its absorption stage.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disconnect any accessories while charging.</td>
<td>Reset AC power.</td>
<td></td>
</tr>
<tr>
<td>Confirm that all AC power is available.</td>
<td>Contact Daktronics Customer Service for replacement.</td>
<td></td>
</tr>
<tr>
<td>Internal failure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Problem with the AC outlet</td>
<td>Check all connections at the AC outlet.</td>
<td></td>
</tr>
<tr>
<td>Defective or oversensitive charger</td>
<td>Try a different outlet, or replace the charger.</td>
<td></td>
</tr>
</tbody>
</table>

### 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.

<table>
<thead>
<tr>
<th>Problem</th>
<th>Possible Cause</th>
<th>Solution/Items to Check</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scoreboard doesn’t light and console doesn’t work</td>
<td>No power to the scoreboard</td>
<td>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.</td>
</tr>
<tr>
<td>Scoreboard digits don’t light, but console works</td>
<td>No wired signal from console</td>
<td>Check that the scoreboard is receiving 120 VAC or battery power. Check that the red DS2 LED on the driver lights up when sending commands from the control console (see Section 6.4).</td>
</tr>
<tr>
<td>Scoreboard digits don’t light, but console works</td>
<td>No radio signal from console</td>
<td>Cycle power to the scoreboard and watch for radio settings (see Section 4.4).</td>
</tr>
</tbody>
</table>

Scoreboard Troubleshooting 17
<table>
<thead>
<tr>
<th>Problem</th>
<th>Possible Cause</th>
<th>Solution/Items to Check</th>
</tr>
</thead>
<tbody>
<tr>
<td>Problem</td>
<td>Possible Cause</td>
<td>Solution/Items to Check</td>
</tr>
<tr>
<td>Check that the green POWER and amber RADIO IN RANGE indicators on the radio receiver in the scoreboard light up when the control console is powered on. Keep the console between 20 to 1500 feet from the scoreboard.</td>
<td>Move the console 20-30 feet 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.</td>
<td></td>
</tr>
</tbody>
</table>
| Scoreboard digits light, but not in the correct order | Incorrect sport code | Ensure the correct sport code is being used for the scoreboard model. Refer to the operation manual for the console being used:  
- All Sport 1600 (ED-12462)  
- RC-100 (ED-15133) |
<p>| Scoreboard digits light, but not in the correct order | Incorrect driver address | Check that the scoreboard driver is set to the correct address (see Section 6.4) |
| Scoreboard works, but some LEDs always stay on | Short in digit circuit | Swap the digit with one known to work correctly to verify the problem. Replace if necessary (see Section 6.3). |</p>
<table>
<thead>
<tr>
<th>Problem</th>
<th>Possible Cause</th>
<th>Solution/Items to Check</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scoreboard works, but some LEDs do not light or they blink</td>
<td>Bad connection</td>
<td>Verify the power/signal connector on the back of the digit circuit board is secure (see Section 6.3).</td>
</tr>
<tr>
<td></td>
<td>Bad digit or driver</td>
<td>Swap the digit/driver with one known to work correctly to verify the problem. Replace if necessary (see Section 6.3 for digits or Section 6.4 for drivers).</td>
</tr>
<tr>
<td>Scoreboard works, but some digits do not light</td>
<td>Bad digit or driver</td>
<td>(see solution above)</td>
</tr>
<tr>
<td></td>
<td>Incorrect sport code</td>
<td>(see solution on previous page)</td>
</tr>
<tr>
<td></td>
<td>Incorrect driver address</td>
<td>(see solution on previous page)</td>
</tr>
<tr>
<td></td>
<td>Wrong console controlling scoreboard</td>
<td>Another console's radio signal could be transmitting to the scoreboard. An example would be football and baseball scoreboards that are within 1500 feet of each other.</td>
</tr>
<tr>
<td></td>
<td>Radio interference</td>
<td>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.</td>
</tr>
</tbody>
</table>

### 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.

**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:

Address Table 1; GEN IV Driver Address Dip Switch .............................................. A-290261
Specifications; LED Driver IV, 16 Col................................................................. A-288137

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, three LEDs labeled DS1, DS2, and DS3 in Figure 10, provide the following diagnostic information:

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

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

Figure 10: Driver Status Indicators
Replacing a Driver

1. Open the back panel as described in Section 6.2.
2. Loosen the screws securing the metal cover to the driver enclosure, and then lift it up and off the keyholes.
3. Disconnect all connectors from the driver by squeezing together the locking tabs and pulling the connectors free.

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

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

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

8. Ensure the driver is set to the correct address (refer to Setting the Driver Address).
9. Close and secure the 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. Addresses are set through the S1 dip switch on the driver (Figure 11) using a pen or small, pointed object.

**Figure 11: Driver Address Dip Switch**

**Note:** The MS-2013 will always be set to address 11. Refer to Drawing A-290261 in Appendix A for addressing information.
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).

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.

<table>
<thead>
<tr>
<th>Description</th>
<th>Daktronics Part No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Horn assembly</td>
<td>0A-1072-0023</td>
</tr>
<tr>
<td>RC-100 Base Station, Scoreboard Receiver Kit</td>
<td>0A-1110-0035</td>
</tr>
<tr>
<td>RC-100 Wireless Handheld</td>
<td>0A-1110-0053</td>
</tr>
<tr>
<td>Cable, 4-pin, 100' extension</td>
<td>0A-1166-0022</td>
</tr>
<tr>
<td>Cable, 9-pin to 9-pin, 4'</td>
<td>0A-1171-4003</td>
</tr>
<tr>
<td>Cable, 9-pin to 9-pin, 6'</td>
<td>0A-1171-4004</td>
</tr>
<tr>
<td>Cable, 9-pin to 9-pin, 8'</td>
<td>0A-1171-4005</td>
</tr>
<tr>
<td>Cover (optional)</td>
<td>0A-1192-1092</td>
</tr>
<tr>
<td>Caption panel, team name (optional)</td>
<td>0A-1192-1105</td>
</tr>
<tr>
<td>Caption panels, segment timing (optional)</td>
<td>0A-1192-2723</td>
</tr>
<tr>
<td>Caption panels, volleyball (optional)</td>
<td>0A-1192-2724</td>
</tr>
<tr>
<td>Caption panels, baseball/softball (optional)</td>
<td>0A-1192-2725</td>
</tr>
<tr>
<td>Driver, 16-col outdoor LED</td>
<td>0P-1192-0011</td>
</tr>
<tr>
<td>Battery Monitor (Circuit Board)</td>
<td>0P-1192-0097</td>
</tr>
<tr>
<td>Digit, 10&quot; red, 7-seg</td>
<td>0P-1192-0251</td>
</tr>
<tr>
<td>Battery; 12V, 28 A/H sealed lead-acid (Panasonic Model LC-X1228P)</td>
<td>BT-1023</td>
</tr>
<tr>
<td>Battery Charger; dual 12 or 24V, 3 A (Guest ChargePro Model 2607)</td>
<td>BT-1022</td>
</tr>
<tr>
<td>Fuse, AGC-10, 10A, 250 V glass tube</td>
<td>F-1006</td>
</tr>
<tr>
<td>Fuse, MDL-7, 7.5 A, 250 V glass tube</td>
<td>F-1031</td>
</tr>
<tr>
<td>Washer, ½ flat</td>
<td>HC-1095</td>
</tr>
<tr>
<td>Wheel Bolt, ½ -13 x 3 ½&quot;</td>
<td>HC-1363</td>
</tr>
<tr>
<td>Wheel, 10x1.75, semi-pneumatic, 1/2&quot; axle</td>
<td>RA-1007</td>
</tr>
<tr>
<td>Transformer, sec. 24 V @4A, pri. 115/230V, 50/60 Hz</td>
<td>T-1043</td>
</tr>
<tr>
<td>Power cord, 360° rotating, 8'</td>
<td>W-1181</td>
</tr>
<tr>
<td>Fuse holder</td>
<td>X-1287</td>
</tr>
</tbody>
</table>
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.**

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

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

<table>
<thead>
<tr>
<th>Drawing Title</th>
<th>Drawing Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Segmentation, 7 Segment Bar Digit</td>
<td>A-38532</td>
</tr>
<tr>
<td>Schematic: MS-2013-11</td>
<td>B-158030</td>
</tr>
<tr>
<td>Mechanical Specifications, MS-2013</td>
<td>A-159886</td>
</tr>
<tr>
<td>Electrical Specifications, MS-2013</td>
<td>A-159887</td>
</tr>
<tr>
<td>Cart Assembly, MS-2013</td>
<td>A-159889</td>
</tr>
<tr>
<td>Caption Options, MS-2013</td>
<td>A-159890</td>
</tr>
<tr>
<td>Battery Service, MS-2013</td>
<td>A-159891</td>
</tr>
<tr>
<td>Radio Receiver Installation- MS-2013</td>
<td>A-160015</td>
</tr>
<tr>
<td>Ad Panel Installation, MS-2013</td>
<td>A-160057</td>
</tr>
<tr>
<td>Cover Installation- MS-2013</td>
<td>A-160060</td>
</tr>
<tr>
<td>System Riser Diagrams- MS-2013-11</td>
<td>A-160237</td>
</tr>
<tr>
<td>Installation: Outdoor- Gen V Radio Receiver</td>
<td>A-203543</td>
</tr>
<tr>
<td>Base Station: Outdoor Installation</td>
<td>A-236394</td>
</tr>
<tr>
<td>System Riser Diagram: RC-100- MS-2013</td>
<td>A-244926</td>
</tr>
<tr>
<td>Specifications; LED Driver IV, 16 Col</td>
<td>A-288137</td>
</tr>
<tr>
<td>Installation Drawing; Outdoor Scbd Gen VI Radio Receiver</td>
<td>A-1109181</td>
</tr>
</tbody>
</table>
7 SEGMENT BAR DIGIT
FRONT VIEW

CONNECTOR PIN NUMBERING
NOTE SPLINE NEAR NO. 1

COLOR CODE

<table>
<thead>
<tr>
<th>PIN NO.</th>
<th>WIRE COLOR</th>
<th>DRIVER SEGMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ORN</td>
<td>C</td>
</tr>
<tr>
<td>2</td>
<td>RED</td>
<td>B</td>
</tr>
<tr>
<td>3</td>
<td>BRN</td>
<td>A</td>
</tr>
<tr>
<td>4</td>
<td>BLU</td>
<td>F</td>
</tr>
<tr>
<td>5</td>
<td>PNK</td>
<td>E</td>
</tr>
<tr>
<td>6</td>
<td>TAN</td>
<td>D</td>
</tr>
<tr>
<td>7</td>
<td>BLK</td>
<td>COM.</td>
</tr>
<tr>
<td>8</td>
<td>GRY</td>
<td>H</td>
</tr>
<tr>
<td>9</td>
<td>VIO</td>
<td>G</td>
</tr>
</tbody>
</table>

NOTE: "H" SEGMENT, GRAY WIRE IS NOT USED ON 7 SEGMENT BAR DIGIT.
PULL PIN AND SLIDE TUBE TO ADJUST THE HEIGHT.
HANDLES AT BOTH SIDES FOR LIFTING

ALL ALUMINUM CABINET
STEEL TUBE CART/STAND
10" DIGITS

POWER AND SIGNAL CONNECTORS
REAR COMPARTMENT FOR STORING CONTROL CONSOLE
HOOKS FOR STORING LONG SIGNAL CABLE

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

THE DRIVER IS SET TO ADDRESS NO. 11.

ALL SPORT 1600 CONTROL CONSOLE STORED IN REAR COMPARTMENT.

CHARGE STATUS LIGHTS:
- RED ONLY — HIGH CHARGE
- RED & GREEN — MEDIUM CHARGE
- GREEN ONLY — FLOAT CHARGE

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.

06 16 MAY 07 UPDATED DETAILS TO SHOW NEW LED DRIVER, OP-1192-0363
05 03 APR 07 REPLACED DISSTAKE PART OP-1192-0048 WITH OP-1192-0097
04 26 FEB 07 MOVED COMPARTMENT ON REAR PANEL DOWN 4'
03 17 FEB 03 ADJUSTED LOCATION OF THE HORN FROM THE LEFT SIDE TO THE RIGHT SIDE OF THE SYSTEM
02 03 JAN 02 ADDED BATTERY ORIENTATION 90°

DIGIT, 10" RED-ORG (OP-1192-0045)

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

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

HORN

HOLE FOR MOUNTING OPTIONAL RADIO RECEIVER ANTENNA

FRONT VIEW
DRIVER ASSIGNMENTS

S1

J31

J41

ALL SPORT 1600 CONTROL CONSOLE STORED IN REAR COMPARTMENT.

CHARGE STATUS LIGHTS:
- RED ONLY — HIGH CHARGE
- RED & GREEN — MEDIUM CHARGE
- GREEN ONLY — FLOAT CHARGE

POWER REQUIREMENT: 120V AC, 100 WATTS.
MS-2013 CAN OPERATE ON 120V AC POWER OR INTERNAL 12 VOLT BATTERIES.
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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, TWO 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. TIGHTEN WITH A 3/4" WRENCH.

ADDITIONAL WHEELS MAY BE INSTALLED ON THE OTHER END. ORDER DAKTRONICS PART NO. 0A-1192-1102.

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.
CLOCK/SCORE MODE
OPTIONAL TEAM NAME
CAPTION SET OA-1192-1105

SEGMENT TIMNG MODE
CAPTION SET OA-1192-1098

GAMES WON GAMES WON
HOME 8 GUEST
GAME 88

VOLLEYBALL MODE
CAPTION SET OA-1192-1099

BALL STRIKE OUT
HOME 8 GUEST
INNING 88

BASEBALL/SOFTBALL MODE
CAPTION SET OA-1192-1100

HOOK & LOOP FASTENER STRIPS APPLIED TO THE BACKS OF THE CAPTION PANELS
THE LOOP STRIP STAYS ON THE PANEL
THE HOOK STRIP STAYS ON THE SCOREBOARD.

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.
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.

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.
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.

LOCATE THE HOLE INSIDE THE FRONT OF MS-2013, NEAR THE RECEIVER LOCATION, WHERE THE ANTENNA IS TO BE MOUNTED.

REMOVE THE BACKING FROM THE FASTENER STRIP ON THE RECEIVER, INSERT THE ANTENNA CONNECTOR THROUGH THE HOLE AND STICK THE RECEIVER TO THE INSIDE OF THE FRONT OF MS-2013, JUST ABOVE THE ANTENNA CONNECTOR.

LOCATE THE RECEIVER’S POWER/SIGNAL CABLE IN THE MS-2013. ROUTE THE CABLE AND MATE THE CONNECTOR.

FROM THE OUTSIDE, INSTALL THE LOCK WASHER AND THE NUT ON THE ANTENNA CONNECTOR AND TIGHTEN. MOUNT THE ANTENNA ON THE CONNECTOR, TURNING THE NUT ON THE ANTENNA UNTIL IT IS SNUG. ROTATE THE ANTENNA SO IT POINTS UP.

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COPYRIGHT 2012 DAKTRONICS, INC.
ATTACH THE AD PANEL TO THE MS-2013, USING THREE SCREWS INTO THE THREADED INSERTS LOCATED IN THE TOP OF THE SCOREBOARD.

AD PANEL, 52"W X 12"H

APPLY VINYL COPY TO THIS SIDE (THE RETURN FLANGE WILL BE DOWN AND TO THE BACK).

SCREW, #10-24X5/8" (HC-1470)
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.


OPTIONAL FRONT COVER
0A-1192-1092
ALL SPORT 1600, CABLE CONNECTION

POWER AND SIGNAL CONNECTORS ARE LOCATED BEHIND COVER ON REAR OF MS-2013

100 FT [30 M] CONTROL CABLE
0A-1166-0022

120V AC FOR CHARGING THE BATTERIES

NOTE:
THE SCOREBOARD CAN OPERATE FROM 120V AC OR FROM INTERNAL BATTERIES.

MS-2013-11 REAR VIEW

ALL SPORT 1610R5 RADIO CONTROL

RADIO RECEIVER INSIDE MS-2013

0A-1196-0039, BATTERY KIT
BATTERY PACK BT-1021

OPTIONAL RADIO CONTROL METHOD
SIGNAL IS TRANSMITTED FROM CONTROL CONSOLE TO MS-2013 VIA RADIO. CONSOLE RECEIVES POWER FROM OPTIONAL 12V BATTERY PACK.

ALL SPORT 1610 CONTROL CONSOLE

RC-100 RADIO CONTROL

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

RADIO RECEIVER BASE STATION INSIDE MS-2013

RC-100 HANDHELD BATTERY OPERATED

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DAKTRONICS, INC.
SPOKANE, SD 52006

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PROJ.

TITLE: SYSTEM RISER DIAGRAMS—MS-2013-11

DESIGN: AVB
DRAWN: A. VANBEMMELE
DATE: 17 DEC 01

SCALE: 1:1 = 32

SHEET REVISION JOB NO.
03 P1192 R-04-A

160237
MULTIPLE CONSOLES WITH MULTIPLE SCOREBOARDS OR SINGLE CONSOLE WITH SINGLE SCOREBOARD

SETTING CHANNELS

STEP 1
OPEN RADIO RECEIVER BY REMOVING 4 SCREWS IN COVER.

STEP 2
USE A SMALL FLAT HEAD SCREWDRIVER TO CHANGE THE SWITCH TO THE DESIRED CHANNEL NUMBER. SEE DETAIL "C" FOR LOCATION OF CHANNEL SWITCH. REFER TO DRAWING A-203113 FOR CHANNEL SETTING CRITERIA.

STEP 3
IF NECESSARY, RADIO BROADCAST GROUPS (1-4) CAN BE CHANGED USING THE JUMPER ON either J4 OR J5. SEE DETAIL "C" FOR LOCATION OF BCAST JUMPER (J4 OR J5). REFER TO DRAWING A-203113 FOR BCAST SELECTION CRITERIA.

SETTING CHANNELS

STEP 4
NOTE THE CHANNEL NUMBER AND BCAST SETTING FOR THE RADIO RECEIVER AND PUT COVER BACK ON. REFER TO THE SECTION AT RIGHT FOR RADIO RECEIVER INSTALLATION.

DETAIL: C
CHANNEL SWITCH AND BCAST JUMPER LOCATIONS
FRONT VIEW OF RADIO RECEIVER; COVER REMOVED

NOTE: THE DOTTED CIRCLE REPRESENTS THE JUMPER PLACEMENT FOR EACH OF THE 4 BROADCAST GROUPS. ONLY 1 JUMPER (SUPPLIED) CAN BE PLACED ON J4 OR J5 AT ANY TIME.

S1: CHANNEL SWITCH, FACTORY SET TO "1"

BCAST #1
J5
BCAST #2
BCAST #3
BCAST #4

DETAIL: A
MOUNTING THE RADIO RECEIVER ENCLOSURE
SCOREBOARD LEFT SIDE CUT AWAY VIEW

NOTE: BE SURE TO CHOOSE A LOCATION ON THE OUTSIDE OF THE POWER/SIGNAL ENTRANCE DOOR SUCH THAT WHEN THE RADIO IS MOUNTED INTERNALLY IT WILL NOT INTERFERE WITH ANYTHING.

SCOREBOARD POWER/SIGNAL ENTRANCE PANEL

INTERNAL MOUNTED DRIVER ENCLOSURE

RF ATTACHED VELOCORD TONGUE & ATTACHED NUTS OF VELOCORD AT-100

TOOTH LOCK WASHER NUT

EXTERNAL ANTENNA ON OUTSIDE FACE OF SCOREBOARD A-1005

9/32" HOLE DRILLED INTO SCOREBOARD POWER/SIGNAL POWER/SIGNAL ANTENNA CABLE MUST EXIT FROM LOWER RECEIVER BOX

RADIO RECEIVER POWER/SIGNAL CABLE

CONNECT THE RADIO RECEIVER TO THE 5 PIN JACK J45 FROM THE DRIVER ENCLOSURE AS SHOWN IN DETAIL "B". DO NOT ATTEMPT TO PLUG THE RADIO INTO ANYWHERE ELSE AS THIS MAY DESTROY THE RADIO.

REPLACE COVER OVER DRIVER ENCLOSURE AND CLOSE POWER/SIGNAL ACCESS DOOR. THE RADIO RECEIVER IS NOW READY FOR OPERATION.

DETAIL: B
CONNECTING THE RADIO RECEIVER WIRE HARNESS
FRONT VIEW OF DRIVER ENCLOSURE; Lid REMOVED

NOTE: KS-20313 SCOREBOARD HAS A SPECIALIZED INTERFACE CARD

PLUG THE CABLE FROM RADIO RECEIVER INTO THE 5 PIN JACK J45. THIS IS THE ONLY CONNECTION THAT NEEDS TO BE MADE FOR THE RADIO RECEIVER.
NOTE: THIS DETAIL SHOWS A MS-2013 ACTUAL RC-100
SCOREBOARD RECEIVER BASE STATION MAY BE IN A DIFFERENT
LOCATION DEPENDING ON DISPLAY TYPE.

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.

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<td>2</td>
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<tr>
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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, A-115079 FOR J19 ADDRESS SETTINGS.

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DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ.: SPECIFICATIONS; LED DRIVER IV, 16 COL
DES.: DULSCHM
REV.: 02
SCALE: 1 = 2
DATE: 09 OCT 06
APPR.: 1192-R04A-288137
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 BCASS DIALS AS NEEDED. USE SMALL FLAT HEAD SCREW DRIVER.

MOUNTING RADIO RECEIVER IN MOST OUTDOOR SCOREBOARDS.

NEAR THE MAIN 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.

THE SUPPLIED VELCRO STRIPS CAN BE USED TO HELP HOLD THE RADIO

RADIO RECEIVER

FACE SHEET

FACE SHEET

"D" HOLE PUNCH IN SCOREBOARD PANEL.

EXTERNAL ANTENNA ON OUTSIDE FACE OF SCOREBOARD A-1654 OR A-3173

NUT

TOOTH LOCK WASHER

RADIO RECEIVER POWER/SIGNAL CABLE

8FT LONG

ROUTE TO DRIVER ENCLOSURE

MASTER DRIVER ENCLOSURE, LOCATION VARIES PER SCOREBOARD MODEL.

NOTE: MS-2013 SCOREBOARD HAS A SPECIALIZED INTERFACE CARD

- PLUG THE CABLE INTO THE 5 PIN JACK LABELED J45.

- THE J45 HARNESS SHOULD ALREADY BE CONNECTED TO J21 (RADIO) ON THE DRIVER.

CONNECTOR LABELED "J45"
Appendix B: Daktronics Warranty and Limitation of Liability
DAKTRONICS

WARRANTY AND LIMITATION OF LIABILITY

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

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

1. Warranty Coverage

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

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

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

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

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

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

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

THIS LIMITED WARRANTY IS NOT TRANSFERABLE.

2. Exclusion from Warranty Coverage

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

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

B. Any damage caused by the unauthorized adjustment, repair or service of the Equipment by anyone other than personnel of Daktronics or its authorized repair agents;
C. Damage caused by the failure to provide a continuously suitable environment, including, but not limited to: (i) neglect or misuse, (ii) a failure or sudden surge of electrical power, (iii) improper air conditioning or humidity control, or (iv) any other cause other than ordinary use;

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

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

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

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

H. Any performance of preventive maintenance.

3. Limitation of Liability

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

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

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

4. Assignment of Rights

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

5. Dispute Resolution

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

6. Governing Law

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

7. Availability of Extended Service Agreement

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