

LED TIMER W/ BATTERIES
DISPLAY MANUAL

P1192, P1753

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1 Introduction

This manual outlines specifications, operation, and troubleshooting for Daktronics timing displays with batteries for portability. For additional information regarding the safety, installation, operation, or service of these displays, refer to **Section 7: Daktronics Exchange and Repair & Return Programs (p.19)**. This manual is not specific to a particular installation. Project-specific information takes precedence over any other general information found in this manual.

Important Safeguards

- **Read and understand all instructions before first use.**
- **Toggle the power switch to "OFF" when not using the display.**
- **Disconnect the batteries and turn the power switch "OFF" when servicing the display.**
- **Do not modify the structure or attach any panels or coverings to the display 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 the control equipment or allow it to get wet.**

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.

Resources

Figure 2 illustrates a Daktronics drawing label. This manual refers to drawings by listing the last set of digits. In the example, the drawing would be referred to as **DWG-1007804**. All references to drawing numbers, appendices, figures, or other manuals are presented in bold typeface. Any drawings referenced in a particular section are listed at the beginning of it as shown below:

		DAKTRONICS, INC. BROOKINGS, SD 57006		THE CONCEPTS EXPRESSED AND DETAILS SHOWN ON THIS DRAWING ARE CONFIDENTIAL AND PROPRIETARY. DO NOT REPRODUCE BY ANY MEANS WITHOUT THE EXPRESSED WRITTEN CONSENT OF DAKTRONICS, INC. COPYRIGHT 2010 DAKTRONICS, INC.	
DO NOT SCALE DRAWING					
PROJ: DAKTRONICS					
TITLE: SYSTEM RISER DIAGRAM					
DESIGN:		DRAWN: APAGE		DATE: 11 MAY 10	
SCALE: NONE					
SHEET	REV	JOB NO.	FUNC-TYPE-SIZE	1007804	
200	02	C17581	F-01-D		

Drawing Number

Figure 2: Drawing Label

Reference Drawing:

System Riser Diagram **DWG-1007804**

Daktronics identifies manuals by the DD or ED number located on the cover page.

Daktronics Nomenclature

Most display components have a white label that lists the part number (**Figure 3**). Part numbers will also appear on certain drawings. If a component is not found in the **Replacement Parts (p.17)**, use the label to order a replacement. Refer to **Section 7: Daktronics Exchange and Repair & Return Programs (p.19)** if replacing or repairing any display component.

0P-1127-0024
SN: 2465
02/19/12 Rev. 1

Figure 3: Part Label

Main Component Labels		Accessory Labels	
Part Type	Part Number	Component	Label
Individual circuit board	0P-XXXX-XXXX	Termination block for power or signal cable	TBXX
Assembly; a collection of circuit boards	0A-XXXX-XXXX	Grounding point	EXX
Wire or cable	W-XXXX	Power or signal jack	JXX
Fuse	F-XXXX	Power or signal plug for the opposite jack	PXX
Transformer	T-XXXX		
Metal part	0M-XXXXXXX		
Fabricated metal assembly	0S-XXXXXX		
Specially ordered part	PR-XXXXX-X		

Display Controllers

The display is controlled via an All Sport® 1600 or 5000 series control console. Either console may be equipped with an optional radio transmitter. The 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)**
- **All Sport 5000 Series Control Console Operation Manual (ED-11976)**

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

Product Safety Approval

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

2 Specifications

The table below lists all of the mechanical specifications, circuit specifications, and power requirements for the displays in this manual.

	TI-2203 (TI-2003 w/ Batteries)	TI-2215 (TI-2015 w/ Batteries)
Dimensions: Height, Width, Depth	Display Only: 3'-0" H x 4'-0" W x 8" D (914 mm, 1.22 m, 203 mm) With Side Stands: 3'-0" H x 4'-2" W x 20" D (914 mm, 1.27 m, 508 mm) With Optional Cart (minimized): 4'-2" H x 5'-0" W x 2'-6" D (1.27 m, 1.52 m, 762 mm) With Optional Cart (maximized): 6'-4" H x 5'-0" W x 3'-7" D (1.93 m, 1.32 m, 1.09 m)	Display Only: 2'-4" H x 3'-4" W x 8" D (711 mm, 1.02 m, 203 mm) With Side Stands: 2'-4" H x 3'-6" W x 16" D (711 mm, 1.07 m, 406 mm) With Optional Cart (minimized): 3'-6" H x 4'-4" W x 2'-6" D (1.07 m, 1.32 m, 762 mm) With Optional Cart (maximized): 5'-8" H x 4'-4" W x 3'-7" D (1.73 m, 1.32 m, 1.09 m)
Weight	Display Only: 85 lb (39 kg) With Optional Cart: 95 lb (43 kg)	Display Only: 56 lb (25 kg) With Optional Cart: 66 lb (30 kg)
Digit Size/Color	30" (762 mm) / Red or Amber	24" (610 mm) / Red or Amber
Maximum Wattage	300 W	300 W
Power	120 VAC or 24 V Battery	120 VAC or 24 V Battery
Batteries	Lead Acid 2 @ 12 V (each) 28 Amp/Hours	Lead Acid 2 @ 12 V (each) 28 Amp/Hours
Amps per Line - Single Phase	2.5 A	2.5 A
Driver Number (Address)	A1 (11)	A1 (11)

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

3 Mechanical Installation

The display itself may feature a carrying handle and may not require assembly or permanent installation. Some assembly may be required, however, for attachment of a wheeled cart.

Cart Assembly

The display cart (**Figure 4**) comes standard with four wheels. Included in the cart kit is an installation quick guide (**DD3695776**). Refer to this guide when attaching the cart to the display.

Note: In order to install the cart, the triangular stands on the sides of the display must first be removed using a Philips screwdriver. For the TI-2203, the carrying handles must also be removed.

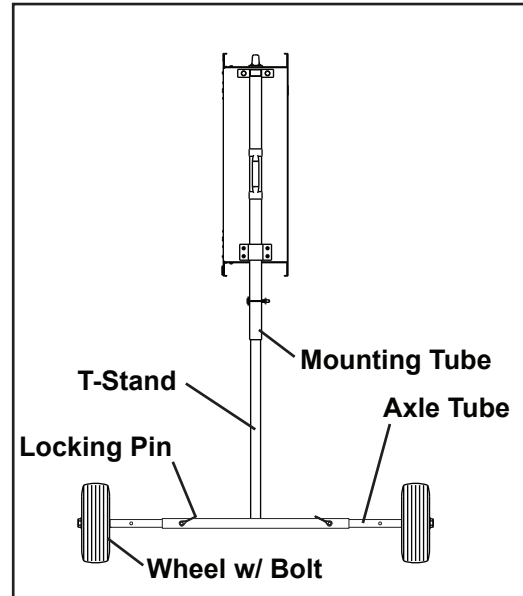


Figure 4: Cart Assembly

Adjusting the Cart

Reference Drawing:

Assy; Small Display w/ Stands **DWG-3220250**

Caution! Do not raise the display in high winds or transport the display in the raised position. These actions increase the likelihood of tipping over and causing injury or damage to the display.

DWG-3220250 in **Appendix A** shows the two axle positions that may be used with the cart. The extended axle position provides maximum stability and should be used whenever the display is raised. Use the narrow axle position (and lowest height) to move the display through doorways and for storage. The drawing also illustrates front profiles of the display in transport position and at maximum viewing height.

There are three height-adjustment holes in the mounting tubes on the sides of the display. Raise the display for viewing by removing the pins and retaining clips, sliding the display upward on the T-stands and reinserting the pins in the appropriate holes. Lower the display for storage or transportation. It may be helpful to have one person lift the display while another person adjusts the locking pins.

4 Electrical Installation

Power

Power for the display 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: Battery Care and Charging (p.7)** 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 three-prong power receptacle, located on the side of the display. 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 display runs on battery power.

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

A control switch on the side of the display activates power to the internal components.

- Flip the switch **ON** (up) for display operation.
- At all other times, keep the switch in the **OFF** (down) position.

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

Keep the display 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.

Wired Signal Connection

Connect a signal cable with 1/4" phone plugs from the signal jack on the side of the display to the **J1**, **J2**, or **J3** jack on the back of the All Sport 5000 console (or **J1/J2** on the All Sport 1600). Daktronics offers several pre-terminated signal cable lengths. Refer to **Replacement Parts (p.17)**.

Wireless Radio Receiver Installation

Note: A control console equipped with an optional radio transmitter is required for wireless communication.

The All Sport radio receiver is 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 radio receiver is not already installed:

1. Access the inside of the display by unlocking the latches securing the front access panel or by removing a digit panel.
2. Position the unit inside the display so the antenna connector can extend through the hole in the left side of the display.
3. Remove the backing from the fastener strips on the unit, and then firmly press the unit against the interior, sticking the fastener's adhesive to the sheet metal.

4. Route and connect the cable protruding from the bottom of the radio unit to the 6-pin jack labeled **J21** on the LED driver.
5. Close and secure the access panel.
6. Note that the antenna connector now protrudes through the side of the display.
 - 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).

Radio Settings

Reference Drawing:

Installation Drawing; Outdoor Scbd Gen VI Radio Receiver **DWG-1109181**

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



Radio Settings in Console

The values set on the receiver must match the settings in the controller. Refer to the controller screen at right and the manual listed in **Display Controllers (p.2)**.

If the radio receiver channel and broadcast settings do match those set in the console but the console does not control the display, there may be radio interference. In this case, change the settings of the wireless radio receiver inside the display and in the console as described in the radio control manuals.

For more information, refer to the **Gen VI Radio Installation Manual (DD2362277)**, provided with the receiver unit and available online at www.daktronics.com/manuals.

5 Battery Care and Charging

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

On-Board Charger

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 display during the off-season; storing the display with a discharged battery can contribute to early battery failure. Keep the display plugged in to a 120 VAC receptacle during storage.

The Maringo ChargePro model 28210 on-board battery charger is designed both to recharge the batteries of the displays and to extend battery life in applications where display and batteries are stored for long periods of time. The charger is located in the cabinet interior, attached to the left side of the display back sheet (as viewed with the front panel open). The charger is connected to the transformer, next to the driver enclosure, and to the batteries.

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: 8–10.5 A at 14.3 VDC
- When absorption charging: 3–10 A at 14.3 VDC
- When float charging: 0–3 A at 13.3 VDC

Maximum recommended battery size:

- For recharging: Up to 120 A/H

Input:

- Rated AC voltage: 100–240 VAC, 50–60 Hz
- Current draw: 2.5 A at full output

The ChargePro 28210 charger (**Figure 5**), is a 2 bank, 10 A, 12/24 VDC output charger with a wide input range of 100–240 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.

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.



Figure 5: ChargePro Charger

The charge cycle is as follows:







1. **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.
2. **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.
3. **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 go to the next stage.
4. **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.
5. **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 display's power cord into a standard 120 VAC, 60 Hz outlet. Red and green LED indicators on the charger, visible through holes on the rear of the display cabinet, indicate the recharging status. A label at this location also describes charging levels.

Note: When the batteries are connected, they will continuously supply power, even if the digits are blank. Make sure that the display is powered **ON** only during an event or when testing. At all other times, the display should be powered **OFF**.

The table below describes how the charger indicators operate:

LED Indicators	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 (p.9) .
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 (p.9) .
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 (p.9) .
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 display 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 Replacing Batteries (p.16) .
	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 Replacing Batteries (p.16) .
	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.

Problem	Cause	Solution
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 Replacing Batteries (p.16) .
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 display'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.

Battery and 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 display 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.

Battery Care and Charging

- Be extra cautious while servicing the display 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.

6 Troubleshooting

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

Troubleshooting Table

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

Problem	Possible Cause	Solution/Items to Check
Display doesn't light, and console doesn't work	No power to the display	Flip power switch ON (up).
		Check that the display has 120 VAC power.
		There may be a problem with the batteries/charger. Refer to the Charger Troubleshooting Table (p.9) .
	No power to console	Ensure the console is plugged into 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 if necessary.
Display digits do not light, but console works	No wired signal from control console	Check that the display is receiving 120 VAC or battery power.
		Verify the red DS5 (or DS2) LED on the driver lights up when sending commands from the control console. See LED Driver (p.15) .
	No radio signal from control console	Check the receiver (display) and transmitter (console) radio settings.
		Check that the green POWER and amber RADIO IN RANGE indicators on the radio receiver in the display light up when the control console is powered on. Keep the console 20–1500' (6–457 m) away.
		Move the console 20–30' (6–9 m) from the display and test again. Verify that both the console and display antennas are securely tightened and in a vertical position.
		Replace the radio receiver.
	No signal to driver	Check that the display is receiving 120 VAC or battery power.
		Verify the red DS5 (or DS2) LED on the driver lights up when sending commands from the control console. See LED Driver (p.15) .
		Exchange driver with a working one of the same part # to verify the problem. Replace if necessary. See LED Driver (p.15) .
	No power to driver	Verify the red DS8 (or green DS1) LED on the driver is always lit up when the display is powered on. See LED Driver (p.15) .

Problem	Possible Cause	Solution/Items to Check
Display does not run on 120 VAC power	Blown fuse	Check fuse in fuse holder labeled F5. If blown, replace with Daktronics part # F-1077.
Display digits light, but not in the correct order	Incorrect sport code	Ensure the correct sport code is being used for the display model. Refer to the appropriate console operation manual.
	Incorrect driver address	Check that the display driver is set to the correct address. See Setting the Driver Address (p.16) .
Digits light, console works, but nothing displays	No wired signal from control console	(see solution on previous page)
	No radio signal from control console	(see solution on previous page)
	Bad/damaged field wiring	Verify the red DS5 (or DS2) LED on the driver lights up when sending commands from the control console. See LED Driver (p.15) .
Display 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 Replacing Digit Segments (p.14) .
Display 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 Replacing Digit Segments (p.14) .
	Bad digit or driver	Exchange the digit or driver with a working one of the same part # to verify the problem. Replace if necessary. See Replacing Digit Segments (p.14) for digits or LED Driver (p.15) for drivers.
Display works, but some digits do not light	Bad digit or driver	(see solution above)
	Incorrect sport code	(see solution above)
	Incorrect driver address	(see solution above)
	Wrong console controlling display	Another console's radio signal may be transmitting to the scoreboard. For example, a football and baseball scoreboard 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.

Component Locations and Access

Reference Drawing:

Component Location; TI-2203.....	DWG-3438261
Component Location; TI-2215.....	DWG-3438262

To gain access to the internal components of the TI-2003/TI-2203, remove the screws securing a digit panel to the display face, and then carefully lift the panel away from the scoreboard, sliding it out and down. **DWG-3438261** in **Appendix A** illustrates both digit panels removed, exposing the internal components.

On the TI-2015/TI-2215, the front panel is hinged on the left side. To gain access to the internal components, simply unlock the two latches securing the front panel to the display cabinet, and swing it open. **DWG-3438262** in **Appendix A** illustrates the front panel open, exposing the internal components.

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

Replacing Digit Segments

Digits that are 24" or larger are composed of seven circuit board segments. The digit segment circuit boards are mounted to the back of the digit panel (**Figure 6**). Do not attempt to remove individual LEDs; it may be possible to make repairs by removing just the defective segment.

To replace a digit segment:

1. Open the front panel as described in **Component Locations and Access (p.14)**.
2. Disconnect the 2-pin plug from the back of the digit segment by squeezing the locking tabs together while pulling the connector free.
3. Use a 9/32" nut driver to remove the nuts securing the digit segment to the inside of the panel, and then lift the digit segment off the standoff studs.
4. Position a new digit segment over the studs, and tighten the nuts.
5. Reconnect the 2-pin plug. This is a keyed connector and it will attach in one way only. Do not force the connection.
6. Close and secure the front panel, then power up and test the display to verify the issue has been resolved.

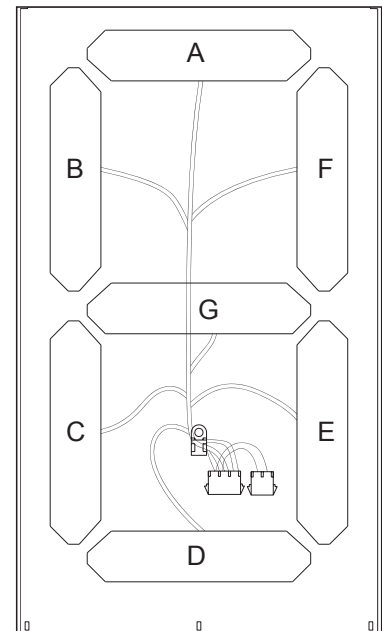


Figure 6: Digit Segments & Panel

Segmentation and Digit Designation

Reference Drawings:

Segmentation, 7 Segment Bar Digit	DWG-38532
Component Location; TI-2203.....	DWG-3438261
Component Location; TI-2215.....	DWG-3438262

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

DWG-3438261 and **DWG-3438262** in **Appendix A** indicate the driver connectors controlling the digits. The numbers shown in the upper half of a digit indicate which driver connector is wired to it.

LED Driver

Reference Drawings:

Specifications; LED Driver IV, 16 Col	DWG-288137
Specifications; Gyrus LED Driver, 16 Col.....	DWG-3071833
Schematic; Battery Operated TI-XXXX w/Horn (<i>prior to June 2016</i>)	DWG-3074676
Schematic; Battery Operated TI-XXXX with Horn.....	DWG-3333212
Component Location; TI-2203.....	DWG-3438261
Component Location; TI-2215.....	DWG-3438262

The LED driver performs the task of switching digits on and off within the display. LED drivers are located inside of a driver enclosure. Refer to **DWG-3438261** and **DWG-3438262** to view the location of the driver enclosure. Refer to **DWG-3333212** for detailed wiring schematics.

Note: For displays built before June 2016, refer to **DWG-3074676** for wiring schematics.

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 display powered on to check the LED indicators, always turn off display 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 driver has power.

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

16-Column Drivers (prior to April 2015)

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 driver has power.

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

Replacing a Driver

If the driver status indicators are not working correctly, the driver may need replacement.

1. Open the front panel as described in **Component Locations and Access (p.14)**.
2. Remove the metal cover of the driver enclosure by lifting it up, then back and down to expose the driver components.
3. Disconnect all plugs from the driver by squeezing the locking tabs together and pulling the connectors free. It may be helpful to label the cables or take a picture to know which plug goes to which jack when connecting the replacement 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 plugs to their mating jacks on the driver. The connectors are keyed and will attach in one way only. Do not force the connections.
8. Ensure the new driver is set to the correct address. This will be the same address of the old driver being replaced. Refer to **Setting the Driver Address (p.16)**.
9. Put the metal cover back on the enclosure, securely close the front panel, and then power up and test the display to verify the issue has been resolved.

Setting the Driver Address

Reference Drawings:

Address Table; Rotary Switches H and L **DWG-1198765**

Since the same LED drivers can be used for many display models, each driver must be set to receive the correct signal input, or address, for the model being used.

- For 16-column "Gyrus" drivers, addresses are set through the S2 (L) and S3 (H) rotary switches on the driver (Figure 7) using a small flathead screwdriver. The displays in this manual will always be set to **Address 2**, where H = 0 and L = 2.
- For older 16-column drivers built prior to April 2015, addresses are set through the S1 dip switch on the driver using a pen or small, pointed object. The displays in this manual will always be set to **Address 2**, where switch 2 is set to ON (up).

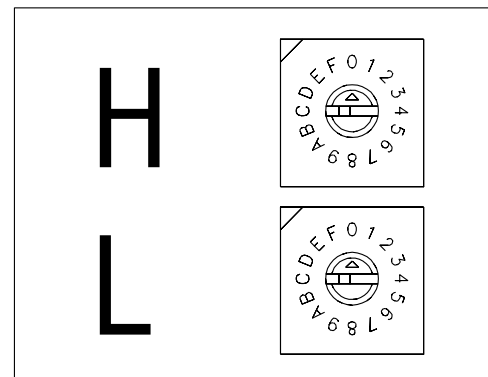


Figure 7: Driver Address Dials

Replacing Batteries

As the batteries age, they may lose capacity to sufficiently operate the display, even on a full charge. When replacement becomes necessary, use the same brand of battery as the original equipment. Similar batteries may be used as long as they meet the specifications for the display. 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 **Replacement Parts (p.17)** for part numbers of batteries and fuses.

Mounting brackets hold the batteries in place at the bottom of the display. The bracket is designed to hold batteries measuring 7" high, 6.5" wide, and 5" deep (178 mm, 165 mm, 127 mm). The bracket is not designed to support a battery of different dimensions.

To replace the batteries:

1. Open the front panel as described in **Component Locations and Access (p.14)**.
2. Use a 3/8" socket or nut driver to unfasten the four nuts securing each battery bracket to the display studs and remove the brackets.
3. Remove the screws securing the wires to the battery terminals. Disconnect the negative (-) terminal first followed by the positive (+) terminal.
4. Remove the battery from the display.
5. Reverse the procedure to install new batteries. Connect the positive (+) terminal first followed by the negative (-) terminal.

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 display 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.

Horn (TI-2015/TI-2215)

A 12 V buzzer horn is mounted in the center of the front face panel of the TI-2015/TI-2215. To replace a horn:

1. Open the front panel as described in **Component Locations and Access (p.14)**.
2. Disconnect the 2-pin cable running from the horn to the horn interface card jack **J3**.
3. Remove the hardware securing the horn to the horn mounting bracket.
4. Reattach the new horn to the front face panel.
5. Connect the new 2-pin cable to the horn interface card jack **J3**.
6. Close and secure the front panel, then power up the display and test the horn to verify the issue has been resolved.

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

Replacement Parts

The following table contains display components that may require replacement. Many of the other components will have attached part number labels.

Description	Daktronics Part #
Digit segment, 24" outdoor LED, red (vertical)	0A-1192-6150
Digit segment, 24" outdoor LED, red (horizontal)	0A-1192-6151
Digit segment, 24" outdoor LED, amber (vertical)	0A-1192-6250
Digit segment, 24" outdoor LED, amber (horizontal)	0A-1192-6251
Digit segment, 30" outdoor LED, red (vertical)	0A-1192-6160
Digit segment, 30" outdoor LED, red (horizontal)	0A-1192-6161
Digit segment, 30" outdoor LED, amber (vertical)	0A-1192-6260

Description	Daktronics Part #
Digit segment, 30" outdoor LED, amber (horizontal)	0A-1192-6261
16 Column Digit Driver	0A-1782-0100
Horn Interface Card	0P-1192-0398
Battery Monitor (Circuit Board)	0P-1192-0097
Battery; 12V, 28 A/H sealed lead-acid (Power Sonic Model PS12280)	BT-1023
Battery Charger; dual 12 or 24 V, 3 A (ChargePro Model 28210)	BT-1053
Horn, 12 VDC	DS-1520
Fuse, AGC-10, 10 A, 250 V glass tube	F-1006
Fuse, MDL-7, 7.5 A, 250 V glass tube	F-1031
Fuse, MDL-1, 1 A, 250 V glass tube	F-1077
Washer, 1/2" flat (<i>prior to June 2016</i>)	HC-1095
Wheel Bolt, 1/2 -13 x 3 1/2" (<i>prior to June 2016</i>)	HC-1363
Washer 5/8" flat	HC-1846
Wheel Bolt, 5/8 -11 x 4"	HC-3223756
Locking Pin	HS-1207
Wheel, 10x1.75, semi-pneumatic, 1/2" axle (<i>prior to June 2016</i>)	RA-1007
Wheel, 10" x 3.5", 5/8" axle	RA-3223755
Transformer; 115/230 V, 6.25 A	T-1066
Power cord, 360° rotating, 8'	W-1181
Cable, 20' phone plug	W-1236
Cable, 50' phone plug	W-1237
Cable, 30' phone plug	W-1238
Cable, 10' phone plug	W-1340
Fuse holder	X-1287

Refer to **Section 7: Daktronics Exchange and Repair & Return Programs (p.19)** for information on exchanging or returning parts.

7 Daktronics Exchange and Repair & Return Programs

Exchange Program

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

Before contacting Daktronics, identify these important numbers:

Display Serial Number: _____

Display Model Number: _____

Job/Contract Number: _____

Date Manufactured/Installed: _____

Daktronics Customer ID Number: _____

To participate in the Exchange Program, follow these steps:

1. Call Daktronics Customer Service.

United States & Canada: 1-800-DAK-TRON (325-8766)

Outside the U.S. & Canada: +1-605-275-1040

2. When the new exchange part is received, mail the old part to Daktronics.

If the replacement part fixes the problem, send in the problem part being replaced.

- a. Package the old part in the same shipping materials in which the replacement part arrived.
- b. Fill out and attach the enclosed UPS shipping document.
- c. Ship the part to Daktronics.

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

If any part is not returned within five (5) weeks, a non-refundable invoice will be presented to the customer for the costs of replenishing the exchange parts inventory with a new part. Daktronics reserves the right to refuse parts that have been damaged due to acts of nature or causes other than normal wear and tear.

Repair & Return Program

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

1. Call Daktronics Customer Service.

United States & Canada: 1-800-DAK-TRON (325-8766)

Outside the U.S. & Canada: +1-605-275-1040

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

5. Ship to:

Daktronics Customer Service

[Case #]

201 Daktronics Drive, Dock E

Brookings, SD 57006

Daktronics Warranty & Limitation of Liability

The Daktronics Warranty & Limitation of Liability is located at the end of this manual. The Warranty is independent of Extended Service agreements and is the authority in matters of service, repair, and display operation.

A Reference Drawings

Refer to **Resources (p.1)** for information regarding how to read the drawing number.
Any contract-specific drawings take precedence over the general drawings.

Reference Drawings:

Segmentation, 7 Segment Bar Digit	DWG-38532
Specifications; LED Driver IV, 16 Col	DWG-288137
Installation Drawing; Outdoor Scbd Gen VI Radio Receiver	DWG-1109181
Assy; TI-2015 w/ Stands (<i>prior to June 2016</i>)	DWG-1200521
Specifications; Gyrus LED Driver, 16 Col	DWG-3071833
Schematic; Battery Operated TI-XXXX w/Horn (<i>prior to June 2016</i>)	DWG-3074676
Assy; Small Display w/ Stands	DWG-3220250
Schematic; Battery Operated TI-XXXX with Horn	DWG-3333212
Component Location; TI-2203	DWG-3438261
Component Location; TI-2215	DWG-3438262
Gyrus Driver, Battery Operated TI-XXXX w/Horn	DWG-4764373

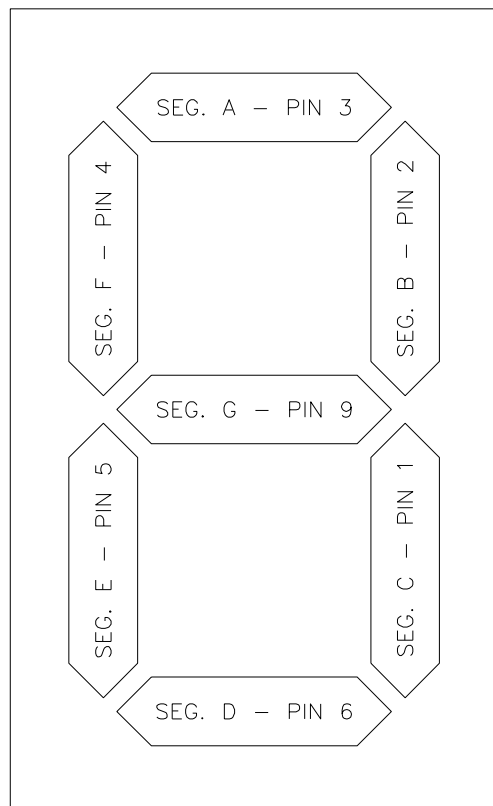
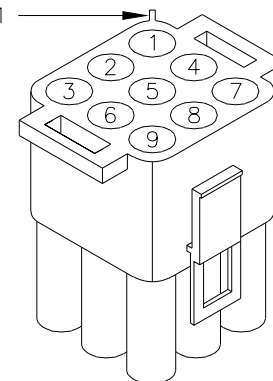
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7 SEGMENT BAR DIGIT

FRONT VIEW

CONNECTOR PIN NUMBERING

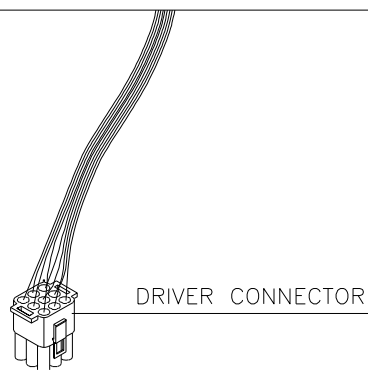
NOTE SPLINE NEAR NO. 1



EFFECTIVE APRIL 2021
ALL WIRE COLORS CHANGED
TO BLACK

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.



DRIVER CONNECTOR

REV 03	DATE: 20 APR 21	CN118578 ADDED NOTE TO CALL OUT CHANGE OF WIRE COLOR TO BLACK EFFECTIVE APRIL 2021.	BY: JSF
		THE CONCEPTS EXPRESSED AND DETAILS SHOWN ON THIS DRAWING ARE CONFIDENTIAL AND PROPRIETARY. DO NOT REPRODUCE BY ANY MEANS WITHOUT THE EXPRESS WRITTEN CONSENT OF DAKTRONICS, INC. OR ITS WHOLLY OWNED SUBSIDIARIES. COPYRIGHT 2021 DAKTRONICS, INC. (USA)	
THIRD ANGLE PROJECTION			
PROJECT: BASKETBALL			
TITLE: SEGMENTATION- 7 SEGMENT BAR DIGIT			
DATE: 05 JUN 89	DIM UNITS: INCHES [MILLIMETERS]	SHEET	REV 03
SCALE: 1=4	DO NOT SCALE DRAWING		
DESIGN: AVB	JOB NO.	FUNC - TYPE - SIZE	
DRAWN: HEIDERSCHIEDT P1192	-	- A	

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	

38532

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

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

REFER TO DWGS
A-290261 & A-290689

S1 ADDRESS
DIP SWITCH PACKAGE

J19 ADDRESS

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

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

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

J22 RC-100 RADIO

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

J21 2.4GHz RADIO

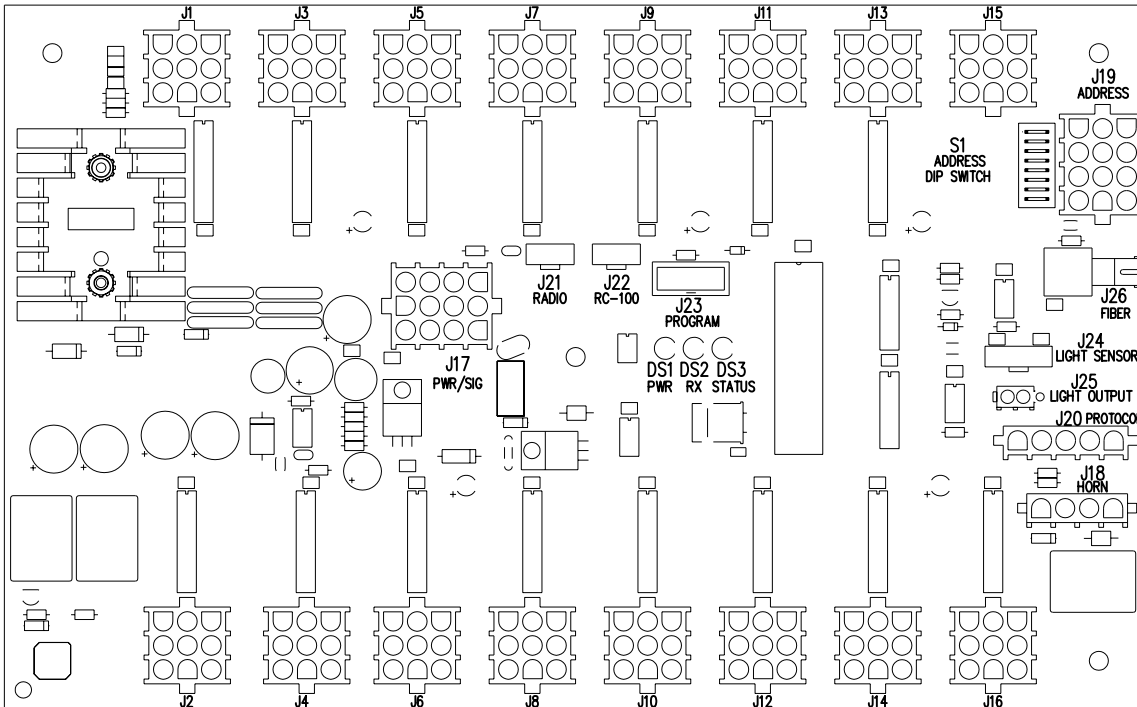
PIN	FUNCTION
1	+UNREG-P
2	GND-N
3	GND-N
4	RX_INPUT-P

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

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



J26 FIBER RX

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

J24 LIGHT SENSOR

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

J25 LIGHT OUT- NEXT DRIVER

PIN	FUNCTION
1	LIGHT_OUT-P
2	LIGHT_OUT-N

REFER TO DWG A-115081
FOR PROTOCOL SETTINGS

J20 PROTOCOL

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

J18 HORN

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

NOTES:

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

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DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ:

TITLE: SPECIFICATIONS; LED DRIVER IV, 16 COL

DES. BY:

DRAWN BY: DULSCHM

DATE: 09 OCT 06

REVISION

APPR. BY:

02

SCALE: 1 = 2

1192-R04A-288137

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	
REV.	DATE	DESCRIPTION	BY	APPR.

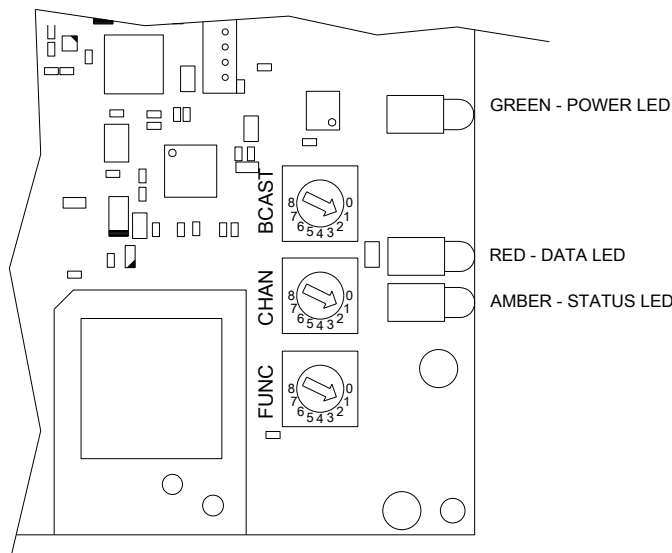
OUTDOOR SCOREBOARDS ONLY

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.

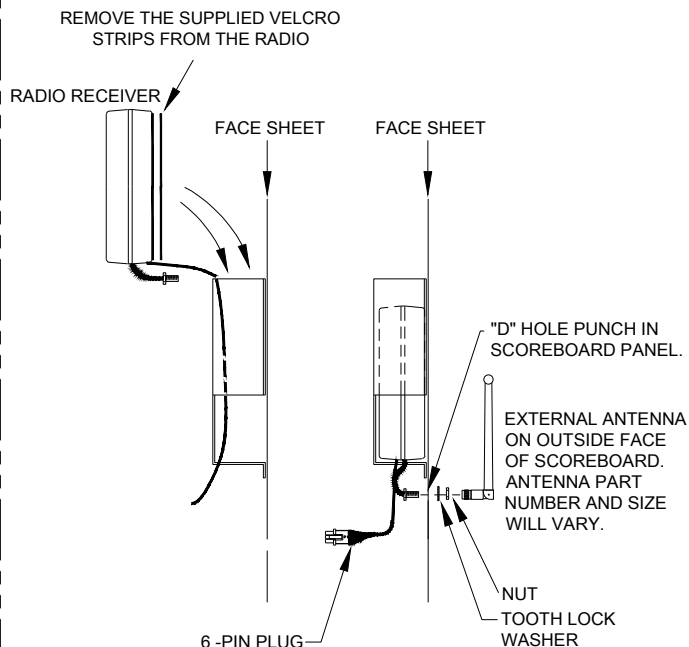
OR

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.



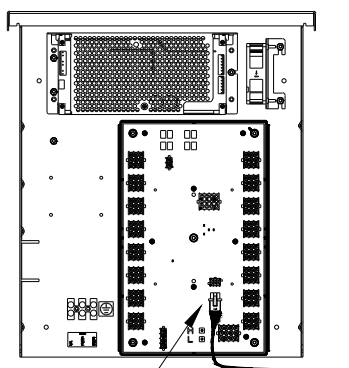
MOUNTING RADIO RECEIVER IN MOST OUTDOOR SCOREBOARDS.

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.



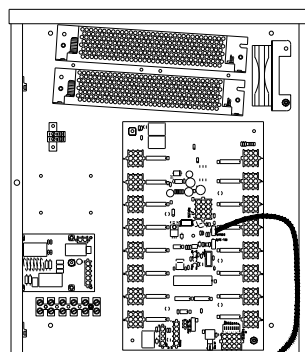
PRIMARY DRIVER ENCLOSURE, LOCATION VARIES PER SCOREBOARD MODEL.

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



DAKTRONICS, INC.

BROOKINGS, SD 57006

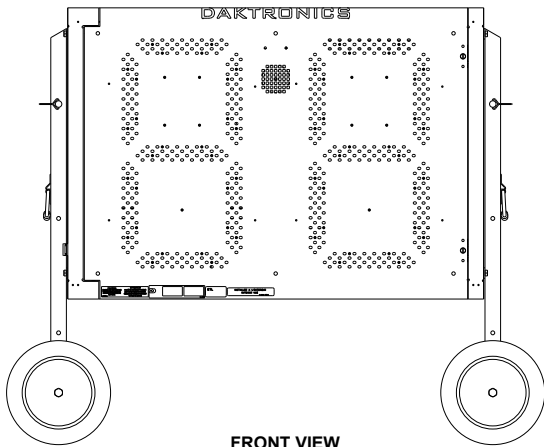
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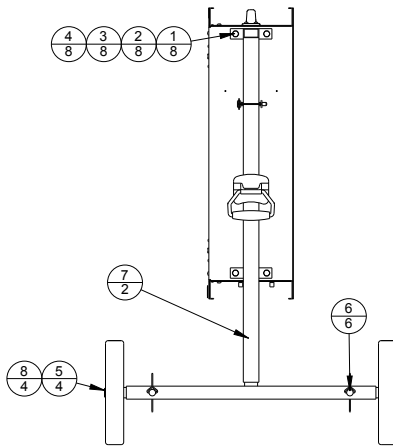
REV 03	DATE: 18 FEB 15	ADDED GYRUS VIEW UPDATED RADIO RECEIVER AND LEGACY VIEWS	BY: BJB
REV 02	DATE: 26 NOV 14	ADDED "REMOVE VELCRO" NOTES	BY: KDD
REV 01	DATE: 27 MAR 14	PER EC-13907, ADDED OUTDOOR SCBD ONLY NOTE	BY: KDD

PROJ: ALL SPORT RADIO			
TITLE: INSTALLATION DRAWING; OUTDOOR SCBD GEN VI RADIO RECEIVER			
DESIGN: MMILLER		DRAWN: MMILLER	
SCALE: NONE		DATE: 07 AUG 12	
SHEET	REV	JOB NO:	FUNC-TYPE-SIZE
	03	P 1110	F - 01 - A
			1109181

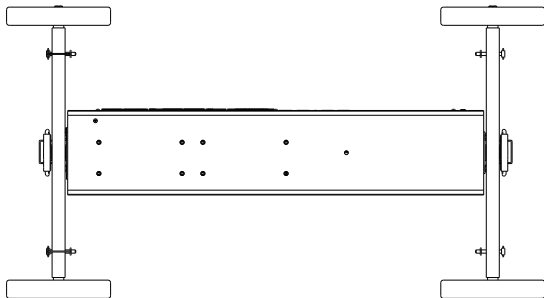
INDEX	NAME	QTY	DESCRIPTION
1	HC-1057	8	BOLT; 3/8-16X1 HEX HEAD, PLATED, GRADE 5
2	HC-1087	8	NUT, 3/8-16 HEX, ZN PLTD, GRADE 5
3	HC-1093	8	WASHER; 3/8 FLAT, ZN PLTD, SAE
4	HC-1100	8	WASHER; 3/8 SPLIT LOCK, ZN PLTD, MEDIUM
5	HC-1363	4	Bolt; 1/2-13x3-1/2 Hex Head, plated
6	HS-1207	6	PIN, 5/16X2", W/SAFETY SNAP SPRING CLIP
7	PR-(SEE BOM)	2	CART / STAND ASSY, TI-2015 PER DWG 1200640
8	RA-1007	4	WHEEL, 10X1.75 SEMI-PNEUMATIC, 1/2" AXLE



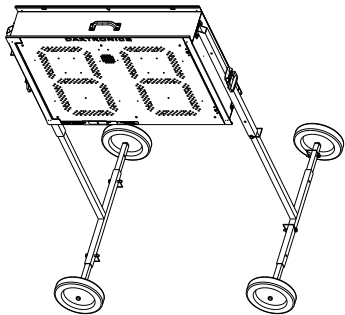
FRONT VIEW



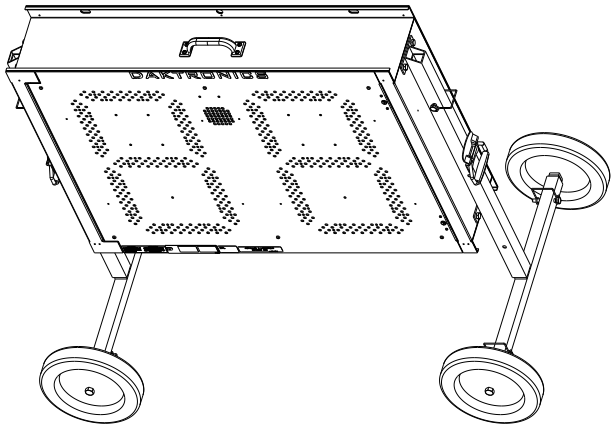
SIDE VIEW



BOTTOM VIEW




ROTATED VIEW
SCALE 1/25
CART DEPTH AND HEIGHT MAXIMIZED



ROTATED VIEW
CART DEPTH AND HEIGHT MINIMIZED

NOTES:
-ATTACH PR-(SEE BOM) STAND TO BTM
MTG BRACKET AND 7/16" HOLES USING 3/8" HARDWARE
-ATTACH CASTERS TO LEGS USING 1/2" BOLTS
-ATTACH STAND PIECES TOGETHER USING HS-1207 PINS



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BROOKINGS, SD 57006
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PROJ: OUTDOOR SHEETMETAL SCOREBOARDS
TITLE: ASSY; TI-2015 W/STANDS

DESIGN: KDRAGT	DRAWN: KDRAGT	DATE: 08-JUN-15
SCALE: 1/12		
SHEET: 1 OF 1	REV: 01	JOB NO: P 1753
		FUNC-TYPE-SIZE: E - 10 - B

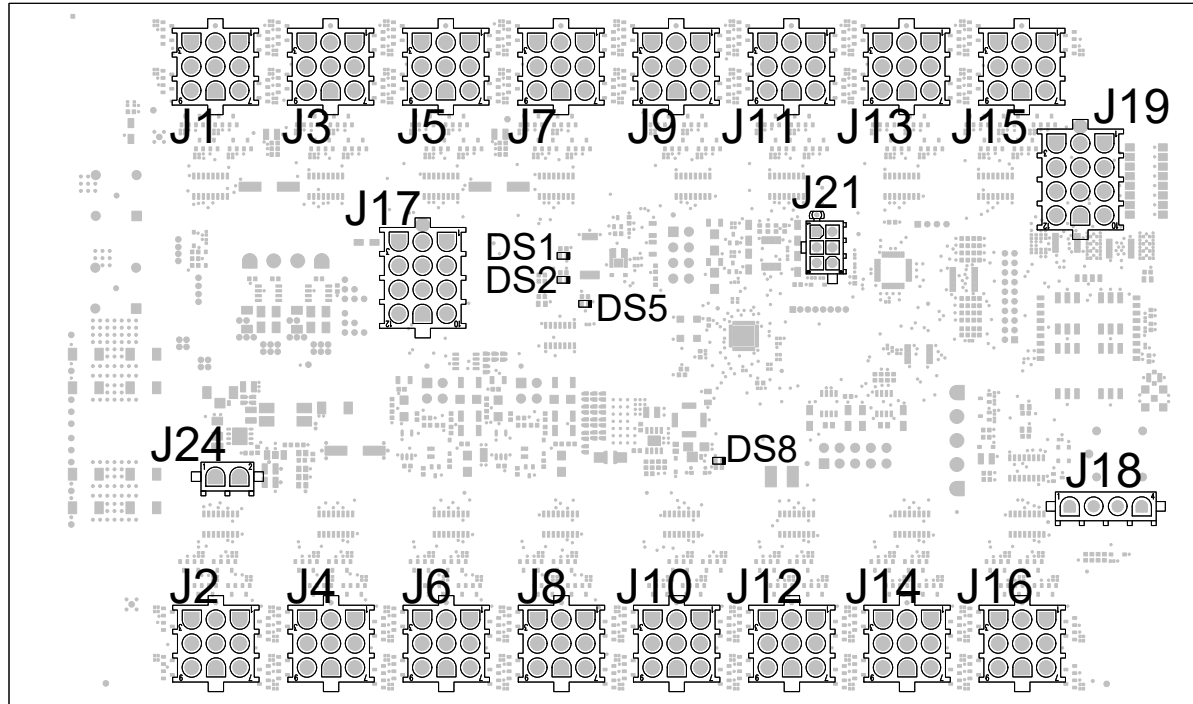
1200521

01	8 JUN 15	CHANGED SO NUMBER TO P1753, CHANGED PR NUMBER TO DEFINED BY BOM	ZSW 18100	BY:
REV	DATE:			

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

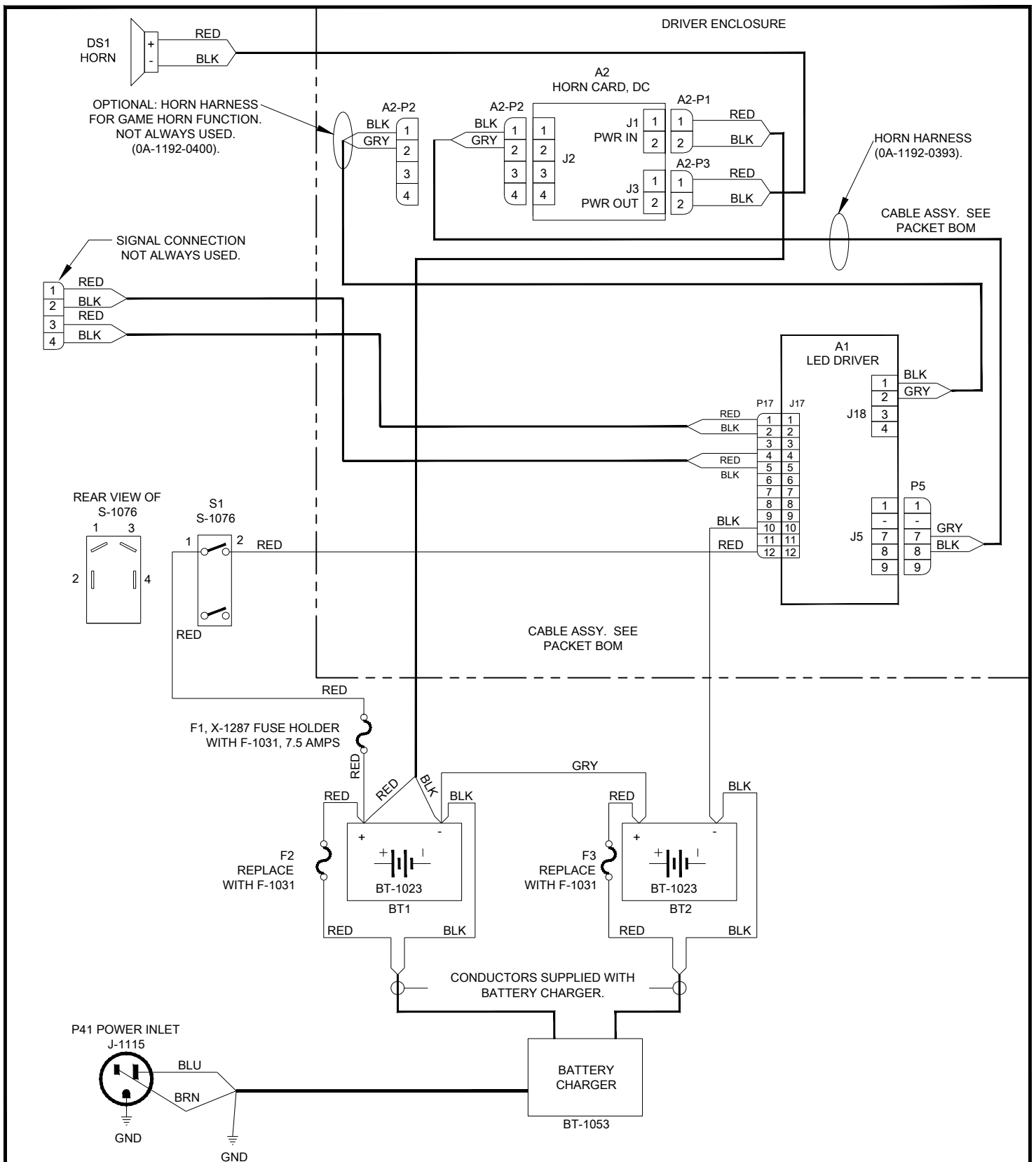
Indicators:


- 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

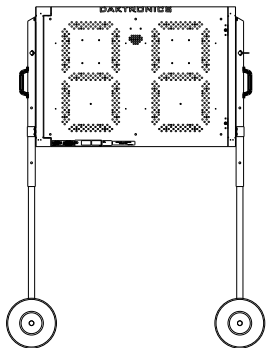
Reference Drawings

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

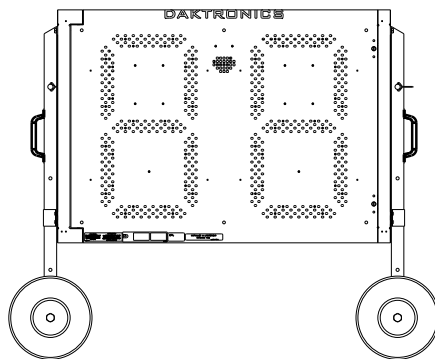
DAKTRONICS, INC. BROOKINGS, SD 57006				THE CONCEPTS EXPRESSED AND DETAILS SHOWN ON THIS DRAWING ARE CONFIDENTIAL AND PROPRIETARY. DO NOT REPRODUCE BY ANY MEANS WITHOUT THE EXPRESSED WRITTEN CONSENT OF DAKTRONICS INC. Copyright © 2015 Daktronics Inc.			
DO NOT SCALE DRAWING							
PROJECT		.					
TITLE		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			



		DAKTRONICS, INC.		THE CONCEPTS EXPRESSED AND DETAILS SHOWN ON THIS DRAWING ARE CONFIDENTIAL AND PROPRIETARY. DO NOT REPRODUCE BY ANY MEANS WITHOUT THE EXPRESS WRITTEN CONSENT OF DAKTRONICS, INC. COPYRIGHT 2015 DAKTRONICS, INC.	
		BROOKINGS, SD 57006			
		DO NOT SCALE DRAWING			
PROJ:OUTDOOR SHEETMETAL SCOREBOARDS					
TITLE:SCHEMATIC; BATTERY OPERATED TI-XXXX W/HORN					
DESIGN:DOPPELT		DRAWN:ZWOODWA		DATE: 10 JUN 15	
SCALE:NONE					
SHEET		REV	JOB NO:	FUNC -TYPE- SIZE	3074676
		02	P 1753	E - 03 - A	



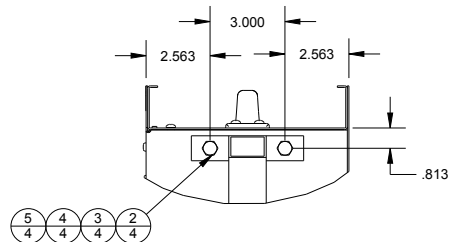
FRONT VIEW
CART FULLY EXTENDED
SCALE 1/25



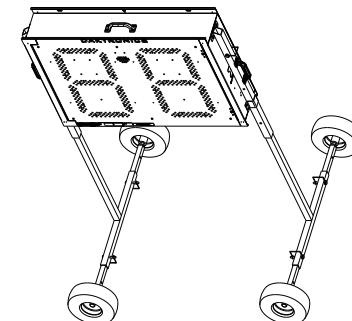
EXAMPLE DISPLAY. APPEARANCE MAY DIFFER

FRONT VIEW

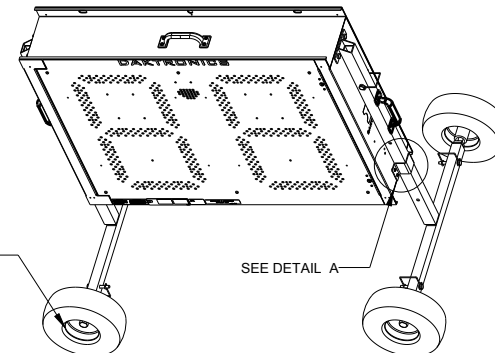
0A-1753-0186			
INDEX	NAME	QTY	DESCRIPTION
1	0M-3219308	2	HAT BRACKET; CART ATTACHMENT, TI-2015
2	HC-1057	4	BOLT, 3/8-16 X 1.000, HEX HEAD, GRADE 5, ZN PLTD
3	HC-1087	4	NUT, 3/8-16 HEX, ZN PLTD, GRADE 5
4	HC-1093	4	WASHER; 3/8 FLAT, ZN PLTD, SAE
5	HC-1100	4	WASHER; 3/8 SPLIT LOCK, ZN PLTD, MEDIUM
6	HC-1243	8	NUT, #10-24 HEX KEPS, ZN PLTD
7	HC-1273	4	NUT; 5/8-11 HEX, PLTD, GRADE 5
8	HC-1470	8	MACH SCR, #10-24 X 0.625, PHIL PAN HEAD, BLK
9	HC-1579	4	BOLT, 5/8-11 X 3.00, HEX HEAD, GRADE 5
10	HS-1207	6	PIN, 5/16X2", W/SAFETY SNAP SPRING CLIP
11	HS-3218660	2	CART / STAND ASSY, TI-2015, PER DWG-3218659
12	RA-3223755	4	WHEEL; 10"X3.5"; 300LB CAP



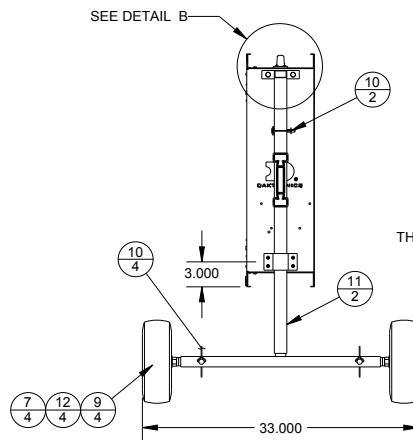
DETAIL B
SCALE 1/5
7/16" HOLE LOCATIONS



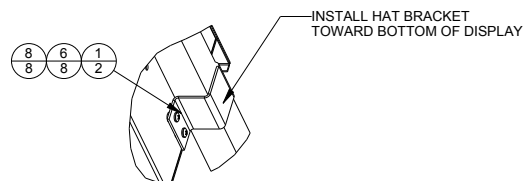
ROTATED VIEW
CART DEPTH AND HEIGHT MAXIMIZED
SCALE 1/25



ROTATED VIEW
CART DEPTH AND HEIGHT MINIMIZED



SIDE VIEW



DETAIL A
SCALE 1/5

NOTES:

REFERENCE ED-3695776 FOR MORE ASSEMBLY DETAILS
DRILL OUT 7/16" HOLES IN THE LOCATIONS SHOWN ON DETAIL B
ATTACH HS-3218660 STAND TO DISPLAY USING 3/8" HARDWARE
SEE DETAIL A. USE HAT BRACKET TO MATCH DRILL 13/64" HOLES
INTO SIDE OF DISPLAY, AVOIDING ELECTRICAL HOLES
ATTACH HAT BRACKET USING HARDWARE SHOWN ON DETAIL A
ATTACH WHEELS TO LEGS USING 5/8" BOLTS



ASSEMBLE STAND PIECES TOGETHER USING HS-1207 PINS - 03.1

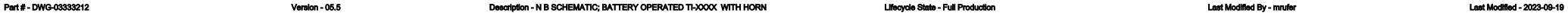
Description - N B ASSY; SMALL DISPLAY W/STANDS

Lifecycle State - Full Production

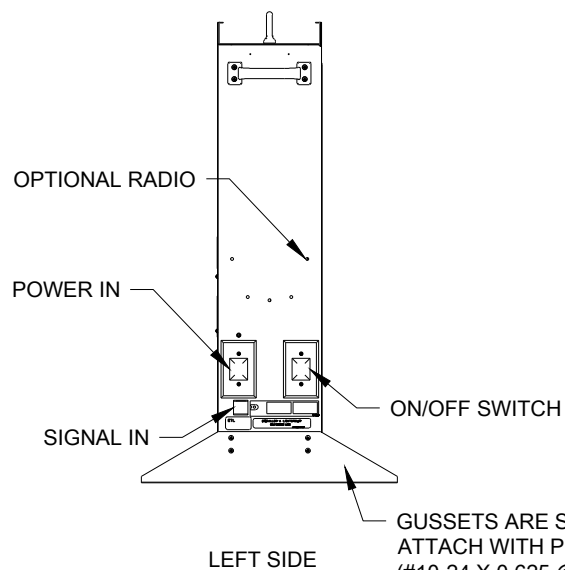
Last Modified By - kdragt

Last Modified - 2017-08-10

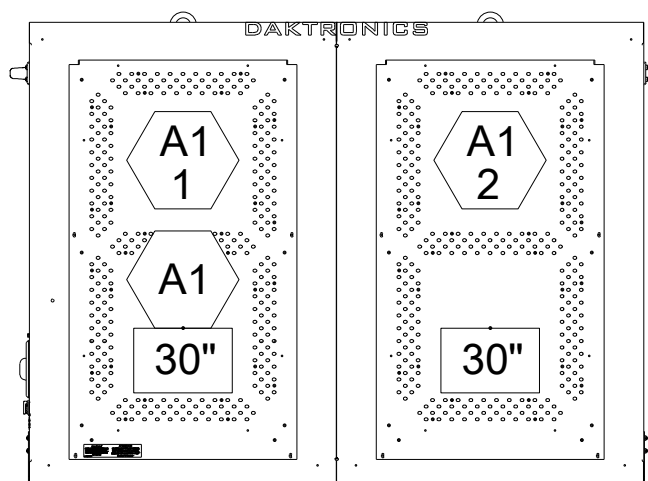
03	10 AUG 17	PER CH-40670; ADDED ED-3695776 FOR ASSEMBLY DETAILS REPLACED HC-1846 WASHERS AND HC-3223756 BOLTS WITH HC-1273 NUTS AND HC-1579 BOLTS, FLIPPED WHEELS		KDD	
02	7 JUN 16	PER EC-21467; UPDATED HANDLES, WHEELS, BOLTS AND WASHERS		RDF 16255	
01	19 APR 16	PER EC-20956; ADDED BOM BALLOONS		KDD	
REV	DATE:				BY:
<div><div><p>THE CONCEPTS EXPRESSED AND DETAILS SHOWN ON THIS DRAWING ARE CONFIDENTIAL AND PROPRIETARY. DO NOT REPRODUCE BY ANY MEANS WITHOUT THE EXPRESS WRITTEN CONSENT OF DAKTRONICS, INC. OR ITS WHOLLY OWNED SUBSIDIARIES. COPYRIGHT 2016 DAKTRONICS, INC. (USA)</p></div><div></div></div>					THIRD ANGLE PROJECTION
PROJECT: OUTDOOR SCOREBOARDS					
TITLE: ASSY; SMALL DISPLAY W/STANDS					
DATE: 10-AUG-17		DIM UNITS: INCHES (MILLIMETERS)		SHEET 1 OF 1	REV 03
SCALE: 1/15		DO NOT SCALE DRAWING			
DESIGN: KDRAGT		JOB NO: P1753		3220250	
DRAWN: KDRAGT		FUNC - TYPE - SIZE: E - 10 - B			



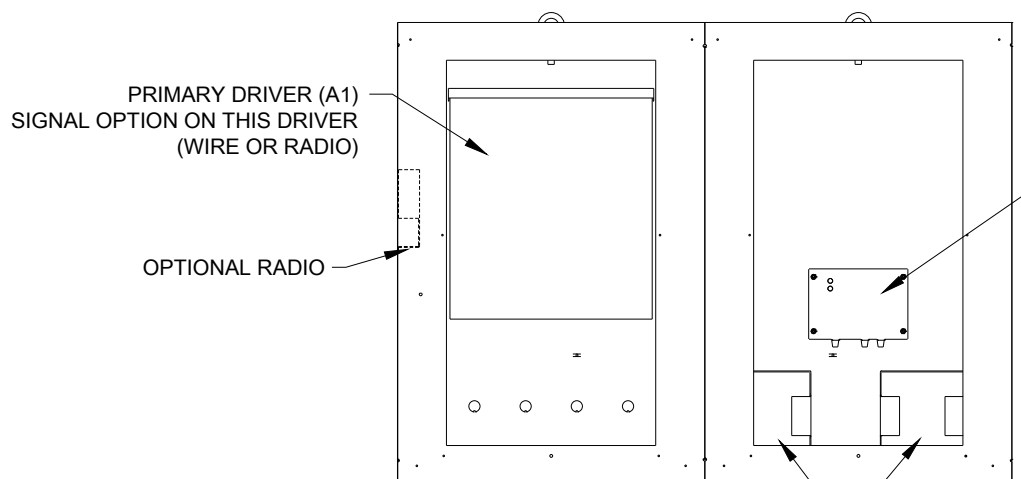
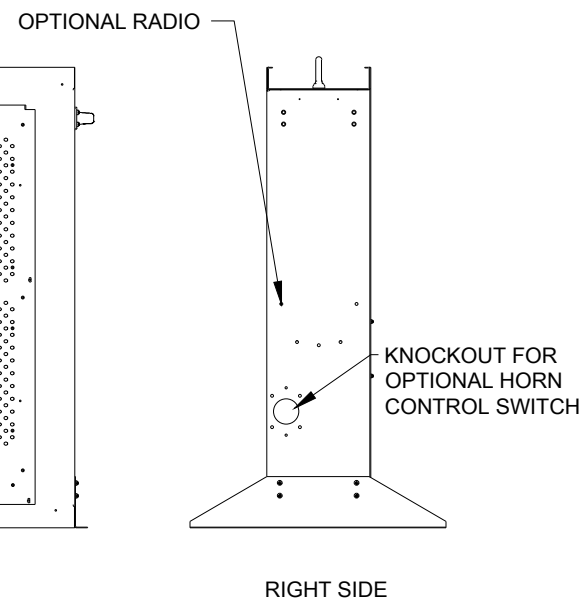
TI-2203-R/A



GUSSETS ARE SHIPPED LOOSE,
ATTACH WITH PROVIDED SCREWS
(#10-24 X 0.625 @8) PRIOR TO USE






FRONT VIEW


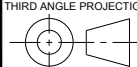


FRONT VIEW
SHOWN WITHOUT DIGITS

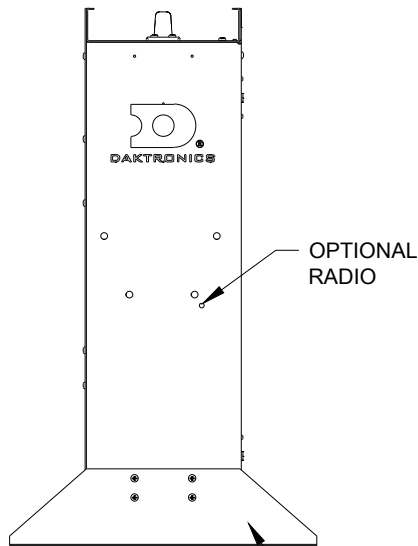
12V BATTERY

NOTES:

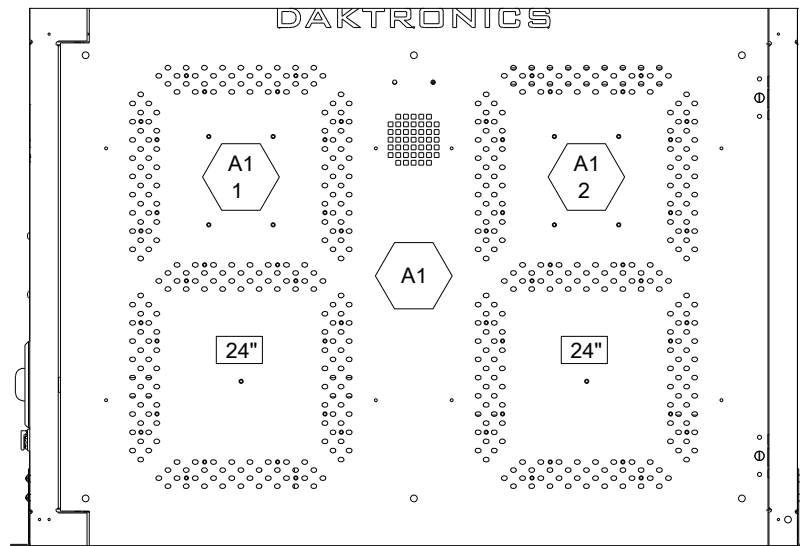
-  = DRIVER CONNECTOR WIRED TO THAT DIGIT
-  = LED DRIVER NUMBER
-  = DIGIT SIZE

REV 02	DATE: 03 MAR 23	PER CN-155038, ADDED HORN SWITCH MTG HOLES	BY: KDM
REV 01	DATE: 04 NOV 16	PER EC-22891, ADDED HOLES FOR ANTENNA, RADIO AND ADDED BRACKET	BY: MJR
<div><p>THE CONCEPTS EXPRESSED AND DETAILS SHOWN ON THIS DRAWING ARE CONFIDENTIAL AND PROPRIETARY. DO NOT REPRODUCE BY ANY MEANS WITHOUT THE EXPRESS WRITTEN CONSENT OF DAKTRONICS, INC. OR ITS WHOLLY OWNED SUBSIDIARIES. COPYRIGHT 2016 DAKTRONICS, INC. (USA)</p></div>			<div>THIRD ANGLE PROJECTION</div>
PROJECT: OUTDOOR SHEETMETAL SCOREBOARDS			
TITLE: COMPONENT LOCATION; TI-2203			
DATE: 17 AUG 16		DIM UNITS: INCHES [MILLIMETERS]	SHEET
SCALE: 1=15		DO NOT SCALE DRAWING	
DESIGN: KDRAGT		JOB NO.	3438261
DRAWN: KDRAGT		P1753	
		FUNC - TYPE - SIZE	
		E - 10 - A	

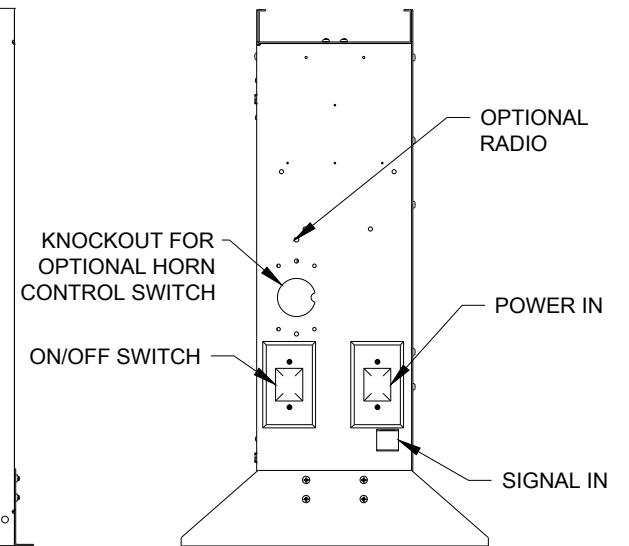
TI-2215-R/A



LEFT SIDE



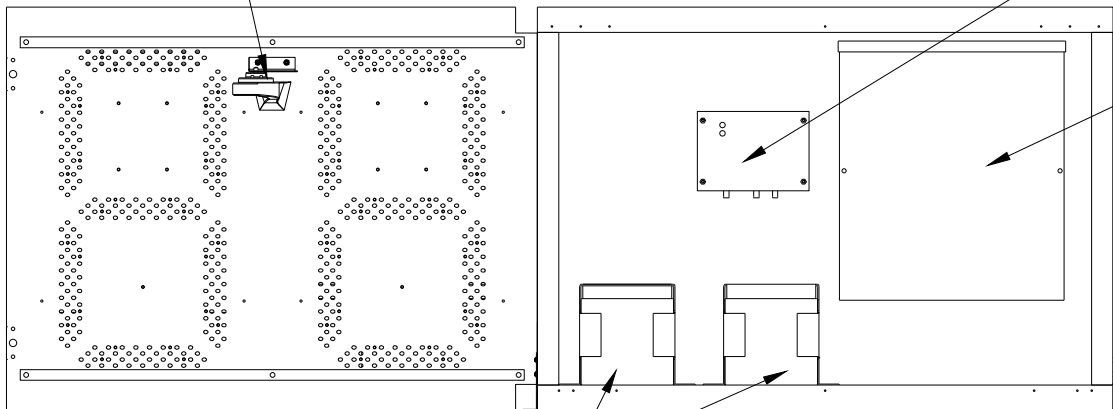
FRONT VIEW



RIGHT SIDE

GUSSETS ARE SHIPPED LOOSE,
ATTACH WITH PROVIDED SCREWS
(#10-24 X 0.625 @8) PRIOR TO USE


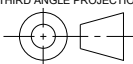
12V HORN

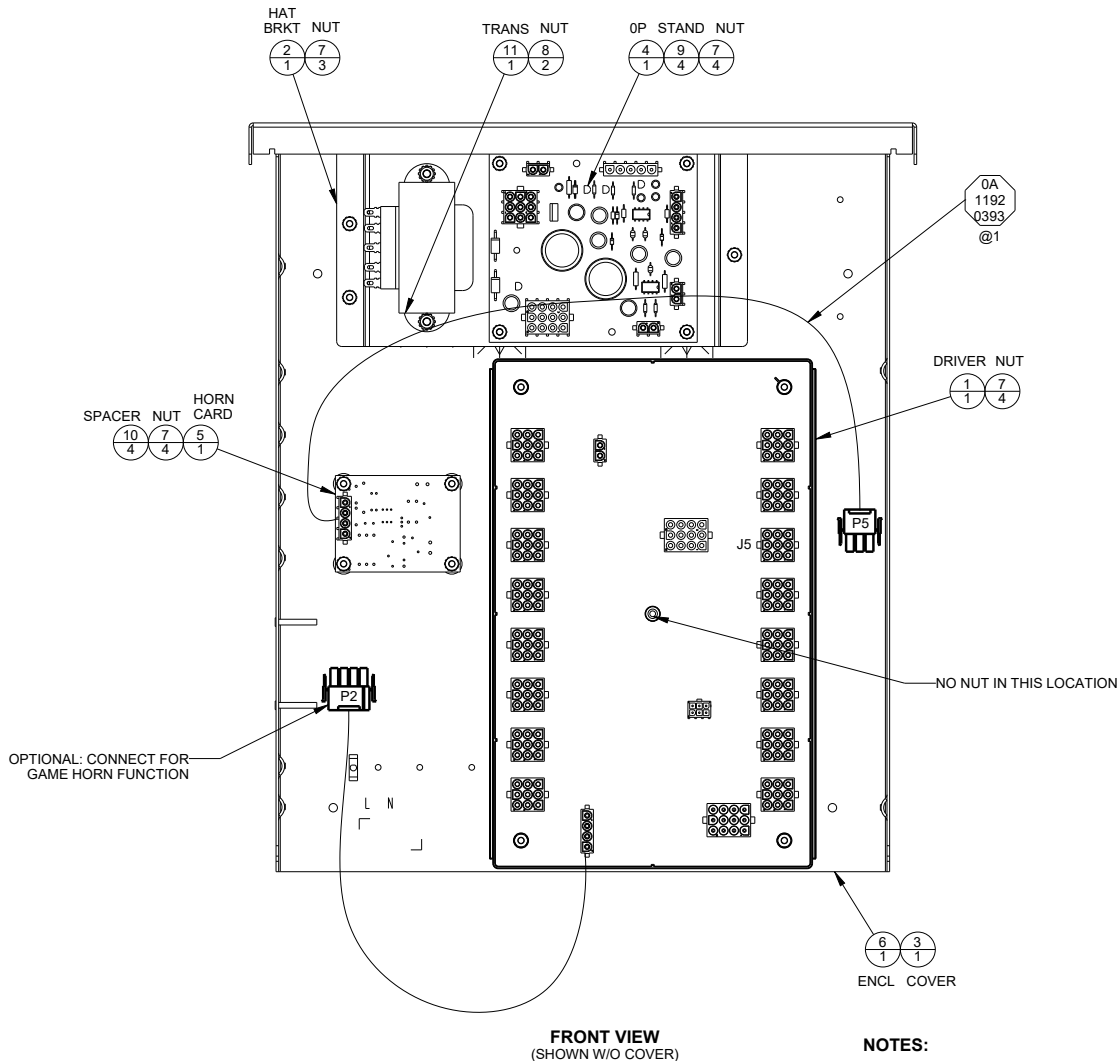


FRONT VIEW
SHOWN WITH DOOR OPEN

NOTES:

- A1 2 = DRIVER CONNECTOR WIRED TO THAT DIGIT
- A1 = DRIVER NUMBER
- 18" = DIGIT SIZE

REV 04	DATE: 29 MAR 23	PER CN-155013, ADDED HORN SWITCH KNOCKOUT	BY: KDM	
		THE CONCEPTS EXPRESSED AND DETAILS SHOWN ON THIS DRAWING ARE CONFIDENTIAL AND PROPRIETARY. DO NOT REPRODUCE BY ANY MEANS WITHOUT THE EXPRESS WRITTEN CONSENT OF DAKTRONICS, INC. OR ITS WHOLLY OWNED SUBSIDIARIES. COPYRIGHT 2016 DAKTRONICS, INC. (USA)		
PROJECT: OUTDOOR SHEETMETAL SCOREBOARDS				
TITLE: COMPONENT LOCATION; TI-2215				
DATE: 17 AUG 16	DIM UNITS: INCHES [MILLIMETERS]			SHEET
SCALE: 1=10	DO NOT SCALE DRAWING			REV 04
DESIGN: KDRAGT	JOB NO. P1753	FUNC - TYPE - SIZE E - 10 - A		3438262
DRAWN: KDRAGT				





INDEX	NAME	QTY	DESCRIPTION
1	0A-1782-0100	1	POTTED DIGIT DRIVER
2	0M-1184564	1	HAT BRACKET; BATTERY MONITOR, TRANS AND OP MOUNT
3	0M-1196053	1	ENCLOSURE COVER; SNAP LID, DIGIT DRIVER
4	0P-1192-0097	1	0P-1192-0097
5	0P-1192-0398	1	HORN INTERFACE BOARD, DC HORN
6	0S-4299751	1	ENCLOSURE BODY: OUTDOOR DIGIT DRIVER Z-FILTER
7	HC-1238	15	NUT, #6-32 HEX KEPS, ZN PLTD
8	HC-1354	2	NUT, #6-32 HEX KEPS, ZN PLTD
9	HE-1071	4	STANDOFF, 6-32X1/2 F-F HEX, BRASS
10	HS-1042	4	SPACER, PLASTIC 1/2"OD X .378"LONG, 1/4" BORE
11	T-1066	1	TRANS;PRI;DUAL 115/230V;SEC:16VCT @6.25A

NOTES:

- TORQUE ALL HARDWARE TO 5 IN-LBS
- SEE DWG-1198707 FOR COVER LABELING LABELS ARE PUT ON IN FINAL ASSEMBLY

ASSEMBLY PACKETS:

0A-1753-0181...GYRUS DRIVER; BATTERY OPERATED TI-XXXX W/HORN

REV:	DATE:	DESCRIPTION:	BY:	REV
<div><div><p>THE CONCEPTS EXPRESSED AND DETAILS SHOWN ON THIS DRAWING ARE CONFIDENTIAL AND PROPRIETARY. DO NOT REPRODUCE BY ANY MEANS WITHOUT THE EXPRESS WRITTEN CONSENT OF DAKTRONICS, INC. OR ITS WHOLLY OWNED SUBSIDIARIES. COPYRIGHT 2020 DAKTRONICS, INC. (USA)</p></div></div>			<div>THIRD ANGLE PROJECTION</div> 	
PROJECT: OUTDOOR LED SCOREBOARDS				
TITLE: GYRUS DRIVER; BATTERY OPERATED TI-XXXX W/HORN				
DATE: 27-OCT-20	DIM UNITS: INCHES [MILLIMETERS]		SHEET	REV
SCALE: 1/3	DO NOT SCALE DRAWING			
DESIGN: KSCHNABEL	JOB NO:	FUNC - TYPE - SIZE	4764373	
DRAWN: KSCHNABEL	P1782	E - 10 - B		

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B Daktronics Warranty & Limitation of Liability

This section includes the Daktronics Warranty & Limitation of Liability statement (SL-02374).

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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”, which may also be the Purchaser) 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 per Incoterms® 2020. 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 per Incoterms® 2020; 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 per Incoterms® 2020. 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;

DAKTRONICS WARRANTY & LIMITATION OF LIABILITY

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;
- 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 Equipment 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

- A. 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.
- B. 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
- C. 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

- A. 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; Election of Remedies

- A. 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.
- B. Any dispute, controversy or claim arising from or related to this Warranty, the parties shall first attempt to settle through negotiations. In the event that no resolution is reached, then such dispute, controversy, or claim shall be resolved by final and binding arbitration under the Rules of Arbitration of the International Chamber of Commerce. The language of the arbitration

DAKTRONICS WARRANTY & LIMITATION OF LIABILITY

shall be English. The place of the arbitration shall be Sioux Falls, SD. A single arbitrator selected by the parties shall preside over the proceeding. If a single arbitrator cannot be agreed upon by the parties, each party shall select an arbitrator, and those arbitrators shall confer and agree on the appointed arbitrator to adjudicate the arbitration. The arbitrator shall have the power to grant any provisional or final remedy or relief that it deems appropriate, including conservatory measures and an award of attorneys' fees. The arbitrator shall make its decisions in accordance with applicable law. By agreeing to arbitration, the Parties do not intend to deprive any court of its jurisdiction to issue a pre-arbitral injunction, pre-arbitral attachment, or other order in aid of arbitration proceedings and the enforcement of any award. Without prejudice to such provisional remedies as may be available under the jurisdiction of a court, the arbitrator shall have full authority to grant provisional remedies and to direct the Parties to request that any court modify or vacate any temporary or preliminary relief issued by such court, and to award damages for the failure of any Party to respect the arbitrator's orders to that effect.

6. Availability of Extended Service Agreement

- A. 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).

Additional Terms applicable to sales outside of the United States

The following additional terms apply **only** where the installation site of the Equipment is located outside of the United States of America.

1. In the event that the installation site of the Equipment is in a country other than the U.S.A., then, notwithstanding Section 5 of the Warranty, where the selling entity is the entity listed in Column 1, then the governing law of this Warranty is the law of the jurisdiction listed in the corresponding row in Column 2 without regard to its conflict of law principles. Furthermore, if the selling entity is an entity listed in Column 1, then the place of arbitration is listed in the corresponding row in Column 3.

Column 1 (Selling Entity)	Column 2 (Governing Law)	Column 3 (Location of Arbitration)
Daktronics, Inc.	The state of Illinois	Chicago, IL, U.S.A.
Daktronics Canada, Inc.	The Province of Ontario, Canada	Toronto, Ontario, Canada
Daktronics UK Ltd.	England and Wales	Bristol, UK
Daktronics GmbH	The Federal Republic of Germany	Wiesbaden, Germany
Daktronics Hong Kong Limited	Hong Kong, Special Administrative Region of the P.R.C.	Hong Kong SAR
Daktronics Shanghai Co., Ltd.	The Peoples Republic of China	Shanghai, P.R.C.
Daktronics France, SARL	France	Paris, France
Daktronics Japan, Inc.	Japan	Tokyo, Japan
Daktronics International Limited	Macau, Special Administrative Region of the P.R.C.	Macau SAR
Daktronics Australia Pad Ltd	Australia	Sydney, Australia
Daktronics Singapore Pte. Ltd	Singapore	Singapore
Daktronics Brazil LTDA	Brazil	São Paulo, Brazil
Daktronics Spain S.L.U.	Spain	Madrid, Spain
Daktronics Belgium N. V	Belgium	Kruikeke, Belgium
Daktronics Ireland Co. Ltd.	Ireland	Dublin, Ireland

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