Galaxy® Outdoor
Series AF-3200/3400 89mm

Display Manual

ED15400 **Rev 0** **21 July 2005**

DAKTRONICS

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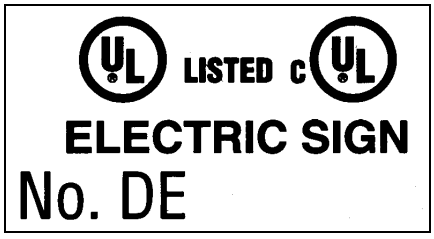
ED15400
Product 1259
Rev 0 – 21 July 2005



DAKTRONICS, INC.

Table of Contents

List of Figures

Section 1: Introduction

This manual explains the installation, maintenance, and troubleshooting of the 89mm AF-3200/3400 Galaxy® displays. For questions regarding the safety, installation, operation, or service of this system, please refer to the telephone numbers listed on the cover page of this manual.

The manual contains seven sections: Introduction, Mechanical Installation, Electrical Installation, Maintenance and Troubleshooting, Appendix A, Appendix B, and Appendix C.

- **Introduction** covers the basic information needed to make the most of the rest of this manual. Take time to read the entire introduction as it defines terms and explains concepts used throughout the manual.
- **Mechanical Installation** provides general guidance on display mounting.
- **Electrical Installation** gives general guidance on terminating power and signal cable at the display.
- **Maintenance and Troubleshooting** addresses such topics as removing basic sign components, troubleshooting the sign, performing general maintenance and exchanging display components.
- **Appendix A** lists the drawings included within the manual.
- **Appendix B** includes information about the signal converter.
- **Appendix C** includes information about the Optional Temperature Sensor.

Daktronics identifies manuals by an ED number located on the cover page of each manual. For example, Daktronics refers to this manual as **ED15400**.

Daktronics, commonly uses a number of drawing types, along with the information that each provides. This manual might not contain all of these drawings:

- **System Riser Diagrams:** overall system layout from control computer to display, power and phase requirements.
- **Shop Drawings:** fan locations, mounting information, power and signal entrance points and access method (front and rear).
- **Schematics:** power and signal wiring for various components.
- **Display Assembly:** locations of critical internal display components such as power supply assemblies, controller boards, thermostats and light detectors.

Figure 1 illustrates Daktronics drawing label. The lower-right corner of the drawing contains the drawing number. The manual identifies the drawings by listing the last set of digits and the letter preceding them. In the example below, the manual refers to the drawing as **Drawing B-206146**. Reference drawings are inserted in **Appendix A**.

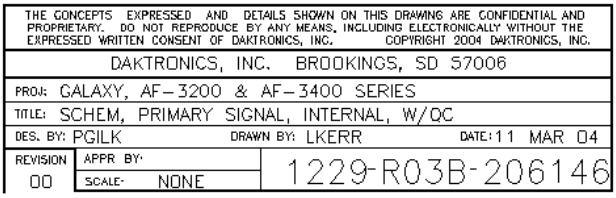


Figure 1: *Drawing Label*

This manual shows all references to drawing numbers, appendices, figures, or other manuals in **bold** typeface, as shown below:

"Refer to **Drawing B-206146** in **Appendix A** for the power supply wiring."

Additionally, the manual lists drawings referenced in a particular section at the beginning of that section as seen in the following example:

Reference Drawing:
Schem; Primary Signal, Internal, w/QC ..... **Drawing B-206146**

Daktronics builds displays for long life and that require little maintenance, however certain sign components may need replacing. The **Replacement Parts List** in **Section 4.13** provides the names and numbers of components that may need to be replaced during the life of the sign. Most sign components have a white label that lists the part number. The component part number is in the following format: 0P-_ _ _ _-_ _ _ _ (circuit board) or 0A-_ _ _ _-_ _ _ _ (multi-component assembly).

Following the **Replacement Parts List** in **Section 4.17** the **Exchange and Repair and Return Programs** in **Section 4.18** refers to the instructions if any sign component needs replacement or repair.

1.1 Safety Precautions

Important Safeguards:

1. Read and understand these instructions before installing.
2. Be sure the display and external enclosures are properly grounded with an earth ground electrode at the display.
3. Disconnect power when servicing the display.
4. **Do not** modify the display structure or attach any panels or coverings to the display without the written consent of Daktronics, Inc.

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference. In such cases, the user will be required to correct the interference at their own expense.

Modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment under FCC rules.

1.2 Network Concepts

The concept of using LED displays as cost effective, high impact method of communication is rapidly growing throughout many industries and businesses. The reasons for this growth are many, but the need for additional features and complexity of multiple display installations has emerged. Daktronics display systems have been designed to meet those needs.

The common thread to most client requests is a means of programming and controlling a group of displays from a central control point. Daktronics responded by developing a powerful system of interconnecting and controlling displays. Great care has been taken to design products that will satisfy a wide variety of installations. Some of the design goals of these systems include the following:

- Easy transfer of messages
- The ability to tell a display or group of displays in the network which message should run
- The ability to determine the status of any display on the network
- The ability to control multiple display technologies on the same network

There are six network systems available: RS232, RS422, modem, fiber, radio and Ethernet. They differ on the type of physical connections needed, the distance allowed, and equipment required. A separate manual is provided for the type of communication method ordered with your display.

Up to 240 displays can exist on one network.

1.3 Display Overview

Reference Drawings:

Power Specs, AF-3400-(8-48X32-112)-89-A-*-* ..... **Drawing A-178168**
Power Specs, AF-3400-(8-48X32-112)-89-R-*-* ..... **Drawing A-178240**
Power Specs, AF-3200-(8-48X32-112)-89-RGB-*-* .... **Drawing A-183906**
Shop Drawings..... **Refer to Appendix A**

Daktronics 89mm, AF-3200/3400 Galaxy® displays are designed and manufactured for performance, reliability, easy maintenance, and long life. The pixels have an 89mm center-to-center spacing and LEDs (light emitting diodes). Each sign section has minimum 24-inch character height. A light sensor on the front of the first display is used for automatic dimming of the LEDs based on the ambient light levels. The configuration of pixels depends on the model of sign ordered.

Refer to the **Drawings A-178168, A-178240, A-183906** and the **Shop Drawings** for the approximate size, weight, and power requirements for your model of display.

The following describes the Galaxy® model numbers: **AF-3400-RRCCC-89-X**

AF-3400	=	Outdoor 89mm Louvered Galaxy Display
RR	=	Number of Rows High (8, 16, 24, 32, 40 and 48 are available)
CCC	=	Number of Columns Long (32, 48, 64, 80, 96, and 112 are available)
89	=	89mm center-to-center pixel spacing
X	=	LED Color (monochrome red or amber are available)

A typical sign system consists of a Windows® based personal computer (PC) running Venus® 1500 software and one or more displays. Venus® 1500 is a software package that runs under Windows® 98, ME™, NT® 4.0, 2000, or XP Home/Professional operating systems on an IBM-compatible computer. Refer to the Venus 1500 controller manual, **ED13530**, for installation and maintenance of the Venus 1500 editing station.

The displays are offered as single-face units which are single-sided, stand-alone displays. Each display can be independently controlled and addressed, but the controllers can be interconnected for the case of communications.

1.4 Component Identification

The following illustrations and definitions depict some of the more commonly accessed Galaxy® sign components. Because Daktronics occasionally alters standard design to meet customer needs, the actual display design may vary slightly from the illustrations below.

This is only a brief overview. Refer to **Section 4** for detailed information on maintaining and troubleshooting various sign components.

Com Port: The serial connector on the back of the control computer. The COM port controls the sign through a 9 serial connector.

Controller: The display's controller is the "brains" of the display. The controller receives, translates, and activates the signal information from the control computer to the appropriate pixels on the display accordingly.

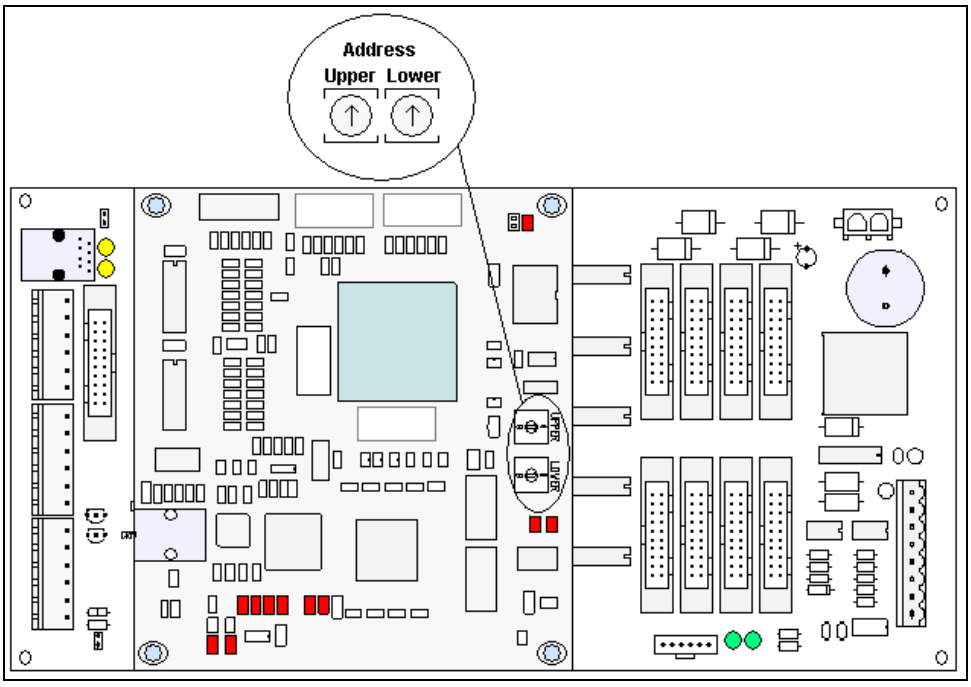


Figure 2: *Version 3 Controller*

Display Address: The display address is an identification number assigned to each display of a network. Rotating the address switches on the controller sets the display address. The control software uses the address to locate and communicate with each display. Displays that are on the same network cannot have the same address.

Driver: The driver is a circuit board responsible for switching the intensity levels of the LEDs. The driver is located inside the driver box and mounts on the back of the module.

Galaxy®: Daktronics trademarked name for LED monochrome or tri-colored matrix displays.

Latch Access Fastener: Device utilizing a rotating retainer bar to hold the module firmly to the sign frame. There is one per module near the center of the module on the right side.

LED (light emitting diode): An LED is a low energy, high intensity lighting unit.

Louver: Black shade positioned horizontally above each pixel row. The louvers increase the level of contrast on the sign face and direct LED light.

Module: 89mm Galaxy® modules are 8 pixels high by 8 pixels wide. They consist of pixel strips, louvers, and a driver. Refer to **Figure 3** for identification of these parts.

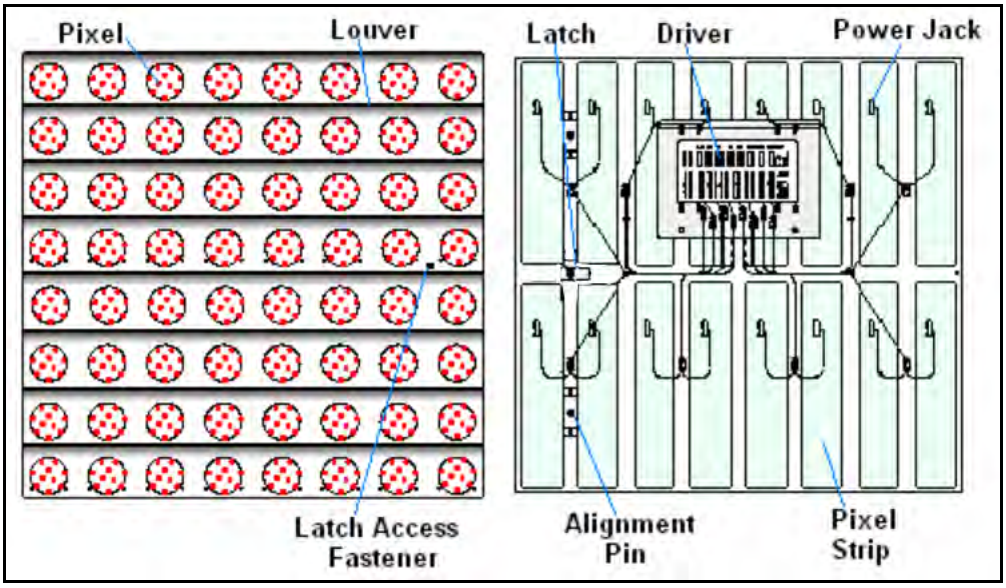


Figure 3: *8x8 Pixel Module (Front and Rear)*

Network: Consists of multiple signs connected to each other.

Pixel: Cluster of LEDs. The number and color of the LEDs depends on display application.

Pixel Strip: Four LED pixels mount directly onto a pixel strip. Each pixel strip is removable from the module. There are 16 pixel strips per module.

Power Supply: Converts AC line voltage from the load center to low DC voltage for one or more module driver boards.

Venus® 1500: Daktronics designed, Windows® based software used to create and edit messages on the display. Refer to **ED13530** for more information.

1.5 Daktronics Nomenclature

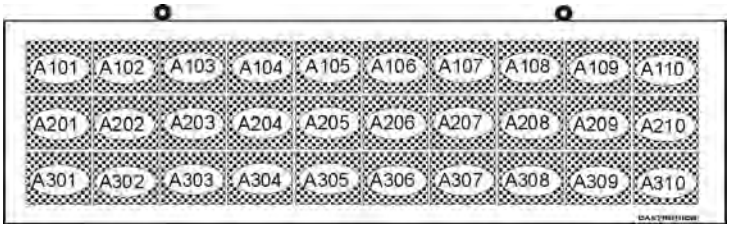


Figure 4: *Module Numbering Example – 24x80 Front*

To fully understand some Daktronics drawings, such as schematics, it is necessary to know how those drawings label various components. This information is also useful when trying to communicate maintenance or troubleshooting efforts.

A module is the building block of the display. Each module measures 8 pixels high by 8 pixels wide. By placing modules side-by-side and on top of one another, Daktronics can design and build displays of any size. **Figure 4** illustrates how Daktronics numbers modules on a Galaxy® display. **Figure 5** breaks down the module numbering method.

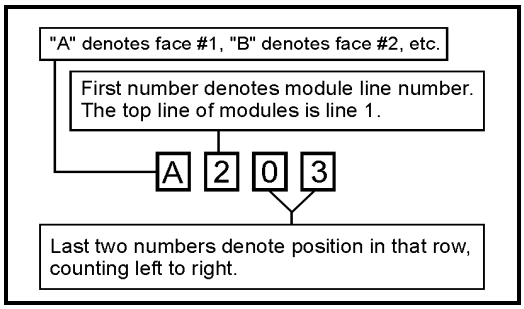


Figure 5: *Module Numbering*

In addition, various Daktronics drawings may contain the following labeling formats:

- "TB_ _" shows a termination block for power or signal cable.
- "F_ _" denotes a fuse.
- "E_ _" signifies a grounding point.
- "J_ _" stands for a power or signal jack.
- "P_ _" represents a power or signal plug for the opposite jack.

Finally, drawings commonly have Daktronics part numbers. You can use those part numbers when requesting replacement parts from Daktronics Customer Service. Take note of the following part number formats:

- "0P-_ _ _ _-_ _ _ _" gives the form of an individual circuit board, such as a module driver.
- "0A-_ _ _ _-_ _ _ _" represents an assembly, such as a circuit board and the plate or bracket to which it mounts. A collection of circuit boards working as a single unit may also carry an assembly label.
- "W-_ _ _ _" indicates a wire or cable. Cables may also carry the assembly numbering format in certain circumstances. This is especially true of ribbon cables.

Most circuit boards and components within this sign carry a label that lists the part number of the unit. If the **Replacement Parts List** in **Section 4.17** does not list a circuit board or assembly, use the label to order a replacement. **Figure 6** illustrates a typical label. The part number is in bold.

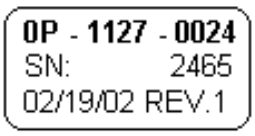


Figure 6: *Typical Label*

Section 2: Mechanical Installation

Note: Daktronics does not guarantee the warranty in situations where the display is not constantly in a stable environment.

Daktronics engineering staff must approve **any** changes that may affect the weather-tightness of the display. If you make any modifications, you must submit detailed drawings of the changes to Daktronics for evaluation and approval, or you may void the warranty.

Daktronics is not responsible for installations or the structural integrity of support structures done by others. The customer is responsible to ensure a qualified structural engineer approves the structure and any additional hardware.

2.1 Mechanical Installation Overview

Because every installation site is unique, Daktronics has no single procedure for mounting Galaxy® displays. This section contains general information only and may or may not be appropriate for your particular installation.

A qualified installer must make all decisions regarding the mounting of this display.

Read both the mechanical and electrical installation sections of this manual before beginning any installation procedures.

2.2 Support Structure Design

Support structure design depends on the mounting methods, display size and weight. Since the structure design is critical, only a qualified individual should mount the display. Display height and wind loading are also critical factors. It is the customer's responsibility to ensure that the structure and mounting hardware are adequate. **Daktronics is not responsible for the installations or the structural integrity of support structures done by others.**

The installer is responsible to ensure the mounting structure and hardware are capable of supporting the display and agrees with local codes.

Before beginning the installation process, verify the following:

- The mounting structure provides a straight and square frame for the display.
- The mounting structure supports the display without yielding at any unsupported points after mounting.
- Clearance: 3 " of unobstructed space is available below the display for ventilation. 1¼" of unobstructed space is available above the top of the display.

Correct any deficiencies before installation.

2.3 Ventilation Requirements

Reference Drawings:

Shop Drawings .....**Refer to Appendix A**

Fans mounted in the backsheets toward the top of the display allow for ventilation. Maintain a minimum distance of 3" (7.62 cm) below the display to maintain proper airflow. Refer to the appropriate S**hop Drawing** for additional information.

If the display cabinet is completely enclosed:

- Provide 6 square inches of unobstructed opening per module to ensure adequate cooling.
- Make allowances to compensate for the percentage of material covering the openings in the structure.
- For adequate cooling, the cabinet may require forced ventilation. If the enclosed cabinet must use forced ventilation, it must ventilate at a rate of 10 cubic feet per minute per module (28" x 28" active area).

Failure to comply with these requirements voids the Galaxy® display warranty.

2.4 Lifting the Display

The top of the display has eyebolts to lift the unit. Do not exceed the rated load of the eyebolts. Refer to the information at the end of this section labeled **Eyebolts** to determine the allowable load of the eyebolts shipped with the display.

Figure 7 illustrates both the correct (left example) and the incorrect (right example) method of lifting a display. Lift the display as shown on the left, with the lifting bar. **Use every lifting point provided.**

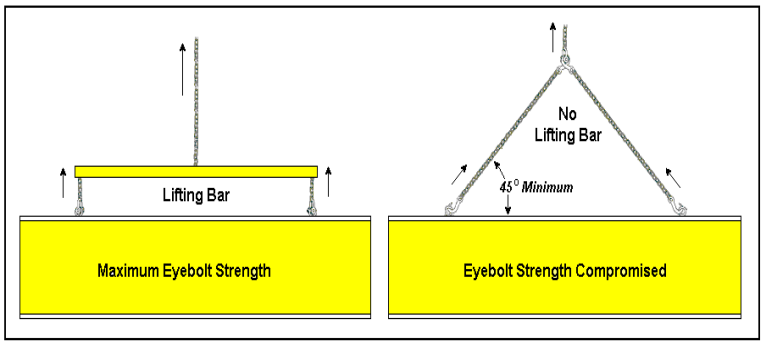


Figure 7: *Lifting the Display (left; correct) and (right; incorrect)*

Do not attempt to permanently support the display by the eyebolts.

If you remove the eyebolts, adequately seal the holes using 13 bolts and sealing washers, ½ inch in size. Silicone along the threads to ensure water does not enter the display.

2.5 Display Mounting

Reference Drawings:

Assy, Grounding and Fan Harness ..... **Drawing A-175194**
Schematic, AF-3400-(8-48x32x***)-89-Mono ..... **Drawing A-177829**
Block Diag, Pwr, AF-3400-(8-48X32-112)-M-*-* ..... **Drawing B-175203**
Shop Drawings ..... **Refer to Appendix A**

The method used to mount displays varies greatly from location to location. For this reason the manual covers only general mounting topics.

The installer is responsible to ensure the installation will adequately meet local codes and standards. The installer is also responsible for the mounting method and hardware.

Before beginning the installation process, verify the following items:

- The mounting structure will provide a straight and square frame for the display. Height variation in any four-foot horizontal section may **not** exceed ¼- inch.
- The mounting structure will not give way at any unsupported points after the display is mounted.

The back of the display uses 3x2x$^{3}/_{8}$" steel clip angles at the locations shown in the **Shop Drawings**. These angles assist in mounting the display. Remember to have **all** mounted displays inspected by a qualified structural engineer.

The customer **must** have a qualified structural engineer review the number of attachment points needed and the wall structure to ensure both meet all national and local codes. Daktronics recommends using all clip angles as attachment points.

1. Carefully uncrate the sign. Look over each side of the display for possible damage caused during shipping.
2. Following the guidelines described in **Section 2.4**, lift the display into position on the support structure using all provided eyebolts.
3. Weld or use ½" Grade-5 bolts and hardware to secure the clip angles to the support structure as shown in **Top View** in the **Shop Drawing** for your display size. Refer to **Section 3** for information on routing power and signal.
4. **(For Sectional Displays Only):** Remove lift eyes from the bottom section. Using all lift eyes provided, lift the top section over the bottom section. Align the holes as required for 5/8" hardware. Secure sections using 5/8" hardware, as shown in the **Shop Drawings**. Connect power and signal per **Drawings A-175194**, **A-177829**, and **B-175203**. Display is then ready for installation.
5. Upon completing the installation, carefully inspect the display for any holes that may allow water to seep into the display. Seal any openings with silicone. If you remove the eyebolts on the top of the sign, plug the holes with bolts and the rubber sealing washers that you removed with the eyebolts. Silicone the threads on the bolts.

2.6 Optional Temperature Sensor

If you have an optional temperature sensor to be used with your display, see **Appendix C** for mounting and signal connections.

Section 3: Electrical Installation

Only a qualified individual should terminate power and signal cable within this Daktronics display.

The Daktronics engineering staff must approve **any** changes made to the display. Before altering the display, submit detailed drawings for the proposed modifications to the Daktronics engineering staff for evaluation and approval or you will render the warranty null and void.

3.1 Common Connectors in the Display

The power and signal connections in the displays use many different types of connectors. Take special care when disengaging any connector so as not to damage the connector, the cable or the circuit board. When pulling a connector plug from a jack, **do not** pull on the wire or cable; pull on the jack itself. Pulling on the wires may damage the connector.

The following information presents some common connectors encountered during display installation and maintenance.

1. **Ribbon Cable Connectors:**
   Figure 8 illustrates a typical ribbon connector. To disconnect the ribbon cable, push the plastic clips on the sides to unlock and remove the jack.

   Before replacing a ribbon cable connector, spray it with DeoxIT™ contact cleaner to remove any foreign matter that may cause signal problems. In addition, apply a generous amount of CaiLube™ protector paste to the plug before inserting it into the jack. This paste protects both the plug and the jack from corrosion.

2. **Termination Blocks:**
   Termination blocks, as shown in **Figure 9**, connect internal power and signal wires to wires of the same type coming into the display from an external source. Most signal wires come with forked connectors crimped to the ends of the wire. Power wires need to have one-half inch of insulation stripped from the end of the wire prior to termination. Tighten all screws firmly to ensure a good electrical connection.

3. **Phoenix™-Style Connectors:**
   Phoenix-style connectors, usually green, allow for signal termination on circuit boards. Refer to **Figure 10**. Strip one-quarter inch of insulation from the wire prior to termination. To remove a wire, turn the above screw counter-clockwise to loosen the connectors grip on the wire. To insert a wire, push the bare wire into the connector and turn the above screw clockwise to lock the wire into place.

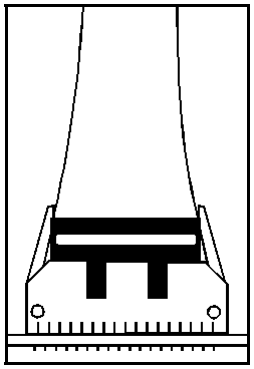


Figure 8: *Ribbon Cable Connector*

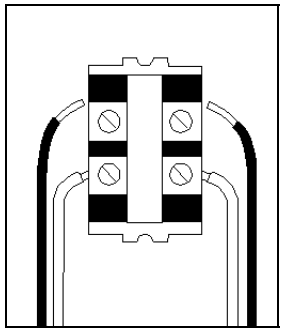


Figure 9: *Termination Block*

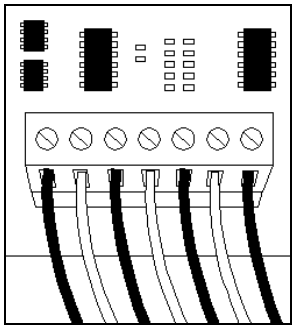


Figure 10: *Phoenix Connector*

4. **Mate-n-Lok™ Connectors:**
The white Mate-n-Lok connectors found in the displays come in a variety of sizes. **Figure 11** illustrates a five-pin Mate-n-Lok connector. To remove the plug from the jack, squeeze the plastic locking clasps on the side of the plug and pull it from the jack.

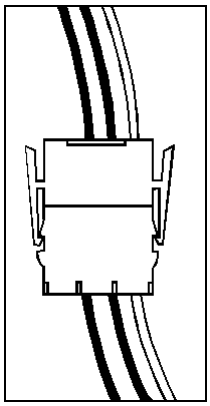


Figure 11: *Mate-N-Lok Connector*

5. **Fiber Optic Connectors:**
A fiber optic cable has a "twist-on" connector at each end. To remove the fiber plug, push it toward the board and twist it counter-clockwise until you can pull the plug from the jack. **Figure 12** shows this connector.

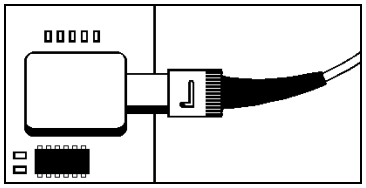


Figure 12: *Fiber Optic Cable*

6. **RJ11/RJ45 Connectors:**
RJ connectors, as seen in **Figure 13**, are similar to the telephone and LAN connectors found in homes and businesses. In order to remove this plug from the jack, depress the small clip on the underside of the plug.

Before replacing an RJ connector, spray it with DeoxIT™ contact cleaner to remove any foreign matter that may cause signal problems. In addition, apply a generous amount of CaiLube™ protector paste to the plug before inserting it into the jack. This paste will protect both the plug and the jack from corrosion.

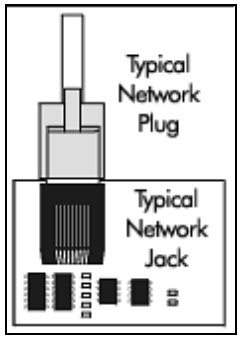


Figure 13: *RJ45 Connector*

7. **Quick Connect Jack:**
The display uses quick connect jacks for the connection of the signal termination enclosure, and the temperature sensor. There are three input and one output quick connect jacks located on the back of the primary display, and when not used the attached dust cover should be kept closed.

To attach the cable to a jack, make sure to line up the plug to match the jack, push the plug in, then turn the outer collar to lock in place. **Figure 14** illustrates the 6-pin quick connect jack.

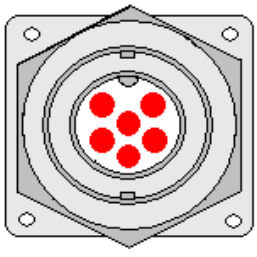


Figure 14: *RS232/6-pin Quick Connect Jack*

3.2 Signal Termination Enclosures

In each communication method, the final connection will be from a provided weather resistant enclosure to the display. For signal termination to the enclosure, see the manual included in the box with the enclosure.

Note the following information when mounting the enclosure:

1. Be sure to mount the enclosure with the cables exiting from the bottom as to prevent water from entering into the enclosure.
2. Mount the enclosure securely and, if possible, at a height or location inaccessible to vandalism
3. A quick connect cable will be connected to the signal termination enclosure and will terminate to the back of the primary display – the length of the cable is 25 feet.
4. The quick connect cable can be run from the enclosure though 2" conduit or through the display pole to the sign, but is no required – the cable is weather and sunlight resistant.

   Note: Daktronics engineers strongly recommend that the quick connect cable be secured to protect it from weather or vandalism.

5. Earth ground enclosures that use wire signal cable – the resistance to ground should be 10 ohms or less (a grounding electrode conductor is attached to the enclosure to make the necessary earth ground connection)

3.3 Conduit

Reference Drawings:

Shop Drawings..... **Refer to Appendix A**

Daktronics does not include the conduit. Refer to the **Shop Drawing** for your display size for approximate locations of power and signal conduit. You must use separate conduit to route:

- Power
- Signal IN wires
- Signal OUT wires (if another sign requires signal)

Locate the conduit holes at the bottom right (rear view) of the display (refer to the **Shop Drawing** for your display.)

Punch or drill out the desired conduit openings. Be careful not to damage **any** internal components. Attach the conduit, and then route the power and signal cables.

For displays with more than one face, signal and temperature sensor wiring between displays can be routed through the same conduit.

3.4 Preparing for Power/Signal Connection

Reference Drawings:

Shop Drawings .....**Refer to Appendix A**

If the display needs openings for the power and signal, punch out the knockouts in the lower right corner from the rear. Refer to the **Shop Drawing** for your display.

Figure 15: *Opening the Display for Power and Signal*

1. With a 7/32" nutdriver, apply pressure to latch and turn it a quarter-turn counter-clockwise. The module door will swing open to the left.
2. Route power to the display through a fused disconnect switch capable of opening all ungrounded power conductors. Locate this disconnect within the line of sight of any personnel performing maintenance on the display. If the disconnect is located out of sight of the display, it must be capable of being locked in the open position.
3. Power conductors from the disconnect to the display must route through conduit in agreement with local codes.
4. You may also route the signal cable from the control computer to the display at this time. **Be sure to run the power and signal cables in separate conduit.**

3.5 Power

Reference Drawings:

Layout, Pnl Bd, (8-48x32-112)-89mm, 1 Phase..... **Drawing A-175209**
Layout, Pnl Bd,(8-48x32-112)-89mm, 3 Phase..... **Drawing A-175212**
Schematic, AF-3400-(8-48X32-112)-89-Mono-*-*..... **Drawing A-177829**
Power Spec, AF-3400-(8-48X32-112)-89-A-*-*..... **Drawing A-178168**
Power Spec, AF-3400-(8-48X32-112)-89-R-*-*..... **Drawing A-178240**
Power Spec, AF-3400-(8-48X32-112)-89-RGB-*-* ..... **Drawing A-183906**

Refer to **Drawings A-178168, A-178240,** and **A-183906** for voltage and current requirements for your display size. Each uses a 120/240VAC single-phase or 120/208 three-phase power source.

Do **not** connect the displays to any voltage other than that listed on the Daktronics product label.

Proper power installation is imperative for proper display operation. The following sub-sections give details of display power installation. Electrical installations must be performed by qualified personnel. Unqualified personnel should not attempt to install the electrical equipment. Serious danger to equipment and personnel could occur if equipment is improperly installed.

Grounding

This sign is intended to be installed with the requirements of Article 600 of the National Electrical Code and/or other applicable local codes. This includes proper grounding and bonding of the sign.

Displays **must** be grounded according to the provisions outlined in Article 250 of the National Electrical Code®. Daktronics requires a resistance to ground of 10 ohms or less. Verification of ground resistance can be performed by the electrical contractor who is performing the electrical installation. Daktronics Sales and Service personnel can also perform this service

The display system **must** be connected to earth-ground. Proper grounding is necessary for reliable equipment operation. It also protects the equipment from damaging electrical disturbances and lightning. **The display must be properly grounded or the warranty will be void.**

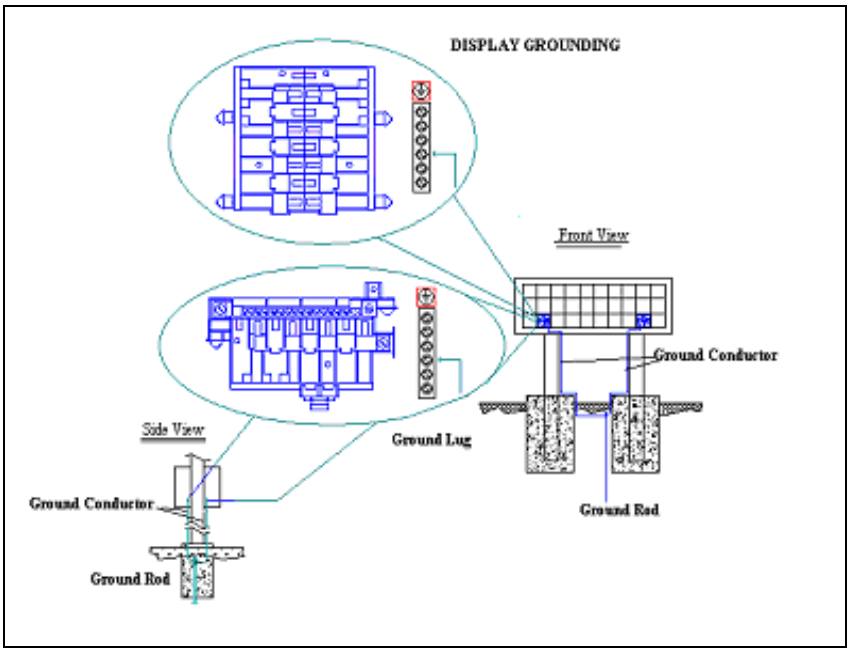


Figure 16: *Display Grounding*

A minimum of one grounding electrode must be installed for each display face. The grounding electrode is typically one grounding rod for each display face. Other grounding electrodes as described in Article 250 of the National Electric Code may be used. Daktronics requires that the resistance to ground be 10 ohms or less. If the resistance to ground is higher than 10 ohms, it will be necessary to install additional grounding electrodes to reduce the resistance. The grounding electrode should be installed within 25 feet of the base of the display. The grounding electrode must be connected to the ground terminal in the display panel board.

This grounding electrode must be installed in addition to the equipment-grounding conductor that should be part of the power installation. The material of an earth-ground electrode differs from region to region and from conditions present at the site. The support structure of the display cannot be used as an earth ground electrode. The support is generally embedded in concrete, and if in earth, the steel is either primed or it corrodes, making it a poor ground.

Power Installation

There are two considerations for power installation: installation with ground and neutral conductors provided and installation with only a neutral conductor provided. For these displays, installation with ground and neutral conductors provided is used.

Installation with Ground and Neutral Conductors Provided

For this type of installation, the power cable **must** contain an isolated earth-ground conductor. Under this circumstance, **do not** connect neutral to ground at the disconnect or at the display. This would violate electrical codes and void the warranty. Use a disconnect so that all hot lines and neutral can be disconnected. The National Electrical Code requires the use of a lockable power disconnect within sight of or at the display.

Main Disconnect

The National Electrical Code requires the use of a lockable power disconnect near the display. Provide a lockable disconnect switch (knife switch) at the display location so that all power lines can be completely disconnected. Use a 3-conductor disconnect to disconnect both hot lines and the neutral. Mount the main disconnect at or near the point of power supply connection to the display. Provide a main disconnect for each supply circuit to the display.

You must locate the means of disconnection in a direct line-of-sight from the display or outline lighting that it controls. This requirement provides protection by enabling a worker to keep the disconnecting means within view while working on the display.

Exception: You may locate the disconnecting means that are capable of being locked in the open position elsewhere.

3.6 Signal Termination from Computer to Sign

The 89mm AF-3200/3400 display is designed for quicker signal and power connection to the display and between displays.

- The signal will terminate to watertight enclosure, which connects to the primary display using a quick connect cable.
- Mounting the temperature sensor to the display structure at least one foot away from the display is preferred – terminate it to the primary display with a quick connect cable (**DO NOT** mount the temperature sensor between displays, or anywhere the airflow is restricted)

A separate manual is provided for explaining the connection to the signal termination enclosure. There are seven different methods of communication; your manual will be one of these types:

Communication Type	Communication Manual ED#
RS232	ED-14739
RS422	ED-14742
Fiber	ED-14743
Radio	ED-13932
Modem	ED-14744
Ethernet	ED-14745
Fiber Ethernet	ED-14746

If two (or more) primary displays are used, a 4-conductor shielded signal cable must be used to connect between the display controllers. Strip 1/4" from the cable wires and connect it at the “RS422 OUT” 6-position controller board terminal block (TB3) in the first display, and terminate it to the “RS422 IN” 6-position controller board terminal block (TB2) on the second display.

Note: If a temperature sensor is also used, a separate cable must also be used to connect between controllers. **Appendix C** explains the connections for a temperature sensor.

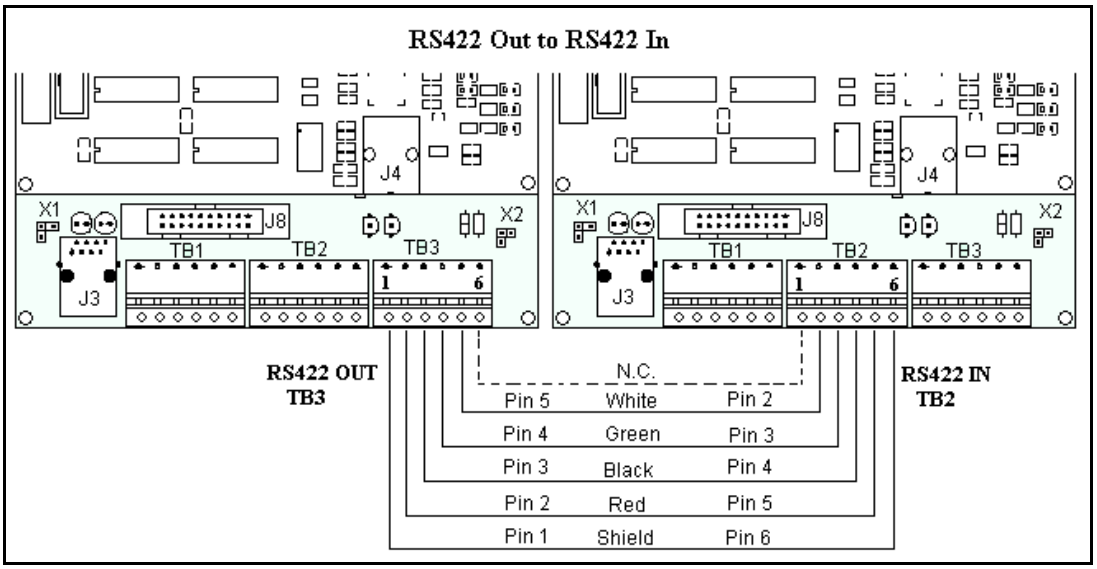


Figure 17: *RS422 Interconnection*

RS422 Interconnection

Face A RS422 Out (TB3)	Field Cabling	Face B RS422 IN (TB2)
Pin 1 (GND)	Shield	Pin 6 (GND)
Pin 2 (D2OUT-N)	Red	Pin 5 (D1IN-N)
Pin 3 (D2OUT-P)	Black	Pin 4 (D1IN-P)
Pin 4 (D2IN-N)	Green	Pin 3 (D1OUT-N)
Pin 5 (D2IN-P)	White	Pin 2 (D1OUT-P)
Pin 6 (Shield)		Pin 1 (Shield)

Note: When not using the quick connect interconnect cable; cabling must be in conduit between displays.

3.7 Optional Temperature Sensor

If you have an optional temperature sensor to be used with your display, see **Appendix C** for mounting and signal connections.

3.8 First Time Operation

Each time the display is powered up; the display will run through an initialization in which it will display the following:

1. Product Name (Galaxy®)
2. Display Size (Row x Column)
3. Shading (64 Mono)
4. Bootloader Version (OS X.XX)
5. Firmware Number **(ED13305)**
6. Firmware Revision (Rev X.XX)
7. Hardware Address (HW:XX)
8. Software Address (SW:XX)
9. IP Address: ((default) 172.16.192.25)
10. Subnet Msk: ((default) Msk: 255.255.0.0)
11. COM1 Configuration (C1:V15) ((Modem C1:V15) If a Modem is present)
12. COM 2 Configuration (C2:RTD)
13. Socket 3001: (IP 3001: V15)
14. Socket 3002: (IP 3002: RTD)
15. Line Frequency (CLK: AUTO 60 Hz)
16. Display Name Description (Galaxy Row x Column)

After this sequence is complete, the display will blank. A single pixel will flash in the lower right hand corner of the display to show that the display has power, but no messages are currently running.

Section 4: Maintenance and Troubleshooting

Important Notes:

1. **Disconnect power before performing any repairs or maintenance work on the sign!**
2. **Only qualified service personnel may access internal sign electronics.**
3. **The Daktronics engineering staff must approve ANY changes made to the sign. Before altering the sign, you must submit to the Daktronics engineering staff detailed drawings for the proposed modifications for evaluation and approval or you will void the warranty.**

4.1 Maintenance and Troubleshooting Overview

Daktronics Galaxy® series AF-3200/3400 89mm signs are front accessible, meaning you can access the internal components from the front of the sign.

This section provides the following Galaxy® sign information:

- **Recommended Tools List** provides a listing of all tools needed in order to perform maintenance work on your display
- **Signal Routing Summaries** give a basic explanation of how the signal travels through the sign.
- **Power Routing Summaries** show a basic explanation of how the power travels through the sign.
- **Service and Diagnostics** offer instructions for removing various sign components and explains the functions of circuit board connectors and the meanings of any diagnostic LEDs.
- **Maintenance** lists a number of steps to take to keep this Galaxy® sign in safe, working order.
- **Troubleshooting** presents some possible sign malfunctions and provides a number of possible causes for that malfunction.
- **Replacement Parts List** includes the part description and number of sign components that could possibly need replacing during the life of this sign.
- **Daktronics Exchange and Repair and Return Programs** explain the Daktronics component return policy.

4.2 Display Access

Display access for 89mm displays is normally from the front. To open the sign:

1. Locate the latch access fastener on the module. It is centered on the right side of the module.
2. With a #2 screwdriver, apply pressure to latch and turn it counter-clockwise. The module door will swing open to the left.
3. Interior display components may be accessed and the pixel strips may be removed.

Figure 18: *Opening the Display*

When closing a display, reverse the previous steps and take note of the following points:

- The weather-stripping on the back edge of the module is intact and in good condition for preventing water from seeping into the sign.
- The module latches are fully engaged to create a water resistant seal around the edge of the module. The module **must** be firmly seated against the sign when the latches are fully engaged.

4.3 Signal Summary

Reference Drawings:

Schematic, AF-3400-(8-48X32-112)-89-Mono-*-*..... **Drawing A-177829**

The signal routing for the display can be summarized as follows:

1. Data from the controller computer, which runs Venus® 1500 software, travels via RS232, RS422, modem, fiber optic cable, radio, or Ethernet signal into the display.
2. From the controller, the signal then travels over a 20-conductor ribbon cables from the controller (J11 through J16 provides signal out) to J2 on the driver of the first column of modules in the display.
3. Data exists at J1 and is relayed to J2 of the next driver board and so on, traveling down the entire row of modules.
4. For multiple face display or a display network, an RS422 (most typical) or fiber cable relays signal between the controller of the first display and the controller in the second display.

   Note: The RS422 interconnection is not allowed when the input to the first display is Ethernet.

5. Refer to **Drawing A-177829** and **Figure 19** for further information. The drivers use this display data to control the LEDs.

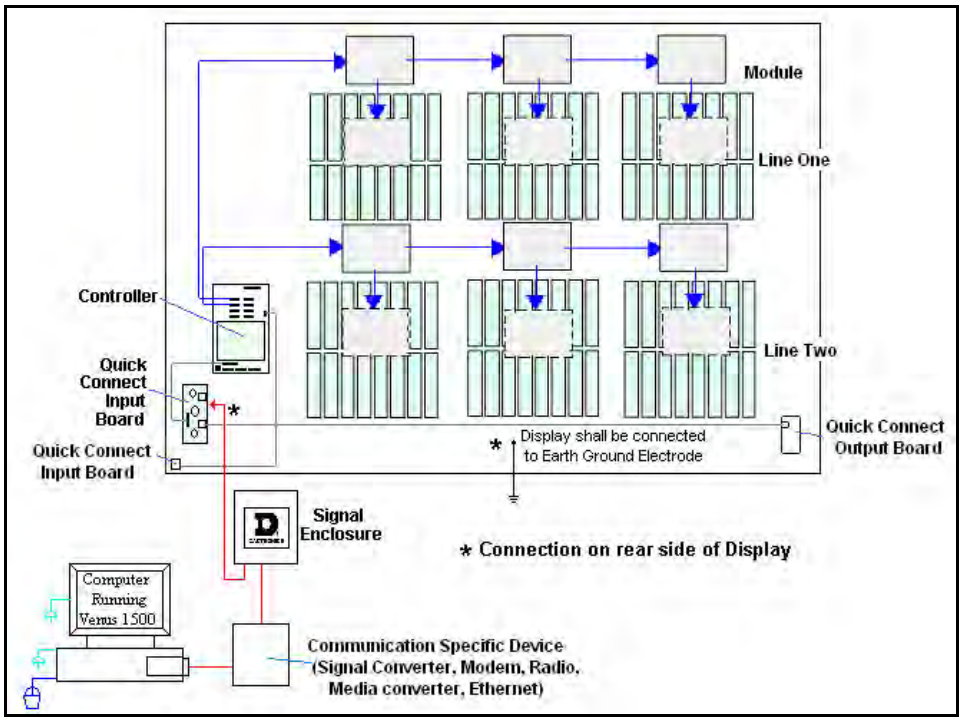


Figure 19: *AF-3190 Signal Flow Diagram*

4.4 Power Summary

Reference Drawings:

Schematic; Power Supply Configurations..... **Drawing A-158225**
Schematic, AF-3400-(8-48X32-112)-89-Mono-*-* ..... **Drawing A-177829**
Schematic; Power Supply Assembly ..... **Drawing A-184245**

The following describes the internal display power routing for the display:

1. Incoming power terminates at the panel board.
2. 120 VAC power is then relayed to the power supplies in the display, which convert the power to DC voltage.
3. +12VDC power supplies power the modules in a monochrome red display and +14.7VDC power supplies power the modules in a monochrome amber and the RGB displays. Refer to **Drawings A-158225**, **A-184245** and **A-177829** for power supply wiring information.
4. Power is also sent to the fans, which cool the display and the transformer that provides power to the controller.

4.5 Recommended Tools List

When performing maintenance work on your display, Daktronics recommends using the following tools and placing them in a convenient, easy-access location.

- **7/32" Nut Driver** to open the modules in front access displays
- **3/16" Nut Driver** to remove screws from the control boards.
- **7/16" Wrench** removes support hardware from power supplies
- **#2 Phillips Screwdriver** removes support hardware from power supplies and detaches power supplies

4.6 Service and Diagnostics

Reference Drawings:
Component Layout, AF-3190-**X***- 89mm ..... **Drawing B-181666**

The following sub-sections address servicing of the below display components:

- Line filter and ground bar
- Modules, drivers, and power supplies

The sub-sections also address any diagnostic LEDs, fuses and signal/power connectors found on the components.
Drawing B-181666 denotes the components as follows:

Component…	Denoted As…	Location…
Line Filters and Ground Bar	0A-1259-4003	Left side, behind module AX02
Modules	0A-1259-3104 or 0A-1259-3105	Over entire face of the display
Power Supplies	0A-1259-4402 0A-1259-4405 0A-1259-4410	Behind the modules; refer to **Drawing B-181666**

4.7 Line Filter

Reference Drawings:
Z Filter Assy, 2 W/Grnd Bar..... **Drawing A-158472**
Schematic, AF-3400-(8-48X32-112)-89-Mono-*-*..... **Drawing A-177829**

You can replace the line filter by first labeling and removing all connecting wires, and then releasing the attachment hardware. Refer to **Drawing A-158472**. Install the new filter and reference **Drawing A-177829** for correct wiring.

4.8 Modules, Pixel Strips and Drivers

Reference Drawing:
Driver Assy; AF-3190-8x8-89mm-Mono..... **Drawing A-178210**
Module Panel, AF-3190-8x*-89mm-Amber ..... **Drawing B-178218**
Module Panel, AF-3190-8x8-89mm, Red..... **Drawing B-178220**

A module consists of louvers, 16 pixel strips per module, and a driver board mounted to the back. Refer to **Section 4.2** to open a display and access the modules, pixel strips, and driver boards. Refer to **Drawings B-178218** and **B-178220** for module assembly.

A pixel strip is a circuit board with four LED pixel clusters mounted directly on it. Each pixel strip is removable from the module. To remove a pixel strip from the module:

1. Open the display as described in **Section 4.2**
2. Disconnect the power and signal connector from the strip you wish to replace.

3. If the pixel strip you wish to replace is located behind the driver assembly, label and unplug all signals and power connections on the driver assembly and remove the four corner screws. Refer to **Drawing A-178210**.
4. Remove the six wing nuts holding the pixel strip in place.
5. Gently lift the strip from the display.
6. Reverse the above procedure to install a new pixel strip.

The driver is a circuit board responsible for switching the intensity levels of the LEDs. It is located inside the driver box and mounts on the back of the module. To remove a driver board:

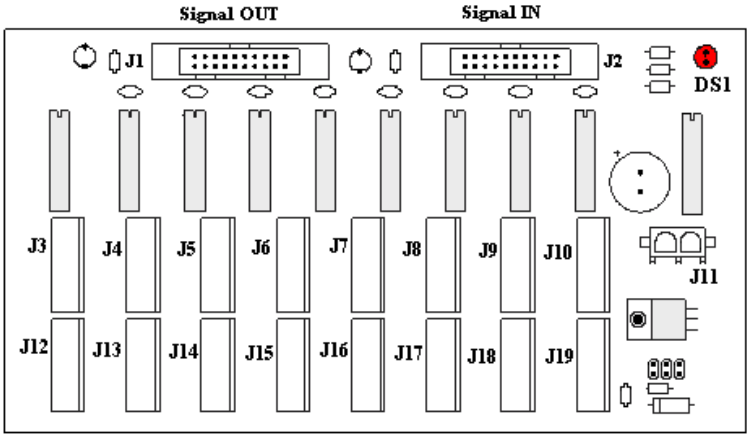


Figure 20: *Driver Board*

1. Open the display as described in **Section 4.2**
2. Loosen the two #10 screws holding the driver cover in place.
3. Lift the cover off from the assembly. Refer to **Drawing A-178210**.
4. Label and disconnect all power and signal connections from the driver board.
5. Remove the four #6 nuts holding the board in place.
6. Gently lift the board from the display.
7. Reverse the above procedure to install a new driver board.

The following connectors are found on each driver board; refer to **Figure 20**:

LED/Connector	Function
J1	Signal out to next driver board
J2	Signal in
J3-J10, J12-J19	Output to pixel strips
J11	Power
DS1	Power indicator

The connectors out to the pixel strips connect to the pixel strips in the following manner:

Connector	Pixel Strip Coordinates	Connector	Pixel Strip Coordinates
J3	Top Row, Column 8	J12	Bottom Row, Column 8
J4	Top Row, Column 7	J13	Bottom Row, Column 7
J5	Top Row, Column 6	J14	Bottom Row, Column 6
J6	Top Row, Column 5	J15	Bottom Row, Column 5
J7	Top Row, Column 4	J16	Bottom Row, Column 4
J8	Top Row, Column 3	J17	Bottom Row, Column 3
J9	Top Row, Column 2	J18	Bottom Row, Column 2
J10	Top Row, Column 1	J19	Bottom Row, Column 1

4.9 Controller

Reference Drawings:

Controller, Galaxy, 8-conn, J1087..... **Drawing B-177838**

The controller sends data to the modules. Refer to the signal summary in **Section 4.3** for more information and to the component location drawings for the position of the controller board. **Figure 21** and **Drawing B-177838** illustrate a typical controller.

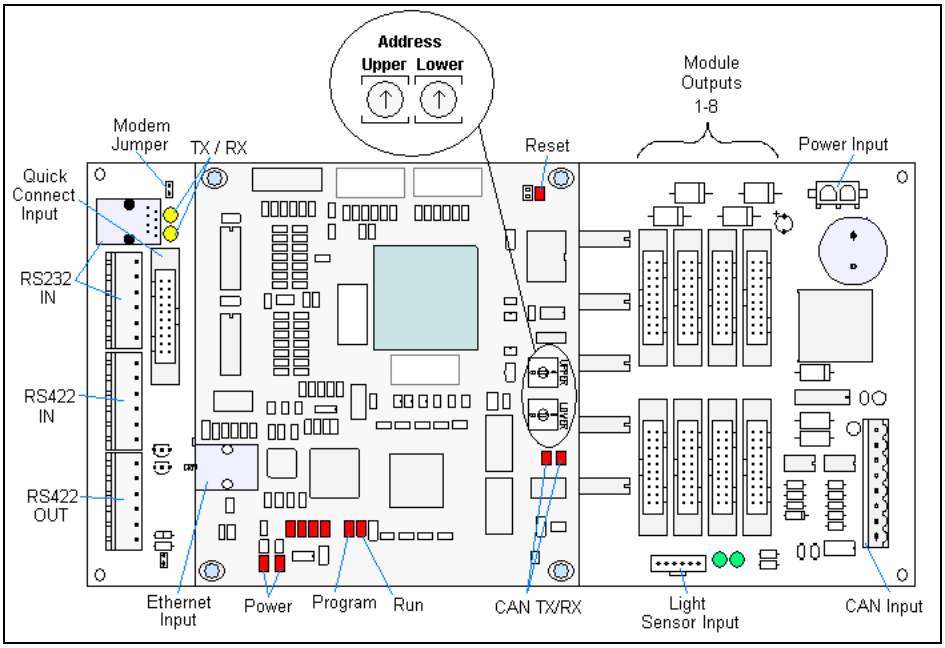


Figure 21: *Controller*

Complete the following steps to remove the controller from the display:

1. Disconnect power from J5.
2. Remove all power and signal connections from the board. “Locked” connectors are released by pushing apart the latches, and then carefully pulling them from the jack. When replacing the board, it is helpful to have the cables labeled for easier replacement.
3. Remove each of the six screws holding the board in place with a 3/16” nut driver.

4. Follow the previous steps in reverse order to install a new controller board.

The rotary switches set the hardware address, which the software uses to identify that particular display. When replacing a controller board, be sure to set the rotary switches in the same address configuration as the defective controller. Each controller in a network needs a unique address.

The rotary switches follow a standard hexadecimal code. The table shows several common addresses.

Note: Test mode is activated by setting the rotary switches to address 0 (set the switches to 0 by rotating them counter clockwise until the arrow points to 0). The controller's power must be turned off and then turned back on to run the test mode.

Controller Address Settings					
Address	**Upper**	**Lower**	**Address**	**Upper**	**Lower**
Test Mode	0	0	10	0	A
1	0	1	11	0	B
2	0	2	12	0	C
3	0	3	13	0	D
4	0	4	14	0	E
5	0	5	15	0	F
6	0	6	16	1	0
7	0	7	17	1	1
8	0	8	…	…	…
9	0	9	240	F	0

Diagnostic LEDs are located on the controller; the table below shows what each LED denotes:

CPU			
LED	**Color**	**Function**	**Operation**
DS1	Red	CAN TxD	Flashes when controller is transmitting CAN information.
DS2	Red	CAN RxD	Flashes when controller is receiving CAN information.
DS3	Red	System Reset	Off when controller is functioning properly. Flashes at 1.5-second rate if the watchdog timer is not being reset by controller.
DS4	Red	Run	A steady flash indicates the controller is running properly. Normal flash rate is about once per second.
DS5	Red	U15 Programmed	On when U15 contains a valid logic program.
DS7	Red	Link	On when Ethernet interface is in the link-up condition. Flashes when the Ethernet chip detects, transmits, or receives activity.
DS8	Red	Speed	On when the Ethernet interface is at 100Mbps. Off when the Ethernet interface is 10Mbps.
DS9	Red	Duplex	On when the Ethernet interface is at full duplex. Off when the Ethernet interface detects a collision in half-duplex.
DS10	Red	Collision	Flashes when the Ethernet interface detects a collision in half-duplex.

DS12	Red	+2.5V	On when +2.5V power supply is functioning.
DS13	Red	+3.3V	On when +3.3V power supply is functioning.
Product Board			
DS1	Green	+5V	On when +5V power supply is functioning.
DS2	Green	+3.3V	On when +3.3V power supply is functioning.
DS3	Yellow	COM1 TxD	Flashes when transmitting serial information.
DS4	Yellow	COM1 RxD	Flashes when receiving serial information.
DS5	Yellow	Light	Flashes when transmitting serial information
DS6	Yellow	Com2 RX2	Flashes when receiving serial information.
Temperature/Light Sensor			
DS1	Green	+5V	On when +5V power supply is functioning.
DS2	Red	Run	A steady flash indicates the controller is running correctly. Normal flash rate is about once a second. Flashes faster when the sensor is transmitting temperature or light information.

The terminating jumper is located on the quick connect board on the inside of the display. Most displays have both an input and an output quick connect board. When no output board is available, the terminating jumper will be placed on the input board of the last display.

4.10 Power Supplies

Reference Drawings:

Schematic; Power Supply Configurations ..... **Drawing A-158225**
Schematic; Power Supply Assembly..... **Drawing A-184245**

The LED power supplies are identified as assemblies 0A-1259-4402 for amber displays and 0A-1259-4405 for red displays. Each power supply controls two modules. Refer to **Drawing A-158225** or **Drawing A-184245** for power supply wiring.

Complete the following steps to remove a power supply from the sign:

1. Open the module directly in front of the failed power supply.
2. Label and disconnect all the wires connected to the power supply.
3. Remove the hardware holding the power supply in place to free the unit.
4. Follow these steps in reverse order to install a new power supply.
5. Verify power supply voltage.

4.11 Ventilation Systems

Check ventilation fans after 1,500 hours of operation and every 1,500 hours after that to ensure the display cools properly. Check fans more often if the display is located in a dusty or harsh weather environment (i.e. along a gravel road with dust laden air).

- 1,500 hours is equivalent to 83 days if the display operates for 18 hours a day with the power to the display disconnected when not in use.
- 1,500 hours is equivalent to 62 days if the display runs non-stop for 24 hours a day.

Attention: Shut off power to the display when it is not in use. Leaving the power on when the display is not operating exposes electrical components to excess condensation, which shortens their life.

Each time you open the display, for whatever reason, take a minute to inspect the fans:

- Check the fan blades for dirt and debris. If the fan blades have a large accumulation of dirt and debris, change the filters more often. Keep the fan blades clean to maintain fan efficiency and ensure proper cooling.
- Spin the fan blades with a pen or pencil to ensure that the bearings are free and the fan is still in balance.

To check the operation of the fans:

- Hold your hand or a piece of light paper beneath the fan to detect air movement. If the operation of a fan is questionable, a fan-test should be performed
- Press button on the internal thermostat and ensure they run freely.
- If the fan does not turn or does not operate smoothly, replace it.

4.12 Thermostats

Reference Drawing:
Component Layout, AF-3190-**X***-89mm ..... **Drawing B-181666**

A thermostat controls when the ventilation fans operate in the display. Refer to **Drawing B-181666** for the location of the thermostat. The ventilation fans turn on when the inside of the fan reaches 85° F (29° C), and turn off at 70° F (21° C).

4.13 Sign Maintenance

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

- **Loose Hardware**
  Verify fasteners, such as bolts and rivets, have not come loose. Check, tighten, and replace fasteners as required.

- **Excessive Dust Buildup**
  Occasionally it may be necessary to vacuum the inside of the display cabinet to remove dust/dirt buildup that may interfere with airflow.

- **Water Intrusion – Water Stain Marks**
  Water can enter the display where weather stripping has come loose or deteriorated or where fasteners have come loose allowing gaps in the panels or where moisture may be entering around hardware. Check electronic components for signs of corrosion.

- **Corrosion**
  Check the paint; look for possible corrosion, especially at footings, structural tie points and ground rods.

If you notice any of the above conditions, take action to correct the situation.

4.14 Weather Stripping

To ensure the display is weather resistant, Daktronics provides weather stripping around the entire display and around each module. The weather stripping must be properly installed at all times or water may leak into the display, damaging the components.

4.15 Troubleshooting

This sub-section contains some symptoms that you may encounter in the displays. This list does not include every possible symptom, but does represent common situations that may occur.

Symptom/Condition	Possible Cause/Remedy
One or more LEDs on a single module fail to light.	• Replace/check cables on the module. • Replace pixel strip • Replace the driver.
One or more LEDs on a single module fail to turn off.	• Replace/check cables on module. • Replace pixel strip • Replace the driver.
A section of the sign is not working. The section extends all the way to the right side of the sign.	• Replace/check the ribbon cables. • Check power to the modules. • Replace the first driver on the left side of the first module that is not working. • Replace the second driver that is not working. • Replace the power supply assembly to the first module that is not working.
One row of modules does not work or is garbled.	• Replace/check the ribbon cables. • Replace first driver. • Replace controller. • Check the fuses in the power termination box.
A group of modules, which share the same power supply assembly, fail to work.	• Check power supply voltage. • Check the power supply cables. • Replace the power supply assembly.
Entire sign fails to work.	• Check for proper line voltage into the power termination panel. • Check the fuse in the power termination panel. • Check/replace the ribbon cable from the controller to the driver. • Check the voltage settings on the power supplies. • Verify proper use of the software in the operation manual. • Replace the controller. • (For direct displays) Check the signal cable to the display by doing a loopback test.
Temperature always reads –196 degrees	• Check temperature sensor connections. • Replace the temperature sensor. • Replace the controller.
Sign is stuck on bright or dim.	• Check Manual/Auto dimming in Venus 1500 software. • Check light detector cable.

Sign is stuck on bright or dim	• Check light detector for obstructions. • Replace the light detector. • Replace the controller.

4.16 Initial Operation Information

Every time the display is operated, the display will run through an initialization in which it will display the following:

1. Product Name (Galaxy®)
2. Display Size (Row x Column)
3. Shading (64 Mono)
4. Bootloader Version (OS X.XX)
5. Firmware Number **(ED13305)**
6. Firmware Revision (Rev X.XX)
7. Hardware Address (HW:XX)
8. Software Address (SW:XX)
9. IP Address: ((default) 172.16.192.25)
10. Subnet Msk: ((default) Msk: 255.255.0.0)
11. COM1 Configuration (C1:V15) ((Modem C1:V15) If a Modem is present)
12. COM 2 Configuration (C2:RTD)
13. Socket 3001: (IP 3001: V15)
14. Socket 3002: (IP 3002: RTD)
15. Line Frequency (CLK: AUTO 60 Hz)
16. Display Name Description (Galaxy Row x Column)

After this sequence is complete, the display will blank. A single pixel will flash in the lower right hand corner of the display to show that the display has power, but no messages are currently running.

4.17 Replacement Parts List

The following table contains some of the items in this sign that you may need to replace over time. Many of the parts within the sign also list their part numbers on labels affixed to them.

To prevent theft, Daktronics recommends purchasing a lockable cabinet to store manuals and replacement/spare parts.

Part Description	Part Number
Controller	0A-1229-0013
Light Detector	0P-1151-0002
Digital Temp Sensor	0P-1247-0008
Cable; 20 position, 18”, dual row	W-1387
Ribbon Assy, 20 Position, 60"	0A-1000-0021
Cable; 20 position, 84”, dual row	0A-1000-0023
Cable Assy, 6-pin to 6-pin harness	0A-1261-0001
20ft, RJ45; 4-pair Twisted	W-1406
30ft, RJ45; 4-pair Twisted	W-1446
50ft, RJ45; 4-pair Twisted	W-1464
Quick Connect Interface, Input	0P-1229-2004
Quick Connect Interface, Output	0P-1229-2002

Thermostat Enclosure	0A-1213-4024
Pixel Boards prior to Feb 1, 2003	
Amber Pixel Board, 4x1, 20A	0P-1261-0003
Red Pixel Board, 4x1, 8R	0P-1261-0004
Pixel Boards after Feb 1, 2003	
Amber Pixel Board, 4x1, 20A	0P-1261-0009
Red Pixel Board, 4x1, 8R	0P-1261-0010
Module Driver Board	0P-1261-0008
Power Supply, w/harn.; calibrated, (A-1555), R	0A-1259-4405
Power Supply, w/harn.; calibrated, (A-1593), A	0A-1259-4402
Fan; 134CFM, 120VAC, 22W, 60Hz, 4.5”	B-1053
Line Filter Assembly	0A-1259-4003
Manual; Venus 1500 Operator’s	**ED13530**

4.18 Daktronics Exchange and Repair and Return Programs

To serve customers' repair and maintenance needs, Daktronics offers both an Exchange Program and a Repair and Return Program.

Daktronics' unique Exchange Program is a quick, economical service for replacing key components in need of repair. If a component fails, Daktronics sends the customer a replacement, and the customer, in turn, sends the failed component to Daktronics. This not only saves money but also decreases display downtime.

Daktronics provides these plans to ensure users get the most from their Daktronics products, and it offers the service to qualified customers who follow the program guidelines explained below. Please call the Help Desk – 877-605-1113 – if you have questions regarding the Exchange Program or any other Daktronics service.

When you call the Help Desk, a trained service technician will work with you to solve the equipment problem. You will work together to diagnose the problem and determine which replacement part to ship. If, after you make the exchange, the equipment still causes problems, please contact our Help Desk immediately.

If the replacement part fixes the problem, package the defective part in the same box and wrapping in which the replacement part arrived, fill out and attach the enclosed UPS shipping document, and **return the part to Daktronics**. In most circumstances, you will be invoiced for the replacement part at the time it is shipped. This bill, which represents the exchange price, is due when you receive it.

Daktronics expects immediate return of an exchange part if it does not solve the problem. The company also reserves the right to refuse equipment that has been damaged due to acts of nature or causes other than normal wear and tear.

If you do not ship the defective equipment Daktronics within 30 working days from the invoice date, Daktronics assumes you are purchasing the replacement part outright (with no exchange), and you will be invoiced for it. This second invoice represents the difference between the exchange price and the full purchase price of the equipment. The balance is due when you receive the second invoice.
If you return the exchange equipment after 30 working days from the invoice date, you will be credited for the amount on the second invoice, minus a restocking fee.

To avoid a restocking charge, you must return the defective equipment within 30 days from the invoice date.

Daktronics also offers a Repair and Return Program for items not subject to exchange.

Return Materials Authorization: To return parts for service, contact your local representative prior to shipment to acquire a Return Material Authorization (RMA) number. If you do not have a local representative, call the Daktronics Help Desk for the RMA. This expedites repair of your component when it arrives at Daktronics.

Packaging for Return: Package and pad the item well so that it will not be damaged in shipment. Electronic components such as printed circuit boards should be installed in an enclosure or placed in an antistatic bag before boxing. Please enclose your name, address, phone number and a clear description of symptoms.

This is how to reach us:

Mail: Customer Service, Daktronics Inc.
PO Box 5128
331 32nd Ave
Brookings SD 57006

Phone: Daktronics Help Desk: 877-605-1113 (toll free)
or 605-697-4034

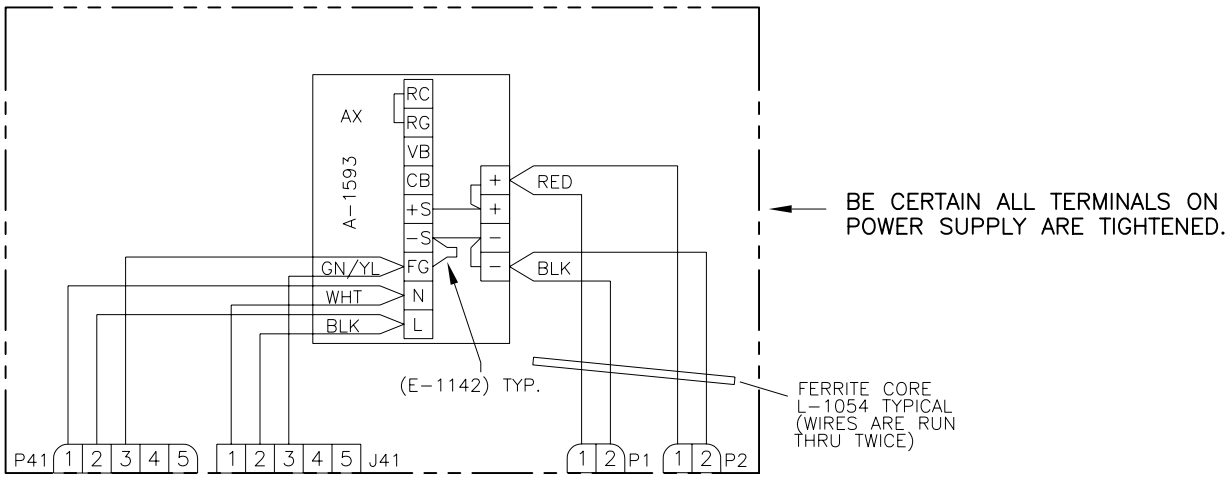
Fax: 605-697-4444

E-mail: helpdesk@daktronics.com

Appendix A: Reference Drawings

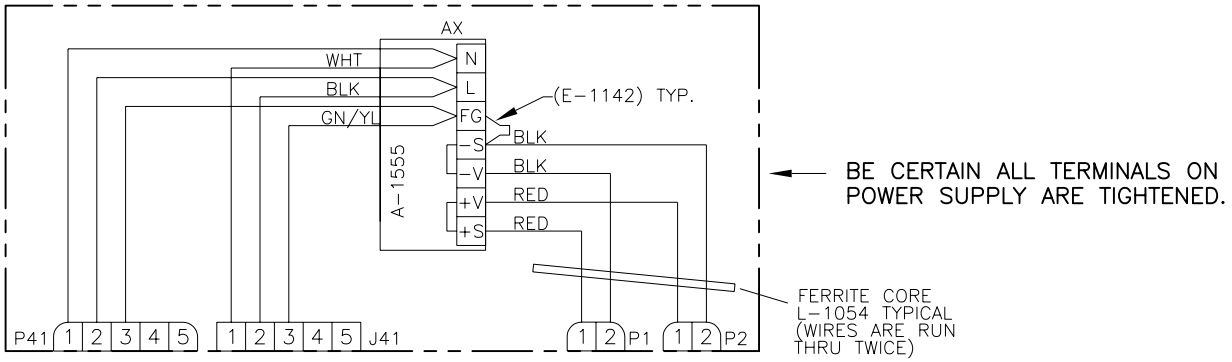
Refer to **Section 1.1** for information on reading drawing numbers. This appendix lists the following drawings in numerical order by size (A, B, etc.)

14.7VDC VERSION (AMBER)
0A-1259-4005
0A-1259-4402
(SET POWER SUPPLIES TO 14.7VDC)



BE CERTAIN ALL TERMINALS ON POWER SUPPLY ARE TIGHTENED.

12.0VDC VERSION (RED)
0A-1259-4008
0A-1259-4405
(SET POWER SUPPLIES TO 12.0VDC)



BE CERTAIN ALL TERMINALS ON POWER SUPPLY ARE TIGHTENED.

NOTES

1) ALL WIRE IS 14 AWG EXCEPT * IS 18 AWG UNLESS OTHERWISE NOTED.
2) REFER TO ASSEMBLY PACKET FOR WIRE ROUTING COMING OFF OF POWER SUPPLIES.

REV.	DATE	DESCRIPTION	BY	APPR.
05	21NOV07	REARRANGED RED AND BLK WIRES ON A-1555 ASSEMBLY PER ECO 59151.	LLK	LLK
04	10FEB05	ADDED L-1054 TO BOTH POWER SUPPLIES.	WRS	LLK
03	05MAR03	ADDED 0A-1259-4402 AND 0A-1259-4405.	LLK	
02	29JAN02	ADDED 0A-1259-4005 AND 0A-1259-4008. REMOVED 0Z-9837-3300PA. (ADDED IT TO DWG B-158483)	LLK	
01	20NOV01	CHANGED PS SETTING FROM 14V TO 14.7V	LLK	LLK

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ:

TITLE: SCHEMATIC; POWER SUPPLY CONFIGURATIONS

DES. BY: DRAWN BY: LKERR DATE: 31OCT01

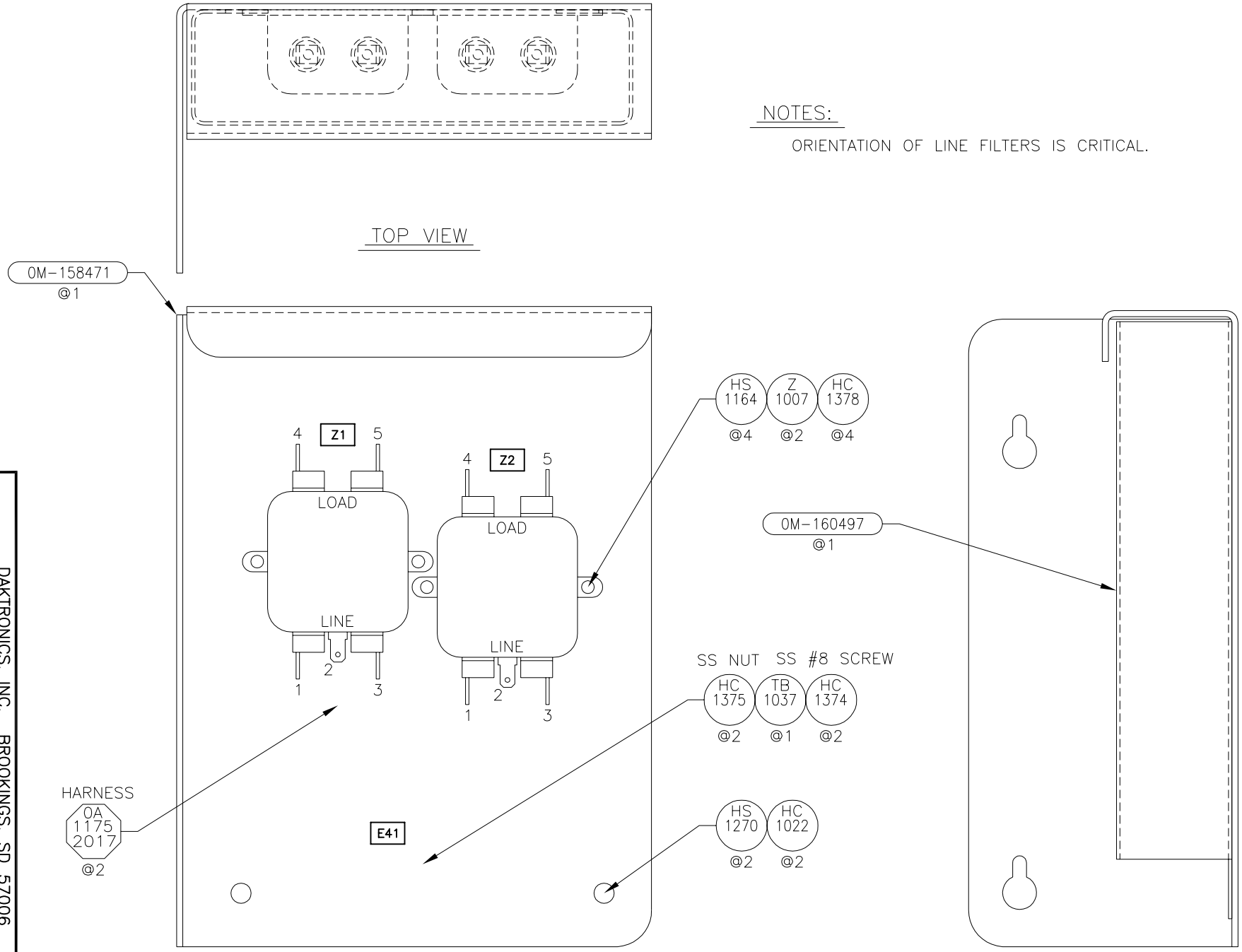
REVISION 05 APPR. BY: SCALE:

1259-R03A-158225

REV.	DATE	DESCRIPTION	BY	APPR.
02	05 FEB 01	ADDED LABELS AND GROUND HARNESS @2.	JAA	JMT
01	21 DEC 01	REVISED LAYOUT FOR COVER.	JAA	JMT

NOTES:

ORIENTATION OF LINE FILTERS IS CRITICAL.



DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: AF-3090 GALAXY LARGE CHARACTER

TITLE: Z-FILTER ASSY 2, W/GND BAR

DES. BY: JTELLIN DRAWN BY: JAMUNDS DATE: 06 NOV 01

APPR. BY:

SCALE: 1=2

REVISION

1259-E07A-158472

NOTES:
- OA-1054-0126 WILL BE RUN ALONG THE POWER CONDUIT CLOSEST TO THE FANS.
- REMOVE ALL PAINT AND ATTACH E-1036 TO THE NEAREST ALIGNMENT CHANNEL.
- FANS HAVE NO POLARITY.

REV.	DATE	DESCRIPTION	BY	APPR.
01	19 AUG 05	CHANGED THERMOSTAT P.N. FROM 0A-1213-4024 TO 0A-1327-3101. REMOVED 0A-1259-4105 P.N. TAG. REMOVED LENGTH FROM 0A-1051-126.	RBN	LLK

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: GALAXY, LARGE CHARACTER

TITLE: ASSY., GROUNDING & FAN HARNESS

DES. BY: LKERR DRAWN BY: LKERR DATE: 16SEP02

REVISION 01 APPR. BY: SCALE: NONE

1259-R06A-175194

8X32-112 (0A-1259-4300) EN-1217

PANEL BOARD

	15	15	15				
1	2	3	4	5	6	7	8
NOT USED	Z1 A10X EVEN PS	Z2 A10X ODD PS	CNTRL/FANS				NOT USED

16X48-112 (0A-1259-4301) EN-1217

PANEL BOARD

	15	15	15	15	15		
1	2	3	4	5	6	7	8
NOT USED	Z1 A10X EVEN PS	Z2 A10X ODD PS	Z3 A20X EVEN PS	Z4 A20X ODD PS	CNTRL/FANS		NOT USED

24X48-112 (0A-1259-4302) EN-1043

PANEL BOARD

15A	1	Z1 A10X EVEN PS	Z2 A10X ODD PS	2	15A
15A	3	Z3 A20X EVEN PS	Z4 A20X ODD PS	4	15A
15A	5	Z5 A30X EVEN PS	CNTRL/FANS	6	15A
15A	7	Z6 A30X ODD PS		8	
	9			10	
	11			12	

32X48-112 (0A-1259-4303) EN-1043

PANEL BOARD

15A	1	Z1 A10X EVEN PS	Z2 A10X ODD PS	2	15A
15A	3	Z3 A20X EVEN PS	Z4 A20X ODD PS	4	15A
15A	5	Z5 A30X EVEN PS	Z6 A30X ODD PS	6	15A
15A	7	Z7 A40X EVEN PS	Z8 A40X ODD PS	8	15A
15A	9	FANS	CONTROLLER	10	15A
	11			12	

40X48-112 (0A-1259-4304) EN-1043

PANEL BOARD

15A	1	Z1 A10X EVEN PS	Z2 A10X ODD PS	2	15A
15A	3	Z3 A20X EVEN PS	Z4 A20X ODD PS	4	15A
15A	5	Z5 A30X EVEN PS	Z6 A30X ODD PS	6	15A
15A	7	Z7 A40X EVEN PS	Z8 A40X ODD PS	8	15A
15A	9	Z9 A50X EVEN PS	FANS	10	15A
15A	11	Z10 A50X ODD PS	CONTROLLER	12	15A

48X48-112 (0A-1259-4305) EN-1225

PANEL BOARD

15A	1	Z1 A10X EVEN PS	Z2 A10X ODD PS	2	15A
15A	3	Z3 A20X EVEN PS	Z4 A20X ODD PS	4	15A
15A	5	Z5 A30X EVEN PS	Z6 A30X ODD PS	6	15A
15A	7	Z7 A40X EVEN PS	Z8 A40X ODD PS	8	15A
15A	9	Z9 A50X EVEN PS	Z10 A50X ODD PS	10	15A
15A	11	Z11 A60X EVEN PS	Z12 A60X ODD PS	12	15A
15A	13	FANS	CONTROLLER	14	15A
	15			16	
	17			18	
	19			20	
	21			22	
	23			24	

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: GALAXY, LARGE CHARACTER

TITLE: LAYOUT, PNL BD,8-48X32-112, 89mm, 1 PHASE

DES. BY: LKERR DRAWN BY: LKERR DATE: 16SEP02

REVISION 01 APPR. BY: SCALE: 1=1

1259-R07A-175209

REV.	DATE	DESCRIPTION	BY	APPR.
01	16FEB05	REVERSED BREAKERS 4 AND 5 ON ASSEMBLY 0A-1259-4301	LLK	LLK

8X32-112 (0A-1259-4310) EN-1236

PANEL BOARD

15A	1	Z1 A10X EVEN PS		2	
15A	3	Z2 A10X ODD PS		4	
15A	5	CNTRL/FANS		6	
	7			8	
	9			10	
	11			12	

16X48-112 (0A-1259-4311) EN-1236

PANEL BOARD

15A	1	Z1 A10X EVEN PS	Z2 A10X ODD PS	2	15A
15A	3	Z3 A20X EVEN PS	CNTRL/FANS	4	15A
15A	5	Z4 A20X ODD PS		6	
	7			8	
	9			10	
	11			12	

24X48-112 (0A-1259-4312) EN-1236

PANEL BOARD

15A	1	Z1 A10X EVEN PS	Z2 A10X ODD PS	2	15A
15A	3	Z3 A20X EVEN PS	Z4 A20X ODD PS	4	15A
15A	5	Z5 A30X EVEN PS	Z6 A30X ODD PS	6	15A
15A	7	CNTRL/FANS		8	
	9			10	
	11			12	

32X48-112 (0A-1259-4313) EN-1236

PANEL BOARD

15A	1	Z1 A10X EVEN PS	Z2 A10X ODD PS	2	15A
15A	3	Z3 A20X EVEN PS	Z4 A20X ODD PS	4	15A
15A	5	Z5 A30X EVEN PS	Z6 A30X ODD PS	6	15A
15A	7	Z7 A40X EVEN PS	CONTROLLER	8	15A
15A	9	Z8 A40X ODD PS		10	
15A	11	FANS		12	

40X48-112 (0A-1259-4314) EN-1236

PANEL BOARD

15A	1	Z1 A10X EVEN PS	Z2 A10X ODD PS	2	15A
15A	3	Z3 A20X EVEN PS	Z4 A20X ODD PS	4	15A
15A	5	Z5 A30X EVEN PS	Z6 A30X ODD PS	6	15A
15A	7	Z7 A40X EVEN PS	Z8 A40X ODD PS	8	15A
15A	9	Z9 A50X EVEN PS	FANS	10	15A
15A	11	Z10 A50X ODD PS	CONTROLLER	12	15A

48X48-112 (0A-1259-4315) EN-1237

PANEL BOARD

15A	1	Z1 A10X EVEN PS	Z2 A10X ODD PS	2	15A
15A	3	Z3 A20X EVEN PS	Z4 A20X ODD PS	4	15A
15A	5	Z5 A30X EVEN PS	Z6 A30X ODD PS	6	15A
15A	7	Z7 A40X EVEN PS	Z8 A40X ODD PS	8	15A
15A	9	Z9 A50X EVEN PS	Z10 A50X ODD PS	10	15A
15A	11	Z11 A60X EVEN PS	Z12 A60X ODD PS	12	15A
15A	13	FANS	CONTROLLER	14	15A
	15			16	
	17			18	
	19			20	

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: GALAXY, LARGE CHARACTER

TITLE: LAYOUT, PNL BD,8-48X32-112, 89mm 3 PHASE

DES. BY: LKERR DRAWN BY: LKERR DATE: 16SEP02

REV.	DATE	DESCRIPTION	BY	APPR.

REVISION

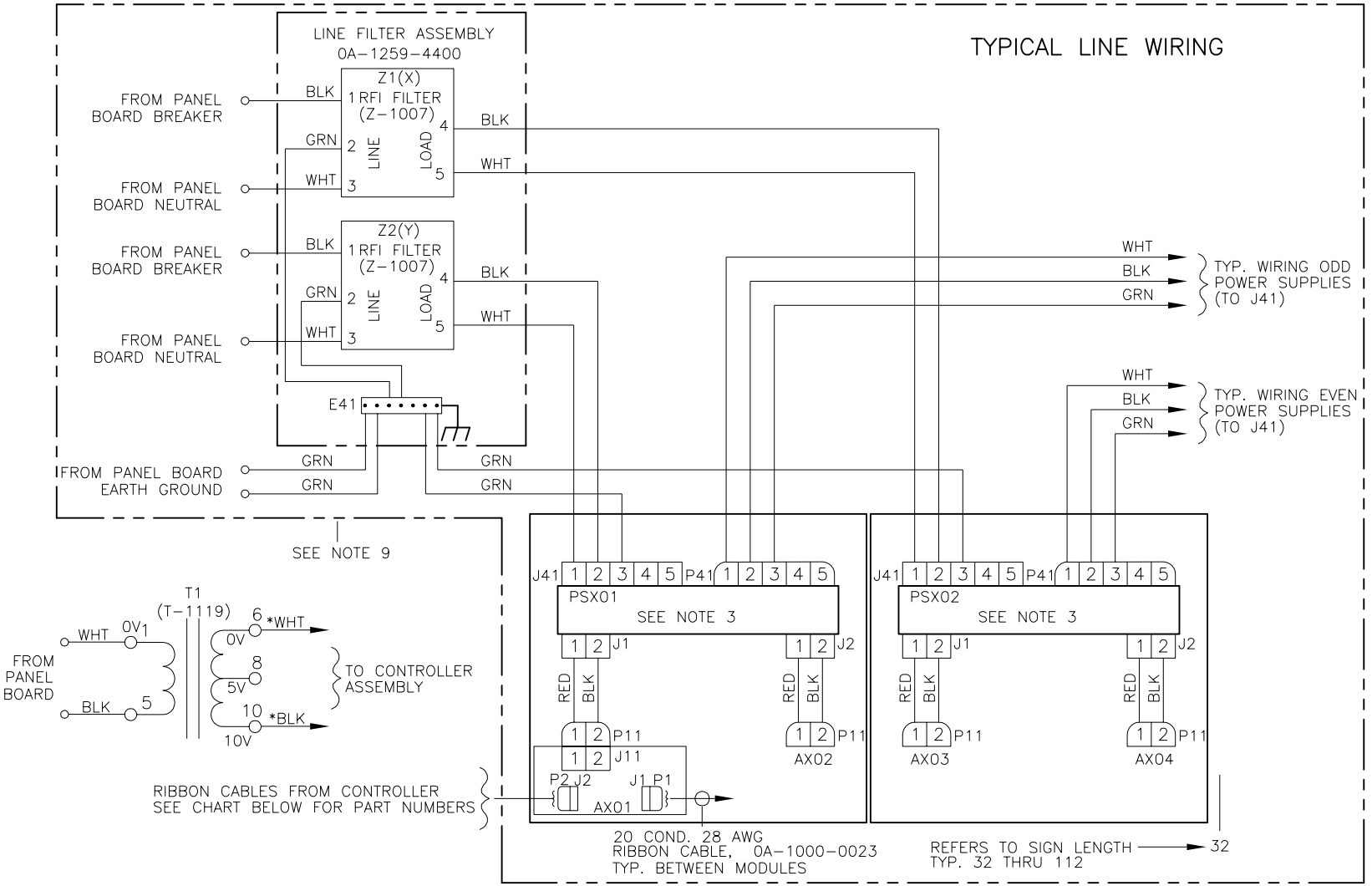
APPR. BY:

SCALE: 1=1

1259-R07A-175212

REV.	DATE	DESCRIPTION	BY	APPR.
02	22 FEB 05	REPLACED 0A-1259-4003 WITH 4400 REPLACED DWG B-177662 WITH B-206146. CHANGED TITLE FROM 3190 TO 3400	LLK	
01	27 OCT 03	REPLACED 40 PIN CABLE WITH 20 PIN. REPLACED POWER SPEC DWG'S	LLK	

TYPICAL LINE WIRING



CONTROLLER OUTPUT RIBBON CABLE CHART

LINE/ PLUG#	DISPLAY HEIGHT					
	8	16	24	32	40	48
1 (P11)	0023	0023	0088	0088	0089	0090
2 (P12)	N/A	0023	0023	0088	0088	0089
3 (P13)	N/A	N/A	0023	0023	0088	0088
4 (P14)	N/A	N/A	N/A	0023	0023	0088
5 (P15)	N/A	N/A	N/A	N/A	0023	0023
6 (P16)	N/A	N/A	N/A	N/A	N/A	0023

(0A-1000-****)

NOTES

1) ALL WIRE IS 14 AWG EXCEPT * IS 18 AWG UNLESS OTHERWISE NOTED.
2) EACH LED MODULE IS A 8X8 MATRIX.
3) FOR POWER SUPPLY CONFIGURATIONS REFER TO DWG A-158225.
4) FOR SINGLE PHASE (120/240VAC) PANEL BOARD LAYOUT REFER TO DRAWING A-175209.
   FOR THREE PHASE (120/208VAC) PANEL BOARD LAYOUT REFER TO DRAWING A-175212.
5) FOR SIGNAL AND CONTROLLER WIRING REFER TO DWG B-206146.
6) FOR FAN WIRING REFER TO DWG A-175194.
7) FOR BLOCK DIAGRAM REFER TO B-175203.
8) FOR DISPLAYS USING AMBER LEDS REFER TO DWG A-178168 FOR POWER SPECS..
   FOR DISPLAYS USING RED LEDS REFER TO DWG A-178240 FOR POWER SPECS..
9) ABOVE WIRING DETAIL IS REPEATED FOR ALL SIZES IE. A 16 HIGH DISPLAY WOULD REQUIRE 2 OF THE ABOVE.

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: GALAXY, LARGE CHARACTER

TITLE: SCHEMATIC, AF-3400-(8-48X32-112)-89-MONO-*-*

DES. BY: DRAWN BY: LKERR DATE: 04NOV02

APPR. BY:

SCALE: NONE

REVISION 02

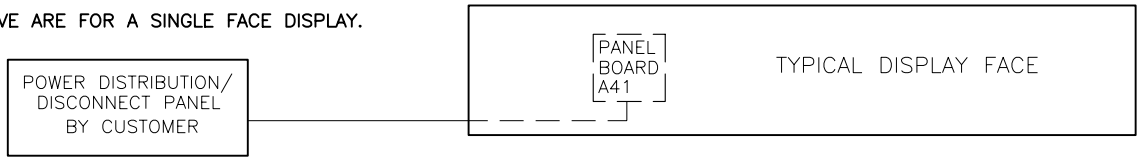
1259-R03A-177829

GALAXY, 89mm, AMBER LEDS
POWER SPECIFICATION CHART

MATRIX SIZE	WATTS	120/208, 4 WIRE + GND			120/240, 3 WIRE + GND	
		PHASE A AMPS	PHASE B AMPS	PHASE C AMPS	LINE 1 AMPS	LINE 2 AMPS
8X32	780	2.91	2.91	0.68	3.59	2.91
8X48	1174	2.91	5.83	1.04	3.95	5.83
8X64	1567	5.83	5.83	1.41	7.23	5.83
8X80	1961	5.83	8.74	1.78	7.60	8.74
8X96	2354	8.74	8.74	2.14	10.88	8.74
8X112	2748	8.74	11.65	2.51	11.25	11.65
16X48	2352	8.74	5.04	5.83	10.86	8.74
16X64	3132	11.65	8.62	5.83	14.44	11.65
16X80	3911	14.57	9.28	8.74	18.02	14.57
16X96	4690	17.48	12.86	8.74	21.60	17.48
16X112	5469	20.39	13.53	11.65	25.18	20.39
24X48	3401	10.86	8.74	8.74	13.78	14.57
24X64	4530	14.44	11.65	11.65	20.27	17.48
24X80	5658	18.02	14.57	14.57	23.85	23.30
24X96	6787	21.60	17.48	17.48	30.34	26.22
24X112	7916	25.18	20.39	20.39	33.92	32.04
32X48	4690	11.78	14.57	12.74	21.60	17.48
32X64	6248	17.60	17.48	16.99	28.76	23.30
32X80	7806	20.52	23.30	21.23	35.92	29.13
32X96	9365	26.34	26.22	25.48	43.08	34.96
32X112	10923	29.26	32.04	29.72	50.24	40.78
40X48	5738	17.48	15.65	14.69	24.52	23.30
40X64	7646	23.30	22.81	17.60	34.59	29.13
40X80	9554	29.13	27.06	23.43	41.75	37.87
40X96	11462	34.96	34.22	26.34	51.82	43.70
40X112	13370	40.78	38.46	32.17	58.98	52.43
48X48	6787	21.60	17.48	17.48	30.34	26.22
48X64	9045	28.76	23.30	23.30	40.41	34.96
48X80	11302	35.92	29.13	29.13	50.49	43.70
48X96	13559	43.08	34.96	34.96	60.56	52.43
48X112	15817	50.24	40.78	40.78	70.63	61.17

NOTES:

1. SPECS LISTED ABOVE ARE FOR A SINGLE FACE DISPLAY.



REV.	DATE	DESCRIPTION	BY	APPR.
02	01 NOV 05	UPDATED SPECS ON 8 HIGH DISPLAYS DUE TO FAN CHANGING FROM B-1019 TO B-1053	LLK	
01	16 FEB 05	UPDATED SPECIFICATION CHART.	WRS	LLK

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: GALAXY, LARGE CHARACTER

TITLE: P SPECS, AF-3400-(8-48X32-112)-89-A-*-*

DES. BY: DRAWN BY: DMATHERN DATE: 08NOV02

REVISION 02 | APPR. BY: | SCALE: NONE

1259-R10A-178168

REV.	DATE	DESCRIPTION	BY	APPR.
04	21 AUG 06	CHANGED HC-1022 TO HC-1233	JMP	
03	21OCT05	CHANGED HC-1233 TO HC-1022	JTELLIN	
02	19SEP05	UPDATED CHANGES PER ECO 048652	NKJ	
01	12SEP05	ADDED DETAIL: A	NKJ	

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: AF-3190 GALAXY, LARGE CHARACTER

TITLE: DRIVER ASSY; AF-3190, 8X8-89MM-MONO

DES. BY: JMT DRAWN BY: JMT DATE: 8 NOV 02

APPR. BY:

SCALE: 1=5

REVISION 04

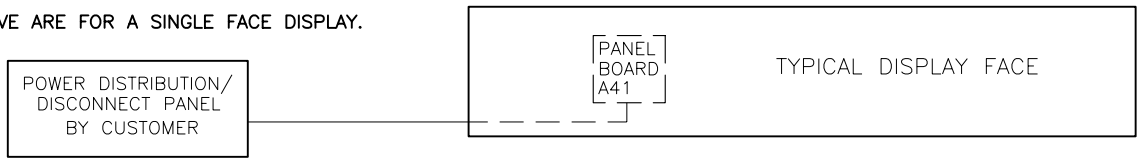
1259-E10A-178210

GALAXY, 89mm, RED LEDS
POWER SPECIFICATION CHART

MATRIX SIZE	WATTS	120/208, 4 WIRE + GND			120/240, 3 WIRE + GND	
		PHASE A AMPS	PHASE B AMPS	PHASE C AMPS	LINE 1 AMPS	LINE 2 AMPS
8X32	366	1.19	1.19	0.68	1.86	1.19
8X48	553	1.19	2.38	1.04	2.23	2.38
8X64	740	2.38	2.38	1.41	3.79	2.38
8X80	927	2.38	3.57	1.78	4.15	3.57
8X96	1113	3.57	3.57	2.14	5.71	3.57
8X112	1300	3.57	4.76	2.51	6.08	4.76
16X48	1111	3.57	3.31	2.38	4.50	4.76
16X64	1477	4.76	5.17	2.38	7.55	4.76
16X80	1842	5.95	5.84	3.57	8.22	7.14
16X96	2208	7.14	7.69	3.57	11.26	7.14
16X112	2573	8.33	8.36	4.76	11.93	9.52
24X48	1540	5.69	3.57	3.57	6.88	5.95
24X64	2048	7.55	4.76	4.76	9.93	7.14
24X80	2556	9.41	5.95	5.95	11.78	9.52
24X96	3064	11.26	7.14	7.14	14.83	10.71
24X112	3572	13.12	8.33	8.33	16.69	13.08
32X48	2208	4.88	5.95	7.57	11.26	7.14
32X64	2939	7.26	7.14	10.09	14.97	9.52
32X80	3670	8.45	9.52	12.61	18.69	11.89
32X96	4401	10.83	10.71	15.14	22.40	14.27
32X112	5132	12.02	13.08	17.66	26.11	16.65
40X48	2636	7.14	8.76	6.07	12.45	9.52
40X64	3510	9.52	12.47	7.26	17.35	11.89
40X80	4383	11.89	14.99	9.64	21.07	15.46
40X96	5257	14.27	18.71	10.83	25.97	17.84
40X112	6131	16.65	21.23	13.21	29.68	21.41
48X48	3064	11.26	7.14	7.14	14.83	10.71
48X64	4081	14.97	9.52	9.52	19.73	14.27
48X80	5097	18.69	11.89	11.89	24.63	17.84
48X96	6114	22.40	14.27	14.27	29.54	21.41
48X112	7130	26.11	16.65	16.65	34.44	24.98

NOTES:

1. SPECS LISTED ABOVE ARE FOR A SINGLE FACE DISPLAY.



REV.	DATE	DESCRIPTION	BY	APPR.
02	01 NOV 05	UPDATED SPECS ON 8 HIGH DISPLAYS DUE TO FAN CHANGING FROM B-1019 TO B-1053.	LLK	
01	16 FEB 05	UPDATED SPECIFICATION CHART.	WRS	LLK

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: GALAXY, LARGE CHARACTER

TITLE: P SPECS, AF-3400-(8-48X32-112)-89-R-*-*

DES. BY: DRAWN BY: DMATHERN DATE: 11NOV02

REVISION 02 | APPR. BY: | SCALE: NONE

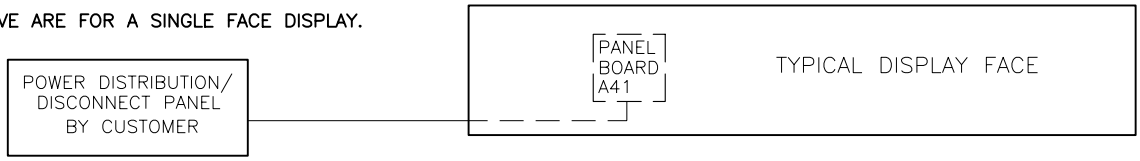
1259-R10A-178240

GALAXY, 89mm, R.G.B. LEDS
POWER SPECIFICATION CHART

MATRIX SIZE	WATTS	120/208, 4 WIRE + GND			120/240, 3 WIRE + GND	
		PHASE A AMPS	PHASE B AMPS	PHASE C AMPS	LINE 1 AMPS	LINE 2 AMPS
8X32	824	3.09	3.09	0.68	3.77	3.09
8X48	1239	3.09	6.19	1.04	4.14	6.19
8X64	1654	6.19	6.19	1.41	7.60	6.19
8X80	2070	6.19	9.28	1.78	7.96	9.28
8X96	2485	9.28	9.28	2.14	11.42	9.28
8X112	2900	9.28	12.38	2.51	11.79	12.38
16X48	2483	9.28	5.22	6.19	8.31	12.38
16X64	3306	12.38	8.98	6.19	15.17	12.38
16X80	4128	15.47	9.65	9.28	15.84	18.57
16X96	4951	18.57	13.41	9.28	22.69	18.57
16X112	5774	21.66	14.07	12.38	23.36	24.75
24X48	3597	11.41	9.28	9.28	11.41	18.57
24X64	4791	15.17	12.38	12.38	21.36	18.57
24X80	5985	18.93	15.47	15.47	22.02	27.85
24X96	7179	22.69	18.57	18.57	31.97	27.85
24X112	8373	26.45	21.66	21.66	32.64	37.13
32X48	4951	12.50	15.47	13.28	16.50	24.75
32X64	6596	18.69	18.57	17.71	30.21	24.75
32X80	8241	21.79	24.75	22.14	31.55	37.13
32X96	9887	27.97	27.85	26.57	45.26	37.13
32X112	11532	31.07	34.04	30.99	46.59	49.51
40X48	6065	18.57	16.38	15.60	19.60	30.94
40X64	8081	24.75	23.90	18.69	36.40	30.94
40X80	10098	30.94	28.33	24.88	37.74	46.42
40X96	12115	37.13	35.85	27.97	54.54	46.42
40X112	14131	43.32	40.28	34.16	55.87	61.89
48X48	7179	22.69	18.57	18.57	22.69	37.13
48X64	9567	30.21	24.75	24.75	42.59	37.13
48X80	11955	37.74	30.94	30.94	43.92	55.70
48X96	14343	45.26	37.13	37.13	63.82	55.70
48X112	16731	52.78	43.32	43.32	65.16	74.26

NOTES:

1. SPECS LISTED ABOVE ARE FOR A SINGLE FACE DISPLAY.



REV.	DATE	DESCRIPTION	BY	APPR.
02	01 NOV 05	UPDATED SPECS ON 8 HIGH DUE TO FAN CHANGING FROM B-1019 TO B-1053.	LLK	
01	16 FEB 05	UPDATED SPECIFICATION CHART.	WRS	LLK

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: GALAXY, LARGE CHARACTER, RGB

TITLE: P SPECS, AF-3200-(8-48X32-112)-89-RGB-*-*

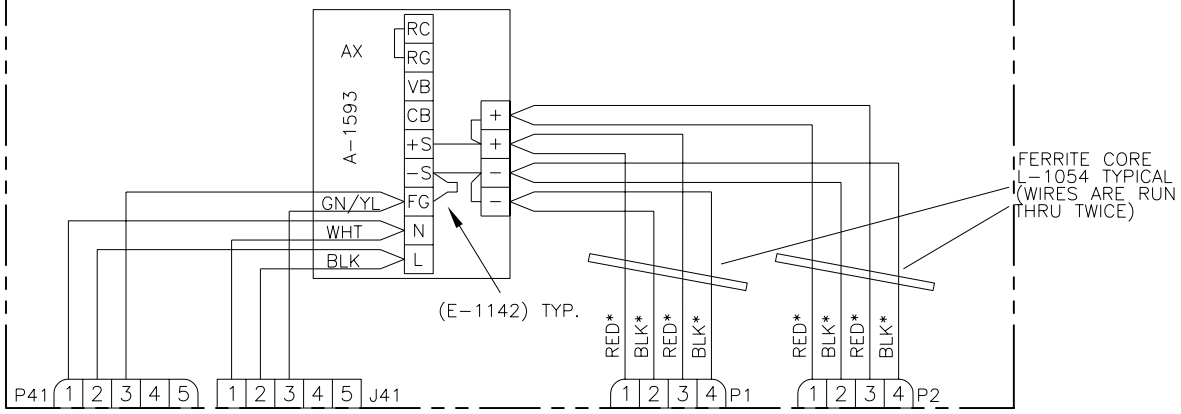
DES. BY: DMATHERN DRAWN BY: RVOSS DATE: 25 FEB 03

REVISION 02 | APPR. BY: | SCALE: NONE

1259-R10A-183906

BE CERTAIN ALL TERMINALS ON POWER SUPPLY ARE TIGHTENED.

14.7VDC VERSION (RGB)
0A-1259-4410
(SET POWER SUPPLIES TO 14.7VDC)



NOTES:

FOR EASE OF ASSEMBLY THE GN/YL, WHT, BLK CRIMPS MAY BE RUN FROM BOTH THE TOP AND THE BOTTOM OF POWER SUPPLY TERMINAL BLOCK.

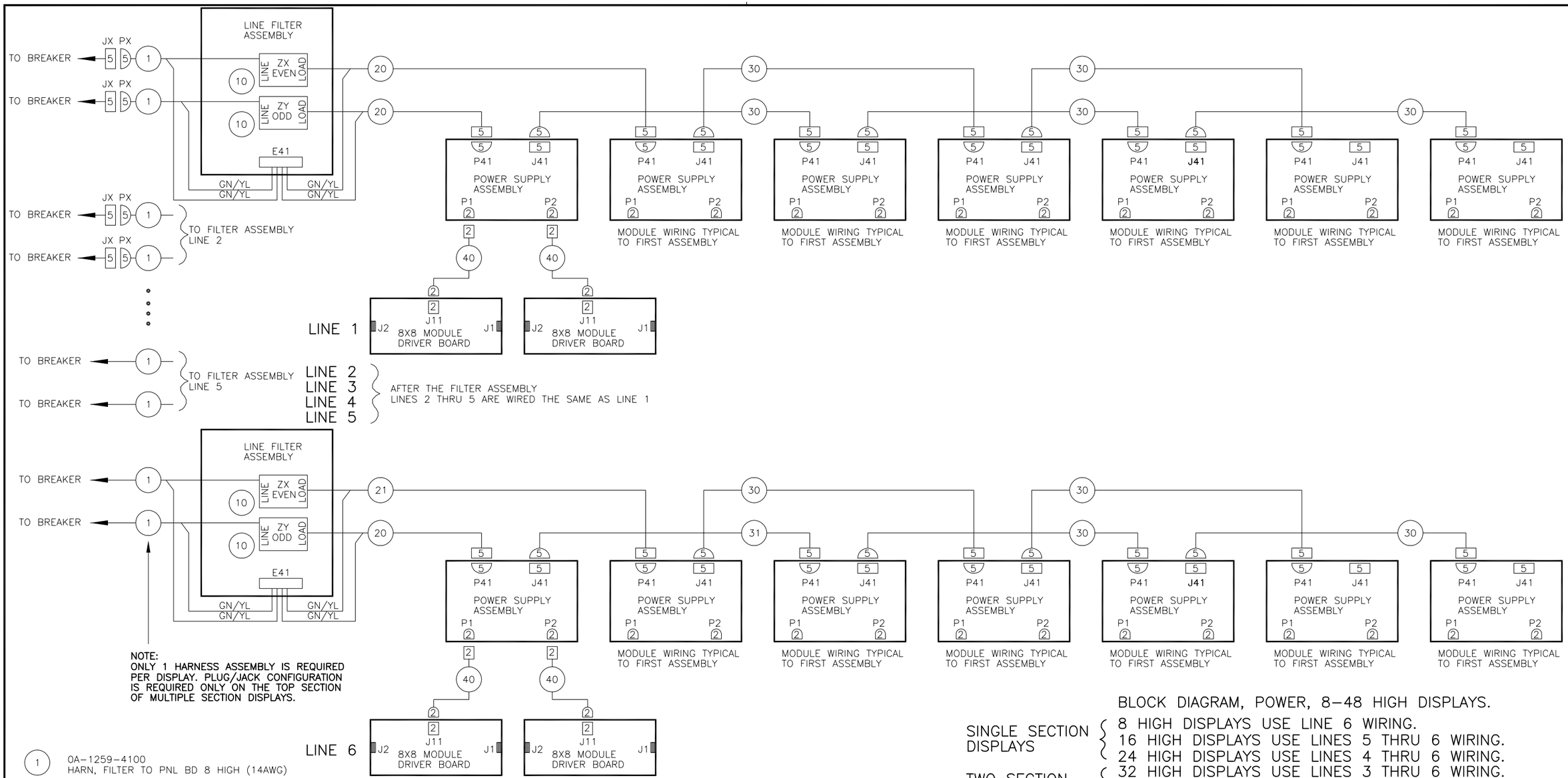
NOTES

1) ALL WIRE IS 12 AWG EXCEPT * IS 14 AWG UNLESS OTHERWISE NOTED.
2) REFER TO ASSEMBLY PACKET FOR WIRE ROUTING COMING OFF OF POWER SUPPLIES.

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: GALAXY; 89mm, LARGE CHARACTOR
TITLE: SCHEMATIC; POWER SUPPLY ASSEMBLY
DES. BY: DRAWN BY: DMATHERN DATE: 27 FEB 03
REVISION 02 APPR. BY: SCALE: 1=1
1259-R03A-184245

REV.	DATE	DESCRIPTION	BY	APPR.
02	10 FEB 05	ADDED L-1054(QTY 2). UPDATED TEXT IN NOTES.	WRS	LLK
01	09 JAN 04	ADDED NOTE ABOUT POWER SUPPLY PER ECO 38529	MJW	



1. 0A-1259-4100
   HARN, FILTER TO PNL BD 8 HIGH (14AWG)
   0A-1259-4101
   HARN, FILTER TO PNL BD 16 HIGH (14AWG)
   0A-1259-4102
   HARN, FILTER TO PNL BD 24 HIGH (14AWG)
   0A-1259-4103
   HARN, FILTER TO PNL BD 32 HIGH (14AWG)
   0A-1259-4104
   HARN, FILTER TO PNL BD 40 HIGH (14AWG)
   0A-1259-4105
   HARN, FILTER TO PNL BD 48 HIGH (14AWG)
10. 0A-1175-2017
    HARN, FILTER GND 6IN (14AWG)
20. 0A-1259-4111
    HARN, PWR, FILTER TO POWER SUPPLY 6FT (14AWG)
21. 0A-1259-4112
    HARN, PWR, FILTER TO POWER SUPPLY 10FT (14AWG)
30. 0A-1259-4113
    HARN, PWR, INTC, 5 PIN PLUG TO 5 PIN JACK 10FT (14AWG)
31. 0A-1259-4114
    HARN, PWR, INTC, 5 PIN PLUG TO 5 PIN JACK 14FT (14AWG)
40. 0A-1259-4403
    HARN, PS TO MOD, 4FT (14AWG)
60. 0A-1259-4109
    HARN, GROUNDING & FAN, 8-24X32-112 (14AWG)
    (FOR BOTTOM SECTION)
61. 0A-1259-4110
    HARN, GROUNDING & FAN, W/INTERCONNECT (14AWG)
    (FOR TOP SECTION)

BLOCK DIAGRAM, POWER, 8-48 HIGH DISPLAYS.

SINGLE SECTION DISPLAYS
- 8 HIGH DISPLAYS USE LINE 6 WIRING.
- 16 HIGH DISPLAYS USE LINES 5 THRU 6 WIRING.
- 24 HIGH DISPLAYS USE LINES 4 THRU 6 WIRING.

TWO SECTION DISPLAYS
- 32 HIGH DISPLAYS USE LINES 3 THRU 6 WIRING.
- 40 HIGH DISPLAYS USE LINES 2 THRU 6 WIRING.
- 48 HIGH DISPLAYS USE LINES 1 THRU 6 WIRING.

REV.	DATE	DESCRIPTION	BY	APPR.
01	16 FEB 05	CHANGED WIRE COLOR GRN TO GN/YL. REMOVED A-1259-4405 REPLACED WITH A-1259-4403.	WRS	LLK

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: GALAXY, LARGE CHARACTER

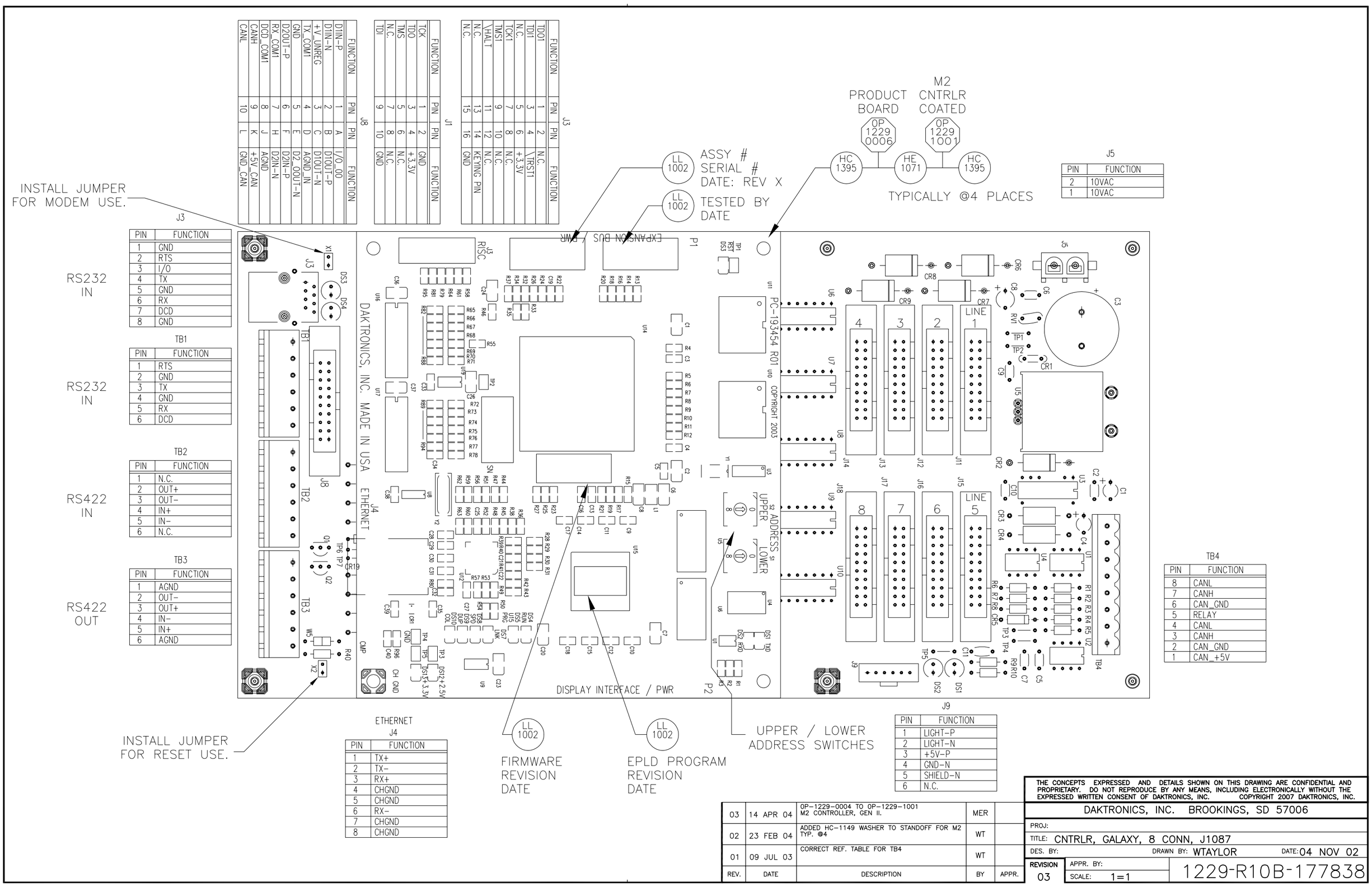
TITLE: BLOCK DIAG., PWR, AF-3400-(8-48X32-112)-89-M-*-*

DES. BY: LKERR DRAWN BY: LKERR DATE: 16SEP02

REVISION 01 APPR. BY:

SCALE: NONE

1259-R01B-175203



J3

PIN	FUNCTION
1	GND
2	RTS
3	I/O
4	TX
5	GND
6	RX
7	DCD
8	GND

RS232 IN

TB1

PIN	FUNCTION
1	RTS
2	GND
3	TX
4	GND
5	RX
6	DCD

RS232 IN

TB2

PIN	FUNCTION
1	N.C.
2	OUT+
3	OUT-
4	IN+
5	IN-
6	N.C.

RS422 IN

TB3

PIN	FUNCTION
1	AGND
2	OUT-
3	OUT+
4	IN-
5	IN+
6	AGND

RS422 OUT

J8

PIN		FUNCTION
1	A	D1IN-P
2	B	D1IN-N
3	C	+V_UNREG
4	D	TX_COM1
5	E	GND
6	F	D2OUT-P
7	H	RX_COM1
8	J	DCD_COM1
9	K	CANH
10	L	CANL

J1

PIN		FUNCTION
1	2	TCK
3	4	TDO
5	6	TMS
7	8	N.C.
9	10	N.C.

J3

PIN		FUNCTION
1	2	TDO1
3	4	TDI1
5	6	N.C.
7	8	TCK1
9	10	TMS1
11	12	\HALT
13	14	N.C.
15	16	N.C.

J5

PIN	FUNCTION
2	10VAC
1	10VAC

TB4

PIN	FUNCTION
8	CANL
7	CANH
6	CAN_GND
5	RELAY
4	CANL
3	CANH
2	CAN_GND
1	CAN_+5V

ETHERNET J4

PIN	FUNCTION
1	TX+
2	TX-
3	RX+
4	CHGND
5	CHGND
6	RX-
7	CHGND
8	CHGND

J9

PIN	FUNCTION
1	LIGHT-P
2	LIGHT-N
3	+5V-P
4	GND-N
5	SHIELD-N
6	N.C.

REV.	DATE	DESCRIPTION	BY	APPR.
03	14 APR 04	OP-1229-0004 TO OP-1229-1001 M2 CONTROLLER, GEN II.	MER	
02	23 FEB 04	ADDED HC-1149 WASHER TO STANDOFF FOR M2 TYP. @4	WT	
01	09 JUL 03	CORRECT REF. TABLE FOR TB4	WT	

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ:

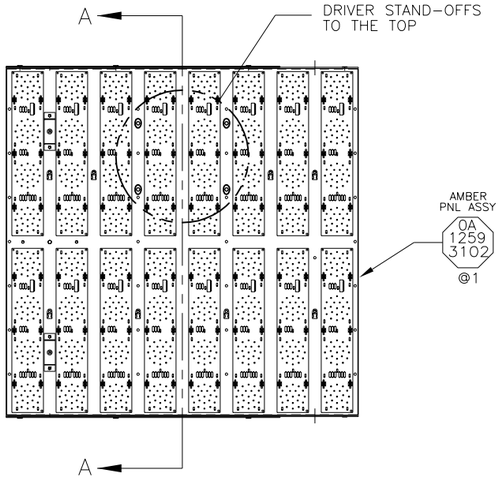
TITLE: CNTRLR, GALAXY, 8 CONN, J1087

DES. BY: DRAWN BY: WTAYLOR DATE: 04 NOV 02

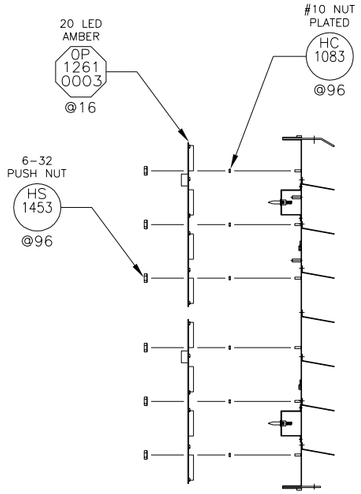
REVISION 03 APPR. BY:

SCALE: 1=1

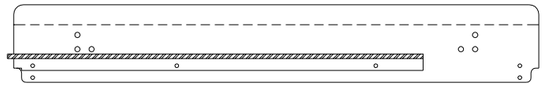
1229-R10B-177838



REAR VIEW



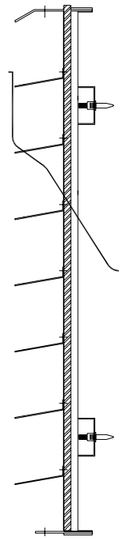
SECTION: A-A
(SCALE 1=1)



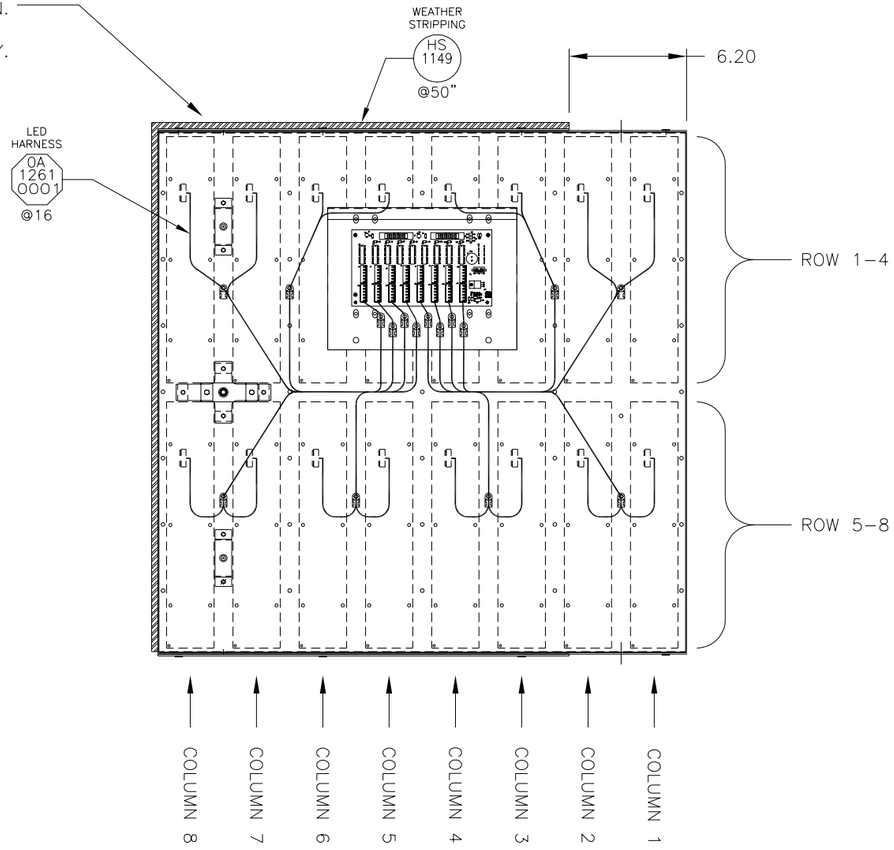
TOP VIEW
(NOT TO SCALE)

APPLY WEATHER STIPPING (HS-1149) TO THE OUTSIDE EDGE OF FACE PANEL AS SHOWN.

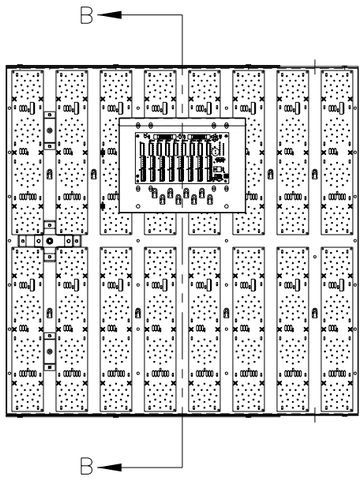
TOP AND LEFT (REAR VEIW) SIDE ONLY.



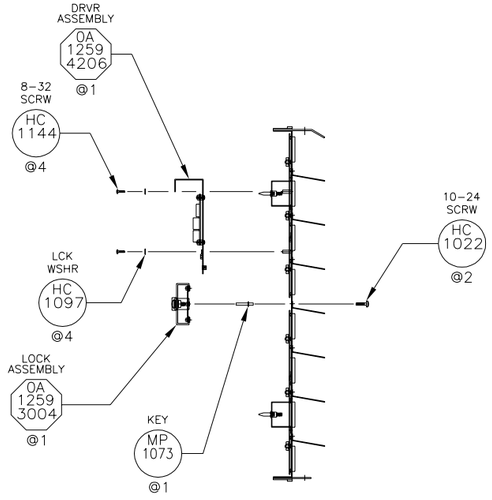
LEFT SIDE
(NOT TO SCALE)



REAR VIEW
(NOT TO SCALE)



REAR VIEW



SECTION: B-B
(SCALE 1=1)

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: AF-3190 GALAXY, LARGE CHARACTER

TITLE: MODULE PANEL , AF-3190-8X8-89MM-A

DES. BY: JMT DRAWN BY: JMT DATE: 8 NOV 02

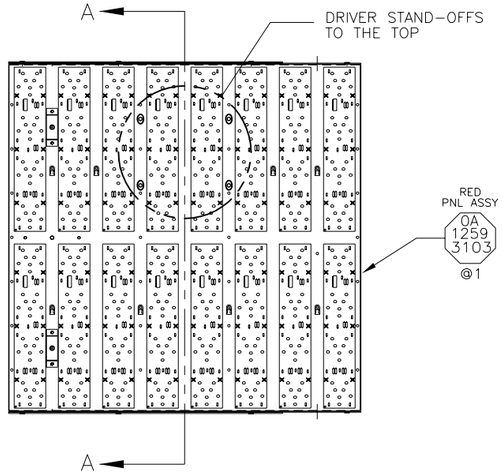
REV.	DATE	DESCRIPTION	BY	APPR.

REVISION

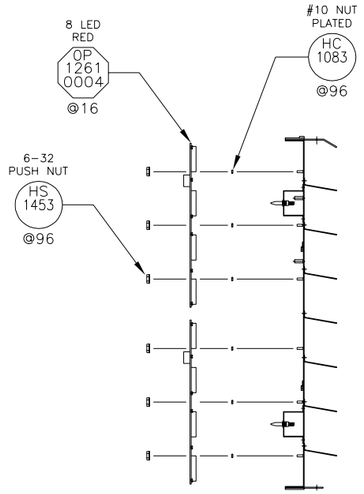
APPR. BY:

SCALE: 1 = 12

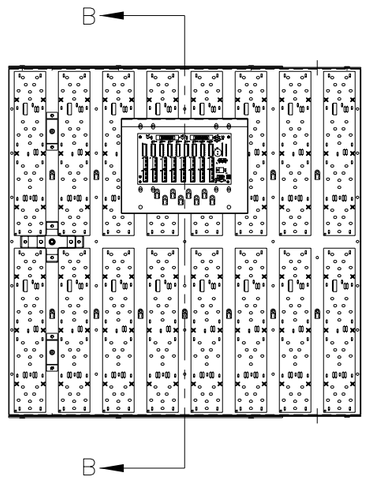
1259-E10B-178218



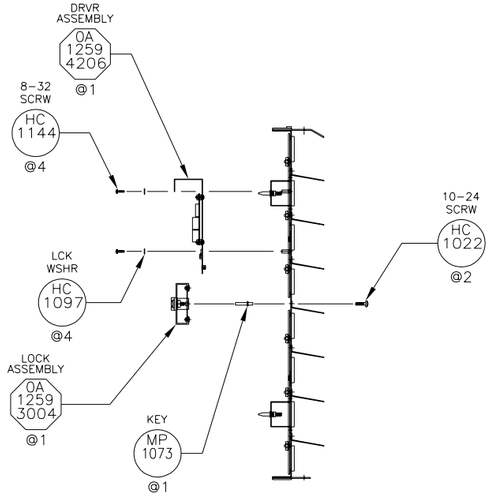
REAR VIEW



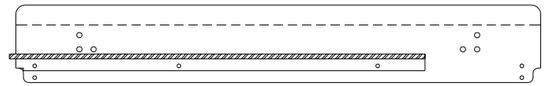
SECTION: A-A
(SCALE 1=1)



REAR VIEW



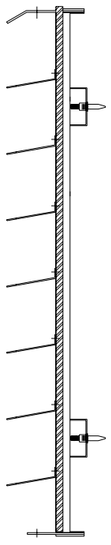
SECTION: B-B
(SCALE 1=1)



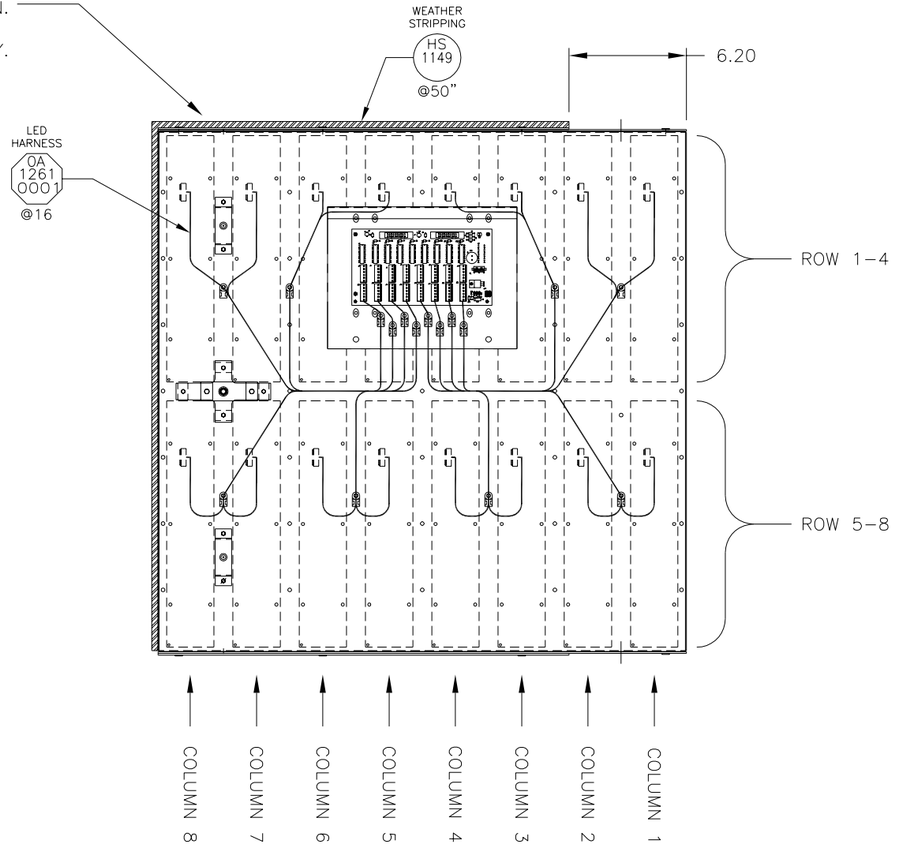
TOP VIEW
(NOT TO SCALE)

APPLY WEATHER STIPPING
(HS-1149) TO THE OUTSIDE EDGE
OF FACE PANEL AS SHOWN.

TOP AND LEFT (REAR VEIW) SIDE ONLY.



LEFT SIDE
(NOT TO SCALE)



REAR VIEW
(NOT TO SCALE)

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: AF-3190 GALAXY, LARGE CHARACTER

TITLE: MODULE PANEL, AF-3190-8X8-89MM-R

DES. BY: JMT DRAWN BY: JMT DATE: 8 NOV 02

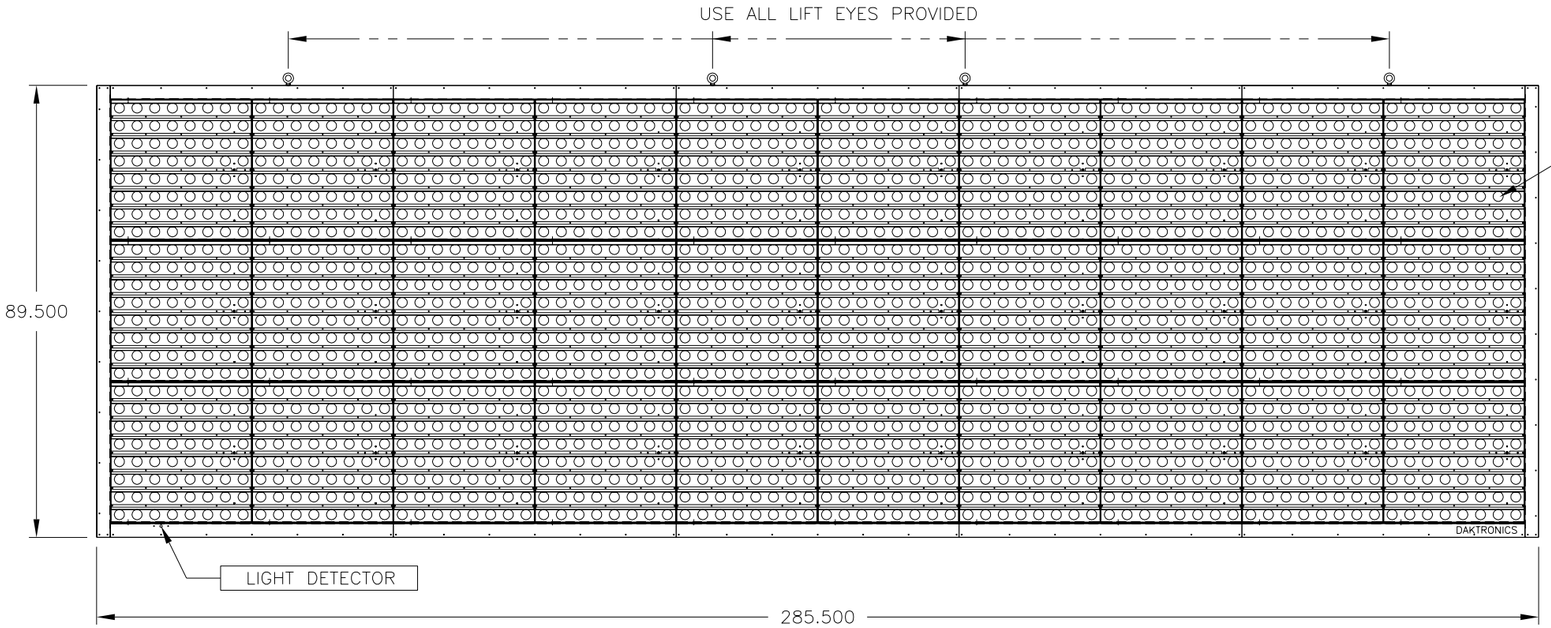
REV.	DATE	DESCRIPTION	BY	APPR.

REVISION

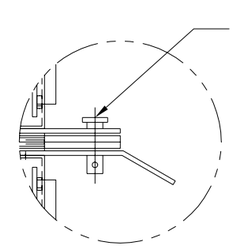
APPR. BY:

SCALE: 1 = 12

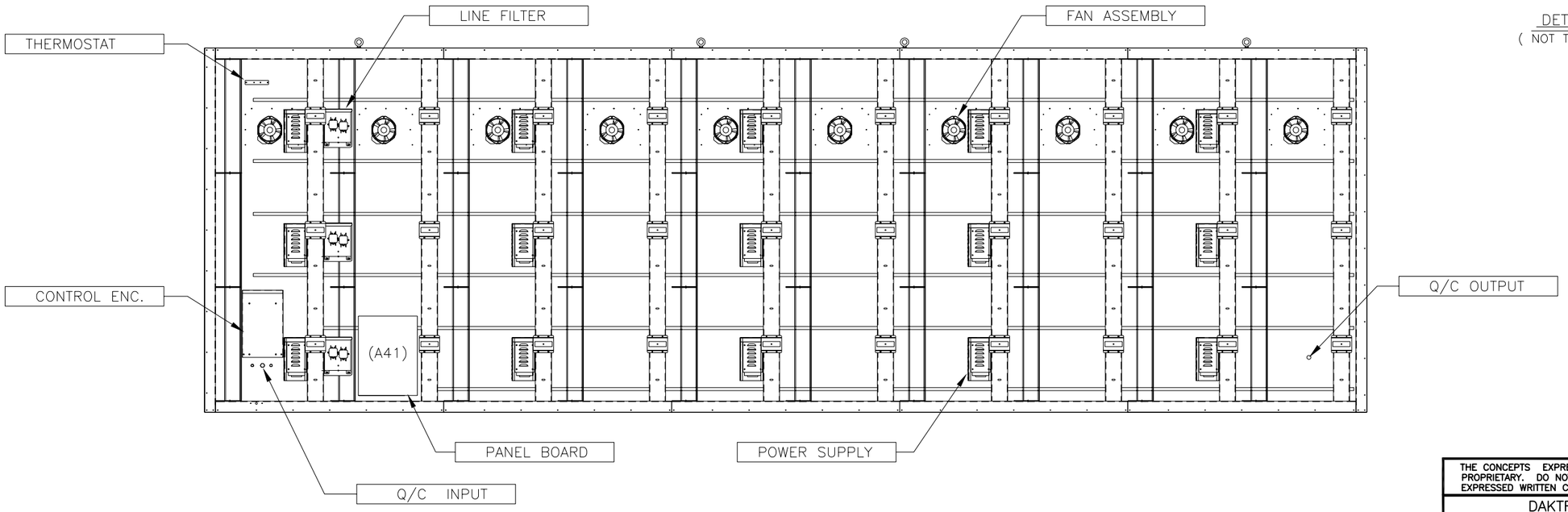
1259-E10B-178220



FRONT VIEW
(SHOWN WITH MODULE PANELS)



DETAIL: A
(NOT TO SCALE)



FRONT VIEW
(SHOWN WITHOUT MODULE PANELS)

REV.	DATE	DESCRIPTION	BY	APPR.
01	14JUN05	UPDATED NOMENCLATURE	JTELLIN	

DAKTRONICS, INC. BROOKINGS, SD 57006

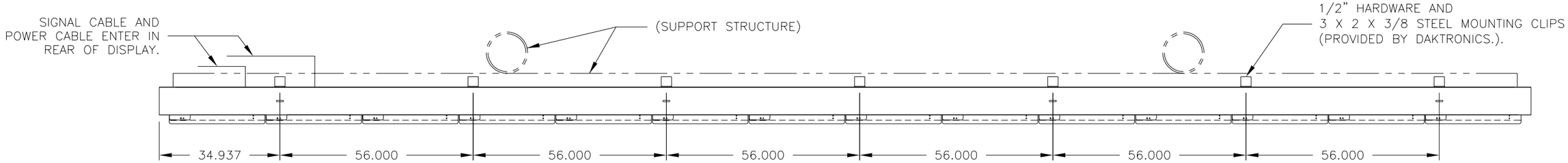
PROJ: AF-3400 GALAXY LARGE CHARACTER

TITLE: COMPONENT LAYOUT, AF-3400-**X**-89MM

DES. BY: JMT DRAWN BY: JMT DATE: 15 JAN 03

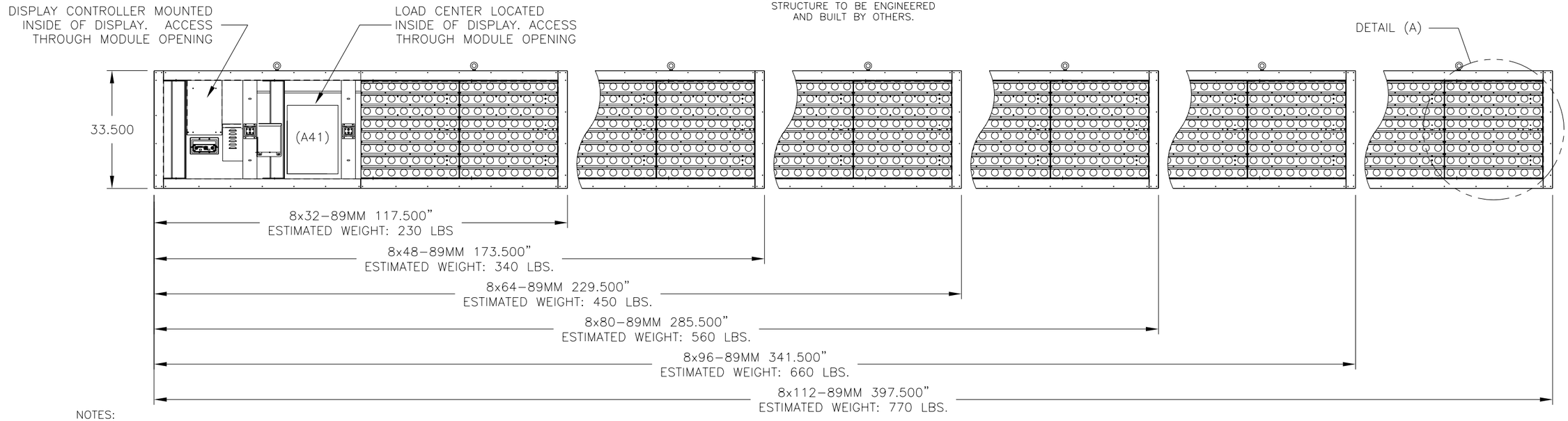
REVISION 01 | APPR. BY: | SCALE: 1=30

1259-E10B-181666



TOP VIEW

ALL SUPPORT STRUCTURE SHOWN IS FOR CONCEPT ONLY. SUPPORT STRUCTURE TO BE ENGINEERED AND BUILT BY OTHERS.



FRONT VIEW

NOTES:

1) ALL DIMENSIONS ARE GIVEN IN INCHES

2) DISPLAY IS OF ALL ALUMINUM CONSTRUCTION WITH STEEL MOUNTING CLIP ANGLES / HARDWARE.

3) DISPLAY IS PAINTED FLAT BLACK

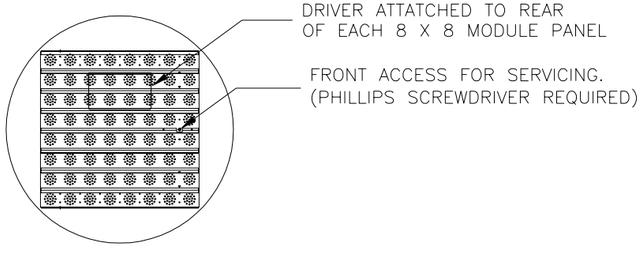
4) SERVICE ACCESS FOR ALL DRIVERS AND ELECTRONICS IS FROM THE FRONT.

5) LIFT EYES WILL BE PROVIDED IN EACH SECTION FOR INSTALLATION PURPOSES. HOLES IN TOP OF THE TOP SECTIONS MUST BE FILLED AND SEALED TO PREVENT EXCESS WATER FROM ENTERING CABINET.

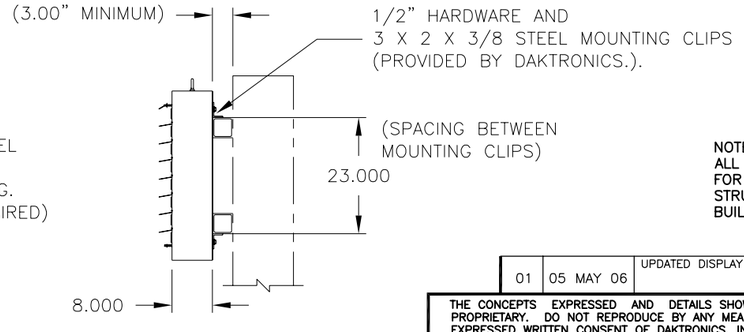
6) DISPLAY CONTROLLER AND LOAD CENTERS SUPPLIED BY DAKTRONICS AND MOUNTED INTERNALLY. SIGNAL TO BE RAN IN CONDUIT OR RACEWAY FROM COMPUTER LOCATION TO SIGNAL ENTRANCE IN BACK OF DISPLAY.

7) POWER CABLE / SIGNAL CABLE, ALL CONDUIT, AND ALL LABOR TO BE PROVIDED BY CUSTOMERS ELECTRICAL CONTRACTOR.

8) REFER TO RISER DIAGRAM FOR ELECTRICAL SPECIFICATIONS AND SIGNAL HOOK UPS.



DETAIL: A
(8 X 8 MODULE PANEL)



SIDE VIEW

MINIMUMS SHOWN ARE FOR VENTILATION REQUIREMENTS.

NOTE:
ALL SUPPORT STRUCTURE SHOWN IS FOR CONCEPT ONLY. SUPPORT STRUCTURE TO BE ENGINEERED AND BUILT BY OTHERS.

REV.	DATE	DESCRIPTION	BY	APPR.
02	19 JUN 06	AMENDED NOTE IN DETAIL A, SUBSTITUTING PHILLIPS SCREWDRIVER FOR 7/32 NUT DRIVER	RDK	
01	05 MAY 06	UPDATED DISPLAY WEIGHTS	NKJ	

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: AF-3*00 GALAXY, LARGE CHARACTER

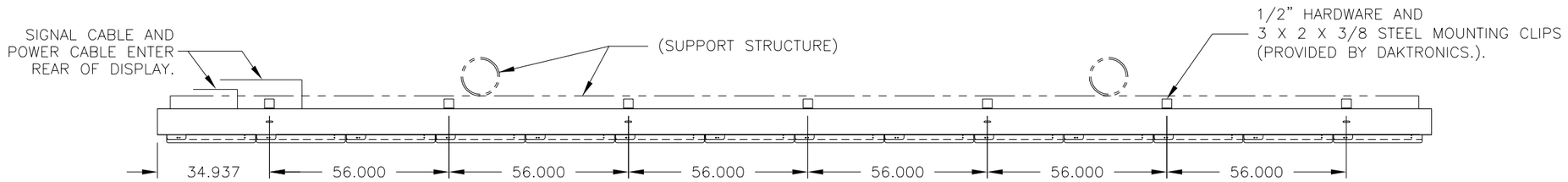
TITLE: SHOP DRAWING, AF-3400-8X**-89

DES. BY: JTELLIN DRAWN BY: SMENNIN DATE: 28FEB05

REVISION 02 APPR. BY:

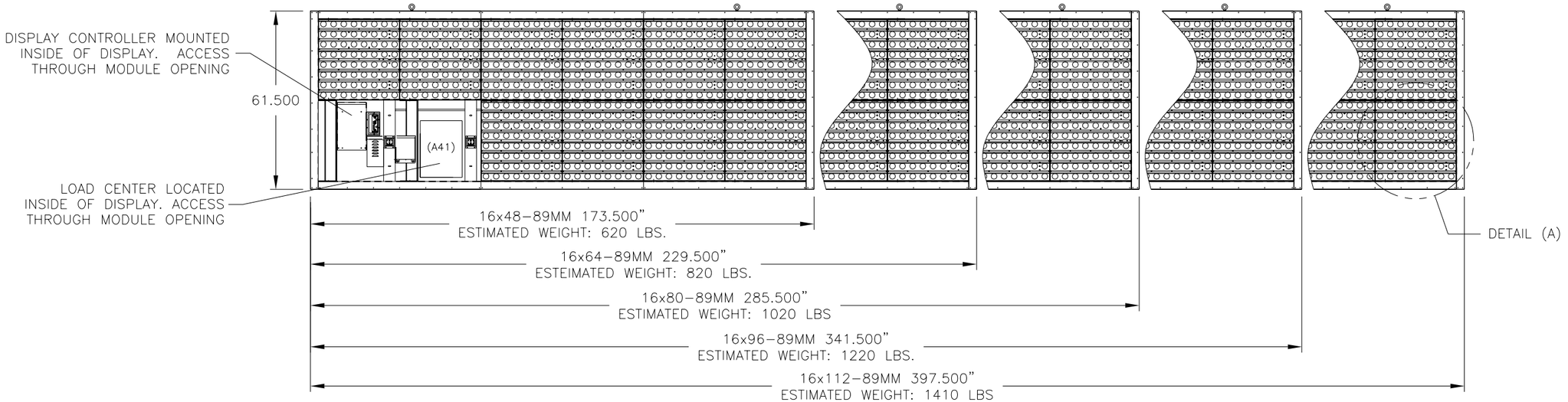
SCALE: 1=30

1259-E10B-235413



TOP VIEW

ALL SUPPORT STRUCTURE SHOWN IS FOR CONCEPT ONLY. SUPPORT STRUCTURE TO BE ENGINEERED AND BUILT BY OTHERS.



FRONT VIEW

NOTES:

1) ALL DIMENSIONS ARE GIVEN IN INCHES

2) DISPLAY IS OF ALL ALUMINUM CONSTRUCTION WITH STEEL MOUNTING CLIP ANGLES / HARDWARE.

3) DISPLAY IS PAINTED FLAT BLACK

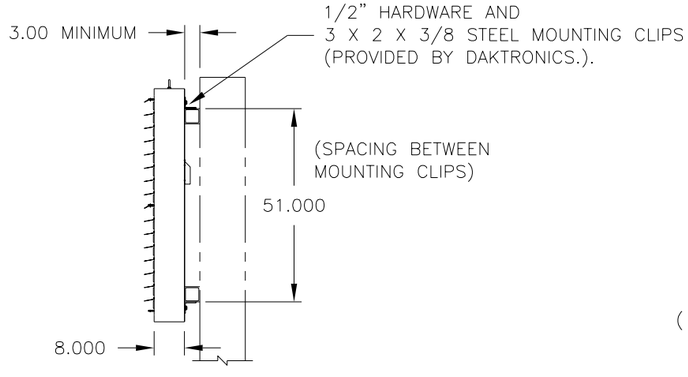
4) SERVICE ACCESS FOR ALL DRIVERS AND ELECTRONICS IS FROM THE FRONT.

5) LIFT EYES WILL BE PROVIDED IN EACH SECTION FOR INSTALLATION PURPOSES. HOLES IN TOP OF THE TOP SECTIONS MUST BE FILLED AND SEALED TO PREVENT EXCESS WATER FROM ENTERING CABINET.

6) DISPLAY CONTROLLER AND LOAD CENTERS SUPPLIED BY DAKTRONICS AND MOUNTED INTERNALLY. SIGNAL TO BE RAN IN CONDUIT OR RACEWAY FROM COMPUTER LOCATION TO SIGNAL ENTRANCE IN BACK OF DISPLAY.

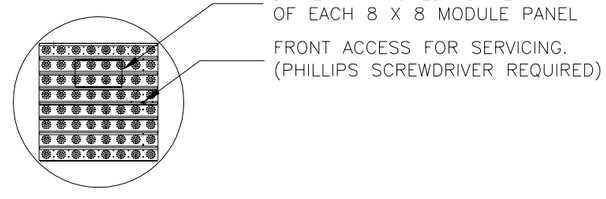
7) POWER CABLE / SIGNAL CABLE, ALL CONDUIT, AND ALL LABOR TO BE PROVIDED BY CUSTOMERS ELECTRICAL CONTRACTOR.

8) REFER TO RISER DIAGRAM FOR ELECTRICAL SPECIFICATIONS AND SIGNAL HOOK UPS.



SIDE VIEW

MINIMUMS SHOWN ARE FOR VENTILATION REQUIREMENTS.



DETAIL: A

(8 X 8 MODULE PANEL)

NOTE:
ALL SUPPORT STRUCTURE SHOWN IS FOR CONCEPT ONLY. SUPPORT STRUCTURE TO BE ENGINEERED AND BUILT BY OTHERS.

REV.	DATE	DESCRIPTION	BY	APPR.
02	19 JUN 06	AMENDED NOTE IN DETAIL A, SUBSTITUTING PHILLIPS SCREWDRIVER FOR 7/32 NUT DRIVER	RDK	
01	05 MAY 06	UPDATED DISPLAY WEIGHTS	NKJ	

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: AF-3*00 GALAXY, LARGE CHARACTER

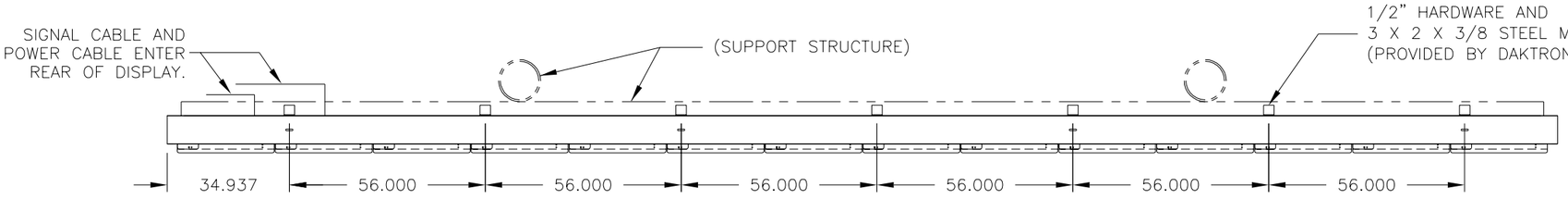
TITLE: SHOP DRAWING, AF-3400-16X**-89

DES. BY: JTELLIN DRAWN BY: SMENNIN DATE: 28FEB05

REVISION 02 APPR. BY:

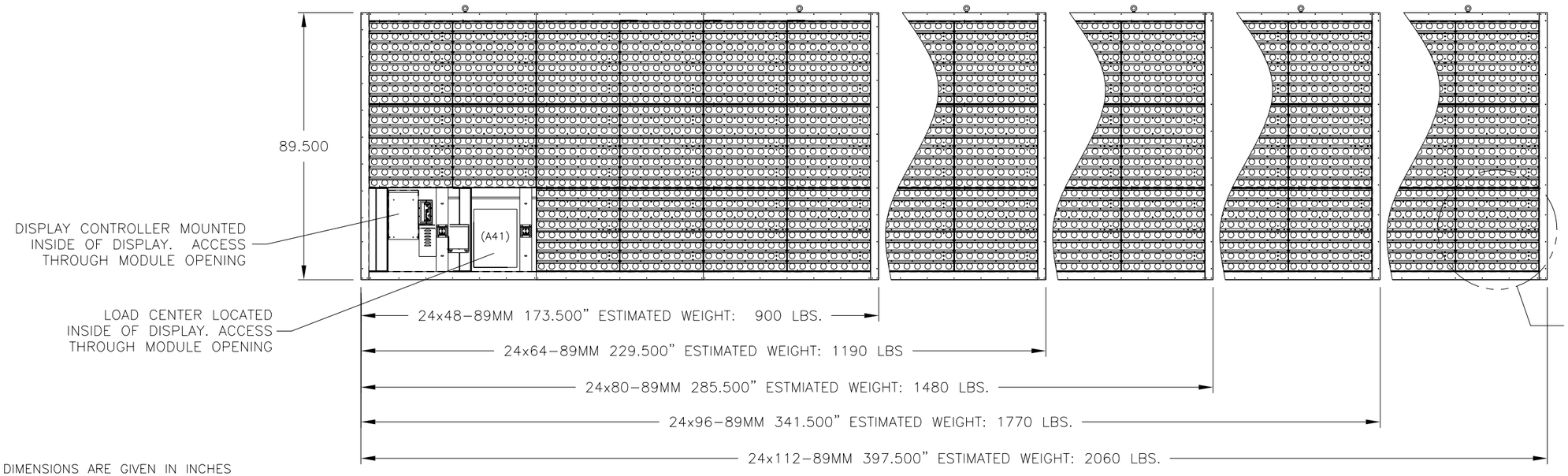
SCALE: 1=40

1259-E10B-235414



TOP VIEW

ALL SUPPORT STRUCTURE SHOWN IS FOR CONCEPT ONLY. SUPPORT STRUCTURE TO BE ENGINEERED AND BUILT BY OTHERS.



FRONT VIEW

NOTES:

1) ALL DIMENSIONS ARE GIVEN IN INCHES

2) DISPLAY IS OF ALL ALUMINUM CONSTRUCTION WITH STEEL MOUNTING CLIP ANGLES / HARDWARE.

3) DISPLAY IS PAINTED FLAT BLACK

4) SERVICE ACCESS FOR ALL DRIVERS AND ELECTRONICS IS FROM THE FRONT.

5) LIFT EYES WILL BE PROVIDED IN EACH SECTION FOR INSTALLATION PURPOSES. HOLES IN TOP OF THE TOP SECTIONS MUST BE FILLED AND SEALED TO PREVENT EXCESS WATER FROM ENTERING CABINET.

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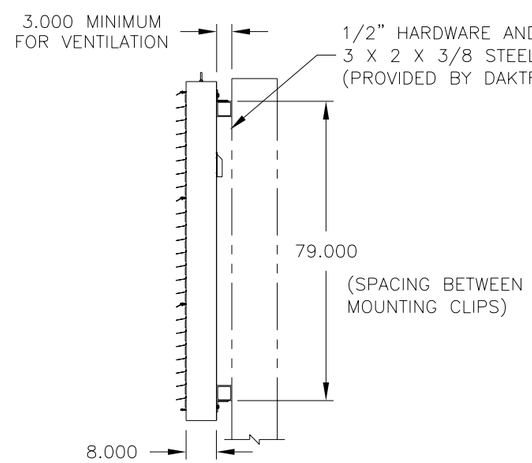
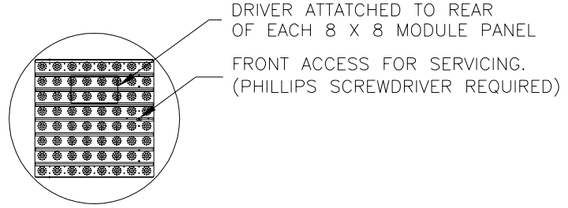
8) REFER TO RISER DIAGRAM FOR ELECTRICAL SPECIFICATIONS AND SIGNAL HOOK UPS.



SIDE VIEW

MINIMUMS SHOWN ARE FOR VENTILATION REQUIREMENTS.



DETAIL: A

(8 X 8 MODULE PANEL)

NOTE:
ALL SUPPORT STRUCTURE SHOWN IS FOR CONCEPT ONLY. SUPPORT STRUCTURE TO BE ENGINEERED AND BUILT BY OTHERS.

REV.	DATE	DESCRIPTION	BY	APPR.
02	19 JUN 06	AMENDED NOTE IN DETAIL A, SUBSTITUTING PHILLIPS SCREWDRIVER FOR 7/32 NUT DRIVER	RDK	
01	05 MAY 06	UPDATED DISPLAY WEIGHTS	NKJ	

DAKTRONICS, INC. BROOKINGS, SD 57006

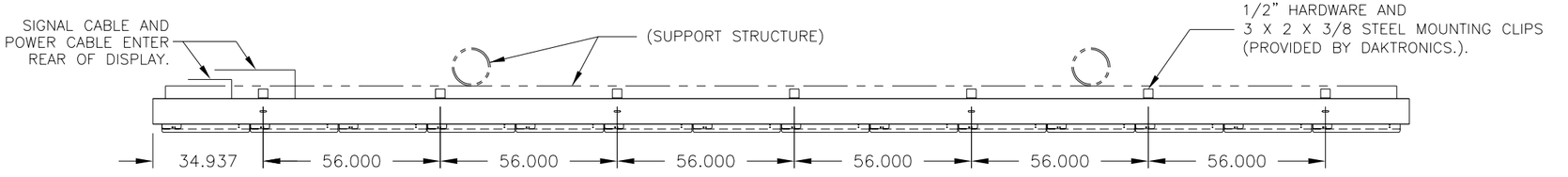
PROJ: AF-3*00 GALAXY, LARGE CHARACTER

TITLE: SHOP DRAWING, AF-3400-24X**-89

DES. BY: JTELLIN DRAWN BY: SMENNIN DATE: 28FEB05

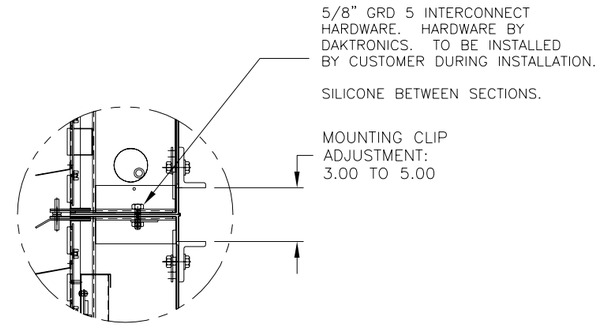
REVISION 02 | APPR. BY: | SCALE: 1=40

1259-E10B-235415



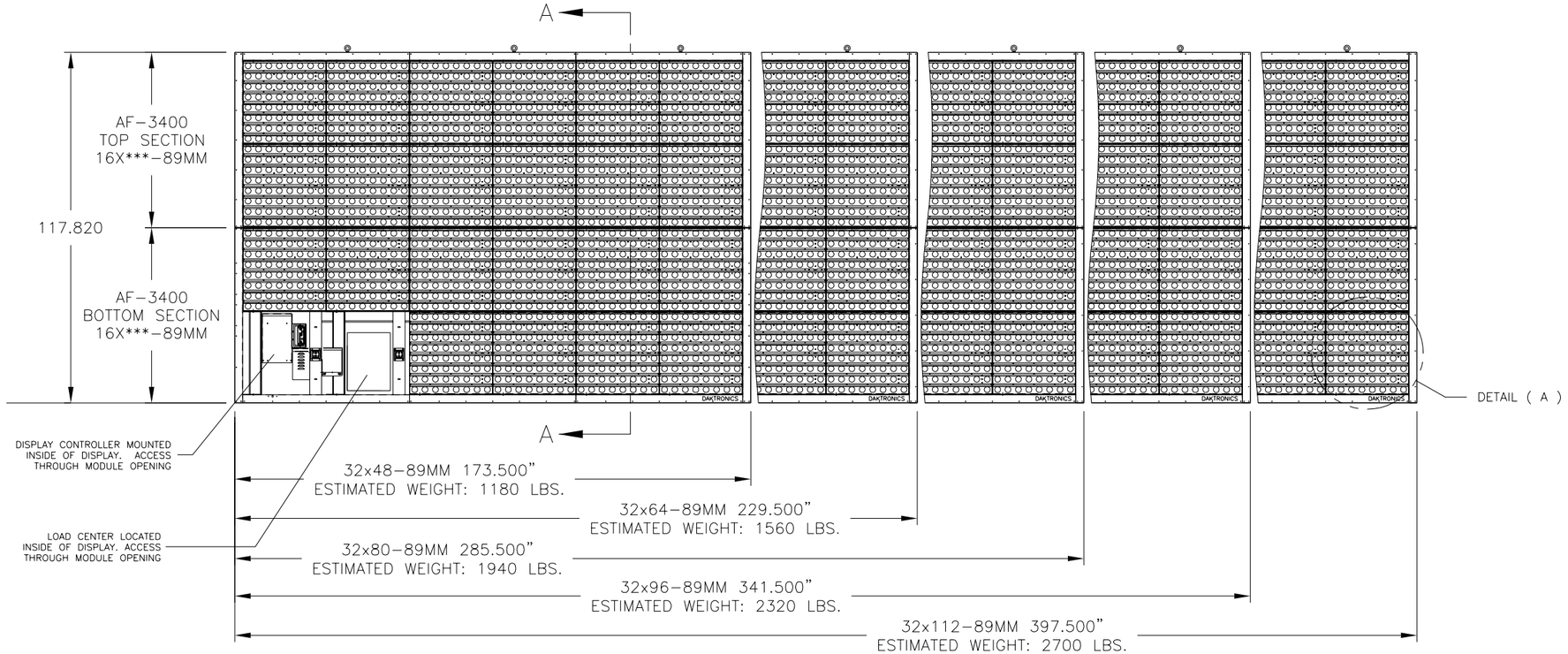
TOP VIEW

ALL SUPPORT STRUCTURE SHOWN IS FOR CONCEPT ONLY. SUPPORT STRUCTURE TO BE ENGINEERED AND BUILT BY OTHERS.

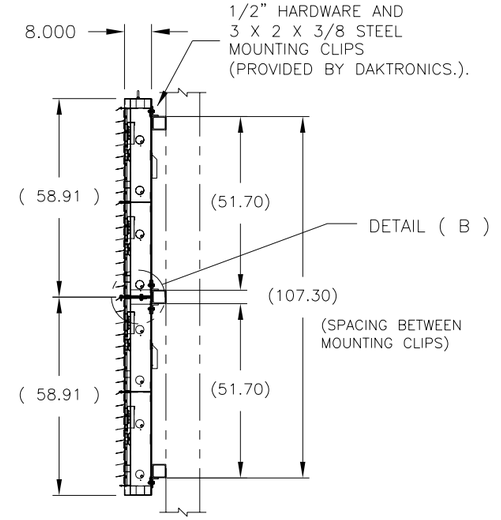


DETAIL: B

(NOT TO SCALE)



FRONT VIEW



SECTION: A-A

(1 X SCALE)

ALL SUPPORT STRUCTURE SHOWN IS FOR CONCEPT ONLY. SUPPORT STRUCTURE TO BE ENGINEERED AND BUILT BY OTHERS.

NOTES:

1) ALL DIMENSIONS ARE GIVEN IN INCHES
2) DISPLAY IS OF ALL ALUMINUM CONSTRUCTION WITH STEEL MOUNTING CLIP ANGLES / HARDWARE.
3) DISPLAY IS PAINTED FLAT BLACK
4) SERVICE ACCESS FOR ALL DRIVERS AND ELECTRONICS IS FROM THE FRONT.
5) LIFT EYES WILL BE PROVIDED IN EACH DISPLAY FOR INSTALLATION PURPOSES. HOLES IN THE TOP OF EACH DISPLAY MUST BE FILLED AND SEALED TO PREVENT EXCESS WATER FROM ENTERING CABINET.

NOTES CONTINUED:

6) DISPLAY CONTROLLER AND LOAD CENTERS SUPPLIED BY DAKTRONICS AND MOUNTED INTERNALLY. SIGNAL TO BE RAN IN CONDUIT OR RACEWAY FROM COMPUTER LOCATION TO SIGNAL ENTRANCE IN BACK OF DISPLAY.
7) POWER CABLE / SIGNAL CABLE, ALL CONDUIT, AND ALL LABOR TO BE PROVIDED BY CUSTOMERS ELECTRICAL CONTRACTOR.
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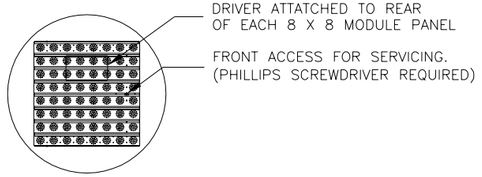


DETAIL: A

(8 X 8 MODULE PANEL)

REV.	DATE	DESCRIPTION	BY	APPR.
02	19 JUN 06	AMENDED NOTE IN DETAIL A, SUBSTITUTING PHILLIPS SCREWDRIVER FOR 7/32 NUT DRIVER	RDK	
01	05 MAY 06	UPDATED DISPLAY WEIGHTS	NKJ	

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: AF-3*00 GALAXY, LARGE CHARACTER

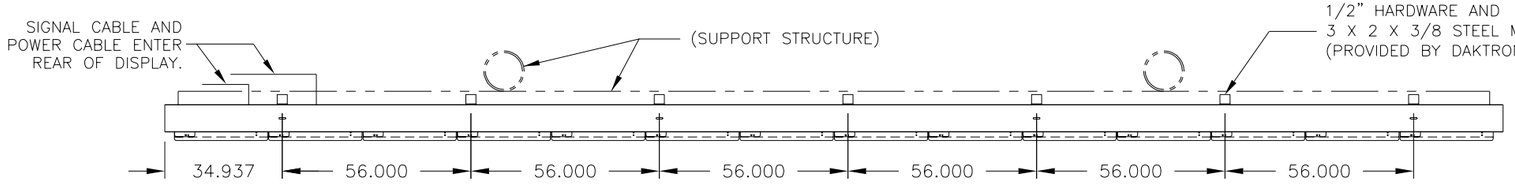
TITLE: SHOP DRAWING, AF-3400-32x***-89

DES. BY: JTELLIN DRAWN BY: SMENNIN DATE: 28FEB05

REVISION 02 APPR. BY:

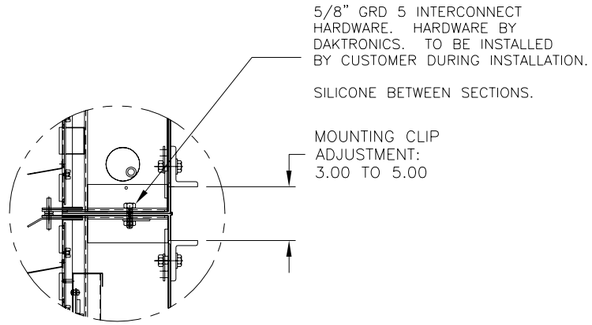
SCALE: 1=45

1259-E10B-235416



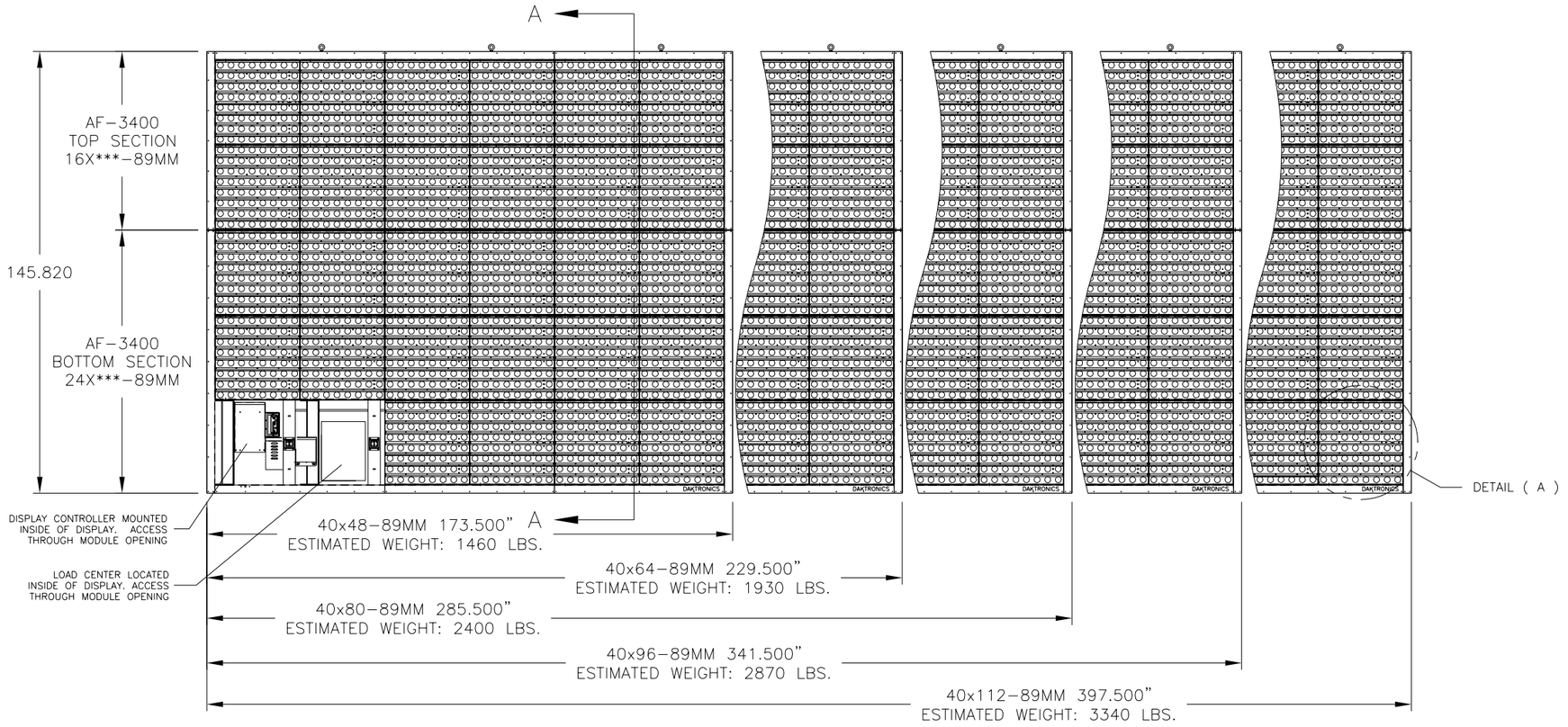
TOP VIEW

ALL SUPPORT STRUCTURE SHOWN IS FOR CONCEPT ONLY. SUPPORT STRUCTURE TO BE ENGINEERED AND BUILT BY OTHERS.

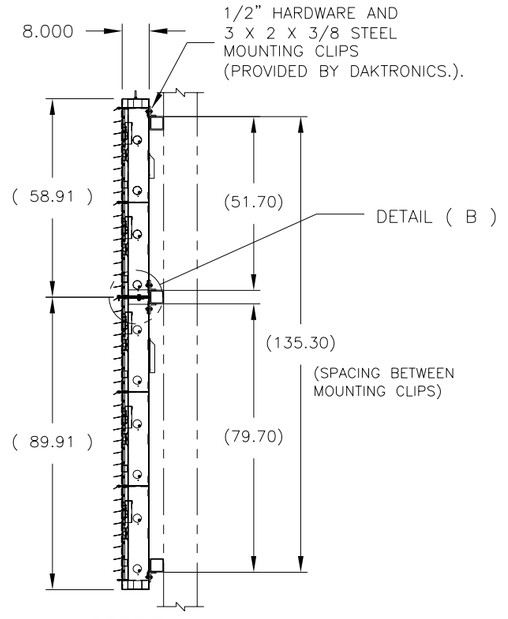


DETAIL: B

(NOT TO SCALE)



FRONT VIEW



SECTION: A-A

(1 X SCALE)

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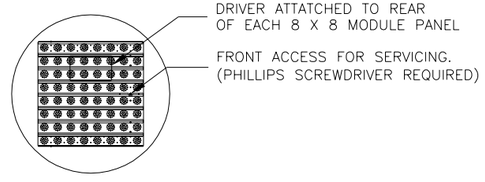


DETAIL: A

(8 X 8 MODULE PANEL)

REV.	DATE	DESCRIPTION	BY	APPR.
02	19 JUN 06	AMENDED NOTE IN DETAIL A, SUBSTITUTING PHILLIPS SCREWDRIVER FOR 7/32 NUT DRIVER	RDK	
01	05 MAY 06	UPDATED DISPLAY WEIGHTS	NKJ	

DAKTRONICS, INC. BROOKINGS, SD 57006

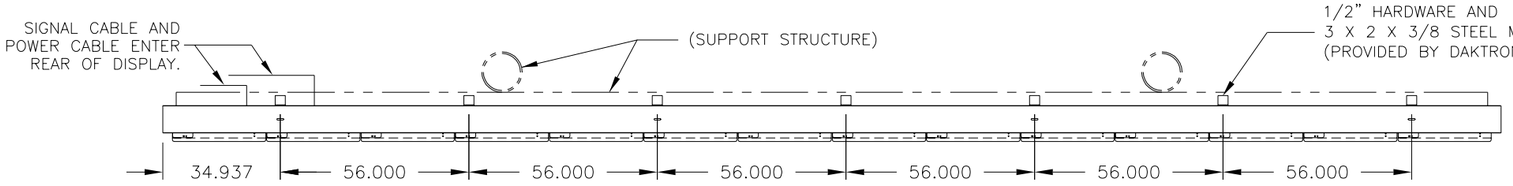
PROJ: AF-3*00 GALAXY, LARGE CHARACTER

TITLE: SHOP DRAWING, AF-3400-40x***-89

DES. BY: JTELLIN DRAWN BY: SMENNIN DATE: 28FEB05

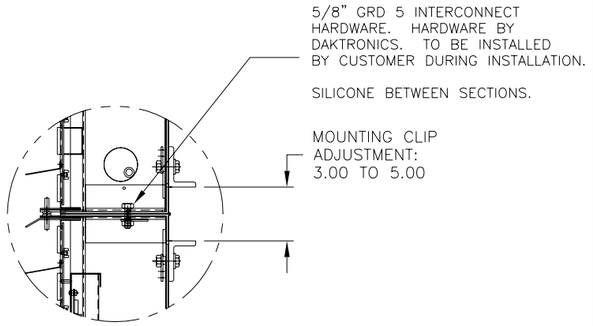
REVISION 02 APPR. BY: SCALE: 1=45

1259-E10B-235417



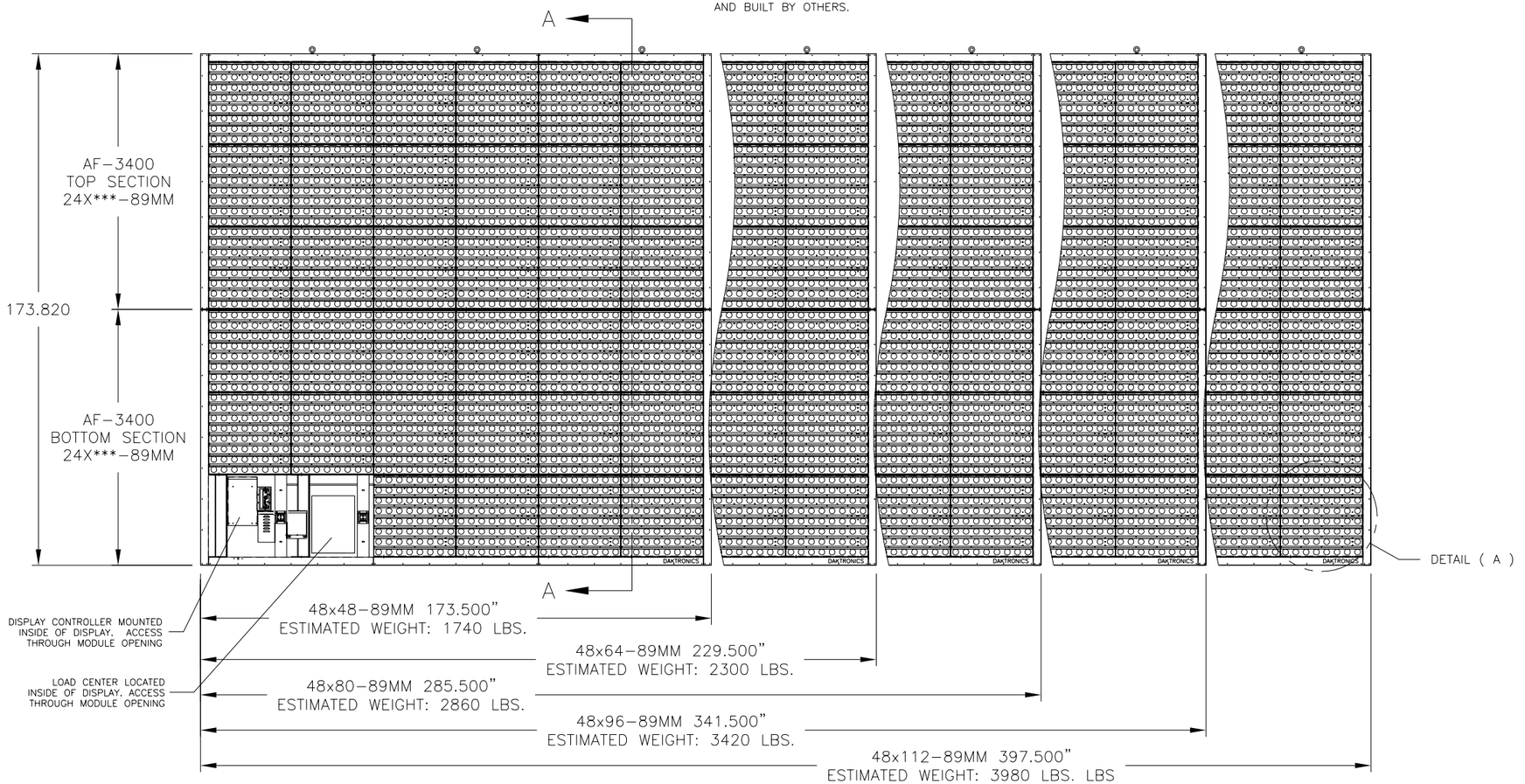
TOP VIEW

ALL SUPPORT STRUCTURE SHOWN IS FOR CONCEPT ONLY. SUPPORT STRUCTURE TO BE ENGINEERED AND BUILT BY OTHERS.

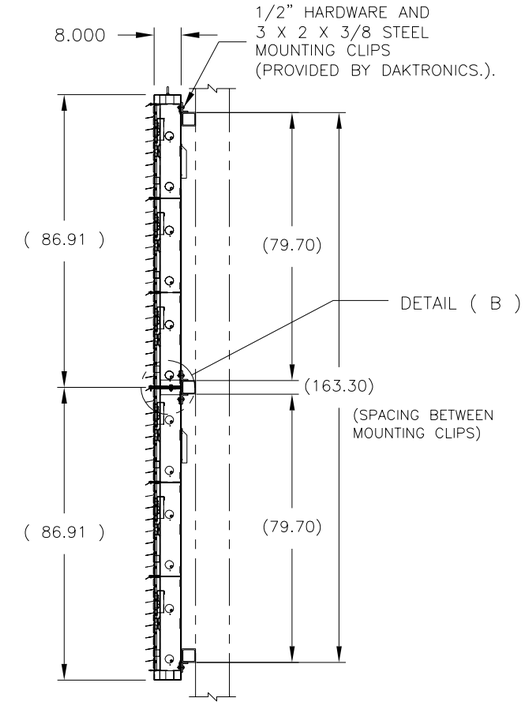


DETAIL: B

(NOT TO SCALE)



FRONT VIEW



SECTION: A-A

(1 X SCALE)

ALL SUPPORT STRUCTURE SHOWN IS FOR CONCEPT ONLY. SUPPORT STRUCTURE TO BE ENGINEERED AND BUILT BY OTHERS.

NOTES:

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NOTES CONTINUED:

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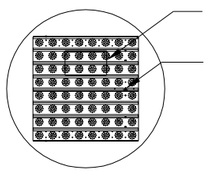


DETAIL: A

(8 X 8 MODULE PANEL)

REV.	DATE	DESCRIPTION	BY	APPR.
02	19 JUN 06	AMENDED NOTE IN DETAIL A, SUBSTITUTING PHILLIPS SCREWDRIVER FOR 7/32 NUT DRIVER	RDK	
01	05 MAY 06	UPDATED DISPLAY WEIGHTS	NKJ	

DAKTRONICS, INC. BROOKINGS, SD 57006

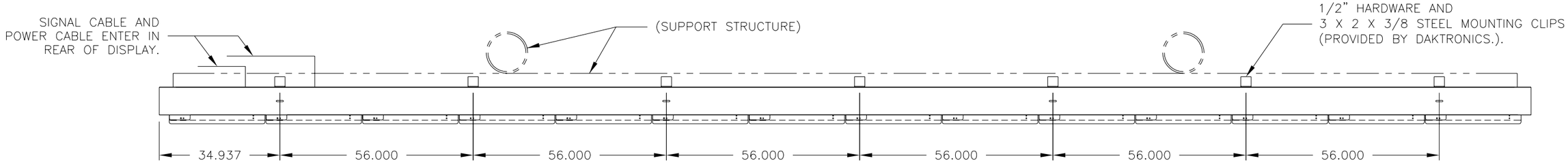
PROJ: AF-3*00 GALAXY, LARGE CHARACTER

TITLE: SHOP DRAWING, AF-3400-48x***-89

DES. BY: JTELLIN DRAWN BY: SMENNIN DATE: 28FEB05

REVISION 02 | APPR. BY: | SCALE: 1=45

1259-E10B-235418



TOP VIEW

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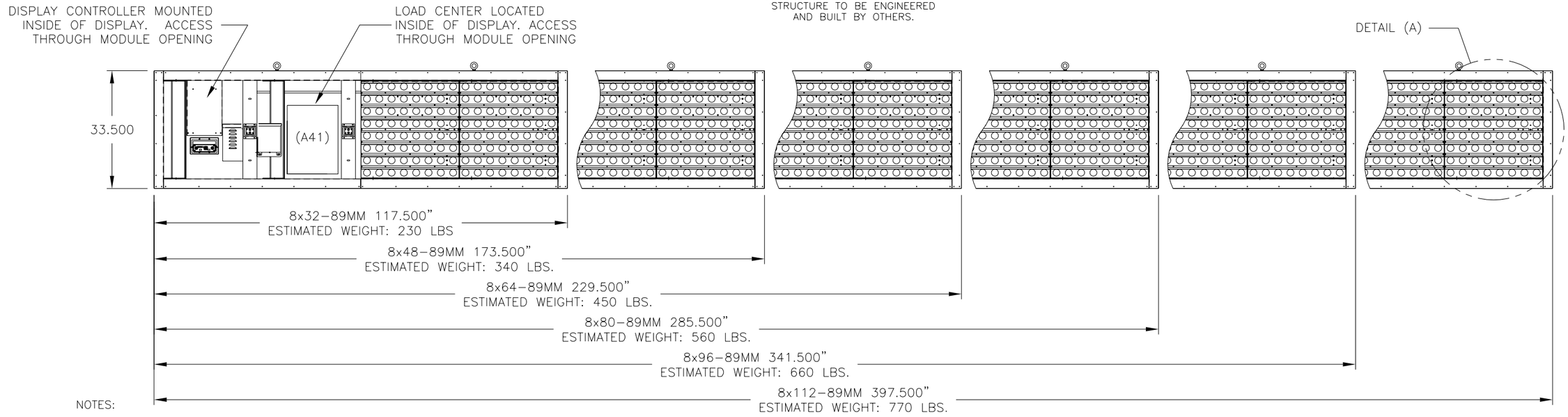

FRONT VIEW

NOTES:

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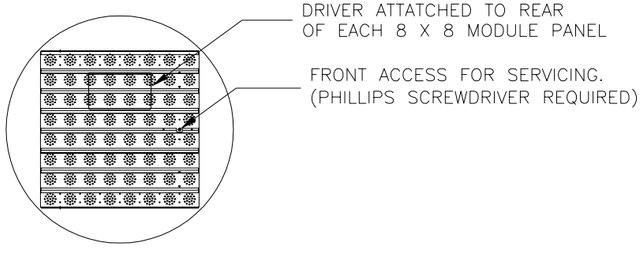
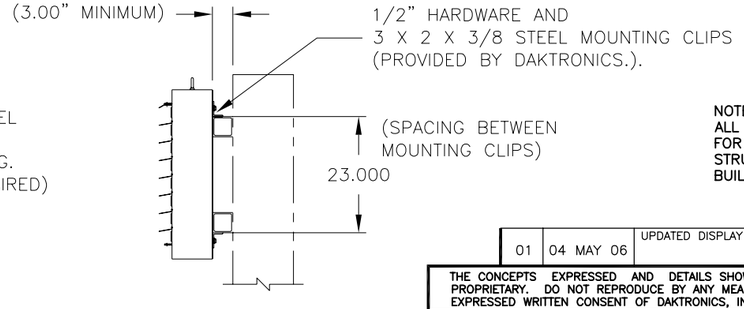


DETAIL: A

(8 X 8 MODULE PANEL)



SIDE VIEW

MINIMUMS SHOWN ARE FOR VENTILATION REQUIREMENTS.

NOTE:
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REV.	DATE	DESCRIPTION	BY	APPR.
02	19 JUN 06	AMENDED NOTE IN DETAIL A, SUBSTITUTING PHILLIPS SCREWDRIVER FOR 7/32 NUT DRIVER	RDK	
01	04 MAY 06	UPDATED DISPLAY WEIGHTS	NKJ	

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: AF-3*00 GALAXY, LARGE CHARACTER

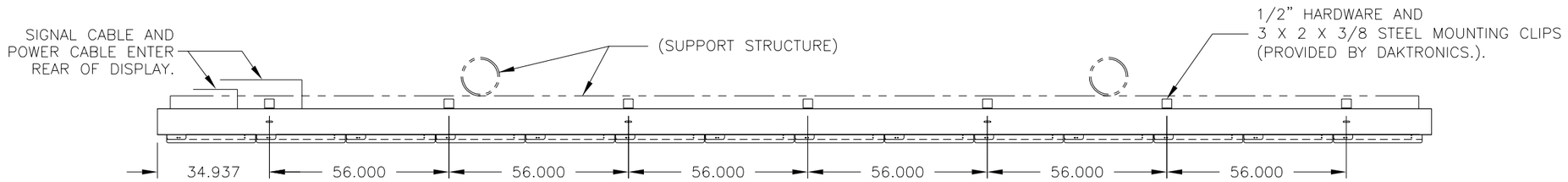
TITLE: SHOP DRAWING, AF-3200-8X**-89-RGB

DES. BY: JTELLIN DRAWN BY: SMENNIN DATE: 28FEB05

REVISION 02 APPR. BY:

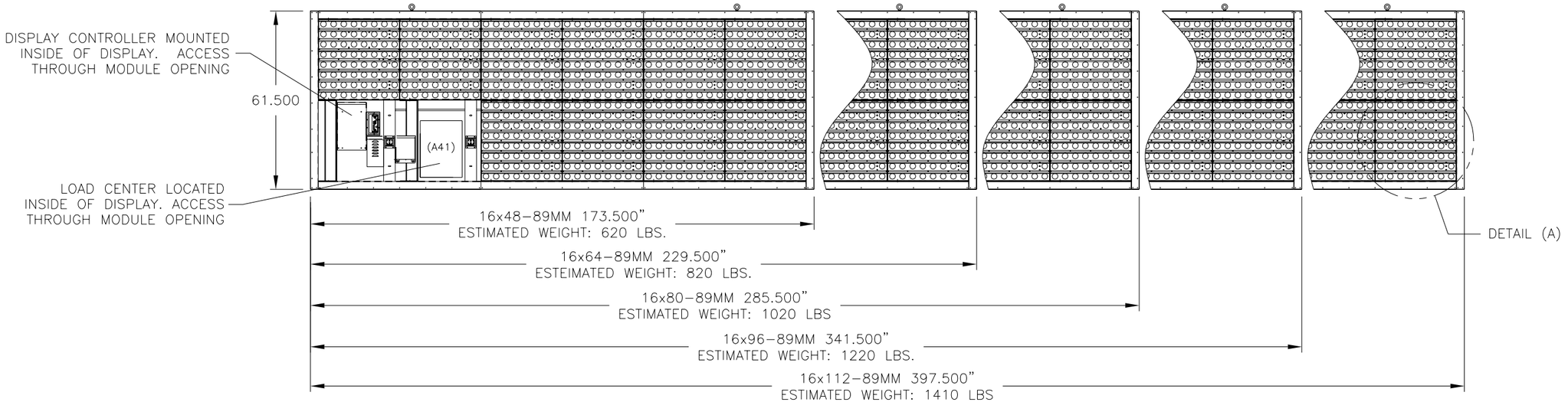
SCALE: 1=30

1259-E10B-235419



TOP VIEW

ALL SUPPORT STRUCTURE SHOWN IS FOR CONCEPT ONLY. SUPPORT STRUCTURE TO BE ENGINEERED AND BUILT BY OTHERS.



FRONT VIEW

NOTES:

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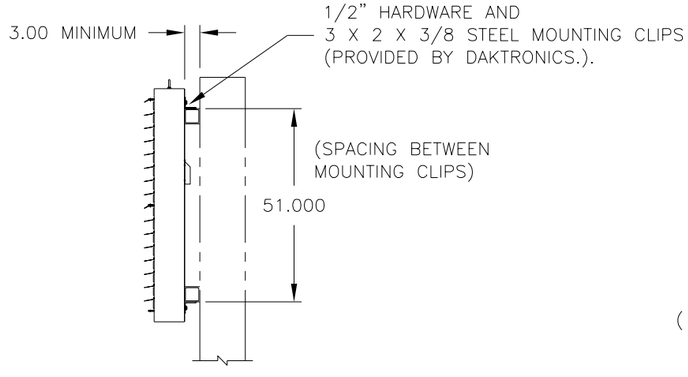
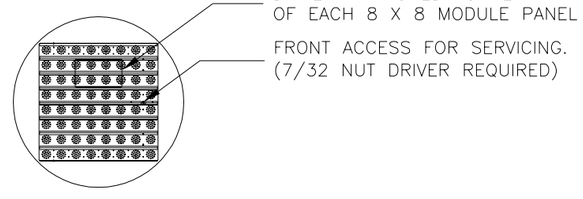


SIDE VIEW

MINIMUMS SHOWN ARE FOR VENTILATION REQUIREMENTS.



DETAIL: A
(8 X 8 MODULE PANEL)

NOTE:
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REV.	DATE	DESCRIPTION	BY	APPR.
02	19 JUN 06	AMENDED NOTE IN DETAIL A, SUBSTITUTING PHILLIPS SCREWDRIVER FOR 7/32 NUT DRIVER	RDK	
01	04 MAY 06	UPDATED DISPLAY WEIGHTS	NKJ	

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: AF-3*00 GALAXY, LARGE CHARACTER

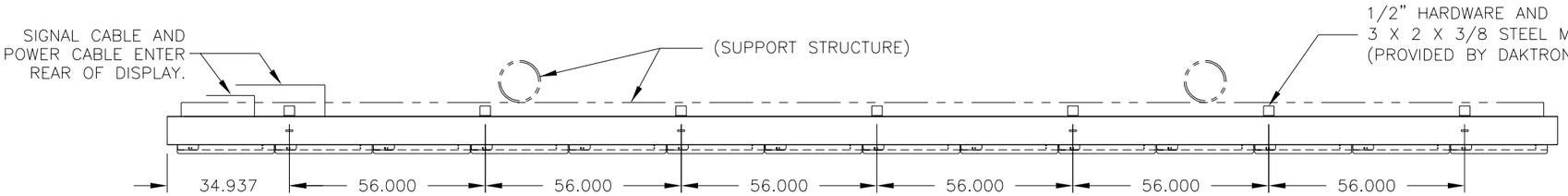
TITLE: SHOP DRAWING, AF-3200-16X**-89-RGB

DES. BY: JTELLIN DRAWN BY: SMENNIN DATE: 28FEB05

REVISION 02 APPR. BY:

SCALE: 1=40

1259-E10B-235420



TOP VIEW

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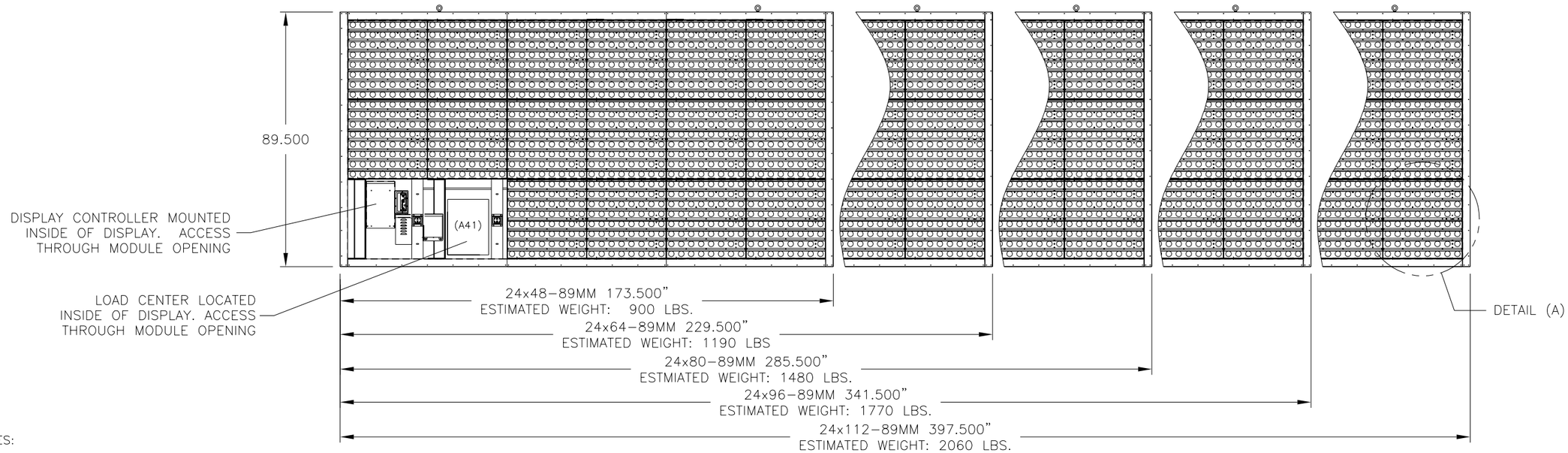

FRONT VIEW

NOTES:

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3) DISPLAY IS PAINTED FLAT BLACK

4) SERVICE ACCESS FOR ALL DRIVERS AND ELECTRONICS IS FROM THE FRONT.

5) LIFT EYES WILL BE PROVIDED IN EACH SECTION FOR INSTALLATION PURPOSES. HOLES IN TOP OF THE TOP SECTIONS MUST BE FILLED AND SEALED TO PREVENT EXCESS WATER FROM ENTERING CABINET.

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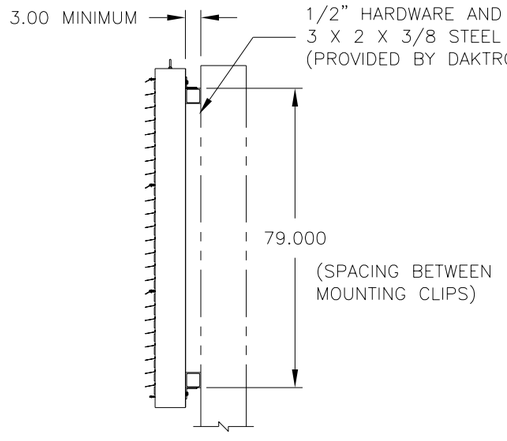
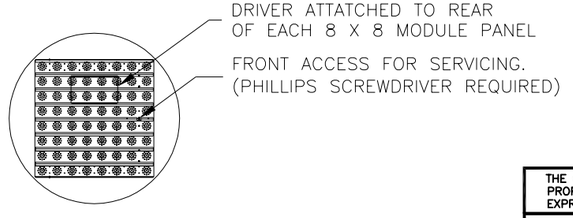
8) REFER TO RISER DIAGRAM FOR ELECTRICAL SPECIFICATIONS AND SIGNAL HOOK UPS.



SIDE VIEW

MINIMUMS SHOWN ARE FOR VENTILATION REQUIREMENTS.



DETAIL: A

(8 X 8 MODULE PANEL)

NOTE:
ALL SUPPORT STRUCTURE SHOWN IS FOR CONCEPT ONLY. SUPPORT STRUCTURE TO BE ENGINEERED AND BUILT BY OTHERS.

REV.	DATE	DESCRIPTION	BY	APPR.
02	19 JUN 06	AMENDED NOTE IN DETAIL A, SUBSTITUTING PHILLIPS SCREWDRIVER FOR 7/32 NUT DRIVER	RDK	
01	04 MAY 06	UPDATED DISPLAY WEIGHTS	NKJ	

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: AF-3*00 GALAXY, LARGE CHARACTER

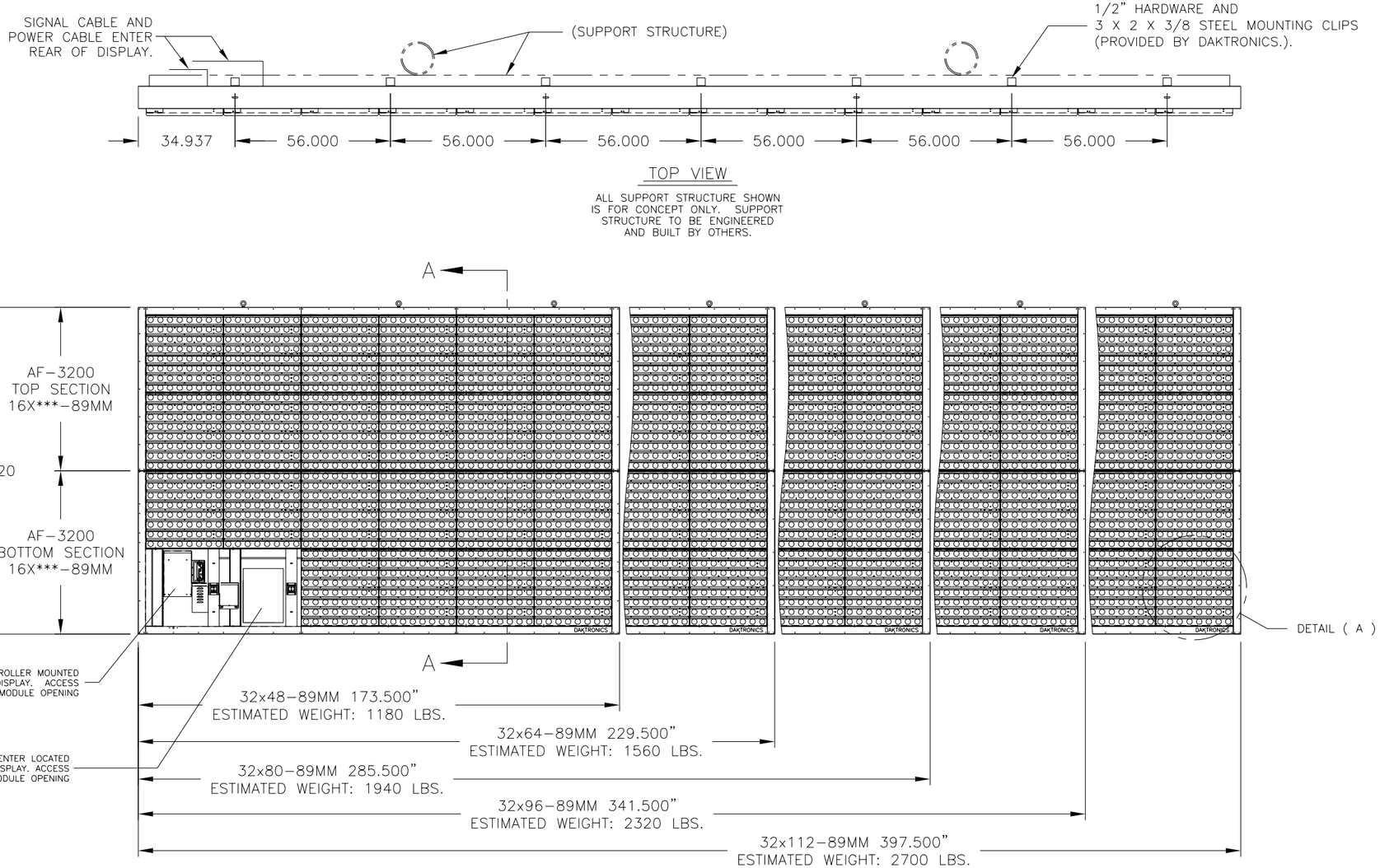
TITLE: SHOP DRAWING, AF-3200-24X**-89-RGB

DES. BY: JTELLIN DRAWN BY: SMENNIN DATE: 28FEB05

REVISION 02 APPR. BY:

SCALE: 1=40

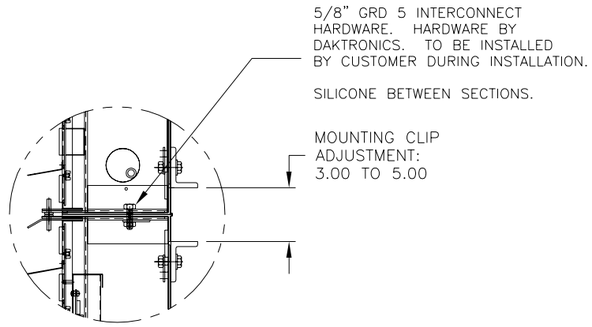
1259-E10B-235421



TOP VIEW

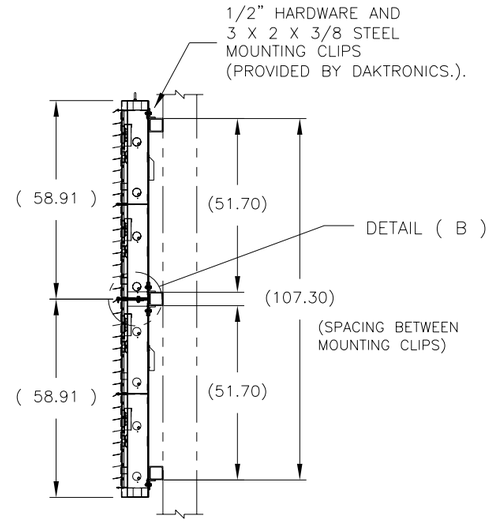
ALL SUPPORT STRUCTURE SHOWN IS FOR CONCEPT ONLY. SUPPORT STRUCTURE TO BE ENGINEERED AND BUILT BY OTHERS.

FRONT VIEW



DETAIL: B

(NOT TO SCALE)



SECTION: A-A

(1 X SCALE)

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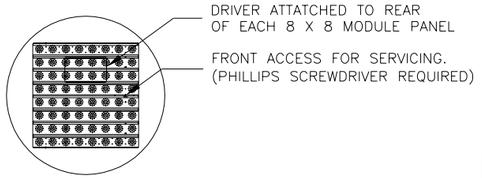

DETAIL: A

(8 X 8 MODULE PANEL)

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DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: AF-3*00 GALAXY, LARGE CHARACTER

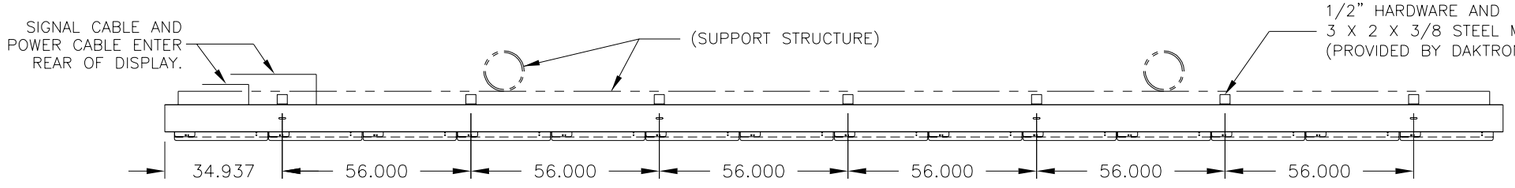
TITLE: SHOP DRAWING, AF-3200-32x**-89-RGB

DES. BY: JTELLIN DRAWN BY: SMENNIN DATE: 28FEB05

REVISION 02 APPR. BY:

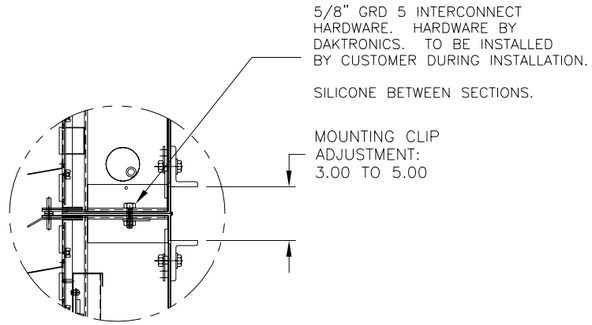
SCALE: 1=45

1259-E10B-235422



TOP VIEW

ALL SUPPORT STRUCTURE SHOWN IS FOR CONCEPT ONLY. SUPPORT STRUCTURE TO BE ENGINEERED AND BUILT BY OTHERS.



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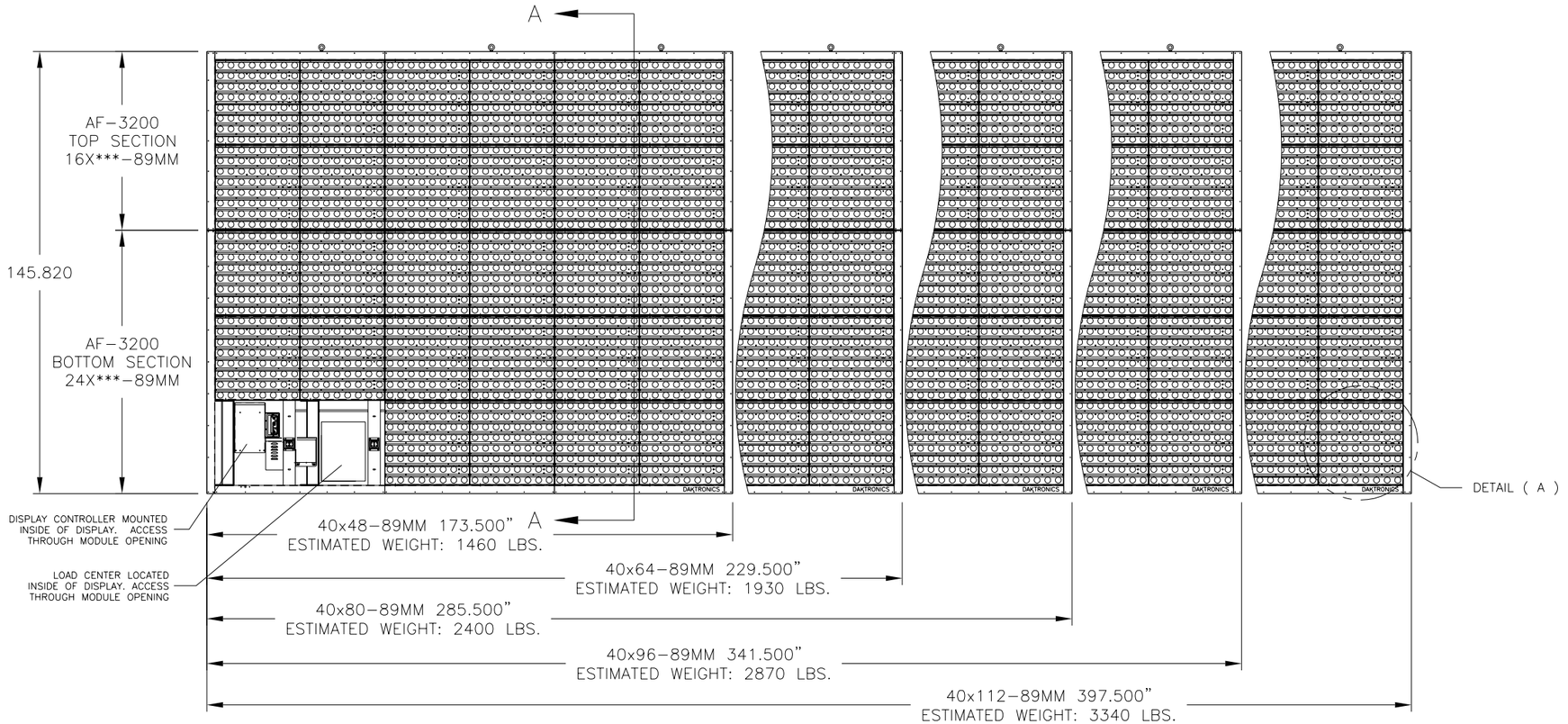
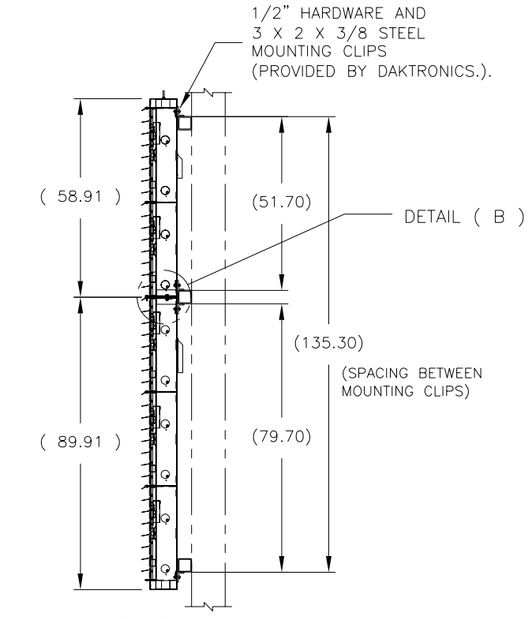
(NOT TO SCALE)



FRONT VIEW



SECTION: A-A

(1 X SCALE)

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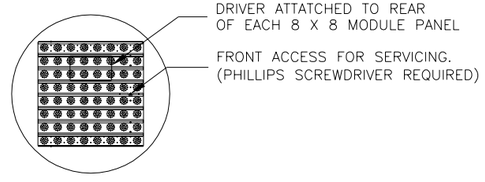

DETAIL: A

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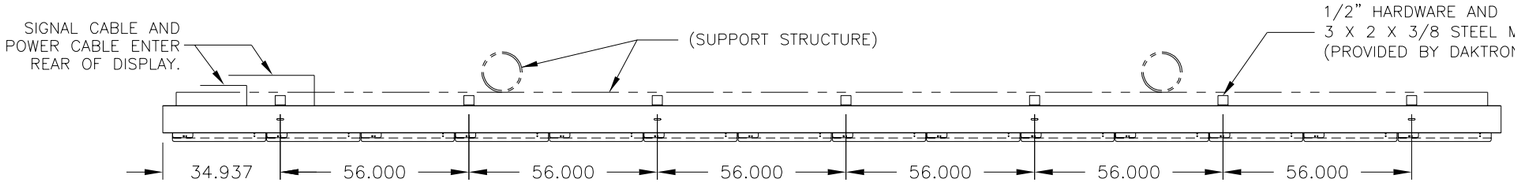
TITLE: SHOP DRAWING, AF-3200-40x**-89-RGB

DES. BY: JTELLIN DRAWN BY: SMENNIN DATE: 28FEB05

REVISION 02 APPR. BY:

SCALE: 1=45

1259-E10B-235423



TOP VIEW

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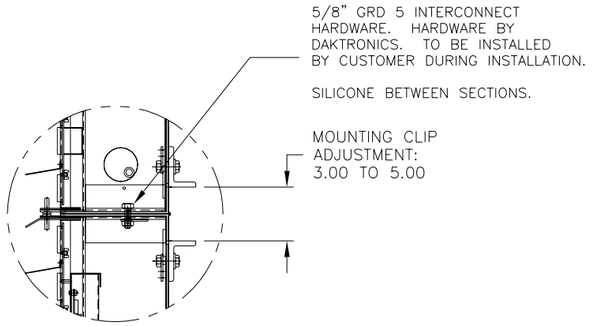
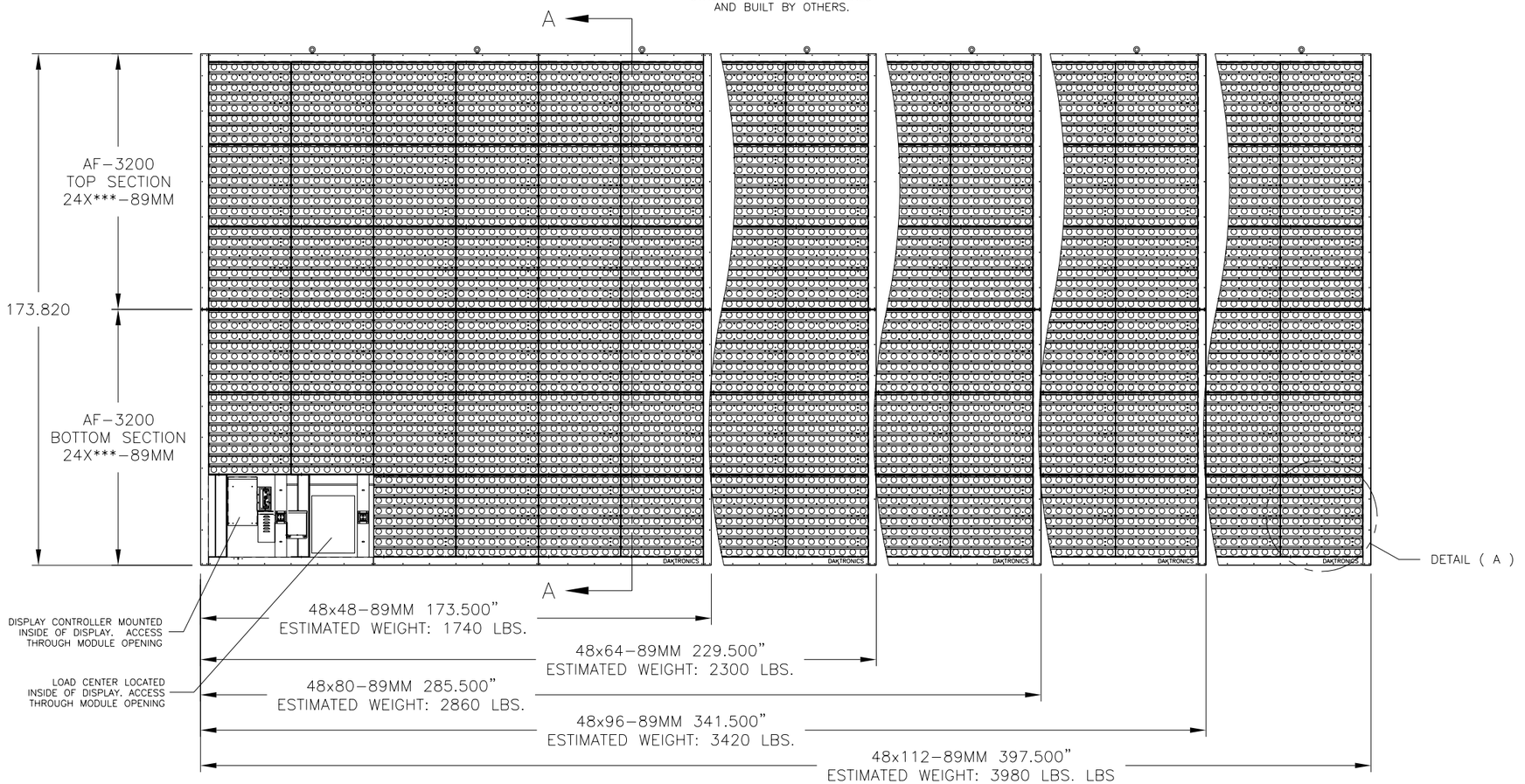
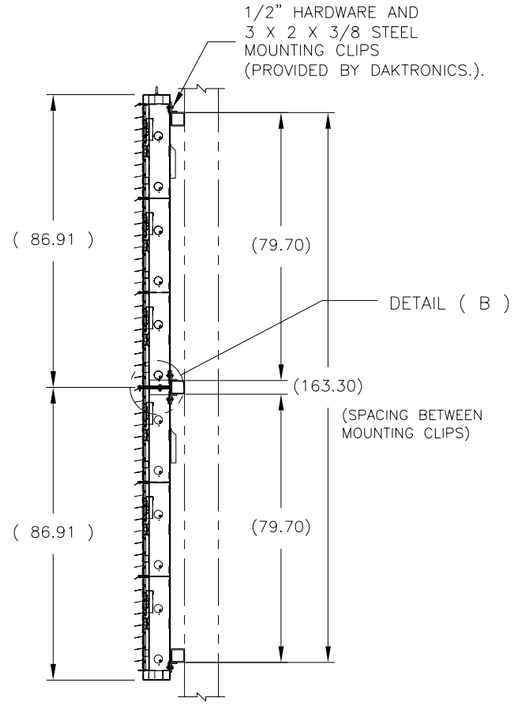


DETAIL: B

(NOT TO SCALE)



FRONT VIEW



SECTION: A-A

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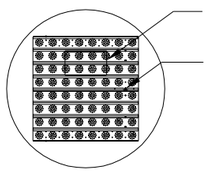

DETAIL: A

(8 X 8 MODULE PANEL)

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DES. BY: JTELLIN DRAWN BY: SMENNIN DATE: 28FEB05

REVISION 02 | APPR. BY: | SCALE: 1=45

1259-E10B-235424

Appendix B: Signal Converter

Appendix C: Optional Temperature Sensor

Optional Temperature Sensor Mounting

For Galaxy displays only

Reference Drawings:

Temperature Sensor Cable Routing Schematic ..... **Drawing A-197884**
Exploded Temperature Housing Assembly..... **Drawing A-198371**

1.1 Temperature Sensor Overview

The temperature sensor enclosure is made up of eight plastic disks, a metal mounting bracket, and a 25-foot weather resistant cable. Refer to **Figure 1**.

In most cases, the enclosure will be mounted using two screws. The cable will be plugged into the back of the display.

In certain cases, it may be necessary to disassemble the enclosure or rewire the temperature sensor board. Instructions are provided for those situations. If replacement or additional parts are needed, refer to the following chart for part numbers.

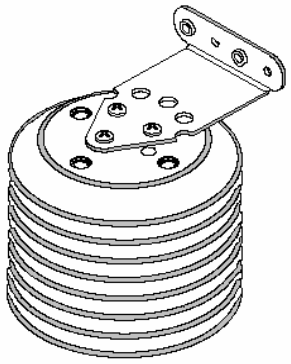


Figure 1: *Temperature Sensor*

Parts List	
Part description	**Daktronics part number**
Temperature sensor housing	0A-1151-0005
Temperature sensor	0P-1247-0008
4-pin Mal Conxall cable	W-1819
22 AWG 2-pair shielded cable	W-1234
30-foot extension cable	W-1820
100-foot extension cable	W-1821
200-foot extension cable	W-1822

1.2 Mounting Locations

For greater accuracy of temperature, follow these mounting recommendations:

- An ideal location is under a north eave or on a northern exposure away from direct sunlight (**Figure 4**).
- Mount the sensor above grass or vegetation rather than concrete or other paving.
- Mount at least 20 feet away from chimneys, vents, air conditioners, or other items that would influence correct temperature readings.
- **Do not** mount between displays or in any location that restricts air movement.
- Mount the sensor so that the cable can be protected from weather and vandalism.

The most common locations for the temperature sensor are on the display cabinet (**Figure 2**), or on the display structure (**Figure 3**). A light-colored display is preferred in this location. Location of the sensor should be below or on a northern edge of the display to keep the sensor shaded.

Figure 2: *Located on the Display*

Figure 3: *Located on Structure*

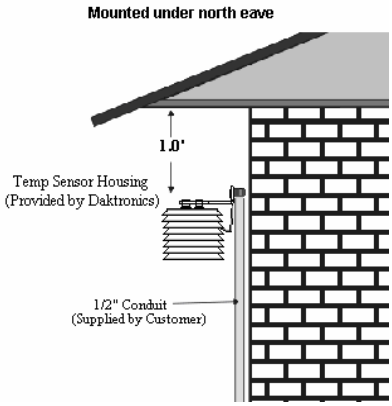


Figure 4: *Located on the North Eave*

When exposed to outdoor conditions, it is necessary to route cable through conduit. In cases such as this, the quick-connect cable must be extended or replaced with four-conductor, 22-AWG, shielded cable. The maximum length of the cable should be no more than 500 feet.

Mounting to a sheet metal surface

Follow these instructions when mounting the sensor to a sheet metal surface:

1. Drill two pilot holes using a 5/32″ drill bit. Horizontally space the holes 1.5″ apart.
2. Insert two self-drilling screws through the holes of the mounting bracket, and screw into the pilot holes.
3. Route cable up to the quick-connect jack on the back of the display and plug into J31. Refer to **Section 1.3** for an example of connection.

1.3 Temperature Signal Connection

Three options for signal connection are explained in this section:

- Using the 25-foot quick-connect cable.
- Using the quick-connect cable but less than 25 feet.
- Using more than 25-feet including extension cables or 22 AWG shielded cable.

Using the provided 25-foot quick-connect cable

1. The temperature sensor is provided with a 25-foot weather-resistant cable. This cable does not need to be in conduit. The sensor connects to the display at J31. Refer to **Figure 5** for the location of the quick-connect plug.
2. Secure any excess cable to discourage vandalism.
3. Between displays, the quick-connect signal cable connects both communication and temperature signal, thus no additional wiring is required from display to display for the temperature sensor.

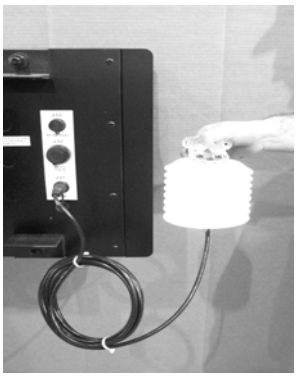


Figure 5: *Quick-connect Cable*

Using the quick-connect cable and less than the 25-foot cable

1. Open the temperature sensor housing by removing the four nuts from the bottom and then removing the five bottom disks. Refer to **Drawing A-198371** for details on sensor housing disassembly.
2. Disconnect the quick-connect CAN temperature sensor cable from the temperature terminal block in the CAN temperature sensor housing.
3. Cut the cable to the desired length and reattach to the temperature sensor terminal block in the CAN temperature sensor housing. Refer to the table and **Figure 6** for the temperature sensor wiring.
4. Make sure to route cable around the sensor board as shown in **Figure 7** and **Drawing A-197884**.
5. Reconnect the cable and reassemble the sensor.

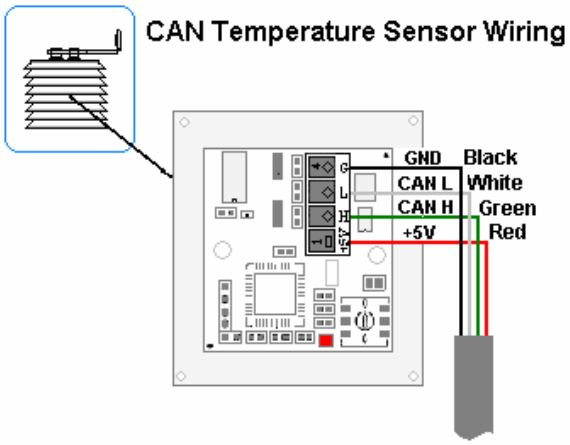


Figure 6: *CAN Temperature Sensor Wiring*

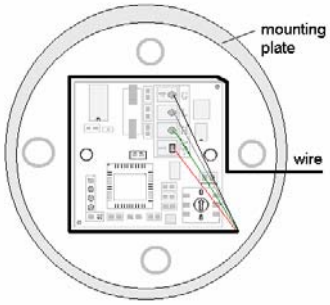


Figure 7: *Wiring Around Sensor*

Wire Color	Temperature Sensor Terminal Block (TB1)
Red	+5V CAN (Pin 1)
Green	CANH (Pin 2)
White	CANL (Pin 3)
Black	GND (Pin 4)
***Note:** Do not terminate shield at this point.*	

Using more than 25-feet of cable

To meet customer needs, Daktronics has designed extension cables that allow extra length from the sensor to the display without separate rewiring. These cables contain the correct circular ends to be used with the quick-connect cable and quick-connect input. Refer to the parts list in **Section 1.1** for the cable options available.

If 22 AWG shielded cable is used instead of the cable extensions, follow these steps:

1. Run 1/2" conduit from the temperature sensor to a knockout on the back of the primary display. The cable must be routed through 1/2" metal conduit that should be earth-grounded to protect the sensor and controller from lightning damage.
2. Use a 2-pair 22 AWG individually shielded cable to connect the sensor to the 8-position terminal block in the display labeled "CAN US/DS" (A31/TB4). Connect to the controller as shown in **Figure 8**.
3. Open the temperature sensor housing by removing the four nuts from the bottom and then removing the five bottom disks. Refer to **Drawing A-198371** for details on sensor housing disassembly.
4. Disconnect the quick-connect temperature sensor cable from the terminal block in the temperature sensor housing.
5. Connect the cable coming from the display's terminal block to the temperature sensor board in the temperature sensor housing. Refer to **Figure 8** and table below for wiring locations at the sensor and to the controller.
6. Make sure to route cable around the sensor board as shown in **Drawing A-197884**. Connect the cable and reassemble the sensor. Refer to **Figure 8** and to the table below for the temperature sensor wiring.

Note: The cable length from the sensor to the display should not exceed 500 feet.

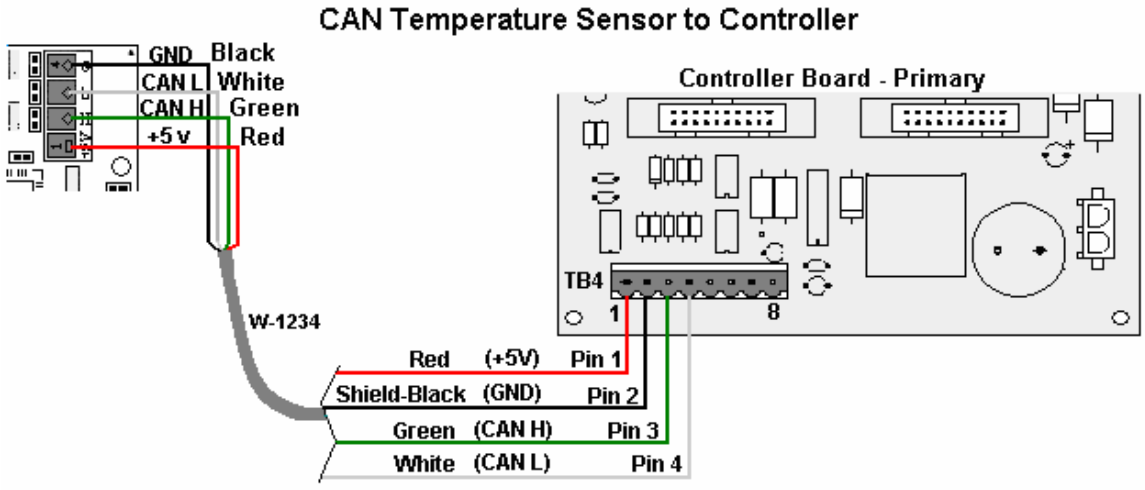


Figure 8: *CAN Temperature Sensor Connection*

CAN Temperature Sensor (TB1)	Field Cabling	Primary - Controller Board CAN US (A31-TB4)
Pin 1 (+5V CAN)	Red	Pin 1 (+5V CAN)
Pin 2 (CAN H)	Green	Pin 3 (CAN H)
Pin 3 (CAN L)	White	Pin 4 (CAN L)
Pin 4 (GND CAN)	Black	Pin 2 (GND CAN)
	Shield	Pin 2 (Shield)

1.4 Temperature Interconnection Between Displays

If the display uses the quick-connect interconnect cable, this connection is already complete.

If the interconnect cable was not used, a 4-conductor shielded cable is needed to terminate the temperature sensor from side one to side two. One end terminates at the "CAN US/DS" 8-position terminal block (A31-TB4) on the Primary display. The other end terminates at the "CAN US/DS" 8-position terminal block (A31-TB4) at the second Primary display. Refer to **Figure 9** and the table for correct interconnect locations.

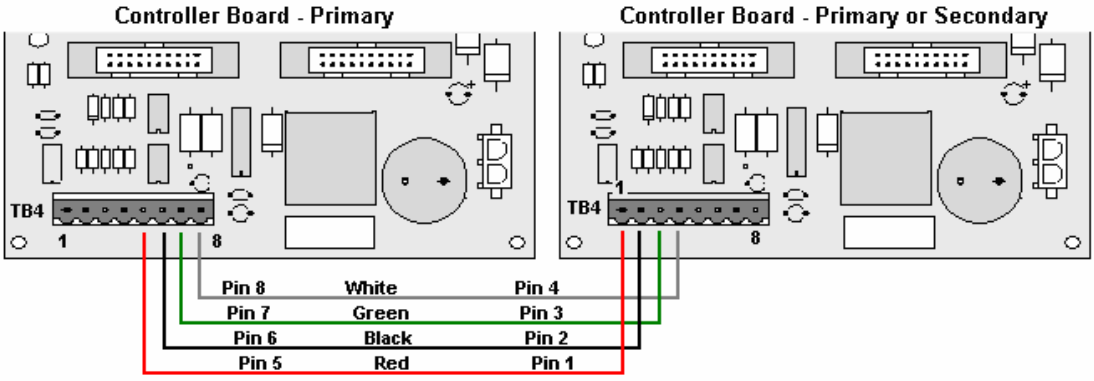


Figure 9: *CAN Controller Interconnect*

Primary - CAN DS (A31-TB4)	Field Cabling	Secondary - CAN US (A31-TB4)
Pin 7 (CAN H)	Green	Pin 3 (CAN H)
Pin 8 (CAN L)	White	Pin 4 (CAN L)
Pin 6 (GND CAN)	Black	Pin 2 (GND CAN)
Pin 5 (Relay)	Red	Pin 1(CAN +5V)
	Shield	

1.5 Sensor Board Replacement

If a problem occurs with the temperature sensor board or the wiring to the sensor, the board can be accessed in the following method:

1. Open the temperature sensor housing by removing the four nuts from the bottom, and removing the five bottom disks. Refer to **Figure 10** or **Drawing A-198371** for details on sensor housing disassembly.
2. Label the wires connected to the temperature sensor board and then disconnect the cable from the temperature sensor terminal block in the temperature sensor housing.
3. Remove the two screws holding the board to the plastic disk. Install the new board, and replace the two screws.
4. Reconnect the cable to the temperature sensor board, making sure all the wire make a good electrical connection.
5. Make sure to route cable around the sensor board as shown in **Drawing A-197884**, and reassemble the sensor enclosure.

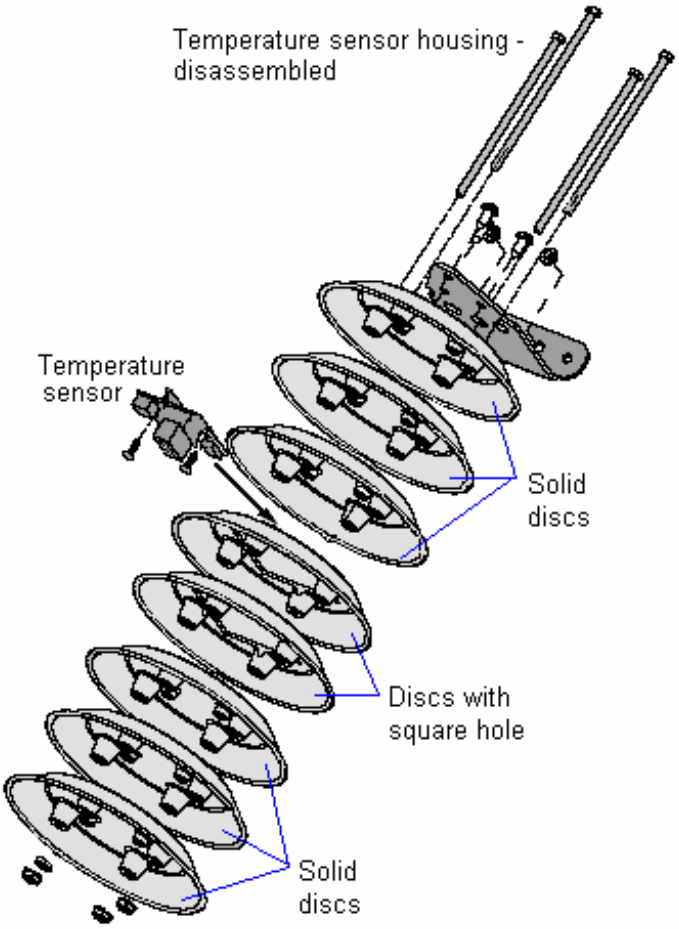
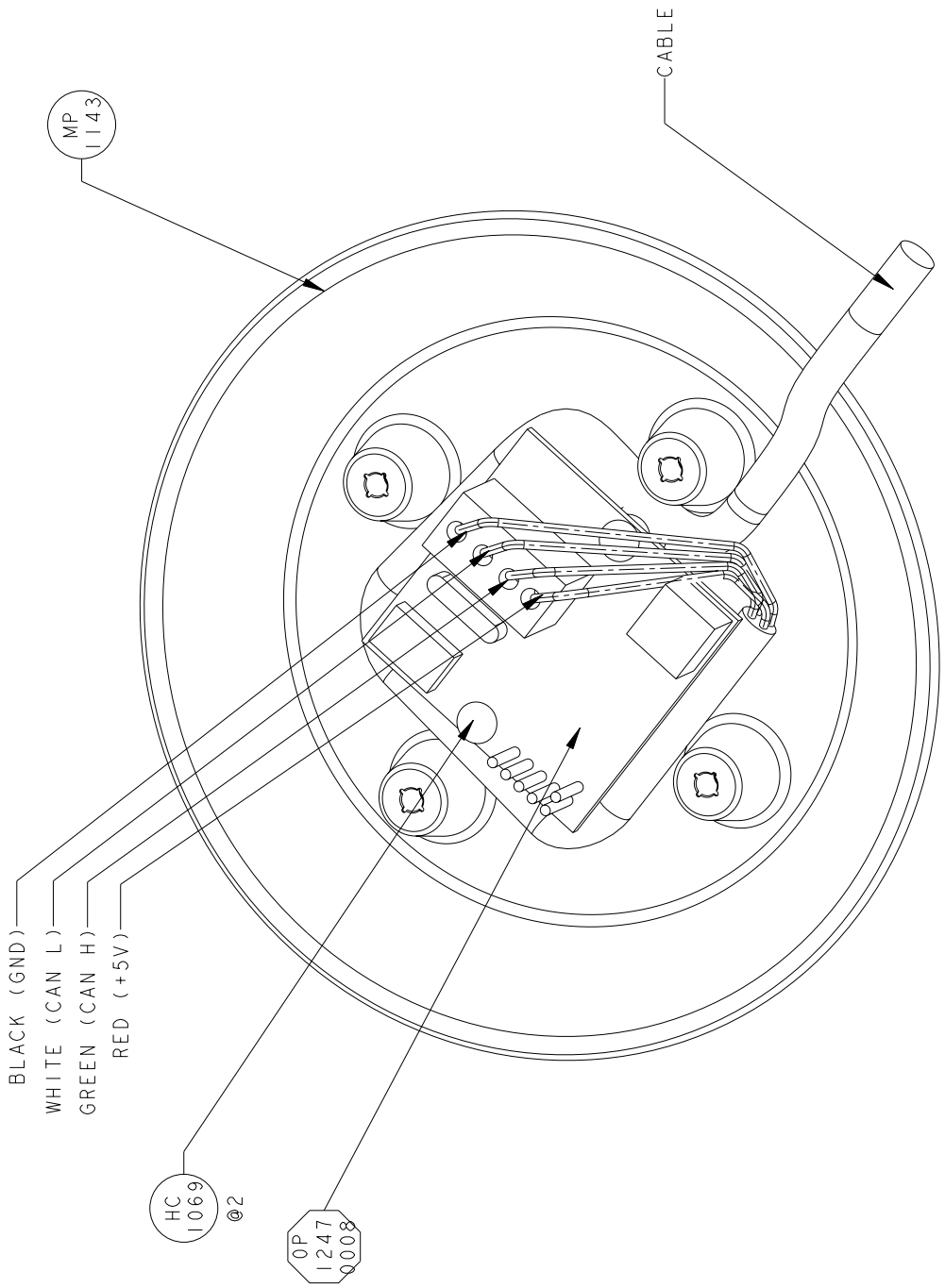


Figure 10: *Temperature Sensor Housing Disassembled*



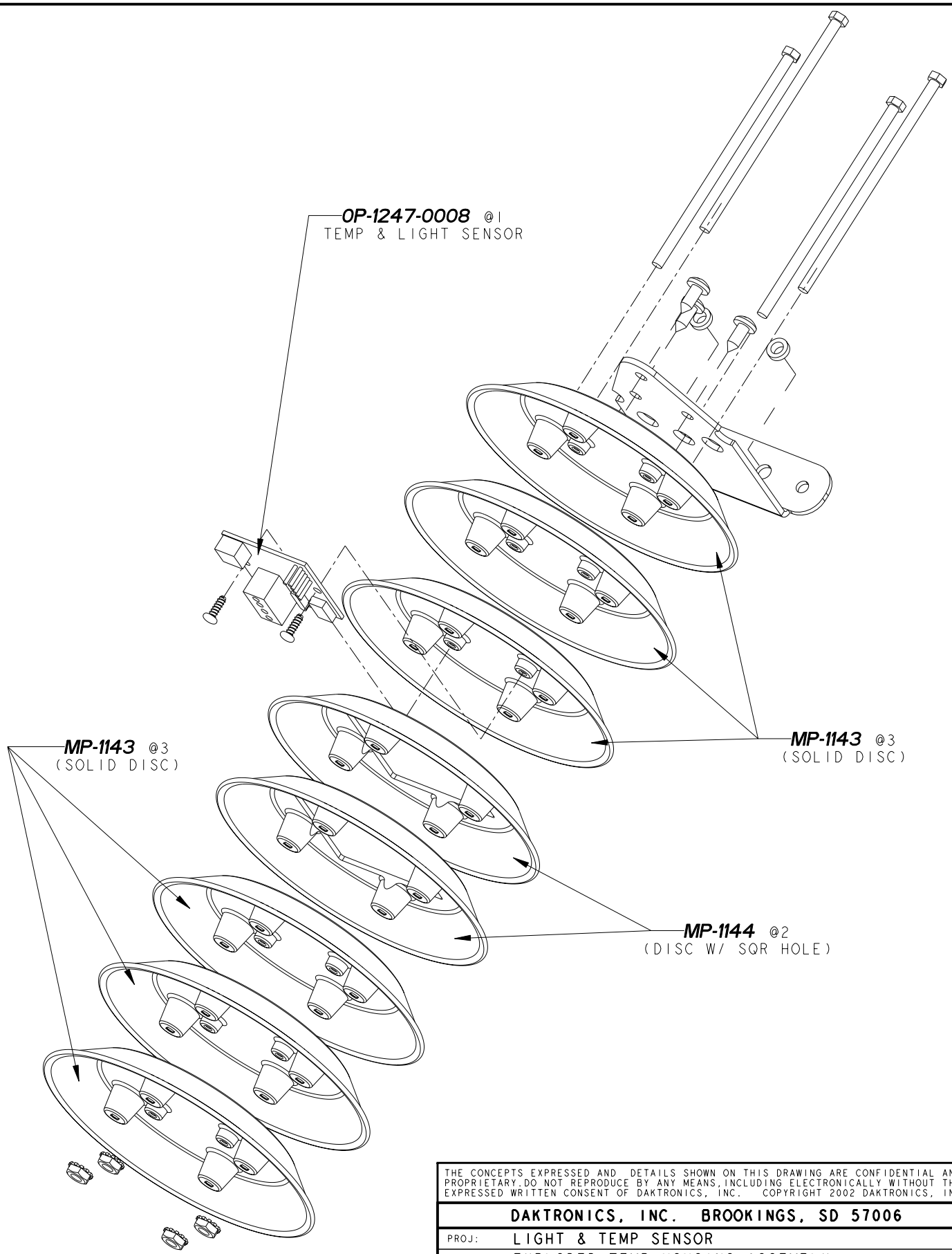
ASSEMBLY INSTRUCTIONS:

ATTACH PC BOARD TO MP-1143 W/ HC-1069.
STRIP JACKET OF W-1819 2". STRIP INSULATION
OF INDIVIDUAL WIRES APPROXIMATELY 1/4".
INSERT WIRES INTO TERMINALS AS SHOWN & TIGHTEN.
ROUTE CABLE AS SHOWN.

	DAKTRONICS, INC. BROOKINGS, SD 57006
PROJ:	LIGHT & TEMP SENSORS
TITLE:	TEMP SENSOR CABLE ROUTING SCHEMATIC
DES. BY: KMILLER	DRAWN BY: KMILLER DATE: 030CT03
REVISION	SHEET 1 OF DWG 197884
	SCALE: 1=1

1151-E10A-197884

REV.	DATE	DESCRIPTION	BY	APPR.



	DAKTRONICS, INC. BROOKINGS, SD 57006
PROJ:	LIGHT & TEMP SENSOR
TITLE:	EXPLODED TEMP HOUSING ASSEMBLY
DES. BY:	KMILLER
DRAWN BY:	KMILLER
DATE:	14OCT03
REVISION	SHEET 1 OF DWG 198371
SCALE:	1=3
	1151-E10A-198371

REV.	DATE	DESCRIPTION	BY	APPR.