

**Galaxy<sup>®</sup> 64mm**  
**Outdoor - Mono**  
Series AF-3400  
Display Manual

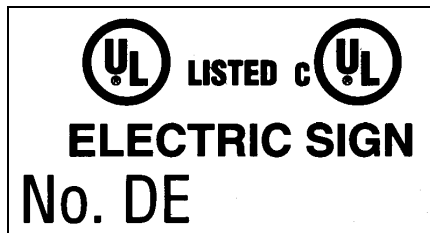
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**DAKTRONICS**

**ED16004**  
**Product 1308**  
**Rev 0 – 13 January 2006**



**DAKTRONICS, INC.**

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# Section 1: Introduction

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This manual explains the installation, maintenance, and troubleshooting of the Galaxy<sup>®</sup> 64mm AF-3400 louvered monochrome LED display. 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 six sections: Introduction, Mechanical Installation, Electrical Installation, Maintenance and Troubleshooting, Appendix A, and Appendix B.

- **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 sign mounting.
- **Electrical Installation** gives general guidance on terminating power and signal cable at the sign.
- **Maintenance and Troubleshooting** addresses such topics as removing basic sign components, troubleshooting the sign, performing general maintenance, and exchanging sign components.
- **Appendix A** lists the drawings referenced within the manual.
- **Appendix B** 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 **ED16004**.

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
- **Component Placement Diagrams:** 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**. **Appendix A** contains all reference drawings.

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DAKTRONICS, INC. BROOKINGS, SD 57006		
PROJ: GALAXY, AF-3200 & AF-3400 SERIES		
TITLE: SCHEM, PRIMARY SIGNAL, INTERNAL, W/QC		
DES. BY: PGILK	DRAWN BY: LKERR	DATE: 11 MAR 04
REVISION	APPR BY:	1229-R03B-206146
00	SCALE: NONE	

**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 connections.”

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, from time to time, certain display components need replacing. The **Replacement Parts List** in **Section 4.13** provides the names and numbers of components that may need replaced during the life of the display. Most display components have a white label that lists the part number. The component part number is in the following format: OP-\_\_\_\_-\_\_\_\_ (circuit board) or OA-\_\_\_\_-\_\_\_\_ (multi-component assembly).

Following the **Replacement Parts List** is the **Exchange and Repair and Return Programs** in **Section 4.14**. Refer to these instructions if any display 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 signal 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 a 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

Tools required for mounting the display depend on the location and size of the display. For some installations, it may be possible to use pre-terminated telephone cables for use with the displays.

There are six network systems available: RS232, RS422, modem, fiber, radio and Ethernet. They differ in the type of physical connections needed, the distance allowed, and the equipment used. A separate manual is provided for the type of communication method ordered with your display. See **Section 3.7** for the communication manual ED numbers.

Up to 240 displays can exist on one network.

## 1.3 Display Overview

### Reference Drawings:

Power Specs, AF-3400, \*\*x\*\*-64-A-P-\*-Domestic..... **Drawing A-192935**  
 Power Specs AF-3400, \*\*x\*\*-64-R-P-\*-Domestic..... **Drawing A-192937**  
 Shop Drawings ..... **Refer to Appendix A**

Daktronics 64 mm, AF-3400 Galaxy® displays are designed and manufactured for performance, reliability, easy maintenance, and long life. The pixels have a 64mm center-to-center spacing and LEDs (light emitting diodes). Each display section has minimum 18-inch character height. An optional remotely mounted light sensor can automatically dim the LEDs based on the ambient light levels. The configuration of pixels depends on the model of display ordered.

Refer to the appropriate **Shop Drawings** for the approximate size, weight, and power requirements for your model of display.

The Galaxy® model numbers are described as follows: **AF-3400-RRCCC-64-X-P**

<b>AF-3400</b>	=	Outdoor Louvered Galaxy Display
<b>RR</b>	=	Number of Rows High (8, 16, 24, and 32)
<b>CCC</b>	=	Number of Columns Long (32, 48, 64, 80, 96, and 112)
<b>64</b>	=	64mm center-to-center pixel spacing
<b>R or A</b>	=	LED Color, R (Red) or A (Amber)
<b>P</b>	=	Primary

A typical display 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, or 2000 operating systems on an IBM®-compatible computer. Refer to the Venus 1500 controller operator's manual (**ED13530**) included on the installation CD for installation and operation of the Venus® 1500 software.

The displays are offered as single-face units, which are single-sided, stand-alone displays. They can become double-faced by mounting them back-to-back with a second primary unit.

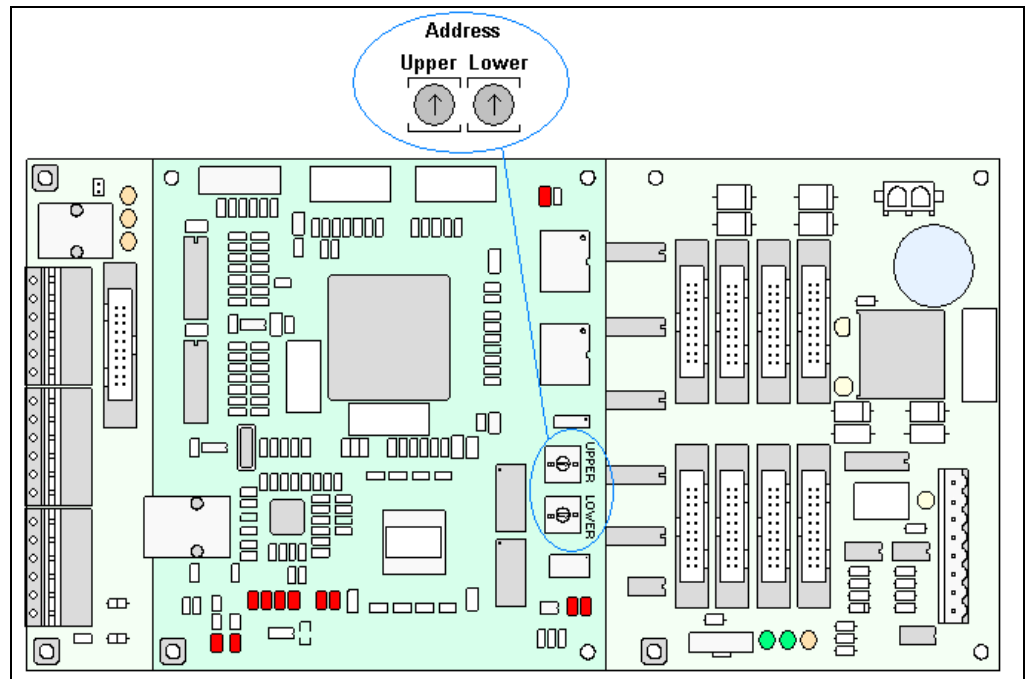
## 1.4 Component Identification

The following illustrations and definitions depict some of the more commonly accessed Galaxy® display 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 display components.

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

**Controller:** The display's controller is the "brains" of the display (refer to **Figure 2**). The controller receives, translates, and activates the signal information from the control computer to the appropriate pixels on the display.



**Figure 2:** Controller

**Display Address:** The display address is an identification number assigned to each display of a network. It is set by rotating hex switches on the controller. 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.

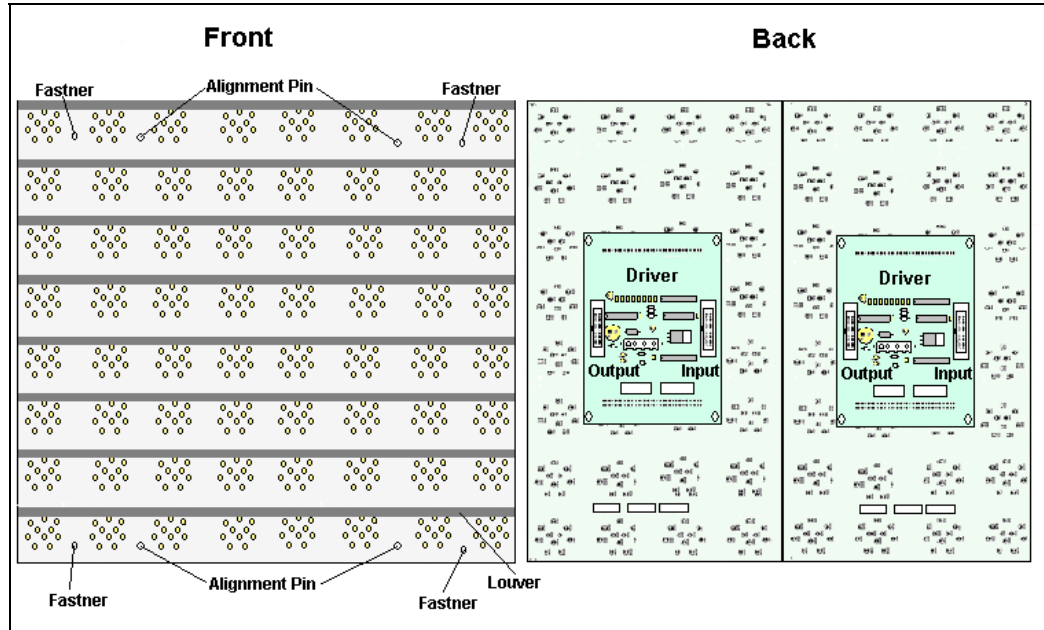
**Driver:** Circuit board responsible for switching the intensity levels of the LEDs. One driver mounts on the back of each 4x8 board of an 8x8 module.

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

**LED (light emitting diode):** Low energy, high intensity lighting units.

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

**Module:** 64mm Galaxy® modules are 8 pixels high by 8 pixels wide. They consist of the louver assembly, two 4x8 pixel boards, and two drivers (refer to **Figure 3**).



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

**Network:** Consists of multiple displays connected to each other.

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

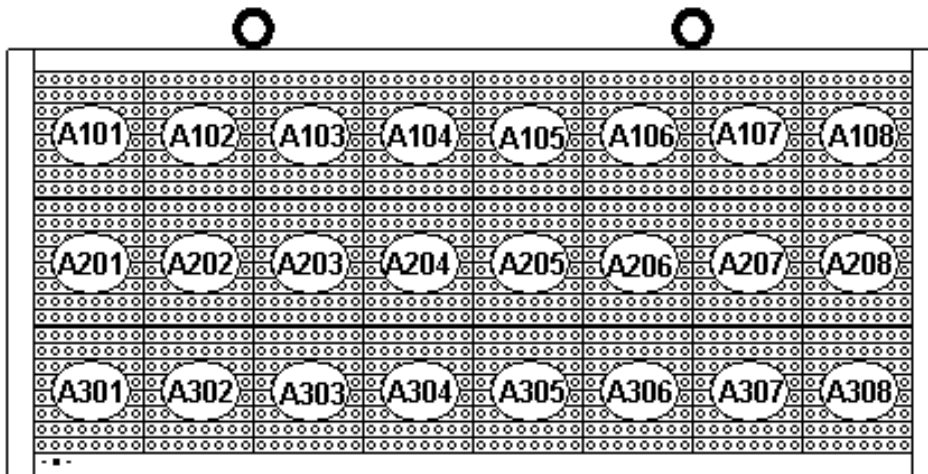
**Pixel Board:** The pixel board contains the LED clusters, which mount into the metal face panel. A module driver is attached to the back of each 4x8 pixel board.

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

**Primary:** A primary display is a single-faced unit. The communication and temperature input will be connected to this display. The light sensor is internally mounted in this display. If two primary displays are used, the display signal and temperature information is hardwired from display to display. Route the interconnect cable through conduit when exposed to outdoor conditions.

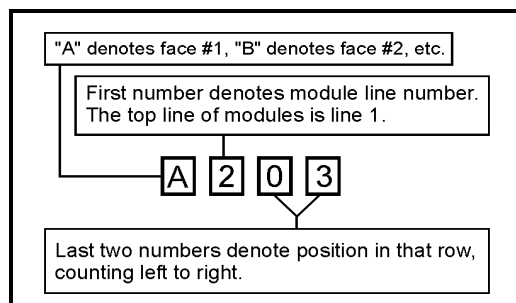
## 1.5 Daktronics Nomenclature

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.



**Figure 4:** Module Numbering Example – 24x64 Front

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. A person can easily remove individual modules from the displays if required. **Figure 4** illustrates how Daktronics numbers modules on a Galaxy<sup>®</sup> display. **Figure 5** breaks down the module numbering method.



**Figure 5:** Module Numbering

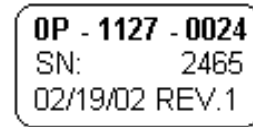
In addition, various Daktronics drawings may contain the following labeling formats:

- “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:

- “OP-” gives the form of an individual circuit board, such as a fiber optic board.
- “OA-” 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.
- “F-” signifies a fuse.

Most circuit boards and components within this display carry a label that lists the part number of the unit. If the **Replacement Parts List** in **Section 4.13** 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

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**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 any modifications are made, detailed drawings of the changes must be submitted to Daktronics for evaluation and approval, or the warranty may be void.

**Daktronics is not responsible for installations or the structural integrity of support structures done by others.** The customer is responsible to ensure that 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 the Galaxy<sup>®</sup> 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 agree 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 behind 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:

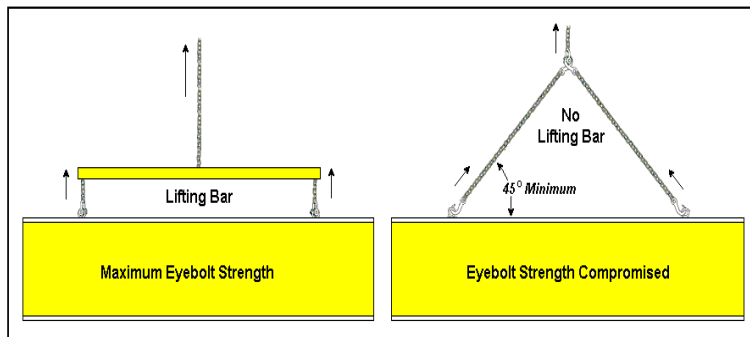
Shop Drawings .....Refer to Appendix A

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

If the display cabinet is shrouded or completely enclosed, allowances must be made to compensate for the percentage of material covering the openings in the structure.

Failure to comply with these requirements voids the Galaxy<sup>®</sup> display warranty.

## 2.4 Lifting the Display



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

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.**

**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:

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<sup>3</sup>/<sub>8</sub>" 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 display. Look over all sides of the display for possible damage 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 Drawings**. Refer to **Section 3** for information on routing power and signal.
4. **For 40 and 48 high 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 **Shop Drawings**. Connect power using the Mate-N-Lok<sup>®</sup> plugs provided with the display. Connect the signal by routing the ribbon cable from the controller to the first driver in the row of modules for the rows in the top section.
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 eyebolts are removed on the top of the display, plug the holes with bolts and the rubber sealing washers that were removed with the eyebolts. Silicone the threads on the bolts.**

## 2.6 Optional Temperature Sensor Installation

If an optional temperature sensor will be used with the display, see **Appendix B** 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 the warranty will render 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.

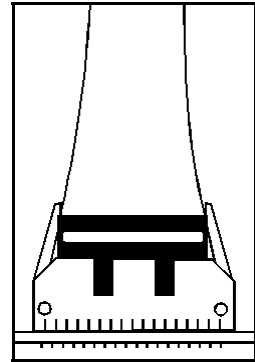
Before replacing a ribbon cable connector, spray it with DeoxIT™ contact cleaner to remove any foreign matter that may cause signal problems. In addition, apply a generous amount of CaiLube™ protector paste to the plug before inserting it into the jack. This paste protects both the plug and the jack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

#### 2. Termination Blocks:

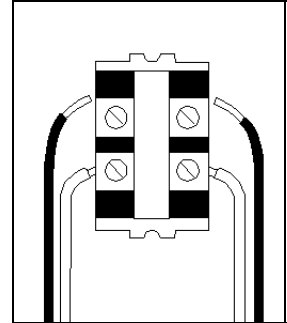
Termination blocks connect internal power and signal wires to wires of the same type coming into the display from an external source. Most signal wires come with forked connectors crimped to the ends of the wire. Power wires need to have one-half inch of insulation stripped from the end of the wire prior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

#### 3. Phoenix™-Style Connectors:

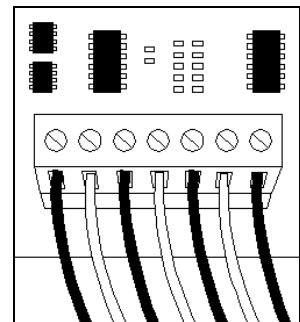
Phoenix-style connectors, usually green, allow for signal termination on circuit boards. Refer to **Figure 10**. Strip one-quarter inch of insulation from the wire prior to termination. To remove a wire, turn the above



**Figure 8:** Ribbon Cable Connector



**Figure 9:** Termination Block

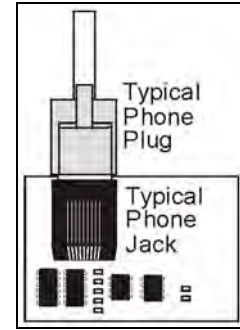


**Figure 10:** Phoenix Connector

screw counterclockwise 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.

**4. Phone Jacks (RJ11/RJ45 Connectors):**

RJ connectors, as shown in **Figure 11**, are similar to the telephone connectors found in homes. In order to remove this plug from the jack, depress the small clip on the underside of the plug.

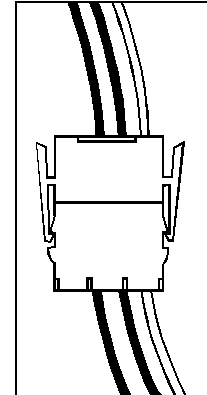


**Figure 11:** RJ45 Connector

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.

**5. Mate-n-Lok™ Connectors:**

The white Mate-n-Lok connectors found in the displays come in a variety of sizes. **Figure 12** 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.

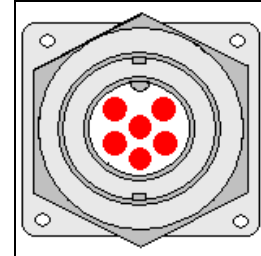


**Figure 12:** Mate-n-Loc Connector

**6. Quick Connect Jack:**

The display uses quick connect jacks for the connection of the signal termination enclosure and the temperature sensor. There is one quick connect input board with three input jacks. The board is located on the back of the display, and when the jacks are 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, and then turn the outer collar to lock in place. **Figure 13** illustrates the 6-pin quick connect jack.



**Figure 13:** 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 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 through 2” conduit or through the display pole to the display but is not 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 the 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 approximate locations of power and signal conduit. You must use separate conduit to route:

- Power
- Signal IN wires
- Signal OUT wires (if another display is being utilized)

Locate the conduit holes at the bottom right (rear view) of the back of the 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 connection between displays is done with interconnect signal wiring. The signal output on the first display will connect to the input on the second. The interconnect wiring is included in the manual for the communication type. The interconnect wiring for the temperature sensor is shown in **Appendix B**.

### 3.4 Preparing for Power/Signal Connection

**Reference Drawings:**

Shop Drawings .....Refer to Appendix A

1. To create an opening for display power and interconnect signal cable in the back of the display, punch or drill through the knockouts in the lower right corner from the rear. Refer to the **Shop Drawings** for appropriate locations.
2. Route power to the display through a fused disconnect switch capable of opening all ungrounded power conductors. Install 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 should be routed through conduit in agreement with local code. **Run the power and signal cables in a separate conduit.**
4. Display power will terminate to the display at the power termination box located behind the second module from the left when viewed from the front.
5. Connect the grounding electrode conductor to the display at the ground lug.
6. An enclosure is provided with the display for termination of signal. (If the installation of the display does not allow for the use of the enclosure, the manual for the communication type shows the alternate termination method for the signal.)
7. Signal into the enclosure must be routed through conduit. The size of the knockouts in the enclosure requires the use of 1/2" conduit.
8. The quick connect cable from the enclosure to the display can be routed through conduit or the display pole.
9. **Note:** Daktronics engineers strongly recommends that the quick connect cable be secured to protect it from weather or vandalism.

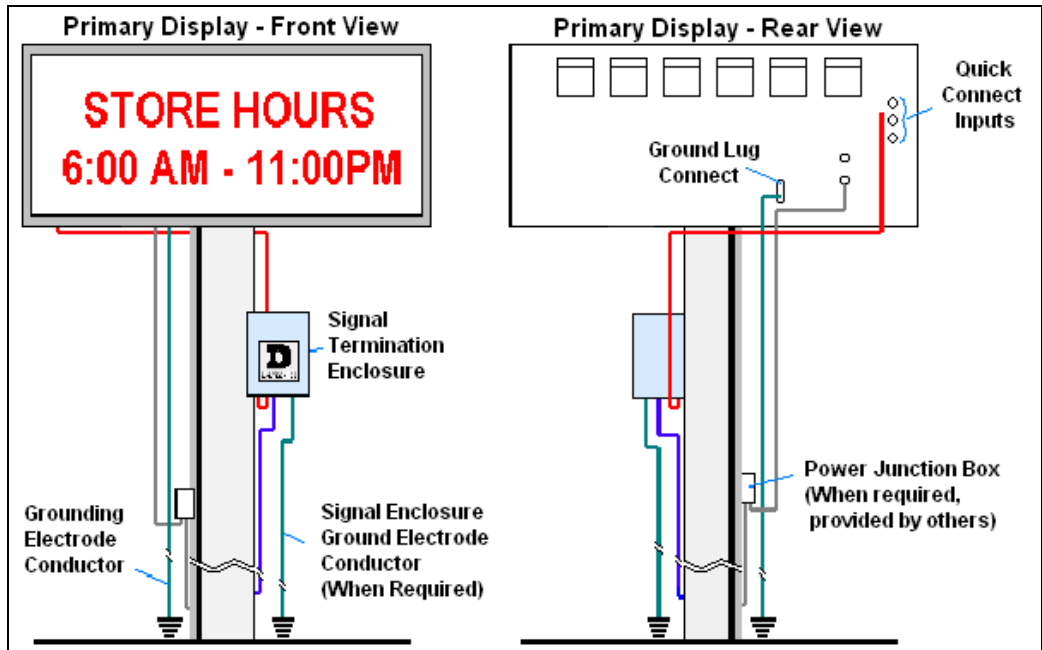


Figure 14: Primary Display with Enclosure

## 3.5 Power

### Reference Drawings:

Panel Board Layout, AF-3400-64mm .....	<b>Drawing A-192369</b>
Power Specs, AF-3400-**x**-64-A-P-*-Domestic .....	<b>Drawing A-192935</b>
Power Specs, AF-3400-**x**-64-R-P-*-Domestic .....	<b>Drawing A-192937</b>

Refer to **Drawings A-192935** and **A-192937** for voltage and current requirements for the display size. The display will use either a 120/240VAC single-phase power or 120/208 three-phase power source.

**Do not connect the display 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.

### Grounding

**This sign is intended to be installed in accordance 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.**

A grounding lug is included on the back of the display for easier connection of the grounding electrode.

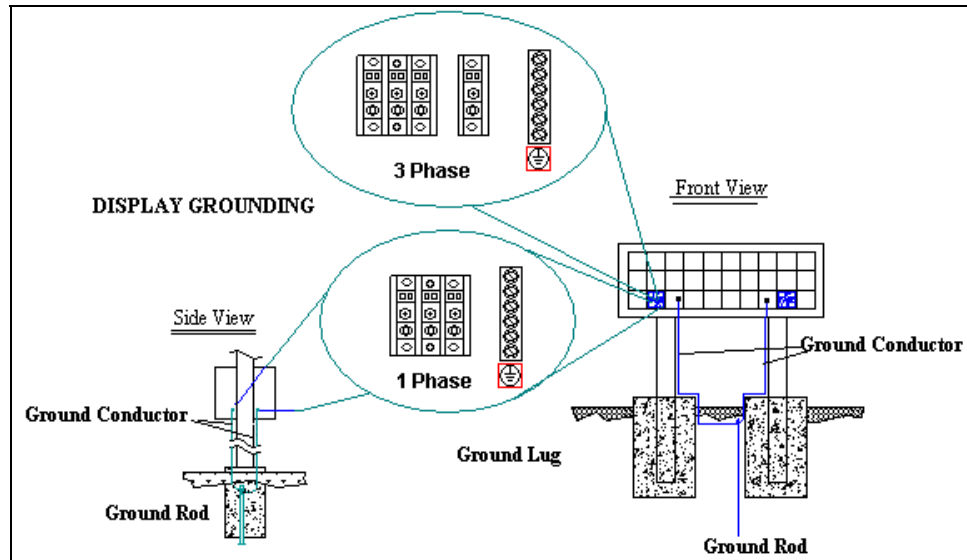


Figure 15: Display Grounding

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 on the back of the display.

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 because of 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. The grounding system and grounding electrodes must be installed according to Article 250 of the National Electrical Code and any applicable local codes.

**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.

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.

**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.

**Power Connection**

Display power is connected to the power termination panel in the display. Complete the following steps to terminate the hot, neutral, and ground wires to the termination panel. Refer to **Drawing A-192369** for assistance.

1. With a #2" screwdriver, release the four screws that hold the module in place. The module will pull forward and out from the display.
2. Disconnect the power and signal cables from the back of the module.
3. Route the power cable through conduit to the back of the display – use one of the ½" knockouts for access, being careful not to damage any internal components.
4. Make the following connections as shown in **Figure 16** for a single phase display:

<b>120/240 (Three wires plus Ground)</b>		
TB41	1	Line 1 (Hot)
	2	Line 2 (Hot)
	3	Neutral
E41		Ground



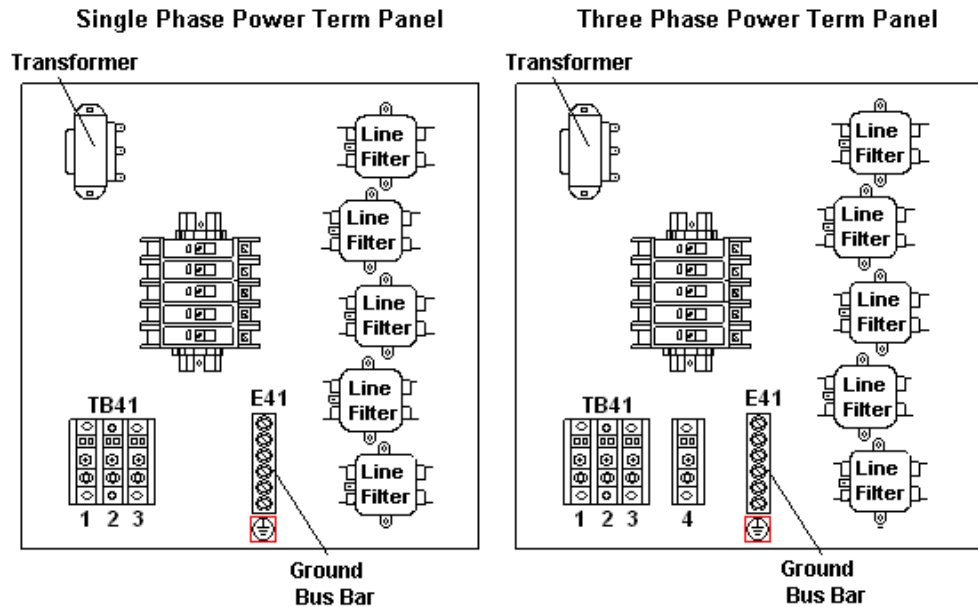


Figure 16: Power Termination Box

5. Make the following connections as shown in **Figure 16** for a three phase display:

120/208 (Four wires plus Ground)		
TB41	1	Phase A
	2	Phase B
	3	Phase C
	4	Neutral
E41		Ground

6. Power needs to be connected to all display faces.

### 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 all power lines can be completely disconnected. Use a disconnect to disconnect the 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 Display

The 64mm, AF-3400 Mono display is designed for quicker signal and power connection to the display and between displays.

- Signal will terminate to a watertight enclosure, which connects to the primary display using a quick connect cable.
- Mounting the temperature sensor to the display structure and 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).
- If two primary displays are being used, signal and temperature sensor wires will be connected between the controllers on each display.

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
Serial Fiber	ED-14743
Radio	ED-13932
Modem	ED-14744
Wire Ethernet	ED-14745
Fiber Ethernet	ED-14746

### 3.7 Signal Termination between Displays

**Reference Drawings:**

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

The connection between display controllers requires a 4-conductor shielded cable for signal. One end will connect at the “RS422 OUT” 6-position controller board terminal block (TB3) on the first primary display, and terminate on the “RS422 IN” 6-position controller board terminal block (TB2) on the second display. Refer to **Drawing B-177838** for terminal block locations. The interconnect signal wiring between displays is shown in **Figure 17**.

A cable will also need to be routed for connection between displays for the temperature sensor if one is being used. See **Appendix B** for the necessary wiring of the temperature sensor.

Primary - RS422 Out (TB3)	Field Cabling	Secondary - 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)

## Display-to-Display RS422 Interconnection

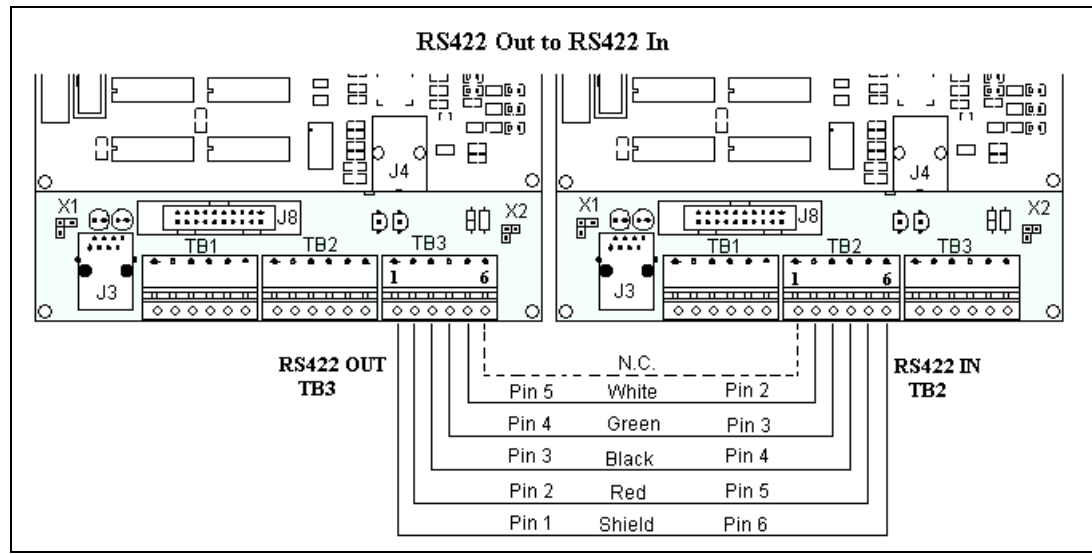


Figure 17: RS422 Interconnection

### 3.8 Optional Temperature Sensor Installation

If you are using an optional temperature sensor with your display, see **Appendix B** for mounting and signal connections.

### 3.9 First Time Operation

When first 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) 255.255.0.0)
11. COM1 Configuration (C1:V15) ((Modem C1:V15) If a Modem is present)
12. COM2 Configuration (C2:RTD)
13. Socket 3001: (IP 3001: V15)
14. Socket 3002: (IP 3002: RTD)
15. Line Frequency (CLK: AUTO (60))
16. Display Name Description (Galaxy Row x Column)



# Section 4: Maintenance and Troubleshooting

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## Important Notes:

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

## 4.1 Maintenance and Troubleshooting Overview

Daktronics Galaxy® AF-3400, 64mm series mono displays are front accessible; meaning access to the internal components can be gained only from the front of the display.

This section provides the following Galaxy® display information:

- **Signal Routing Summaries** give a basic explanation of the signal travel through the display.
- **Power Routing Summaries** show a basic explanation of the power travel through the display.
- **Service and Diagnostics** offer instructions for removing various display components and explain 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® display in safe, working order.
- **Troubleshooting** presents some possible display malfunctions and provides a number of possible causes for that malfunction.
- **Replacement Parts List** includes the part description and number of display components that could need replacing during the life of this display.
- **Daktronics Exchange and Repair and Return Programs** explain the Daktronics component return policy.
- **Frequently Asked Questions** lists some general information regarding the Galaxy 3400 Series displays.

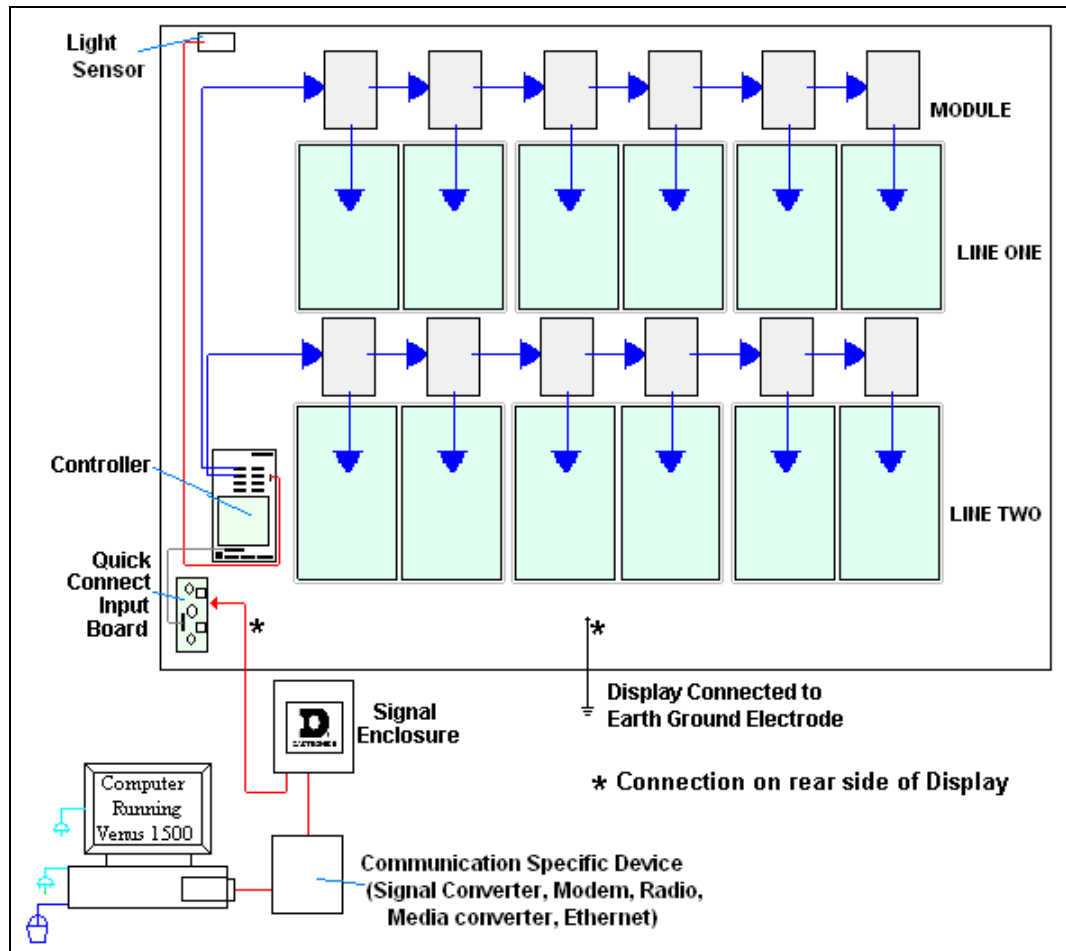
**Note:** A single pixel flashing in the lower right hand corner of the display indicates that the display has power, but no messages are currently running.

## 4.2 Signal Summary

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 signal or Ethernet to the signal termination enclosure at the primary display.
2. From the signal enclosure, signal is sent to the primary display via a quick connect cable.

3. From the quick connect input board, the signal is transferred to the display's controller via a 20-conductor ribbon cable.
4. From the controller, the signal then travels over 20-conductor ribbon cables from the controller (J11 through J18 provides signal out) to J2 on the driver of the first row of modules in the display.
5. The data exists at J1 and is then relayed to J2 of the next driver board and so on, traveling down the entire row of modules. The drivers use this display data to control the LEDs.
6. From the first display controller, signal can also be transferred to another display controller in a second display.
7. Refer to **Figure 18** for the signal summary in a primary display.



*Figure 18: Primary Display Signal Summary*

### 4.3 Power Summary

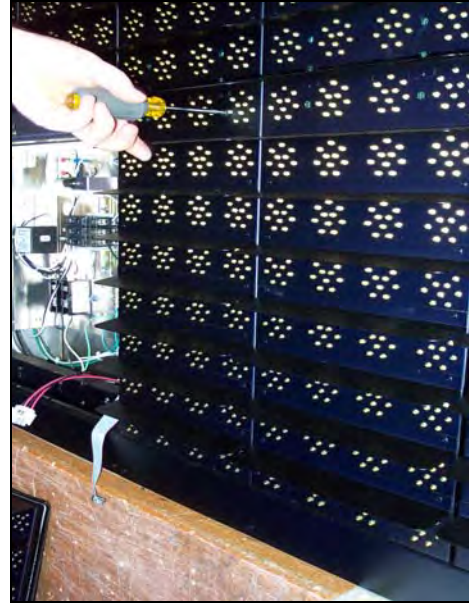
The following describes the internal display power routing for the display:

1. Incoming power terminates at the panel board.
2. +12.5VDC power supplies power to the modules in both the monochrome red and amber displays.

## 4.4 Display Access

Display access for all 64mm displays is from the front. To open the display:

1. Locate the four screws that hold the module in place. Two are on top of the module and two are on bottom of the module.
2. With a #2 Phillips screwdriver, loosen the four screws as shown in **Figure 19**. The screws are part of the module and will not be removed.
3. Interior display components may be accessed, or the module driver or LED board may be removed from the module itself.



**Figure 19: Removing a Module**

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 display.
- The module screws are tight to create a water resistant seal around the edge of the module. The module must be firmly seated against the display to shed water.

## 4.5 Service and Diagnostics

### Reference Drawings:

Schematic; Power Supply Configurations..... **Drawing A-191636**  
 Shop Drawings..... **Refer to Appendix A**

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.

The **Shop Drawings** denote the components as follows:

Component...	Denoted As...	Location...
Modules	0A-1308-0002 or 0A-1308-0003	Over entire face of the display
Power Supplies	0A-1307-0500 0A-1307-0501 0A-1307-0502 0A-1307-0503 0A-1307-0511 0A-1307-0512	Behind the modules; refer to <b>Drawing A-191636</b> and the <b>Shop Drawings</b> .

## Line Filter

You can replace the filter by labeling and removing all connecting wires, and then releasing the attachment hardware.

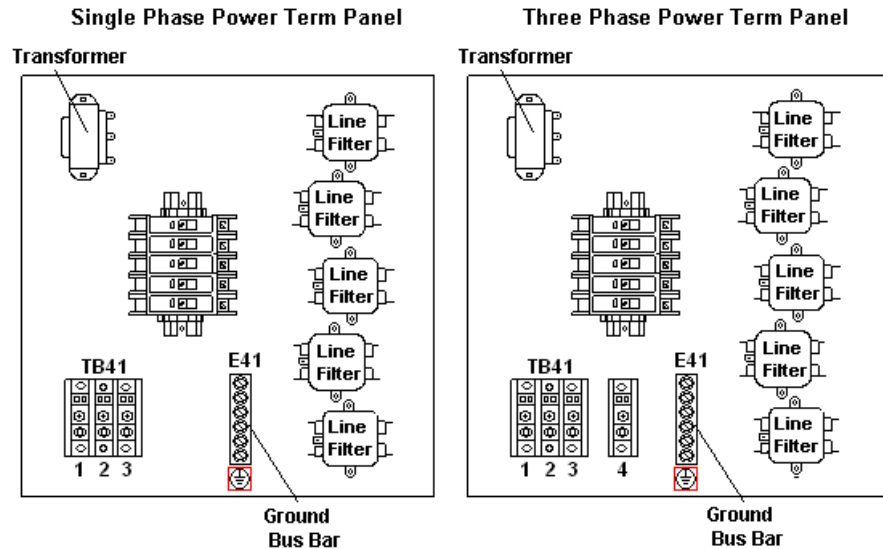


Figure 20: Power Term Panels

## Modules and Drivers

An 8x8 module consists of louvers and two 4x8 LED display boards, each with a driver mounted to the display board. Refer to **Section 4.4** to open a display and access the LED display boards and the drivers.

Each 4x8 LED board is a circuit board with 32 LED pixel clusters mounted directly on it. Each LED board is removable from the 8x8 module. To remove an LED board from the module:

1. Open the display as described in **Section 4.4**.
2. Disconnect the power and signal connector from the driver on the LED board you wish to replace.
3. Remove the four nuts holding the LED board to the louver assembly.
4. Remove the 5/16" nut that holds the driver to the LED board, and gently pry the driver from the LED board. (A 1/4" hex screw can be removed from the front of the LED board to remove the driver and the stand-off.)
5. Reverse the above procedure to install a new pixel board.

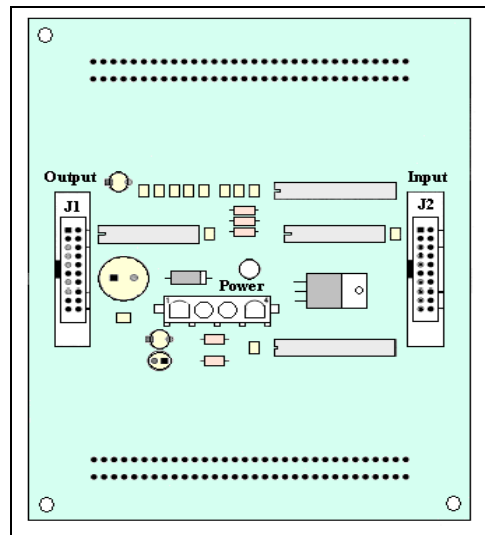


Figure 21: Driver Board



The driver is a circuit board responsible for switching the intensity levels of the LEDs. One mounts on the back of each module. To remove a driver board:

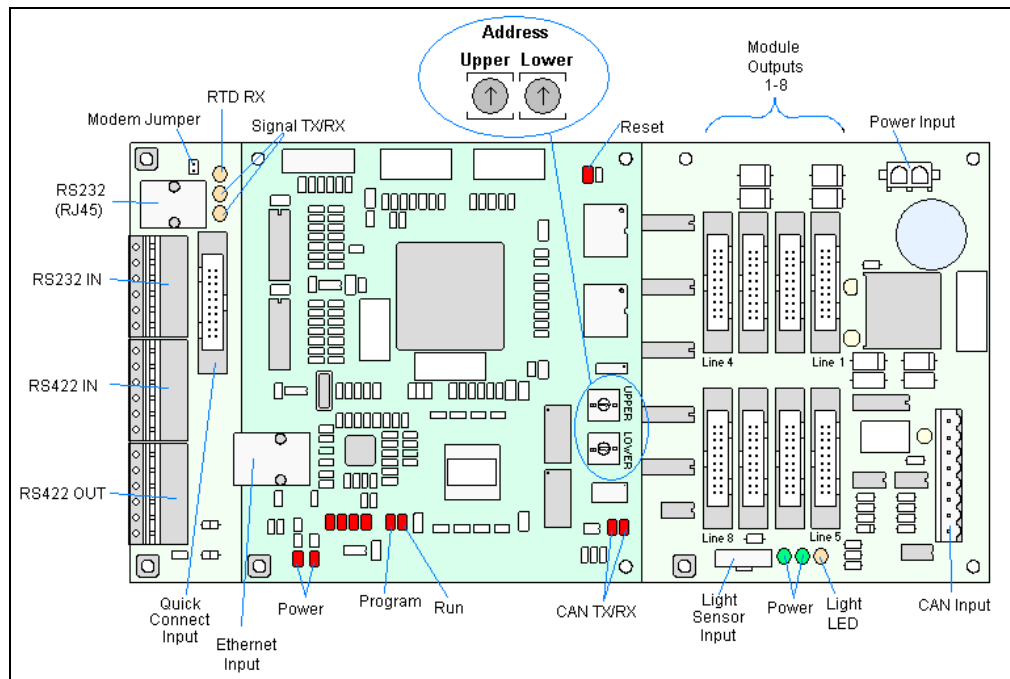
1. Open the display as described in **Section 4.4**.
2. Disconnect all power and signal connections from the driver board.
3. Remove the one #6 nut holding the board in place.
4. Gently lift the board from the display.
5. Reverse the above procedure to install a new driver board.

## 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 4.2** for more information, and refer to the component location drawings for the position of the controller board. **Figure 22** and **Drawing B-177838** illustrate a typical controller.



**Figure 22:** Controller

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.

**Note:** Setting the rotary switches to address 0 (set the switches to 0 by rotating them counterclockwise until the arrow points to 0) can activate a test mode. The display's power must be turned off and then turned back on to run the test mode.

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

1. Open the display as described in **Section 4.4**.

2. Disconnect power.
3. 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 as to which was removed from which connector.
4. Remove each of the six screws holding the board in place.
5. Follow the previous steps in reverse order to install a new controller board.

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

Four 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 controller is not resetting the watchdog timer.
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 at 10Mbps.
DS9	Red	Duplex	On when the Ethernet interface is at full duplex. Off when the Ethernet interface is at 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			
LED	Color	Function	Operation
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 receiving signal from light sensor
DS6	Yellow	Com 2 RX2	Normal state is ON. When connected to receive RTD input, the LED will be OFF. The LED flashes when receiving signal from RTD input device.
<b>Temp Sensor</b>			
<b>LED</b>	<b>Color</b>	<b>Function</b>	<b>Operation</b>
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.

## Power Supplies

### Reference Drawings:

Schematic, Power Supply Configurations.....**Drawing A-192369**  
 Power Supply Wiring Drawings..... **Refer to Appendix A**

The LED power supplies are identified as assemblies in the **Power Supply Wiring Drawings:**

1. 0A-1307-0502/0503 for six amber 8x8 modules (12, 4x8 LED boards)
2. 0A-1307-0501 for four amber 8x8 modules (8, 4x8 LED boards)
3. 0A-1307-0511/0512 for four red 8x8 modules (8, 4x8 LED boards)
4. 0A-1307-0500 for two red or amber 8x8 modules (4, 4x8 LED boards)

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

1. Open the display as described in **Section 4.4**.
2. Remove the module directly in front of the failed power supply.
3. Disconnect all the wires connected to the power supply.
4. Remove the hardware holding the power supply in place to free the unit.
5. Follow these steps in reverse order to install a new power supply.
6. Verify power supply voltage.

## 4.6 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, 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 display 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.

## 4.7 Thermostats

### Reference Drawings:

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

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

## 4.8 Display 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, 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.**

## 4.9 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.

## 4.10 Troubleshooting

This sub-section contains some symptoms that may occur 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.	<ul style="list-style-type: none"> <li>• Replace/check cables on the module.</li> <li>• Replace LED board.</li> <li>• Replace the driver.</li> </ul>
One or more LEDs on a single module fail to turn off.	<ul style="list-style-type: none"> <li>• Replace/check cables on module.</li> <li>• Replace LED board.</li> <li>• Replace the driver.</li> </ul>
A section of the display is not working. The section extends all the way to the right side of the display.	<ul style="list-style-type: none"> <li>• Replace/check the ribbon cable.</li> <li>• Move/replace the first driver on the left side of the first module that is not working.</li> <li>• Move/replace the second driver that is not working.</li> <li>• Check/replace the power supply assembly on the first module that is not working.</li> </ul>
One row of modules does not work or is garbled.	<ul style="list-style-type: none"> <li>• Move/replace first driver</li> <li>• Replace controller.</li> <li>• Check the fuses in the power termination box.</li> </ul>
A group of modules, which share the same power supply assembly, fail to work.	<ul style="list-style-type: none"> <li>• Check power supply voltage.</li> <li>• Check/replace ribbon cables.</li> <li>• Replace the power supply assembly.</li> </ul>
Entire display fails to work.	<ul style="list-style-type: none"> <li>• Check for proper line voltage into the power termination panel.</li> <li>• Check fuse in power termination box.</li> <li>• Check/replace the ribbon cable from the controller to the driver.</li> <li>• Check the voltage settings on the power supplies.</li> <li>• Replace the controller.</li> <li>• Verify proper use of the software in the operation manual.</li> <li>• Communicate to display directly using a laptop.</li> <li>• Check/replace the signal cable to the controller.</li> </ul>
Temperature always reads -196 degrees F.	<ul style="list-style-type: none"> <li>• Check temperature sensor connections.</li> <li>• Replace the temperature sensor.</li> <li>• Replace the controller.</li> </ul>
Sign is stuck on bright or dim.	<ul style="list-style-type: none"> <li>• Check Manual/Auto dimming in Venus 1500 software.</li> </ul>

	<ul style="list-style-type: none"> <li>• Check that the address on the light detector is set to address 2</li> <li>• Check light detector cable.</li> <li>• Check light detector for obstructions.</li> <li>• Replace the light detector.</li> <li>• Replace the controller.</li> </ul>
--	---

## 4.11 Initial Operation Information

When first 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) 255.255.0.0)
11. COM1 Configuration (C1:V15) ((Modem C1:V15) If a Modem is present)
12. COM2 Configuration (C2:RTD)
13. Socket 3001: (IP 3001: V15)
14. Socket 3002: (IP 3002: RTD)
15. Line Frequency (CLK: AUTO (60))
16. Display Name Description (Galaxy Row x Column)

## 4.12 Replacement Parts List

The following table contains some of the items in this display that may need to be replaced over time. Many of the parts within the display 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-1247-0002
Digital Temp Sensor	0P-1247-0008
Quick Connect Interface, Input	0P-1229-2004
Thermostat Enclosure	0A-1213-4024
Ribbon Assy, 20 Pos., 18", Mod. to Mod.	W-1387
Amber Pixel Board (Check display BOM)	0P-1261-0005
Red Pixel Board (Check display BOM)	0P-1261-0003
Red Driver Board	0P-1308-0001
Amber Driver Board	0P-1308-0004
Power Supply Amber/Red, 2 Mod. (A-1555), w/harness	0A-1307-0500
Power Supply, Amber, 4 Mod., (A-1648), w/harness	0A-1307-0501

Power Supply, Amber, 6 Mod., (A-1648) w/harness	0A-1307-0502
Power Supply, Red, 4 Mod., (A-1555), w/harness	0A-1307-0511
Fan; 110CFM, 115VAC, 17W, 60Hz, 4.5"	B-1053
Transformer, 120 VAC Input	T-1119
Transformer, 240 VAC Input	T-1121

Controller Output Ribbon Cable Chart						
Line/ Plug	Display Height (0A-1000-****)					
	8	16	24	32	40	48
1 (P11)	0018	0020	0022	0025	0026	0088
2 (P12)		0018	0020	0022	0025	0026
3 (P13)			0018	0020	0022	0025
4 (P14)				0018	0020	0022
5 (P15)					0018	0020
6 (P16)						0018

### 4.13 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](mailto:helpdesk@daktronics.com)



## Appendix A: Reference Drawings

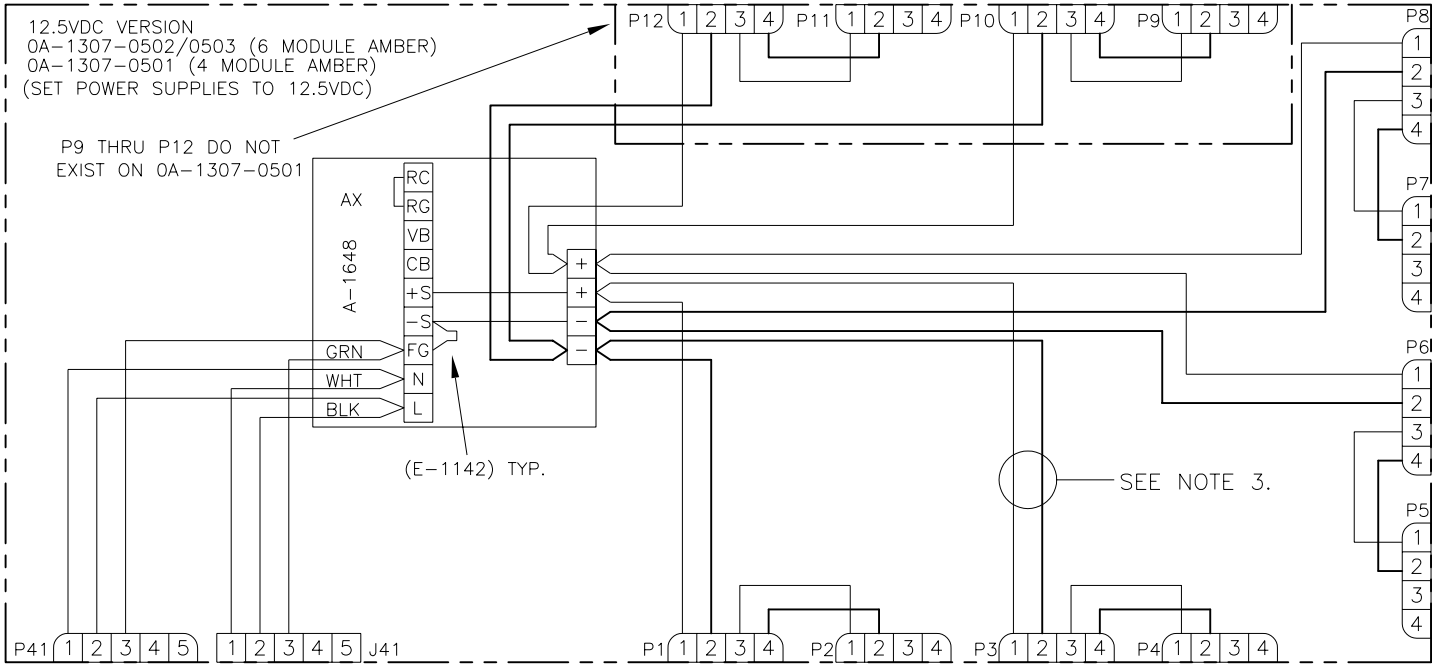
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Refer to **Section 1.1** for information on reading drawing numbers. This appendix lists the following drawings in numerical order by size (A, B, etc.)

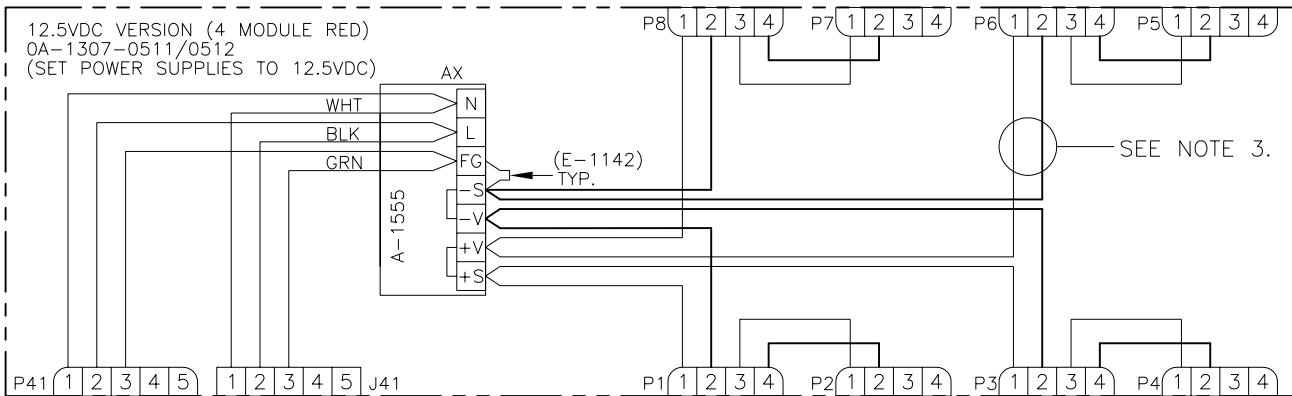
Schematic; Power Supply Configurations .....	<b>Drawing A-191636</b>
Panel Board Layout, AF-3400-64mm .....	<b>Drawing A-192369</b>
Power Specs, AF-3400- <b>x</b> -64-A-P-* <b>-</b> Domestic.....	<b>Drawing A-192935</b>
Power Specs, AF-3400- <b>x</b> -64-A-P-* <b>-</b> Domestic.....	<b>Drawing A-192937</b>
P/S Wiring, Horizontal Row; AF-3180-64mm, Amber .....	<b>Drawing A-194620</b>
P/S Wiring, 6 Horizontal; AF-3180-64mm, Amber.....	<b>Drawing A-194621</b>
P/S Wiring, 6 Vertical; AF-3180-64mm, Amber.....	<b>Drawing A-194622</b>
P/S Wiring, 4 & 2 Modules, AF-3180-64mm, Amber.....	<b>Drawing A-194624</b>
P/S Wiring, 4 Module stack; AF-3180-64mm, Red.....	<b>Drawing A-195340</b>
P/S Wiring, 4 & 2 Modules Horizontal, AF-3180-64mm, Red .....	<b>Drawing A-195341</b>
Controller; Galaxy, 8 Conn, J1087 .....	<b>Drawing B-177838</b>
Layout, AF-3400- (8-48x48-112)-64-A-P-* <b>-</b> 1 PH.....	<b>Drawing B-191693</b>
Layout, AF-3400- (8-48x48-112)-64-R-P-* <b>-</b> 1 PH.....	<b>Drawing B-191723</b>
Layout, AF-3400- (8-48x48-112)-64-R-P-* <b>-</b> 3 PH.....	<b>Drawing B-192629</b>
Layout, AF-3400- (8-48x48-112)-64-A-P-* <b>-</b> 3 PH.....	<b>Drawing B-192661</b>
Shop Drawing, AF-3400-8 <b>x</b> -64 .....	<b>Drawing B-195926</b>
Shop Drawing, AF-3400-16 <b>x</b> -64 .....	<b>Drawing B-195946</b>
Shop Drawing, AF-3400-24 <b>x</b> -64 .....	<b>Drawing B-195959</b>
Shop Drawing, AF-3400-32 <b>x</b> -64 .....	<b>Drawing B-195972</b>
Shop Drawing, Sect, AF-3400-40 <b>x</b> -64.....	<b>Drawing B-195977</b>
Shop Drawing, Sect, AF-3400-48 <b>x</b> -64.....	<b>Drawing B-196019</b>
Schem, Primary Signal, Internal, w/QC.....	<b>Drawing B-206146</b>

12.5VDC VERSION  
 0A-1307-0502/0503 (6 MODULE AMBER)  
 0A-1307-0501 (4 MODULE AMBER)  
 (SET POWER SUPPLIES TO 12.5VDC)

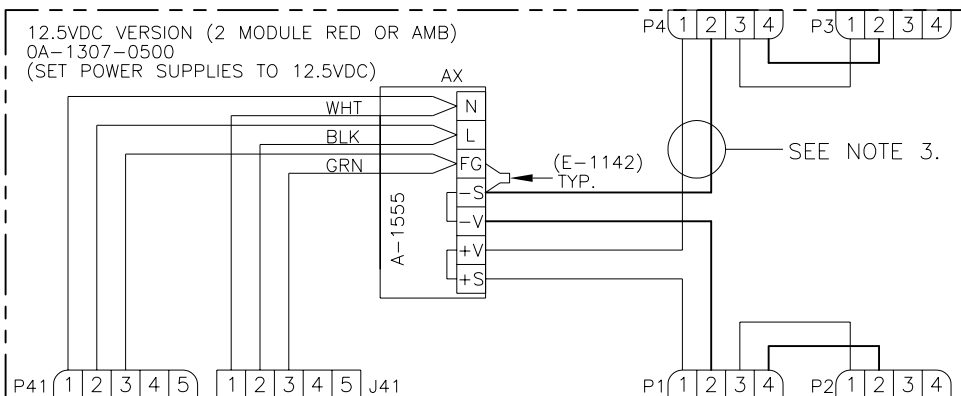
P9 THRU P12 DO NOT  
 EXIST ON 0A-1307-0501



12.5VDC VERSION (4 MODULE RED)  
 0A-1307-0511/0512  
 (SET POWER SUPPLIES TO 12.5VDC)



12.5VDC VERSION (2 MODULE RED OR AMB)  
 0A-1307-0500  
 (SET POWER SUPPLIES TO 12.5VDC)



BE CERTAIN ALL TERMINALS ON  
 POWER SUPPLY ARE TIGHTENED.

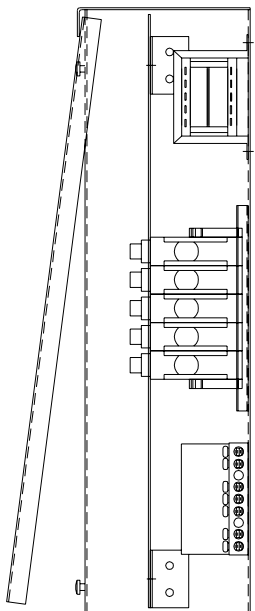
NOTES

- 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.
- 3) REFER TO BELOW FOR LOW VOLTAGE WIRE COLOR.

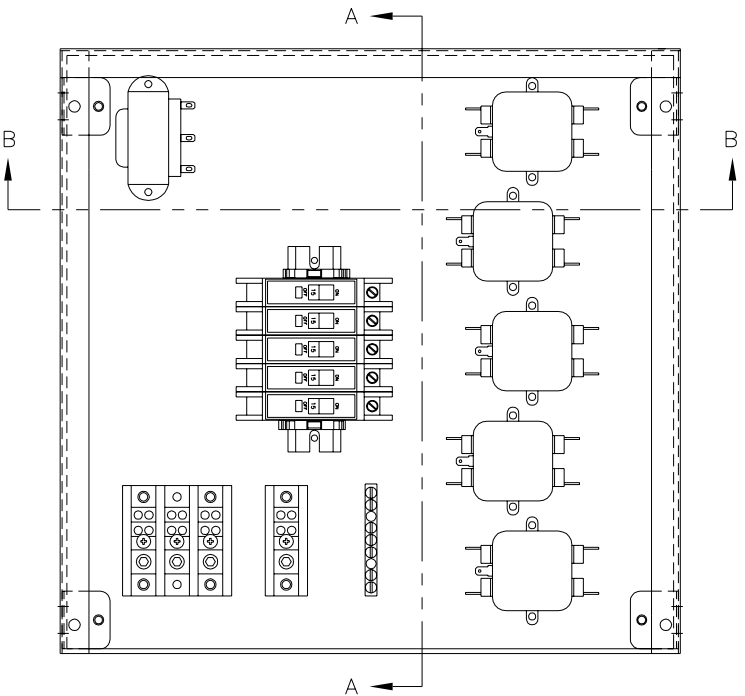
RED  
 BLK

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DAKTRONICS, INC. BROOKINGS, SD 57006			
PROJ: GALAXY, 64MM			
TITLE: SCHEMATIC; POWER SUPPLY CONFIGURATIONS			
DES. BY: LKERR		DRAWN BY: DMATHER	DATE: 02 JUL 03
REVISION	APPR. BY:	1307-R03A-191636	
00	SCALE: NONE		

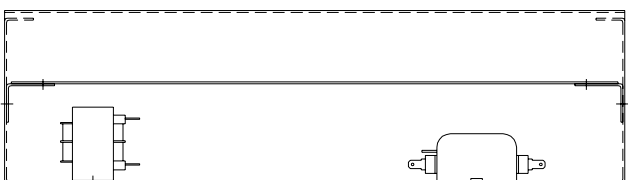
REV.	DATE	DESCRIPTION	BY	APPR.



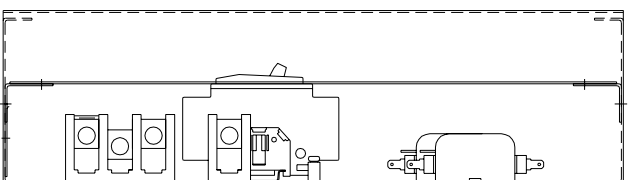
SECTION: A-A



FRONT VIEW



SECTION: B-B



BOTTOM VIEW

REV.	DATE	DESCRIPTION	BY	APPR.
01	11JAN06	REMOVED SURGE ARRESTORS AND FUSE: AND UPDATED TO 3400 NOMENCLATURE:	JSW	

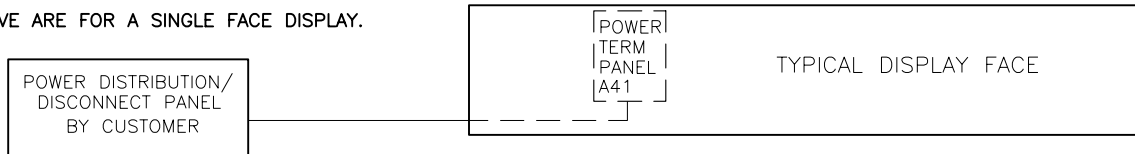
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DAKTRONICS, INC. BROOKINGS, SD 57006	
PROJ:	GALAXY, AF-3400-64MM
TITLE:	PANEL BOARD LAYOUT, AF-3400-64MM
DES. BY:	JTELLIN
DRAWN BY:	SMENNIN
DATE:	22 JUL 03
REVISION	APPR. BY:
01	SCALE: 1=5
1307-E10A-192369	

## GALAXY, 64mm, 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	259	0.00	1.67	0.49	0.37	1.79
8X48	403	0.00	2.50	0.86	0.73	2.63
8X64	548	0.83	2.50	1.23	1.93	2.63
8X80	692	1.67	2.50	1.59	3.14	2.63
8X96	836	2.50	2.50	1.96	4.34	2.63
8X112	980	2.50	3.34	2.33	4.70	3.46
16X48	748	2.50	2.50	1.23	3.60	2.63
16X64	992	2.50	4.17	1.59	3.97	4.30
16X80	1236	3.34	5.01	1.96	5.17	5.13
16X96	1481	5.01	5.01	2.33	7.21	5.13
16X112	1725	5.01	6.68	2.69	7.57	6.80
24X48	1048	2.50	5.01	1.23	3.60	5.13
24X64	1393	5.01	5.01	1.59	6.47	5.13
24X80	1737	5.01	7.51	1.96	6.84	7.63
24X96	2081	7.51	7.51	2.33	9.71	7.63
24X112	2426	7.51	10.01	2.69	10.08	10.14
32X48	1349	5.01	2.50	3.73	6.11	5.13
32X64	1793	5.01	4.17	5.76	6.47	8.47
32X80	2238	6.68	5.01	6.96	8.51	10.14
32X96	2682	10.01	5.01	7.33	12.21	10.14
32X112	3127	10.01	6.68	9.37	12.58	13.48
40X48	1781	5.01	4.70	5.13	7.21	7.63
40X64	2370	7.51	7.11	5.13	10.44	9.30
40X80	2958	8.34	8.67	7.63	12.01	12.64
40X96	3547	12.52	9.41	7.63	16.92	12.64
40X112	4135	12.52	11.81	10.14	17.65	16.81
48X48	2081	5.01	7.21	5.13	7.21	10.14
48X64	2770	10.01	7.94	5.13	12.95	10.14
48X80	3459	10.01	11.18	7.63	13.68	15.14
48X96	4148	15.02	11.91	7.63	19.42	15.14
48X112	4836	15.02	15.15	10.14	20.15	20.15

**NOTES:**

- SPECS LISTED ABOVE ARE FOR A SINGLE FACE DISPLAY.



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DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: GALAXY, 64MM

TITLE: POWER SPECS, AF-3400-\*\*X\*\*-64-A-P-\*-DOMESTIC

DES. BY: LKERR

DRAWN BY: DMATHER

DATE: 22 JUL 03

01	28JUN05	CHANGED TITLE BLOCK FROM 3180 TO 3400 UPDATED POWER SPECS FOR FAN AND DRIVER CURRENT CHANGES.	LLK	LLK
REV.	DATE	DESCRIPTION	BY	APPR.

REVISION  
01

APPR. BY:  
SCALE: NONE

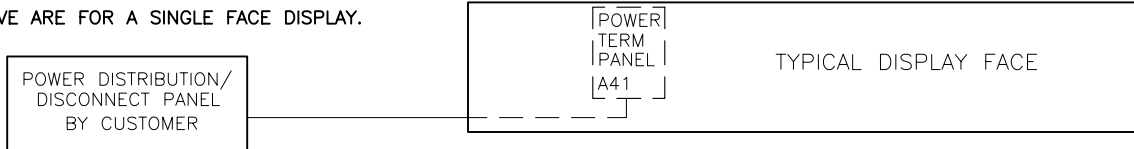
1307-R10A-192935

## GALAXY, 64mm, 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	193	0.00	1.12	0.49	0.49	1.12
8X48	304	0.56	1.12	0.86	1.42	1.12
8X64	415	1.12	1.12	1.23	2.34	1.12
8X80	526	1.12	1.67	1.59	2.71	1.67
8X96	637	1.12	2.23	1.96	3.07	2.23
8X112	748	1.67	2.23	2.33	4.00	2.23
16X48	549	1.12	2.23	1.23	2.34	2.23
16X64	727	2.23	2.23	1.59	3.82	2.23
16X80	905	2.23	3.35	1.96	4.19	3.35
16X96	1083	3.35	3.35	2.33	5.67	3.35
16X112	1261	3.35	4.46	2.69	6.04	4.46
24X48	750	1.67	2.23	2.34	2.90	3.35
24X64	995	3.35	2.23	2.71	4.94	3.35
24X80	1240	3.35	3.35	3.63	5.31	5.02
24X96	1485	4.46	3.35	4.56	6.79	5.58
24X112	1729	5.02	4.46	4.92	7.71	6.70
32X48	951	2.23	2.23	3.46	3.46	4.46
32X64	1263	4.46	2.23	3.82	6.06	4.46
32X80	1574	4.46	3.35	5.31	6.42	6.70
32X96	1886	6.70	3.35	5.67	9.02	6.70
32X112	2198	6.70	4.46	7.16	9.39	8.93
40X48	1284	2.79	4.43	3.47	4.99	5.71
40X64	1706	5.58	5.17	3.47	8.51	5.71
40X80	2129	5.58	7.02	5.15	9.25	8.50
40X96	2552	7.81	7.75	5.71	12.21	9.05
40X112	2975	8.37	9.60	6.82	13.51	11.29
48X48	1485	3.35	5.55	3.47	5.55	6.82
48X64	1974	6.70	6.28	3.47	9.63	6.82
48X80	2464	6.70	8.13	5.15	10.36	10.17
48X96	2954	8.93	9.98	5.71	13.33	11.29
48X112	3444	10.05	11.83	6.82	15.18	13.52

**NOTES:**

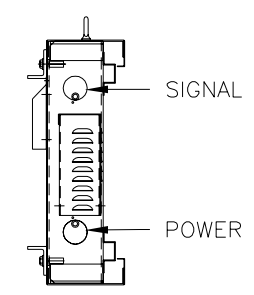
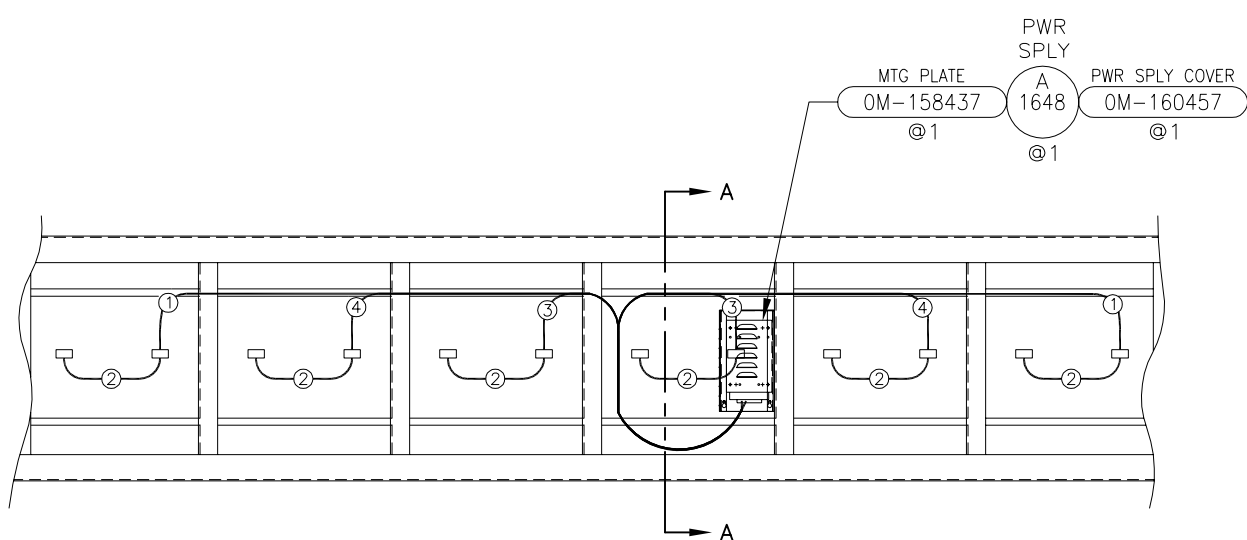
- SPECS LISTED ABOVE ARE FOR A SINGLE FACE DISPLAY.



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DAKTRONICS, INC. BROOKINGS, SD 57006			
PROJ: GALAXY, 64 MM			
TITLE: POWER SPECS, AF-3400-**-**-64-R-P-*-DOMESTIC			
DES. BY: LKERR		DRAWN BY: DMATHER	
DATE: 22 JUL 03			
REVISION	APPR. BY:	1307-R10A-192937	
01	SCALE: NONE		

REV.	DATE	DESCRIPTION	BY	APPR.
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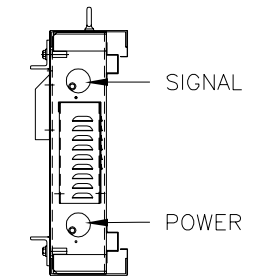
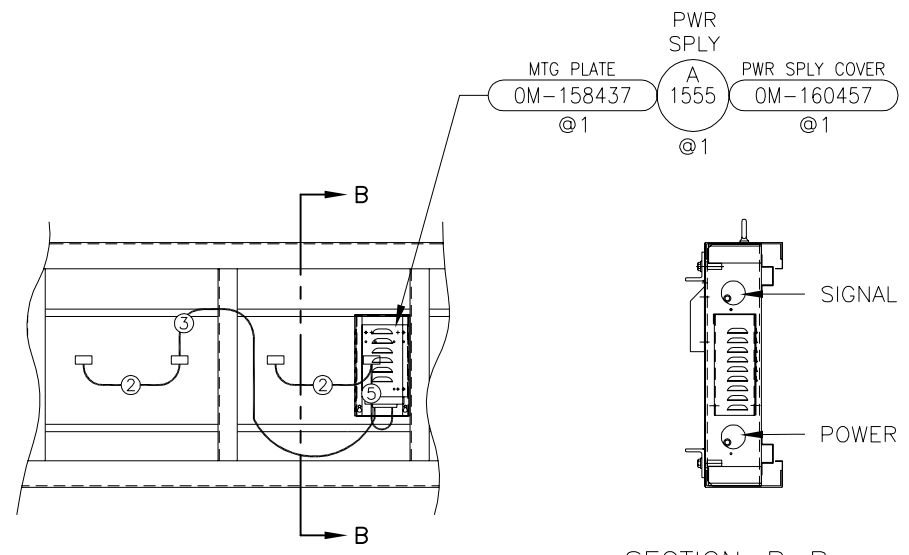
REV.	DATE	DESCRIPTION	BY	APPR.
------	------	-------------	----	-------



SECTION: A-A

FRONT VIEW  
( 0A-1307-0503 )  
AMBER, 6 MOD

- ① LOW VOLTAGE PWR WIRES @90 INCHES IN LENGTH
- ② LOW VOLTAGE PWR WIRES @18 INCHES IN LENGTH
- ③ LOW VOLTAGE PWR WIRES @60 INCHES IN LENGTH
- ④ LOW VOLTAGE PWR WIRES @72 INCHES IN LENGTH
- ⑤ LOW VOLTAGE PWR WIRES @30 INCHES IN LENGTH



SECTION: B-B

FRONT VIEW  
( 0A-1307-0500 )  
AMBER, 2 MOD

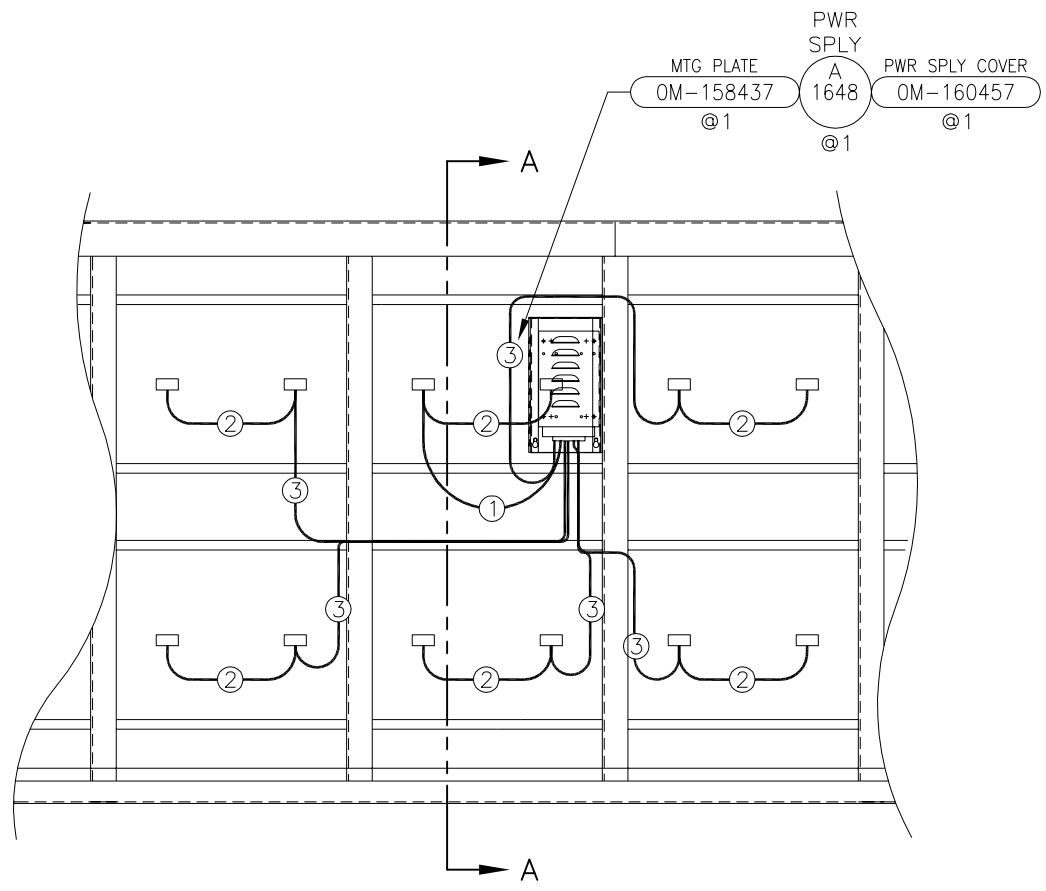
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PROJ: GALAXY, 64MM  
DAKTRONICS, INC. BROOKINGS, SD 57006

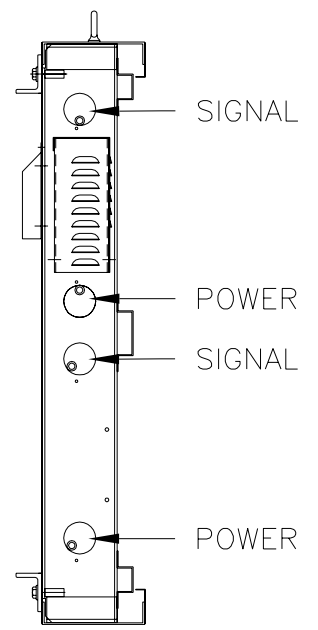
TITLE: P/S WIRING, HORIZ ROW; AF-3180-64MM-AMBER  
DES. BY: JTELLIN  
DRAWN BY: EYOUNG  
DATE: 11 AUG 03

REVISION 00  
APPR. BY: 1307-E10A-194620  
SCALE: 1=20

REV.	DATE	DESCRIPTION	BY	APPR.
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DAKTRONICS, INC. BROOKINGS, SD 57006				
PROJ: GALAXY, 64MM				
TITLE: P/S WIRING, 6 HORIZ; AF-3180-64MM-AMBER				
DES. BY: JTELLIN DRAWN BY: EYOUNG DATE: 11 AUG 03				
REVISION 00 APPR. BY: SCALE: 1=15 1307-E10A-194621				



FRONT VIEW  
 ( 0A-1307-0502 )  
 AMBER, 6MOD



SECTION: A-A

- ① LOW VOLTAGE PWR WIRES @30 INCHES IN LENGTH
- ② LOW VOLTAGE PWR WIRES @18 INCHES IN LENGTH
- ③ LOW VOLTAGE PWR WIRES @60 INCHES IN LENGTH

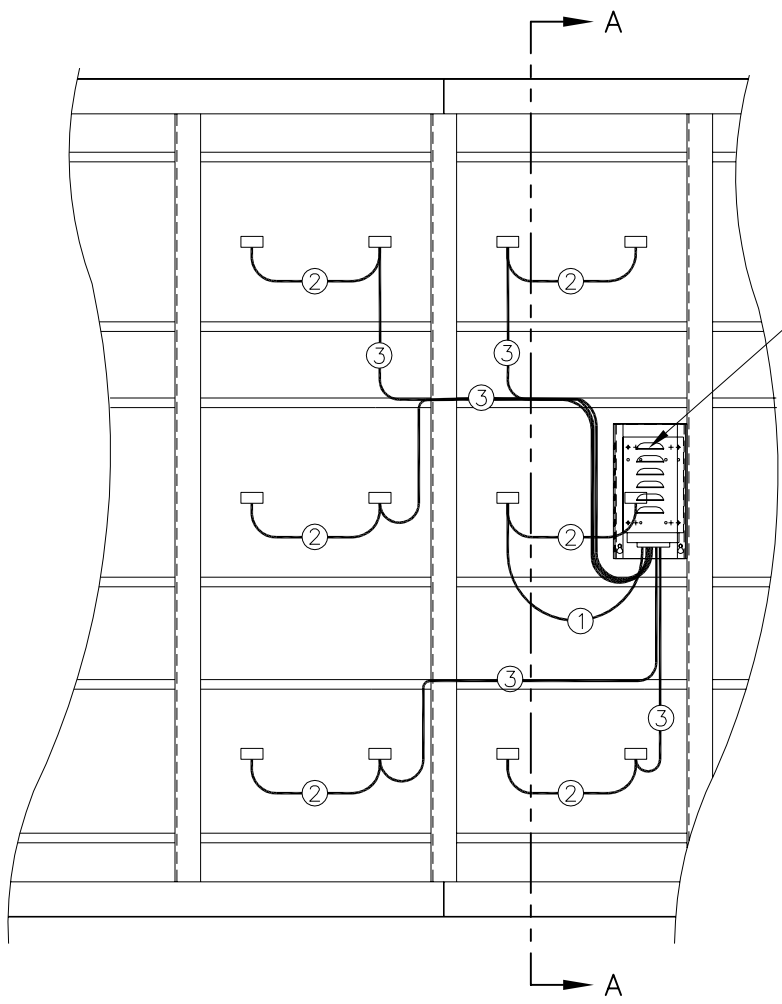
REV.	DATE	DESCRIPTION	BY	APPR.

REVISION	APPR. BY:	DATE:
00	EYOUNG	11 AUG 03
SCALE:	1=15	
1307-E10A-194622		

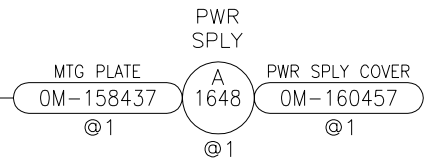
THE CONCEPTS EXPRESSED AND DETAILS SHOWN ON THIS DRAWING ARE CONFIDENTIAL AND PROPRIETARY. DO NOT REPRODUCE BY ANY MEANS, INCLUDING ELECTRONICALLY WITHOUT THE EXPRESSED WRITTEN CONSENT OF DAKTRONICS, INC. COPYRIGHT 2003 DAKTRONICS, INC.

PROJ: GALAXY, 64MM  
 DAKTRONICS, INC. BROOKINGS, SD 57006

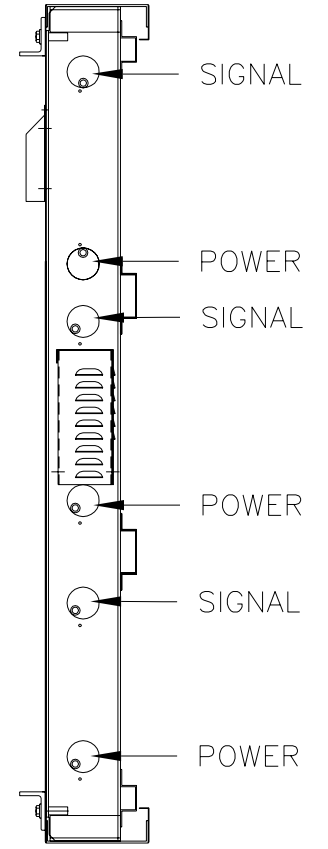
TITLE: P/S WIRING, 6 VERT; AF-3180-64MM-AMBER  
 DES. BY: JTELLIN DRAWN BY: EYOUNG DATE: 11 AUG 03



FRONT VIEW  
 ( 0A-1307-0502 )  
 AMBER, 6 MOD



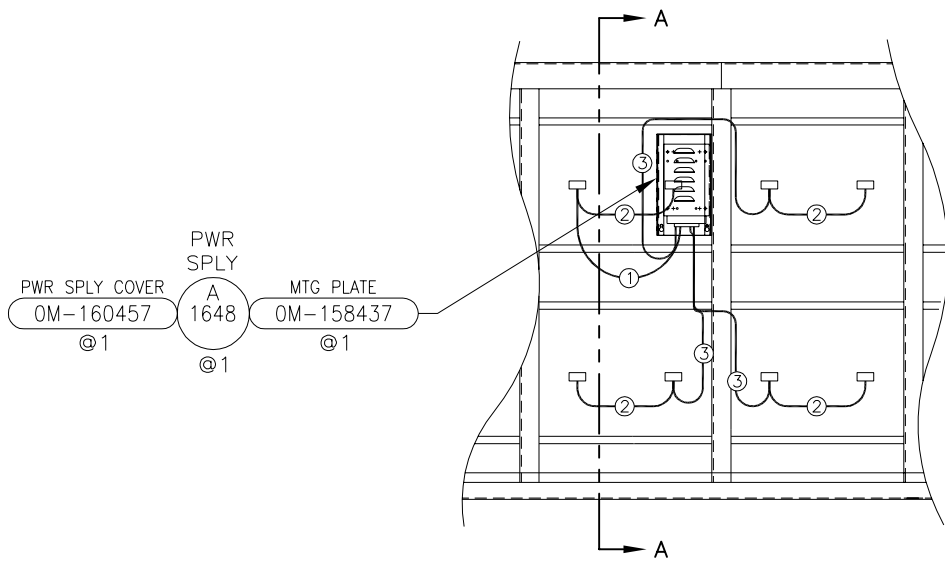
- ① LOW VOLTAGE PWR WIRES @30 INCHES IN LENGTH
- ② LOW VOLTAGE PWR WIRES @18 INCHES IN LENGTH
- ③ LOW VOLTAGE PWR WIRES @60 INCHES IN LENGTH



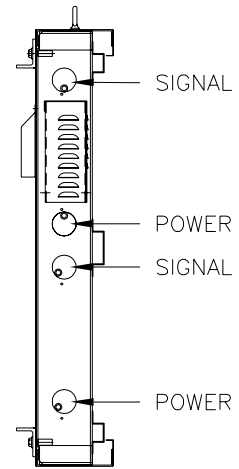
SECTION: A-A



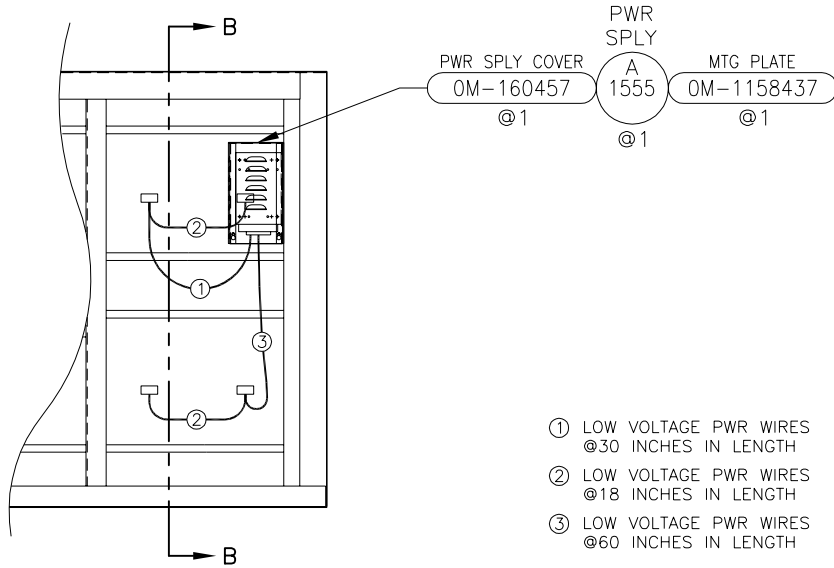
REV.	DATE	DESCRIPTION	BY	APPR.
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FRONT VIEW  
( OA-1307-0501 )  
AMBER, 4 MOD

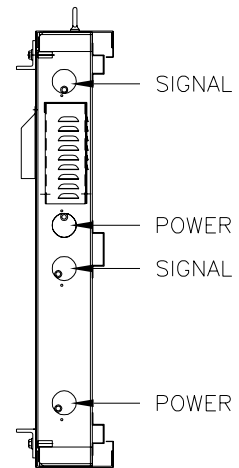


SECTION: A-A



FRONT VIEW  
( OA-1307-0500 )  
AMBER, 2 MOD

- ① LOW VOLTAGE PWR WIRES @30 INCHES IN LENGTH
- ② LOW VOLTAGE PWR WIRES @18 INCHES IN LENGTH
- ③ LOW VOLTAGE PWR WIRES @60 INCHES IN LENGTH



SECTION: B-B

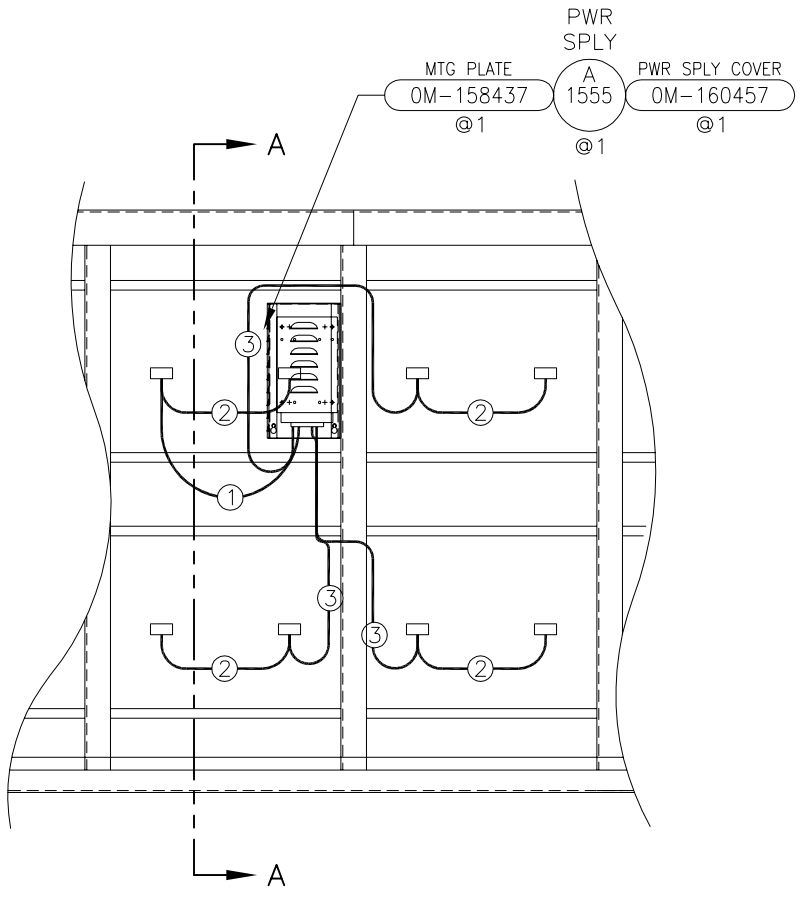
PROJ: GALAXY, 64MM  
 TITLE: P/S WIRING, 4 & 2 MODULES, AF-3180-AMBER  
 DES. BY: JTELLIN DRAWN BY: EYOUNG DATE: 13 AUG 03  
 REVISION 00 APPR. BY: 1307-E10A-194624  
 SCALE: 1=20

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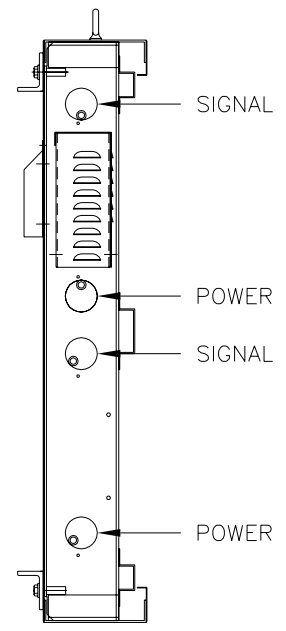
DAKTRONICS, INC. BROOKINGS, SD 57006

REV.	DATE	DESCRIPTION	BY	APPR.

THE CONCEPTS EXPRESSED AND DETAILS SHOWN ON THIS DRAWING ARE CONFIDENTIAL AND PROPRIETARY. DO NOT REPRODUCE BY ANY MEANS, INCLUDING ELECTRONICALLY WITHOUT THE EXPRESSED WRITTEN CONSENT OF DAKTRONICS, INC. COPYRIGHT 2003 DAKTRONICS, INC.				
<b>DAKTRONICS, INC. BROOKINGS, SD 57006</b>				
PROJ: GALAXY, 64MM				
TITLE: P/S WIRING, 4 MOD STACK; AF-3180-64MM-RED				
DES. BY: JTELLIN      DRAWN BY: EYOUNG      DATE: 13 AUG 03				
REVISION	APPR. BY:	DATE:		
00	SCALE: 1=15		1307-E10A-195340	



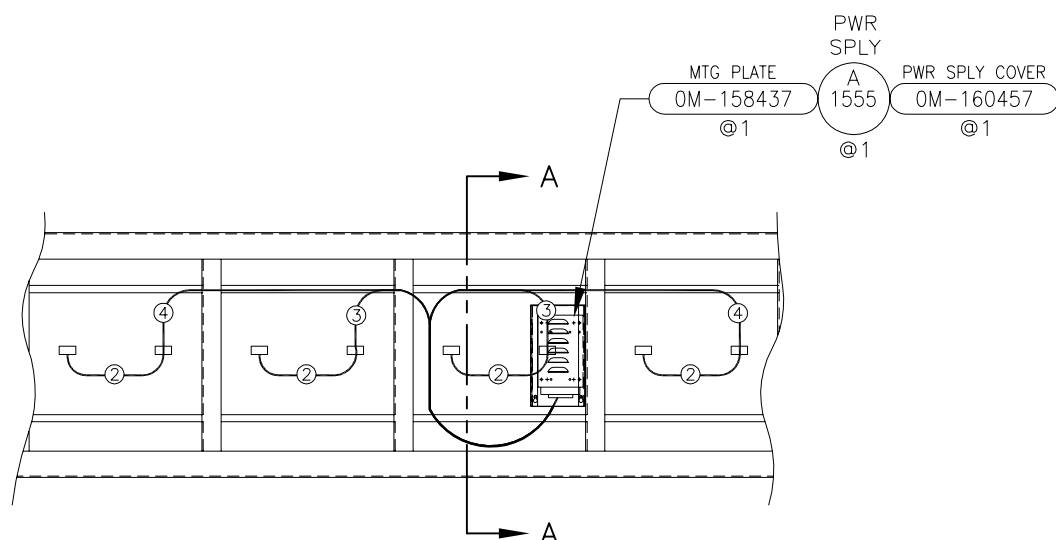
FRONT VIEW  
 ( 0A-1307-0511 )  
 RED, 4 MOD



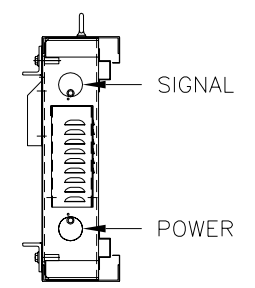
SECTION: A-A

- ① LOW VOLTAGE PWR WIRES @30 INCHES IN LENGTH
- ② LOW VOLTAGE PWR WIRES @18 INCHES IN LENGTH
- ③ LOW VOLTAGE PWR WIRES @60 INCHES IN LENGTH

REV.	DATE	DESCRIPTION	BY	APPR.
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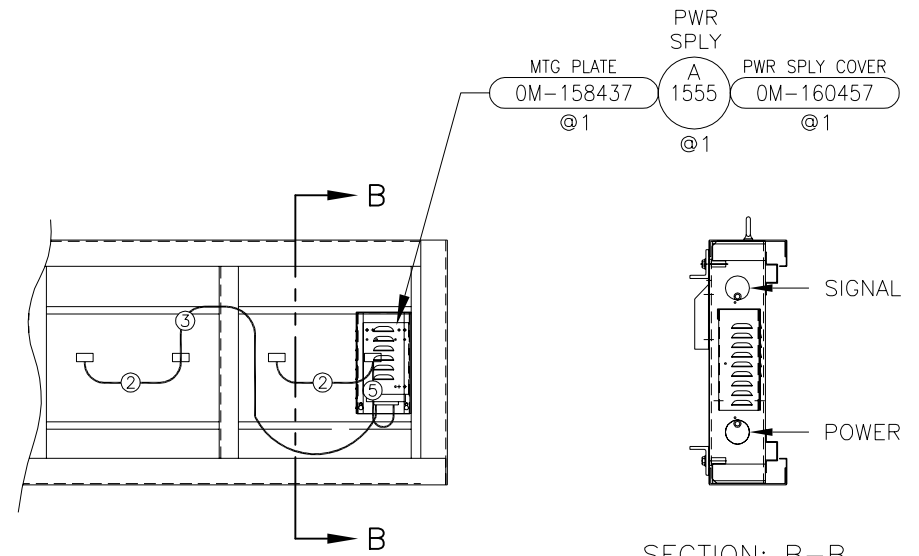


FRONT VIEW  
( OA-1307-0512 )  
RED, 4 MOD

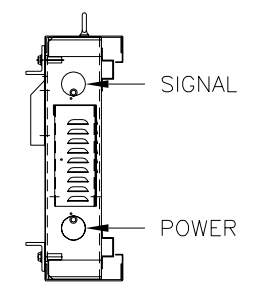


SECTION: A-A

- ① LOW VOLTAGE PWR WIRES @90 INCHES IN LENGTH
- ② LOW VOLTAGE PWR WIRES @18 INCHES IN LENGTH
- ③ LOW VOLTAGE PWR WIRES @60 INCHES IN LENGTH
- ④ LOW VOLTAGE PWR WIRES @72 INCHES IN LENGTH
- ⑤ LOW VOLTAGE PWR WIRES @30 INCHES IN LENGTH



FRONT VIEW  
( OA-1307-0500 )  
RED, 2 MOD



SECTION: B-B

THE CONCEPTS EXPRESSED AND DETAILS SHOWN ON THIS DRAWING ARE CONFIDENTIAL AND PROPRIETARY. DO NOT REPRODUCE BY ANY MEANS, INCLUDING ELECTRONICALLY WITHOUT THE EXPRESSED WRITTEN CONSENT OF DAKTRONICS, INC. COPYRIGHT 2003 DAKTRONICS, INC.

PROJ: GALAXY, 64MM  
DAKTRONICS, INC. BROOKINGS, SD 57006

TITLE: P/S WIRING, 4 & 2 MODULES HORIZ. AF-3180-RED  
DES. BY: JTELLIN  
DRAWN BY: EYOUNG  
DATE: 13 AUG 03

REVISION 00  
APPR. BY: [Signature]  
SCALE: 1=15  
1307-E10A-195341

INSTALL JUMPER FOR MODEM USE.

FUNCTION	PIN	PIN	FUNCTION
D1IN-P	1	A	I/O_00
D1IN-N	2	B	D1OUT-P
+V_UNREG	3	C	D1OUT-N
TX_COM1	4	D	AGND_IN
GND	5	E	D2_00OUT-N
D2OUT-P	6	F	D2IN-P
RX_COM1	7	H	D2IN-N
DCD_COM1	8	J	AGND
CANH	9	K	+5V_CAN
CANL	10	L	GND_CAN

FUNCTION	PIN	PIN	FUNCTION
TCK	1	2	GND
TDO	3	4	+3.3V
TMS	5	6	N.C.
N.C.	7	8	N.C.
TDI	9	10	GND

FUNCTION	PIN	PIN	FUNCTION
TDO1	1	2	N.C.
TDI1	3	4	VBST1
N.C.	5	6	+3.3V
TCK1	7	8	N.C.
TMS1	9	10	N.C.
VHALT	11	12	N.C.
N.C.	13	14	KEYING PIN
N.C.	15	16	GND

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

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

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

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

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

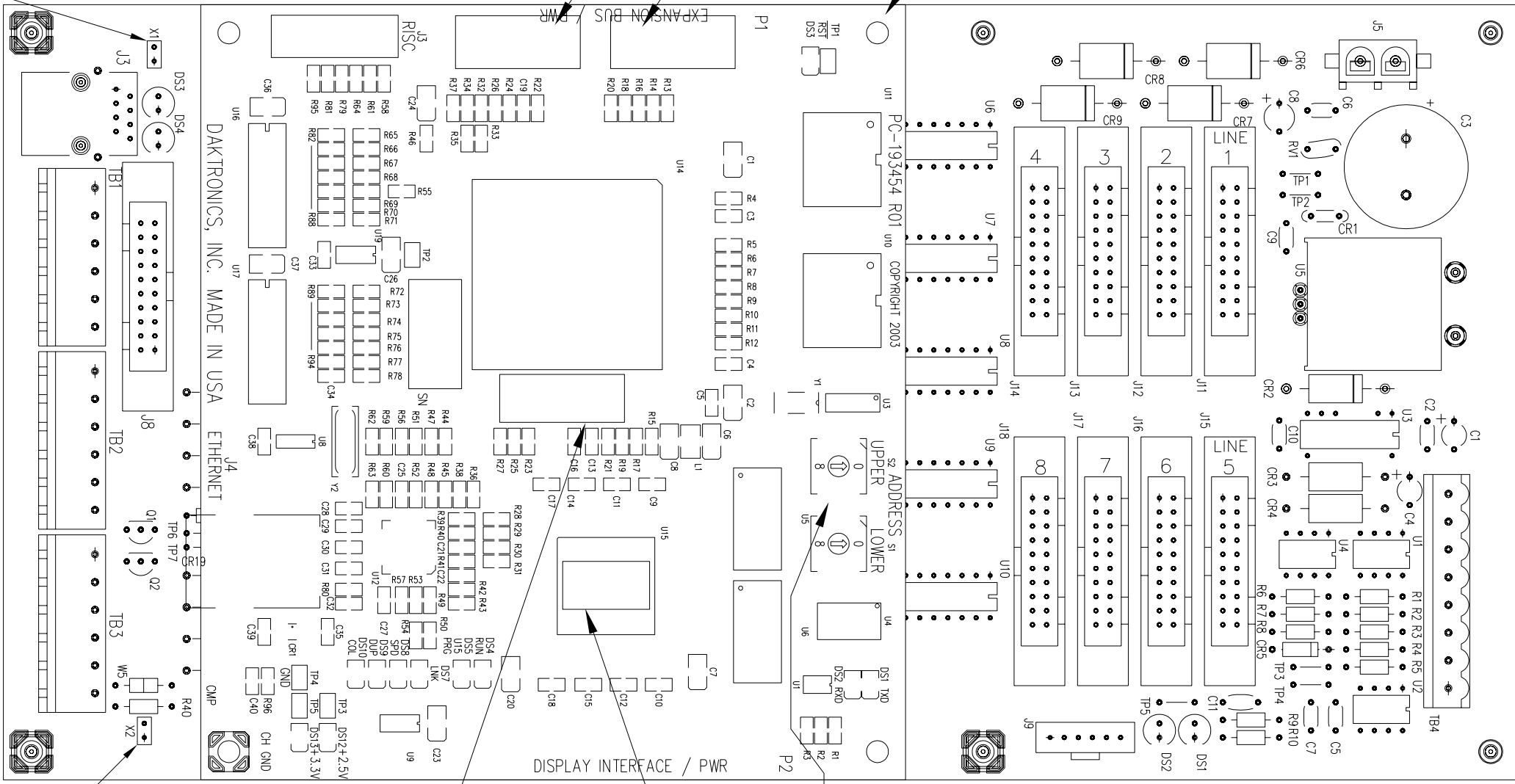
PIN	FUNCTION
2	10VAC
1	10VAC

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

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	

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DAKTRONICS, INC. BROOKINGS, SD 57006	
PROJ:	
TITLE:	CNTRLR, GALAXY, 8 CONN, J1087
DES. BY:	WTAYLOR
DATE:	04 NOV 02
REVISION	APPR. BY:
03	SCALE: 1=1
1229-R10B-177838	



LL 1002  
FIRMWARE REVISION DATE

LL 1002  
EPLD PROGRAM REVISION DATE

UPPER / LOWER ADDRESS SWITCHES

INSTALL JUMPER FOR RESET USE.

RS232 IN

RS232 IN

RS422 IN

RS422 OUT

PRODUCT BOARD

M2 CNTRLR COATED

TYPICALLY @4 PLACES

ASSY #  
SERIAL #  
DATE: REV X  
TESTED BY  
DATE

ETHERNET J4

DISPLAY INTERFACE / PWR

UPPER / LOWER ADDRESS SWITCHES

INSTALL JUMPER FOR RESET USE.

RS232 IN

RS232 IN

RS422 IN

RS422 OUT

PRODUCT BOARD

M2 CNTRLR COATED

TYPICALLY @4 PLACES

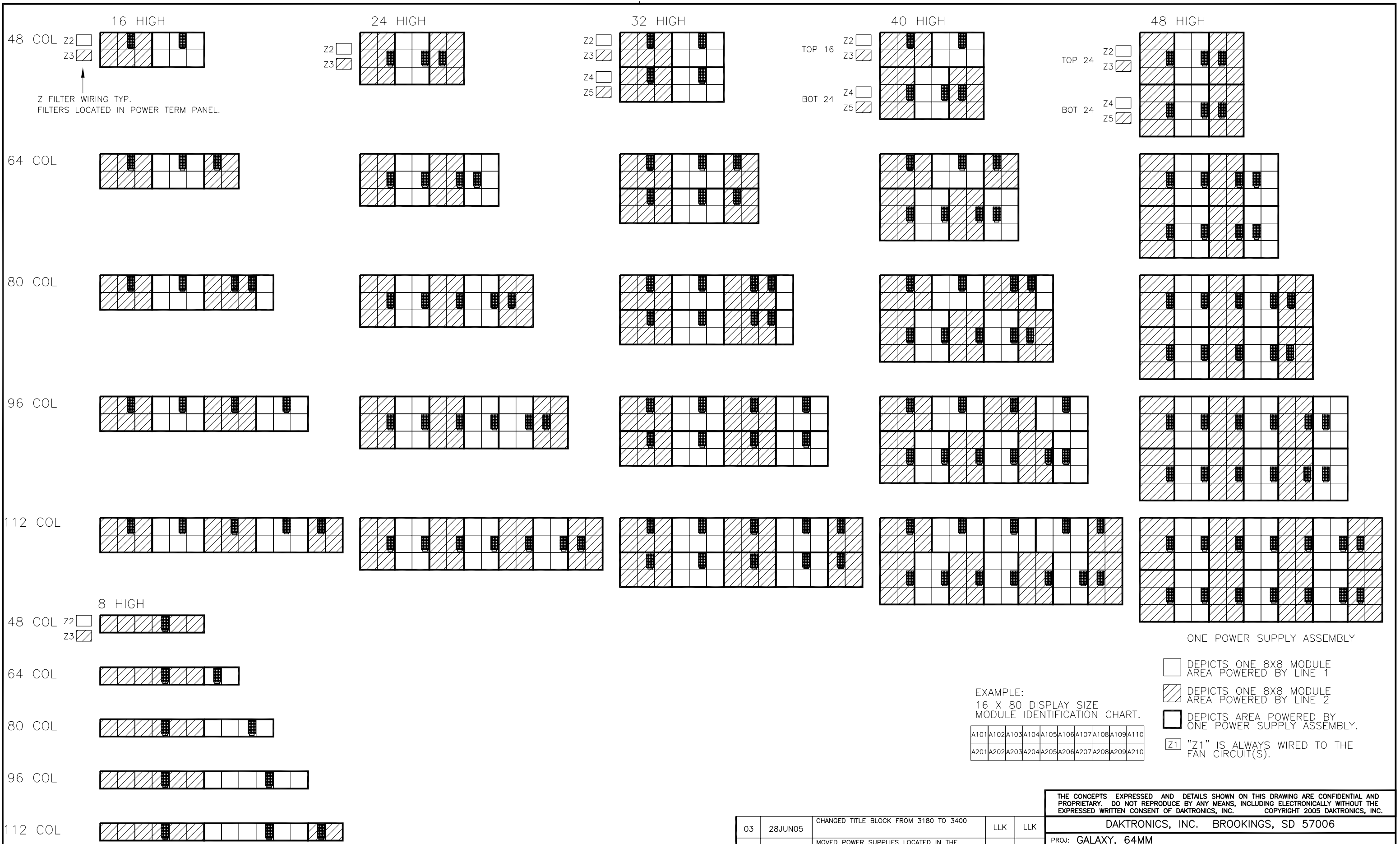
ASSY #  
SERIAL #  
DATE: REV X  
TESTED BY  
DATE

ETHERNET J4

DISPLAY INTERFACE / PWR

UPPER / LOWER ADDRESS SWITCHES

INSTALL JUMPER FOR RESET USE.



Z FILTER WIRING TYP.  
 FILTERS LOCATED IN POWER TERM PANEL.

ONE POWER SUPPLY ASSEMBLY

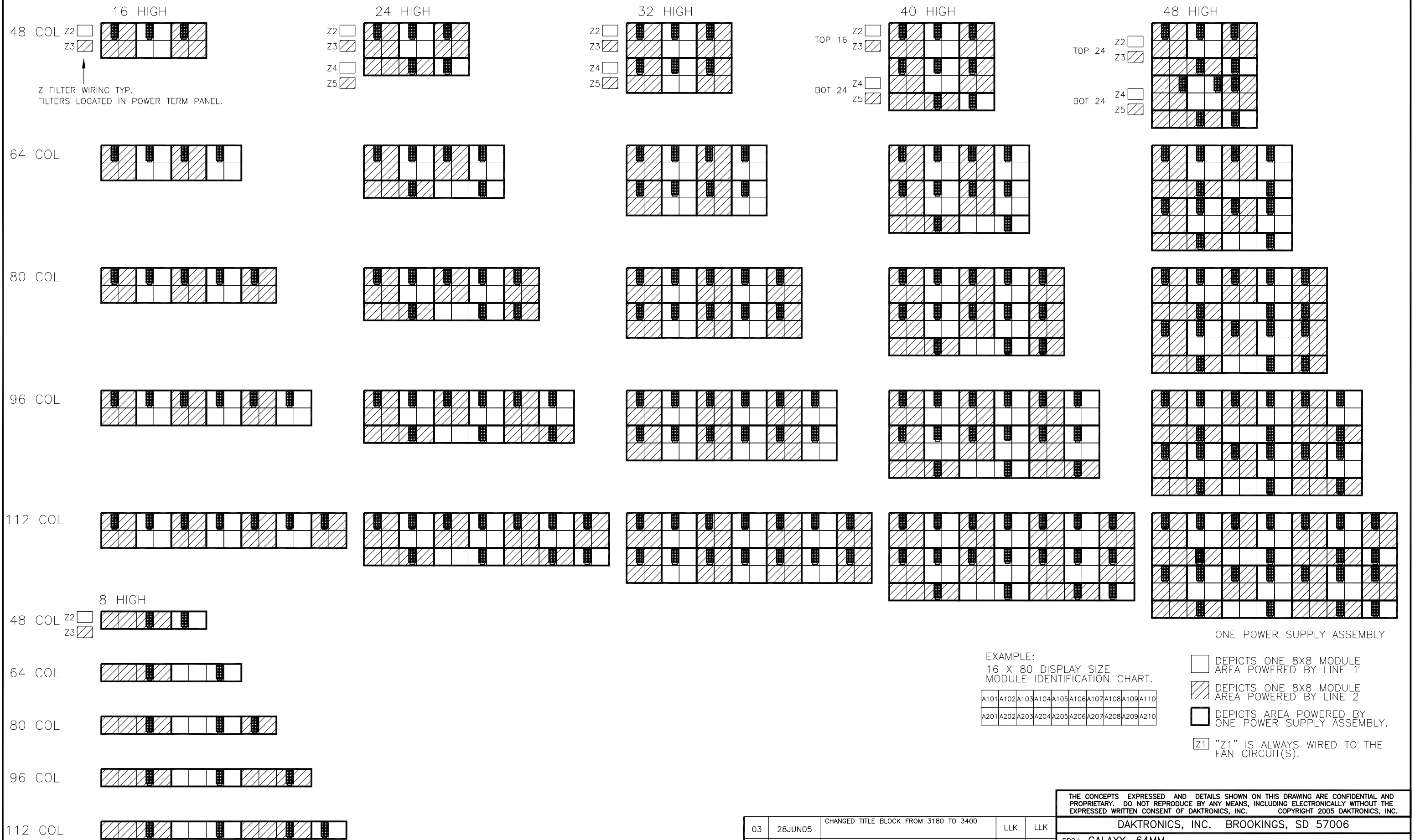
EXAMPLE:  
 16 X 80 DISPLAY SIZE  
 MODULE IDENTIFICATION CHART.

A101	A102	A103	A104	A105	A106	A107	A108	A109	A110
A201	A202	A203	A204	A205	A206	A207	A208	A209	A210

- DEPICTS ONE 8X8 MODULE AREA POWERED BY LINE 1
- DEPICTS ONE 8X8 MODULE AREA POWERED BY LINE 2
- DEPICTS AREA POWERED BY ONE POWER SUPPLY ASSEMBLY.
- "Z1" IS ALWAYS WIRED TO THE FAN CIRCUIT(S).

REV.	DATE	DESCRIPTION	BY	APPR.
03	28JUN05	CHANGED TITLE BLOCK FROM 3180 TO 3400	LLK	LLK
02	13 APR 04	MOVED POWER SUPPLIES LOCATED IN THE RIGHT-MOST BAY ONE BAY TO THE LEFT.	RTV	
01	21 AUG 03	UPDATED LAYOUT PER DESIGN CHANGE.	EJY	

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DAKTRONICS, INC. BROOKINGS, SD 57006	
PROJ:	GALAXY, 64MM
TITLE:	LAYOUT, AF-3400-(8-48X48-112)-64-A-P-*-1PH
DES. BY:	LKERR
DRAWN BY:	DMATHER
DATE:	03 JUL 03
REVISION	03
APPR. BY:	
SCALE:	NONE
1307-R03B-191693	



Z FILTER WIRING TYP.  
 FILTERS LOCATED IN POWER TERM PANEL.

EXAMPLE:  
 16 X 80 DISPLAY SIZE  
 MODULE IDENTIFICATION CHART.

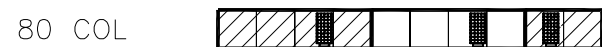
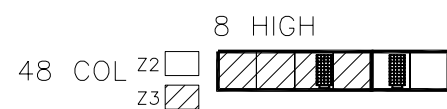
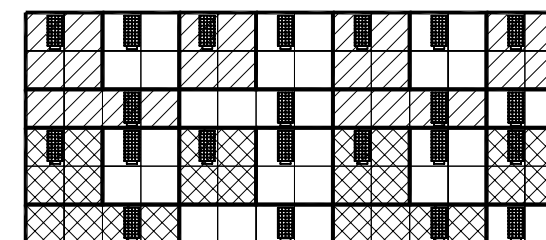
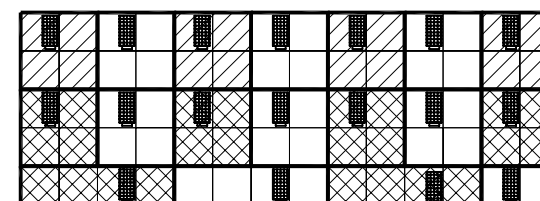
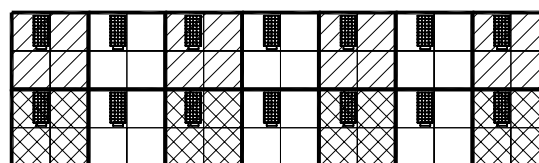
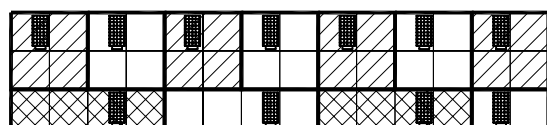
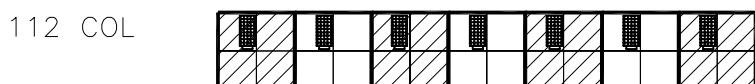
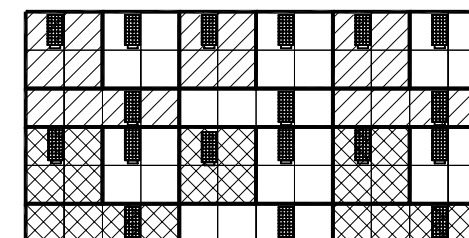
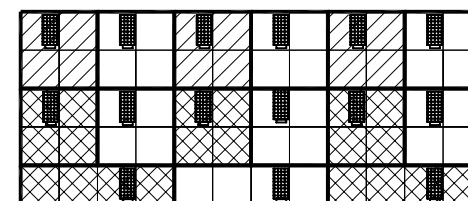
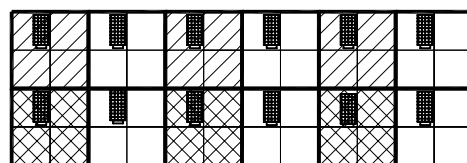
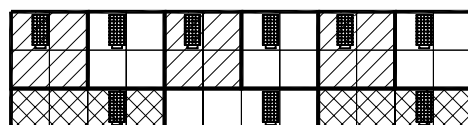
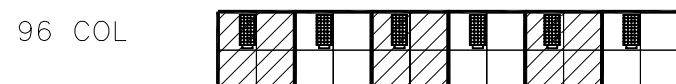
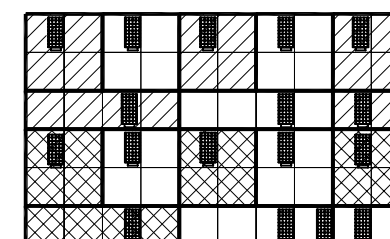
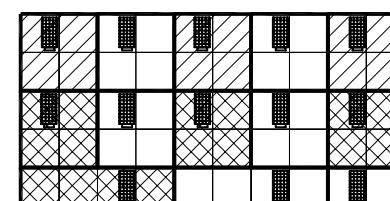
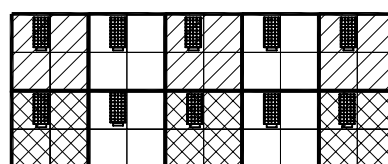
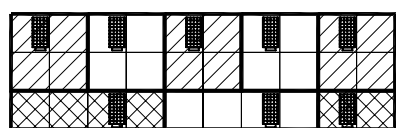
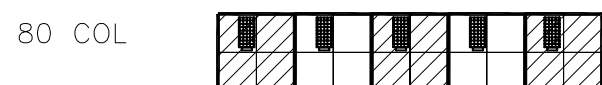
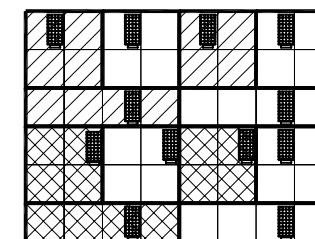
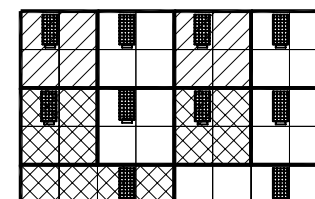
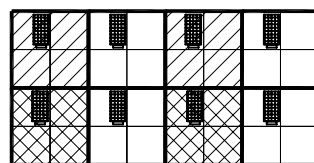
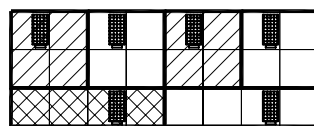
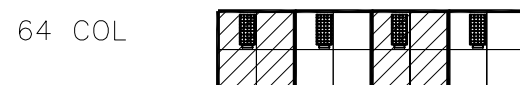
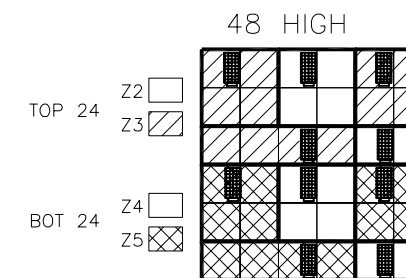
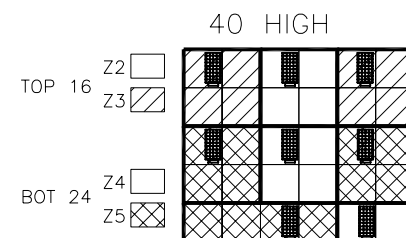
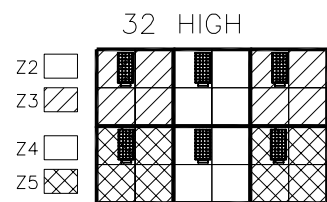
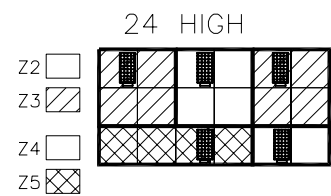
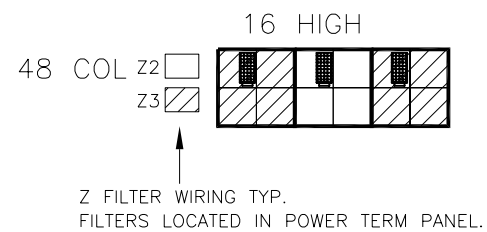
A101	A102	A103	A104	A105	A106	A107	A108	A109	A110
A201	A202	A203	A204	A205	A206	A207	A208	A209	A210

- DEPICTS ONE 8X8 MODULE AREA POWERED BY LINE 1
- DEPICTS ONE 8X8 MODULE AREA POWERED BY LINE 2
- DEPICTS AREA POWERED BY ONE POWER SUPPLY ASSEMBLY.
- "Z1" IS ALWAYS WIRED TO THE FAN CIRCUIT(S).

ONE POWER SUPPLY ASSEMBLY

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DAKTRONICS, INC. BROOKINGS, SD 57006			
PROJ: GALAXY, 64MM			
TITLE: LAYOUT, AF-3400-(8-48X48-112)-64-R-P-*-1PH			
DES. BY: LKERR		DRAWN BY: DMATHER	
DATE: 03 JUL 03			
REVISION	APPR. BY:	1307-R03B-191723	
03	SCALE: NONE		

REV.	DATE	DESCRIPTION	BY	APPR.
03	28JUN05	CHANGED TITLE BLOCK FROM 3180 TO 3400	LLK	LLK
02	13 APR 04	MOVED POWER SUPPLIES LOCATED IN THE RIGHT-MOST BAY ONE BAY TO THE LEFT.	RTV	
01	21 AUG 03	UPDATED LAYOUT PER DESIGN CHANGE.	EJY	



 ONE POWER SUPPLY ASSEMBLY

 DEPICTS ONE 8X8 MODULE AREA POWERED BY PHASE A

 DEPICTS ONE 8X8 MODULE AREA POWERED BY PHASE B

 DEPICTS ONE 8X8 MODULE AREA POWERED BY PHASE C

 DEPICTS AREA POWERED BY ONE POWER SUPPLY ASSEMBLY.

 "Z1" IS ALWAYS WIRED TO THE FAN CIRCUIT(S). PHASE MAY VARY.

EXAMPLE:  
16 X 80 DISPLAY SIZE  
MODULE IDENTIFICATION CHART.

A101	A102	A103	A104	A105	A106	A107	A108	A109	A110
A201	A202	A203	A204	A205	A206	A207	A208	A209	A210

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DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: GALAXY, 64MM

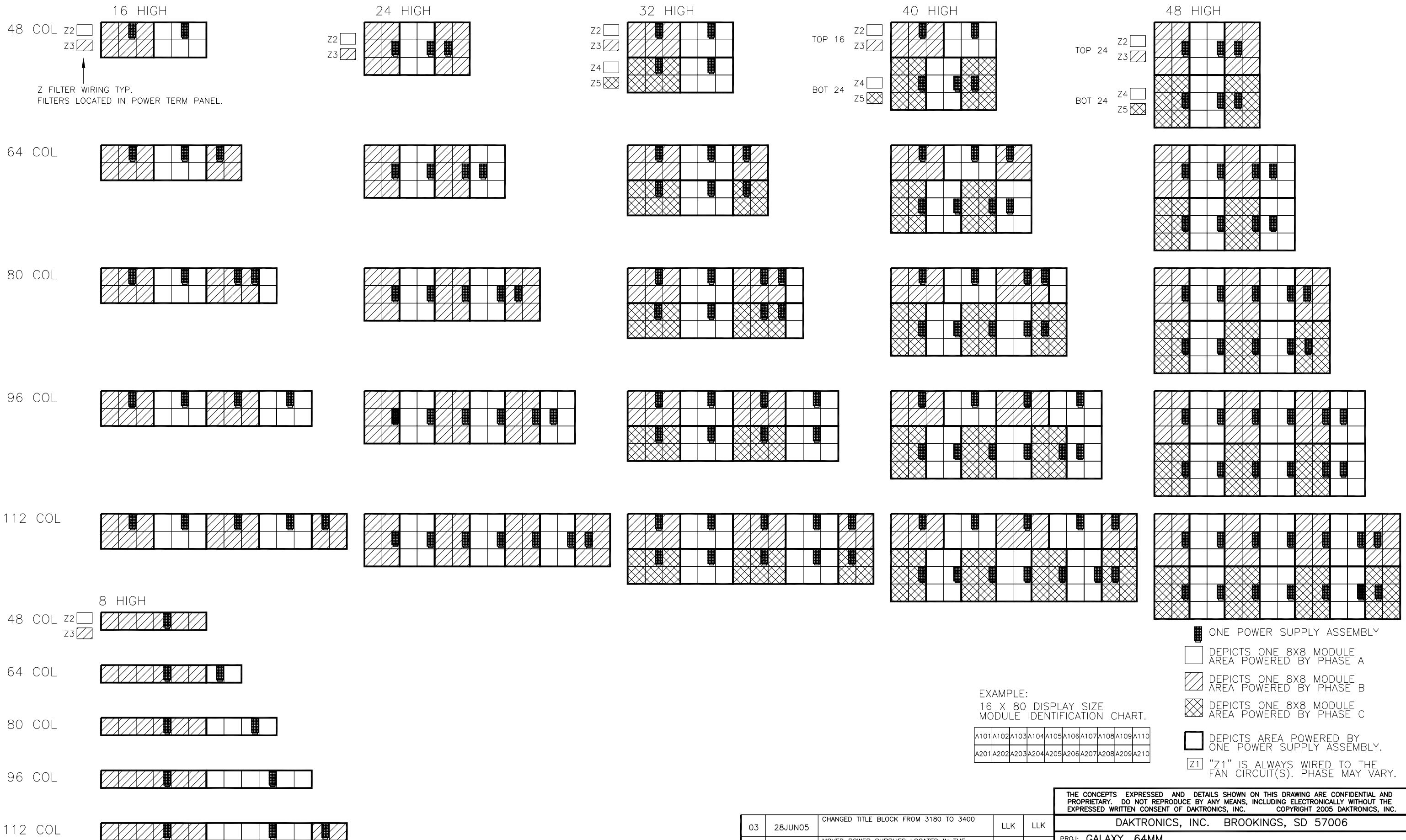
TITLE: LAYOUT, AF-3400-(8-48X48-112)-64-R-P-\*-3PH

DES. BY: LKERR DRAWN BY: LKERR DATE: 17 JUL 03

REVISION APPR. BY: 1307-R03B-192629

SCALE: NONE

REV.	DATE	DESCRIPTION	BY	APPR.
03	28JUN05	CHANGED TITLE BLOCK FROM 3180 TO 3400	LLK	LLK
02	13 APR 04	MOVED POWER SUPPLIES LOCATED IN THE RIGHT-MOST BAY ONE BAY TO THE LEFT.	RTV	
01	21 AUG 03	UPDATED LAYOUT PER DESIGN CHANGE.	EJY	



Z FILTER WIRING TYP.  
 FILTERS LOCATED IN POWER TERM PANEL.

EXAMPLE:  
 16 X 80 DISPLAY SIZE  
 MODULE IDENTIFICATION CHART.

A101	A102	A103	A104	A105	A106	A107	A108	A109	A110
A201	A202	A203	A204	A205	A206	A207	A208	A209	A210

- ONE POWER SUPPLY ASSEMBLY
- DEPICTS ONE 8X8 MODULE AREA POWERED BY PHASE A
- DEPICTS ONE 8X8 MODULE AREA POWERED BY PHASE B
- DEPICTS ONE 8X8 MODULE AREA POWERED BY PHASE C
- DEPICTS AREA POWERED BY ONE POWER SUPPLY ASSEMBLY.
- "Z1" IS ALWAYS WIRED TO THE FAN CIRCUIT(S). PHASE MAY VARY.

REV.	DATE	DESCRIPTION	BY	APPR.
03	28JUN05	CHANGED TITLE BLOCK FROM 3180 TO 3400	LLK	LLK
02	13 APR 04	MOVED POWER SUPPLIES LOCATED IN THE RIGHT-MOST BAY ONE BAY TO THE LEFT.	RTV	
01	21 AUG 03	UPDATED LAYOUT PER DESIGN CHANGE.	EJY	

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DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: GALAXY, 64MM

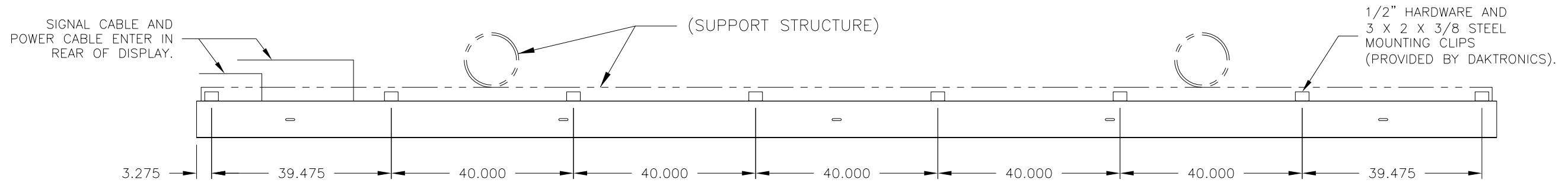
TITLE: LAYOUT, AF-3400-(8-48X48-112)-64-A-P-\*-3PH

DES. BY: LKERR      DRAWN BY: LKERR      DATE: 17JUL03

REVISION 03      APPR. BY:      SCALE: NONE

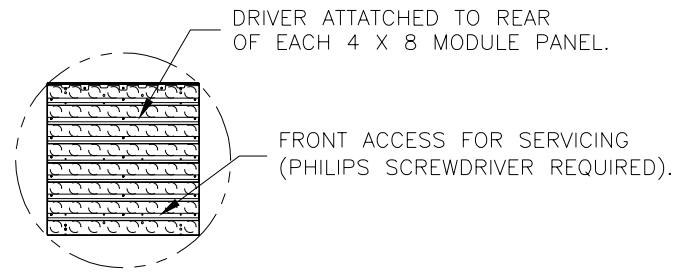
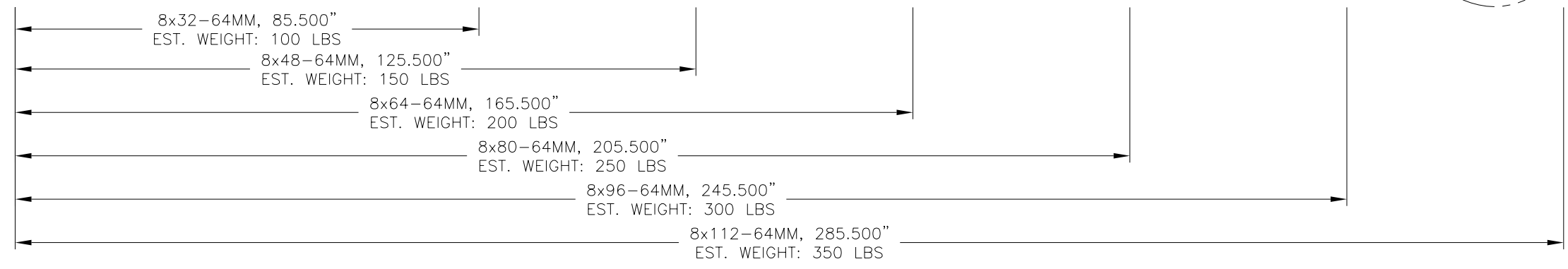
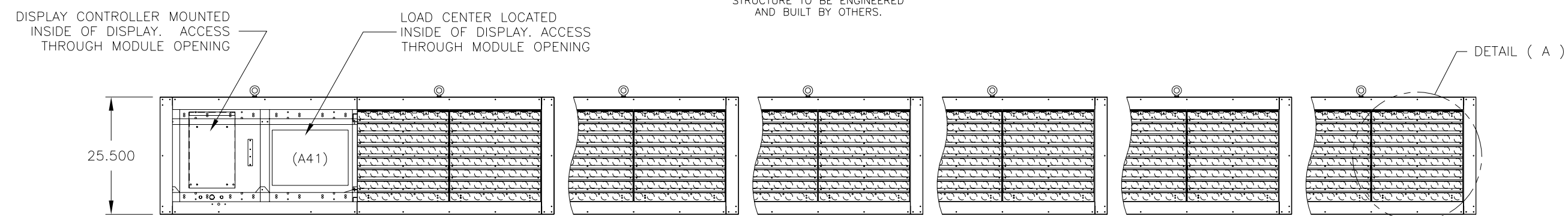
1307-R03B-192661





TOP VIEW

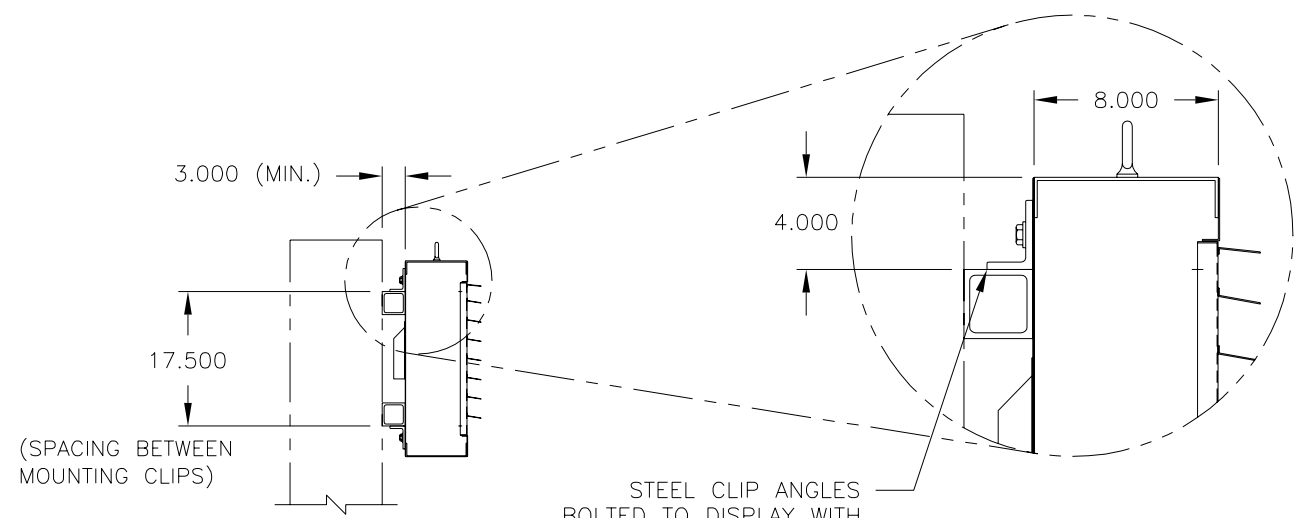
ALL SUPPORT STRUCTURE SHOWN IS FOR CONCEPT ONLY. SUPPORT STRUCTURE TO BE ENGINEERED AND BUILT BY OTHERS.



NOTES:

- 1) ALL DIMENSIONS ARE GIVEN IN INCHES
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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.
- 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.
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- 8) REFER TO RISER DIAGRAM FOR ELECTRICAL SPECIFICATIONS AND SIGNAL HOOK UPS.

FRONT VIEW

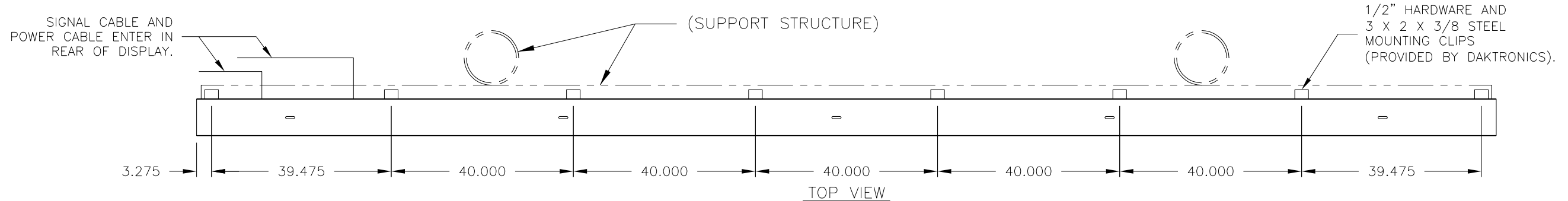


MINIMUMS SHOWN ARE FOR VENTILATION REQUIREMENTS.

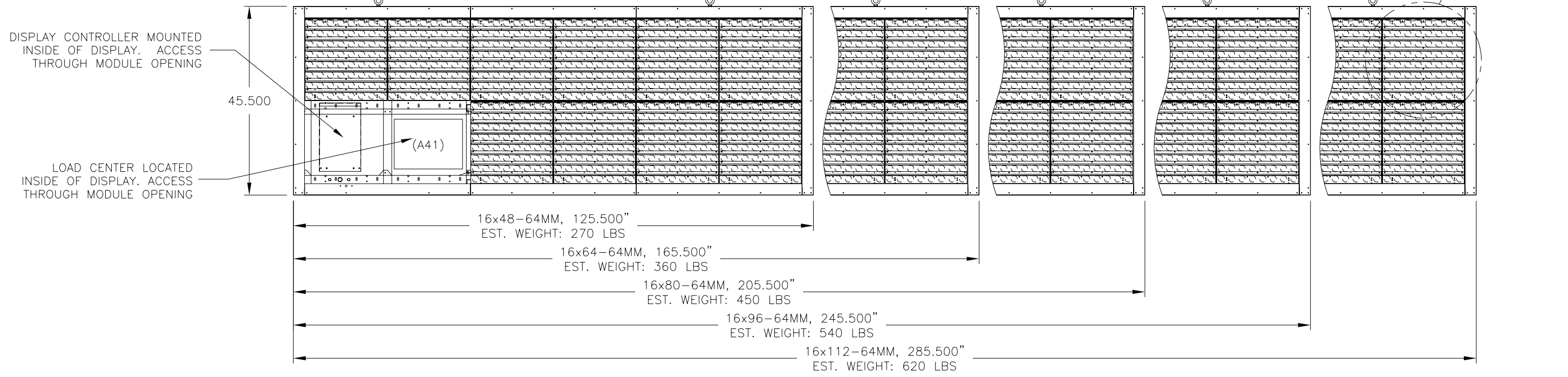
NOTE:  
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DAKTRONICS, INC. BROOKINGS, SD 57006					
PROJ: GALAXY, AF-3400-64MM					
TITLE: SHOP DRAWING, AF-3400-8X**-64					
DES. BY: JTPELLIN		DRAWN BY: SMENNIN		DATE: 28 AUG 03	
REVISION	APPR. BY:	1307-E10B-195926			
03	SCALE: 1=25				

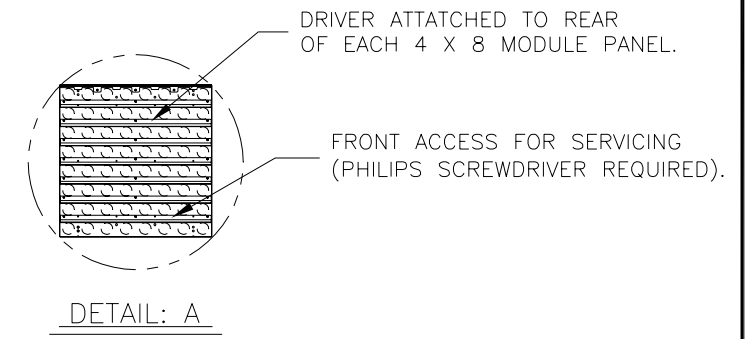
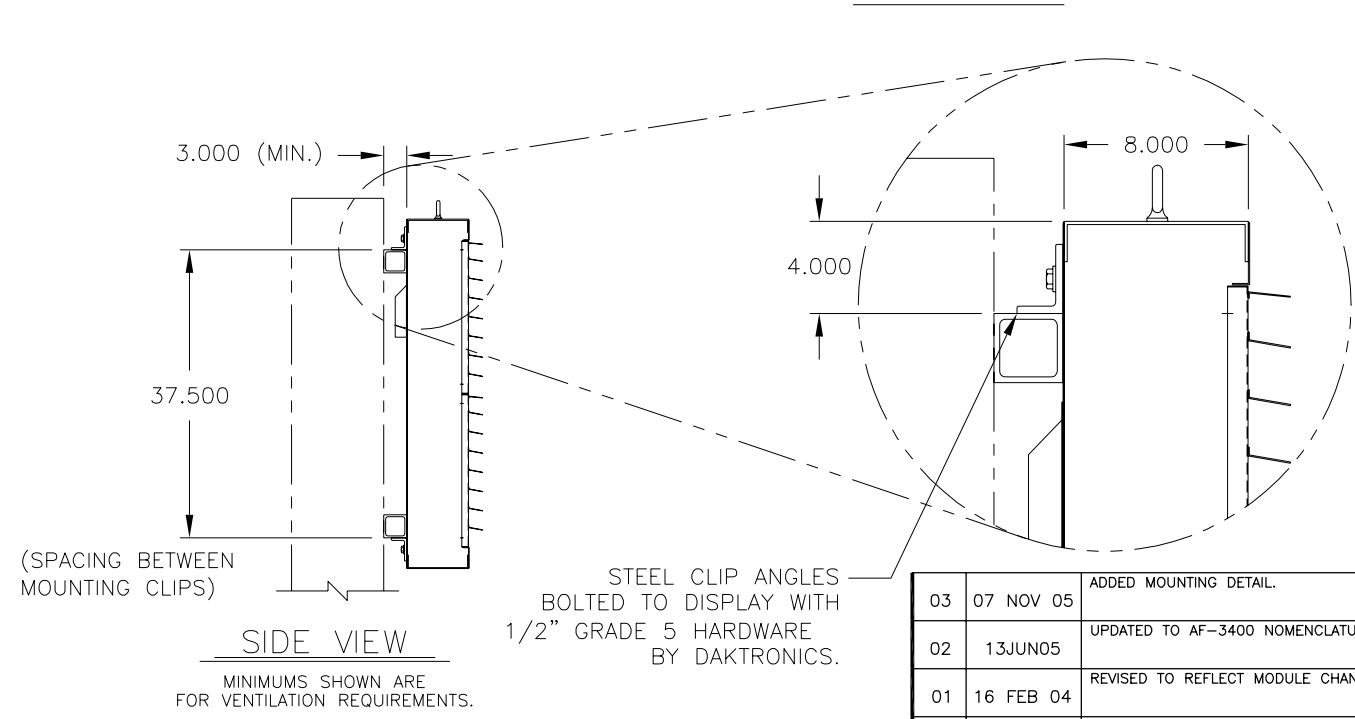
REV.	DATE	DESCRIPTION	BY	APPR.
03	07 NOV 05	ADDED MOUNTING DETAIL.	NKJ	
02	13JUN05	UPDATED TO AF-3400 NOMENCLATURE	JTELLIN	
01	16 FEB 04	REVISED TO REFLECT MODULE CHANGES.	SWM	JMT



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

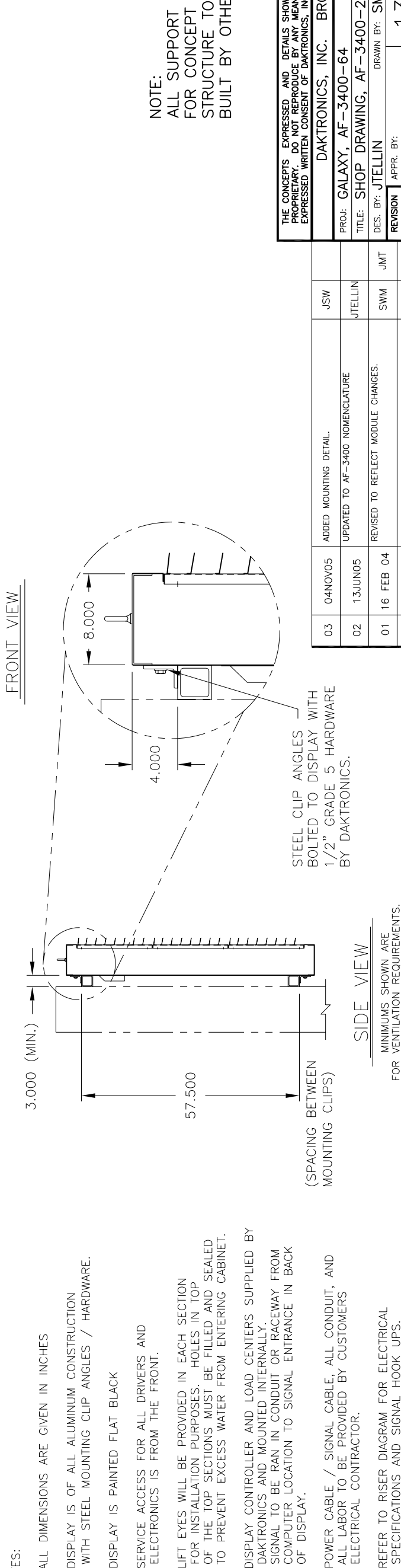
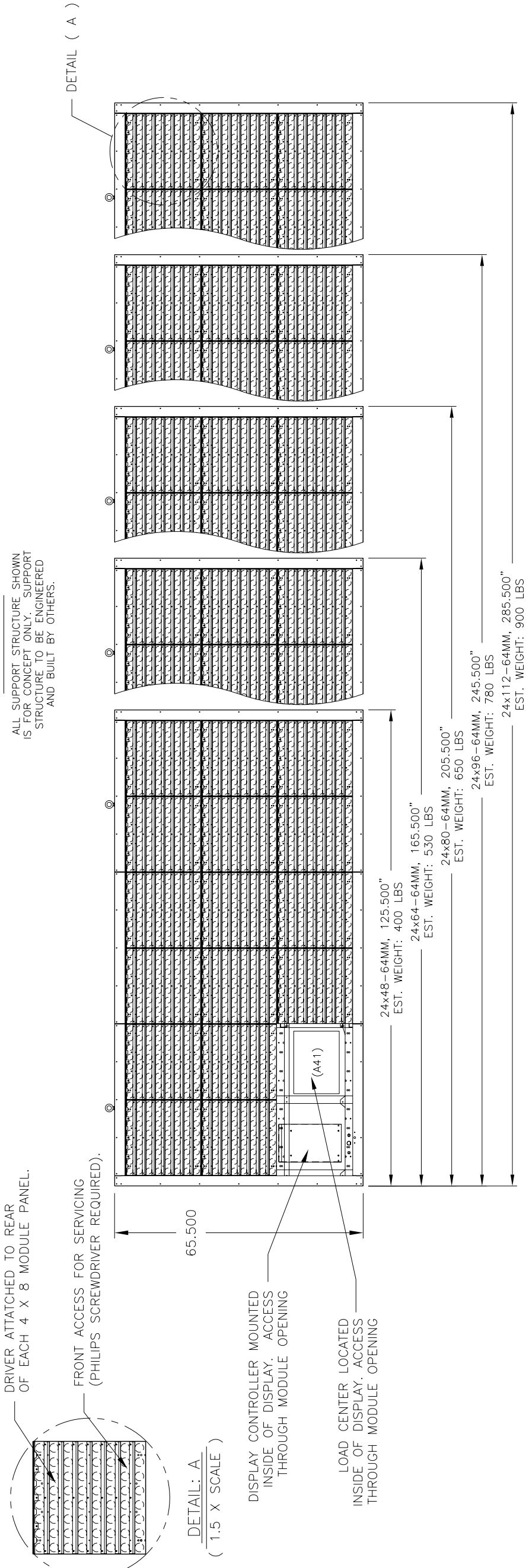
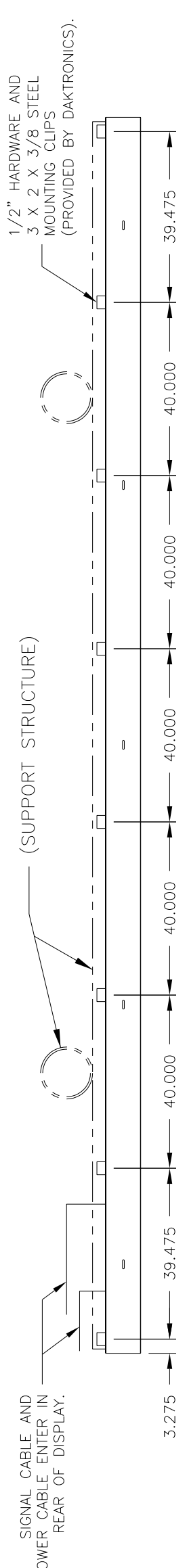


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  - 7) POWER CABLE / SIGNAL CABLE, ALL CONDUIT, AND ALL LABOR TO BE PROVIDED BY CUSTOMERS ELECTRICAL CONTRACTOR.
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DAKTRONICS, INC. BROOKINGS, SD 57006					
PROJ: GALAXY, AF-3400-64MM					
TITLE: SHOP DRAWING, AF-3400-16X**-64					
DES. BY: JTPELLIN		DRAWN BY: SMENNIN		DATE: 29 AUG 03	
REVISION	DATE	DESCRIPTION	BY	APPR.	SCALE: 1=25
03	07 NOV 05	ADDED MOUNTING DETAIL.	NKJ		1307-E10B-195946
02	13JUN05	UPDATED TO AF-3400 NOMENCLATURE	JTELLIN		
01	16 FEB 04	REVISED TO REFLECT MODULE CHANGES.	SWM	JMT	



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PROJ: GALAXY, AF-3400-64

TITLE: SHOP DRAWING, AF-3400-24X\*-64

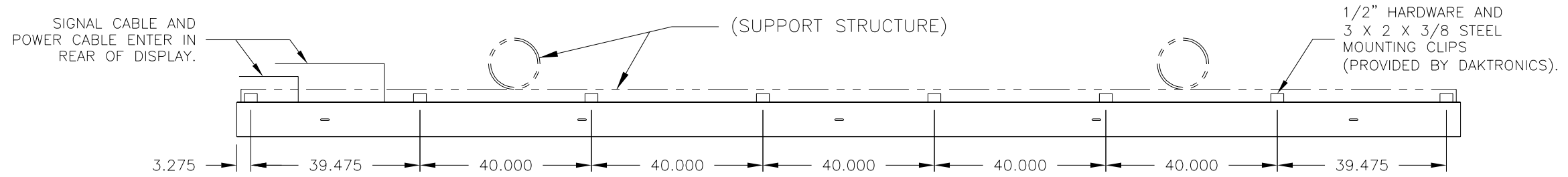
DES. BY: JTJELLIN DRAWN BY: SMENNIN DATE: 29 AUG 03

REVISION 03 APPR. BY: JMT

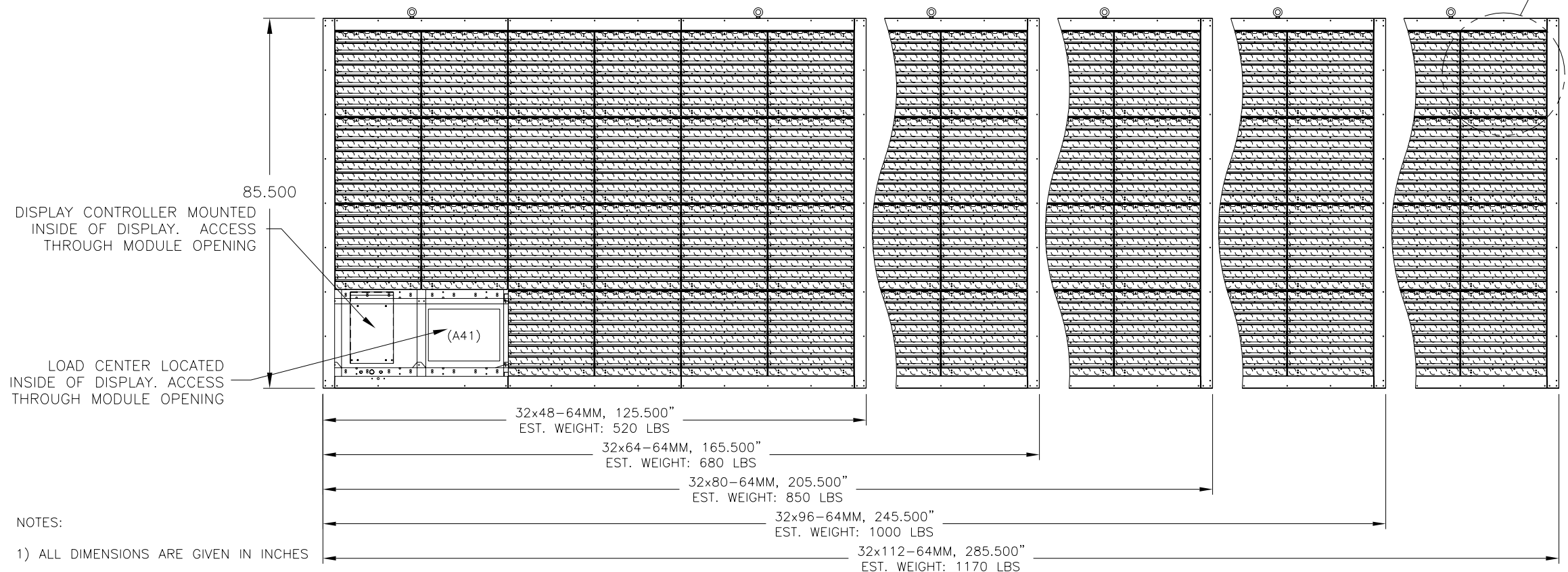
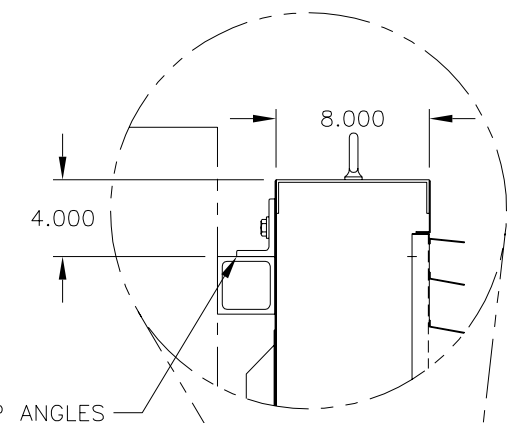
SCALE: 1=30

1307-E10B-195959

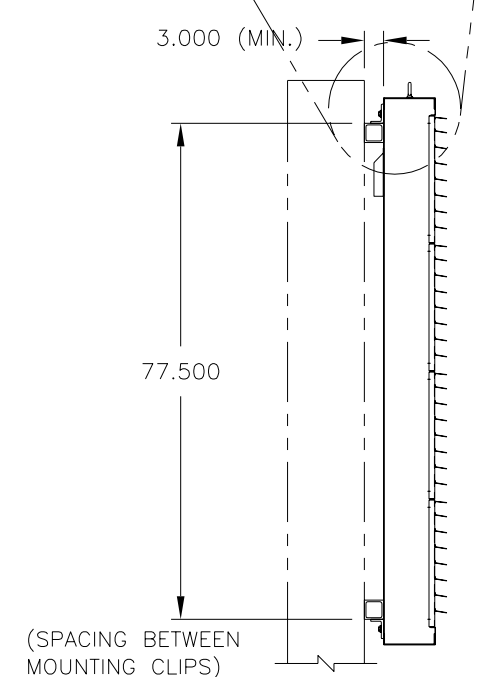
REV.	DATE	DESCRIPTION	BY	APPR.
03	04NOV05	ADDED MOUNTING DETAIL.	JSW	
02	13JUN05	UPDATED TO AF-3400 NOMENCLATURE	JTJELLIN	
01	16 FEB 04	REVISED TO REFLECT MODULE CHANGES.	SWM	JMT



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

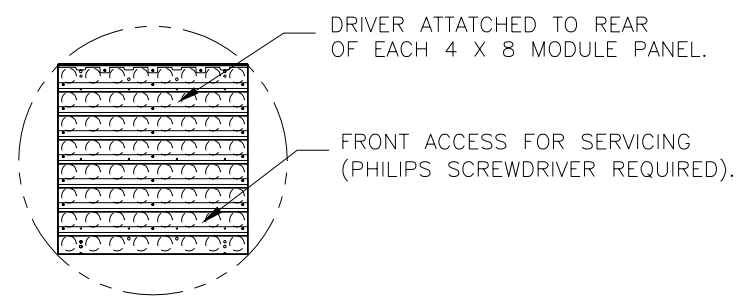


**FRONT VIEW**



**SIDE VIEW**

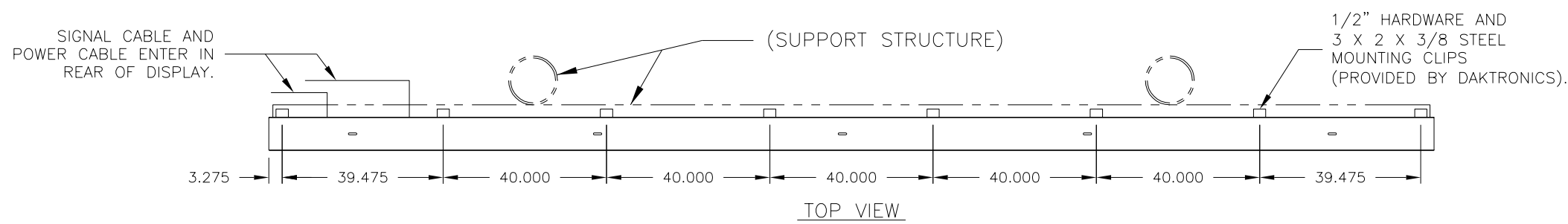
- NOTES:
- 1) ALL DIMENSIONS ARE GIVEN IN INCHES
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  - 8) REFER TO RISER DIAGRAM FOR ELECTRICAL SPECIFICATIONS AND SIGNAL HOOK UPS.



**DETAIL: A**  
( 1.5 X SCALE )

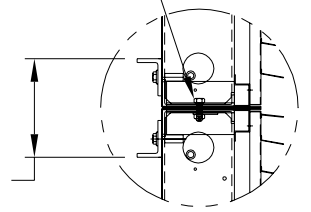
NOTE:  
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DAKTRONICS, INC. BROOKINGS, SD 57006				
PROJ: GALAXY, AF-3400-64MM				
TITLE: SHOP DRAWING, AF-3400-32X**-64				
DES. BY: JTPELLIN		DRAWN BY: SMENNIN		DATE: 29 AUG 03
REVISION	APPR. BY:	1307-E10B-195972		
03	SCALE: 1=30			
REV.	DATE	DESCRIPTION	BY	APPR.
03	07 NOV 05	ADDED MOUNTING DETAIL.	NKJ	
02	13JUN05	UPDATED TO AF-3400 NOMENCLATURE	JTELLIN	
01	16 FEB 04	REVISED TO REFLECT MODULE CHANGES.	SWM	JMT



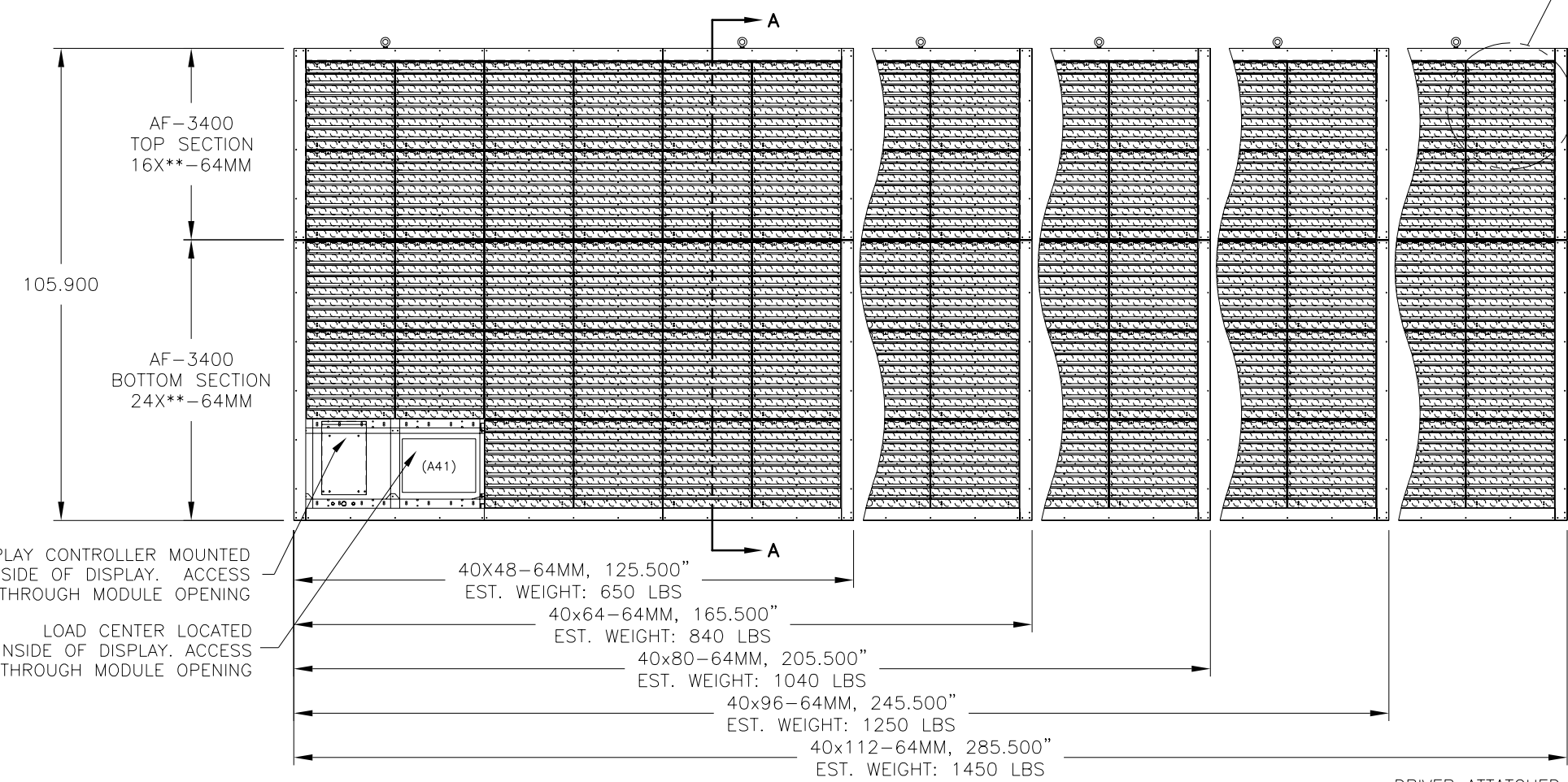
TOP VIEW  
 ALL SUPPORT STRUCTURE SHOWN IS FOR CONCEPT ONLY. SUPPORT STRUCTURE TO BE ENGINEERED AND BUILT BY OTHERS.

5/8" GRD INTERCONNECT HARDWARE PROVIDED BY DAKTRONICS. TO BE INSTALLED BY CUSTOMER.



MOUNTING CLIP ADJUSTMENT: 3.00" TO 5.00"

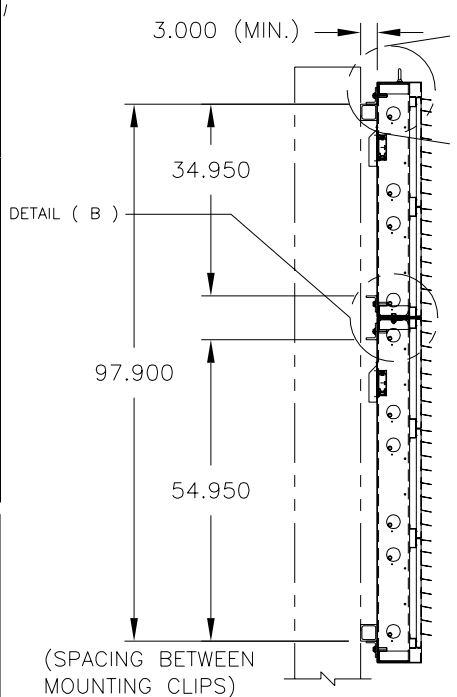
DETAIL: B



FRONT VIEW

DETAIL ( A )

DETAIL ( B )



SECTION: A-A  
 MINIMUMS SHOWN ARE FOR VENTILATION REQUIREMENTS.

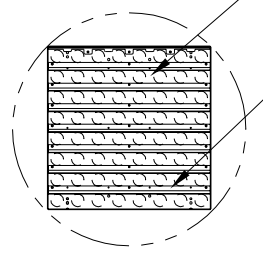
STEEL CLIP ANGLES BOLTED TO DISPLAY WITH 1/2" GRADE 5 HARDWARE BY DAKTRONICS.

DISPLAY CONTROLLER MOUNTED INSIDE OF DISPLAY. ACCESS THROUGH MODULE OPENING

LOAD CENTER LOCATED INSIDE OF DISPLAY. ACCESS THROUGH MODULE OPENING

DRIVER ATTACHED TO REAR OF EACH 4 X 8 MODULE PANEL.

FRONT ACCESS FOR SERVICING (PHILIPS SCREWDRIVER REQUIRED).



DETAIL: A  
 ( 1.5 X SCALE )

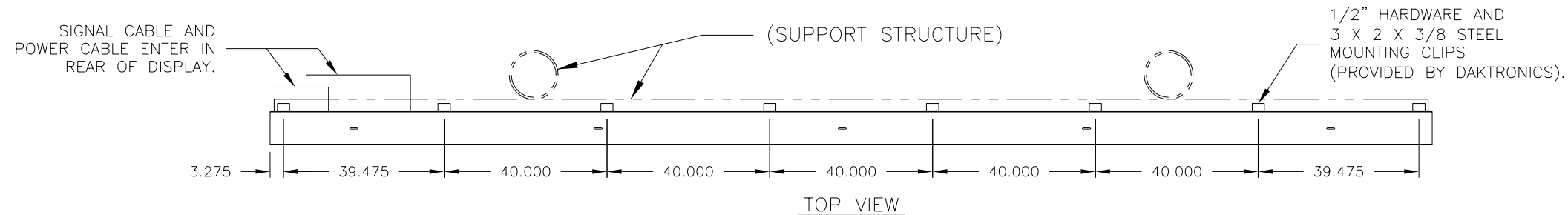
- NOTES:
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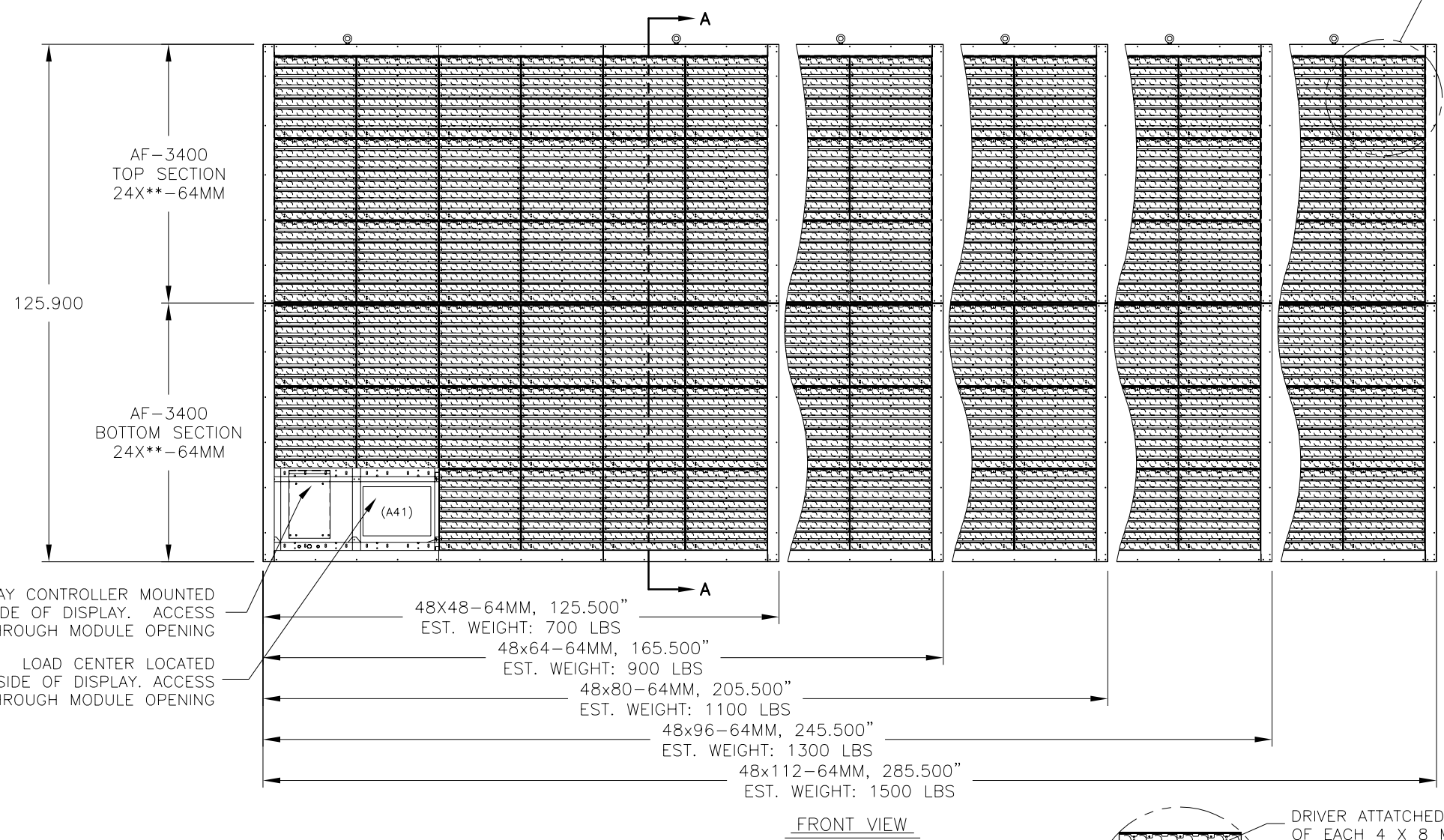
NOTE:  
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DAKTRONICS, INC. BROOKINGS, SD 57006			
PROJ: GALAXY, AF-3400-64MM			
TITLE: SHOP DRAWING, SECT, AF-3400-40X**-64			
DES. BY: JTPELLIN		DRAWN BY: SMENNIN	
DATE: 29 AUG 03		REVISION	
03	APPR. BY:	1307-E10B-195977	
SCALE: 1=35			

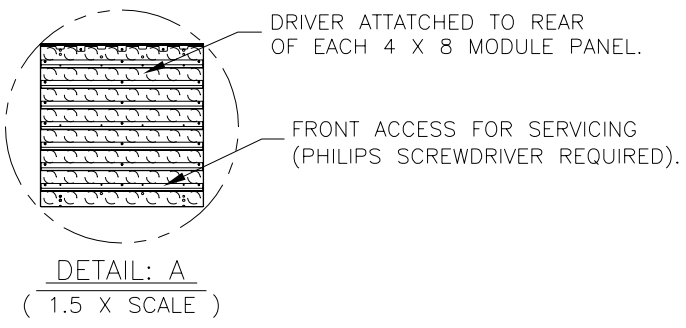
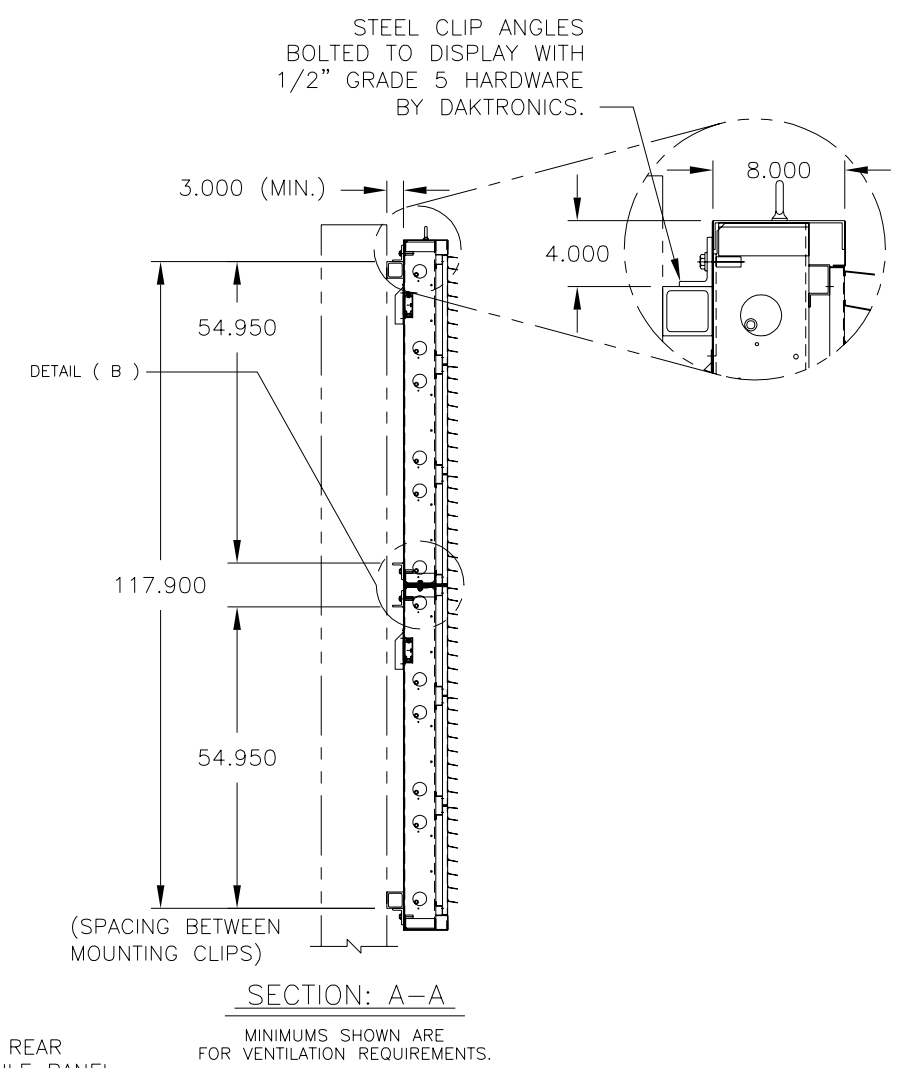
REV.	DATE	DESCRIPTION	BY	APPR.
03	07 NOV 05	ADDED MOUNTING DETAIL.	NKJ	
02	13JUN05	UPDATED TO AF-3400 NOMENCLATURE	JTELLIN	
01	16 FEB 04	REVISED TO REFLECT MODULE CHANGES.	SWM	JMT



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DETAIL ( A )



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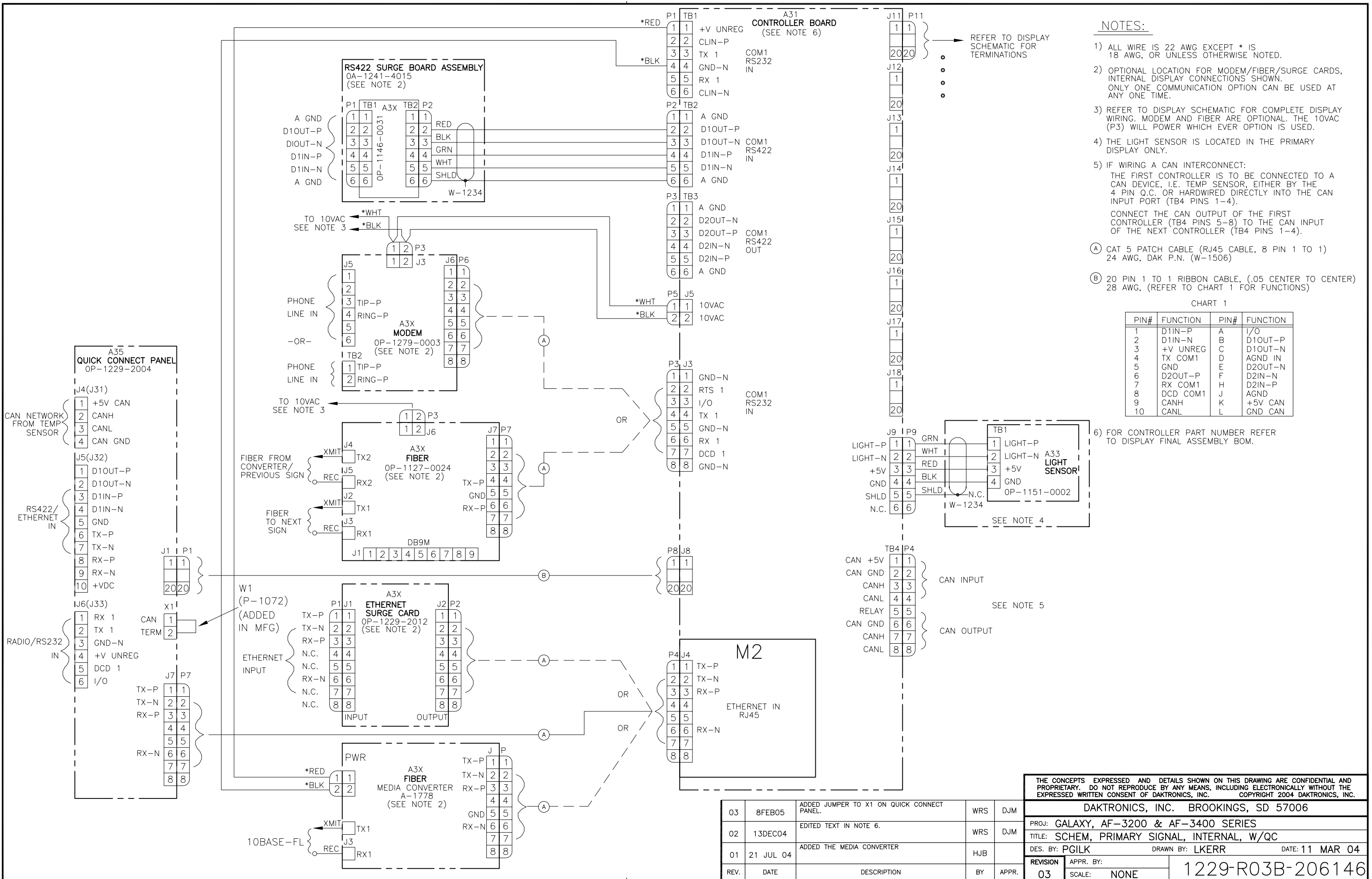
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REV.	DATE	DESCRIPTION	BY	APPR.
03	07 NOV 05	ADDED MOUNTING DETAIL.	NKJ	
02	13JUN05	UPDATED TO AF-3400 NOMENCLATURE	JTELLIN	
01	16 FEB 04	REVISED TO REFLECT MODULE CHANGES.	SWM	JMT

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DAKTRONICS, INC. BROOKINGS, SD 57006	
PROJ: GALAXY, AF-3400-64MM	
TITLE: SHOP DRAWING, SECT, AF-3400-48X**-64	
DES. BY: JTELLIN	DRAWN BY: JTELLIN
DATE: 7OCT03	
REVISION 03	SCALE: 1=35
1307-E10B-196019	



**NOTES:**

- 1) ALL WIRE IS 22 AWG EXCEPT \* IS 18 AWG, OR UNLESS OTHERWISE NOTED.
  - 2) OPTIONAL LOCATION FOR MODEM/FIBER/SURGE CARDS, INTERNAL DISPLAY CONNECTIONS SHOWN. ONLY ONE COMMUNICATION OPTION CAN BE USED AT ANY ONE TIME.
  - 3) REFER TO DISPLAY SCHEMATIC FOR COMPLETE DISPLAY WIRING. MODEM AND FIBER ARE OPTIONAL. THE 10VAC (P3) WILL POWER WHICH EVER OPTION IS USED.
  - 4) THE LIGHT SENSOR IS LOCATED IN THE PRIMARY DISPLAY ONLY.
  - 5) IF WIRING A CAN INTERCONNECT: THE FIRST CONTROLLER IS TO BE CONNECTED TO A CAN DEVICE, I.E. TEMP SENSOR, EITHER BY THE 4 PIN Q.C. OR HARDWIRED DIRECTLY INTO THE CAN INPUT PORT (TB4 PINS 1-4).  
CONNECT THE CAN OUTPUT OF THE FIRST CONTROLLER (TB4 PINS 5-8) TO THE CAN INPUT OF THE NEXT CONTROLLER (TB4 PINS 1-4).
- (A) CAT 5 PATCH CABLE (RJ45 CABLE, 8 PIN 1 TO 1) 24 AWG, DAK P.N. (W-1506)
- (B) 20 PIN 1 TO 1 RIBBON CABLE, (.05 CENTER TO CENTER) 28 AWG, (REFER TO CHART 1 FOR FUNCTIONS)

CHART 1

PIN#	FUNCTION	PIN#	FUNCTION
1	D1IN-P	A	I/O
2	D1IN-N	B	D1OUT-P
3	+V UNREG	C	D1OUT-N
4	TX COM1	D	AGND IN
5	GND	E	D2OUT-N
6	D2OUT-P	F	D2IN-N
7	RX COM1	H	D2IN-P
8	DCD COM1	J	AGND
9	CANH	K	+5V CAN
10	CANL	L	GND CAN

6) FOR CONTROLLER PART NUMBER REFER TO DISPLAY FINAL ASSEMBLY BOM.

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03	8FEB05	ADDED JUMPER TO X1 ON QUICK CONNECT PANEL.	WRS	DJM
02	13DEC04	EDITED TEXT IN NOTE 6.	WRS	DJM
01	21 JUL 04	ADDED THE MEDIA CONVERTER	HJB	
REV.	DATE	DESCRIPTION	BY	APPR.

DAKTRONICS, INC. BROOKINGS, SD 57006  
 PROJ: GALAXY, AF-3200 & AF-3400 SERIES  
 TITLE: SCHEM, PRIMARY SIGNAL, INTERNAL, W/QC  
 DES. BY: PGILK DRAWN BY: LKERR DATE: 11 MAR 04  
 REVISION 03 APPR. BY: SCALE: NONE 1229-R03B-206146





## **Appendix B: Optional Temperature Sensor**

## For Galaxy displays only

### Reference Drawings:

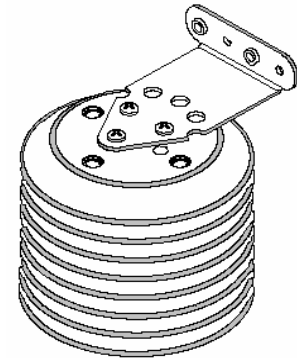
Temperature Sensor Cable Routing Schematic .....	Drawing A-197884
Exploded Temperature Housing Assembly.....	Drawing A-198371

## 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**

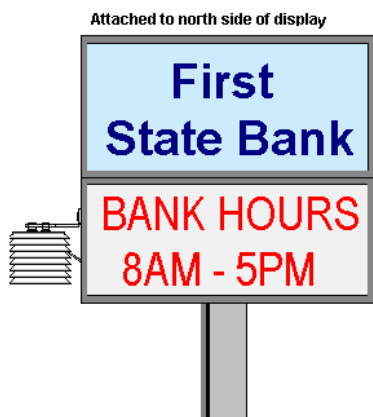
Parts List	
Part description	Daktronics part number
Temperature sensor housing	0A-1151-0005
Temperature sensor	0P-1247-0008
4-pin Mal Conxall cable	W-1819
22 AWG 2-pair shielded cable	W-1234
30-foot extension cable	W-1820
100-foot extension cable	W-1821
200-foot extension cable	W-1822

## 1.2 Mounting Locations

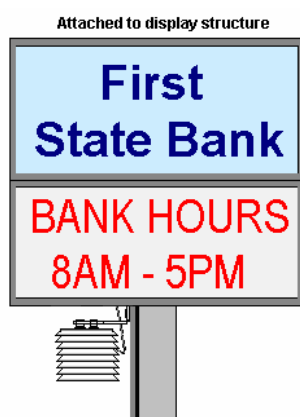
For greater accuracy of temperature, follow these mounting recommendations:

- 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.

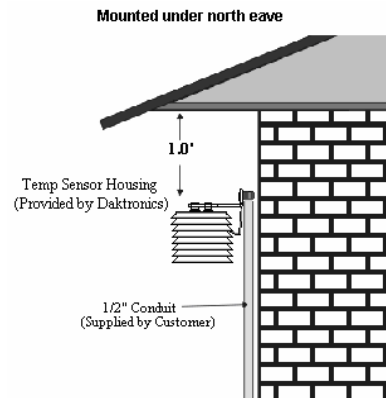
The most common locations for the temperature sensor are on the display cabinet (**Figure 2**), or on the display structure (**Figure 3**). A light-colored display is preferred in this location. Location of the sensor should be below or on a northern edge of the display to keep the sensor shaded.



**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.

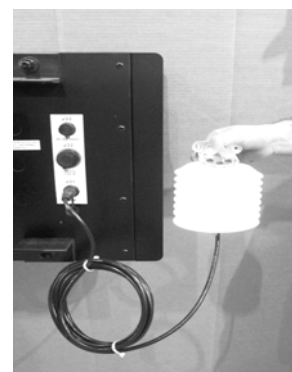
## 1.3 Temperature Signal Connection

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

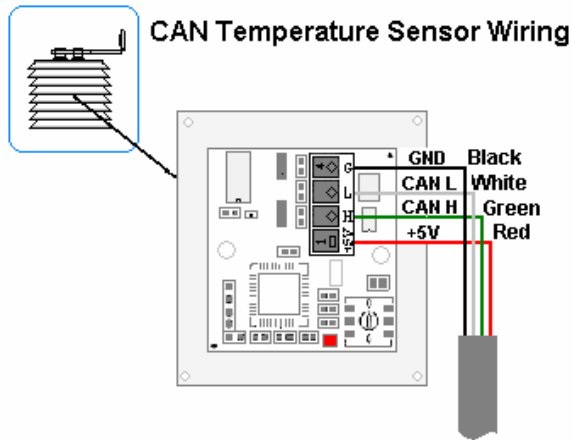
1. The temperature sensor is provided with a 25-foot weather-resistant cable. This cable does not need to be in conduit. The sensor connects to the display at J31. Refer to **Figure 5** for the location of the quick-connect plug.
2. Secure any excess cable to discourage vandalism.
3. Between displays, 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.



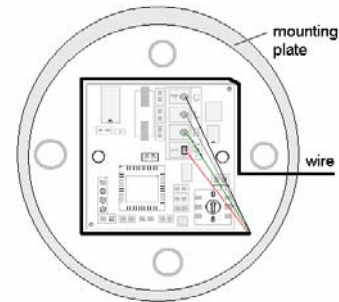
**Figure 5:** Quick-connect Cable

## 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)
<b>*Note:</b> Do not terminate shield at this point.	

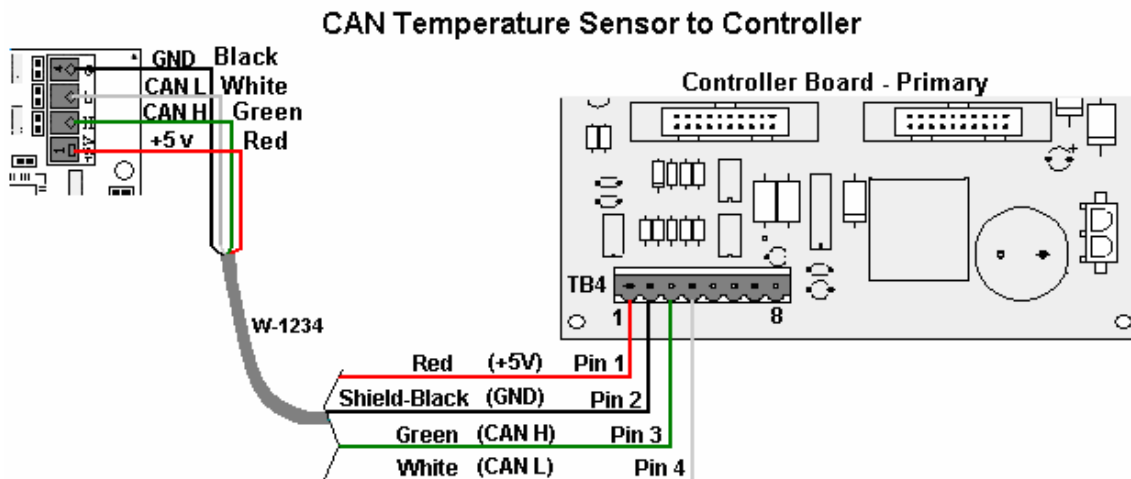
## Using more than 25-feet of cable

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.

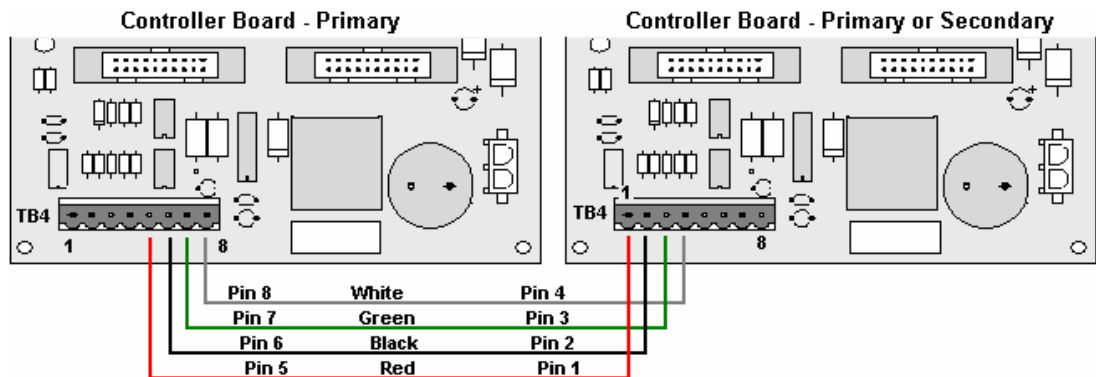


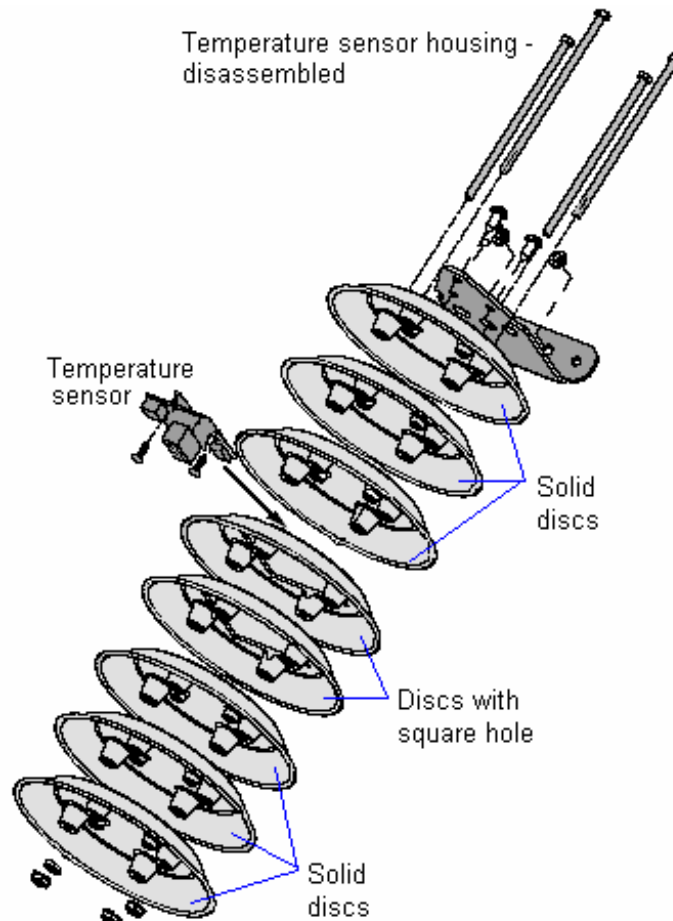
Figure 9: CAN Controller Interconnect

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	

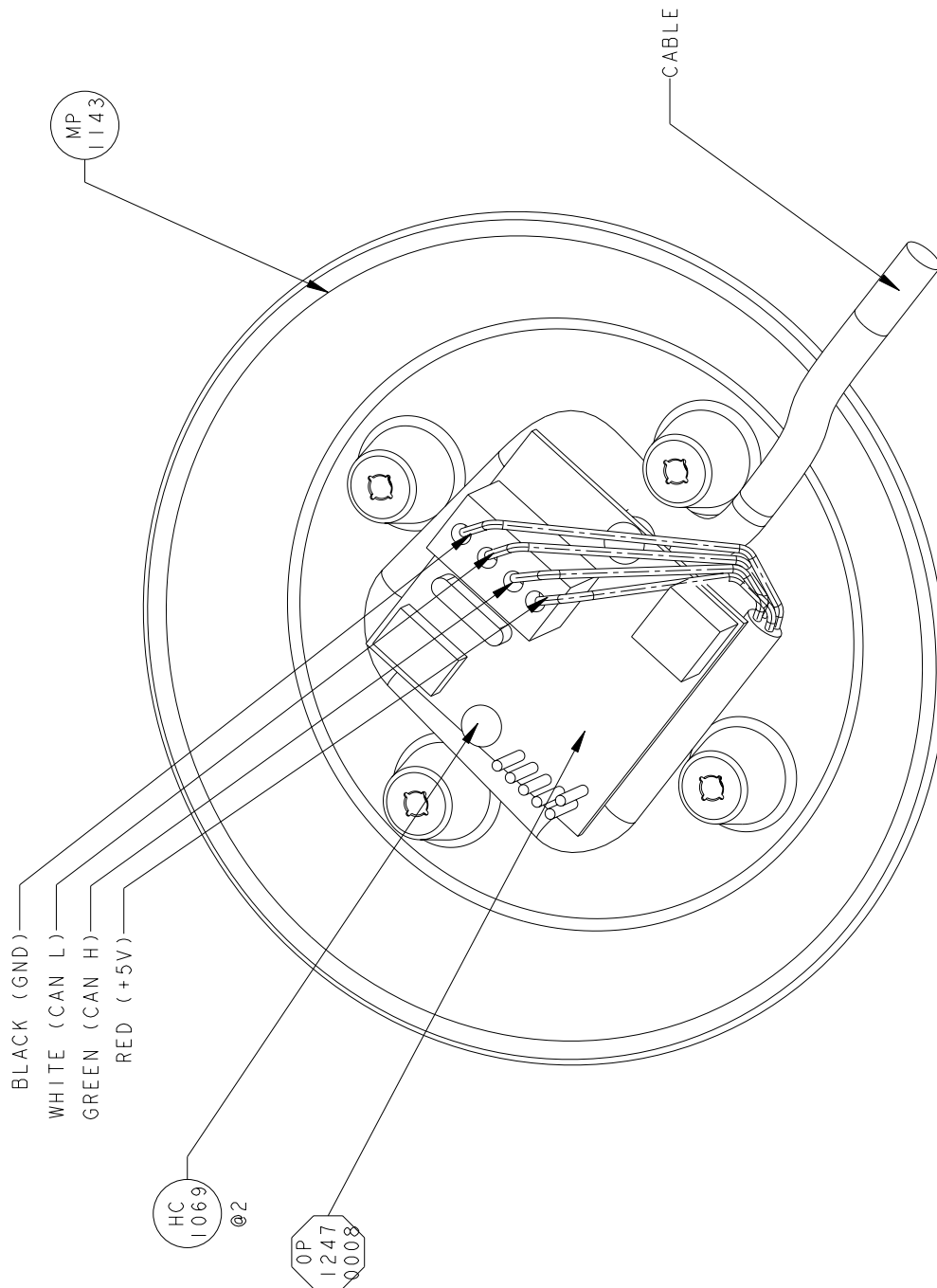
## 1.5 Sensor Board Replacement

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.

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**DAKTRONICS, INC. BROOKINGS, SD 57006**

PROJ: LIGHT & TEMP SENSORS

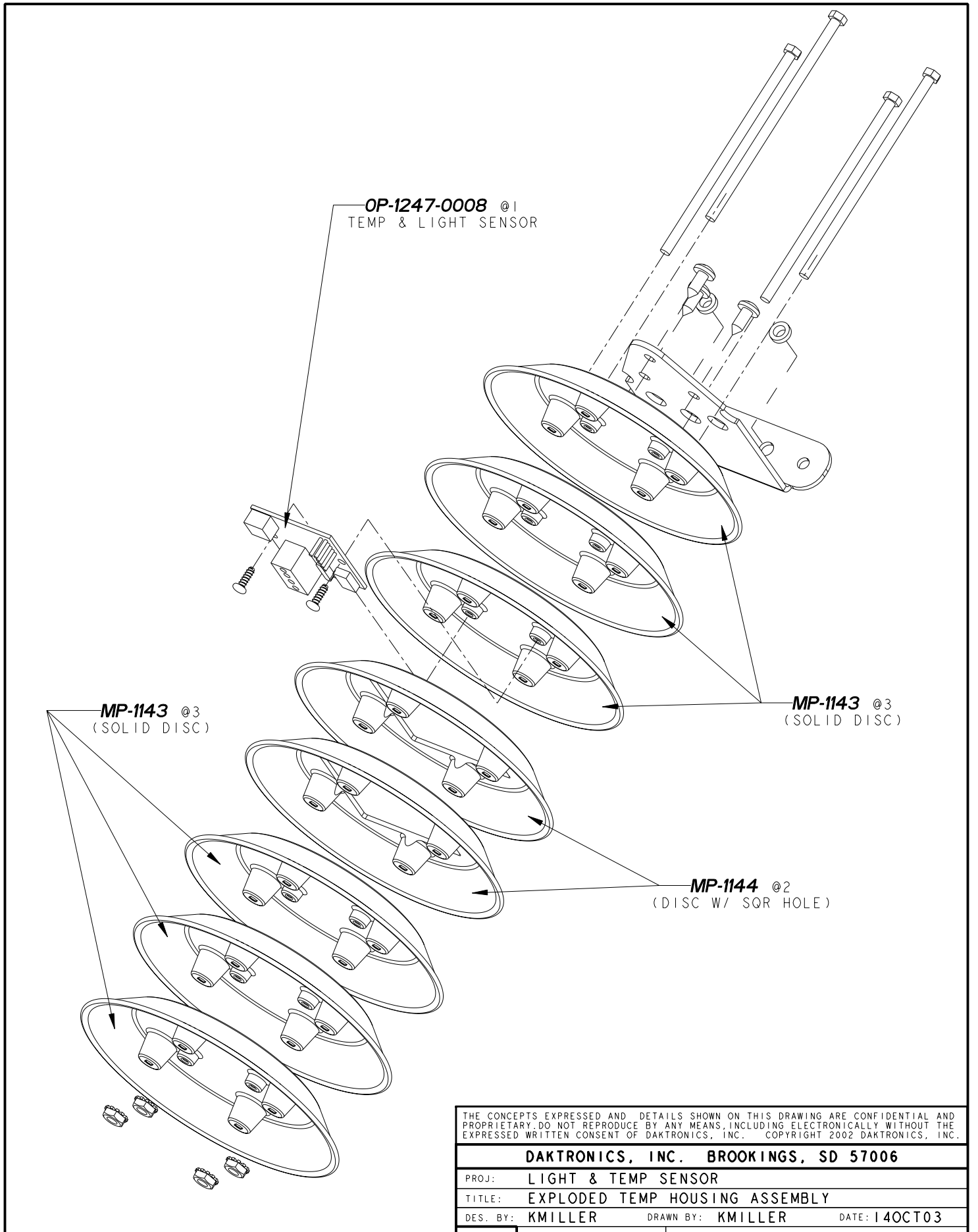
TITLE: TEMP SENSOR CABLE ROUTING SCHEMATIC

DES. BY: K MILLER DRAWN BY: K MILLER DATE: 03OCT03

REVISION SHEET 1 OF DWG 197884 1151-E10A-197884  
 SCALE: 1 = 1

REV.	DATE	DESCRIPTION	BY	APPR.





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<b>DAKTRONICS, INC. BROOKINGS, SD 57006</b>	
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.