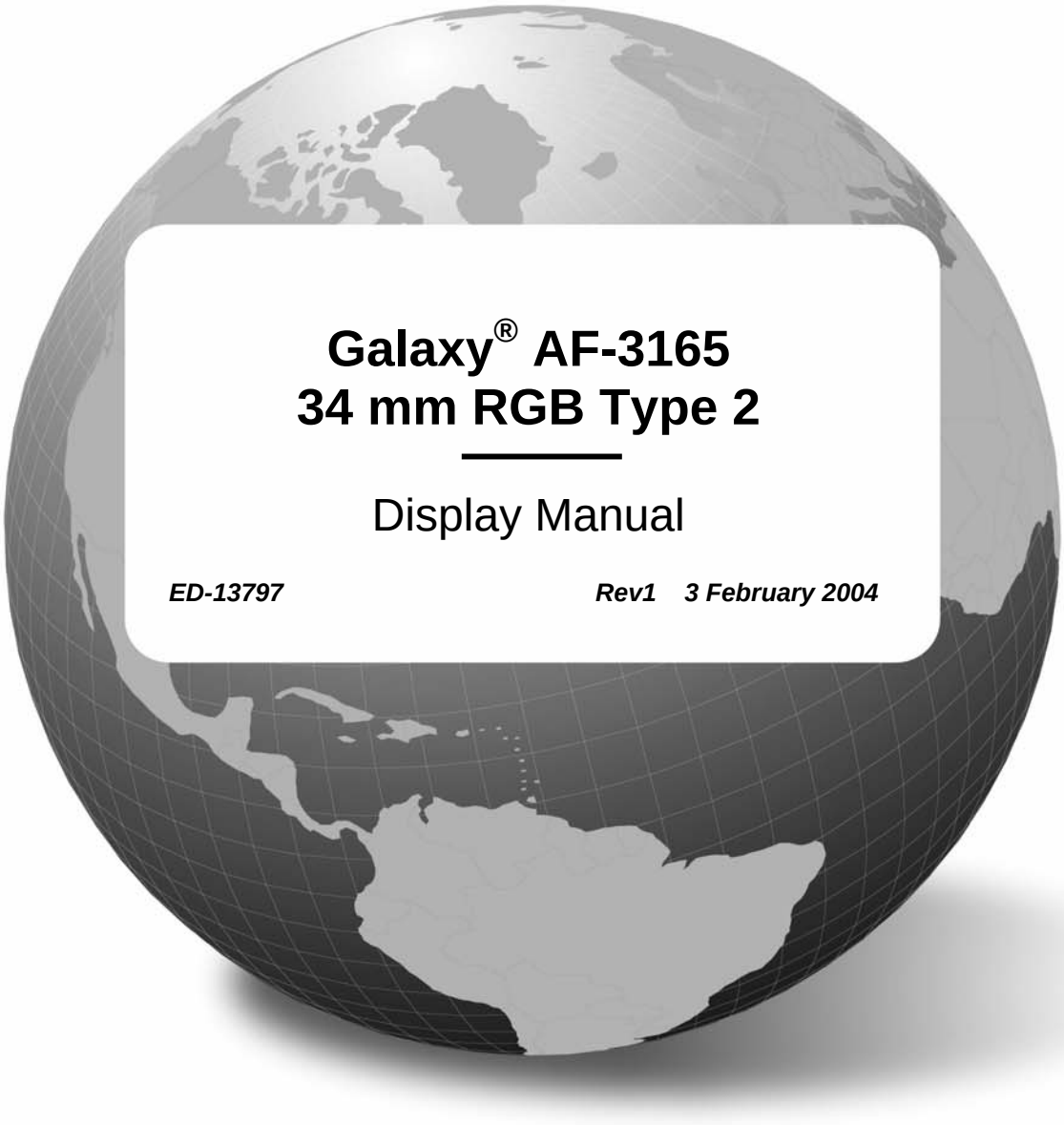

Galaxy® AF-3165
34 mm RGB Type 2

Display Manual

ED-13797 ***Rev1 3 February 2004***

Informing & Entertaining the World

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DAKTRONICS

ED-13797
Product 1241
Rev 1 – 3 February 2004

DAKTRONICS, INC.

Table of Contents

List of Figures

Section 1: Introduction

This manual explains the installation, maintenance and troubleshooting of the 34mm AF-3165 RGB Galaxy® 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 is divided into seven sections: Introduction, Mechanical Installation, Electrical Installation, Maintenance and Troubleshooting, Appendix A, Appendix B, and Appendix C.

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

Daktronics identifies manuals by an ED number located on the cover page of each manual. For example, this manual would be referred to as **ED13797**.

Listed below are a number of drawing types commonly used by Daktronics, along with the information that each is likely to provide. This manual might not contain all 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 a Daktronics drawing label. The drawing number is located in the lower-right corner of the drawing. Listing the last set of digits and the letter preceding them identifies drawings in the manual. In the example below, the drawing would be referred to as **Drawing A-69945**. Reference drawings are inserted in **Appendix A**.

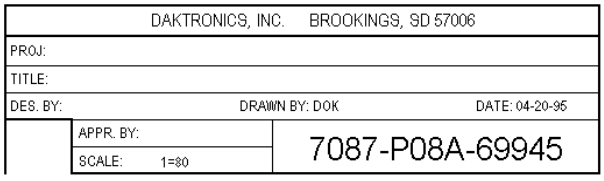


Figure 1: *Drawing Label*

All references to drawing numbers, appendices, figures, or other manuals are presented in **bold** typeface, as shown below.

"Refer to **Drawing A-69945** in **Appendix A** for the power supply location."

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

Reference Drawing:

Component Placement Diagram ..... **Drawing A-69945**

Daktronics builds displays for long life and that require little maintenance. However, from time to time, certain display components will need replacing. The **Replacement Parts List** in **Section 4.11** provides the names and numbers of components that may need to be ordered during the life of the display. Most display components have a white label that lists the part number. The component's part number is in the following format: 0P-_ _ _ _-_ _ _ _ (circuit board) or 0A-_ _ _ _-_ _ _ _ multi-component assembly).

Following the **Replacement Parts List** is the **Daktronics Exchange and Repair and Return Programs** in **Section 4.12**. 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 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.

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, and Daktronics display systems have been designed to meet those needs.

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

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

There are five (5) network systems available: RS232, RS422, modem, fiber, and radio. Up to 240 displays can exist on one network.

RS232 Network

RS232 (EIA/TIA-232-E) is a standard communication interface that employs a single-ended serial transmission scheme that uses a maximum cable length of 7.6 meters (approximately 25 feet). This interface was designed for computer communication at short distances. All computers have an RS232 communications port. Refer to **Section 3** for additional information.

RS422 Network

RS422 (EIA/TIA-422-B) is a standard communication interface that utilizes a differential balanced transmission scheme that uses a typical maximum cable length of 1.2 km (approximately 4000 feet). The main advantage to RS422 over RS232 is the longer cable length that is possible. A signal converter is needed to convert the computer's RS232 to RS422. Refer to **Section 3** for additional information.

Modem Network

The modem is a standard communication interface that utilizes standard phone transmission lines. The phone company assigns each phone line a number that the modem uses to communicate between controller and display. Each modem network needs to have a dedicated phone line assigned to it. Refer to **Section 3** for additional information.

Fiber Optic Network

A fiber optic network is a standard communication method transmitting light (signal) through a glass fiber. Fiber optic cable has a maximum length of 600 meters (approximately 2,000 feet). A signal converter is needed to convert the computers RS232 signal to fiber optic signal; a minimum of two fibers is required. Refer to **Section 3** to additional information.

Radio Network

The Radio network is a standard communication method that uses radio waves at high frequencies to transmit signal. The Venus® 1500 Radio network has a maximum distance of 450 meters (approximately 1500 feet) outdoor and 150 meters (approximately 500 feet) indoor. A nearly straight line-of-sight path must be maintained between the Server Radio connected to the computer and the Client Radio connected to the display. Refer to **Section 3** and the Venus 1500 Radio manual, **ED-13932,** for the additional information.

1.3 Display Overview

Reference Drawings:

Power Specs, 8x48-48x144 Display RGB..... **Drawing A-179873**
Shop Drawing; AF-3165-8-32 High-34-RGB..... **Drawing B-172745**
Shop Drawing; AF-3165-40-48 High-34-RGB..... **Drawing B-172746**

Daktronics AF-3165 Galaxy® displays are designed and manufactured for performance, reliability, easy maintenance and long life. The pixels have a 34mm center-to-center spacing, and are lit using LEDs (light emitting diodes). A light sensor on the front of the first or primary display is used for automatic dimming of the LEDs based on the ambient light levels. The configuration of pixels depends on the model of display ordered.

Refer to **Drawings B-172745** and **B-172746** for the approximate size and weight of your display, and **Drawing A-179873** for the power requirements.

The Galaxy® model numbers are described as follows:
AF-3165-RRCCC-34-RGB-X(X)

AF-3165	=	Outdoor 34mm Louvered Galaxy Display
RR	=	Number of Rows High (8-48)
CCC	=	Number of Columns Long (Up to 144 Columns, Standard)
34	=	34mm pixel to pixel spacing
RGB	=	LED Color (32,000 RGB)
X(X)	=	PM – Primary-Mirror and M – Mirror or PS – Primary-Secondary and S - Secondary

A typical display system consists of a Windows® based personal computer (PC) running Venus® 1500 software and one or more displays. 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 unit.

Venus® 1500 is a software package that runs under Windows® 98, ME, NT, 4.0, 2000, or XP Home/Professional operating systems on an IBM®-compatible computer. Refer to the Venus® 1500 Software manual, **ED13530**, for installation and operation of the Venus® 1500 editing station.

1.4 Component Identification

The following illustrations 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 additional information on maintaining the various display components.

Com Port: A COM port is a connector on the back of the control computer. The COM port is used to control the display network through either a 9- or a 25-pin serial connector.

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

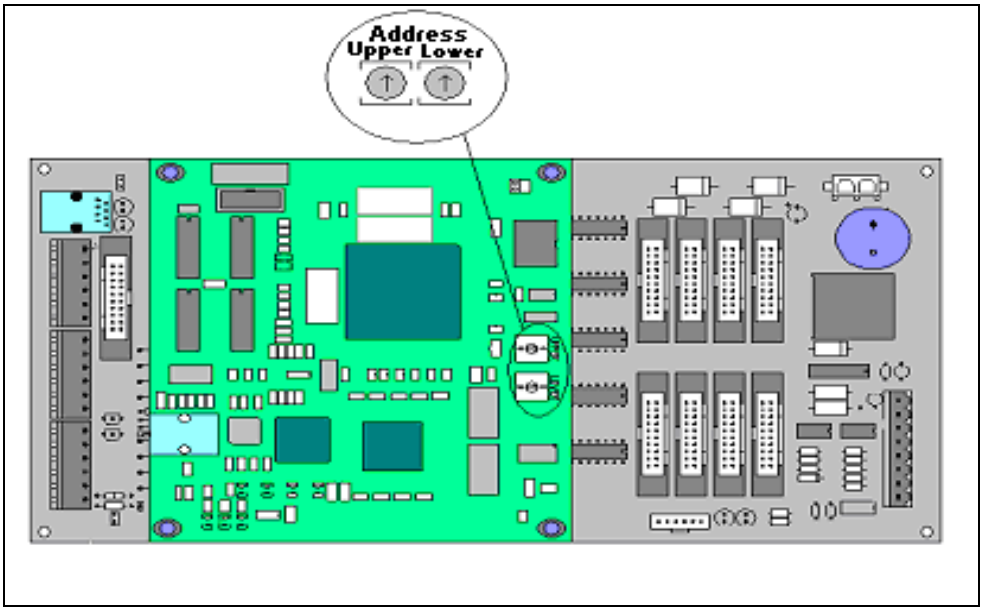


Figure 2: *Version 3 Controller*

Control Area Network: Serial Communication Protocol supporting distributed real-time control and multiplexing. The light and temperature sensors use this type of protocol.

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

Network: A network consists of multiple displays connected to each other. Up to 240 displays can exist on one network.

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

RS232: RS232 is a standard PC communication type with a maximum cable length of 25 feet (7.6 meters).

RS422: RS422 is a standard differential communication type with a maximum cable length of 4000 feet (1.2 kilometers).

Display Address: The display address is an identification number assigned to each display of a network. Rotating the address switches on the controller sets it. 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.

Signal Converter: The signal converter, shown in **Figure 3** on the right, is a Daktronics supplied unit that converts the data from RS232 to RS422, or RS232 to fiber optic signal. The signal converter is connected to the control PC via straight through serial cable.

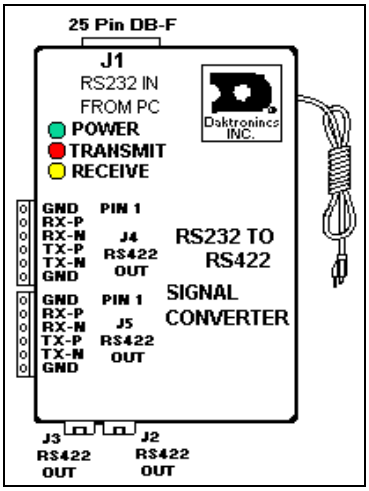


Figure 3: *Signal Converter (RS232 to RS422 Shown)*

Driver/Pixel Board: The LED pixels are mounted directly onto the driver/pixel board. This board is also responsible for the switching and intensity levels of the LEDs.

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

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

Module: 34mm Galaxy® RGB modules are 8 pixels high by 8 pixels wide. Modules are individually removable from the front of the display. Refer to **Figure 4**.

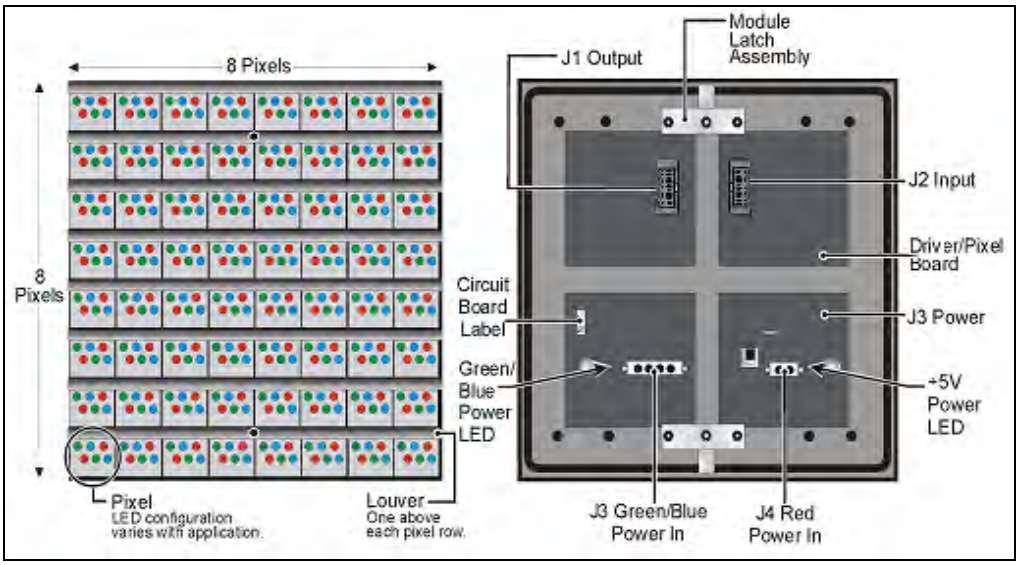


Figure 4: *AF-3165 LED Module*

Module Latch Assembly: device utilizing a rotating retainer bar to hold the module firmly to the display frame. There are two per module: one near the top and one near the bottom. Use a 1/8" Allen wrench to turn the retaining bar.

Pixel: a cluster of LEDs. Each cluster on the AF-3165 module contains two red, two green, and two blue LED's.

1.5 Daktronics Nomenclature

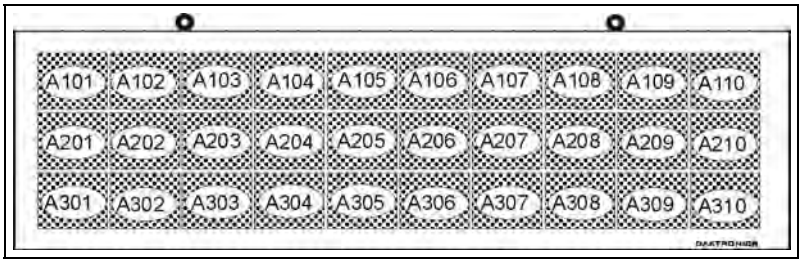


Figure 5: *Module Numbering Example – 24x80 Front*

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

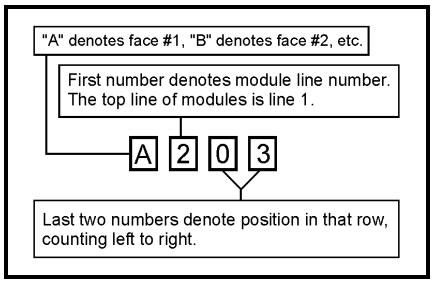


Figure 6: *Module Numbering*

A module is the building block of the Galaxy® display. Each module measures 8 pixels high by 8 pixels wide. By placing modules side-by-side and on top of one another a display of any size can be designed and built. Individual modules can be easily removed from the display if required. **Figure 5** above illustrates how Daktronics numbers modules on a Galaxy® display. **Figure 6** on the right breaks down the module numbering method.

In addition, the following labeling formats might be found on various Daktronics drawings:

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

Finally, Daktronics part numbers are commonly found on drawings. Those part numbers can be used when requesting replacement parts from Daktronics Customer Service. Take note of the following part number formats:

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

Most circuit boards and components within this display carry a label that lists the part number of the unit. If a circuit board or assembly is not listed in the replacement parts list in **Section 4**, use the label to order a replacement. A typical label is shown in **Figure 7**. The part number is in bold.

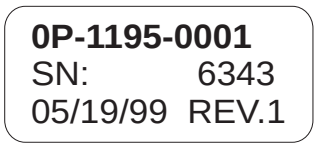


Figure 7: *Typical Label*

Section 2: Mechanical Installation

Notes: 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 will be void.

Daktronics is not responsible for installations or the structural integrity of support structures done by others. It is the customer's responsibility to ensure that a qualified structural engineer has approved the structure and any additional hardware.

2.1 Mechanical Installation Overview

Because every installation site is unique, there is no single Daktronics-approved procedure for mounting the Galaxy® displays. The information contained in this section is general information only and may or may not be appropriate for your particular installation.

A qualified individual 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. The structure design is critical and should be done only by a qualified individual. 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.**

It is the installer's responsibility to ensure the mounting structure and hardware are capable of supporting the display, and agrees with local codes.

Before beginning the installation process, verify the following:

- The mounting structure will provide a straight and square-mounting frame for the display
- The mounting structure is capable of supporting the display and will not yield at any unsupported points after mounting
- Clearance: 3" of unobstructed space is available below the display for filter removal from the display. 1-¼" of unobstructed space is available above the top of the display to remove the eyebolt and plug the hole properly

Correct any deficiencies before installation.

2.3 Ventilation Requirements

Reference Drawings:

Shop Drawing, AF-3165-8-32 High-34-RGB;.....**B-172745**
Shop Drawing, AF-3165-40-48 High-34-RGB;.....**B-172746**

Fans are mounted in the bottom of the display for 8-32 high displays and to the back sheet for ventilation on the 40 and 48 high displays. Maintain a minimum distance of 3" (7.62cm) below the display to maintain proper airflow and for easy air filter removal. Refer to **Drawing B-172745** or **B-172746** for additional information.

If the display cabinet is completely enclosed:

- 6 square inches of unobstructed opening per module must be provided to ensure adequate cooling.
- Allowances must be made to compensate for the percentage of material covering the openings in the structure.
- For adequate cooling, forced ventilation may be required. If air is forced into the enclosed cabinet, 10 cubic feet per minute must be provided per module (10.6" x 10.6" active area).

If these requirements are not met, the Galaxy® display warranty may be void.

2.4 Lifting the Display

The top of the larger displays is equipped with eyebolts that are used to lift the unit. Take special care to ensure that the rated load of the eyebolts is not exceeded. 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 8 below illustrates both the correct (left example) and the incorrect (right example) method of lifting a display. Lift the display as shown on the left, with the lifting bar. Use every lifting point provided.

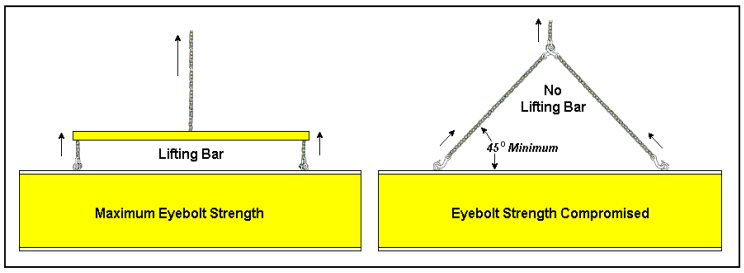


Figure 8: *Lifting the Display (Correct, Left; Incorrect, Right)*

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

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

2.5 Display Mounting

Reference Drawings:

Shop Drawing, AF-3165-8-32 High-34-RGB; **B-172745**
Shop Drawing, AF-3165-40-48 High-34-RGB; **B-172746**

The method used to mount displays can vary greatly from location to location. For this reason, only general mounting topics can be addressed in this manual.

It is the responsibility of the installer to ensure the installation will adequately meet local codes and standards. The mounting hardware and method is also the responsibility of the installer.

Before beginning the installation process, verify the following items:

- The mounting structure will provide a straight and square-mounting 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 is equipped with 2 x 2 x ¼" steel clip angles at the locations shown in **Drawings B-172745** and **B-172746**. These angles may be used for mounting purposes. Remember to have **all** mounted displays inspected by a qualified structural engineer. It is the customer's responsibility to determine the proper wall mounting method and location.

Refer to **Drawings B-172745** and **B-172746** for a suggested wall mount method. The number of attachment points needed and the wall structure **must** be reviewed by a qualified structural engineer and meet all national and local codes. Daktronics recommends using all clip angles as attachment points.

1. Carefully uncrate the display. Look each side of the display over for possible damage during shipping.
2. Following the guidelines described in **Section 2.4**, lift the display into position on the support structure.
3. Weld or use ½" Grade-5 bolts and hardware to secure the clip angles to the support structure as shown in **Drawing B-172745** or **B-172746**.
4. Refer to **Section 3** for information on routing power and signal.
5. After installation is complete, carefully inspect the display for any holes that may allow water to seep into the display. Seal any openings with silicone. If the eyebolts on the top of the display have been removed, plug the holes with bolts and the rubber-sealing washer that was removed with the eyebolt.

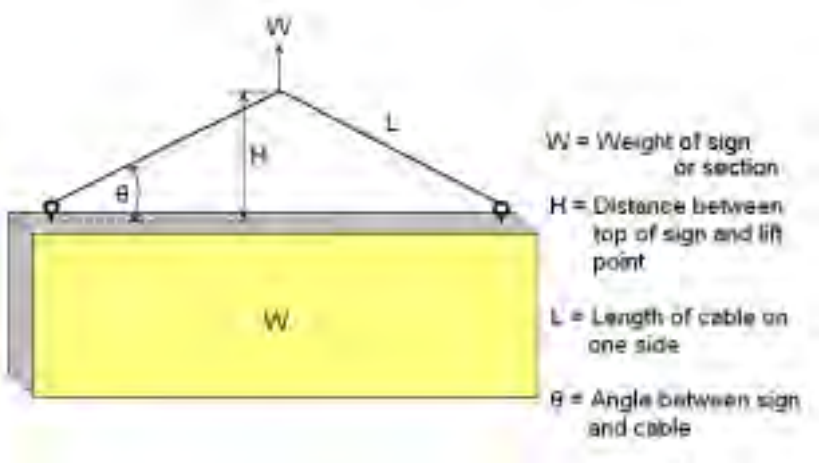
2.6 Optional Temperature Sensor

If a temperature sensor will be used with your display, see **Appendix C** for mounting and signal connections.

Eyebolts

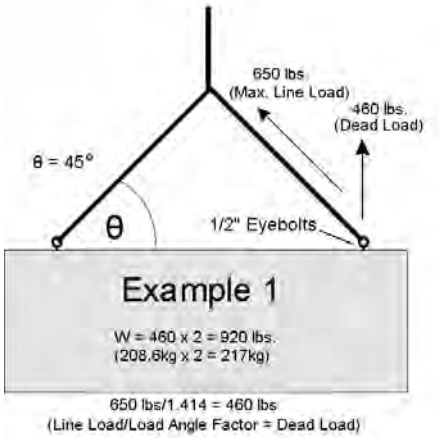
Almost every display that leaves Daktronics is equipped with eyebolts for lifting the display. There are two standard sizes of eyebolts: ½″ and ⅝″.

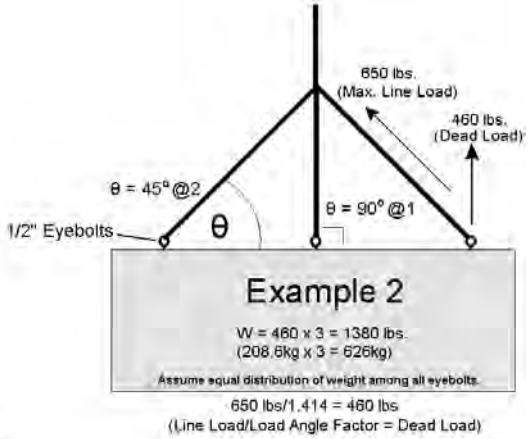
Load Increase Factor: The load increases as the lift angle (θ) decreases. The allowable load on the eyebolts also decreases with the lift angle due the bending stress on the eyebolts. In sum, the smaller the angle between the cable and the top of the display, the lighter the sign must be to safely lift it. *Do NOT attempt to lift the display when the lift angle is less than 30 degrees.*

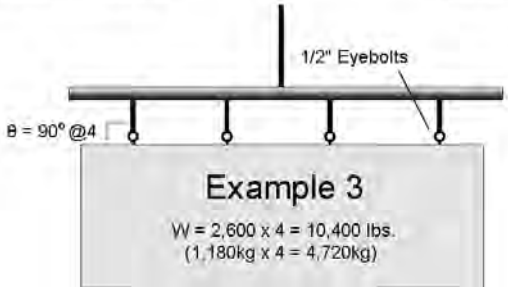


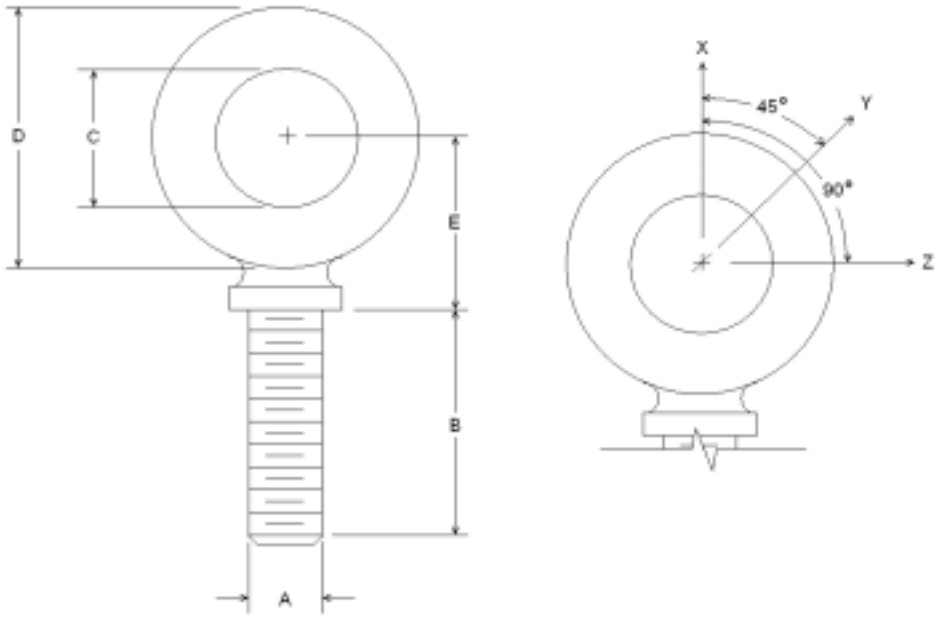
Horizontal Angle	Load Angle Factor (L/H)
90	1.00
60	1.155
50	1.305
45	1.414
30	2.00

	½"		⅝"	
θ	Line Load	Weight/ Anchor	Line Load	Weight/ Anchor
90	2600	2600	4000	4000
60	1500	1299	3300	2858
45	650	460	1000	707
30	520	260	800	400









A	B	C	D	E	No.	Min. Proof Load (lbs.)	Min. Break Load (lbs.)	Stocked	Min. Eff. Thrd. Length	Line Loads		
										Wx	Wy	Wz
1/4	1	3/4	1-3/16	25/32	21	600	2,000	Blank 1/4-20	7/8	400	100	80
3/8	1-1/4	1	1-21/32	1-3/16	23	2,100	5,000	Blank 3/8-16	1-1/8	1,400	350	250
1/2	**1-1/2**	**1-3/16**	**2-1/16**	**1-13/32**	**25**	**3,900**	**9,200**	**Blank 1/2-13**	**1-11/32**	**2,600**	**650**	**520**
9/16	1-5/8	1-9/32	2-13/16	1-17/32	26	4,500	11,830	Blank 9/16-12	1-3/8	3,000	750	600
5/8	**1-3/4**	**1-3/8**	**2-1/2**	**1-11/16**	**27**	**6,000**	**14,700**	**Blank 5/8-11**	**1-9/16**	**4,000**	**1,000**	**800**
3/4	2	1-1/2	2-13/16	1-13/16	28	9,000	21,700	Blank 3/4-10	1-5/8	6,000	1,500	1,200
7/8	2-1/4	1-11/16	3-1/4	2-1/16	29	10,000	30,000	Blank 7/8-9	1-13/16	6,600	1,670	1,330
1	2-1/2	1-13/16	3-9/16	2-5/16	30	12,000	39,400	Blank 1-8	2-1/16	8,000	2,000	1,600
1-1/2	3-1/2	2-9/16	5-1/2	3-5/32	34	27,000	91,300	Blank 1-1/2-6	3	17,800	4,500	3,600

A. Do not use eyebolts on angular lifts unless absolutely necessary. For angular lifts, the shoulder pattern eyebolt is preferred.

B. Load should always be applied to eyebolts in the plane of the eye, not at some angle to this plane.

C. Shoulder eyebolts must be properly seated (should bear firmly against the mating part), otherwise the working loads must be reduced to those indicated for regular eyebolts. A washer or spacer may be required to put the plane of the eye in the direction of the load when the shoulder is seated.

D. No load greater than the safe working load listed in the data table should be used.

E. To obtain the greatest strength from the eyebolt, it must fit reasonably tight in its mounting hole to prevent accidental unscrewing due to twist of cable.

F. Eyebolts should never be painted or otherwise coated when used for lifting. Such coatings may cover potential flaws in the eyebolt.

G. To attain the safe working loads listed for regular eyebolts, 90% of the thread length must be engaged.

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 be rendered 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.

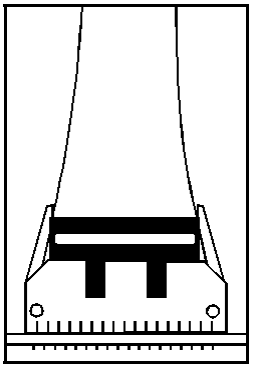


Figure 9: *Ribbon Cable Connector*

1. **Ribbon Cable Connectors:**
   Figure 9 illustrates a typical ribbon connector. To disconnect the ribbon cable, push the plastic clips on the sides of the jack to unlock and remove the cable.

   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 will protect both the plug and the jack from corrosion.

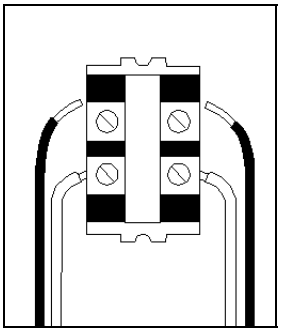


Figure 10: *Termination Block*

2. **Termination Blocks:**
   Termination blocks are usually used to connect internal power and signal wires to wires of the same type coming into the display from an external source. 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 10**.

3. **Phoenix™-Style Connectors:**
Phoenix-style connectors, which are usually green, are often used for signal termination on circuit boards. Refer to **Figure 11**. Strip one-quarter inch of insulation from the wire prior to termination. To remove a wire, turn the above screw counter-clockwise to loose the connectors grip on the wire. To insert a wire, push the bare wire into the connector and turn the above screw clockwise to lock the wire into place.

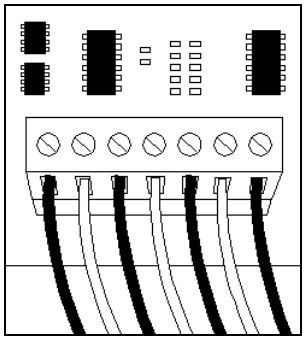


Figure 11: *Phoenix Connector*

4. **Mate-n-Lok™ Connectors:**
The Mate-n-Lok connectors found in the displays are white and come in a variety of sizes. **Figure 12** illustrates a four-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.

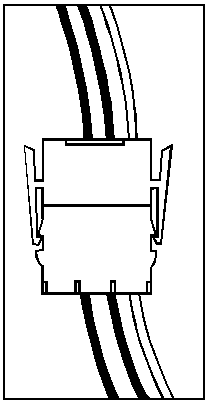


Figure 12: *Mate-n-Loc Connector*

5. **Phone Jacks (RJ11/RJ45 Connectors):**
RJ connectors, as seen in **Figure 13**, are similar to the telephone connectors found in homes and are used on the ends of flat RJ11 cable. In order to remove this plug from the jack, depress the small clip on the underside of the plug.

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

6. **Six-Pin Insulation Displacement Connector**
The six-pin connectors found in the display are keyed connectors, meaning that they will only go together one way and should not be forced. To remove the connector squeeze the plastic tab and gently pull the plug from the jack.

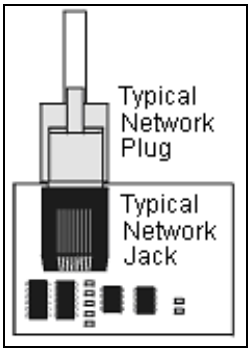


Figure 13: *RJ45 Connector*

3.2 Control Cable Requirements

RS232

This cable is a 2-conductor shielded cable used to transmit an RS232 signal (Daktronics part number W-1117). This shielded cable should not be subjected to mechanical flexing after installation. This cable is not for direct burial and should be routed in a dedicated, grounded metallic conduit from the base of the sign structure. **Power and signal cable cannot be run in the same conduit**. This cable has a maximum length of 25 feet (7.6 meters).

RS422

This cable is a 4-conductor shielded cable used to transmit an RS422 signal (Daktronics part number W-1234). This shielded cable consists of paired wires. They should not be subjected to mechanical flexing after installation. This cable is not for direct burial and should have one of the following routings:

- Dedicated metallic conduit – **power and signal cable cannot be run in the same conduit**
- Inside buildings – if cable is not in conduit, keep away from interference signals

With interference signals (such as power conductors, intercom, etc.) typically a two-foot separation is required. The maximum length of an RS422 signal cable is 4,000 feet (1.22 km).

Modem

The modem option will use standard telephone cable routed through conduit. **Power and phone cable cannot be run in the same conduit**. The local telephone company will need to assist in this installation. Ask the telephone company which color is used for the TIP wire and which color for the RING wire for signal hook up.

Note: The telephone lines must be dedicated lines and **not** run through a switch board/communications system.

Fiber Optic

This cable is a 4-fiber cable (Daktronics part number W-1376). Two fibers are used for display communications and the other two are saved for spares. The cable may be either direct burial or routed in conduit but it should not be subjected to mechanical flexing. The fiber can be routed in the same conduit as the power. The maximum length of a fiber optic cable is 2,000 feet (611.6 meters).

Radio

The Server radio connected to the computer requires an 18-gauge six-conductor cable (Daktronics part number W-1370). Four conductors will be used for the signal and a two for the power. These wires need to be in conduit when exposed to outdoor conditions to the Server radio. The maximum distance from the J-box to the Server radio is 1000 feet (305.8 meters).

The Client radio at the display comes with cable that is rated for outdoor use and does not need to be in conduit. **Note:** Secure excess cable to prevent it from being pulled loose by weather or vandalism.

3.3 RJ Connector Cables

Two types of RJ connectors are used in the display. There is the 6-pin RJ11 and the 8-pin RJ45. **Figure 14** illustrates a typical RJ11 connector. These connectors can be found on many telephones and LANs.

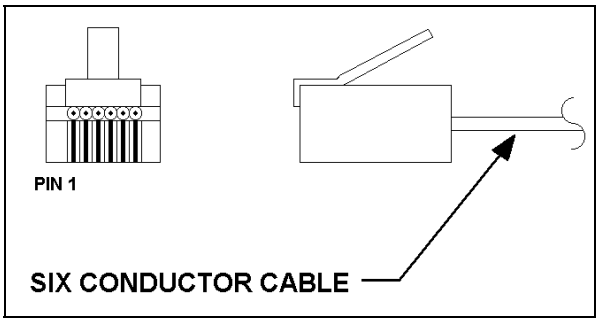


Figure 14: *6-Conductor RJ11 Connector and Cable*

The cable used in the display are straight through cables meaning that the wire to pin one at one end is the same as pin one at the other end, and so forth. When installing a network, and on cables exterior to the display, flipped cables are often used. This cable has one end that is the mirror image of the other end (i.e. the cable is flipped). Refer to **Figure 15** for a standard flipped cable.

Notice in **Figure 15** that the color code on one connector must be made the opposite on the other connector. When installing a network, it is not easy to remember in which direction the previous end was oriented. One simple way to avoid confusion is to standardize the color code, having one color for the connector going into the output of a sign and the opposite color for a connector going into the input of a sign. This will help ensure correct cabling since cables are always installed from the output jack of one sign to the input jack of the next sign.

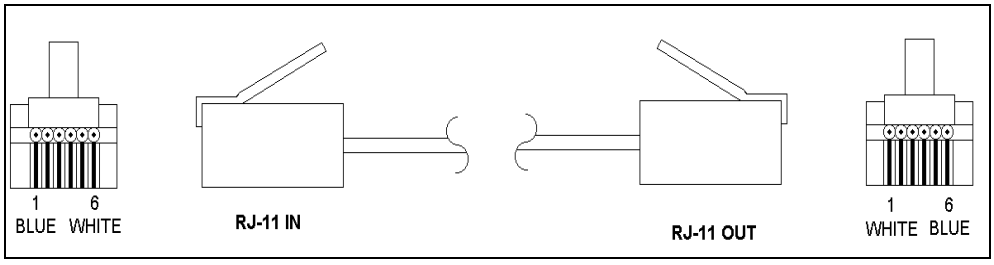


Figure 15: *Flipped Cable with RJ Connectors*

Installing an RJ Connector

Installing an RJ connector on the end of the conductor cable is a simple task when the correct tools are used. The RJ crimping tool (Daktronics part number TH-1033) performs two separate steps.

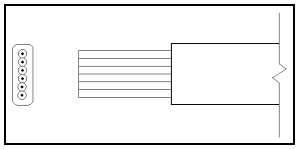


Figure 16: *Wire with Outer Jacket Stripped*

First, use the crimping tool to strip the outer insulation from the inner wires. This does not result in bare wires since only the gray outer jacket is removed. After correct stripping, the wire will appear as shown in **Figure 16**.

The crimping tool is then used to crimp the RJ connector onto the cable. The RJ connector is locked into a special socket in the tool. The stripped wire is inserted into the RJ connector. Finally, the tool is squeezed like pliers to crimp the connector onto the wire. This completes the installation of an RJ connector onto the wire.

3.4 Conduit

Reference Drawings:

Shop Drawing, AF-3165-8-32 High-34-RGB; **B-172745**
Shop Drawing, AF-3165-40-48 High-34-RGB; **B-172746**

Daktronics does not include the conduit. Refer to **Drawings B-172745** and **B-172746** for your display size for approximate locations for power and signal conduit. Separate conduit must be used to route:

- Power
- Signal IN wires, including phone line
- Signal OUT wires (if signal is required for another display)

Knockout holes for ½" conduit are located at the bottom right (rear view) of the back of the display (refer to **Drawings B-172745** and **B-172746**).

For displays with more than one face, signal and temperature sensor wiring between displays is normally completed using the quick connect interconnect cable. If not using the interconnect cable, the separate signal and temperature sensor cables can be routed through the same conduit.

3.5 Preparing for Power/Signal Connection

Reference Drawings:

Component Layout Drawings .....**Refer to Appendix A**

1. Punch or use 1/2" (0.875" in diameter) conduit holes for the desired conduit openings. **Be careful that none of the internal components are damaged**. Attach the conduit
2. Remove the bottom left two modules (AX01 and AX02) to expose the power enclosure and signal panel. To do this, use a $^{1}/_{8}$" Allen wrench to turn the latch access fasteners one-quarter turn. Turn the top latch clockwise and the bottom latch counter-clockwise. Lift each module away from the display; reach behind it and disconnect all power and signal connections. Refer to **Figure 17**
3. Locate the controller and power termination box for these displays in the **Component Layout Diagram** for your sign
4. The controller receives the incoming signal and relays it to the individual modules
5. 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
6. Power conductors from the disconnect to the display should be routed through conduit in agreement with local code
7. You may route the signal cable from the control computer to the display at this time – **Be sure to run the power and signal cables in separate conduit**

***Figure 17**: Removing a Module*

3.6 Power

Reference Drawings:

Power Specs, 8x48-48X144 Display RGB..... **Drawing A-179873**

Power Requirements

Refer to **Drawing A-179873** for voltage and current requirements for your display size. Each uses a 120VAC or 120/240 VAC single-phase power source. Depending on the display size the number of power supplies may vary.

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

Proper power installation is imperative for proper display operation. The following sub-sections give details of display power installation.

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.

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.**

The material of an earth-ground electrode differs from region to region and from conditions present at the site. Consult the National Electrical Code and any local electrical codes that may apply. 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.

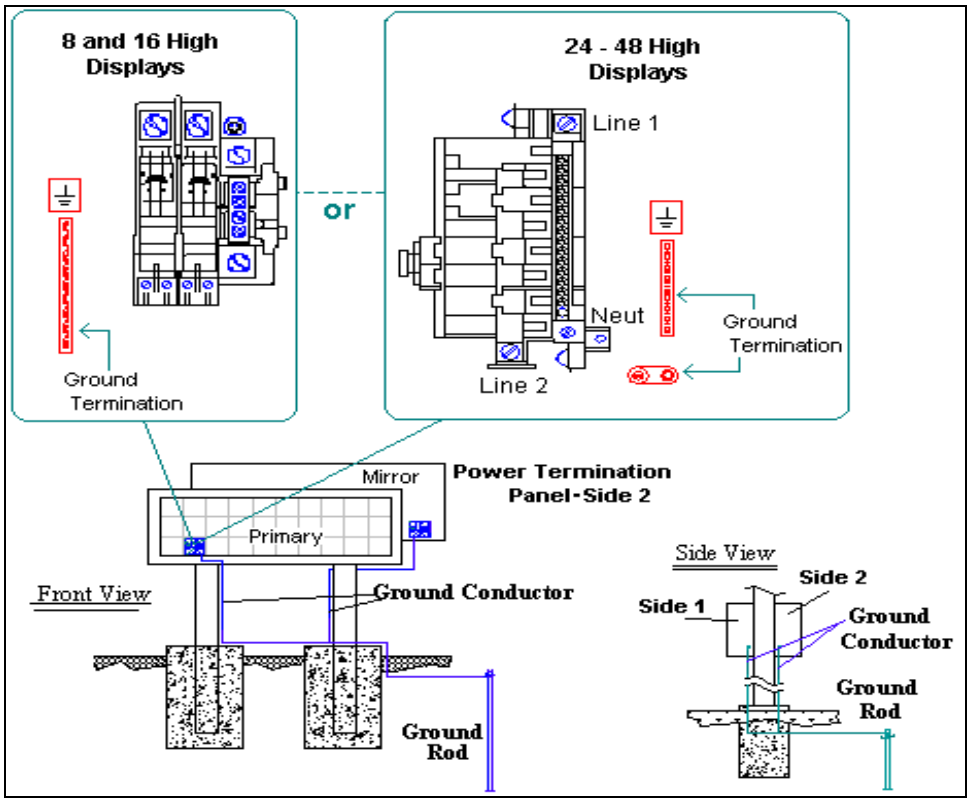


Figure 18: *Grounding*

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 in higher than 10 ohms it will be necessary to install additional grounding electrodes to reduce the resistance. The grounding electrode should be installed within 25 feet of the base of the display. The grounding electrode must be connected to the ground terminal in the display panel board.

Power Installation

There are two considerations for power installation: installation with ground and neutral conductors provided and installation with only a neutral conductor provided. These two power installations differ slightly, as described in the following paragraphs:

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 opened. Refer to **Figure 19** for installation details. The National Electrical Code requires the use of a lockable power disconnect within sight of or at the sign.

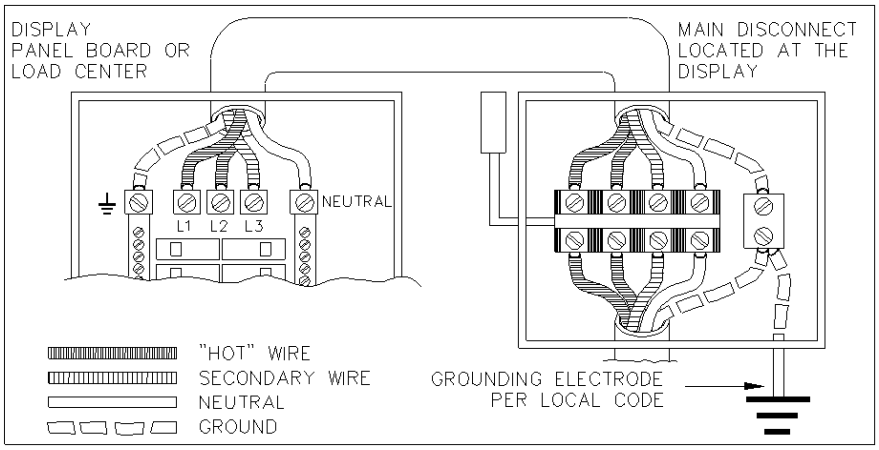


Figure 19: *Installation with Ground and Neutral Conductors Provided*

Installation with Only a Neutral Conductor Provided

Installations where no grounding conductor is provided must comply with article 250-32 of the National Electrical Code. If the installation in question meets all of the requirements of article 250-32, the following guidelines must be observed:

- Connect the grounding electrode cable at the local disconnect, never at the sign panel board.
- A disconnect that opens all of the ungrounded phase conductors should be used.
- The neutral and the ground conductors should be bonded in the sign panel board.

Refer to **Figure 20** for installation details.

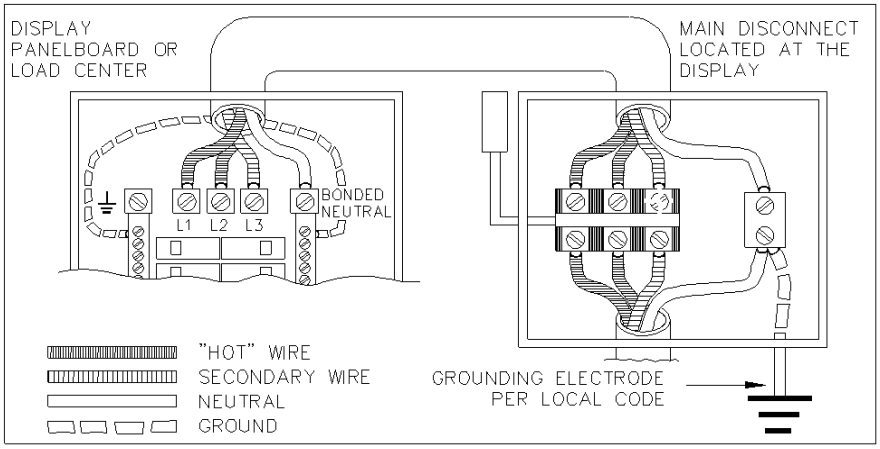


Figure 20: *Installation with Only A Neutral Conductor Provided*

Power Connection

Reference Drawings:

Power Term Box, AF-3X65, 8- Pos. ..... **Drawing A-154965**
Power Term Box 2-Pos ..... **Drawing A-175131**
Power Specs, 8x48-48X144 Display RGB ..... **Drawing A-179873**
Schematic ..... **Refer to Appendix A**

Incoming power is connected within the power termination enclosure. Complete the following steps to terminate the hot and neutral wires at the termination block within the enclosure. Refer to **Drawing A- 154965** or **A-175131** and the appropriate **Schematic** for your display size.

1. Access the enclosure by removing the left bottom two modules as described in **Section 3.5**
2. Route the power cables through the power conduit in the rear of the sign and to the enclosure
3. Connect the white neutral wire to neutral bus
4. If one power line is being terminated (120VAC), connect the black “hot” wire to L1. Install a jumper per note one on **Drawing A-154965**
5. If two power lines are being terminated (120/240VAC). Connect the second “hot” wire to L2 and **do not** install the jumper
6. Connect the green grounding wire to the grounding bus E41. Refer to **Figure 20**

Main Disconnect

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

The disconnecting means must be located 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: Disconnecting means that are capable of being locked in the open position may be located elsewhere.

3.7 Signal Termination from Computer to Display

The AF-3165 is designed for quicker connection to other displays and other additional equipment. Connection of the first display to the control equipment needs to be wired to the controller, modem, fiberboard, or surge suppression card in that display. Depending on the display type ordered, the following cables may be provided with the display:

1. Interconnect cable from Primary to Secondary, length 4 feet
2. Interconnect cable from Primary to Mirror, length 6 feet
3. Temperature sensor with quick connect cable, length 25 feet
4. Displays using radio, the quick connect cable with Client, length of 25 feet

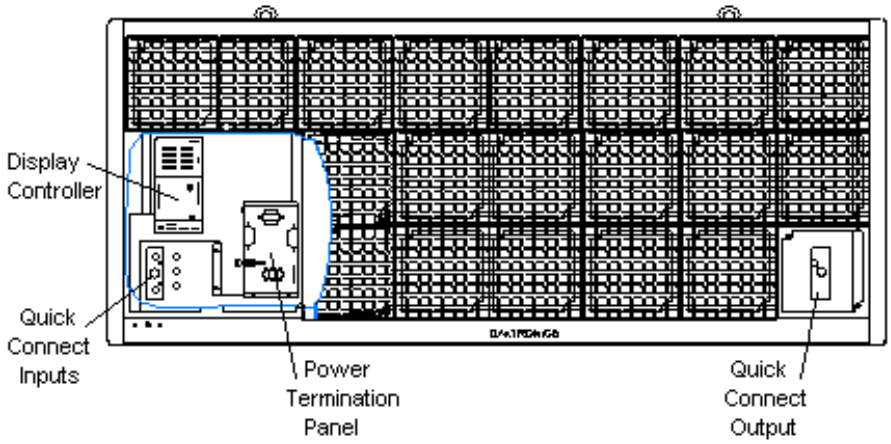


Figure 21: *Primary/Secondary Display; Front View*

RS232

Reference Drawings:

System Riser Diagram, RS232 ..... **Drawing A-174341**
Schematic, Signal Wiring, Internal, w/QC PCB ..... **Drawing B-177662**
Controller, Galaxy, 8-conn, J-1087 ..... **Drawing B-177838**

The RS232 controlled display requires the use of a J-box within 25 feet of the display. From the J-box to the display, the signal may be connected using a quick connect cable or directly wired to the controller inside the display. A non-quick connect cable from the J-box to the display must be routed though conduit**. Do not run signal and display power through the same conduit.**

1. If using a quick connect cable, connect the wires at the J-box and plug the quick connect into J33 on the back of the display
2. When connecting directly to the display, terminate one end at the J-box and the other end of the wire to the 6-position terminal block on the controller labeled “RS232 IN” (A31-TB1). Refer to **Figure 23** and **Drawing B-177662** for the terminal block wiring, and **Drawing B-177838** for the controller termination locations

The controlling laptop computer connects to the J-box through the serial cable (refer to **Drawing A-174341**).

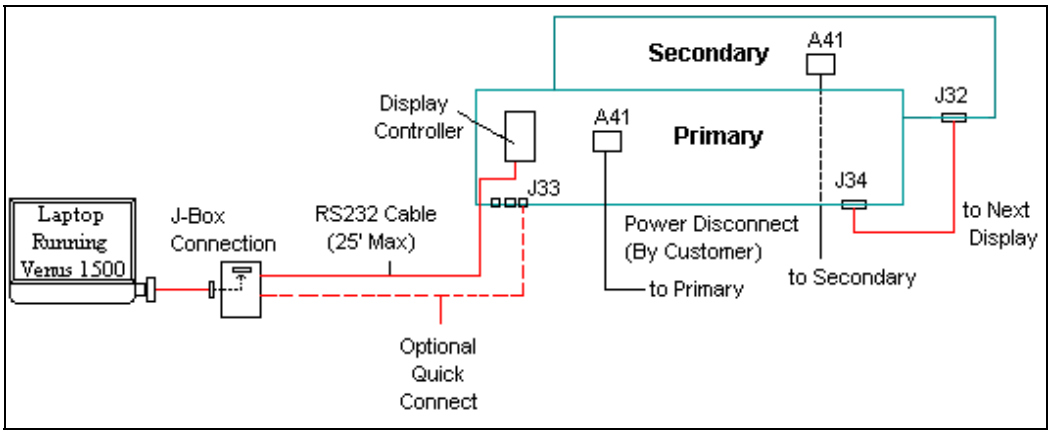


Figure 22: *RS232 Display Layout*

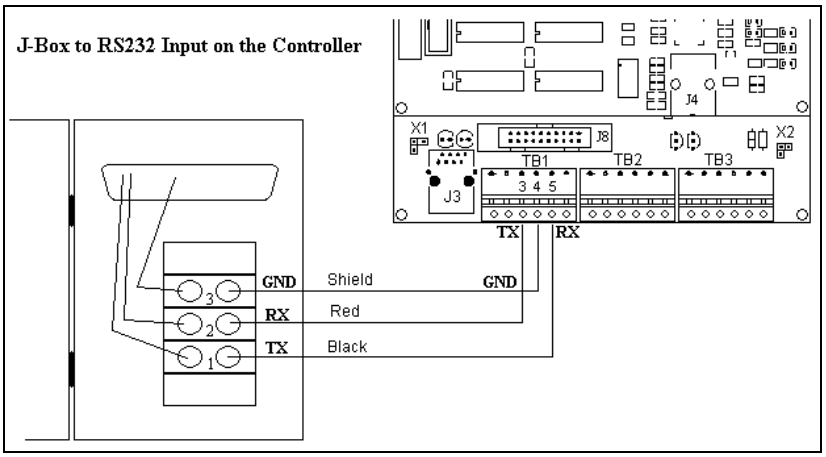


Figure 23: *J-Box to Controller Board*

J-Box to Controller Board (A31)

J-Box	Field Cabling	Controller Board TB1 (RS232 In)
Pin 1 (TX-P)	Black	Pin 5 (RX-1)
Pin 2 (RX-P)	Clear/Red	Pin 3 (TX-1)
Pin 3 (GND)	Shield	Pin 4 (GND-N)

RS422

Reference Drawings:

System Riser Diagram, RS422 ..... **Drawing A-174135**
Schematic, Signal Wiring Internal, w/QC PCB ..... **Drawing B-177662**

The RS422 controlled display requires the use of signal converter (0A-1127-0237) near the computer. From the signal converter, cable is run to the surge board assembly in the display. The cable from the signal converter to the display must be routed though conduit. **Do not run signal and display power through the same conduit.** Refer to **Drawing A-174135** and **Figure 24** for system layout.

1. If using a quick connect cable, connect from the signal converter to a junction box at the display, and from there to J32 on the back of the display
2. When connecting directly to the display, terminate one end at the signal converter and the other end of the wire to the 6-position terminal block on the surge board assembly labeled “RS422 IN” (A34-TB1). The connection from the surge board to the controller is already completed. Refer to **Figure 25** and **Drawing B-177662** for the terminal block wiring

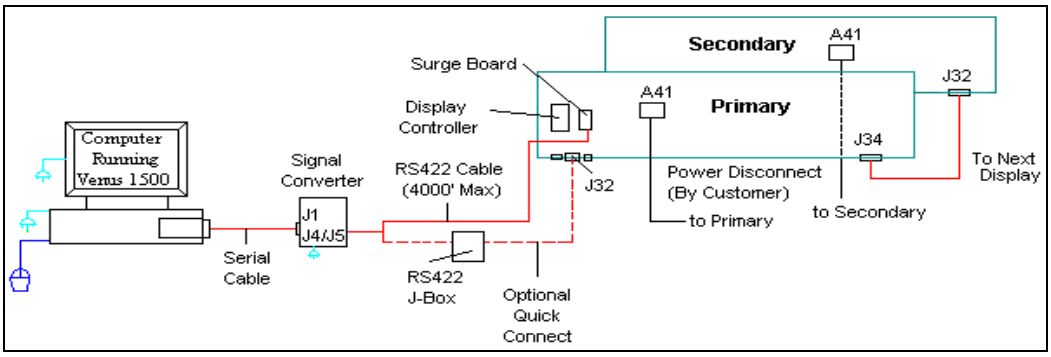


Figure 24: *RS422 Display Layout*

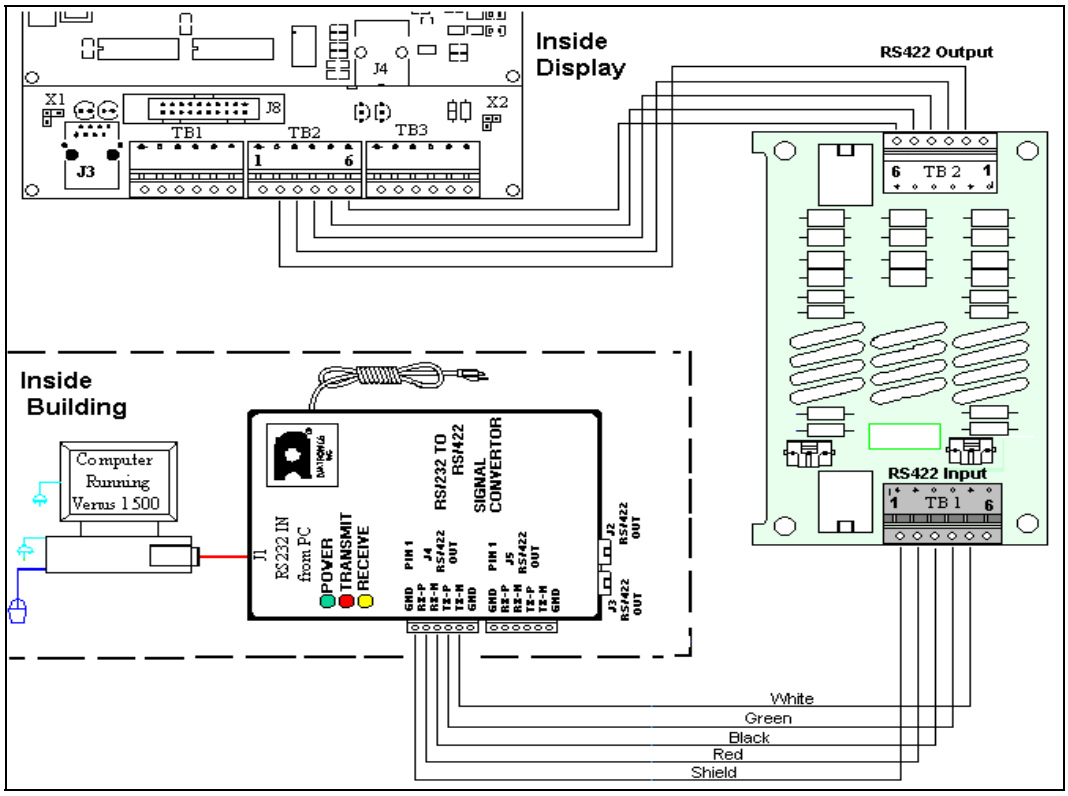


Figure 25: *Signal Converter to Surge Board Connection*

Signal Converter to Surge Board Assembly (A31)

Signal Converter (J4/J5)	Field Cabling	Surge Board Assembly TB1 (RS422 In)
Pin 1 (GND)	Shield	Pin 1 (NC)
Pin 2 (RX-P)	Red	Pin 2 (D1OUT-P)
Pin 3 (RX-N)	Black	Pin 3 (D1OUT-N)
Pin 4 (TX-P)	Green	Pin 4 (D1IN-P)
Pin 5 (TX-N)	White	Pin 5 (D1IN-N)
Pin 6 (GND)		Pin 6 (NC)

Modem

Reference Drawings:

System Riser Diagram, Modem ..... **Drawing A-174342**
Schematic, Signal Wiring Internal, w/QC PCB ..... **Drawing B-177662**

A modem-controlled display requires the use of an internal or external modem at the computer. The local phone company must provide a dedicated phone line to the display and identify the colors used for the Tip wire and for the Ring wire. The telephone cable is terminated to TB2 on the modem in the display. The phone cable must be routed though conduit. **Do not run phone line and display power through the same conduit**. Refer to **Figure 26** and **Drawing A-174342** for system layout.

1. If using a quick connect cable, the phone line will run to a junction box at the display and then a cable will connect the phone line to J32 on the back of the display. A 6-conductor phone cable with RJ11 connectors (Daktronics part number 0A-1137-0160) relays the signal from the quick connect input board to the modem
2. When connecting directly to the display, terminate the phone line to TB2 on the display modem. If the phone company provided a phone termination box in the display a straight phone cable can be connected from the box to the J5 Phone IN on the modem board. Refer to **Figure 27** and **Drawing B-177662** for the terminal block wiring
3. A straight through RJ45 cable (Daktronics part number 0A-1229-0054) transfers data from J6 on the modem to J3 (RS232 IN) on the controller

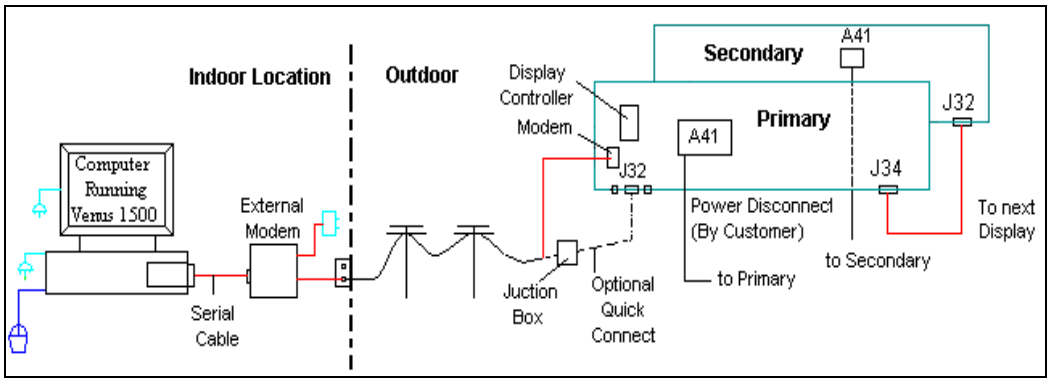


Figure 26: *Modem Display Layout*

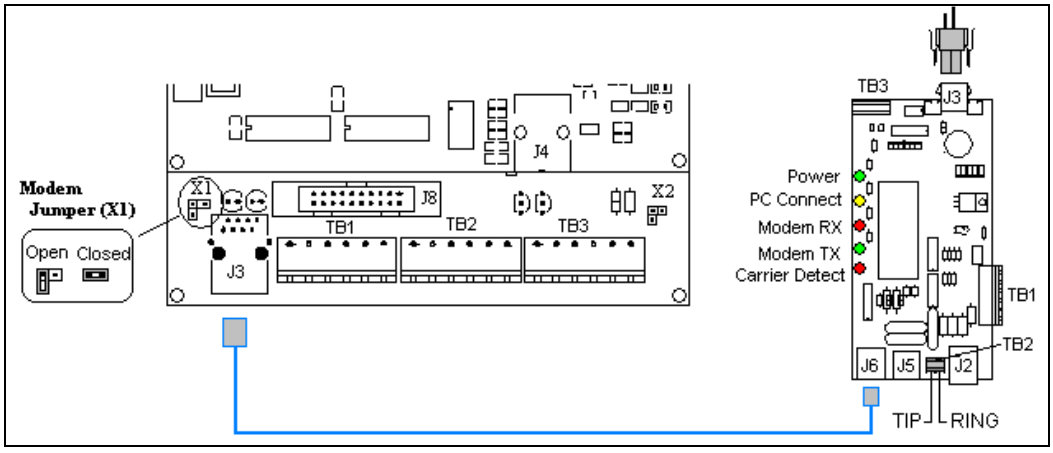


Figure 27: *Modem Phone Line Termination, Modem Jumper*

Note: The jumper (X1) on the controller board **must be** closed while the display powers up to recognize that a modem is being used with the display.

Fiber Optic

Reference Drawings:

System Riser Diagram Fiber ..... **Drawing A-174344**
Schematic, Signal Wiring Internal, w/QC PCB ..... **Drawing B-177662**

When fiber optic cables are used, signal from the converter enters the display and connects to the fiberboard (J4/J5). An 8-conductor cable with RJ45 connectors (Daktronics part number 0A-1229-0054) relays the signal from J7 on the fiberboard to J3 (RS232 IN) on the controller. Refer to **Figure 28** and **Drawing A-174344** for the system riser and to **Figure 29** and **Drawing B-177662** for terminal block cabling.

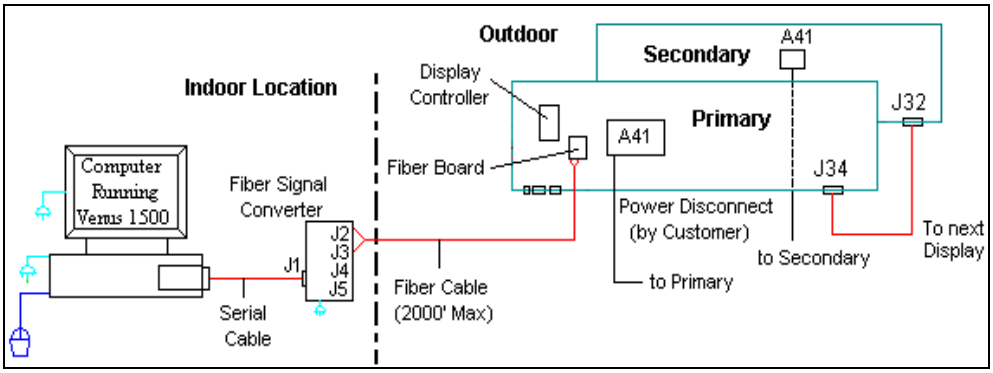


Figure 28: *Fiber Display Layout*

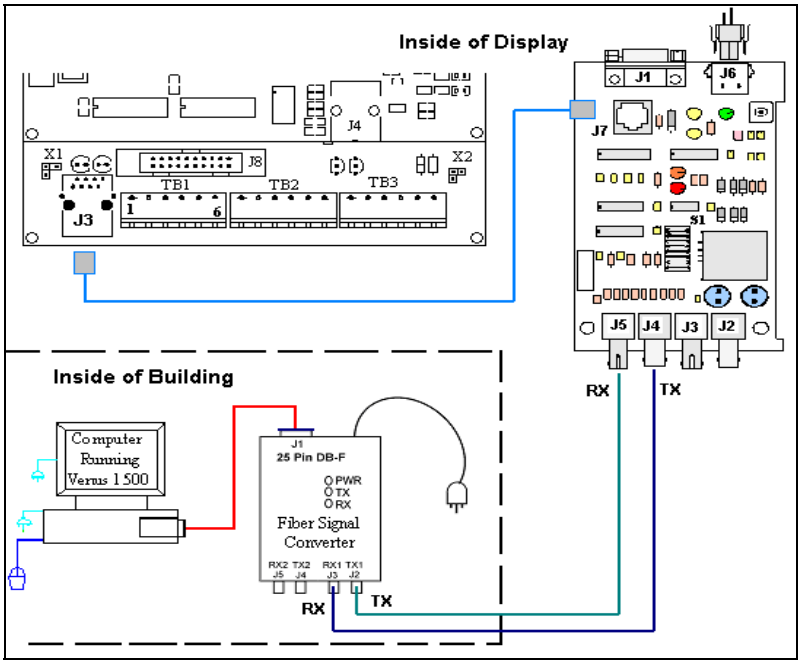


Figure 29: *Fiber Signal Connections*

Signal Converter to Fiber Card (A3X)

Signal Converter	Field Cabling	Fiber Control Card
J2 (TX1)	(Color varies)	J5 (RX2)
J3 (RX1)	(Color varies)	J4 (TX2)

Venus® 1500 Radio Client

Reference Drawings:

System Riser Diagram;

QC Outdoor Radio, Gen 2 ..... **Drawing A-185359**

Schematic, Signal Wiring Internal, w/QC PCB..... **Drawing B-177662**

A radio-controlled display requires a server radio connected to the control computer, and a client radio at the display. The radios must be within line-of-sight of each other. The client radio enclosure includes 25 feet of weather resistant pre-terminated cable. One end of the cable is pre-terminated to TB1 inside the radio enclosure, and a quick connect plug is terminated at the other end of the cable. The cable can be terminated to the display at J33 with the quick connect plug as shown in **Figure 31**. Refer to **Figure 30** and **Drawing A-185359** for the system layout. Additional drawings for the Server connections are in the Venus 1500 Radio manual **(ED13932)**.

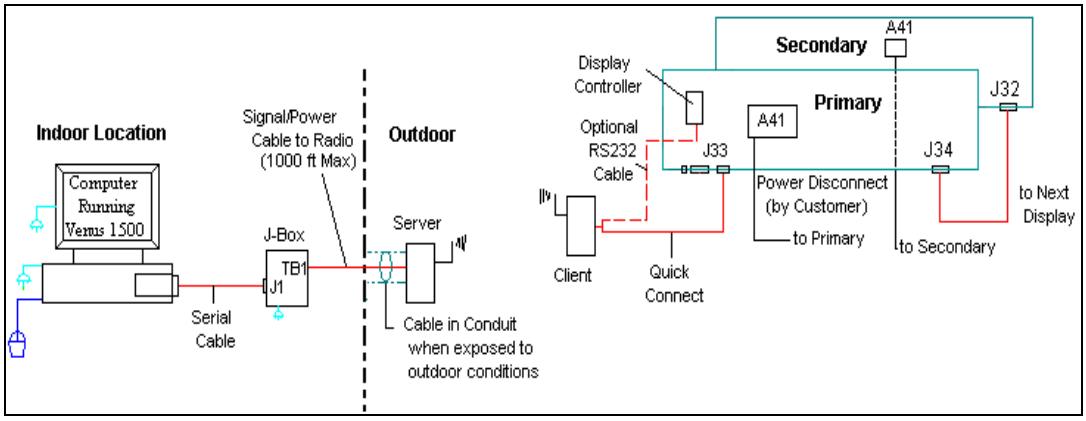


Figure 30: *Radio Display Layout*

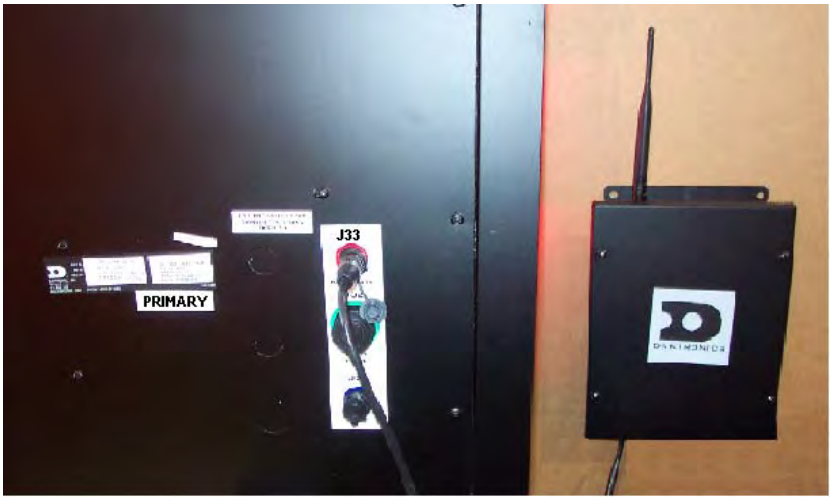


Figure 31: *Client Radio Display Connection*

3.8 Signal Termination Between Two (or More) Signs

Reference Drawings:

System Riser Diagram Fiber ..... **Drawing A-174344**
Schematic, Signal Wiring, Internal, W/QC ..... **Drawing B-177662**

RS422 Interconnection

The quick connect cable is the most common method of terminating signal between two displays. The cable goes from the RS422 OUT on the primary display to the RS422 IN on the secondary display as shown in **Figure 32**.

Figure 32: *Display Interconnection*

If the displays are not back-to-back, or are too far apart for the quick connect interconnect cable to reach, a 4-conductor shielded cable of the correct length is used. One end will connect at the "RS422 OUT" 6-position controller board terminal block (A31-TB3) in the first display, and terminate on the "RS422 IN" 6-position controller board terminal block (A31-TB2) on the second display. Refer to **Figure 33**. **When not using the quick inter-connect cable, wires must be in conduit.**

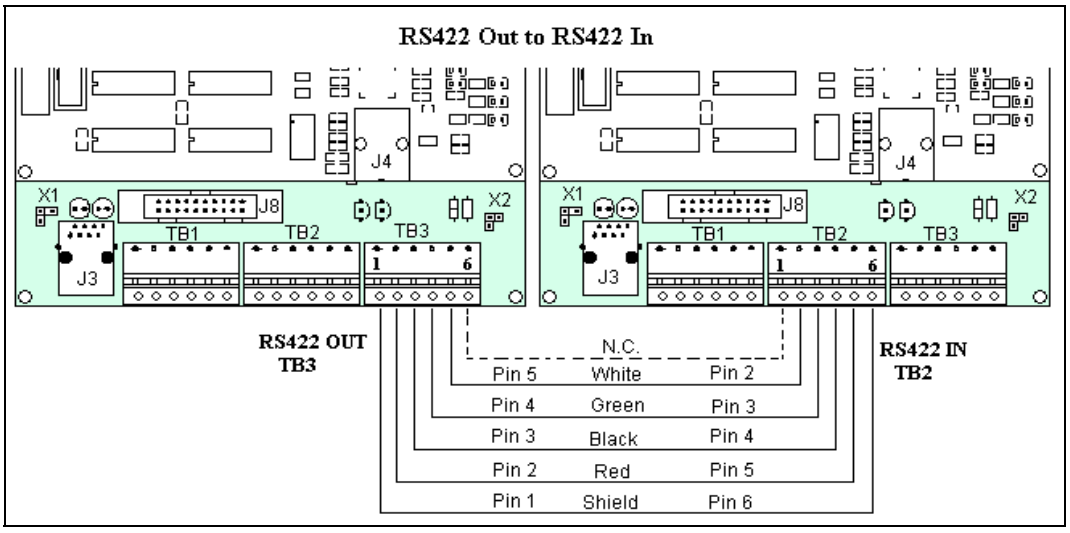


Figure 33: *RS422 Interconnection*

RS422 Interconnection

Primary – RS422 OUT (A31-TB3)	Field Cabling	Secondary – RS422 IN (A31-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)

Fiber Interconnection

Reference Drawings:

System Riser Diagram Fiber ..... **Drawing A-174344**

A fiber cable may be used to connect two or more displays in the fiber interconnection method. Connect the fiber cable to the fiber cards of the display as described in **Drawing A-174344** and on the following table.

Face A Data Out (A34)	Field Cabling	Face B Data In (A34)
J2 (TX1)	Color varies	J5 (RX2)
J3 (RX1)	Color varies	J4 (TX2)

3.9 Optional Temperature Sensor

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

3.10 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 (32K RGB)
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: (172.16.192.25)
10. Subnet Msk: (255.255.0.0)
11. COM1 Configuration (C1:V15) ((Modem C1:V15) If a Modem is present)
12. Line Frequency (CLK:60 Hz)
13. Display Name Description

Section 4: Maintenance and Troubleshooting

Important Notes:

1. **Power must be turned off before any repair or maintenance work is done on the display.**

2. **Qualified service personnel must make any access to internal display electronics.**

3. **The Daktronics engineering staff must approve ANY changes made to the display. Before altering the display, detailed drawings for the proposed modifications must be submitted to the Daktronics engineering staff for evaluation and approval or the warranty will be rendered null and void.**

4.1 Maintenance and Troubleshooting Overview

Daktronics Galaxy® series AF-3165 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** provide a basic explanation of the way signal travels through the display
- **Power Routing Summaries** provide a basic explanation of the way power travels through the display
- **Service and Diagnostics** give instructions for removing various display components and explains the functions of circuit board connectors and the meanings of any diagnostic LEDs
- **Maintenance** includes a number of steps to take to keep the display in safe, working order
- **Troubleshooting** lists some possible display malfunctions and provides a number of possible causes for that malfunction
- **Replacement Parts List** includes the part number and description, of display components that could possibly need replacing during the life of the display
- **Exchange and Repair and Return Programs** explain Daktronics component return policy

4.2 Signal Summary

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

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

4.3 Power Summary

Reference Drawing:

Schematic.....**Refer to Appendix A**

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

1. Incoming power terminates at the power termination enclosure. Before leaving the enclosure, power is sent through a circuit breaker and an RFI electrical filter
2. Power for the controller board passes through a transformer located on the controller/power panel. The transformer steps down the power to approximately 10 VAC
3. Both +6.5VDC and +9VDC power supplies are used to power the modules. Power supplies are preset. Contact Daktronics Customer Service for the proper settings
4. In Galaxy® displays, the 9VDC power supply powers the green and blue LEDs through the 4-pin connector. The 6.5VDC power supply powers the red LEDs and driver's logic circuit through 2-pin connectors. See your display **Schematic** for power supply wiring information

4.4 Service and Diagnostics

Reference Drawings:

Detail, AF-3165-8/16X** Pwr/Control Corner..... **Drawing A-186055**
Detail, AF-3165-24/32/40/48X** Pwr/ Control Corner . **Drawing A-186056**
Component Layout..... **Refer to Appendix A**
Schematic ..... **Refer to Appendix A**

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

- transformer, RFI filter
- controller
- modules, drivers and power supplies

The sub-sections also address any diagnostic LEDs, fuses and signal/power connectors found on the unit. On the **Schematics** and **Component Layout Diagrams**, the components are denoted as follows.

Component…	Denoted As…	Location…
Filter and Transformer	0A-1241-4019 (8 or 16 high) 0A-1241-4005	Inside the power termination box
Controller	0A-1229-0005	Refer to **Drawing A-186055** or **A-186056**
Modules	Squares (0A-1208-2552) A101 through A418	Over entire face of the display (includes driver)
Power Supplies	0A-1241-4001 and 0A-1213-4034	Behind modules (refer to your display's Component Layout)
Light Detector	0A-1241-4013	Behind\below the bottom left module
Modem	0P-1279-0003	Refer to **Drawing A-186055** or **A-186056**
Fiber Board	0P-1127-0024	Refer to **Drawing A-186055** or **A-186056**
RS422 Surge Card	0P-1146-0031	Refer to **Drawing A-186055** or **A-186056**

Transformer and RFI Filter

Reference Drawings:

Power Termination Box, AF-3X65, 8-Pos ..... **Drawing A-154965**
Power Termination Box 2-Pos..... **Drawing A-175131**
Schematic.....**Refer to Appendix A**

Remember: Disconnect power before servicing any internal components.

Transformer

The transformer is located in the upper portion of the power termination box. To replace the transformer, first disconnect and label all the wires attached to it. **Turn off power to the display before removing the wires.** Then release the hardware securing it to the inside of the enclosure. Position the new transformer in its place, and tighten it down. Re-connect all the wires using the display's **Schematic** as a reference.

If one power line is terminated (120VAC), the black "hot" wire will be connected to line one and a jumper will be installed per note one on **Drawing A-154965**. If two power lines are terminated (120/240VAC), the second "hot" wire will be connected to L2 and no jumper will be installed.

The ground wire will be connected to the ground bus or ground lug.

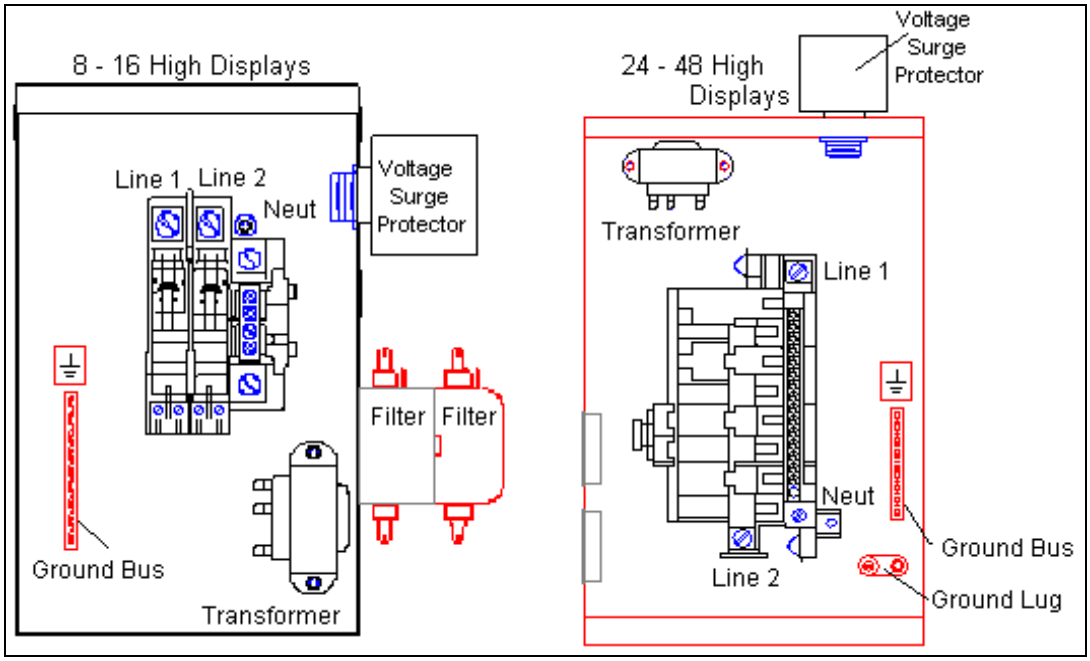


Figure 34: *Power Termination Panel*

RFI Filter

The RFI electrical filters are mounted above and to the side of the power termination box (Z1 and Z2 in **Drawing A-175131**). Like the transformer, the filters can be replaced by first removing all connecting wires, then releasing the attachment hardware. Install the new filter using the display's **Schematic** as a wiring reference.

Controller

Reference Drawings:

Controller, Galaxy, 8-conn, J-1087 ..... **Drawing B-177838**

The controller sends data to the modules. Refer to the signal summary in **Section 4.2** for more information and to the component location drawings for the position of the controller board. **Figure 35** and **Drawing B-177838** illustrates a typical controller.

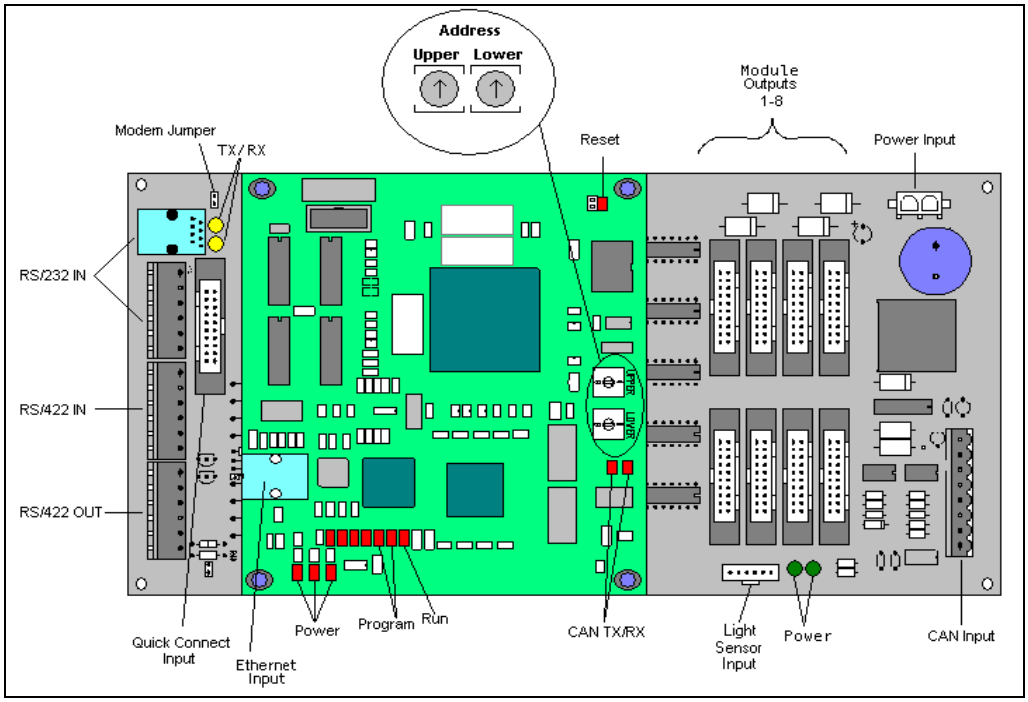


Figure 35: *Controller Component Layout*

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 both rotary switches to address 0 (set the switches to 0 by rotating them counter clockwise 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. Communication to the display is not possible while the display is in test mode using address 0.

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

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

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

Controller Address Settings		
S2 (Upper)	**S1 (Lower)**	**Address**
0	0	Test Mode
0	1	1
0	2	2
0	3	3
0	4	4
0	5	5
0	6	6
0	7	7
0	8	8
0	9	9
0	A	10
0	B	11
0	C	12
0	D	13
0	E	14
0	F	15
1	0	16
1	1	17
…	…	…
F	0	240

Four diagnostic LEDs are located on the controller; the table below tells what each LED denotes:

CPU			
LED	**Color**	**Function**	**Operation**
DS1	Red	CAN TxD	Flashes when controller is transmitting CAN information.
DS2	Red	CAN RxD	Flashes when controller is receiving CAN information.
DS3	Red	System Reset	Off when controller is functioning properly. Flashes at 1.5 second rate if the watchdog timer is not being reset by controller
DS4	Red	Run	A steady flash indicates the controller is running properly. Normal flash rate is about once per second.
DS5	Red	U15 Programmed	On when U15 contains a valid logic program
DS6	Red	U7 Programmed	On when U7 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.
DS11	Red	+5V	On when +5V power supply is functioning.
DS12	Red	+3.3V	On when +3.3V power supply is functioning.
DS13	Red	+2.5V	On when +2.5V 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.
Temp/Light Sensor			
LED	**Color**	**Function**	**Operation**
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 temp or light information.

Modules and Drivers

The module and driver board are a single functional unit. Each module assembly is made up of a module housing (containing LEDs and the driver) and a louver assembly.

Figure 36: *Removing a Module*

To remove a module, complete the following steps:

1. Locate the latch access fasteners on the module. One is centered below the top row of pixels and one is centered above the bottom row
2. With a 1/8"Allen wrench, turn the latch fasteners a quarter turn as shown in **Figure 36**. The top one should be turned clockwise and the bottom one counter-clockwise
3. Pull the display module far enough to reach around the back and disconnect the ribbon and power cables

When installing a module, reverse the previous steps and take note of the following points:

- The weather-stripping on the back edge of the module must be intact and in good condition if it is to prevent water from seeping into the display
- The module latches must be fully engaged to create a watertight seal around the edge of the module. The module should be firmly seated against the display when the latches are fully engaged

Power Supplies

Reference Drawings:

Component Layout Drawings .....**Refer to Appendix A**
Schematic.....**Refer to Appendix A**

The LED power supplies are identified as assemblies. Each power supply unit controls four modules; a power supply assembly (three power supplies) controls eight. The LED power supplies assemblies are identified 0A-1241-4001and 0A-1213-4034 in the **Component Layout Drawings**.

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

1. Remove the module directly in front of the failed power supply – refer to the **Component Drawings** for power supply locations
2. Disconnect and label all the wires connected to the power supply
3. Remove the hardware holding the power supply in place to free the unit
4. Follow these steps in reverse order to install a new power supply – refer to the display's **Schematic** when reconnecting the wires

Light Detector

Reference Drawings:

Schematic, Sig. Wiring, Internal, w/Quick Connect ..... **Drawing B-177662**
Component Layout..... **Refer to Appendix A**

The light detector is internally mounted and wired at Daktronics. It is located in the bottom left corner on the front of the display as shown in **Figure 37** (identified as assembly 0A-1241-4013 (LT) in the **Component Layout Diagram**). A 4-conductor cable is terminated at the terminal block on the light sensor and attached to a jack that plugs into the controller. The cable connects the light detector to the controller at J9 (refer to **Drawing B-177662**). When the displays are mounted back-to-back, only the primary side has a light sensor.

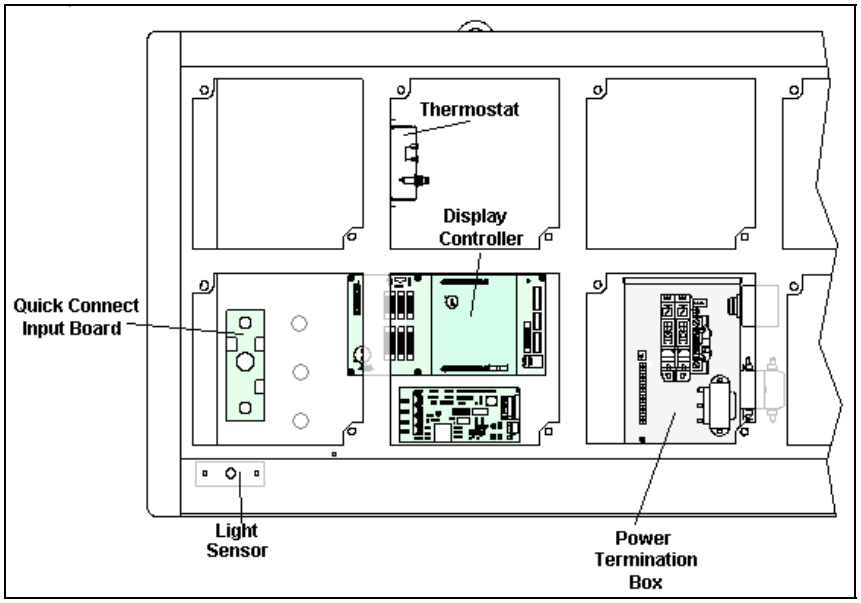


Figure 37: *Light/Thermostat Location in 16x80 display*

Modem

Reference Drawings:

Detail, AF-3165-8/16x**-Pwr/Control Corner ..... **Drawing A-186055**
Detail, AF-3165-24/32/40/48x**-Pwr/Control Corner ... **Drawing A-186056**

If a modem was included with the display, it is located inside the display next to the controller board. Refer to **Drawing A-186055** or **A-186056** for modem location.

1. To replace a modem, first disconnect the power and signal connections (refer to **Figure 38** for the location of the connectors)
2. The modem is held in place with four screws. Remove the screws using a 3/16" nut driver, and lift the modem out of the display
3. Install the new modem, replace the screws, and reconnect the power and signal cables

The modem module has five LEDs.

1. The power LED should remain lit while power is applied to the modem
2. The RX and TX LED's will flash when communicating
3. The carrier detect LED will light when the modem has established a connection with another modem
4. The PC Connect LED is not used in this application

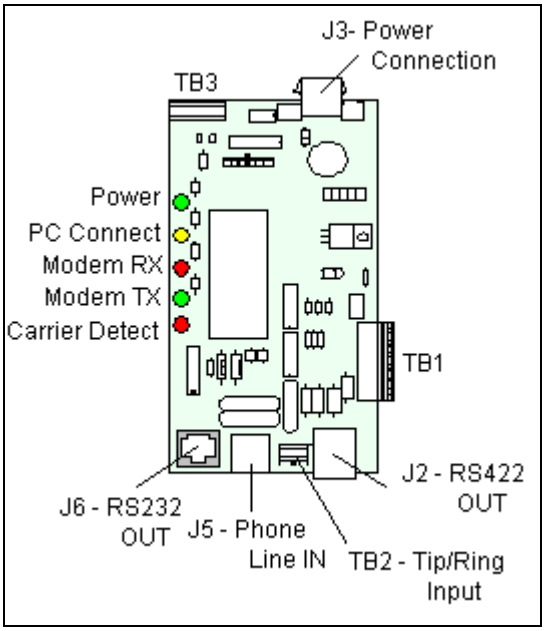


Figure 38: *Modem*

The modem board also has several input and output jacks:

1. J3 is the power input for 12VAC
2. TB2 is a phoenix connector to terminate the Tip and Ring wires
3. J5 is an RJ11 jack for termination of a pre-terminated phone line
4. J6 is the RS232 RJ45 output to the controller
5. J2, TB1, and TB3 are not used in this display application

A modem system requires the X1 jumper to be set on the controller board. Refer to **Figure 39** for the jumper location. **Note:** the jumper is only recognized on power up.

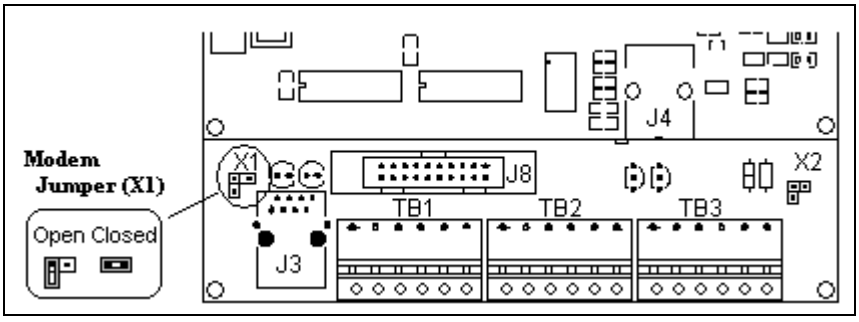


Figure 39: *Modem Jumper Location*

Fiber Board

Reference Drawings:

Detail, AF-3165-8/16x**-
Pwr/Control Corner..... **Drawing A-186055**

Detail, AF-3165-24/32/40/48x**-
Pwr/Control Corner..... **Drawing A-186056**

If a fiberboard was ordered with the display, it is located inside the sign next to the controller. Refer to **Drawing A-186055** or **A-186056** for the location.

1. To replace a fiber optic board, first disconnect the power and signal connections (refer to **Figure 40** for disconnection of power and signal)
2. The fiber optic board is held in place with four screws. Carefully remove them
3. Install the new fiberboard, replace the screws and reconnect power and signal cables

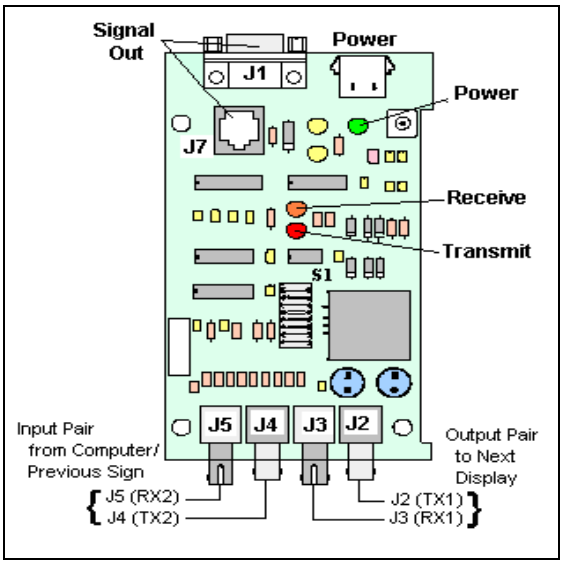


Figure 40: *Fiber Optic Board*

The fiber module has three LEDs.

1. The power LED should remain lit while power is applied to the module
2. The receive LED will flash when the display fiberboard is accepting signal from the signal converter
3. The transmit LED will flash when the display fiberboard is sending to the signal converter

In addition, the fiber module has several input and output jacks:

1. Two fiber connectors, one RX and one TX, connect to the fiber coming from the signal converter or a previous display
2. Two fiber connectors, one RX and one TX, connect to the fiber going to an additional fiber display
3. A straight through RJ45 cable connects J7 on the fiberboard to J3 on the controller board

RS422 Surge Board Assembly

Reference Drawings:

Detail, AF-3165-8/16x**-Pwr/Control Corner..... **Drawing A-186055**
Detail, AF-3165-24/32/40/48x**-Pwr/Control Corner .. **Drawing A-186056**

If a surge board was included with your display, it is located inside the display next to the controller board. Refer to **Drawing A-186055** or **A-186056** for the location.

1. To replace the surge board, first disconnect the signal connections (Refer to **Figure 41** at right)
2. The surge suppressor is held in place with four screws. Carefully remove them with a 3/16" nut driver
3. Install the new surge suppressor; replace the screws and the signal cables

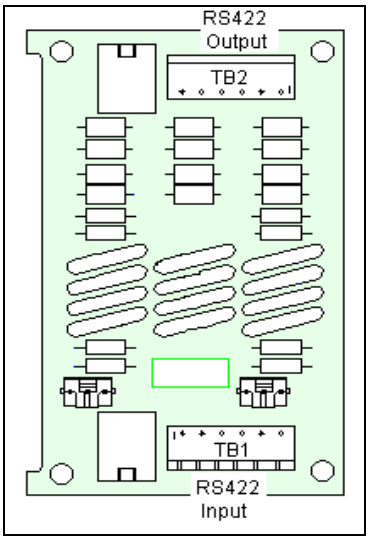


***Figure 41: RS422** Surge Suppressor*

The surge suppressor is an inline device that is used to filter the RS422 data line. It suppresses surges down to a low voltage in order to protect the display controller's RS422 input. The surge suppressor must be firmly connected to the display chassis in order to be effective. The mounting hardware used to secure the surge suppressor is sufficient if it is fastened properly.

Location of CAN Termination Jumper

Temperature and light sensors are controlled as part of a CAN network. For the CAN network to work correctly, the network must be terminated at both ends of the network. This is true for a single display or for multiple displays. The correct terminations are completed during the building process. However, if the order or number of displays is changed on-site, the terminating jumper may need to be relocated.

W1 is the necessary location of the terminations.

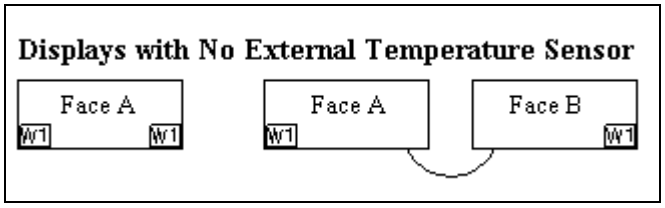


***Figure 42:** Displays with No External Temperature Sensor*

In the case of those displays that utilize a temperature sensor, the sensor is internally terminated. Therefore, only one other termination needs to be made at the output of the last sign in the network. The most common input location for the temperature sensor is to the first or primary display in the network.

The terminating jumper is located on the quick connect board on the inside of the display. Most displays have both an input and an output quick connect board. When no output board is available, the terminating jumper will be placed on the input board of the last display. Refer to **Figure 42** and **Figure 43** for more information.

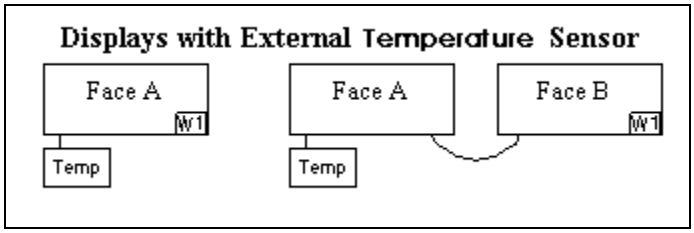


Figure 43: *Displays with External Temperature Sensor*

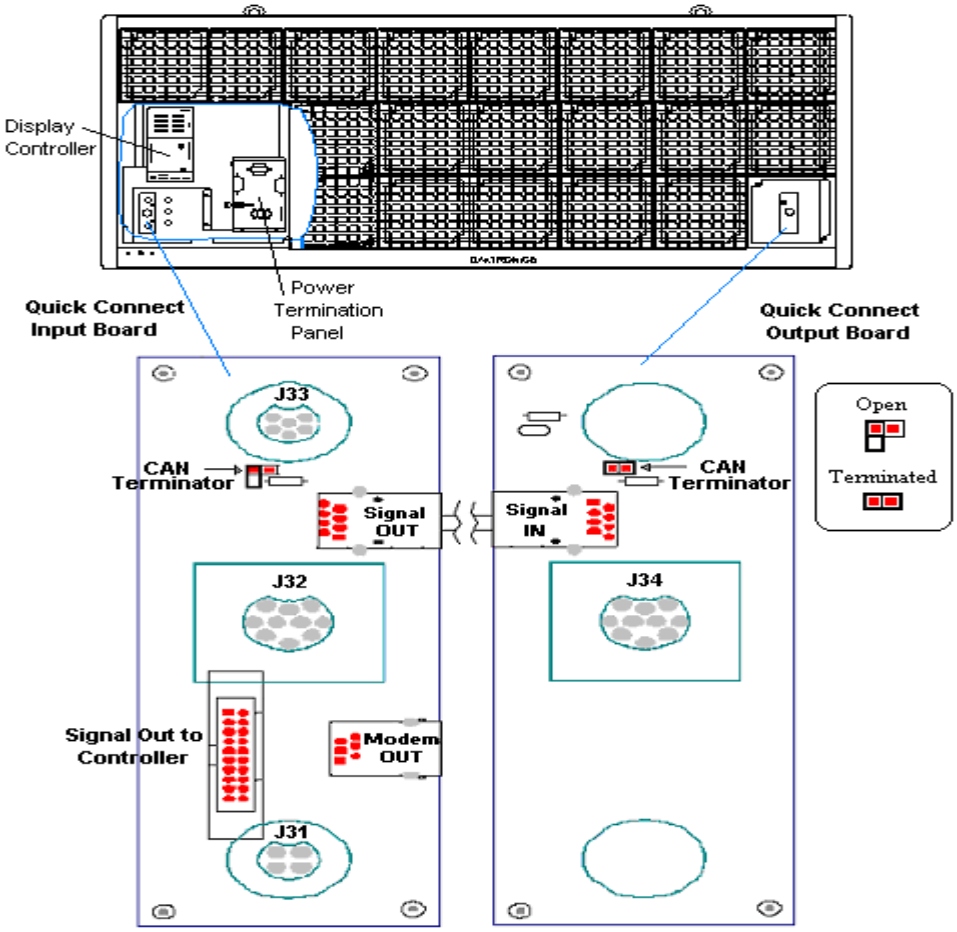


Figure 44: *Locations of Quick Connect Boards*

4.5 Ventilation Systems (With Fans and Filters)

Ventilation fans should be checked after 1,500 hours of operation and every 1,500 hours after that to ensure the display is being cooled properly. Fans should be checked 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 is operated for 18 hours a day and the power to the display is turned off when not in use
- 1,500 hours is equivalent to 62 days if the display is running non-stop for 24 hours a day
- Each time a module is removed, for whatever reason, take a minute to inspect the fans
- Check the fan blades for dirt and debris. If the fan blades have a large accumulation of dirt and debris, this indicates that the filters must be cleaned/changed more often. Fan blades must be kept 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, push the bypass button (momentary contact) on the thermostat enclosure to temporarily turn the fans on: (The bypass button is located behind A102, top row, and second module from the left.)

- Hold your hand or a piece of light paper beneath the display to detect air movement
- If the fan does not turn or does not operate smoothly, replace it

Filters must be checked once a year or after every 1,500 hours of operation, whichever comes first.

Filters can be cleaned with water and a mild detergent, such as dish soap. (Allow the filters to dry completely before reinstalling them in the sign.) Compressed air can also be used to clean the filters provided the nozzle is held at least six inches away from the filter, the pressure is no greater than 60 psi and the air is blown through the filter in the opposite direction from which air normally flows. The arrow stamped on the frame filter indicates airflow direction.

4.6 Thermostats

Reference Drawing:

Comp. Layout Diagram.....**Refer to Appendix A**

A thermostat controls when the ventilation fans are turned on in the display. Refer to the **Component Layout Diagram** and **Figure 37** for the location of the thermostat. The thermostat is located behind in the top row, second column of modules.

The ventilation fans turn on when the inside of the display reaches 85° F (29° C), and turn off at 70° F (21° C).

4.7 Weather Stripping

To ensure that the display is waterproof, weather stripping has been provided around the entire display and around each module. It is important that the weather stripping is installed properly at all times or water may leak into the display and damage the components.

4.8 Display Maintenance

A yearly inspection should be completed 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. Fasteners should be checked and tightened or replaced as required

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

- **Water Intrusion – Water Stain Marks**
  Water can enter the display where weather stripping has come loose or deteriorated or where fasteners have come loose allowing gaps in the panels or where moisture may be entering around hardware. Be sure to check around the lift eyes and bolts to ensure that water has not entered there. If so, replace hardware immediately to prevent more water from entering the display. Also, check electronic components for possible corrosion

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

If any of the above conditions are noticed, action must be taken to correct the situation.

4.9 Troubleshooting

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

Symptom/Condition	Possible Cause/Remedy
One or more LEDs on a single module fail to light.	• Replace/check ribbon cables on the module. • Replace the module.
One or more LEDs on a single module fail to turn off.	• Replace/check ribbon cables on module. • Replace the module.
A section of the display is not working. The section extends all the way to the right side of the display.	• Replace/check the ribbon cable. • Check power to module. • Replace the first module/driver on the left side of the first module that is not working. • Replace the second module that is not working. • Replace the power supply assembly on the first module that is not working.
One row of modules does not work or is garbled.	• Replace/check ribbon cable to first module. • Check for bent pins on module and controller • Replace first module. • Replace controller. • Check the fuses in the power termination box.
A group of modules, (a column of block) which share the same power supply assembly, fail to work.	• Check voltage to module. • Check the wire connections at the power supply. • Replace the power supply assembly.
Entire display fails to work.	• Check for proper line voltage into the power termination panel. • Check fuse in power termination panel. • Check for correct power to controller and modules. • Check/replace the ribbon cable from the controller to the modules. • Check the voltage settings on the power supplies. • Verify proper use of the software in the operation manual. • Replace the controller. • (For direct displays) Check the signal cable from the computer to the controller by doing a loop back test. (See **Appendix B**)
Temperature always reads –196F/-127C degrees F/ C	• Check temperature sensor connections. • Replace the temperature sensor. • Replace the controller.

Display is stuck on bright or dim.	• Check Manual/Auto dimming in Venus 1500 software. • Check light detector cable. • Check the address on the Light Sensor • Check light detector for obstructions. • Replace the light detector. • Replace the controller.

4.10 Initial Operation Information

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

1. Product Name (Galaxy®)
2. Display Size (Row x Column)
3. Shading (32K RGB)
4. Bootloader Version (OS X.XX)
5. Firmware Number (**ED-13305**)
6. Firmware Revision (Rev X.XX)
7. Hardware Address (HW:XX)
8. Software Address (SW:XX)
9. IP Address: (172.16.192.25)
10. Subnet Msk: (255.255.0.0)
11. COM1 Configuration (C1:V15) ((Modem C1:V15) If a Modem is present)
12. Line Frequency (CLK:60 Hz)
13. Display Name Description

4.11 Replacement Parts List

The following tables contain some of the items that may need to be replaced in these displays 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 II, 48x168, Louvered Galaxy	0A-1229-0005
Module, 2R2G2B (1:1) 8x8 (30x70) Type 1	0A-1208-2552
Power Supply Assembly, 2 A-1633, 1 A-1591	0A-1241-4001 and 0A-1213-4034
Thermostat Enclosure 85-70-9L	0A-1213-4024
Digit Light Sensor	0P-1247-0003
Assembly, CAN Temp/Photo Sensor Housing	0A-1151-0005
Digit Temperature Sensor	0P-1247-0007
Filter; Air, Gasket, 7.50” x 13.50” x .88”	EN-1774
Fan; 250CFM, 115VAC, 0.65A, 5.84x6.0”	B-1019
Transformer; Pri 115V, Sec 10VCT@3A (120V Displays)	T-1119
Filter, RFI Line 10 AMP 120 VAC	Z-1007
Fan Finger Guard (for B-1019 fan)	HS-1130
Modem Board; 232 Coated	0P-1279-0003
Fiber Board; RS232 to Fiber, 12V	0P-1127-0024
Surge Board Assembly	0P-1146-0031
Signal Converter (RS232/RS422)	0A-1127-0237
Signal Converter (RS232/Fiber)	0A-1127-0239
Outdoor Client Radio Interface, QC, Gen 2	0A-1146-0078
Outdoor Server Radio Interface, QC, Gen 2	0A-1146-0079
Radio TX Interface J-box, signal converter	0A-1279-0161
Modem/Radio Interface J-box, signal converter	0A-1279-0168
Cables:	
Cable Assy; 20 pos, Ribbon 18”, Dual row	W-1387
Ribbon Cable; 20 pos, 30”	0A-1000-0017
Ribbon Cable; 20 Pos, 36”	0A-1000-0018
Ribbon Cable; 20 Pos, 60”	0A-1000-0021
Cable; 18” RJ11; 6-Cond., Straight	0A-1137-0160
Cable; RJ45, 8-Cond, M-M, Straight, 18”	0A-1229-0054
Cable; 10-pin male to 10-pin male, 4’, QC	W-1483
Cable; 10-pin male to 10-pin male, 10’, QC	W-1500

Cable; 10ft, RJ45, 4 pair twisted, Black	W-1383
Cable; 20ft, RJ45, 4 pair twisted 24 AWG	W-1406
Cable; 22 AWG (Light Sensor/Temp Sensor to Controller)	W-1234
Quick Connect Interface, Input	0P-1229-2001
Quick Connect Interface, Output	0P-1229-2002
Power Supply, (A-1633@1, A-1591@1) RGB	0A-1213-4034
Power Supply; (A-1633@2, A-1591@1) RGB	0A-1241-4001
Electrical Contact Cleaner Lubricant / Cal-Lube	CH-1019
Hex Wrench, T-Handle 1/8" RT	TH-1062
Manual; Venus 1500 Operator's, Version 3.0	**ED13530**

4.12 Daktronics Exchange and Repair and Return Programs

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

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

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

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

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

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

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

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

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

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

This is how to reach us:

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

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

Fax: 605-697-4444

E-mail: helpdesk@daktronics.com

Appendix A: Reference Drawings

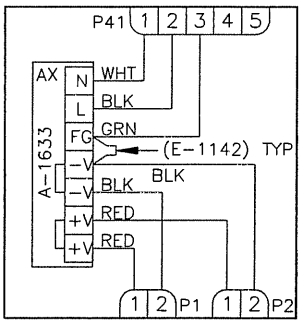
Refer to **Section 1.5** for information on reading drawing numbers. The following drawings are listed in numerical order by size (A, B, etc.)

Schematic; Power Supply Configurations ..... **Drawing A-126330**
Power Term Box, AF-3X65, 8-Pos. ..... **Drawing A-154965**
Comp. Layout; AF-3165-8/16/24/32x48-34-RGB ..... **Drawing A-172652**
Comp. Layout; AF-3165-40/48x48-34-RGB ..... **Drawing A-172655**
Comp. Layout; AF-3165-8/16/24/32x64-34-RGB ..... **Drawing A-172657**
Comp. Layout; AF-3165-40/48x64-34 RGB ..... **Drawing A-172658**
Comp. Layout; AF-3165-8/16/24/32x80-34-RGB ..... **Drawing A-172660**
Comp. Layout; AF-3165-40/48x80-34-RGB ..... **Drawing A-172662**
Comp. Layout; AF-3165-8/16/24/32-96-34-RGB ..... **Drawing A-172667**
Comp. Layout; AF-3165-40/48x96-34-RGB ..... **Drawing A-172669**
Comp, Layout; AF-3165-8/16/24/32x112-34-RGB ..... **Drawing A-172674**
Comp. Layout; AF-3165-40/48x112-34-RGB ..... **Drawing A-172679**
Comp. Layout; AF-3165-8/16/24/32x128-34-RGB ..... **Drawing A-172680**
Comp. Layout; AF-3165-40/48x128-34-RGB ..... **Drawing A-172682**
Comp. Layout; AF-3165-8/16/24/32x144-34-RGB ..... **Drawing A-172684**
Comp. Layout; AF-3165-40/48x144-34-RGB ..... **Drawing A-172687**
Symbols; AF-3165 Component Layout ..... **Drawing A-172691**
System Riser Diagram, RS422 ..... **Drawing A-174135**
System Riser Diagram, RS232 ..... **Drawing A-174341**
System Riser Diagram, Modem ..... **Drawing A-174342**
System Riser Diagram, Fiber ..... **Drawing A-174344**
Power Term Box 2-Pos ..... **Drawing A-175131**
Power Specs, 8x48-48X144 Display RGB ..... **Drawing A-179873**
System Riser Diagram; QC Outdoor Radio, Gen 2 ..... **Drawing A-185359**
Detail, AF-3165-8/16x**-Pwr/Control Corner ..... **Drawing A-186055**
Detail, AF-3165-24/32/40/48x**-Pwr/Control Corner ..... **Drawing A-186056**

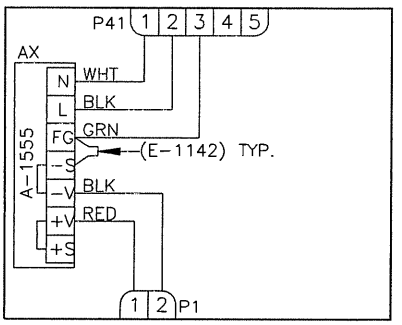
Shop Drawing, AF-3165-8-32 High-34-RGB ..... **Drawing B-172745**
Shop Drawing, AF-3165-40-48 High-34-RGB ..... **Drawing B-172746**
Schematic, Signal Wiring Internal, W/Quick Connect PCB ..... **Drawing B-177662**
Controller, Galaxy, 8 Conn, J-1087 ..... **Drawing B-177838**
Schematic, AF-3165-24X***-34, Gen 2 ..... **Drawing B-185684**
Schematic, AF-3165-8X***-34, Gen 2 ..... **Drawing B-185682**

Schematic, AF-3165-16/32/48/64X***-34, Gen 2 ..... **Drawing C-185683**
Schematic, AF-3165-40X***-34, Gen 2 ..... **Drawing C-185685**

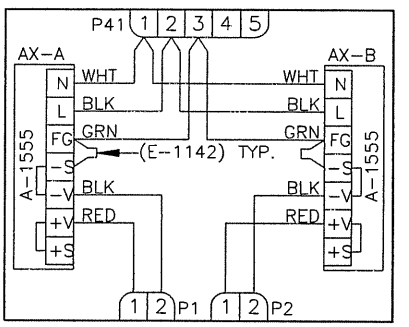
9VDC VERSION
0A-1213-2039, **0A-1327-0099**
(SET POWER SUPPLIES TO 9.0VDC)



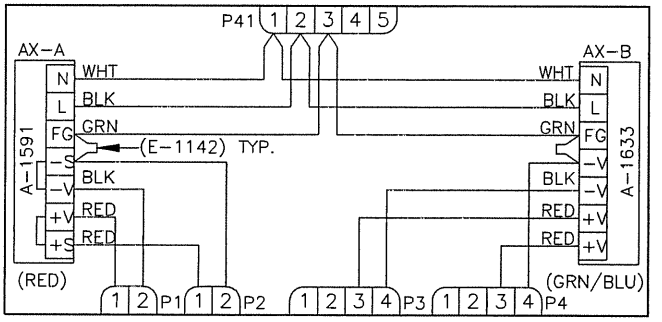
12VDC VERSION (SINGLE)
0A-1213-2011, **0A-1327-0097**
(SET POWER SUPPLIES TO 11.0VDC)



12VDC VERSION (DUAL)
0A-1213-2043, **0A-1327-0098**
(SET POWER SUPPLIES TO 11.0VDC)

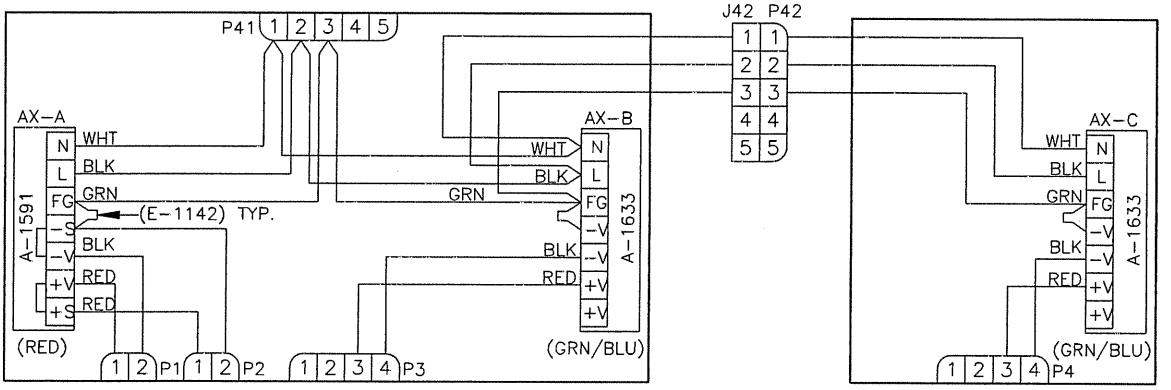


6.5/9.5VDC VERSION (DUAL FOR RG/RGB)
0A-1213-2042, **0A-1327-0096**
SET POWER SUPPLIES TO 6.5VDC (A-1591) AND 9.5VDC (A-1633)



4 MODS 4 MODS 4 MODS 4 MODS RG (NOT USED ON RGB)

6.5/9.5VDC VERSION (TRIPLE FOR RGB)
0A-1241-2001, **0A-1327-0095**
SET POWER SUPPLIES TO 6.5VDC (A-1591) AND 9.5VDC (A-1633)



4 MODS 4 MODS 4 MODS 4 MODS

NOTES

1) ALL WIRE IS 14 AWG EXCEPT * IS 18 AWG UNLESS OTHERWISE NOTED.
2) **ASSEMBLY NUMBERS IN BOLD HAVE MOUNTING BRACKET (0M-212638).**

REV.	DATE	DESCRIPTION	BY	APPR.
06	27JUL04	ADDED NEW ASSY NUMBERS 0A-1327-0095, -0096,-0097,-0098, -0099.	DJM	
05	16OCT01	CHANGED ASSEMBLY NUMBERS FROM (4013, 4026, 4022, 4034, 4001) TO (2039, 2011, 2043, 2042, 2001) RESPECTIVELY.	DJM	
04	08MAY01	ADDED 0A--1241-4001 ASSEMBLY	LLK	
03	03 JAN 01	ADDED 0A--1213-4034 PACKET	LMH	
02	09MAY00	CHANGED 0A-1213--4013 PS ASSEMBLY FROM 9.6VDC TO 9.0VDC.	LLK	
01	20APR00	CHANGED 0A-1213-4004 PACKET TO 0A-1213-4013 FOR THE 9V POWER SUPPLY	MDM	

DAKTRONICS, INC. BROOKINGS, SD 57006

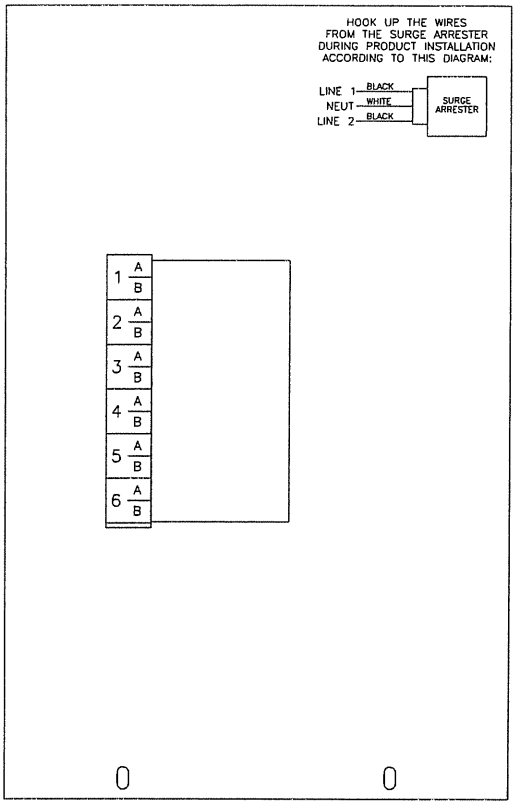
PROJ: 1.33" LINE DISPLAYS

TITLE: SCHEMATIC; POWER SUPPLY CONFIGURATIONS

DES. BY: DRAWN BY: LKERR DATE: 17 JAN 00

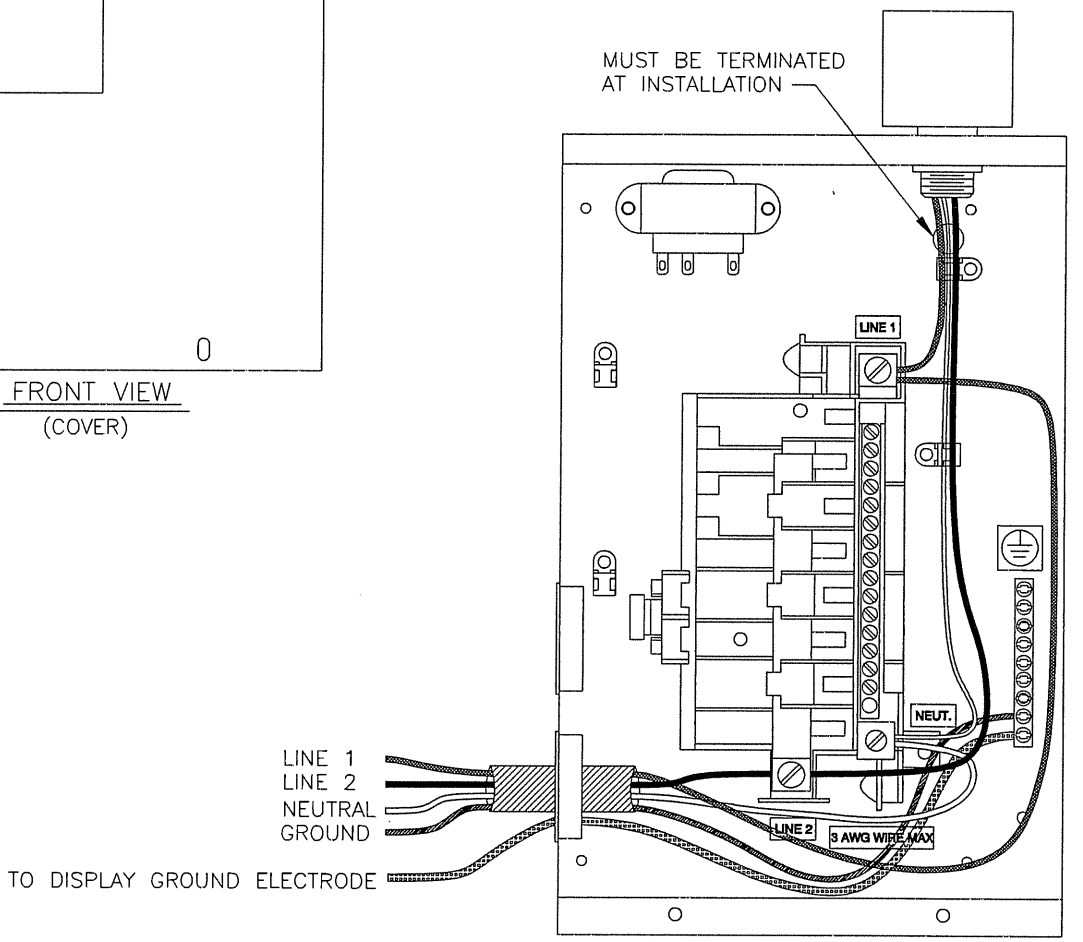
REVISION 06 APPR. BY: SCALE:

1213-R03A-126330



FRONT VIEW
(COVER)

ALL ELECTRICAL WORK (INCLUDING GROUNDING) MUST BE DONE ACCORDING TO LOCAL AREA AND THE NATIONAL ELECTRICAL CODES.



NOTE 1: IF DISPLAY IS POWERED WITH 120VAC SINGLE PHASE (TWO WIRE + GND), INSTALL A JUMPER BETWEEN LUG(LINE 1) AND LUG(LINE 2). SIZE JUMPER PER NEC.

REV.	DATE	DESCRIPTION	BY	APPR.

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: GALAXY, LOUVERED V1500 RGB 34MM

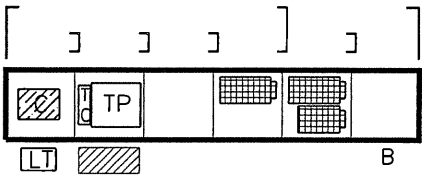
TITLE: POWER CONNECTION, AF-306X

DES. BY: DRAWN BY: DMATHERN DATE: 22AUG01

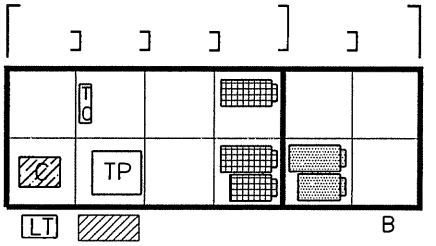
REVISION APPR. BY:

SCALE: NONE

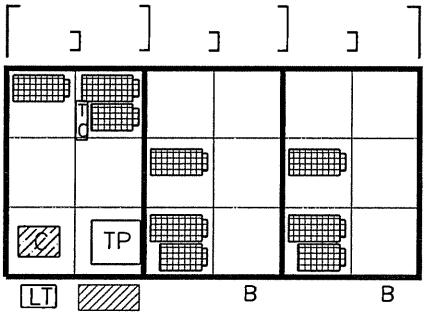
1241R01A-154965



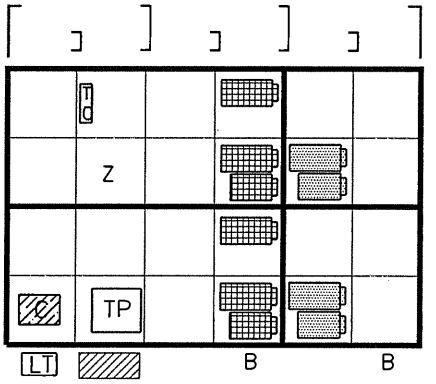
FRONT VIEW
AF-3165-848-34-RGB



FRONT VIEW
AF-3165-1648-34-RGB



FRONT VIEW
AF-3165-2448-34-RGB



FRONT VIEW
AF--3165-3248-34--RGB

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: GALAXY, LOUVERED V1500 RGB 34MM

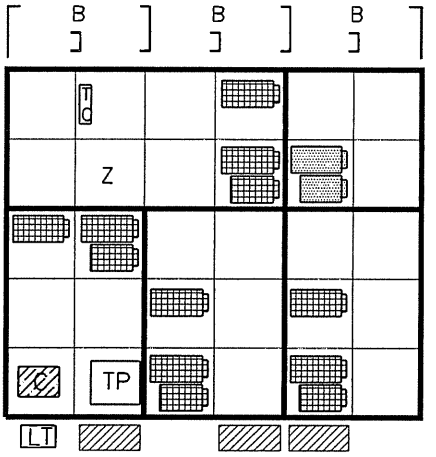
TITLE: COMP. LAYOUT; AF-3165-8/16/24/32X48-34-RGB

DES. BY: MMAMMENGA DRAWN BY: WTUCKER DATE: 22OCT2002

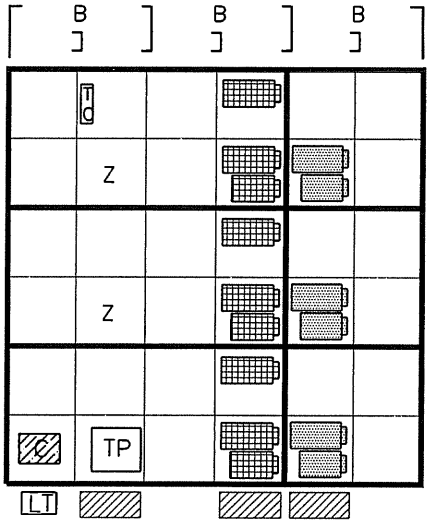
REVISION 01 | APPR. BY: | SCALE: NONE

1241-E10A-172652

REV.	DATE	DESCRIPTION	BY	APPR.
01	31MAR03	UPDATED LAYOUT	MLS	



FRONT VIEW
AF-3165-4048-34-RGB



FRONT VIEW
AF-3165-4848-34-RGB

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: GALAXY, LOUVERED V1500 RGB 34MM

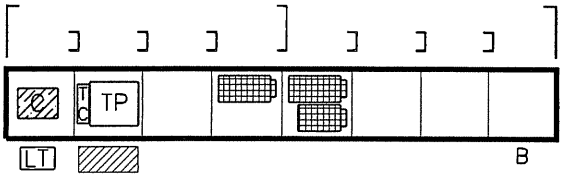
TITLE: COMP. LAYOUT; AF-3165-40/48X48-34-RGB

DES. BY: MMAMMENGA DRAWN BY: WTUCKER DATE: 22OCT2002

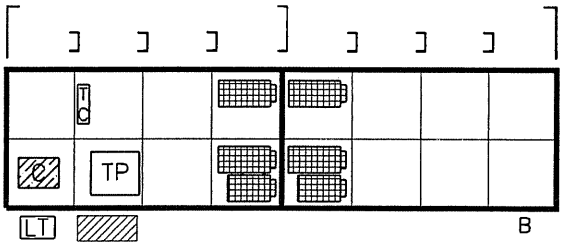
REVISION 01 | APPR. BY: | SCALE: NONE

1241-E10A-172655

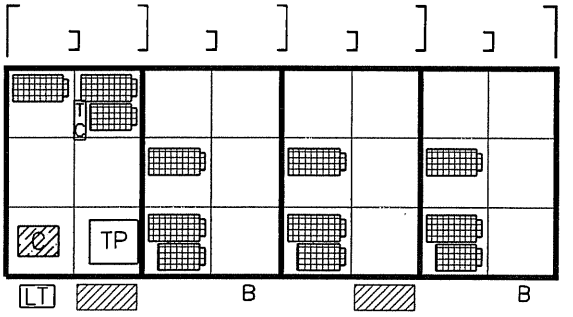
REV.	DATE	DESCRIPTION	BY	APPR.
01	31MAR03	UPDATED LAYOUT	MLS	



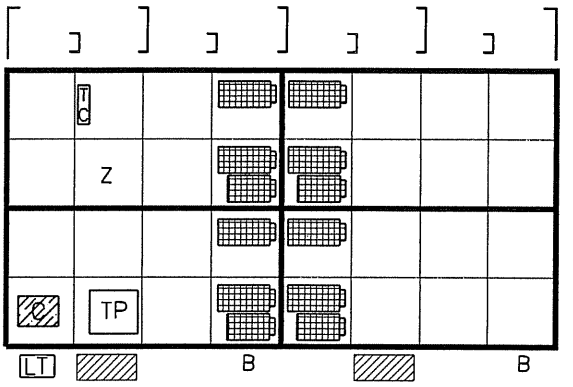
FRONT VIEW
AF-3165-864-34-RGB



FRONT VIEW
AF-3165-1664-34-RGB



FRONT VIEW
AF-3165-2464-34-RGB



FRONT VIEW
AF-3165-3264-34-RGB

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: GALAXY, LOUVERED V1500 RGB 34MM

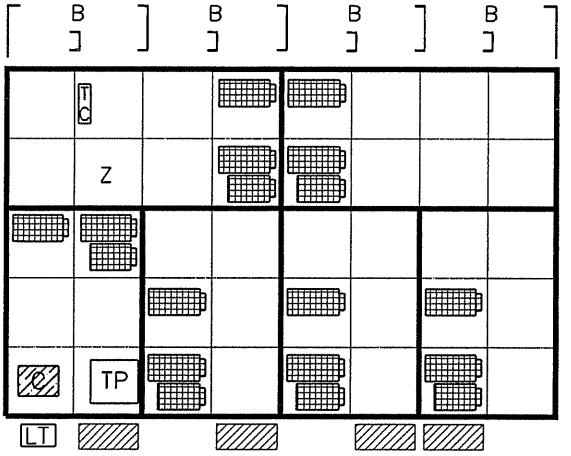
TITLE: COMP. LAYOUT; AF-3165-8/16/24/32X64-34-RGB

DES. BY: MMAMMENGA DRAWN BY: WTUCKER DATE: 22OCT2002

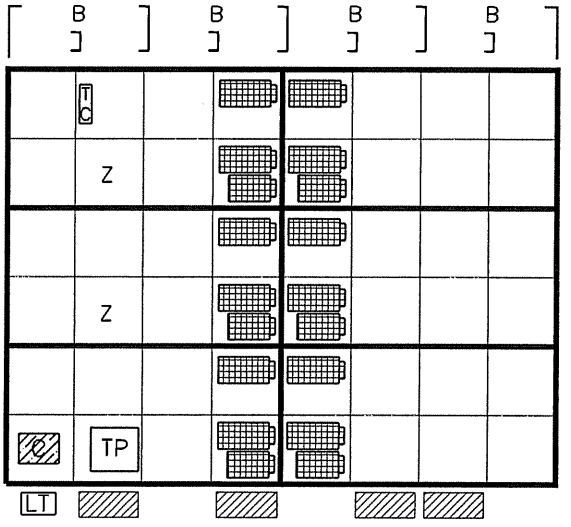
REVISION 01 | APPR. BY: | SCALE: NONE

1241-E10A-172657

REV.	DATE	DESCRIPTION	BY	APPR.
01	31 MAR 03	UPDATED DRAWING	MLS	



FRONT VIEW
AF-3165-4064-34-RGB



FRONT VIEW
AF-3165-4864-34-RGB

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: GALAXY, LOUVERED V1500 RGB 34MM

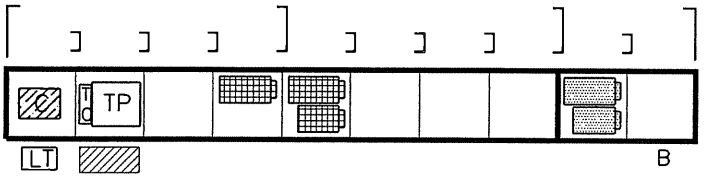
TITLE: COMP. LAYOUT; AF-3165-40/48X64-34-RGB

DES. BY: MMAMMENGA DRAWN BY: WTUCKER DATE: 22OCT2002

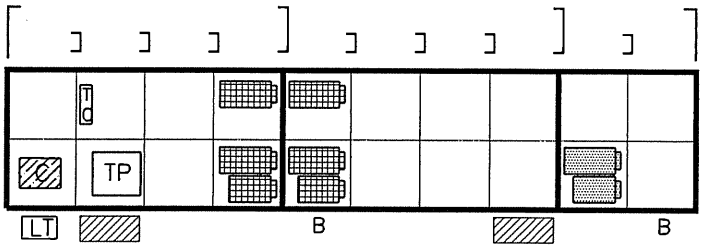
REVISION 01 | APPR. BY: | SCALE: NONE

1241-E10A-172658

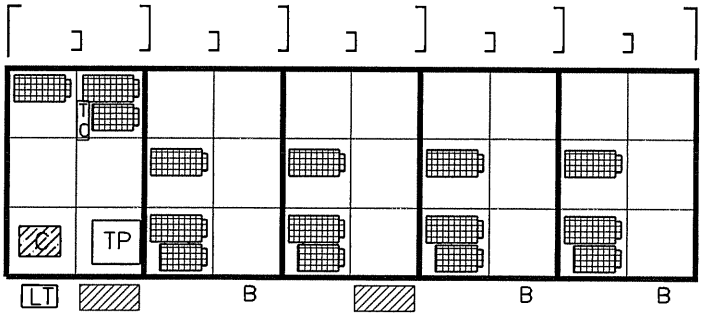
REV.	DATE	DESCRIPTION	BY	APPR.
01	31MAR03	UPDATED LAYOUT	MLS	



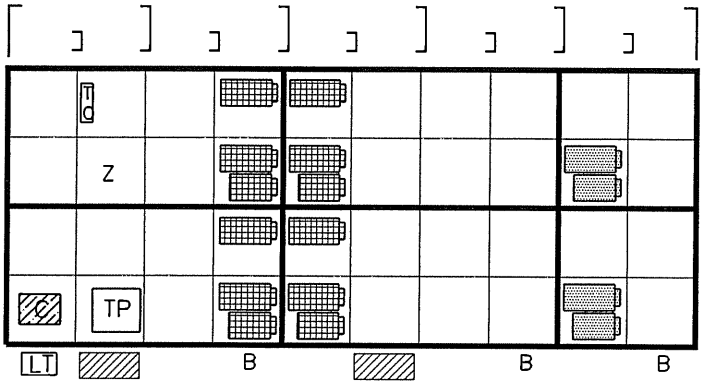
FRONT VIEW
AF-3165-880-34-RGB



FRONT VIEW
AF-3165-1680-34-RGB



FRONT VIEW
AF-3165-2480-34-RGB



FRONT VIEW
AF-3165-3280-34-RGB

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: GALAXY, LOUVERED V1500 RGB 34MM

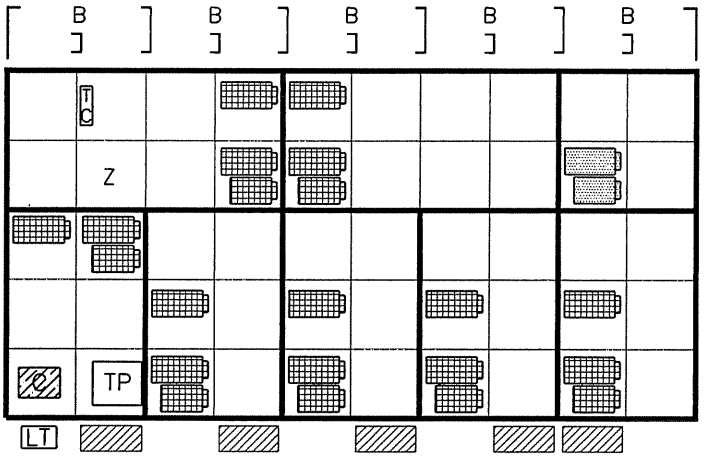
TITLE: COMP. LAYOUT; AF-3165-8/16/24/32X80-34-RGB

DES. BY: MMAMMENGA DRAWN BY: WTUCKER DATE: 22OCT2002

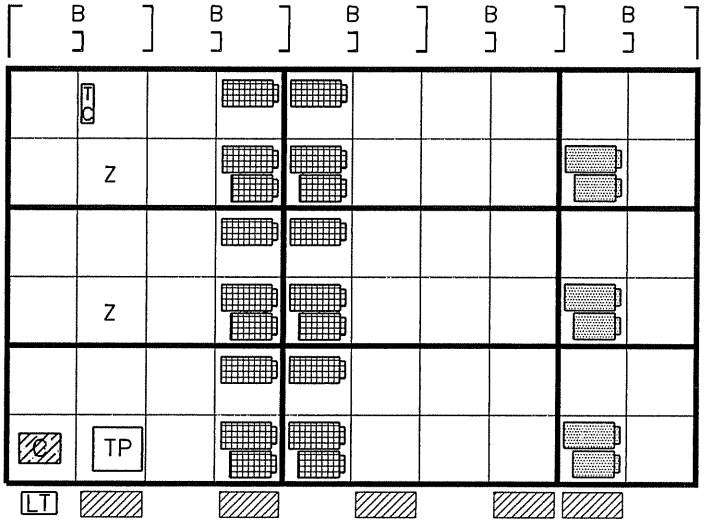
REVISION 01 | APPR. BY: | SCALE: NONE

1241-E10A-172660

REV.	DATE	DESCRIPTION	BY	APPR.
01	31MAR03	UPDATED LAYOUT	MLS	



FRONT VIEW
AF-3165-4080-34-RGB



FRONT VIEW
AF-3165-4880-34-RGB

REV.	DATE	DESCRIPTION	BY	APPR.
01	31MAR03	UPDATED LAYOUT	MLS	

DAKTRONICS, INC. BROOKINGS, SD 57006

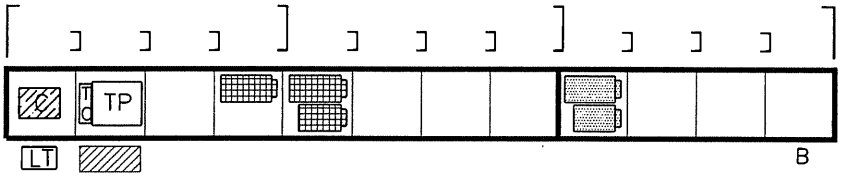
PROJ: GALAXY, LOUVERED V1500 RGB 34MM

TITLE: COMP. LAYOUT; AF-3165-40/48X80-34-RGB

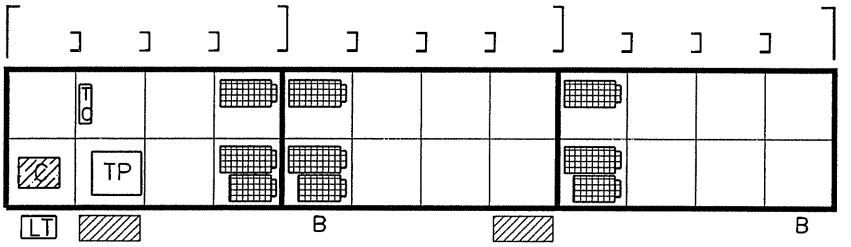
DES. BY: MMAMMENGA DRAWN BY: WTUCKER DATE: 22OCT2002

REVISION 01 | APPR. BY: | SCALE: NONE

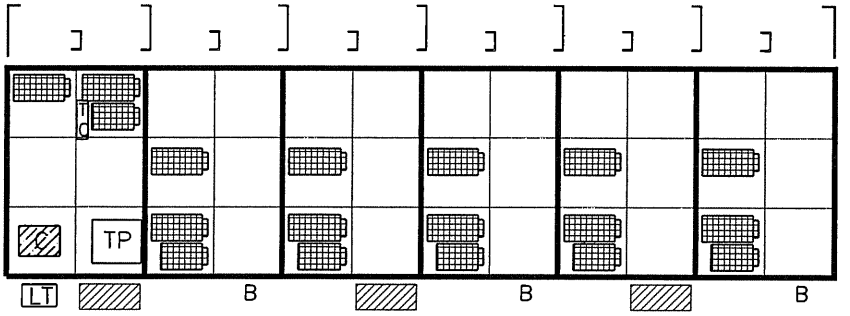
1241-E10A-172662



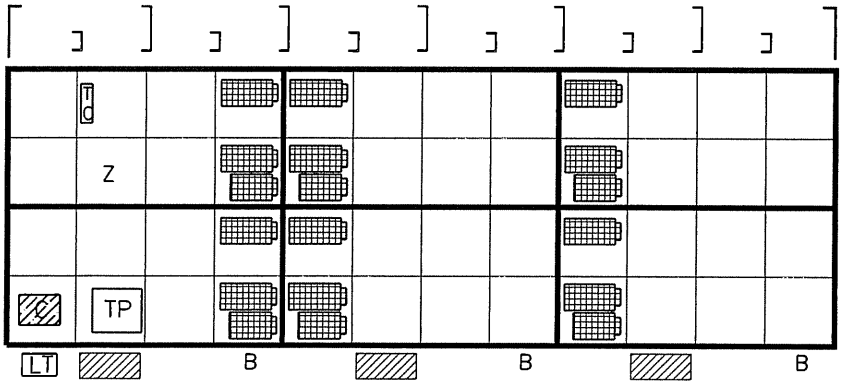
FRONT VIEW
AF-3165-896-34-RGB



FRONT VIEW
AF-3165-1696-34-RGB



FRONT VIEW
AF-3165-2496-34-RGB



FRONT VIEW
AF-3165-3296-34-RGB

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: GALAXY, LOUVERED V1500 RGB 34MM

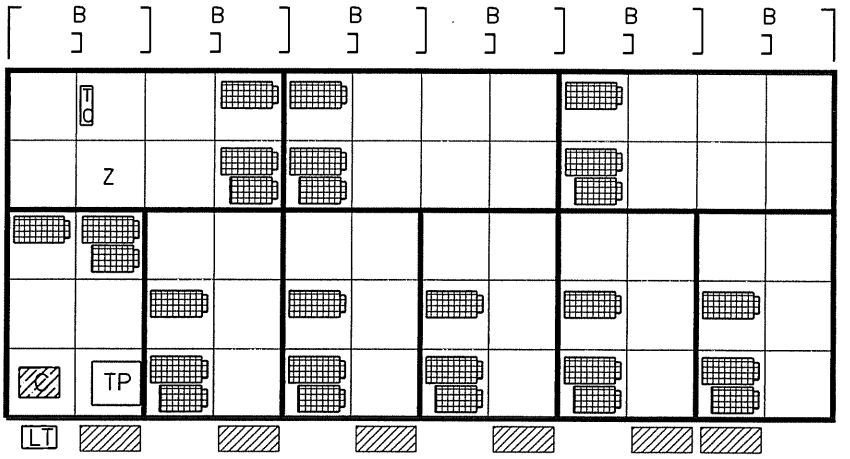
TITLE: COMP. LAYOUT; AF-3165-8/16/24/32X96-34-RGB

DES. BY: MMAMMENGA DRAWN BY: WTUCKER DATE: 21OCT2002

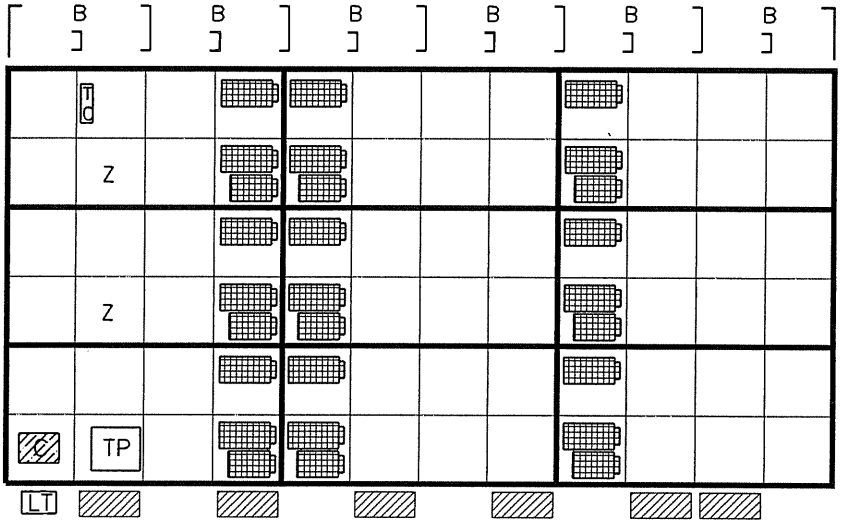
REVISION 01 | APPR. BY: | SCALE: NONE

1241-E10A-172667

REV.	DATE	DESCRIPTION	BY	APPR.
01	31MAR03	UPDATED LAYOUT	MLS	



FRONT VIEW
AF-3165-4096-34-RGB



FRONT VIEW
AF-3165-4896-34-RGB

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: GALAXY, LOUVERED V1500 RGB 34MM

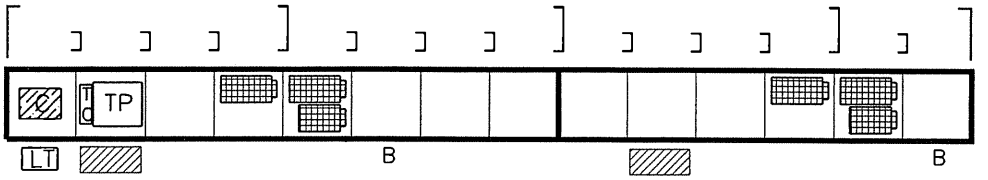
TITLE: COMP. LAYOUT; AF-3165-40/48X96-34-RGB

DES. BY: MMAMMENGA DRAWN BY: WTUCKER DATE: 21OCT2002

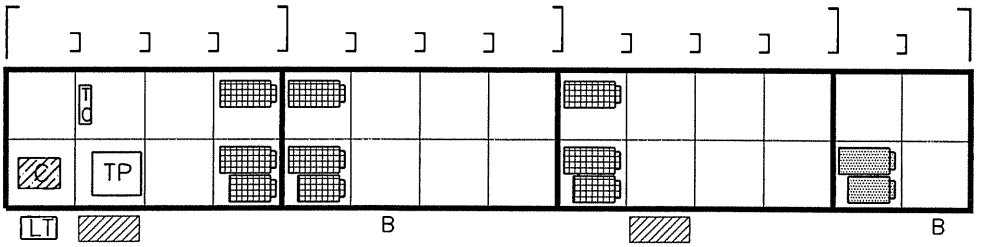
REVISION 01 | APPR. BY: | SCALE: NONE

1241-E10A-172669

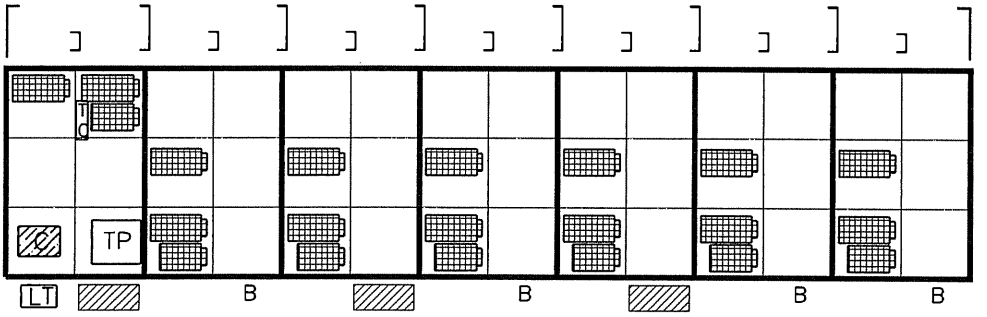
REV.	DATE	DESCRIPTION	BY	APPR.
01	31MAR03	UPDATED LAYOUT	MLS	



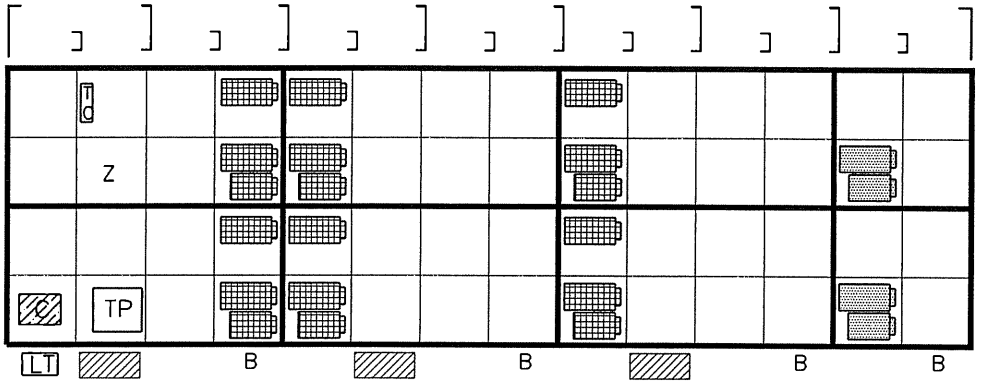
FRONT VIEW
AF-3165-8112-34-RGB



FRONT VIEW
AF-3165-16112-34-RGB



FRONT VIEW
AF-3165-24112-34-RGB



FRONT VIEW
AF-3165-32112-34-RGB

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: GALAXY, LOUVERED V1500 RGB 34MM

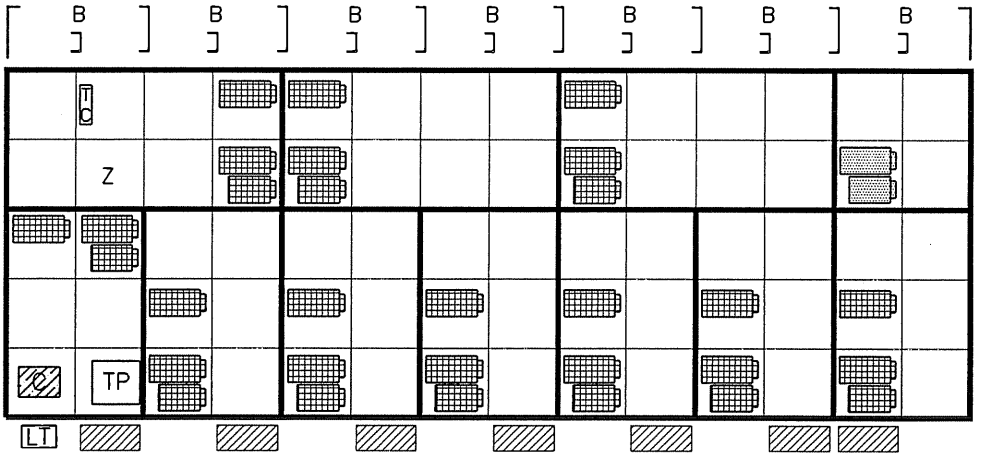
TITLE: COMP. LAYOUT; AF-3165-8/16/24/32X112-34-RGB

DES. BY: MMAMMENGA DRAWN BY: WTUCKER DATE: 21OCT2002

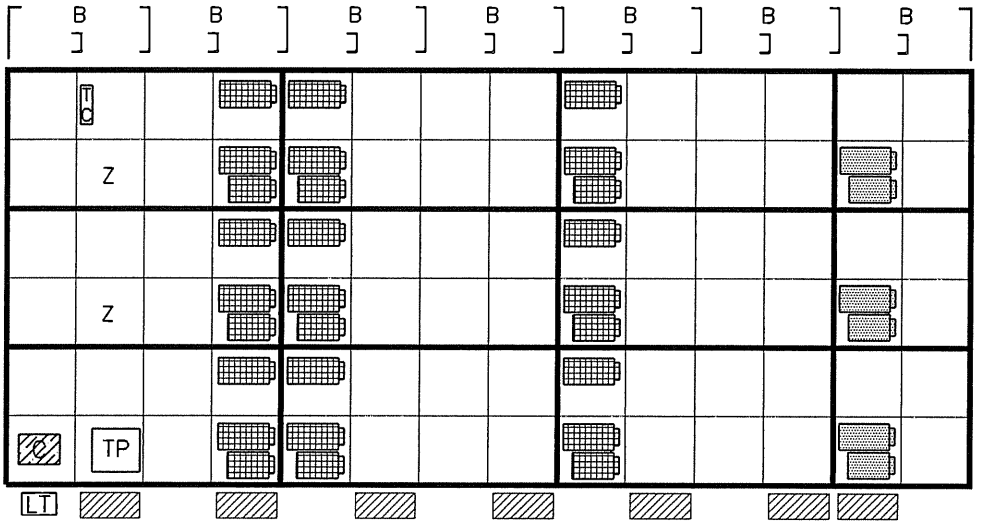
REVISION 01 | APPR. BY: | SCALE: NONE

1241-E10A-172674

REV.	DATE	DESCRIPTION	BY	APPR.
01	31MAR03	UPDATED LAYOUT	MLS	



FRONT VIEW
AF-3165-40112-34-RGB



FRONT VIEW
AF-3165-48112-34-RGB

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: GALAXY, LOUVERED V1500 RGB 34MM

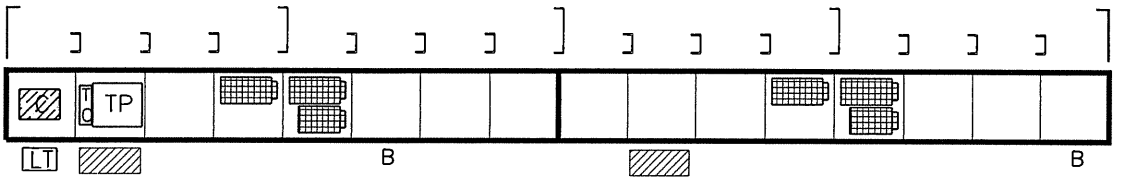
TITLE: COMP. LAYOUT; AF-3165-40/48X112-34-RGB

DES. BY: MMAMMENGA DRAWN BY: WTUCKER DATE: 21OCT2002

REVISION 01 | APPR. BY: | SCALE: NONE

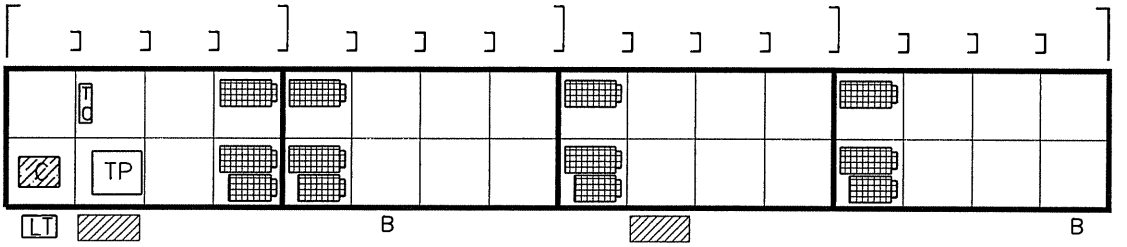
1241-E10A-172679

REV.	DATE	DESCRIPTION	BY	APPR.
01	31MAR03	UPDATED LAYOUT	MLS	



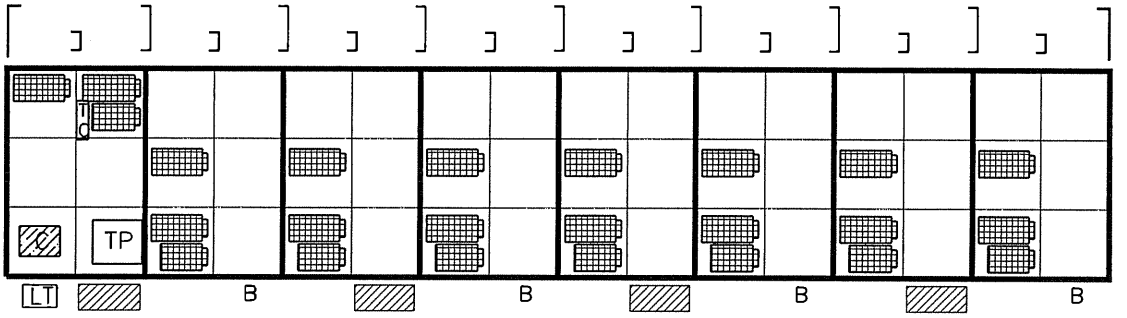
FRONT VIEW

AF-3165-8128-34-RGB



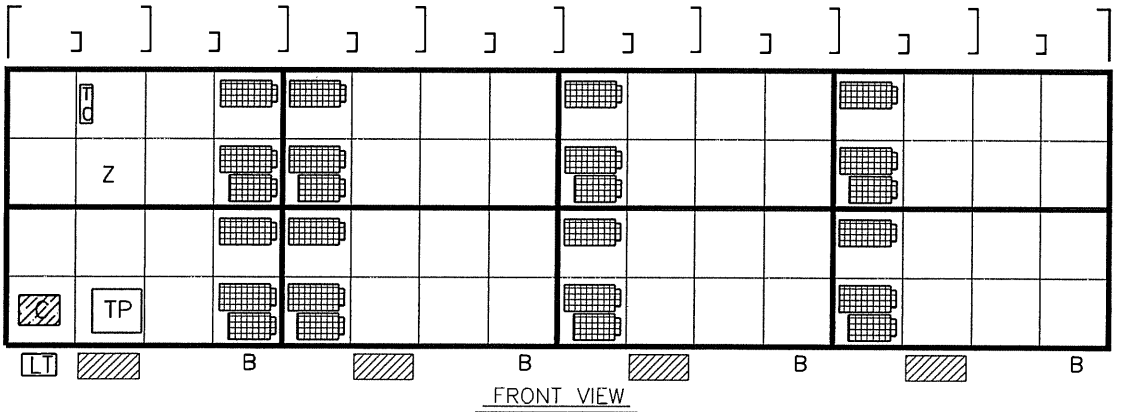
FRONT VIEW

AF-3165-16128-34-RGB



FRONT VIEW

AF-3165-24128-34-RGB



FRONT VIEW

AF-3165-32128-34-RGB

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: GALAXY, LOUVERED V1500 RGB 34MM

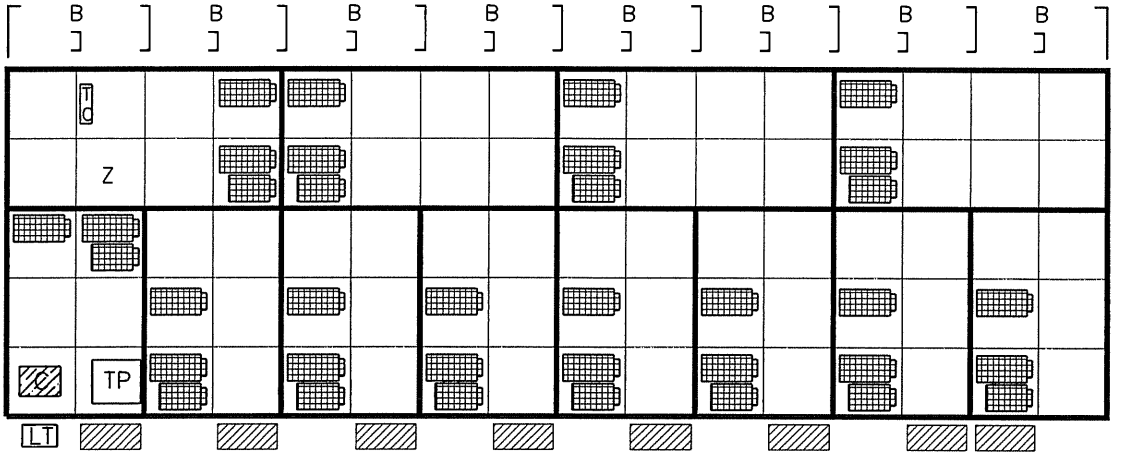
TITLE: COMP. LAYOUT; AF-3165-8/16/24/32X128-34-RGB

DES. BY: MMAMMENGA DRAWN BY: WTUCKER DATE: 21OCT2002

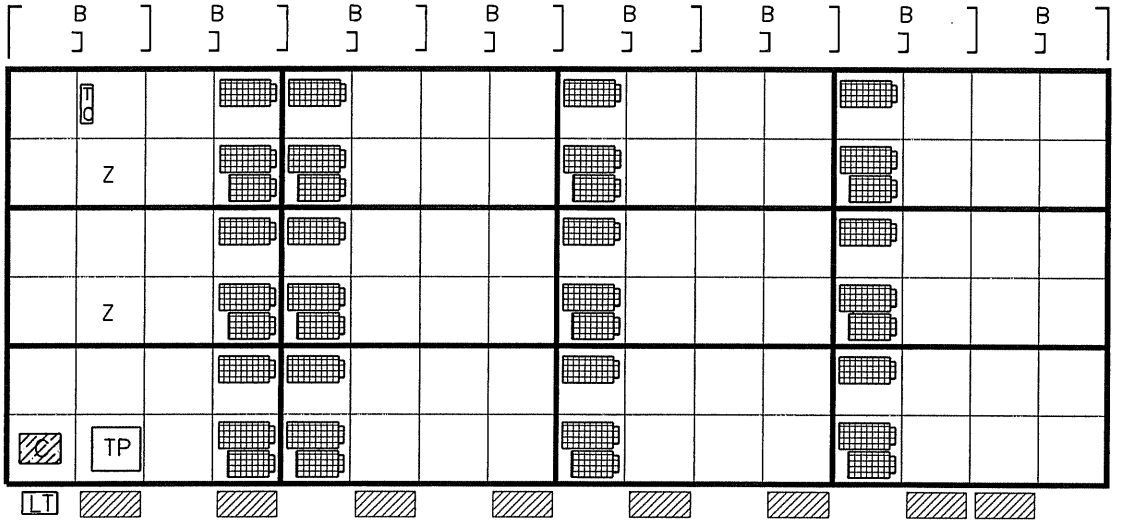
REVISION 01 | APPR. BY: | SCALE: NONE

1241-E10A-172680

REV.	DATE	DESCRIPTION	BY	APPR.
01	31MAR03	UPDATED LAYOUT	MLS	



FRONT VIEW
AF-3165-40128-34-RGB



FRONT VIEW
AF-3165-48128-34-RGB

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: GALAXY, LOUVERED V1500 RGB 34MM

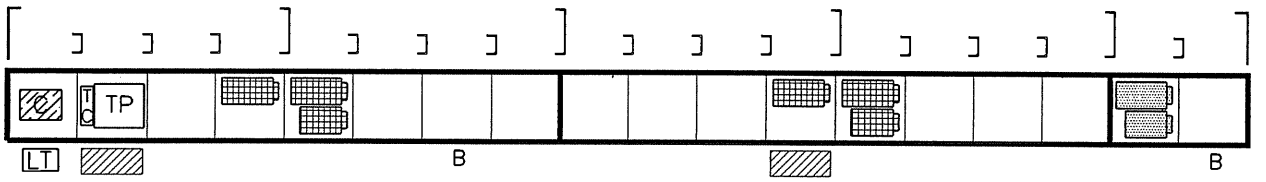
TITLE: COMP. LAYOUT; AF-3165-40/48X128-34-RGB

DES. BY: MMAMMENGA DRAWN BY: WTUCKER DATE: 21OCT2002

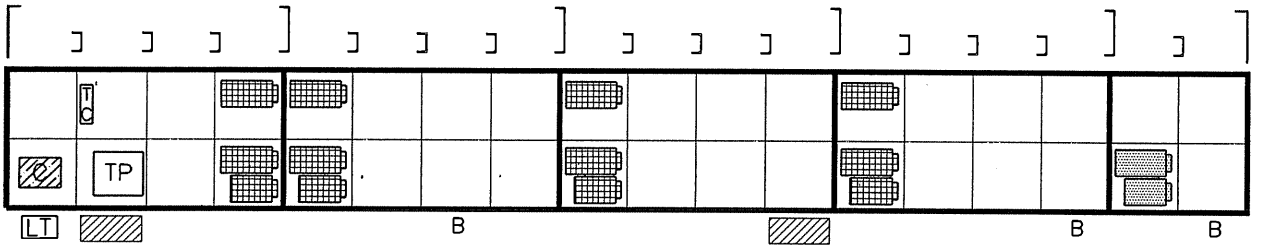
REVISION 01 | APPR. BY: | SCALE: NONE

1241-E10A-172682

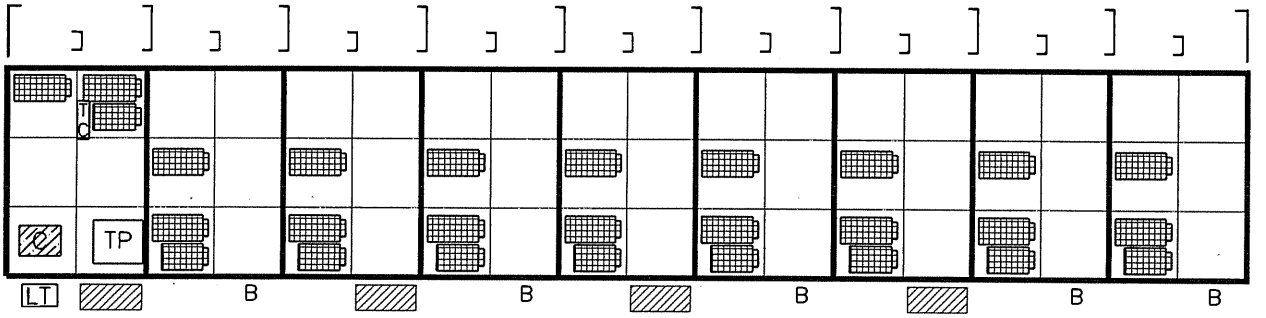
REV.	DATE	DESCRIPTION	BY	APPR.
01	31MAR03	UPDATED LAYOUT	MLS	



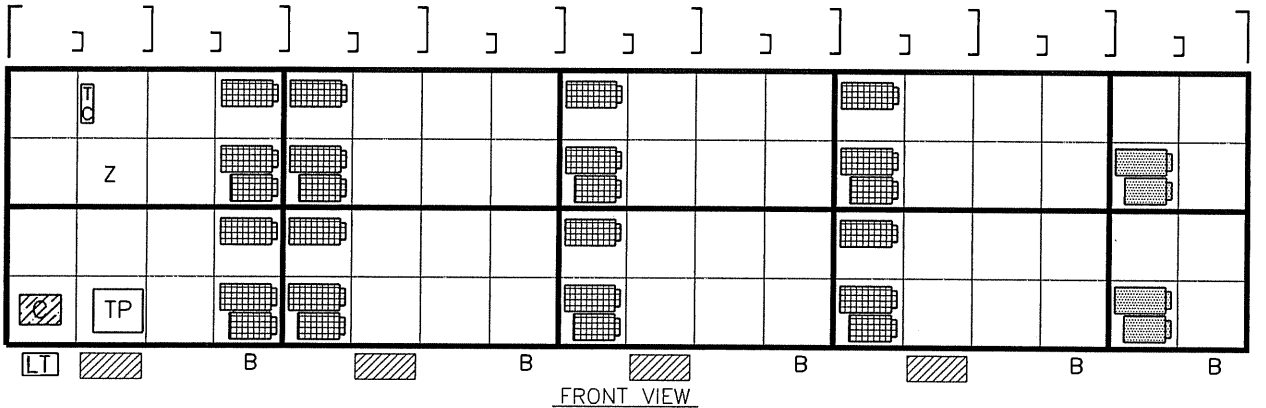
FRONT VIEW
AF-3165-8144-34-RGB



FRONT VIEW
AF-3165-16144-34-RGB



FRONT VIEW
AF-3165-24144-34-RGB



FRONT VIEW
AF-3165-32144-34-RGB

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: GALAXY, LOUVERED V1500 RGB 34MM

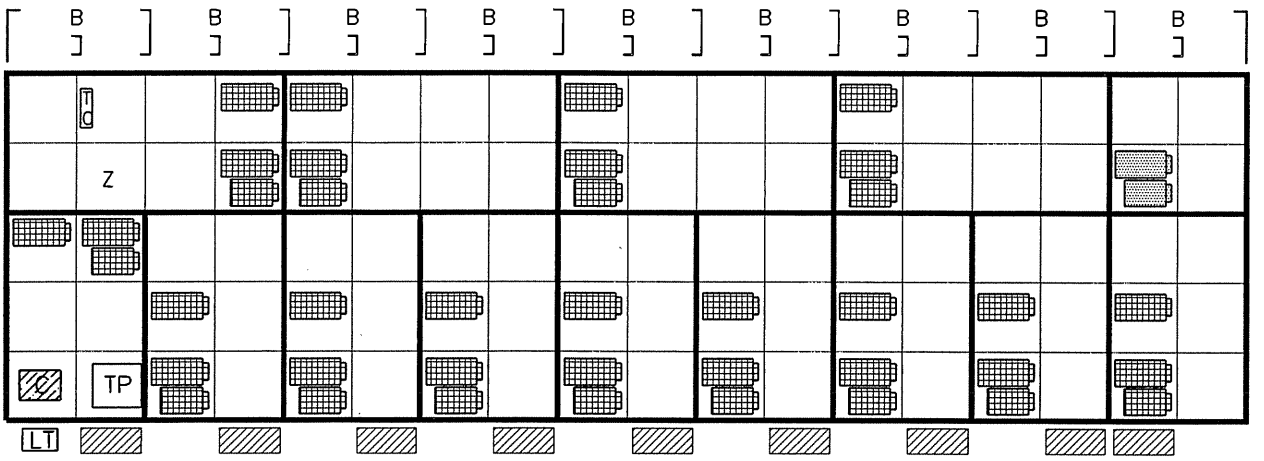
TITLE: COMP. LAYOUT; AF-3165-8/16/24/32X144-34-RGB

DES. BY: MMAMMENGA DRAWN BY: WTUCKER DATE: 17OCT2002

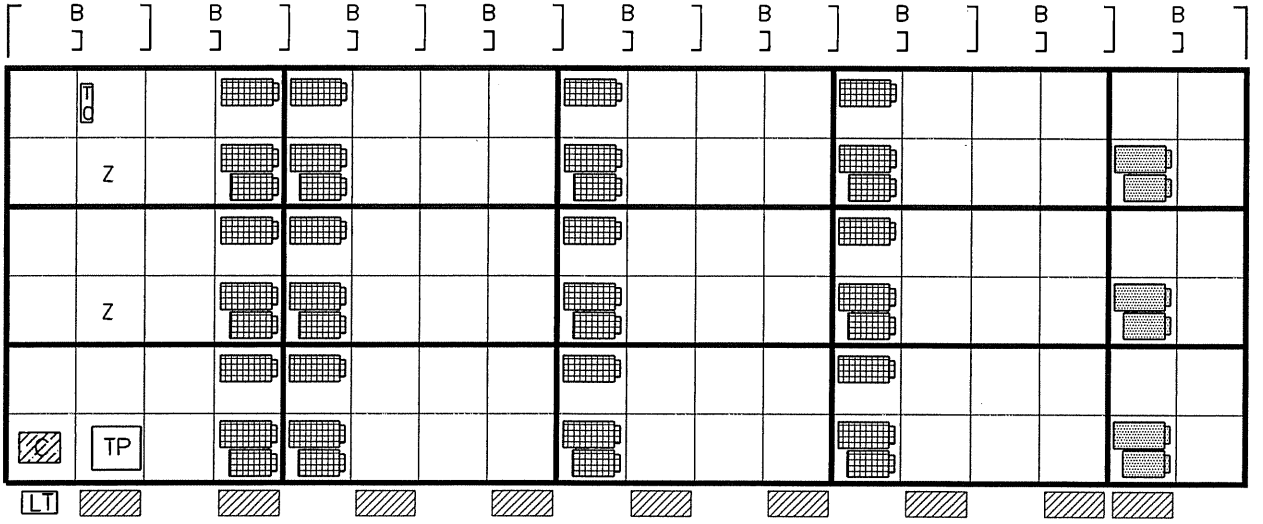
REVISION 01 | APPR. BY: | SCALE: NONE

1241-E10A-172684

REV.	DATE	DESCRIPTION	BY	APPR.
01	31MAR03	UPDATED LAYOUT	MLS	



FRONT VIEW
AF-3165-40144-34-RGB



FRONT VIEW
AF-3165-48144-34-RGB

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: GALAXY, LOUVERED V1500 RGB 34MM

TITLE: COMP. LAYOUT; AF-3165-40/48X144-34-RGB

DES. BY: MMAMMENGA DRAWN BY: WTUCKER DATE: 21OCT2002

REVISION 01 | APPR. BY: | SCALE: NONE | 1241-E10A-172687

REV.	DATE	DESCRIPTION	BY	APPR.
01	31MAR03	UPDATED LAYOUT	MLS	

TC	THERMOSTAT 0A-1213-4024 MOUNTED TO VERTICAL
LT	LIGHT DETECTOR 0A-1241-4013 (MASTER) 0A-1241-4009 (SLAVE)
Z	LINE FILTER 0A-1241-4002
	DARKER GRID LINES REPRESENT A GROUPING OF MODULES THAT ARE POWERED BY A GROUPING OF POWER SUPPLIES. ABOVE EXAMPLES SHOW SIX, EIGHT AND FOUR MODULE GROUPS.
	POWER SUPPLY CONFIGURATIONS 0A-1213-4034 A-1633 @1 AND A-1591 @1
	CONTROLLER & CAN TERMINATION 0A-1229-0001 & 0A-1241-4014
	AIR FILTER EN-1774
	POWER SUPPLY CONFIGURATIONS 0A-1241-4001 A-1633 @2 AND A-1591 @1
TP	POWER TERMINATION BOX 0A-1241-4019 IN 8 & 16 HIGH 0A-1241-4005 IN 24/32/40/48 HIGH
B	FAN 0A-1213-4010 B-1019 WITH HARDWARE
	MODULE 10.64" X 10.64"

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: GALAXY, LOUVERED V1500 RGB 34MM

TITLE: SYMBOLS; AF-3165 COMPONENT LAYOUT

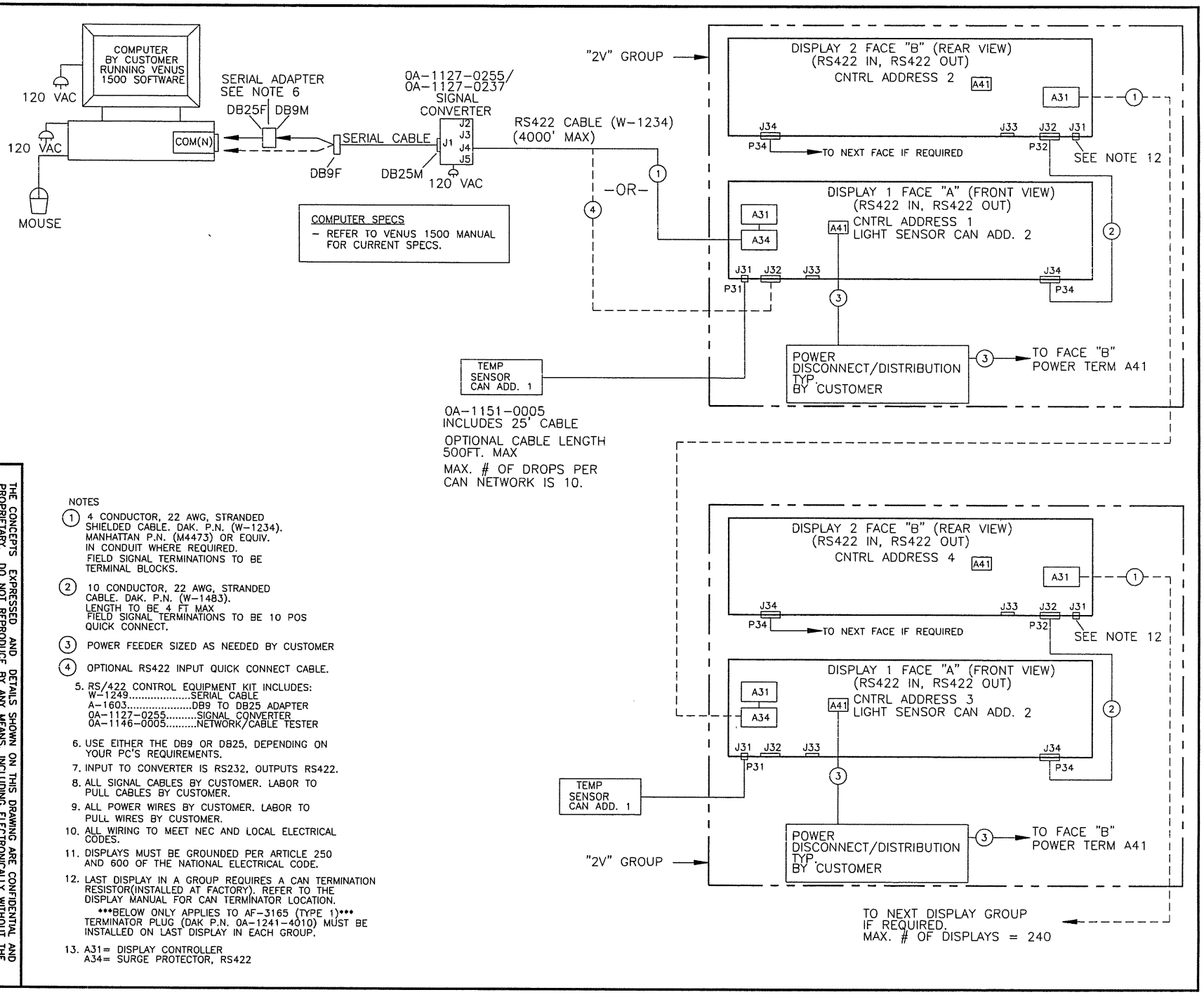
DES. BY: MMAMMENGA DRAWN BY: WTUCKER DATE: 22OCT2002

REVISION 01 | APPR. BY: | SCALE: NONE

1241-E10A-172691

REV.	DATE	DESCRIPTION	BY	APPR.
01	31 MAR 03	UPDATED SYMBOLS PER LAYOUT UPDATES	MLS	

REV.	DATE	DESCRIPTION	BY	APPR.
03	26 MAR 04	REPLACED 0A-1127-0237 WITH 0A-1127-0255 (INCLUDES SURGE PROTECTION)	SAI	DJM
02	26DEC03	CHANGED TEMP SENSOR PART NUMBER FROM 0A-1241-4017 TO 0A-1151-0005. REMOVED NOTE2.	DJM	
01	27JAN03	REMOVED CHART 1 (PWR, SIGNAL, SPEC). REPLACED 0A-1241-4016 WITH W-1483. ADDED TO TERM PLUG NOTE.	DJM	



NOTES

1. 4 CONDUCTOR, 22 AWG, STRANDED SHIELDED CABLE. DAK. P.N. (W-1234). MANHATTAN P.N. (M4473) OR EQUIV. IN CONDUIT WHERE REQUIRED. FIELD SIGNAL TERMINATIONS TO BE TERMINAL BLOCKS.
2. 10 CONDUCTOR, 22 AWG, STRANDED CABLE. DAK. P.N. (W-1483). LENGTH TO BE 4 FT MAX FIELD SIGNAL TERMINATIONS TO BE 10 POS QUICK CONNECT.
3. POWER FEEDER SIZED AS NEEDED BY CUSTOMER
4. OPTIONAL RS422 INPUT QUICK CONNECT CABLE.
5. RS/422 CONTROL EQUIPMENT KIT INCLUDES:
   W-1249.....SERIAL CABLE
   A-1603.....DB9 TO DB25 ADAPTER
   0A-1127-0255.....SIGNAL CONVERTER
   0A-1146-0005.....NETWORK/CABLE TESTER
6. USE EITHER THE DB9 OR DB25, DEPENDING ON YOUR PC'S REQUIREMENTS.
7. INPUT TO CONVERTER IS RS232, OUTPUTS RS422.
8. ALL SIGNAL CABLES BY CUSTOMER. LABOR TO PULL CABLES BY CUSTOMER.
9. ALL POWER WIRES BY CUSTOMER. LABOR TO PULL WIRES BY CUSTOMER.
10. ALL WIRING TO MEET NEC AND LOCAL ELECTRICAL CODES.
11. DISPLAYS MUST BE GROUNDED PER ARTICLE 250 AND 600 OF THE NATIONAL ELECTRICAL CODE.
12. LAST DISPLAY IN A GROUP REQUIRES A CAN TERMINATION RESISTOR(INSTALLED AT FACTORY). REFER TO THE DISPLAY MANUAL FOR CAN TERMINATOR LOCATION.
    BELOW ONLY APPLIES TO AF-3165 (TYPE 1) TERMINATOR PLUG (DAK P.N. 0A-1241-4010) MUST BE INSTALLED ON LAST DISPLAY IN EACH GROUP.
13. A31= DISPLAY CONTROLLER
    A34= SURGE PROTECTOR, RS422

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: OUTDOOR LED PRODUCT LINE

TITLE: SYSTEM RISER DIAGRAM, RS422

DES. BY:

DRAWN BY: LKERR

DATE: 22AUG02

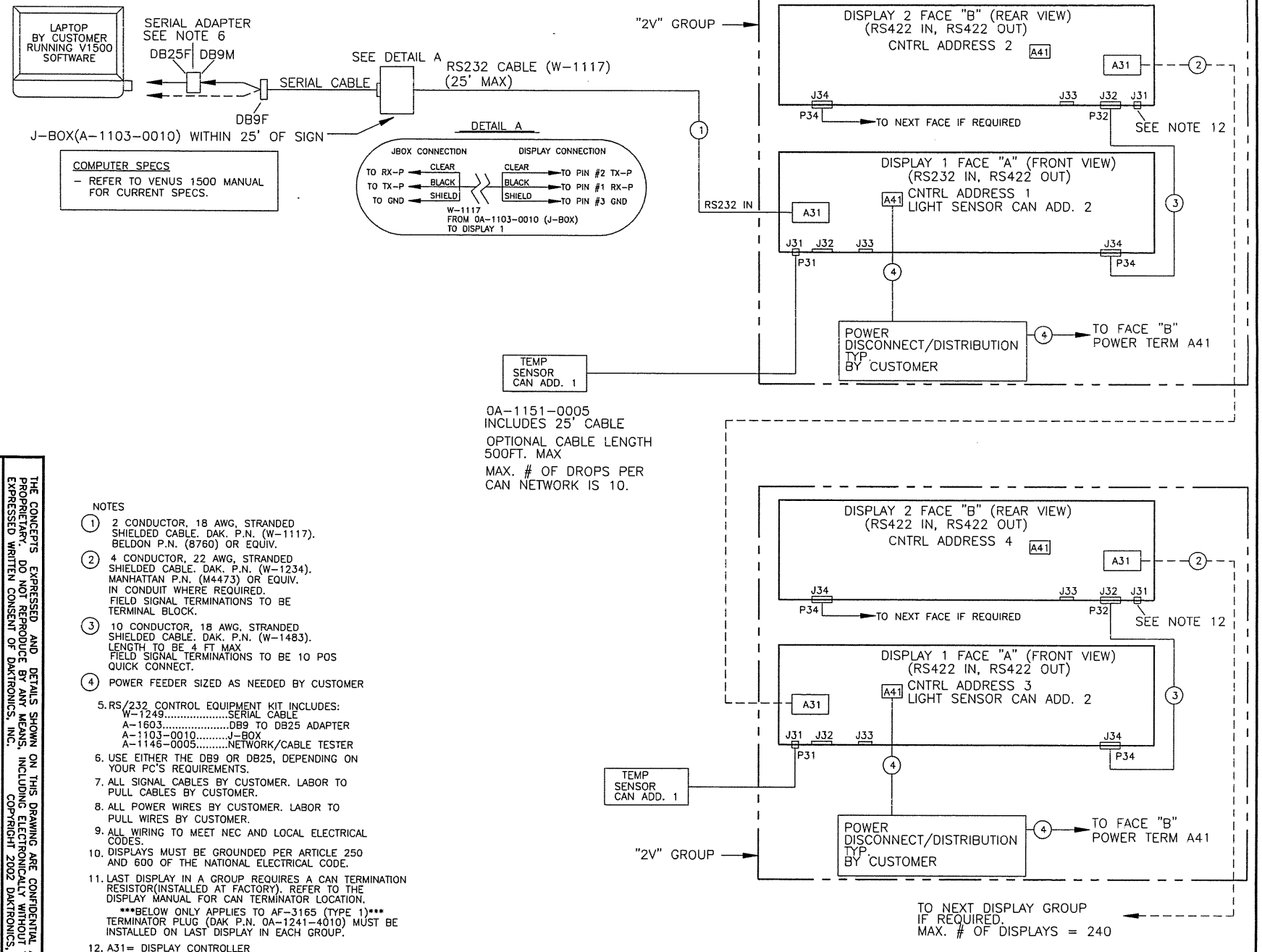
APPR. BY:

SCALE: NONE

REVISION 03

1229-R01A-17413 5

REV.	DATE	DESCRIPTION	BY	APPR.
02	26DEC03	CHANGED TEMP SENSOR PART NUMBER FROM 0A-1241-4017 TO 0A-1151-0005. REMOVED NOTE 3 AND 6.	DJM	
01	27JAN03	REMOVED CHART 1 (PWR, SIGNAL, SPEC). REPLACED 0A-1241-4016 WITH W-1483. ADDED TO TERM PLUG NOTE.	DJM	



NOTES

1. 2 CONDUCTOR, 18 AWG, STRANDED SHIELDED CABLE. DAK. P.N. (W-1117). BELDON P.N. (8760) OR EQUIV.
2. 4 CONDUCTOR, 22 AWG, STRANDED SHIELDED CABLE. DAK. P.N. (W-1234). MANHATTAN P.N. (M4473) OR EQUIV. IN CONDUIT WHERE REQUIRED. FIELD SIGNAL TERMINATIONS TO BE TERMINAL BLOCK.
3. 10 CONDUCTOR, 18 AWG, STRANDED SHIELDED CABLE. DAK. P.N. (W-1483). LENGTH TO BE 4 FT MAX FIELD SIGNAL TERMINATIONS TO BE 10 POS QUICK CONNECT.
4. POWER FEEDER SIZED AS NEEDED BY CUSTOMER
5. RS/232 CONTROL EQUIPMENT KIT INCLUDES:
   W-1249.....SERIAL CABLE
   A-1603.....DB9 TO DB25 ADAPTER
   A-1103-0010.....J-BOX
   A-1148-0005.....NETWORK/CABLE TESTER
6. USE EITHER THE DB9 OR DB25, DEPENDING ON YOUR PC'S REQUIREMENTS.
7. ALL SIGNAL CABLES BY CUSTOMER. LABOR TO PULL CABLES BY CUSTOMER.
8. ALL POWER WIRES BY CUSTOMER. LABOR TO PULL WIRES BY CUSTOMER.
9. ALL WIRING TO MEET NEC AND LOCAL ELECTRICAL CODES.
10. DISPLAYS MUST BE GROUNDED PER ARTICLE 250 AND 600 OF THE NATIONAL ELECTRICAL CODE.
11. LAST DISPLAY IN A GROUP REQUIRES A CAN TERMINATION RESISTOR(INSTALLED AT FACTORY). REFER TO THE DISPLAY MANUAL FOR CAN TERMINATOR LOCATION.
    BELOW ONLY APPLIES TO AF-3165 (TYPE 1) TERMINATOR PLUG (DAK P.N. 0A-1241-4010) MUST BE INSTALLED ON LAST DISPLAY IN EACH GROUP.
12. A31= DISPLAY CONTROLLER
13. INPUT TO J-BOX IS RS232, OUTPUT IS RS232.

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: OUTDOOR LED PRODUCT LINE

TITLE: SYSTEM RISER DIAGRAM, RS232

DES. BY:

DRAWN BY: LKERR

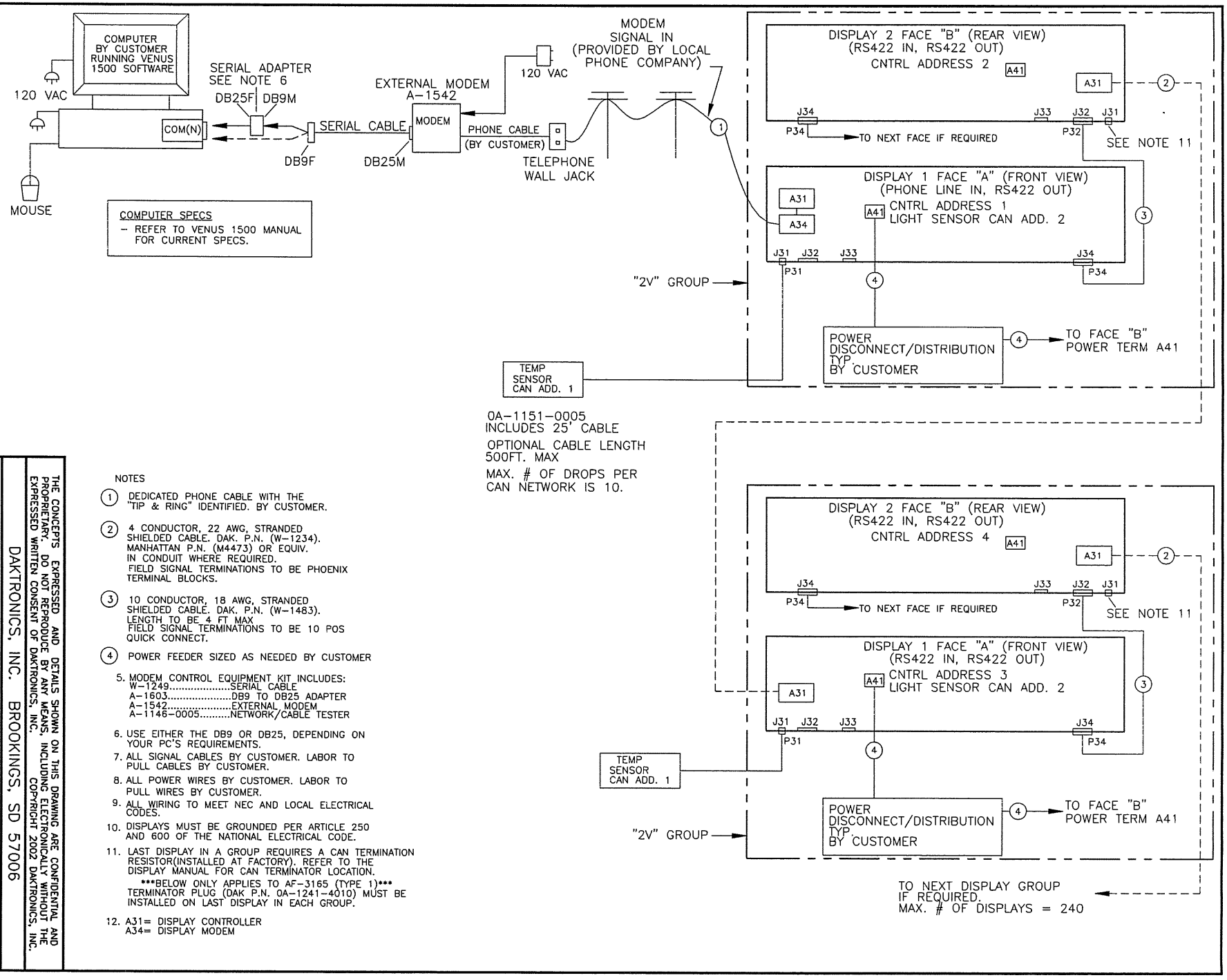
DATE: 28AUG02

REVISION 02

APPR. BY:

SCALE: NONE

1229-R01A-174341



REV.	DATE	DESCRIPTION	BY	APPR.
02	26DEC03	CHANGED TEMP SENSOR PART NUMBER FROM 0A-1241-4017 TO 0A-1151-0005. REMOVED NOTE 3.	DJM	
01	27JAN03	REMOVED CHART 1 (PWR, SIGNAL, SPEC). REPLACED 0A-1241-4016 WITH W-1483. ADDED TO TERM PLUG NOTE.	DJM	

NOTES

1. DEDICATED PHONE CABLE WITH THE "TIP & RING" IDENTIFIED. BY CUSTOMER.
2. 4 CONDUCTOR, 22 AWG, STRANDED SHIELDED CABLE. DAK. P.N. (W-1234). MANHATTAN P.N. (M4473) OR EQUIV. IN CONDUIT WHERE REQUIRED. FIELD SIGNAL TERMINATIONS TO BE PHOENIX TERMINAL BLOCKS.
3. 10 CONDUCTOR, 18 AWG, STRANDED SHIELDED CABLE. DAK. P.N. (W-1483). LENGTH TO BE 4 FT MAX. FIELD SIGNAL TERMINATIONS TO BE 10 POS QUICK CONNECT.
4. POWER FEEDER SIZED AS NEEDED BY CUSTOMER
5. MODEM CONTROL EQUIPMENT KIT INCLUDES:
   W-1249.....SERIAL CABLE
   A-1603.....DB9 TO DB25 ADAPTER
   A-1542.....EXTERNAL MODEM
   A-1146-0005.....NETWORK/CABLE TESTER
6. USE EITHER THE DB9 OR DB25, DEPENDING ON YOUR PC'S REQUIREMENTS.
7. ALL SIGNAL CABLES BY CUSTOMER. LABOR TO PULL CABLES BY CUSTOMER.
8. ALL POWER WIRES BY CUSTOMER. LABOR TO PULL WIRES BY CUSTOMER.
9. ALL WIRING TO MEET NEC AND LOCAL ELECTRICAL CODES.
10. DISPLAYS MUST BE GROUNDED PER ARTICLE 250 AND 600 OF THE NATIONAL ELECTRICAL CODE.
11. LAST DISPLAY IN A GROUP REQUIRES A CAN TERMINATION RESISTOR(INSTALLED AT FACTORY). REFER TO THE DISPLAY MANUAL FOR CAN TERMINATOR LOCATION.
    BELOW ONLY APPLIES TO AF-3165 (TYPE 1)
    TERMINATOR PLUG (DAK P.N. 0A-1241-4010) MUST BE INSTALLED ON LAST DISPLAY IN EACH GROUP.
12. A31= DISPLAY CONTROLLER
    A34= DISPLAY MODEM

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: OUTDOOR LED PRODUCT LINE

TITLE: SYSTEM RISER DIAGRAM, MODEM

DES. BY:

DRAWN BY: LKERR

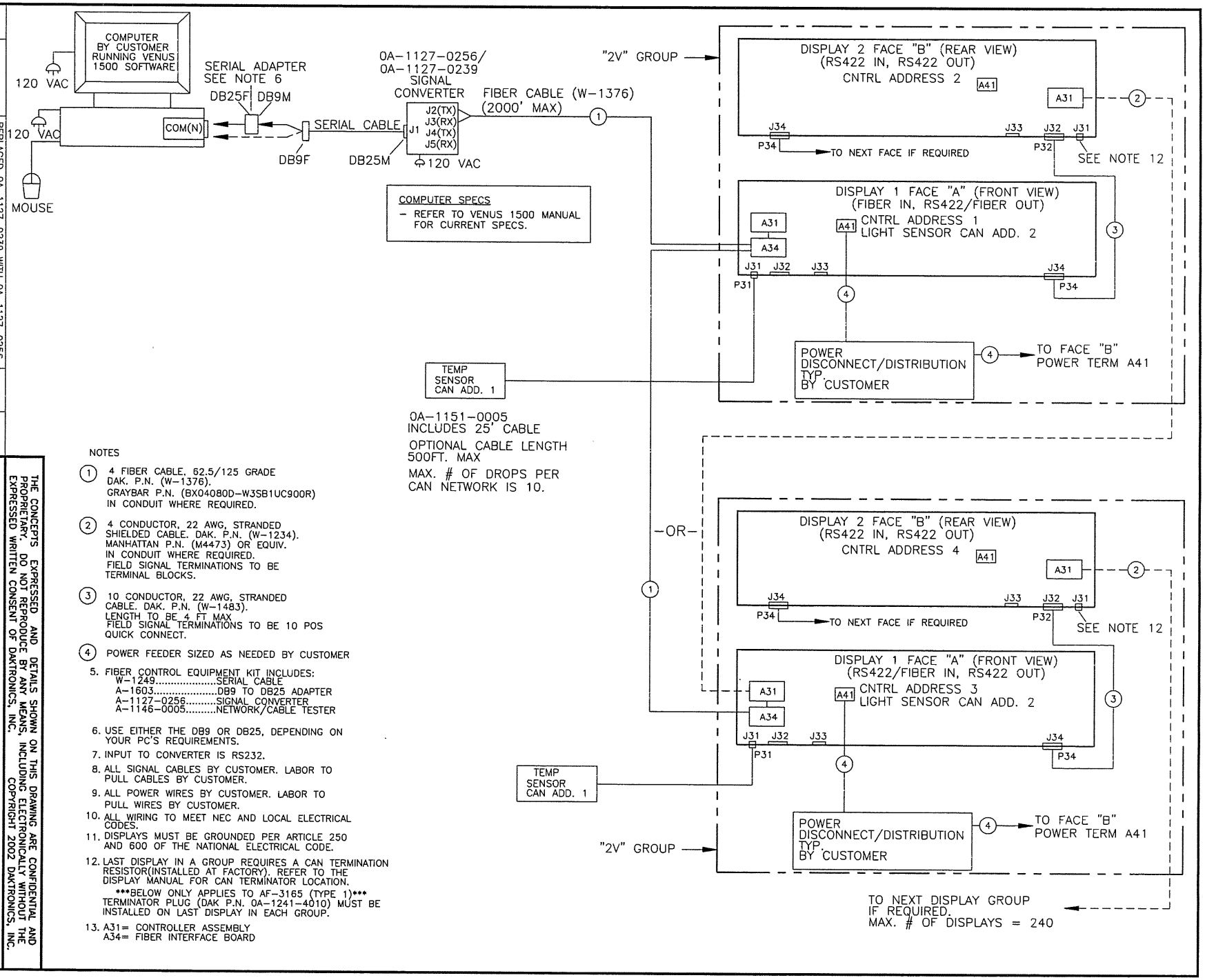
DATE: 28AUG02

APPR. BY:

SCALE: NONE

REVISION 02

1229-R01A-174342



NOTES

1. 4 FIBER CABLE, 62.5/125 GRADE DAK. P.N. (W-1376). GRAYBAR P.N. (BX04080D-W3SB1UC900R) IN CONDUIT WHERE REQUIRED.
2. 4 CONDUCTOR, 22 AWG, STRANDED SHIELDED CABLE. DAK. P.N. (W-1234). MANHATTAN P.N. (M4473) OR EQUIV. IN CONDUIT WHERE REQUIRED. FIELD SIGNAL TERMINATIONS TO BE TERMINAL BLOCKS.
3. 10 CONDUCTOR, 22 AWG, STRANDED CABLE. DAK. P.N. (W-1483). LENGTH TO BE 4 FT MAX FIELD SIGNAL TERMINATIONS TO BE 10 POS QUICK CONNECT.
4. POWER FEEDER SIZED AS NEEDED BY CUSTOMER
5. FIBER CONTROL EQUIPMENT KIT INCLUDES:
   W-1249.....SERIAL CABLE
   A-1603.....DB9 TO DB25 ADAPTER
   A-1127-0256.....SIGNAL CONVERTER
   A-1146-0005.....NETWORK/CABLE TESTER
6. USE EITHER THE DB9 OR DB25, DEPENDING ON YOUR PC'S REQUIREMENTS.
7. INPUT TO CONVERTER IS RS232.
8. ALL SIGNAL CABLES BY CUSTOMER. LABOR TO PULL CABLES BY CUSTOMER.
9. ALL POWER WIRES BY CUSTOMER. LABOR TO PULL WIRES BY CUSTOMER.
10. ALL WIRING TO MEET NEC AND LOCAL ELECTRICAL CODES.
11. DISPLAYS MUST BE GROUNDED PER ARTICLE 250 AND 600 OF THE NATIONAL ELECTRICAL CODE.
12. LAST DISPLAY IN A GROUP REQUIRES A CAN TERMINATION RESISTOR(INSTALLED AT FACTORY). REFER TO THE DISPLAY MANUAL FOR CAN TERMINATOR LOCATION.
    BELOW ONLY APPLIES TO AF-3165 (TYPE 1) TERMINATOR PLUG (DAK P.N. 0A-1241-4010) MUST BE INSTALLED ON LAST DISPLAY IN EACH GROUP.
13. A31= CONTROLLER ASSEMBLY
    A34= FIBER INTERFACE BOARD

REV.	DATE	DESCRIPTION	BY	APPR.
03	26 MAR 04	REPLACED 0A-1127-0239 WITH 0A-1127-0256 (INCLUDES SURGE PROTECTION)	SAI	DJM
02	26DEC03	CHANGED TEMP SENSOR PART NUMBER FROM 0A-1241-4017 TO 0A-1151-0005. REMOVED NOTE 3.	DJM	
01	27JAN03	REMOVED CHART 1 (PWR, SIGNAL, SPEC). REPLACED 0A-1241-4016 WITH W-1483. ADDED TO TERM PLUG NOTE.	DJM	

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: OUTDOOR LED PRODUCT LINE

TITLE: SYSTEM RISER DIAGRAM, FIBER

DES. BY:

DRAWN BY: LKERR

DATE: 06SEP02

REVISION 03

APPR. BY:

SCALE: NONE

1229-R01A-174344

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: GALAXY, LOUVERED V1500 RGB 34MM

TITLE: ASSY, TERM PANEL BOX-2 POSITION

DES. BY: MMAMMENGA DRAWN BY: MSTUBBE DATE: 13SEP02

REVISION 02 APPR. BY: SCALE: 1 = 4

1241-E10A-175131

REV.	DATE	DESCRIPTION	BY	APPR.
02	27SEP04	CHANGED HC-1212 AND HC-1289 QTY FROM 2 TO 1 PER ECO #45683	JJP	
01	14OCT02	UPDATED DOOR GRAPHIC PER PART CHANGE	MLS	

34mm LOUVERED RGB GALAXY DISPLAYS
POWER SPECIFICATION CHART

MATRIX SIZE	TOTAL WATTS	120V AMPS	120/240 3, wire LINE 1 AMPS	LINE 2 AMPS	240V AMPS
8X48	341	2.84	NOTE:		1.42
8X64	436	3.64			1.82
8X80	532	4.43	120/240 VAC, 3 WIRE PLUS GND. IS NOT AVAILABLE ON THESE DISPLAY SIZES.		2.22
8X96	627	5.22			2.61
8X112	762	6.35			3.18
8X128	858	7.15			3.57
8X144	953	7.94			3.97
16X48	627	5.22	2.05	3.18	2.61
16X64	818	6.81	3.64	3.18	3.41
16X80	1048	8.74	3.97	4.77	4.37
16X96	1239	10.32	3.97	6.35	5.16
16X112	1429	11.91	5.56	6.35	5.96
16X128	1620	13.50	7.15	6.35	6.75
16X144	1851	15.42	7.48	7.94	7.71
24X48	953	7.94	3.17	4.77	3.97
24X64	1239	10.32	5.56	4.77	5.16
24X80	1565	13.04	5.89	7.15	6.52
24X96	1851	15.42	8.27	7.15	7.71
24X112	2177	18.14	8.61	9.53	9.07
24X128	2463	20.52	10.99	9.53	10.26
24X144	2789	23.24	11.32	11.92	11.62
32X48	1239	10.32	3.97	6.35	5.16
32X64	1620	13.50	7.15	6.35	6.75
32X80	2041	17.01	7.48	9.53	8.51
32X96	2423	20.19	7.48	12.71	10.09
32X112	2844	23.70	10.99	12.71	11.85
32X128	3225	26.88	14.17	12.71	13.44
32X144	3647	30.39	14.50	15.89	15.19
40X48	1565	13.04	5.10	7.94	6.52
40X64	2081	17.35	9.40	7.94	8.67
40X80	2598	21.65	9.74	11.92	10.83
40X96	3115	25.96	12.45	13.51	12.98
40X112	3631	30.26	14.37	15.89	15.13
40X128	4148	34.57	18.68	15.89	17.28
40X144	4664	38.87	19.01	15.89	19.44
48X48	1851	15.42	5.89	9.53	7.71
48X64	2463	20.52	10.99	9.53	10.26
48X80	3075	25.62	11.32	14.30	12.81
48X96	3687	30.72	11.66	19.06	15.36
48X112	4298	35.82	16.76	19.06	17.91
48X128	4910	40.92	21.86	19.06	20.46
48X144	5522	46.02	22.19	23.83	23.01

THE ABOVE DISPLAY SIZES CAN BE POWERED BY EITHER 120VAC (2 WIRE + GND), 120/240 (3 WIRE + GND) OR 240VAC (2 WIRE + GND) SERVICES (EXCEPT WHERE NOTED). 240VAC (2 WIRE + GND) SERVICES (TYPICAL OVERSEAS), REQUIRE BREAKERS DESIGNED FOR SUCH USE.
* WHERE 2 WIRE + GND SYSTEMS ARE USED, LINE 1 AND LINE 2 TERMINALS NEED TO BE CONNECTED BY FIELD INSTALLED JUMPER. JUMPER SIZED PER NEC.

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: GALAXY, LOUVERED, VENUS 1500, 34MM, AF-3165

TITLE: POWER SPECS, 8X48-48X144 DISPLAY, RGB

DES. BY: DRAWN BY: DMATHERN DATE: 12 DEC 02

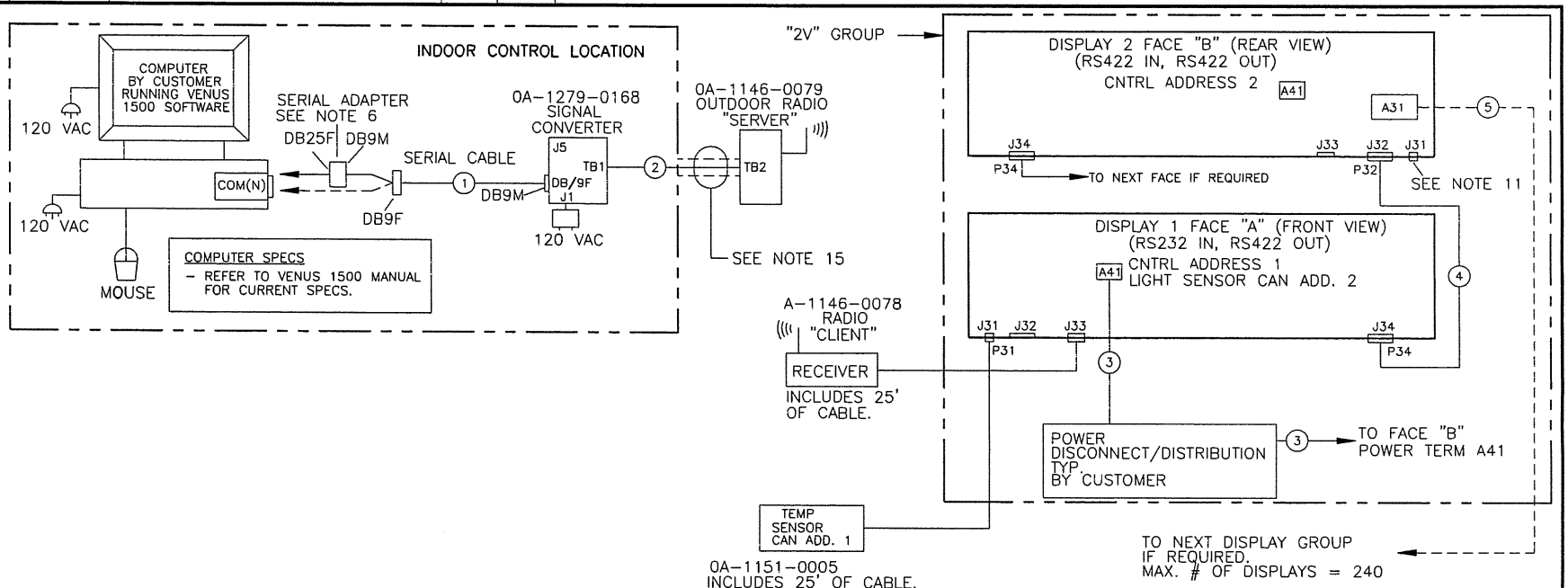
REV.	DATE	DESCRIPTION	BY	APPR.

REVISION APPR. BY:

SCALE: 1=1

1241-R10A-179873

REV.	DATE	DESCRIPTION	BY	APPR.
03	29MAR05	CHNAGED J-BOX 0A-1279-0162 TO 0A-1279-0168	HBC	
02	26DEC03	CHANGED TEMP SENSOR PART NUMBER FROM 0A-1241-4017 TO 0A-1151-0005.	DJM	
01	25JUN03	REVISED NOTE 2 FROM W-1210 22 AWG TO W-1370 18 AWG. ADDED MAX LENGTH OF W-1370 TO 1000'.	KAP	



NOTES

1. DB9F TO DB9M SERIAL CABLE DAK. P.N. (W-1267)
2. 6 CONDUCTOR, 18 AWG, STRANDED SHIELDED CABLE. DAK. P.N (W-1370). IN CONDUIT WHERE REQUIRED. FIELD SIGNAL TERMINATIONS TO BE PHOENIX TERMINAL BLOCKS. FIELD CABLES ARE PINNED 1 TO 1 FROM ONE END TO THE OTHER, TO A MAXIMUM OF 1000'.
3. POWER FEEDER SIZED AS NEEDED BY CUSTOMER
4. 10 CONDUCTOR, 18 AWG, STRANDED SHIELDED CABLE. DAK. P.N. (W-1483). LENGTH TO BE 4 FT MAX FIELD SIGNAL TERMINATIONS TO BE 10 POS QUICK CONNECT. SUPPLIED WITH FACE "B".
5. 4 CONDUCTOR, 22 AWG, STRANDED SHIELDED CABLE. DAK. P.N. (W-1234). MANHATTAN P.N. (M4473) OR EQUIV. IN CONDUIT WHERE REQUIRED. FIELD SIGNAL TERMINATIONS TO BE TERMINAL BLOCK.
6. USE EITHER THE DB9 OR DB25, DEPENDING ON YOUR PC'S REQUIREMENTS. DAK. P.N. (A-1603)
7. ALL SIGNAL CABLES BY CUSTOMER. LABOR TO PULL CABLES BY CUSTOMER.
8. ALL POWER WIRES BY CUSTOMER. LABOR TO PULL WIRES BY CUSTOMER.
9. ALL WIRING TO MEET NEC AND LOCAL ELECTRICAL CODES.
10. DISPLAYS MUST BE GROUNDED PER ARTICLE 250 AND 600 OF THE NATIONAL ELECTRICAL CODE.
11. LAST DISPLAY IN A GROUP REQUIRES A CAN TERMINATION RESISTOR(INSTALLED AT FACTORY). REFER TO THE DISPLAY MANUAL FOR CAN TERMINATOR LOCATION.
    BELOW ONLY APPLIES TO AF-3165 (TYPE 1)
    TERMINATOR PLUG (DAK P.N. 0A-1241-4010) MUST BE INSTALLED ON LAST DISPLAY IN EACH GROUP.
12. A31= DISPLAY CONTROLLER
    A41= POWER TERMINATION PANEL
13. **SERVER AND CLIENT(S) MUST BE SET TO SAME CHANNEL. (VIA SOFTWARE OR ON-BOARD SWITCHES) ALL CLIENT DISPLAYS MUST HAVE A UNIQUE ADDRESS. TOTAL SYSTEM CANNOT EXCEED 240 DISPLAYS.**
14. **IN AREAS USING MULTIPLE SERVER/CLIENT SYSTEMS WITHIN CLOSE PROXIMITY OF EACH OTHER, ALTERNATE CHANNELS MUST BE USED, TO AVOID INTERFERENCE BETWEEN SYSTEMS.**
15. CABLE TO BE IN CONDUIT WHERE EXPOSED TO OUTDOOR ELEMENTS.

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: OUTDOOR LED PRODUCT LINE

TITLE: SYSTEM RISER DIAGRAM, QC OUTDOOR RADIO, GEN 2

DES. BY:

DRAWN BY: LKERR

DATE: 20MAR03

APPR. BY:

SCALE: NONE

REVISION 02

1229-R01A-185359

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: GALAXY, LOUVERED, VENUS 1500, 34MM

TITLE: DETAIL, AF-3165-8/16X** POWER/CONTROL CORNER

DES. BY: MMAMMENGA DRAWN BY: EYOUNG DATE: 10 JUL 03

REVISION 00 | APPR. BY: | SCALE: 1=5

1241-E10A-186055

REV.	DATE	DESCRIPTION	BY	APPR.

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: GALAXY, LOUVERED, VENUS 1500, 34MM

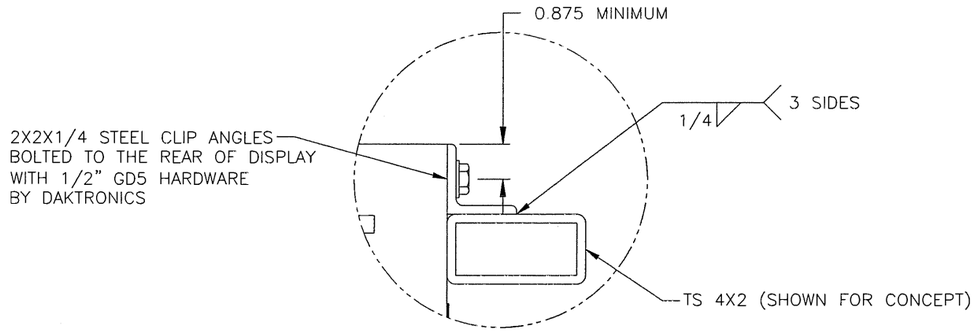
TITLE: DETAIL,AF-3165-24/32/40/48X**-PWR/CONTROL CORNER

DES. BY: MMAMMENGA DRAWN BY: EYOUNG DATE: 10 JUL 03

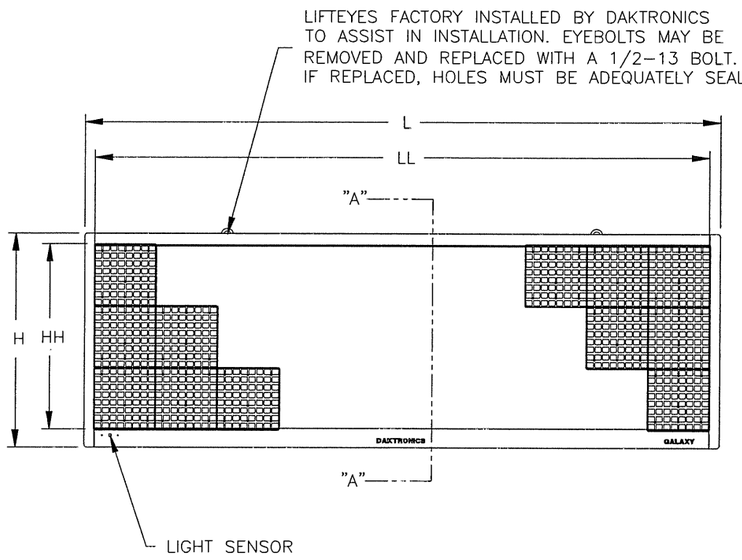
REVISION 00 | APPR. BY: | SCALE: 1=5

1241-E10A-186056

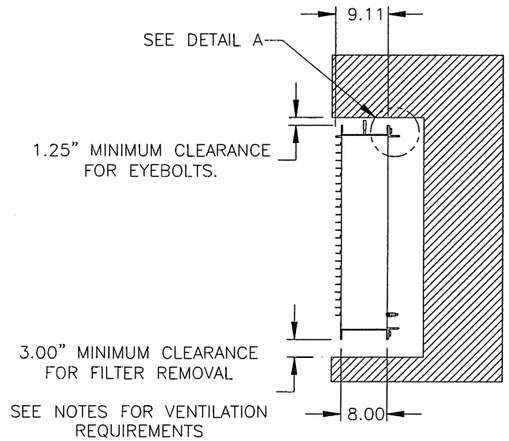
REV.	DATE	DESCRIPTION	BY	APPR.



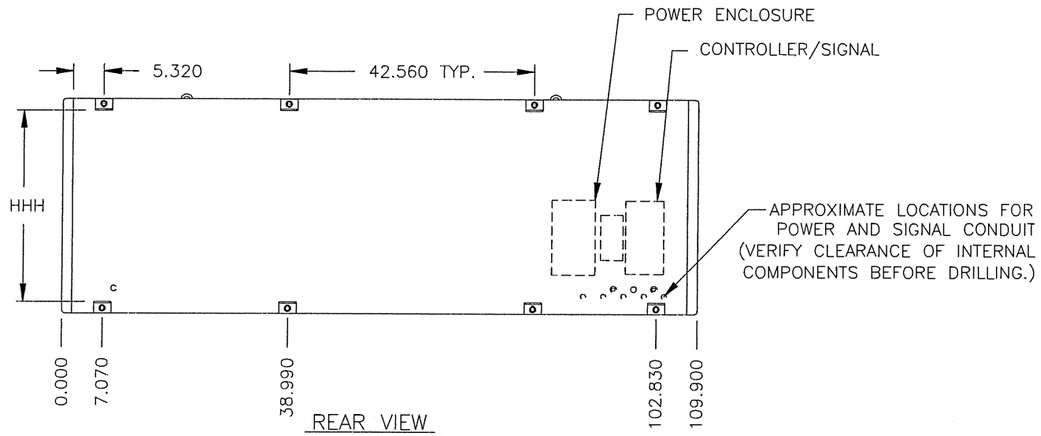
DETAIL: A



FRONT VIEW
(24X80 SHOWN)



SECTION: A–A



REAR VIEW

SIZES AND (APPROX.) WEIGHTS FOR 34 mm DISPLAYS AX–XXXX–8/32XX–34B						
SIZE	TOTAL DISPLAY H	TOTAL DISPLAY L	ACTIVE AREA HH	ACTIVE AREA LL	CLIP DISTANCE HHH	(APPROX.) UNCRATED WEIGHT
8X48	15.64	67.34	10.64	63.84	11.64	70 lbs
8X64	15.64	88.62	10.64	85.12	11.64	90 lbs
8X80	15.64	109.90	10.64	106.40	11.64	110 lbs
8X96	15.64	131.18	10.64	127.68	11.64	140 lbs
8X112	15.64	152.46	10.64	148.96	11.64	160 lbs
8X128	15.64	173.74	10.64	170.24	11.64	180 lbs
8X144	15.64	195.02	10.64	191.52	11.64	200 lbs
16X48	26.28	67.34	21.28	63.84	22.28	140 lbs
16X64	26.28	88.62	21.28	85.12	22.28	180 lbs
16X80	26.28	109.90	21.28	106.40	22.28	220 lbs
16X96	26.28	131.18	21.28	127.68	22.28	270 lbs
16X112	26.28	152.46	21.28	148.96	22.28	310 lbs
16X128	26.28	173.74	21.28	170.24	22.28	360 lbs
16X144	26.28	195.02	21.28	191.52	22.28	400 lbs
24X48	36.92	67.34	31.92	63.84	32.92	200 lbs
24X64	36.92	88.62	31.92	85.12	32.92	270 lbs
24X80	36.92	109.90	31.92	106.40	32.92	330 lbs
24X96	36.92	131.18	31.92	127.68	32.92	400 lbs
24X112	36.92	152.46	31.92	148.96	32.92	470 lbs
24X128	36.92	173.74	31.92	170.24	32.92	530 lbs
24X144	36.92	195.02	31.92	191.52	32.92	600 lbs
32X48	47.56	67.34	42.56	63.84	32.92	270 lbs
32X64	47.56	88.62	42.56	85.12	43.56	360 lbs
32X80	47.56	109.90	42.56	106.40	43.56	440 lbs
32X96	47.56	131.18	42.56	127.68	43.56	530 lbs
32X112	47.56	152.46	42.56	148.96	43.56	620 lbs
32X128	47.56	173.74	42.56	170.24	43.56	710 lbs
32X144	47.56	195.02	42.56	191.52	43.56	800 lbs

NOTES:

1. ALL DIMENSIONS ARE IN INCHES.
2. DISPLAY CABINET IS ALUMINUM.
3. DISPLAY CABINET COLOR IS FLAT BLACK.
4. FRONT ACCESS FOR SERVICE.
5. THE DISPLAY IS BOTTOM VENTILATED.
6. MINIMUM BOTTOM CLEARANCE IS 3.00".
7. MINIMUM TOP CLEARANCE IS 1.25".
7. MAIN ELECTRICAL DISCONNECT TO BE FURNISHED BY CUSTOMER."
8. FOR SIZES AND APPROX. WEIGHTS SEE ABOVE TABLE.
9. FOR POWER REQUIREMENTS REFER TO 1241–R01A–148571.
10. DAKTRONICS INC. IS NOT RESPONSIBLE FOR HARDWARE ATTACHING DISPLAY TO STRUCTURE.
11. VENTILATION: IN ENCLOSED CABINET SITUATION, 6 SQUARE INCHES OF UNOBSTRUCTED OPENING PER MODULE MUST BE PROVIDED TO INSURE ADEQUATE DISPLAY COOLING. ALLOWANCES MUST BE MADE TO COMPENSATE FOR THE PERCENTAGE OF A MATERIAL COVERING THE OPENINGS IN THE STRUCTURE. FOR ADEQUATE COOLING, FORCED VENTILATION OF THE ENCLOSED STRUCTURE MAY BE REQUIRED. IF AIR MUST BE FORCED INTO THE ENCLOSED CABINET, 10 CUBIC FEET PER MINUTE MUST BE PROVIDED PER MODULE (10.6" X 10.6" ACTIVE AREA).
12. CUSTOMER IS RESPONSIBLE FOR THE STRUCTURAL INTEGRITY OF THE STRUCTURE THAT THE DISPLAY IS MOUNTED TO.
13. MAIN ELECTRICAL DISCONNECT TO BE FURNISHED BY CUSTOMER.

REV.	DATE	DESCRIPTION	BY	APPR.
02	20 JAN 03	UPDATED APPROX. UNCRATED SIGN WEIGHTS.	MLS	
01	14 JAN 03	UPDATED MTG CLIP PLACEMENT	MLS	

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: GALAXY, LOUVERED V1500 RGB 34MM

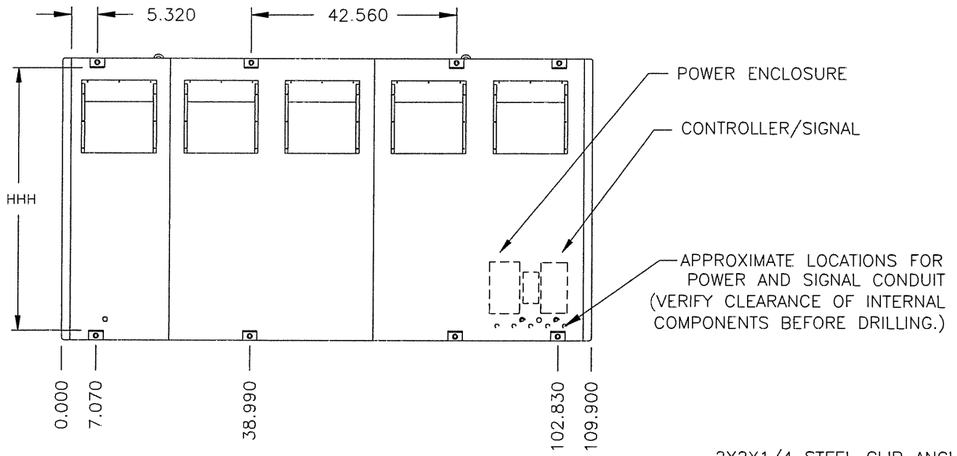
TITLE: SHOP DRAWING, AF–3165–8–32 HIGH–34–RGB

DES. BY: MMAMMENGA DRAWN BY: MMAMMENGA DATE: 02AUG02

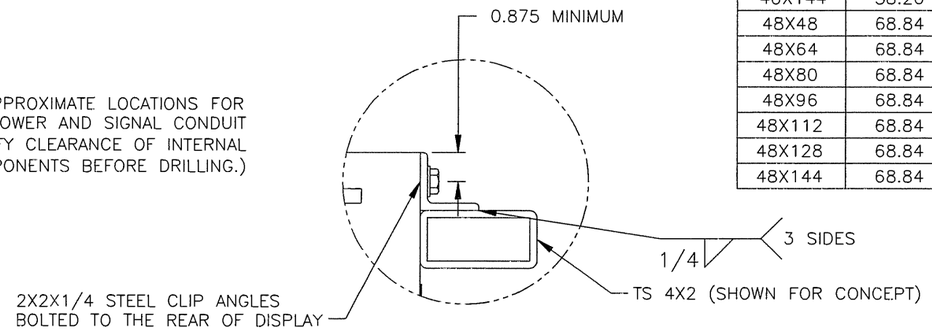
REVISION APPR. BY:

SCALE: 1 = 25

1241-E10B-172745



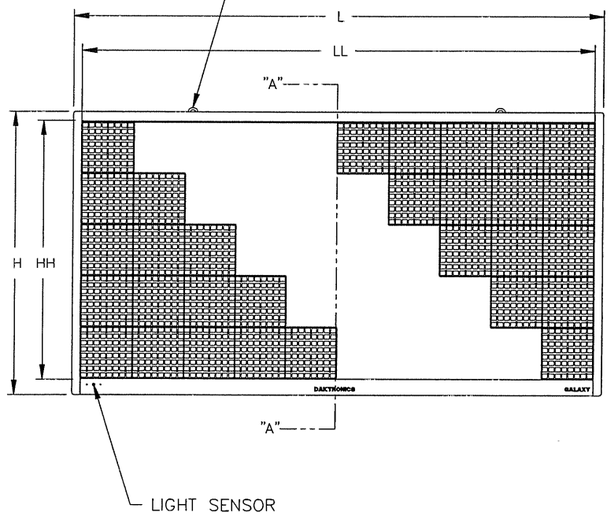
REAR VIEW



DETAIL: A

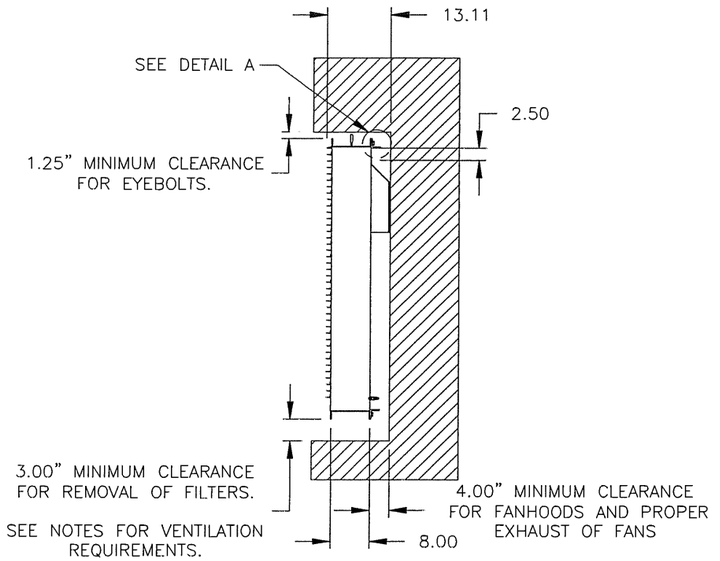
SIZE	TOTAL DISPLAY H	TOTAL DISPLAY L	ACTIVE AREA HH	ACTIVE AREA LL	CLIP DISTANCE HHH	(APPROX.) UNCRATED WEIGHT
40X48	58.20	67.34	53.20	63.84	54.20	330 lbs
40X64	58.20	88.62	53.20	85.12	54.20	440 lbs
40X80	58.20	109.90	53.20	106.40	54.20	550 lbs
40X96	58.20	131.18	53.20	127.68	54.20	660 lbs
40X112	58.20	152.46	53.20	148.96	54.20	770 lbs
40X128	58.20	173.74	53.20	170.24	54.20	880 lbs
40X144	58.20	195.02	53.20	191.52	54.20	990 lbs
48X48	68.84	67.34	63.84	63.84	64.84	400 lbs
48X64	68.84	88.62	63.84	85.12	64.84	530 lbs
48X80	68.84	109.90	63.84	106.40	64.84	660 lbs
48X96	68.84	131.18	63.84	127.68	64.84	800 lbs
48X112	68.84	152.46	63.84	148.96	64.84	930 lbs
48X128	68.84	173.74	63.84	170.24	64.84	1100 lbs
48X144	68.84	195.02	63.84	191.52	64.84	1200 lbs

LIFTEYES FACTORY INSTALLED BY DAKTRONICS TO ASSIST IN INSTALLATION. EYEBOLTS MAY BE REMOVED AND REPLACED WITH A 1/2–13 BOLT IF REPLACED , HOLES MUST BE ADEQUATELY SEALED.



FRONT VIEW

(40X80 SHOWN)



SECTION: A–A

NOTES:

1. ALL DIMENSIONS ARE IN INCHES.
2. DISPLAY CABINET IS ALUMINUM.
3. DISPLAY CABINET COLOR IS FLAT BLACK.
4. FRONT ACCESS FOR SERVICE.
5. THE DISPLAY IS BOTTOM VENTILATED.
6. MINIMUM BOTTOM CLEARANCE IS 3.00"
7. MINIMUM TOP CLEARANCE IS 1.25"
8. FOR SIZES AND APPROX. WEIGHTS SEE ABOVE TABLE.
9. FOR POWER REQUIREMENTS REFER TO 1241–R01A–148571.
10. DAKTRONICS INC. IS NOT RESPONSIBLE FOR HARDWARE ATTACHING DISPLAY TO STRUCTURE.
11. REFER TO INSTALLATION ENGINEERING DOCUMENT FOR MOUNTING TEMPERATURE SENSOR. (ER–010711)
12. VENTILATION: IN ENCLOSED CABINET SITUATION, 6 SQUARE INCHES OF UNOBSTRUCTED OPENING PER MODULE MUST BE PROVIDED TO INSURE ADEQUATE DISPLAY COOLING. ALLOWANCES MUST BE MADE TO COMPENSATE FOR THE PERCENTAGE OF A MATERIAL COVERING THE OPENINGS IN THE STRUCTURE. FOR ADEQUATE COOLING, FORCED VENTILATION OF THE ENCLOSED STRUCTURE MAY BE REQUIRED. IF AIR MUST BE FORCED INTO THE ENCLOSED CABINET, 10 CUBIC FEET PER MINUTE MUST BE PROVIDED PER MODULE (10.6" X 10.6" ACTIVE AREA).
13. CUSTOMER IS RESPONSIBLE FOR THE STRUCTURAL INTEGRITY OF THE STRUCTURE THAT THE DISPLAY IS MOUNTED TO.
14. MAIN ELECTRICAL DISCONNECT TO BE FURNISHED BY CUSTOMER.

REV.	DATE	DESCRIPTION	BY	APPR.
02	20 JAN 03	UPDATED APPROX. UNCRATED SIGN WEIGHTS.	MLS	
01	14 JAN 03	UPDATED MTG CLIP PLACEMENT	MLS	

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: GALAXY, LOUVERED V1500 RGB 34MM

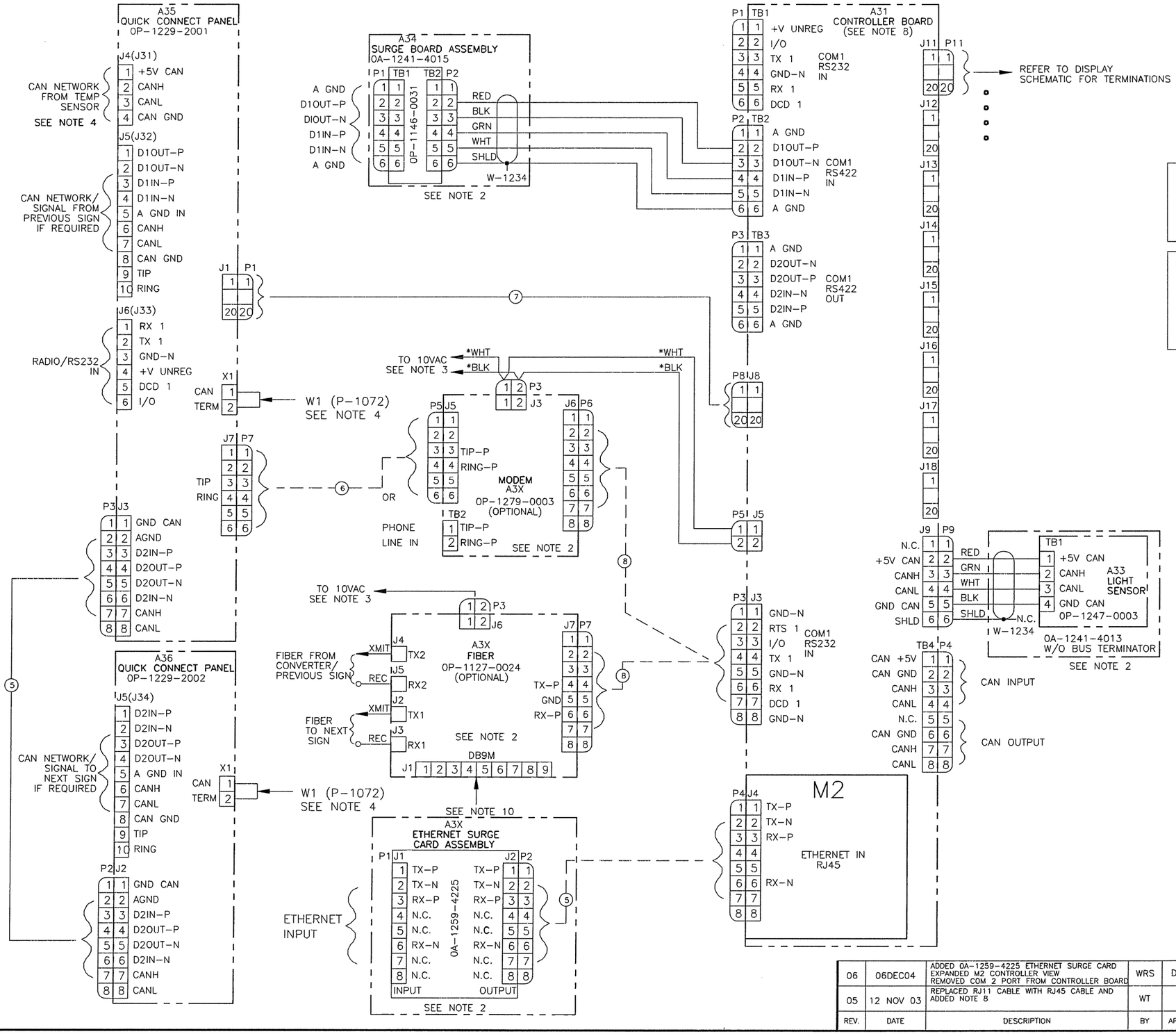
TITLE: SHOP DRAWING, AF–3165–40–48 HIGH–34RGB

DES. BY: MMAMMENGA DRAWN BY: MMAMMENGA DATE: 06AUG02

REVISION APPR. BY:

SCALE: 1 = 30

1241-E10B-172746



NOTES:

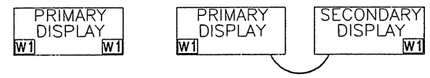
1) ALL WIRE IS 22 AWG EXCEPT * IS 18 AWG UNLESS OTHERWISE NOTED.

2) THE LIGHT SENSOR, SURGE BOARD, MODEM, FIBER CARD, AND WIRING ARE LOCATED IN THE PRIMARY DISPLAY ONLY. NOTE, ONLY ONE COMMUNICATION METHOD CAN BE USED AT ONE TIME.

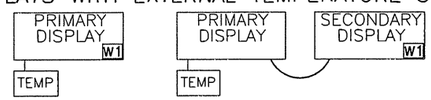
3) REFER TO DISPLAY SCHEMATIC FOR COMPLETE DISPLAY WIRING. MODEM AND FIBER ARE OPTIONAL. THE 10VAC (P3) WILL POWER WHICH EVER OPTION IS USED.

4) REFER TO BELOW DIAGRAMS FOR W1 JUMPER LOADING DETAIL. THE CAN LINE MUST BE TERMINATED AT BOTH ENDS OF THE DISPLAY NETWORK. NOT ALL POSSIBLITIES ARE SHOWN.

DISPLAYS WITH NO EXTERNAL TEMPERATURE SENSOR.



DISPLAYS WITH EXTERNAL TEMPERATURE SENSOR.



TEMP SENSORS ARE INTERNALLY TERMINATED.

(5) CAT 5 PATCH CABLE (RJ45 CABLE, 8 PIN 1 TO 1) 24 AWG, DAK P.N. (W-1506)

(6) RJ11 CABLE. 6 COND, 26 AWG, FLAT; PINNED 1 TO 1. DAK P.N. (0A-1137-0160)

(7) 20 PIN 1 TO 1 RIBBON CABLE, (.05 CENTER TO CENTER) (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

(8) RJ45 CABLE, 8 COND. M-M, ST PINNING, 18 INCH DAK P.N. (0A-1229-0054)

9) PART NUMBER IS 0A-1229-0005 FOR AF-31XX DISPLAYS, EXCEPT FOR AF-3190 & AF-3197, PART NUMBER IS 0A-1229-0009.

10) IF FIBER CARD IS BELOW REVISION 10, PC ADAPTOR(0A-1146-0029) IS REQUIRED TO CONNECT RJ11 CABLE FROM A31 J3 TO J1 OF FIBER CARD.

REV.	DATE	DESCRIPTION	BY	APPR.
06	06DEC04	ADDED 0A-1259-4225 ETHERNET SURGE CARD EXPANDED M2 CONTROLLER VIEW REMOVED COM 2 PORT FROM CONTROLLER BOARD	WRS	DJM
05	12 NOV 03	REPLACED RJ11 CABLE WITH RJ45 CABLE AND ADDED NOTE 8	WT	
04	08OCT03	ADDED NOTE ABOUT CONTROLLER PART CHANGING WITH AF-3190 & AF-3197 DISPLAYS.	DJM	
03	09SEPT03	ADDED DETAIL A. J7 WAS ADDED ON REVISION 10 OF FIBER CARD. PC ADAPTOR IS NO LONGER REQUIRED FOR CONNECTION TO CONTROLLER.	DJM	
02	10JULY03	REPLACED FACE A AND B NOTES WITH PRIMARY AND SECONDARY DISPLAY NOTES	WRT	
01	28JAN03	ADDED CAN TERMINATION JUMPER AND REVISED NOTE # 4 TO REFLECT THE CHANGE.	DJM	

DAKTRONICS, INC. BROOKINGS, SD 57006

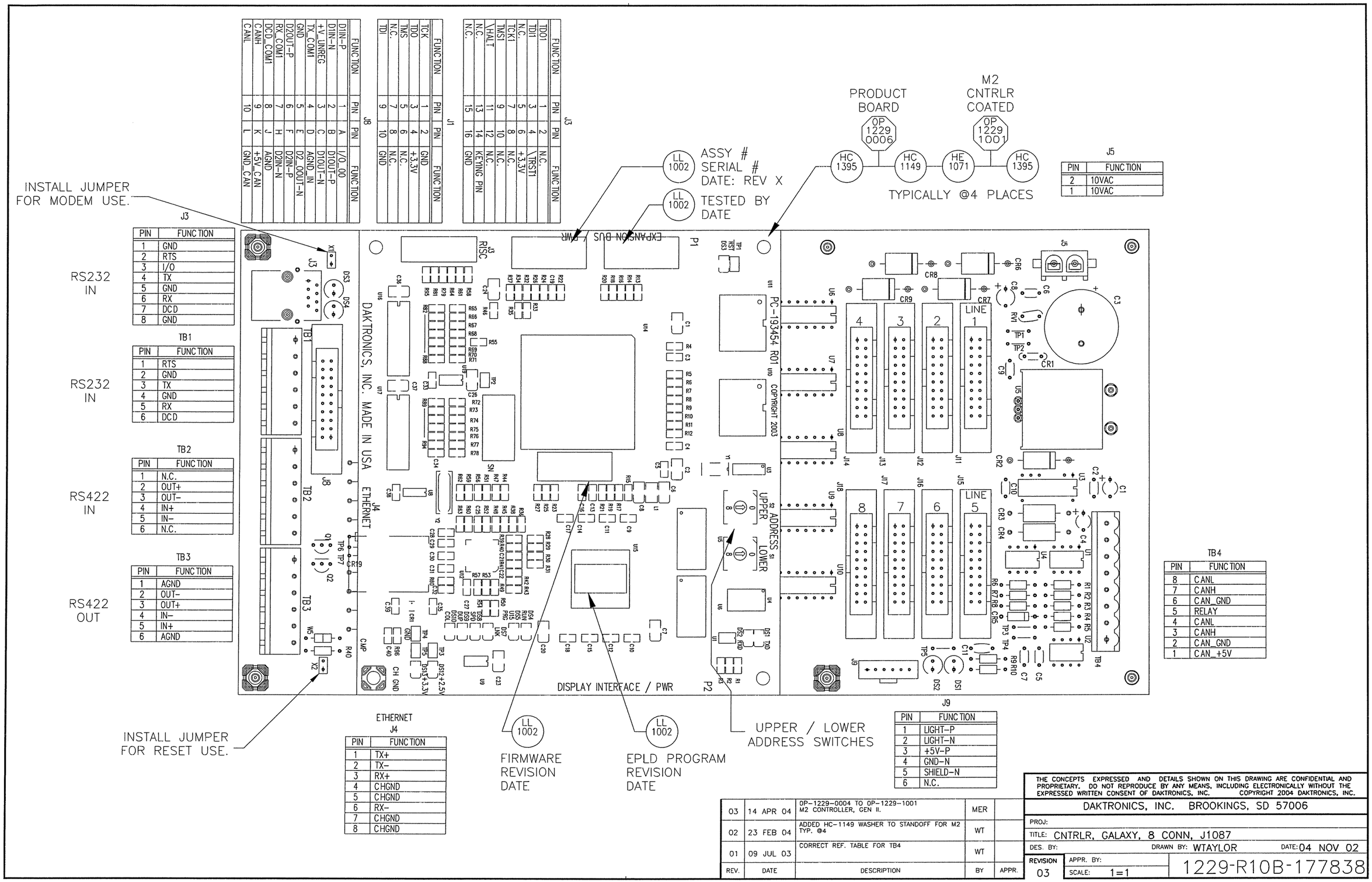
PROJ: GALAXY, LOUVERED, V1500

TITLE: SCHEM, SIG WIRING, INTERNAL, W/QUICK CONNECT PCB

DES. BY: PGILK DRAWN BY: LKERR DATE: 30OCT02

REVISION 06 APPR. BY: SCALE: NONE

1229-R03B-177662



J3

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

TB1

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

TB2

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

TB3

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

J8 PIN	J8 FUNCTION	J1 PIN	J1 FUNCTION	J3 PIN	J3 FUNCTION
1	DIIN-P	1	TCK	1	TDO1
2	DIIN-N	2	GND	2	N.C.
3	+V_UNREG	3	TDO	3	TDI1
4	TX_COM1	4	+3.3V	4	\TRST1
5	GND	5	TMS	5	N.C.
6	D2OUT-P	6	N.C.	6	+3.3V
7	RX_COM1	7	N.C.	7	TCK1
8	DCD_COM1	8	N.C.	8	N.C.
9	C_ANH	9	TDI	9	TMS1
10	C_ANL	10	GND	10	N.C.
L	GND_CAN			11	\HALT
K	+5V_C_AN			12	N.C.
J	AGND			13	N.C.
H	D2IN-N			14	KEYING PIN
G	D2IN-P			15	N.C.
F	D2_OOUT-N			16	GND
E	D2_OOUT-P				
D	AGND_IN				
C	D1OUT-N				
B	D1OUT-P				
A	I/O_00				

J5

PIN	FUNCTION
2	10VAC
1	10VAC

TB4

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

ETHERNET J4

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

J9

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

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

DAKTRONICS, INC. BROOKINGS, SD 57006

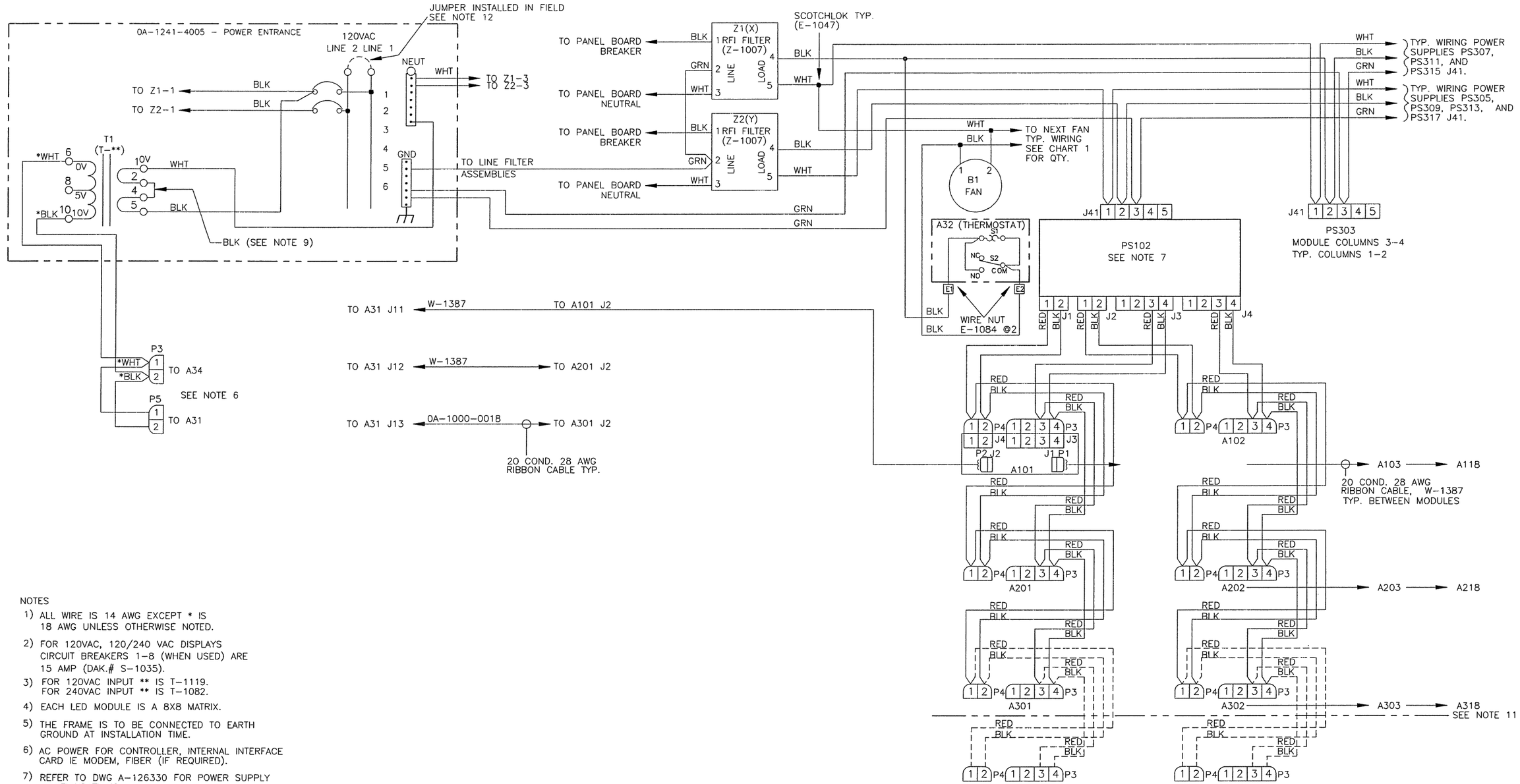
PROJ:

TITLE: CNTRLR, GALAXY, 8 CONN, J1087

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

REVISION 03 APPR. BY: SCALE: 1=1

1229-R10B-177838



NOTES

1) ALL WIRE IS 14 AWG EXCEPT * IS 18 AWG UNLESS OTHERWISE NOTED.
2) FOR 120VAC, 120/240 VAC DISPLAYS CIRCUIT BREAKERS 1-8 (WHEN USED) ARE 15 AMP (DAK.# S-1035).
3) FOR 120VAC INPUT ** IS T-1119. FOR 240VAC INPUT ** IS T-1082.
4) EACH LED MODULE IS A 8X8 MATRIX.
5) THE FRAME IS TO BE CONNECTED TO EARTH GROUND AT INSTALLATION TIME.
6) AC POWER FOR CONTROLLER, INTERNAL INTERFACE CARD IE MODEM, FIBER (IF REQUIRED).
7) REFER TO DWG A-126330 FOR POWER SUPPLY CONFIGURATIONS.
8) REFER TO DWG A-179873 FOR POWER SPECS.
9) WHEN T-1119 IS USED PINS 2 & 3 AND THE JUMPER SHOWN DOES NOT EXIST.
10) SCHEMATIC SHOWN DEPICTS THE LARGEST LENGTH 24 ROW DISPLAY (X144). REFER TO CHART 1 FOR DETAILS ON OTHER LENGTH DISPLAYS.
11) REMAINING HARNESS IS NOT USED.
12) WHEN 120VAC (2 WIRES + GND) IS USED TO POWER THE DISPLAYS, A JUMPER SIZED PER NEC, MUST BE INSTALLED IN FIELD AS SHOWN.
13) REFER TO DWG. B-177662 FOR CONTROLLER SIGNAL WIRING.

CHART 1

DISPLAY LENGTH (PIXELS)	POWER SUPPLY ASSEMBLY QTY.	MODULE QTY.	FAN QTY.
48	3	18	2
64	4	24	2
80	5	30	3
96	6	36	3
112	7	42	4
128	8	48	4
144	9	54	5

REV.	DATE	DESCRIPTION	BY	APPR.

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: GALAXY; LOUVERED VENUS 1500, RGB 34MM

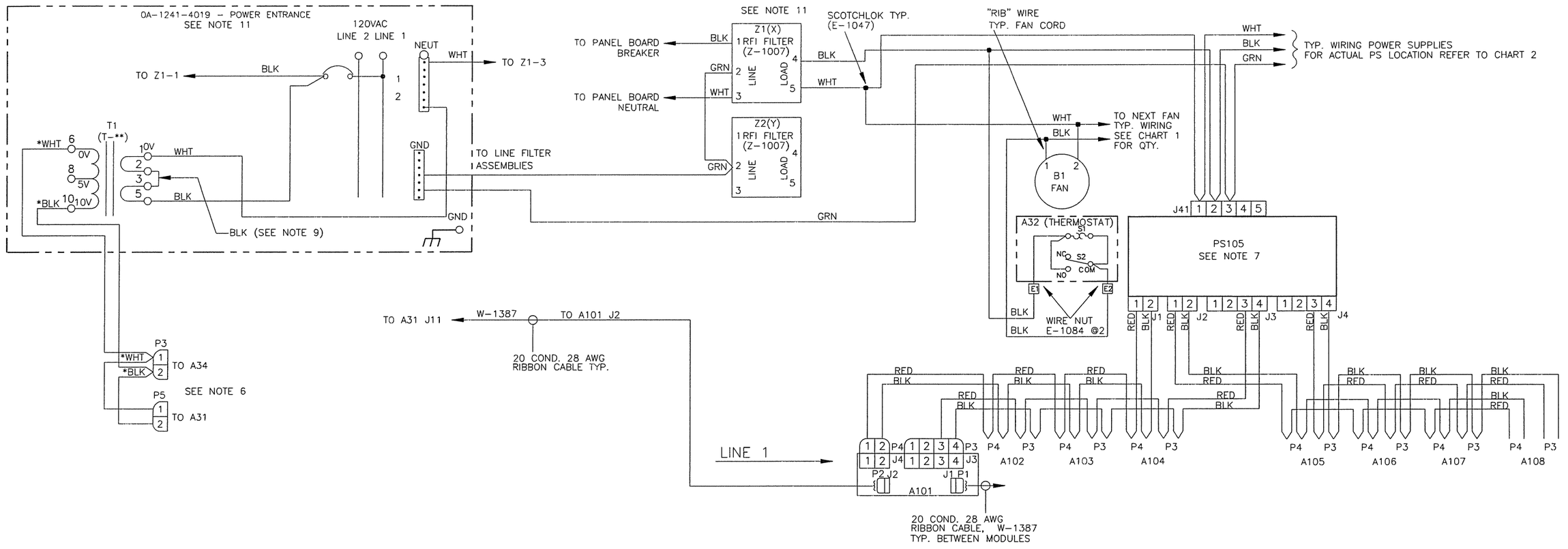
TITLE: SCHEMATIC, AF-3165-24X***-34, GEN2

DES. BY: DRAWN BY: DMATHER DATE: 27 MAR 03

REVISION APPR. BY:

SCALE: NONE

1241-R03B-185684



NOTES

1) ALL WIRE IS 14 AWG EXCEPT * IS 18 AWG UNLESS OTHERWISE NOTED.
2) CIRCUIT BREAKERS 1-2 (WHEN USED) ARE 15 AMP (DAK.# S-1035).
3) FOR 120VAC INPUT ** IS T-1119. FOR 240VAC INPUT ** IS T-1082.
4) EACH LED MODULE IS A 8X8 MATRIX.
5) THE FRAME IS TO BE CONNECTED TO EARTH GROUND AT INSTALLATION TIME.
6) AC POWER FOR CONTROLLER, INTERNAL INTERFACE CARD IE MODEM, FIBER (IF REQUIRED).
7) REFER TO DWG A-126330 FOR POWER SUPPLY CONFIGURATIONS.
8) REFER TO DWG A-179873 FOR POWER SPECS.
9) WHEN T-1119 IS USED PINS 2 & 3 AND THE JUMPER SHOWN DOES NOT EXIST.
10) SCHEMATIC SHOWN DEPICTS THE LARGEST LENGTH 8 ROW DISPLAY (X144). REFER TO CHART 1 & 2 FOR DETAILS ON OTHER LENGTH DISPLAYS.
11) 8 HIGH DISPLAYS USE POWER ENTRANCE 0A-1241-4019. (THIS IS A 2 CIRCUIT ASSEMBLY) 8 HIGH DISPLAYS HAVE Z1 MOUNTED ON THE CONTROLLER PLATE.
12) REFER TO DWG. B-177662 FOR CONTROLLER SIGNAL WIRING.

CHART 1

DISPLAY LENGTH (PIXELS)	POWER SUPPLY ASSEMBLY QTY.	MODULE QTY.	FAN QTY.
48	1	6	1
64	1	8	1
80	2	10	1
96	2	12	1
112	2	14	2
128	2	16	2
144	3	18	2

CHART 2

DEPICTS 8 HIGH BY XXX NUMBER OF COLUMNS.

48 col [F] [F] [P] [P] [B]
64 col [F] [F] [P] [P] [F] [B]
80 col [F] [F] [P] [P] [F] [F] [P] [B]
96 col [F] [F] [P] [P] [F] [F] [P] [F] [B]
112 col [F] [F] [P] [P] [B] [F] [F] [F] [F] [P] [P] [B]
128 col [F] [F] [P] [P] [B] [F] [F] [F] [F] [P] [P] [F] [B]
144 col [F] [F] [P] [P] [B] [F] [F] [F] [F] [P] [P] [F] [F] [P] [B]

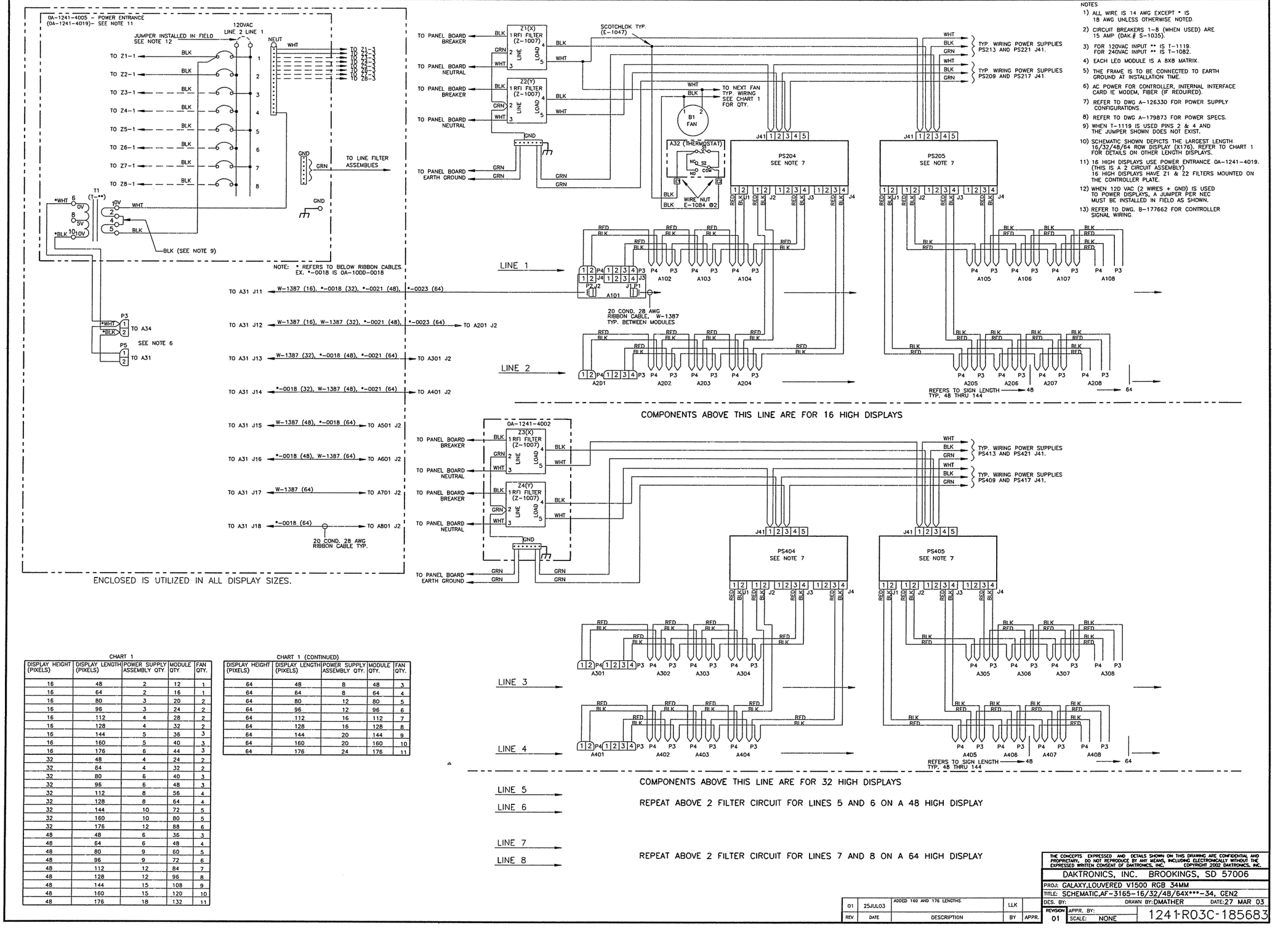
P - POWER SUPPLY ASSEMBLY
F - FILTER
B - FAN

REV.	DATE	DESCRIPTION	BY	APPR.

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: GALAXY, LOUVERED, V1500, RGB 34MM
TITLE: SCHEMATIC, AF-3165-8X***-34, GEN2
DES. BY: DRAWN BY: DMATHER DATE: 27 MAR 03
REVISION APPR. BY:
SCALE: NONE

1241-R03B-185682



NOTES

1) ALL WIRE IS 14 AWG EXCEPT * IS 18 AWG UNLESS OTHERWISE NOTED.
2) CIRCUIT BREAKERS 1-8 (WHEN USED) ARE 15 AMP (DAK.# S-1035).
3) FOR 120VAC INPUT ** IS T-1119. FOR 240VAC INPUT ** IS T-1082.
4) EACH LED MODULE IS A 8X8 MATRIX.
5) THE FRAME IS TO BE CONNECTED TO EARTH GROUND AT INSTALLATION TIME.
6) AC POWER FOR CONTROLLER, INTERNAL INTERFACE CARD IE MODEM, FIBER (IF REQUIRED).
7) REFER TO DWG A-126330 FOR POWER SUPPLY CONFIGURATIONS.
8) REFER TO DWG A-179873 FOR POWER SPECS.
9) WHEN T-1119 IS USED PINS 2 & 4 AND THE JUMPER SHOWN DOES NOT EXIST.
10) SCHEMATIC SHOWN DEPICTS THE LARGEST LENGTH 16/32/48/64 ROW DISPLAY (X176). REFER TO CHART 1 FOR DETAILS ON OTHER LENGTH DISPLAYS.
11) 16 HIGH DISPLAYS USE POWER ENTRANCE 0A-1241-4019. (THIS IS A 2 CIRCUIT ASSEMBLY) 16 HIGH DISPLAYS HAVE Z1 & Z2 FILTERS MOUNTED ON THE CONTROLLER PLATE.
12) WHEN 120 VAC (2 WIRES + GND) IS USED TO POWER DISPLAYS, A JUMPER PER NEC MUST BE INSTALLED IN FIELD AS SHOWN.
13) REFER TO DWG. B-177662 FOR CONTROLLER SIGNAL WIRING.

CHART 1

DISPLAY HEIGHT (PIXELS)	DISPLAY LENGTH (PIXELS)	POWER SUPPLY ASSEMBLY QTY.	MODULE QTY.	FAN QTY.
16	48	2	12	1
16	64	2	16	1
16	80	3	20	2
16	96	3	24	2
16	112	4	28	2
16	128	4	32	2
16	144	5	36	3
16	160	5	40	3
16	176	6	44	3
32	48	4	24	2
32	64	4	32	2
32	80	6	40	3
32	96	6	48	3
32	112	8	56	4
32	128	8	64	4
32	144	10	72	5
32	160	10	80	5
32	176	12	88	6
48	48	6	36	3
48	64	6	48	4
48	80	9	60	5
48	96	9	72	6
48	112	12	84	7
48	128	12	96	8
48	144	15	108	9
48	160	15	120	10
48	176	18	132	11

CHART 1 (CONTINUED)

DISPLAY HEIGHT (PIXELS)	DISPLAY LENGTH (PIXELS)	POWER SUPPLY ASSEMBLY QTY.	MODULE QTY.	FAN QTY.
64	48	8	48	3
64	64	8	64	4
64	80	12	80	5
64	96	12	96	6
64	112	16	112	7
64	128	16	128	8
64	144	20	144	9
64	160	20	160	10
64	176	24	176	11

REV.	DATE	DESCRIPTION	BY	APPR.
01	25JUL03	ADDED 160 AND 176 LENGTHS.	LLK	

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: GALAXY,LOUVERED V1500 RGB 34MM

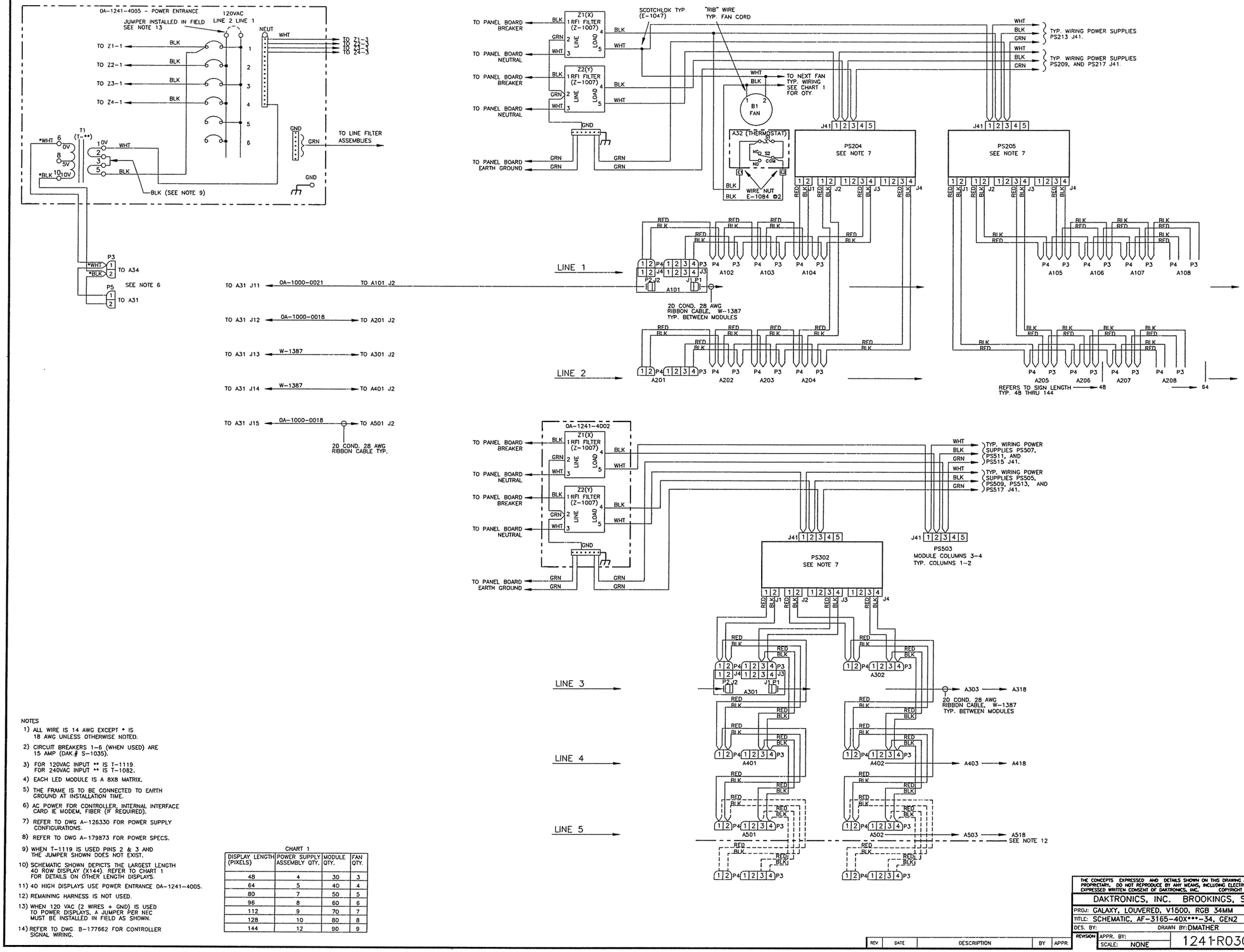
TITLE: SCHEMATIC,AF-3165-16/32/48/64X***-34, GEN2

DES. BY: DRAWN BY:DMATHER DATE:27 MAR 03

REVISION 01 APPR. BY:

SCALE: NONE

1241-R03C-185683



NOTES

1) ALL WIRE IS 14 AWG EXCEPT * IS 18 AWG UNLESS OTHERWISE NOTED.
2) CIRCUIT BREAKERS 1-6 (WHEN USED) ARE 15 AMP (DAK.# S-1035).
3) FOR 120VAC INPUT ** IS T-1119. FOR 240VAC INPUT ** IS T-1082.
4) EACH LED MODULE IS A 8X8 MATRIX.
5) THE FRAME IS TO BE CONNECTED TO EARTH GROUND AT INSTALLATION TIME.
6) AC POWER FOR CONTROLLER, INTERNAL INTERFACE CARD IE MODEM, FIBER (IF REQUIRED).
7) REFER TO DWG A-126330 FOR POWER SUPPLY CONFIGURATIONS.
8) REFER TO DWG A-179873 FOR POWER SPECS.
9) WHEN T-1119 IS USED PINS 2 & 3 AND THE JUMPER SHOWN DOES NOT EXIST.
10) SCHEMATIC SHOWN DEPICTS THE LARGEST LENGTH 40 ROW DISPLAY (X144). REFER TO CHART 1 FOR DETAILS ON OTHER LENGTH DISPLAYS.
11) 40 HIGH DISPLAYS USE POWER ENTRANCE 0A-1241-4005.
12) REMAINING HARNESS IS NOT USED.
13) WHEN 120 VAC (2 WIRES + GND) IS USED TO POWER DISPLAYS, A JUMPER PER NEC MUST BE INSTALLED IN FIELD AS SHOWN.
14) REFER TO DWG. B-177662 FOR CONTROLLER SIGNAL WIRING.

CHART 1

DISPLAY LENGTH (PIXELS)	POWER SUPPLY ASSEMBLY QTY.	MODULE QTY.	FAN QTY.
48	4	30	3
64	5	40	4
80	7	50	5
96	8	60	6
112	9	70	7
128	10	80	8
144	12	90	9

REV.	DATE	DESCRIPTION	BY	APPR.

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: GALAXY, LOUVERED, V1600, RGB 34MM
TITLE: SCHEMATIC, AF-3165-40X***-34, GEN2
DES. BY: DRAWN BY: DMATHER DATE: 27 MAR 03
REVISION APPR. BY:
SCALE: NONE

1241-R03C-185685