

Venus 1500 Radio – Gen 2

Operation Manual

ED-13932

Rev 6

28 August 2007

DAKTRONICS

ED-13932
Product 1146
Rev 6 – 28 August 2007

DAKTRONICS, INC.

Copyright © 2002-2007

All rights reserved. While every precaution has been taken in the preparation of this manual, the publisher assumes no responsibility for errors or omissions. No part of this book covered by the copyrights hereon may be reproduced or copied in any form or by any means – graphic, electronic, or mechanical, including photocopying, taping, or information storage and retrieval systems – without written permission of the publisher.

Venus® is a registered trademark of Daktronics, Inc. All others are trademarks of their respective companies.

Table of Contents

Section 1:	Introduction.....	3
1.1	Safety Precautions.....	3
1.2	Component Identification.....	3
1.3	Site Selection.....	5
1.4	Line-Of-Sight.....	5
1.5	Antenna Orientation.....	6
1.6	Channel Number.....	6
1.7	Baud Rate.....	7
Section 2:	Installation Guidelines.....	9
2.1	Site Survey.....	9
2.2	Server Radio Installation.....	9
2.3	Installing a Server Radio.....	9
	Direct Server Installation.....	10
	Server Installation via Modem.....	12
2.4	Installing the Client Radio.....	14
	Display with Quick-connect Option.....	14
	Display without Quick-connect Option.....	15
2.5	Multi-Client Radio Installations.....	16
2.6	Indoor Server Radio Installation.....	17
	Installing an Indoor Server Radio.....	17
2.7	Indoor Radio Server Board.....	20
2.8	Signal Termination between Two Displays.....	20
	Primary - Mirror.....	20
	Primary - Primary Signal Termination.....	21
Section 3:	Maintenance and Troubleshooting.....	23
3.1	Service and Diagnostics.....	23
	Addressing.....	23
	Server/Client Selection.....	23
	Signal Strength Mode.....	24
	Reconfiguration.....	24
	Client Cable Connection.....	25
3.2	Troubleshooting.....	26
3.3	Loop-back Test.....	27
	Conducting the Venus 1500 Software Test.....	27
3.4	Replacement Parts.....	29
3.5	Daktronics Exchange and Repair & Return Programs.....	30
	Exchange Program.....	30
	Repair & Return Program.....	31
	Appendix A: Reference Drawings.....	33

Section 1: Introduction

This manual provides installation, maintenance, and troubleshooting information for Daktronics Venus 1500 Radio, Generation 2. For questions regarding the installation, operation, or service of this system, please refer to the contact information listed on the cover page of this manual.

1.1 Safety Precautions



- Read and understand these instructions before installing.
- Be sure the display and radio enclosures are properly grounded with an earth-grounding electrode.
- **Disconnect power when servicing the display or radios.**
- **Do not** modify the display structure or attach any panels or coverings to the display without the written consent of Daktronics, Inc.

1.2 Component Identification

Client Radio: This radio must be mounted within 25 feet (8 m) of the display. It communicates with the display via RS-232 signal. Power is provided by the display. A client radio is shown in **Figure 1**.

Server Radio: This radio is connected to the control computer, sending information to the display via the client radio. It is connected to the computer either directly or through a J-box/signal converter. Server radios may be either outdoor or indoor types. An outdoor server is shown in **Figure 2**.



Figure 1: Client Radio



Figure 2: Server Radio

Radio Channel: The channel set on the radios must be the same for all radios within the same network. The default channel is 67, which corresponds to address 0 on the radio hex dial.

J-box/Signal Converter: In the case of Venus 1500-controlled radios, a J-box/signal converter is used to send RS4-22 signal and power to the server radio. The signal converter will be one of two types: one that accepts serial information from a computer via RS-232 and one that accepts RS-232 information and a modem or dial-up input. The same J-box/signal converter (**Figure 3**) is used with both the indoor and outdoor server radios.



Figure 3: J-box/Signal Converter

RS-232: RS-232 is a standard PC communication type with a maximum cable length of 25 feet (8 m). The output of the client radio is RS-232.

RS-422: RS-422 is a standard differential communication type with a maximum cable length between the J-box/signal converter and the serial radio of 1000 feet (300 m).

Signal Strength Indicator: The server and client radios have eight LEDs that are used to display signal strength. Refer to the left side of **Figure 4**. The number of LEDs that are lit on the client radio indicates the signal strength, with eight being full strength and one indicating a weak signal. The specific address needs to be set on the server radio to display signal strength, as explained in **Section 3.1**.

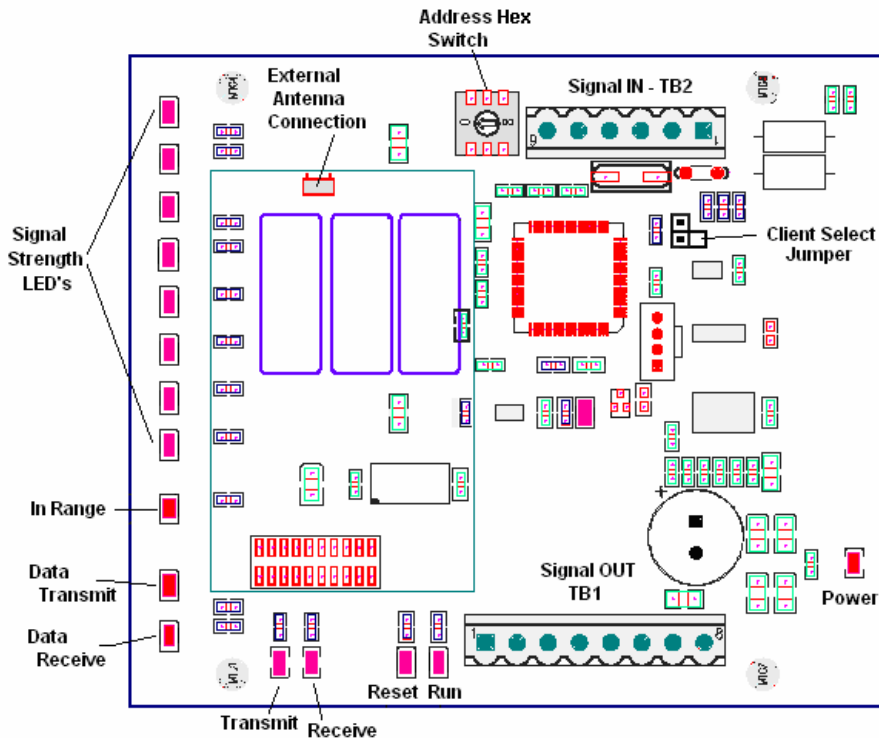


Figure 4: Outdoor Server/Client Radio Board Layout

1.3 Site Selection

Due to the uncertainties associated with radio communication, it is recommended that the radios be temporarily installed to check signal strength and consistency of communication. Once the radios have proven reliable in a location, they can be mounted permanently.

The performance of high-frequency radios may be diminished by obstructions that impede the signal. Therefore, a clear line-of-sight between antennas is required for optimum performance at maximum range. Refer to **Figure 5**.

Obstructions that interfere with radio signal include but are not limited to:

- Electrical interference from power lines or street lights close to radio locations.
- Physical features, such as hills, large buildings, or trees.
- Telephone, radio, television towers, etc. in the immediate area.
- Two-way radios or other communication equipment used at the business.
- Transmission through glass, especially security glass, and communication through a doorway in indoor installations.

If the radios are not working at optimal performance levels, communication may be slowed or even lost. In addition, weather conditions, such as strong winds, rain, or snow may adversely affect the communication signal. The type of message sent can also affect the time needed to download to the display, with graphic frames and animations taking greater time than simple text messages.

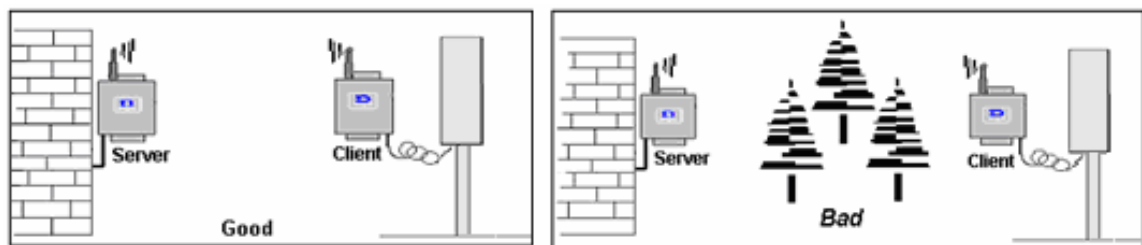


Figure 5: Good Site and Obstructed Site

1.4 Line-Of-Sight

The radios operate at 2.4 GHz. Radio waves at high frequencies such as this travel in a nearly straight line-of-sight path. To relay strong signal, the radio antennas that communicate with each other must be free of any obstructions. Refer to **Figure 5**.

To achieve optimal performance, the radios must meet the following criteria:

- A clear line-of-sight path among all antennas that communicate directly with each other. Some obstruction may be tolerated in short range, but it is difficult to predict the performance if the signal is obstructed.
- A maximum distance of 500 feet (150 m) indoors and 1,500 feet (450 m) outdoors between server and client radios. The signal strength indicator LEDs will show the maximum range of the radios possible in a specific location.
- All antennas be properly oriented. The antennas distributed with the radio are dipole antennas that must be oriented in a parallel position for maximum performance.
- The presence of other radio signals may also cause interference if they are located in or near the line-of-sight.

1.5 Antenna Orientation

The radios come with high quality dipole antennas. Dipole antennas perform the best when information is being received on the broadside of the antenna. To maximize the performance, mount the radios so that their antennas are in an upright position and are on equal elevations.

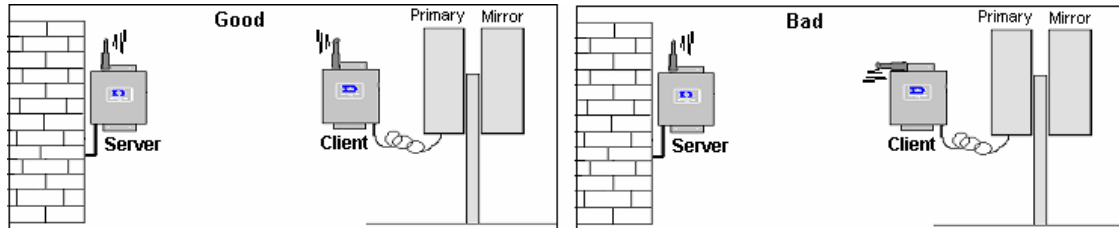


Figure 6: Correct/Incorrect Antenna Orientation

An inclination of more than 45 degrees from a perfect parallel position may reduce the performance of the radios by more than half. However, dipole antennas are not directional and will transmit signal equally for 360 degrees around the antenna.

A difference in elevation may be allowed depending on the distance and orientation of the antennas. If both antennas are angled at 45 degrees, performance can again be maximized. Refer to **Figure 7** for details.

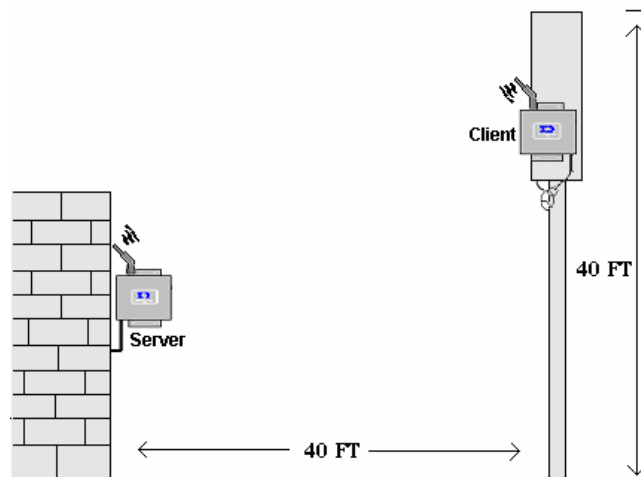


Figure 7: Correct Antenna Orientation at Elevations

1.6 Channel Number

The channel number is a parameter that must be the same for all server and client radios in the same network. Each product line will have a set of channels on which the radios may operate. The Venus 1500 radio can operate on channels 67-74. The default channel is 67, which corresponds to address 0 on the radio's hex dial. To change the radio address, refer to **Section 3.1**.

1.7 Baud Rate

If a modem is used for signal transmission, the baud rate must also be the same for all the server and client radios in the same network. This parameter will also be unique to each product line. The Venus 1500 radio default configuration is 19200, and has been set prior to shipment.

Section 2: Installation Guidelines

2.1 Site Survey

For maximum performance of the Venus 1500 radio system, survey the installation site and answer the following questions:

- Is a **direct** line-of-sight possible between the server and client radios?
- Will the distance between the outdoor radios be less than 1500 feet (450 m), and between the indoor radios less than 500 feet (150 m)? If not, is it possible to achieve the required distance?
- Where will the radios need to be located in order to achieve the required direct line-of-sight?
- Is there an optional location for the radios in case of interference that may degrade the quality of the radio signal?
- Should maintenance be required, will the radios be easy to access?

2.2 Server Radio Installation

Installation of a radio system consists of two parts:

- connecting a server radio to a computer either directly or over a phone line.
- connecting a client radio at the display. Refer to **Section 2.4** for this information.

Two types of server radios may be installed, outdoor or indoor, depending on the location of the display. The most common is the outdoor server radio mounted to the outside of a building and communicating with the client radio located near an outdoor display. An indoor server radio is also available that communicates with the client radio mounted near an indoor display. This type of installation is most common with a message center/scoreboard setup.

To work correctly, the server and client radios must be set to the same channel in order to communicate with each other. Daktronics will set them to the same default channel before they are shipped to the customer. If a different channel is required because of multiple radio sets near each other, the channels on both radios will need to be set accordingly. Addressing information is located in **Section 3.1** of this manual.

2.3 Installing a Server Radio



Warning: Cat-5 cable is not recommended in this installation. The distance that power and signal can travel may vary with the use of Cat-5 cable. If Cat-5 cable is pulled, use one pair for the ground (pin 6) and one pair for the power (pin 1). Do not place Cat-5 cable in this application next to Ethernet communication cables or signal loss may occur.

This section includes instructions for installing a server radio with either of these two options:

- directly to the computer through a J-box/signal converter or
- remotely through a modem.

The J-box/signal converter and J-box/modem look very similar. The connection from the J-box to the server radio is the same in both cases and only the input signal to the J-box will vary.

Direct Server Installation

Reference Drawings:

System Riser Diagram; QC Outdoor Radio, Gen 2..... **Drawing A-211606**



Warning: Cat-5 cable is not recommended in this installation. The distance that power and signal can travel may vary with the use of Cat-5 cable. If Cat-5 cable is pulled, use one pair for the ground (pin 6) and one pair for the power (pin 1). Do not place Cat-5 cable in this application next to Ethernet communication cables or signal loss may occur.

Install the J-box /signal converter near the control computer. Mount the server radio at an outdoor location in a direct line-of-sight path with the client radio. Route the signal/power cable between the J-box and the server radio. The maximum distance between the J-box to the server radio is 1000 feet (300 m). Refer to the system riser **Drawing A-211606**, and **Figure 8** for more information.

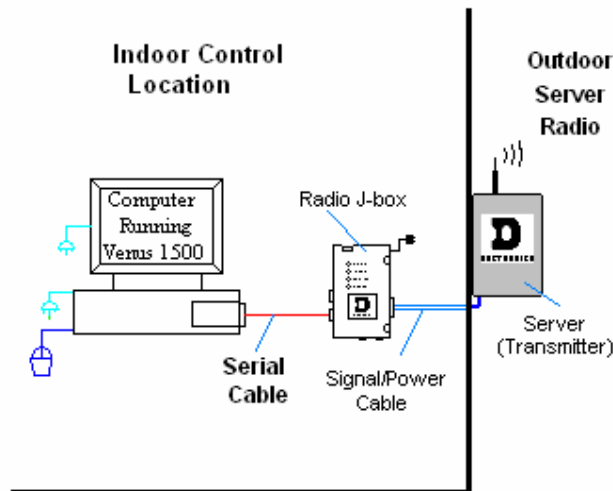


Figure 8: Server Radio Installation

The following directions are provided for connecting from the computer to the server radio:

1. Plug the serial cable's 9-pin male connector into the J-box at the jack labeled "DB9 Female V1500 PC Connect". Plug the 9-pin female connector into the RS-232 COM port on the computer.
2. Plug the J-box/signal converter's power adaptor into a 120 VAC grounded outlet.
3. Plug the jack into the J-box at the port labeled 12V power IN.
4. Connect the power/signal cables as follows:
 - Run the 6-conductor, 18 AWG stranded cable from the J-box to the server radio.
 - Connect the wires at the phoenix plug (labeled RS-422 to Radio) on the J-box/signal converter.
 - Connect the wires to the phoenix plug labeled TB2 (RS422 IN) on the server radio board. The cable is pinned one-to-one.

5. Refer to **Figure 9** and the included table for connections from the J-box/signal converter to the server radio.

Note: When exposed to outdoor conditions, the signal/power cable must be in conduit.

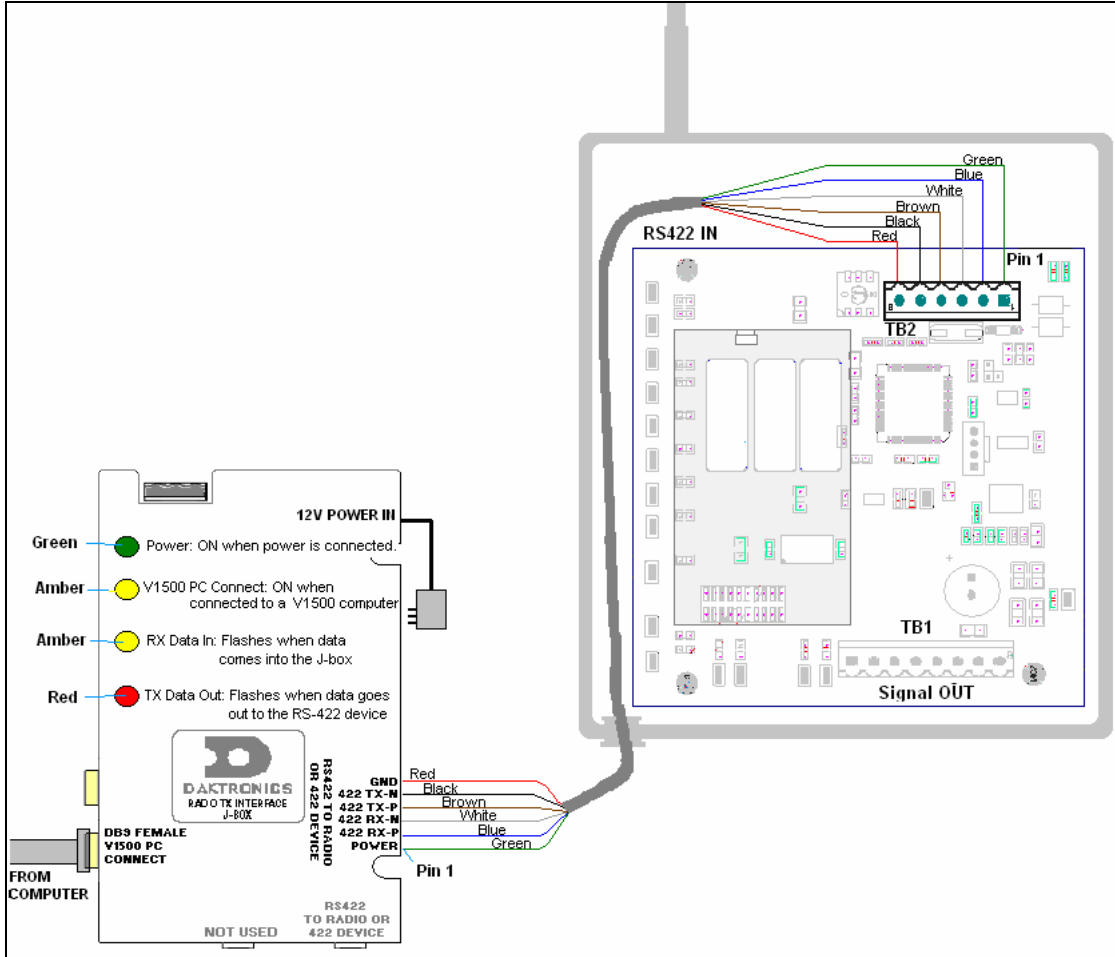


Figure 9: Direct Wiring, J-box to Outdoor Server Radio

J-Box/Signal Converter to Server Radio		
J-box/signal converter RS422 to Radio (TB1)	Cable Color	Server Radio Signal IN (TB2)
Pin 1 (POWER)	Green	Pin 1 (+V UNREG)
Pin 2 (422 RX-P)	Blue	Pin 2 (422 TX-P)
Pin 3 (422 RX-N)	White	Pin 3 (422 TX-N)
Pin 4 (422 TX-P)	Brown	Pin 4 (422 RX-P)
Pin 5 (422 TX-N)	Black	Pin 5 (422 RX-N)
Pin 6 (GND)	Red	Pin 6 (GND)

Server Installation via Modem

Reference Drawings:

System Riser Diagram; Modem/QC Outdoor Radio, Gen 2 **Drawing A-242383**



Warning: Cat-5 cable is not recommended in this installation. The distance that power and signal can travel may vary with the use of Cat-5 cable. If Cat-5 cable is pulled, use one pair for the ground (pin 6) and one pair for the power (pin 1). Do not place Cat-5 cable in this application next to Ethernet communication cables or signal loss may occur.

The modem signal system allows the control software to call another location using a dial-up network. A signal is then sent to the server radio via a J-box/ modem at a second location. This section will explain how to connect to the server radio from the J-box. The maximum distance from the J-box to the server radio is 1000 feet (300 m). Refer to the system riser **Drawing A-242383**, and **Figure 10** for more information.

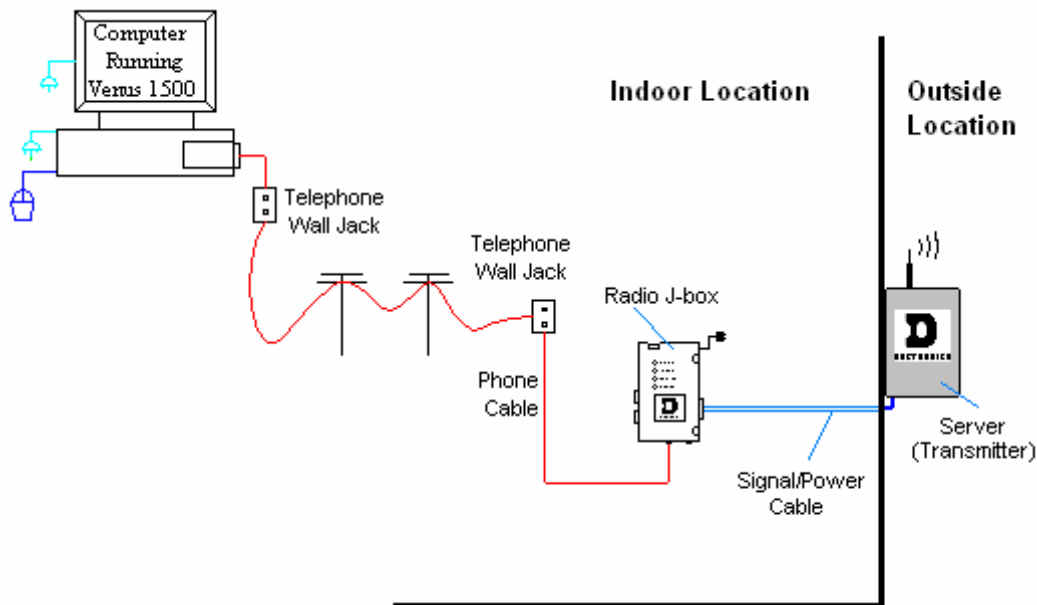


Figure 10: Remote Location to Server Radio via Modem

The following directions are provided for connecting from the computer to the server radio:

1. Using a flipped, 6-conductor, 26 AWG, stranded silver satin cable, plug one end of the RJ-11 cable into the telephone wall jack. Plug the other end into the J-box/modem, at the jack labeled "Phone Line Connection".
2. Plug the J-box's power adaptor into a 120VAC grounded outlet. Plug the jack into the J-box/modem at the port labeled 12V power IN.
3. Connect power/signal cables as follows:
 - Run the 6-conductor, 18 AWG stranded cable from the J-box/modem to the server radio.
 - Connect the wires at the phoenix plug (labeled RS-422 Out to Radio) on the J-box/modem.
 - Connect the wires to phoenix plug labeled TB2 (RS-422 IN) on the server radio board. The cable is pinned one-to-one.

- Refer to **Figure 11** and the table for the connections from the J-box/modem to the server radio.

Note: When exposed to outdoor conditions, the signal/power cable must be in conduit.

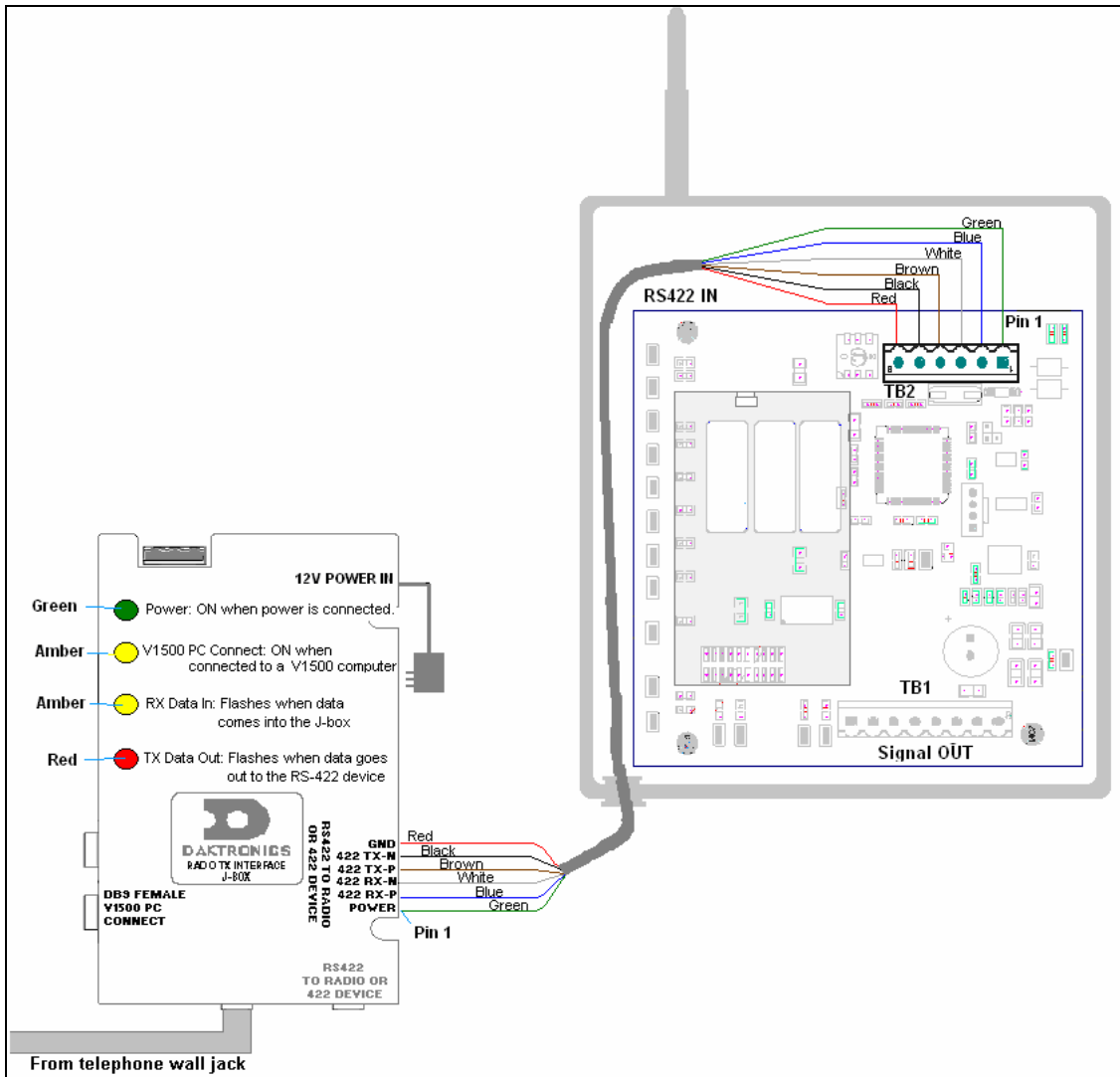


Figure 11: Modem Wiring, J-box to Server Radio

J-Box/Modem to Server Radio		
J-box/Modem RS 422 to Radio (TB1)	Cable Color	Server Radio Signal IN (TB2)
Pin 1 (POWER)	Green	Pin 1 (+V UNREG)
Pin 2 (422 RX-P)	Blue	Pin 2 (422 TX-P)
Pin 3 (422 RX-N)	White	Pin 3 (422 TX-N)
Pin 4 (422 TX-P)	Brown	Pin 4 (422 RX-P)
Pin 5 (422 TX-N)	Black	Pin 5 (422 RX-N)
Pin 6 (GND)	Red	Pin 6 (GND)

2.4 Installing the Client Radio

Currently most Galaxy displays allow the client radio to be installed using a quick-connect cable. This provides for a quicker and simpler installation. However, some displays are not equipped with quick-connect jacks, but they are or can be controlled with a radio system. This section includes client radio installation both with and without quick-connects.

Note: Daktronics recommends that the client radio be temporarily mounted in the desired location. Once the radio is proven effective in this location, it can be permanently installed.

Display with Quick-connect Option

Reference Drawings:

System Riser Diagram; QC Outdoor Radio, Gen 2..... **Drawing A-211606**
System Riser Diagram; Modem/QC Outdoor Radio, Gen 2 **Drawing A-242383**

The client radio is watertight and should not need additional protection from the elements. The cable is also rated for outdoor use and does not have to be routed in conduit. Use **Drawings A-211606** and **A-242383** for reference.

Note: If the client radio enclosure is opened, make sure the screws and the gasket are closed tightly to insure a watertight seal.

1. Turn power off to the display during the installation of the radio.
2. Mount the radio at or within 25 feet (8 m) of the display.
3. A watertight gasket is used to connect the signal/power cable to the client and a quick-connect cable connects from the enclosure to the display.
4. Using the provided quick connect cable, plug into the red six-pin jack labeled J33, RS-232/Radio, as shown in **Figure 12**.
5. Secure any additional cable to the display to protect it from weather or vandalism.



Figure 12: Quick-connect Radio Installation Location

Display without Quick-connect Option

Reference Drawings:

- System Riser Diagram; Modem/Outdoor Radio, Gen 2 **Drawing A-148606**
 System Riser Diagram; Outdoor Radio, Gen 2 **Drawing A-185325**

The client radio is watertight and should not need additional protection from the elements. The cable is also rated for outdoor use and does not have to be routed in conduit. Use **Drawings A-148606** and **A-185325** for reference.

Note: If the client radio enclosure is opened, make sure the screws and the gasket are tightly closed to insure a watertight seal.

1. Turn power off to the display during the installation of the radio.
2. A watertight gasket is used to connect the signal/power cable to the client and another is included to provide a watertight seal to the display.
3. Go through one of the knockouts on the back of the display, if possible. If that is not an option, make a 3/4" hole in the display, making sure that the internal components are not damaged, and shavings from the hole do not interfere with those same parts.
4. Remove the locking nut on the watertight gasket on the cable and run the cable through the hole into the display. Tighten the locking nut on the inside of the display.
5. The cable coming into the display has a 2-pin connector and three wires that need to be terminated. Also, refer to **Figure 13** and **Figure 14** for the specific type of display.
 - Connect the included jack to the white plug in the display that provides power from the internal transformer.
 - Connect the following to the RS-232 IN at the display:

Radio Server	Cable Color	Display Terminal Block
Pin 5 (RX)	Blk 2	Pin 3 (TX-P)
Pin 6 (TX)	Red 2	Pin 5 (RX-P)
Pin 4 (GND)	Blk 3	Pin 4 (GND)
	Shield	Pin 4 (GND)

AF-3050/AF-3060/AF-3090 Displays

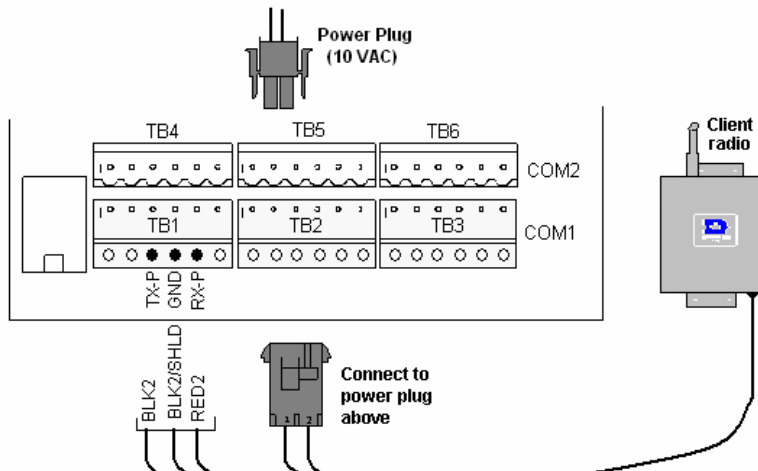


Figure 13: Connection for AF-3050, AF-3060, AF-3090 Displays

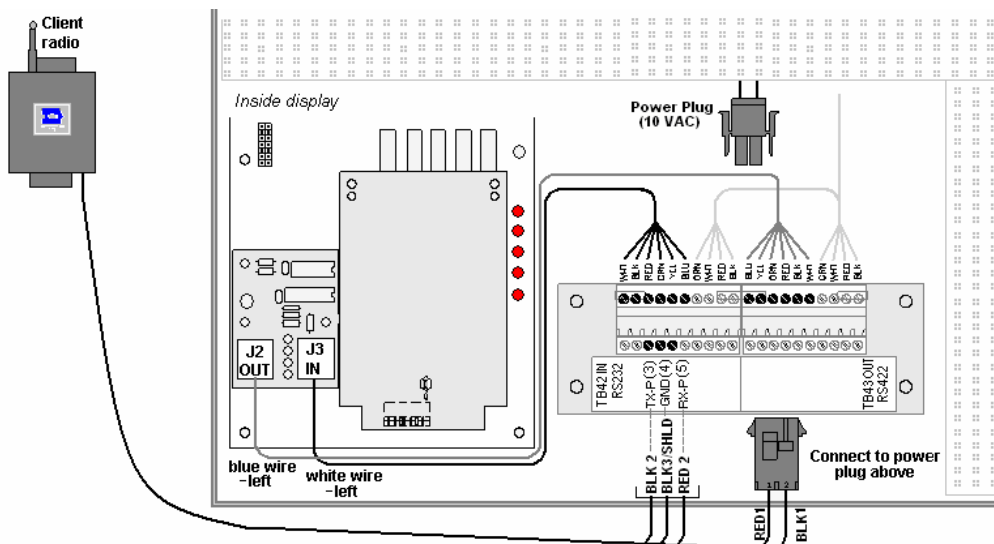


Figure 14: Connection for G-1000, AF-3010, X-1000 Displays

2.5 Multi-Client Radio Installations

If additional client radio(s) are to be added after a set of radios was previously installed, please note the following conditions:

- Each client radio must be in direct line-of-site with the server radio.
- Each client radio must have the J2 jumper in the closed position.
- All radios must be set to the same address.
- All displays, even those back-to-back, must have their own unique address.
- The signal strength on the server will not be available in multiple-client-mode because the strength will be different for each client radio.

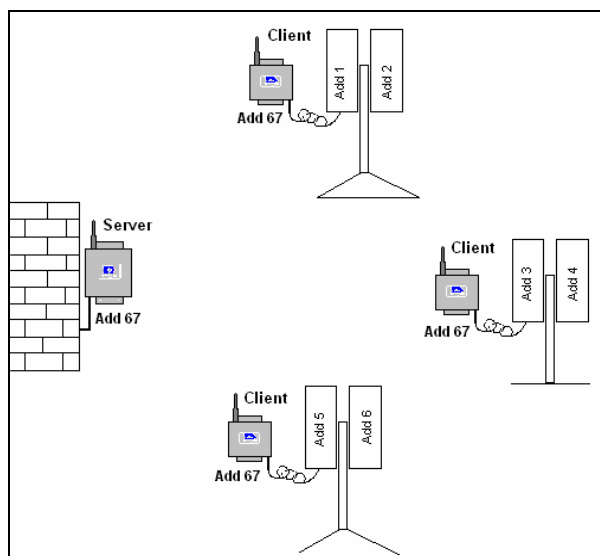


Figure 15: Multi-Client Site Layout

2.6 Indoor Server Radio Installation

The indoor server radio uses a different circuit board than the outdoor server or client radios. Additional inputs for RS-232 and RS-422 signal are provided, and LED's for transmit, receive, in-range, and power are included. Refer to **Figure 16**. In addition, the indoor server radio is powered with a wall-pack transformer that provides 12 VAC to the radio. As with outdoor radio systems, the server and client radios must maintain a direct line-of-sight between antennas for clear communication.

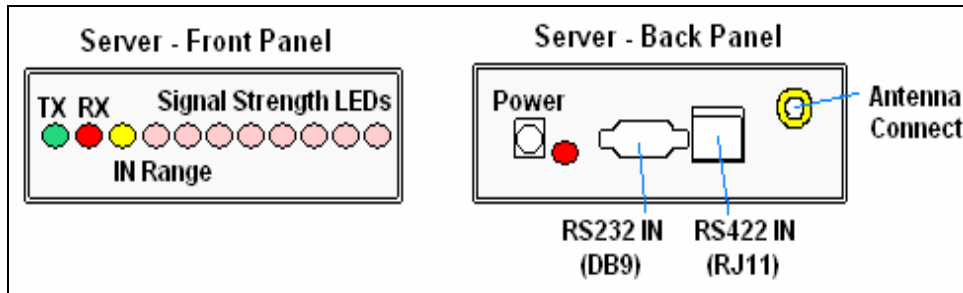


Figure 16: Indoor Server Front and Back Panels

The indoor server radio comes in a plastic case and is intended for use only with indoor displays. It should be handled carefully. **Do not drop the indoor server radio or allow it to get wet.**

(Some early outdoor displays were sold with an indoor server radio that communicated to the client through a window. Because many of these sites proved to be problematic, this practice was discontinued. However, the types of connections used then are similar to those in the following directions.)

Note the following for correct signal communication:

- The Power LED will be on when power is applied to the radio.
- The In Range LED will be on when the server and client are in range of each other.
- The TX and RX LEDs will flicker when communication is taking place between the server and client radios.
- The antenna should be attached securely and in a parallel position to the antenna on the client radio.

Installing an Indoor Server Radio

Reference Drawings:

- System Riser Diagram, Radio Interface, Indoor Gen 2 **Drawing A- 187988**
- System Riser Diagram, Radio Interface, QC, Gen 2 **Drawing A-187998**

Three types of signal are possible with the indoor radio installation:

- RS-232.
- RS-422.
- Modem.

Refer to the installation steps that correspond to the signal method being used.

Direct – RS-232

This system connects the server radio directly to the computer with a serial cable. This cable is a DB9M-DB9F, 10-foot (3 m) serial cable. Refer to **Figure 17** for an illustration of the connections.

1. Plug the DB9F into the PC's RS-232 serial COM port.
2. Plug the DB9M to the server radio RS-232 input port (J4).
3. Plug the wall pack transformer's jack into the radio, and the pack into a 120 VAC grounded outlet.

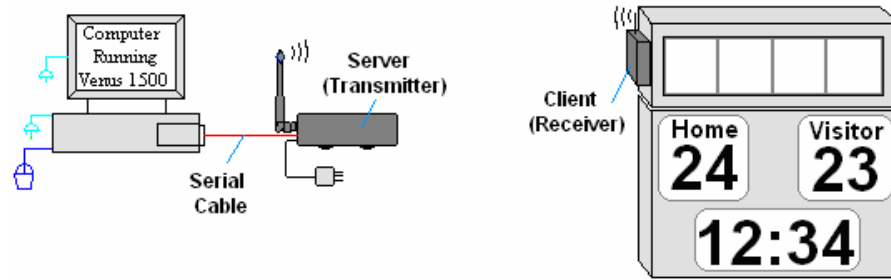


Figure 17: Indoor Control Location with RS-232

Direct – RS-422

This system requires a J-box/signal converter to connect the computer to the radio. It allows the radio to be up to 1000 feet (300 m) away from the computer.

1. Plug the serial cable's DB9M connector into the J-box/signal converter at the jack labeled "V1500 PC Connect".
2. Plug the DB9F connector into RS-232 COM port on the computer.
3. Plug the wall pack transformer's jack into the radio, and the wall pack into a 120 VAC grounded outlet.
4. Plug the wall pack transformer's jack into the J-box/signal converter, and the wall pack into a 120 VAC grounded outlet.
5. Plug a flipped six-conductor RJ-11 cable into the jack labeled "RS-422 to Radio or 422 Device" on the J-box/signal converter and the opposite end into the RS-422 IN (J5) on the Server radio.

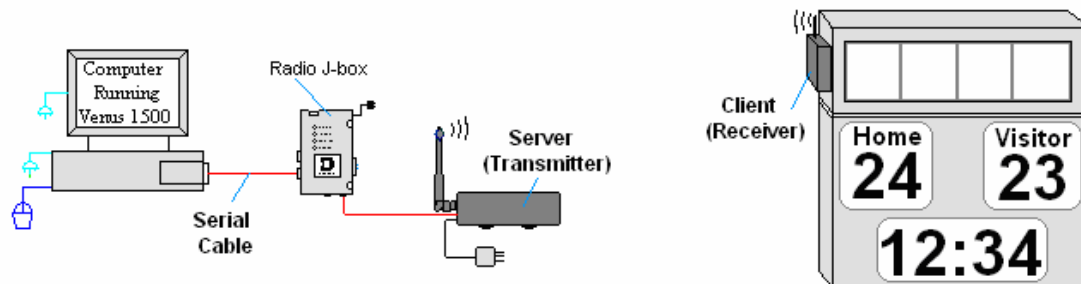


Figure 18: Indoor Control Location with RS-422

Remote - Modem

This system requires a J-box/modem to connect a phone line to the radio. It allows the computer to communicate to the display from a remote location. In addition, the radio may be up to 1000 feet (300 m) away from the J-box/modem.

1. Plug a 6-conductor flipped phone cable into a phone wall jack.
2. Plug the other end of the phone cable into the connector on the J-box/modem labeled "Phone Line Connection".
3. Plug the wall pack transformer's jack into the radio, and the wall pack into a 120 VAC grounded outlet.
4. Plug the wall pack transformer's jack into the J-box/modem, and the wall pack into a 120 VAC grounded outlet.
5. Plug a flipped 6-conductor RJ-11 cable into the jack labeled "RS-422 to Radio or 422 Device" on the J-box and the opposite end into the RS-422 IN (J5) on the server radio.

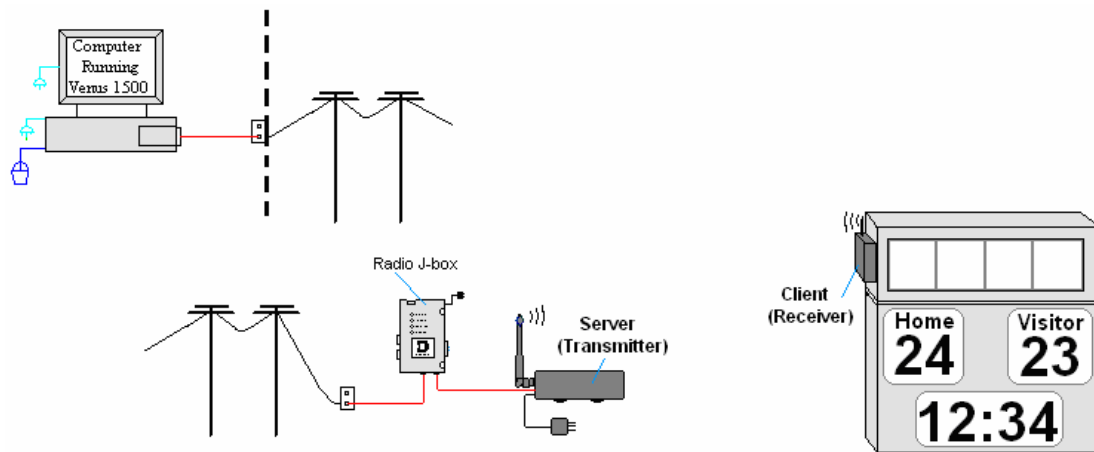


Figure 19: Remote Indoor Control Location with Modem

2.7 Indoor Radio Server Board

Figure 20 is an example of the internal radio control board found in the indoor server. It has several additional parts not found on the outdoor server or client radios, therefore the boards are not interchangeable.

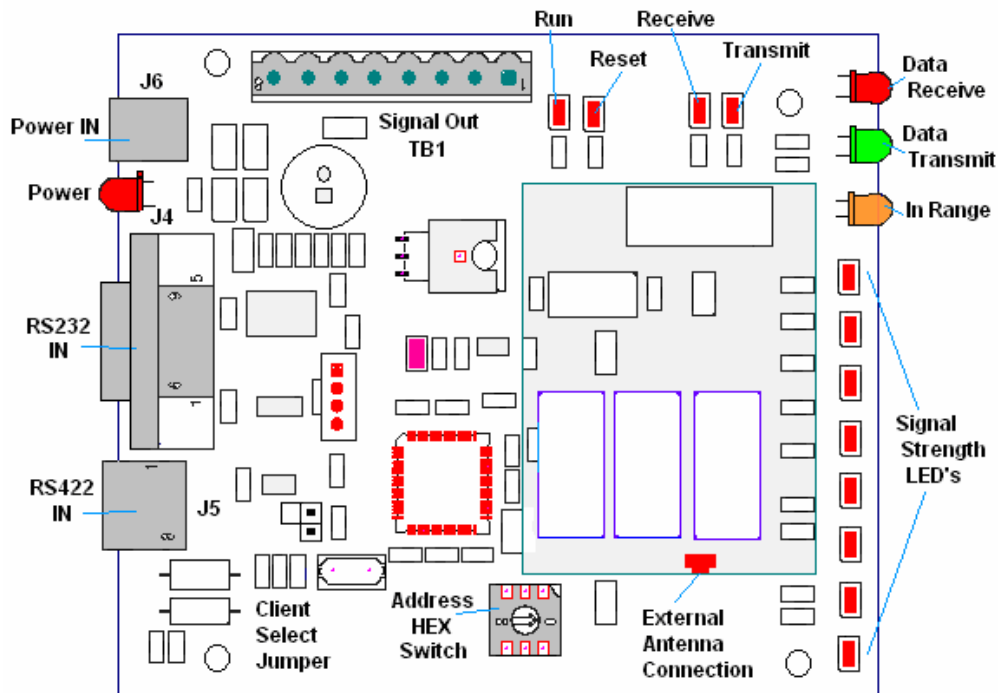


Figure 20: Indoor Server Radio Board

2.8 Signal Termination between Two Displays

Primary - Mirror

Most displays are shipped as either a single primary display or two displays in a two-face primary-mirror configuration.

The primary-mirror (2V) quick-connect cable is used to terminate signal between these two displays. The six-foot cable goes from the Signal OUT (J34) on the primary display to Signal IN (J32) on the mirror display as shown in Figure 21.

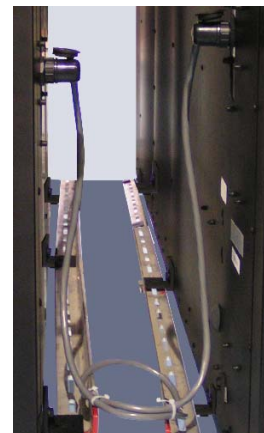


Figure 21: Quick-connect between Displays

Primary – Primary Signal Termination

If the location requires two displays that cannot be mounted back-to-back, two primary displays will need to be installed. In that case, the following connections will need to be made:

1. Open the display and locate the controller for these displays.
2. Route the cable through conduit from the back of the first primary display to the back of the second primary display. Use one of the knockouts for access, being careful not to damage any internal components.
3. Use either a 4-pair signal cable or two 4-conductor, shielded cables to connect both the signal and the temperature sensor information between displays.
4. The signal cable will connect from TB3 out on the first primary display to either:
 - a. A surge board at TB1 in a second primary display.
 - b. (or) To TB2 on the controller in the second primary display.

Note: In either case, the connections are flipped. See the table for connections on both displays.
5. In **Figure 22**, the signal connections between two controllers are shown.
6. See the instructions for the Optional Temperature Sensor in the appendix of the display manual for connections that need to be made for the temperature sensor termination.

Primary to Primary Connections		
Primary RS422 OUT (TB3)	Field Cabling	Primary RS422 IN (TB2)
Pin 1 (GND)	Shield	Pin 6 (GND)
Pin 2 (D2OUT-N)	Red	Pin 5 (D1IN-N)
Pin 3 (D2OUT-P)	Black	Pin 4 (D1IN-P)
Pin 4 (D2IN-N)	Green	Pin 3 (D1OUT-N)
Pin 5 (D2IN-P)	White	Pin 2 (D1OUT-P)
Pin 6 (Shield)		Pin 1 (Shield)

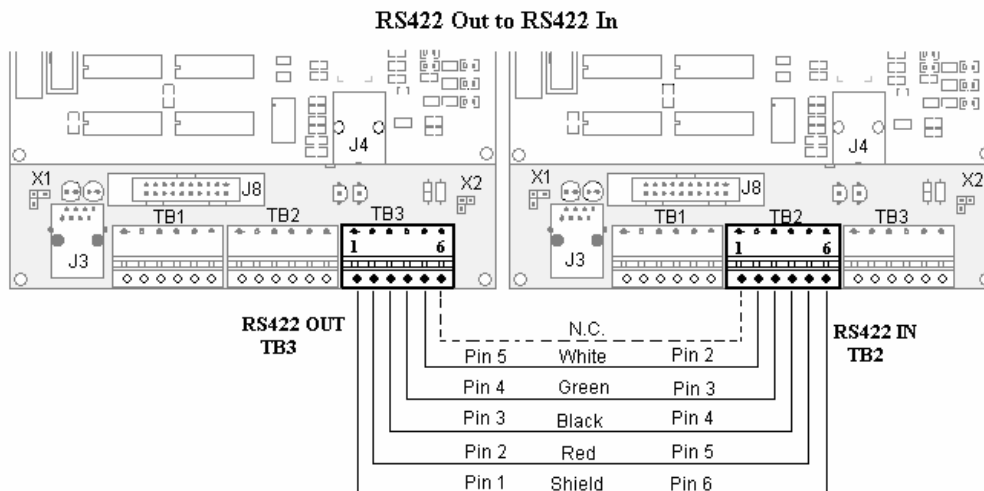


Figure 22: Connection between Two Primary Displays

Section 3: Maintenance and Troubleshooting

This section covers service and diagnostic procedures, loopback testing, and replacement parts. The troubleshooting chart lists symptoms that may occur with the radios along with solutions for these issues. The replacement part section lists all the components for indoor and outdoor radio systems as well as information on Daktronics Exchange and Repair & Return Programs.

3.1 Service and Diagnostics

Note: The following items only apply to those radios that are revision 7 and higher. The revision of the radio is found on the same label as the part number for the radio.

Addressing

The channel address is a parameter that should be the same for all the server and client radios in the same network. The Venus 1500 radio can operate on channels 67-74. The default channel is 67, which corresponds to 0 on the hex dial.

A rotary hex switch is used to set the address of the radios. The address is only read on power up. To change the address, power down the radio, set the new address, and then power it back up. Only the first eight numbers are used for addressing and can be set according to the following table.

Hardware Channel Setting (Hex Switch)	Venus 1500 Radio Channel
0	67
1	68
2	69
3	70
4	71
5	72
6	73
7	74

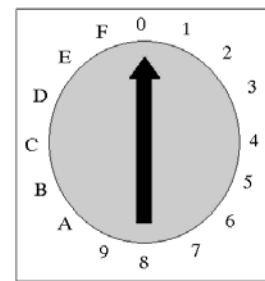


Figure 23: Rotary Switch (Channel 67)

If more than one set of radios is being used in close proximity, each set can be set to their own unique address. For example, the address of the server and the client at the first business can be set to address 67, and the server and client at the second business can be set to address 68.

Server/Client Selection

The same circuit board is used in both the outdoor server and client radio enclosures. The client is selected by use of a jumper located at J2 of the radio board, as shown in **Figure 24**. To select a client, the jumper should cover both pins.

The jumper is only recognized on power up. If the jumper is in the open position, the radio will power up as a server radio. When the jumper is in the closed position, the radio will power up as a client. **Figure 24** illustrates both the closed and open positions.

When moving an internal radio board, making a server into a client, or a client into a server, make sure that the jumper is in the correct location for the type of radio.

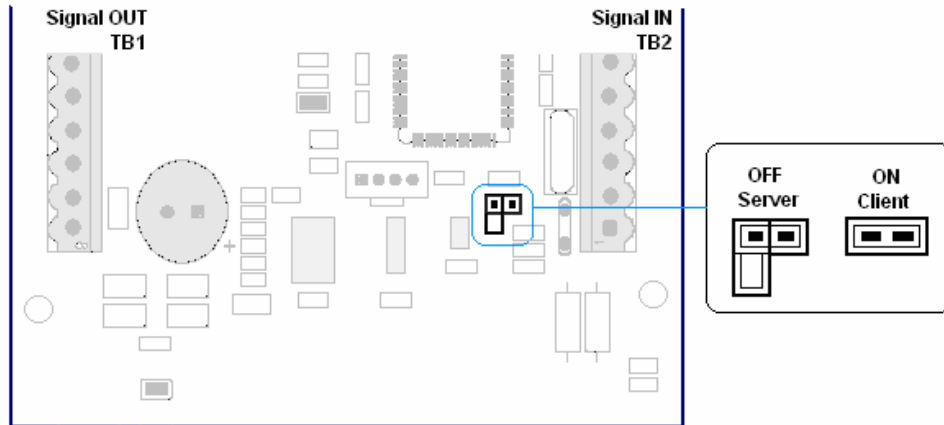


Figure 24: Radio Jumper Location

Signal Strength Mode

Signal strength mode is shown on all client displays. Signal strength is determined by the number of LEDs that are lit, the more LEDs the stronger the signal. Refer to **Figure 4** for the location of the signal strength LEDs. The client radio will display signal strength during normal operation. However, in normal operation, the server board does not display signal strength.

To display signal strength mode on the server radio LEDs, follow these directions:

1. Allow the radio to power up on the address as normal.
2. Change the hex switch to E and allow it to remain there for 10 seconds.
3. The hex switch on the server must be returned to the address location if the power is recycled to the radio.

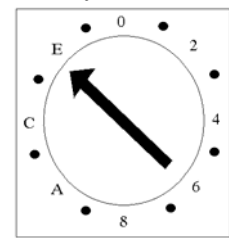


Figure 25: Signal Strength Mode on Server Radio

Note: Signal strength mode can only be used with the one server - one client configuration. This option is not available with the multiple-client mode.

Reconfiguration

At certain times, it may be necessary to reconfigure the internal radio board to its original settings. (This will not change the board's identity as either a server or a client, which is determined by the location of the jumper.)

After the radio has powered up on the address, the hex switch can then be changed. To reconfigure the radio to the original settings, change the hex switch to F and keep it there for at least 10 seconds. The radio will flash all signal strength LEDs ON and OFF when all values have been reset. This setting makes it possible to reconfigure a radio for use with a system that does not have this same capability.

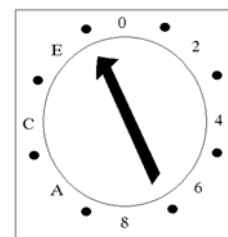


Figure 26: Reconfiguration Mode on the Radio

Client Cable Connection

The cable that connects from the client radio to the top jack of the quick connect on the back of the display is pre-terminated at Daktronics. The cable is connected inside the client radio as shown in **Figure 1**.

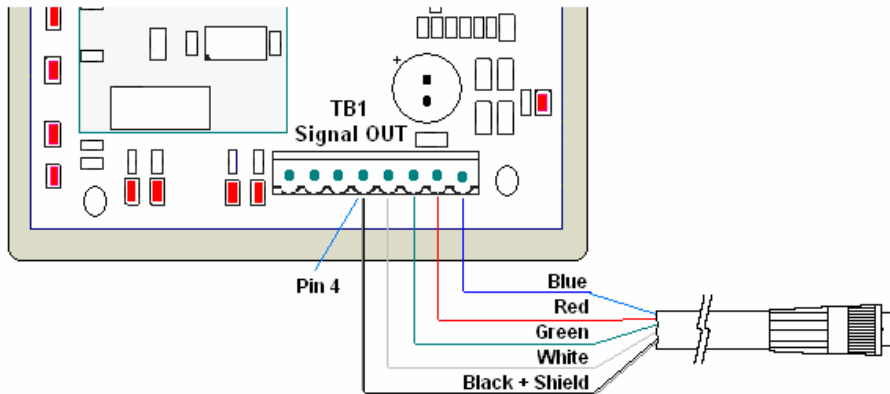


Figure 1: Client Radio Connection

Client Connection (TB 1)	Cable Color
CAN L (Pin 1)	
CAN H (Pin 2)	
+5V (Pin 3)	
GND (Pin 4)	Black + Shield
RX (Pin 5)	White
TX (Pin 6)	Green
AC Power (Pin 7)	Red
AC Power (Pin 8)	Blue
N.C.	Brown

3.2 Troubleshooting

This subsection contains some symptoms that may be encountered when using the radios. This list does not include every possible symptom, but does represent common situations that may occur.

Symptom/Condition	Possible Cause/Remedy
<ul style="list-style-type: none"> No power to the Server 	<ul style="list-style-type: none"> Is the cable from the J-box/signal converter connected to the server radio? Does the J-box/signal converter have power?
<ul style="list-style-type: none"> No power to the Client 	<ul style="list-style-type: none"> Does the display have power? Does the controller have power? Are the correct wires terminated in TB1 on the client radio board? Is the white power plug from the quick connect cable plugged to the spare mate-n-loc power plug (AF-3010)?
<ul style="list-style-type: none"> Server will not communicate with the computer 	<ul style="list-style-type: none"> Does the server have power? Does the J-box/signal converter have power? Is the signal cable connected to the J-box at J2 and to the server at TB2? Is the cable from the J-box to the server pinned one-to-one? Is the correct serial cable being used between the computer and the J-box/signal converter? (W-1267)?
<ul style="list-style-type: none"> Server will not communicate with Client 	<ul style="list-style-type: none"> Do both the server and client have power? Are the radios in line-of-sight? Are the antennas in parallel? Are they set to the same channel? Have you done a loop-back test (Section 3.3)?
<ul style="list-style-type: none"> Client will not communicate with display 	<ul style="list-style-type: none"> Does the display have power? Does the client have power? Are the correct wires terminated into TB1 on the client radio (TB42 on the AF-3010)? In the jumper ON at the client and OFF at the server? Is the V1500 software configured correctly? Is the controller in the display on the address that is configured in the software?
<ul style="list-style-type: none"> Computer will not communicate with the display 	<ul style="list-style-type: none"> Are the display and radios powered up? Is the server connected to the computer, through the J-box? Is the client connected to the display? Are the radios in line-of-sight? Are the antennas in the parallel position or oriented properly? Does the display boot up? Is it set to the correct address? Is the V1500 software configured correctly? Is the controller in the display on the address that is configured in the V1500 software?

3.3 Loop-back Test

A loop-back test can be used to verify a good signal between the server and client radios. A jumper will be connected from transmit to receive on the client radio only.

Follow these steps to run the test:

1. Remove the cover from the client radio.
2. Label the location of the green and white wires going into the radio interface board.
3. Disconnect the green and white wires going into pin-5 (RX) and pin-6 (TX) on TB1 of the radio.

Note: The other wires to the radio must remain connected to provide power to the radio board.

4. Put a jumper wire into pins 5 and 6 of the interface board, as shown in **Figure 28**.

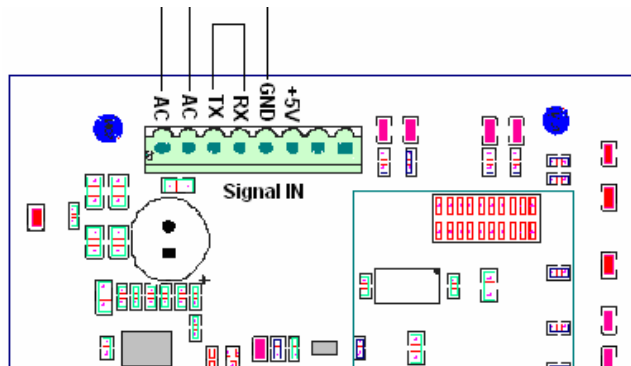
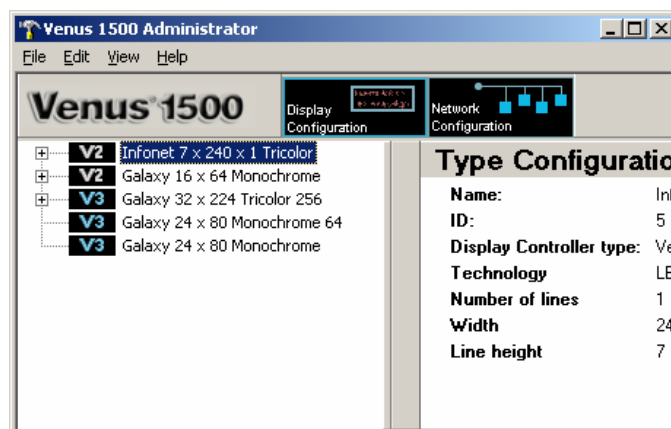


Figure 28: Jumper Location for Loop-back Test

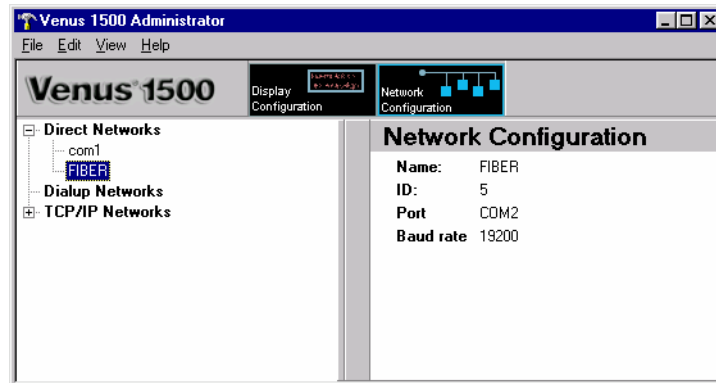
5. Conduct the loop-back test using the Venus 1500 software according to the following directions.

Conducting the Venus 1500 Software Test

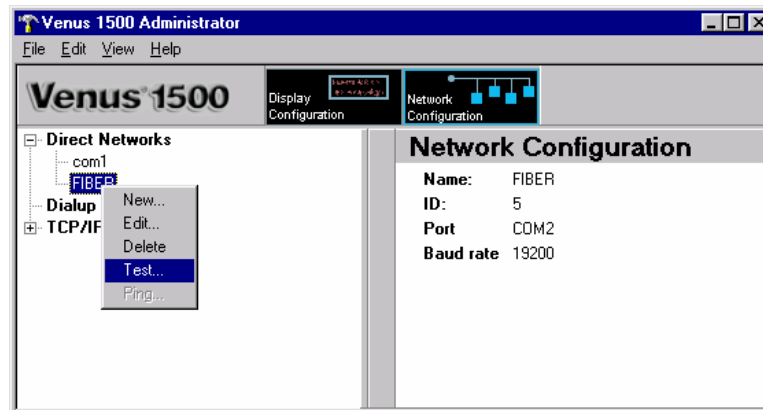
1. Open *Venus 1500 Administrator*.



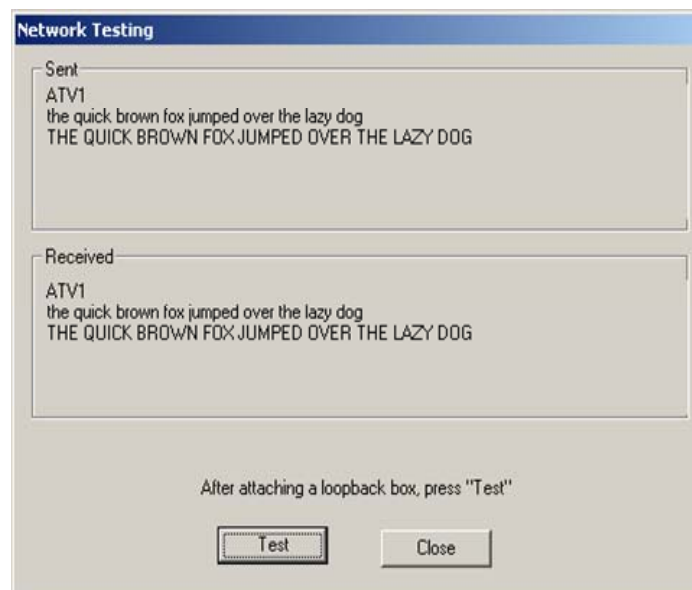
2. Click **Network Configuration** and open the direct network by clicking on the [+] in front of *Direct Network*.



3. Right click on the network to be tested.



4. Click Test.



5. If the same message appears in the *Received* box as in the *Sent* box, the loop-back test was successful, implying that the radios are communicating.
6. If "No Response" appears in the *Received* box, the test failed due to one of the following problems:
 - a. The computer COM port or the USB port being used is not configured as a "serial" port.
 - b. Communication problem: the wire to the server radio or the terminations are bad.
 - c. A problem occurred while conducting the test:
 - The serial cable to the J-box/signal converter is bad or not plugged in.
 - The J-box/signal converter is not plugged in.
7. If the following message is seen: "It appears as if this port has a modem attached", the modem will need to be moved or a different COM port used.

After the test is complete:

1. Remove the wire jumper and make sure terminations are correct.
2. Run the test again without the jumpers and the test should fail.
3. Use *Venus 1500 Display Manager* to get status to ensure communication now works correctly.

3.4 Replacement Parts

Daktronics recommends keeping replacement parts in a locked cabinet or an enclosure to prevent theft. Below is a list of parts that may need to be replaced during the life of the radio.

Replacement Parts	Part Number
Radio Interface, Gen 2, Outdoor Server w/enclosure	0A-1146-0079
Radio Interface, Gen 2, Outdoor Client, w/o QC	0A-1146-0077
Radio Interface, Gen 2, Outdoor Client, w/QC	0A-1146-0078
Radio Interface Indoor Server w/enclosure	0A-1146-0085
Radio Interface Board, Gen 2, Outdoor Server and all Client Radios	0P-1146-0039
Radio Interface Board, Gen 2, Indoor Server Only	0P-1146-0040
Radio Interface J-box; RS-232 to RS-422	0A-1279-0161
Radio Interface J-box/Modem	0A-1279-0162
Transformer, 12V; Wall pack, 6' cord, (Indoor Server, J-box/signal converter and J-box/modem)	T-1118
DB9 Female to DB9 Male 10 ft. Cable	W-1267
Serial Cable, DB9 Female to DB25 Male, 6 ft.	W-1249
6 Conductor, 25' Modular Phone Cord	W-1265
Cable, 6-conductor, 26 AWG, stranded, silver satin	W-1368
Cable, 6-conductor, 18-AWG, Stranded cable	W-1370
Radio Antenna	A-1654
DB9M/DB25F Serial Port Adaptor	A-1603

3.5 Daktronics Exchange and Repair & Return Programs

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

Exchange Program

Daktronics unique Exchange Program is a quick service for replacing key parts in need of repair. If a part requires repair or replacement, Daktronics sends the customer a replacement, and the customer sends the defective part to Daktronics. This decreases display downtime.

Before Contacting Daktronics

Insert important part numbers here:

Fill in these numbers before calling Customer Service:

Display Serial Number: _____
Display Model Number: _____
Contract Number: _____
Date Installed: _____
Location of Display: _____
Daktronics Customer ID Number: _____

To participate in the Exchange Program, follow these steps:

1. **Call Daktronics Customer Service: 866-343-3122**
2. **When the new exchange part is received, mail the old part to Daktronics.**

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

 - a. Package the old part in the same shipping materials in which the replacement part arrived.
 - b. Fill out and attach the enclosed UPS shipping document.
 - c. Ship the part to Daktronics.
3. **A charge will be made for the replacement part immediately, unless a qualifying service agreement is in place.**

In most circumstances, the replacement part will be invoiced at the time it is shipped.
4. **If the replacement part does not solve the problem, return the part within 30 working days or the full purchase price will be charged.**

If the equipment is still defective after the exchange was made, please contact Customer Service immediately. Daktronics expects immediate return of an exchange part if it does not solve the problem. The company also reserves the right to refuse parts that have been damaged due to acts of nature or causes other than normal wear and tear.

Repair & Return Program

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

1. Call or fax Daktronics Customer Service:

Phone: 866-343-3122 Fax: 605-697-4444

2. Receive a Return Materials Authorization (RMA) number before shipping.

This expedites repair of the part.

3. Package and pad the item carefully to prevent damage during shipment.

Electronic components, such as printed circuit boards, should be placed in an antistatic bag before boxing. Daktronics does not recommend Styrofoam peanuts in packaging.

4. Enclose:

- your name
- address
- phone number
- the RMA number
- a clear description of symptoms

Shipping Address

Daktronics Customer Service
PO Box 5128
331 32nd Avenue
Brookings, SD 57006

Appendix A: Reference Drawings

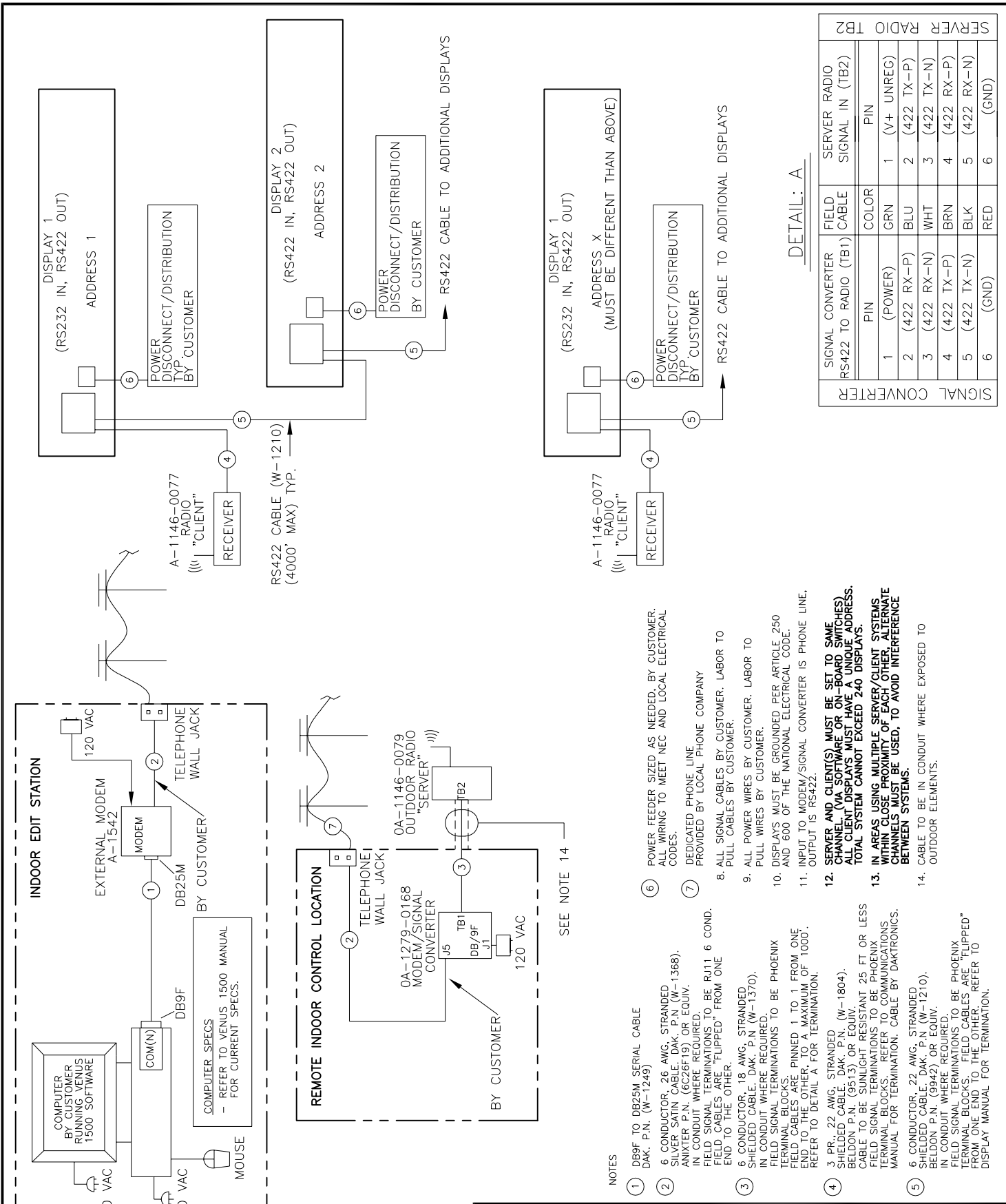
The Daktronics drawing number is located on the bottom right corner of the drawing. Refer to **Figure 29** for a sample drawing label with the drawing number circled. The drawings are listed here in numerical order by the last set of digits and grouped together by drawing size, (A, B).

THE CONCEPTS EXPRESSED AND DETAILS SHOWN ON THIS DRAWING ARE CONFIDENTIAL AND PROPRIETARY. DO NOT REPRODUCE BY ANY MEANS, INCLUDING ELECTRONICALLY WITHOUT THE EXPRESSED WRITTEN CONSENT OF DAKTRONICS, INC. COPYRIGHT 2004 DAKTRONICS, INC.			
DAKTRONICS, INC. BROOKINGS, SD 57006			
PROJ: GALAXY, AF-3200 & AF-3400 SERIES			
TITLE: SCHEM, PRIMARY SIGNAL, INTERNAL, W/QC			
DES. BY: PGILK		DRAWN BY: LKERR	DATE: 11 MAR 04
REVISION	APPR BY:	1229-R03	B-206146
00	SCALE: NONE		

Drawing number

Figure 29: Drawing Label

System Riser Diagram; Modem/Outdoor Radio, Gen 2.....	Drawing A-148606
System Riser; Radio Interface.....	Drawing A-160039
Radio QC Cable Term/Assy, V1500.....	Drawing A-176792
System Riser Diagram; Outdoor Radio, Gen 2.....	Drawing A-185325
System Riser Diagram, Radio Interface, Indoor, Gen 2.....	Drawing A-187988
System Riser, Radio Interface, QC, Gen 2.....	Drawing A-187998
System Riser Diagram; Radio (Gen 2) QC.....	Drawing A-211606
System Riser Diagram; Modem/QC Outdoor Radio, Gen 2.....	Drawing A-242383
System Riser Diagram, Indoor Radio, Gen 2, QC.....	Drawing A-285780
Radio Cable Connections/Assembly.....	Drawing B-161953



DETAIL: A

SIGNAL CONVERTER		FIELD CABLE		SERVER RADIO	
RS422 TO RADIO (TB1)		COLOR		SIGNAL IN (TB2)	
PIN	(POWER)	COLOR	PIN		
1	(POWER)	GRN	1	(V+ UNREG)	
2	(422 RX-P)	BLU	2	(422 TX-P)	
3	(422 RX-N)	WHT	3	(422 TX-N)	
4	(422 TX-P)	BRN	4	(422 RX-P)	
5	(422 TX-N)	BLK	5	(422 RX-N)	
6	(GND)	RED	6	(GND)	

- NOTES
- DB9F TO DB25M SERIAL CABLE DAK. P.N. (W-1249).
 - 6 CONDUCTOR, 26 AWG, STRANDED SILVER SATIN CABLE. DAK. P.N. (W-1368). ANIXTER P.N. (6C26F19) OR EQUIV. IN CONDUIT WHERE REQUIRED. FIELD SIGNAL TERMINATIONS TO BE RJ11 6 COND. END TO THE OTHER.
 - 3 PR., 22 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'. REFER TO DETAIL A FOR TERMINATION.
 - 3 PR., 22 AWG, STRANDED SHIELDED CABLE. DAK. P.N. (W-1804). BELDON P.N. (9513) OR EQUIV. CABLE TO BE SUNLIGHT RESISTANT 25 FT OR LESS FIELD SIGNAL TERMINATIONS TO BE PHOENIX TERMINAL BLOCKS. REFER TO COMMUNICATIONS MANUAL FOR TERMINATION. CABLE BY DAKTRONICS.
 - 6 CONDUCTOR, 22 AWG, STRANDED SHIELDED CABLE. DAK. P.N. (W-1210). BELDON P.N. (9942) OR EQUIV. IN CONDUIT WHERE REQUIRED. FIELD SIGNAL TERMINATIONS TO BE PHOENIX TERMINAL BLOCKS. FIELD CABLES ARE "FLIPPED" FROM ONE END TO THE OTHER. REFER TO DISPLAY MANUAL FOR TERMINATION.
 - POWER FEEDER SIZED AS NEEDED. BY CUSTOMER. ALL WIRING TO MEET NEC AND LOCAL ELECTRICAL CODES.
 - DEDICATED PHONE LINE PROVIDED BY LOCAL PHONE COMPANY.
 - ALL SIGNAL CABLES BY CUSTOMER. LABOR TO PULL CABLES BY CUSTOMER.
 - ALL POWER WIRES BY CUSTOMER. LABOR TO PULL WIRES BY CUSTOMER.
 - DISPLAYS MUST BE GROUNDED PER ARTICLE 250 AND 600 OF THE NATIONAL ELECTRICAL CODE.
 - INPUT TO MODEM/SIGNAL CONVERTER IS PHONE LINE. OUTPUT IS RS422.
 - SERVER AND CLIENT(S) MUST BE SET TO SAME CHANNEL VIA SOFTWARE OR ON-BOARD SWITCHES. ALL CLIENTS MUST HAVE A UNIQUE ADDRESS. TOTAL SYSTEM CANNOT EXCEED 240 DISPLAYS.
 - IN AREAS USING MULTIPLE SERVER/CLIENT SYSTEMS WITHIN CLOSE PROXIMITY OF EACH OTHER, ALTERNATE CHANNELS MUST BE USED, TO AVOID INTERFERENCE BETWEEN SYSTEMS.
 - CABLE TO BE IN CONDUIT WHERE EXPOSED TO OUTDOOR ELEMENTS.

REV.	DATE	DESCRIPTION	BY	APPR.
03	26 FEB 07	ADDED MANUAL REFERENCES AND DETAIL A.	MLG	
02	29 MAR 05	CHANGED THE J-BOX FROM A 162 TO A 168	HBC	
01	25 JUN 03	REVISED NOTE 3 FROM W-1210 22 AWG TO W-1370 18 AWG ADDED MAX LENGTH OF W-1370 TO 1000'	KAP	

THE CONCEPTS EXPRESSED AND DETAILS SHOWN ON THIS DRAWING ARE CONFIDENTIAL AND PROPRIETARY. DO NOT REPRODUCE BY ANY MEANS, INCLUDING ELECTRONICALLY WITHOUT THE EXPRESSED WRITTEN CONSENT OF DAKTRONICS, INC. COPYRIGHT 2007 DAKTRONICS, INC.

DAKTRONICS, INC. BROOKINGS, SD 57006

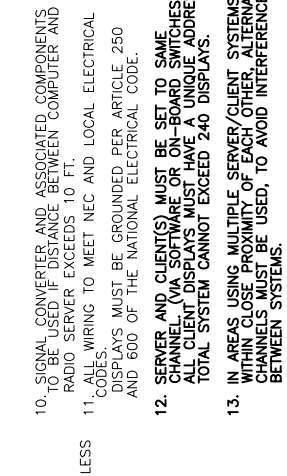
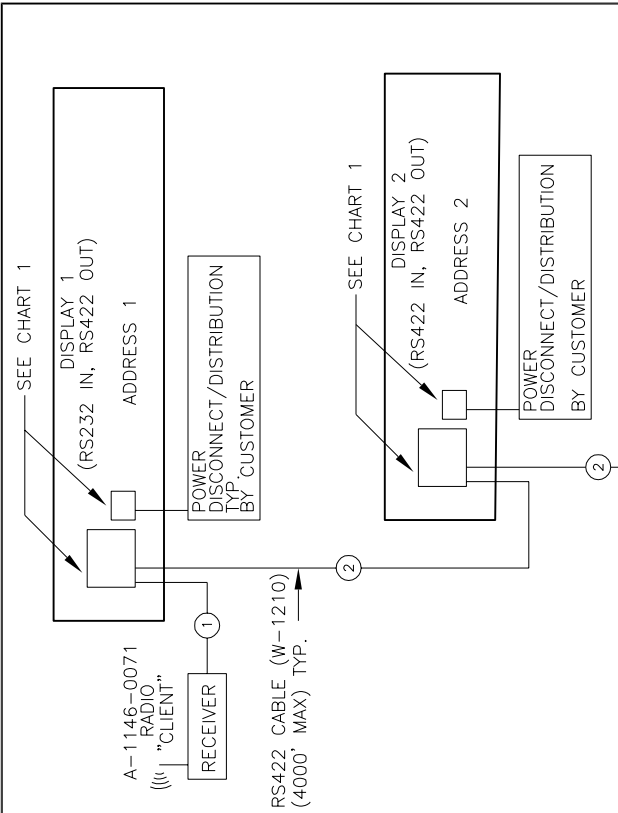
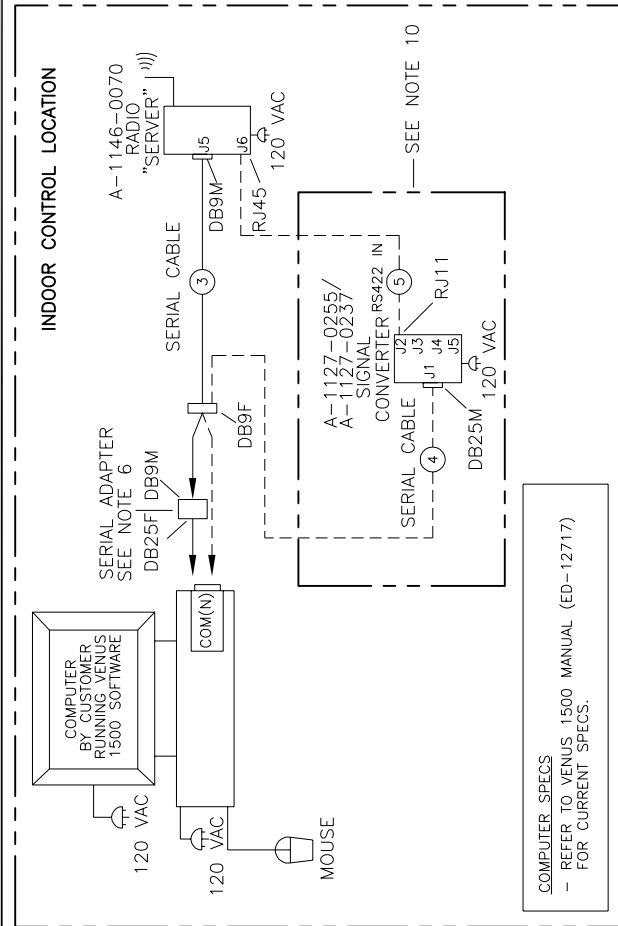
PROJ: OUTDOOR LED PRODUCT LINE

TITLE: SYSTEM RISER DIAGRAM, MODEM/OUTDOOR RADIO, GEN 2

DES. BY: DRAWN BY: LKERR DATE: 19MAR03

REVISION 03 APPR. BY: SCALE: NONE

1146-R01A-148606



DISPLAY TYPE	POWER CONN. DWG.#	SIGNAL CONN. DWG.#	POWER SPEC. DWG.#
G-1000	A-88427	A-88427	C-87896
X-1000	A-140262	A-88427	A-154944
AE-3030	A-140262	A-88427	A-154944
AF-3010	A-140262	A-88427	A-154950
AF-3060-MONO	A-129227	A-129110	A-127440
AF-3060-RG	A-129227	A-129110	A-142449
AF-3065	A-154965	A-129110	A-148571
AE-3030-SPORT	PWR CORD	A-129110	A-179356

- NOTES**
- 3 PR., 22 AWG, STRANDED SHIELDED CABLE. DAK. P.N. (W-1804). BELDON P.N. (9513) OR EQUIV. CABLE TO BE SUNLIGHT RESISTANT 25 FT. OR LESS FIELD SIGNAL TERMINATIONS TO BE PHOENIX TERMINAL BLOCKS. CABLE BY DAKTRONICS
 - 6 CONDUCTOR, 22 AWG, STRANDED SHIELDED CABLE. DAK. P.N. (W-1210). BELDON P.N. (9942) OR EQUIV. IN CONDUIT WHERE REQUIRED. FIELD SIGNAL TERMINATIONS TO BE PHOENIX TERMINAL BLOCKS. FIELD CABLES ARE "FLIPPED" FROM ONE END TO THE OTHER.
 - DB9F TO DB9M SERIAL CABLE DAK. P.N. (W-1267)
 - DB9F TO DB25M SERIAL CABLE DAK. P.N. (W-1249)
 - 6 CONDUCTOR, 26 AWG, STRANDED SILVER SATIN CABLE. DAK. P.N. (W-1368). ANIXTER P.N. (GC26F19) OR EQUIV. IN CONDUIT WHERE REQUIRED. FIELD SIGNAL TERMINATIONS TO BE RJ11 6 COND. FIELD CABLES ARE "FLIPPED" FROM ONE END TO THE OTHER.
10. SIGNAL CONVERTER AND ASSOCIATED COMPONENTS TO BE USED IF DISTANCE BETWEEN COMPUTER AND RADIO SERVER EXCEEDS 10 FT.
11. ALL WIRING TO MEET NEC AND LOCAL ELECTRICAL CODES. DISPLAYS MUST BE GROUNDED PER ARTICLE 250 AND 600 OF THE NATIONAL ELECTRICAL CODE.
12. 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.
13. IN AREAS USING MULTIPLE SERVER/CLIENT SYSTEMS WITHIN CLOSE PROXIMITY OF EACH OTHER, ALTERNATE CHANNELS MUST BE USED, TO AVOID INTERFERENCE BETWEEN SYSTEMS.

REV.	DATE	DESCRIPTION	BY	APPR.
03	26 MAR 04	REPLACED 0A-1127-0237 WITH 0A-1127-0255 (INCLUDES SURGE PROTECTION)	SAI	DJM
02	27 NOV 02	EDITED AE-3030-SPORT LINES IN CHART 1	SLG	
01	04 NOV 02	ADDED AE-3030 MODELS TO THE CHARTS.	MWM	

THE CONCEPTS EXPRESSED AND DETAILS SHOWN ON THIS DRAWING ARE CONFIDENTIAL AND PROPRIETARY. DO NOT REPRODUCE BY ANY MEANS, INCLUDING ELECTRONICALLY WITHOUT THE EXPRESSED WRITTEN CONSENT OF DAKTRONICS, INC. COPYRIGHT 2004 DAKTRONICS, INC.

DAKTRONICS, INC. BROOKINGS, SD 57006

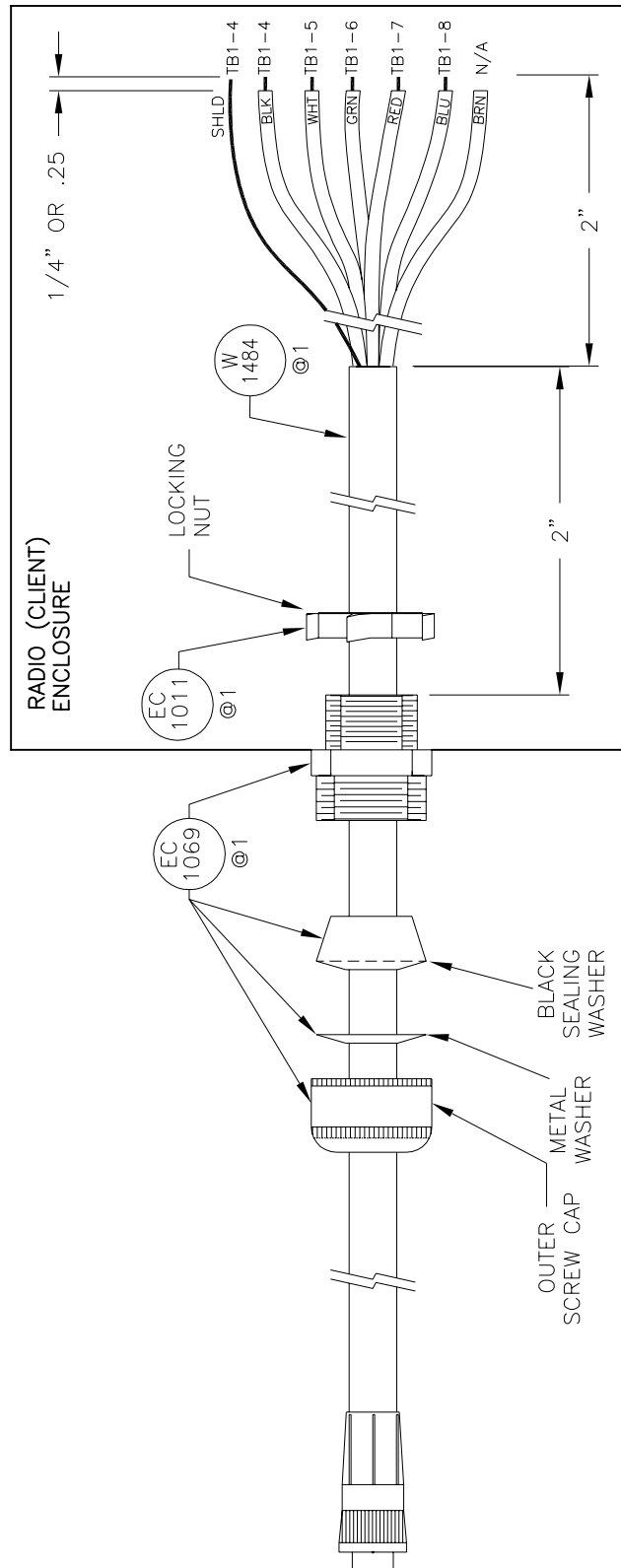
PROJ: OUTDOOR LED PRODUCT LINE

TITLE: SYSTEM RISER DIAGRAM, RADIO INTERFACE

DES. BY: DRAWN BY: LKERR DATE: 11DEC01

REVISION	APPR. BY:	1146-R01A-160039
03	SCALE: NONE	

- 1) SLIDE CABLE THROUGH PARTS OF EC-1069 EXCEPT LOCKING NUT.
- 2) TIGHTEN BLACK SEALING WASHER AND OUTER SCREW CAP SO THAT 4" OF CABLE ARE ON THE SIDE OPPOSITE THE BLACK SEALING WASHER.
- 3) STRIP 2" OF CABLE JACKET OFF THE END OF THE CABLE.
- 4) STRIP INSULATION FOR INDIVIDUAL WIRES TO DIMENSION SHOWN.
- 5) CUT THE BRN WIRE OFF EVEN WITH THE CABLE JACKET.



THE CONCEPTS EXPRESSED AND DETAILS SHOWN ON THIS DRAWING ARE CONFIDENTIAL AND PROPRIETARY. DO NOT REPRODUCE BY ANY MEANS, INCLUDING ELECTRONICALLY WITHOUT THE EXPRESSED WRITTEN CONSENT OF DAKTRONICS, INC. COPYRIGHT 2002 DAKTRONICS, INC.

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: MDC

TITLE: RADIO QC CABLE TERM/ASSY, V1500

DES. BY:

DRAWN BY: DMATHERN

DATE: 11OCT02

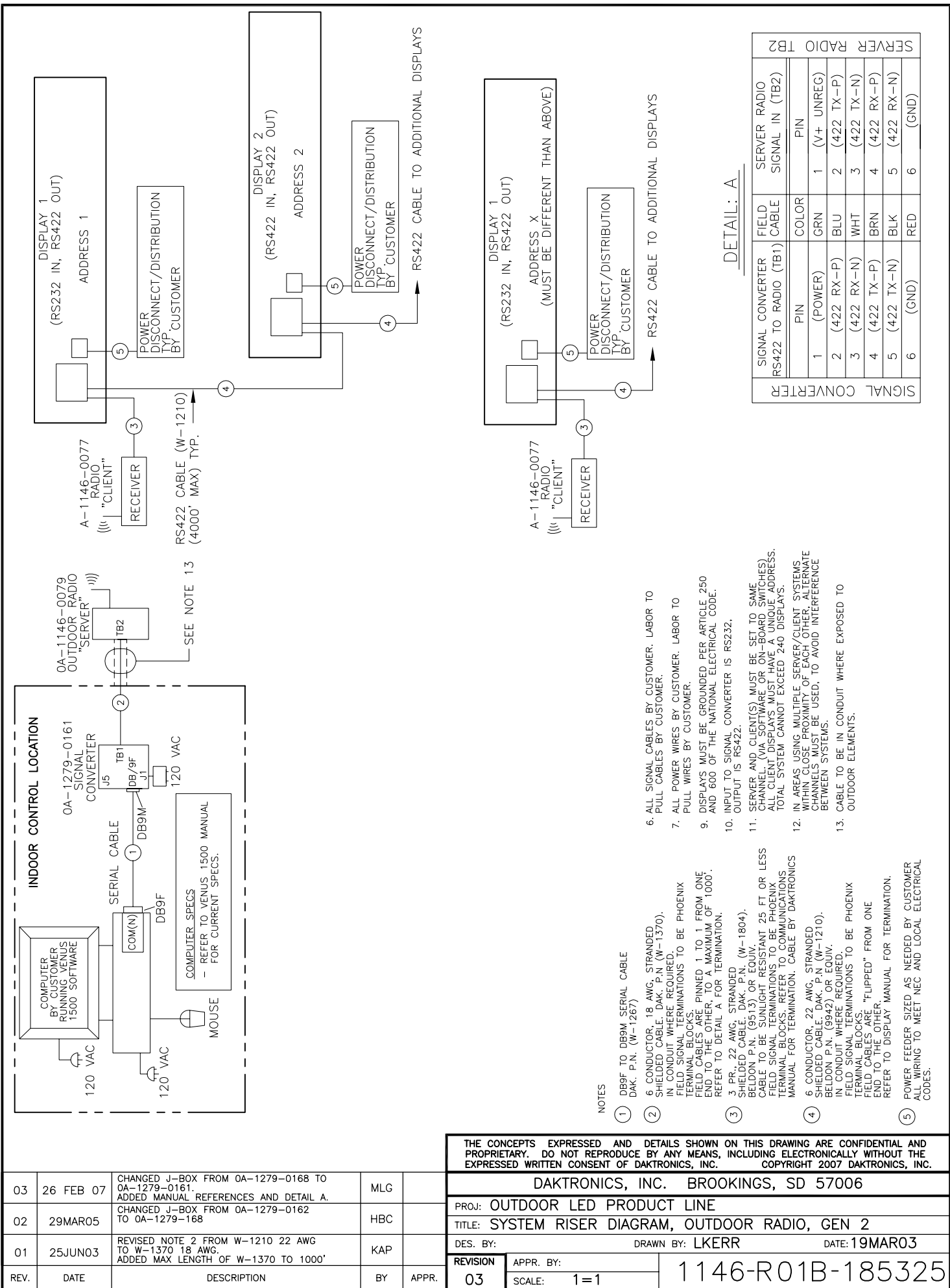
REVISION

APPR. BY:

SCALE: NONE

1146-R03A-176792

01	02DEC02	REPLACED EC-1070 WITH EC-1069.	DJM	
REV.	DATE	DESCRIPTION	BY	APPR.



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'. REFER TO DETAIL A FOR TERMINATION.
- 3 PR., 22 AWG, STRANDED SHIELDED CABLE, DAK. P.N. (W-1804). BELDON P.N. (9513) OR EQUIV. CABLE TO BE SUNLIGHT RESISTANT 25 FT OR LESS FIELD SIGNAL TERMINATIONS TO BE PHOENIX TERMINAL BLOCKS. REFER TO COMMUNICATIONS MANUAL FOR TERMINATION. CABLE BY DAKTRONICS
- 4 6 CONDUCTOR, 22 AWG, STRANDED SHIELDED CABLE, DAK. P.N. (W-1210). BELDON P.N. (G942) OR EQUIV. IN CONDUIT WHERE REQUIRED. FIELD SIGNAL TERMINATIONS TO BE PHOENIX TERMINAL BLOCKS. FIELD CABLES ARE "FLIPPED" FROM ONE END TO THE OTHER. REFER TO DISPLAY MANUAL FOR TERMINATION.
- 5 POWER FEEDER SIZED AS NEEDED BY CUSTOMER ALL WIRING TO MEET NEC AND LOCAL ELECTRICAL CODES.
- 6 ALL SIGNAL CABLES BY CUSTOMER. LABOR TO PULL CABLES BY CUSTOMER.
- 7 ALL POWER WIRES BY CUSTOMER. LABOR TO PULL WIRES BY CUSTOMER.
9. AND 600 OF THE NATIONAL ELECTRICAL CODE.
10. INPUT TO SIGNAL CONVERTER IS RS232. OUTPUT IS RS422.
11. 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.
12. IN AREAS USING MULTIPLE SERVER/CLIENT SYSTEMS WITHIN CLOSE PROXIMITY OF EACH OTHER, ALTERNATE CHANNELS MUST BE USED, TO AVOID INTERFERENCE BETWEEN SYSTEMS.
13. CABLE TO BE IN CONDUIT WHERE EXPOSED TO OUTDOOR ELEMENTS.

REV.	DATE	DESCRIPTION	BY	APPR.
03	26 FEB 07	CHANGED J-BOX FROM 0A-1279-0168 TO 0A-1279-0161. ADDED MANUAL REFERENCES AND DETAIL A.	MLG	
02	29MAR05	CHANGED J-BOX FROM 0A-1279-0162 TO 0A-1279-168	HBC	
01	25JUN03	REVISED NOTE 2 FROM W-1210 22 AWG TO W-1370 18 AWG. ADDED MAX LENGTH OF W-1370 TO 1000'	KAP	

THE CONCEPTS EXPRESSED AND DETAILS SHOWN ON THIS DRAWING ARE CONFIDENTIAL AND PROPRIETARY. DO NOT REPRODUCE BY ANY MEANS, INCLUDING ELECTRONICALLY WITHOUT THE EXPRESSED WRITTEN CONSENT OF DAKTRONICS, INC. COPYRIGHT 2007 DAKTRONICS, INC.

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: OUTDOOR LED PRODUCT LINE

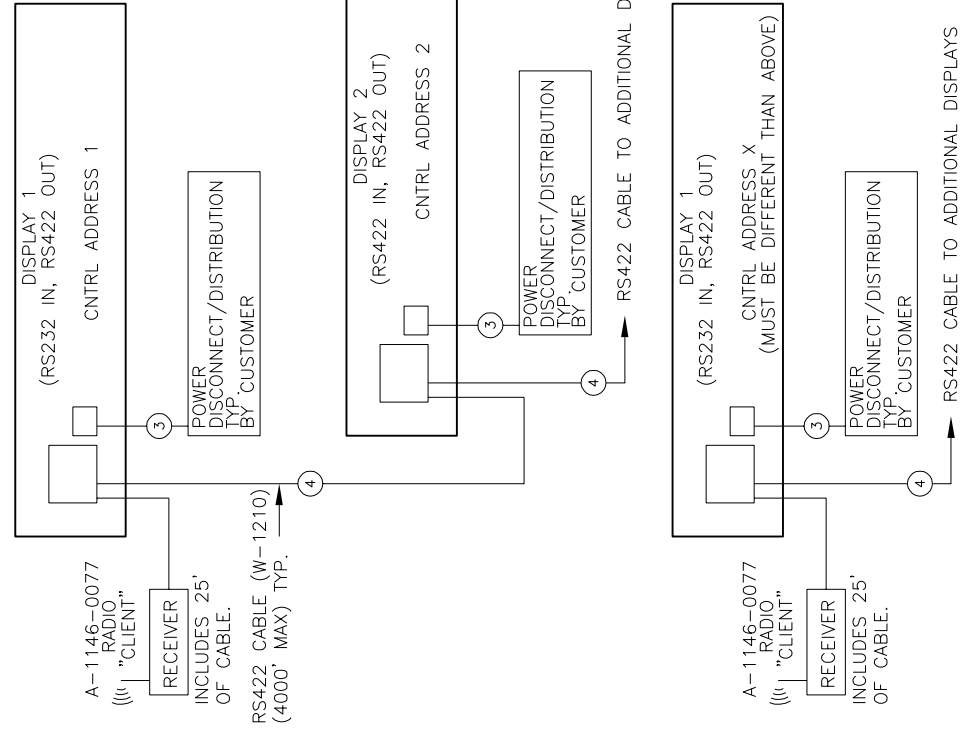
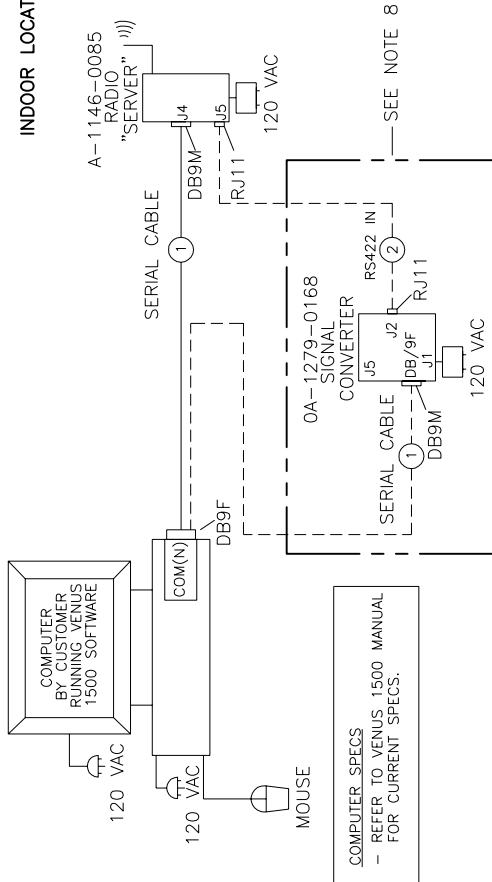
TITLE: SYSTEM RISER DIAGRAM, OUTDOOR RADIO, GEN 2

DES. BY: DRAWN BY: LKERR DATE: 19MAR03

REVISION 03 APPR. BY: SCALE: 1=1

1146-R01B-185325

INDOOR LOCATION



8. SIGNAL CONVERTER AND ASSOCIATED COMPONENTS TO BE USED IF DISTANCE BETWEEN COMPUTER AND RADIO SERVER EXCEEDS 10 FT.
 9. DISPLAYS MUST BE GROUNDED PER ARTICLE 250 AND 600 OF THE NATIONAL ELECTRICAL CODE.
 10. 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.
 11. IN AREAS USING MULTIPLE SERVER/CLIENT SYSTEMS WITHIN CLOSE PROXIMITY OF EACH OTHER, ALTERNATE CHANNELS MUST BE USED, TO AVOID INTERFERENCE BETWEEN SYSTEMS.

1. DB9F TO DB9M SERIAL CABLE DAK. P.N. (W-1267)
 2. 6 CONDUCTOR, 26 AWG, STRANDED SILVER SATIN CABLE. DAK. P.N. (W-1368). ANIXTER P.N. (6C26F19) OR EQUIV. IN CONDUIT WHERE REQUIRED. FIELD SIGNAL TERMINATIONS TO BE RJ11 6 COND. FIELD CABLES ARE "FLIPPED" FROM ONE END TO THE OTHER.
 3. POWER FEEDER SIZED AS NEEDED BY CUSTOMER. ALL WIRING TO MEET NEC AND LOCAL ELECTRICAL CODES.
 4. 6 CONDUCTOR, 22 AWG, STRANDED SHIELDED CABLE. DAK. P.N. (W-1210). BELDON P.N. (9942) OR EQUIV. IN CONDUIT WHERE REQUIRED. FIELD SIGNAL TERMINATIONS TO BE PHOENIX TERMINAL BLOCKS. "FLIPPED" FROM ONE END TO THE OTHER. REFER TO DISPLAY MANUAL FOR TERMINATION.
 5. INPUT TO SIGNAL CONVERTER IS RS232. OUTPUTS RS422.
 6. ALL SIGNAL CABLES BY CUSTOMER. LABOR TO PULL CABLES BY CUSTOMER.
 7. ALL POWER WIRES BY CUSTOMER. LABOR TO PULL WIRES BY CUSTOMER.

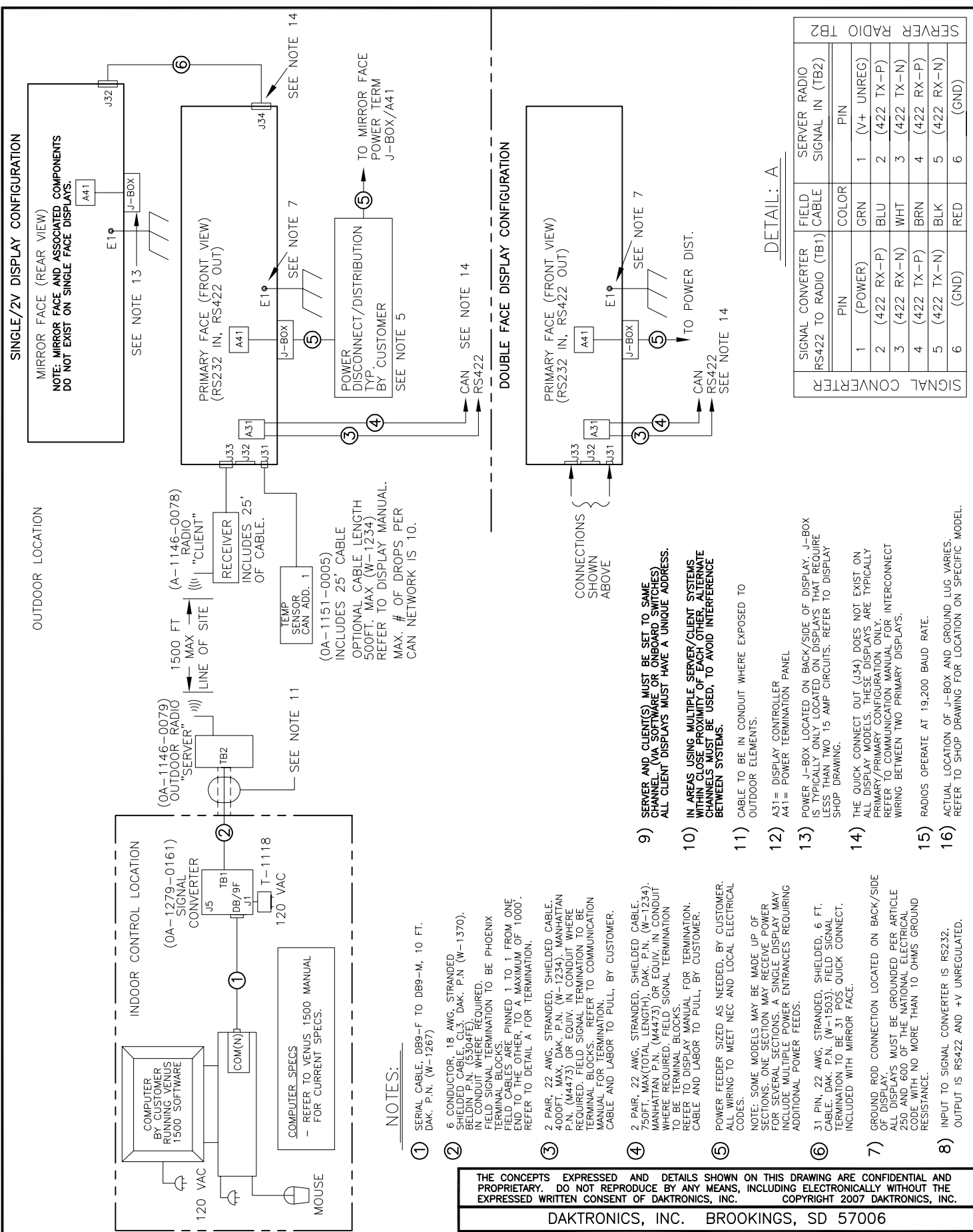
THE CONCEPTS EXPRESSED AND DETAILS SHOWN ON THIS DRAWING ARE CONFIDENTIAL AND PROPRIETARY. DO NOT REPRODUCE BY ANY MEANS, INCLUDING ELECTRONICALLY WITHOUT THE EXPRESSED WRITTEN CONSENT OF DAKTRONICS, INC. COPYRIGHT 2007 DAKTRONICS, INC.

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: LED PRODUCT LINE
 TITLE: SYSTEM RISER DIAGRAM, RADIO INTERFACE, INDOOR GEN 2
 DES. BY: DRAWN BY: LKERR DATE: 01MAY03

REVISION 02 APPR. BY: SCALE: NONE 1146-R01A-187988

REV.	DATE	DESCRIPTION	BY	APPR.
02	26 FEB 07	REMOVED DB25F COM PORT REFERENCES.	MLG	
01	29MAR05	CHANGED J-BOX FROM A 0A-1279-0162 TO A 0A-1279-0168	HBC	



REV.	DATE	DESCRIPTION	BY	APPR.
02	24MAY07	ADDED DOUBLE FACE DISPLAY AND UPDATED NOTES.	REF	DJM
01	20SEP06	ADDED DETAIL A. ADDED MANUAL REFERENCES.	MLG	DJM

THE CONCEPTS EXPRESSED AND DETAILS SHOWN ON THIS DRAWING ARE CONFIDENTIAL AND PROPRIETARY. DO NOT REPRODUCE BY ANY MEANS, INCLUDING ELECTRONICALLY WITHOUT THE EXPRESSED WRITTEN CONSENT OF DAKTRONICS, INC.	
DAKTRONICS, INC. BROOKINGS, SD 57006	
PROJ:	M2 MATRIX CONTROLLER, OUTDOOR
TITLE:	SYSTEM RISER DIAGRAM, RADIO (GEN 2), QC
DES. BY:	DRAWN BY: DMATHER DATE: 12 MAY 04
REVISION	APPR. BY:
02	SCALE: NONE
1229-R01A-211606	

NOTES:

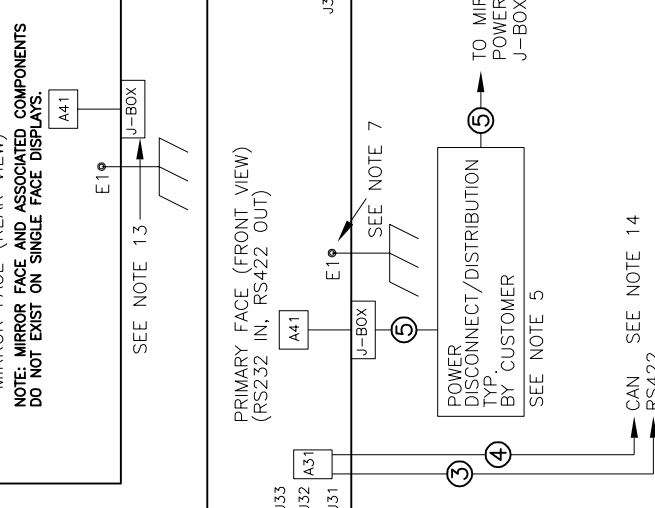
- 1 SERIAL CABLE, DB9-F TO DB9-M, 10 FT. DAK. P.N. (W-1267)
- 2 6 CONDUCTOR, 18 AWG, STRANDED SHIELDED CABLE, CLS, DAK. P.N. (W-1370). IF CONDUIT IS USED, FIELD SIGNAL TERMINATION TO BE PHOENIX TERMINAL BLOCKS. REFER TO COMMUNICATION MANUAL FOR TERMINATION. CABLE AND LABOR TO PULL, BY CUSTOMER.
- 3 2 PAIR, 22 AWG, STRANDED, SHIELDED CABLE, 4000FT. MAX. DAK. P.N. (W-1234). MANHATTAN P.N. (M4473) OR EQUIV. IN CONDUIT WHERE REQUIRED. FIELD SIGNAL TERMINATION TO BE TERMINAL BLOCKS. REFER TO COMMUNICATION MANUAL FOR TERMINATION. CABLE AND LABOR TO PULL, BY CUSTOMER.
- 4 2 PAIR, 22 AWG, STRANDED, SHIELDED CABLE, 750FT. MAX(TOTAL LENGTH), DAK. P.N. (W-1234). MANHATTAN P.N. (M4473) OR EQUIV. IN CONDUIT WHERE REQUIRED. FIELD SIGNAL TERMINATION TO BE TERMINAL BLOCKS. REFER TO COMMUNICATION MANUAL FOR TERMINATION. CABLE AND LABOR TO PULL, BY CUSTOMER.
- 5 POWER FEEDER SIZED AS NEEDED, BY CUSTOMER. ALL WIRING TO MEET NEC AND LOCAL ELECTRICAL CODES.
NOTE: SOME MODELS MAY BE MADE UP OF SECTIONS. ONE SECTION MAY RECEIVE POWER FOR SEVERAL SECTIONS. A SINGLE DISPLAY MAY INCLUDE MULTIPLE POWER ENTRANCES REQUIRING ADDITIONAL POWER FEEDS.
- 6 31-PIN, 22 AWG, STRANDED, SHIELDED, 6 FT. CABLE, DAK P.N. (W-1503). FIELD SIGNAL TERMINATION TO BE 31 POS QUICK CONNECT. INCLUDED WITH MIRROR FACE.
- 7 GROUND ROD CONNECTION LOCATED ON BACK/SIDE OF DISPLAY. THESE DISPLAYS ARE TYPICALLY PRIMARY/PRIMARY CONFIGURATION ONLY. REFER TO COMMUNICATION MANUAL FOR INTERCONNECT WIRING BETWEEN TWO PRIMARY DISPLAYS.
ALL DISPLAYS MUST BE GROUNDED PER ARTICLE 250 AND 600 OF THE NATIONAL ELECTRICAL CODE WITH NO MORE THAN 10 OHMS GROUND RESISTANCE.
- 8 INPUT TO SIGNAL CONVERTER IS RS232. OUTPUT IS RS422 AND +V UNREGULATED.
- 9 SERVER AND CLIENT(S) MUST BE SET TO SAME CHANNEL (VIA SOFTWARE OR ONBOARD SWITCHES) ALL CLIENT DISPLAYS MUST HAVE A UNIQUE ADDRESS.
- 10 IN AREAS USING MULTIPLE SERVER/CLIENT SYSTEMS WITHIN CLOSE PROXIMITY OF EACH OTHER, ALTERNATE CHANNELS MUST BE USED, TO AVOID INTERFERENCE BETWEEN SYSTEMS.
- 11 CABLE TO BE IN CONDUIT WHERE EXPOSED TO OUTDOOR ELEMENTS.
- 12 A41= DISPLAY CONTROLLER
A31= POWER TERMINATION PANEL
- 13 POWER J-BOX LOCATED ON BACK/SIDE OF DISPLAY. J-BOX IS TYPICALLY ONLY LOCATED ON DISPLAYS THAT REQUIRE LESS THAN TWO 15 AMP CIRCUITS. REFER TO DISPLAY SHOP DRAWING.
- 14 THE QUICK CONNECT OUT (J34) DOES NOT EXIST ON ALL DISPLAY MODELS. THESE DISPLAYS ARE TYPICALLY PRIMARY/PRIMARY CONFIGURATION ONLY. REFER TO COMMUNICATION MANUAL FOR INTERCONNECT WIRING BETWEEN TWO PRIMARY DISPLAYS.
- 15 RADIOS OPERATE AT 19,200 BAUD RATE.
- 16 ACTUAL LOCATION OF J-BOX AND GROUND LUG VARIES. REFER TO SHOP DRAWING FOR LOCATION ON SPECIFIC MODEL.

DETAIL: A

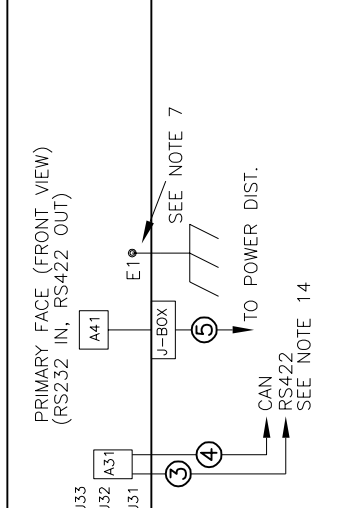
SIGNAL CONVERTER	FIELD CABLE	SERVER RADIO
RS422 TO RADIO (TB1)		SIGNAL IN (TB2)
PIN	COLOR	PIN
1 (POWER)	GRN	1 (V+ UNREG)
2 (422 RX-P)	BLU	2 (422 TX-P)
3 (422 RX-N)	WHT	3 (422 TX-N)
4 (422 TX-P)	BRN	4 (422 RX-P)
5 (422 TX-N)	BLK	5 (422 RX-N)
6 (GND)	RED	6 (GND)

SINGLE/2V DISPLAY CONFIGURATION

OUTDOOR LOCATION



DOUBLE FACE DISPLAY CONFIGURATION



MIRROR FACE (REAR VIEW)
NOTE: MIRROR FACE AND ASSOCIATED COMPONENTS DO NOT EXIST ON SINGLE FACE DISPLAYS.

INDOOR CONTROL LOCATION

PRIMARY FACE (FRONT VIEW)
(RS232 IN, RS422 OUT)

PRIMARY FACE (FRONT VIEW)
(RS232 IN, RS422 OUT)

POWER DISCONNECT/DISTRIBUTION UNIT
TYP. BY CUSTOMER
SEE NOTE 5

RECEIVER
INCLUDES 25' OF CABLE.
(A-1146-0078)
MAX. LINE OF SITE 1500 FT.
MAX. # OF DROPS PER CAN NETWORK IS 10.

TEMP SENSOR CAN. ADD. 1
(0A-1151-0005)
INCLUDES 25' CABLE
OPTIONAL CABLE LENGTH 500FT. MAX (W-1234)
REFER TO DISPLAY MANUAL.

CONNECTIONS SHOWN ABOVE

TO MIRROR FACE POWER TERM J-BOX/A41

TO POWER DIST.

SEE NOTE 13

SEE NOTE 14

SEE NOTE 7

SEE NOTE 14

SEE NOTE 14

SEE NOTE 14

SEE NOTE 14

SEE NOTE 14

SEE NOTE 14

SEE NOTE 14

SEE NOTE 14

SEE NOTE 14

SEE NOTE 14

SEE NOTE 14

SEE NOTE 14

SEE NOTE 14

SEE NOTE 14

SEE NOTE 14

SEE NOTE 14

SEE NOTE 14

SEE NOTE 14

SEE NOTE 14

SEE NOTE 14

SEE NOTE 14

SEE NOTE 14

SEE NOTE 14

SEE NOTE 14

SEE NOTE 14

SEE NOTE 14

SEE NOTE 14

SEE NOTE 14

SEE NOTE 14

SEE NOTE 14

SEE NOTE 14

SEE NOTE 14

SEE NOTE 14

SEE NOTE 14

SEE NOTE 14

SEE NOTE 14

SEE NOTE 14

SEE NOTE 14

SEE NOTE 14

SEE NOTE 14

SEE NOTE 14

SEE NOTE 14

SEE NOTE 14

SEE NOTE 14

SEE NOTE 14

SEE NOTE 14

SEE NOTE 14

SEE NOTE 14

SEE NOTE 14

SEE NOTE 14

SEE NOTE 14

SEE NOTE 14

SEE NOTE 14

SEE NOTE 14

SEE NOTE 14

SEE NOTE 14

SEE NOTE 14

SEE NOTE 14

SEE NOTE 14

SEE NOTE 14

SEE NOTE 14

SEE NOTE 14

SEE NOTE 14

SEE NOTE 14

SEE NOTE 14

SEE NOTE 14

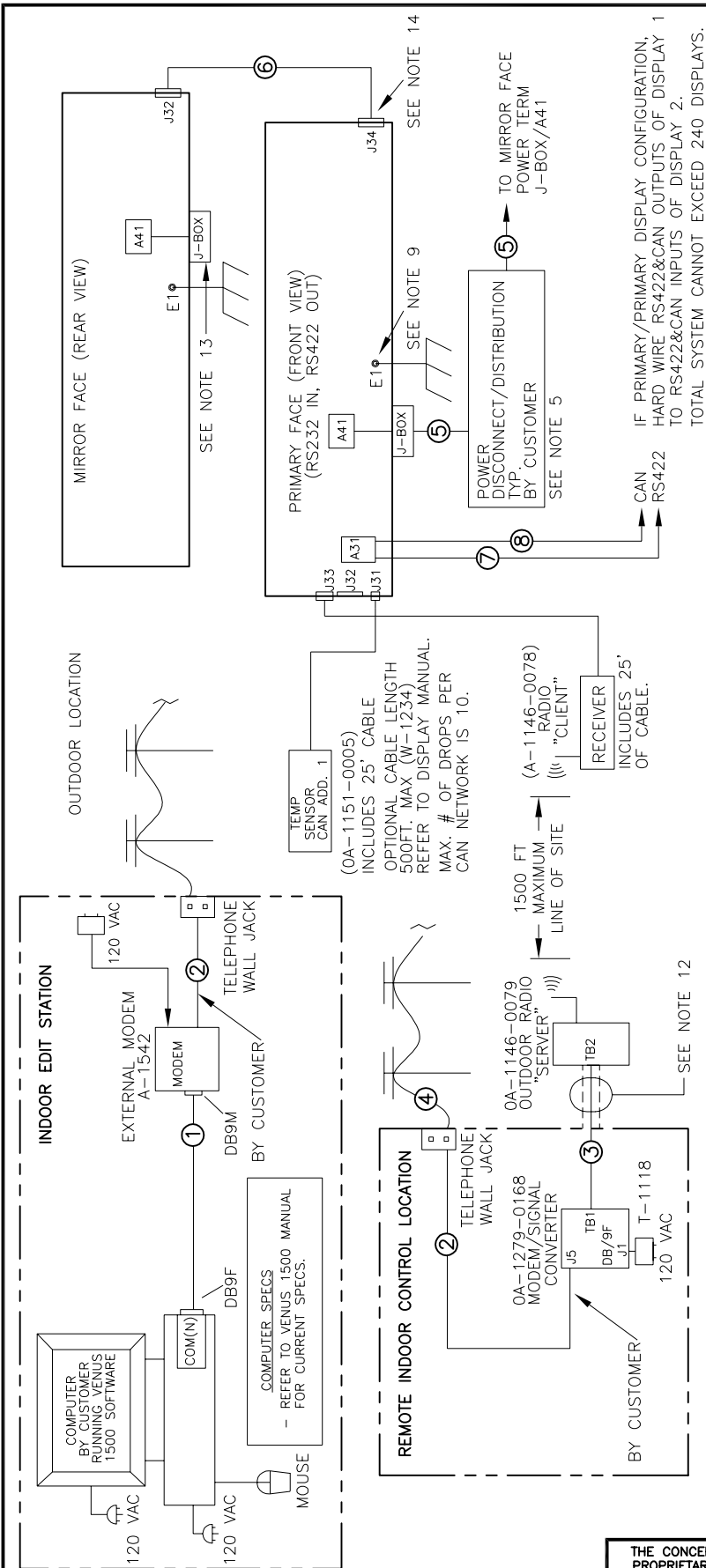
SEE NOTE 14

SEE NOTE 14

SEE NOTE 14

SEE NOTE 14

SEE NOTE 14



NOTES:

- ① DB9F TO DB25M SERIAL CABLE, 6FT DAK. P.N. (W-1249)
- ② 6 CONDUCTOR, 26 AWG, STRANDED SILVER SATIN CABLE. DAK. P.N. (W-1369). ANIXTER P.N. (6C26F19) OR EQUIV. IN CONDUIT WHERE REQUIRED.
- ③ 6 CONDUCTOR, 18 AWG, STRANDED SHIELDED CABLE. DAK. P.N. (W-1370). IN CONDUIT WHERE REQUIRED.
- ④ DEDICATED PHONE LINE PROVIDED BY LOCAL PHONE COMPANY
- ⑤ POWER FEEDER SIZED AS NEEDED, BY CUSTOMER. ALL WIRING TO MEET NEC AND LOCAL ELECTRICAL CODES.
- ⑥ 31 PIN, 22 AWG, STRANDED, SHIELDED, 6 FT. CABLE. DAK. P.N. (W-1503). FIELD SIGNAL TERMINATION TO BE 51 POS QUICK CONNECT. INCLUDED WITH MIRROR FACE.
- ⑦ 2 PAIR, 22 AWG, STRANDED, SHIELDED CABLE. 4000FT. MAX. DAK. P.N. (W-1234). MANHATTAN P.N. (M4473) OR EQUIV. IN CONDUIT WHERE REQUIRED. FIELD SIGNAL TERMINATION TO BE TERMINAL BLOCKS. REFER TO COMMUNICATION MANUAL FOR TERMINATION. CABLE AND LABOR TO PULL, BY CUSTOMER.
- ⑧ 750FT. MAX(TOTAL LENGTH), SHIELDED CABLE. MANHATTAN P.N. (M4473) OR EQUIV. IN CONDUIT WHERE REQUIRED. FIELD SIGNAL TERMINATION TO BE TERMINAL BLOCKS. REFER TO DISPLAY MANUAL FOR TERMINATION. CABLE AND LABOR TO PULL, BY CUSTOMER.
- ⑨ GROUND ROD CONNECTION, LOCATED ON BACK OF DISPLAY. ALL DISPLAYS MUST BE GROUNDED PER ARTICLE 250 AND 600 OF THE NATIONAL ELECTRICAL CODE WITH NO MORE THAN 10 OHMS GROUND RESISTANCE.
- ⑩ **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.**
- ⑪ **IN AREAS USING MULTIPLE SERVER/CLIENT SYSTEMS CHANNELS MUST BE EXAMINED FOR OTHER ALTERNATE CHANNELS TO BE USED, TO AVOID INTERFERENCE BETWEEN SYSTEMS.**
- ⑫ CABLE TO BE IN CONDUIT WHERE EXPOSED TO OUTDOOR ELEMENTS.
- ⑬ POWER J-BOX LOCATED ON BACK OF DISPLAY. J-BOX IS TYPICALLY ONLY LOCATED ON DISPLAYS THAT REQUIRE LESS THAN TWO 15 AMP CIRCUITS. REFER TO DISPLAY SHOP DRAWING.
- ⑭ THE QUICK CONNECT OUT (J34) MAY NOT EXIST ON ALL DISPLAY MODELS. THESE DISPLAYS ARE TYPICALLY PRIMARY/PRIMARY CONFIGURATION ONLY. REFER TO COMMUNICATION MANUAL FOR INTERCONNECT WIRING BETWEEN TWO PRIMARY DISPLAYS.
- ⑮ RADIOS OPERATE AT 19,200 BAUD RATE.

DETAIL: A

SIGNAL CONVERTER	SIGNAL CONVERTER RS422 TO RADIO (TB1)	FIELD CABLE	COLOR	SERVER RADIO SIGNAL IN (TB2)
	PIN			PIN
1	(POWER)	GRN		1 (V+ UNREG)
2	(422 RX-P)	BLU		2 (422 TX-P)
3	(422 RX-N)	WHT		3 (422 TX-N)
4	(422 TX-P)	BRN		4 (422 RX-P)
5	(422 TX-N)	BLK		5 (422 RX-N)
6	(GND)	RED		6 (GND)

THE CONCEPTS EXPRESSED AND DETAILS SHOWN ON THIS DRAWING ARE CONFIDENTIAL AND PROPRIETARY. DO NOT REPRODUCE BY ANY MEANS, INCLUDING ELECTRONICALLY WITHOUT THE EXPRESSED WRITTEN CONSENT OF DAKTRONICS, INC. COPYRIGHT 2005 DAKTRONICS, INC.

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: M2 MATRIX CONTROLLER, OUTDOOR

TITLE: SYSTEM RISER DIAGRAM, MODEM/QC OUTDR RADIO.GEN 2

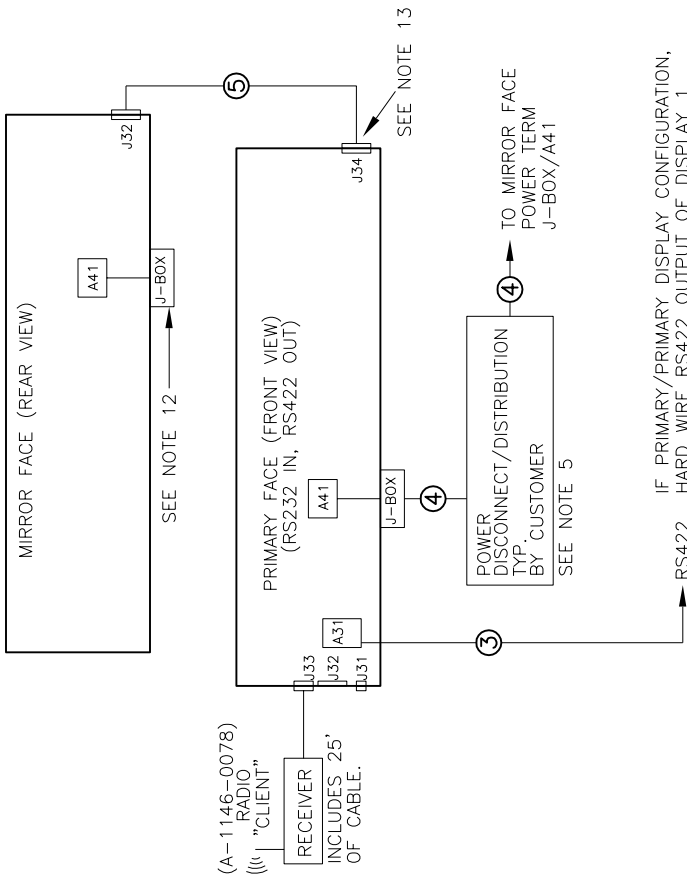
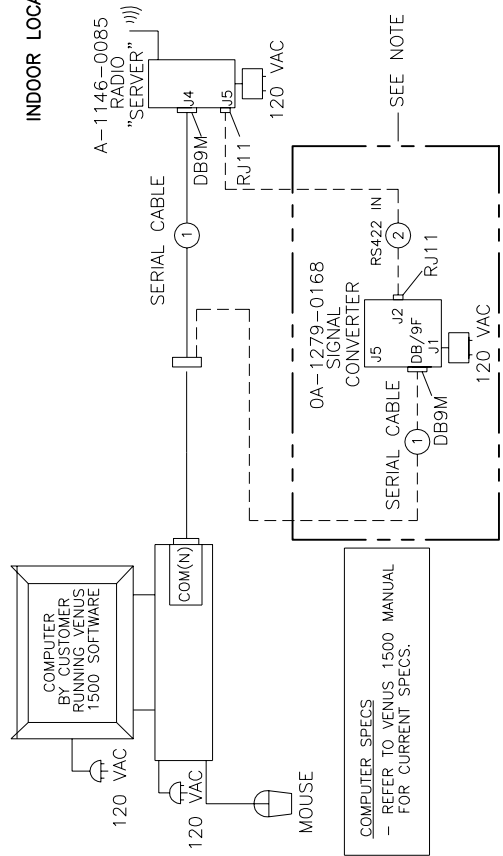
DES. BY: DMATHER DRAWN BY: WSCHNEI DATE: 19MAY05

REVISION 01 APPR. BY: DJM SCALE: NONE

1229-R01A-242383

REV.	DATE	DESCRIPTION	BY	APPR.
01	20SEP06	ADDED WIRING DETAIL A AND BELDIN CABLE P.N. ADDED MANUAL REFERENCES.	MLG	DJM

INDOOR LOCATION



IF PRIMARY/PRIMARY DISPLAY CONFIGURATION,
HARD WIRE RS422 OUTPUT OF DISPLAY 1
TO RS422 INPUT OF DISPLAY 2.
TOTAL SYSTEM CANNOT EXCEED 240 DISPLAYS.

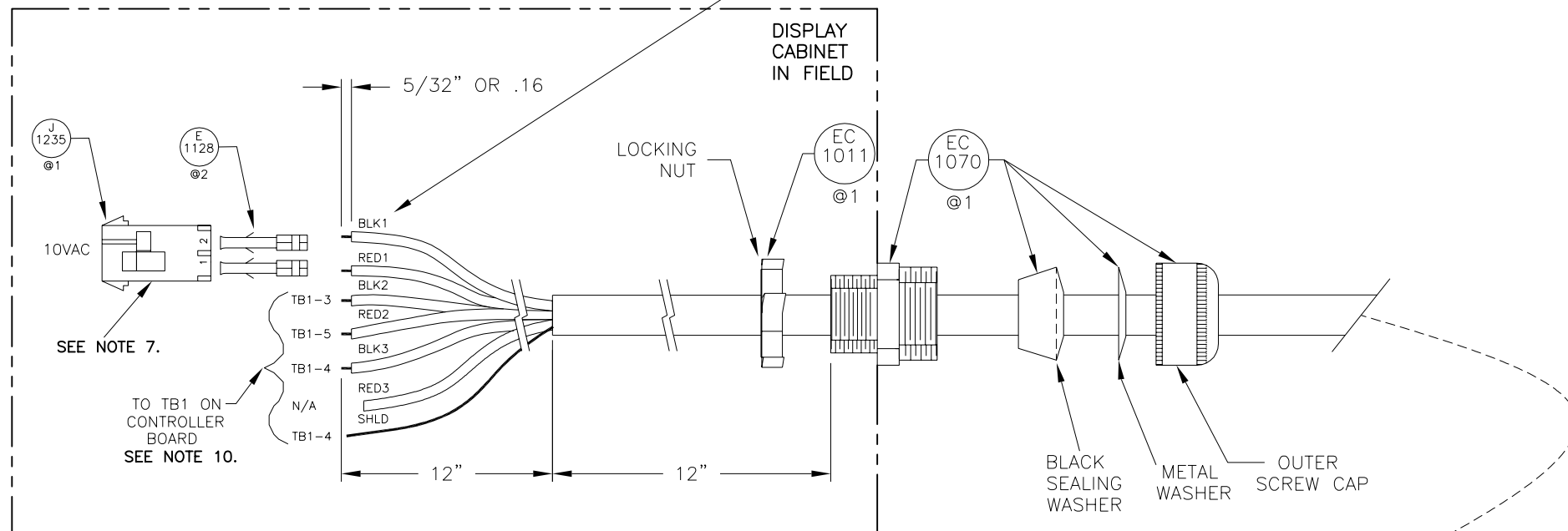
NOTES:

- 1) SERIAL CABLE, DB9-F TO DB9-M, 10 FT. DAK. P.N. (W-1267)
- 2) 6 CONDUCTOR, 26 AWG, STRANDED SILVER SATIN CABLE. DAK. P.N. (W-1368), ANIXTER P.N. (6C26F19) OR EQUIV. IN CONDUIT WHERE REQUIRED.
- 3) FIELD SIGNAL TERMINATION TO BE RJ11 6 COND. FIELD CABLES ARE "FLIPPED" FROM ONE END TO THE OTHER. CABLE AND LABOR TO PULL, BY CUSTOMER.
- 4) POWER FEEDER SIZED AS NEEDED, BY CUSTOMER. ALL WIRING TO MEET NEC AND LOCAL ELECTRICAL CODES.
- 5) 31 PIN, 22 AWG, STRANDED, SHIELDED, 6 FT. CABLE. DAK. P.N. (W-1503). FIELD SIGNAL TERMINATION TO BE 31 POS QUICK CONNECT. INCLUDED WITH MIRROR FACE.
- 6) ALL DISPLAYS MUST BE GROUNDED PER ARTICLE 250 AND 600 OF THE NATIONAL ELECTRICAL CODE WITH NO MORE THAN 10 OHMS GROUND RESISTANCE.
- 7) INPUT TO SIGNAL CONVERTER IS RS232. OUTPUT IS RS422.
- 8) SERVER AND CLIENT(S) MUST BE SET TO SAME CHANNEL (VIA SOFTWARE OR ON-BOARD SWITCHES) ALL CLIENT DISPLAYS MUST HAVE A UNIQUE ADDRESS.
- 9) IN AREAS USING MULTIPLE SERVER/CLIENT SYSTEMS WITHIN CLOSE PROXIMITY OF EACH OTHER, ALTERNATE CHANNELS MUST BE USED, TO AVOID INTERFERENCE BETWEEN SYSTEMS.
- 10) A31= DISPLAY CONTROLLER A41= POWER TERMINATION PANEL
- 11) POWER J-BOX LOCATED ON BACK OF DISPLAY. J-BOX IS TYPICALLY ONLY LOCATED ON DISPLAYS THAT REQUIRE LESS THAN TWO 15 AMP CIRCUITS. REFER TO DISPLAY SHOP DRAWING.
- 12) THE QUICK CONNECT OUT (J34) MAY NOT EXIST ON ALL DISPLAY MODELS. THESE DISPLAYS ARE TYPICALLY PRIMARY/PRIMARY CONFIGURATION ONLY. REFER TO COMMUNICATION MANUAL FOR INTERCONNECT WIRING BETWEEN TWO PRIMARY DISPLAYS.
- 13) SIGNAL CONVERTER AND ASSOCIATED COMPONENTS TO BE USED IF DISTANCE BETWEEN COMPUTER AND RADIO SERVER EXCEEDS 10 FT.

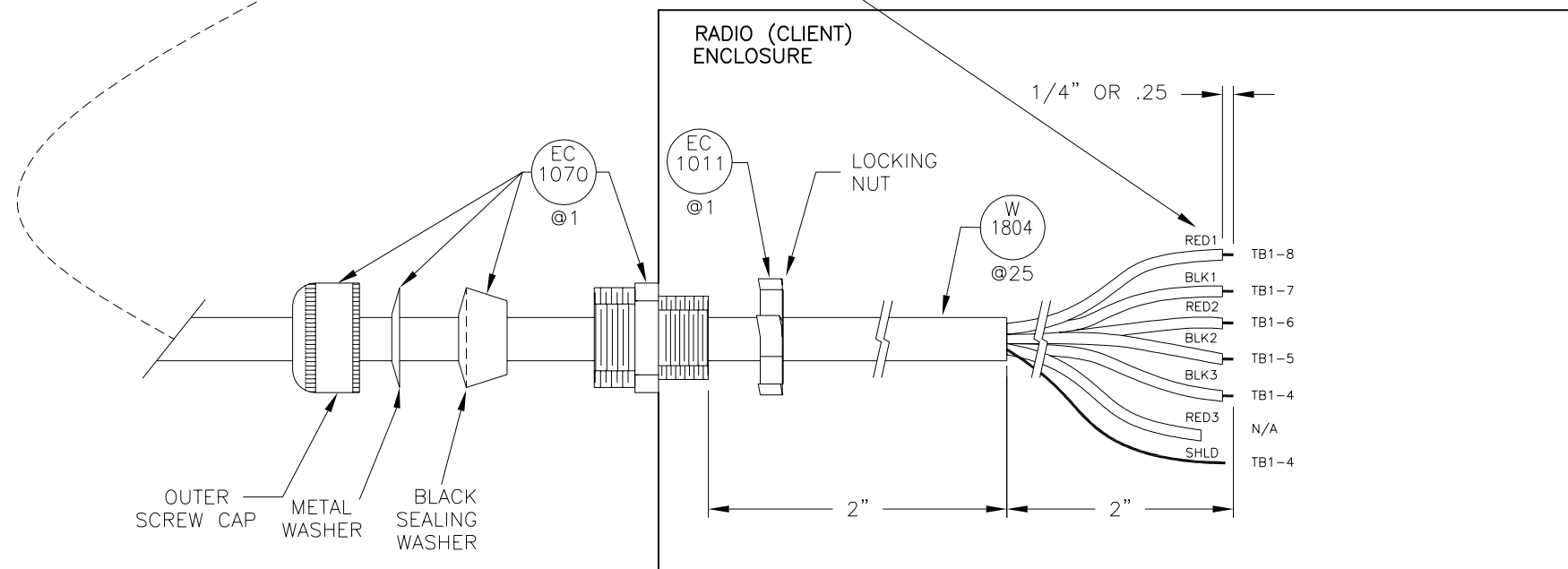
THE CONCEPTS EXPRESSED AND DETAILS SHOWN ON THIS DRAWING ARE CONFIDENTIAL AND PROPRIETARY. DO NOT REPRODUCE BY ANY MEANS, INCLUDING ELECTRONICALLY WITHOUT THE EXPRESSED WRITTEN CONSENT OF DAKTRONICS, INC.			
DAKTRONICS, INC. BROOKINGS, SD 57006			
PROJ: M2 MATRIX CONTROLLER			
TITLE: SYSTEM RISER DIAGRAM, INDOOR RADIO, GEN 2, QC			
DES. BY: MGAARD		DRAWN BY: MGAARD	
		DATE: 25SEP06	
REVISION	APPR. BY:	1229-R01A-285780	
00	SCALE: NONE		

REV.	DATE	DESCRIPTION	BY	APPR.

NOTES: INDIVIDUAL WIRES WITHIN W-1804 ARE NUMBERED FOR IDENTIFICATION.



NOTES: INDIVIDUAL WIRES WITHIN W-1804 ARE NUMBERED FOR IDENTIFICATION.



- 1) SLIDE CABLE THROUGH PARTS OF EC-1070 EXCEPT LOCKING NUT.
- 2) TIGHTEN BLACK SEALING WASHER AND OUTER SCREW CAP SO THAT 2' OF CABLE ARE ON THE SIDE OPPOSITE THE BLACK SEALING WASHER.
- 3) CUT OUTER JACKET AWAY 12" FROM THE END.
- 4) STRIP INSULATION FOR INDIVIDUAL WIRES TO DIMENSION SHOWN.
- 5) CRIMP E-1128 @2 ON WIRE PAIR ONE.
- 6) PLACE WIRES IN J-1235 AS SHOWN.
- 7) SEE ABOVE. WITH A SIDECUTTER, CLIP THE FOUR TABS ON THE EDGE OF THE TWO PIN JACK SO THAT IT CAN FIT THROUGH THE LOCKING NUT.
- 8) SLIDE LOCKING NUT OVER JACK AND OTHER WIRES.
- 9) SCREW LOCKING NUT TO ASSEMBLY.
- 10) TO BE TERMINATED IN THE FIELD.
IF INSTALLING THE RADIO WITH AF-3010, X-1000 OR G-1000 TERMINATIONS MUST BE TERMINATED AT TB42 PER THE FOLLOWING CHART:

CHART 1

TB42 PIN ASSIGNMENTS	W-1804 3 PR CABLE
PIN 3 (TX-P)	BLK2
PIN 4 (GND)	BLK3 & SHLD
PIN 5 (RX-P)	RED2

DAKTRONICS, INC. BROOKINGS, SD 57006

REV.	DATE	DESCRIPTION	BY	APPR.
2	28 OCT 02	RE-ORDERED CONNECTION SEQUENCE FOR MORE CLARITY, PER ECO #035081.	ORS	
1	22 APR 02	ADDED NOTES FOR W-1804, PER ECO #033637.	ORS	

PROJ:			
TITLE:	RADIO CABLE CONNECTIONS/ASSEMBLY		
DES. BY:	DRAWN BY:	TNYSTRO	DATE: 06FEB02
REVISION	APPR. BY:		
	SCALE:	NONE	
1146-R01B-161953			