



**GLOW CUBE® LINE
DISPLAY SYSTEMS**

**INSTALLATION / OPERATION /
MAINTENANCE MANUAL**

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DAKTRONICS, INC.

Setting New Standards Worldwide

P.O. Box 5128 331 32nd Ave. Brookings, SD 57006
Phone (605) 697-4400 or (800) 843-9879 Fax 697-4700




Table of Contents

1. MECHANICAL INSTALLATION	1-1
1.1 Display Configurations	1-1
1.2 Support Column Selection	1-2
1.3 Mounting Details	1-2
2. ELECTRICAL INSTALLATION	2-1
2.1 System Layouts and Schematics	2-1
2.2 Display Access	2-2
2.3 Power and Signal Connections	2-2
2.3.1 Power Connection	2-2
2.3.2 2V Power Connection	2-3
2.3.3 Signal Connection	2-4
2.3.4 2V Signal Connection	2-4
2.4 Grounding	2-5
2.5 Optional Temperature/Daylight Sensor	2-6
2.6 First Time Turn On	2-8
3. MAINTENANCE & TROUBLESHOOTING	3-1
3.1 The Drivers and Display Boards	3-1
3.1.1 Connectors	3-1
3.1.2 LED Status Indicators	3-3
3.2 Venus 1000 Controller	3-5
3.2.1 Connectors	3-5
3.2.2 Switches and Jumpers	3-7
3.2.3 Status Indicators	3-8
3.3 Display Access	3-9
3.4 Troubleshooting	3-10
3.5 Removing a Display Board	3-10
3.6 Glow Cube Pixel Replacement	3-11
3.7 Removing a Driver	3-12
3.8 Fluorescent Lamps and Ballasts	3-12
3.9 Display Cooling System	3-13

3.10 Fuse Replacement	3-14
3.11 Cleaning the Displays	3-14
3.12 Structural Inspection	3-14
3.13 Modem/FCC Regulations	3-15
3.14 Replacement Parts List	3-16
3.15 Exchange/Replacement Procedure	3-17
4. DRAWINGS	4-1

List of Figures

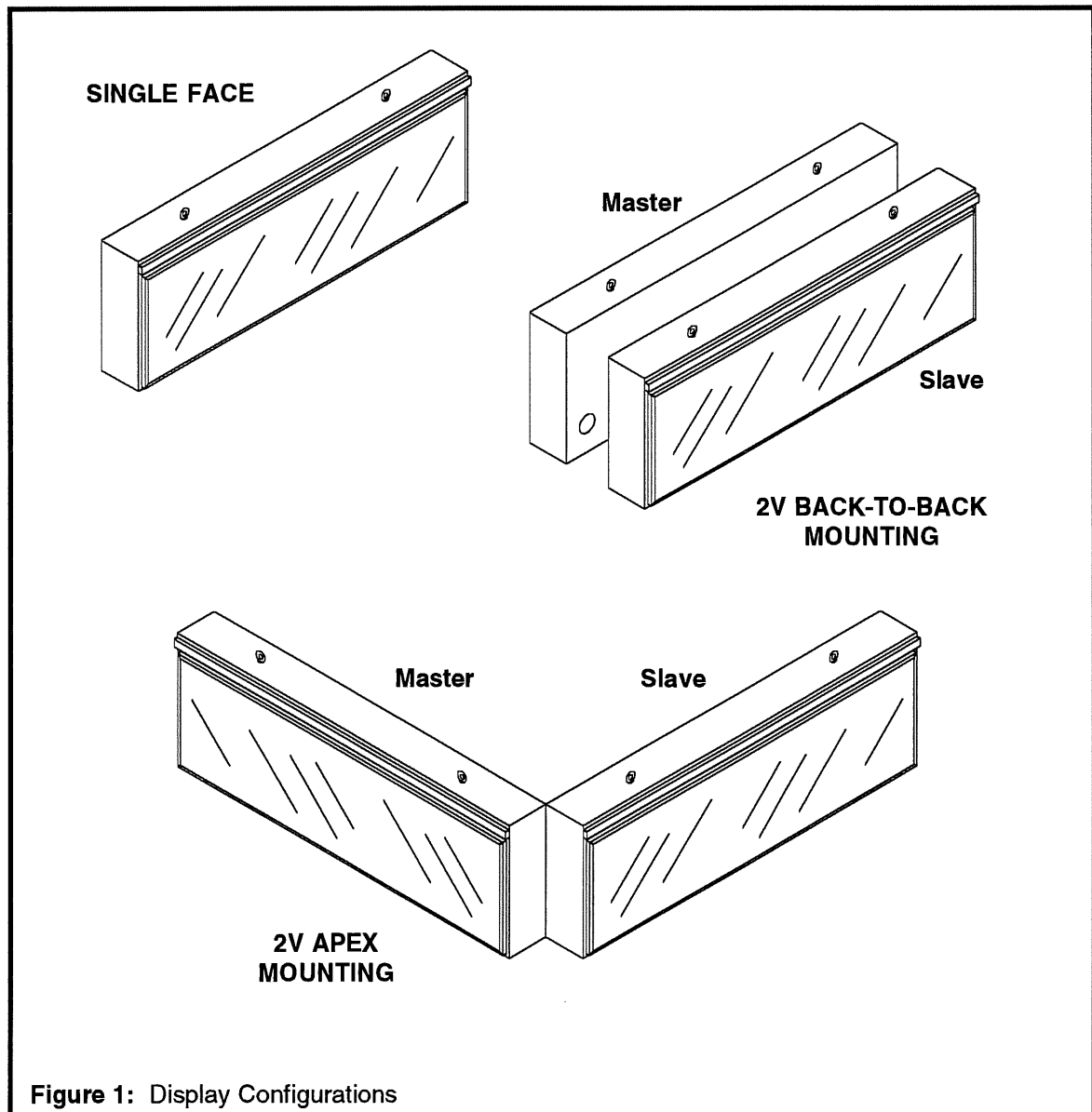
FIGURE 1	Display Configurations	1-1
FIGURE 2	Display Mounting / Method 1 - Direct Fastening	1-2
FIGURE 3	Display Mounting / Method 2 - Clamping to a Vertical Channel	1-3
FIGURE 4	Display Mounting / Method 3 - Clamping to a Horizontal Channel	1-4
FIGURE 5	Typical System Layout, 2 Lines - 6 x 64	2-1
FIGURE 6	Hinging the Face Panel Open	2-2
FIGURE 7	Power/Signal Termination Panel	2-3
FIGURE 8	New Power Installation (120 Single Phase Installations)	2-5
FIGURE 9	Existing Power Installation (120 Single Phase Installations)	2-6
FIGURE 10	Eave Mounting of Sensor	2-7
FIGURE 11	The Driver	3-3
FIGURE 12	Display Boards	3-4
FIGURE 13	Venus 1000 Controller with Enclosure	3-5
FIGURE 14	Venus 1000 Interface Board	3-6
FIGURE 15	Venus 1000 Processor Board	3-6
FIGURE 16	Hinging the Face Panel Open	3-9

Section 1: Mechanical Installation

1.1 Display Configurations

The Glow Cube line displays are offered in single face and 2V display configurations. A **single face display** is a single-sided, stand-alone unit. A **2V display** consists of two single face units; one master and one slave. Each face has its own power and signal termination panels and are wired separately. For 2V displays separated 24 inches or less, a signal interconnect harness is pre-wired into the master face to make signal connecton easier. The Venus 1000 controller is mounted in the master face.

Refer to **Figure 1** for illustrations of these display configurations. Displays have a Daktronics label that is marked with the serial number, manufacturing information, and warnings. This label will appear just inside the face panel, near the power termination panel.

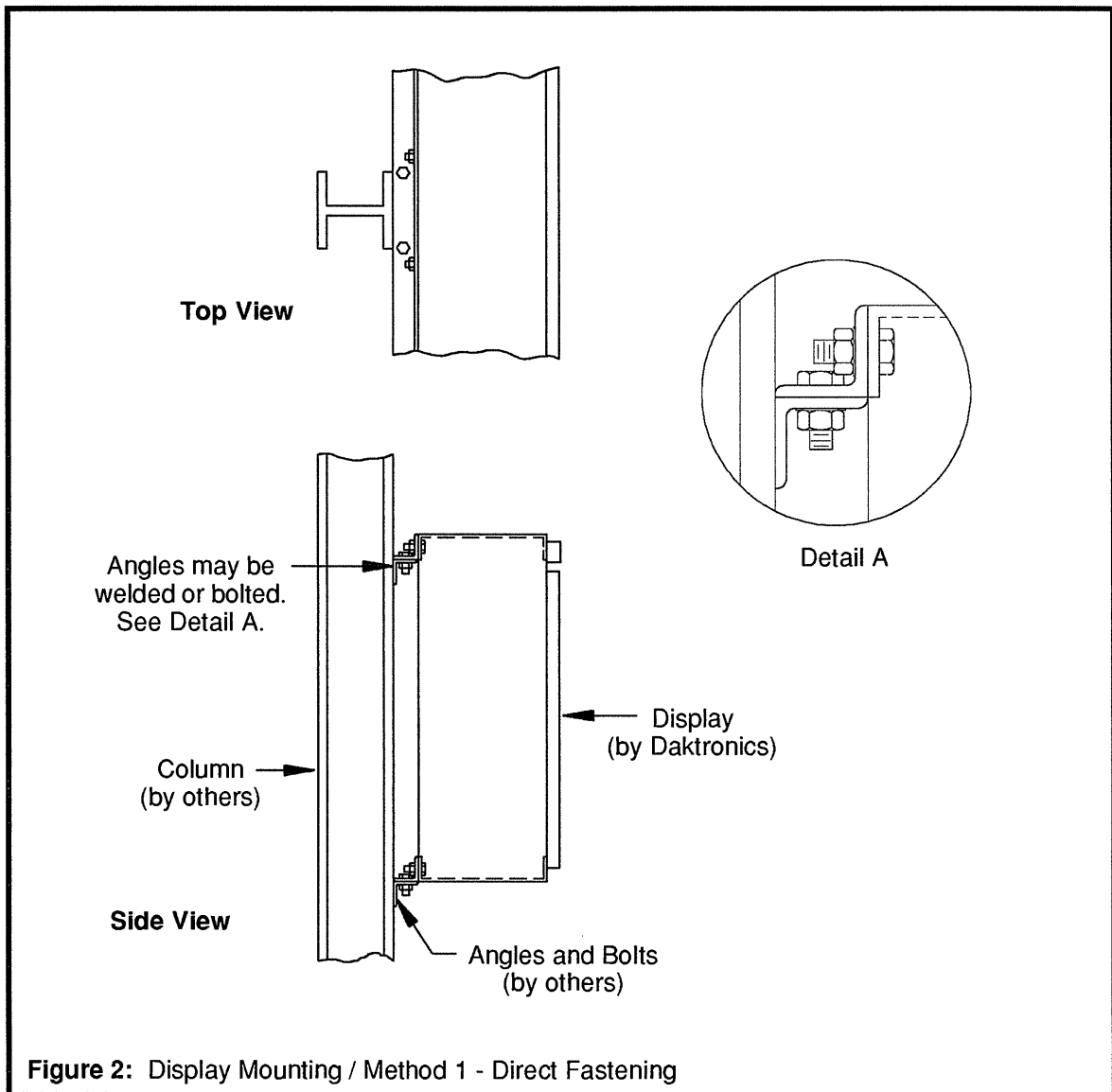


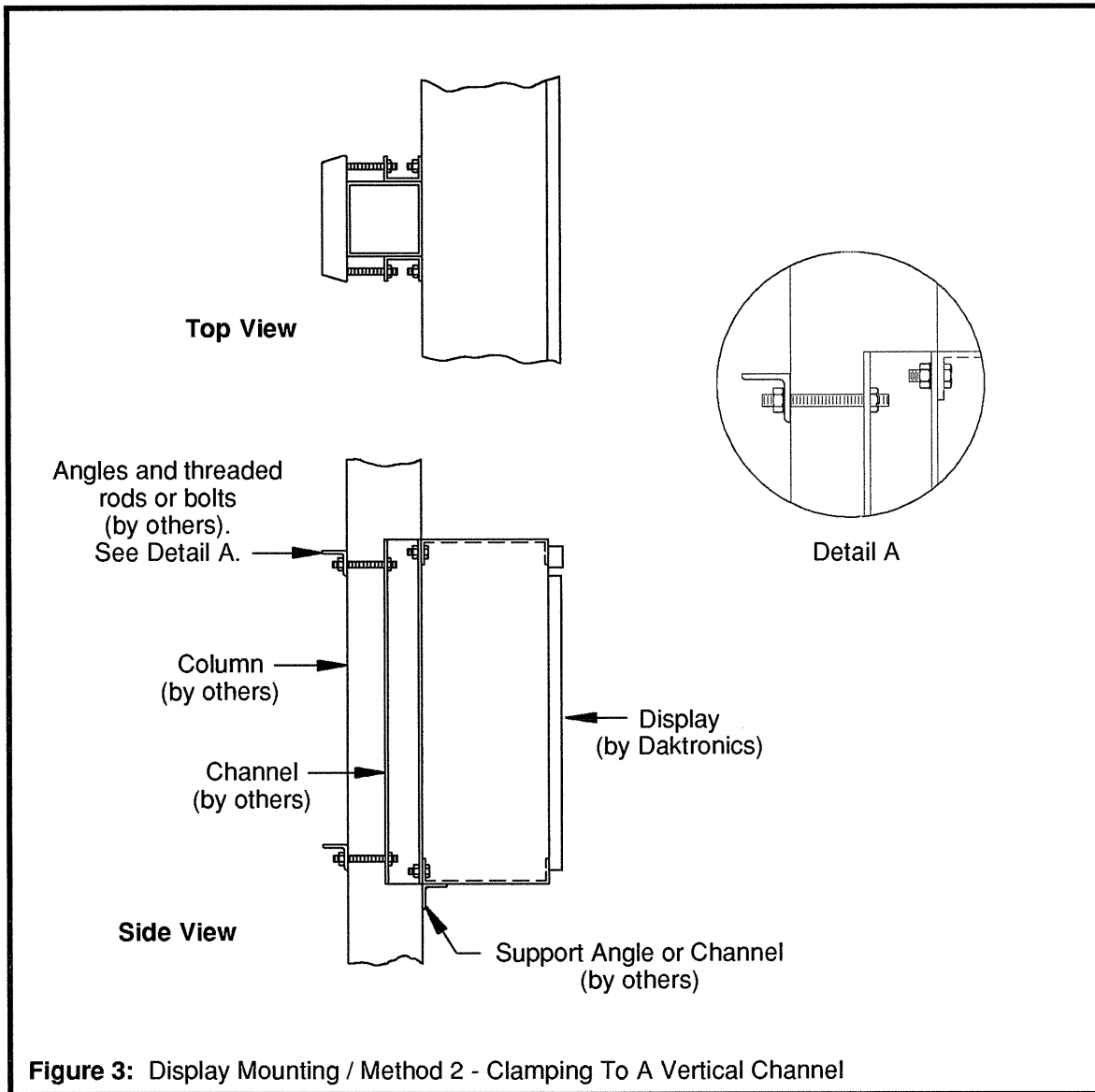
1.2 Support Column Selection

Support column size is dependent on the height and total wind loading of the message center and any other signage that make up the entire display. Column selection is critical and should be done only by a qualified individual. It is the installers responsibility to specify the exact type of column and number of columns to be used. Using more columns generally allows smaller columns. The greater the number of columns, the greater the tolerances required.

1.3 Mounting Details

Figures 2, 3, and 4 show *suggested mounting techniques only*. It is the responsibility of the installer to insure the installation will adequately meet local standards.





(Mounting Details Continued On Next Page)

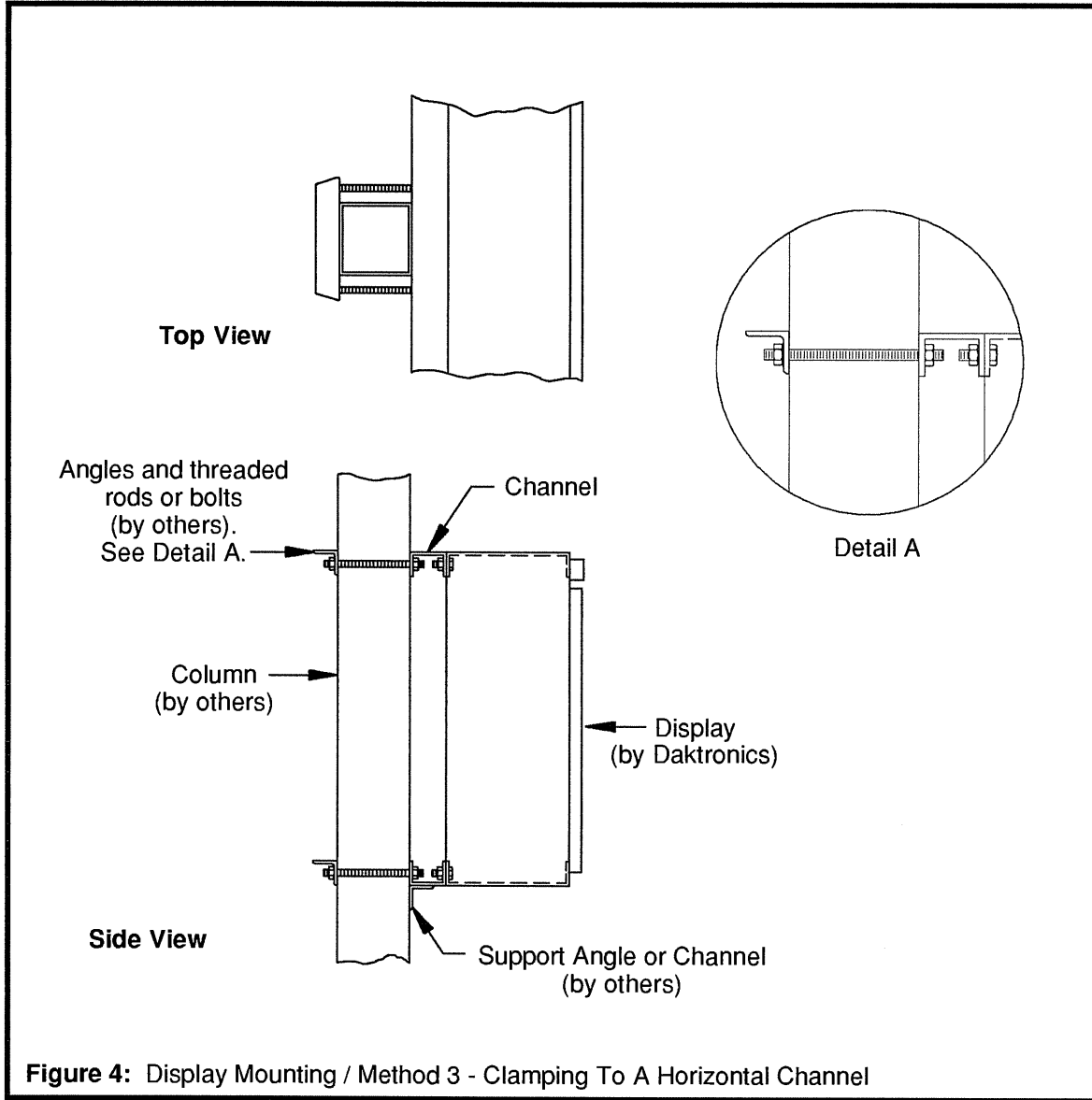


Figure 4: Display Mounting / Method 3 - Clamping To A Horizontal Channel

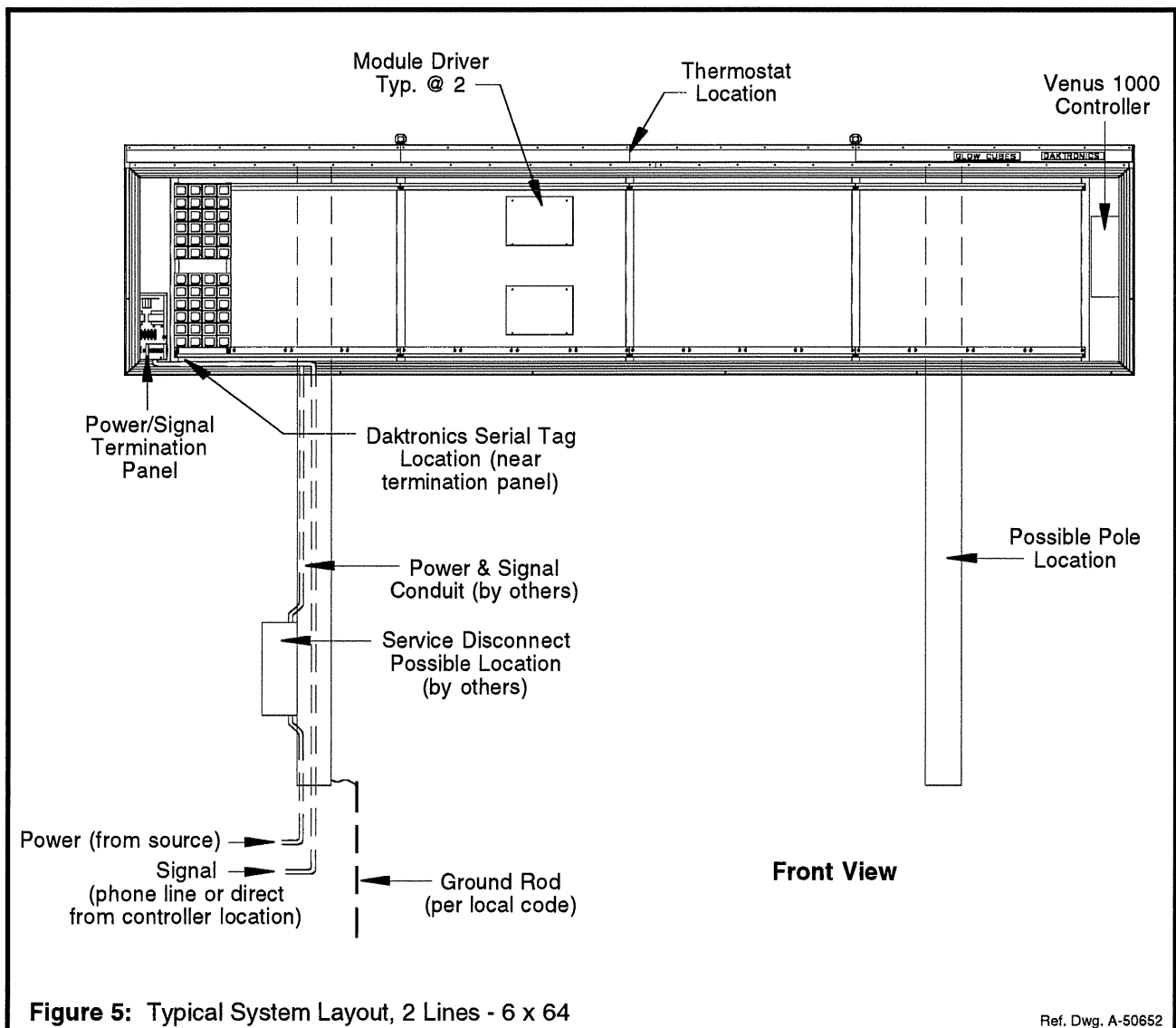
Section 2: Electrical Installation

2.1 System Layouts and Schematics

Figure 5 shows a typical system layout for a 2-line, 64-column display installation and suggested conduit entrance locations. If cables are brought in through the backsheet, be sure to use the grommets provided to go through any vertical cabinet members inside the display rather than going around the front of them.

Electrical component locations will vary with display size. Refer to the appropriate final assembly drawing located in Section 4 for component locations for your display. Component labeling is defined under the "notes" section in each drawing.

The wiring schematic drawings are also located in Section 4.



2.2 Display Access

To access any of the display components, hinge the face panel open using the following instructions:

1. Release the captivated screws on the bottom and sides of the face retainer.
2. Hinge the face open and swing out the prop rods provided on each end of the cabinet. Slide the prop rod securely into the slot of the face retainer support bracket. Refer to **Figure 6**.

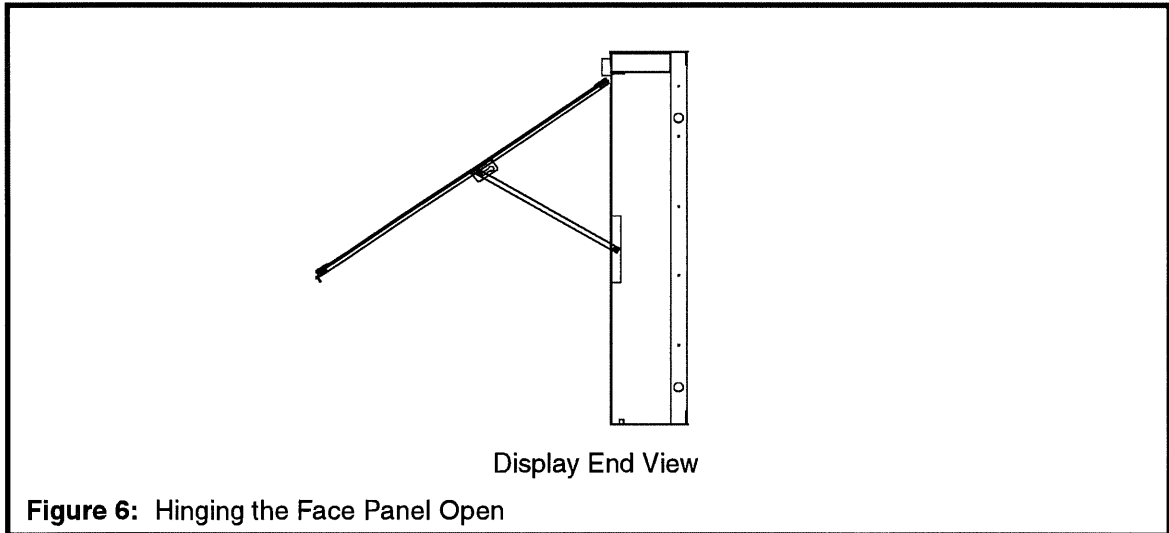


Figure 6: Hinging the Face Panel Open

2.3 Power and Signal Connections

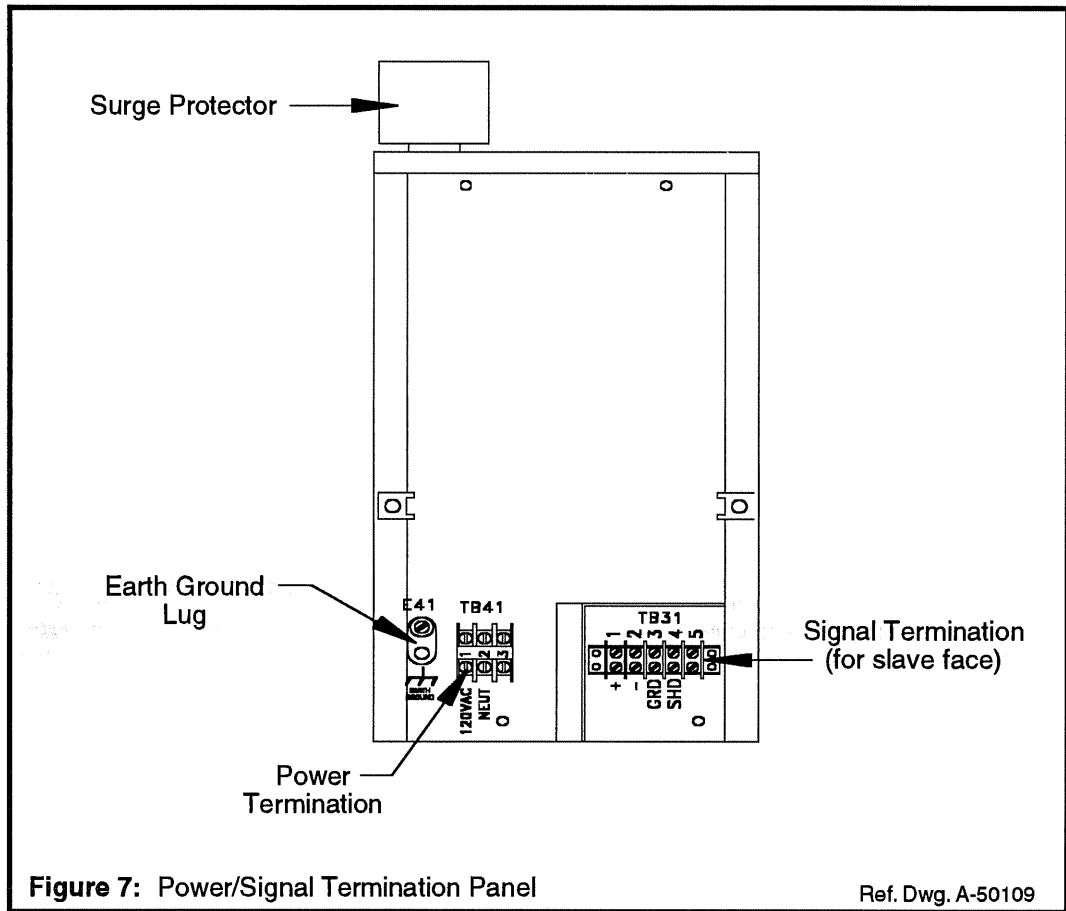
Figure 7 illustrates the power/signal termination panel. The panel is located in the left end of the display face (front view). To access, hinge the face panel open, release the two 1/4-turn fasteners in the termination panel cover, and slide the cover down and out.

2.3.1 Power Connection

The conduit for power should enter the display face near the termination panel. If cables are brought in through the backsheet, be sure to use the grommets provided to go through any vertical cabinet members rather than going around the front of them. Refer to the schematic for your display size (located in **Section 4**) for the power rating of the display. The maximum power requirements are also given on the Daktronics serial tag located near the termination panel. The power (120 VAC, 2 wires plus ground) is connected to TB41 and E41, located in the lower left corner of the termination panel.

Connect as follows:

1. Route power through conduit into the display and over to the termination panel.
2. Connect the white, neutral wire to position 2 (“NEUT”) on TB41.
3. Connect the hot wire to position 1 (“120 VAC”) on TB41.
4. Connect the ground wire to E41 (“EARTH GROUND”). Make sure the wire and lug are secure. Refer to **Section 2.4** for special grounding instructions.



2.3.2 2V Power Connection

For a 2V display, power needs to be connected to both faces. Power can be brought in separately through conduit into the slave face, or it can be tapped off the power feed into the master face. If brought in separately, follow the procedure in Section 2.3.1.

To tap off the master face, connect as follows:

1. Connect power to the master face as stated in Section 2.3.1.
- NOTE: The power stated on the serial tag is for one face only. Make sure the power feed is adequate to run both faces!**
2. Route a power cable (2 wires plus ground) from the termination panel (TB41) in the master face through a nipple that connects the left end of the master face (near the termination panel) to the right end of the slave face.
 3. Route the cable from the right end of the slave face to the termination panel in the left end.
 4. Connect the neutral, hot, and ground wires to TB41 and E41 as stated in Section 2.3.1. Refer to Section 2.4 for special grounding instructions.

2.3.3 Signal Connection

The Venus 1000 controller is built into the right end (front view) of the **master** display face. The controller enclosure is hidden by a shroud panel. The panel can be removed by removing the two tapping screws that hold it to a vertical support. It is not necessary to access the Venus 1000 for signal connection.

The signal connection for a Venus 1000 is made with a telephone line. The line for the display should have its own number that is not used elsewhere. The conduit for the telephone line should enter the master face near the termination panel. The telephone terminal block is located at the left end of the cabinet near the termination panel (not by the Venus 1000). Use standard telephone communications cable to connect a telephone line to the terminal block. The terminal block is marked with standard 6-wire telephone wire colors.

Dial-up phone line connection:

1. Route the telephone line through conduit into the master face and over to the telephone terminal block.
2. Remove the terminal block cover and connect the wires using standard telephone wire colors. The positions marked with "R" (red) and "G" (green) are the only ones that need to be terminated. Replace the cover.
3. The terminal block contains an RJ-11 jack used to connect to the Venus 1000. Make sure the wires from this jack stay properly connected to the terminal block. A telephone can be plugged into the RJ-11 jack for testing the line connection. Be sure to plug the Venus 1000 line back in when done with testing.

Leased line (direct wire) connection:

1. Route the communication cable from the programmer's console location to the display and connect as stated above.
2. Release the four (4) screws on the cover of the Venus 1000 and remove the cover. There is a set of eight (8) DIP switches on the top of the processor board. All or most of the switches will be in the OFF position. Change switch #3 (#1 is on the left) to the ON position. Replace the cover securely. Refer to **Section 3.2** for layout drawings of the Venus 1000.

2.3.4 2V Signal Connection

For a 2V display, the slave face needs to be connected to the signal from the master face. A signal interconnect cable is provided that is already wired into the termination panel of the master face and routed over to the right end (front view) where it is coiled up.

Connect the slave face as follows:

1. Route the interconnect cable through a conduit nipple that connects the right end of the master face to the left end of the slave face (near the termination panel).
2. Remove the cover of the termination panel in the slave face. Connect the signal cable to TB31 located in the sectioned off lower right corner of the termination panel.
3. Connect the signal (+) wire (red) to position 1 on TB31.
4. Connect the signal (-) wire (black) to position 2 on TB31.

5. Connect the signal ground wire (white) to position 3 on TB31. The green wire is not used.
6. Connect the shield drain wire to position 4 on TB31.

2.4 Grounding

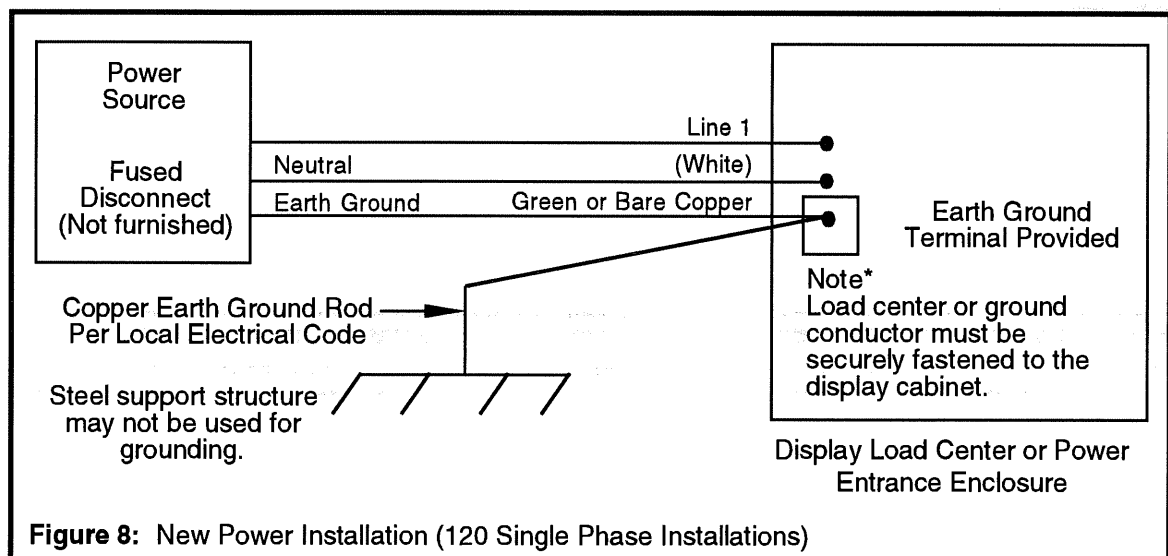
Proper grounding is necessary for reliable equipment operation. It also serves to provide some protection to the equipment from damaging electrical disturbances and lighting. If the following grounding methods are not adhered to, the warranty will be void.

The steel support structure for the display cannot be used as grounding. The support is generally imbedded in concrete, and if in earth, the steel is either primed or it corrodes making it a poor ground.

The two considerations for power installations, New Power Installations and Existing Power Installations, differ slightly. They are explained in detail below.

1. New Power Installation

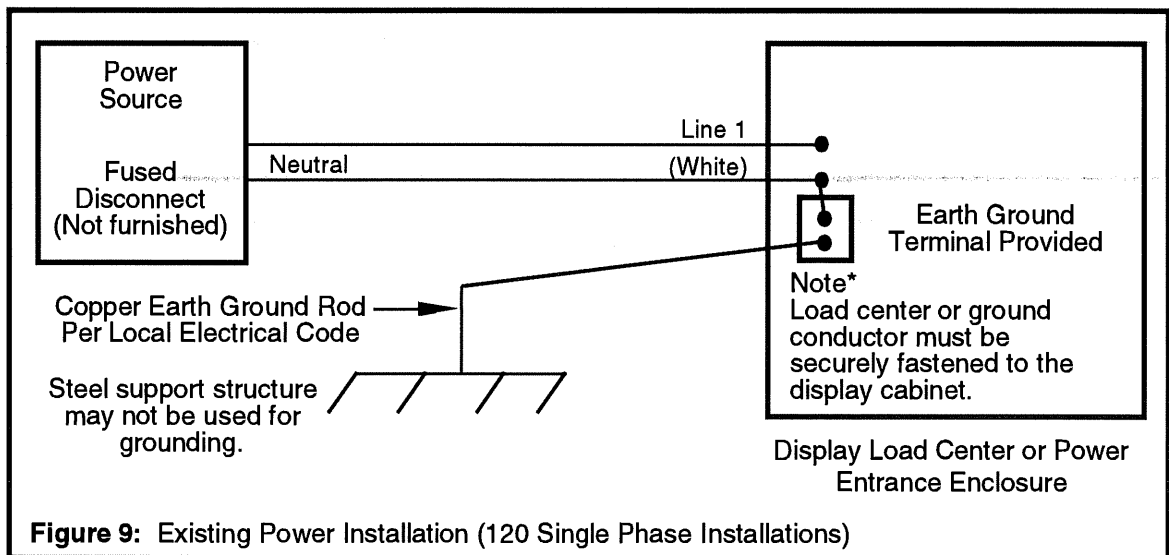
The display has built-in surge protection. However, for this to be effective, the display must be properly earth grounded. **Figure 8** illustrates the proper power and grounding installation showing an earth ground conductor from the power source. This method should be used whenever a new installation needs to be done for a display. Please note that this installation shows an earth ground conductor from the first point of disconnect or power source to the display location. The earth ground conductor must then be tied securely to the display cabinet via the load center or in some cases directly to the cabinet. Another conductor is then run from this termination to a copper earth ground rod making certain that the termination to the ground rod is secure. This termination should be made with a brass or copper connection. The earth ground rod should be the diameter and length appropriate for the local electrical code. The earth ground conductor should be of the same size as the line and neutral conductors or no less than one size under these conductors.



(Grounding continued on next page)

2. Existing Power Installation

In many cases, displays will be installed where it is advantageous to use an existing power installation. These existing power installations may not have an earth ground conductor. If this is the situation, the earth grounding should be done as outlined in **Figure 9**. Please note, if new power is being pulled to the display, the *New Power Installation* method (Figure 8) using an earth ground conductor from the source is recommended. The *Existing Power Installation* method used in Figure 9 is not as effective in protecting equipment as the method in Figure 8. In Figure 9, the neutral conductor must be tied to the ground terminal provided in the load center in the power entrance enclosure. A conductor size equal to the neutral needs to be run from the terminal to an earth ground rod in accordance with local codes.



2.5 Optional Temperature/Daylight Sensor

The (optional) temperature/daylight sensor is mounted separately and requires a location away from the influence of chimneys, air conditioners, or vents which can cause abnormal temperature fluctuations. Usually a separation of at least 20 to 30 feet horizontally is required to achieve this. Locations where air movement is restricted are also unsatisfactory.

The best sensor location is a north eave or northern exposure. This location gives extra stability and accuracy to the sensor because of the added shading usually obtained.

The second choice for locating a temperature sensor is on the display itself, or somewhere on the display structure. A light colored display is preferred in this application. Location of the sensor should be on a northern edge of the display to try to keep the sensor shaded. Greater accuracy is obtained if there is grass below the display rather than concrete or some other material. Display mounted sensors are generally discouraged because of the potential of the display to self-heat from the sun, thereby causing erroneous temperature readings.

Eave Mounting of Sensor

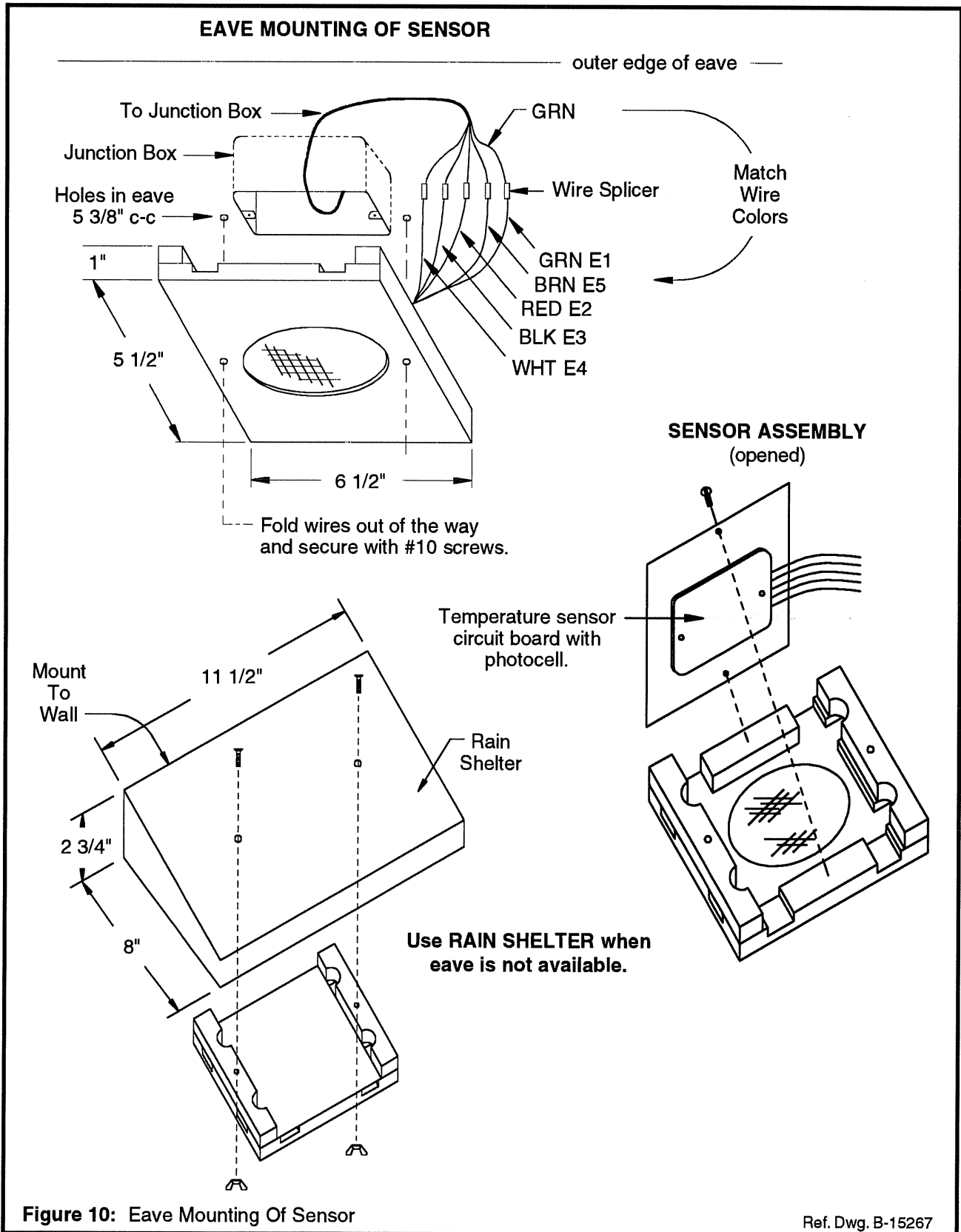
Figure 10 shows a temperature sensor that has been mounted under a roof eave. After connections are made as in **Figure 10**, inspect connections, fold wires away, and secure with #10 screws. Be sure to heat shrink the connections.

Connection To Controller

A 5-conductor, 18-gauge cable (Belden 8465, Daktronics part number W-1007) is used to connect the temperature/daylight sensor to the Venus 1000 controller. Maximum length is 1000 feet.

Install as follows:

1. Connect the cable to the temperature sensor as shown in **Figure 10** and route through 1/2" conduit to the display master face, near the termination panel.
2. Locate the 5-conductor cable near the termination panel with crimp connections installed on it. Connect the cable from the temperature sensor to this cable. Match wire colors (white, black, red, brown, green).



2.6 First Time Turn On

After all the connections are made, it is time to turn on the display for the first time field test.

1. Remove the fuses from the power termination panel. (If the fuses have different ratings, be sure to return the fuses to the proper location when done.)
2. Turn power ON to the display.
3. Carefully check the voltage between TB41-1 and TB41-2. Normal voltage range is between 110 VAC and 125 VAC.
4. If there are problems with the display voltage, check with your local electrician or power company.
5. Turn the power OFF, replace the fuses, and replace the covers on all the termination panels. Leave the face panel open, or at least do not fasten it down until the display has passed the fire up test.
6. Turn power ON to the display.
7. The display will go through a driver power up test of ALL ON, ALL OFF. Then the Venus 1000 will do a power up test of these frames:
 - Model # and revision
 - Baud rate and connection type
 - Test pattern

1-A	1-B	1-C	1-D
2-A	2-B	2-C	2-D

 (2-line, 64-column display)
8. When the test patterns are done, the Venus 1000 will start to run some messages on the display that were previously stored in the battery backed memory. These messages will continue to run until the power is turned OFF or they are changed with the Venus 1000 programmer's console.

Section 3: Maintenance & Troubleshooting

IMPORTANT NOTES:

1. Display power must be turned OFF before any repair or maintenance work is done on your display.
2. Any access to internal display electronics must be made by qualified service personnel.

3.1 The Drivers and Display Boards

The Glow Cube pixel elements in this display are mounted to a circuit board referred to as a display board. There are two types of display boards. The 15" character displays (260 series pixel) consist of display boards 6 pixels high by 4 pixels wide. The 9" character displays (150 series pixel) consist of display boards 6 pixels high by 8 pixels wide. The display boards are placed side by side to form a continuous line(s). Each display board has an input and output signal jack(s) used to daisy chain them with a ribbon cable.

The display boards are controlled by a Glow Cube line matrix driver. Each output jack on the driver can control a matrix of 6 rows by 16 columns (four 6 x 4 boards or two 6 x 8 boards). A cable from the jack on the driver connects to the input jack on a display board. The output jack on that display board is connected to the input jack of the display board beside it, but only for a total of 16 columns. There are four output jacks on the driver so it can control up to a 6 high by 64 column line. Lines up to 64 columns require one driver. Lines over 64 columns and up to 128 columns require two drivers.

3.1.1 Connectors

Signal and power are brought into the driver on J1 (12 pin). Refer to **Figure 11**. Power is 28VAC from the transformer(s) in the termination panel. Signal is RS-485 network that is connected to all the drivers in a display including the slave face. J1 also has connections for two switch outputs. Switch output #1 is used to control a 120VAC relay that turns on the front lighting ballast (relay mounted in termination panel).

J1			
PIN	FUNCTION	PIN	FUNCTION
1	NC	7	Switch 1+
2	Network -	8	Switch 1-
3	Earth Ground	9	Power (28VAC)
4	Reset	10	Network +
5	Reset Ground	11	Switch 2+
6	Power (28VAC)	12	Switch 2-

With network signal, each driver in a display must have a unique address. This address is set by jumpers in J2 (9 pin). The address lines are on pins 5, 6, 7 and 8 of J2. The selection is made by connecting some combination of these pins to ground, pin 9 on J2. The plug that is in J2 should always stay with the display in the same location. Driver address numbering starts with the first driver on the top line of the master face, continues down the master face and keeps going starting at the top of the slave face.

Jumpers on J2 are also used to activate a driver self test. A test that turns the pixels ALL ON and ALL OFF at one second intervals can be run by connecting pin 1 to pin 9(GND) of J2. If pin 2 is connected to pin 9 on J2 at the same time, the test will be a walking dot test that turns one pixel at a time.

J2			
PIN	FUNCTION	PIN	FUNCTION
1	Test 1	6	Address 2
2	Test 2	7	Address 3
3	Strobe	8	Address 4
4	Unused	9	Ground
5	Address 1		

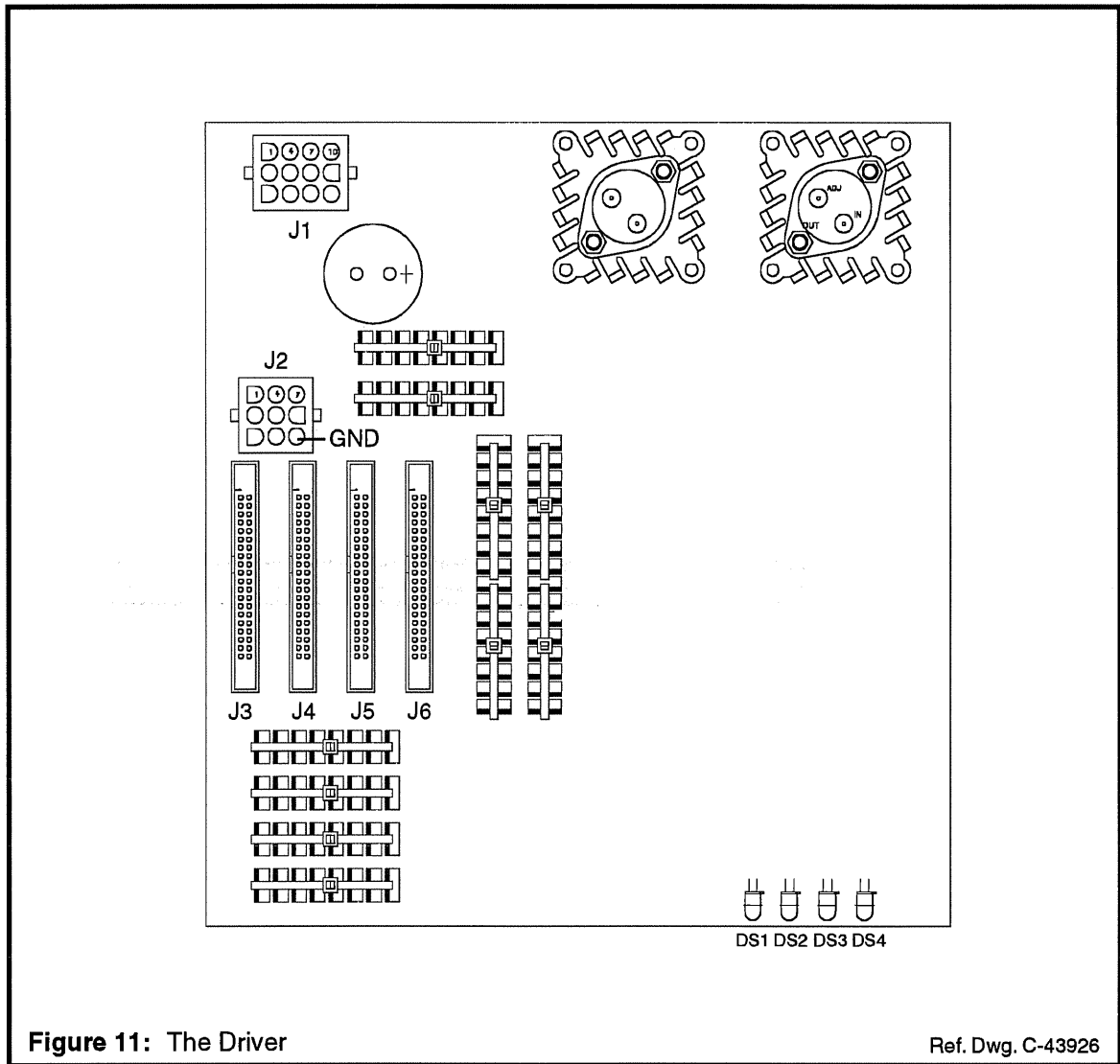
The table below shows which pins need to be connected to ground for addresses 1-16.

DRIVER #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
AD1, J2-5	0	X	0	X	0	X	0	X	0	X	0	X	0	X	0	X
AD2, J2-6	0	0	X	X	0	0	X	X	0	0	X	X	0	0	X	X
AD3, J2-7	0	0	0	0	X	X	X	X	0	0	0	0	X	X	X	X
AD4, J2-8	0	0	0	0	0	0	0	0	X	X	X	X	X	X	X	X

0 - OPEN X - CONNECTED TO GROUND (J2-9)

The driver is connected to the display boards through four, 40 pin headers. The first 6 by 16 matrix is connected to J3, the second is connected to J4, etc.

J3			
PIN	FUNCTION	PIN	FUNCTION
1	RCOL1	A	SCOL1
2	RCOL2	B	SCOL2
3	RCOL3	C	SCOL3
4	RCOL4	D	SCOL4
5	RCOL5	E	SCOL5
6	RCOL6	F	SCOL6
7	RCOL7	H	SCOL7
8	RCOL8	J	SCOL8
9	RCOL9	K	SCOL9
10	RCOL10	L	SCOL10
11	RCOL11	M	SCOL11
12	RCOL12	N	SCOL12
13	RCOL13	P	SCOL13
14	RCOL14	R	SCOL14
15	RCOL15	S	SCOL15
16	RCOL16	T	SCOL16
17	ROW1	U	ROW2
18	ROW3	V	ROW4
19	ROW5	W	ROW6
20	UNUSED	X	UNUSED

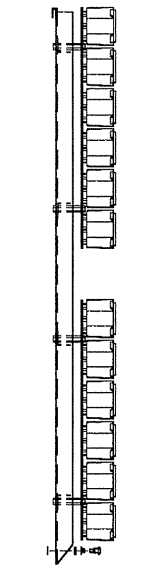


3.1.2 LED Status Indicators

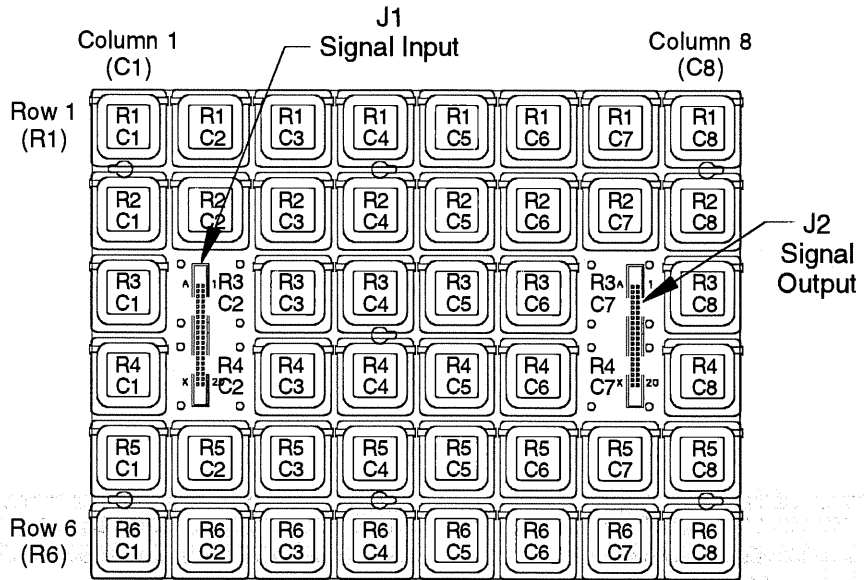
There are three LEDs on the driver that are used to show the driver status:

DS2	ON = strobe stuck high	FLASH = strobe stuck low
DS3	ON = checksum bad	FLASH = processor ram bad
DS4	ON = VBB low	

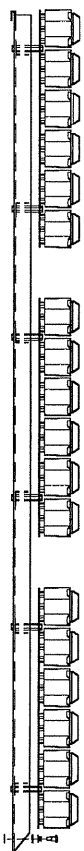
If DS2 or DS3 are ON, try resetting the driver (short J1-4 to J1-5). If these LEDs continue to stay ON, the driver needs to be replaced and repaired. If DS4 is on for very long, the voltage coming into the driver is probably low.



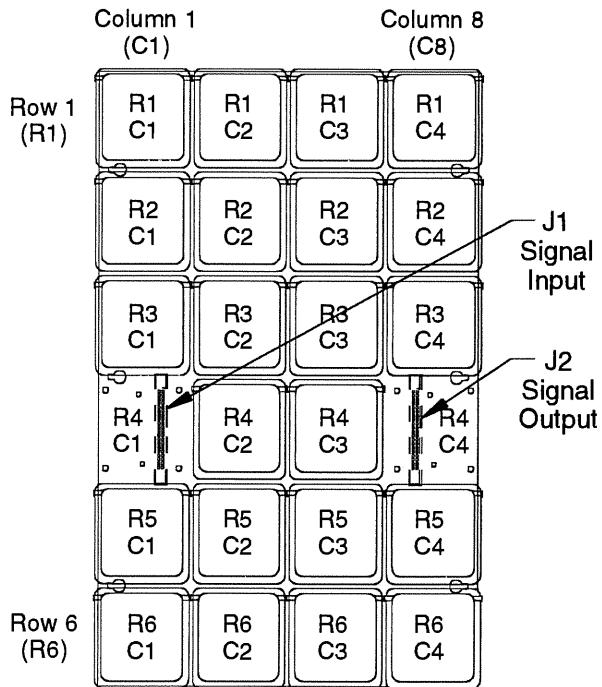
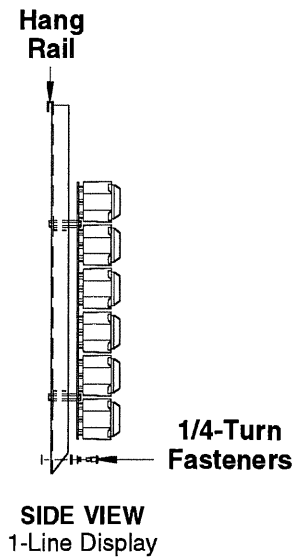
SIDE VIEW
2-Line Display



9" CHARACTER
Display Board



SIDE VIEW
3-Line Display



15" CHARACTER
Display Board

Figure 12: Display Boards

Ref. Dwg. A-50655, A-50629, A-50784 & 50786

3.2 Venus 1000 Controller

The Venus 1000 controller is located inside the master display cabinet. The controller consists of a processor printed circuit board, an interface printed circuit board and a transformer -- all mounted in a weather-proof polycarbonate box (refer to **Figure 13**). It is programmed by the Venus 1000 programmer's console and sends signal to the display boards in the display.

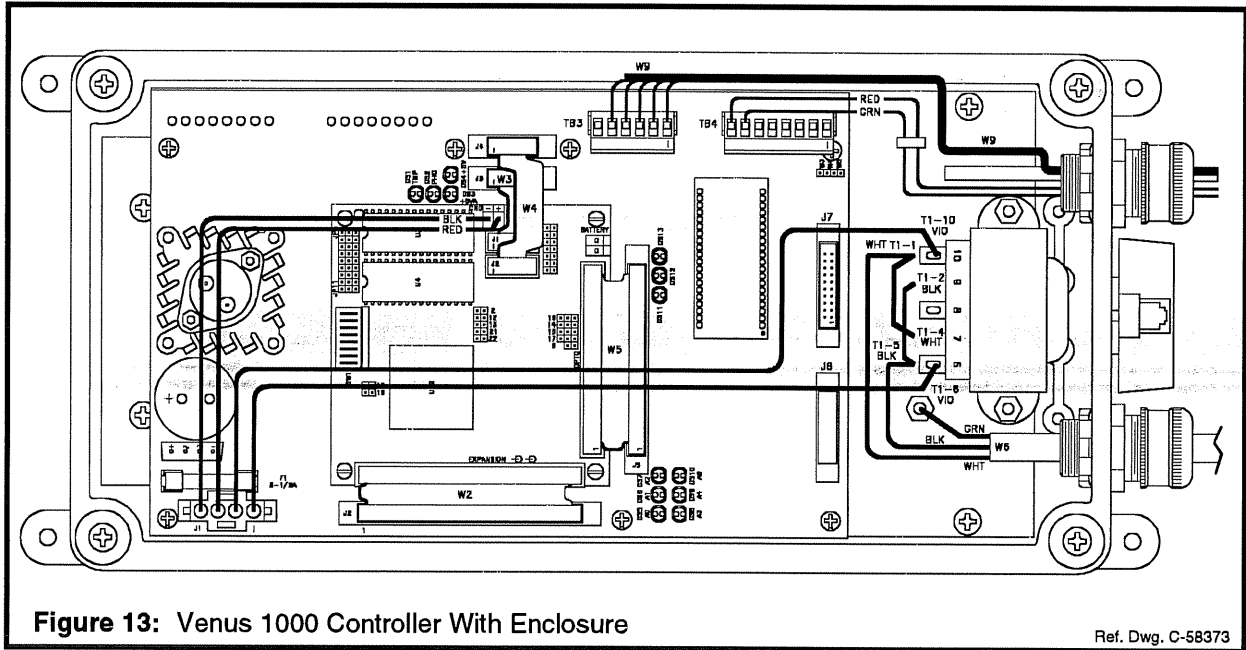


Figure 13: Venus 1000 Controller With Enclosure

Ref. Dwg. C-58373

3.2.1 Connectors

The processor board and the interface board are connected together by four (4) ribbon cables. The cable sizes and connections are listed below.

Cable	Processor	Positions	Interface
W2	Expansion	60	J2
W5	OPTO	50	J5
W3	J1	10	J3
W4	J2	10	J4

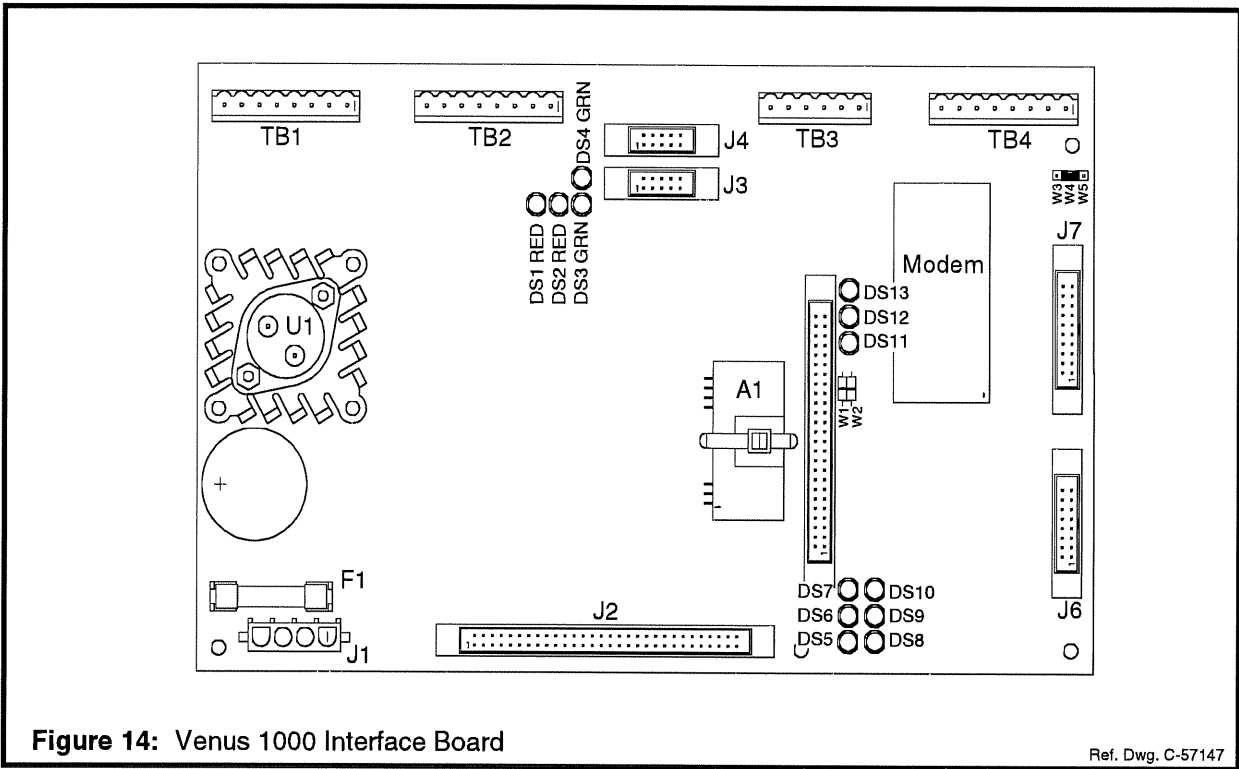


Figure 14: Venus 1000 Interface Board

Ref. Dwg. C-57147

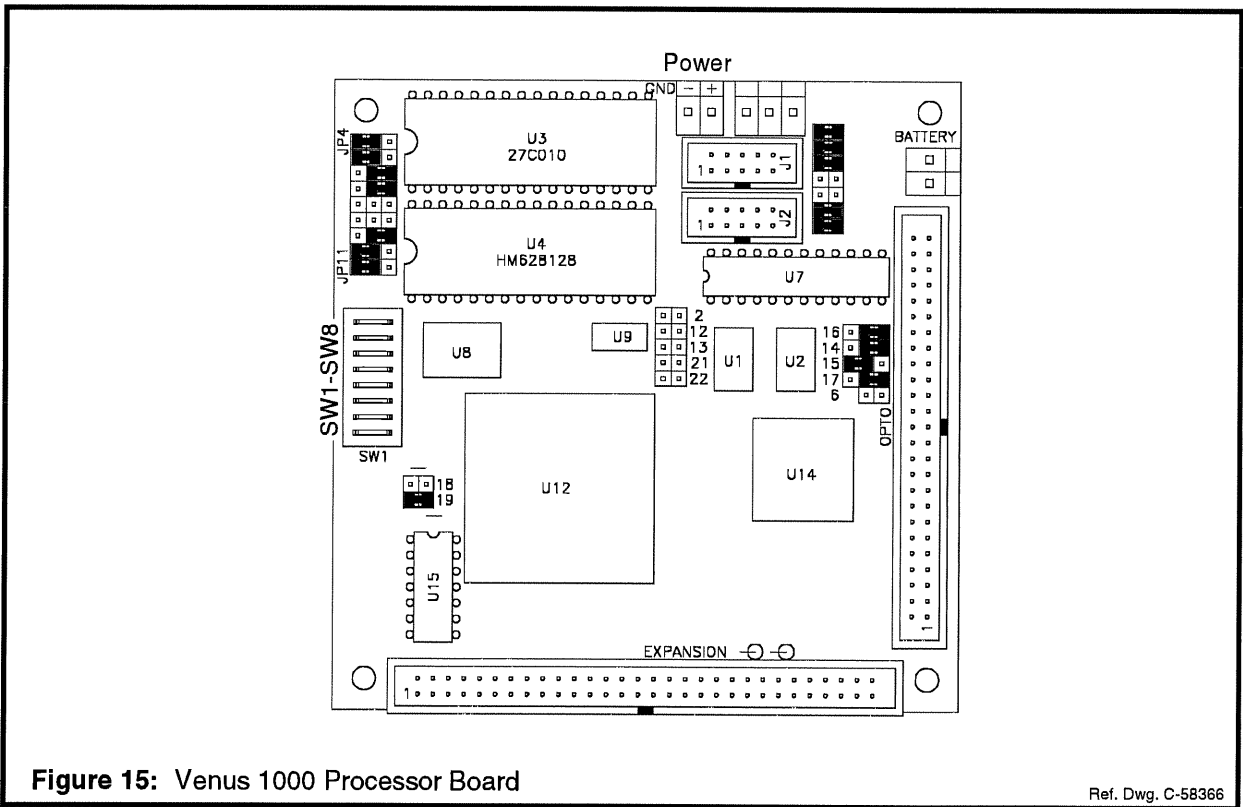


Figure 15: Venus 1000 Processor Board

Ref. Dwg. C-58366

Power from the transformer comes into the interface board on **J1**. Power for the processor board also comes out of jack J1. Signal comes in from the telephone line on **TB4** and from the temperature sensor on **TB3**. Signal goes out to the display boards on **J6** for low wattage incandescent displays; **TB1** and **TB2** for standard incandescent displays; and **TB4** for Glow Cube line displays. Refer to the interface board illustrated in **Figure 14** for the locations of these connectors. The following tables show the pin functions of these connectors.

J1	
PIN	FUNCTION
1	Power In (10 VAC)
2	Power In (10 VAC)
3	Power Out (+5 VDC)
4	Power Out (GND)

TB3	
PIN	FUNCTION
1	Photocell
2	GND
3	+5 Volts
4	GND
5	Temperature
6	GND

TB4	
PIN	FUNCTION
1	TX (RS232)
2	RX (RS232)
3	GND
4	Data + (RS485)
5	Data - (RS485)
6	GND
7	Telephone (Tip)
8	Telephone (Ring)

3.2.2 Switches And Jumpers

Some of the configurations of the Venus 1000 are set through jumpers and a DIP switch package. Most of these are located on the processor board. Refer to the processor board illustrated in **Figure 15**. The jumpers on the processor board are set at the factory and should not be changed. The interface board has jumpers W1-W5. Refer to the interface board illustrated in **Figure 14**. W1 and W2 are set at the factory. There is one black shunt used for W3-W5. The shunt is placed in the **W5** (bottom) position for telephone modem connections. The shunt is placed in the **W3** (top) position for RS232 connections. Some of the DIP switches may need to be set during installation (default is all off). Refer to the processor board illustrated in **Figure 15** for the DIP switch package location.

Refer to the following table for the DIP switch functions and settings:

1 OPERATION MODE

OFF Normal Operation
ON Display Test Mode

2 POWER FAIL RECOVERY

OFF Power fail recovery enabled
ON Power recovery disabled - clear RAM on power-up

3	4	CONNECTION TYPE
OFF	OFF	Modem - Dial-Up
ON	OFF	Modem - Leased Line
OFF	ON	Direct RS232 - No Modem
ON	ON	Reserved

5	6	DATA SPEED
OFF	OFF	2400 Baud
ON	OFF	9600 Baud
OFF	ON	4800 Baud
ON	ON	1200 Baud

7	CLOCK SOURCE
OFF	Clock operates off power line frequency
ON	Clock operates off internal oscillator (Real Time Clock)

8 NOT USED

3.2.3 Status Indicators

There are several LED indicators on the interface board that show the status of the Venus 1000. Refer to the interface board illustrated in **Figure 14** for the location of these LEDs. All LEDs are red except where noted. The LED functions are as follows:

DS1: Temperature Sensor Status
 ON: Temperature sensor input detected.
 OFF: No sensor input.

DS2: Photocell Status
 ON: Detecting a BRIGHT condition
 OFF: Detecting a DIM condition (or sensor is disconnected)

DS3: Temperature Sensor Power (+5 volts) (Green)
 ON: Power is present.

DS4: Controller Main Logic Power (+5 volts) (Green)
 ON: Power is present.

DS5: Error Code
 OFF: No errors.
 FLASHING: Error detected.

Refer to the following **Error Code Indicator** notes to read the error code.

DS6: Sign Status
 ON: Running message(s), no schedule.
 OFF: Sign stopped.
 ON/Blinks OFF: Schedule running message(s).
 OFF/Blinks ON: Schedule in shutdown (no messages).
 Blinks ON/OFF Steady: Running test pattern.

DS7: Not used.

DS8: Clock
 ON/OFF: Blinks at one second intervals if using power line frequency.
 OFF: Running off internal oscillator (Real Time Clock).

- DS9:** Communication
ON: Receiving data from programmer's console.
OFF: Not receiving data.
- DS10:** Sign Driver Status
Blinks when sign driver software is running.
- DS11:** Modem Speed
ON: 1200 baud.
OFF: 2400 baud.
- DS12:** Modem Auto Answer
ON: Modem will answer call (dial-up only).
OFF: Not Auto Answer (leased line).
- DS13:** Line Off Hook
ON: Modem has control of telephone line.
OFF: Modem has hung-up telephone line.

Error Code Indicator

The Venus 1000 does several tests on power-up. During these tests, errors can be detected.

The error code LED is read by counting how many times it blinks ON. The blinking represents a two digit number. The first number is preceded by a long pause. The first and second number are separated by a short pause.

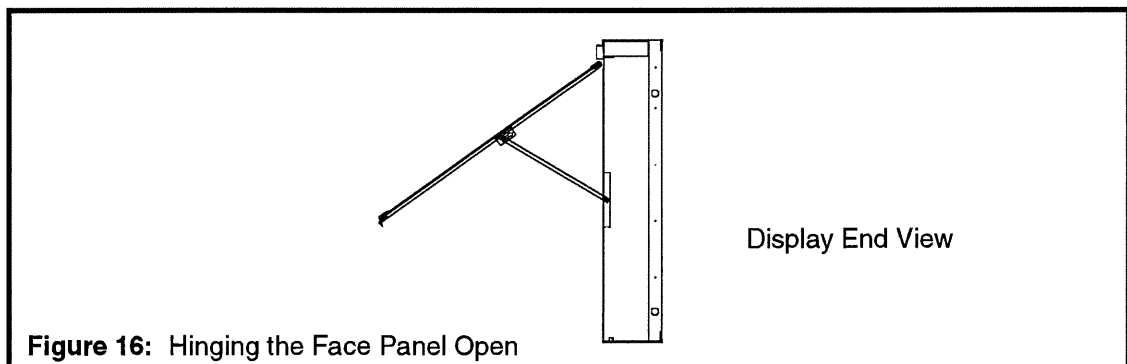
To read the error code: (1) wait for a long pause, (2) count the number of blinks before the short pause (first digit), (3) count the number of blinks before the long pause (second digit). Possible error codes are:

- 31: No modem detected (possible failed modem).
- 32: Modem loopback test failed (possible failed modem).
- 41: ROM checksum failed (program has been corrupted).
- 42: Message storage invalid.
- 43: RAM access error.

3.3 Display Access

To access any of the display components, hinge the face panel open using the following instructions:

1. Release the captivated screws on the bottom and sides of the face retainer.
2. Hinge the face open and swing out the prop rods provided on each end of the cabinet. Slide the prop rod securely into the slot of the face retainer support bracket. Refer to **Figure 16**.



3.4 Troubleshooting

1. **Spinning Cube** - Visually inspect cube for broken bumper pegs. Replace if necessary.
2. **Bouncing Cube** - Visually inspect cube for missing rubber bumpers. Replace if necessary.
3. **Cubes Sticking** - Some cubes may tend to stick after long periods of no use. Replace rubber bumpers on these cubes.
4. **Entire Display Board(s) Is Not Working** - If an entire display board(s) is not working, there are several different possible causes. Check the driver connector to see if it is loose or not fully seated in place. Make sure there is a good signal connection for the driver. Check for pins that may be pushed back in the plug going to the driver. If a pin is pushed back, it is possibly not making contact. It may be necessary to bend out the locking ears on the pin to keep it secure.
5. **Cube Column / Row Is Not Working** - If a column or row of cubes is not working, there are a few things to check for. First, examine the driver-to-display board connection, or the connection between display boards, making sure connections are not loose. Swap the appropriate driver with a known good driver. If the problem moves by swapping drivers, the driver is bad and needs repair or replacing. If not, check the ribbon cable for defects.
6. **Individual Cube Is Not Working** - If the cube is not flipping or flips intermittently, measure the pixel DC resistance. To test a cube with an ohmmeter, put the ohmmeter leads to the upper right and lower left cube contact points on the back of the circuit board. In some cubes, a short will only appear when the cubes are in motion.

150/10 (9" character)

An ohmmeter reading of sixteen to zero ohms indicates a shorted cube. Ohmmeter should read 17.5 to 18.5 ohms for a 150/10 pixel.

260/18 (15" character)

An ohmmeter reading of eight to zero ohms indicates a shorted cube. Ohmmeter should read 8.5 to 9.5 ohms for a 260/18 pixel.

If the DC resistance is less than the correct range, or infinite, then the pixel has failed. If the DC resistance is correct, gently turn the pixel rotor and feel for any internal binding. If there is none, heat all four solder connections between the pixel and the display board. This would eliminate any cold solder joints. **It is important that the pixel DC resistance is measured before it is removed from the PC board. Otherwise, good pixels may be unnecessarily removed.**

If the cube flips only part way, it may have some type of internal binding. If internal binding is detected with manual rotation, the pixel should be removed.

7. **Entire Display Is "Dead"** - Check if the display has power with these two tests. First, turn display power off. Wait for ten seconds. Repower and watch for all cubes flipping from yellow (color side) to black. This indicates that there is power. A second test is to measure voltage at the termination panel. If there is power, check the fuses and replace if necessary. There could also be a possibility that no signal is running to the drivers. Check signal wires and connections. Locate and repair any breaks in the signal wire.

3.5 Removing a Display Board

Display boards are mounted to the cabinet on rails. These rails will have one, two or three display boards mounted to them depending on how many lines are in the display. A display model featuring 9" characters will have display boards eight pixels wide; a display model featuring 15" characters will have display boards four pixels wide.

Figure 12 illustrates (1) display boards, (2) the pixel numbering convention, (4) the hang rail that secures the top of the display board to the cabinet, and (3) the 1/4-turn fasteners that hold the bottom of the display board in place.

To remove a display board:

1. Release the two 1/4-turn fasteners that hold the bottom of the display board.
2. Pull outward on the bottom of the display board making sure that the top remains hooked.
3. Reach behind the display board(s) and release the plugs from the jacks on the back. A one line display has two jacks, a two line display has four jacks (two per line), and a three line display has six jacks (two per line). **Figure 12** shows the jack locations.
4. Hold the display board(s) firmly by the two mounting rails and raise slightly to unhook the top. Carefully lift it out.

3.6 Glow Cube Pixel Replacement

Use the following steps for Glow Cube pixel replacement:

1. Heat the soldering iron to full temperature and make sure solder extractor is clean.
2. Locate the defective cube(s) on the front of the display board(s). Use a small piece of masking tape to mark the defective cube(s).
3. Remove the display board that the defective cube is attached to (refer to **Section 4.2**). Locate the four pins on the back of the module that hold the defective cube in place. Use a piece of masking tape to mark the pin locations.
4. Lay the module face down on a clean flat surface. Be sure that none of the cubes are stopped halfway between yellow and black sides, as this may result in damage to the cubes taking on the weight of the entire module.
5. Use the soldering iron on one pin at a time. As the solder melts, use the solder extractor to clear **all four pin holes as much as possible**.
6. If the cube does not come out at this time, clamp gently onto one corner of the cube box with a needle nose pliers while applying heat to the solder side of the PC board. Gently pull each corner of the cube box until loose from the PC board. When pulling on the corner of the boxes **DO NOT** use excessive force or damage to the PC board may occur.
7. Once the cube is free from the PC board, check the holes to make sure they are completely clear of solder.
8. To install a new cube, be sure it is aligned in the proper direction with the notched part of the cube towards the bottom of the module. Gently push the new cube in place making certain it is flush with other cubes around it. Solder the four pins.
9. Connect the display board and test using the driver self test.
10. Carefully clean the cube faces with a damp soft cloth.

3.7 Removing a Driver

Use the following steps to remove a driver for repair or replacement:

1. Remove the display board(s) in front of the driver to be replaced or serviced. Carefully place the display boards on a clean piece of packing material with the cubes facing upwards (do not put any excess weight on the display board when in this position).
2. Release the two 1/4-turn fasteners on the cover of the driver enclosure. Slide the cover down and remove.
3. Remove the six (6) screws holding the circuit board in place, and unplug the ribbon and power cables.
4. Pull the circuit board straight off the spacers and place it in an antistatic bag.
5. Reverse the steps to install a new driver. Test the driver using the self test.

3.8 Fluorescent Lamps and Ballasts

The displays contain internal night lighting and use fluorescent lights in the bottom of the display. The fluorescent lamps are controlled by a photocell which measures light conditions near the sign. Available light is measured by the photocell which in turn causes the controller to send a message to the designated driver (usually A1) to turn the fluorescents ON or OFF.

The fluorescents can also be controlled manually by changing the controller schedule to override the photocell. We recommend changing the controller schedule with the changing of the seasons. Leave the fluorescents on a little longer in the morning hours of spring and fall. This prevents the buildup of dew or frost on the clear face panel caused by low temperatures and/or high humidity. In extremely cold conditions, turn the fluorescents on at least one hour earlier in the evening and leave them on at least one hour longer in the morning; or leave them on all day. In summer leave the controller in the **automatic** position with the photocell dictating the on/off schedule. The controller can be set to **manual dim** which would leave the fluorescents operating continuously, or **manual bright** which would leave the fluorescents off. If frost or dew builds up on the face panel, the controller can be set to **manual dim** to turn the fluorescents on and heat the inside of the display enough to remove the moisture.

Notes: Bright and dim refer to outside light conditions.
The photocell is optional.

Display size determines the number of fluorescent lamps, which in turn determines the number and size of ballasts. Ballast location varies, although generally, ballasts are located in the bottom of the display.

To access the fluorescent lamps and/or ballasts, first hinge the face panel open. To replace a lamp, grasp and push the lamp towards the spring-loaded end of the lamp holder, and pull out. To remove a ballast, remove the mounting screws and unplug the Mate-N-Lok connector.

If one or more of the fluorescent lamps do not light up, use the following checklist. This checklist has been arranged in order, according to which areas should be checked first. **Note:** The controller must be on dim or the photocell darkened for testing during daylight hours, giving the signal that the fluorescent lamps should be on.

1. **Lamp** - Replace the bad lamp. If the new lamp does not light up, continue using this checklist for other possible problems.
2. **Fuses** - Visually check the power termination panel for bad fuses and replace them.

3. **Driver** - Check if the driver that runs the fluorescents (normally driver A1) is operating correctly, by swapping the driver with another driver. If the fluorescents still do not work, the driver is not the problem. If the situation is corrected by swapping drivers, this signifies a bad driver.
4. **Relay** - Check voltage on both sides of the relay with a voltage meter. Check for 120 VAC between the neutral lug in the termination panel and each set of contacts. Contact pairs are on terminals 6, 9 and 4, 7 of the relay socket if they have wires attached to them. Also, check that the relay is energized.
5. **Photocell** (optional) - If the fluorescents are not turning ON and OFF with the photocell, but operate properly with the controller, the photocell is possibly at fault. The photocell measures light conditions near the display. To check that it is operating correctly, cover the photocell and the fluorescents should turn on. Or shine a flashlight into the photocell and the fluorescents should turn OFF. Since the photocell has a delay, give the test four to five minutes to work. If the fluorescent do not pass these tests, replace the photocell.
6. **Controller Schedule** - A trained operator can check that the schedule is set according to the controller manual.
7. **Ballast** - Check voltage on the primary side of the ballast with a voltage meter. There should be 120 VAC on the primary side, and 600-1200 VAC on the secondary side. Also, check for black tar leaking from the ballast which indicates that it needs replacing.

If the fluorescent lamps are still not functioning properly after checking each of these areas and replacing or repairing any necessary parts, contact the Daktronics Customer Service Department for assistance.

3.9 Display Cooling System

The display cooling system consists of a fan control thermostat assembly and cooling fan(s). The thermostat assembly is located at the top and center of the display cabinet. It is stud-mounted to the display backsheet. The fans and thermostat are fused by F43 (check schematic) in the power termination panel.

The thermostat assembly consists of a fuse (MDX-5 amp, 125 volt), temperature sensor, momentary switch, and an enclosure. The temperature sensor activates the display cooling fans to turn on at 120 degrees Fahrenheit, and to turn off a 90 degrees. The momentary switch is used to check fan operation. Check fans periodically to ensure they are running smoothly.

The fan air inlets are located in the bottom of the cabinet. The fans pressurize the cabinet and force warm air from inside the cabinet out through the louver on the top of the display. ***Airflow cannot be restricted to the bottom of the display cabinet.*** If you choose to "skin" over the display frame, you must provide adequate ventilation ports through the skin. Holes in the skin must be equal to the size and quantity of the holes provided in the Daktronics cabinet.

A faulty thermostat or cooling fan must be repaired or replaced as soon as possible to extend the life of the display's electrical components. If a cooling fan or fans in the bottom of the display should fail, use the following guidelines to locate and correct the malfunction.

1. Access the display as described in **Sections 3.4 and 3.5.**
2. Make sure the fuse (F43) is not blown.
3. Push the momentary switch on the thermostat assembly to manually activate fans. If one or more fans operate while others do not, replace the fans that do not work.

(Display Cooling System continued on next page)

(Display Cooling System, continued)

4. If the momentary switch fails to activate any of the fans, remove the cover from the thermostat assembly and check for a blown fuse. Replace fuse if necessary (MDX-5 amp, 125 volt).
5. If the momentary switch activates all the fans, test the thermostat by using a soldering iron to heat up the thermostat (heat the metal behind the ½" hole punched in the cover). If the fans do not activate by heating up the thermostat, the thermostat assembly should be replaced.

If problems with the display cooling system persist, contact your Daktronics customer service representative.

3.10 Fuse Replacement

All fuses are located on the termination panel. **NOTE:** Replace fuses with type and rating specified.

FUSE	PROTECTS	FUSE TYPE & RATING
F41	Relay / Ballasts	MDX-5, 5 Amp
F42	Transformer	MDX-5, 5 Amp
F43	Fan & Second Transformer	MDX-5, 5 Amp
F44	Driver	MDX-5, 5 Amp (Toroid; AGC-10, 10 Amp)
F45	Driver	MDX-5, 5 Amp (Toroid; AGC-10, 10 Amp)
F46	Driver	Toroid; AGC-10, 10 Amp
F47	Driver	Toroid; AGC-10, 10 Amp

3.11 Cleaning The Displays

Face Panel Cleaning

If needed, clean the face panel inside and out with a wet cloth, followed by a clean dry cloth. An antistat polycarbonate cleaner is highly recommended and will yield the best long-term results. How often the face will require cleaning will depend upon the site conditions. Glow Cube pixels do not require the face to be cleaned for any reason except visual impairment.

Glow Cube Cleaning

Clean cubes only when necessary. Use a damp cloth or sponge for the best results.

1. Do not use soap, cleaning solvents or sprays.
2. Avoid excess water to come in contact with any portion of the cube except the black and yellow display faces. Excess water can displace oil from the cube bearings and cause premature bearing failure and/or tarnishing of the yellow display face.
3. Avoid using excess pressure on the cube faces.
4. Work in upward strokes when all cubes are yellow side up. Work in downward strokes when all cubes are black side up.

3.12 Structural Inspection

Visual inspection should be done annually to check paint and possible corrosion, especially at footings, structural tie points, and ground rods. Fasteners should be checked and tightened or replaced as required.

3.13 Modem/FCC Regulations

The modem on the Venus 1000 interface PCB complies with Part 68 of the FCC rules and regulations. With each device shipped, there is a label which contains among other information, the FCC Registration number and Ringer Equivalence Number (REN) for this product. You must, upon request, provide this information to your telephone company.

The REN is useful to determine the number of devices you may connect to a telephone line and still have all of these devices ring when the number is called. In most, but not all areas, the sum of the REN's of all of these devices connected to one line should not exceed five. To be certain of the number of devices you may connect to the line, as determined by the REN, you should contact the local telephone company to determine the maximum REN for your calling area.

If your system causes harm to the telephone network, the telephone company may discontinue service temporarily. If possible, they will notify you in advance. If advance notification is not practical, you will be notified as soon as possible.

Your telephone company may make changes in its facilities, equipment, operations or procedures that could affect proper functioning of your equipment. If they do, you will be notified in advance to give you an opportunity to maintain uninterrupted telephone service.

If you experience trouble with this device, please contact Daktronics customer service for information on obtaining service or repairs. The telephone company may ask you to disconnect this device from the network until the problem has been corrected or until you are sure that the device is not malfunctioning.

The device may not be used on coin service lines provided by the telephone company (this does not apply to private coin telephone applications which use standard telephone lines). Connection to party lines is subject to state tariffs.

3.14 Replacement Parts List

PARTS DESCRIPTION	DAKTRONICS PART #
Glow Cube Display Element, 9"	A-1066-83
Glow Cube Display Element, 15"	A-1066-85
Display Board, 9"	P-1066-34
Display Board, 15"	P-1066-30
Driver	P-1066-21
Temperature Sensor	P-1048-07
Fuse, MDX-5	F-1021
Fuse, AGC-10	F-1006
Fan, 110 CFM	B-1006
Fan Finger Guard (B-1006)	HS-1036
Fan, 240 CFM	B-1007
Fan Finger Guard (B-1006)	HS-1036
Fan, 240 CFM	B-1007
Fan Finger Guard (B-1007)	HS-1130
Fluorescent Lamp, 4'	DS-1036
Fluorescent Lamp, 5'	DS-1049
Fluorescent Lamp, 6'	DS-1037
Fluorescent Lamp, 7'	DS-1038
Ballast; 1, 2 Lamp Combo, 6-12 Ft. Total Lamp Length	A-1095-37
Ballast; 2, 3, 4 Lamp Combo, 8-16 Ft. Total Lamp Length	A-1095-38
Ballast; 4 Lamp Combo, 16-22 Ft. Total Lamp Length	A-1095-39
Ballast; 4, 5, 6 Lamp Combo, 24-36 Ft. Total Lamp Length	A-1095-40
Transformer	T-1004
Transformer, Toroid	T-1059
Relay	K-1010

3.15 Exchange / Replacement Procedure

Daktronics unique exchange program was designed with the client's needs in mind. This is the quickest and most economical way available for product repair. If a component has failed, Daktronics will send the customer a replacement. The customer in turn sends the failed component to Daktronics. This not only saves money but also decreases the amount of time that the display is inoperable. In urgent situations, every attempt is made to ship by the fastest transit method available.

If, after you exchange the part, the equipment still causes problems, please contact our **Help Desk** immediately at **800/843-9879**. If the replacement part fixes the problem, package the defective part in the same packaging the replacement part arrived in, fill out and attach the enclosed UPS shipping document and **RETURN THE PART TO DAKTRONICS**. (*We expect immediate return of your defective part or return the exchange part if it does not solve the problem*). Please list all symptoms of the defective part as clearly as possible.

For most equipment, you will be invoiced for the replacement part at the time it is shipped. This invoice is due when you receive it. If you don't ship the defective equipment to Daktronics within 30 working days from invoice date, we will assume that you are purchasing the replacement part and will invoice you for it. This second invoice represents the difference between the exchange price and the purchase price of the equipment. This amount 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 25 percent restocking fee.

When equipment is promptly returned to Daktronics, it helps us keep our exchange inventory at a level to promptly respond to all exchange program requests. **TO AVOID A 25 PERCENT RESTOCKING CHARGE, PLEASE RETURN THE DEFECTIVE EQUIPMENT WITHIN 30 DAYS OF SHIPMENT OF THE REPLACEMENT PART.**

It is our pleasure to provide this service to ensure that you get the most from your Daktronics products. Please call our Help Desk if you have any questions regarding the Exchange Program.

Section 4: Drawings

FINAL ASSEMBLY DRAWINGS

Final Assembly, 1-648-9GOC-SF	Drawing A-50819
Final Assembly, 1-664-9GOC-SF	Drawing A-50820
Final Assembly, 1-680-9GOC-SF	Drawing A-50821
Final Assembly, 1-696-9GOC-SF	Drawing A-50822
Final Assembly, 1-6128-9GOC-SF	Drawing A-50823
Final Assembly, 2-648-9GOC-SF	Drawing A-50945
Final Assembly, 2-664-9GOC-SF	Drawing A-50946
Final Assembly, 2-680-9GOC-SF	Drawing A-50947
Final Assembly, 2-696-9GOC-SF	Drawing A-50948
Final Assembly, 2-6128-9GOC-SF	Drawing A-50949
Final Assembly, 3-648-9GOC-SF	Drawing A-50934
Final Assembly, 3-664-9GOC-SF	Drawing A-50935
Final Assembly, 3-680-9GOC-SF	Drawing A-50936
Final Assembly, 3-696-9GOC-SF	Drawing A-50937
Final Assembly, 3-6128-9GOC-SF	Drawing A-50938
Final Assembly, 1-648-15GOC-SF	Drawing A-50647
Final Assembly, 1-664-15GOC-SF	Drawing A-50648
Final Assembly, 1-680-15GOC-SF	Drawing A-50649
Final Assembly, 1-696-15GOC-SF	Drawing A-50650
Final Assembly, 2-648-15GOC-SF	Drawing A-50651
Final Assembly, 2-664-15GOC-SF	Drawing A-50652
Final Assembly, 2-680-15GOC-SF	Drawing A-50653
Final Assembly, 1-696-15GOC-SF	Drawing A-50654

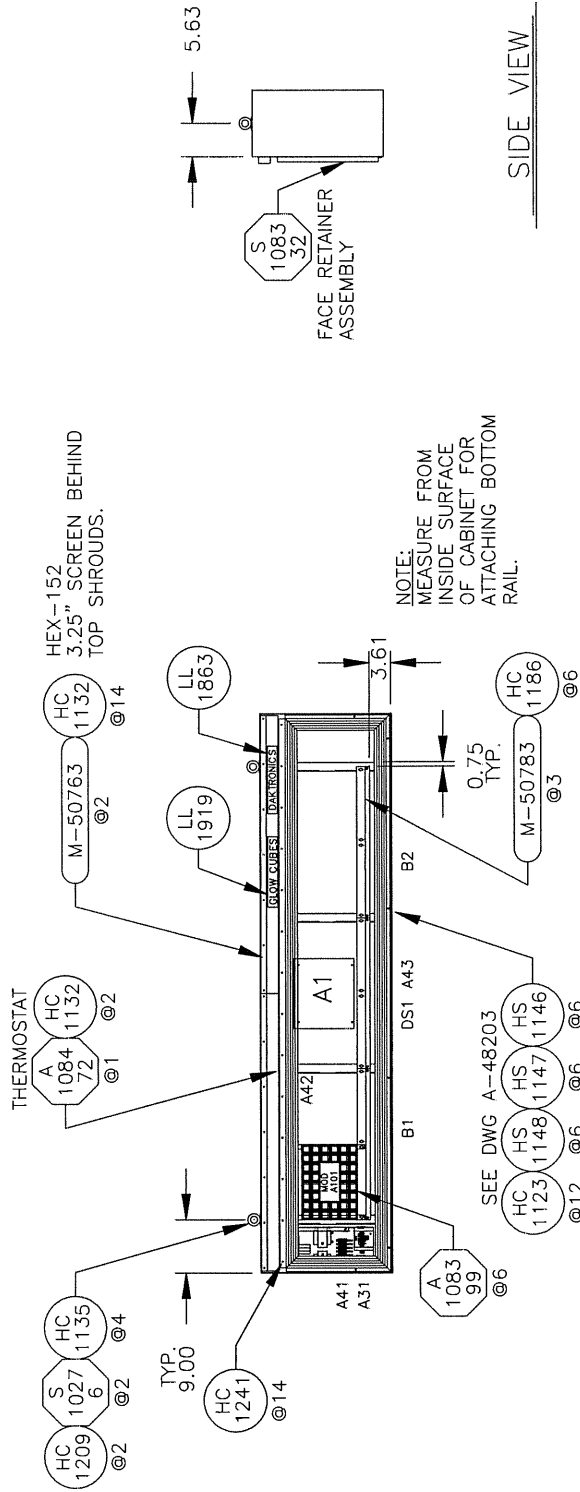
WIRING SCHEMATICS

Schematic, 1-648 To 664-9GOC-SF, DF	Drawing A-50301
Schematic, 1-680-9GOC-SF, DF	Drawing A-50303
Schematic, 1-696-9GOC-SF, DF	Drawing A-50304
Schematic, 1-6128-9GOC-SF, DF	Drawing A-51086
Schematic, 2-648 To 664-9GOC-SF, DF	Drawing A-50306
Schematic, 2-680-9GOC-SF, DF	Drawing B-50308
Schematic, 2-696-9GOC-SF, DF	Drawing B-50309
Schematic, 2-6128-9GOC-SF, DF	Drawing B-50310
Schematic, 3-648-9GOC-SF, DF	Drawing B-50311
Schematic, 3-664-9GOC-SF, DF	Drawing B-50312
Schematic, 3-680-9GOC-SF, DF	Drawing B-50313

(Wiring Schematic List continued on next page)

(Wiring Schematic List, continued)

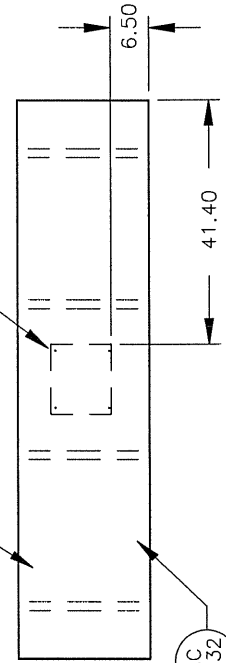
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Schematic, 1-664-15GOC-SF, DF	Drawing A-50294
Schematic, 1-680 To 696-15GOC-SF, DF	Drawing A-50295
Schematic, 2-648-15GOC-SF, DF	Drawing A-50297
Schematic, 2-664-15GOC-SF, DF	Drawing A-50298
Schematic, 2-696-15GOC-SF, DF	Drawing B-50300



NOTE:
MEASURE FROM
INSIDE SURFACE
OF CABINET FOR
ATTACHING BOTTOM
RAIL.

FRONT VIEW

USE TEMPLATE M-50779
FOR MARKING AND DRILLING.



RIVET PERIMETER & VERT.
@ APPROX. 8" SPACING

REAR VIEW

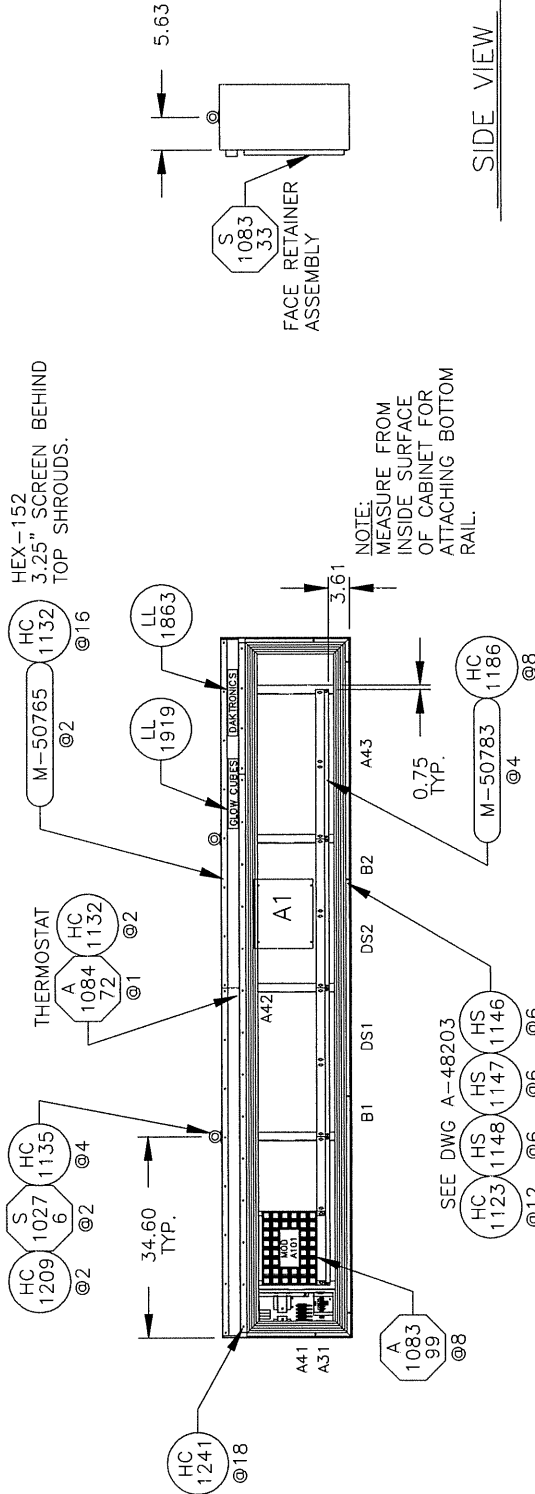
NOTES

- A1 - INDICATES A DRIVER.
- A31 - INDICATES SIGNAL TERMINATION LOCATION.
- A41 - INDICATES POWER TERMINATION LOCATION.
- A42 - INDICATES THERMOSTAT LOCATION.
- A43 - INDICATES BALLAST LOCATION.
- B1 AND B2 - INDICATE FAN LOCATIONS.
- DS1 - INDICATES 7' FLUORESCENT LOCATION.

SIDE VIEW

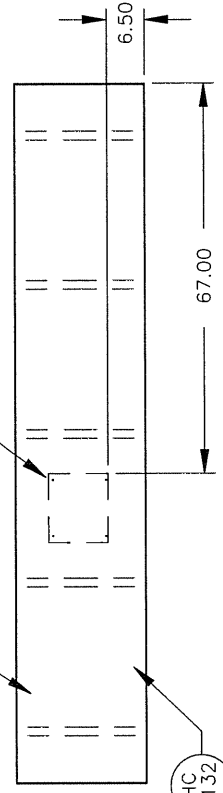
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DES. BY: WTUCKER		DRAWN BY: WTUCKER	
DATE: 17MAR92			
REVISION	APPR. BY:	1083-E10A-50819	
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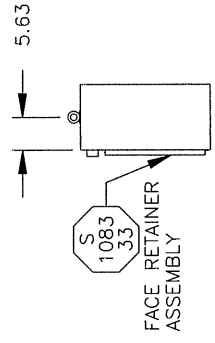


FRONT VIEW

USE TEMPLATE M-50779 FOR MARKING AND DRILLING.



REAR VIEW



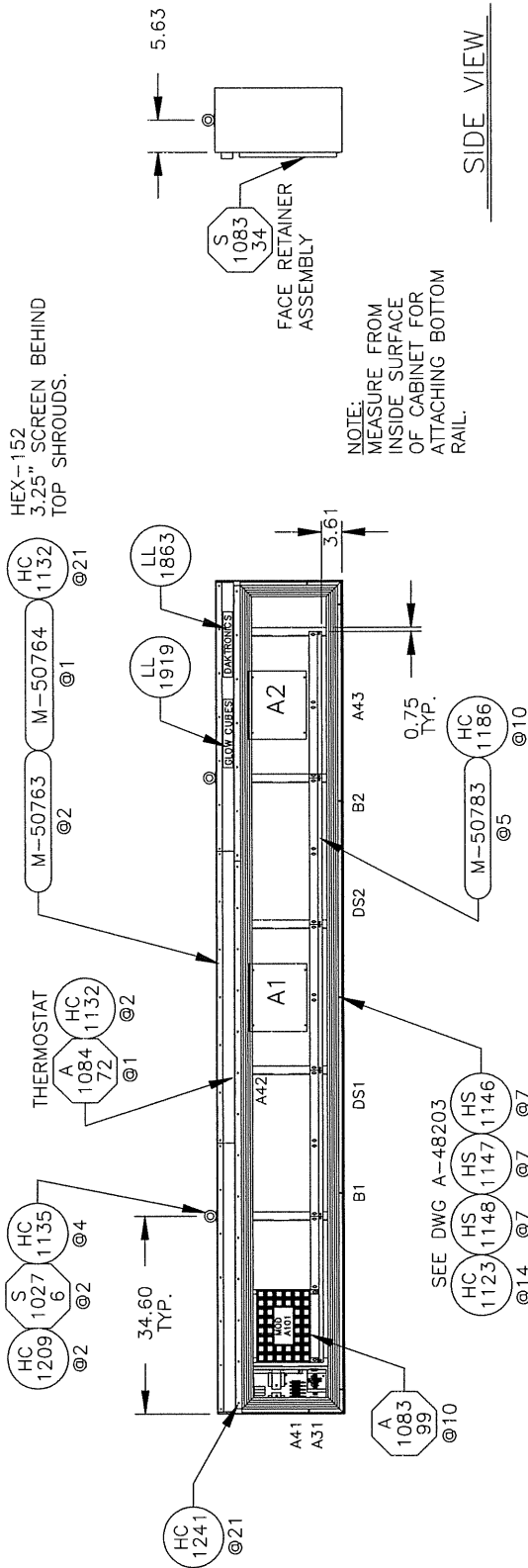
SIDE VIEW

NOTES

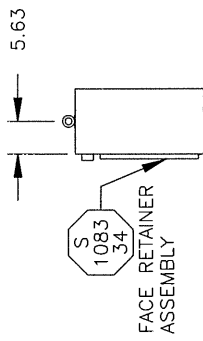
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- A42 - INDICATES THERMOSTAT LOCATION.
- A43 - INDICATES BALLAST LOCATION.
- B1 AND B2 - INDICATE FAN LOCATIONS.
- DS1 - INDICATES 4' FLUORESCENT LOCATION.
- DS2 - INDICATES 5' FLUORESCENT LOCATION.

REV.	DATE	DESCRIPTION	BY	APPR.

DAKTRONICS, INC. BROOKINGS, SD 57006	
PROJ: GLOW CUBE LINE DISPLAYS	
TITLE: FINAL ASSY, 1-664-9GOC-SF	
DES. BY: WTUCKER	DATE: 10MAR92
DRAWN BY: WTUCKER	
REVISION	APPR. BY:
SCALE: 1=30	1083-E10A-50820



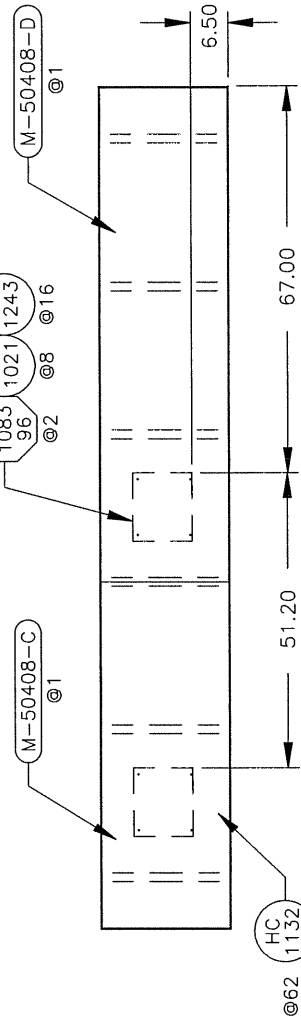
NOTE:
MEASURE FROM
INSIDE SURFACE
OF CABINET FOR
ATTACHING BOTTOM
RAIL.



SIDE VIEW

FRONT VIEW

USE TEMPLATE M-50779
FOR MARKING AND DRILLING.



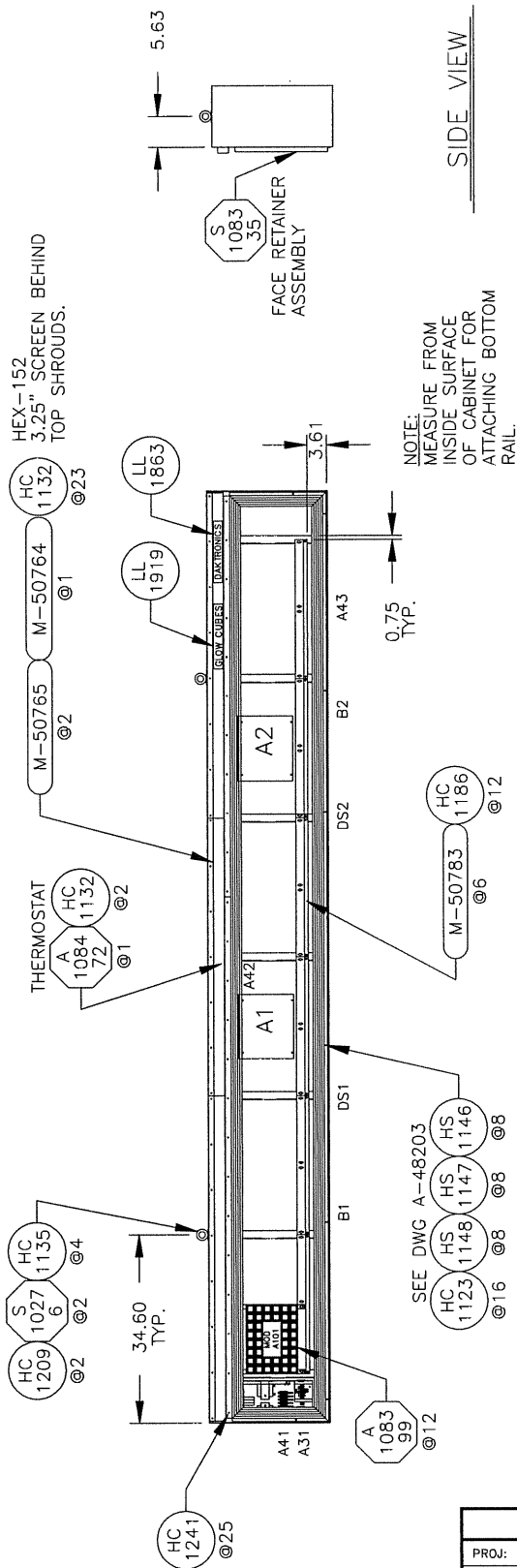
REAR VIEW

NOTES

- A1 AND A2 - INDICATES DRIVERS.
- A31 - INDICATES SIGNAL TERMINATION LOCATION.
- A41 - INDICATES POWER TERMINATION LOCATION.
- A42 - INDICATES THERMOSTAT LOCATION.
- A43 - INDICATES BALLAST LOCATION.
- B1 AND B2 - INDICATE FAN LOCATIONS.
- DS1 - INDICATES 5' FLUORESCENT LOCATION.
- DS2 - INDICATES 6' FLUORESCENT LOCATION.

REV.	DATE	DESCRIPTION	BY	APPR.

DAKTRONICS, INC. BROOKINGS, SD 57006	
PROJ: GLOW CUBE LINE DISPLAYS	
TITLE: FINAL ASSY, 1-680-9GOC-SF	
DES. BY: WTUCKER	DRAWN BY: MSOLHEIM
DATE: 16MAR92	
REVISION	APPR. BY:
SCALE: 1=30	1083-E10A-50821



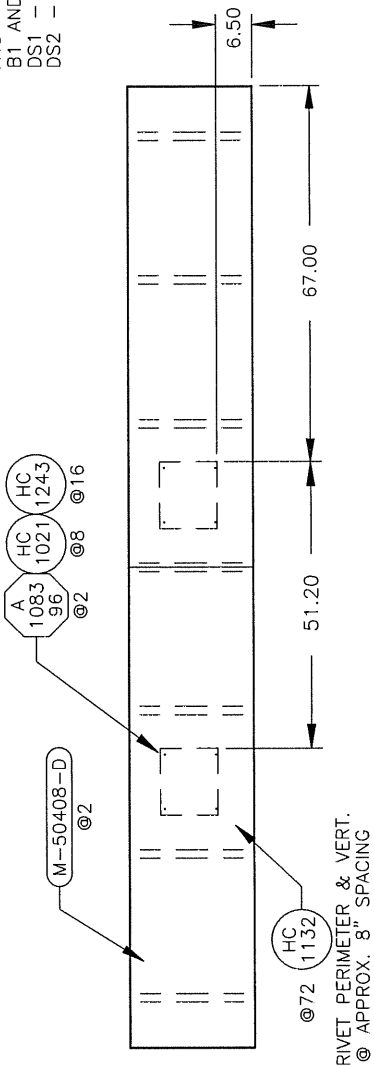
SIDE VIEW

FRONT VIEW

NOTES

- A1 AND A2 - INDICATES DRIVERS
- A31 - INDICATES SIGNAL TERMINATION LOCATION.
- A41 - INDICATES POWER TERMINATION LOCATION.
- A42 - INDICATES THERMOSTAT LOCATION.
- A43 - INDICATES BALLAST LOCATION.
- B1 AND B2 - INDICATE FAN LOCATIONS.
- DS1 - INDICATES 6' FLUORESCENT LOCATION.
- DS2 - INDICATES 7' FLUORESCENT LOCATION.

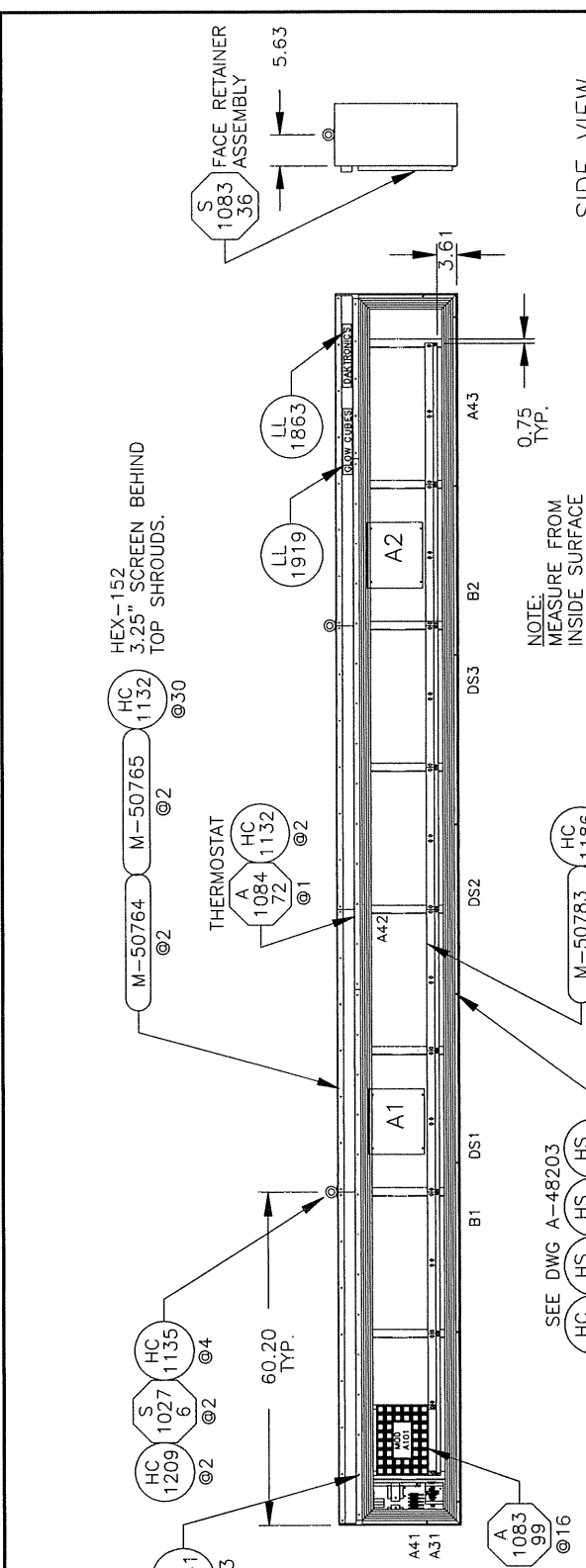
USE TEMPLATE M-50779 FOR MARKING AND DRILLING.



REAR VIEW

REV.	DATE	DESCRIPTION	BY	APPR.

DAKTRONICS, INC. BROOKINGS, SD 57006			
PROJ: GLOW CUBE LINE DISPLAYS			
TITLE: FINAL ASSY, 1-696-9GOC-SF			
DES. BY: WTUCKER		DRAWN BY: MSOLHEIM	
DATE: 16MAR92			
REVISION	APPR. BY:	1083-E10A-50822	
SCALE: 1=30			

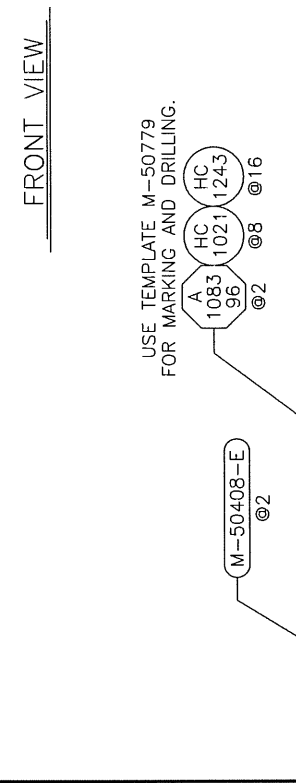


SIDE VIEW

FRONT VIEW

NOTES

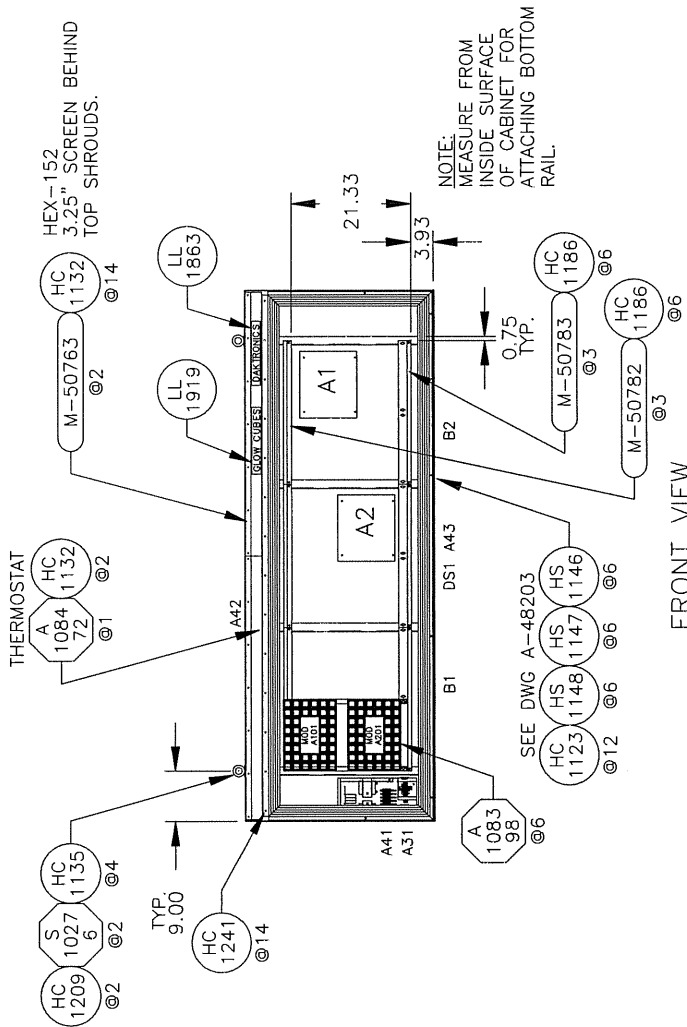
- A1 AND A2 - INDICATES DRIVERS.
- A31 - INDICATES SIGNAL TERMINATION LOCATION.
- A41 - INDICATES POWER TERMINATION LOCATION.
- A42 - INDICATES THERMOSTAT LOCATION.
- A43 - INDICATES THERMOSTAT LOCATION.
- B1 AND B2 - INDICATE FAN LOCATIONS.
- DS1 AND DS3 - INDICATE 6' FLUORESCENT LOCATIONS.
- DS2 - INDICATES 5' FLUORESCENT LOCATION.



REAR VIEW

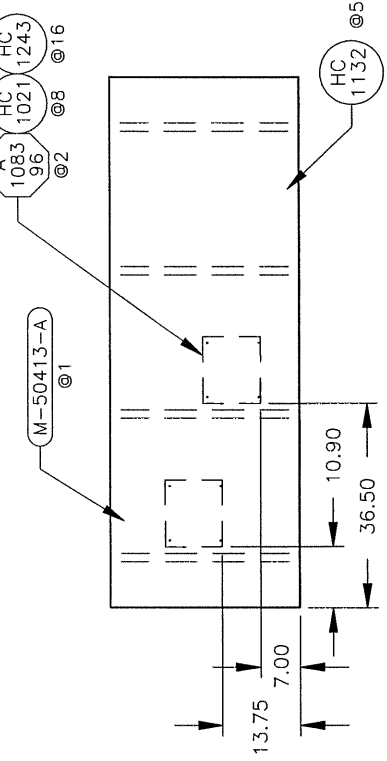
REV.	DATE	DESCRIPTION	BY	APPR.

DAKTRONICS, INC. BROOKINGS, SD 57006			
PROJ: GLOW CUBE LINE DISPLAYS			
TITLE: FINAL ASSY, 1-6128-9GOC-SF			
DES. BY: WTUCKER		DRAWN BY: MSOLHEIM	
DATE: 18MAR92			
REVISION	APPR. BY:	1083-E10A-50823	
SCALE: 1=30			

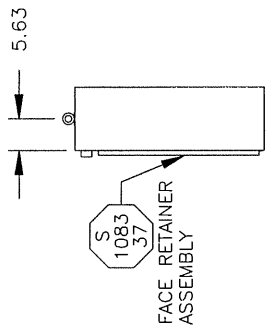


FRONT VIEW

USE TEMPLATE M-50779 FOR MARKING AND DRILLING.



REAR VIEW



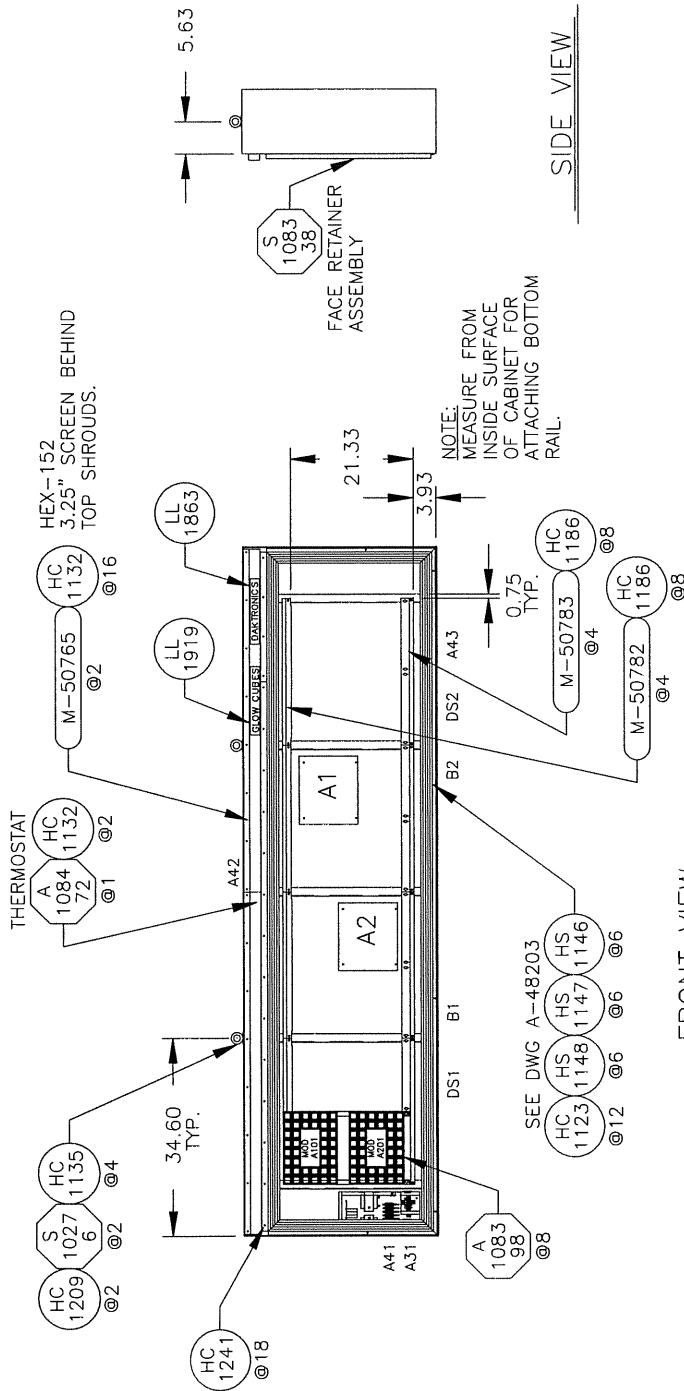
SIDE VIEW

NOTES

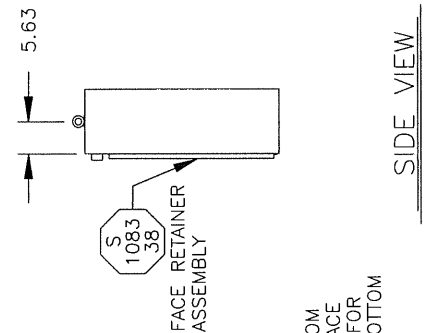
- A1 AND A2 - INDICATES DRIVERS.
- A31 - INDICATES SIGNAL TERMINATION LOCATION.
- A41 - INDICATES POWER TERMINATION LOCATION.
- A42 - INDICATES THERMOSTAT LOCATION.
- A43 - INDICATES BALLAST LOCATION.
- B1 AND B2 - INDICATE FAN LOCATIONS.
- DS1 - INDICATES 7' FLUORESCENT LOCATION.

REV.	DATE	DESCRIPTION	BY	APPR.
1	1/APR/92	MOVED DRIVERS TO THE LEFT 1"	CI	

DAKTRONICS, INC. BROOKINGS, SD 57006			
PROJ: GLOW CUBE LINE DISPLAYS			
TITLE: FINAL ASSY, 2-648-9GOC-SF			
DES. BY: WTUCKER	DRAWN BY: WTUCKER	DATE: 17MAR92	
REVISION	APPR. BY:	1083-E10A-50945	
	SCALE: 1=30		



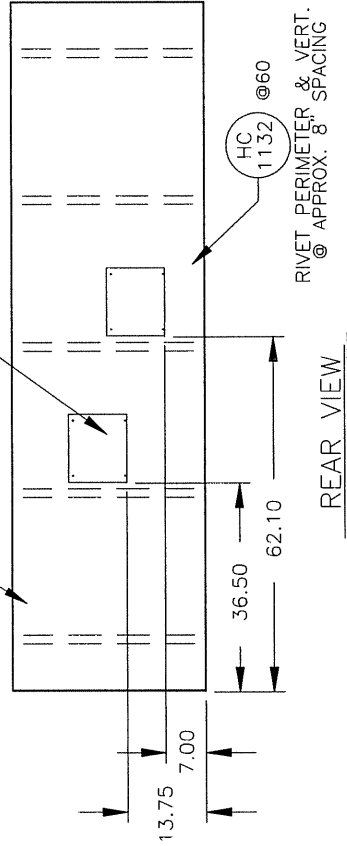
FRONT VIEW



SIDE VIEW

NOTE:
MEASURE FROM
INSIDE SURFACE
OF CABINET FOR
ATTACHING BOTTOM
RAIL.

USE TEMPLATE M-50779
FOR MARKING AND DRILLING.



REAR VIEW

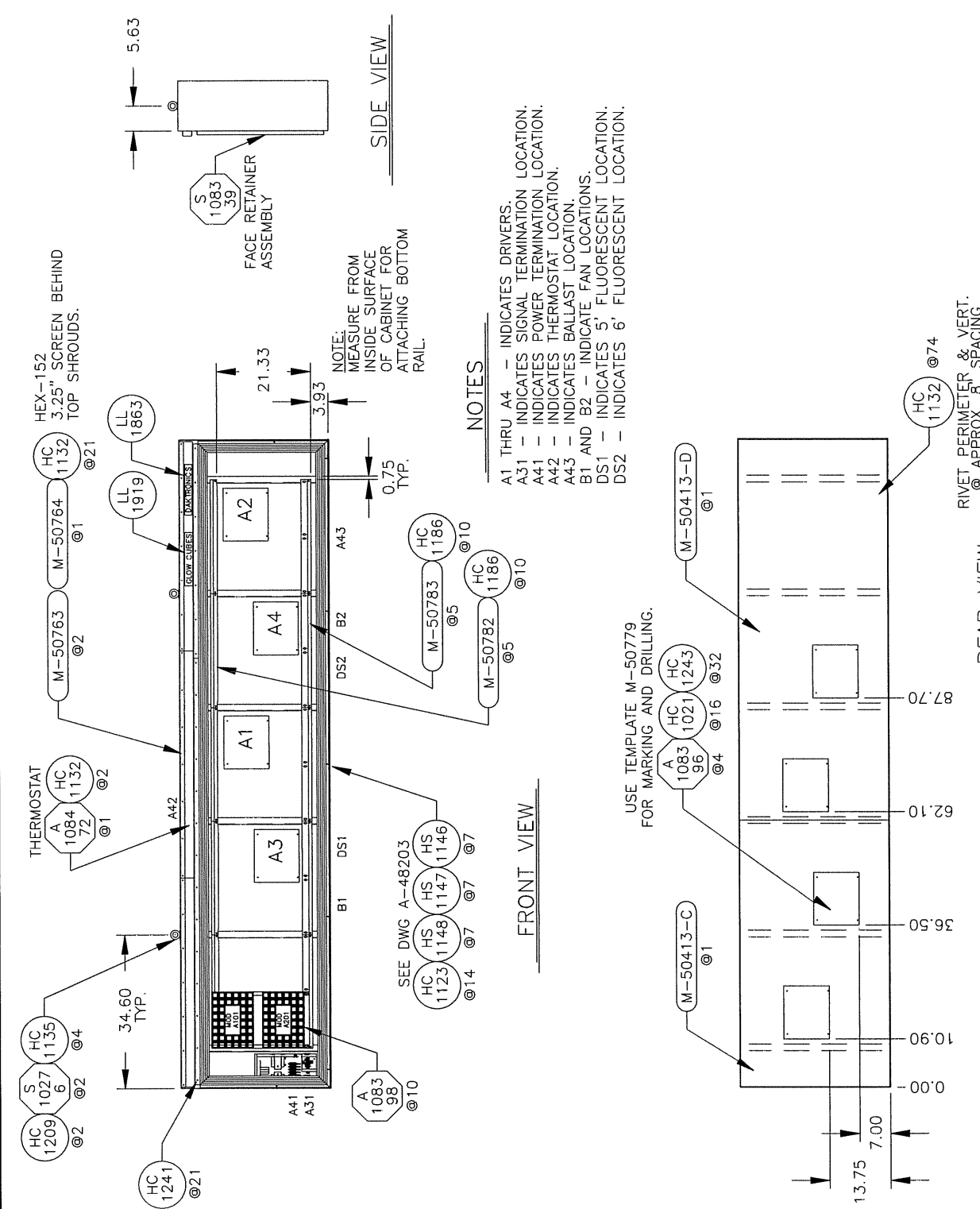
NOTES

- A1 AND A2 - INDICATES DRIVERS.
- A31 - INDICATES SIGNAL TERMINATION LOCATION.
- A41 - INDICATES POWER TERMINATION LOCATION.
- A42 - INDICATES THERMOSTAT LOCATION.
- A43 - INDICATES BALLAST LOCATION.
- B1 AND B2 - INDICATE FAN LOCATIONS.
- DS1 - INDICATES 4' FLUORESCENT LOCATION.
- DS2 - INDICATES 5' FLUORESCENT LOCATION.

RIVET PERIMETER & VERT.
@ APPROX. 8" SPACING

DAKTRONICS, INC. BROOKINGS, SD 57006	
PROJ: GLOW CUBE LINE DISPLAYS	
TITLE: FINAL ASSY, 2-664-9GOC-SF	
DES. BY: WTUCKER	DATE: 18/MAR/92
DRAWN BY: CIVERSEN	
REVISION	APPR. BY:
SCALE: 1=30	1083-E10A-50946

REV.	DATE	DESCRIPTION	BY	APPR.
1	1/APR/92	MOVED DRIVERS TO THE LEFT 1"	CI	



NOTES

A1 THRU A4 - INDICATES DRIVERS.
 A31 - INDICATES SIGNAL TERMINATION LOCATION.
 A41 - INDICATES POWER TERMINATION LOCATION.
 A42 - INDICATES THERMOSTAT LOCATION.
 A43 - INDICATES BALLAST LOCATION.
 B1 AND B2 - INDICATE FAN LOCATIONS.
 DS1 - INDICATES 5' FLUORESCENT LOCATION.
 DS2 - INDICATES 6' FLUORESCENT LOCATION.

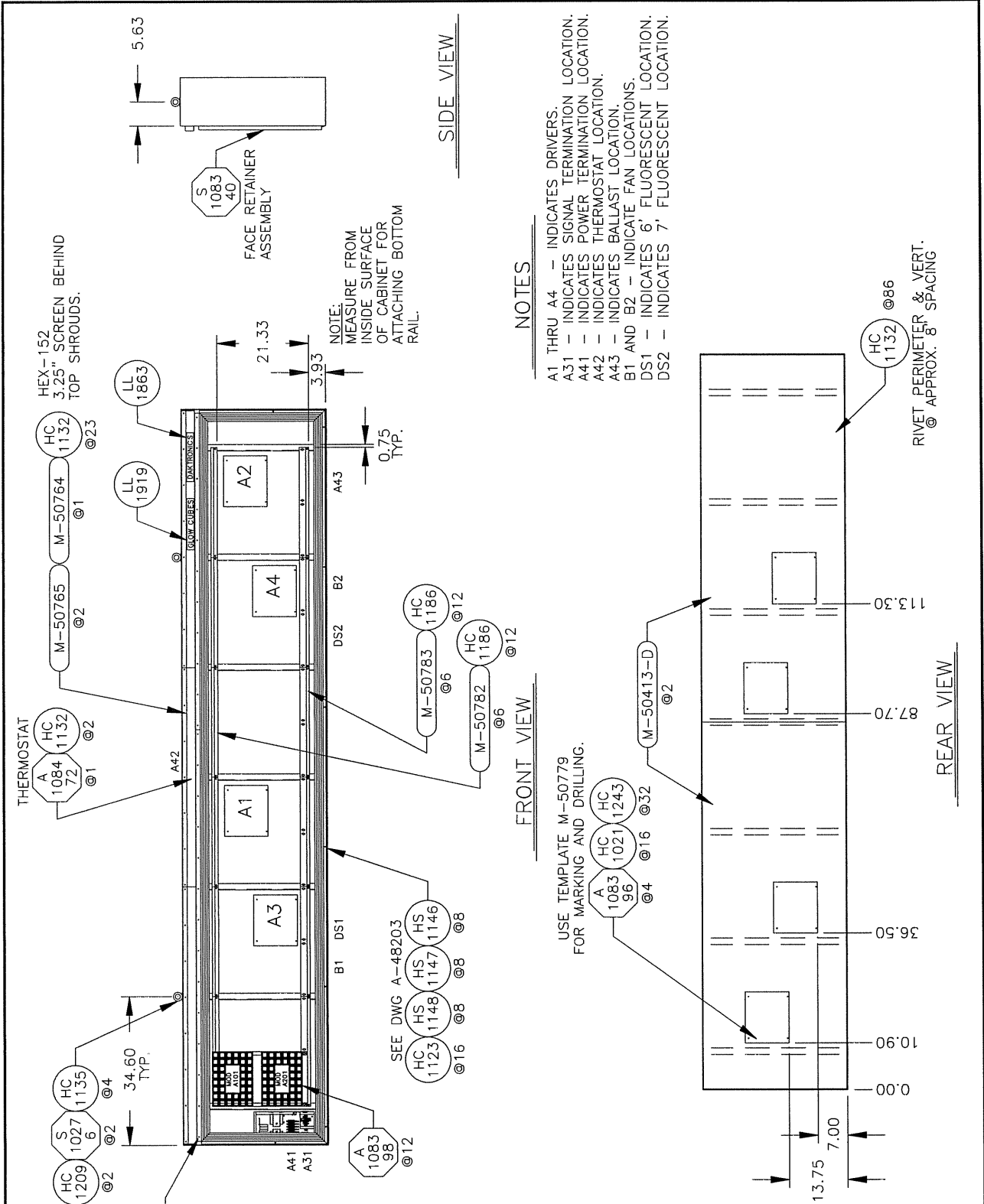
NOTE:
 MEASURE FROM
 INSIDE SURFACE
 OF CABINET FOR
 ATTACHING BOTTOM
 RAIL.

USE TEMPLATE M-50779
 FOR MARKING AND DRILLING.

RIVET PERIMETER & VERT.
 @ APPROX. 8" SPACING

DAKTRONICS, INC. BROOKINGS, SD 57006	
PROJ: GLOW CUBE LINE DISPLAYS	
TITLE: FINAL ASSY, 2-680-9GOC-SF	
DES. BY: WTUCKER	DATE: 18/MAR/92
DRAWN BY: CIVERSEN	
REVISION	APPR. BY:
SCALE: 1 = 30	1083-E10A-50947

REV.	DATE	DESCRIPTION	BY	APPR.
1	1/APR/92	MOVED DRIVERS TO THE LEFT 1"	CI	



NOTES

- A1 THRU A4 - INDICATES DRIVERS.
- A31 - INDICATES SIGNAL TERMINATION LOCATION.
- A41 - INDICATES POWER TERMINATION LOCATION.
- A42 - INDICATES THERMOSTAT LOCATION.
- A43 - INDICATES BALLAST LOCATION.
- B1 AND B2 - INDICATE FAN LOCATIONS.
- DS1 - INDICATES 6' FLUORESCENT LOCATION.
- DS2 - INDICATES 7' FLUORESCENT LOCATION.

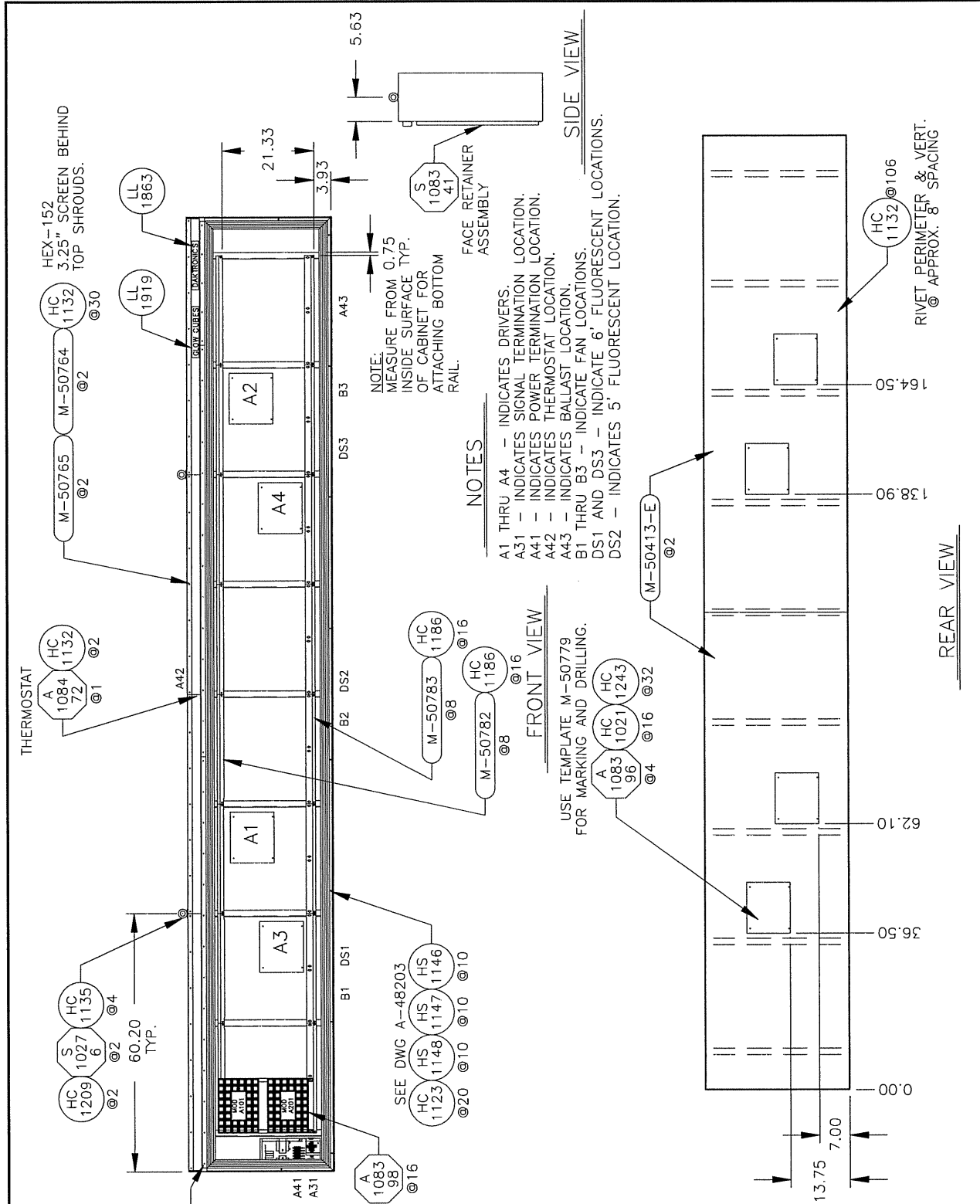
FRONT VIEW

USE TEMPLATE M-50779 FOR MARKING AND DRILLING.

REAR VIEW

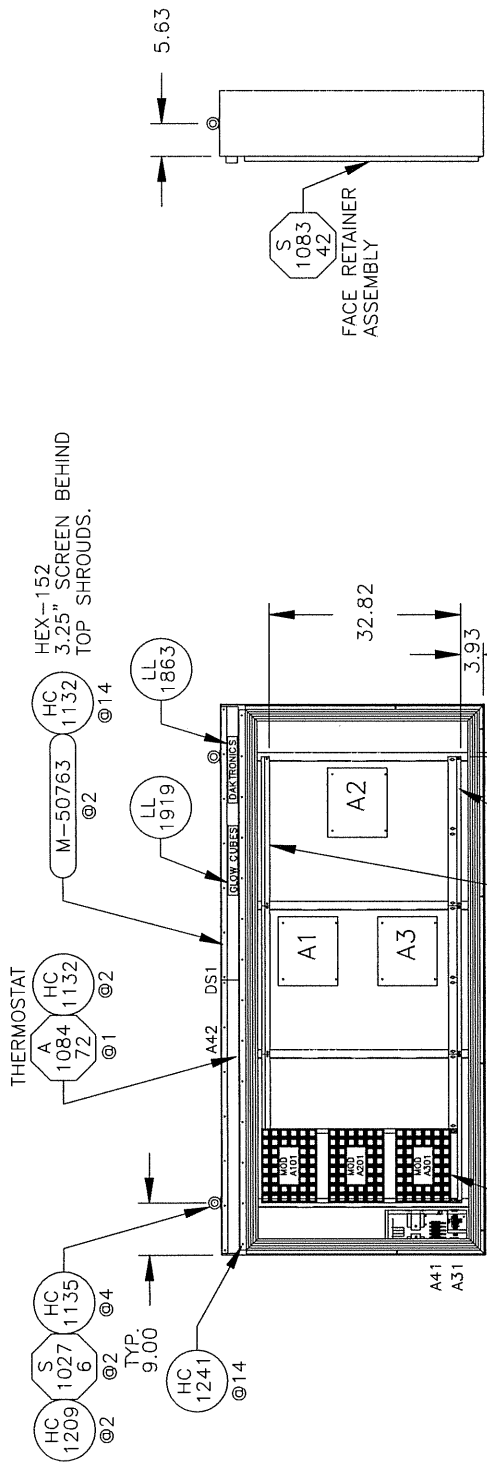
DAKTRONICS, INC. BROOKINGS, SD 57006			
PROJ: GLOW CUBE LINE DISPLAYS			
TITLE: FINAL ASSY, 2-696-9GOC-SF			
DES. BY: WTUCKER		DRAWN BY: CIVERSEN	
DATE: 18/MAR/92		REVISION	
APPR BY:		1083-E10A-50948	
SCALE: 1 = 30			

REV.	DATE	DESCRIPTION	BY	APPR.
1	1/APR/92	MOVED DRIVERS TO THE LEFT 1"	CI	



REV.	DATE	DESCRIPTION	BY	APPR.
1	1/APR/92	MOVED DRIVERS TO THE LEFT 1"	CI	

DAKTRONICS, INC. BROOKINGS, SD 57006			
PROJ: GLOW CUBE LINE DISPLAYS			
TITLE: FINAL ASSY, 2-6128-9GOC-SF			
DES. BY: WTUCKER	DRAWN BY: CIVERSEN	DATE: 20/MAR/92	
REVISION	APPR. BY:	1083-E10A-50949	
	SCALE: 1=30		



SIDE VIEW

NOTE:
MEASURE FROM
INSIDE SURFACE
OF CABINET FOR
ATTACHING BOTTOM
RAIL.

FRONT VIEW

USE TEMPLATE M-50779
FOR MARKING AND DRILLING.

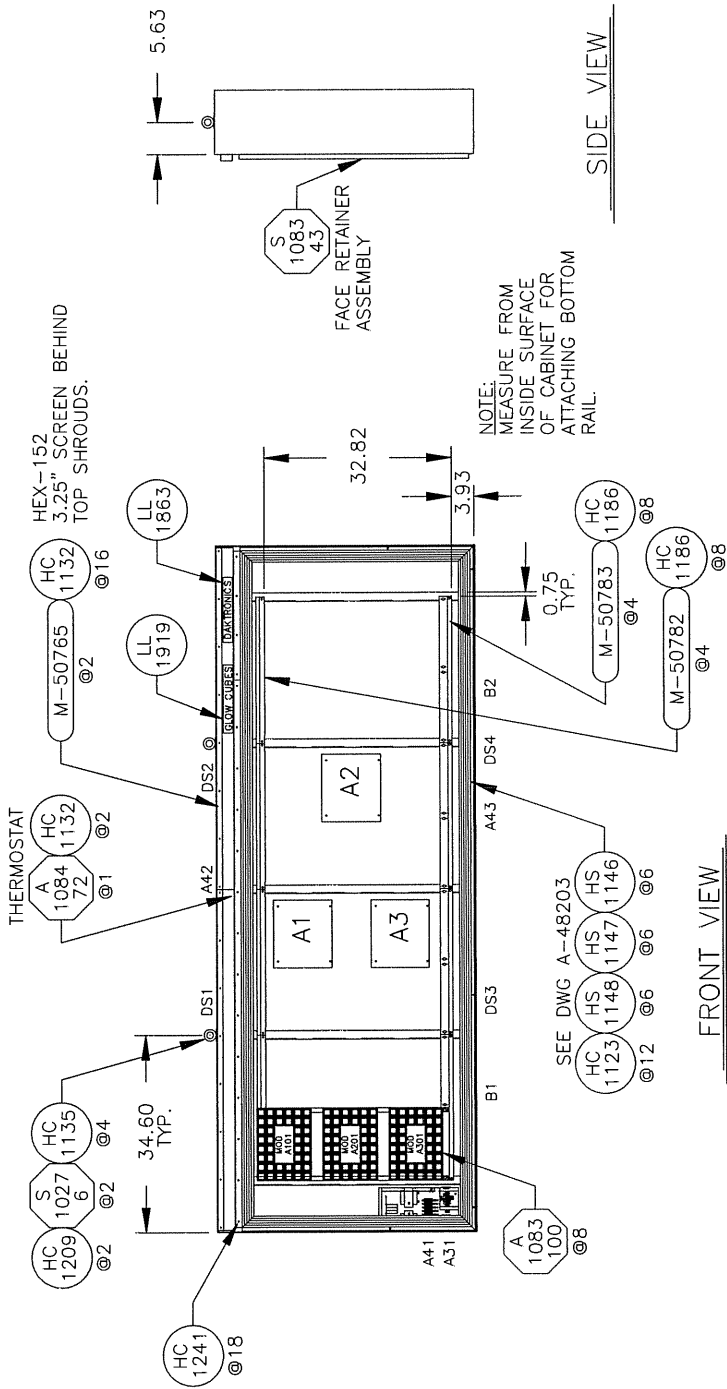
REAR VIEW

NOTES

- A1 THRU A3 - INDICATES DRIVERS.
- A31 - INDICATES SIGNAL TERMINATION LOCATION.
- A41 - INDICATES POWER TERMINATION LOCATION.
- A42 - INDICATES THERMOSTAT LOCATION.
- A43 - INDICATES BALLAST LOCATION.
- B1 AND B2 - INDICATE FAN LOCATIONS.
- DS1 AND DS2 - INDICATE 7' FLUORESCENT LOCATIONS.

DAKTRONICS, INC. BROOKINGS, SD 57006	
PROJ: GLOW CUBE LINE DISPLAYS	
TITLE: FINAL ASSY, 3-648-9GOC-SF	
DES. BY: WTUCKER	DRAWN BY: WTUCKER
DATE: 19MAR92	
REVISION	APPR. BY:
SCALE: 1=30	1083-E10A-50934

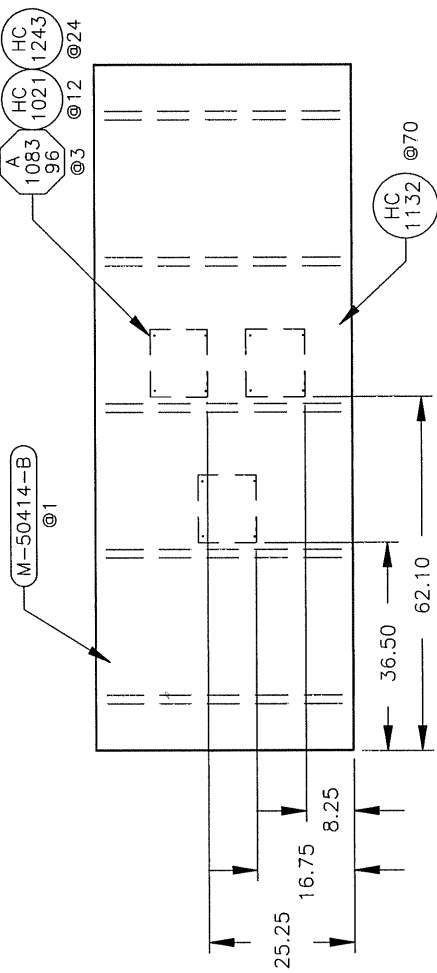
1	2/APR/92	MOVED DRIVERS TO THE LEFT 1"	CI
REV.	DATE	DESCRIPTION	BY APPR.



FRONT VIEW

SIDE VIEW

USE TEMPLATE M-50779 FOR MARKING AND DRILLING.



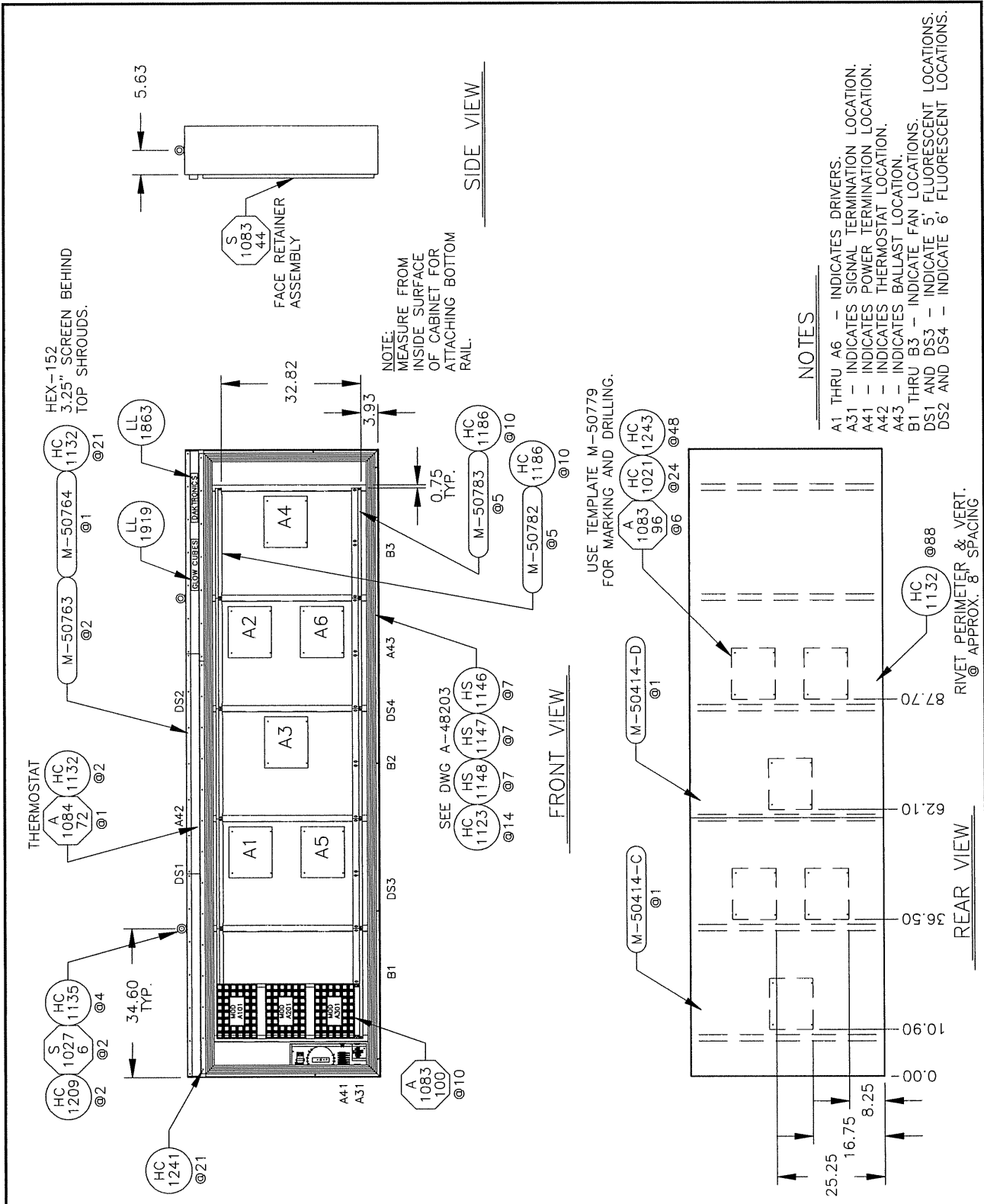
REAR VIEW

NOTES

- A1 THRU A3 - INDICATES DRIVERS.
- A31 - INDICATES SIGNAL TERMINATION LOCATION.
- A41 - INDICATES POWER TERMINATION LOCATION.
- A42 - INDICATES THERMOSTAT LOCATION.
- A43 - INDICATES BALLAST LOCATION.
- B1 AND B2 - INDICATE FAN LOCATIONS.
- DS1 AND DS3 - INDICATE 4' FLUORESCENT LOCATIONS.
- DS2 AND DS4 - INDICATE 5' FLUORESCENT LOCATIONS.

1	2/APR/92	MOVED DRIVERS TO THE LEFT 1"	CI	
REV.	DATE	DESCRIPTION	BY	APPR

DAKTRONICS, INC. BROOKINGS, SD 57006			
PROJ: GLOW CUBE LINE DISPLAYS			
TITLE: FINAL ASSY, 3-664-9GOC-SF			
DES BY: WTUCKER	DRAWN BY: MSOLHEIM	DATE: 19MAR92	
REVISION	APPR. BY:	1083-E10A-50935	
	SCALE: 1=30		



NOTES

- A1 THRU A6 - INDICATES DRIVERS.
- A31 - INDICATES SIGNAL TERMINATION LOCATION.
- A41 - INDICATES POWER TERMINATION LOCATION.
- A42 - INDICATES THERMOSTAT LOCATION.
- A43 - INDICATES BALLAST LOCATION.
- B1 THRU B3 - INDICATE FAN LOCATIONS.
- DS1 AND DS3 - INDICATE 5' FLUORESCENT LOCATIONS.
- DS2 AND DS4 - INDICATE 6' FLUORESCENT LOCATIONS.

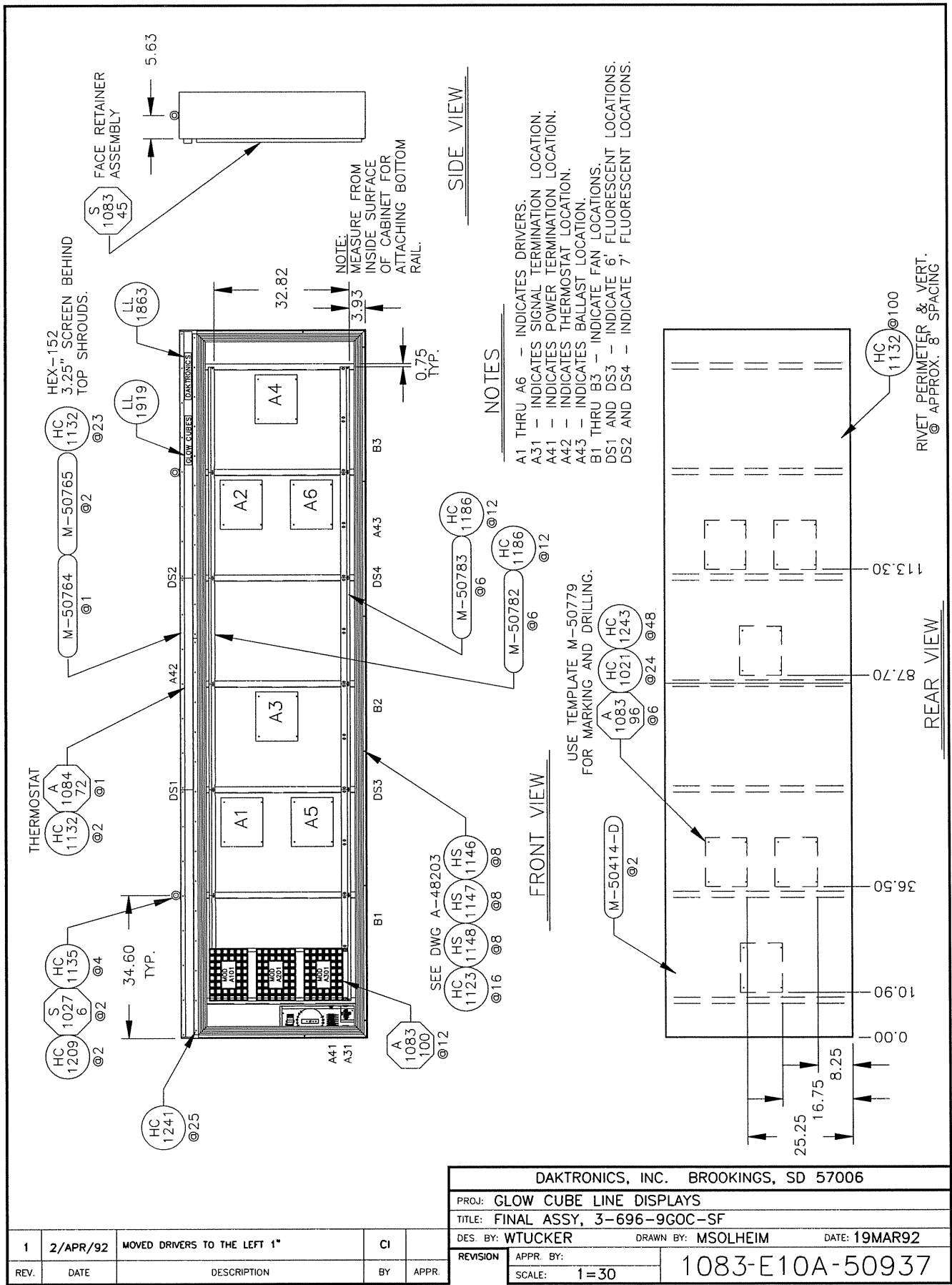
NOTE:
MEASURE FROM
INSIDE SURFACE
OF CABINET FOR
ATTACHING BOTTOM
RAIL.

USE TEMPLATE M-50779
FOR MARKING AND DRILLING.

RIVET PERIMETER & VERT.
@ APPROX. 8" SPACING

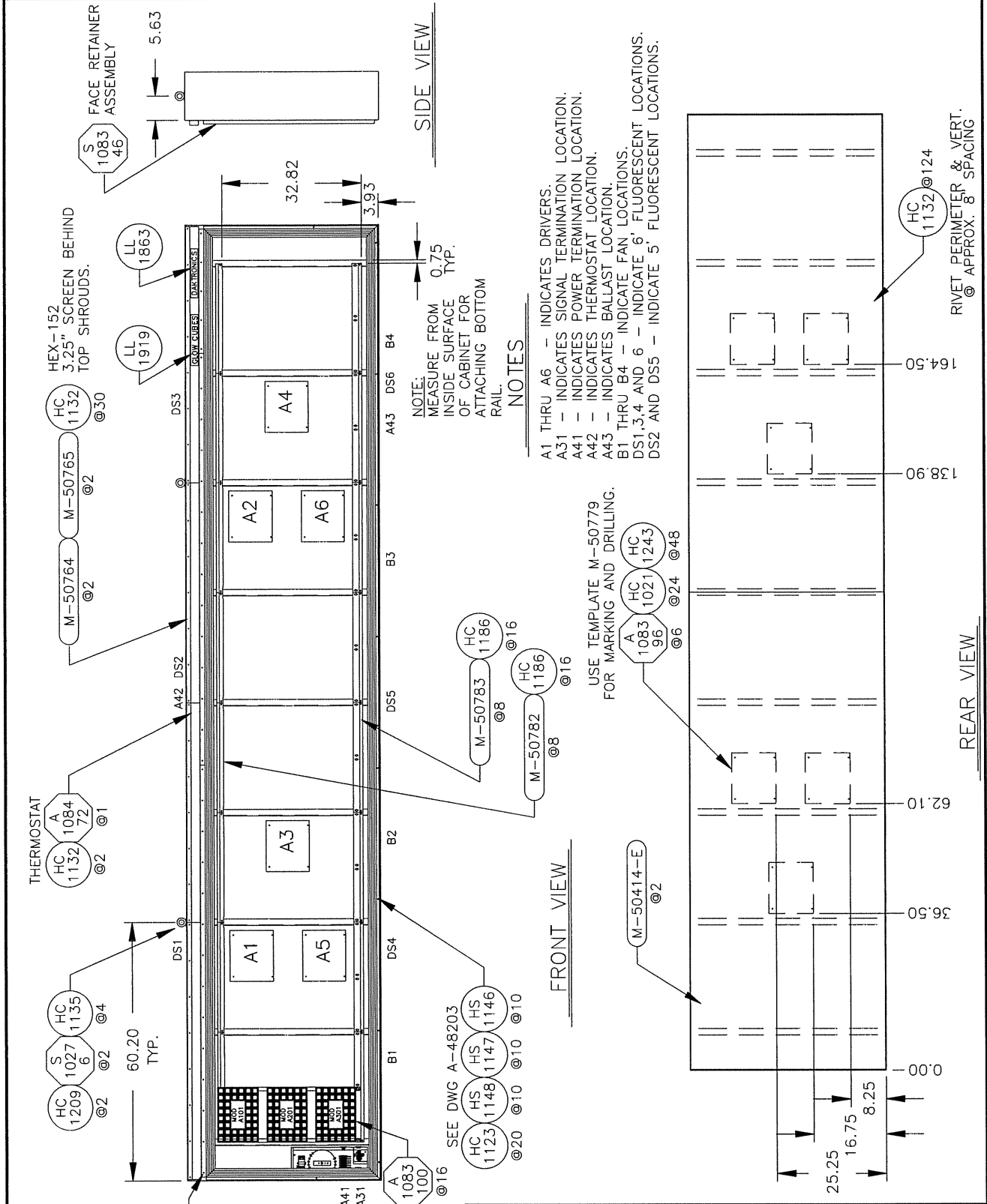
DAKTRONICS, INC. BROOKINGS, SD 57006			
PROJ: GLOW CUBE LINE DISPLAYS			
TITLE: FINAL ASSY, 3-680-9GOC-SF			
DES. BY: WTUCKER	DRAWN BY: MSOLHEIM	DATE: 19MAR92	
REVISION	APPR. BY:	1083-E10A-50936	
SCALE: 1=30			

REV.	DATE	DESCRIPTION	BY	APPR.
1	2/APR/92	MOVED DRIVERS TO THE LEFT 1"	CI	



REV.	DATE	DESCRIPTION	BY	APPR.
1	2/APR/92	MOVED DRIVERS TO THE LEFT 1"	CI	

DAKTRONICS, INC. BROOKINGS, SD 57006		
PROJ: GLOW CUBE LINE DISPLAYS		
TITLE: FINAL ASSY, 3-696-9GOC-SF		
DES BY: WTUCKER	DRAWN BY: MSOLHEIM	DATE: 19MAR92
REVISION APPR. BY:		1083-E10A-50937
SCALE: 1=30		



SIDE VIEW

FRONT VIEW

REAR VIEW

NOTE:
MEASURE FROM
INSIDE SURFACE
OF CABINET FOR
ATTACHING BOTTOM
RAIL.

NOTES

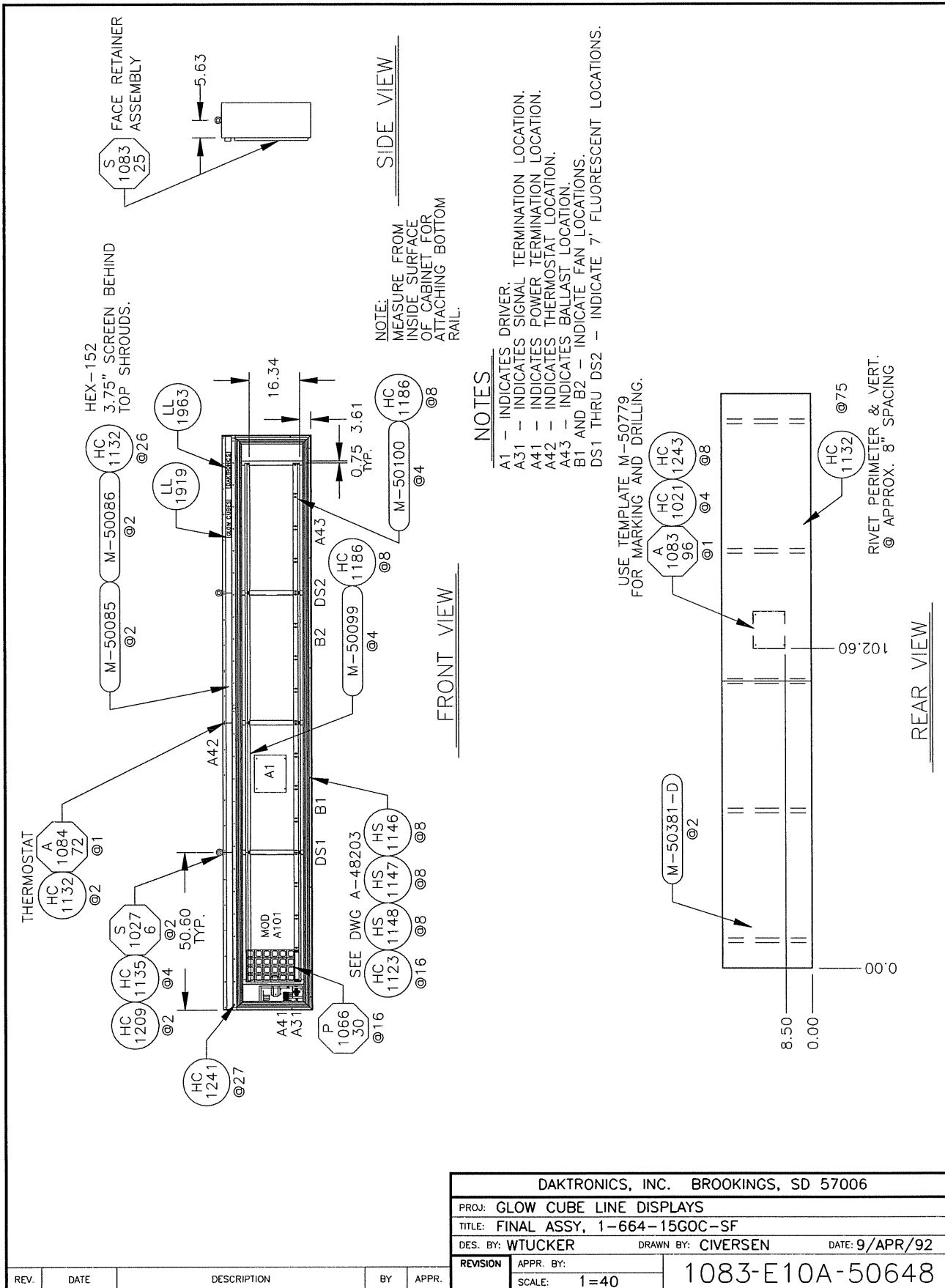
- A1 THRU A6 - INDICATES DRIVERS.
- A31 - INDICATES SIGNAL TERMINATION LOCATION.
- A41 - INDICATES POWER TERMINATION LOCATION.
- A42 - INDICATES THERMOSTAT LOCATION.
- A43 - INDICATES BALLAST LOCATION.
- B1 THRU B4 - INDICATE FAN LOCATIONS.
- DS1,3,4 AND 6 - INDICATE 6' FLUORESCENT LOCATIONS.
- DS2 AND DS5 - INDICATE 5' FLUORESCENT LOCATIONS.

USE TEMPLATE M-50779
FOR MARKING AND DRILLING.

RIVET PERIMETER & VERT.
@ APPROX. 8" SPACING

DAKTRONICS, INC. BROOKINGS, SD 57006			
PROJ: GLOW CUBE LINE DISPLAYS			
TITLE: FINAL ASSY, 3-6128-9GOC-SF			
DES. BY: WTUCKER		DRAWN BY: CIVERSEN	
DATE: 20/MAR/92			
REVISION	APPR. BY:	1083-E10A-50938	
	SCALE: 1=30		

REV.	DATE	DESCRIPTION	BY	APPR.
1	2/APR/92	MOVED DRIVERS TO THE LEFT 1"	CI	



NOTES

- A1 - INDICATES DRIVER.
- A31 - INDICATES SIGNAL TERMINATION LOCATION.
- A41 - INDICATES POWER TERMINATION LOCATION.
- A42 - INDICATES THERMOSTAT LOCATION.
- A43 - INDICATES BALLAST LOCATION.
- B1 AND B2 - INDICATE FAN LOCATIONS.
- DS1 THRU DS2 - INDICATE 7' FLUORESCENT LOCATIONS.

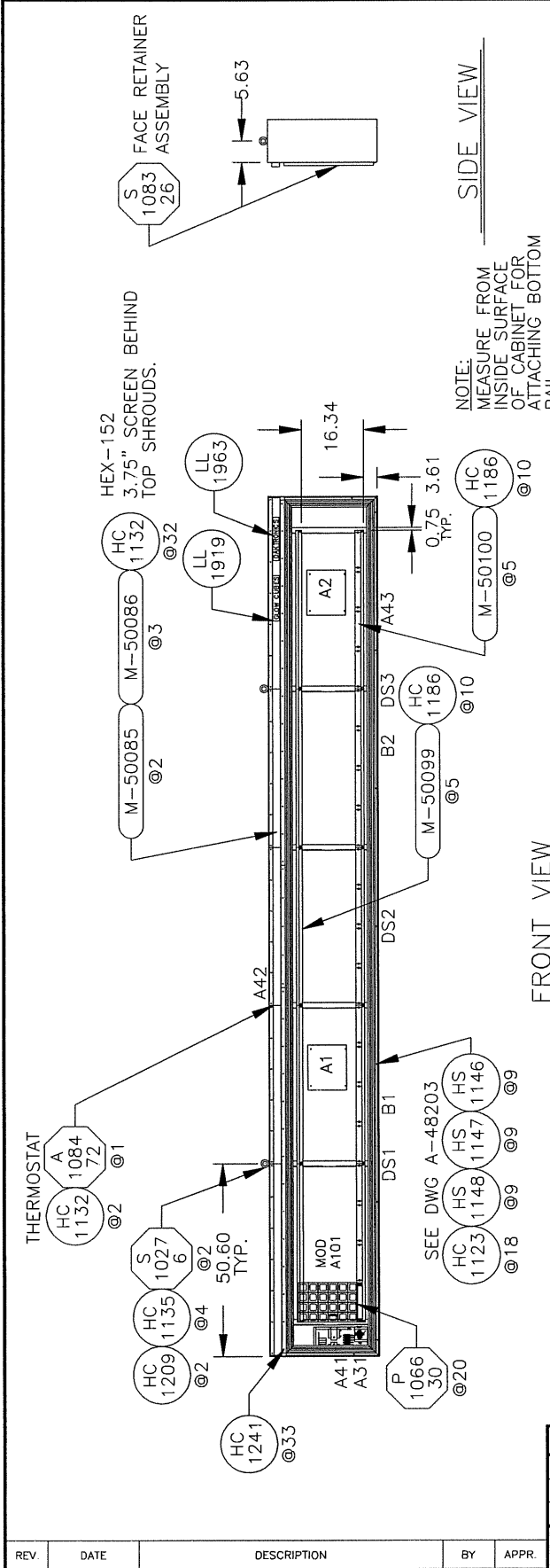
NOTE: MEASURE FROM INSIDE SURFACE OF CABINET FOR ATTACHING BOTTOM RAIL.

USE TEMPLATE M-50779 FOR MARKING AND DRILLING.

RIVET PERIMETER & VERT. @ APPROX. 8" SPACING

REV.	DATE	DESCRIPTION	BY	APPR.

DAKTRONICS, INC. BROOKINGS, SD 57006			
PROJ: GLOW CUBE LINE DISPLAYS			
TITLE: FINAL ASSY, 1-664-15GOC-SF			
DES. BY: WTUCKER		DRAWN BY: CIVERSEN	
DATE: 9/APR/92			
REVISION	APPR. BY:	1083-E10A-50648	
SCALE: 1=40			



NOTE:
MEASURE FROM
INSIDE SURFACE
OF CABINET FOR
ATTACHING BOTTOM
RAIL.

NOTE:
MEASURE FROM
INSIDE SURFACE
OF CABINET FOR
ATTACHING BOTTOM
RAIL.

FRONT VIEW

SIDE VIEW

NOTES

- A1 AND A2 — INDICATES DRIVERS.
- A31 — INDICATES SIGNAL TERMINATION LOCATION.
- A41 — INDICATES POWER TERMINATION LOCATION.
- A42 — INDICATES THERMOSTAT LOCATION.
- A43 — INDICATES BALLAST LOCATION.
- B1 AND B2 — INDICATE FAN LOCATIONS.
- DS1 THRU DS3 — INDICATE 6' FLUORESCENT LOCATIONS.

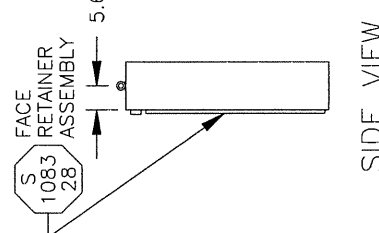
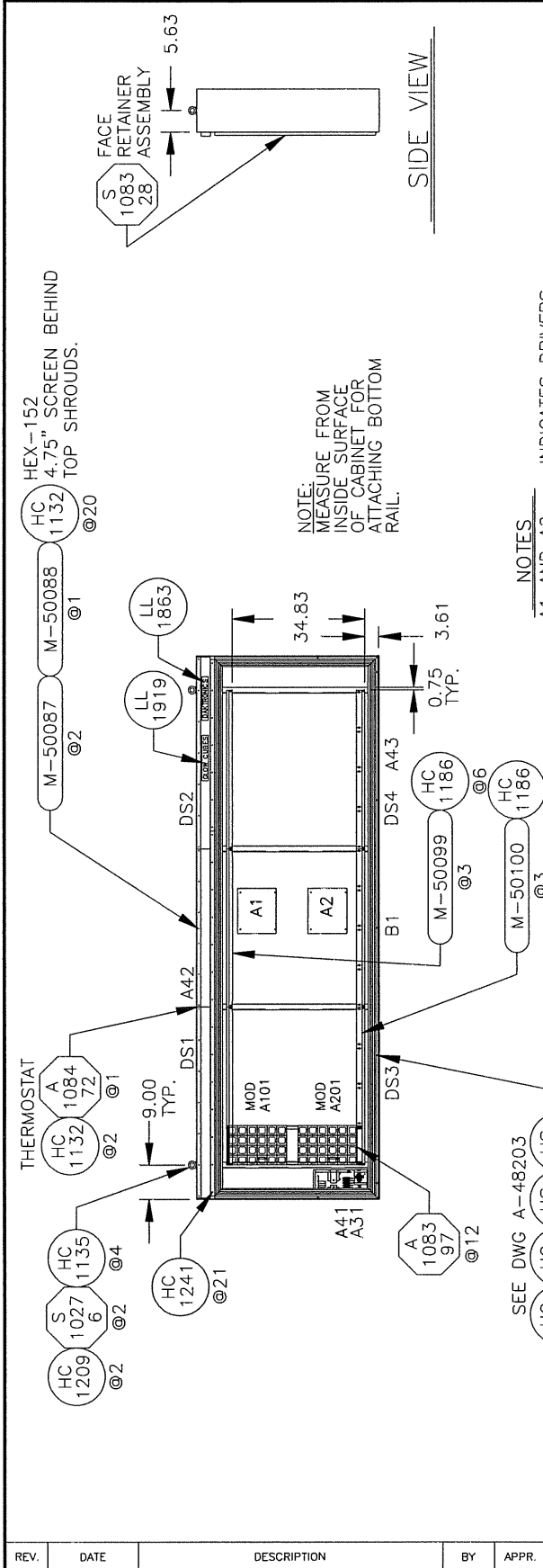
USE TEMPLATE M-50779
FOR MARKING AND DRILLING.

RIVET PERIMETER & VERT.
@ APPROX. 8" SPACING

REAR VIEW

REV.	DATE	DESCRIPTION	BY	APPR.

DAKTRONICS, INC. BROOKINGS, SD 57006			
PROJ: GLOW CUBE LINE DISPLAYS			
TITLE: FINAL ASSY, 1-680-15GOC-SF			
DES. BY: WTUCKER		DRAWN BY: CIVERSEN	DATE: 9/APR/92
REVISION	APPR. BY:	1083-E10A-50649	
	SCALE: 1=40		

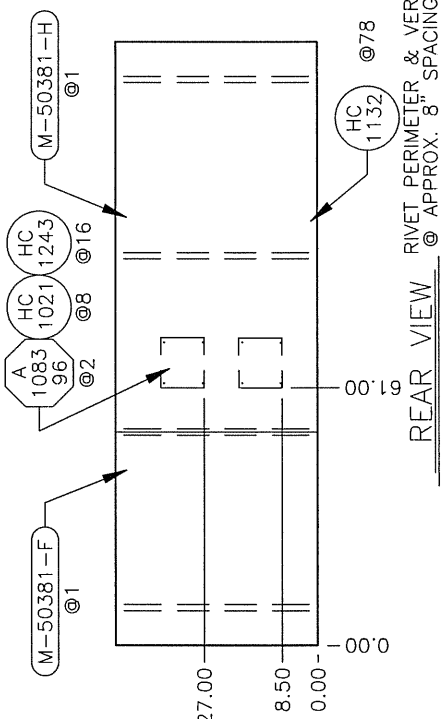


NOTE:
MEASURE FROM
INSIDE SURFACE
OF CABINET FOR
ATTACHING BOTTOM
RAIL.

NOTES

- A1 AND A2 - INDICATES DRIVERS.
- A31 - INDICATES SIGNAL TERMINATION LOCATION.
- A41 - INDICATES POWER TERMINATION LOCATION.
- A42 - INDICATES THERMOSTAT LOCATION.
- A43 - INDICATES BALLAST LOCATION.
- B1 - INDICATES FAN LOCATION.
- DS1 THRU DS4 - INDICATE 5' FLUORESCENT LOCATIONS.

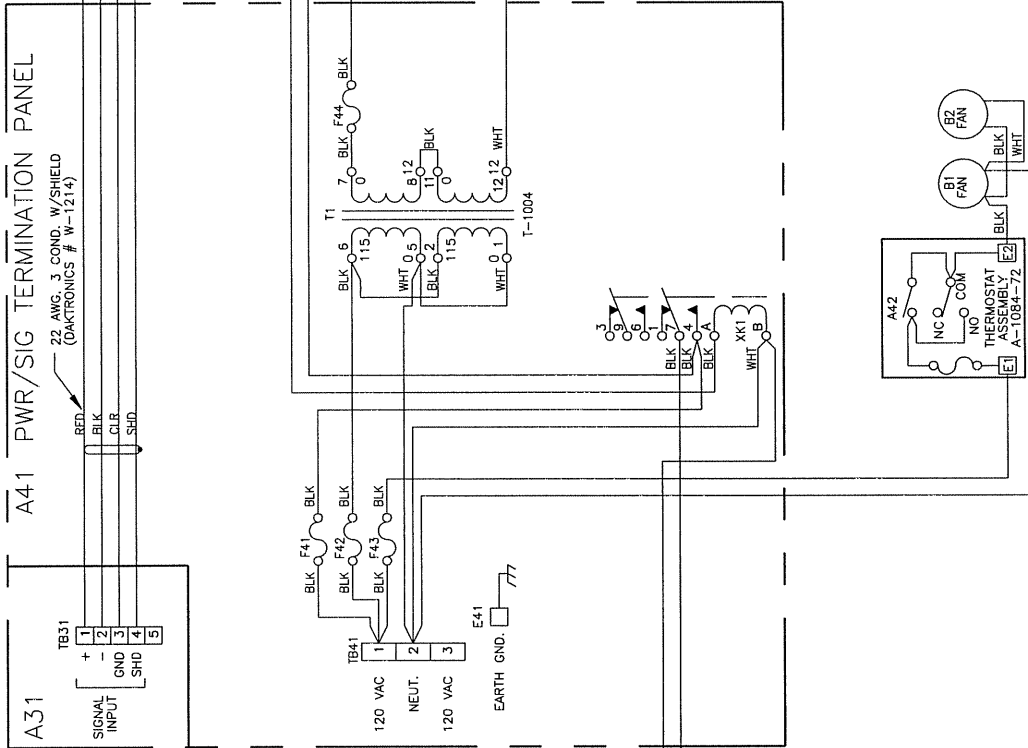
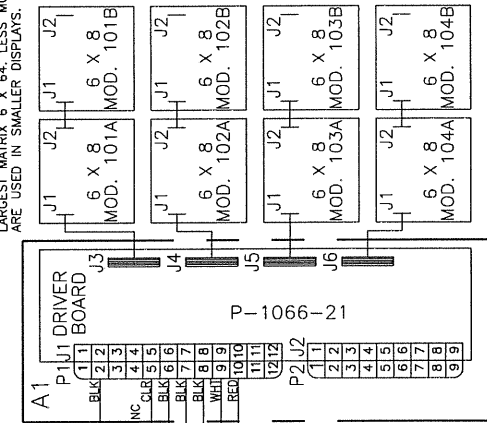
USE TEMPLATE M-50779
FOR MARKING AND DRILLING.



DAKTRONICS, INC. BROOKINGS, SD 57006			
PROJ: GLOW CUBE LINE DISPLAYS			
TITLE: FINAL ASSY, 2-648-15GOC-SF			
DES. BY: WTUCKER		DRAWN BY: CIVERSEN	
DATE: 14/APR/92			
REVISION	APPR. BY:	1083-E10A-50651	
	SCALE: 1=40		

REV.	DATE	DESCRIPTION	BY	APPR.

MODULE CONFIGURATION SHOWN IS OF LARGEST MATRIX 6 X 8. SMALLER MODULES ARE USED IN SMALLER DISPLAYS.



POWER REQUIREMENTS FOR DF

VOLTAGE PRIMARY	120VAC
# OF PHASES	1
MAXIMUM WATTS	720
AMPERES PRIMARY	6.00
VOLTAGE SECONDARY	28VAC

POWER REQUIREMENTS FOR SF

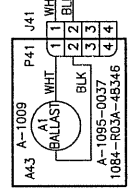
VOLTAGE PRIMARY	120VAC
# OF PHASES	1
MAXIMUM WATTS	360
AMPERES PRIMARY	3.00
VOLTAGE SECONDARY	28VAC

NOTE:
ALL WIRE IS 18 AWG UNLESS OTHERWISE NOTED.
ALL FUSES ARE MDX-5, 5 AMP FUSE (DAK, F-1021).

ADDRESS PIN CONFIGURATION

MASTER	A1	X			
SLAVE	A1				

"X" DENOTES TERMINATION TO J2 PIN 9 (GND).



DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: DAKTRONICS, LINE DISPLAYS

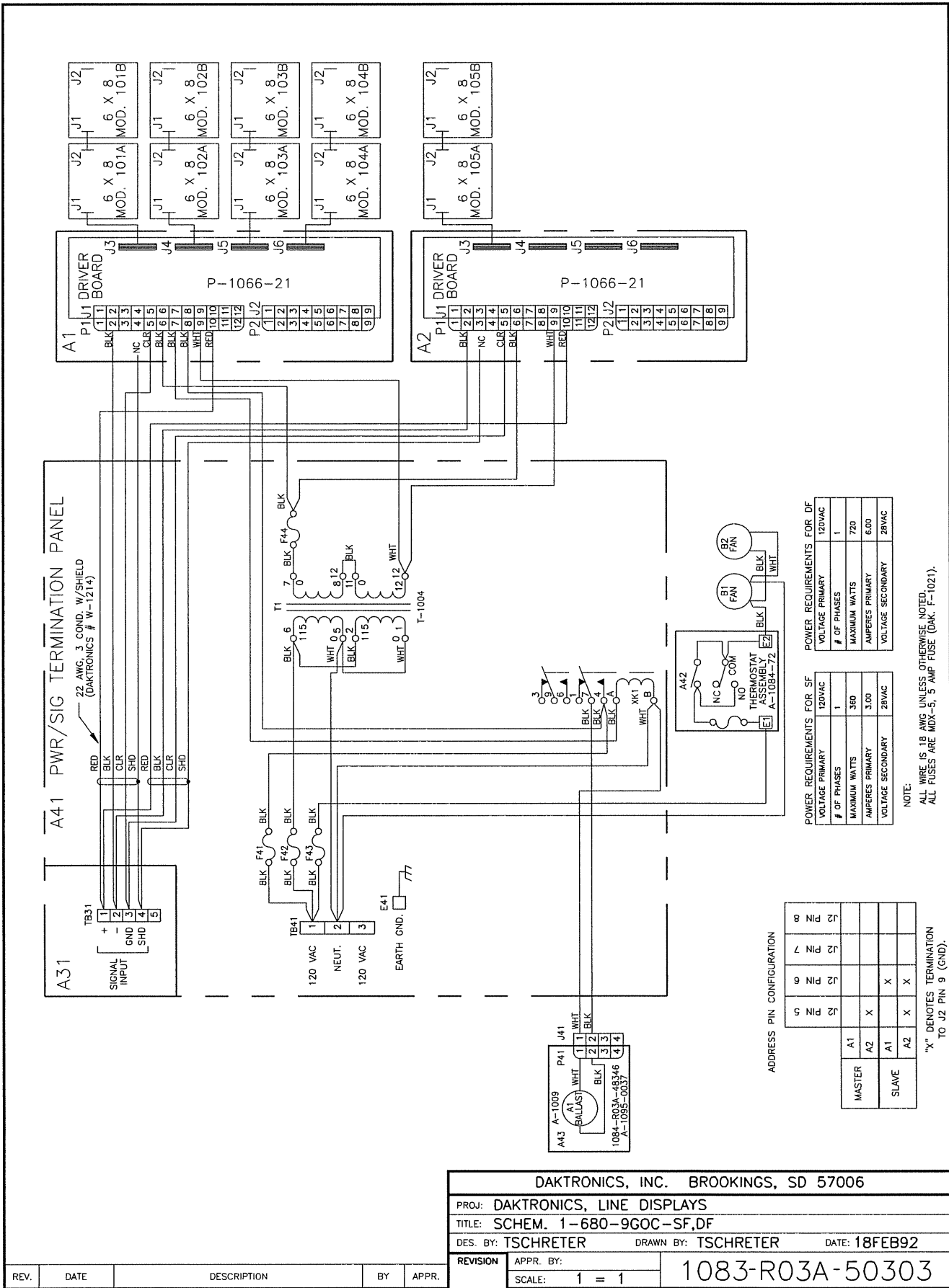
TITLE: SCHEM. 1-648 TO 664-9GOC-SF,DF

DES. BY: TSCHRETER DRAWN BY: TSCHRETER DATE: 18FEB92

REVISION APPR. BY: SCALE: 1 = 1

1083-R03A-50301

REV.	DATE	DESCRIPTION	BY	APPR.



DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: DAKTRONICS, LINE DISPLAYS

TITLE: SCHEM. 1-680-9GOC-SF,DF

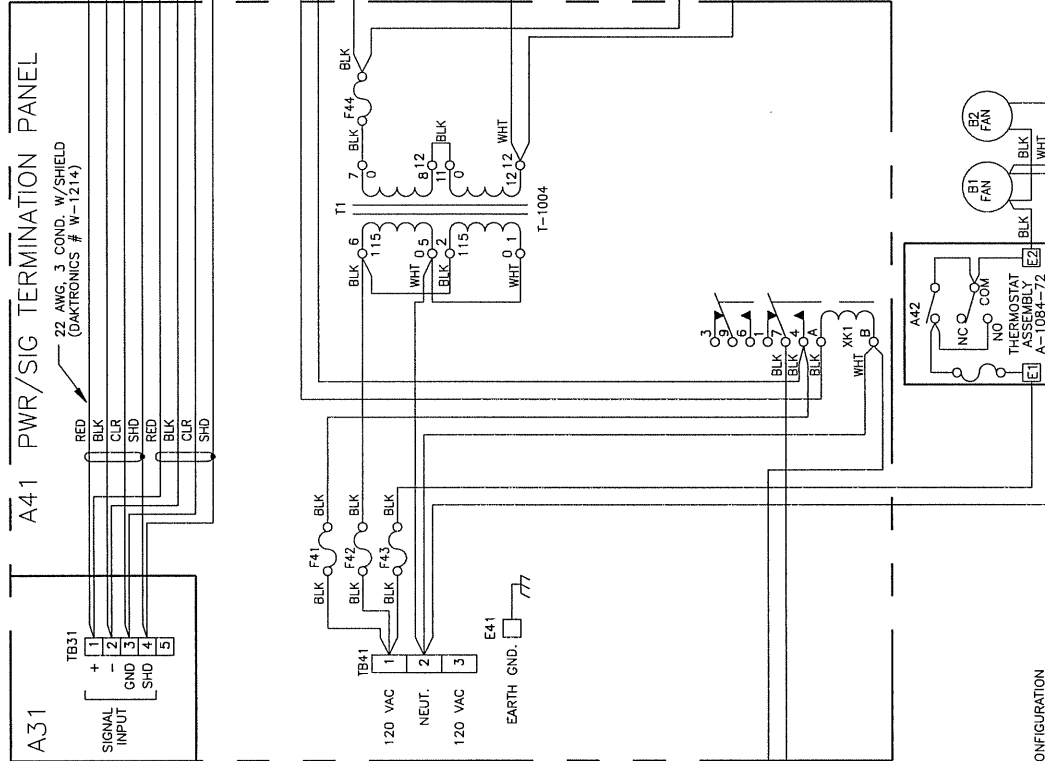
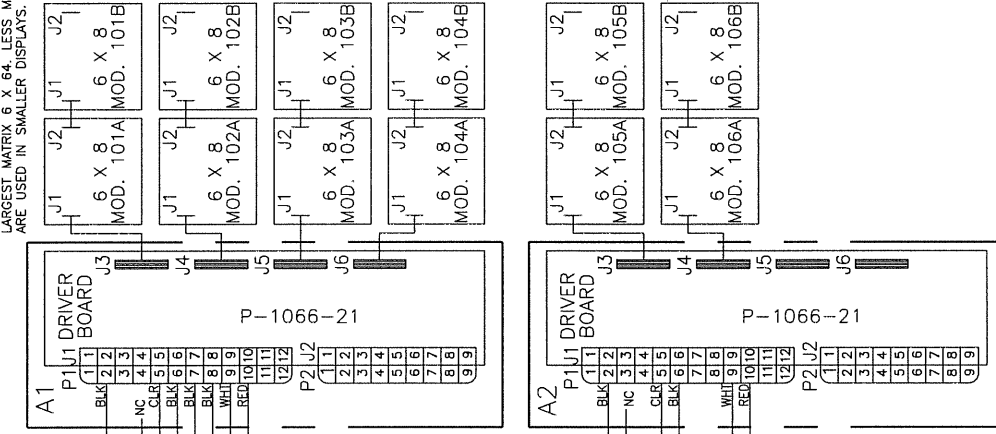
DES. BY: TSCHRETER DRAWN BY: TSCHRETER DATE: 18FEB92

REVISION APPR. BY: SCALE: 1 = 1

1083-R03A-50303

REV.	DATE	DESCRIPTION	BY	APPR.

MODULE CONFIGURATION SHOWN IS OF LARGEST MATRIX 6 X 84. LESS MODULES ARE USED IN SMALLER DISPLAYS.



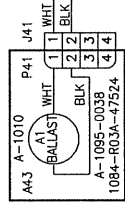
POWER REQUIREMENTS FOR SF

VOLTAGE PRIMARY	120VAC
# OF PHASES	1
MAXIMUM WATTS	480
AMPERES PRIMARY	4.0
VOLTAGE SECONDARY	28VAC

NOTE:
ALL WIRE IS 18 AWG UNLESS OTHERWISE NOTED.
ALL FUSES ARE MDX-5, 5 AMP FUSE (DARK, P-1021).

POWER REQUIREMENTS FOR DF

VOLTAGE PRIMARY	120VAC
# OF PHASES	1
MAXIMUM WATTS	960
AMPERES PRIMARY	8.0
VOLTAGE SECONDARY	28VAC



ADDRESS PIN CONFIGURATION

	J2	J2	J2	J2
MASTER	A1	A2	A1	A2
SLAVE	A2	A1	A2	A1

"X" DENOTES TERMINATION TO J2 PIN 9 (GND).

REV.	DATE	DESCRIPTION	BY	APPR.
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DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: DAKTRONICS, LINE DISPLAYS

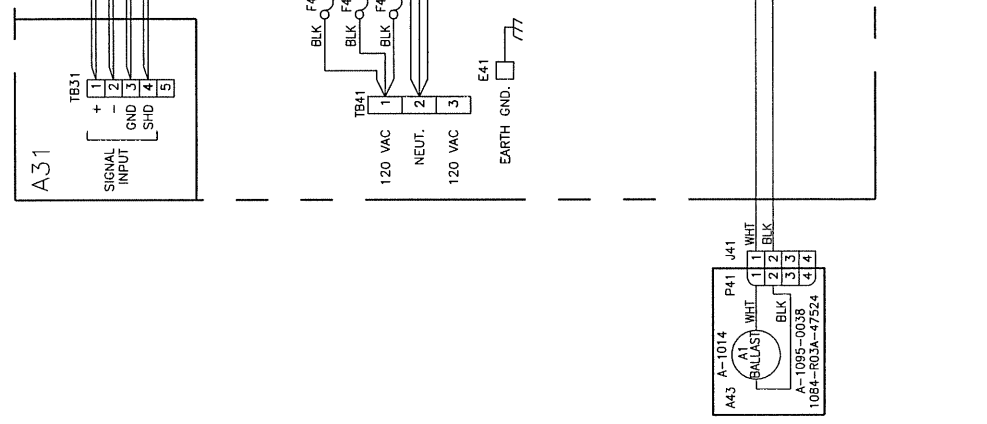
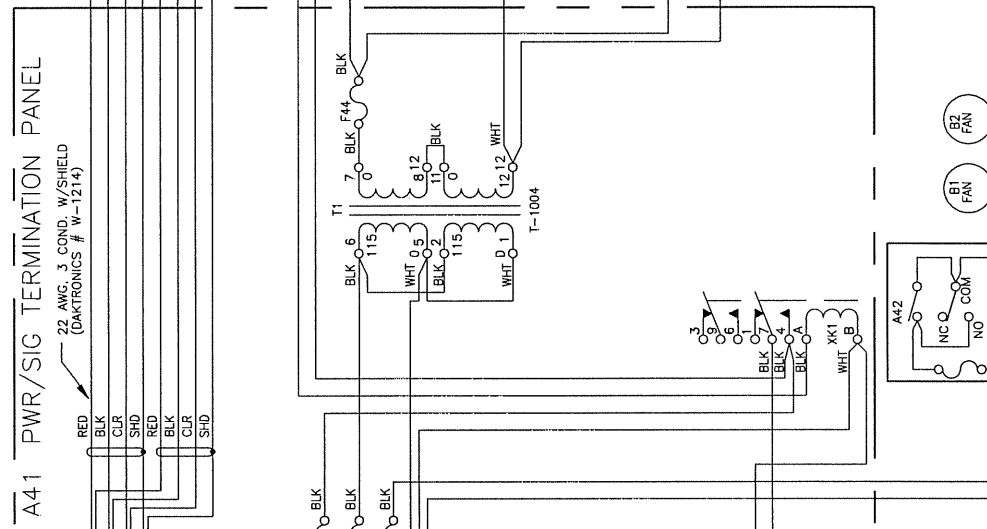
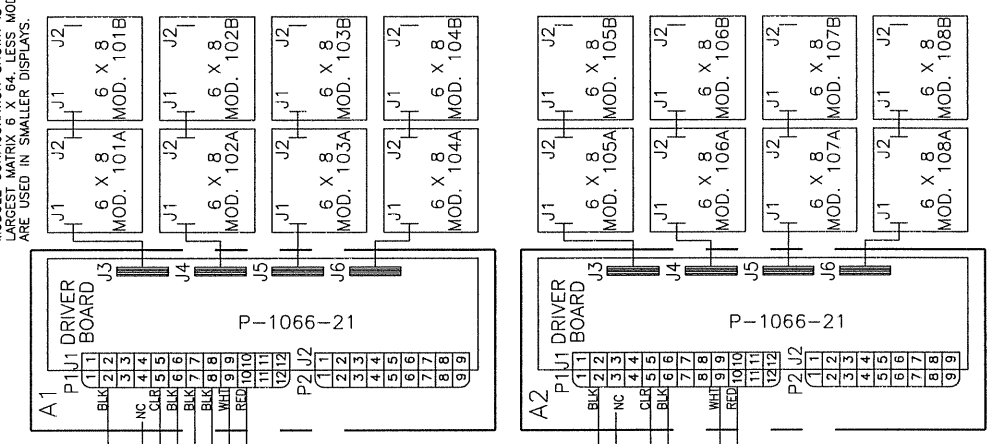
TITLE: SCHEMATIC 1-696-9GOC-SF, DF

DES. BY: TSCHRETER DRAWN BY: TSCHRETER DATE: 18FEB92

REVISION APPR. BY: SCALE: 1 = 1

1083-R03A-50304

MODULE CONFIGURATION SHOWN IS OF LARGEST MATRIX 6 X 64. LESS MODULES ARE USED IN SMALLER DISPLAYS.



NOTE:
ALL WIRE IS 18 AWG UNLESS OTHERWISE NOTED.
ALL FUSES ARE MDX-5, 5 AMP FUSE (QAK, F-1021).

REV	DATE	DESCRIPTION	BY	APPR.

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: DAKTRONICS, LINE DISPLAYS

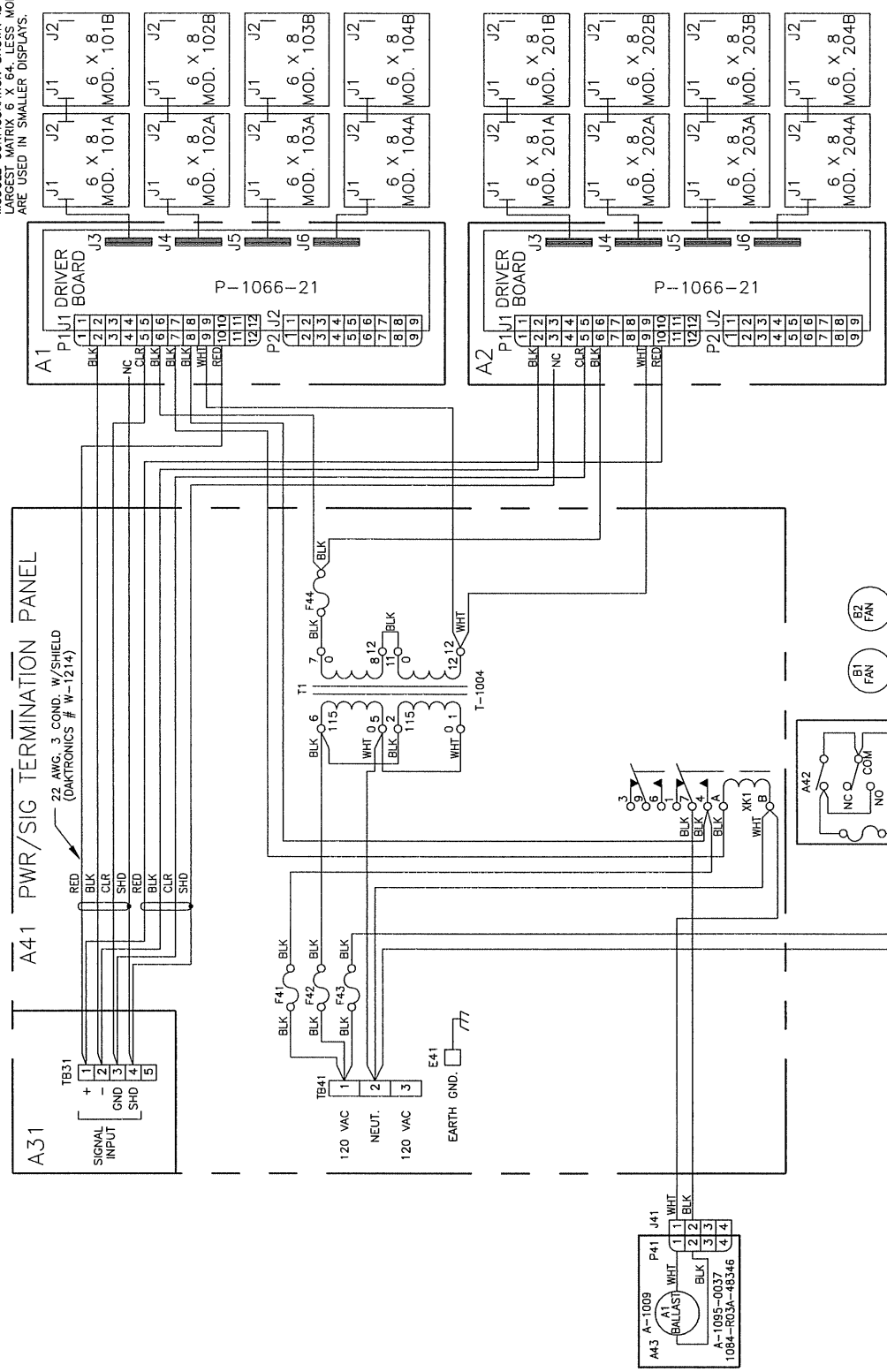
TITLE: SCHEMATIC, 1-6128-9GOC-SF, DF

DES. BY: TSCHRETER DRAWN BY: TSCHRETER DATE: 30MAR92

REVISION APPR. BY: 1083-R03A-51086

SCALE: 1 = 1

MODULE CONFIGURATION SHOWN IS OF LARGEST MATRIX, 6 X 8. SMALLER MODULES ARE USED IN SMALLER DISPLAYS.



POWER REQUIREMENTS FOR SF

VOLTAGE PRIMARY	120VAC
# OF PHASES	1
MAXIMUM WATTS	360
AMPERES PRIMARY	3.00
VOLTAGE SECONDARY	28VAC

POWER REQUIREMENTS FOR DF

VOLTAGE PRIMARY	120VAC
# OF PHASES	1
MAXIMUM WATTS	720
AMPERES PRIMARY	6.00
VOLTAGE SECONDARY	28VAC

ADDRESS PIN CONFIGURATION

	J2 PIN 5	J2 PIN 6	J2 PIN 7	J2 PIN 8
MASTER	A1	X		
SLAVE	A1	X	X	

NOTE:
ALL WIRE IS 18 AWG UNLESS OTHERWISE NOTED.
ALL FUSES ARE MDX-5, 5 AMP FUSE (DAK. F-1021).

REV.	DATE	DESCRIPTION	BY	APPR.

DAKTRONICS, INC. BROOKINGS, SD 57006

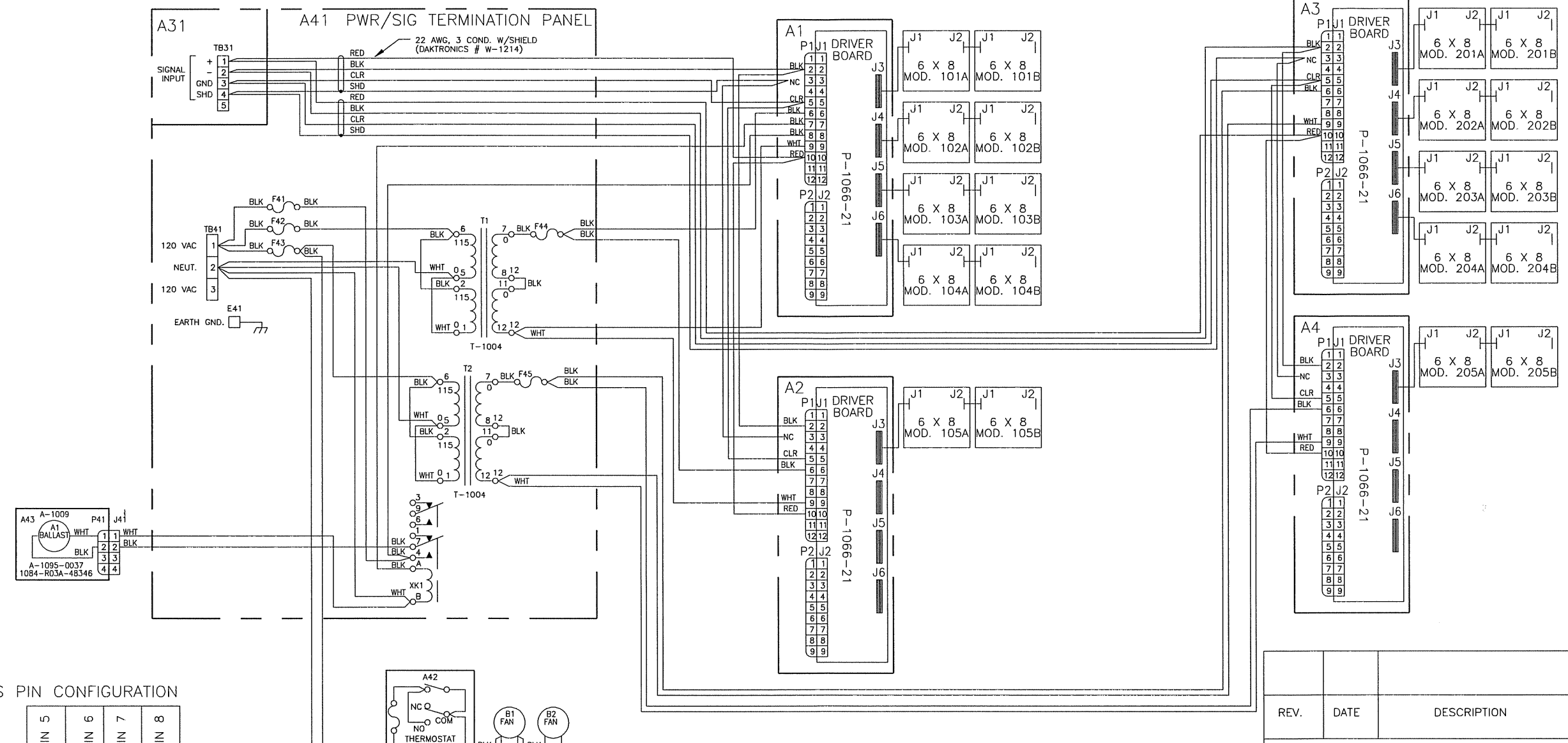
PROJ: DAKTRONICS, LINE DISPLAYS

TITLE: SCHEM. 2-648 TO 664-9GOC-SF, DF

DES. BY: TSCHRETER DRAWN BY: TSCHRETER DATE: 18FEB92

REVISION APPR. BY: SCALE: 1 = 1

1083-R03A-50306



ADDRESS PIN CONFIGURATION

	J2 PIN 5	J2 PIN 6	J2 PIN 7	J2 PIN 8
MASTER	A1			
	A2	X		
	A3		X	
	A4	X	X	
SLAVE	A1			X
	A2	X		X
	A3		X	X
	A4	X	X	X

"X" DENOTES TERMINATION TO J2 PIN 9 (GND).

NOTE:
ALL WIRE IS 18 AWG UNLESS OTHERWISE NOTED.
ALL FUSES ARE MDX-5, 5 AMP FUSE (DAK. F-1021).

POWER REQUIREMENTS FOR SF

VOLTAGE PRIMARY	120VAC
# OF PHASES	1
MAXIMUM WATTS	480
AMPERES PRIMARY	4.0
VOLTAGE SECONDARY	28VAC

POWER REQUIREMENTS FOR DF

VOLTAGE PRIMARY	120VAC
# OF PHASES	1
MAXIMUM WATTS	960
AMPERES PRIMARY	8.0
VOLTAGE SECONDARY	28VAC

REV.	DATE	DESCRIPTION	MADE	APPR.

DAKTRONICS, INC.
BROOKINGS, SOUTH DAKOTA 57006

DAKTRONICS, LINE DISPLAYS

SCHEM. 2-680-9GOC-SF, DF

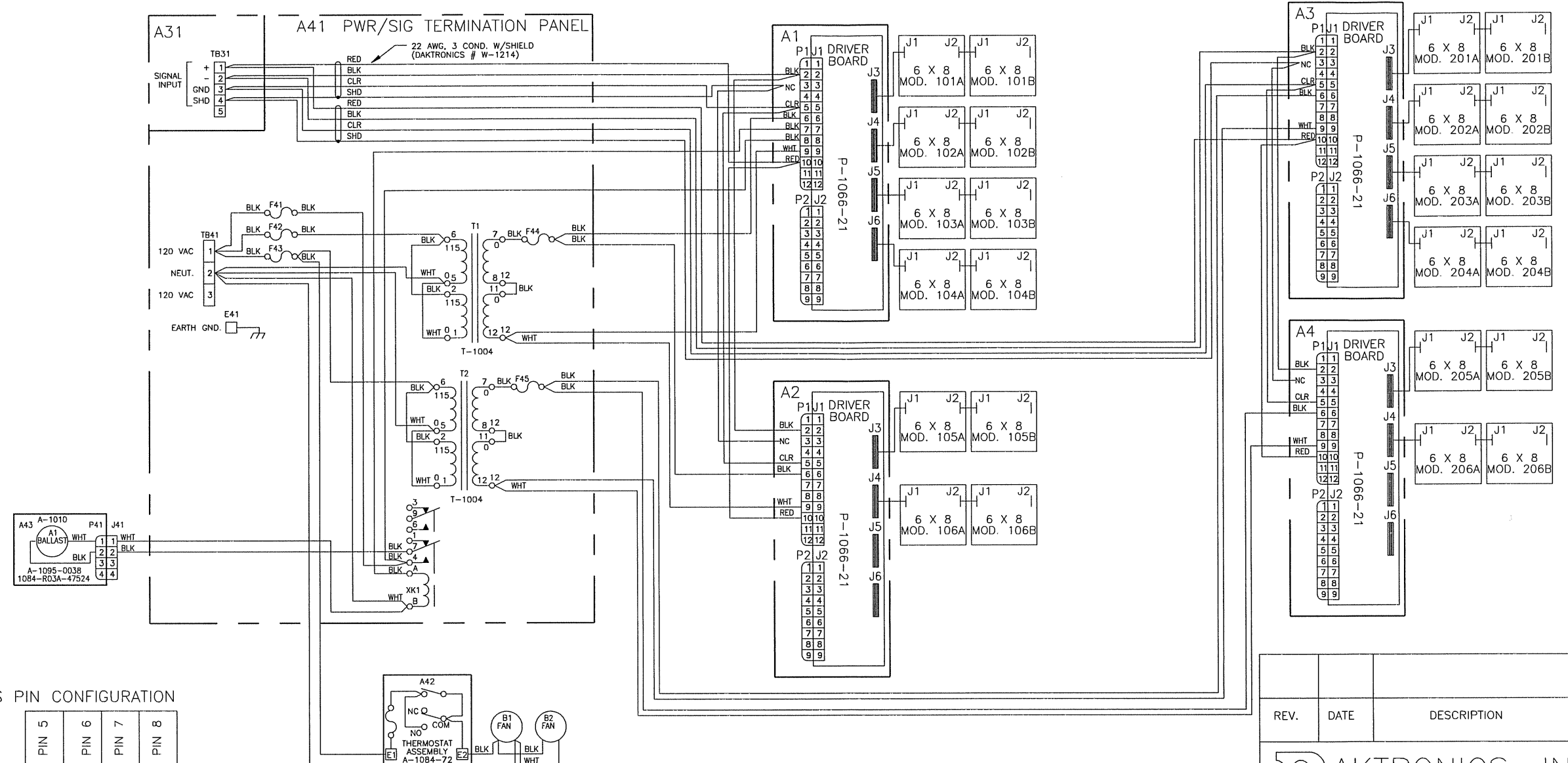
DRAWING NUMBER: 1083-R03B-50308 SCALE: 1 = 1

DESIGNED: TSCHRETER DRAWN: TSCHRETER

DATE: 18FEB92 DATE: 18FEB92

CHECKED: APPROVED:

DATE: DATE:



ADDRESS PIN CONFIGURATION

	J2 PIN 5	J2 PIN 6	J2 PIN 7	J2 PIN 8
MASTER	A1			
	A2	X		
	A3		X	
	A4	X	X	
SLAVE	A1			X
	A2	X		X
	A3		X	X
	A4	X	X	X

"X" DENOTES TERMINATION TO J2 PIN 9 (GND).

NOTE:
 ALL WIRE IS 18 AWG EXCEPT * IS 14 AWG.
 ALL FUSES ARE MDX-5, 5 AMP FUSE (DAK. F-1021).

POWER REQUIREMENTS FOR SF

VOLTAGE PRIMARY	120VAC
# OF PHASES	1
MAXIMUM WATTS	600
AMPERES PRIMARY	5.0
VOLTAGE SECONDARY	28VAC

POWER REQUIREMENTS FOR DF

VOLTAGE PRIMARY	120VAC
# OF PHASES	1
MAXIMUM WATTS	1,200
AMPERES PRIMARY	10.0
VOLTAGE SECONDARY	28VAC

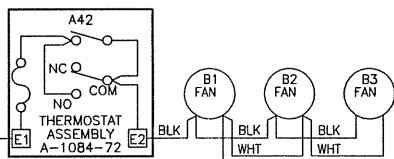
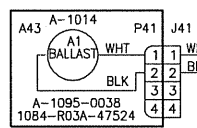
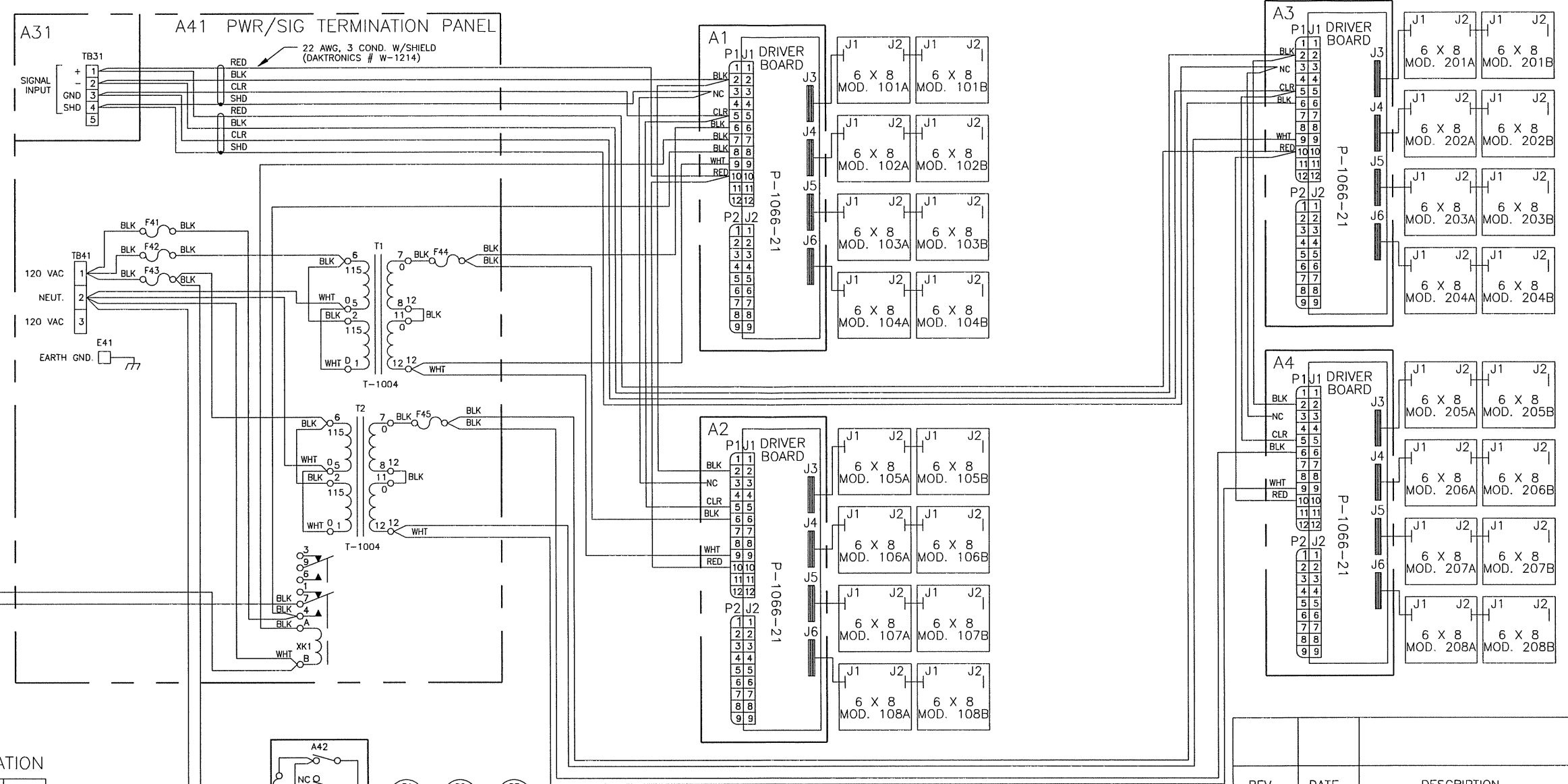
REV.	DATE	DESCRIPTION	MADE	APPR.

AKTRONICS, INC.
 BROOKINGS, SOUTH DAKOTA 57006

DAKTRONICS, LINE DISPLAYS

SCHEM. 2-696-9GOC-SF, DF

DRAWING NUMBER:	1083-R03B-50309	SCALE:	1 = 1
DESIGNED:	TSCHRETER	DRAWN:	TSCHRETER
DATE:	18FEB92	DATE:	18FEB92
CHECKED:		APPROVED:	
DATE:		DATE:	



ADDRESS PIN CONFIGURATION

	J2 PIN 5	J2 PIN 6	J2 PIN 7	J2 PIN 8
MASTER	A1			
	A2	X		
	A3		X	
	A4	X	X	
SLAVE	A1			X
	A2	X		X
	A3		X	X
	A4	X	X	X

"X" DENOTES TERMINATION TO J2 PIN 9 (GND).

NOTE:
ALL WIRE IS 18 AWG EXCEPT * IS 14 AWG.
ALL FUSES ARE MDX-5, 5 AMP FUSE (DAK. F-1021).

POWER REQUIREMENTS FOR SF

VOLTAGE PRIMARY	120VAC
# OF PHASES	1
MAXIMUM WATTS	720
AMPERES PRIMARY	6.0
VOLTAGE SECONDARY	28VAC

POWER REQUIREMENTS FOR DF

VOLTAGE PRIMARY	120VAC
# OF PHASES	1
MAXIMUM WATTS	1,440
AMPERES PRIMARY	12.0
VOLTAGE SECONDARY	28VAC

REV.	DATE	DESCRIPTION	MADE	APPR.

DAKTRONICS, INC.
BROOKINGS, SOUTH DAKOTA 57006

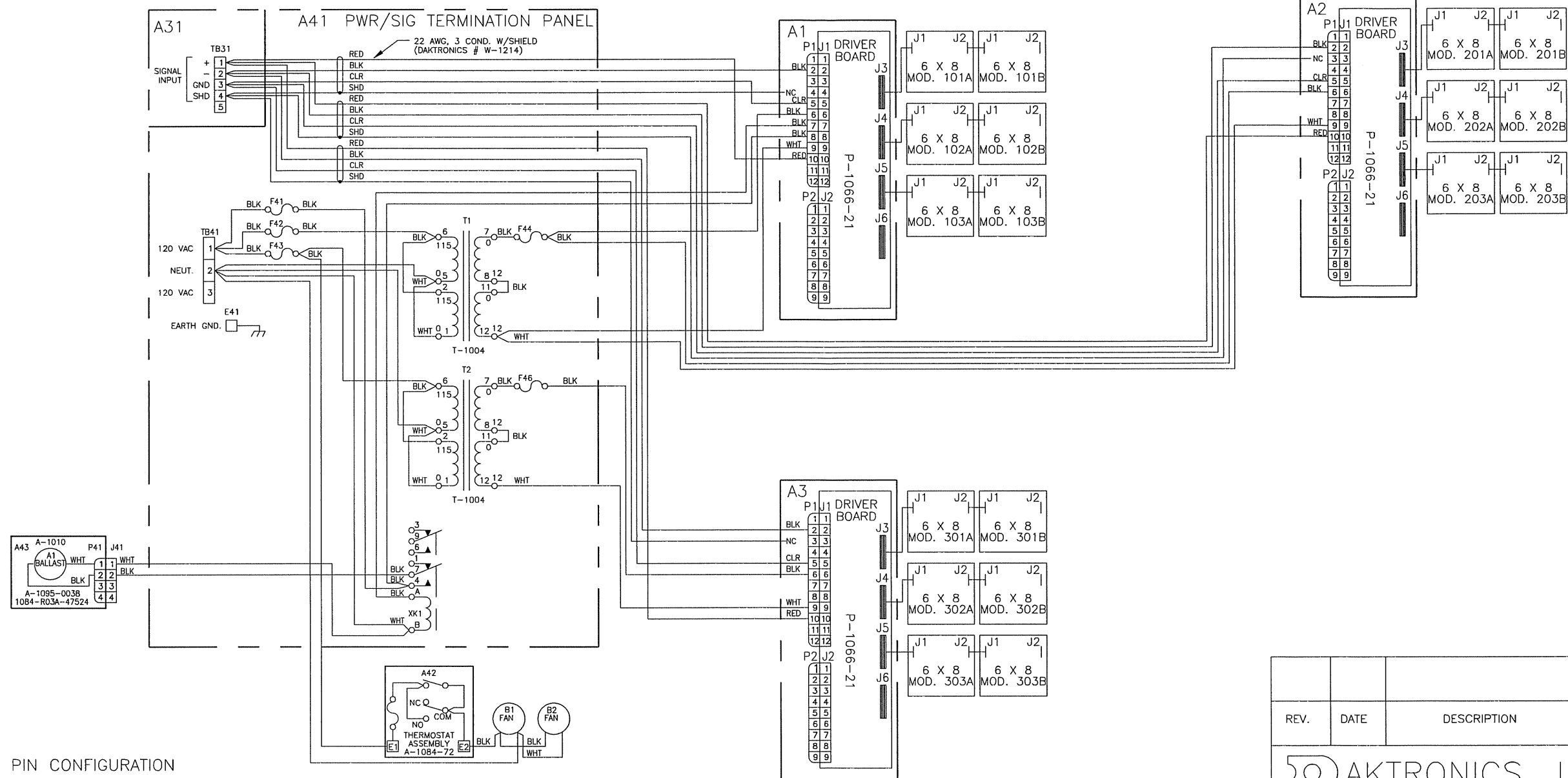
DAKTRONICS, LINE DISPLAYS

SCHEM. 2-6128-9GOC-SF, DF

DRAWING NUMBER: 1083-R03B-50310 SCALE: 1 = 1

DESIGNED: TSCHRETER DRAWN: TSCHRETER
DATE: 18FEB92 DATE: 18FEB92

CHECKED: APPROVED:
DATE: DATE:



ADDRESS PIN CONFIGURATION

		J2 PIN 5	J2 PIN 6	J2 PIN 7	J2 PIN 8
MASTER	A1				
	A2	X			
	A3		X		
SLAVE	A1	X	X		
	A2			X	
	A3	X		X	

"X" DENOTES TERMINATION TO J2 PIN 9 (GND).

NOTE:

ALL WIRE IS 18 AWG EXCEPT * IS 14 AWG.
ALL FUSES ARE MDX-5, 5 AMP FUSE (DAK. F-1021).

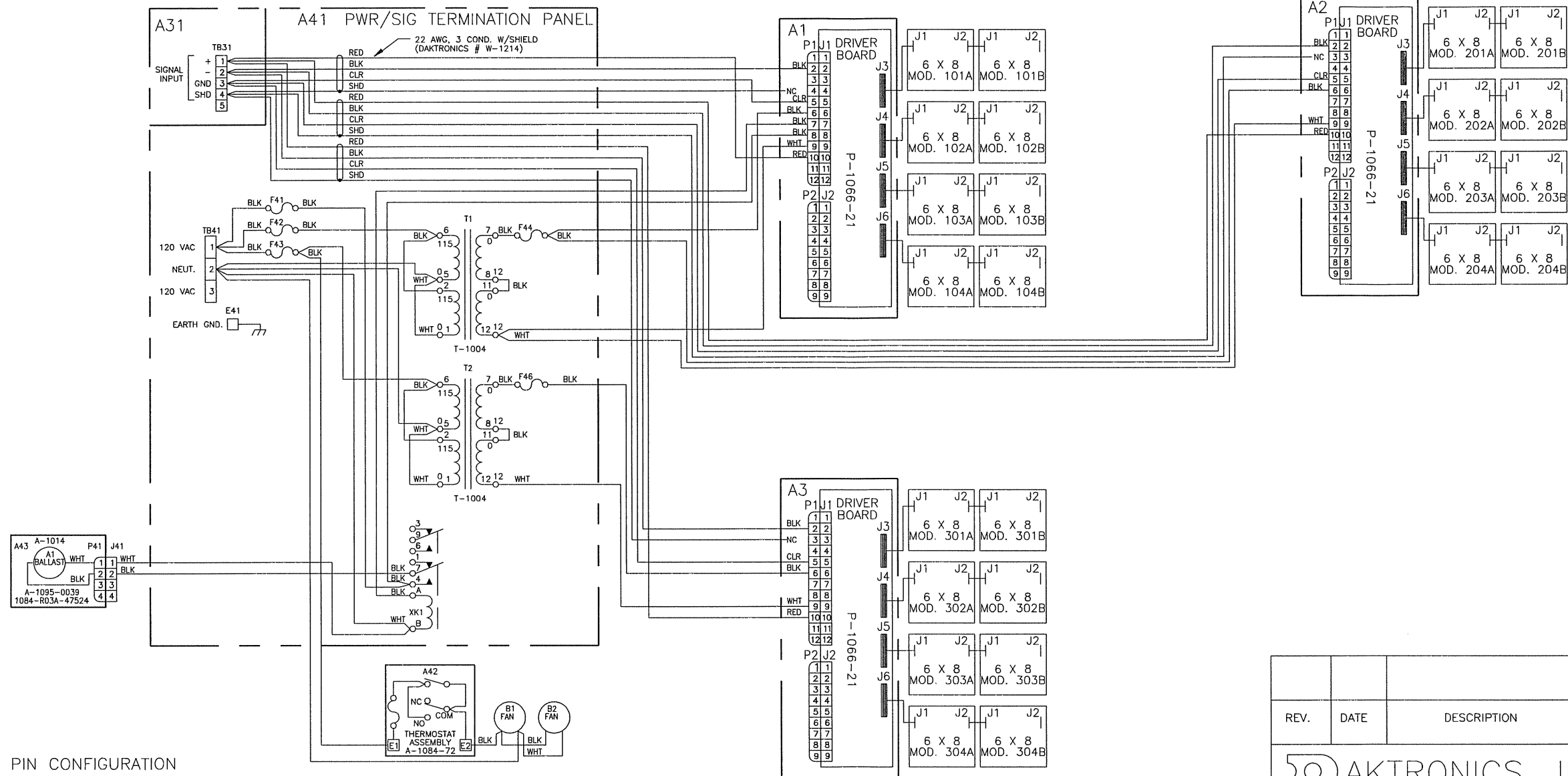
POWER REQUIREMENTS FOR SF

VOLTAGE PRIMARY	120VAC
# OF PHASES	1
MAXIMUM WATTS	480
AMPERES PRIMARY	4.0
VOLTAGE SECONDARY	28VAC

POWER REQUIREMENTS FOR DF

VOLTAGE PRIMARY	120VAC
# OF PHASES	1
MAXIMUM WATTS	960
AMPERES PRIMARY	8.0
VOLTAGE SECONDARY	28VAC

REV.	DATE	DESCRIPTION	MADE	APPR.
 BROOKINGS, SOUTH DAKOTA 57006				
DAKTRONICS, LINE DISPLAYS				
SCHEM. 3-648-9GOC-SF, DF				
DRAWING NUMBER: 1083-R03B-50311		SCALE: 1 = 1		
DESIGNED: TSCHRETER		DRAWN: TSCHRETER		
DATE: 18FEB92		DATE: 18FEB92		
CHECKED:		APPROVED:		
DATE:		DATE:		



ADDRESS PIN CONFIGURATION

		J2 PIN 5	J2 PIN 6	J2 PIN 7	J2 PIN 8
MASTER	A1				
	A2	X			
	A3		X		
SLAVE	A1	X	X		
	A2			X	
	A3	X		X	

"X" DENOTES TERMINATION TO J2 PIN 9 (GND).

NOTE:
ALL WIRE IS 18 AWG EXCEPT * IS 14 AWG.
ALL FUSES ARE MDX-5, 5 AMP FUSE (DAK. F-1021).

POWER REQUIREMENTS FOR SF

VOLTAGE PRIMARY	120VAC
# OF PHASES	1
MAXIMUM WATTS	600
AMPERES PRIMARY	5.0
VOLTAGE SECONDARY	28VAC

POWER REQUIREMENTS FOR DF

VOLTAGE PRIMARY	120VAC
# OF PHASES	1
MAXIMUM WATTS	1,200
AMPERES PRIMARY	10.0
VOLTAGE SECONDARY	28VAC

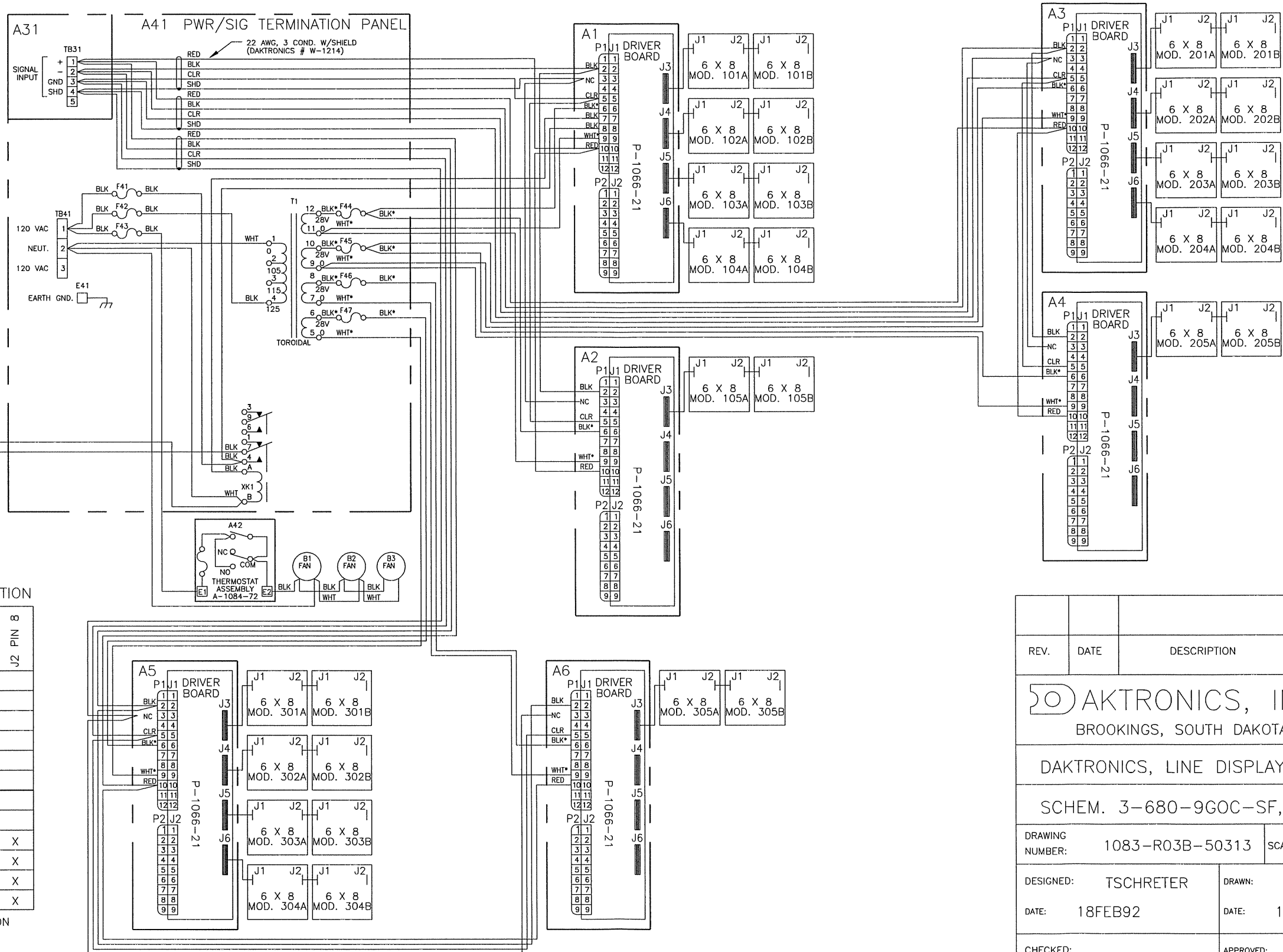
REV.	DATE	DESCRIPTION	MADE	APPR.
 BROOKINGS, SOUTH DAKOTA 57006				
DAKTRONICS, LINE DISPLAYS				
SCHEM. 3-664-9GOC-SF, DF				
DRAWING NUMBER: 1083-R03B-50312		SCALE: 1 = 1		
DESIGNED: TSCHRETER		DRAWN: TSCHRETER		
DATE: 18FEB92		DATE: 18FEB92		
CHECKED:		APPROVED:		
DATE:		DATE:		

POWER REQUIREMENTS FOR SF

VOLTAGE PRIMARY	120VAC
# OF PHASES	1
MAXIMUM WATTS	840
AMPERES PRIMARY	7.0
VOLTAGE SECONDARY	28VAC

POWER REQUIREMENTS FOR DF

VOLTAGE PRIMARY	120VAC
# OF PHASES	1
MAXIMUM WATTS	1,680
AMPERES PRIMARY	14.0
VOLTAGE SECONDARY	28VAC



ADDRESS PIN CONFIGURATION

	J2 PIN 5	J2 PIN 6	J2 PIN 7	J2 PIN 8
MASTER	A1	X		
	A2			
	A3	X	X	
	A4	X		
	A5			X
	A6	X		X
SLAVE	A1		X	X
	A2	X	X	X
	A3	X		
	A4	X		X
	A5		X	X
	A6	X	X	X

"X" DENOTES TERMINATION TO J2 PIN 9 (GND).

NOTE:
 ALL WIRE IS 18 AWG EXCEPT * IS 14 AWG.
 F41 - F43 ARE MDX-5, 5 AMP FUSE (DAK. F-1021).
 ALL OTHER FUSES ARE ACG 10, 10 AMP (DAK. F-1006).

REV.	DATE	DESCRIPTION	MADE	APPR.
 BROOKINGS, SOUTH DAKOTA 57006				
DAKTRONICS, LINE DISPLAYS				
SCHEM. 3-680-9GOC-SF, DF				
DRAWING NUMBER: 1083-R03B-50313		SCALE: 1 = 1		
DESIGNED: TSCHRETER		DRAWN: TSCHRETER		
DATE: 18FEB92		DATE: 18FEB92		
CHECKED:		APPROVED:		
DATE:		DATE:		

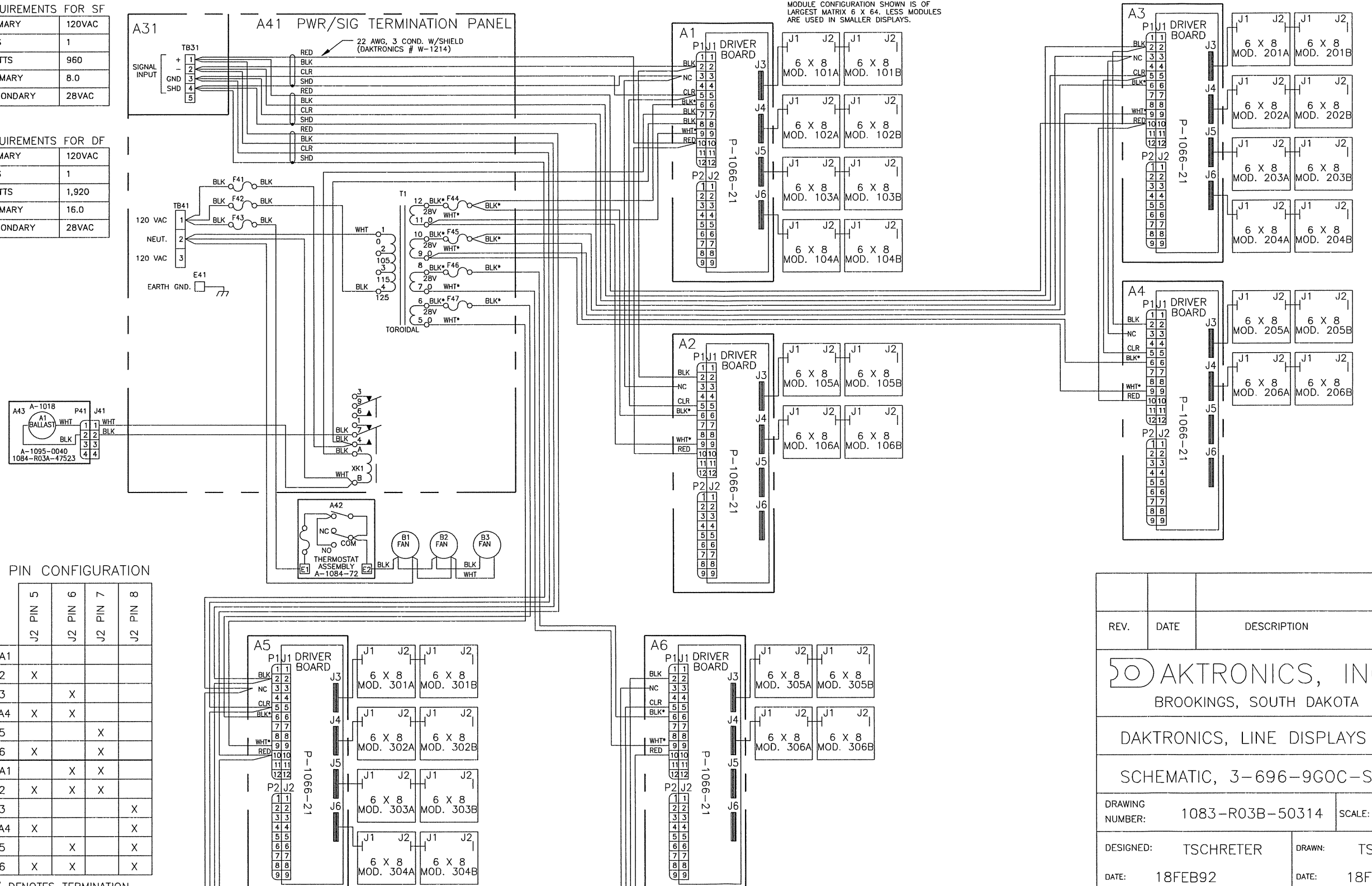
POWER REQUIREMENTS FOR SF

VOLTAGE PRIMARY	120VAC
# OF PHASES	1
MAXIMUM WATTS	960
AMPERES PRIMARY	8.0
VOLTAGE SECONDARY	28VAC

POWER REQUIREMENTS FOR DF

VOLTAGE PRIMARY	120VAC
# OF PHASES	1
MAXIMUM WATTS	1,920
AMPERES PRIMARY	16.0
VOLTAGE SECONDARY	28VAC

MODULE CONFIGURATION SHOWN IS OF LARGEST MATRIX 6 X 64. LESS MODULES ARE USED IN SMALLER DISPLAYS.



ADDRESS PIN CONFIGURATION

	J2 PIN 5	J2 PIN 6	J2 PIN 7	J2 PIN 8	
MASTER	A1				
	A2	X			
	A3		X		
	A4	X	X		
	A5			X	
	A6	X		X	
SLAVE	A1		X	X	
	A2	X	X	X	
	A3				X
	A4	X			X
	A5		X		X
	A6	X	X		X

NOTE:
 "X" DENOTES TERMINATION TO J2 PIN 9 (GND).
 ALL WIRE IS 18 AWG EXCEPT * IS 14 AWG.
 F41 - F43 ARE MDX-5, 5 AMP FUSE (DAK. F-1021).
 ALL OTHER FUSES ARE ACG 10, 10 AMP (DAK. F-1006).

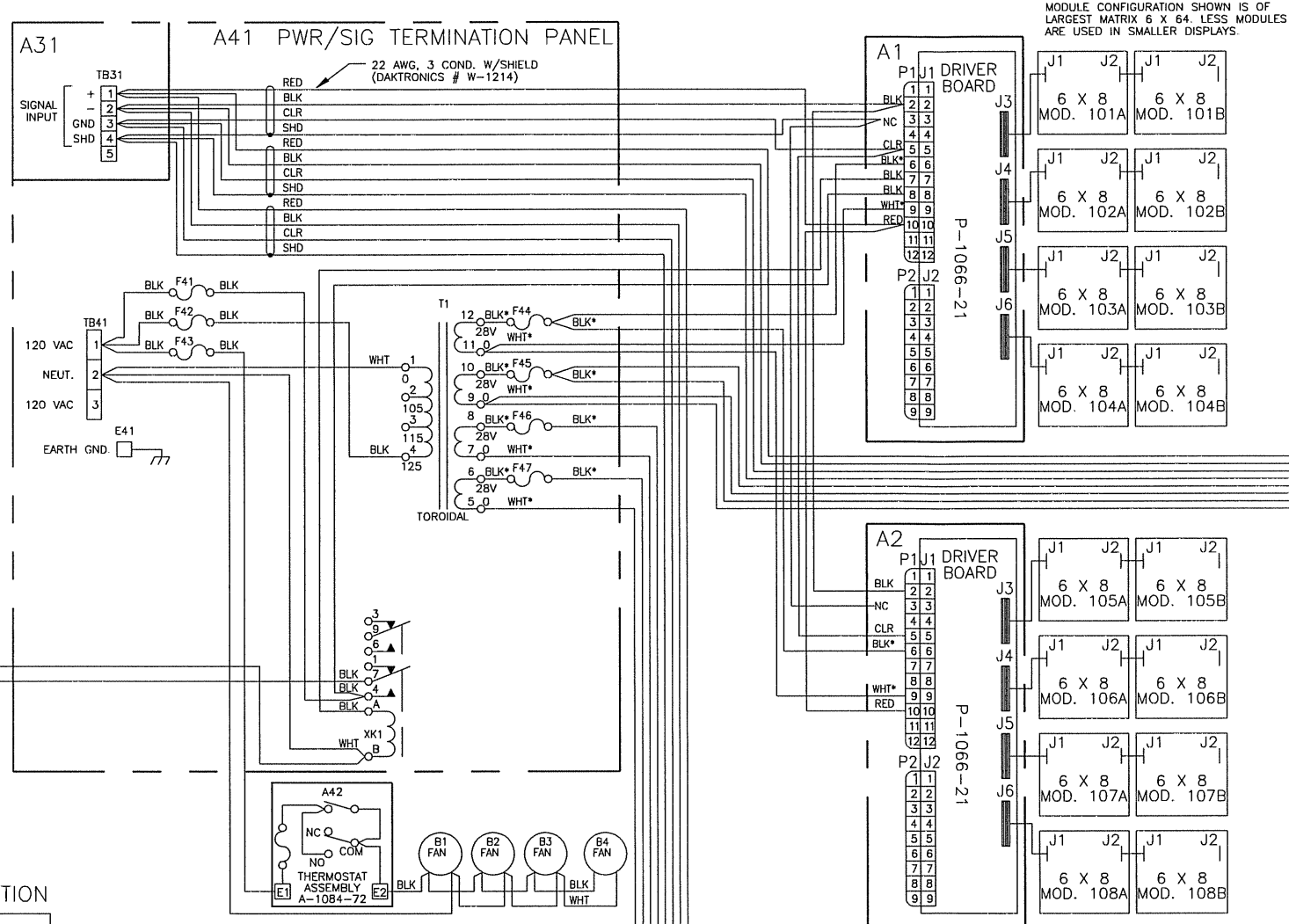
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DRAWING NUMBER: 1083-R03B-50314		SCALE: 1 = 1		
DESIGNED: TSCHRETER		DRAWN: TSCHRETER		
DATE: 18FEB92		DATE: 18FEB92		
CHECKED:		APPROVED:		
DATE:		DATE:		

POWER REQUIREMENTS FOR SF

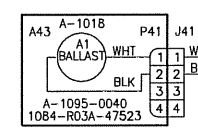
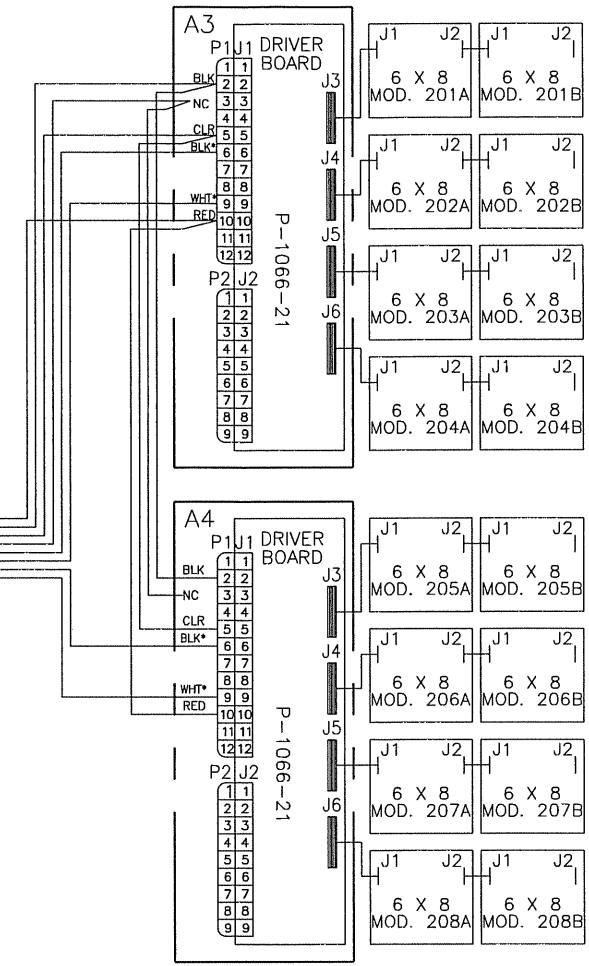
VOLTAGE PRIMARY	120VAC
# OF PHASES	1
MAXIMUM WATTS	960
AMPERES PRIMARY	8.0
VOLTAGE SECONDARY	28VAC

POWER REQUIREMENTS FOR DF

VOLTAGE PRIMARY	120VAC
# OF PHASES	1
MAXIMUM WATTS	1,920
AMPERES PRIMARY	16.0
VOLTAGE SECONDARY	28VAC



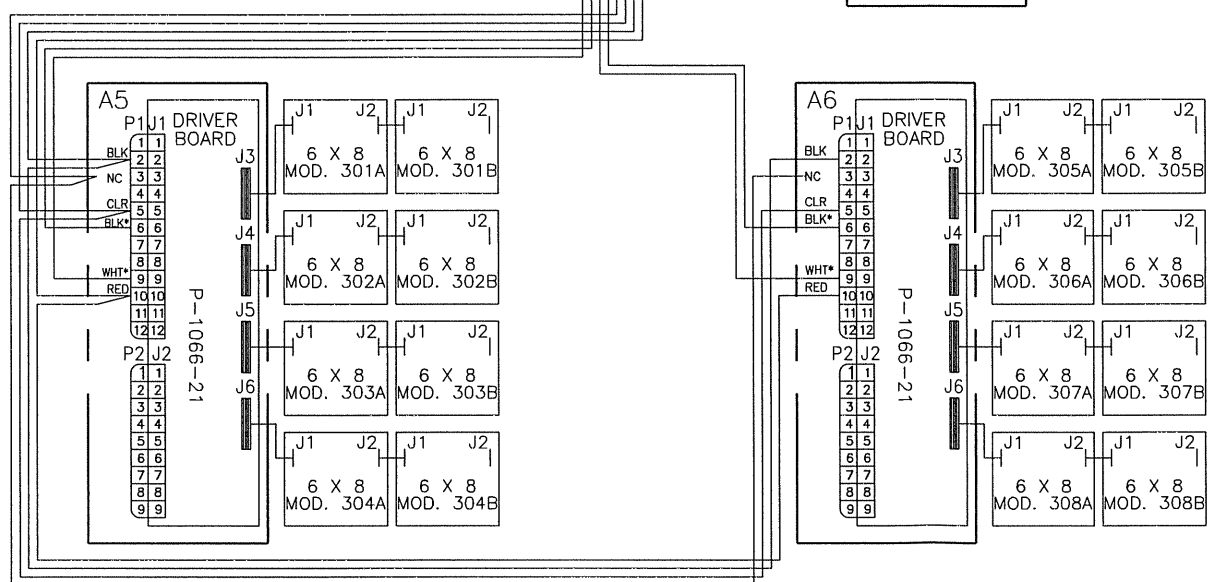
MODULE CONFIGURATION SHOWN IS OF LARGEST MATRIX 6 X 8. LESS MODULES ARE USED IN SMALLER DISPLAYS.



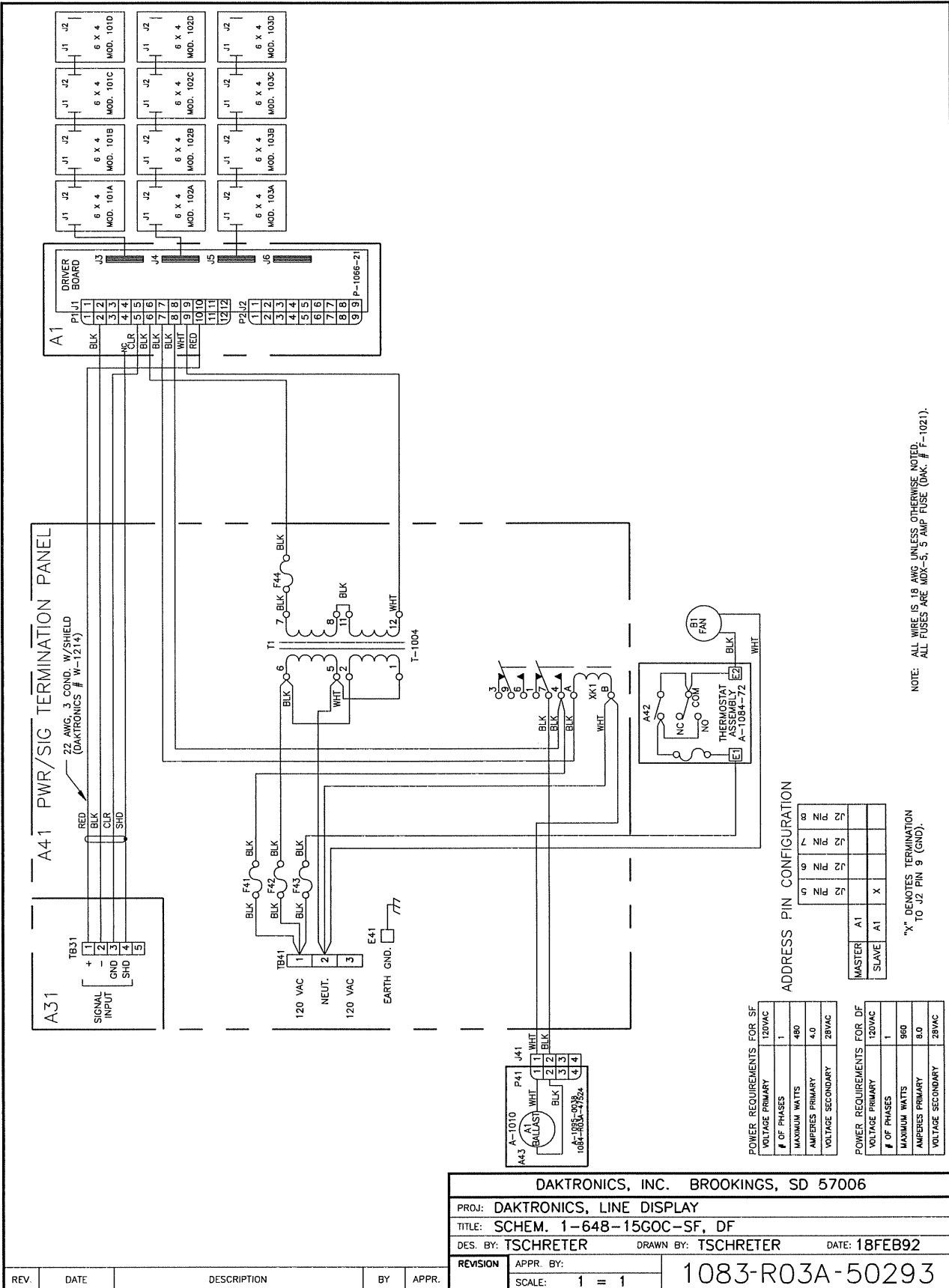
ADDRESS PIN CONFIGURATION

	J2 PIN 5	J2 PIN 6	J2 PIN 7	J2 PIN 8
MASTER	A1			
	A2	X		
	A3		X	
	A4	X	X	
	A5			X
	A6	X		X
SLAVE	A1		X	X
	A2	X	X	X
	A3			X
	A4	X		X
	A5		X	X
	A6	X	X	X

NOTE:
 "X" DENOTES TERMINATION TO J2 PIN 9 (GND).
 ALL WIRE IS 18 AWG EXCEPT * IS 14 AWG.
 F41 - F43 ARE MDX-5, 5 AMP FUSE (DAK. F-1021).
 ALL OTHER FUSES ARE ACG 10, 10 AMP (DAK. F-1006).



REV.	DATE	DESCRIPTION	MADE	APPR.
 BROOKINGS, SOUTH DAKOTA 57006				
DAKTRONICS, LINE DISPLAYS				
SCHEMATIC, 3-6128-9GOC-SF, DF				
DRAWING NUMBER: 1083-R03B-51087		SCALE: 1 = 1		
DESIGNED: TSCHRETER		DRAWN: TSCHRETER		
DATE: 30MAR92		DATE: 30MAR92		
CHECKED:		APPROVED:		
DATE:		DATE:		



DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: DAKTRONICS, LINE DISPLAY

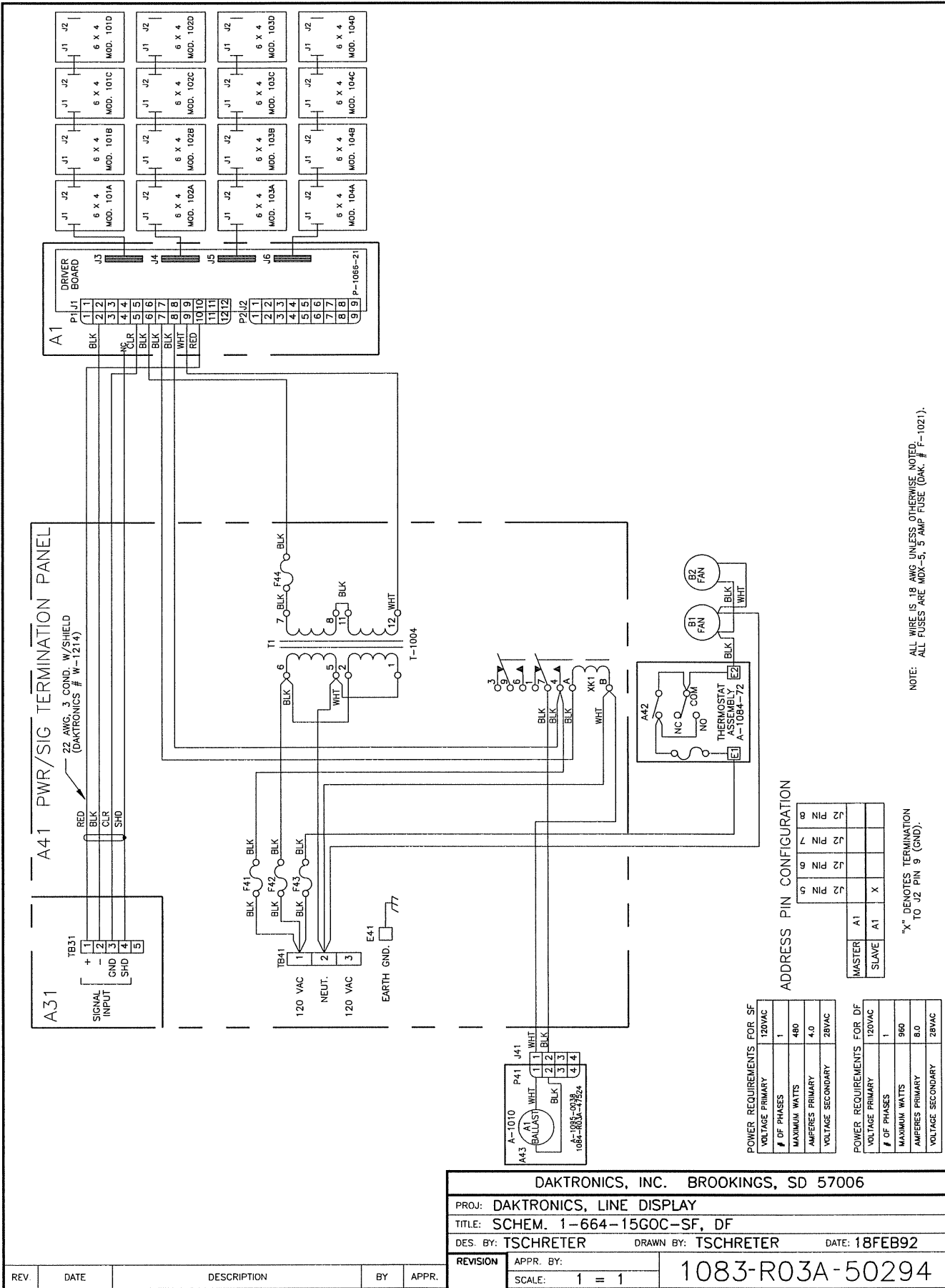
TITLE: SCHEM. 1-648-15GOC-SF, DF

DES. BY: TSCHRETER DRAWN BY: TSCHRETER DATE: 18FEB92

REVISION APPR. BY: 1 = 1

1083-R03A-50293

REV.	DATE	DESCRIPTION	BY	APPR.



NOTE: ALL WIRE IS 18 AWG UNLESS OTHERWISE NOTED. ALL FUSES ARE MDK-5, 5 AMP FUSE (DAK: # F-1021).

ADDRESS PIN CONFIGURATION

MASTER	A1						
SLAVE	A1	X					
			J2	J2	J2	J2	J2
			PN 5	PN 6	PN 7	PN 8	

X DENOTES TERMINATION TO J2 PIN 9 (GND).

POWER REQUIREMENTS FOR SF

VOLTAGE PRIMARY	120VAC
# OF PHASES	1
MAXIMUM WATTS	480
AMPERES PRIMARY	4.0
VOLTAGE SECONDARY	28VAC

POWER REQUIREMENTS FOR DF

VOLTAGE PRIMARY	120VAC
# OF PHASES	1
MAXIMUM WATTS	960
AMPERES PRIMARY	8.0
VOLTAGE SECONDARY	28VAC

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: DAKTRONICS, LINE DISPLAY

TITLE: SCHEM. 1-664-15GOC-SF, DF

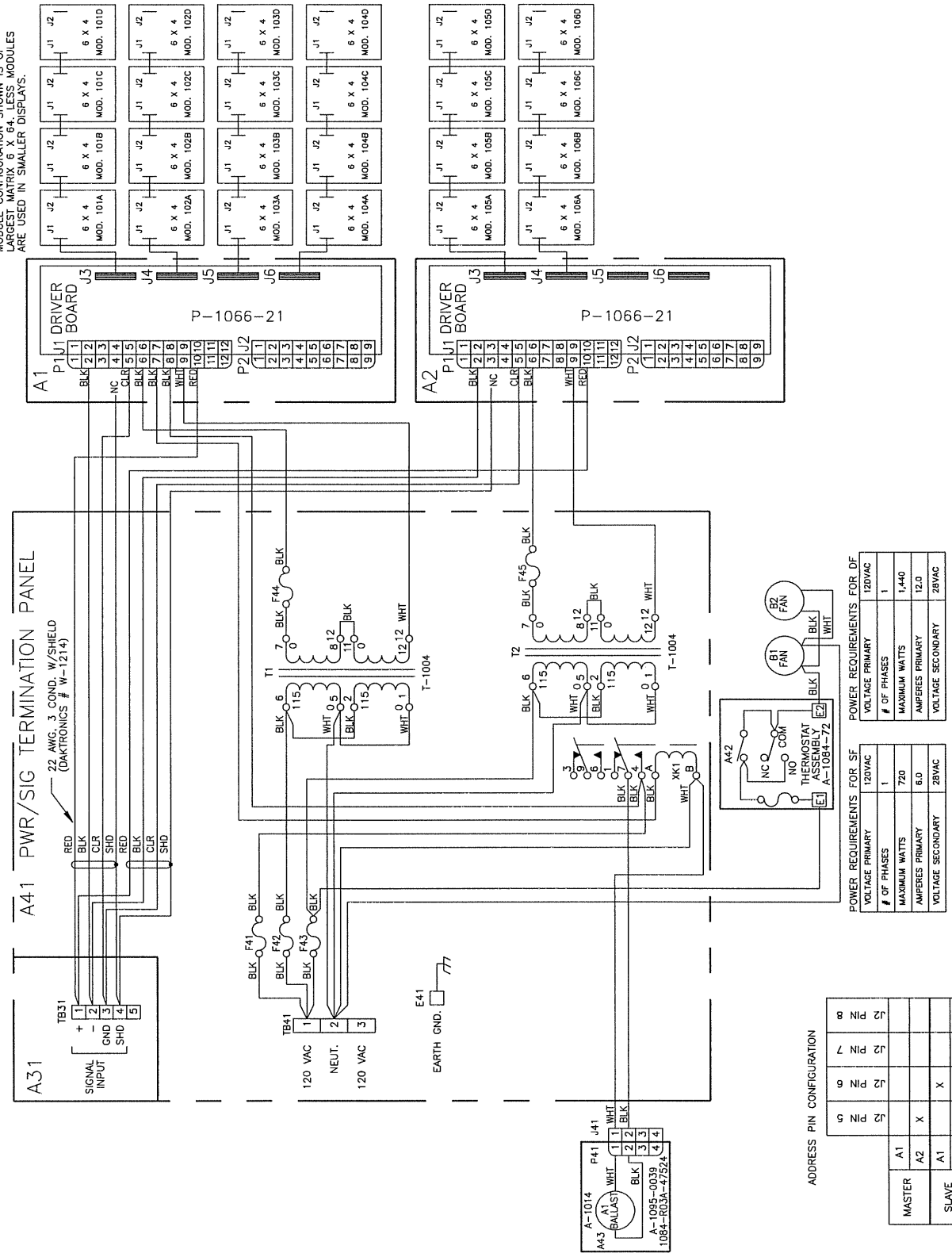
DES. BY: TSCHRETER DRAWN BY: TSCHRETER DATE: 18FEB92

REVISION APPR. BY: 1083-R03A-50294

SCALE: 1 = 1

REV.	DATE	DESCRIPTION	BY	APPR.
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MODULE CONFIGURATION SHOWN IS OF LARGEST MATRIX 6 X 84. SMALLER MODULES ARE USED IN SMALLER DISPLAYS.



NOTE:
ALL WIRE IS 18 AWG UNLESS OTHERWISE NOTED.
ALL FUSES ARE MDX-5, 5 AMP FUSE (DAK. F-1021).

ADDRESS PIN CONFIGURATION

MASTER	A1								
SLAVE	A2	X	X	X	X	X	X	X	X

X DENOTES TERMINATION TO J2 PIN 9 (GND).

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: DAKTRONICS, LINE DISPLAYS

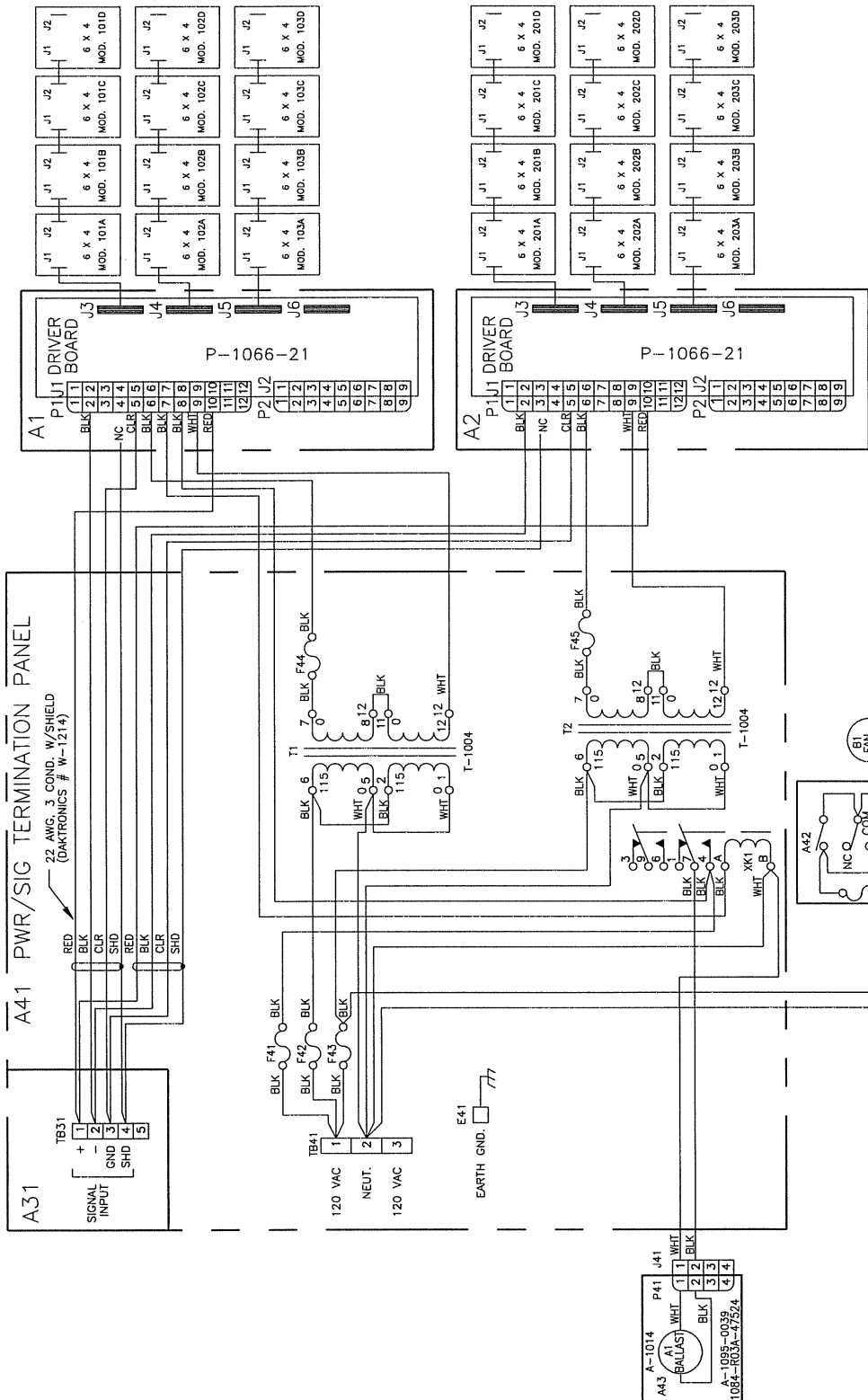
TITLE: SCHEM. 1-680 TO 696-15GOC-SF, DF

DES. BY: T.SCHRETER DRAWN BY: TSCHRETER DATE: 18FEB92

REVISION APPR. BY: SCALE: 1 = 1

1083-R03A-50295

REV.	DATE	DESCRIPTION	BY	APPR.
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POWER REQUIREMENTS FOR SF

VOLTAGE PRIMARY	120VAC
# OF PHASES	1
MAXIMUM WATTS	720
AMPERES PRIMARY	6.0
VOLTAGE SECONDARY	28VAC

POWER REQUIREMENTS FOR DF

VOLTAGE PRIMARY	120VAC
# OF PHASES	1
MAXIMUM WATTS	1,440
AMPERES PRIMARY	12.0
VOLTAGE SECONDARY	28VAC

NOTE:
 ALL WIRE IS 18 AWG UNLESS OTHERWISE NOTED.
 ALL FUSES ARE MDX-5, 5 AMP FUSE (DAK. F-1021).

ADDRESS PIN CONFIGURATION

MASTER	A1				
SLAVE	A1	X	X	X	X

"X" DENOTES TERMINATION TO J2 PIN 9 (GND).

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: DAKTRONICS, LINE DISPLAYS

TITLE: SCHEM 2-648-15GOC-SF, DF

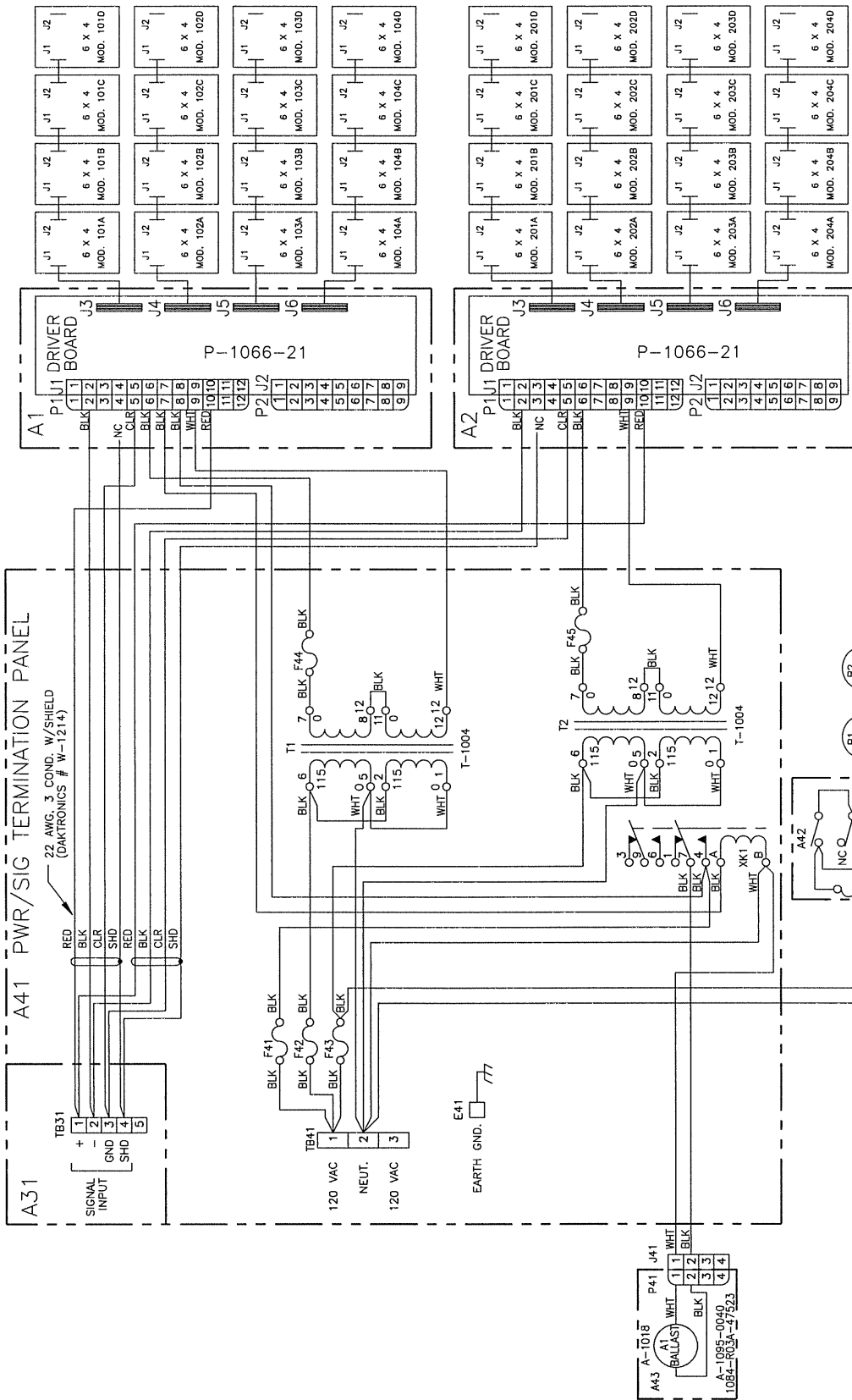
DES. BY: TSCHRETER DRAWN BY: TSCHRETER DATE: 18FEB92

REVISION APPR. BY: SCALE: 1 = 1

1083-R03A-50297

REV.	DATE	DESCRIPTION	BY	APPR.

A41 PWR/SIG TERMINATION PANEL



POWER REQUIREMENTS FOR SF

VOLTAGE PRIMARY	120VAC
# OF PHASES	1
MAXIMUM WATTS	840
AMPERES PRIMARY	7
VOLTAGE SECONDARY	28VAC

POWER REQUIREMENTS FOR DF

VOLTAGE PRIMARY	120VAC
# OF PHASES	1
MAXIMUM WATTS	1,680
AMPERES PRIMARY	14
VOLTAGE SECONDARY	28VAC

NOTE:
ALL WIRE IS 18 AWG UNLESS OTHERWISE NOTED.
ALL FUSES ARE MDX-5, 5 AMP FUSE (DAK. F-1021).

ADDRESS PIN CONFIGURATION

	J2 PIN 8			
	J2 PIN 7			
	J2 PIN 6			
	J2 PIN 5			
MASTER	A1	X		
SLAVE	A2	X	X	X

"X" DENOTES TERMINATION TO J2 PIN 9 (GND).

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: DAKTRONICS, LINE DISPLAYS

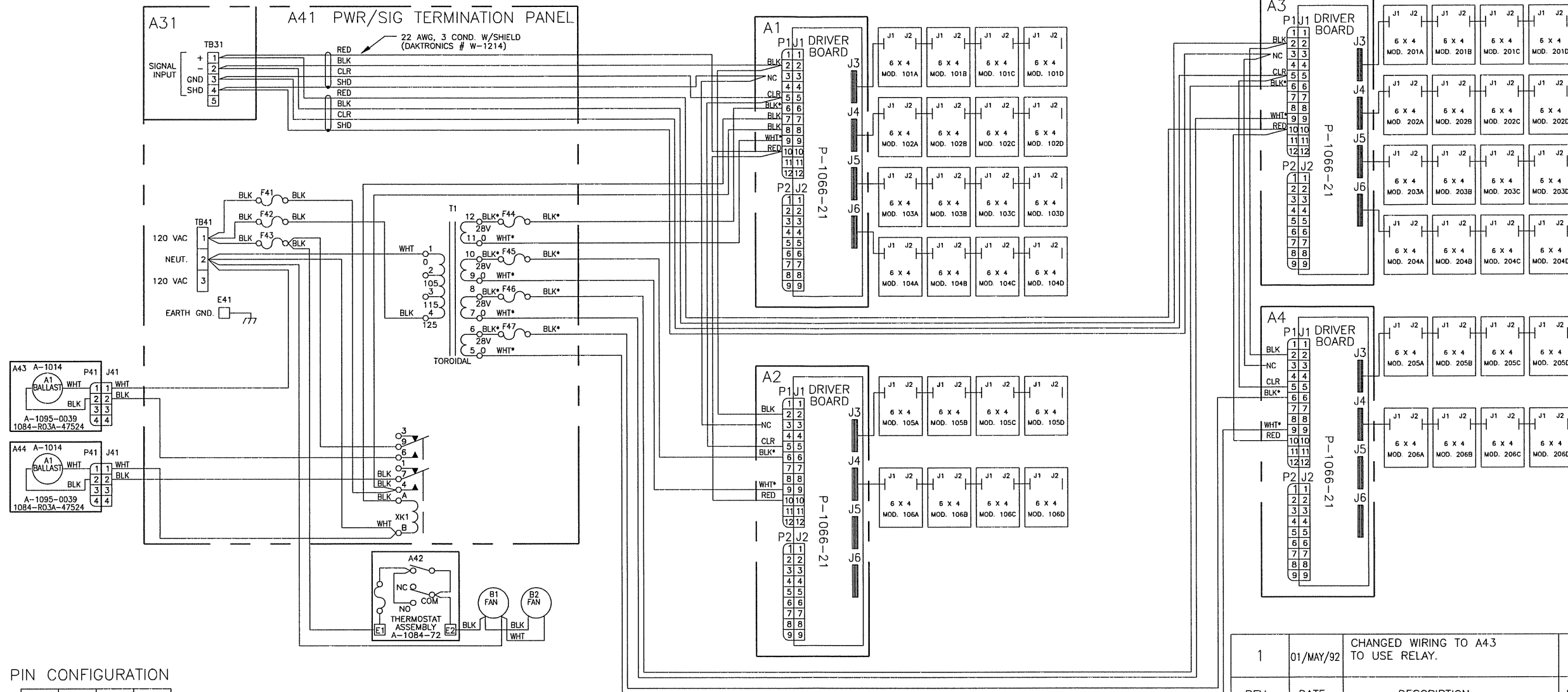
TITLE: SCHEM 2-664-15GOC-SF, DF

DES. BY: TSCHRETER DRAWN BY: TSCHRETER DATE: 18FEB92

REVISION APPR. BY: SCALE: 1 = 1

1083-R03A-50298

REV.	DATE	DESCRIPTION	BY	APPR.
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1	01/MAY/92	CHANGED WIRING TO A43 TO USE RELAY.	TJS	
REV.	DATE	DESCRIPTION	MADE	APPR.

DAKTRONICS, INC.
 BROOKINGS, SOUTH DAKOTA 57006

DAKTRONICS, LINE DISPLAYS

SCHEM. 2-696-15GOC-SF, DF

DRAWING NUMBER: 1083-R03B-50300 SCALE: 1 = 1

DESIGNED: TSCHRETER DRAWN: TSCHRETER
 DATE: 18FEB92 DATE: 18FEB92

CHECKED: DATE: APPROVED: DATE:

ADDRESS PIN CONFIGURATION

		J2 PIN 5	J2 PIN 6	J2 PIN 7	J2 PIN 8
MASTER	A1				
	A2	X			
	A3		X		
	A4	X	X		
SLAVE	A1			X	
	A2	X		X	
	A3		X	X	
	A4	X	X	X	

"X" DENOTES TERMINATION TO J2 PIN 9 (GND).

NOTE:
 ALL WIRE IS 18 AWG EXCEPT * IS 14 AWG.
 F41 - F43 ARE MDA-6, 6 AMP FUSE (DAK. F-1023).
 ALL OTHER FUSES ARE ACG 10, 10 AMP (DAK. F-1006).

POWER REQUIREMENTS FOR SF

VOLTAGE PRIMARY	120VAC
# OF PHASES	1
MAXIMUM WATTS	1,320
AMPERES PRIMARY	11.0
VOLTAGE SECONDARY	28VAC

POWER REQUIREMENTS FOR DF

VOLTAGE PRIMARY	120VAC
# OF PHASES	1
MAXIMUM WATTS	2,640
AMPERES PRIMARY	22.0
VOLTAGE SECONDARY	28VAC