



CH-1421-H and CH-1521-H

Installation & Service Manual

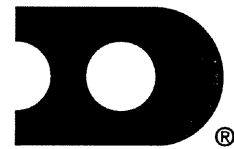
ED-4765

ED-4765

Product#1081

Rev. 11 - 28July98

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DAKTRONICS, INC.

Setting New Standards Worldwide

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Section1: Introduction

Reference Drawing: Display, CH-1421-H & CH-1521-H **Drawing A-101804**

This manual covers installation of the CH-1421-H and CH-1521-H scoring displays. It includes information for servicing the digits, wiring, and basic information about power consumption. Setup and operation of control equipment are not covered in this manual. For questions regarding the safety, installation, operation, or service of this system, please refer to the telephone numbers listed on the cover page of this manual. For display layouts, refer to **Drawing A-101804**.

The following table shows the approximate weights of the individual sections of the CH-1421-H and CH-1521-H display, as well as the maximum power requirement of each section:

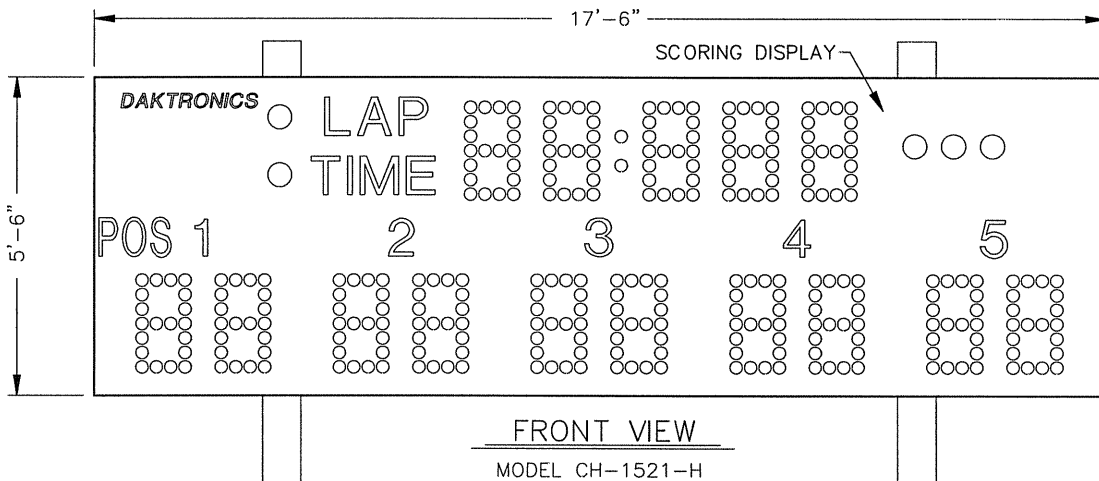
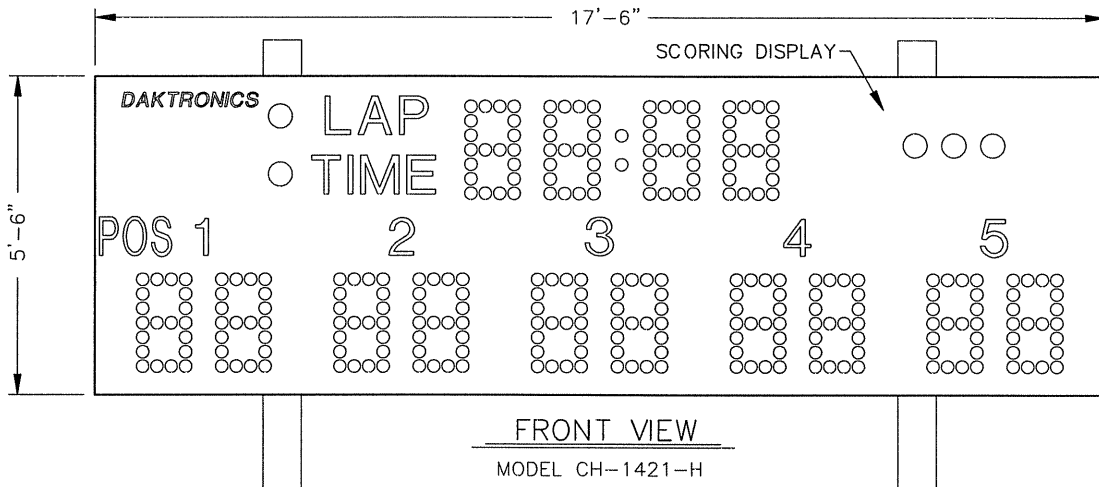
Section	Uncrated Weight	Crated Weight	Amp	
			L1	L2
CH-1421-H	450 lbs.	800 lbs.	40	33
CH-1521-H	450 lbs.	825 lbs.	40	38

Important Safeguards:

1. Read and understand these instructions before installing.
2. Do not drop the control console or allow it to get wet.
3. Be sure that the display is properly grounded with a ground rod at the display location.
4. **Disconnect power to the display when it is not in use.**
5. **Disconnect power when servicing the display.**
6. Do not modify the display structure or attach any panels or coverings to the display without the express written consent of Daktronics, Inc.

The box below illustrates Daktronics drawing numbering system. Daktronics identifies individual drawings by drawing number (7087-P08A-69945, below), located in the title box in the lower right corner of the drawing. The manual refers to drawings by the last set of digits and the letter preceding them. The example below shows **Drawing A-69945**. Reference drawings are inserted at the end of each section.

DAKTRONICS, INC. BROOKINGS, SD 57006	
PROJ.	
TITLE:	
DES. BY:	DRAWN BY: DOK DATE: 04-20-95
APPR. BY:	7087-P08A-69945
SCALE: 1=80	



NOTES:

- OVERALL DIMENSIONS FOR SCORING DISPLAY:
66"H X 210"W X 6"D.
- DIGITS ARE 21" HIGH, 4X7 LAMP MATRICES.
DIGIT LAMPS ARE 25W FROSTED, MEDIUM BASE.
- LAP/TIME INDICATOR LAMPS ARE 30W REFLECTOR LAMPS.
- STATUS INDICATOR LAMPS ARE 85W-MISER FLOOD LAMPS.
- DIGITS MAY BE ORDERED WITH OPTIONAL 30W REFLECTOR, TYPE 30R20 LAMPS.

DAKTRONICS, INC. BROOKINGS, SD 57006	
PROJ: DAKTRONICS RACING DISPLAYS	
TITLE: DISPLAY, CH-1421-H & CH-1521-H	
DES. BY: T WEBER	DATE: 16 APR 98
REVISION	DRAWN BY: T WEBER
APPR. BY:	SCALE: 1=35
1081-R08A-101804	

REV.	DATE	DESCRIPTION	BY	APPR.

Section 2: Mechanical & Electrical Installation

2.1 Mechanical Installation

Reference Drawing: Beam Spacing, CH-1421 / CH-1521-H **Drawing A-38857**

Table 1 contains recommendations for beams and footings. The distance in the first column is from the ground to the bottom of the display, regardless of which sections your display is comprised. The second column is wind velocities that are likely to occur at the display location in miles per hour.

The beams listed are W-section (wide flange) beams which provide maximum wind load strength for the weight and cost of the beams. Decide how high you want your display and what sort of wind it will be subject to. Read across the table to the appropriate column for your display, these are the beams and footings that are recommended. **Drawing 38857** shows a typical installation of beams and footings.

The calculations for footing diameters and depths are based on the assumption that footings are in undisturbed soils, NOT FILL SOILS. Lateral bearing capacity of 300 psf/ft of depth horizontally. However, these recommendations are suggestions only and each installation complies with local codes and is suitable for your particular soil and wind conditions. Daktronics recommends that W-section grade 36 steel be used for beams, and that 28-day (strength 3000 psi) concrete be used for footings.

❖ **Daktronics assumes no responsibility for structures installed by others.** ❖

2.2 Display Mounting

Reference Drawing: Mounting Instructions, CH-1421 / CH-1521-H **Drawing A-38856**

The following table shows the approximate weights of the individual sections of the CH-1421-H and CH-1521-H displays. Use caution when lifting and mounting these displays.

Section	Uncrated Weight	Crated Weight
CH-1421-H	450 lbs	800 lbs
CH-1521-H	450 lbs	825 lbs

Drawing A-38856 shows the mounting procedure typical for the scoring display sections.

✓ **NOTE:** The bolts that secure the display sections do not go through the beams, but run along both sides of the beam to clamp the display to the beams.

A mounting kit is sent with each section, containing mounting angles and ½" hardware for securing that section to two beams.

Position the display section and secure the bottom of the section to both beams as shown in **Drawing A-38856**. Next, secure the top of the section.

Once mounting angles are attached, the display may be slid up or down to the desired height. When positioned as desired, tighten all bolts.

If other sections are used, position the other sections as desired and secure them in the same manner. The following table lists beam and footing recommendations for both CH-1421-H and CH-1521-H displays:

Table 1: Beam and Footing Recommendations

Scoreboard				
DIST TO BOTTOM OF SCBD (FT)	DESIGN WIND VELOCITY (MPH)	BEAM REQUIRED (2 EACH)	Footings	
			DIAM (FT)	DEPTH (FT)
8		W6X12	3.00	5.00
12		W6X15.5	3.25	5.50
16		W6X20	3.50	6.50
20	80	W8X24	4.50	6.50
24		W8X28	4.50	7.00
28		W8X35	5.00	7.50
8		W6X15.5	3.00	5.50
12		W6X16	3.50	6.00
16		W8X20	4.00	7.00
20	90	W8X24	4.25	7.50
24		W8X28	4.25	8.00
28		W8X35	5.50	8.00
8		W6X15.5	3.00	6.00
12		W8X17	3.50	6.50
16		W8X24	4.25	7.50
20	100	W8X28	4.50	8.00
24		W8X35	4.75	8.50
28		W12X53	5.25	9.00

These footing recommendations are based on an allowable soil bearing pressure of 3000 psf vertically and 300 psf/ft of depth horizontally. However, these recommendations are suggestions only, and each installation should be treated individually. You must be sure that your installation complies with local codes and is suitable for your particular soil and wind conditions.

❖ **Daktronics assumes no responsibility for structures installed by others.** ❖

☞ **Information given is only for estimating purposes. Columns and footings must be designed by a state-licensed engineer. Daktronics assumes no liability for any installations derived from this information or for installations designed and installed by others.**

2.3 Electrical Installation

2.3.1 Control Signal Cable Selection

Reference Drawing: Sys Layout, CH-1421 / CH-1521-H **Drawing A-101822**

For a scoring system alone, two conductors of 22 AWG minimum are required. Daktronics has the following cable available: Daktronics part no. W-1077 (Belden part no. 8451). This is a two conductor, 22 AWG cable that must be pulled through conduit.

Refer to **Drawing A-101822** for an illustration of the system layout.

2.3.2 Control Signal Connection

Reference Drawings: Driver Enclosure, Power & Signal . . **Drawing A-37915**
 Comp Locations, CH-1421 / CH-1521 **Drawing A-38854**
 Color Code, 25-pin, J-box **Drawing A-47207**

At the control end of the cables, mount the signal J-box to a convenient location. Connect the wires to the wires leading from the connector in the cover of the scoring display J-box, as shown on **Drawing A-47207**.

Route signal cables to the display location. Open the hinged access door on the scoring display, as shown on **Drawing A-38854**. Remove the cover from the driver enclosure. Refer to **Drawing A-37915** for an illustration of the components inside the enclosure. Connect the signal wires to TB31 as indicated in the table below.

Signal Connections

CONTROL END			DISPLAY END
J-BOX TERMINAL NO.	WIRE COLOR	OUTPUT NO.	TB31 TERMINAL NO.
14	RED/WHT	1*	1 (+)
15	GRN/WHT		2 (-)

*Auxiliary display(s) require(s) a different output no.(s). Consult the CHTS-300 console manual.

2.3.3 Power Wiring

Reference Drawings: System Layout **Drawing A-101822**
 Power Wiring and Grounding **Drawing A-101825**

The display requires that four hot wires, two neutrals, and a separate earth-ground conductor be run into a load center from the electrical source. The load center is mounted on the support pole by others. The power demands for each display are listed in the table below.

Model	Maximum Power Demand	Amps	
		L1	L2
CH-1421-H	8775 Watts	40	33

Model	Maximum Power Demand	Amps	
		L1	L2
CH-1421-H	8775 Watts	40	33
CH-1521-H	9375 Watts	40	38

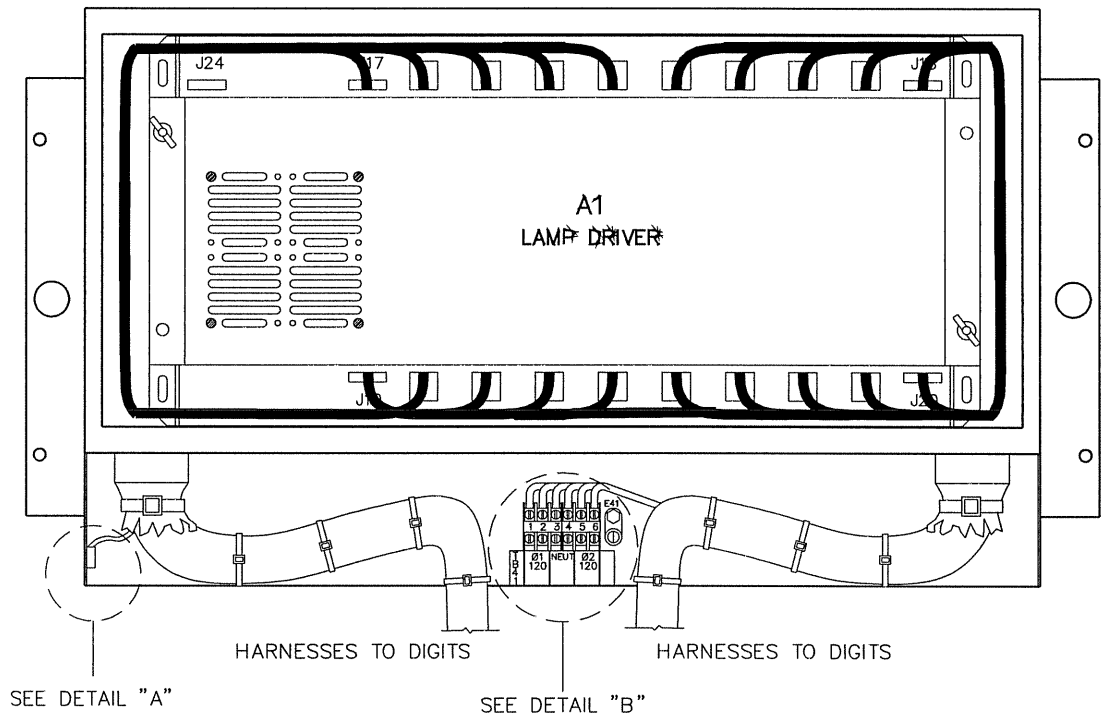
Consult a qualified electrician to run the proper size of wire from your electrical source to the display location.

☞ **If your system does not include a message center**, install a lockable safety disconnect and load center on the poles of the display. A three-conductor disconnect is recommended for proper protection from lightning strikes (refer to **Drawing A-101825**). Install a copper ground rod by each of the support poles for the display.

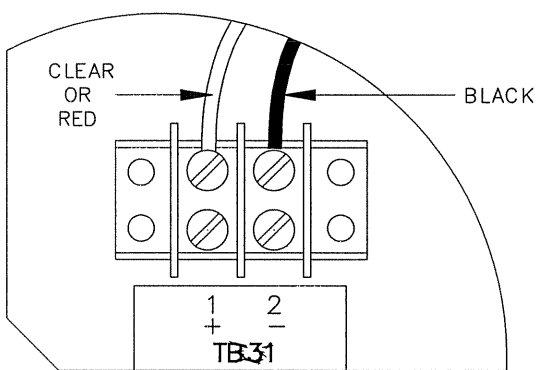
☞ **The display must be connected to earth ground at the display location.** This is in addition to the separate earth-ground conductor in the power cable.

Route four "hot," two "neutral," and one "ground" wire, 12 AWG minimum, through conduit from the load center to the driver enclosure in the scoring display. Refer to **Drawing A-101822** for component location. Connect the ground wire to terminal E41. Connect the two neutral wires to TB41-3 and TB41-4 inside the driver enclosure of the scoring display. Connect the hot wires to the load center and scoring display as listed below.

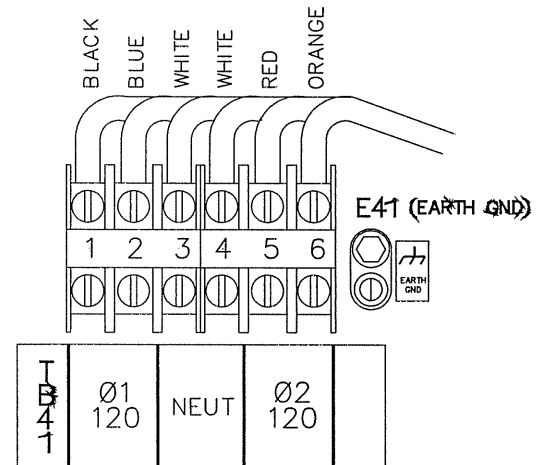
Load Center Breaker Label	Scoring Display Term. No.
TB401-1	TB41-1
TB401-2	TB41-2
TB401-5	TB41-5
TB401-6	TB41-6



FRONT VIEW (COVER REMOVED)



D
A
DETAIL "A" (SIGNAL)



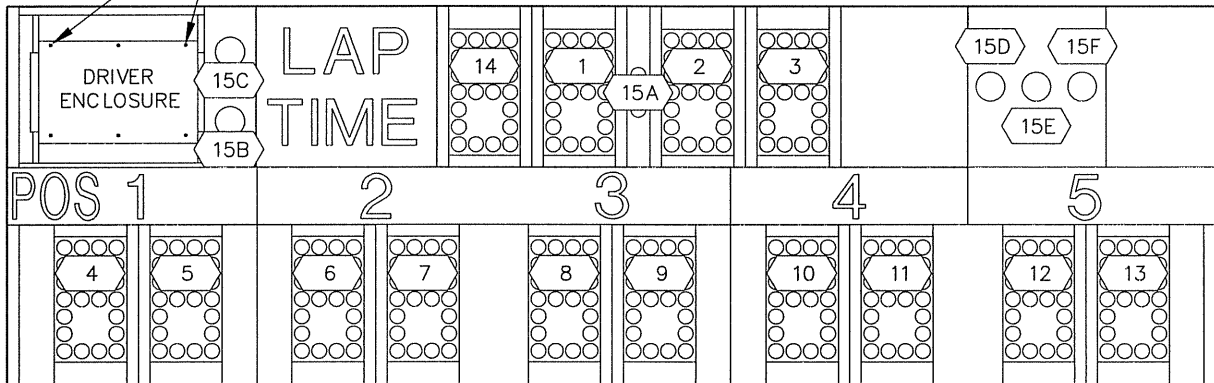
D
B
DETAIL "B" (POWER)

DAKTRONICS, INC. BROOKINGS, SD 57006			
PROJ: CHRONDEK DISPLAYS			
TITLE: DRIVER ENCLOSURE, POWER & SIGNAL			
DES. BY: T. WOODARD		DRAWN BY: T. WOODARD	
DATE: 10 MAY 89			
REVISION	APPR. BY:	1081-R08A-37915	
	SCALE: 1=5		

1	8 MAR 91	ADDED E41 AND CHANGED FROM "B" TO "A" SIZE DWG.	CF	CF
REV.	DATE	DESCRIPTION	BY	APPR.

ACCESS DOOR REMOVED TO SHOW ENCLOSED DRIVER LOCATION.

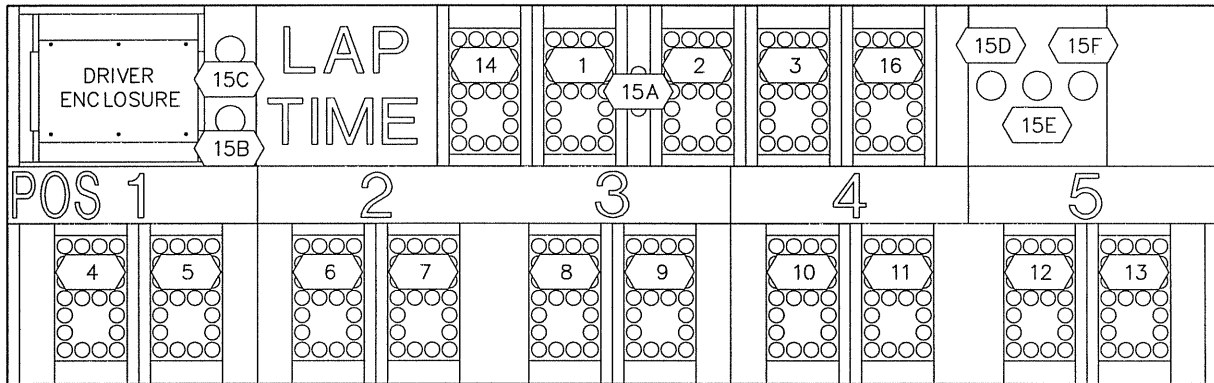
REMOVE (6) SCREWS TO ACCESS DRIVER AND POWER & SIGNAL ENTRANCE COMPONENTS.



FRONT VIEW


MODEL CH-1421-H


TO GAIN ACCESS TO DRIVER ENCLOSURE, REMOVE THE THREE SCREWS AT THE BOTTOM OF THE ACCESS DOOR LOCATED AT THE TOP LEFT CORNER OF THE DISPLAY.



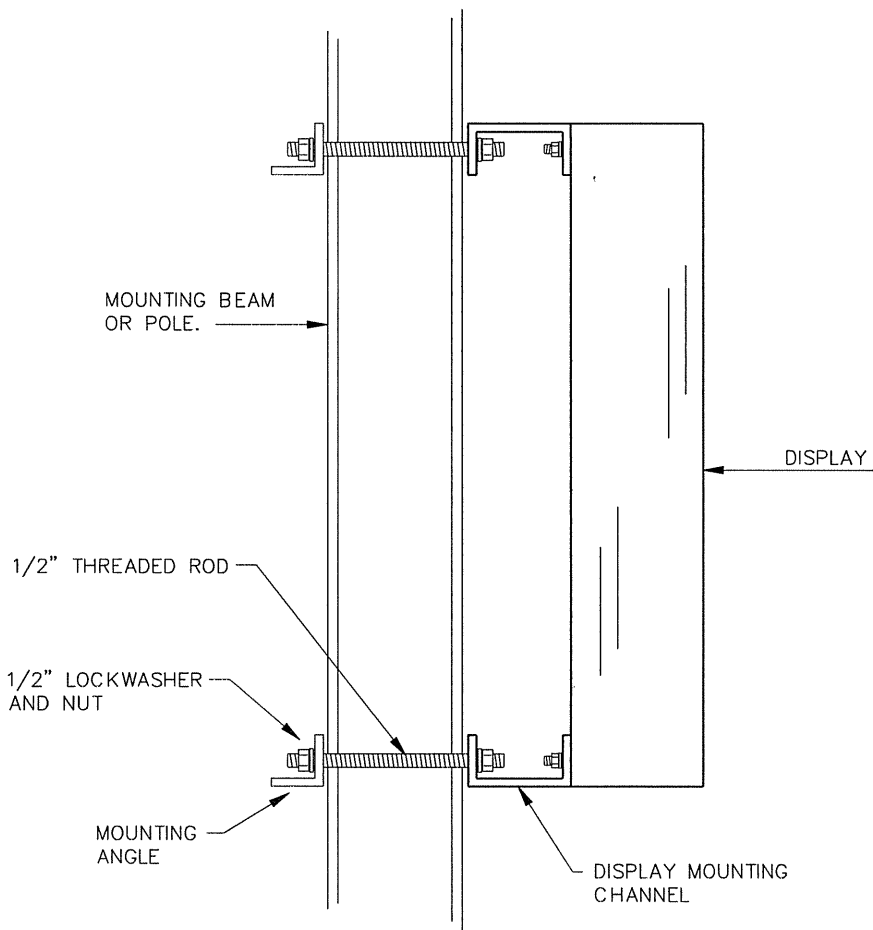
FRONT VIEW

MODEL CH-1521-H

 = LAMP DRIVER CONNECTOR WHICH DIGIT OR INDICATOR IS CONNECTED.

 = LAMP DRIVER CONNECTOR AND PIN (SEGMENT) NO. WHICH THE INDICATOR IS CONNECTED TO.

4	16APR98	CHANGED MODEL NO. CH-1421-GP TO CH-1421-H AND ADDED MODEL CH-1521-H.	TWEBER	DAKTRONICS, INC. BROOKINGS, SD 57006	
3	10 JUN 92	CHANGED FROM "B" TO "A" SIZE DWG. CHANGED MODEL NO. "CH-21GP" TO "CH-1421GP" IN DWG TITLE.	C FICK	PROJ: CHRONDEK	
2	9 MAY 90	CORRECTED TEXT IN SEGMENTATION DESCRIPTION.	JLH	TITLE: COMPONENT LOCATIONS, CH-1421-H & CH-1521-H	
REV.	DATE	DESCRIPTION	BY	APPR.	DES. BY: DRAWN BY: HEIDERSCHIEDT DATE: 24 JUL 89
					REVISION APPR. BY: SCALE: 1=30
					1081-R08A-38854

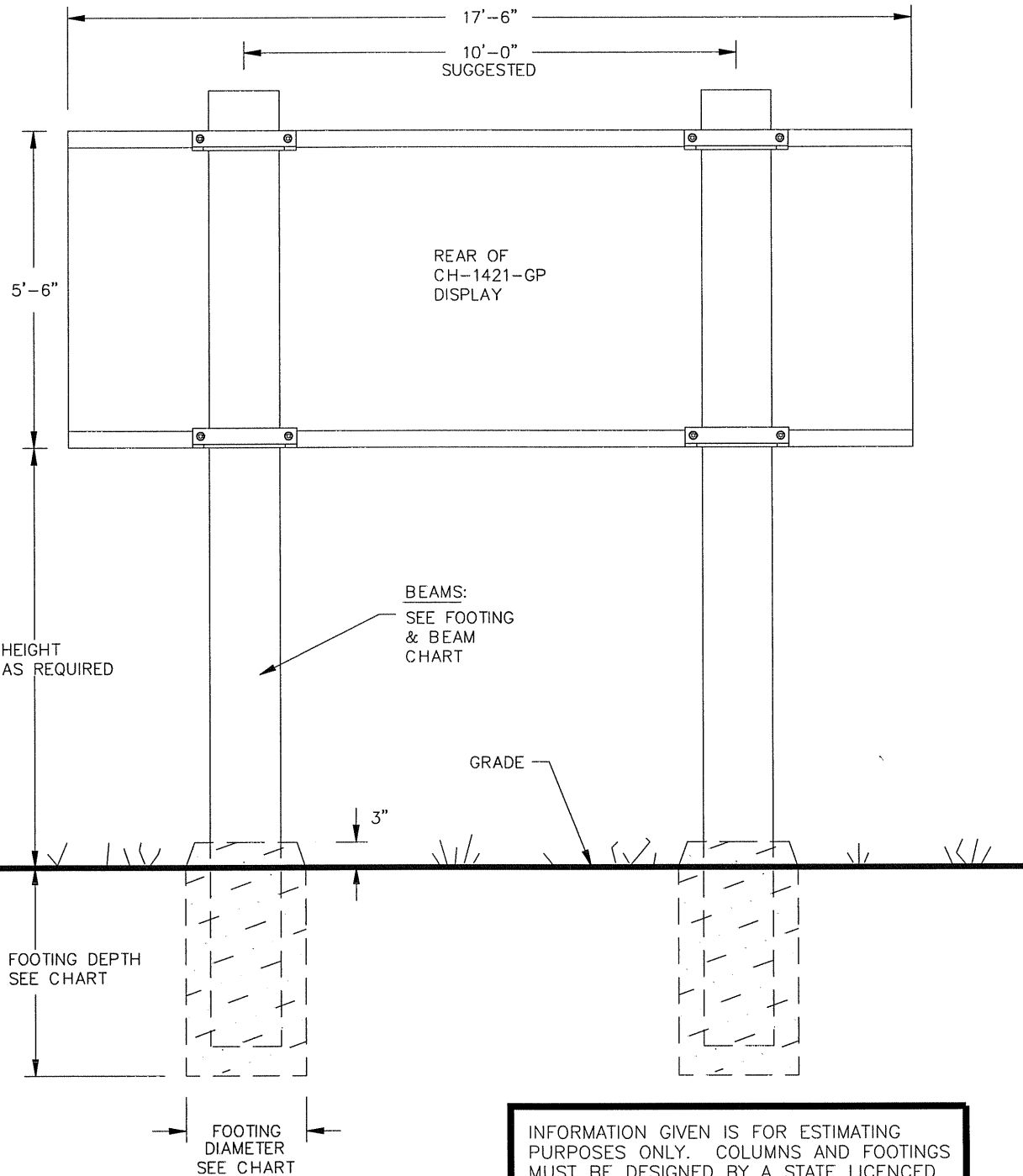


SIDE VIEW

MOUNTING INSTRUCTIONS:

- 1.) LOCATE WHERE THE CENTER OF THE BEAMS WILL BE ON THE BACK OF THE DISPLAY.
- 2.) DRILL $9/16$ " HOLES IN THE MTO CHANNEL ON THE BACK OF THE DISPLAY AT A DISTANCE OF ± 3.50 " OR 4.50 " FROM THE CENTER OF EACH BEAM.
- 3.) LIFT THE DISPLAY IN PLACE.
- 4.) ATTACH MOUNTING HARDWARE AS SHOWN ABOVE.
- 5.) DISPLAY CAN BE SLID UP OR DOWN TO THE HEIGHT REQUIRED.
- 6.) TIGHTEN ALL MOUNTING HARDWARE SECURELY.

8	16APR98	CHANGED MODEL NO. CH-1421-GP TO CH-1421-H AND ADDED MODEL NO. CH-1521-H TO TITLE BLOCK.	TWEBER		DAKTRONICS, INC. BROOKINGS, SD 57006
7	29 APR 93	REMOVED LIST OF MODELS THIS MOUNTING TYPICAL FOR.	C FICK		PROJ: CHRONDEK DISPLAYS
6	9 JUN 92	CHANGED MODEL NO. "CH-21-HSM" TO "CH-1421-GP" IN DWG TITLE.	C FICK		TITLE: MOUNTING INSTRUCTIONS, CH-1421-H & CH-1521-H
REV.	DATE	DESCRIPTION	BY	APPR.	DES. BY: JLH DRAWN BY: JLH DATE: 24 JUL 89
					REVISION APPR. BY: AVB SCALE: 1=1
					1081-R08A-38856

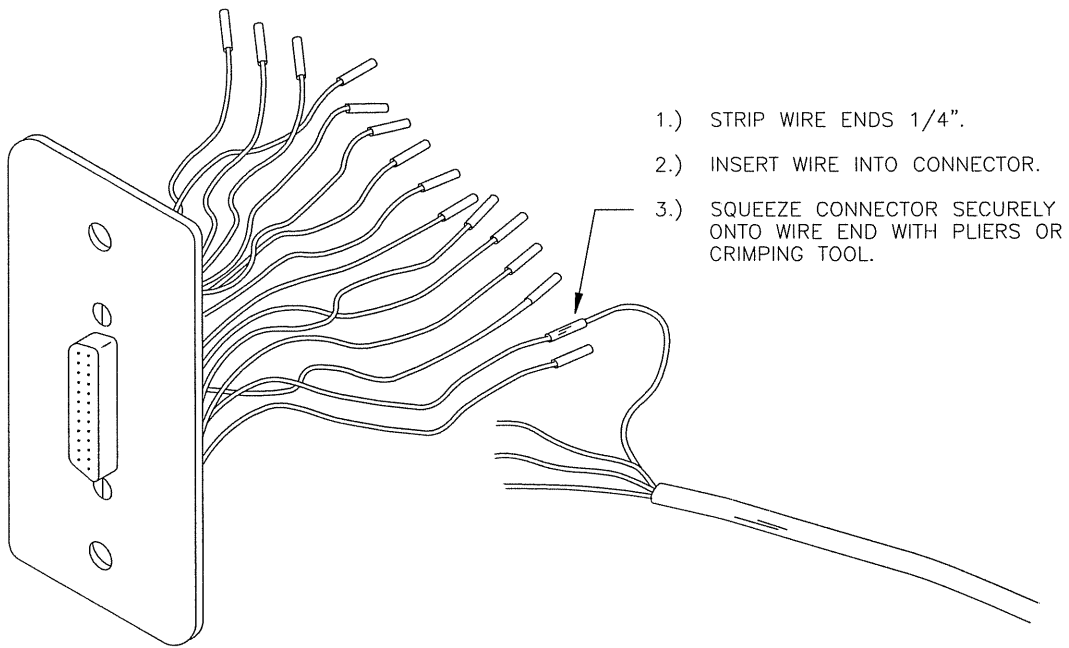


INFORMATION GIVEN IS FOR ESTIMATING PURPOSES ONLY. COLUMNS AND FOOTINGS MUST BE DESIGNED BY A STATE LICENCED ENGINEER. DAKTRONICS DOES NOT ASSUME ANY LIABILITY FOR ANY INSTALLATIONS DERIVED FROM THIS INFORMATION OR DESIGNED AND INSTALLED BY OTHERS.

DAKTRONICS, INC. BROOKINGS, SD 57006

REV.	DATE	DESCRIPTION	BY	APPR
2	15APR98	CHANGED MODEL NUMBER FROM CH-1421GP TO CH-1421-H AND ADDED MODEL NUMBER CH-1521-H	TWEBER	
1	15JUL91	CHANGED MODEL NUMBER FROM CH-21GP TO CH-1421-GP.	JLH	

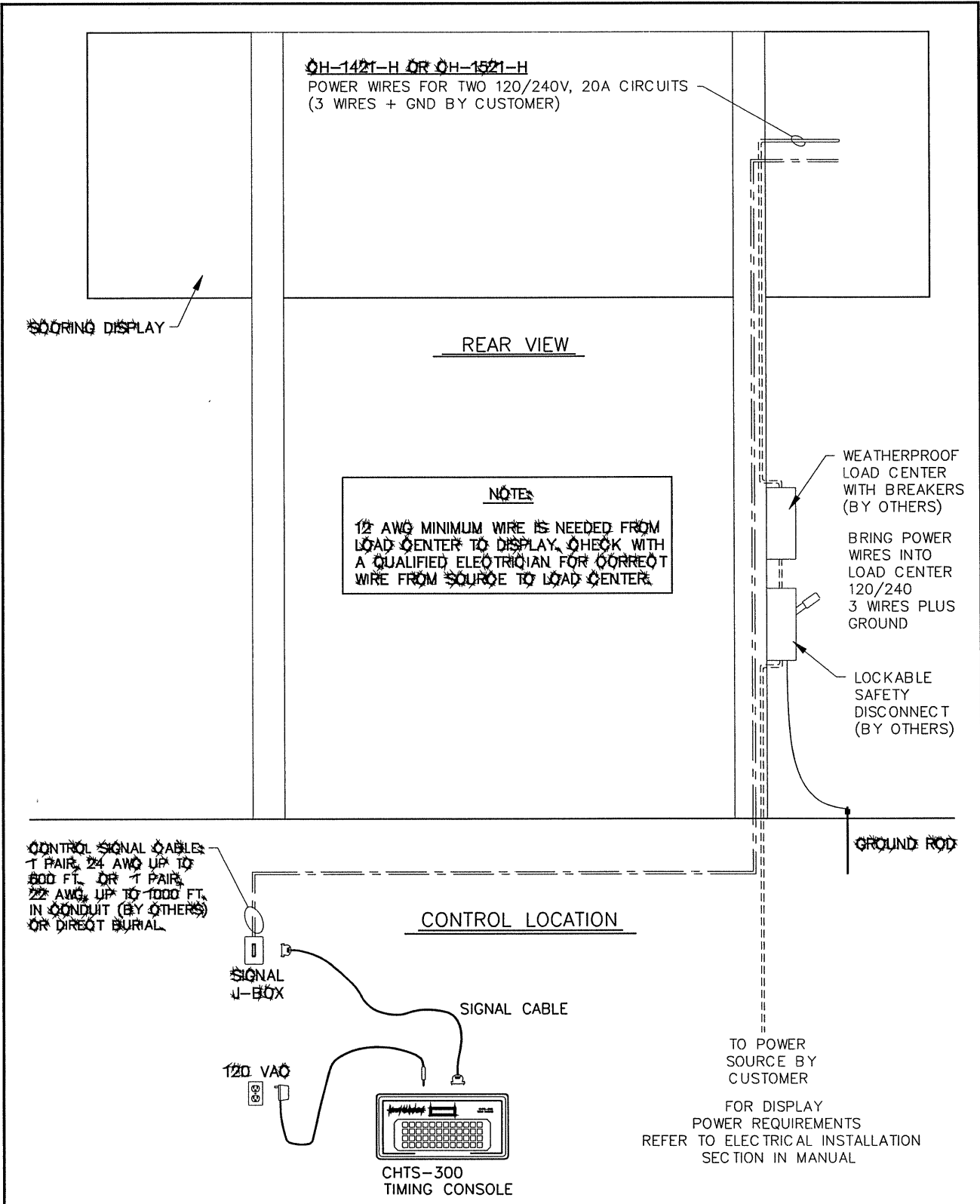
PROJ: CHRONDEK DISPLAYS	
TITLE: BEAM SPACING, CH-1421-H & CH-1521-H	
DES. BY: JHEIDERSCHIEDT DRAWN BY: JHEIDERSCHIEDT DATE: 24JUL89	
REVISION	APPR. BY: AVB
SCALE: NONE	1081-R08A-38857



- 1.) STRIP WIRE ENDS 1/4".
- 2.) INSERT WIRE INTO CONNECTOR.
- 3.) SQUEEZE CONNECTOR SECURELY ONTO WIRE END WITH PLIERS OR CRIMPING TOOL.

PIN NO.	WIRE COLOR	FUNCTION	
1	BLACK	PHOTO 1-N	PHOTOCELL POWER INPUTS
2	WHITE	PWR 1-P	
3	RED	GND 1-N	
4	GREEN	PHOTO 2-N	
5	ORANGE	PWR 2-P	
6	BLUE	GND 2-N	
7	WHITE/BLACK	PHOTO 3-N	
8	RED/BLACK	PWR 3-P	
9	GREEN/BLACK	GND 3-N	
10	ORANGE/BLACK	PHOTO 4-N	
11	BLUE/BLACK	PWR 4-P	
12	BLACK/WHITE	GND 4-N	
14	RED/WHITE	1 SIG-P	SCOREBOARD SIGNAL OUTPUTS
15	GREEN/WHITE	1 SIG-N	
16	BLUE/WHITE	2 SIG-P	
17	BLACK/RED	2 SIG-N	
18	WHITE/RED	3 SIG-P	
19	ORANGE/RED	3 SIG-N	
22	BLUE/RED	4 SIG-P	
23	RED/GREEN	4 SIG-N	
13	ORANGE/GREEN	NOT USED	THESE PINS TYPICALLY NOT USED BY CHTS TIMER
20	BLK/WHT/RED	NOT USED	
21	WHT/BLK/RED	NOT USED	
24	RED/BLK/WHT	12 VAC	
25	GRN/BLK/WHT	12 VAC	

DAKTRONICS, INC. BROOKINGS, SD 57006				
PROJ: CHRONDEK				
TITLE: COLOR CODE, 25-PIN J-BOX				
DES. BY: CF		DRAWN BY: CF		DATE: 1 MAY 91
REVISION	APPR. BY: AVB	1067-R10A-47207		
	SCALE: 1=2			
2	10MAR97	ADDED WIRES TO PINS 13,20,21,24,25	EB	
1	4 JUN 92	CHANGED "SIGNAL INPUTS" TO "SIGNAL OUTPUTS"	C FICK	
REV.	DATE	DESCRIPTION	BY	APPR.



~~CH-1421-H OR CH-1521-H~~
 POWER WIRES FOR TWO 120/240V, 20A CIRCUITS
 (3 WIRES + GND BY CUSTOMER)

SCORING DISPLAY

REAR VIEW

NOTES

12 AWG MINIMUM WIRE IS NEEDED FROM
 LOAD CENTER TO DISPLAY. CHECK WITH
 A QUALIFIED ELECTRICIAN FOR CORRECT
 WIRE FROM SOURCE TO LOAD CENTER.

WEATHERPROOF
 LOAD CENTER
 WITH BREAKERS
 (BY OTHERS)

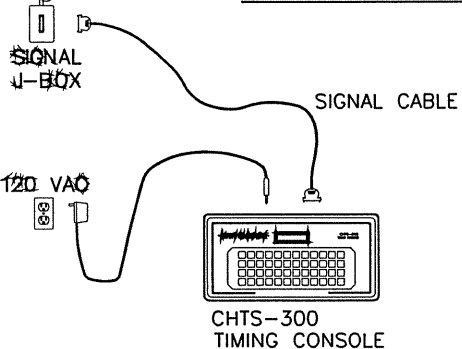
BRING POWER
 WIRES INTO
 LOAD CENTER
 120/240
 3 WIRES PLUS
 GROUND

LOCKABLE
 SAFETY
 DISCONNECT
 (BY OTHERS)

GROUND ROD

CONTROL LOCATION

CONTROL SIGNAL CABLES:
 1 PAIR, 24 AWG UP TO
 800 FT. OR 1 PAIR,
 22 AWG UP TO 1000 FT.
 IN CONDUIT (BY OTHERS)
 OR DIRECT BURIAL.



TO POWER
 SOURCE BY
 CUSTOMER

FOR DISPLAY
 POWER REQUIREMENTS
 REFER TO ELECTRICAL INSTALLATION
 SECTION IN MANUAL

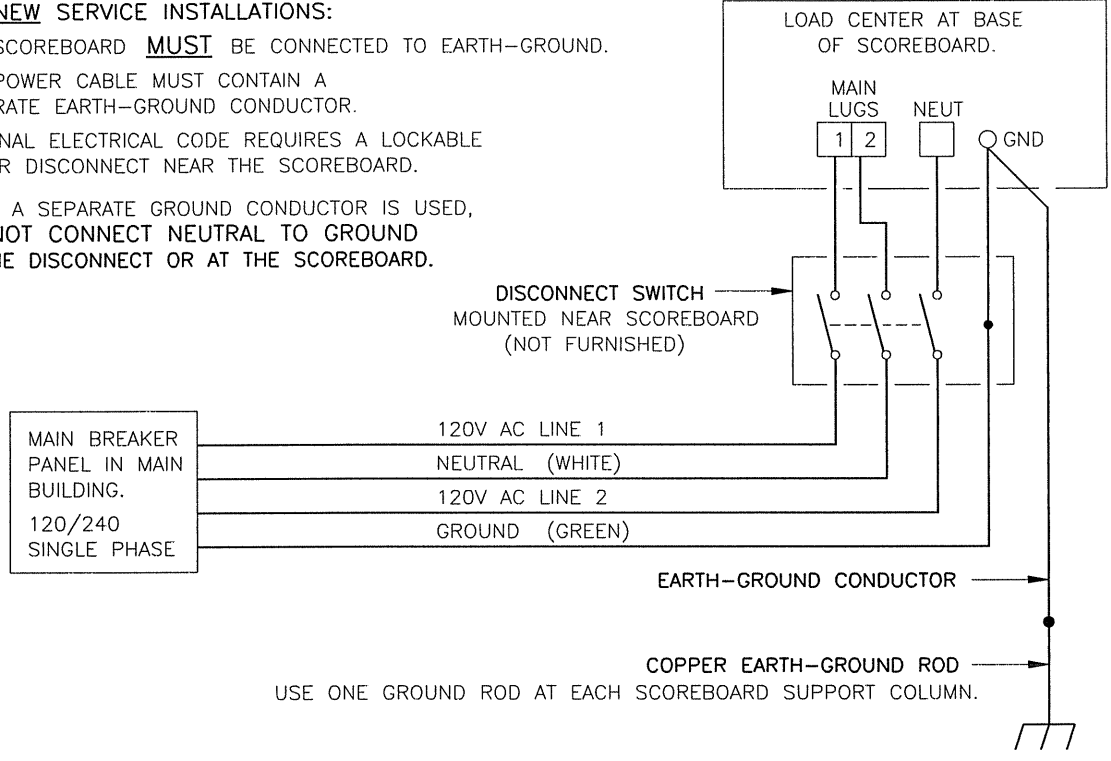
DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ.: CHRONDEK	
TITLE: SYSTEM LAYOUT CH-1421-H & 1521-H	
DES. BY: EBRAVEK	DATE: 17APR98
REVISION	APPR. BY:
SCALE: 1=32	1081-R10A-101822

1	22APR98	CORRECTED SPELLING ERROR	EB	
REV.	DATE	DESCRIPTION	BY	APPR.

FOR NEW SERVICE INSTALLATIONS:

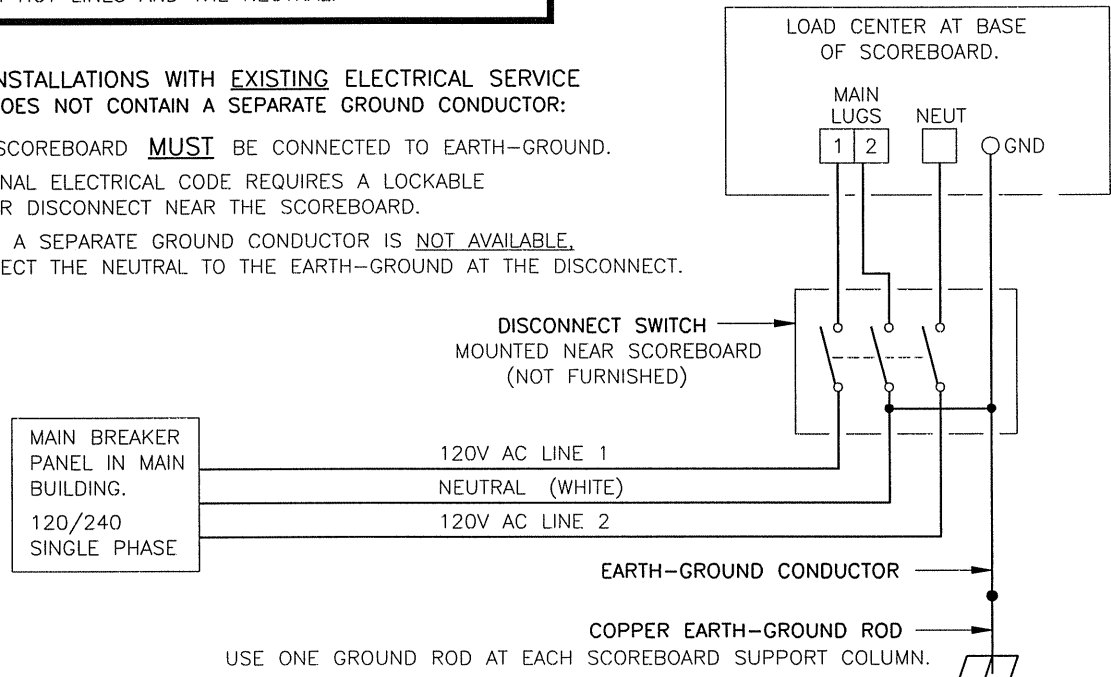
THE SCOREBOARD **MUST** BE CONNECTED TO EARTH-GROUND.
 THE POWER CABLE **MUST** CONTAIN A SEPARATE EARTH-GROUND CONDUCTOR.
 NATIONAL ELECTRICAL CODE REQUIRES A LOCKABLE POWER DISCONNECT NEAR THE SCOREBOARD.
 WHEN A SEPARATE GROUND CONDUCTOR IS USED, **DO NOT** CONNECT NEUTRAL TO GROUND AT THE DISCONNECT OR AT THE SCOREBOARD.



FOR LIGHTNING PROTECTION, DAKTRONICS RECOMMENDS A THREE-CONDUCTOR DISCONNECT THAT CAN BREAK BOTH HOT LINES AND THE NEUTRAL.

FOR INSTALLATIONS WITH EXISTING ELECTRICAL SERVICE THAT DOES NOT CONTAIN A SEPARATE GROUND CONDUCTOR:

THE SCOREBOARD **MUST** BE CONNECTED TO EARTH-GROUND.
 NATIONAL ELECTRICAL CODE REQUIRES A LOCKABLE POWER DISCONNECT NEAR THE SCOREBOARD.
 WHEN A SEPARATE GROUND CONDUCTOR IS NOT AVAILABLE, CONNECT THE NEUTRAL TO THE EARTH-GROUND AT THE DISCONNECT.



DAKTRONICS, INC. BROOKINGS, SD 57006	
PROJ: CHRONDEK	
TITLE: POWER WIRING & GROUNDING (CH-1421 & 1521-H)	
DES. BY: EBRAVEK	DATE: 17APR98
DRAWN BY: EBRAVEK	
REVISION	APPR. BY:
	SCALE: 1=1
1081-R03A-101825	

REV	DATE	DESCRIPTION	BY	APPR.

Section 3: Maintenance & Troubleshooting

This section pertains to the scoring displays only. (For service information about the message center or other scoreboard components, refer to the manual that accompanied that particular component.)

☞ Turn off power to the display at the lockable safety disconnect before servicing.

3.1 Lamp Replacement

Reference Drawing: Digit Service **Drawing A-27674**

The primary service required by the CH-1421-H and CH-1521-H display is to replace burned-out lamps. Refer to **Drawing 27674** for an illustration of how to access the digit lamps for replacement. Replacement lamps for the digits are either 120V, 25W frosted medium base or 120V, 30W reflector type 30R20. Lamps may be obtained at your local store or directly from Daktronics. The 25W frosted bulb is Daktronics part no. DS-1029, the 30W reflector lamp is Daktronics part no. DS-1126.

The Lap/Time indicators use 120V, 30W clear flood lamps, type 30R20 (Daktronics part no. DS-1126).

The Status indicators use 120V, 85W flood lamps, type 85PAR38. The Daktronics part nos. are as follows:

- Amber → DS-1184
- Green → DS-1185
- Red → DS-1186

☞ Do not use lamps larger than those originally installed in the display. Using higher power lamps will likely cause fuse failures in the display and could exceed the current levels that the display's circuits can safely handle.

3.2 Lamp Driver

Reference Drawings: Lamp Driver, 16 Col., w/Fan **Drawing A-37070**
Component Locations, CH-1421 / CH-1521 **Drawing A-38854**

In the display, the task of switching lamps on and off is performed by the lamp driver. **Drawing A-38854 (Section 2)** shows the location of the lamp driver in the display. **Drawing A-37070** is an illustration of the lamp driver and the fuses located in it. The lamp driver has 22 connectors, providing power and signal inputs and outputs to digits. The functions of these connectors are as follows:

Connector #	Function
1 - 16	Outputs to digits
17	Signal Input
18	Power input for outputs 1-8 (120V)
19	Power input for driver logic and fan (120V)
20	Power input for outputs 9-16 (120V)
24	Dim option selector

✎ Please note that, on **Drawing 38854 (Section 2)**, the numbers on the digits refer to the lamp driver output connector wired to each digit.

3.3 Digit Segmentation

Reference Drawing: Segments, 4x7 Lamp Matrix Digit **Drawing A-37685**

In a digit, certain lamps always go on and off together. These groupings of lamps are known as "segments." Each digit has eight segments, referred to by letters A through H. **Drawing A-37685** illustrates these segments and shows which connector pin and wire color are wired to which segment.

3.4 Schematic

Reference Drawings: Driver Enclosure, Power & Signal **Drawing A-37915**
Schematic; Pwr/Sig, CH-1421-H & CH-1521-**Drawing A-38788**

The schematic diagram in **Drawing A-38788** shows the power and signal inputs into the display and to the lamp driver. The component numbers correspond to those shown on **Drawing A-37915 (Section 2)**.

3.5 Troubleshooting

This section lists some symptoms that may occur with the scoreboard. For these symptoms, possible causes and corrective actions are indicated. This list does not include every possible problem, but does represent some of the more common situations that may occur.

Observed Problem	Possible Cause
One lamp won't light	<ul style="list-style-type: none"> • Burned-out lamp
Digit segment won't light	<ul style="list-style-type: none"> • Broken wire • Poor contact at driver connector • Internal driver malfunction
Entire digit won't light	<ul style="list-style-type: none"> • Broken wire (black) • Poor contact at connector, pin 7 • Fuse blown in driver
Half the display won't light	<ul style="list-style-type: none"> • Service breaker tripped • Main fuse blown • Poor contact at main power connection • P20 disconnected
Entire display won't light	<ul style="list-style-type: none"> • Power disruption • Poor signal connection • Driver logic fuse blown • Control not connected to display • P18 disconnected
Segment stays lit	<ul style="list-style-type: none"> • Broken wire behind digit • Internal driver malfunction
Garbled display	<ul style="list-style-type: none"> • Control malfunction • Internal driver malfunction

- ✓ If a problem is observed in one digit, the cause may be isolated by swapping plugs on the driver. That is, connect the plug from the digit into a different jack.
- ✓ If the same digit shows the same problem, the cause may be in the digit or wiring. If the problem moves to another digit, then the cause is probably an internal driver problem.
- ✓ Use a volt meter at driver inputs to determine if power is being supplied to the driver. An ohmmeter can be helpful in finding broken wires and bad connections. Internal electronic problems must be corrected by Daktronics or an authorized service center.

3.6 Replacement Parts

Part Name or Description	Type	Daktronics Part Number
Lamp Driver		0A-1033-0122
J-Box, Signal, 25-Pin		0A-1067-56
Fuse, Lamp Driver, 10A	AGC-10	F-1006
Fuse, Driver Logic, 1/2A	AGC - 1/2	F-1000
Digit Lamp bank, 21" 4X7		0A-1027-75
Socket, Med. Base		X-1046
Lamp, 25W Frosted		DS-1029
Lamp, 30W Reflector	30R20	DS-1126
Lamp, 85W Amber Flood	85PAR38	DS-1184
Lamp, 85W Green Flood	85PAR38	DS-1185
Lamp, 85W Red Flood	85PAR38	DS-1186

For parts not listed, or for more information about installation or service, please call Daktronics at the numbers listed in **Section 3.7**.

3.7 Unit Exchange/Replacement Procedure

Daktronics' unique exchange program offers our clients the quickest, most economical way of receiving product repairs. If a component fails, Daktronics will send the customer a replacement. The customer, in turn, sends the failed component to Daktronics. This not only saves money but decreases the time that the display is inoperable. Daktronics offers repair and return on a timely basis; in urgent situations, every attempt is made to ship by the fastest transit method available.

1. **Packaging for Return:** Package and pad the item well, so that it will not be damaged in shipment. Install electronic components, such as printed circuit boards, in an enclosure or put them in an anti-static bag before boxing.

Enclose your name and address and list all the symptoms your product is demonstrating. Please be as specific as possible.

2. **Digits and Driver Packaging Instructions:** Place digits and drivers in a static-free enclosure for return shipping. Daktronics has an antistatic convoluted foam packing available (part number PK-1135) for your use if needed. Use the shipping box (Daktronics part number PK-1006) in conjunction with the foam.
3. **Where to Send:** To return parts for service, contact your local representative prior to shipment to acquire a Return Material Authorization Number (RMA#). This will expedite the repair of your unit.

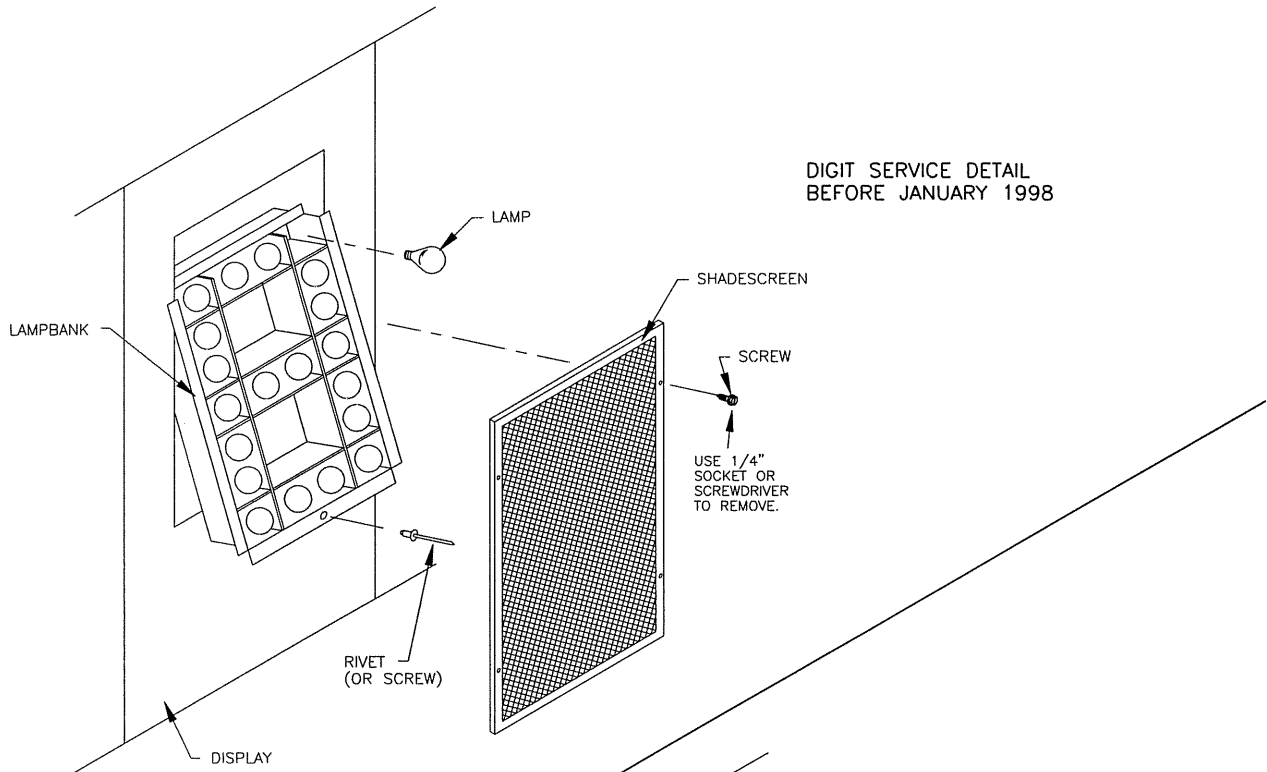
For return of defective items under the exchange program, please utilize the UPS Blue Return Tags found in the package containing the exchange unit sent from Daktronics. This speeds the transaction and also avoids any confusion when the part reaches Daktronics. ☺ **Return the defective item within 15 days of receiving a replacement part.** Using the UPS Blue Return Tag immediately eliminates the possibility of late charges being assessed against your account.

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

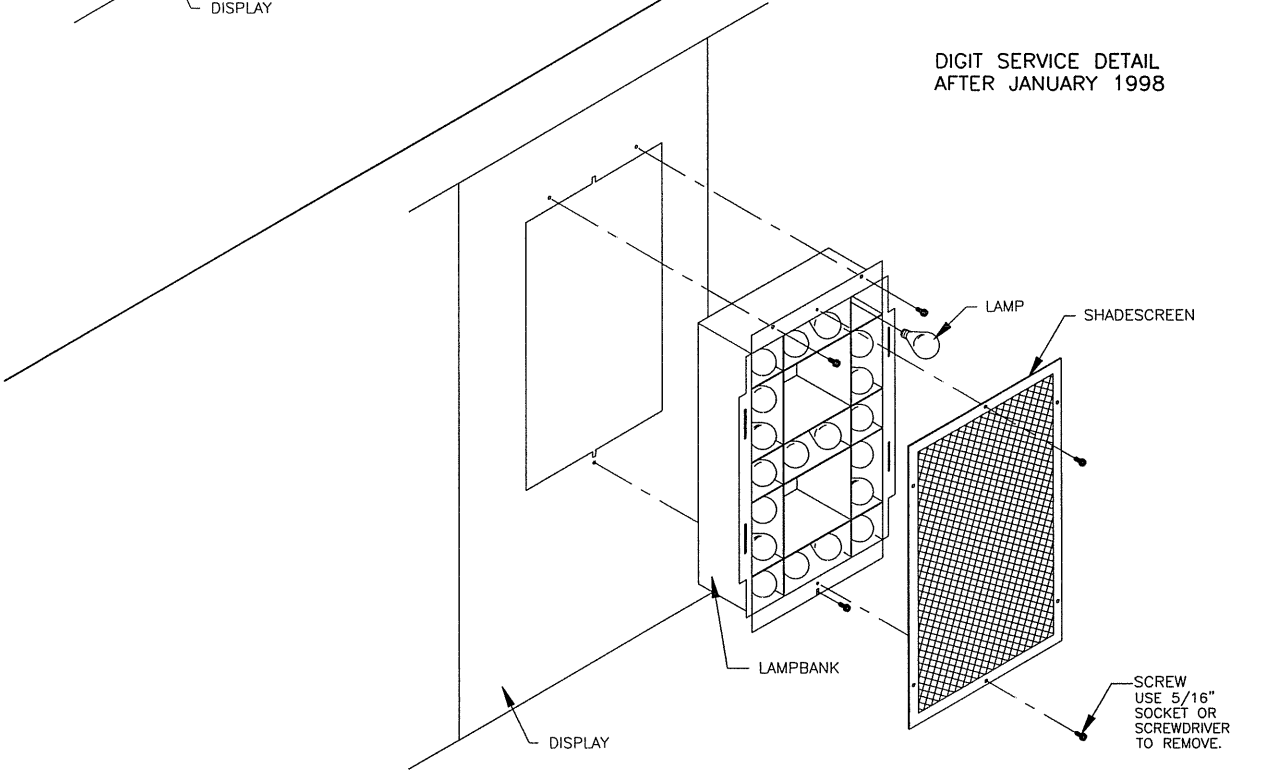
Phone: Toll Free: 1-800-843-9879
or 1-605-697-4400

Customer Service Fax: 1-605-697-4444

E-Mail: helpdesk@daktronics.com



DIGIT SERVICE DETAIL
BEFORE JANUARY 1998



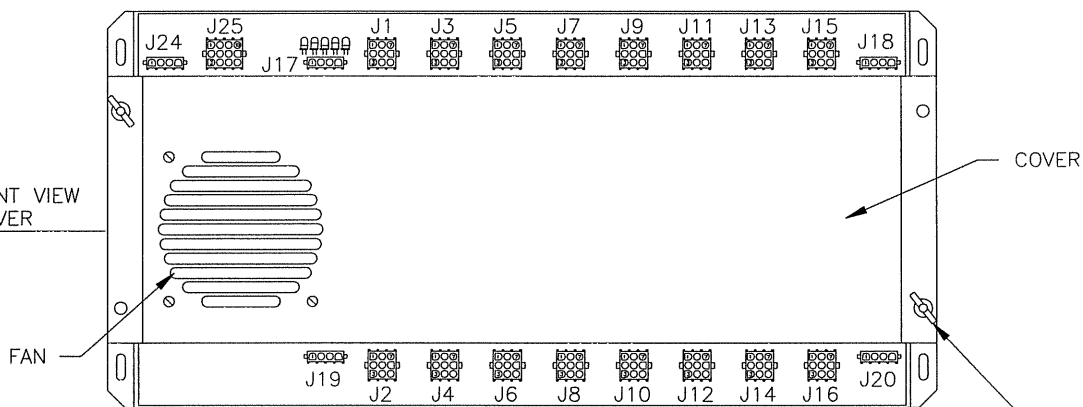
DIGIT SERVICE DETAIL
AFTER JANUARY 1998

DAKTRONICS, INC. BROOKINGS, SD 57006

REV.	DATE	DESCRIPTION	BY	APPR.
2	10NOV97	ADDED DIGIT SERVICE AFTER JANUARY 1998 CHANGED SCALE FROM 1=10 TO 1=15	BDP	
1	5 MAR 91	CHANGED FROM "B" TO "A" SIZE DWG.	CF	

PROJ: OUTDOOR SCOREBOARDS	
TITLE: DIGIT SERVICE	
DES. BY:	DRAWN BY: TERRY P. DATE: 31 JULY 86
REVISION	APPR. BY:
SCALE: 1=15	1064-E10A-27674

DRIVER FRONT VIEW WITH COVER



REMOVE TWO WING NUTS TO REMOVE COVER AND GAIN ACCESS TO FUSES.

J24			
PIN	FUNCTION	PIN	FUNCTION
1	NETWORK+	7	ADDR 3 -
2	NETWORK-	8	NTW GND -
3	NTWREF-P	9	NTW GND -
4	ADDR 0 -	10	FAN SW HOT
5	ADDR 1 -	11	FAN HOT
6	ADDR 2 -	12	NEUT

J17	
PIN	FUNCTION
1	SIGNAL +
2	SIGNAL -
3	N.C.
4	N.C.

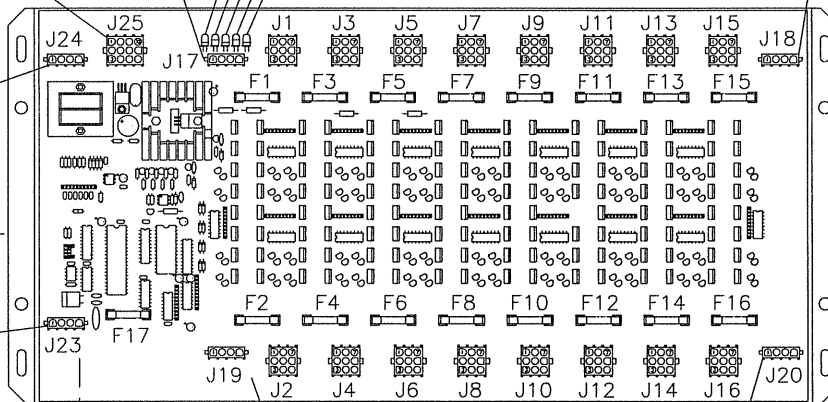
J1 - J16	
PIN	FUNCTION
1	SEG C
2	SEG B
3	SEG A
4	SEG F
5	SEG E
6	SEG D
7	COMMON
8	SEG H
9	SEG G

J18	
PIN	FUNCTION
1	LAMP NEUT
2	LAMP NEUT
3	LAMP HOT 1, 3, 5, 7
4	LAMP HOT 2, 4, 6, 8

J24	
PIN	FUNCTION
1	-5V
2	DIM SEL 1
3	-5V
4	DIM SEL 2

DRIVER FRONT VIEW WITH COVER REMOVED

J23	
PIN	FUNCTION
1	FAN SW HOT
2	N.C.
3	FAN HOT
4	NEUT



J19	
PIN	FUNCTION
1	NEUTRAL
2	NEUTRAL
3	120V HOT
4	120V HOT

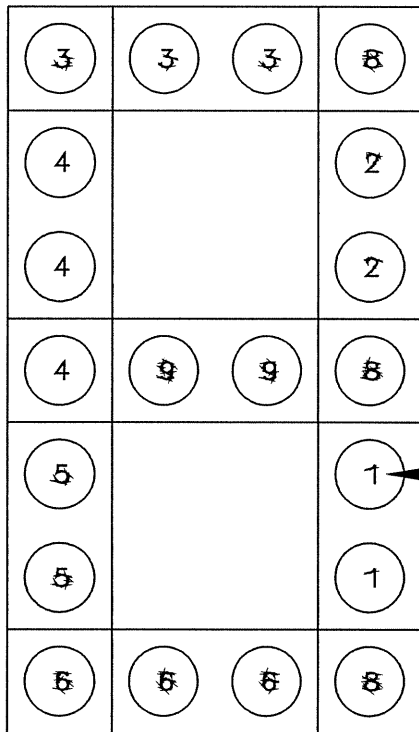
J20	
PIN	FUNCTION
1	LAMP NEUT
2	LAMP NEUT
3	LAMP HOT 9,11,13,15
4	LAMP HOT 10,12,14,16

PLUG FROM FAN IN COVER CONNECTS TO J23



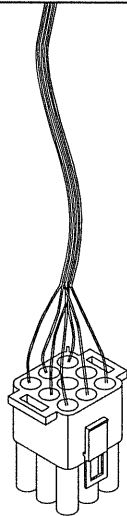
F1 THRU F16 ARE TYPE AGC-10, DAKTRONICS PART NUMBER F-1006. F17 IS TYPE AGC-1/2, DAKTRONICS PART NUMBER F-1000

DAKTRONICS, INC. BROOKINGS, SD 57006					
2		29 APR 97		ADDED TABLES OF PINS AND FUNCTIONS.	
1		5 MAR 91		CHANGED FROM "B" TO "A" SIZE DWG.	
REV.	DATE	DESCRIPTION		BY	APPR.
PROJ: MULTIPLEX CONTROLLERS TITLE: LAMP DRIVER, 16 COL., W/FAN DES. BY: JLH DRAWN BY: JLH DATE: 20 FEB 89				REVISION APPR. BY: SCALE: 1=5	
1033-R04A-37070					



4 x 7 LAMP MATRIX DIGIT

CONNECTOR PIN NUMBER
WIRED TO THAT SEGMENT



LAMP DRIVER
CONNECTOR

COLOR CODE		
PIN NO.	WIRE COLOR	DRIVER SEGMENT
1	ORANGE	C
2	RED	B
3	BROWN	A
4	BLUE	F
5	GRN OR PNK	E
6	YEL OR TAN	D
7	BLACK	COMMON
8	GRAY	H
9	VIOLET	G

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: OUTDOOR SCOREBOARDS

TITLE: SEGMENTS, 4 x 7 LAMP MATRIX DIGIT

DES. BY:

DRAWN BY: AVB

DATE: 18 APR 89

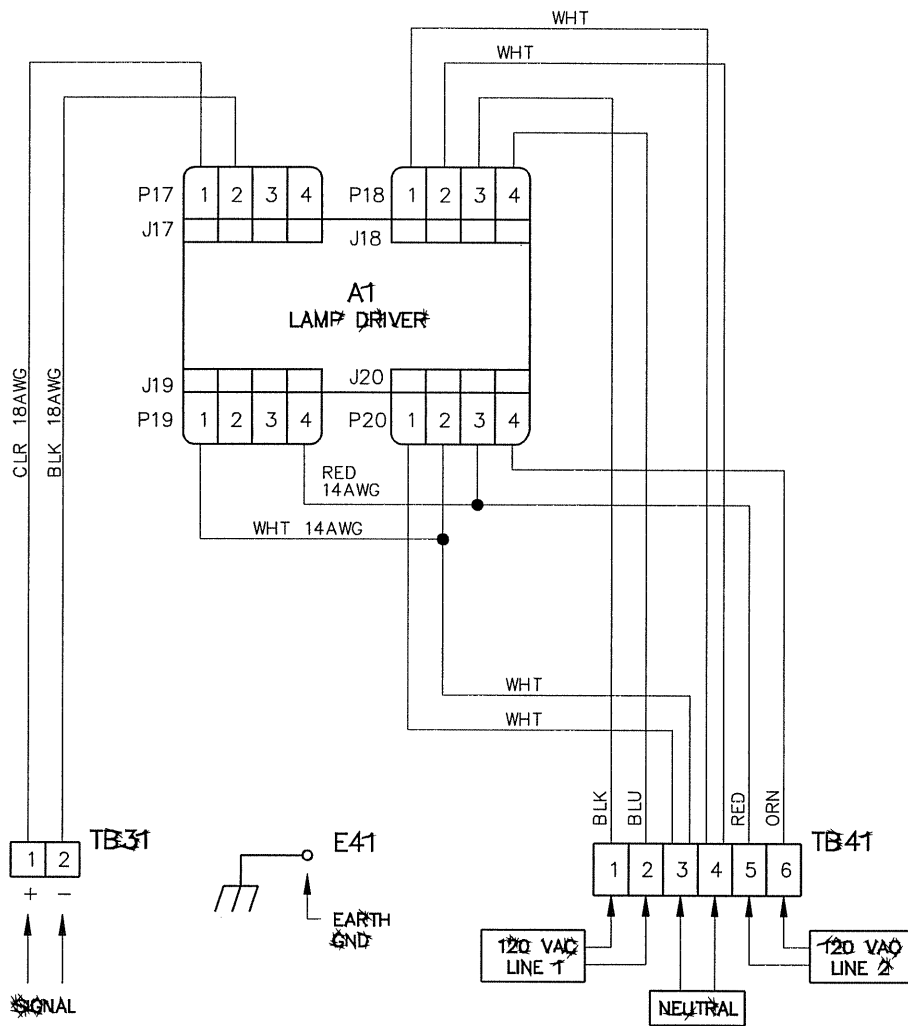
1	5 MAR 91	CHANGED FROM "B" TO "A" SIZE DWG.	CF	
REV.	DATE	DESCRIPTION	BY	APPR.

REVISION

APPR. BY:

SCALE: 1 = 1

1064-R04A-37685



NOTE
 ALL WIRES ARE 12 AWG UNLESS
 OTHERWISE SPECIFIED.

REV.	DATE	DESCRIPTION	BY	APPR.
10	30APR98	CHANGED MODEL NUMBER FROM CH-21GP TO CH-1421-H & CH-1521-H	RDA	RDA
9	11 MAR 93	REMOVED LIST OF DISPLAY MODELS.	C FICK	
8	01 JUL 92	ADDED MODEL CH-1024V TO NOTE.	TWEBER	
7	18 JUN 92	ADDED CH-1421V, CH-1421GP, CH-1424WB AND CH-36-DS TO LIST OF MODELS.	C FICK	

DAKTRONICS, INC. BROOKINGS, SD 57006	
PROJ: CHRONDEK DISPLAYS	
TITLE: SCHEMATIC; PWR/SIG CH-1421-H & CH-1521-H	
DES BY:	DRAWN BY: JLH
REVISION	DATE: 19JUL89
APPR. BY:	1081-R03A-38788
SCALE: 1=1	

Appendix A: Message Centers & Ad Panels

A.1 Introduction

Reference Drawing: Display, CH-1421-H **Drawing A-39115**

This Appendix covers Daktronics message centers and ad panels used in conjunction with the CH-1421-H and CH-1521-H displays. **Drawing A-39115** shows a complete CH-1421-H display, consisting of three sections: the scoring display, a message center, and an Adv display--referred to from here on as an ad panel--for advertising or race track logo. The display can be comprised of only the scoring display, the scoring display with either the message center or the ad panel, or all three sections together.

The following table shows the approximate weights of the message center and ad panel sections of the CH-1421-H display, as well as the maximum power requirement of each.

Section	Uncrated Weight	Crated Weight	Maximum Power Demand
Message Center	650 lbs.	1,100 lbs.	14784 Watts
Ad Panel	300 lbs.	500 lbs.	1200 Watts

A.2 Mechanical Installation

Reference Drawings: System Layout, CH-1421-H **Drawing A-38865**
System Layout, CH-1421-H w/ MC **Drawing A-39121**
Mounting Instructions, CH-1421-H Message .. **Drawing A-39212**

Refer to **Drawing A-38865** for general system layout of a CH-1421-H display without message center. **Drawing A-39121** shows the general system layout of a CH-1421-H with a message center. The general procedure for installing the CH-1421-H display is as follows.

1. Select beam and footing recommendations from the following table. If the display consists of a scoreboard and message center instead of an ad panel, use the column labeled "Scoreboard W/42" Ad Panel."
2. Dig the footing holes and install beams and footings.
3. Route power and signal cables to the display and control locations.
4. All three sections are mounted with no space between them. **Drawing A-39212** shows how to mount the message center to the beams. Start with the scoring display, then attach the other sections above or below it accordingly.
5. Route power and signal wires into the displays as described in **Section A.3**.

BEAM & FOOTING RECOMMENDATIONS

CH-1421-H DISPLAY

DIST TO BOTTOM OF SCBD (FT)	DESIGN WIND VELOCITY (MPH)	Scoreboard			Scoreboard W/ 42" Ad Panel			Scoreboard W/ 42" Ad Panel & Message Broad		
		BEAM REQUIRED (2 EACH)	FOOTINGS		BEAM REQUIRED (2 EACH)	FOOTINGS		BEAM REQUIRED (2 EACH)	FOOTINGS	
			DIAM (FT)	DEPTH (FT)		DIAM (FT)	DEPTH (FT)		DIAM (FT)	DEPTH (FT)
8		W6X12	3.00	5.00	W8X15	3.25	6.00	W8X17	4.50	6.00
12		W6X15.5	3.25	5.50	W8X24	4.50	7.00	W12X22	5.25	7.00
16		W6X20	3.50	6.50	W8X28	5.00	7.50	W12X27	5.25	8.00
20	80	W8X24	4.50	6.50	W8X35	5.00	8.00	W12X36	5.50	8.50
24		W8X28	4.50	7.00	W8X35	5.25	8.50	W12X45	6.00	9.00
28		W8X35	5.00	7.50	W12X53	6.00	9.00	W12X50	6.00	10.00
8		W6X15.5	3.00	5.50	W8X17	4.00	6.50	W8X20	4.75	6.50
12		W6X16	3.50	6.00	W8X28	5.50	7.00	W12X27	6.00	7.50
16		W8X20	4.00	7.00	W8X35	5.50	8.00	W12X31	6.00	8.50
20	90	W8X24	4.25	7.50	W12X36	5.00	9.00	W12X36	6.25	9.00
24		W8X28	4.25	8.00	W12X40	6.00	9.00	W12X45	6.25	10.00
28		W8X35	5.50	8.00	W12X53	6.00	10.00	W12X50	6.25	11.00
8		W6X15.5	3.00	6.00	W8X24	5.00	6.50	W12X19	5.00	7.00
12		W8X17	3.50	6.50	W8X35	5.25	8.00	W12X27	6.50	8.00
16		W8X24	4.25	7.50	W12X31	5.25	9.00	W12X36	6.50	9.00
20	100	W8X28	4.50	8.00	W12X36	6.00	9.25	W12X45	6.00	10.00
24		W8X35	4.75	8.50	W12X40	6.00	10.00	W12X50	6.00	11.00
28		W12X53	5.25	9.00	W12X53	6.00	11.00	W12X58	6.00	12.00

These footing recommendations are based on an allowable soil bearing pressure of 3000 psf vertically and 300 psf/ft of depth horizontally. However, these recommendations are suggestions only and each installation should be treated individually. Confirm that the installation complies with local codes and is suitable for the particular soil and wind conditions.

❖ **Daktronics assumes no responsibility for structures installed by others.** ❖

A.3 Electrical Installation

A.3.1 Control Signal Cable Selection

For a scoring system alone, two conductors of 22 AWG minimum are required. Daktronics has the following cable available: Daktronics part number, W-1077 (Belden part number, 8451). This is a two conductor, 22 AWG cable that must be pulled through conduit.

For a scoring system with a message center, ten conductors, 5 pairs, of 22 AWG minimum are required. Daktronics has the following two cables available:

Description	Daktronics Part #	Industry #	Alpha Part #
22 AWG, 12 pair (direct burial cable)	W-1156	REA-PE-39	---
22 AWG, 11 pair (must be pulled through conduit before burial)	W-1153	---	5489/11

A.3.2 Control Signal Connection

Reference Drawings: Driver Enclosure, Power & Signal . . . **Drawing A-37915**
Component Locations, CH-1421-H . . . **Drawing A-38854**
Color Code, 25-Pin J-box **Drawing A-47207**

1. At the control end of the cables, mount the signal J-box (both J-boxes if a message center is included) to a convenient location.
2. Connect the wires to the wires leading from the connector in the cover of the scoring display J-box as shown in **Drawing A-47207 (Section 2)**.
3. *If a message center is present*, connect eight conductors to pins 1-8 of the message center J-box as shown in **Drawing A-47207**.
4. Route signal cables to display location.
5. *If no message center is present*, open the hinged access door on the scoring display, as shown in **Drawing A-38854 (Section 2)**.
6. Remove the cover from the driver enclosure. Refer to **Drawing A-37915 (Section 2)** for an illustration of the components inside the enclosure.
7. Connect the signal wires to TB31 as indicated in the table below.

Signal Connections

J-box Terminal #	Control End		Display End
	Wire Color	Output #	TB31 Terminal #
14	RED/WHT	1*	1 (+)
15	GRN/WHT		2 (-)

Auxiliary display(s) require(s) a different output number(s). Consult the CHTs-300 console manual.

If your system includes a message center, a signal termination box is located inside the message center, near the center, behind the two center lamp banks.

1. Route all ten signal wires (two for the scoring display and eight for the message center) into the rear of the message center to the signal termination box.
2. Connect to the left-hand screw of each terminal as listed in the following table.

Signal Connections		
Message Center J-Box Pin No.	Scoring Display J-Box Pin No.	Termination Box Terminal No.
1	-	A101+
2	-	A101-
3	-	A102+
4	-	A102-
5	-	A103+
6	-	A103-
7	-	A104+
8	-	A104-
-	14	A105+
-	15	A105-

If a message center is present, the power and signal wires for both the scoring display and the ad panel are connected to the load center and signal termination box inside of the message center. These power and signal wires are already present inside of the scoring display if the system was sold with a message center. Carry out these connections as follows:

1. Remove the 2" hole plug from the bottom of the scoring display.
2. Pull the bundle of wires located just inside the hole out through the hole. These wires carry electrical power and signal from the load center and signal termination box in the message center to the scoring display and the ad panel.
3. Pull these wires through the 2" hole in the top of the message center and route to the load center and signal termination box.
4. Connect to the *right-hand* terminals of the terminal block in the signal termination box inside the message center.

Signal Connection	
Termination Box Term. No.	Scoring Display TB31 Term. No.
A105+	1
A105-	2

A.3.3 Power Wiring

Reference Drawing: Electrical Installation, CH-1421-H . . . **Drawing A-39119**
 Electrical Installation, CH-1421-H . . . **Drawing A-39120**
 Color Code, 25-Pin J-box **Drawing A-47207**
 Power Wiring and Grounding **Drawing A-101825**

The display requires that four “hot” wires, two “neutrals,” and a separate earth-ground conductor be run into a load center from the electrical source. The load center should be mounted on the left-hand support pole if no message center is present. If a message center is present, a load center is provided inside the message center. The power demands for each display section are listed below. Add the values for each section included in your display to find the power required by each line.

Display Section	Line 1 (amps)	Line 2 (amps)
Scoring Display	40.0	33.5
Ad Panel	-	10.0
Message Center	67.2	67.2

Consult a qualified electrician to run the proper size of wire from the chosen electrical source to the display location. *If your system does not include a message center:*

1. Install a lockable safety disconnect and load center on the left-hand (when viewed from front) pole of the display as shown in **Drawing A-39120**. A three-conductor disconnect is recommended for proper protection from lightning strikes. Refer to **Drawing A-101825 (Section 2)**.
2. Install a copper ground rod by each of the support poles for the display.
 ⚠ **The display must be connected to earth ground at the display location.**
 This is in addition to the separate earth-ground conductor in the power cable.
3. Route four hot, two neutral and one "ground" wire, 12 AWG minimum, through conduit from the load center to the driver enclosure in the scoring display. Refer to **Drawing A-47207 (Section 2)** for component locations.
4. Connect the ground wire to terminal E41.
5. Connect the two neutral wires to TB41-3 and TB41-4 inside the driver enclosure of the scoring display.
6. Connect the hot wires to the load center and scoring display as listed below.

Load Center Breaker Label	Scoring Display Term. No.
TB401-1	TB41-1
TB401-2	TB 41-2
TB401-5	TB41-5
TB401-6	TB41-6

7. At the ad display, remove the screws around the sides and bottom of the face panel retainer. The retainer is hinged at the top and may be opened to access TB41 for power connection. TB41 is located in the lower left corner when viewed from the front.
8. Loosen the screw terminals TB31-1, TB31-2, and TB31-3.
9. Remove the power cord consisting of a black, white, and green wire from these terminals, this is used only if the system includes a message center. Discard the power cord.
10. Run a black hot wire from breaker 7 in the load center plus a white neutral conductor through the power conduit into the scoring display, up through the top of the scoring display (remove the 2" hole plug) and bottom of the ad panel to TB41 in the ad panel itself.
11. Run a green ground wire from E41 in the scoring display up into the ad panel to TB41. Connect the hot wire to TB41-1. Connect the neutral wire to TB41-2. Connect the ground wire to TB41-3.

If your system includes a message center:

1. Install a lockable safety disconnect on the right-hand (when viewed from front) pole of the display as shown in **Drawing A-39119**. A three-conductor disconnect is recommended for proper protection from lightning strikes. Refer to **Drawing A-101825 (Section 2)**.
2. Install a copper ground rod by each of the support poles for the display. *The display must be connected to earth ground at the display location.* This is in addition to the separate earth-ground conductor in the power cable.
3. Run power cable (two hot lines, neutral, and a separate earth-ground conductor) from the source through conduit to the safety disconnect and then from the safety disconnect through conduit into the message center and connect to the load center according to the message center installation manual.
4. Connect the display to a ground-rod at the display location from either the load center or the lockable safety disconnect.
5. Remove the 2" hole plug in the bottom of the scoring display and pull the power and signal wires through the hole and route them into the top of the message center through the 2" hole there.
6. Connect the power and signal wires from the scoring display and the ad panel to the message center as described previously in **Section A.3.2**.
7. Remove the 2" hole plug from the top of the scoring display and pull the ad panel power cord through the bottom of the ad panel.
8. Plug the ad panel power cord into the power jack just inside the 2" hole in the top of the scoring display.

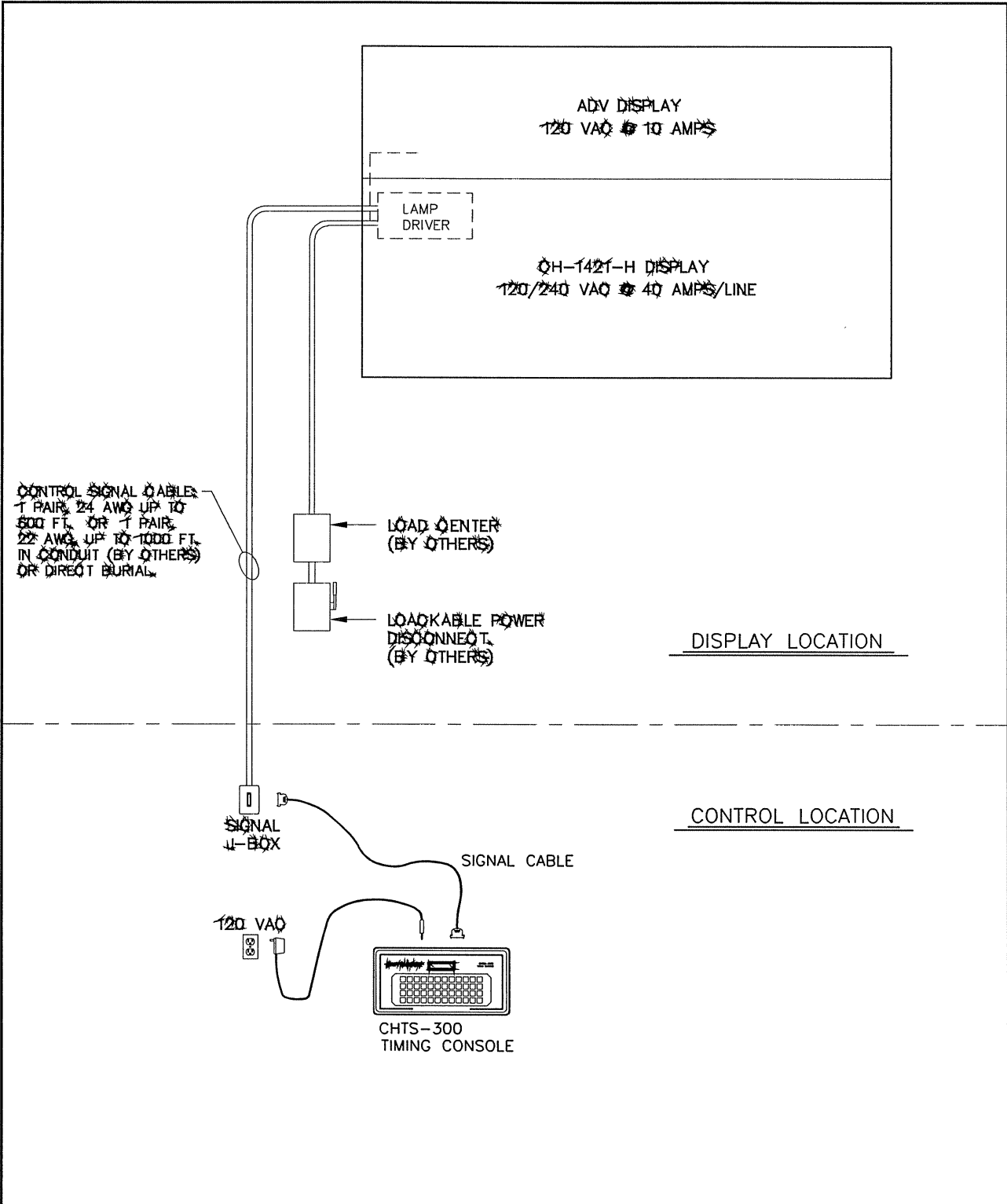
A.4 Maintenance & Troubleshooting (Lamp Replacement)

The ad panel uses 72 inch, 120V, 85W cool white fluorescent lamps, Daktronics part number DS-1037. Remove the screws from sides and bottom of the retainer and swing the face up to access the lamps for replacement.

A.5 Replacement Parts

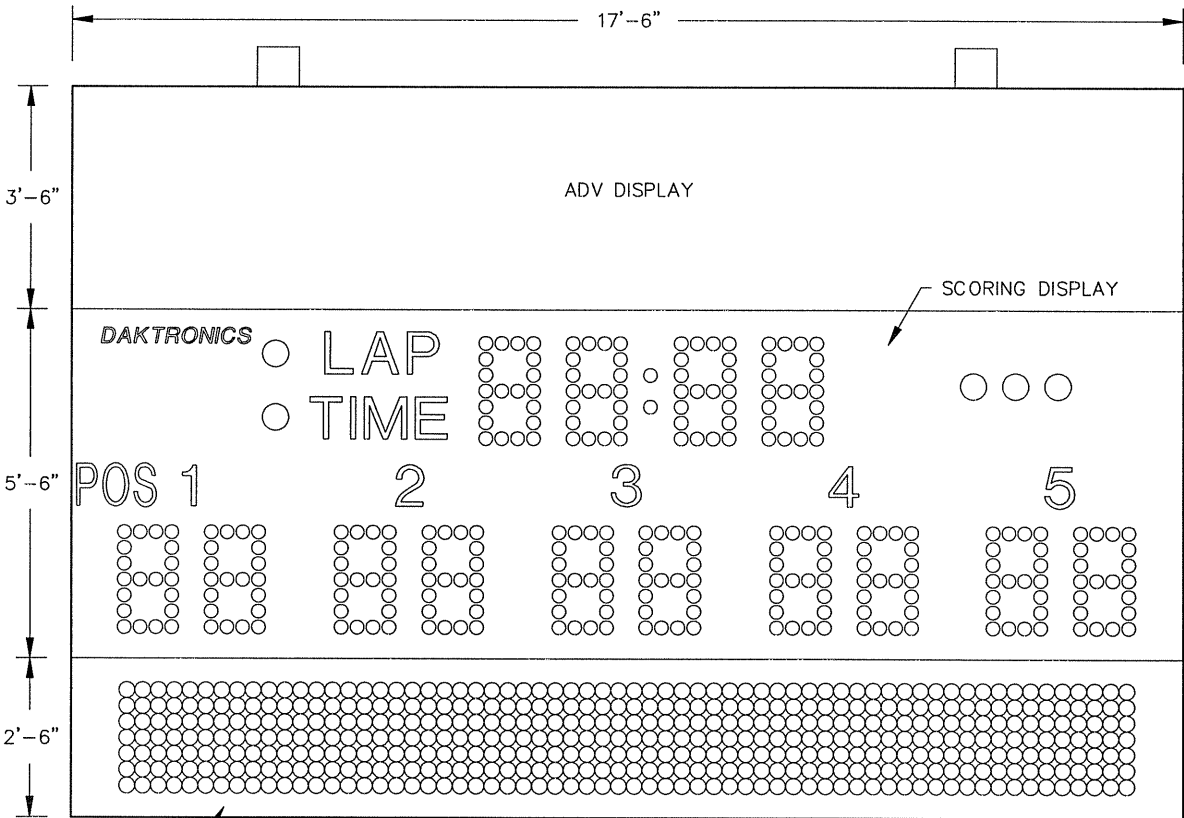
Lamp, 30 W Reflector	30R20	DS-1126
Lamp, 85 W Fluorescent	72"	DS-1037

For parts not listed, or for more information about installation or service, please call Daktronics.



REV.	DATE	DESCRIPTION	BY	APPR.
5	29APR98	CHANGED TITLE FROM SYSTEM LAYOUT, CH-1421-GP TO CH-1421-H	BAJ	
4	15JUL91	CORRECTED CONSOLE AND J-BOX ILLUSTRATION.	JLH	
3	15MAY91	ADDED LOCKABLE SAFETY DISCONNECT. ROUTED ADV DISPLAY POWER WIRES THROUGH CH-1421-GP DISPLAY.	JLH	AVB
2	17JAN90	CHANGED CH-21GP TO CH-21-HSM.	JLH	AVB

DAKTRONICS, INC. BROOKINGS, SD 57006	
PROJ: CHRONDEK DISPLAYS	
TITLE: SYSTEM LAYOUT, CH-1421-H	
DES. BY: JHEIDERSCHIEDT DRAWN BY: JHEIDERSCHIEDT DATE: 24JUL89	
REVISION	APPR. BY: AVB
SCALE: NONE	1081-R08A-38865

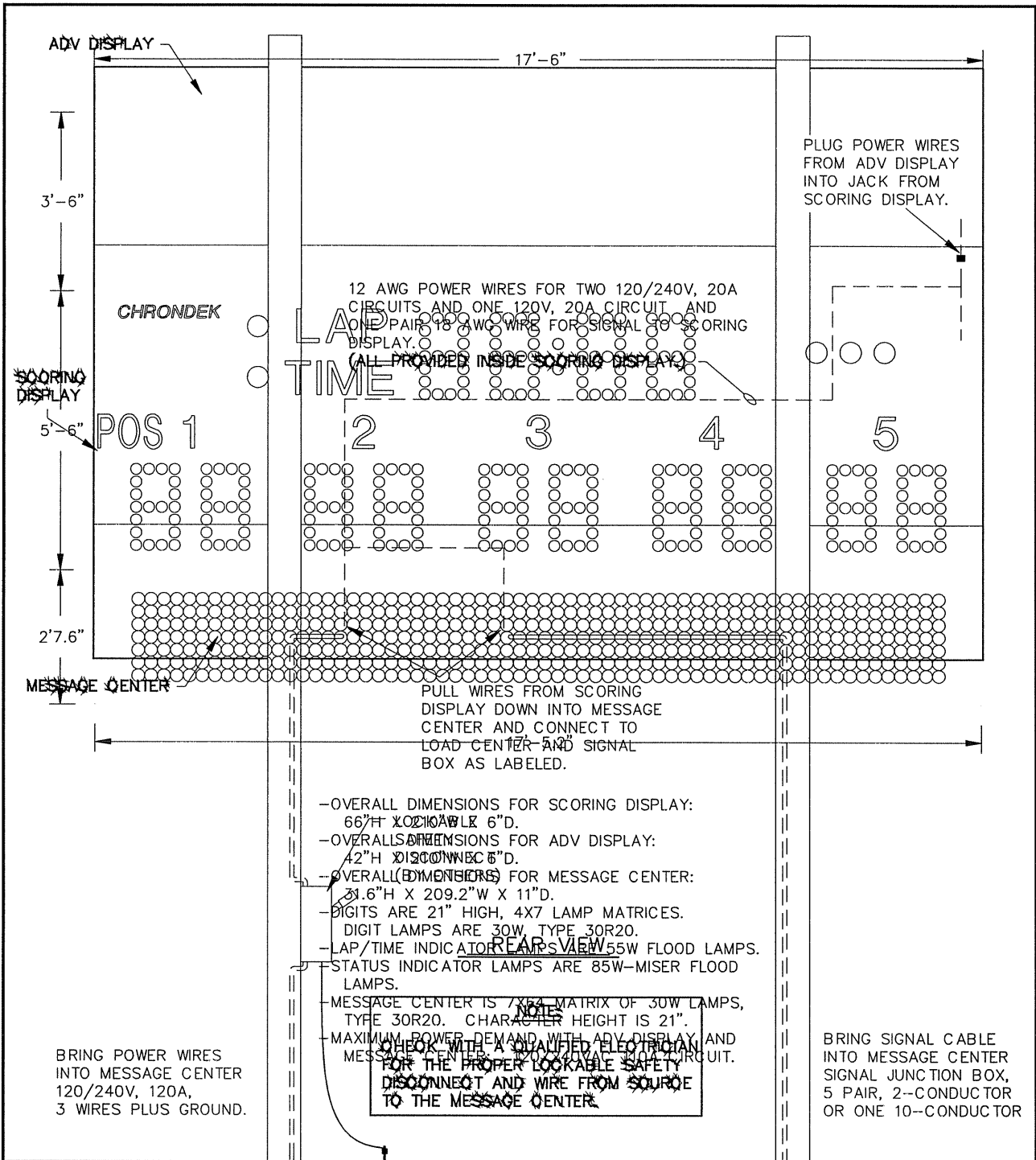


MESSAGE CENTER

- OVERALL DIMENSIONS FOR SCORING DISPLAY:
66"H X 210"W X 6"D.
- OVERALL DIMENSIONS FOR ADV DISPLAY:
42"H X 210"W X 6"D.
- OVERALL DIMENSIONS FOR MESSAGE CENTER:
30"H X 210"W X 11"D
- DIGITS ARE 21" HIGH, 4X7 LAMP MATRICES.
DIGIT LAMPS ARE 25W FROSTED, MEDIUM BASE.
- LAP/TIME INDICATOR LAMPS ARE 30W REFLECTOR,
TYPE 30R20 LAMPS
- STATUS INDICATOR LAMPS ARE 85W-MISER FLOOD
LAMPS.
- MESSAGE CENTER IS 7X64 MATRIX OF 33W MEDIUM
BASE LAMPS. CHARACTER HEIGHT IS 21".
- MAXIMUM POWER DEMAND WITH ADV DISPLAY AND
MESSAGE CENTER: 120/240VAC 120A CIRCUIT.
- BOTH DIGITS AND MESSAGE CENTER MAY BE ORDERED
WITH OPTIONAL 30W REFLECTOR, TYPE 30R20 LAMPS.

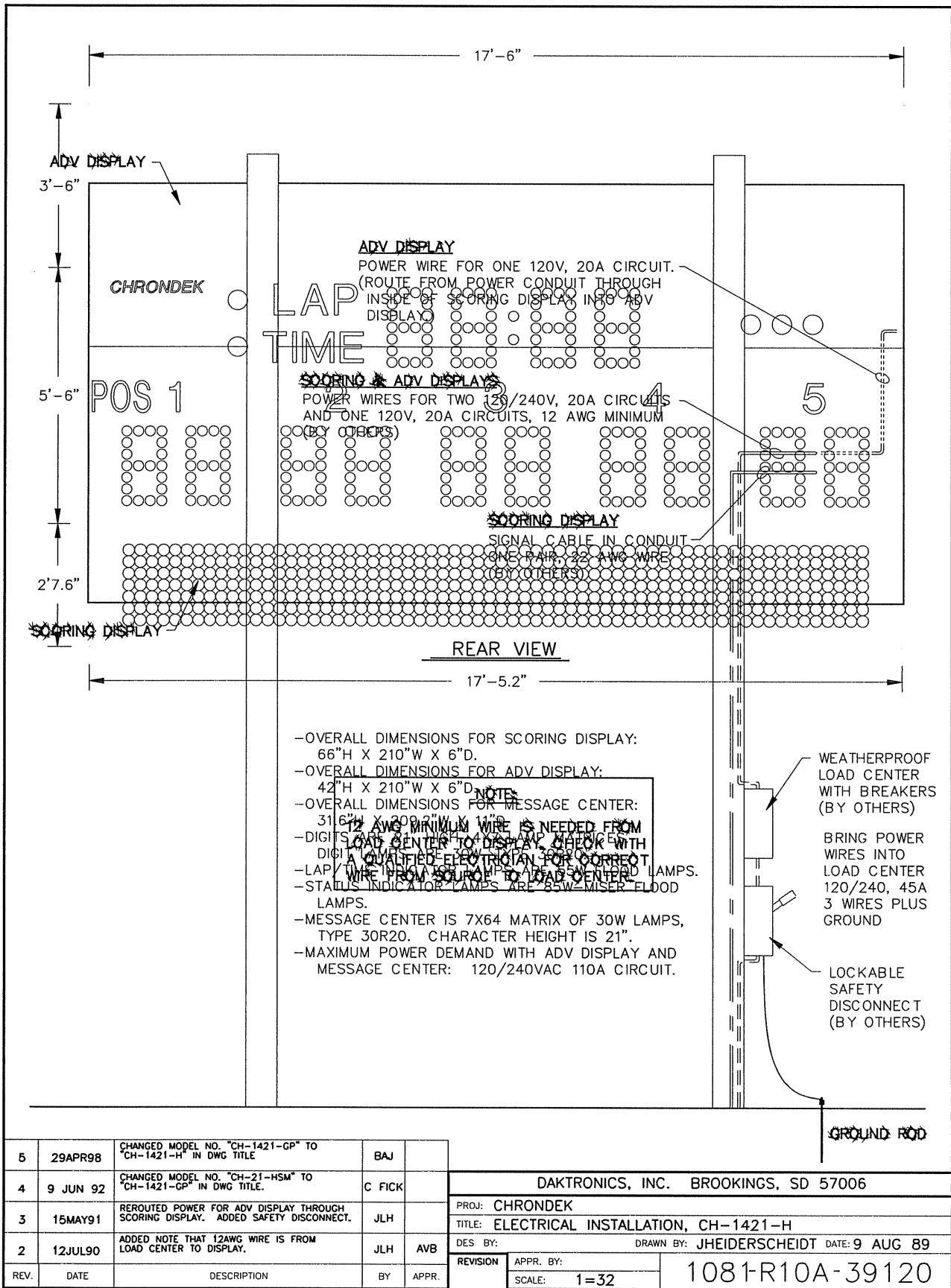
5	29APR98	CHANGED CHRONDEK TO DAKTRONICS CHANGED LAP/TIME IND. LAMPS TO 30W REFL. CHANGED TITLE FROM CH-1421-GP TO -H	BAJ	
4	9 JUN 92	CHANGED MODEL NO. "CH-21-HSM" TO "CH-1421-GP" IN DWG TITLE.	C FICK	
3	14MAY91	CHANGED SPECS FOR MESSAGE CENTER TO REFLECT MESSAGE CENTER DESIGN CHANGES.	JLH	
2	12JUL90	EXPANDED LAMP SPECIFICATIONS.	JLH	AVB
REV.	DATE	DESCRIPTION	BY	APPR.

DAKTRONICS, INC. BROOKINGS, SD 57006	
PROJ: CHRONDEK DISPLAYS	
TITLE: DISPLAY, CH-1421-H	
DES. BY: JHEIDERSCHIEDT DRAWN BY: JHEIDERSCHIEDT DATE: 01AUG89	
REVISION	APPR. BY: AVB
SCALE: 1=32	1081-R08A-39115



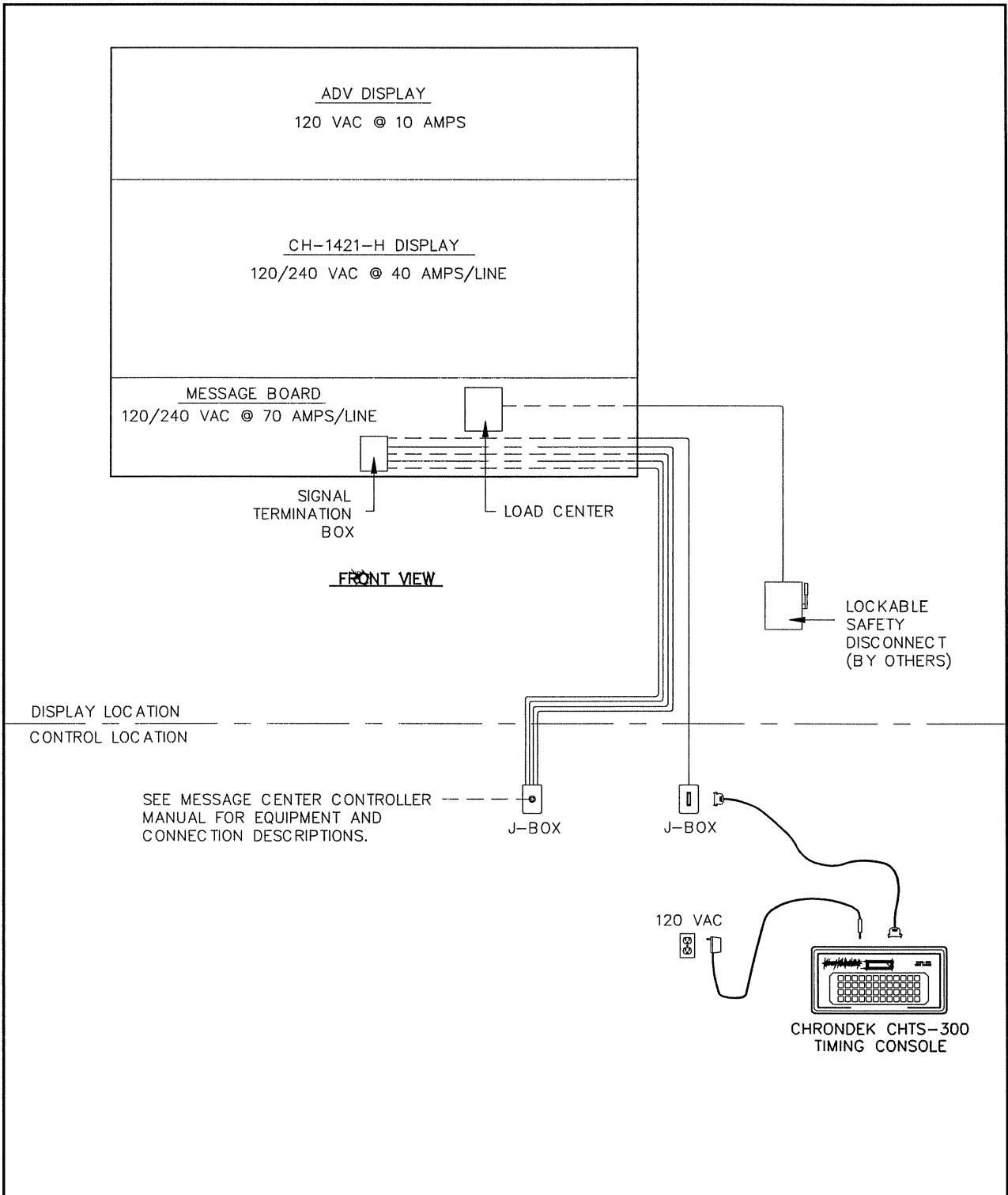
REV.	DATE	DESCRIPTION	BY	APPR.
4	29APR98	CHANGED MODEL NO. "CH-1421-GP" TO "CH-1421-H" IN DWG TITLE	BAJ	
3	9 JUN 92	CHANGED MODEL NO. "CH-21-HSM" TO "CH-1421-GP" IN DWG TITLE.	C FICK	
2	14MAY91	REMOVED EXTERNAL LOAD CENTERS AND SIGNAL TERM. BOX. REMOVED EXTERNAL LINES TO SCORING AND ADV DISPLAYS.	JLH	
1	12JUL90	ADDED NOTE THAT 12 AWG WIRE IS FROM LOAD CENTERS TO DISPLAYS.	JLH	AVB

DAKTRONICS, INC. BROOKINGS, SD 57006	
PROJ: CHRONDEK	
TITLE: ELECTRICAL INSTALLATION, CH-1421-H	
DES. BY: JHEIDERSCHIEDT	DRAWN BY: JHEIDERSCHIEDT DATE: 9 AUG 89
REVISION	APPR. BY:
SCALE: 1=32	1081-R10A-39119



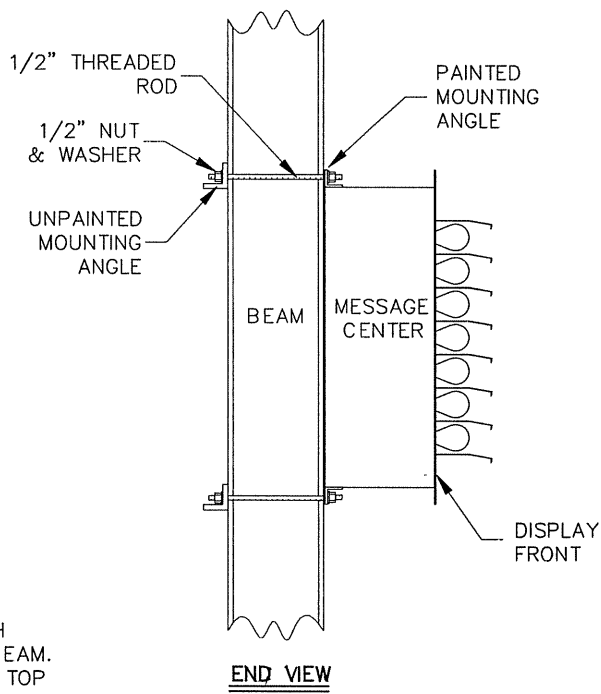
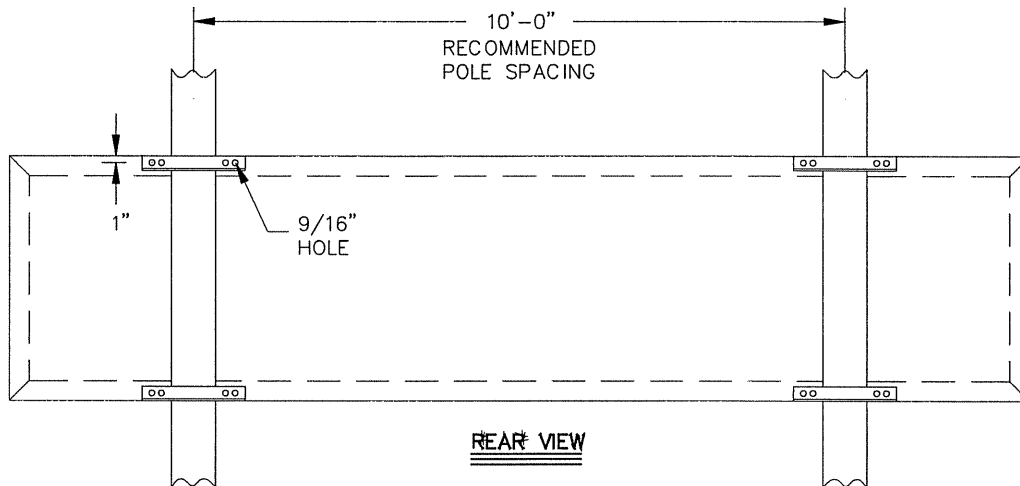
REV.	DATE	DESCRIPTION	BY	APPR.
5	29APR98	CHANGED MODEL NO. "CH-1421-GP" TO "CH-1421-H" IN DWG TITLE	BAJ	
4	9 JUN 92	CHANGED MODEL NO. "CH-21-HSM" TO "CH-1421-GP" IN DWG TITLE.	C FICK	
3	15MAY91	REROUTED POWER FOR ADV DISPLAY THROUGH SCORING DISPLAY. ADDED SAFETY DISCONNECT.	JLH	
2	12JUL90	ADDED NOTE THAT 12AWG WIRE IS FROM LOAD CENTER TO DISPLAY.	JLH	AVB

DAKTRONICS, INC. BROOKINGS, SD 57006	
PROJ: CHRONDEK	
TITLE: ELECTRICAL INSTALLATION, CH-1421-H	
DES. BY: JHEIDERSCHIEDT	DATE: 9 AUG 89
REVISION	APPR. BY:
SCALE: 1=32	
1081-R10A-39120	



4	29APR98	CHANGED TITLE FROM CH-1421-GP TO CH-1421-H	BAJ	
3	15JUL91	CORRECTED CONSOLE, J-BOX, AND DISPLAY ILLUSTRATIONS.	JLH	
2	15MAY91	MOVED SIGNAL TERMINATION BOX AND LOAD CENTER INSIDE MESSAGE CENTER. ADDED LOCKABLE SAFETY DISCONNECT.	JLH	
1	17JAN90	CHANGED CH-21GP TO CH-21-HSM.	JLH	AVB
REV.	DATE	DESCRIPTION	BY	APPR.

DAKTRONICS, INC. BROOKINGS, SD 57006	
PROJ:	CHRONDEK DISPLAYS
TITLE:	SYSTEM LAYOUT, CH-1421-H W/MC
DES. BY:	JHEIDERSCHIEDT
DRAWN BY:	JHEIDERSCHIEDT
DATE:	15MAY91
REVISION	APPR. BY: AVB
	SCALE: NONE
1081R08A-39121	



MESSAGE CENTER MOUNTING INSTRUCTIONS

- LOCATE THE CENTER OF BEAMS ON THE REAR OF THE MESSAGE CENTER.
 - PLACE MOUNTING ANGLE AGAINST DISPLAY TO USE AS A DRILLING GUIDE. DRILL 9/16" HOLES THROUGH WHICHEVER TWO HOLES WILL BE CLOSEST TO THE BEAM. THE HOLES SHOULD BE PLACED 3/4" IN FROM THE TOP OR BOTTOM OF THE DISPLAY.
 - POSITION DISPLAY
 - ATTACH MOUNTING ANGLES AS INDICATED.
- NOTE: THREADED RODS DO NOT GO THROUGH THE BEAMS, BUT RUN ALONG BOTH SIDES OF THE BEAM.
- SLIDE DISPLAY UP OR DOWN AS WANTED. TIGHTEN ALL BOLTS.

DAKTRONICS, INC. BROOKINGS, SD 57006				
PROJ: CHRONDEK DISPLAYS				
TITLE: MOUNTING INSTRUCTIONS, CH-1421-H MESSAGE				
DES. BY: JHEIDERSCHIEDT DRAWN BY: JHEIDERSCHIEDT DATE: 15AUG89				
2	29APR98	CHANGED TITLE FROM CH-1421-GP TO CH-1421-H	BAJ	
1	14MAY91	CORRECTED END VIEW OF MESSAGE CENTER TO CORRESPOND WITH NEW MESSAGE CENTER STYLE.	JLH	
REV.	DATE	DESCRIPTION	BY	APPR.
		REVISION		APPR. BY: AVB
		SCALE: NONE		1081-R10A-39212