

303 W. Main (1)

# SECTION 2: MECHANICAL & ELECTRICAL INSTALLATION

Installation involves three procedures:

1. Erecting the beams or column to which the scoreboard is to be mounted.
2. Mounting the scoreboard to the beams.
3. Routing power and signal wires to the scoreboard and control locations and making the connections

Score board  
Soccer  
field

Refer to Drawing A-44556 for a typical scoreboard installation, depicting beams, footings and wiring conduit.

Reference Drawing: Structure, Football ..... Drawing A-44556

## 2.1 Mechanical Installation

### 2.1.1 Mounting Structure

Be sure that your installation complies with local building codes and is suitable for your particular soil and wind conditions. All footings and beam structures must be designed or inspected by a licensed structural engineer. Daktronics assumes no liability for structures designed and installed by others.

#### Scoreboards without team name message centers

Drawings A-70089 specifies the number of beams and the recommended spacing between the beams for scoreboards *without* team name message centers. Choose the type of model you are installing. There is no fixed mounting location on the back of the scoreboard and beam spacing may vary.

#### Scoreboards with team name message centers

Drawing A-84292 specifies the number of beams and the recommended spacing between them for scoreboards *with* team name message centers. It is critical that these dimensions be adhered to because of the ventilation hoods located on the rear of the display.

Reference Drawings: Beam Spacings, Football/Track/Soccer ..... Drawing A-70089  
Beam Spacings, Football w/TNMC ..... Drawing A-84292

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- 5. Make final adjustments in the positioning of the scoreboard. Tighten the 3/8" bolts in the mounting clamps.
- 6. Make sure that the threaded rods are perpendicular to the scoreboard and tighten all of the 1/2" nuts.

Reference Drawings: Display Mounting ..... Drawing A-44412

**2.1.2.3 Advertisement and Identification Display Mounting**

Study the illustration of the mounting hardware in Drawing A-52187, then use the following procedure:

- 1. Use the mounting channel to determine which hole combination should be used. Be sure to keep the bolts as close to the beam as possible.
- 2. Using the mounting channel as a template, drill 9/16" holes in the upper and lower rear flange of the ad panel where the supports will go.
- 3. Place square nuts inside the channel and thread bolts through them.
- 4. Lift the ad panel into position with the bolts still in place.
- 5. Place mounting angles over each pair of bolts and secure with lock washers and hex nuts.
- 6. When the panel is adjusted to the final desired position, tighten the hex nuts firmly.

Reference Drawings: Ad Panel Mounting ..... Drawing A-52187

**2.2 Electrical Installation**

Electrical installation consists of (1) providing power and ground to a disconnect near the scoreboard, (2) routing power and ground from the disconnect to the scoreboard and connecting, (3) routing control signal cable from the control location to the scoreboard location and (4) connecting several cables from the upper section to the lower section (Models FB-824 and SO-824 have only one section each).

Power and signal cables are routed into the scoreboard from the rear, as illustrated in Drawing A-44556. There are two knockouts for conduit connection in the back of the lower section near the center. All wires connect to the entrance. Refer to the drawings in Appendix A which show the locations of the entrance plates in each model.

Reference Drawings: Structure, Football ..... Drawing A-44556

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### 2.2.1 Power Requirements

All of the scoreboard models require a grounded 120/240 or 120/208 VAC power circuit. The following table gives the maximum power consumption of each scoreboard model as well as the size of the circuit required for each model.

Scoreboard Model No.	Maximum Power	Circuit Required	Maximum Current	
			Line 1	Line 2
FB-824, SO-824	4,160 W	20A*	17A	18A
FB-1424, FB-1430, SO-1424	7,400 W	40A	33A	28A
FB-1524	7,650 W	40A	33A	31A
FB-1624, SO-1624	8,400 W	40A	33A	37A
FB-1530	7,900 W	40A	33A	33A
FB-1630, FB-1630L	8,050 W	50A	25A	42A
FB-1730	8,550 W	50A	29A	42A
FB-1830, FB-1830L	9,050 W	50A	33A	42A
FB-1630L w/TNMC-48	10,930 W	50A	48A	42A
FB-1430 w/TNMC-48	10,280 W	50A	41A	36A
FB-1830L w/TNMC-48	11,930 W	60A	56A	42A
SO-1624 w/TNMC-32	10,320 W	60A	57A	28A

\* Models FB-824 and SO-824 can also use a single 120V, 40 A line, with a jumper to the Line 2 terminal in the scoreboard.

Note: W = watts, A = amps

### 2.2.2 Grounding

The scoreboard **must** be connected to earth-ground. Proper grounding is necessary for reliable equipment operation. It also serves to provide protection to the equipment against damaging electrical disturbances and lightning. 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 embedded in concrete, and if in earth, the steel is either primed or it corrodes, making it a poor ground. Use one ground rod at each scoreboard support column.

The National Electrical Code requires the use of a lockable power disconnect near the scoreboard. Provide a lockable disconnect switch (knife switch) at the scoreboard location so that all power lines can be completely disconnected. Use a 3-conductor disconnect so that both hot lines and the neutral can all be disconnected. This is important in protecting the scoreboard against lightning.

There are two considerations for power installation, New Power Installation and Existing Power Installation. These two power installations differ slightly, as described in the following paragraphs.

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**2.2.2.1 New Power Installation**

The power cable must contain a separate earth-ground conductor. When a separate ground conductor is used, do not connect neutral to ground at the disconnect or at the scoreboard. To do so would violate electrical codes and void the warranty. Refer to Drawing A-45220.

Reference Drawings: Power Wiring and Ground ..... Drawing A-45220

**2.2.2.2 Existing Power Installation**

When a separate ground conductor is not available, connect the neutral to the earth-ground at the disconnect, never at the scoreboard. Refer to Drawing A-45220.

Reference Drawings: Power Wiring and Ground ..... Drawing A-45220

**2.2.3 Power Connection**

**Disconnect Power When The Scoreboard Is Not In Use Or When Servicing!!**

To gain access to the entrance panel, open the access door near the center of the lower section of the scoreboard and remove the cover from the entrance enclosure. Refer to the drawings in Appendix A for the component locations of each model.

Connect the power wires to the terminals of TB41 as marked on the plate and as shown in Drawing A-44363 or A-84293 (scoreboard w/TNMC). Connect the ground terminal E41 to a ground rod at the scoreboard location. The neutral must connect to one of the center terminals of TB41. Connect the ground wire from the power cable to E41 and to the ground rod.

Reference Drawings: Components, Pwr & Sig. 120/240 ..... Drawing A-44363  
Components, Pwr & Sig. 120/240 w/TNMC .. Drawing A-84293

**2.2.4 Signal Wiring**

Refer to Drawing A-27662 for a typical system layout. Mount the control connector J-box in a convenient place at the control location (press box or sideline location). The J-box is for indoor use and should be housed in a rain-shedding enclosure if used outdoors. Route the cable from the control J-box to the scoreboard's entrance panel. The number of conductors required is shown in the following table.

Two Conductors	Four Conductors	Six Conductors
FB-824	FB-1624	FB-1630L w/TNMC
FB-1424	FB-1630	FB-1830L w/TNMC
FB-1524	FB-1730	SO-1624 w/TNMC
FB-1430	FB-1830	
FB-1530	FB-1630L	
SO-824	FB-1830L	
SO-1424	SO-1624	
	FB-1430 w/TNMC	

Connect the wires to the control J-box and to the scoreboard entrance TB-31. Refer to Drawing A-44363 or A-84293 (scoreboards w/TNMC) for the location of TB-31 on the entrance plate.

**Note:**

120 VAC is required in the press box and at the alternate control location. Signal J-boxes may be mounted at each control location (multiple locations are wired parallel). The console may be connected at either location.

**Scoreboards With 1 Driver  
J-box With 1/4" Phone Jack**

J-box Wire Color	Scoreboard TB31 Terminal No.	Function
Red	1	Driver A1 +
Black	2	Driver A1 -

**Scoreboards With 2 Drivers  
J-box With 16-Pin Connector**

J-box Terminal No.	J-box Wire Color	Scoreboard TB31 Terminal No.	Function
1	Red	1	Driver A1 +
2	Black	2	Driver A1 -
3	White	4	Driver A2 +
4	Green	5	Driver A2 -
7	Wht/Blk	7	TNMC +
8	Red/Blk	8	TNMC -

**Reference Drawings:** Components, Pwr & Sig. 120/240 ..... Drawing A-44363  
 Components, Pwr & Sig. 120/240 w/TNMC ..... Drawing A-84293  
 System Layout, Football ..... Drawing A-27662

**2.2.5 Connections Between Sections**

There are several cables extending from the bottom of the upper section of the scoreboard. Route these cables into the hole in the top of the lower section when mounting the upper section.

When you open the access panel to make electrical connections, remove the cover from the connector enclosure located above the entrance enclosure. Connect the plugs on the cables to the mating jacks in the connector panel. Match the numbers on the plugs with the number on the jacks and insert.



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SCOREBOARD WIDTH VARIES BY MODEL NUMBER

SEE THE BEAM SPACING DRAWING FOR RECOMMENDED NUMBER AND SPACING OF BEAMS

W 6  
X 12

REAR OF UPPER SCOREBOARD SECTION

MOUNTING HARDWARE

8'-0"

4'-0"

REAR OF LOWER SCOREBOARD SECTION. (FB-824 HAS ONLY ONE SECTION.)

POWER WIRES FOR 120/240V CIRCUIT (IN CONDUIT). NOT PROVIDED.

SIGNAL CABLE IN CONDUIT, ONE OR TWO PAIR 22 AWG WIRE, NOT PROVIDED

REMOVE KNOCKOUTS TO ROUTE WIRES THROUGH REAR OF DISPLAY TO ENTRANCE ENCLOSURE.

HEIGHT AS REQUIRED

**BEAMS:**  
SEE THE BEAM SPACING DRAWING FOR THE NUMBER AND SPACING CORRECT FOR THE MODEL BEING INSTALLED. BEAM SIZE MUST BE SPECIFIED BY A LICENSED ENGINEER

**\*\*NOTE\*\***  
GROUND ROD (DEPTH PER LOCAL ELECTRICAL CODE)  
REFER TO ELECTRICAL INSTALLATION SECTION OF THE MANUAL.

SERVICE DISCONNECT (NOT FURNISHED) POSSIBLE LOCATION

GRADE

FOOTING DEPTH

FOOTING

2.00X 4.25

FOOTING WIDTH

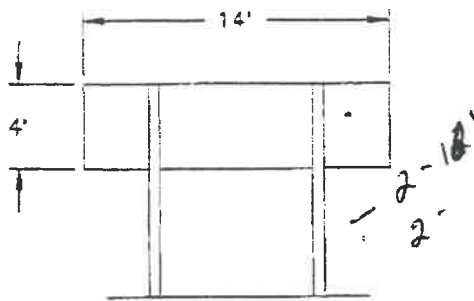
SPECIFICATIONS FOR REINFORCED CONCRETE FOOTINGS MUST BE DETERMINED BY A LICENSED ENGINEER, USING DATA FROM A SOIL SAMPLE TEST AT THE SITE.

DAKTRONICS, INC. BROOKINGS, SD 57006

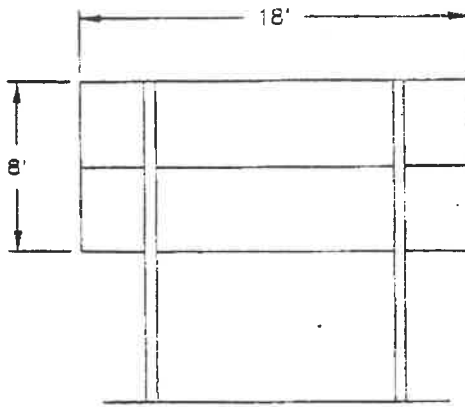
REV.	DATE	DESCRIPTION	BY	APPR.
2	28APR95	ADDED NOTE THAT SPECIFICATIONS MUST BE MADE BY A LICENSED ENGINEER.	AVB	AVB
1	17SEP90	CORRECTED WIRE SPECIFICATIONS. ADDED GROUNDING ROD REFERENCE.	JLH	

PROJ: FOOTBALL SCOREBOARDS
TITLE: STRUCTURE, FOOTBALL
DES. BY: JHEIDERSCHIEDT DRAWN BY: JHEIDERSCHIEDT DATE: 12SEP90
APPR. BY: 1091-R10A-44556
SCALE: 1=45

11

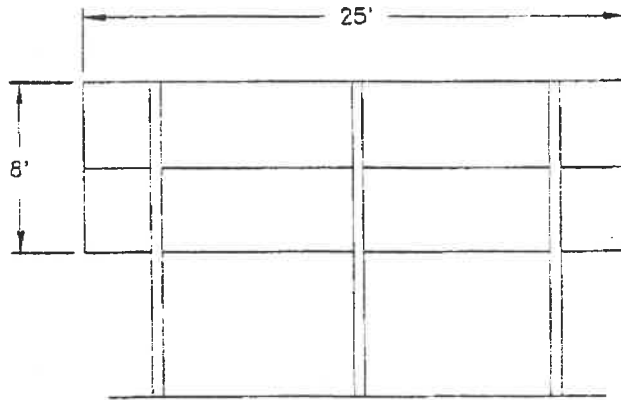


MODELS FB-824, SO-824



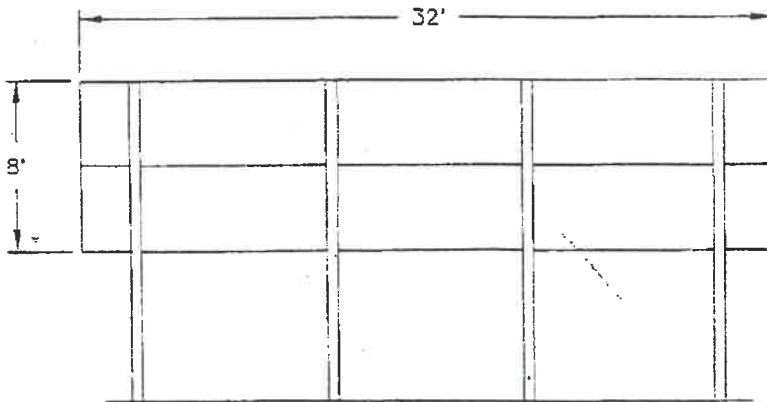
10' TO 12'

MODELS:  
FB-1424, FB-1524,  
FB-1624, SO-1424,  
SO-1624



9' TO 10'  
TYPICAL

MODELS FB-1430, FB-1530,  
FB-1630, FB-1730,  
FB-1830



8' TO 9'  
TYPICAL

MODELS FB-1630L, FB-1830L

DAKTRONICS, INC. BROOKINGS, SD 57006

PROJ: OUTDOOR SCOREBOARDS

TITLE: BEAM SPACINGS, FOOTBALL/TRACK/SOCCER

DES. BY: AVB

DRAWN BY: A VANBEMMEL

DATE: 27APR95

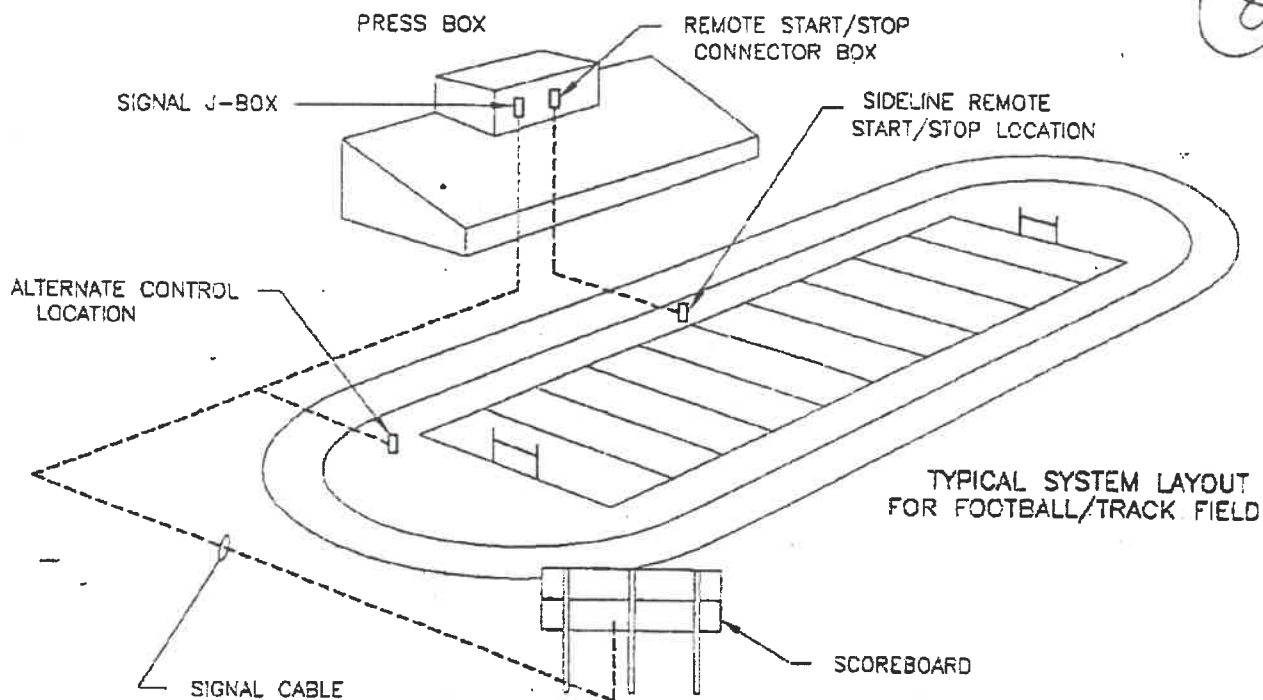
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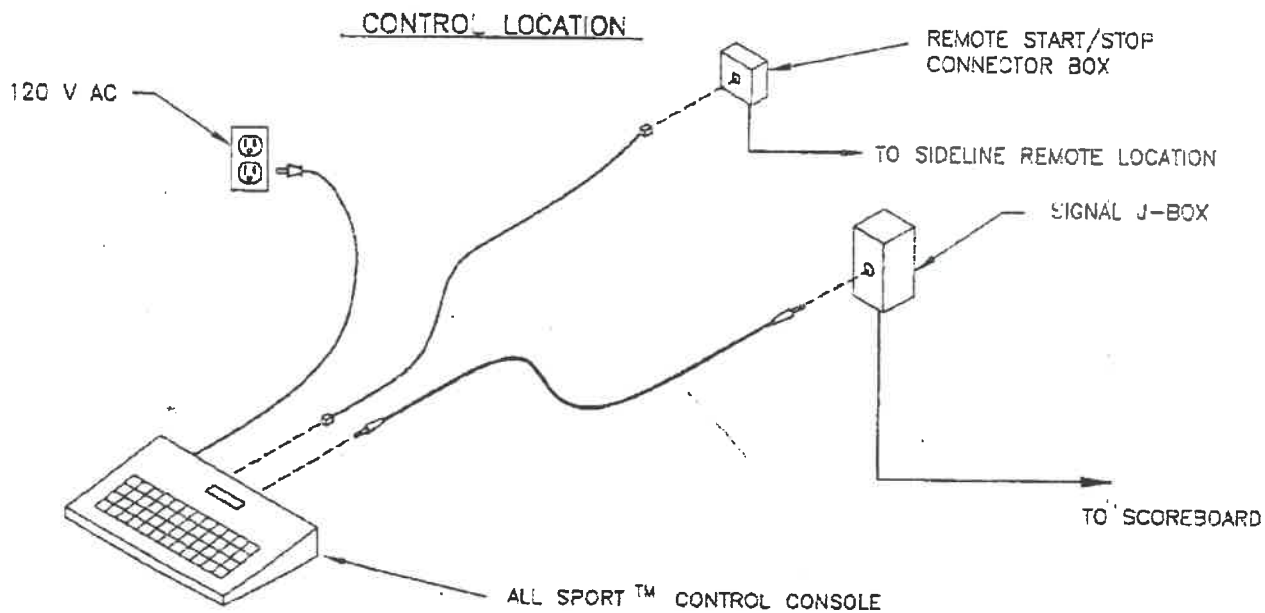
1091-R08A-70089

REV.	DATE	DESCRIPTION	BY	APPR.

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NOTE: 120 VAC IS REQUIRED IN PRESS BOX AND AT ALTERNATE CONTROL LOCATION.  
 SIGNAL J-BOXES MAY BE MOUNTED AT ANY CONVENIENT LOCATION.  
 MULTIPLE LOCATIONS ARE WIRED PARALLEL. CONSOLE MAY BE CONNECTED AT EITHER LOCATION.



3	27APR95	UPDATED POWER CORD ON ALLSPORT CONSOLE.	MSG	AVB	DAKTRONICS, INC. BROOKINGS, SD 57006	
2	23AUG90	REDRAWN ON CADD. CHANGED TO A-SIZE.	AVB		PRJ: FOOTBALL	
1	02OCT87	CHANGED CONSOLE TO ALL SPORT	SO	AVB	TITLE: SYSTEM LAYOUT, FOOTBALL	
REV.	DATE	DESCRIPTION	BY	APPR.	DES. BY:	DATE: 23AUG90
					APP. BY:	DRAWN BY: AVB
					SCALE: NONE	1064-R04A-27662