

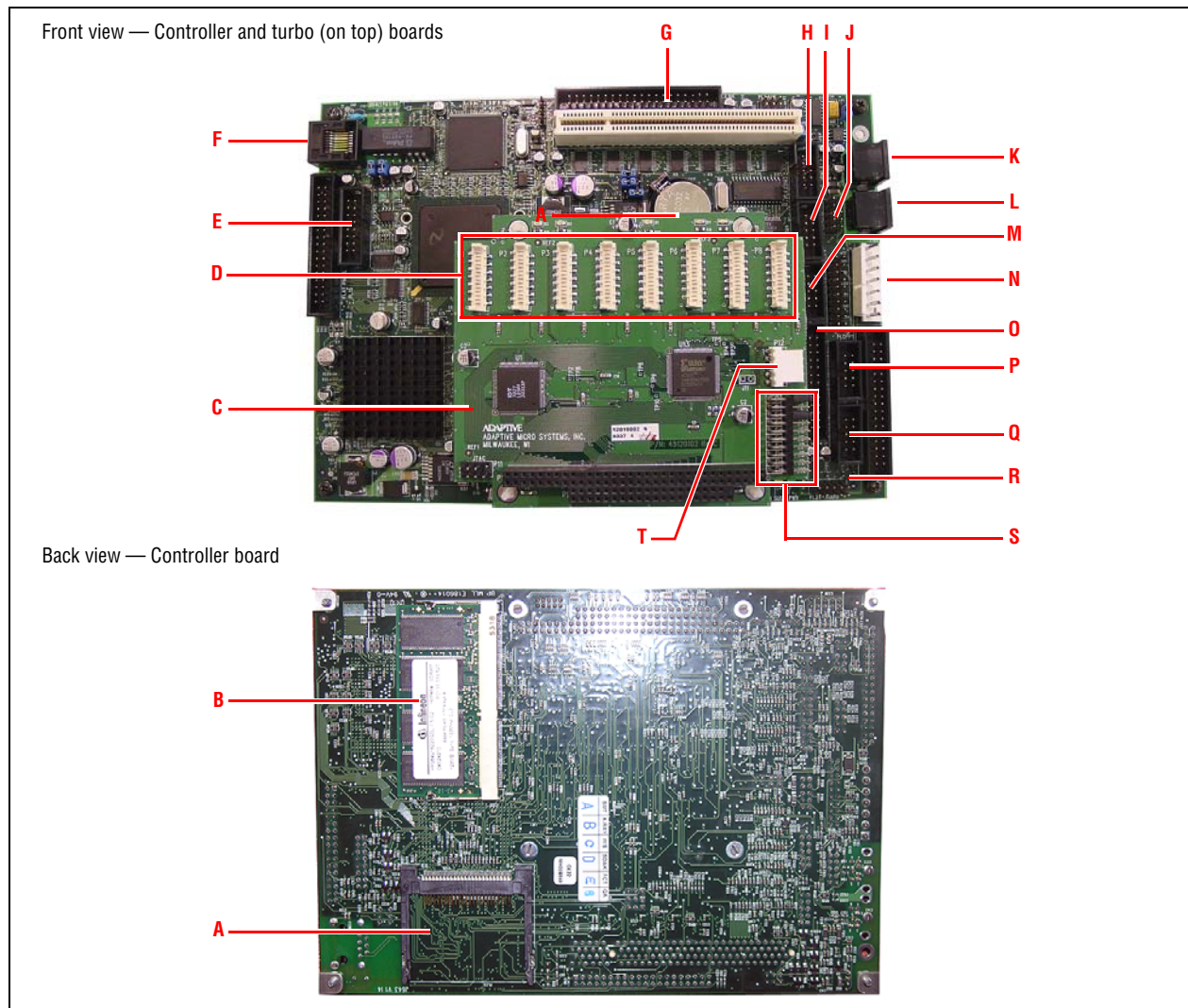
# Type B Sign Part Replacement (pn 1127-9425SP): Controller, Turbo, TuneBlaster Boards and Hard Disk Drive

## 1.1 Description

### 1.1.1 Controller and turbo boards

The Arcom controller board is a 300 MHz computer that uses a National Semiconductor Geode GX1 MMX-enhanced processor. This computer translates incoming Ethernet messages and displays this data on AlphaVision PC signs. The controller board can be connected to a monitor, keyboard, and mouse. There is one controller board per sign. Back-to-back signs also have only one controller board.

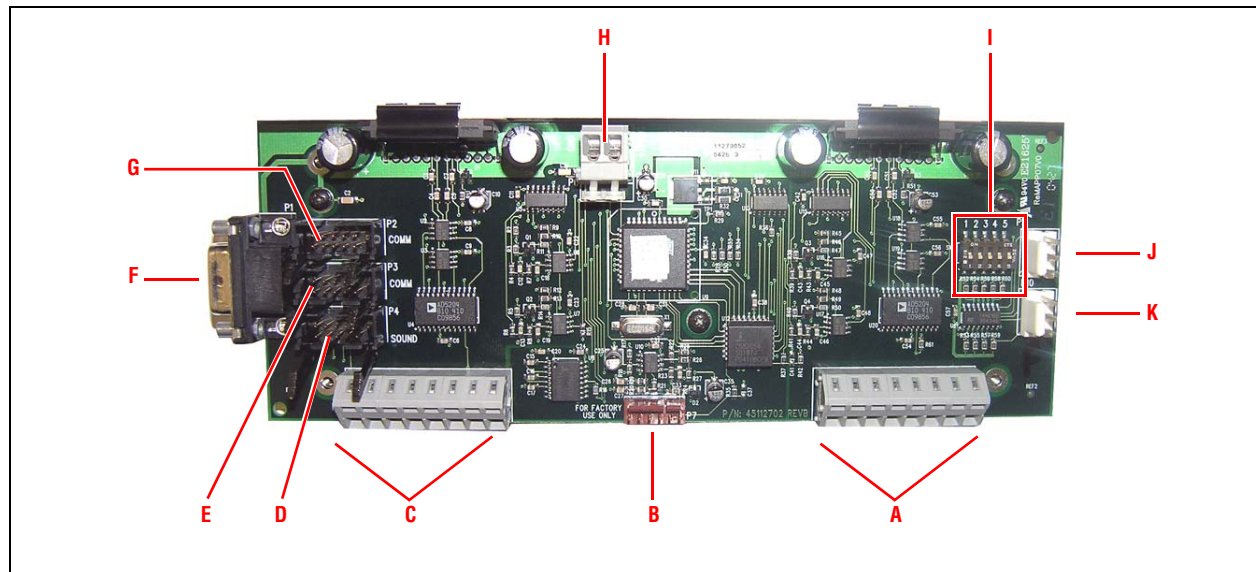
The turbo board, which is attached to the controller board, serves as an interface between the controller and AlphaVision PC sign(s).



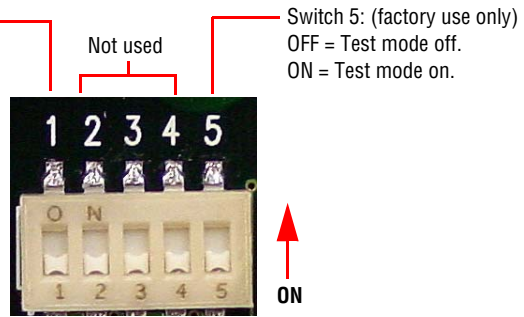
Item	PCB Label	Name	Description
<b>A</b>	PL25	CompactFlash socket	Allows 1x50 pin Type I and Type II CompactFlash cards. If there is an operating system on this card, the controller board will boot from the card if there are no hard disks connected to the controller board.
<b>B</b>	—	144-pin SODIMM	Supports 16, 32, 64, and 128MB 3.3V SDRAM module that conforms to either PC100 or PC133 specifications. The BIOS automatically detects the module size.
<b>C</b>	—	Turbo card	Serves as an interface between the controller board and AlphaVision PC sign.
<b>D</b>	P1 - P8	Turbo connectors	Turbo channels 1 through 8.
<b>E</b>	PL15	VGA CRT connector	Use cable (pn 1127-9055) to connect controller board to a VGA monitor.
<b>F</b>	PL5	Ethernet RJ45	100/10 BASE-T J45 Ethernet connector.
<b>G</b>	PL2	IDE disk interface	Connects to hard disk.
<b>H</b>	PL6	COM3 RS232 serial port	Not used.
<b>I</b>	PL10	COM4 RS232 serial port	Connects to P2 connector on TuneBlaster 1 board.
<b>J</b>	PL8	USB ports	Used to connect stacklight option.
<b>K</b>	PL7	PS/2 keyboard	Allows direct attachment of a keyboard to controller board.
<b>L</b>	PL9	PS/2 mouse	Allows direct attachment of a mouse to controller board.
<b>M</b>	PL14	COM4 RS485/422 serial port	Not used.
<b>N</b>	PL12	Power connector	Supplies 5V power to controller and turbo boards.
<b>O</b>	PL16	Parallel port	Not used.
<b>P</b>	PL18	COM2 RS232 serial port	Connects to P3 connector on TuneBlaster 2 board.
<b>Q</b>	PL19	COM1 RS232 serial port	Connects to P3 on TuneBlaster 1 board.
<b>R</b>	PL24	16-bit SoundBlaster	Connects to P4 on TuneBlaster 1 board and P4 on TuneBlaster 2 board.
<b>S</b>	J1 - J10	Turbo board jumpers	Used to set the following parameters: <ul style="list-style-type: none"> <li>• J1 through J7 = Memory addressing (must be set as shown below): <ul style="list-style-type: none"> <li><input type="checkbox"/> J1 = ON</li> <li><input type="checkbox"/> J2 = OFF</li> <li><input type="checkbox"/> J3 = ON</li> <li><input type="checkbox"/> J4 through J7 = OFF</li> </ul> </li> <li>• J8 = Dimming: <ul style="list-style-type: none"> <li><input type="checkbox"/> J8 OFF = 100% brightness</li> <li><input type="checkbox"/> J8 ON = 50% brightness</li> </ul> </li> <li>• J9 and J10 = IO addressing (must be set as shown below): <ul style="list-style-type: none"> <li><input type="checkbox"/> J9 = OFF</li> <li><input type="checkbox"/> J10 = OFF</li> </ul> </li> </ul>
<b>T</b>	P12	Thermostat connection	Used to shut down the sign when the temperature becomes greater than 160°F.

### 1.1.2 TuneBlaster board

This board sends audio signals from the controller to up to 8 speakers. Each channel on a board can power two speakers. A 4-channel board is shown below:

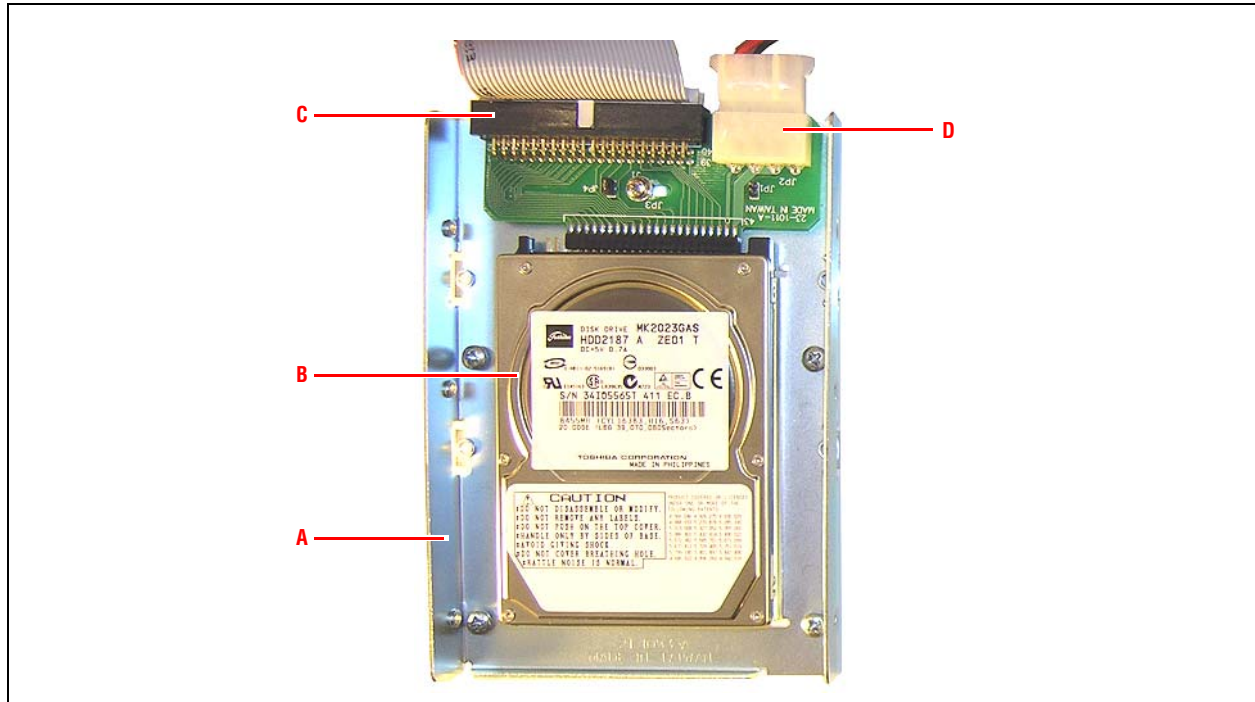


Item	PCB Label	Name	Description
<b>A</b>	P8	Channel 3 and 4 speaker connections	Allows 4 speaker hookups (2 per channel).
<b>B</b>	P7	ISP programming connector	Factory use only.
<b>C</b>	P5	Channel 1 and 2 speaker connections	Allows 4 speaker hookups (2 per channel).
<b>D</b>	P4 SOUND	SoundBlaster input	Connects to PL24 on controller board.
<b>E</b>	P3 COM	RS232 TuneBlaster board interface	TuneBlaster 1 board connects to PL19 on controller board. TuneBlaster 2 board connects to PL18 on controller board.
<b>F</b>	P1	RS232 controller board interface	P1 is a DB9 connector.
<b>G</b>	P2 COM	RS232 controller board interface	P2 is a box-type connector.
<b>H</b>	P6	Power connector	Supplies 12V power to board.
<b>I</b>	SW1	DIP switches	Used to set TuneBlaster board parameters:  Switch 1: _____ OFF on TuneBlaster 1 board. ON on TuneBlaster 2 board.  Switch 5: (factory use only) OFF = Test mode off. ON = Test mode on.
<b>J</b>	P9	Thermostat connectors	Used to dim the sign when the temperature inside becomes greater than 130°F.
<b>K</b>	P10		





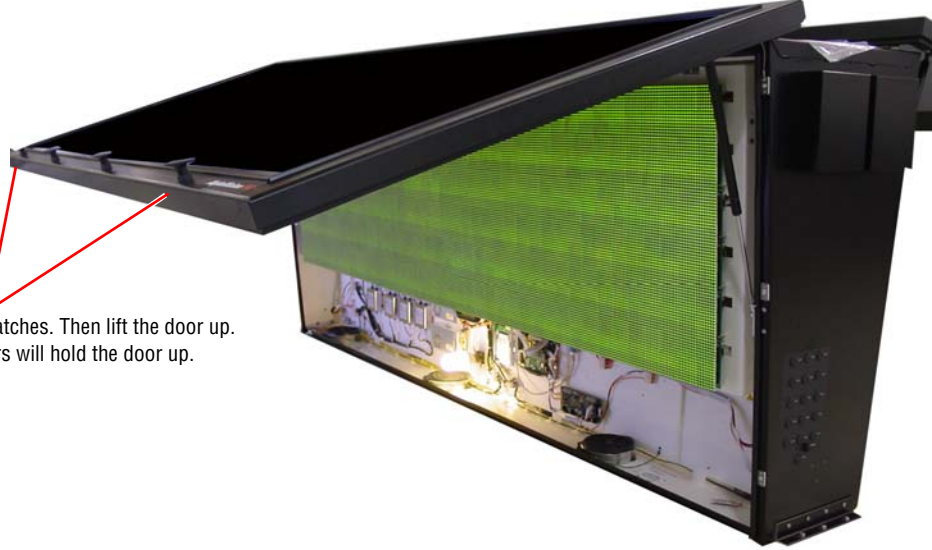
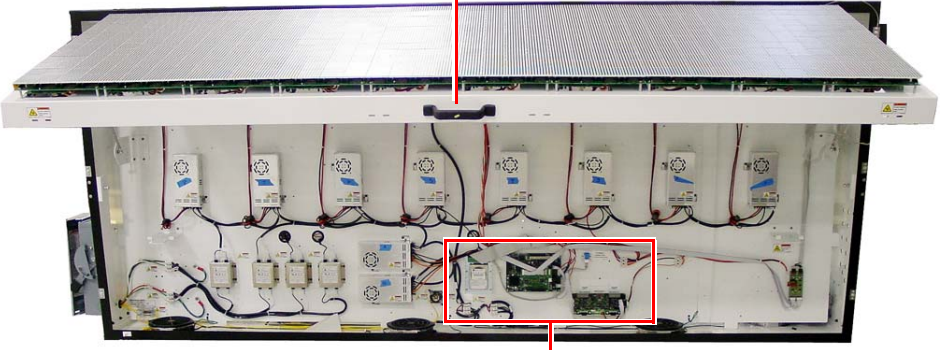
### 1.1.3 Hard disk drive

The hard disk drive is used to store operating system files.



Item	PCB Label	Name	Description
A	—	Hard drive mounting bracket	Used to attach the hard drive to the sign.
B	—	Hard drive	Stores operating system files.
C	J1	Hard drive IDE connector	Connects controller board to the hard drive.
D	JP2	Hard drive power connector	Supplies 5V to power the hard drive.

## 1.2 Installation

<b>1</b>	<b>Prevent electrostatic discharge (ESD) or “static” damage to the replacement part.</b> For safe handling of ESD-sensitive parts, see TechMemo #00-0005.	
<b>2</b>	<b>Remove power from the sign.</b>	
<b>3</b>	<b>Open the sign door. For back-to-back signs, open the controller board side. This side is marked by a label on the bottom of the signs:</b>	 <p>Turn the door latches. Then lift the door up. Shock absorbers will hold the door up.</p>
<b>4</b>	<b>Lift up the LED boards:</b>	 <p>Use the handle to lift the LED boards.</p> <p>Hard drive, controller/turbo board, and TuneBlaster board</p>

**5 Part replacement instructions:**

- To replace the hard drive, go to step 6.
- To replace the controller and turbo boards, go to step 7.
- To replace TuneBlaster board(s), go to step 8.

**6 Hard drive replacement:**

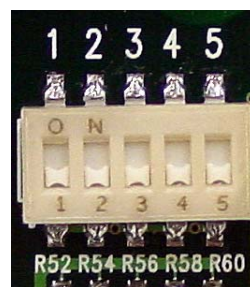
- Disconnect the two cables from the current hard drive.
- Remove the screws holding the current hard drive mounting bracket to the sign.
- Attach the replacement hard disk drive.
- Connect the two cables to the replacement hard drive.
- Go to step 9.

**7 Controller and turbo boards replacement:**

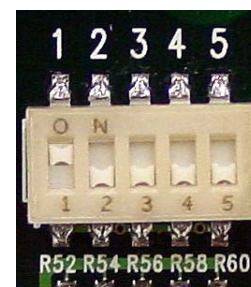
- Disconnect all the cables from the current controller and turbo boards.
- Remove the four screws that hold the current controller board to the sign.
- Attach the replacement controller and turbo boards.
- Connect all the cables to the replacement controller and turbo boards.
- Go to step 9.

**8 TuneBlaster board(s) replacement:**

- Disconnect all the cables from the current TuneBlaster board(s).
- Remove the four screws that hold the current TuneBlaster board(s) to the sign.
- Attach the replacement TuneBlaster boards to the sign. Make sure the DIP switches of the replacement TuneBlaster board(s) match the settings on the current board(s):



TuneBlaster 1  
DIP switch settings:  
All switches OFF.



TuneBlaster 2  
DIP switch settings  
Only switch 1 is ON.

- Connect all the cables to the replacement TuneBlaster board(s).
- Go to step 9.

**9 Close the sign. Apply power to the sign.**

## 1.3 Appendix

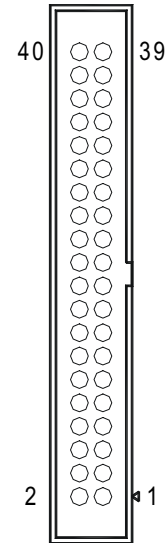
### 1.3.1 Controller board pinouts

#### 1.3.1.1 PL2 - IDE disk interface

##### PL2 - IDE Disk Interface

40 way 0.1" boxed pin header

Pin	Signal Name	Pin	Signal Name
1	/RESET	2	Ground
3	D7	4	D8
5	D6	6	D9
7	D5	8	D10
9	D4	10	D11
11	D3	12	D12
13	D2	14	D13
15	D1	16	D14
17	D0	18	D15
19	Ground	20	+5V
21	DREQ	22	Ground
23	/IOW	24	Ground
25	/IOR	26	Ground
27	/IOCHRDY	28	Ground
29	DACK	30	Ground
31	INTR	32	/IOCS16
33	SA1	34	No Connect
35	SA0	36	SA2
37	/CS0	38	/CS1
39	LED	40	Ground

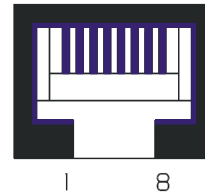


#### 1.3.1.2 PL5 - Ethernet RJ45

##### PL5 - Ethernet RJ45

8 way RJ45

Pin	Signal Name
1	TX+
2	TX-
3	RX+
4	No Connect
5	No Connect
6	RX-
7	No Connect
8	No Connect

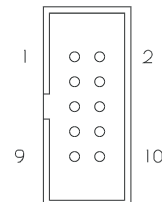


#### 1.3.1.3 PL6 - COM3 RS232 serial port

##### PL6 - COM3 RS232 Serial Port

10 pin 0.1" boxed pin header.

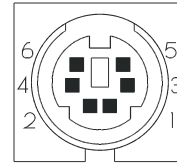
Pin	Signal Name	Pin	Signal Name
1	DCD	2	DSR
3	RXD	4	RTS
5	TXD	6	CTS
7	DTR	8	RI
9	GND	10	No Connect



**1.3.1.4 PL7 - PS/2 keyboard****PL7- PS/2 Keyboard**

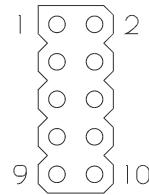
6-pin Mini-DIN

Pin	Signal Name
1	KB DATA
2	No Connect
3	Ground
4	+5V
5	KB CLOCK
6	No Connect

**1.3.1.5 PL8 - USB ports****PL8 - USB Ports**

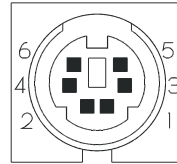
10 way 0.1" dual row pin header

Pin	Signal Name	Pin	Signal Name
1	VBUS-1	2	VBUS-2
3	DNEG-1	4	DNEG-2
5	DPOS-1	6	DPOS-2
7	Ground	8	Ground
9	Ground	10	Ground

**1.3.1.6 PL9 - PS/2 mouse****PL9- PS/2 Mouse**

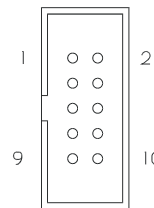
6-pin Mini-DIN

Pin	Signal Name
1	MS DATA
2	No Connect
3	Ground
4	+5V
5	MS CLOCK
6	No Connect

**1.3.1.7 PL10 - COM4 RS232 serial port****PL10 – COM4 RS232 Serial Port**

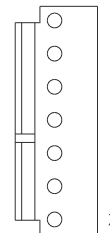
10 pin 0.1" boxed pin header.

Pin	Signal Name	Pin	Signal Name
1	DCD	2	DSR
3	RXD	4	RTS
5	TXD	6	CTS
7	DTR	8	RI
9	GND	10	No Connect

**1.3.1.8 PL12 -Power connector****PL12 - Power Connector**

7-pin locking power connector, Molex part number 26-60-4070.

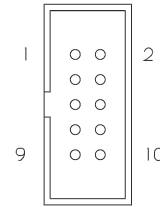
Pin	Signal Name
1	+5V
2	Ground
3	Ground
4	+12V
5	+3.3V (Not Used)
6	Ground
7	+5V



**1.3.1.9 PL14 - COM4 RS485/422 serial port**

**PL14 – COM4 RS485/422 Serial Port**  
10 pin 0.1" boxed pin header

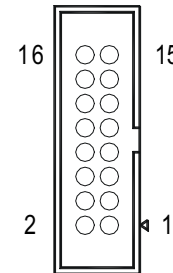
Pin	Signal Name	Pin	Signal Name
1	No Connect	2	No Connect
3	Ground	4	Ground
5	TXB/(RXB 485)	6	TXA/(RXA 485)
7	RXB	8	RXA
9	Ground	10	No Connect



**1.3.1.10 PL15 - VGA CRT connector**

**PL15 -VGA CRT connector**  
16 way 0.1" boxed pin header

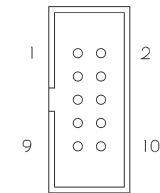
Pin	Signal Name	Pin	Signal Name
1	RED	2	Ground
3	GREEN	4	No Connect
5	BLUE	6	Ground
7	+5V (Fused)	8	No Connect
9	Ground	10	Ground
11	Ground	12	HSYNC
13	DDCSDA	14	VSYNC
15	DDCSCL	16	No Connect



**1.3.1.11 PL18 - COM2 RS232 serial port**

**PL18 – COM2 RS232 Serial Port**  
10 way 0.1" boxed pin header.

Pin	Signal Name	Pin	Signal Name
1	DCD	2	DSR
3	RXD	4	RTS
5	TXD	6	CTS
7	DTR	8	RI
9	GND	10	No Connect

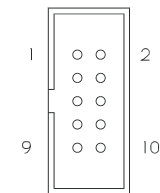


Note:- This pin-out is designed to provide a 1:1 connection to a 9 way IDC D-Type plug.

**1.3.1.12 PL19 - COM1 RS232 serial port**

**PL19 – COM1 RS232 Serial Port**  
10 way 0.1" boxed pin header

Pin	Signal Name	Pin	Signal Name
1	DCD	2	DSR
3	RXD	4	RTS
5	TXD	6	CTS
7	DTR	8	RI
9	GND	10	No Connect

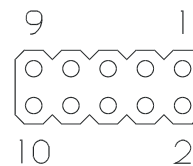


Note:- This pin-out is designed to provide a 1:1 connection to a 9 way IDC D-Type plug.

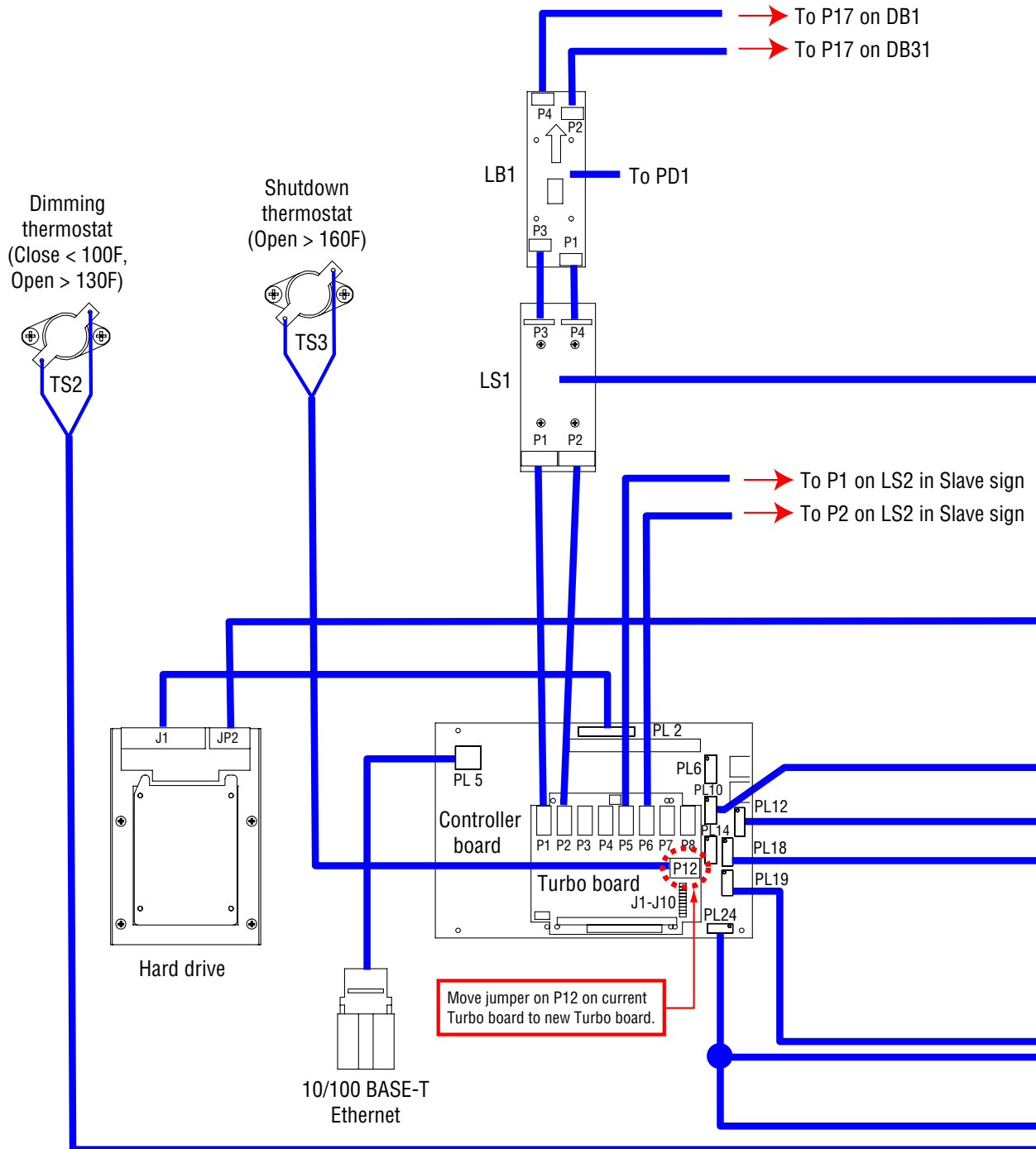
**1.3.1.13 PL24 - 16-bit SoundBlaster**

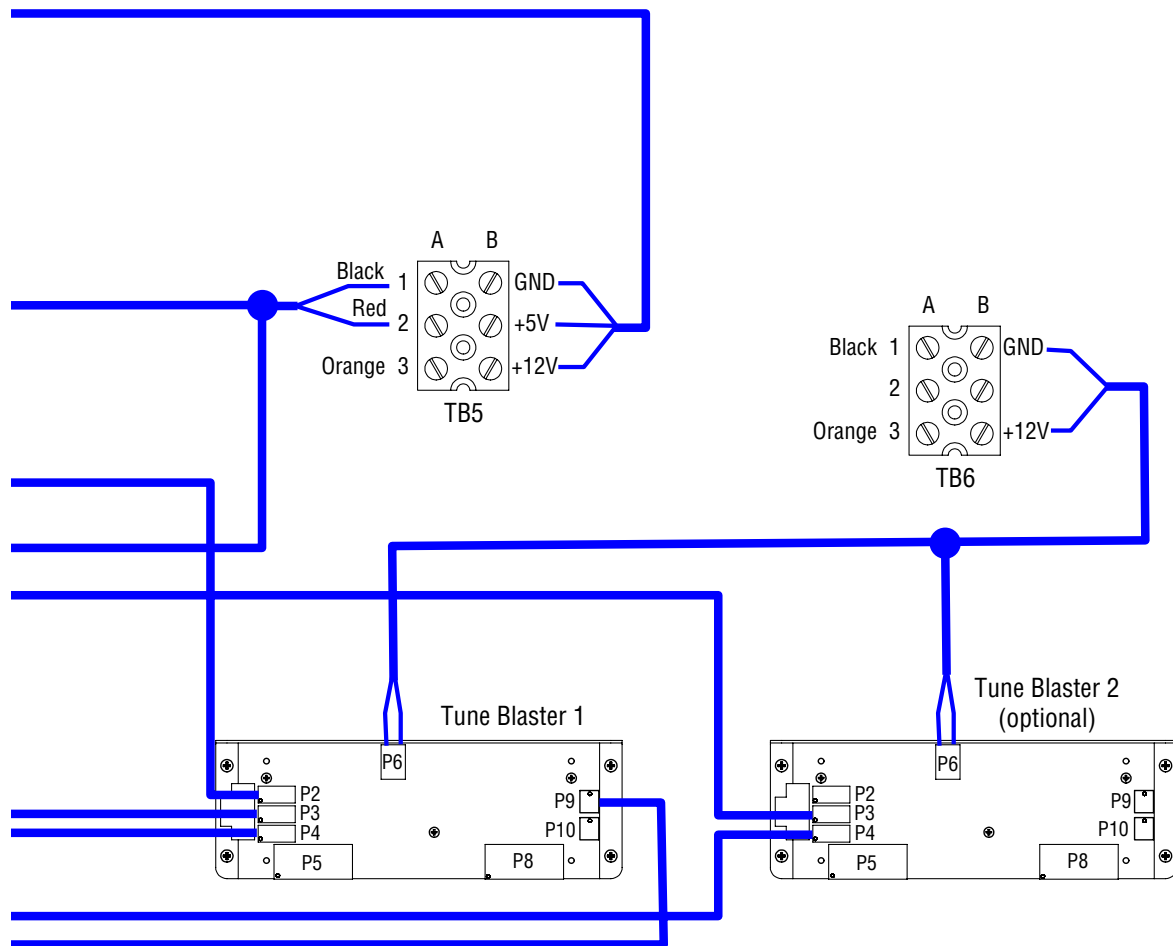
**PL24 - 16-bit SoundBlaster**  
10 way 0.1" pin header

Pin	Signal Name	Pin	Signal Name
1	Ground	2	MIC IN
3	Ground	4	LEFT IN
5	Ground	6	RIGHT IN
7	Ground	8	LEFT OUT
9	Ground	10	RIGHT OUT

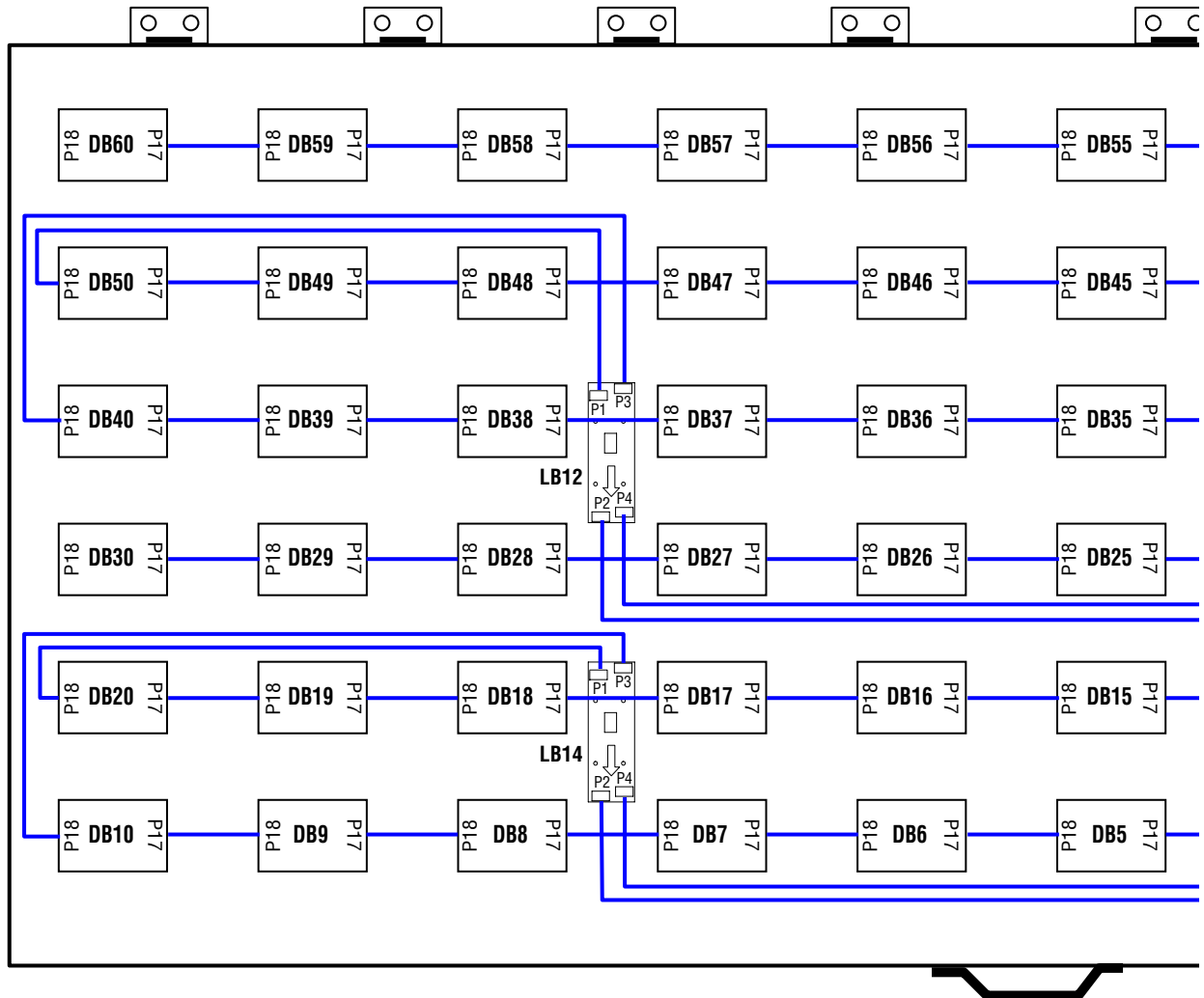


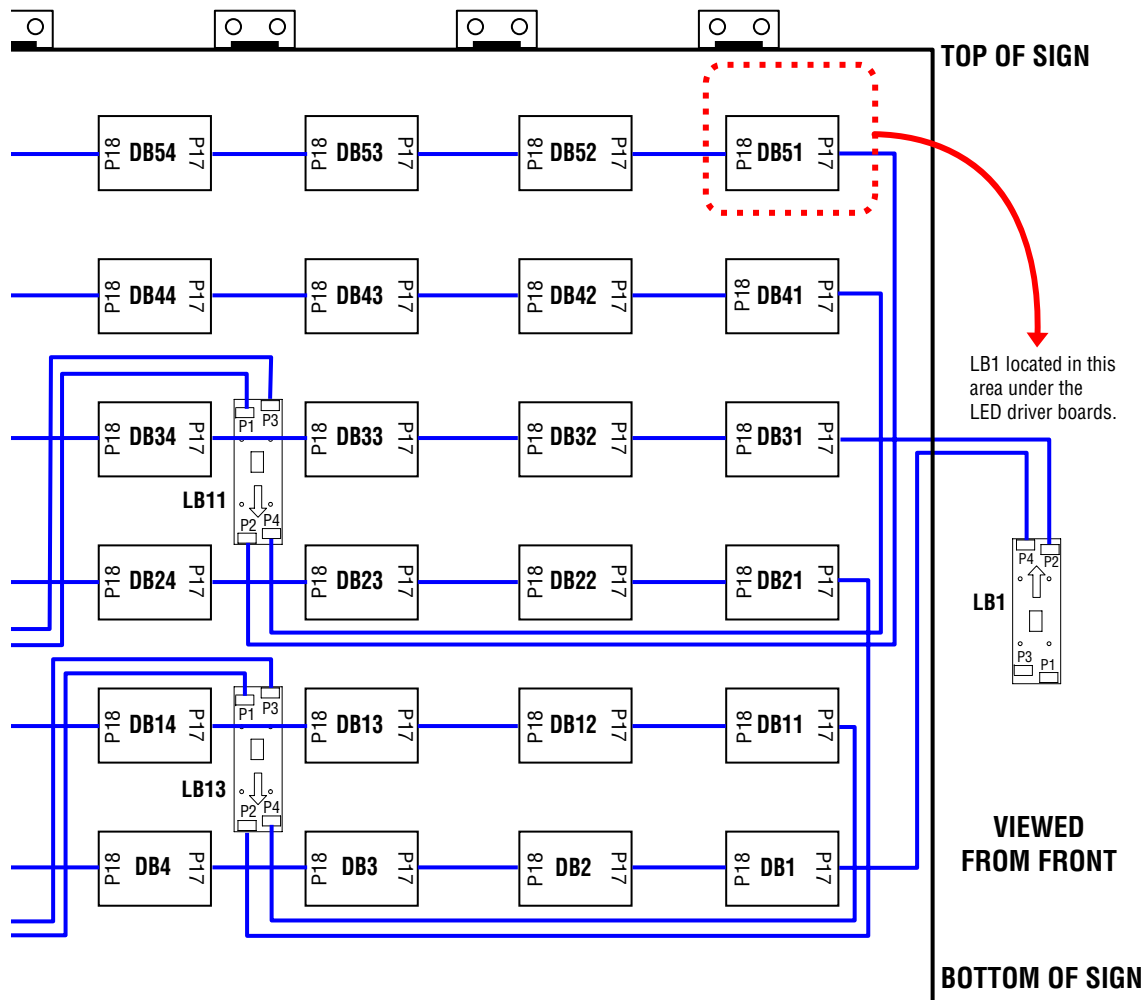
### 1.3.2 Controller board wiring diagram



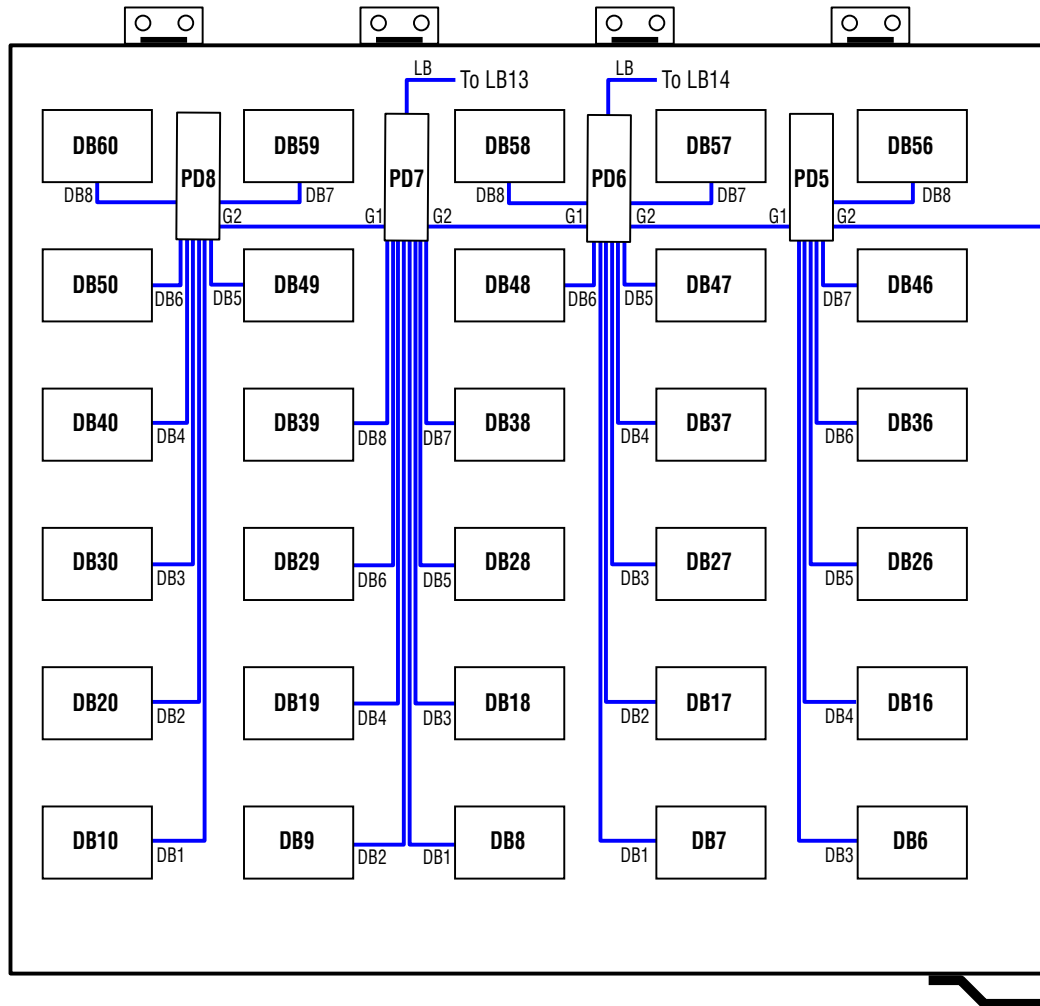


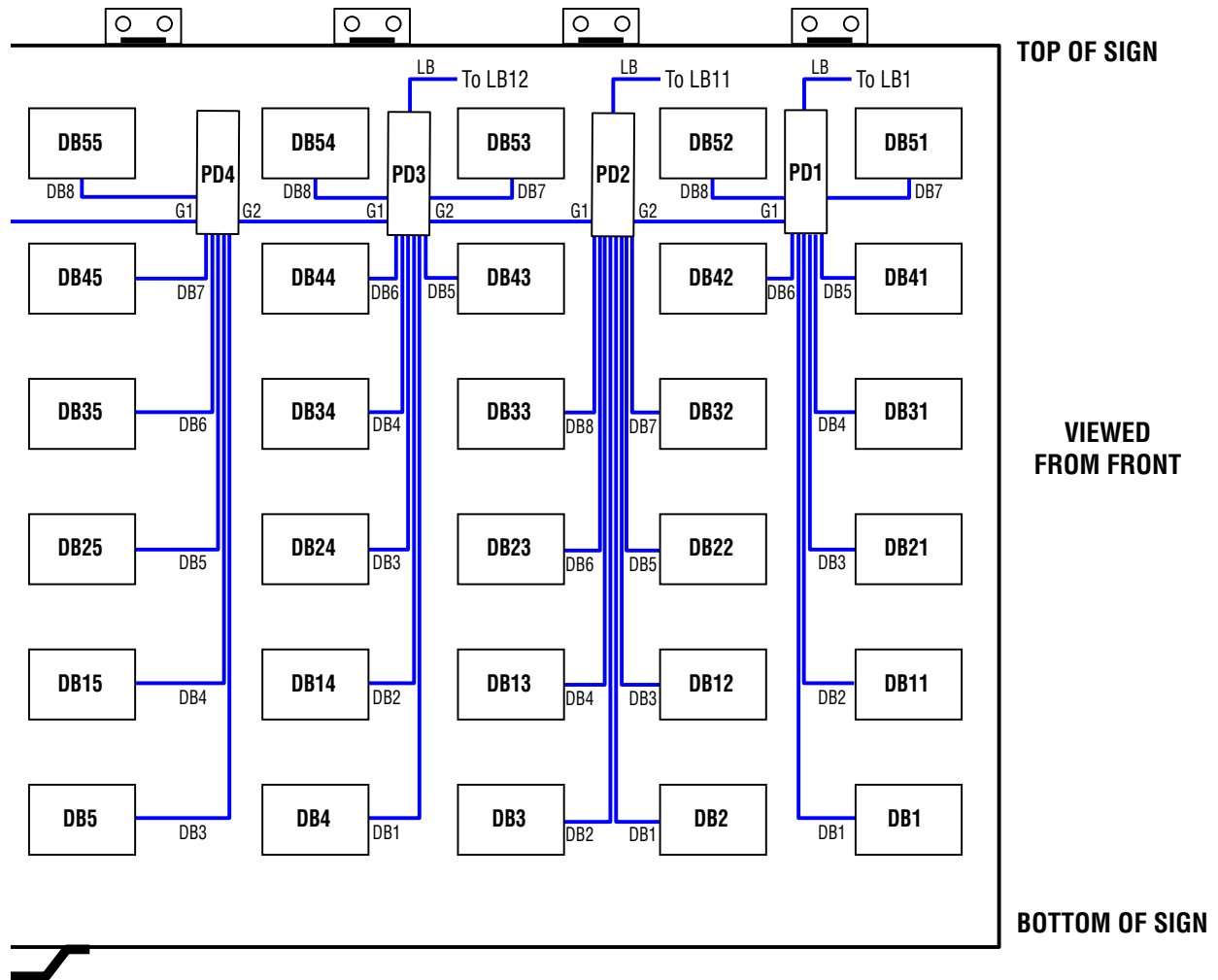
### 1.3.3 LED driver board interconnection





### 1.3.4 DC power wiring







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November 12, 2004

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