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GLOSSARY OF TERMS

The following terms are used in this section. To better understand the information presented in the section you should familiarize yourself with these terms.

CAT5e (Category 5e) - A twisted pair cable used for carrying signals. CAT5e is an enhanced version of Category 5 that adheres to more stringent standards. It is capable of transmitting data at speeds of up to 1000 Mbps (1 Gigabit per second). In the Sync system it is used in an Ethernet network to interconnect the Control Desk computer(s), Peripheral Controller boxes, overhead Display Controllers and the bowler's input consoles.

Peripheral Controller - A box located near the pinsetter on each lane pair that provides multiple functions for the lane pair. It is responsible for interfacing pin cameras, controlling machine functions such as on/off and reset, and handling signals needed for scoring such as foul, sweep switch, and ball detector signals. It can control AMF short cycle and automated bumpers, as needed. It also provides power and communication to optional Vector keypads.

Ethernet - A protocol that specifies how computers send information to one another.

Ethernet Switch - Device that is the central point of connection that enable network devices to communicate with each other. In the Sync scoring system multiple switches are used to connect the Peripheral Controllers, Display Controllers, Sync consoles and the Control system computer(s). Also refer to CAT5e.

IP Address - A unique number assigned to a computer or device to identify it on a network. The number can be assigned to the device as needed from a central point called a DHCP server (dynamic) or set at the device itself (static).

Port - A port can be described as a physical connection on a computer, ethernet switch or other electronic component that allows information to be sent or received from another computer or electronic device. In networking a port describes one of the 65,535 "channels" available within a IP address that allow a device to send and receive information.

RS-232 - The most popular type of serial communication used by computers. This type of communication allows a computer to talk to a single specific device through a 9-pin connector called a comport. Each device that the computer "talks" to will have its own dedicated comport.

RS-485 - A type of serial communication that allows a computer to talk to a multiple devices using one "shared" comport. Also refer to Serial Communication.

Serial Communication - A popular means of transmitting data between a computer and another device. In the Sync system two types of serial communication are used; RS-232 and RS-485. Also refer to RS-232 and RS-485.

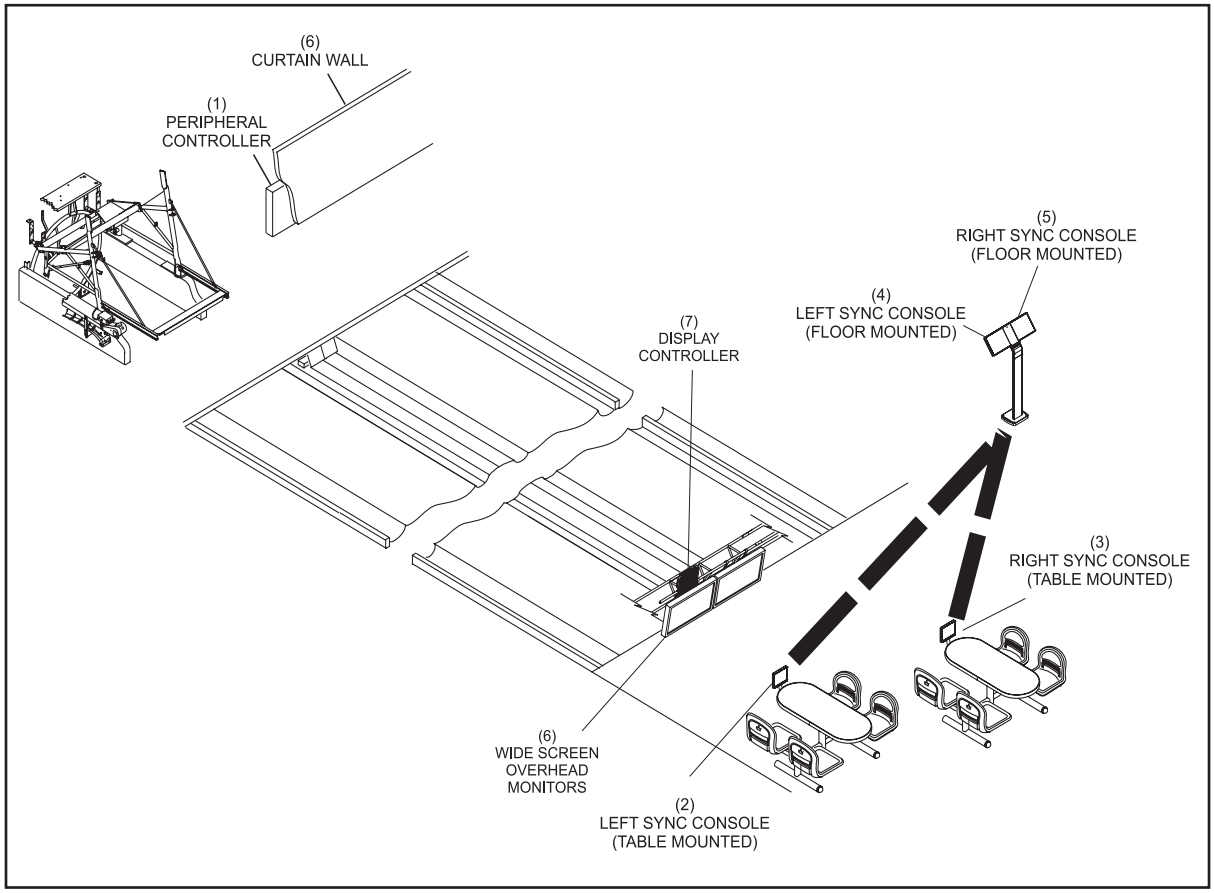
SYNC SCORING OVERVIEW

The Sync scoring system includes electronic components located in the bowler and pinsetter areas. Together, these assemblies perform automatic scoring functions, provide the bowler with input capabilities, control the pinsetter, and display information about the game in progress. Refer to figures titled *Sync Configuration Overview and Vector Keypad Configuration Overview.*

The system is available with Touchpads (keypads) or with full display touchscreen bowler's consoles. Both types of consoles allow the bowler to enter all information needed to begin bowling, change or correct information once bowling has begun and access special features of the scoring system. The full display touchscreen console is also capable of showing the bowler's scoresheet screen. Centers upgrading from Vector scoring have the option of re-using their Vector keypads instead of Sync bowler's consoles.

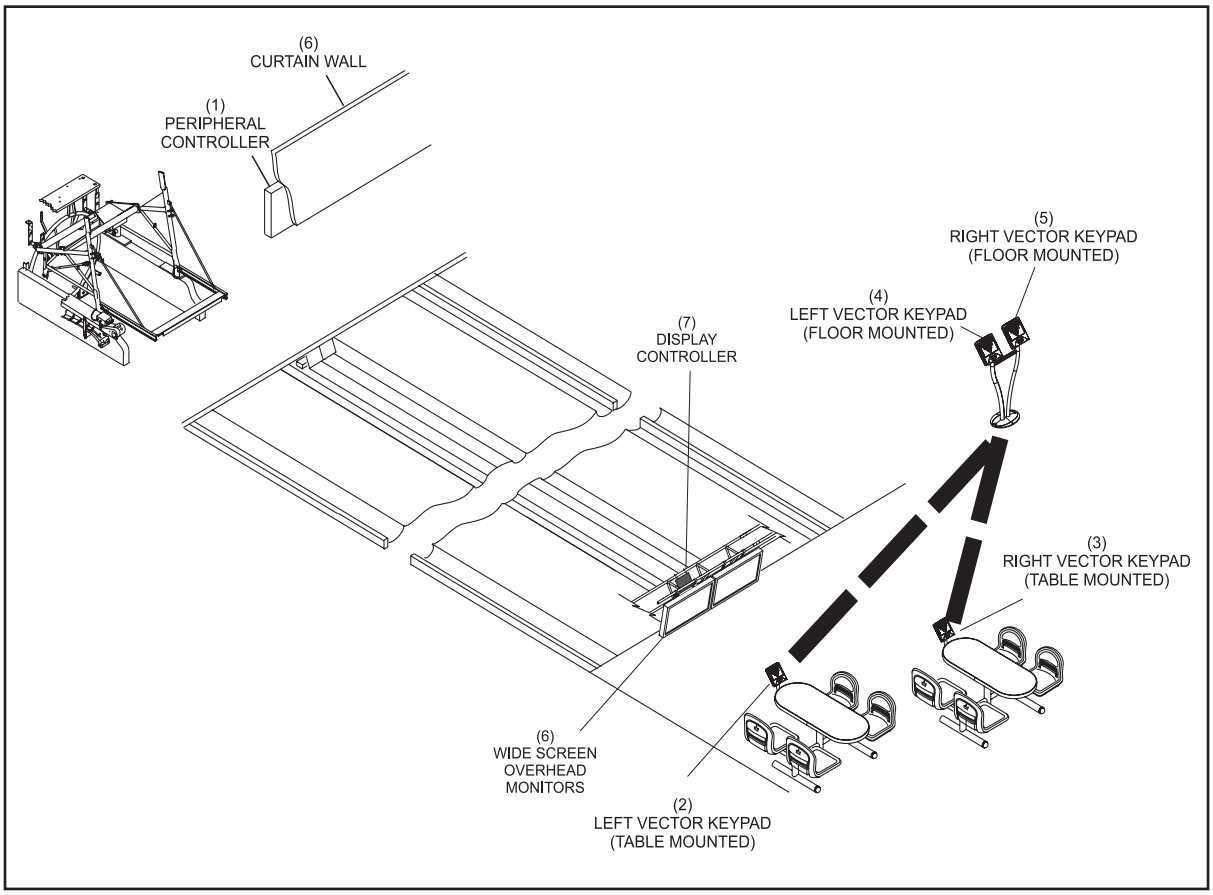
Overhead monitors for each lane pair are equipped with a computer called a Display Controller. This controller provides scoring functionality and produces a high definition (HD) scorer display for the screens.

Peripheral Controller boxes mounted on the curtain wall connect to lane pair components such as the pinsetters, pin cameras, Vector keypads or Sync Touchpads (keypads), and automated bumpers as needed.



Sync Configuration Overview

(1) PERIPHERAL CONTROLLER (TABLE MOUNTED)
(2) LEFT SYNC CONSOLE (TABLE MOUNTED)
(3) RIGHT SYNC CONSOLE
(4) LEFT SYNC CONSOLE (FLOOR MOUNT)
(5) RIGHT SYNC CONSOLE (FLOOR MOUNTED)
(6) CURTAIN WALL
(7) DISPLAY CONTROLLER
(8) WIDESCREEN OVERHEAD MONITORS



Vector Keypad Configuration Overview

(1) PERIPHERAL CONTROLLER
(2) LEFT VECTOR KEYPAD (TABLE MOUNTED)
(3) RIGHT VECTOR KEYPAD (TABLE MOUNTED)
(4) LEFT VECTOR KEYPAD (FLOOR MOUNTED)
(5) RIGHT VECTOR KEYPAD (FLOOR MOUNTED)
(6) CURTAIN WALL
(7) DISPLAY CONTROLLER
(8) WIDESCREEN OVERHEAD MONITORS

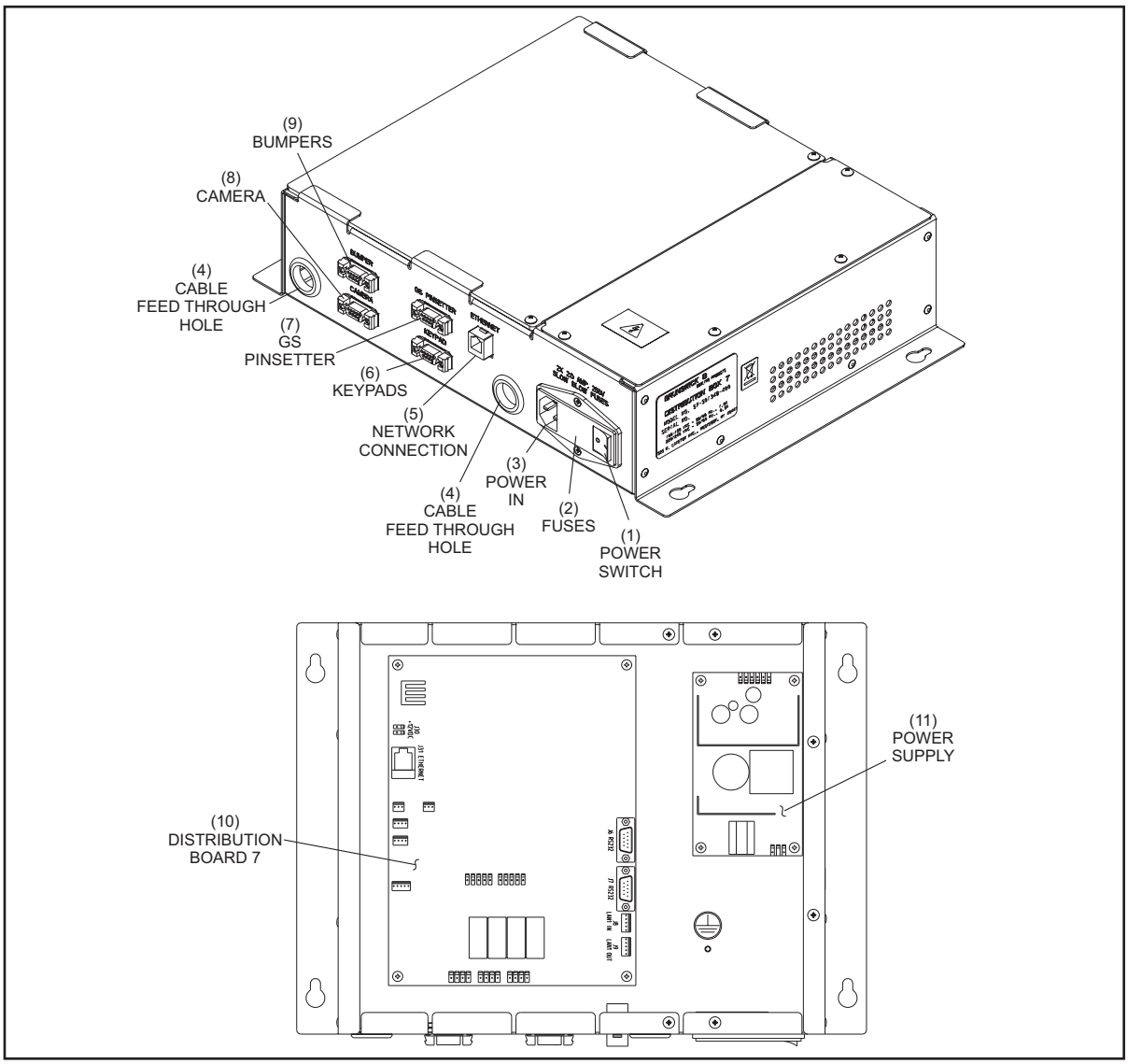
PERIPHERAL CONTROLLER

The Peripheral Controller provides multiple functions for a lane pair dependent on the pinsetter in use and optional devices that may be installed on the lane pair.

The board contains circuits to allow communication to GS series pinsetters, Brunswick automated bumpers and Sync Touchpad (keypad) or optional Vector keyboard.

For non GS pinsetter installations it supplies power to the pin camera and processes the camera's video, turns the pinsetters on/off, cycles the pinsetters as needed, interfaces the ball detectors and foul unit to the scoring system.

The board also has the capability to control AMF automated bumpers and provide signals for AMF pinspotter chassis equipped with the short cycle functionality. Version 7 also contains circuitry and connectors on the circuit board to expand functionality in the future. Refer to figure titled: *Peripheral Controller Box*, *Distribution Board 7 Connectors and Components, Distribution Board 7 LEDs, and Distribution Board 7 Jumpers.*



Peripheral Controller Box , Distribution Board 7 Connectors and Components, Distribution Board 7 LEDs, and Distribution Board 7 Jumpers

The function of the circuit boards, and external connections for the Peripheral Controller include:

(1) **Power Switch -** Power switch for the Peripheral Controller box. Pressing this button turns the Peripheral Controller On/Off .

(2) **Fuses** - Protection for the main input power. Rating = 2.0Amp 250V, Slow Blow.

(3) **Power In** - 120VAC or 240VAC main input power for the Interface box.

(4) **Cable Feed Through Hole -** Access holes for the cables that connect directly to the Distribution board. For non-GS pinsetters the cables that typically route through these holes include those for the pin camera's video and ball detector signals, AMF bumper control, and switches and controls for the pinsetters. For GS pinsetters the ball detector signal used to determine ball speed is routed through the holes.

(5) **Network Connection** - The connection point for the Cat5e cable from the Ethernet Switch located on the curtain wall.

(6) **Keypads** - Connection that provides +12VDC power and RS-232 communication for Sync Touchpads and Vector Keypads.

(7) **GS Pinsetter** - Connection that provides RS-485 communication for GS Series pinsetters.

(8) **Camera** - Connection that provides +12VDC power to the pin camera used for non-GS pinsetter installations.

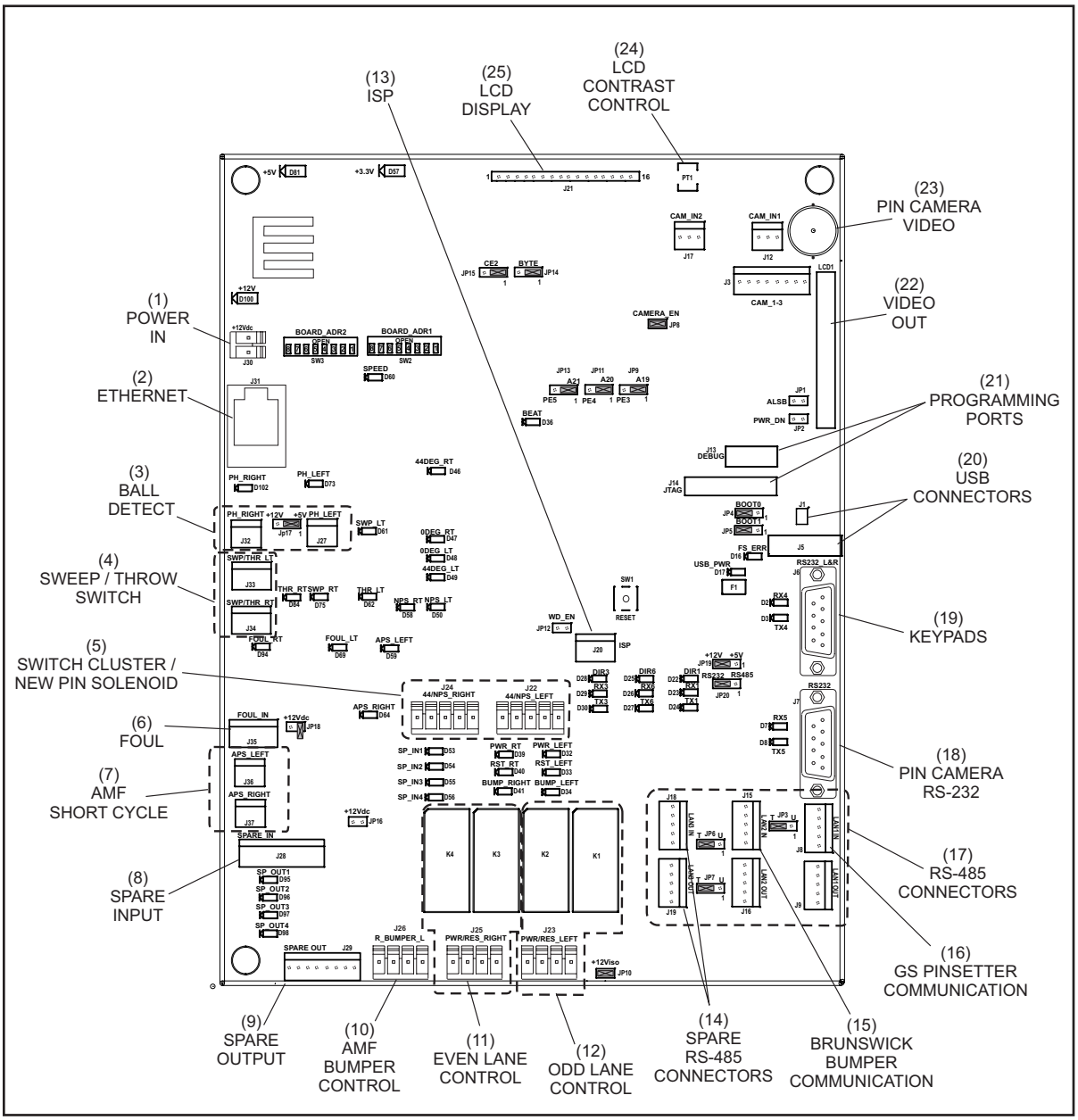
(9) **Bumpers** - Connection that provides RS-485 communication for Brunswick automated bumpers.

(10) **Distribution Board 7** - The main circuit board inside the Peripheral Controller.

(11) **Power Supply -** This board converts the incoming A/C power to supply 12 VDC. This voltage is used to generate additional voltage levels used by the Distribution PCBs, Pin Camera and Sync Touchpads or optional Vector Keypads. Input to the power supply can be 120 VAC or 240 VAC.

Distribution Board 7

Connections and Components



Distribution Board 7 Connectors and Components

The function of the connectors and components on the Distribution Board 7 are:

(1) Power In - ***(J30)*** Board power connector. Input for +12VDC originating at the power supply.

(2) Ethernet - ***(J31)*** Internal connection point for the Cat5e cable that attaches to the external "Ethernet" connector located on the bottom of the Peripheral Controller. The Distribution board communicates with the Sync control system, Display Controllers, and Sync Touchscreen consoles through this connection.

(3) **Ball Detect** - ***(J27,J32)*** Connections for the ball detector signals. When used in a system with pin cameras, these connections provide power for the ball detectors and an input for the signal that starts the scoring process and is used to determine ball speed. They are also used in GS pinsetters to monitor the GS pinsetter's ball detectors so that ball speed can be calculated. Also refer to *Ball Detect Jumper (JP17) and Ball Detect LEDs (D73,D102).*

J27 - Odd (left) lane
J32 - Even (right) lane

(4) **Sweep / Throw Switch** - ***(J33,J34)*** Connections for the signal from the sweep/rake switch installed on the pinsetter when pin cameras are used for scoring. These connections are not used with GS pinsetter installations. Also refer to *Sweep Switch / Throw LEDs (D61,D62, D75,D84).*

J33 - Odd (left) lane
J34 - Even (right) lane

(5) **Switch Cluster / New Pins Solenoid** - ***(J22,J24)*** Connections for the signals from the 0 degree and 44 degree switches and the New Pin Solenoids (NPS) that may be installed as an option for A-2 pinsetters. Also refer to *Switch Cluster LEDs (D46-D49) and NPS LEDs (D50,D58).*

J22 - Odd (left) lane
J24 - Even (right) lane

(6) **Foul** - ***(J35)*** Input for the signals from the foul units for both the left and right lanes. Also refer to *Foul Jumper (JP18) and Foul LEDs (D69,D94).*

(7) **AMF Short Cycle** - ***(J36,J37)*** Connection to the AMF 8270MP pinspotter to allow the machines to perform a short cycle when needed. Also refer to *AMF Short Cycle LEDs (D59,D64).*

J36 - Odd (left) lane
J37 - Even (right) lane

(8) **Spare Input** - ***(J28)*** Reserved for future use.

(9) **Spare Output** - ***(J29)*** Reserved for future use.

(10) **AMF Bumper Control** - ***(J26)*** Connection to AMF automated bumpers. Also refer to AMF *Bumper Control LEDs (D34,D41).*

(11) **Even Lane Control** - ***(J25)*** Connection to the even (right) lane pinsetter. The distribution PCB turns the even lane pinsetter on/off by energizing relay K3 and resets (cycle) the pinsetter by energizing relay K4. LED D19 turns "on" when the pinsetter power relay (K1) energizes. LED D23 turns "on" when the pinsetter reset relay (K2) energizes. This connector is not used for installations with GS Series pinsetters.

(12) **Odd Lane Control** - ***(J23)*** Connection to the odd (left) lane pinsetter. The distribution PCB turns the even lane pinsetter on/off by energizing relay K1 and resets (cycle) the pinsetter by energizing relay K2. LED D27 turns "on" when the pinsetter power relay (K1) energizes. LED D33 turns "on" when the pinsetter reset relay (K4) energizes. This connector is not used for installations with GS Series pinsetters.

(13) **ISP** - ***(J20)*** In system programming connector for manufacturer's use only.

(14) **Spare RS-232 /RS-485 Connectors** - ***(J18,J19)*** Normally theses connection are not used. For centers equipped with an Intellishield ball lift safety device, J18 is used for communication to the Intellishield Controller. Jumper JP20 is used to select RS-232 or RS-485 communication.

(15) **Brunswick Bumper Communication** - ***(J15,J16)*** Internal connection point for the cable that attaches to the external "Bumper" connector located on the bottom of the Peripheral Controller. This connector is used to communicate to optional Brunswick automated bumpers. The output connection (J16) is not used.

(16) **GS Pinsetter Communication** - ***(J8,J9)*** Internal connection point for the cable that attaches to the external "GS Pinsetter" connector located on the bottom of the Peripheral Controller. Connection that provides RS-485 communication for GS series Pinsetters. The output connection (J9) is not used.

(17) **RS-485 Connections** - ***(J8,J9,J15,J16,J18,J19)*** Connections that provides RS-485 communication for GS series Pinsetters (J8) and optional Brunswick automated bumpers (J15). The output connections (J9,J16) and the spare Connectors (J18,J19) are not used.

(18) **Pin Camera RS-232** - ***(J7)*** Internal connection point for the cable that attaches to the external "Camera" connector located on the bottom of the Peripheral Controller. This connection provides +12VDC power for the pin camera.

(19) **Keypads** - ***(J6)*** Internal connection point for the cable that attaches to the external "Keypad" connector located on the bottom of the Peripheral Controller. This connection provides +12VDC power and RS-232 communication for the Sync Touchpad and Vector Keypads.

(20) **USB Connectors** - ***(J1,J5)*** Not Used. For manufacturer's use only.

(21) **Programming Ports** - ***(J13,J14)*** For factory use only.

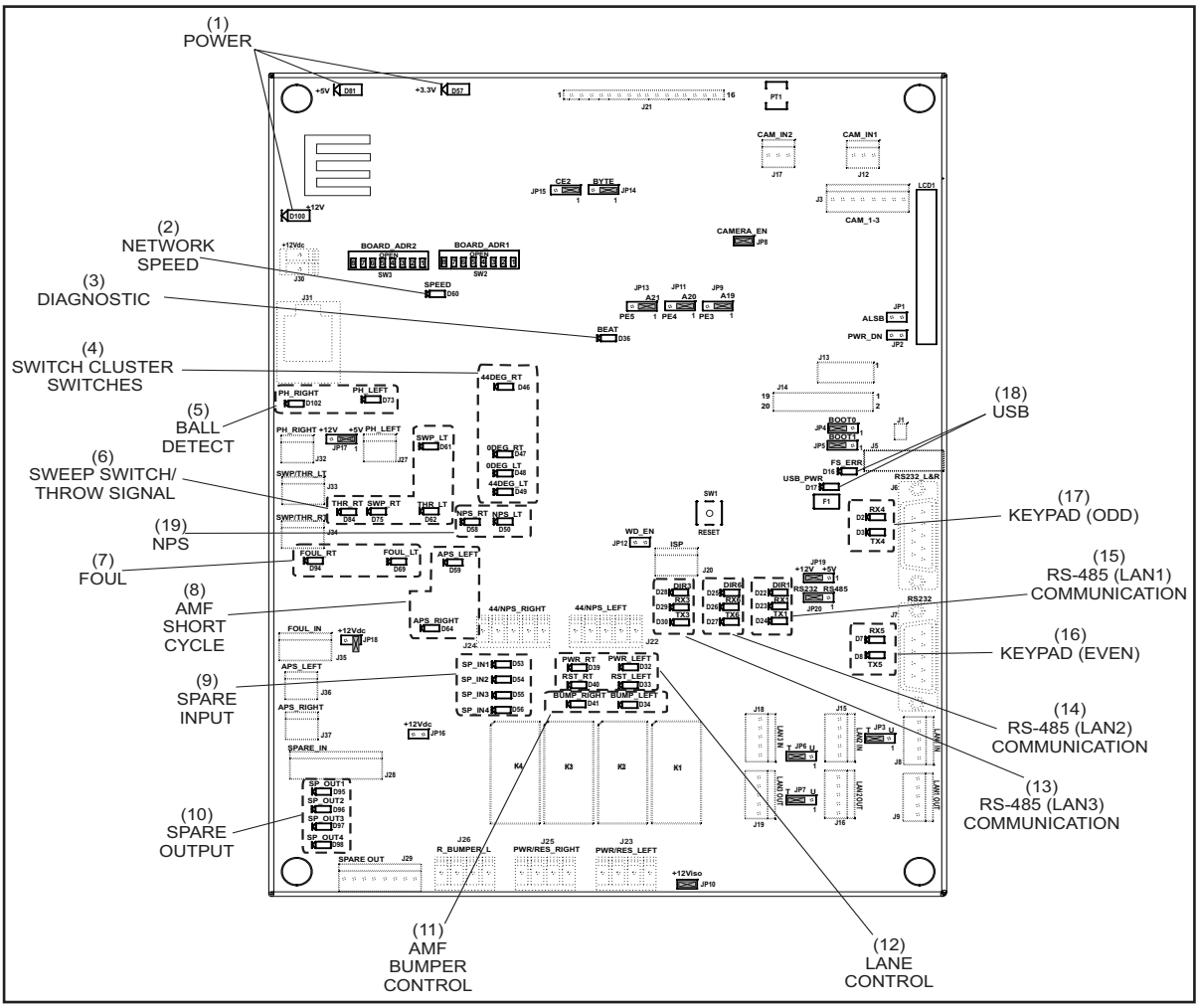
(22) **Video Out** - ***(LCD1)*** For factory use only.

(23) **Pin Camera Video** - ***(J3)*** Connection for the video originating at the pin camera.

(24) **LCD Contrast Control** - ***(PT1)*** For factory use only.

(25) **LCD Display** - ***(J21)*** For factory use only

Status LEDs



Distribution Board 7 LEDs

The function of the LEDs on the Distribution Board 7 are:

(1) Power - ***(D57,D81,D100)*** Power indicator LEDs

D57 (red) - +3.3VDC
D81 (red) - +5VDC
D100 (green) - +12VDC

(2) Network Speed - ***(D60)*** LED D60 (green) indicates the status of the Ethernet network connections.

ON - Network cable is connected
FLASHING - Network activity

(3) Diagnostics - ***(D36)*** LED D36 (green) flashes when the Distribution PCB is working properly.

(4) **Switch Cluster Switches** - ***(D46 - D49)*** These LEDs light to indicate when the zero degree and 44 degree switches that are available as an option on A-2 pinsetters are "closed".

D46 (red) - Right Lane 44 degree switch
D47 (red) - Right Lane 0 degree switch
D48 (green) - Left Lane 0 degree switch
D49 (green) - Left Lane 44 degree switch

(5) **Ball Detect** - ***(D73,D102)*** These LEDs turn "ON" when a ball detect signal occurs.

D73 (green) - Left lane ball detect
D102 (red) - Right lane ball detect

(6) **Sweep Switch / Throw** - ***(D61,D62,D75,D84)*** These LEDs turn "ON" when the sweep switch on the pinsetter is actuated and when the pinsetter is on first ball. These LEDs are only used for installations equipped with pin cameras.

D61 (green) - Left lane sweep switch
D62 (green) - Left lane 1st ball
D75 (red) - Right lane sweep switch
D84 (red) - Left lane 1st ball

(7) **Foul** - ***(D69,D94)*** These LED turn "ON" when the board is receiving a foul signal. These LEDs are not used for GS Series pinsetters installations.

D69 (green) - Left lane foul signal
D94 (red) - Right lane foul signal

(8) **AMF Short Cycle** - ***(D59,D64)*** These LED turn "ON" when the short cycle signal is sent to the AMF pinspotter.

D59 (green) - Left lane short cycle
D64 (red) - Right lane short cycle

(9) **Spare Input** - ***(D53-D56)*** Not Used.

(10) **Spare Output** - ***(D95-D98)*** Not Used.

(11) **AMF Bumper** - ***(D34, D41)*** These LEDs turn "ON" when a signal (voltage) is sent to the AMF automated bumpers.

D34 (green) - Left lane bumpers
D41 (red) - Right lane bumpers

(12) **Lane Control** - ***(D32,D33,D39,D40)*** These LEDs turn "ON" when the relays to turn on or reset the pinsetters are energized. These LEDs are not used for GS Series pinsetters installations.

D32 (green) - Left lane power (K1 energized)
D33 (green) - Left lane reset (K2 energized)
D39 (red) - Right lane power (K3 energized)
D40 (red) - Right lane reset (K4 energized)

(13) **RS-485 (LAN3) Communication** - ***(D28-D30)*** Not Used.

LED D28 (blue) - Direction
LED D29 (red) - Receive
LED D30 (green) - Transmit

(14) **RS-485 (LAN2) Communication** - ***(D25-D27)*** These LEDs turn "ON" when information is being transmitted or received from the Brunswick bumpers.

LED D25 (blue) - Direction
LED D26 (red) - Receive
LED D27 (green) - Transmit

(15) **RS-485 (LAN1) Communication** - ***(D22-D24)*** These LEDs turn "ON" when information is being transmitted or received from the GS Series pinsetter.

LED D22 (blue) - Direction
LED D23 (red) - Receive
LED D24 (green) - Transmit

(16) **Keypad Even** - ***(D7,D8)*** These LEDs turn "ON" when information is being transmitted or received from the even (right) lane Sync Touchpad or Vector Keypad.

LED D7 (red) - Receive
LED D8 (green) - Transmit

(17) **Keypad Odd** - ***(D2,D3)*** These LEDs turn "ON" when information is being transmitted or received from the odd (left) lane Sync Touchpad or Vector Keypad.

LED D2 (red) - Receive
LED D3 (green) - Transmit

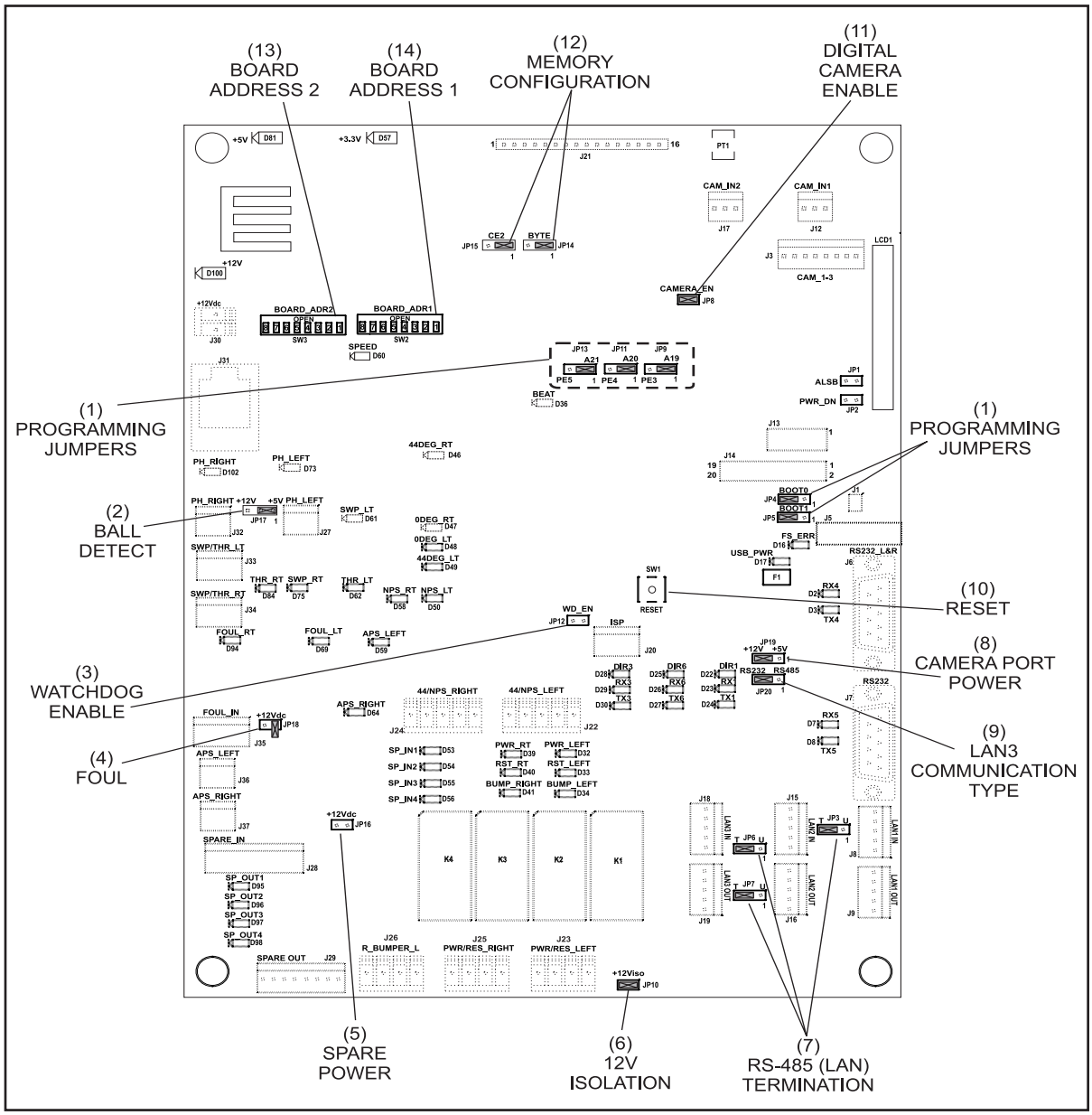
(18) **USB** - ***(D16, D17)*** Not Used.

LED D16 (red) - USB error
LED D17 (green) - USB power

(19) **NPS** - ***(D50,D58)*** These LED turn "ON" when a 12VDC signal is sent to the New Pin Solenoid that is available as an option on A-2 pinsetters.

LED D50 (green) - Left lane NPS
LED D58 (red) - Right lane NPS

Jumpers and Settings



Distribution Board 7 Jumpers

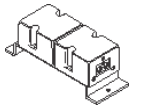
The function of the jumpers on the Distribution Board 7 are:

(1) Programming Jumpers - ***(JP4,JP5,JP9,JP11,JP13)*** For factory use only

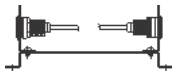
JP4,JP5 - Install jumper at pins 2-3 (Gnd) (Default)
JP9,JP11,JP13 - Install jumper at pins 1-2 (Default)

(2) Ball Detect - ***(JP17)*** Jumper used to configure the Distribution PCB to power the ball detectors used in installations equipped with pin camera with 5VDC or 12VDC. This setting is only impacts installations that use cameras for scoring (Centers without GS-Series pinsetters and StringPin pinsetters). For square type ball detectors, set the jumper to 5VDC. For the round ball detectors, set the jumper to 12VDC.

CAUTION! The ball detect jumper on the Distribution board MUST be set to the proper voltage. Failure to do so can cause permanent damage to the ball detector.



Square Ball Detector - Install jumper at pins 1-2 (5V)



Round Ball Detector - Install jumper at pins 2-3 (12V)

(3) Watchdog Enable - ***(JP12)*** For factory use only.

JP12 - Remove jumper (Default)

(4) Foul - ***(JP18)*** Jumper used to configure the distribution so that is can properly handle the foul input signal. When using Brunswick foul units or foul units that use a relay type (switch) output, install a jumper to short the pins. If using a foul unit that supplies +12VDC as an output (AMF) remove the jumper.

Brunswick Foul Unit - Install jumper (Default)
AMF Foul Unit - Remove Jumper

(5) Spare Power - ***(JP16)*** Reserved for future use.

JP16 - Remove Jumper (Default)

(6) +12V Isolation - ***(JP10)*** Factory use only.

JP10 - Install Jumper (Default)

(7) RS-485 (LAN) Termination - ***(JP3,JP6,JP7)*** Jumpers used to terminate the RS-485 communication.

JP3 - GS pinsetter communication. Install jumper at pins 2-3 (Terminate) (Default)
JP6 - Brunswick automated bumpers. Install jumper at pins 2-3 (Terminate) (Default)
JP7 - Spare. Install jumper at pins 2-3 (Terminate) (Default)

(8) **Camera Port Power *(JP19)*** - Selects voltage level used for the cameras.
Install jumpers at pins 2-3 (+12V).

(9) **LAN3 Communication Type (JP20) -** Determines the communication protocol used for LAN3 (J18).

Default - Install jumper at pins 2-3 (RS232)
Intellishield controller connected to LAN3 - Install jumper at pins 1-2 (RS485)

(10) **Reset** - ***(SW1)*** Push button used to restart the Distribution board.

(11) **Digital Camera Enable** - ***(JP8)*** Factory use only.

JP8 - Install Jumper (Default)

(12) **Memory Configuration** - ***(JP14,JP15)*** Factory use only.

JP14 - Install jumper at pins 1-2 (Default)
JP15 - Install jumper at pins 1-2 (Default)

(13) **Board Address 2** - Factory use only. **Always set switch 8 to the ON position**. Setting the switch to the OFF position will place the board into a factory test mode and cause diagnostics LED, D36 to flash rapidly.

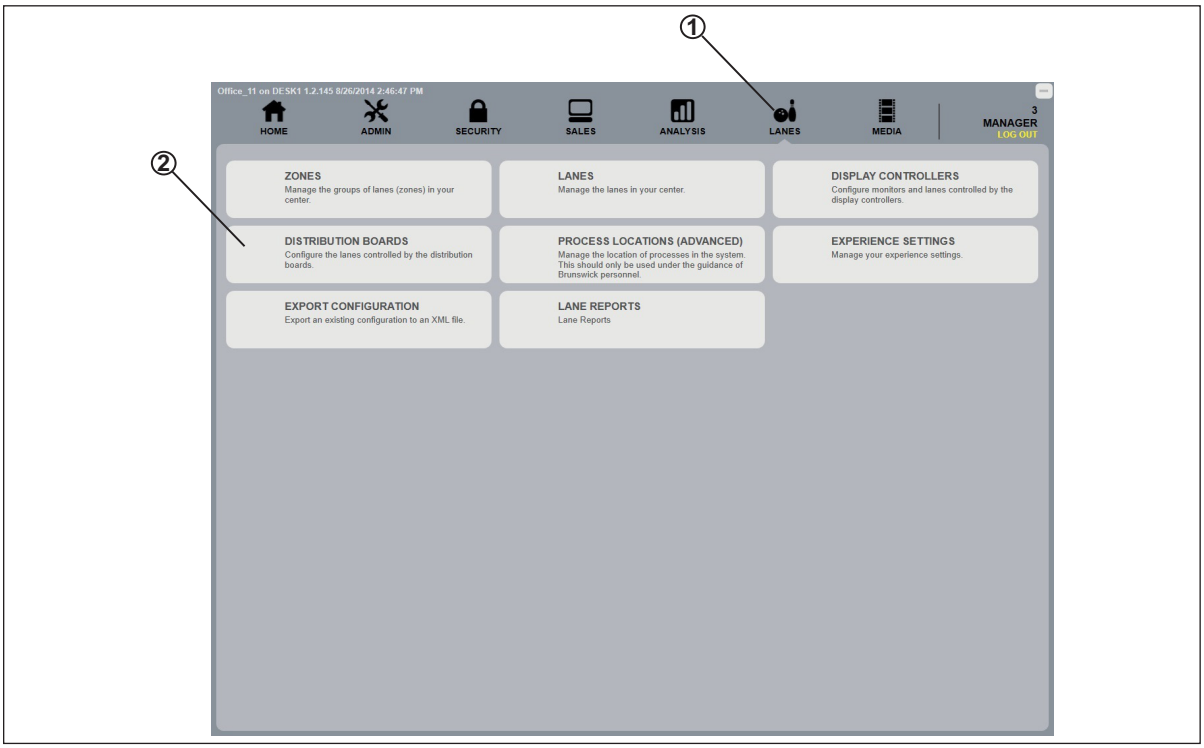
(14) Board Address 1 - Bank of 8 switches used to assign the lane ID. Refer to figure titled *Distribution Board Lane Assignment (Board Address 1).*

Lane No.	SW 1 Value =1	SW 2 Value = 2	SW 3 Value = 4	SW 4 Value =8	SW 5 Value = 16	SW 6 Value =32	SW 7 Value = 64	SW 8 Value =128
1-2	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF
3-4	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF
5-6	ON	OFF	ON	OFF	OFF	OFF	OFF	OFF
7-8	ON	ON	ON	OFF	OFF	OFF	OFF	OFF
9-10	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF
11-12	ON	ON	OFF	ON	OFF	OFF	OFF	OFF
13-14	ON	OFF	ON	ON	OFF	OFF	OFF	OFF
15-16	ON	ON	ON	ON	OFF	OFF	OFF	OFF
17-18	ON	OFF	OFF	OFF	ON	OFF	OFF	OFF
19-20	ON	ON	OFF	OFF	ON	OFF	OFF	OFF
21-22	ON	OFF	ON	OFF	ON	OFF	OFF	OFF
23-24	ON	ON	ON	OFF	ON	OFF	OFF	OFF
25-26	ON	OFF	OFF	ON	ON	OFF	OFF	OFF
27-28	ON	ON	OFF	ON	ON	OFF	OFF	OFF
29-30	ON	OFF	ON	ON	ON	OFF	OFF	OFF
31-32	ON	ON	ON	ON	ON	OFF	OFF	OFF
33-34	ON	OFF	OFF	OFF	OFF	ON	OFF	OFF
35-36	ON	ON	OFF	OFF	OFF	ON	OFF	OFF
37-38	ON	OFF	ON	OFF	OFF	ON	OFF	OFF
39-40	ON	ON	ON	OFF	OFF	ON	OFF	OFF
41-42	ON	OFF	OFF	ON	OFF	ON	OFF	OFF
43-44	ON	ON	OFF	ON	OFF	ON	OFF	OFF
45-46	ON	OFF	ON	ON	OFF	ON	OFF	OFF
47-48	ON	ON	ON	ON	OFF	ON	OFF	OFF
49-50	ON	OFF	OFF	OFF	ON	ON	OFF	OFF
51-52	ON	ON	OFF	OFF	ON	ON	OFF	OFF
53-54	ON	OFF	ON	OFF	ON	ON	OFF	OFF
55-56	ON	ON	ON	OFF	ON	ON	OFF	OFF
57-58	ON	OFF	OFF	ON	ON	ON	OFF	OFF
59-60	ON	ON	OFF	ON	ON	ON	OFF	OFF
61-62	ON	OFF	ON	ON	ON	ON	OFF	OFF
63-64	ON	ON	ON	ON	ON	ON	OFF	OFF
65-66	ON	OFF	OFF	OFF	OFF	OFF	ON	OFF
67-68	ON	ON	OFF	OFF	OFF	OFF	ON	OFF
69-70	ON	OFF	ON	OFF	OFF	OFF	ON	OFF
71-72	ON	ON	ON	OFF	OFF	OFF	ON	OFF
73-74	ON	OFF	OFF	ON	OFF	OFF	ON	OFF
75-76	ON	ON	OFF	ON	OFF	OFF	ON	OFF
77-78	ON	OFF	ON	ON	OFF	OFF	ON	OFF
79-80	ON	ON	ON	ON	OFF	OFF	ON	OFF

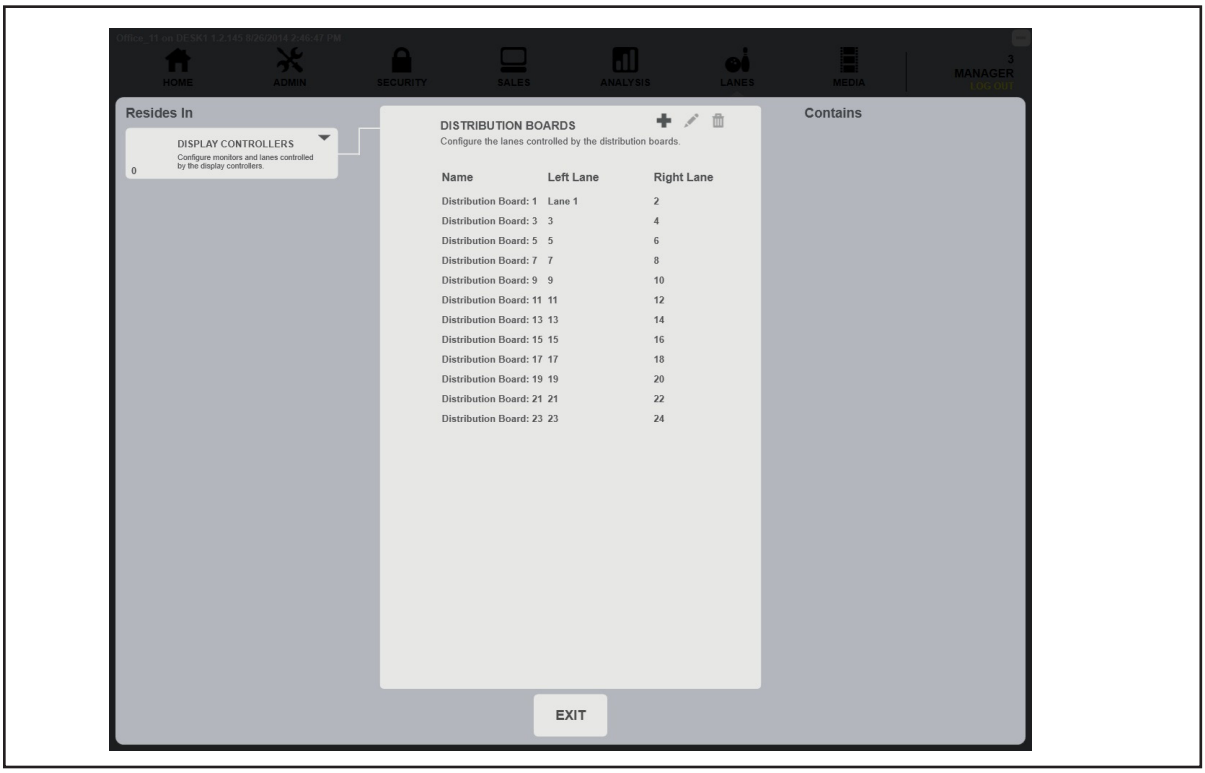
Distribution Board Lane Assignment (Board Address 1)

Peripheral Controller Configuration Settings

Settings for the Peripheral Controller can be found in the Sync office program under the *Lanes* tab, *Distribution Board* selection. These setting are configured at installation and typically do not need to be altered when replacing the Peripheral Controller. They are provided here for reference purposes only. Refer to figures titled *Distribution Setup 1, Distribution Setup 2 and Distribution Properties.*



Distribution Setup 1



Distribution Setup 2

Distribution Properties

(1) Switch Setting - The decimal value of the address of the *Board Address 1* switches.

(2) Lane Assignment - From the drop down box, select the left and right lane numbers where the Distribution Board is connected.

(3) Display Controller - From the drop down box, select the Display Controller that is associated with the lane pair where the Peripheral Controller is connected.

(4) Host - The IP address assigned to the Peripheral Controller. (For informational use only)

(5) Port - The network port assigned to the Peripheral Controller. (For informational use only)

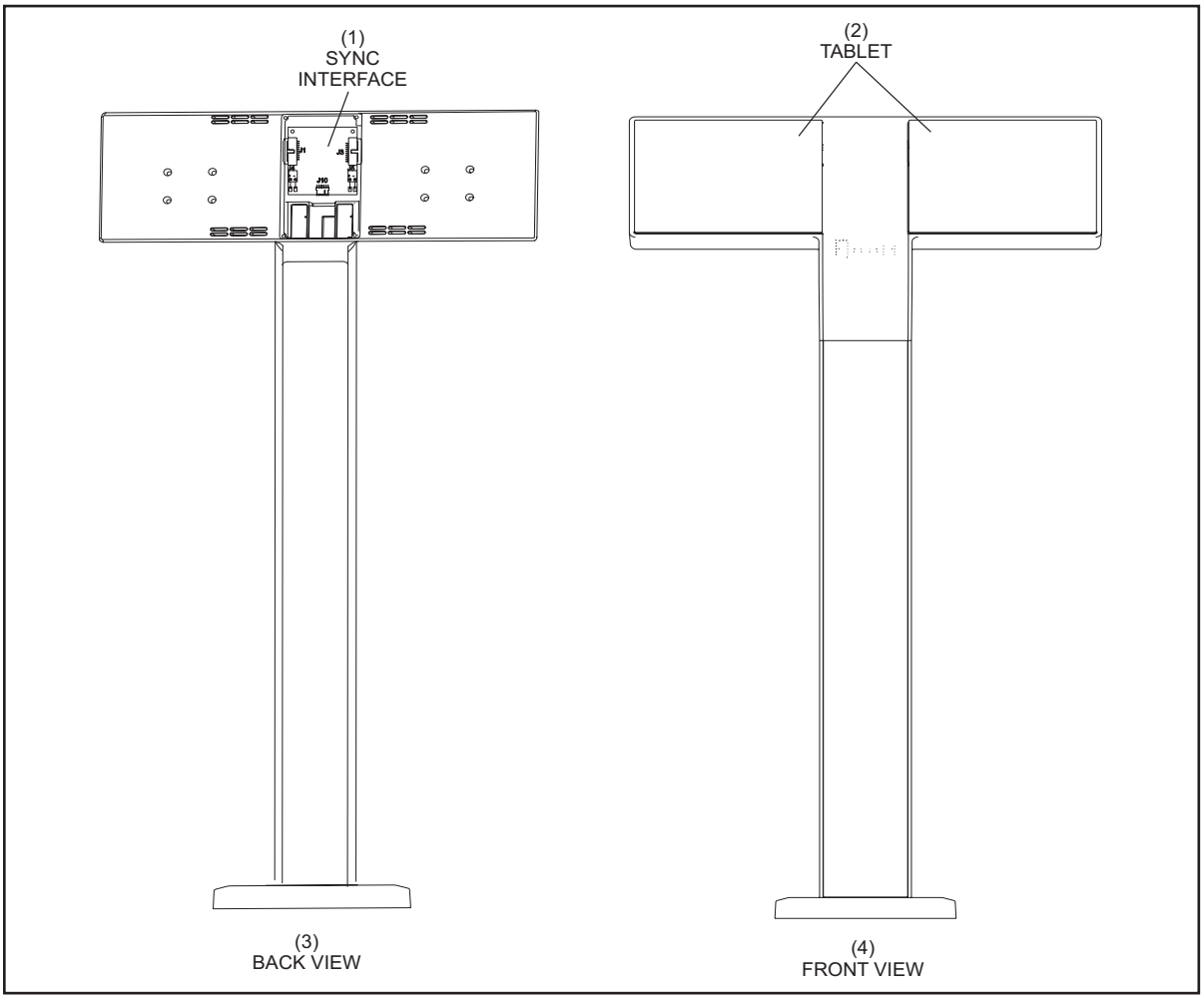
CONSOLE ELECTRONICS

The bowler's console allows the bowler to enter all information needed to begin bowling, change or correct information once bowling has begun and access special features of the scoring system. Sync bowler's consoles can be equipped with a standard keypads (Touchpads) or full touchscreens (Tablets) capable of displaying the bowling scoresheet. Centers upgrading from Vector scoring have the option of re-using their Vector keypads instead of Sync bowler's consoles.

The consoles can be mounted to tables or pedestal mounted to the floor. The type bowler's console and the mounting method determines the interface board needed to connect the console to the rest of the system.

Sync Tablets

Dual Pedestal

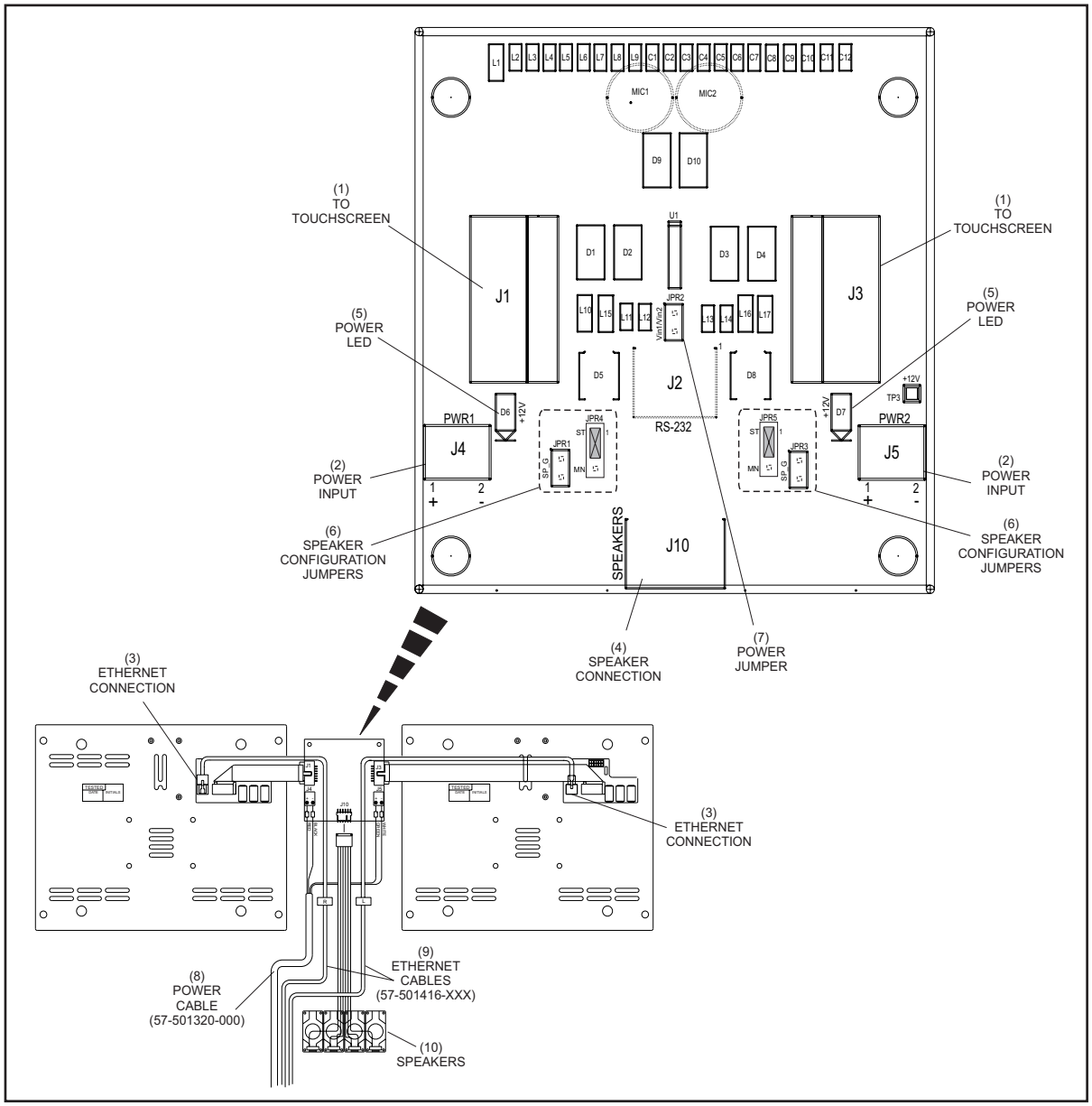


Sync Tablet - Dual Pedestal

(1) SYNC INTERFACE (2) TABLET (3) BACK VIEW
(4) FRONT VIEW

Sync Interface - Dual Pedestal Tablets

The interface board located in dual tablet pedestals connects two touchscreen tablets to the pedestal's speakers and microphones and provides 12VDC to power the tablets. Two similar interface boards are available with the difference being the addition of RJ-45 connectors used for routing the ethernet cat5e network cables. This board with the added connectors provide a simple pass-through for the network signal allowing centers that upgrade their tablets to the most recent model to use their existing network cabling. Refer to the figures titled *Sync Interface - Dual Pedestal Tablets (Non Upgrade Version) and Sync Interface - Dual Pedestal Tablets (Tablet Upgrade Version)*



Sync Interface - Dual Pedestal S5 Tablets (Non Upgrade Version)

The function of the components and connectors on the pedestal mounted Sync Interface are:

(1) **To Touchscreen** - ***(J1,J3)*** Connection to the tablet for the speaker and microphone signals and 12VDC power.

J1 - Right (even) lane
J3 - Left (odd) lane

(2) **Power Input** - ***(J4,J5)*** Input for 12 VDC originating at the Sync console power supply located on the curtain wall.

J4 - Right (even) lane
J5 - Left (odd) lane

(3) **Ethernet Connection** - Connection for the Cat5e cabling from the Sync system network. The tablet communicates with the Sync control system, Display Controllers, and Peripheral Controller through this connection.

(4) **Speakers** - ***(J7)*** Connection for the speakers located in the pedestal.

(5) **Power Led** - ***(D6,D7)*** These LEDs turn "ON" when 12 VDC power is received at the board. *Refer to (2) Power Input.*

D6 - 12 VDC input power at J4 is present.
D7 - 12 VDC input power at J5 is present.

(6) **Speaker Configuration Jumpers** - ***(JPR1,JPR3, JPR4,JPR5)*** Jumpers used to select which audio signal routes to the speaker and the grounding method of the speakers.

JPR1,JPR3 - Ground Method. Remove Jumper (Default)
JPR4 - Audio Channel Select for the even lane (right) tablet. Install jumper at pins 1-2 (Default) to route the tablet's right channel audio to the speakers.
JPR5 - Audio Channel Select for the odd lane (left) tablet. Install jumper at pins 1-2 (Default) to route the tablet's right channel audio to the speakers.

(7) **Power Jumper** - ***(JPR2)*** Jumper that connects the inputs of J4 and J5 together. This allows the both tablets to be powered through either power input connector in the event that power is not available at the other connector.

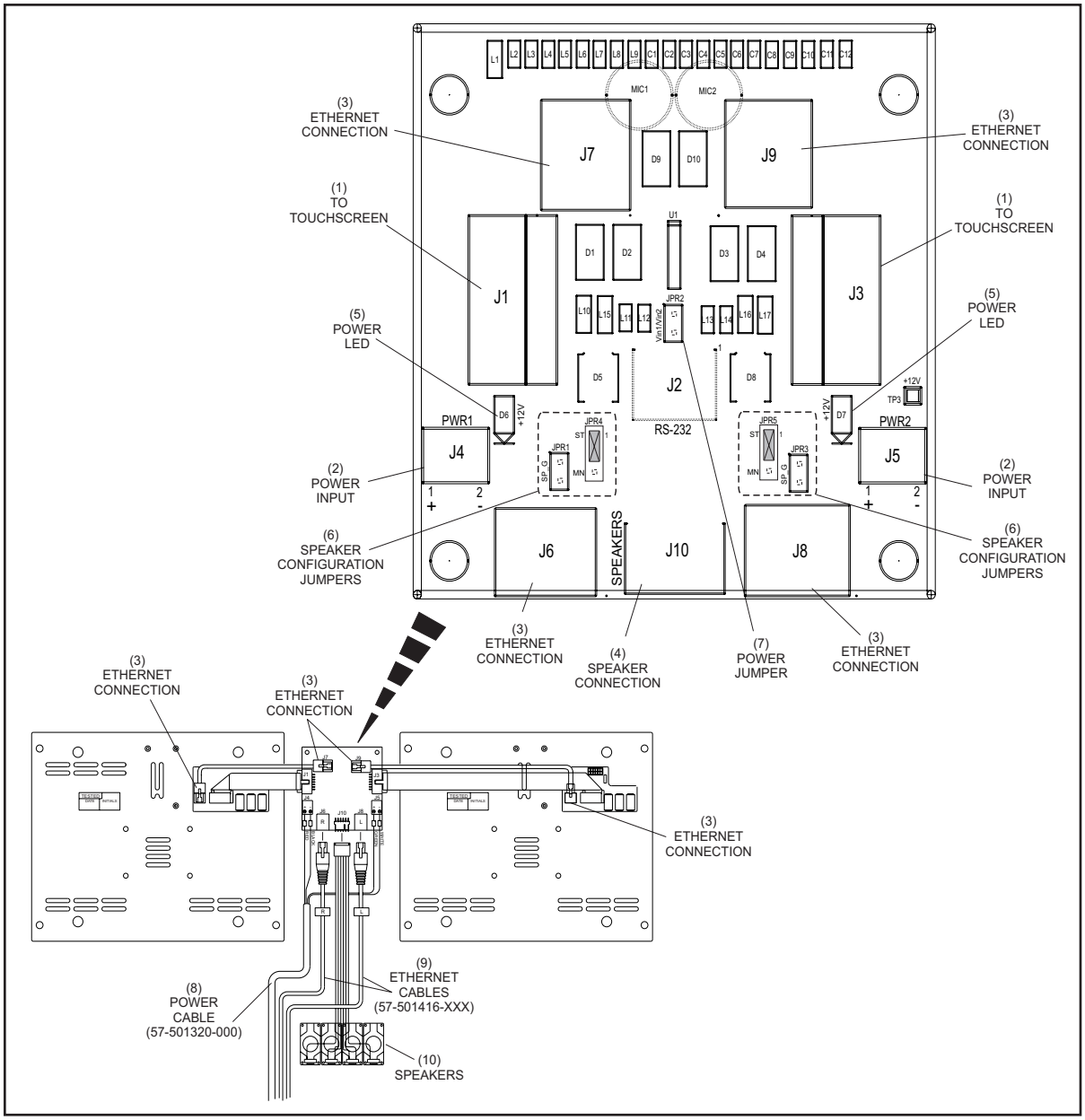
JPR2 - Remove Jumper - DO NOT Install (Default)

(8) **Power Cable** - Power input cables originating from the table power supply located on the curtain wall.

(9) **Ethernet Cables** - Cables to the Sync Network Switch

(10) **Speakers** - Speakers for intercom and exciter audio

WARNING! Do not install a jumper on Power Jumper (JPR2) when power is applied to connector Power Input (J5). Damage to the Sync Console Power Supply may result.



Sync Interface - Dual Pedestal Tablets (Tablet Upgrade Version)

The function of the components and connectors on the pedestal mounted Sync Interface are:

(1) **To Touchscreen** - ***(J1,J3)*** Connection to the tablet for the speaker and microphone signals and 12VDC power.

J1 - Right (even) lane
J3 - Left (odd) lane

(2) **Power Input** - ***(J4,J5)*** Input for 12 VDC originating at the Sync console power supply located on the curtain wall.

J4 - Right (even) lane
J5 - Left (odd) lane

(3) **Ethernet Connection** - Connections for the Cat5e cabling from the Sync system network. These connections provide a pass-though for the network signal to allow the use of existing network cables when upgrading to the latest tablet model. The tablet communication to the Sync control system, Display Controllers, and Peripheral Controller route through these connections.

J6 - Right (even) lane input (from switch)
J7 - Right (even) lane output (to tablet)
J8 - Left (odd) lane input (from switch)
J9 - Left (odd) lane output (to tablet)

(4) **Speakers** - ***(J7)*** Connection for the speakers located in the pedestal.

(5) **Power Led** - ***(D6,D7)*** These LEDs turn "ON" when 12 VDC power is received at the board. *Refer to (2) Power Input.*

D6 - 12 VDC input power at J4 is present.
D7 - 12 VDC input power at J5 is present.

(6) **Speaker Configuration Jumpers** - ***(JPR1,JPR3, JPR4,JPR5)*** Jumpers used to select which audio signal routes to the speaker and the grounding method of the speakers.

JPR1,JPR3 - Ground Method. Remove Jumper (Default)
JPR4 - Audio Channel Select for the even lane (right) tablet. Install jumper at pins 1-2 (Default) to route the tablet's right channel audio to the speakers.
JPR5 - Audio Channel Select for the odd lane (left) tablet. Install jumper at pins 1-2 (Default) to route the tablet's right channel audio to the speakers.

(7) **Power Jumper** - ***(JPR2)*** Jumper that connects the inputs of J4 and J5 together. This allows the both tablets to be powered through either power input connector in the event that power is not available at the other connector.

JPR2 - Remove Jumper - DO NOT Install (Default)

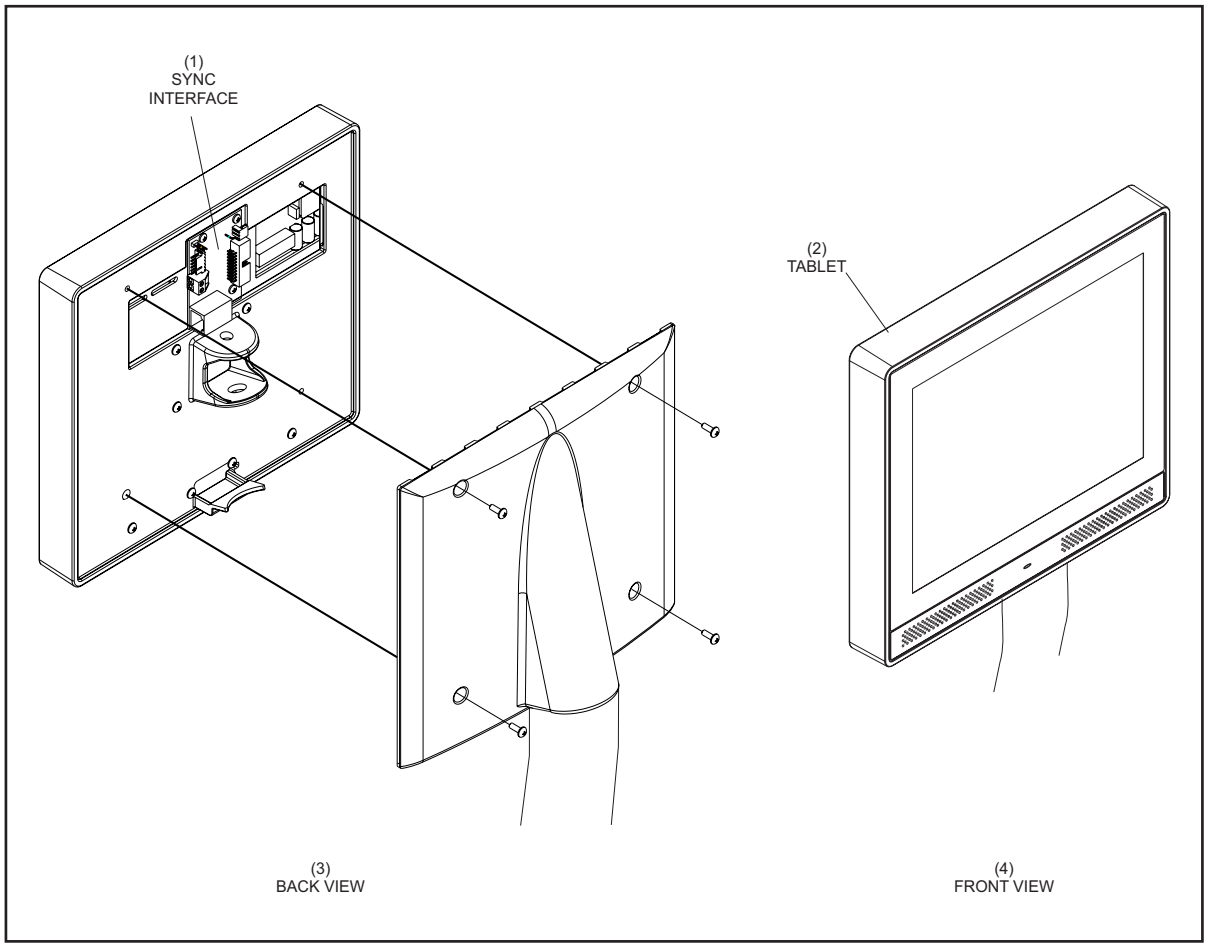
(8) **Power Cable** - Power input cables originating from the table power supply located on the curtain wall.

(9) **Ethernet Cables** - Cables to the Sync Network Switch

(10) **Speakers** - Speakers for intercom and exciter audio

WARNING! Do not install a jumper on Power Jumper (JPR2) when power is applied to connector Power Input (J5). Damage to the Sync Console Power Supply may result.

Single Pedestal / Table Mount

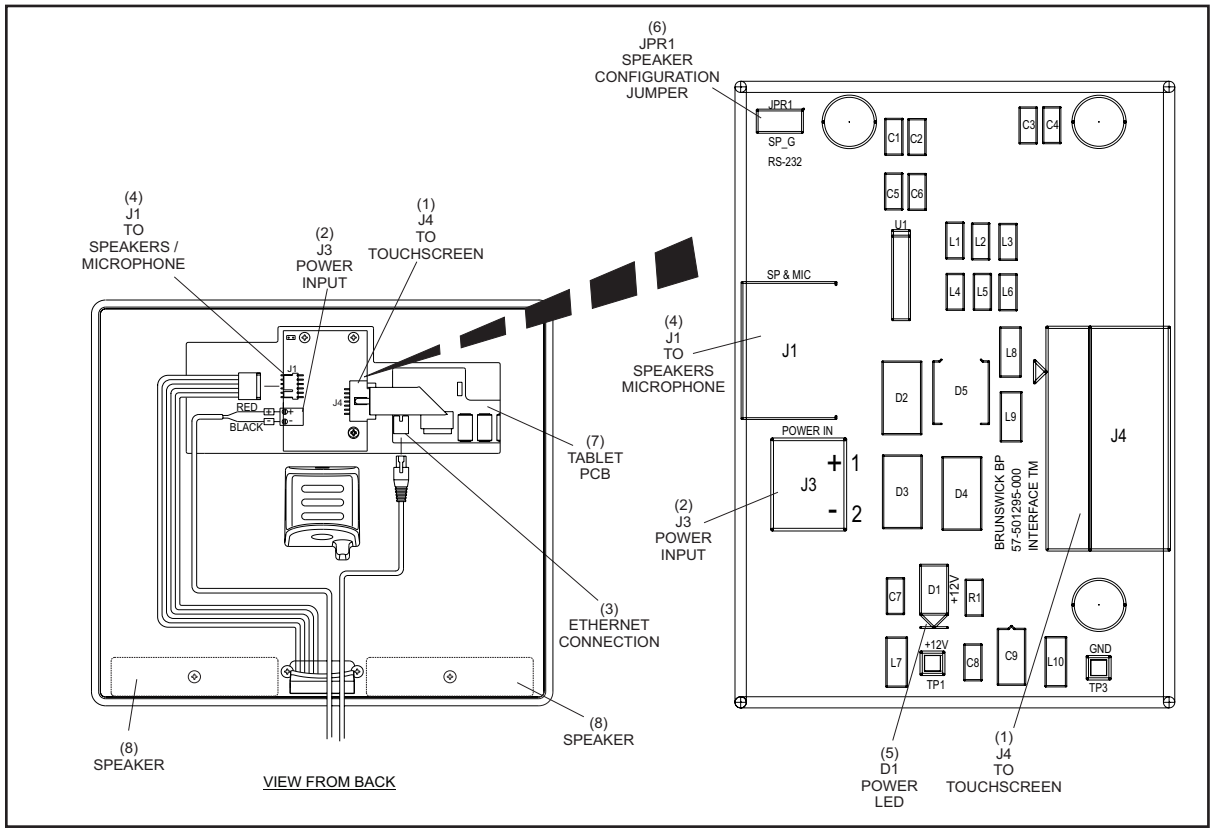


Sync Tablet - Table / Single Pedestal Mounted

(1) SYNC INTERFACE (2) TABLET (3) BACK VIEW
(4) FRONT VIEW

Sync Interface - Single Pedestal / Table Mount Tablet

The interface board for single pedestal or table mounted tablets connects the tablet to the internal speakers and microphone and provides 12VDC to power the tablet. Refer to the figures titled *Sync Interface - Table / Single Pedestal.*



Sync Interface - Single Pedestal / Table Mounted Tablets (Non Upgrade Version)

The function of the components and connectors on the table/single pedestal mounted Sync Interface are:

1) **To Touchscreen** - ***(J4)*** Connection to the tablet for the speaker and microphone signals and 12VDC power.

(2) **Power Input** - ***(J3)*** Input for 12 VDC originating at the Sync console power supply located on the curtain wall.

(3) **Ethernet Connection** - Connection for the Cat5e cabling from the Sync system network. The Sync tablet communicates with the control system, Display Controllers, and Peripheral Controller box through this connection.

(4) **Speakers / Microphone** - ***(J1)*** Connection for the speakers and micophones located in the console.

(5) **Power Led** - ***(D1)*** This LED turns "ON" when 12 VDC power is received at the board. *Refer to (2) Power Input.*

(6) **Speaker Configuration Jumpers** - ***(JPR1)*** Jumper used to select the grounding method of the speakers.

JPR1 - Ground Method. Remove Jumper (Default)

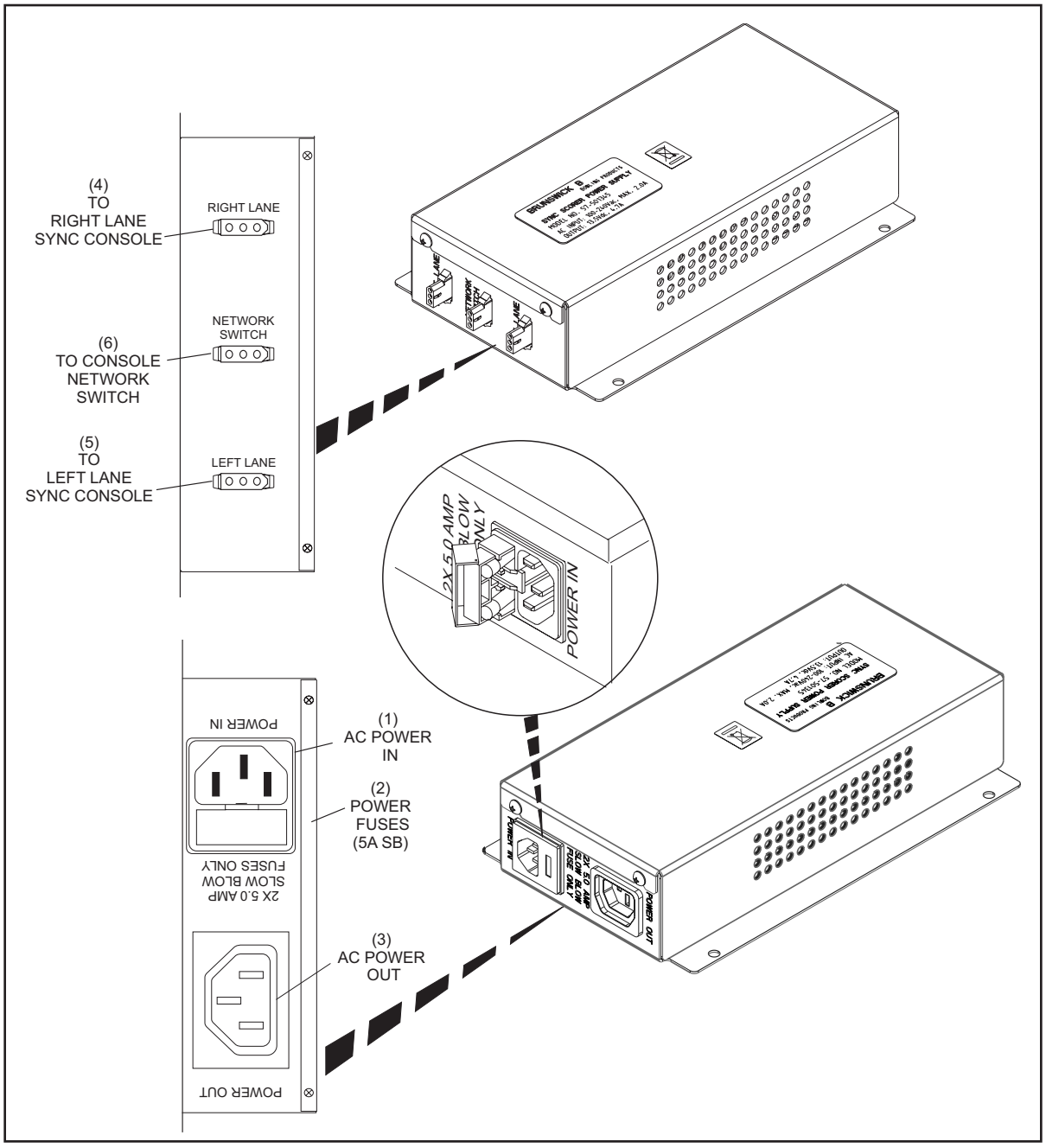
Tablet Cleaning

The tablet surface should be kept free of dirt, dust, finger prints, or other materials that could lower the screen visibility. For fingerprint smudges, dust, and lint, wipe the screen gently using a dry microfiber cloth. Never use a paper towel or other paper-based towels as they can leave scratches on the screen. For dirtier screens, use a small amount of water (don't add soap or anything else to the water) to make a corner of the cloth slightly damp.

IMPORTANT: *DO NOT use harsh chemicals, including Windex, anything with ammonia, or alcohol-based cleaners. If a liquid is necessary, you should only use a small amount of water on the cloth. NEVER use abrasive cloths, paper towels, or tissue paper, which can scratch the touchscreen. The scratches will be small and build up over time, damaging and dulling the screen. Instead, use microfiber cloths, which are specially designed to clean sensitive surfaces.*

Sync Scorer Power Supply

The Sync power supply is mounted on the curtain wall of a lane pair for installations equipped with Sync touchscreens. The unit accepts a universal input of 120 VAC - 240 VAC. Outputs include 12VDC connectors to supply the touchscreen tablets for a lane pair as well as the tablet Ethernet switch located under the ball rack on select lane pairs and a main power output connection that can be used to power the Peripheral Controller. Fuses located inside the power input connector protects the unit from power surges. Refer to the figure titled *Sync Scorer Power Supply - Tablet Installations.*



Sync Scorer Power Supply - Tablet Installations

The function of the connectors and components on the touchscreen transformer are:

(1) **AC Power In -** A/C power input.

(2) **Power Fuses -** Fuses used for the incoming A/C power.

INPUT VOLTAGE	FUSE RATING
110 VAC - 120 VAC	5.0 AMP 250V Slow Blow
220 VAC -240 VAC	5.0 AMP 250V Slow Blow

(3) **AC Power Out -** A/C power connection used to power the Peripheral Interface.

(4) **To Right Lane Sync Console -** Output for 12 VDC for the right (even) lane Sync Tablet console.

(5) **To Left Lane Sync Console** - Output for 12 VDC for the left (odd) lane Sync Tablet console.

(6) **To Console Network Switch** - Output for 12 VDC used to power the Sync Tablet Ethernet switch as needed on select lane pairs.

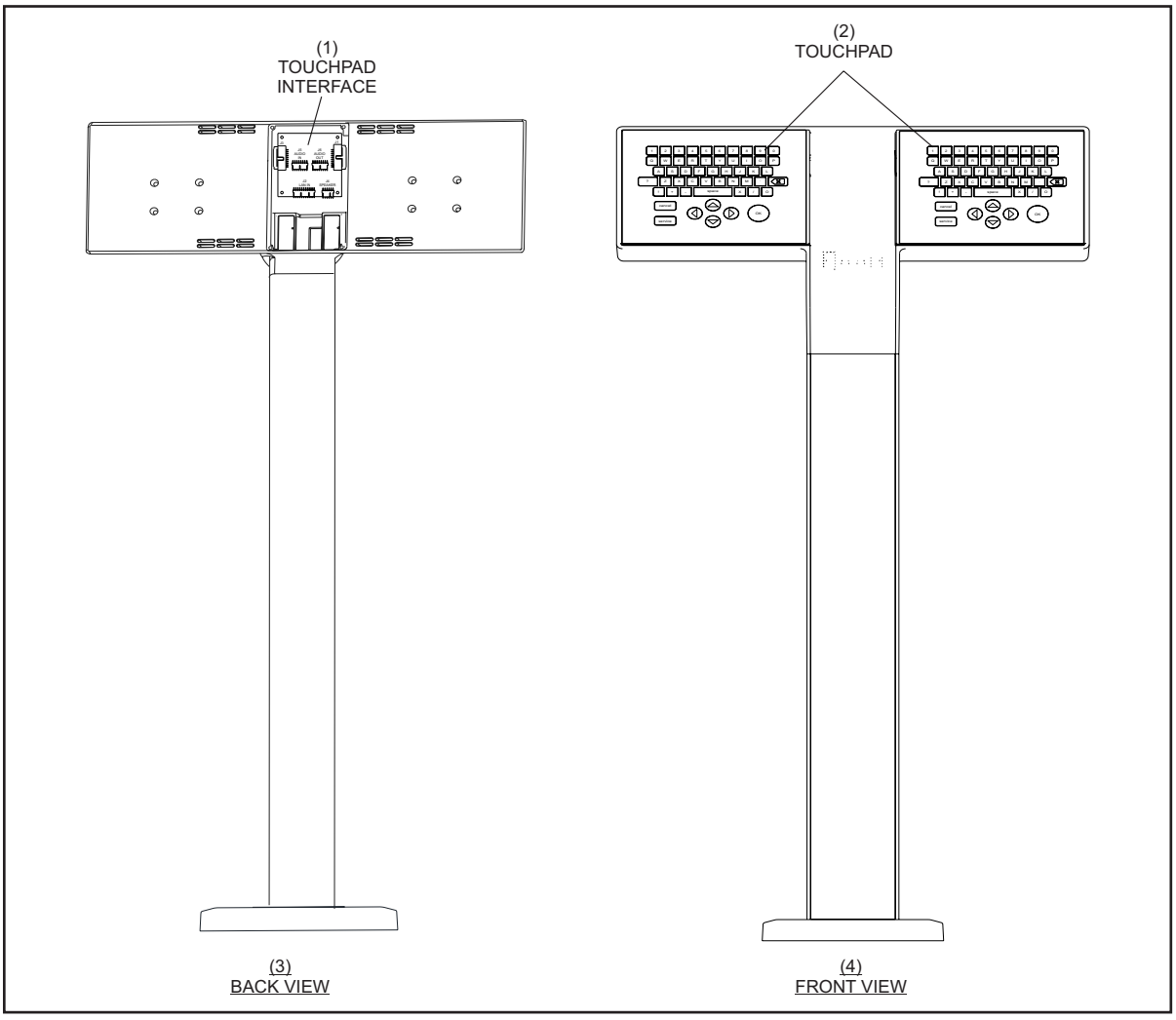
Sync Touchpads

The Sync Touchpads are full function keyboards that allows the bowler to enter all information needed to begin bowling or change/correct information once bowling has begun. The use of a keypad gives the bowler complete control over bowling functions without the added cost of a lower display. The Touchpads are available in floor-mounted dual or single pedestal configurations or can be mounted individually to the table tops of certain Brunswick designed furniture.

For dual pedestal installations, a Touchpad Interface PCB, mounted inside the pedestal, along with the Touchpad Cable Interface board, located under the lanes near the ball lift, provide a convenient and flexible way to route cabling. Because of this cable routing method, only a couple of connectors on the Controller board are used for dual pedestals.

When the touchpad is individually mounted the connections on the Controller board are used to route the cables lane to lane. Because of this, most of the connections are needed when the touchpad are mounted individually using a single pedestal or table mount.

Dual Pedestal

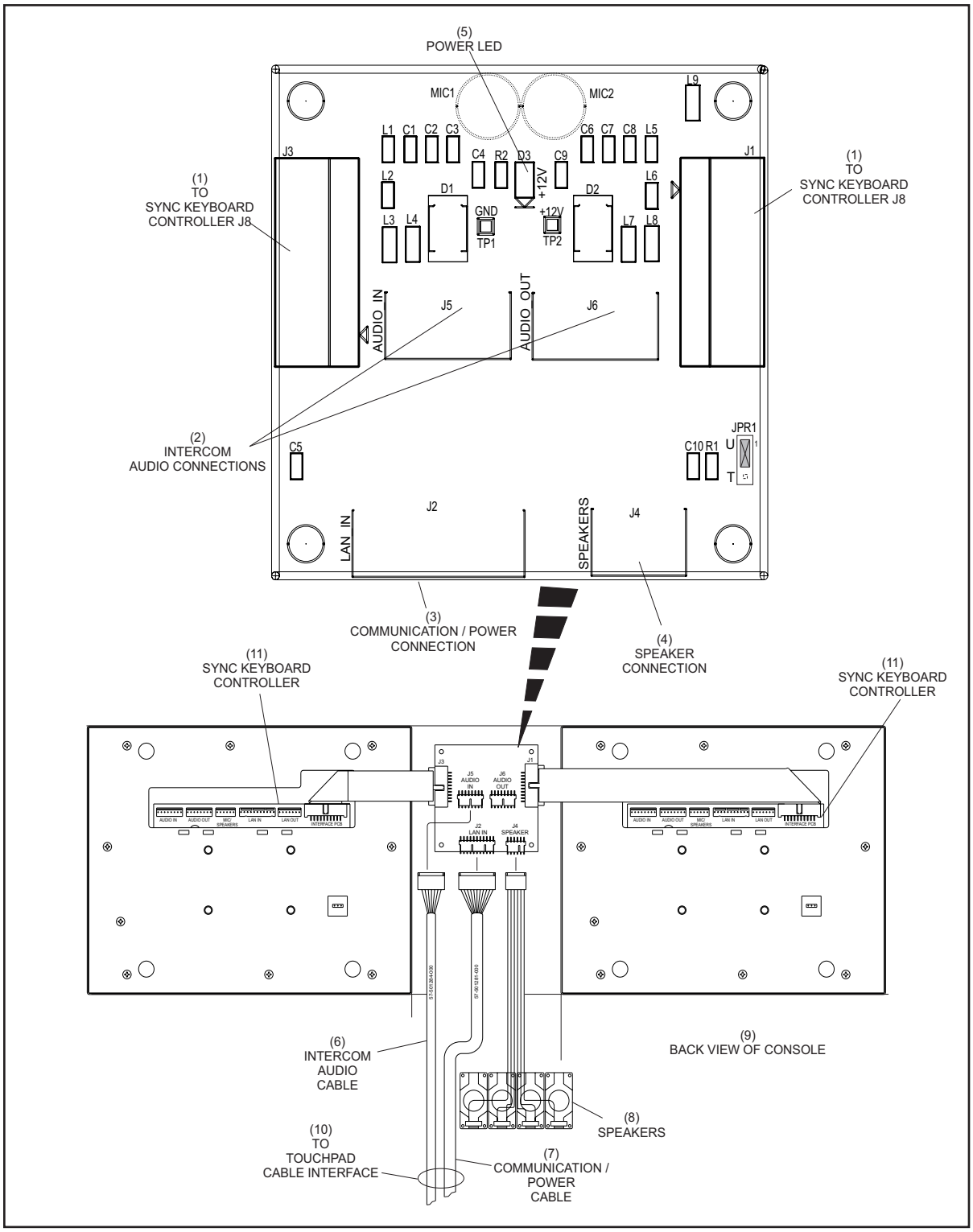


Sync Tablet - Dual Pedestal

(1) TOUCHPAD INTERFACE (2) TOUCHPAD (3) BACK VIEW
(4) FRONT VIEW

Touchpad Interface - Dual Pedestal

The Touchpad Interface PCB for dual pedestal consoles contains the circuitry to connect two touchpad keyboards to the Sync scoring system. The Touchpad Interface PCB along with the Touchpad Cable Interface board located under the lanes near the ball lift provide a convenient and flexible way to route cabling to the touchpads inside a dual pedestal.



Touchpad Interface - Dual Pedestal

The function of the components and connectors on the pedestal mounted Sync Interface are:

(1) **To Sync Keyboard Controller J8** - ***(J1,J3)*** Connection for communication, power and audio that is sent to the J8 connector on the Sync Keypad Controller PCB.
J1 - Left (odd) lane
J3 - Right (even) lane

(2) **Intercom Audio Connections**- ***(J5,J6)*** Connections for the intercom audio originating from the Audio Control Unit located at the control desk.
J5 - Audio In (For Both Lanes)
J6 - Audio Out (Not Used)

(3) **Communication / Power Connection** - ***(J2)*** Connection for the power, communication and audio exciter signals that originate at the Peripheral Controller. This connection handles the signals for both lanes. Refer to *(7) Communication / Power Cable.*

(4) **Speakers** - ***(J4)*** Connection for the speakers located in the pedestal.

(5) **Power Led** - ***(D3)*** This LED turns "ON" when 12 VDC power is received at the board. Refer to *(3) Communication / Power Connection* and *(7) Communication / Power Cable.*

(6) **Intercom Audio Cable** - Cable for the intercom audio(s) originating at the control desk Audio Control box. The cable attaches to the Touchpad Cable Interface PCB located under the lanes, behind the ball lift.

(7) **Communication / Power Cable** - Cable that delivers power, communication and audio exciter signals that originate at the Peripheral Controller. The cable attaches to the Touchpad Cable Interface PCB located under the lanes, behind the ball lift.

(8) **Speakers** - Speakers used for the exciter and intercom audios as well as the keyboard beep that occurs when the bowler presses a button on the touchpad.

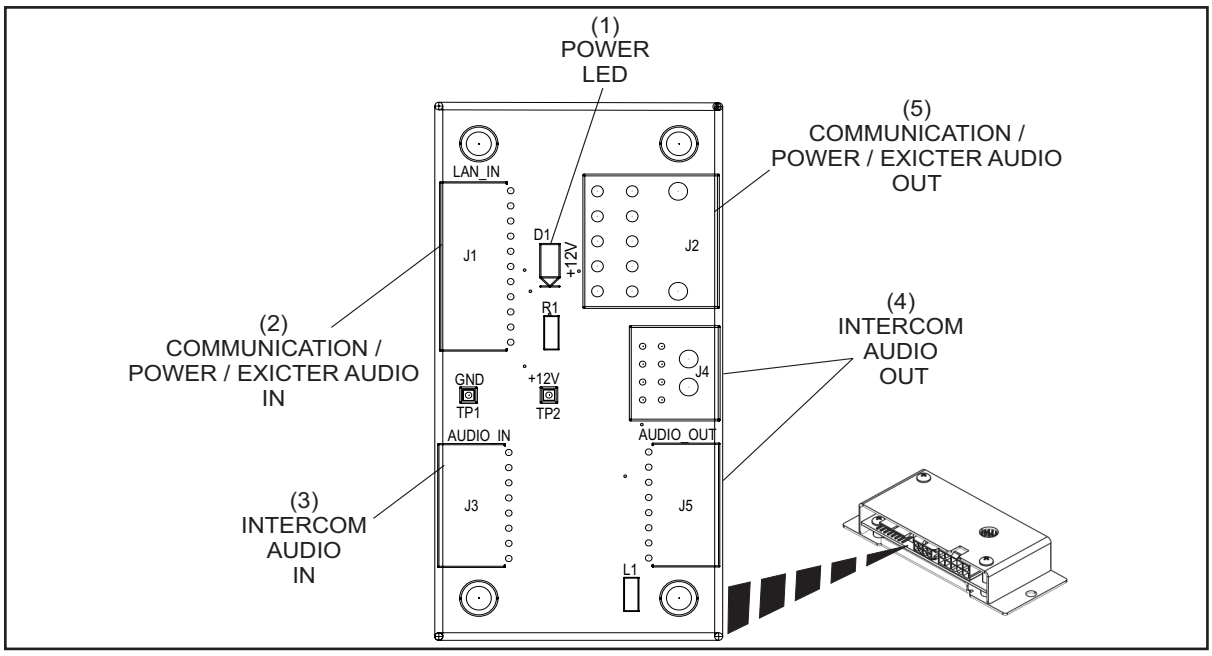
(9) **Back View of Console** - A rear view of the pedestal with all covers removed.

(10) **To Touchpad Cable Interface** - To simplify cable routing and connections, the cables used for the Sync Touchpad first connect to a circuit board called a Touchpad Cable Interface. This board is located under the lanes, near the ball lift.

(11) **Sync Keyboard Controller** - A circuit board responsible for interfacing the keyboard and intercom and exciter audios in the Touchpad. The connections on the board allow for flexibility in routing cables to the Touchpad. The actual connections used on the board is dependent on whether the Touchpad is installed in a dual pedestal or in mounted individually.

Touchpad Cable Interface PCB - Dual Pedestal Touchpads

To conveniently connect cables to a dual pedestal Touchpad as well as route the cables lane to lane, a connection board called a Touchpad Cable Interface is used. The board is located under the lanes, near the ball lift.



Cable Interface - Dual Pedestal Touchpads

The function of the components and connectors on the Cable Interface for dual pedestal touchpads are:

(1) **Power LED (D1)** - This LED turns "ON" when 12 VDC power is received at the board. Refer to *(2) Communication / Power / Exciter Audio In (J1).*

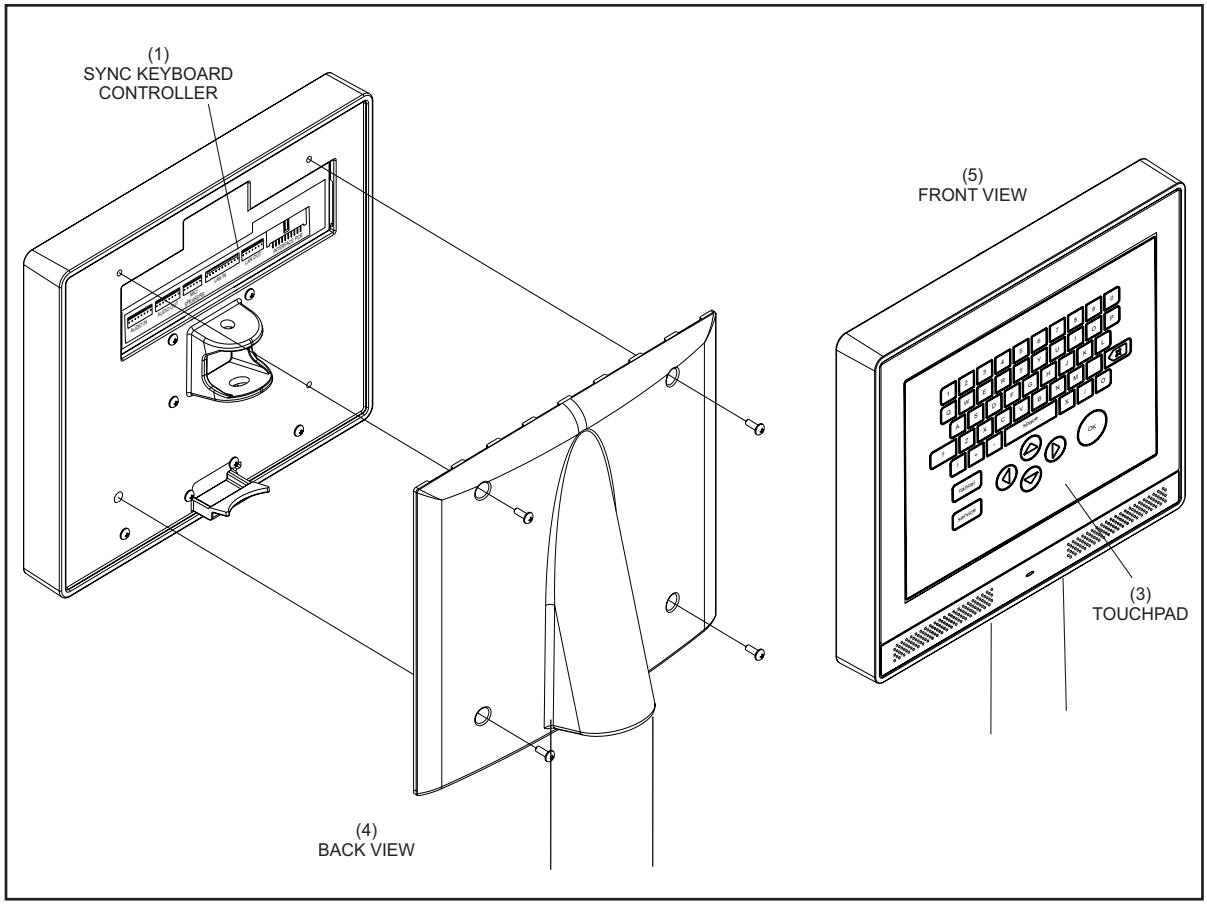
(2) **Communication /Power/Exciter Audio In (J1)** - Connection for the power, communication and audio exciter signals that originate at the Peripheral Controller. The signals that enter the board at this connection pass through the board and directly connect to output connector J2. This connection handles the signals for both lanes. Refer to *(5) Communication/Power/Exciter Audio Out (J2).*

(3) **Intercom Audio In (J3)** - Input of the intercom audio(s) originating at the control desk Audio Control box. If the board is located at the first lane pair, the cable comes from the control desk Audio Control box. For the reset of the lanes, the cable comes from the Cable Interface PCB for the previous lane pair. Refer to *(4) Intercom Audio Out (J4,J5).*

(4) **Intercom Audio Out (J4,J5)** - Output connectors for the intercom audio that entered the board at J3. The J5 connection allows the continuation of the intercom audio(s) to the Cable Interface board for the next lane pair. Connection J4 connects the intercom audio to J5 on the Touchpad Interface board inside the dual pedestal.

(5) **Communication/Power/Exciter Audio Out (J2)** - Output for the power, communication and audio exciter signals that originated at the Peripheral Controller and entered the board at connection J1. These signals are routed to J2 on the Touchpad Interface board inside the dual pedestal. This connection handles the signals for both lanes. Refer to *(2) Communication/ Power/Exciter Audio In (J1).*

Single Pedestal / Table Mount

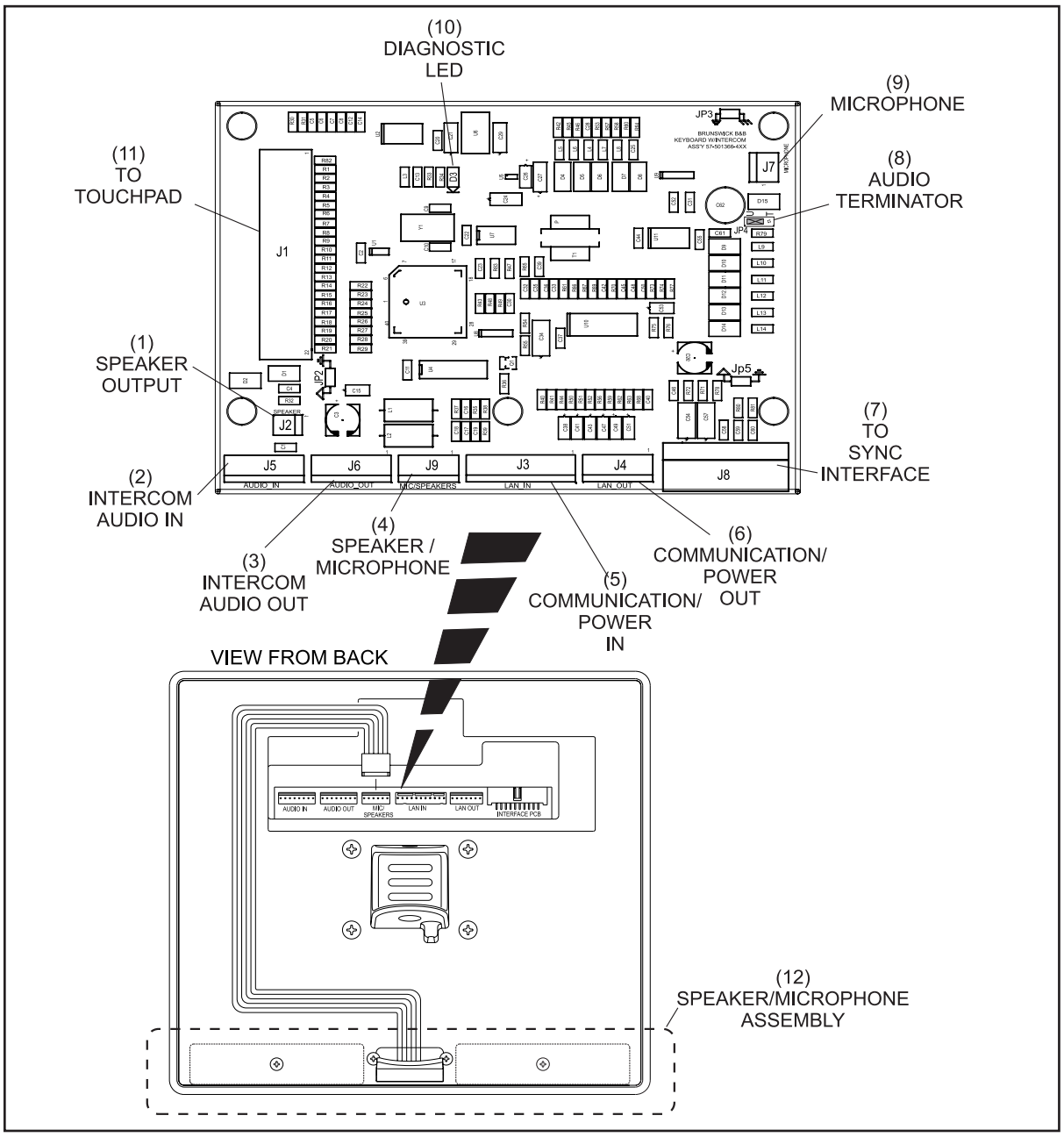


Sync Touchpad- Table / Single Pedestal Mount

(1) SYNC KEYBOARD CONTROLLER
(2) TOUCHPAD
(3) BACK VIEW
(4) FRONT VIEW

Sync Keyboard Controller

The Sync Keyboard Controller contains the circuitry to interface the keyboard and intercom and exciter audios in the Touchpad. The connections on the board allow for flexibility in routing cables to the Touchpad. The actual connections used on the board is dependent on whether the touchpad is installed in a dual pedestal or in mounted individually. Refer to the figure titled *Sync Keyboard Controller - Single Pedestal / Table Mount.*



Sync Keyboard Controller - Single Pedestal / Table Mount

The function of the components and connectors on the table or single pedestal mounted Sync Interface are:

(1) **Speaker (J2) -** Connection to the speaker. Connection that can be used as an alternative way to connect the internal speakers. Currently this connection is not used. Refer to *(4) Speaker / Microphone (J9).*

(2) **Intercom Audio In (J5) -** Input of the intercom audio(s) originating at the control desk Audio Control box. If the board is located in the first console, the cable comes from the control desk Audio Control box. For the reset of the lanes, the cable comes from the Sync Interface PCB for the previous lane. Refer to *(3) Intercom Audio Out (J6).*

(3) **Intercom Audio Out (J6) -** Output of the intercom audio for the next console. This connection allows the continuation of the intercom audio(s) to the next lane. If the board is installed in the last console and the signals do not continue, they are terminated using the termination jumper JP4. Refer to *(8) Audio Terminator (JP4).*

(4) **Speaker / Microphone (J9) -** Connection for the microphone that is used for the intercom system and the speakers used for the intercom, exciter audio, and keyboard beep.

(5) **Comm/Power/Exciter Audio In (J3) -** Connection for the power, communication and audio exciter signals. When the board is located in left console (odd lane), signals for both the left and right lane coming from the Primary Patch Panel of the Scorer Computer enter the board at J3. If the board is located as the second keypad of the lane pair (even lane), the signals route through the odd lane keypad then to this connector. Refer to *(7) Comm/Power/Exciter Audio Out (J4).*

(6) **Comm/Power/Exciter Audio Out (J4) -** Connection for the communication, power and audio exciter going to the second keypad for the lane pair. This connection is only used on the left (odd) lane keypad.

(7) **To Sync Interface (J8) -** Connection used only in dual pedestal installations that connects the intercom, exciter audio, and communication signals to the Touchpad Interface PCB. This connection is not used in table mounted or single pedestal touchpad installations.

(8) **Audio Terminator (JP4) -** Jumper used to terminate the intercom audio signal. If the intercom audio cable does not continue to another console from J6, terminate the signal by placing a jumper between pins 2 and 3 (T). Otherwise place a jumper between pins 1 and 2 (U).

(9) **Microphone (J7) -** Connection that can be used as an alternative way to connect the microphone used for the intercom system. Currently this connection is not used. Refer to *(4) Speaker / Microphone (J9).*

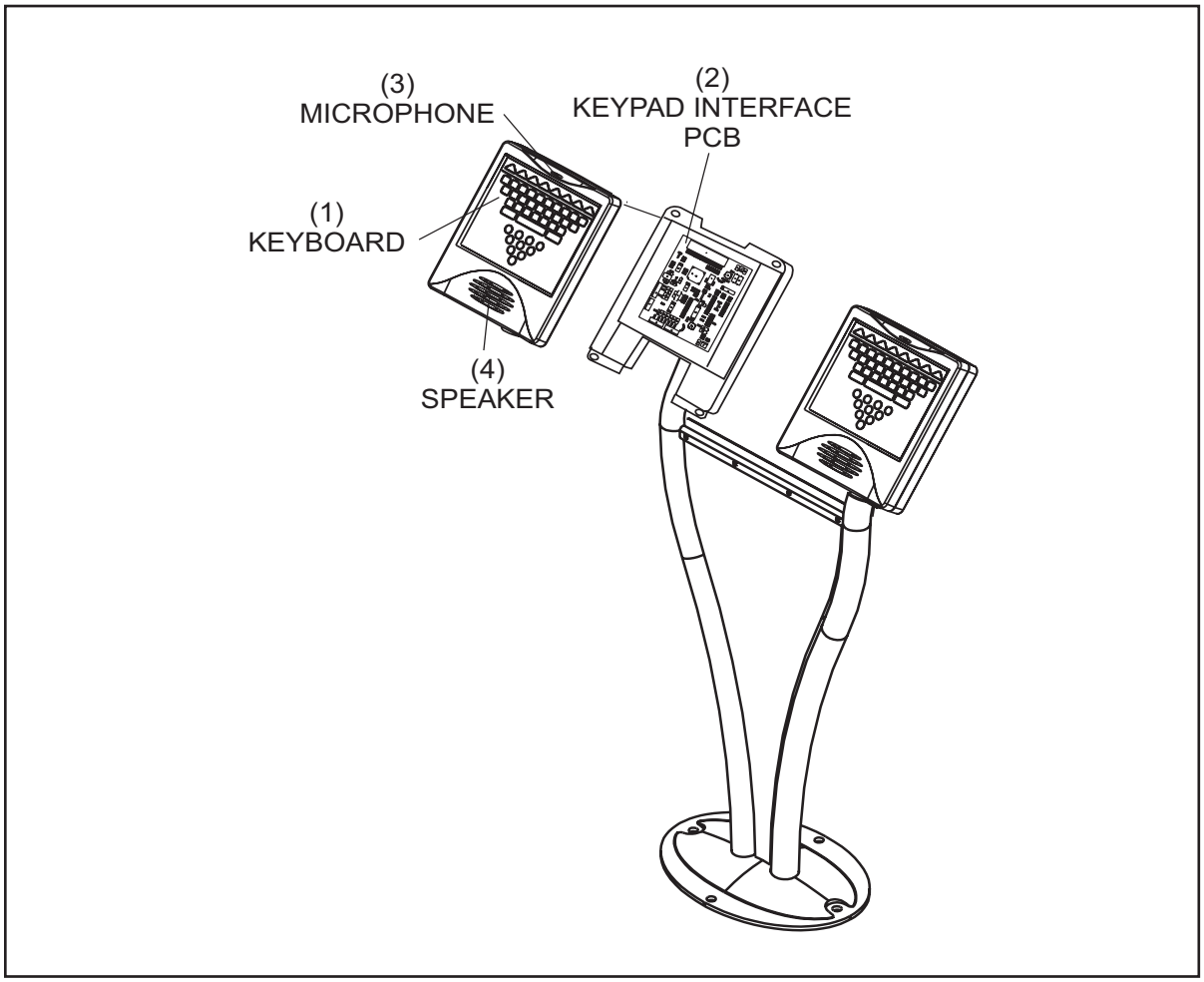
(10) **Diagnostic LED (D3) -** This light flashes to indicate that the PCB is functioning properly.

(11) **To Touchpad (J1) -** Connection to the keyboard in the console.

(12) **Speaker/Microphone Assembly -** The microphone that is used for the intercom system and the speakers used for the intercom, exciter audio, and keyboard beep.

Vector Keypads

Instead of using Sync consoles for the bowler entries, a center can opt to use their existing Vector keypads. These keypads are identical lane to lane and contain circuit boards that are interchangeable. The Keypad Interface PCB located in the keypad housing handles the bowler input, sound selection and communication for the console. Refer to the figures titled Vector *Keypads and Keypad Interface PCB*.



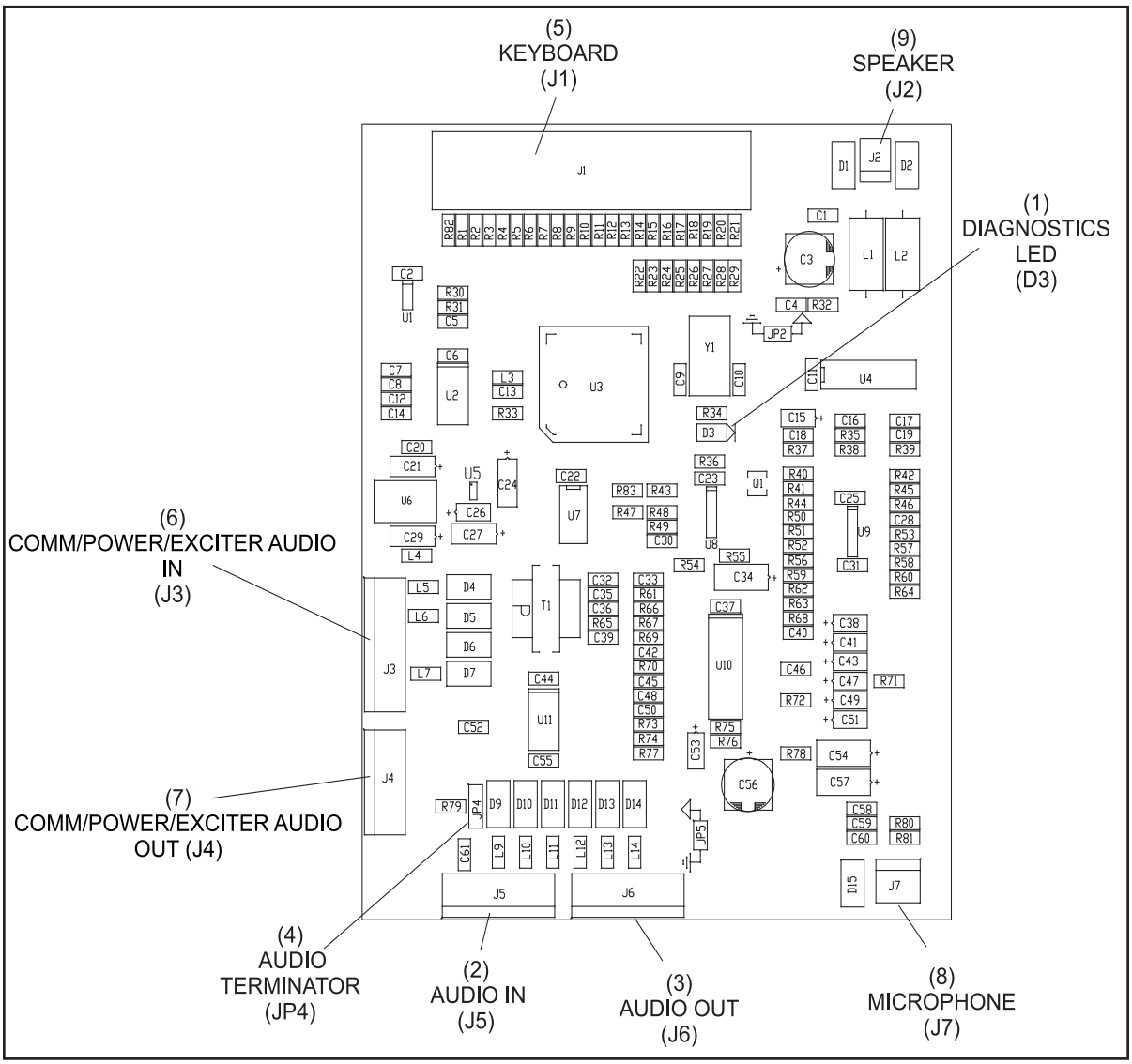
Vector Keypads

(1) KEYBOARD

(2) KEYPAD INTERFACE PRINTED CIRCUIT BOARD

(3) MICROPHONE

(4) SPEAKER



Keypad Interface PCB

The function of the connectors and components on the Keypad Interface are:

(1) Diagnostic LED (D3) - This light flashes to indicate that the PCB is functioning.

(2) Audio In (J5) - Input of the intercom audio(s) originating at the control desk Audio Control box. If the board is located in the first console, the cable comes from the control desk Audio Control box. For the reset of the lanes, the cable comes from the Keypad Interface PCB for the previous lane. Refer to *(3) Audio Out (J6).*

(3) Audio Out (J6) - Output of the intercom audio for the next console. This connection allows the continuation of the intercom audio(s) to the next lane. If the board is installed in the last console and the signals do not continue, they are terminated using the termination jumper JP4. Refer to *(4) Audio Terminator (JP4).*

(4) Audio Terminator (JP4) - Jumper used to terminate the intercom audio signal. If the intercom audio cable does not continue to another console from J6, terminate the signal by placing a jumper between pins 2 and 3 (T). Otherwise place a jumper between pins 1 and 2 (U).

(5) **Keyboard (J1) -** Connection to the keyboard in the console.

(6) **Comm/Power/Exciter Audio In (J3) -** Connection for the power, communication and audio exciter signals. When the board is located in left console (odd lane), signals for both the left and right lane coming from the Peripheral Controller enter the board at J3. If the board is located as the second keypad of the lane pair (even lane), the signals route through the odd lane keypad then to this connector. Refer to *(7) Comm/Power/Exciter Audio Out (J4).*

(7) **Comm/Power/Exciter Audio Out (J4) -** Connection for the communication, power and audio exciter going to the second keypad for the lane pair. This connection is only used on the left (odd) lane keypad.

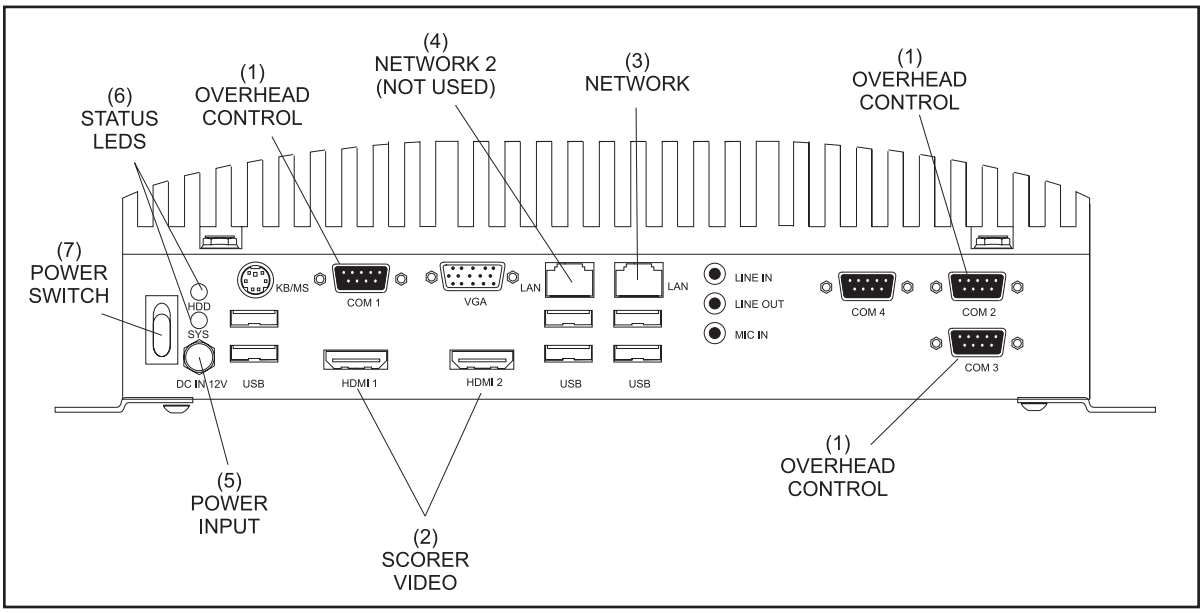
(8) **Microphone (J7) -** Connection to the microphone used for the intercom system.

(9) **Speaker (J2) -** Connection to the speaker. The circuit board applies the selected audio to the speaker through this connection. This audio includes the intercom, exciter audio, and keyboard beep.

DISPLAY CONTROLLER

Connections

The Display Controller receives scoring information from the Peripheral Controller through a network connection. Using this information it provides the high definition scorer video to the monitor for a lane pair using HDMI cables. It also can provide on/off and video input control for the monitors thorough serial ports (Com1, Com2, Com3). Refer to the figure titled *Display Controller*.



Display Controller

The function of the connections on the Display Controller are:

(1) **Overhead Control** - ***(Com 1, Com 2, Com 3)*** RS232 serial ports that provide On/Off and video input control for the overheads.

(2) **Scorer Video** - ***(HDMI 1 / HDMI 2)*** HD Output connection to the LCD monitor for the scorer video.

HDMI 1 - Left (odd) lane video.
HDMI 2 - Right (even) lane video.

(3) **Network** - ***(LAN)*** Connection for the ethernet network. The Display Controller communicates with the other devices in the system through this connection.

(4) **Network 2 (Not Used)** - Disabled network port. Do NOT USE.

(5) **Power In** - ***(DC In 12v)*** Input for power coming from the power supply unit located behind the left lane overhead monitor.

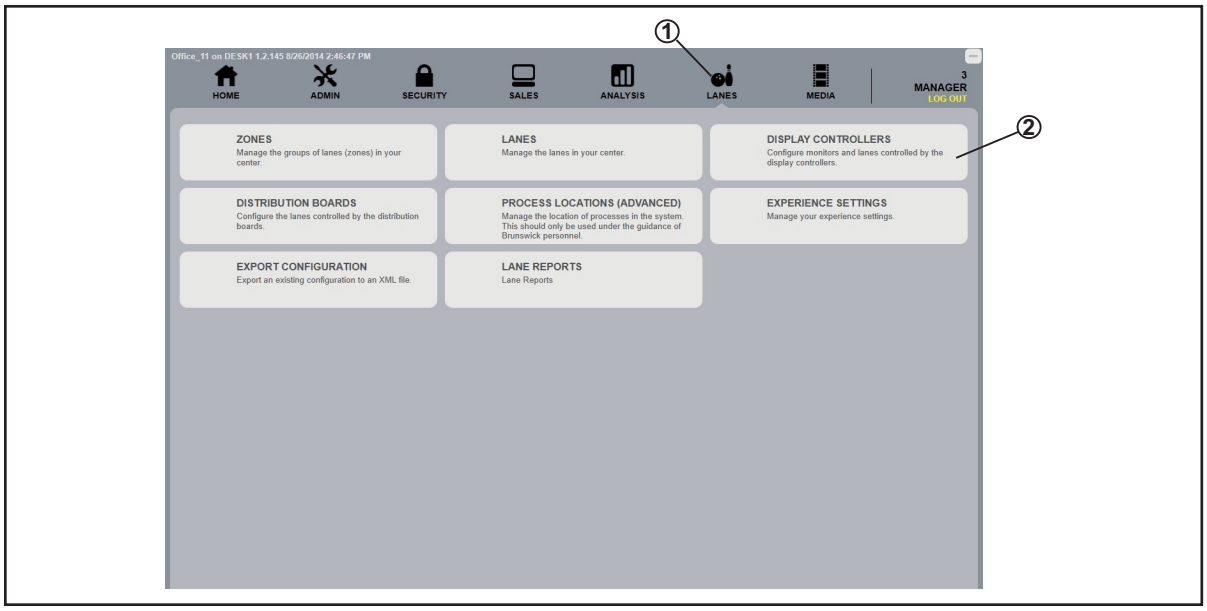
(6) **Status LEDs** - ***(HDD/SYS)*** The HDD LED flashes to indicate when the hard drive inside the Display Controller is being accessed. The system LED lights when the Display Controller is "ON"

(7) **Power Switch** - This switch turns the Display Controller ON/OFF.

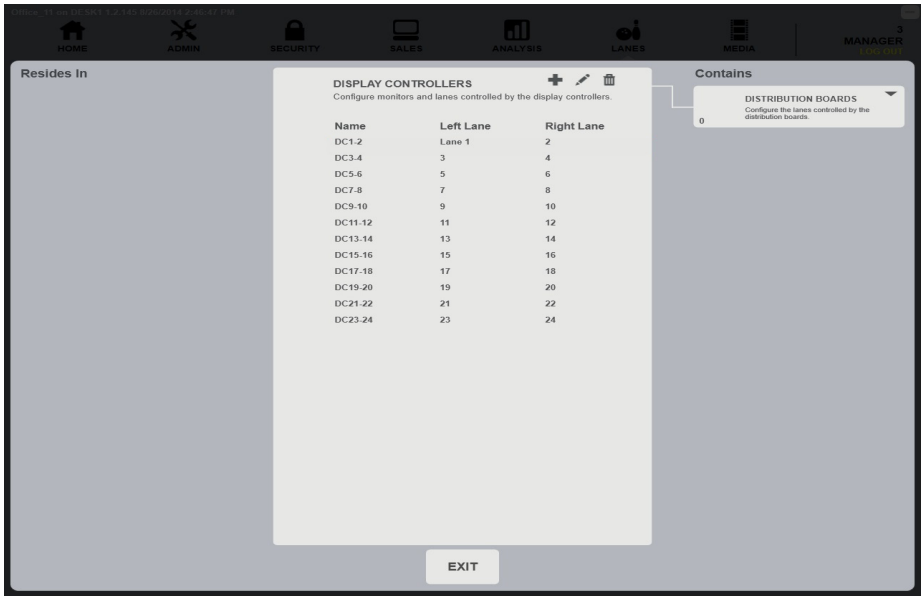
Display Controller Configuration Settings

Settings and assignments for the Display Controller can be found in the Sync office program under the *Lanes* tab, *Display Controller* selection and under the *Administrator* tab, *System Control* selection. These setting located under the *Lane* tab are configured at installation and typically do not need to be altered when replacing the Display Controller. They are provided here as reference only. The Display Controller settings located under the *Admin / System Control* are also configured at installation but should be verified whenever the Display Controller is replaced. Refer to figures titled *Lane Tab - Display Controller Setup 1, Lane Tab - Display Controller Setup 2, Lane Tab - Display Controller Properties and Admin Tab / System Control - Display Controller Setup.*

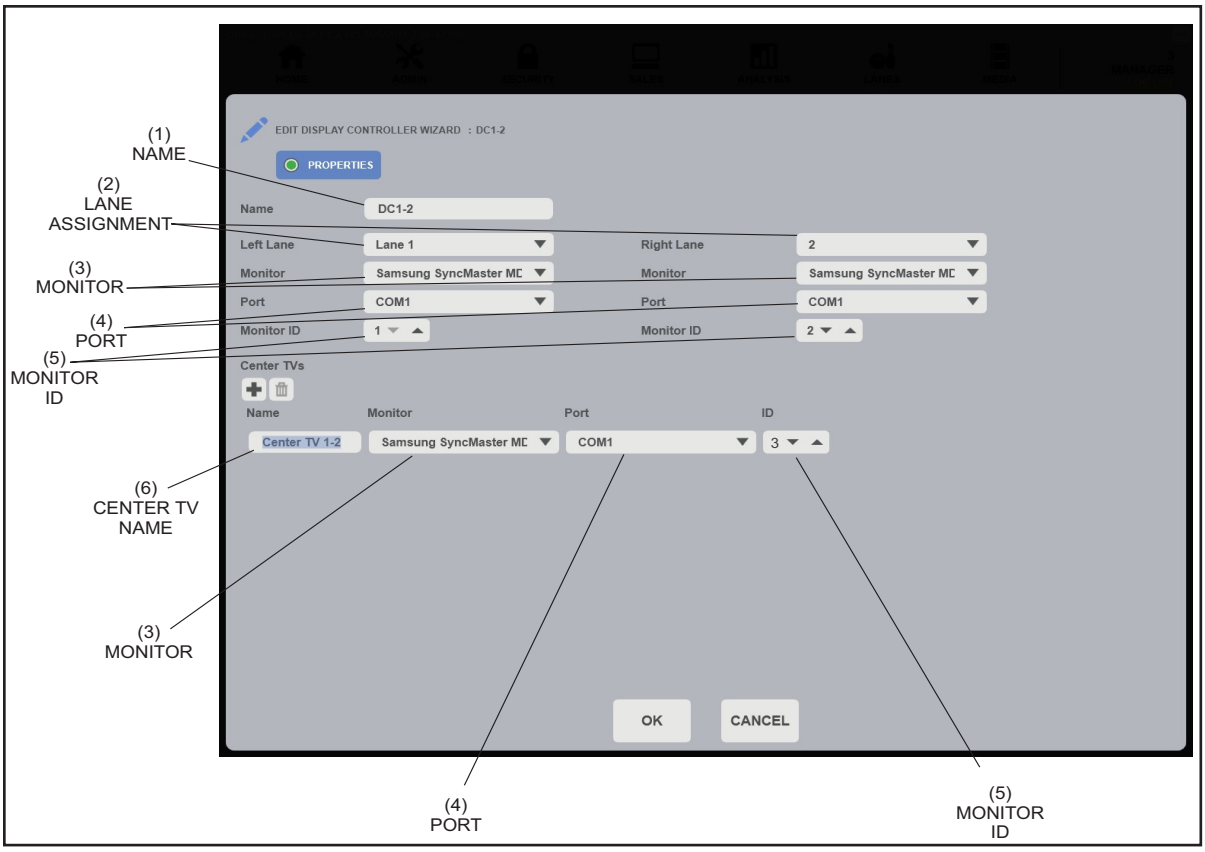
Lane Tab - Display Controller



Lane Tab - Display Controller Setup 1



Lane Tab - Display Controller Setup 2



Lane Tab - Display Controller Properties

(1) **Name** - The name assigned to the Display Controller to identify it from the other controllers in the system.

(2) **Lane Assignment** - Drop down boxes used to assign lane numbers to the Display Controller. Set the Lane Assignment as follows:

> ***Left Lane*** - The left lane number of the lane pair on which the Display Controller is installed.
> ***Right Lane*** - The right lane number of the lane pair on which the Display Controller is installed**.**

(3) **Monitor** - From the drop down boxes, select the model of the monitors used on the left and right lane of the lane pair. This selection determines the "remote control" codes used to control the monitor.

(4) **Port** - From the drop down boxes, select the comport the Display Controller uses to control the monitors. The setting will depend on how the overhead monitor control cables are wired. For monitors that have control cables that are daisy-chained between monitors all should be set to the same comport number since both lanes are controlled through a common connection. For monitors that have dedicated cables from the display controller, the setting should match the comport used for the monitor. In most centers these will be set as follows:

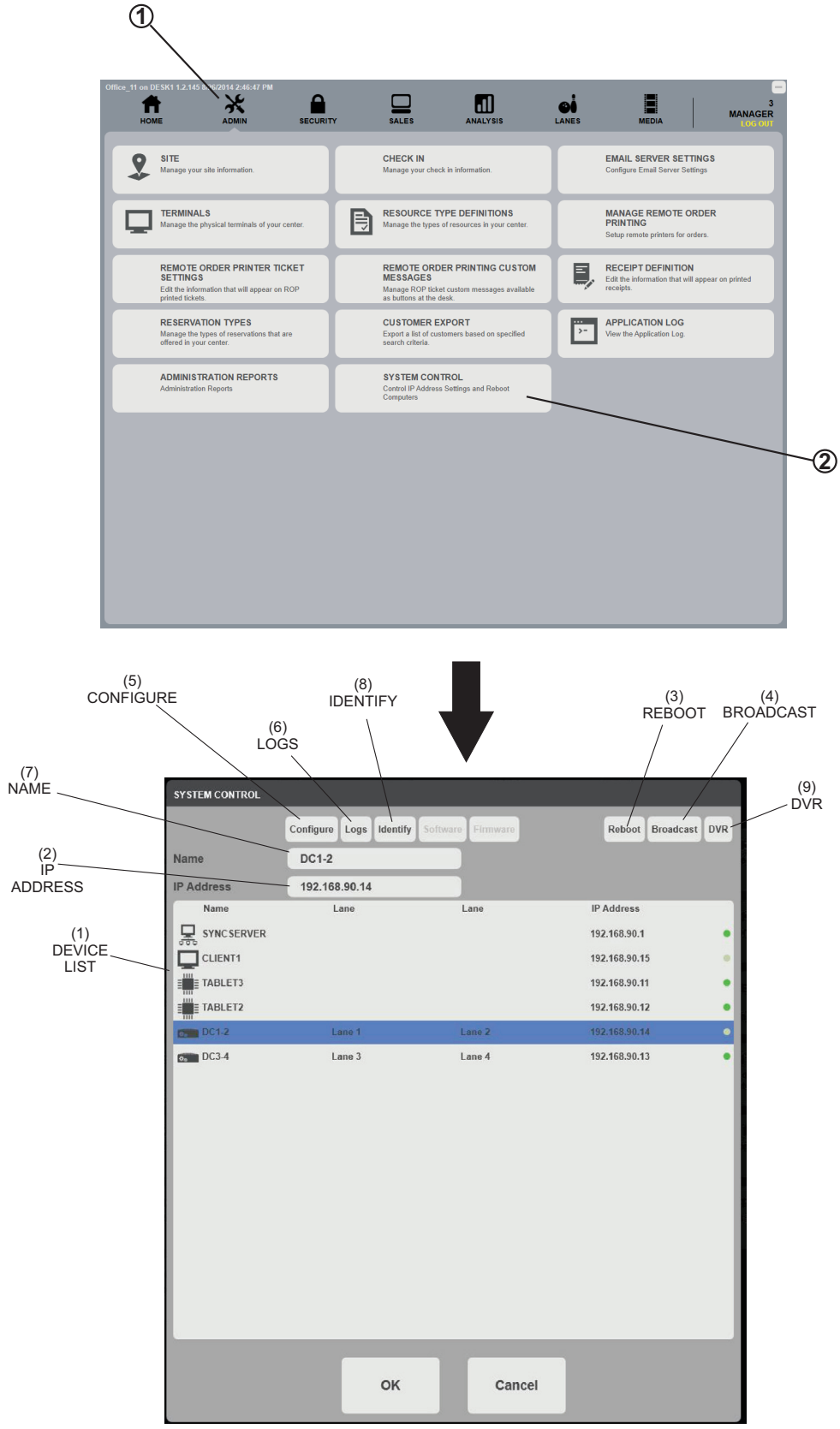
Lane	Daisy-Chained Cables	Dedicated Cables
Left	Com1	Com1
Right	Com1	Com2
Center TVs	Com1	Com3

(5) **Monitor ID** - These settings correspond to the ID number assigned inside the monitor. Also refer to the procedure *Configuring Samsung Overhead Monitors.* For all Display Controllers set the IDs as follows:

Left Lane - 1
Right Lane - 2
Center TVs - 3

(6) **Center TV Name** - The names assigned to the additional TV monitor located at the lanes to identify them from one another.

Admin Tab - System Control



Admin Tab / System Control - Display Controller Setup

(1) **Device List -** A list of all devices on the Sync network.

(2) **IP Address-** The network IP address assigned to the selected device.

(3) **Reboot -** Master system reboot. This selection causes all devices on the network to reboot.

(4) **Broadcast -** Sends the configuration information to all devices on the network.

(5) **Configure -** Sends the configuration information to the selected device.

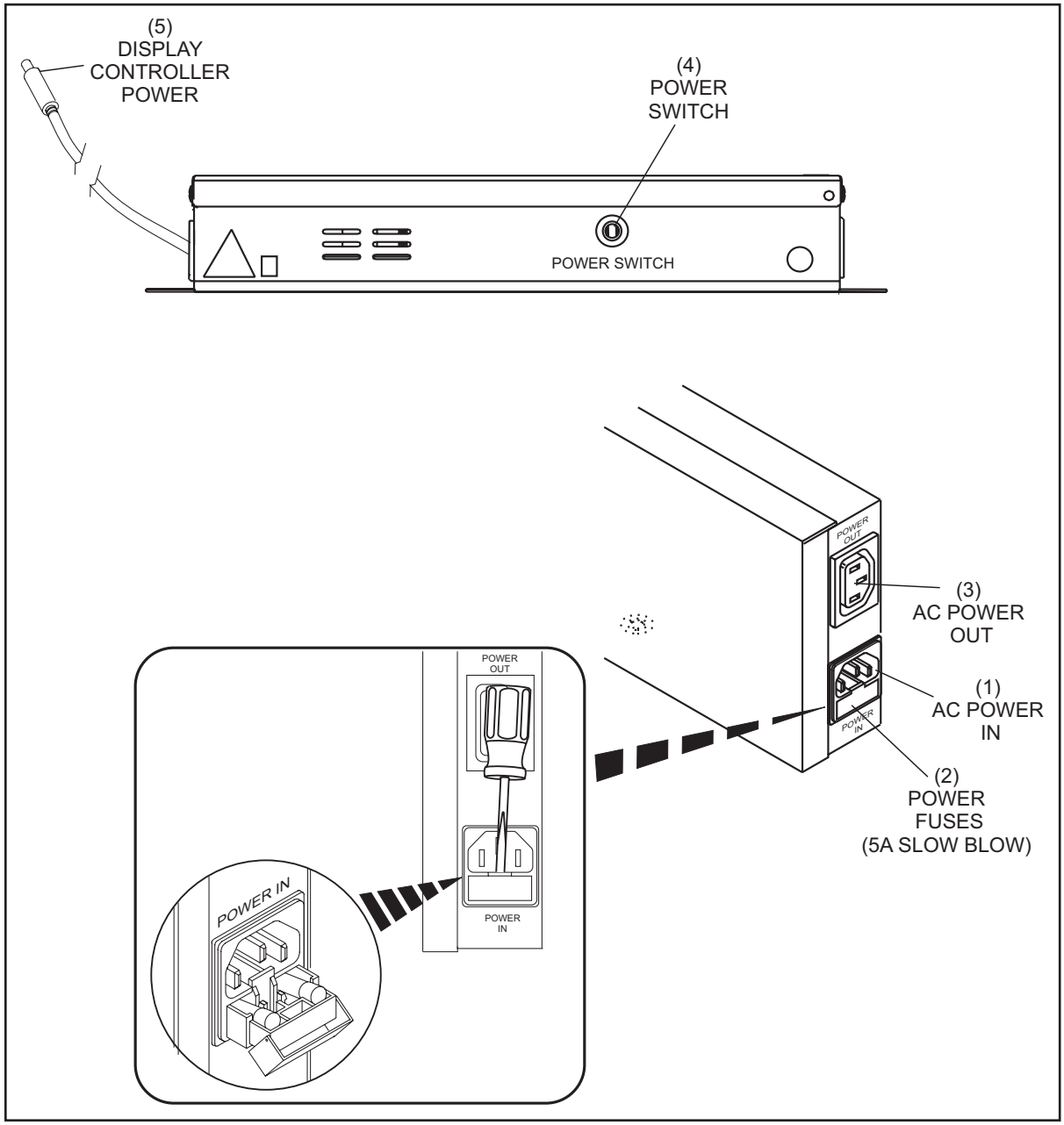
(6) **Logs -** Used by technical support to gather log files if logging has been enabeled. Logging must be turned in the office program on the *Home* tab, *System Analysis* screen.

(7) **Name -** The name assigned to the devices within the system.

(8) **Identify -** Forces the selected device to display its configuration settings on its display monitor.

(9) **DVR -** Used by technical support to enable recording of activity for a device for a specified period of time.

Power Supply



Display Controller Power Supply

(1) AC Power In - AC power input.

(2) Power Fuses - 5 amp, slo blo fuses used for the incoming power.

(3) AC Power Out - AC power connection that can be used to power a monitor.

(4) Power Switch - Push button used to power the unit On/Off.

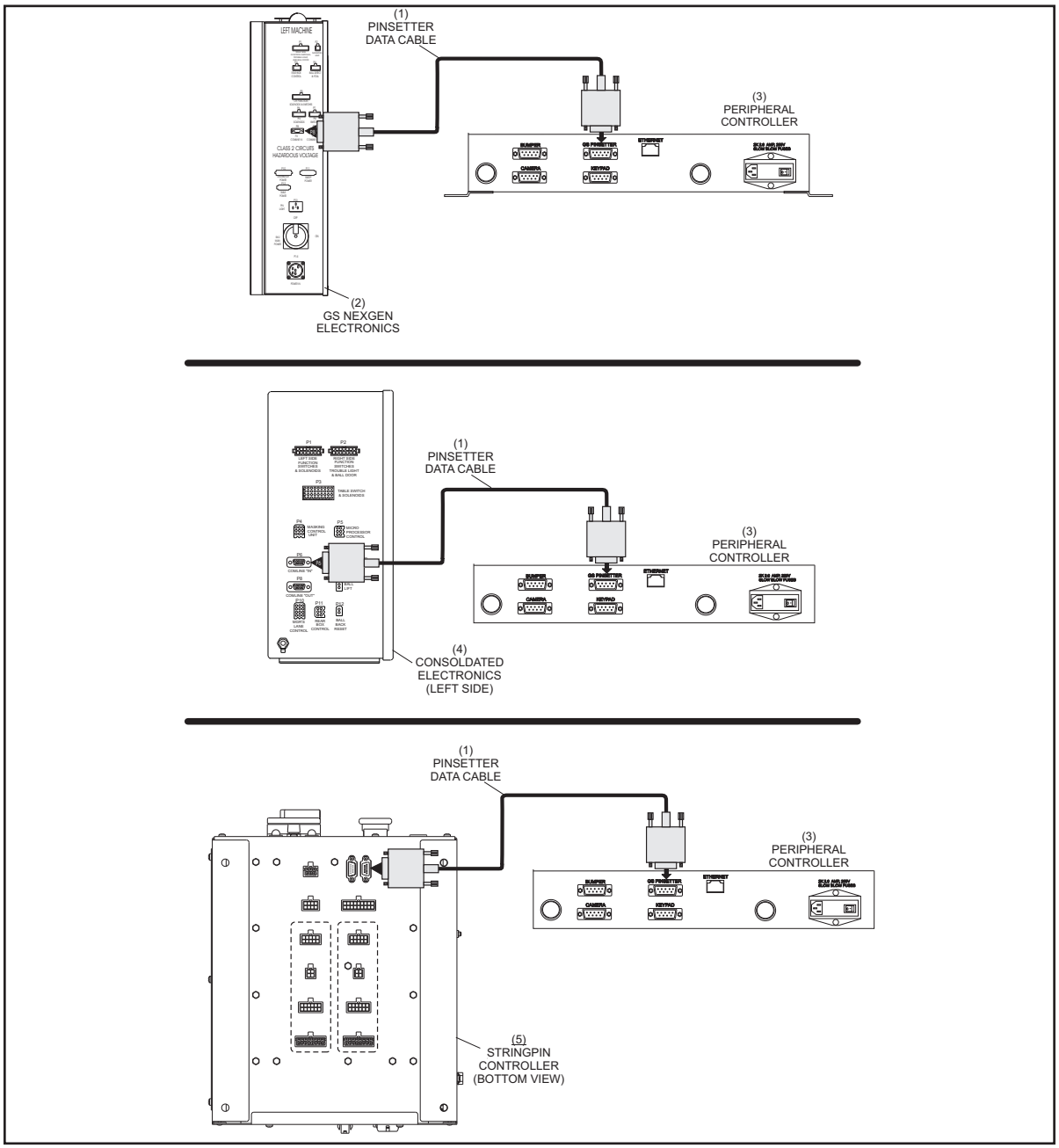
(5) Display Controller Power - 12V DC power output for the Display Controller.

GS AND STRINGPIN PINSETTER INTERFACE

Connections

GS-X, GS-98 Direct Connect, Brunswick StringPin Pinsetters

Brunswick's GS-X, GS-98 Direct Connect, and StringPin pinsetters are designed to directly communicate with the Sync scoring system. Connection to the scoring system consists of a cable connected between the pinsetter and the Sync Peripheral Controller. Refer to figures titled *Cabling - Direct Connect Pinsetters.*

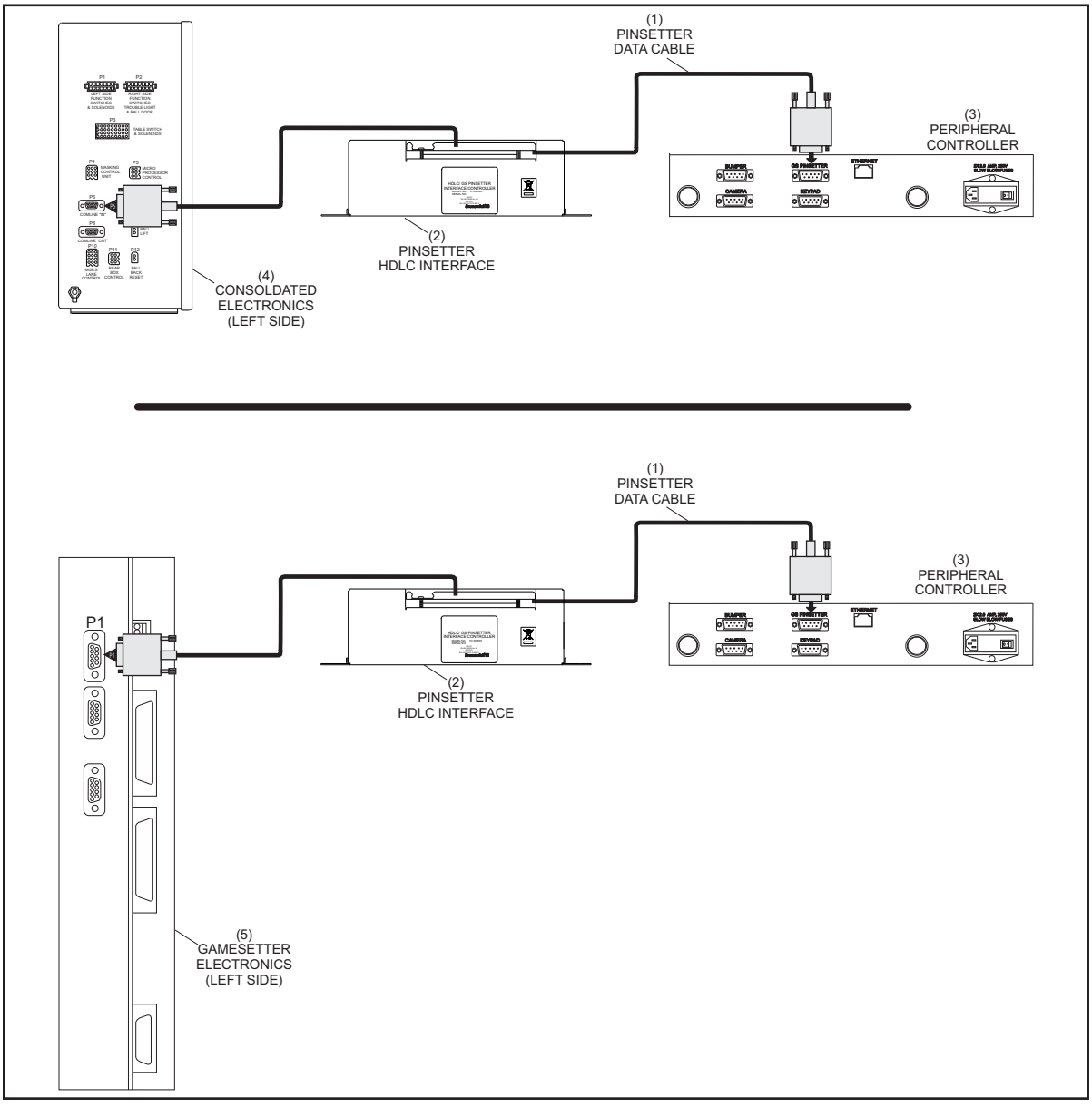


Cabling - Direct Connect Pinsetters

(1) PINSETTER DATA CABLE
(2) GS NEXGEN ELECTRONICS
(3) PERIPHERAL CONTROLLER
(4) CONSOLIDATED ELECTRONICS (LEFT SIDE)
(5) STRINGPIN CONTROLLER (BOTTOM VIEW)

GS-98 Non-Direct Connect, GS-96, GS-92 and GS-10 Pinsetters

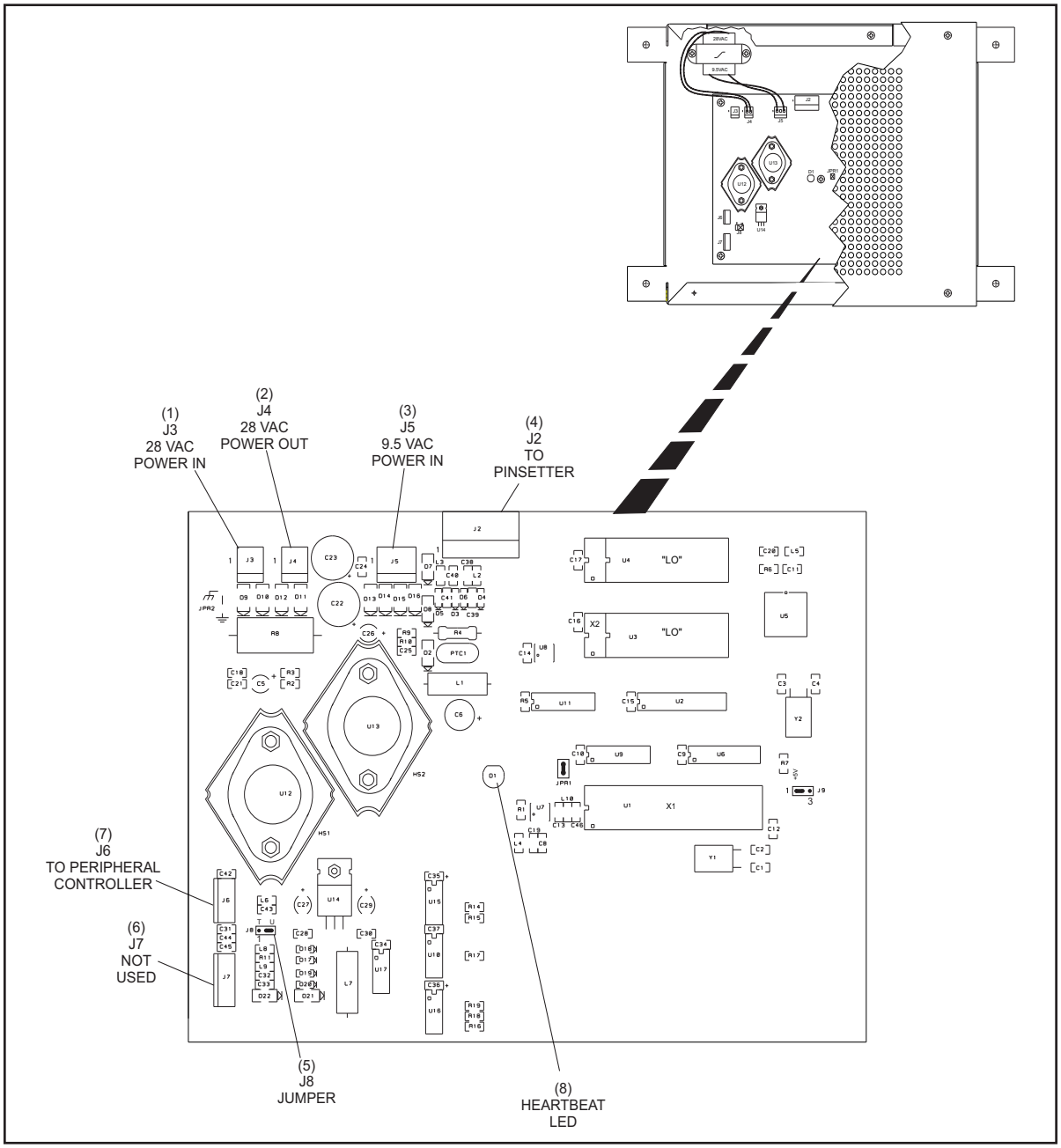
Brunswick's GS-98 Non-Direct Connect, GS-96, GS-92, and GS-10 pinsetters require an interface box between the pinsetter and the Peripheral Controller. The purpose of this box is to translate communication to format format that can be used by the GS machine. Refer to figures titled *Cabling - Non Direct Connect Pinsetters*.



Cabling - Non Direct Connect Pinsetters

(1) PINSETTER DATA CABLE
(2) PINSETTER HDLC INTERFACE
(3) PERIPHERAL CONTROLLER
(4) CONSOLIDATED ELECTRONICS (LEFT SIDE)
(5) GAMESETTER ELECTRONICS (LEFT SIDE)

Pinsetter HDLC Interface



HDLC Interface Board

(1) J3 28VAC POWER IN
(2) J4 28VAC POWER OUT
(3) J5 9.5VAC POWER IN
(4) J2 TO PINSETTER
(5) J8 JUMPER
(6) J7 NOT USED
(7) J6 TO PERIPHERAL CONTROLLER
(8) HEARTBEAT LED

The functions of the connections on the HDLC Interface Board are:

(1) 28 VAC Power In (J3) - Input for the voltage originating at the HDLC Power Supply located on the curtain wall, next to the Interface Box.

(2) 28 VAC Power Out (J4) - Output for the voltage going to the step-down transformer located inside the Interface Box.

(3) 9.5 VAC Power In (J5) - Input for the voltage returning for the step down transformer. This voltage is then changed to +5 VDC on the board.

(4) J2 To Pinsetter (J2) - Connection for communication to P1 connection of the Gamesetter Box on GS-10, GS-92 or GS-96 or P8 on the Consolidated Low Voltage Box of GS-98 pinsetters. Information handled by this communication includes pinsetter on/off, frame count monitoring, scores, and special cycle information.

(5) Termination Jumper (J8) - Jumper used to terminate the communication signal coming from the Peripheral Controller if it does not continue to additional devices. Set the jumper as follows:

Configuration	Jumper Placement
No additional devices connected to J7 (Terminated)	Short Pins 1 and 2 (T)
Additional devices connected to J7 (Not terminated)	Short Pins 2 and 3 (U)

(6) Peripheral Communication Out (J7) - Connection to allow the communication signal from the Peripheral Controller to route to additional devices on a lane pair. Currently this connection is not used. . Refer to (5) Termination Jumper (J8).

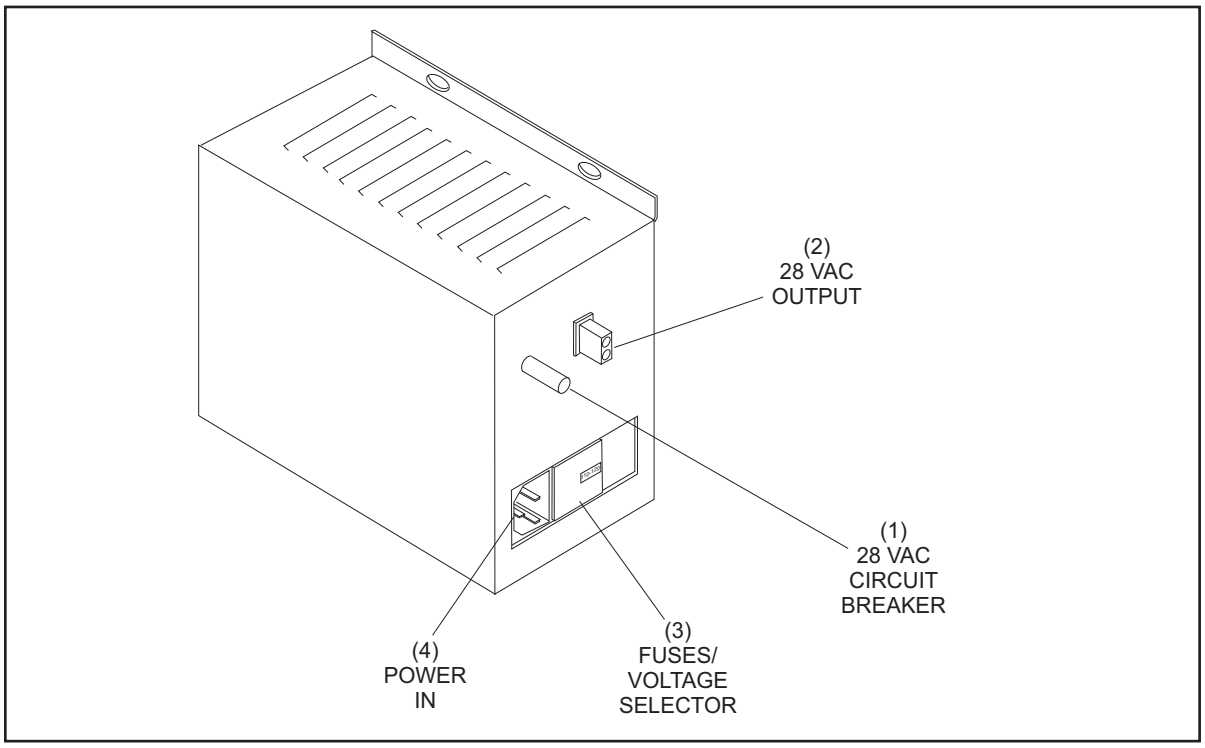
(7) To Peripheral Controller (J6) - Connection for the communication signal coming from the Peripheral Controller. All information needed by the Interface to control the machine and obtain scoring information, are handled through this cable.

(8) Heartbeat LED - The Heartbeat LED allows the user to monitor the communication between the board and the pinsetter. The LED can have the following flash rates. Refer to (4) J2 To Pinsetter.

Flash Rate	Meaning
Flash, Flash, Pause	Normal Communication to Gamesetter
Fast Flashing	No Communication to Gamesetter

Pinsetter HDLC Power Supply

The HDLC Power Supply is a transformer that supplies 28 VAC to the Pinsetter HDLC Interface. Input voltage for the power supply can be either 110 VAC or 230 VAC as selected by a voltage selector PCB located in the power input receptacle.



HDLC Power Supply

The functions of the connections on the HDLC Power Supply are:

(1) **28 VAC Circuit Breaker** - Protection for the 28 VAC used to power the Pinsetter HDLC Interface Box.

(2) **28 VAC Output** - Power output for the Pinsetter HDLC Interface Box.

(3) **Fuses/Voltage Selector** - Slide out panel that allows a user to select either 120 VAC or 220 VAC as the input voltage. Also, the fuses protecting the interal transformer are located here. Refer to Selecting Input Voltage for HDLC Power Supply.

(4) **Power In** - 120 VAC or 240 VAC enters here.

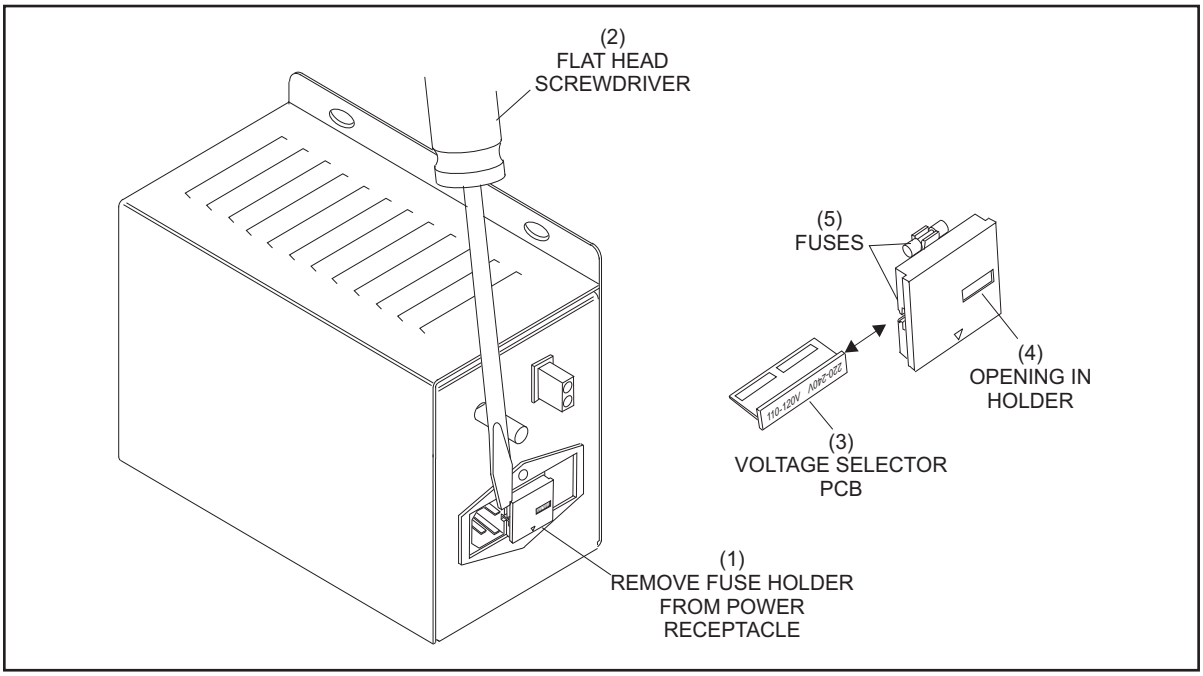
Selecting Input Voltage for Auxiliary or Secondary Transformers

1. Disconnect the power cord from the HDLC Power Supply.

2. Using a flat head screwdriver, remove the fuse holder from the power receptacle. Refer to figure titled *Selecting Input Voltage for HDLC Power Supply.*

3. Remove the Voltage Selector PCB from the holder assembly.

4. Insert the Voltage Selector PCB so the desired voltage rating can be seen through the opening in the holder. Refer to the figure titled *Selecting Input Voltage for HDLC Power Supply.*



Selecting Input Voltage for HDLC Power Supply

(1) REMOVE FUSE HOLDER FROM POWER RECEPTACLE (2) FLAT HEAD SCREWDRIVER (3) VOLTAGE SELECTOR PCB
(4) OPENING IN HOLDER (5) FUSES

5. Examine the fuses in the holder to verify the proper fuse rating according to the charts below:

Input Voltage	Fuse Ratings
110 VAC - 120 VAC	2 AMP 250V
220 VAC - 240 VAC	1 AMP 250V

6. Replace the fuse holder in the power receptacle.

7. Connect the power cord to the HDLC Power Supply.

CIRCUIT BOARD AND COMPONENT REPLACEMENT

CAUTION: Some circuits and circuit boards may be static sensitive and can be damaged due to improper handling. You should follow the suggested guidelines to avoid problems.

NOTE: *Failure to use proper handling techniques for the circuit board may void the warranty.*

1. Before working on or removing any board you **MUST** discharge any static within your body by touching the metal chassis of the component.

2. Always keep static sensitive boards and components in their protective wrapping when not in use.

3. Handle the boards by the edges only to avoid damaging the board.

4. Avoid touching the gold plated edge terminals.

Before replacing any component, you must determine if it requires any initial setup. Refer to the chart titled *Configuration Chart*.

Component	Setup Required	Setup/Comments
Display Controller	Yes	1. Verify the cabling to the Display Controller is connected properly. 2. Set the IP address for the Display Controller in the office program to match the address assigned to the new Display Controller. 3. Updated setting from the Office Program as needed. 4. Assign 2 bowlers to the lane pair using Lite League to test.
Display Controller Power Supply	No	Check power fuses
Peripheral Controller	Yes	1. Set Board Address dip switches to the left lane number of the lane pair. 2. Verify the jumper settings on the board.
Pin Camera	Yes	1. Connect cables as needed. Make sure power cable is connected properly. 2. Calibrate the Camera for the lanes associated with the cameras.
Ethernet Switch	No	Connect cables as needed. Make sure power cable is connected properly.
Sync Interface (Single Mounted Tablet)	Yes	1. Connect cables as needed. Make sure power cable is connected properly. 2. Verify the jumper settings on the board.
Sync Interface (Pedestal Mounted Tablet)	Yes	1. Connect cables as needed. Make sure power cables are connected properly. 2. Verify the jumper settings on the board.
Sync Console Power Supply	No	Check power fuses
Vector Keypad Interface PCB	Yes	Set jumper on **JP4** At 2 and 3(T) if the audio cable does not continue from J6 At pins 1 and 2 (U) if the audio cable continues from J6
Sync Tablet	Yes	1. Connect cables as needed. Make sure power cable is connected properly. 2. Set the IP address for the tablet in the office program to match the address assigned to the new tablet. 3. Assign 2 bowlers to the lane pair using Lite League to test.
Touchpad Interface (Pedestal Mounted Touchpads)	Yes	1. Connect cables as needed. Make sure power cables are connected properly. 2. Verify the jumper settings on the board.
Sync Keyboard Controller (Single Mounted Touchpad)	Yes	1. Connect cables as needed. Make sure power cables are connected properly. 2. Verify the jumper settings on the board.

Configuration Chart.

Display Controller Replacement

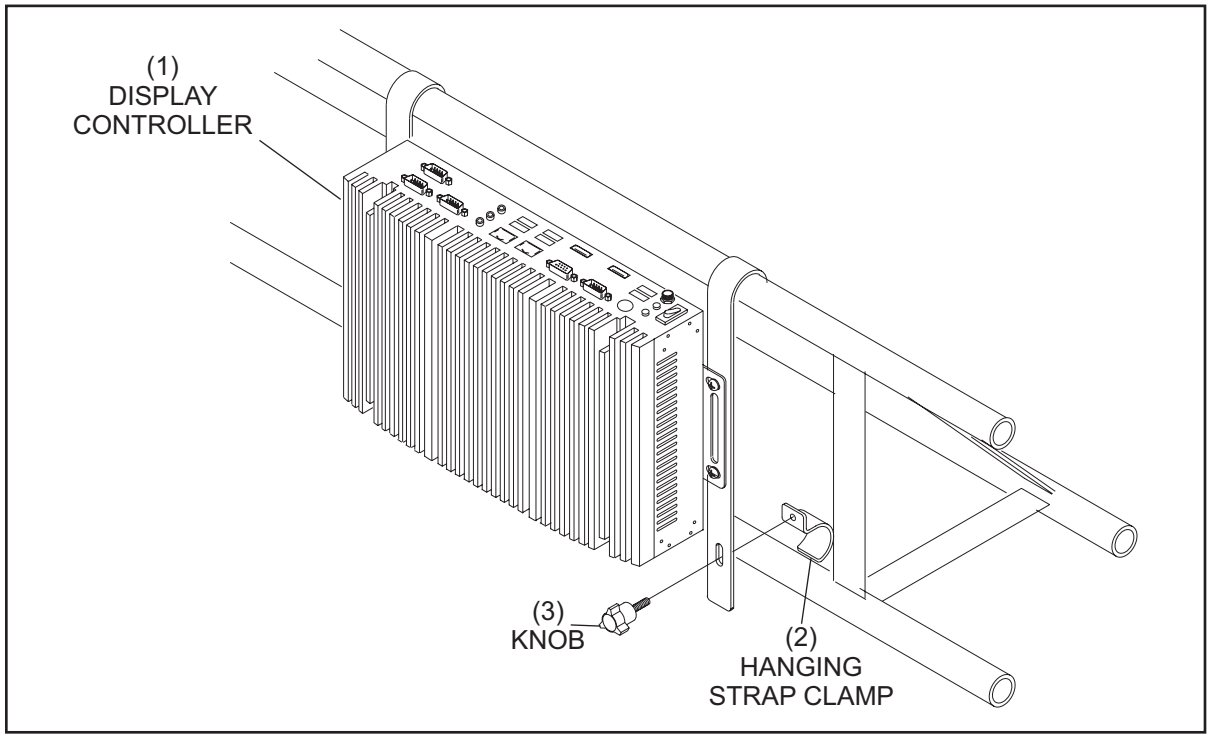
NOTE: *The screen shots in this procedure may vary slightly from what is displayed on your system. Although the graphics might differ, the content and the procedure is the same regardless of the system version.*

NOTE: *Before disconnecting any cables from the original Display Controller, take note of where each cable is connected so that they are attached to the replacement Display Controller properly. It is strongly recommended to mark each cable with a marker to designate its connection before disconnecting the cables.*

1. Turn “OFF” the display controller using the power switch located at the back of the Display Controller.

2. Take note of where each cable connects to the original Display Controller, then disconnect all cables from the Controller.

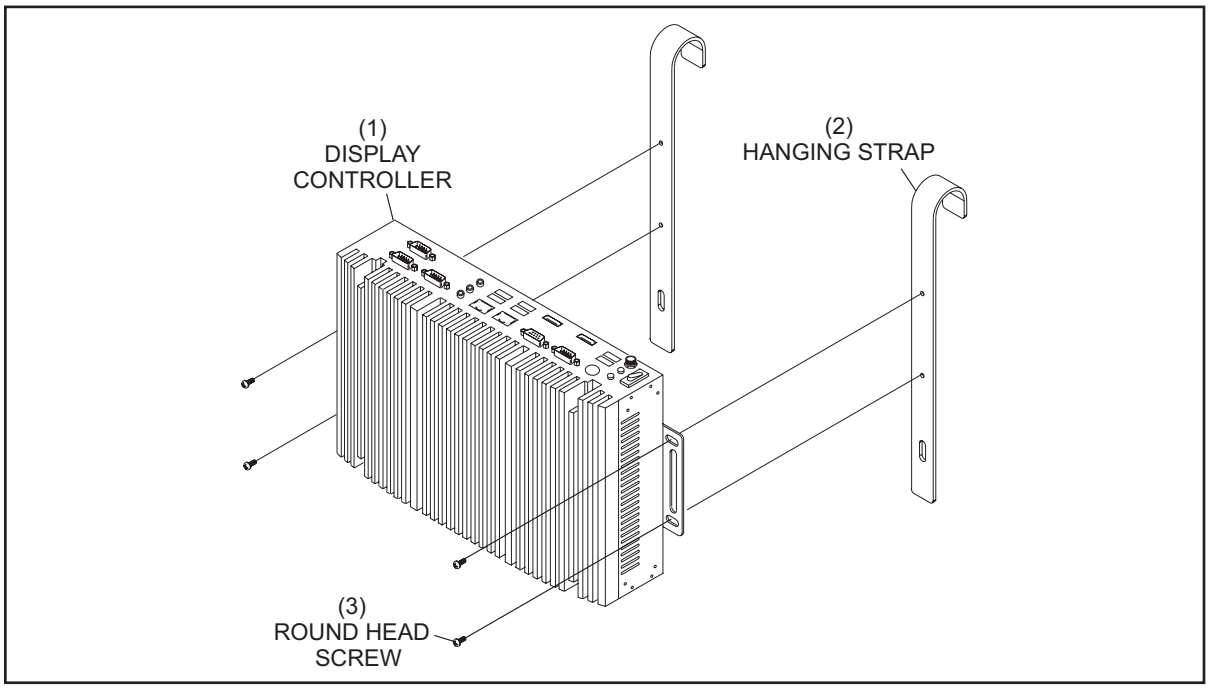
3. Remove the knob and strap clamp from the hanging strap and lift the original Display Controller up and off of the overhead structure. Retain the knob and clamp for reinstallation with the new Display Controller. Refer to the figure titled *Display Controller Clamp.*



Display Controller Clamp

(1) DISPLAY CONTROLLER (2) HANGING STRAP CLAMP (3) KNOB

4. If needed, transfer the hanging straps to the replacement Display Controller and attach it to the overhead structure in the same spot as the original controller. Refer to the figure titled *Display Controller Hanging Straps.*

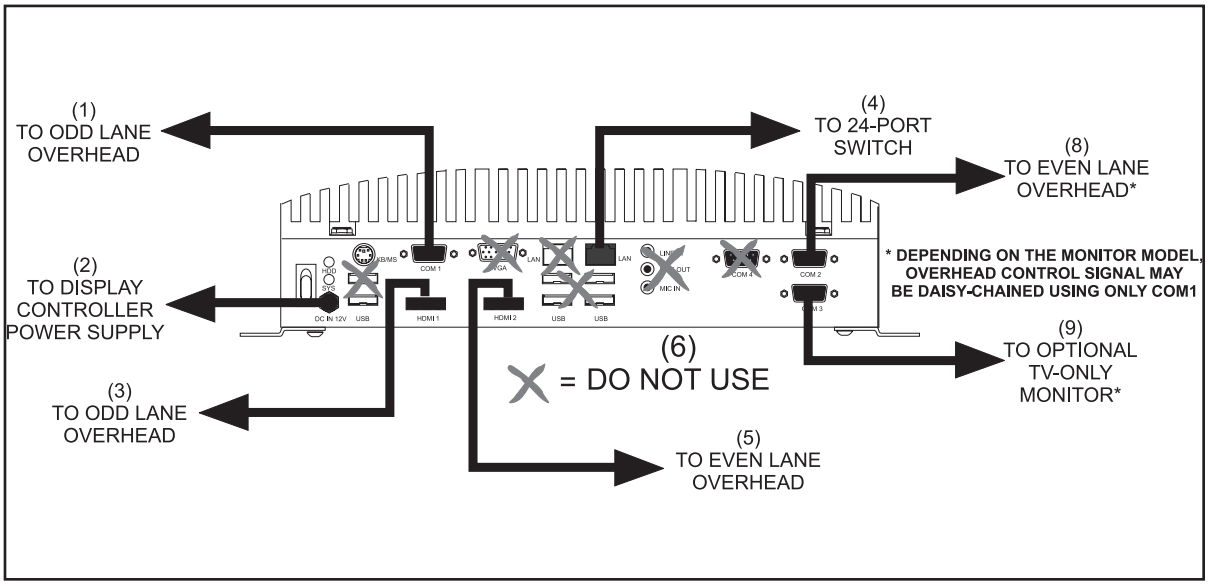


Display Controller Hanging Straps

(1) DISPLAY CONTROLLER (2) HANGING STRAP (3) ROUND HEAD SCREW

5. Secure the controller onto the overhead structure using the knob and strap clamp removed in step 3.

6. Attach the network, video (HDMI), and communication cable to the replacement Display Controller exactly as they were on the original controller and as noted in step 2. Once verified, connect the and power cable to the unit. Refer to the figure titled *Display Controller Connections.*



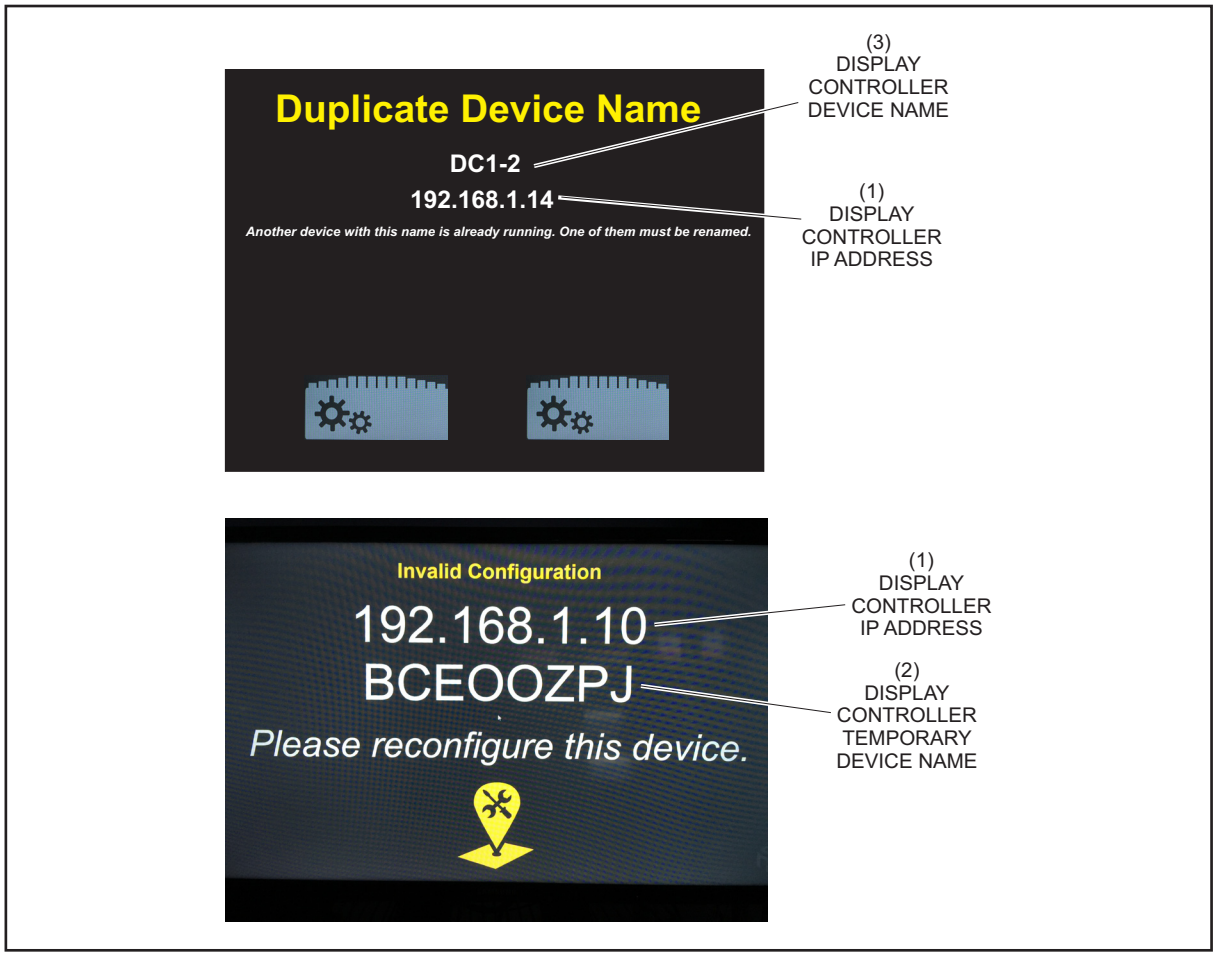
Display Controller Connections

(1) TO ODD LANE OVERHEAD	(2) TO DISPLAY CONTROLLER POWER SUPPLY	(3) TO ODD LANE OVERHEAD
(4) TO 24-PORT SWITCH	(5) TO EVEN LANE OVERHEAD	(6) DO NOT USE

7. If the replacement display controller did not automatically start booting up when the power cable was connected, press the power button on the controller. A beep will sound notifying that the controller is booting up.

NOTE: *The actual information and messages that appears on the configuration screen during and after rebooting is dependent on whether the unit is new from the factory or if it was previously installed.*

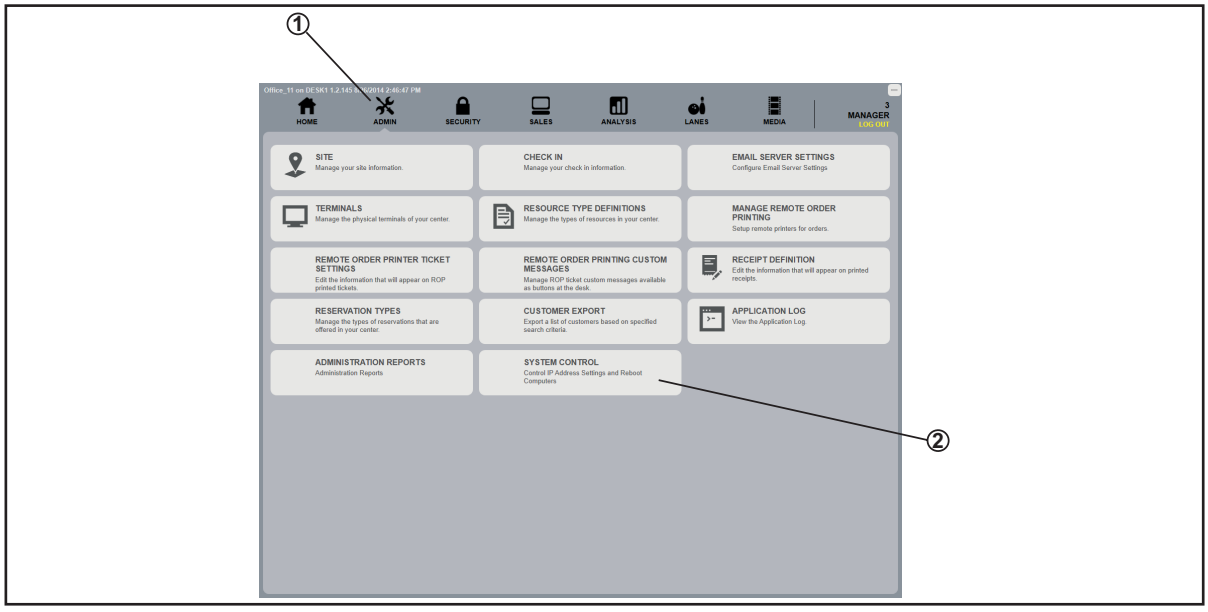
8. Once the Display Controller has fully booted, the overhead display will show the IP address and a Device Name. For previously installed Display Controllers a screen indicating a "*Duplicate Device Name*" along with the name of an existing Display Controller may appear. For Display Controllers that have never been installed, a screen indicated an "*Invalid Configuration*" along with a temporary name. Take note of the IP address as it is needed for the next step. Refer to the figure titled *Display Controller - IP Address.*



Display Controller - IP Address

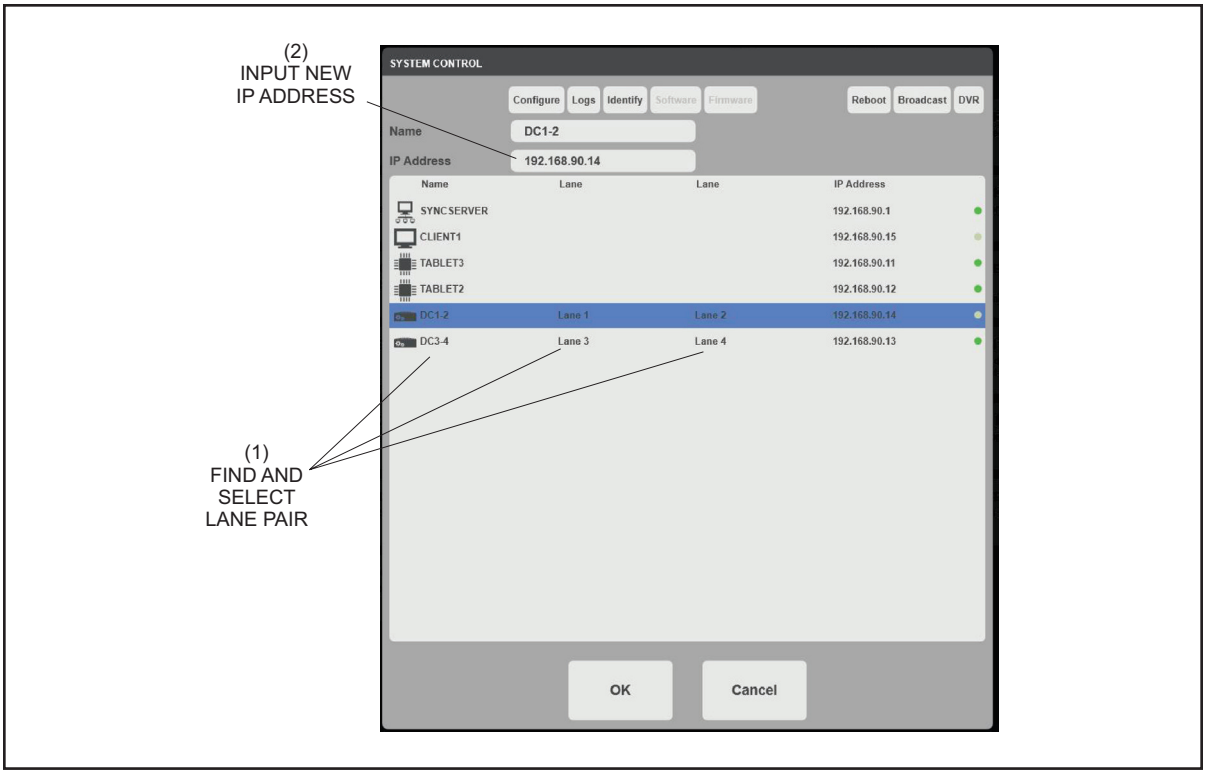
(1) DISPLAY CONTROLLER IP ADDRESS
(2) DISPLAY CONTROLLER TEMPORARY DEVICE NAME
(3) DISPLAY CONTROLLER DEVICE NAME

9. In the Sync Office program, navigate to the system control screen. Refer to the figure titled *Admin - System Control*.



Admin - System Control

10. Find the lane pair that the replacement display controller will be assigned to. Once selected, keep the ***Name*** the same but change the ***IP Address*** to the new IP address currently being displayed on the overhead monitor. Refer to the figure titled *System Control - New IP Address*.



System Control- New IP Address

(1) FIND AND SELECT LANE PAIR (2) INPUT NEW IP ADDRESS

11. Select ***Configure*** to update the Display Controller with the new configuration information. The Display Controller will automatically reboot.

12. Once the controller has fully rebooted, select ***Broadcast*** to notify the other components in the system of the new controller change. Refer to the figure titled *System Control - Configure and Broadcast.*

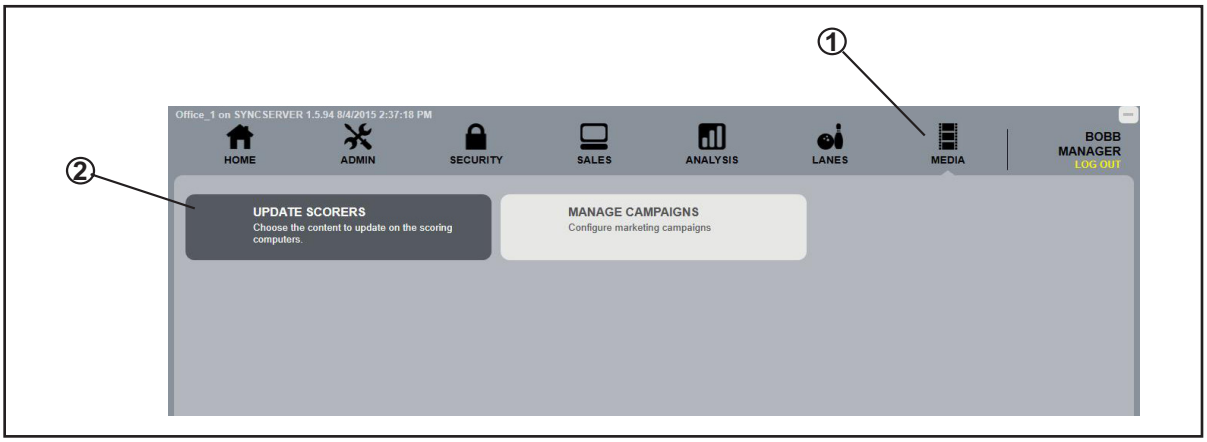
NOTE: *The Configure button will "flash" when pressed. No additional notification will display after a broadcast.*

13. Click OK at the bottom of the page when complete. Refer to the figure titled *System Control - Configure and Broadcast.*

System Control - Configure and Broadcast

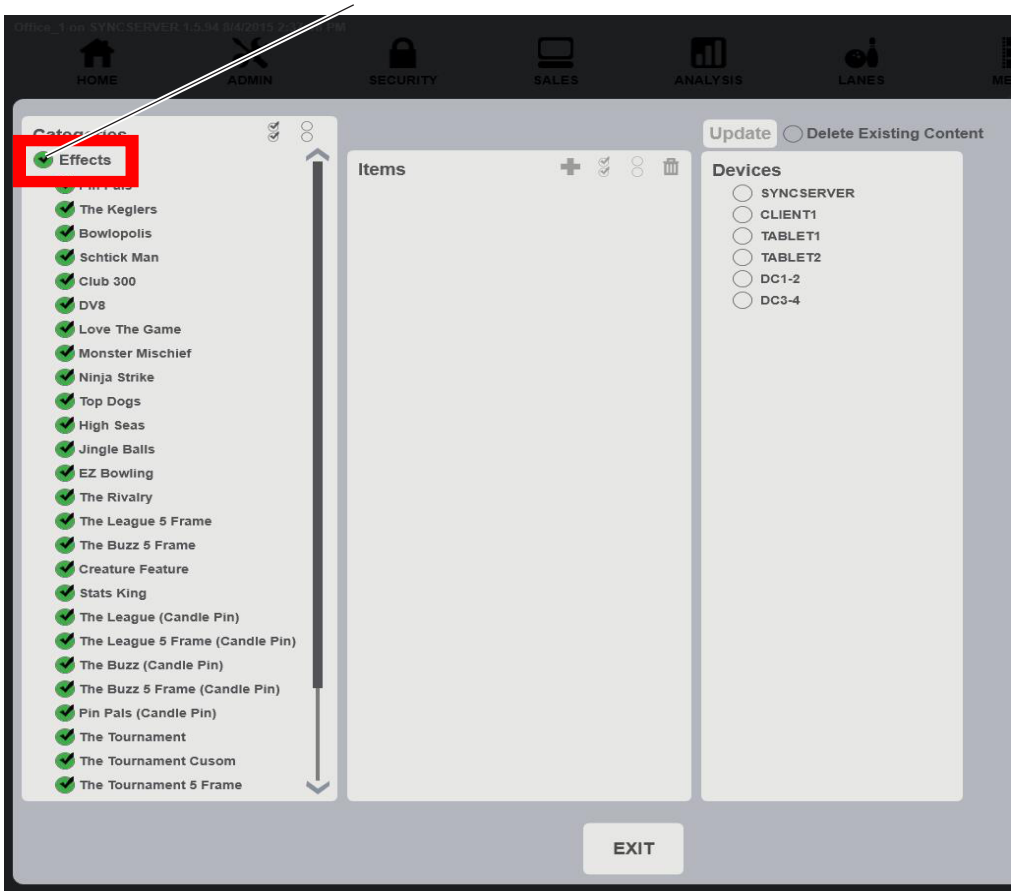
(1) CONFIGURE (2) BROADCAST (3) OK

14. Select the Media tab and click Update Scorers. Refer to the figure titled *Media - Update Scorers.*



Media - Update Scorers

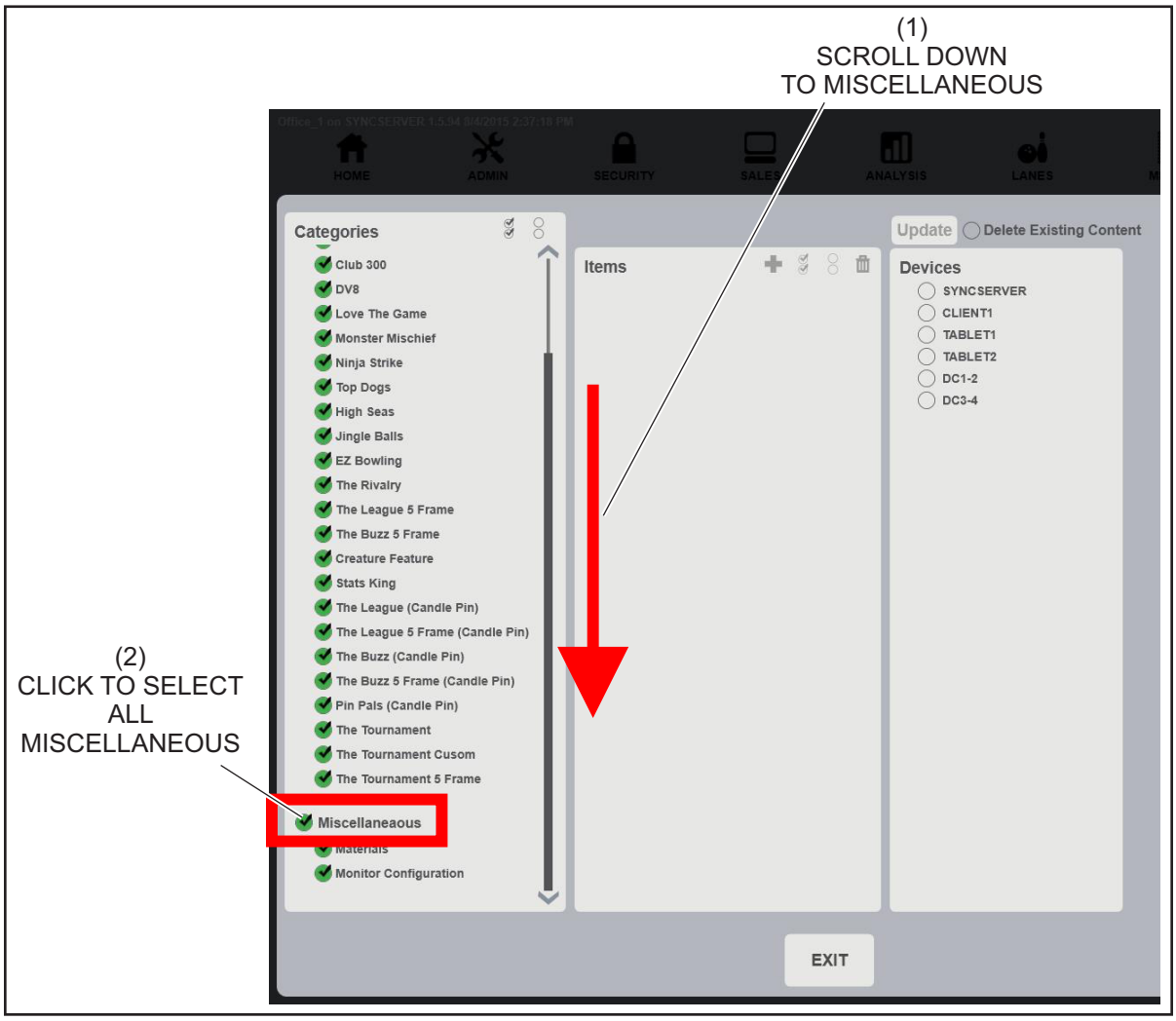
15. Select the check mark next to “Effects” to select all the Effects items. Refer to the figure titled *Update Scorers - Select All Effects.*



Update Scorers - Select All Effects

(1) CLICK TO SELECT ALL EFFECTS

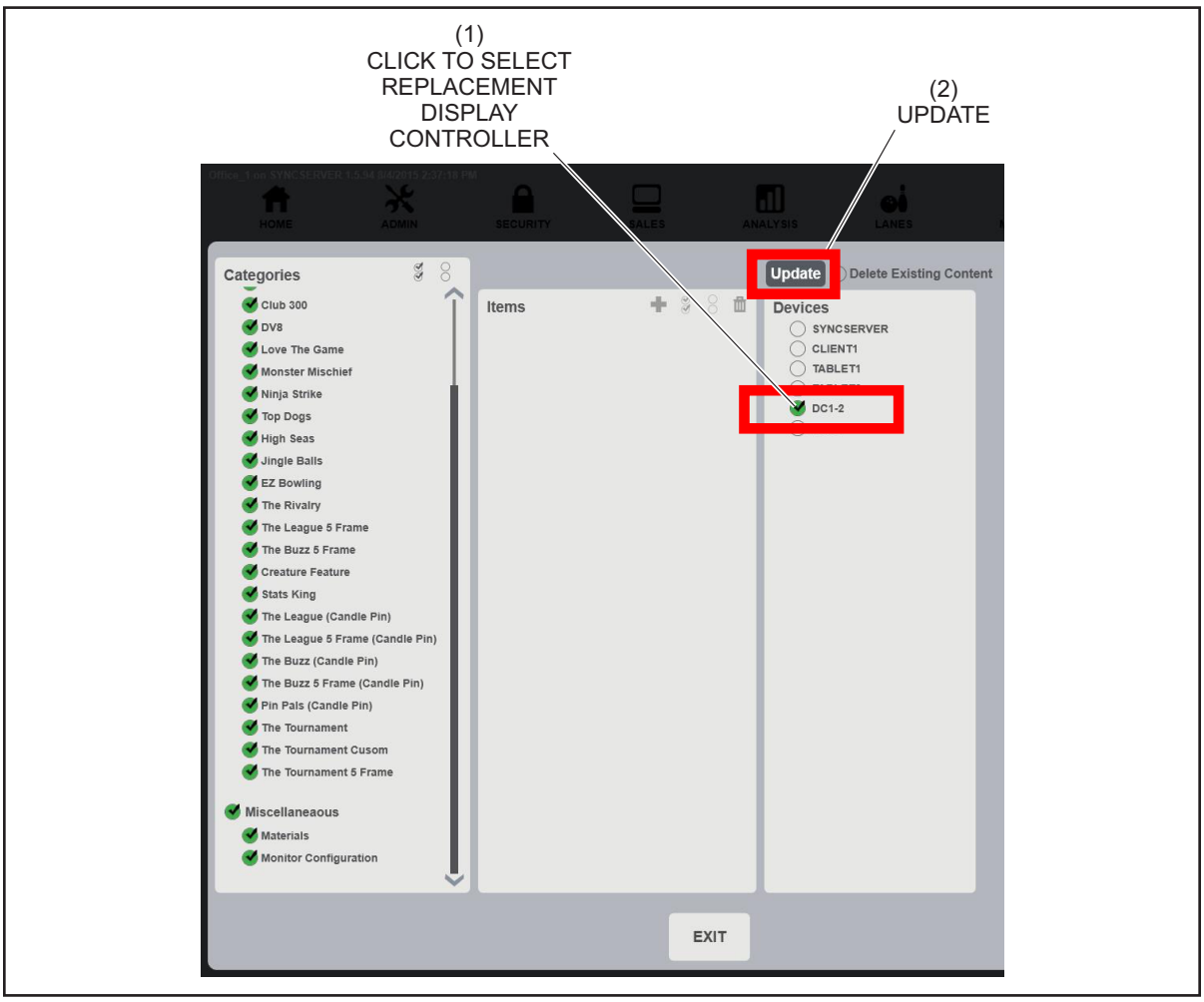
16. Scroll down the Categories section as needed to display “Miscellaneous” subsection. Select the check mark next to “Miscellaneous” to select all the Miscellaneous items. Refer to the figure titled *Update Scorers - Select All Miscellaneous*.



Update Scorers - Select All Miscellaneous

(1) SCROLL DOWN TO MISCELLANEOUS (2) CLICK TO SELECT ALL MISCELLANEOUS

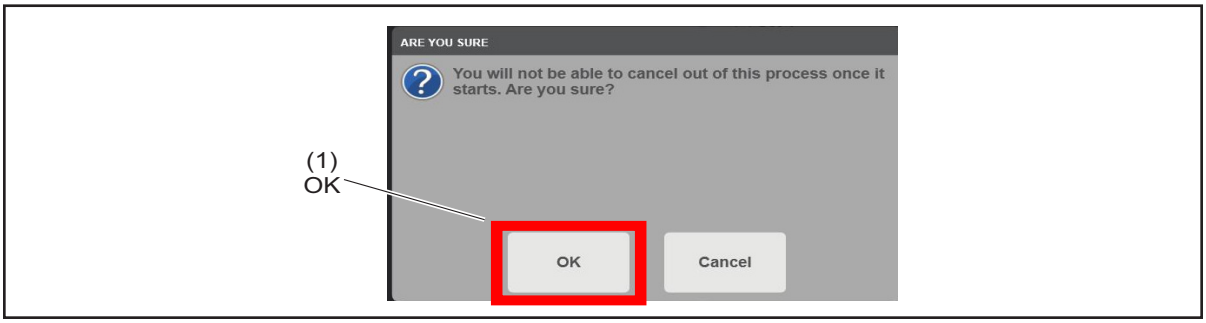
17. Under the Devices section, find the selection for the replacement Display Controller. Click the check mark next to that Display Controller to select it. Select Update to begin the update process. Refer to the figure titled *Update Scorers - Select Display Controller and Update.*



Update Scorers - Select Display Controller and Update

(1) CLICK TO SELECT REPLACEMENT DISPLAY CONTROLLER (2) UPDATE

18. To begin the Scorer Update process, click OK when prompted. Refer to the figure titled *Update Scorers - Are you sure?*



Update Scorers - Are you sure?

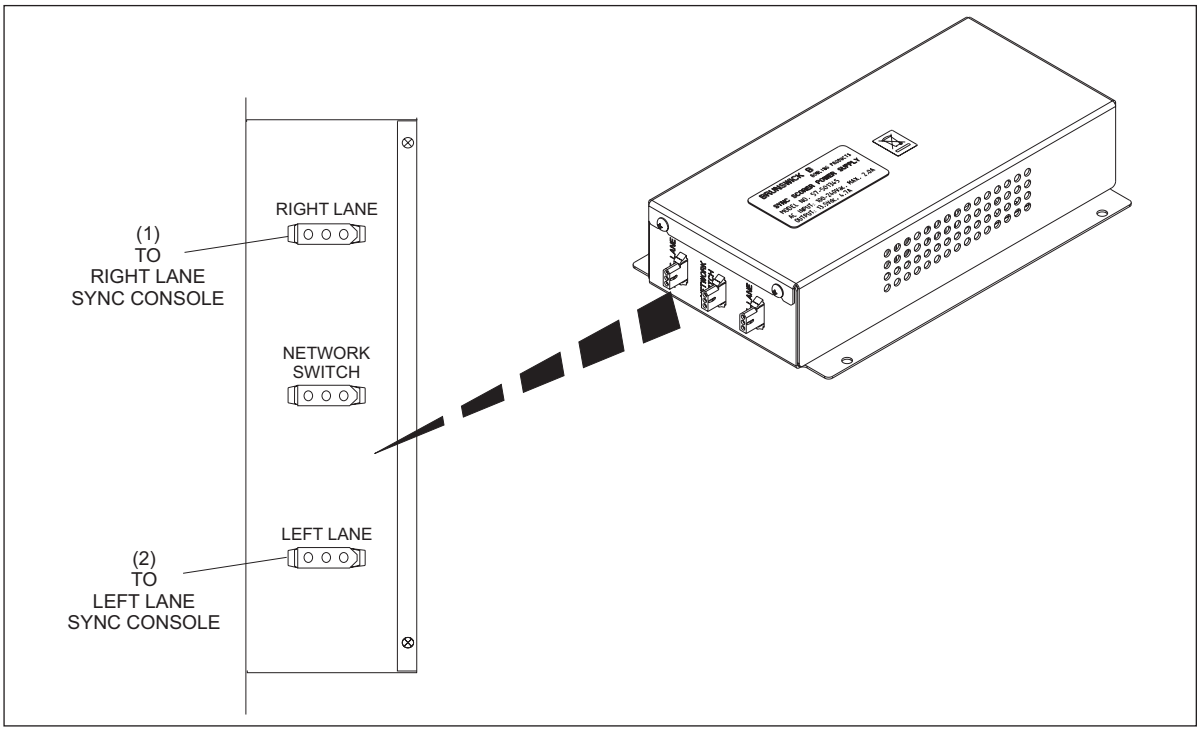
(1) OK

19. ***IMPORTANT!*** Once the Display Controller has completely rebooted, assign 2 bowlers to the lane pair using "Lite League". Bowl on the lanes to test for proper functionality.

Tablet Replacement

NOTE: *The screen shots in this procedure may vary slightly from what is displayed on your system. Although the graphics might differ, the content and the procedure is the same regardless of the system version.*

1. Remove power from the tablet by disconnecting the power plug located on the Sync Scorer Power Supply. Refer to the figure titled *Tablet Power Connections.*



Tablet Power Connections

(1) TO RIGHT LANE SYNC CONSOLE (2) TO LEFT LANE SYNC CONSOLE

2. Unscrew the four screws on the back of the tablet pedestal. Save the screws for reassembly.

3. Gently lift the original tablet out from its encloser and disconnect the ribbon cable from the back of the tablet.

4. Remove any screen protection film from the replacement tablet.

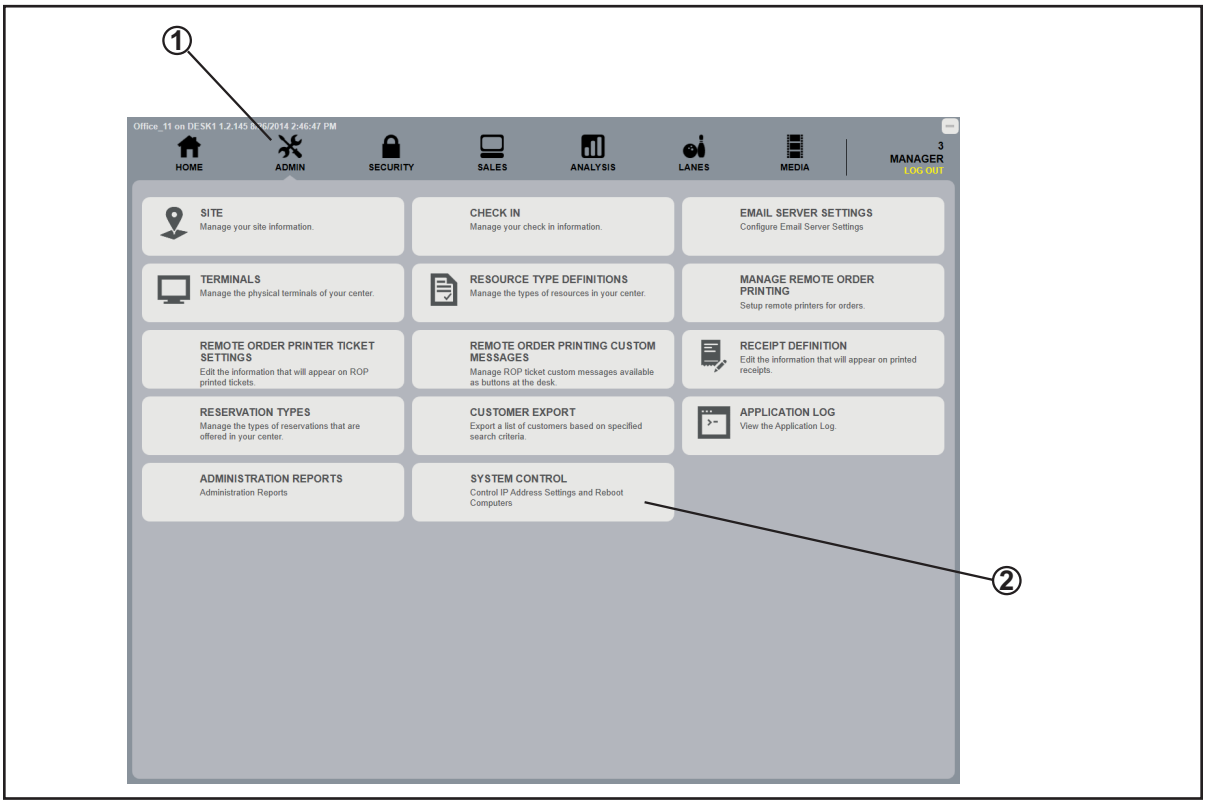
5. Connect the ribbon cable removed in step 3 to the new tablet.

6. Gently put the replacement tablet into its enclosure. Secure the tablet with the four screws removed in step 2. DO NOT OVER TIGHTEN THE SCREWS.

7. Reapply power to the tablet by reconnecting the power plug removed in step 1.

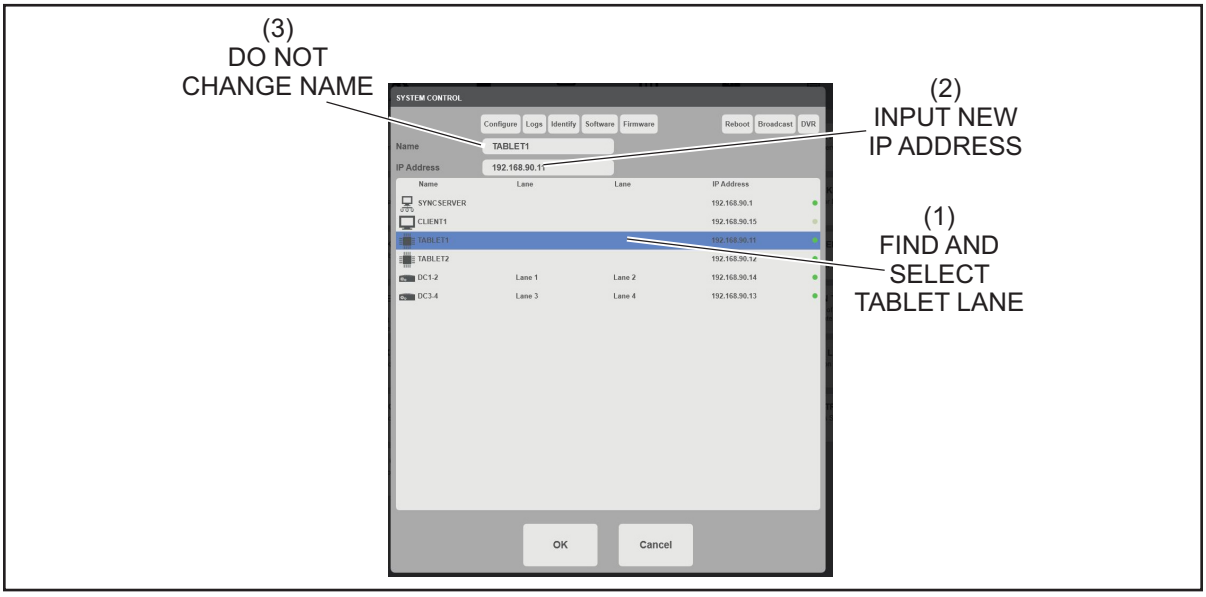
8. Wait for tablet initial reboot. Once booted, the IP address of the tablet will be displayed. Note this number for the next step.

9. In the Sync Office program, navigate to the system control screen. Refer to the figure titled *Admin - System Control*.



Admin - System Control

10. Find the lane that the replacement tablet will be assigned to. The lane is the number after the word Tablet in the name column. Once selected, change the *IP Address* to the new IP address currently being displayed on the tablet and as noted in step 8. DO NOT CHANGE THE NAME OF THE TABLET. Refer to the figure titled *System Control - New IP Address*.

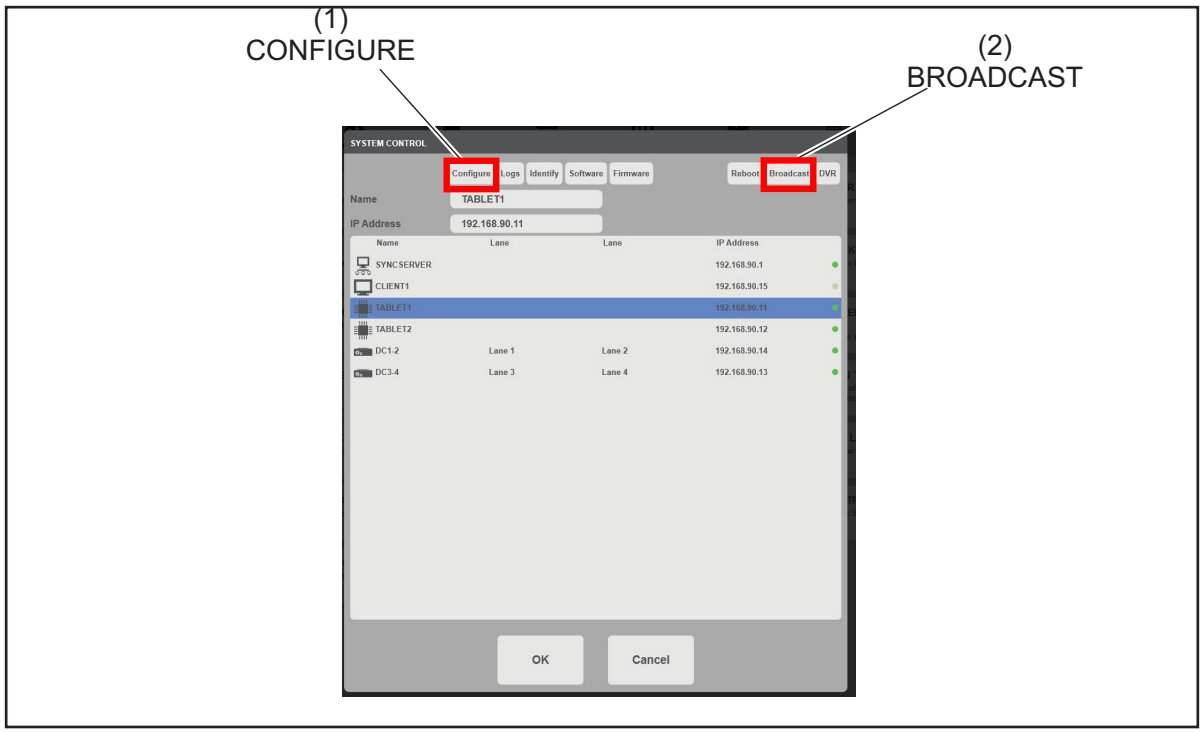


System Control- New IP Address

(1) FIND AND SELECT TABLET LANE (2) INPUT NEW IP ADDRESS (3) DO NOT CHANGE NAME

11. Select ***Configure*** to send the new settings to the tablet. There will be no prompt or other confirmation after selecting configuration. Refer to the figure titled *System Control - Configure and Broadcast.*

12 Select ***Broadcast*** to send the new settings to the entire system. There will be no prompt or other confirmation after selecting broadcast. Refer to the figure titled *System Control - Configure and Broadcast.*

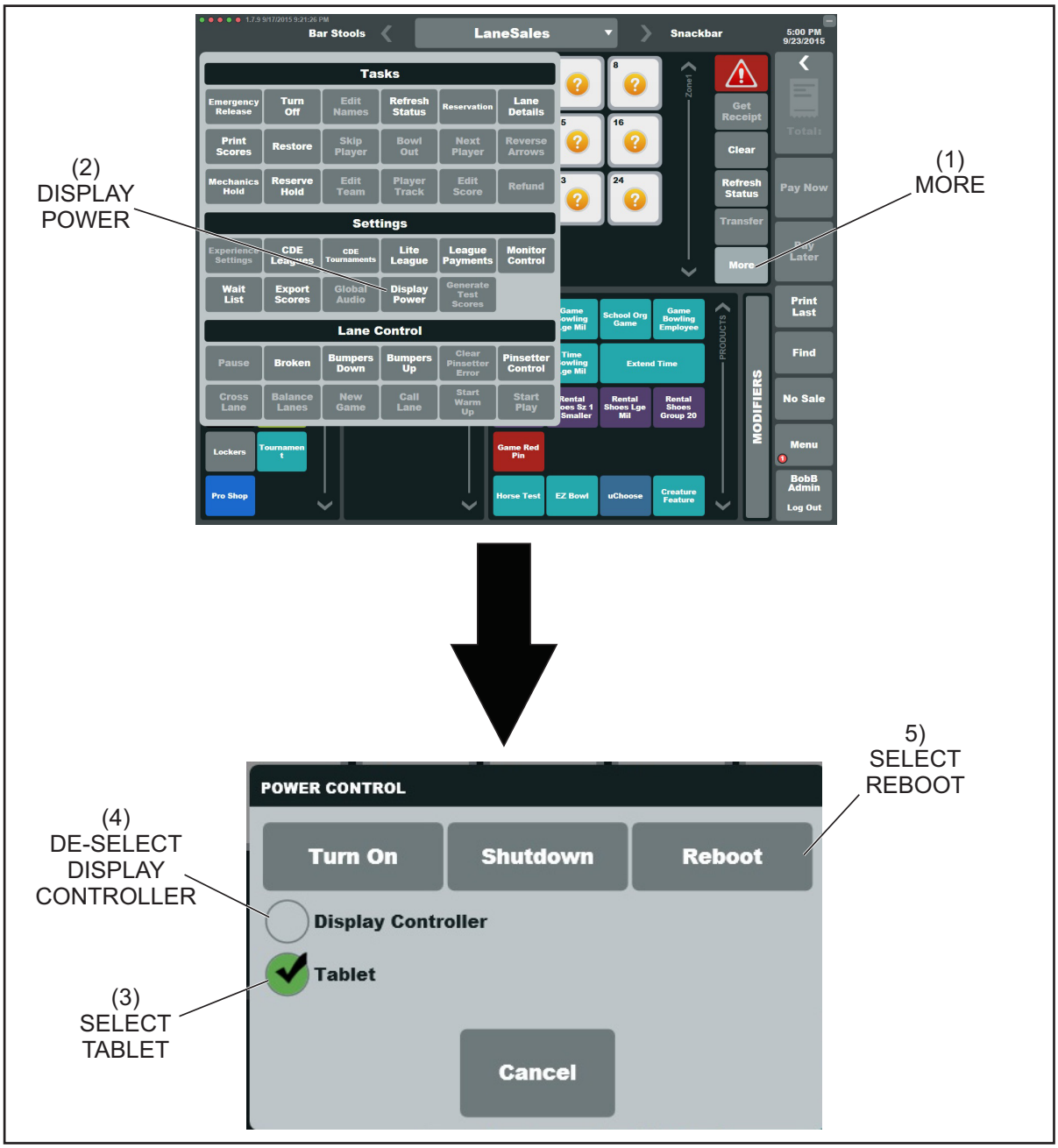


System Control- Configure and Broadcast

(1) CONFIGURE (2) BROADCAST

13. Reboot the newly installed tablet as follows (Refer to figure titled *Rebooting A Tablet*):

    a. In the Sync Desk program, navigate to the Lane Sales page and select the the lane where the new tablet is installed.
    b. Select ***More,*** then select ***Display Power***
    c. Uncheck the Display Controller option and check the Tablet option.
    d. Select ***Reboot***.



Rebooting A Tablet

(1) MORE
(2) DISPLAY POWER
(3) SELECT TABLET
(4) DE-SELECT DISPLAY CONTROLLER
(5) REBOOT

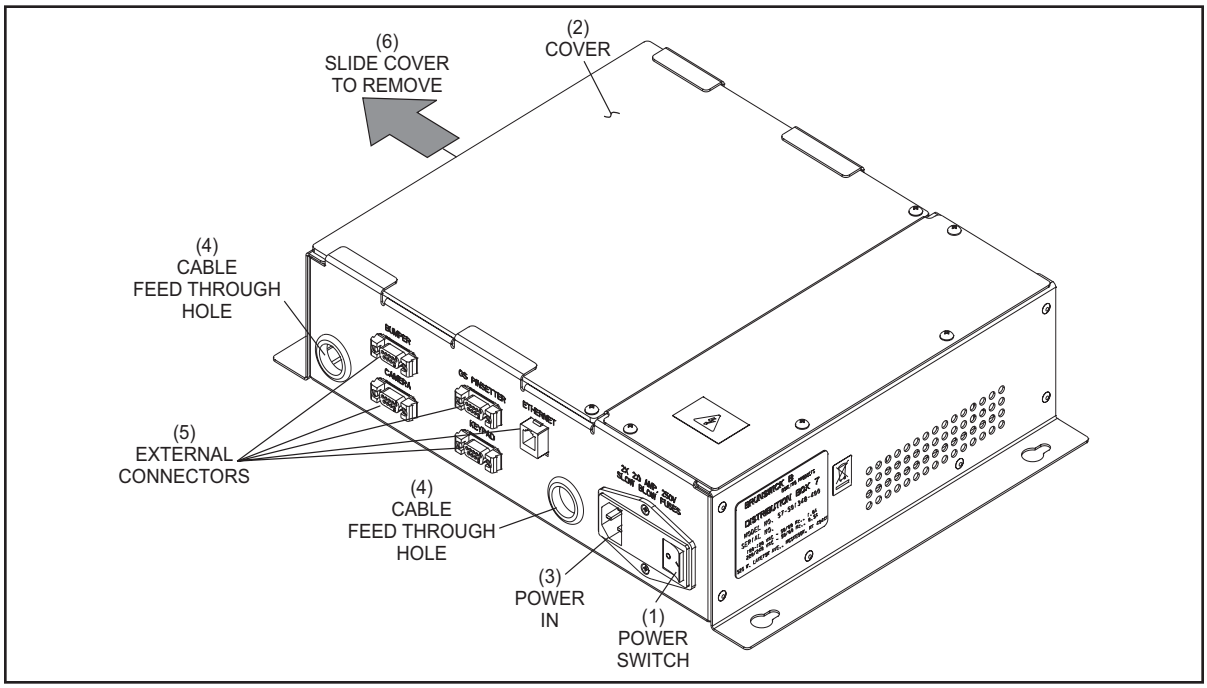
14. ***IMPORTANT!*** Once the Display Controller has completely rebooted, assign 2 bowlers to the lane pair using "Lite League". Bowl on the lanes to test for proper functionality.

Peripheral Controller Replacement

NOTE: *The screen shots in this procedure may vary slightly from what is displayed on your system. Although the graphics might differ, the content and the procedure is the same regardless of the system version.*

NOTE: *Before disconnecting any cables from the original Peripheral Controller, take note of where each cable is connected so that they are attached to the replacement Peripheral Controller properly. It is strongly recommended to mark each cable with a marker to designate its connection before disconnecting the cables.*

1. Remove power from the Peripheral Controller by turning off the power switch on the unit and disconnection the power cable. Refer to the figure titled *Peripheral Controller Power and Connections***.**



Peripheral Controller Power and Connections

(1) POWER SWITCH (2) COVER (3) POWER IN
(4) CABLE FEED THROUGH HOLE (5) EXTERNAL CONNECTORS

2. Take note of where each cable connects external connectors, then disconnect the external cables from the box.

3. Remove the cover screws and cover to gain access to the internal connectors.

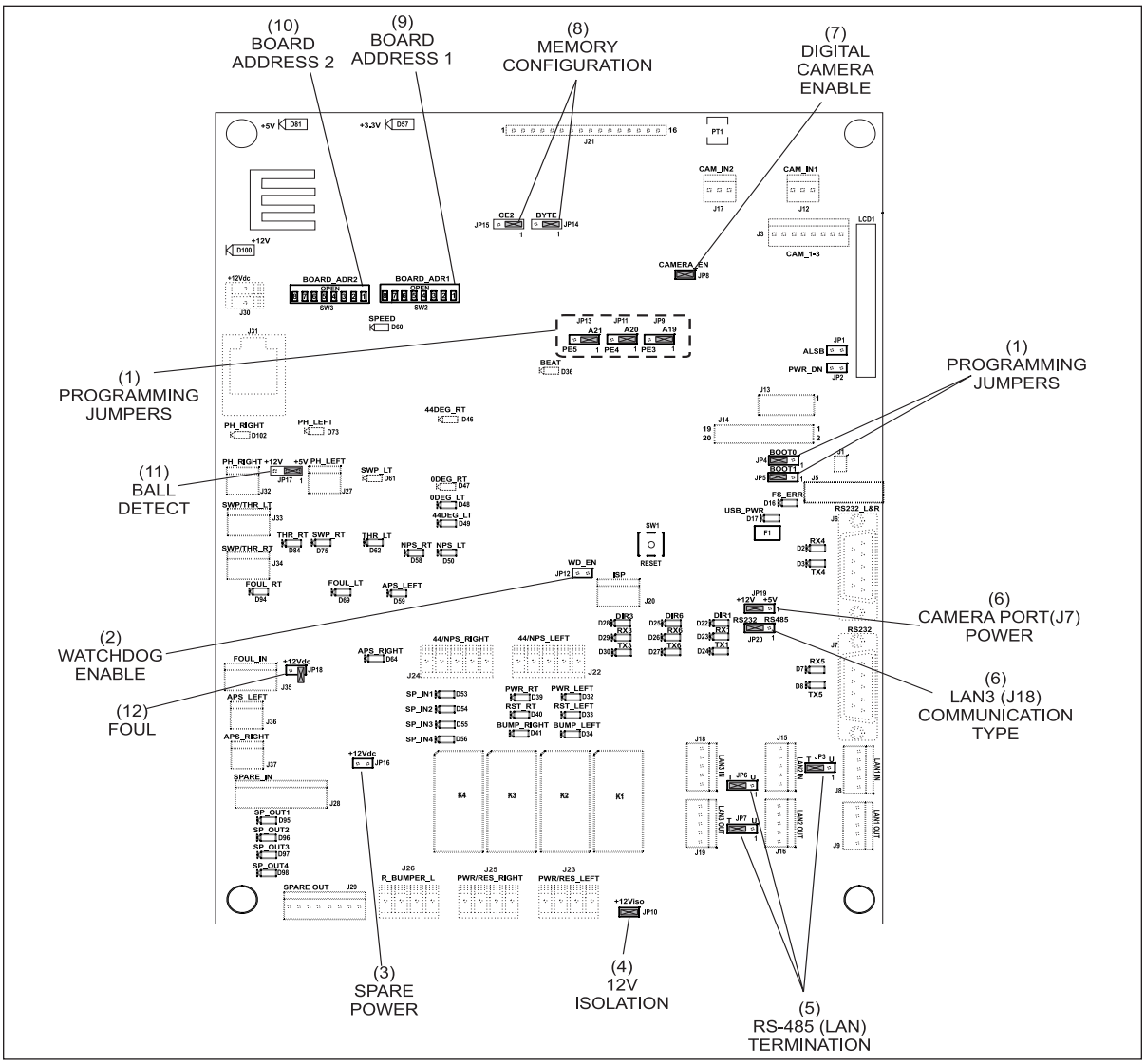
4. Take note of where each cable enters the box through the “feed through” holes and where they attach to the board. Disconnect the cables from the board and carefully remove them from the box.

5. Loosen the screws that hold the Peripheral Controller to its mounting board. Lift and remove the Controller from the mounting board.

6. Remove the cover from the replacement Peripheral Controller to gain access to the Distribution Board.

NOTE: *The jumpers and switches on Distribution board in the Peripheral Controller must be set correctly to ensure the controller works properly for the lane pair. Verify the settings using the original board and the information below as a guide.*

7. Verify the switches and jumpers on the Distribution Board are set as follows. Refer to the figure titled *Distribution Board 7 Jumpers and Settings***.**



Distribution Board 7 Jumpers and Settings

(1) Programming Jumpers *(JP4,JP5,JP9,JP11,JP13)*
JP4,JP5 - Install jumper at pins 2-3
JP9,JP11,JP13 - Install jumper at pins 1-2

(2) Watchdog Enable *(JP12)* - Remove jumper

(3) Spare Power *(JP16)* - Remove Jumper

(4) +12V Isolation *(JP10)* - Install Jumper

(5) RS-485 (LAN) Termination - ***(JP3,JP6,JP7)*** - Install jumpers at pins 2-3 (T)

(6) Camera Port Power *(JP19)* - Selects voltage level used for the cameras. Install jumpers at pins 2-3 (+12V).

(7) Digital Camera Enable - ***(JP8)*** - Install Jumper

(8) Memory Configuration - ***(JP14,JP15)*** - Install jumper at pins 1-2

(9) Board Address 1 - Refer to figure titled *Distribution Board Lane Assignment (Board Address 1).*

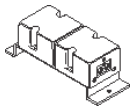
Lane No.	SW 1 Value =1	SW 2 Value = 2	SW 3 Value = 4	SW 4 Value =8	SW 5 Value = 16	SW 6 Value =32	SW 7 Value = 64	SW 8 Value =128
1-2	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF
3-4	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF
5-6	ON	OFF	ON	OFF	OFF	OFF	OFF	OFF
7-8	ON	ON	ON	OFF	OFF	OFF	OFF	OFF
9-10	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF
11-12	ON	ON	OFF	ON	OFF	OFF	OFF	OFF
13-14	ON	OFF	ON	ON	OFF	OFF	OFF	OFF
15-16	ON	ON	ON	ON	OFF	OFF	OFF	OFF
17-18	ON	OFF	OFF	OFF	ON	OFF	OFF	OFF
19-20	ON	ON	OFF	OFF	ON	OFF	OFF	OFF
21-22	ON	OFF	ON	OFF	ON	OFF	OFF	OFF
23-24	ON	ON	ON	OFF	ON	OFF	OFF	OFF
25-26	ON	OFF	OFF	ON	ON	OFF	OFF	OFF
27-28	ON	ON	OFF	ON	ON	OFF	OFF	OFF
29-30	ON	OFF	ON	ON	ON	OFF	OFF	OFF
31-32	ON	ON	ON	ON	ON	OFF	OFF	OFF
33-34	ON	OFF	OFF	OFF	OFF	ON	OFF	OFF
35-36	ON	ON	OFF	OFF	OFF	ON	OFF	OFF
37-38	ON	OFF	ON	OFF	OFF	ON	OFF	OFF
39-40	ON	ON	ON	OFF	OFF	ON	OFF	OFF
41-42	ON	OFF	OFF	ON	OFF	ON	OFF	OFF
43-44	ON	ON	OFF	ON	OFF	ON	OFF	OFF
45-46	ON	OFF	ON	ON	OFF	ON	OFF	OFF
47-48	ON	ON	ON	ON	OFF	ON	OFF	OFF
49-50	ON	OFF	OFF	OFF	ON	ON	OFF	OFF
51-52	ON	ON	OFF	OFF	ON	ON	OFF	OFF
53-54	ON	OFF	ON	OFF	ON	ON	OFF	OFF
55-56	ON	ON	ON	OFF	ON	ON	OFF	OFF
57-58	ON	OFF	OFF	ON	ON	ON	OFF	OFF
59-60	ON	ON	OFF	ON	ON	ON	OFF	OFF
61-62	ON	OFF	ON	ON	ON	ON	OFF	OFF
63-64	ON	ON	ON	ON	ON	ON	OFF	OFF
65-66	ON	OFF	OFF	OFF	OFF	OFF	ON	OFF
67-68	ON	ON	OFF	OFF	OFF	OFF	ON	OFF
69-70	ON	OFF	ON	OFF	OFF	OFF	ON	OFF
71-72	ON	ON	ON	OFF	OFF	OFF	ON	OFF
73-74	ON	OFF	OFF	ON	OFF	OFF	ON	OFF
75-76	ON	ON	OFF	ON	OFF	OFF	ON	OFF
77-78	ON	OFF	ON	ON	OFF	OFF	ON	OFF
79-80	ON	ON	ON	ON	OFF	OFF	ON	OFF

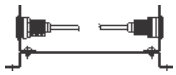
Distribution Board Lane Assignment (Board Address 1)

(10) Board Address 2
Switches 1,2,3,4,5,6,7 - Not used
Switch 8 - Set to the "ON" position.

(11) Ball Detect *(JP17)* - This setting is only impacts installations that use cameras for scoring. (Centers without GS-Series pinsetters and StringPin pinsetters)

CAUTION! The ball detect jumper on the Distribution board MUST be set to the proper voltage. Failure to do so can cause permanent damage to the ball detector.


Square Ball Detector - Install jumper at pins 1-2 (5V)


Round Ball Detector - Install jumper at pins 2-3 (12V)

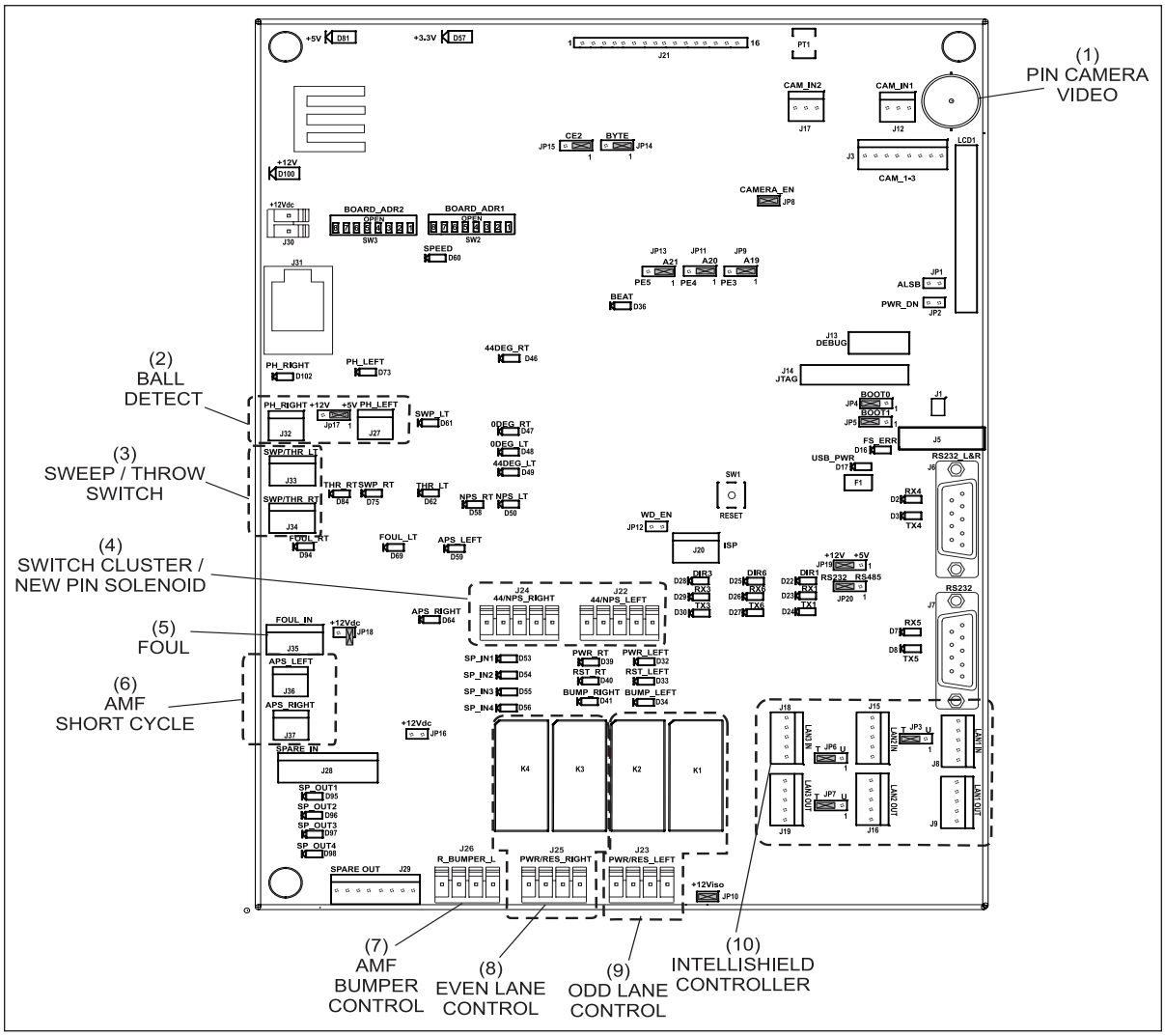
(12) Foul *(JP18)*

Brunswick Foul Unit - Install jumper (Default)
AMF Foul Unit - Remove Jumper

(13) LAN3 Communication Type *(JP20)* - Determines the communication protocol used for LAN3 (J18).
Default - Install jumper at pins 2-3 (RS232)
Intellishield controller connected to LAN3 - Install jumper at pins 1-2 (RS485)

8. Mount the replacement to mounting board and tighten the screws that hold the Peripheral Controller to its mounting board.

9. Carefully feed the cables removed in step 4 through the "feed through" holes. Attach the cables to the connections as noted in step 4. Refer to figure titled *Distribution Board 7 Connections*.



Distribution Board 7 Connections

(1) PIN CAMERA VIDEO	(2) BALL DETECT SWITCH	(3) SWEEP/THROW
(4) SWITCH CLUSTER/NEW PIN SOLENOID	(5) FOUL	(6) AMF SHORT CYCLE
(7) AMF BUMPER CONTROL	(8) EVEN LANE CONTROL	(9) ODD LANE CONTROL
(10) INTELLISHIELD CONTROLLER		

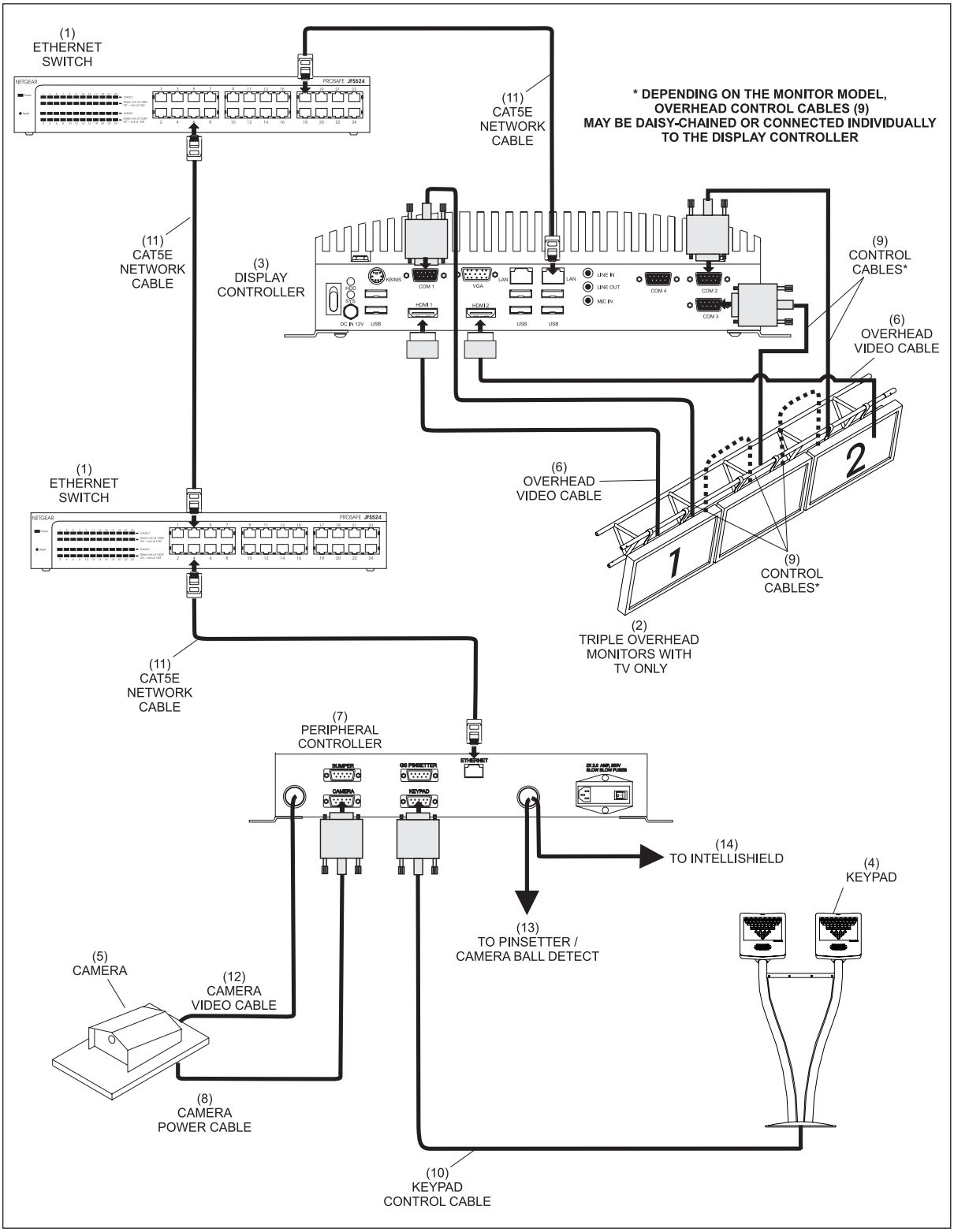
11. Reconnect the external cables removed and noted in step 2. Refer to the figure titled *Peripheral Controller Power and Connections*.

12. Place the cover, removed in step 3, and secure it with the cover screws.

13. Reapply power to the Peripheral Controller by connecting the power cable to the unit and turning the power switch to the "ON" position. Refer to the figure titled *Peripheral Controller Power and Connections*.

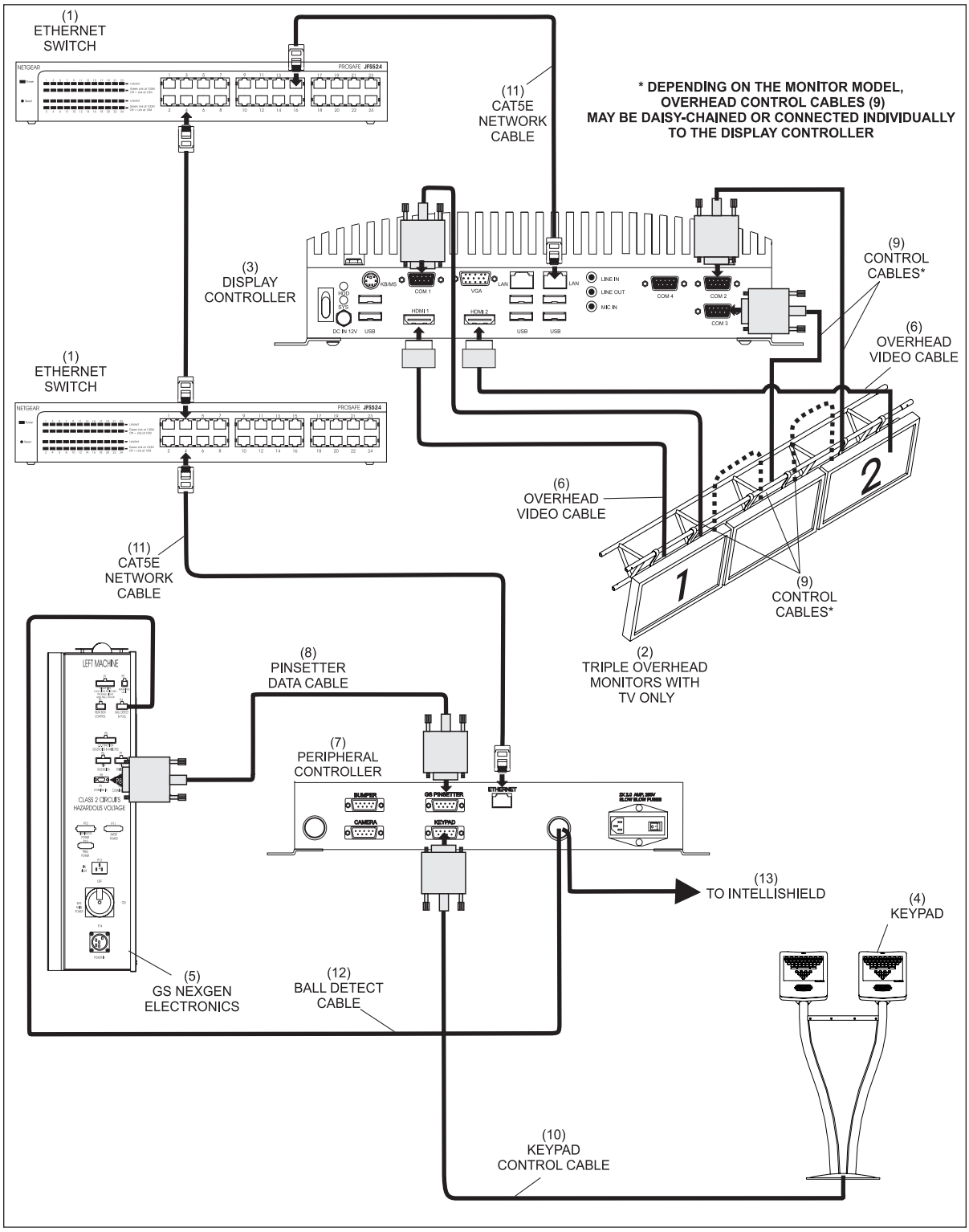
14. ***IMPORTANT!*** Once the Display Controller has completely rebooted, assign 2 bowlers to the lane pair using "Lite League". Bowl on the lanes to test for proper functionality.

CABLING OVERVIEW



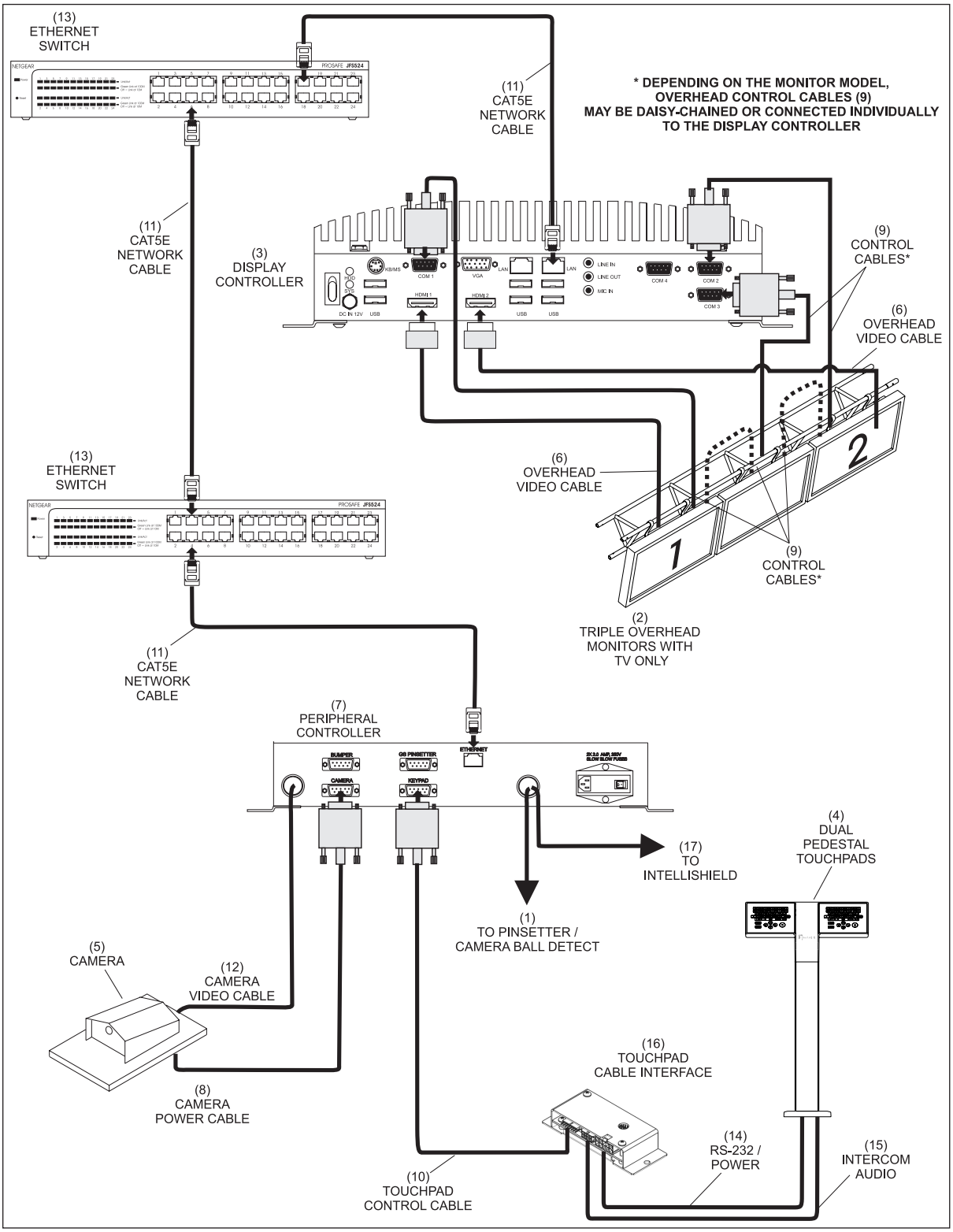
Sync Scoring Lane Pair Cabling - Vector Keypads, Non-GS Pinsetters

(1) ETHERNET SWITCH
(2) TRIPLE OVERHEAD MONITORS W/TV ONLY
(3) DISPLAY CONTROLLER
(4) KEYPAD
(5) CAMERA
(6) OVERHEAD VIDEO CABLE
(7) PERIPHERAL CONTROLLER
(8) CAMERA POWER CABLE
(9) CONTROL CABLES
(10) KEYPAD CONTROL CABLE
(11) CAT5E NETWORK CABLE
(12) CAMERA VIDEO CABLE
(13) TO PINSETTER / CAMERA BALL DETECT
(14) TO INTELLISHIELD



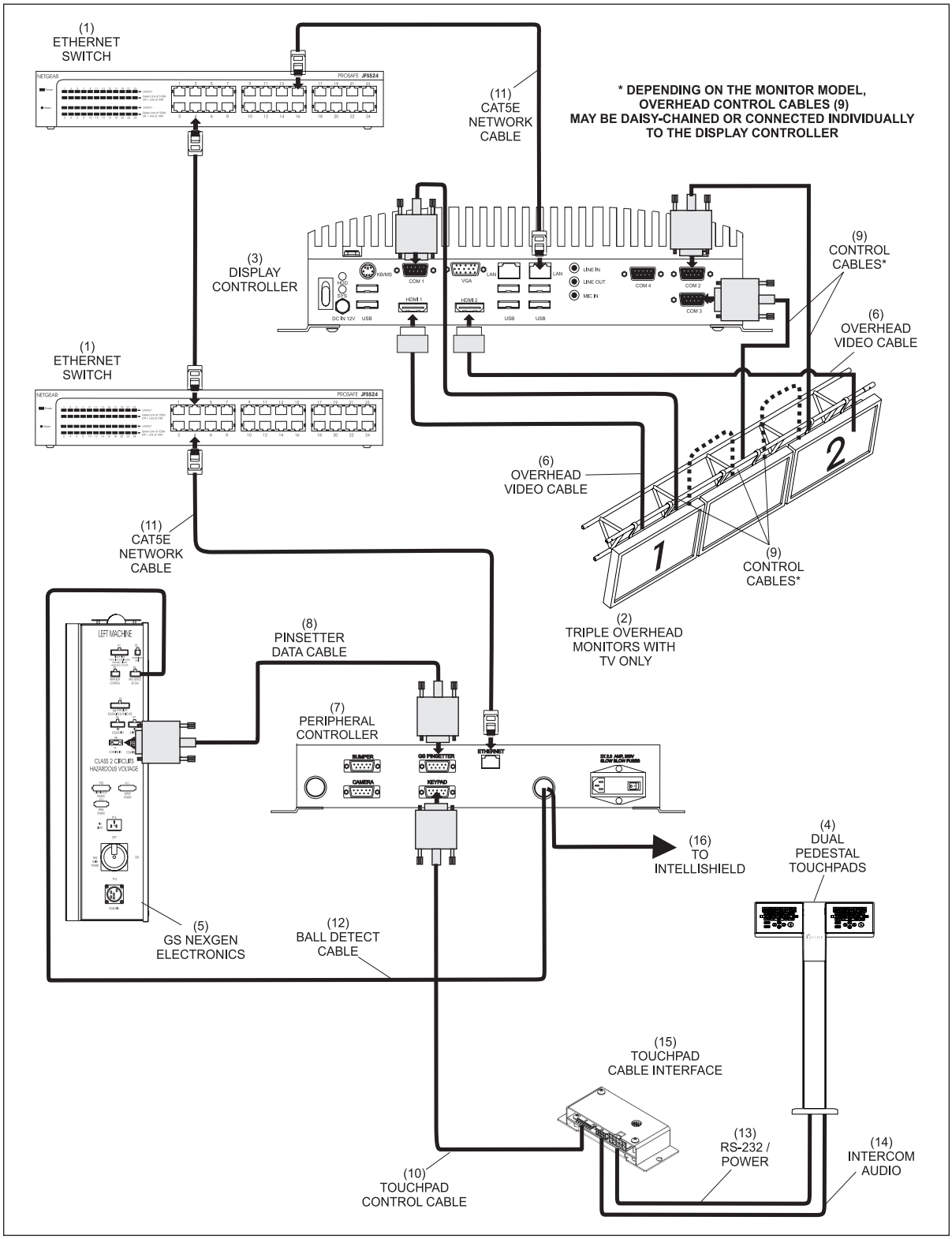
Sync Scoring Lane Pair Cabling - Vector Keypads, GS Pinsetters

(1) ETHERNET SWITCH
(2) TRIPLE OVERHEAD MONITORS W/TV ONLY
(3) DISPLAY CONTROLLER
(4) KEYPAD
(5) GS NEXGEN ELECTRONICS
(6) OVERHEAD VIDEO CABLE
(7) PERIPHERAL CONTROLLER
(8) PINSETTER DATA CABLE
(9) CONTROL CABLES
(10) KEYPAD CONTROL CABLE
(11) CAT5E NETWORK CABLE
(12) BALL DETECT CABLE
(13) TO INTELLISHIELD



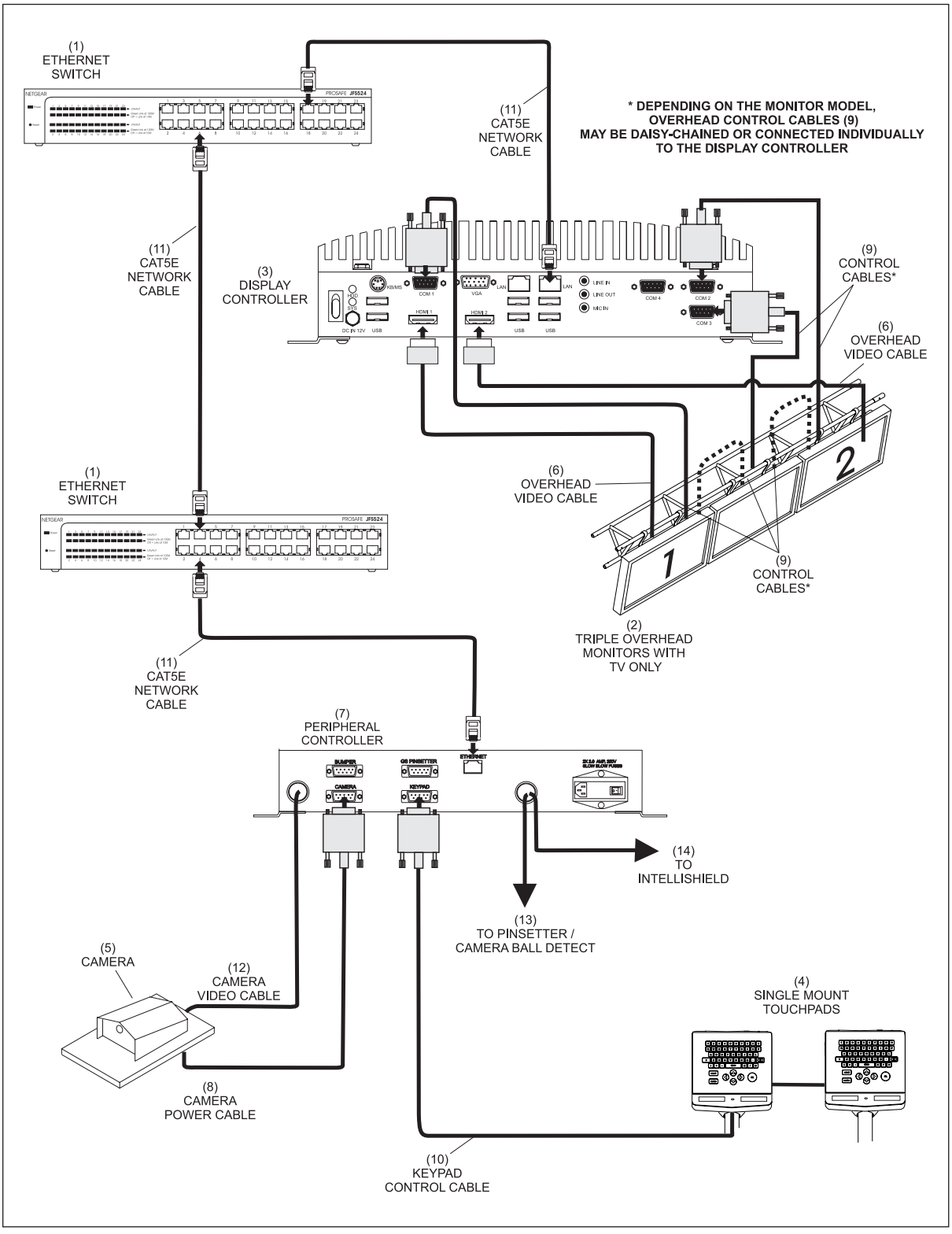
Sync Scoring Lane Pair Cabling - Dual Pedestal Touchpads, Non-GS Pinsetters

(1) TO PINSETTER / CAMERA BALL DETECT	(2) TRIPLE OVERHEAD MONITORS W/TV ONLY	(3) DISPLAY CONTROLLER
(4) DUAL PEDESTAL TOUCHPADS	(5) CAMERA	(6) OVERHEAD VIDEO CABLE
(7) PERIPHERAL CONTROLLER	(8) CAMERA POWER CABLE	(9) CONTROL CABLES
(10) TOUCHPAD CONTROL CABLE	(11) CAT5E NETWORK CABLE	(12) CAMERA VIDEO CABLE
(13) ETHERNET SWITCH	(14) RS232 / POWER	(15) INTERCOM AUDIO
(16) TOUCHPAD CABLE INTERFACE	(17) TO INTELLISHIELD	



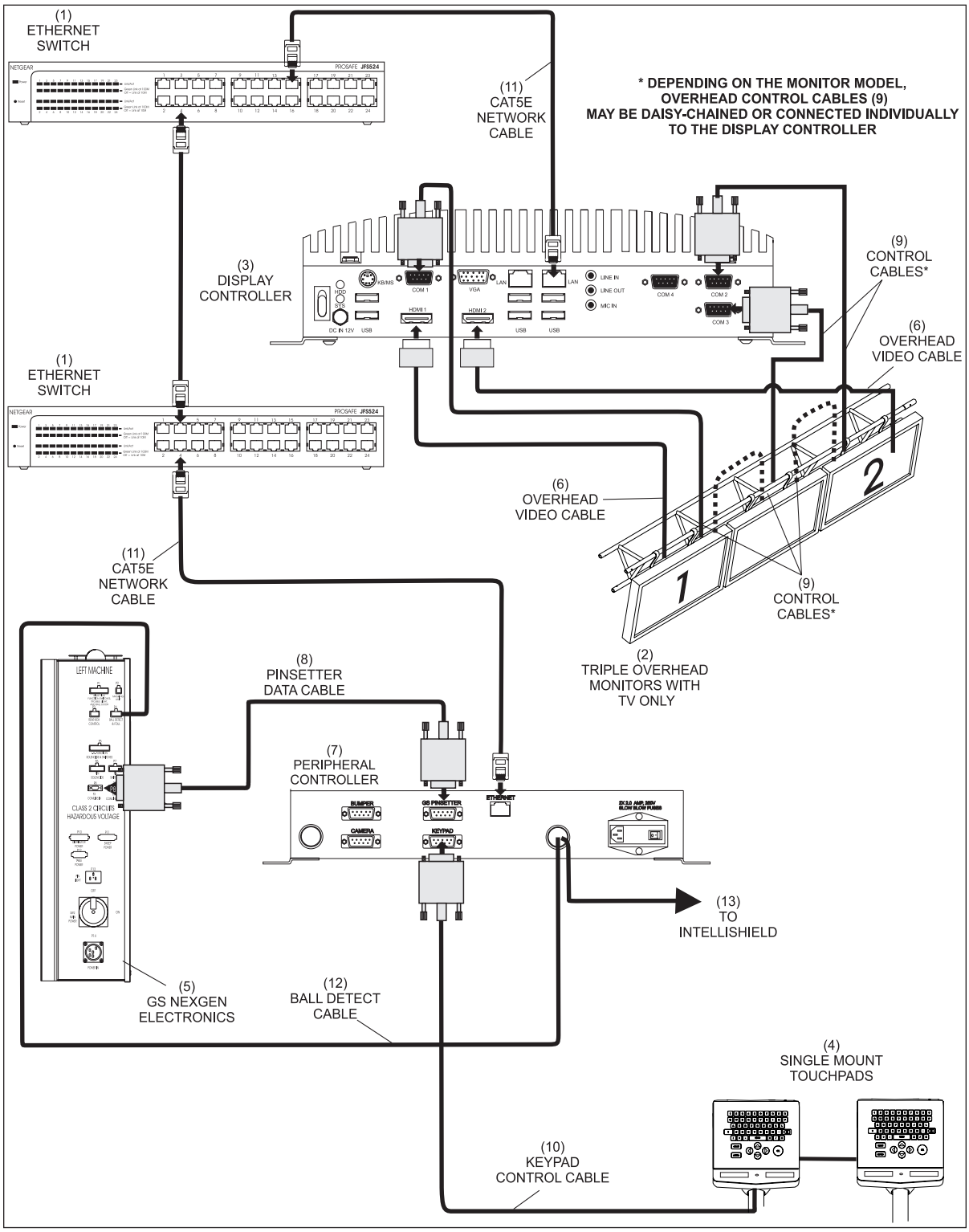
Sync Scoring Lane Pair Cabling - Dual Pedestal Touchpads, GS Pinsetters

(1) ETHERNET SWITCH	(2) TRIPLE OVERHEAD MONITORS W/TV ONLY	(3) DISPLAY CONTROLLER
(4) DUAL PEDESTAL TOUCHPADS	(5) GS NEXGEN ELECTRONICS	(6) OVERHEAD VIDEO CABLE
(7) PERIPHERAL CONTROLLER	(8) PINSETTER DATA CABLE	(9) CONTROL CABLES
(10) TOUCHPAD CONTROL CABLE	(11) CAT5E NETWORK CABLE	(12) BALL DETECT CABLE
(13) RS232 / POWER	(14) INTERCOM AUDIO	(15) TOUCHPAD CABLE INTERFACE
(16) TO INTELLISHEILD		



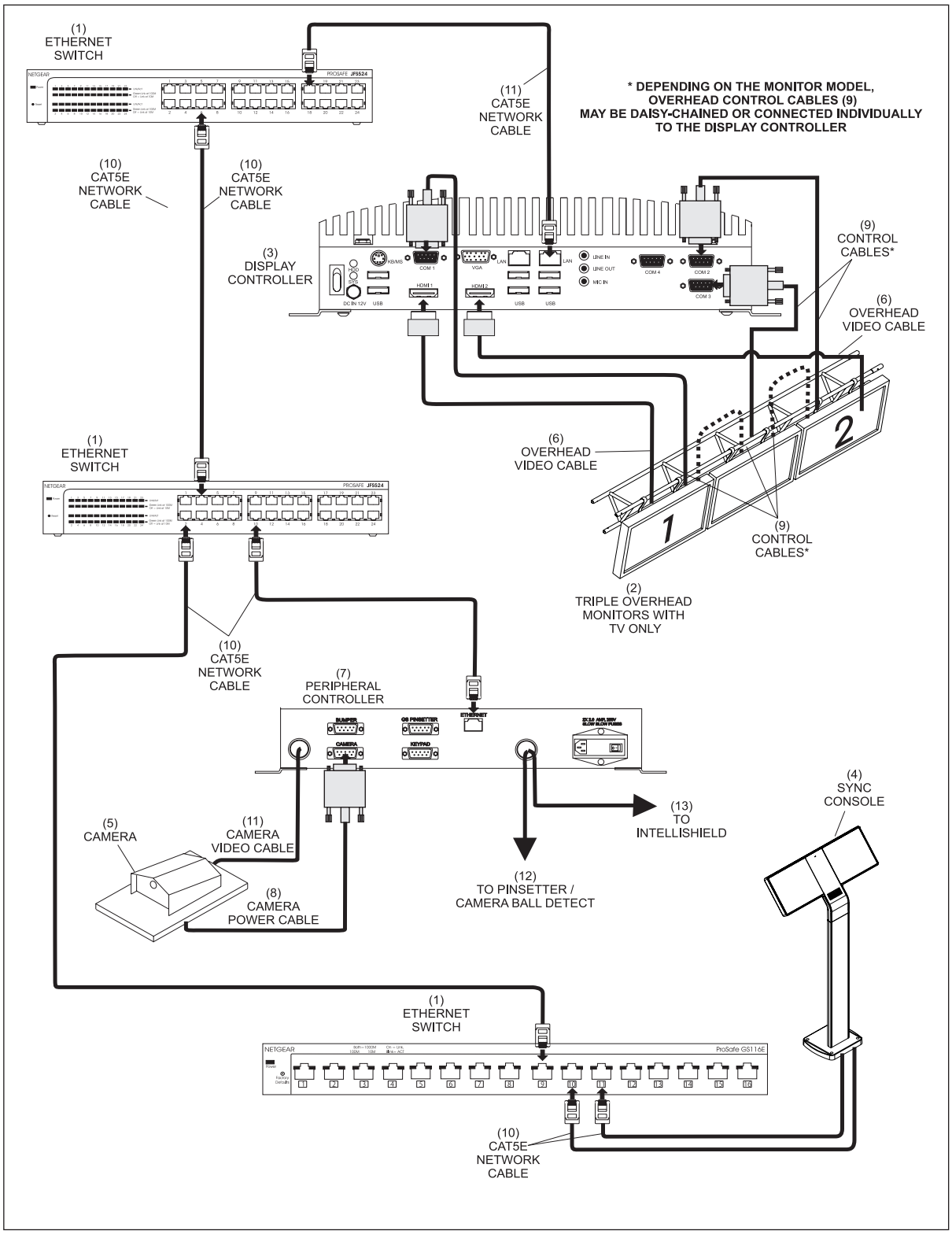
Sync Scoring Lane Pair Cabling - Single Mounted Touchpads, Non-GS Pinsetters

(1) ETHERNET SWITCH	(2) TRIPLE OVERHEAD MONITORS W/TV ONLY	(3) DISPLAY CONTROLLER
(4) SINGLE MOUNT TOUCHPADS	(5) CAMERA	(6) OVERHEAD VIDEO CABLE
(7) PERIPHERAL CONTROLLER	(8) CAMERA POWER CABLE	(9) CONTROL CABLES
(10) KEYPAD CONTROL CABLE	(11) CAT5E NETWORK CABLE	(12) CAMERA VIDEO CABLE
(13) TO PINSETTER / CAMERA BALL DETECT		(14) TO INTELLISHIELD



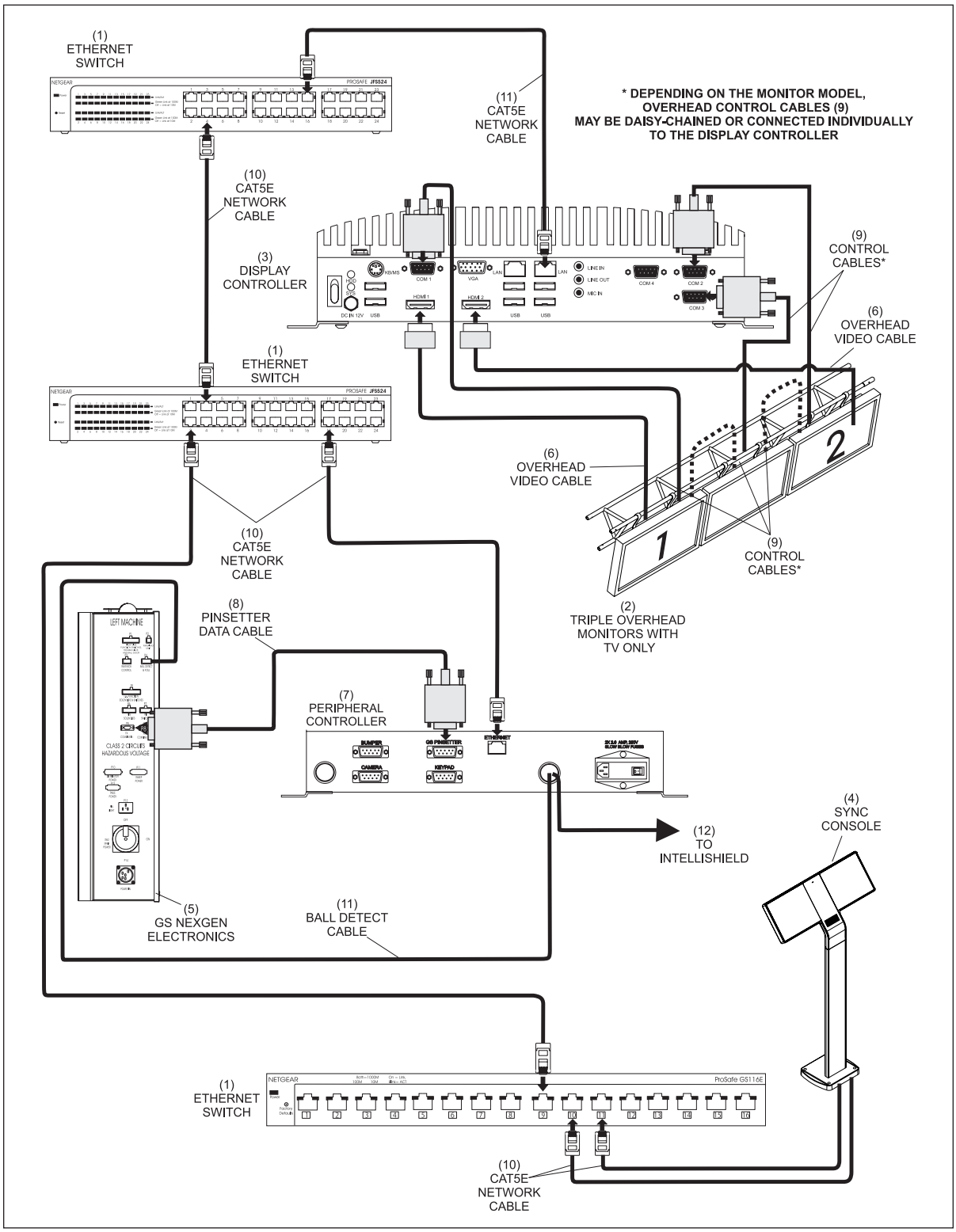
Sync Scoring Lane Pair Cabling - Single Mounted Touchpads, GS Pinsetters

(1) ETHERNET SWITCH
(2) TRIPLE OVERHEAD MONITORS W/TV ONLY
(3) DISPLAY CONTROLLER
(4) SINGLE MOUNT TOUCHPADS
(5) GS NEXGEN ELECTRONICS
(6) OVERHEAD VIDEO CABLE
(7) PERIPHERAL CONTROLLER
(8) PINSETTER DATA CABLE
(9) CONTROL CABLES
(10) KEYPAD CONTROL CABLE
(11) CAT5E NETWORK CABLE
(12) BALL DETECT CABLE
(13) TO INTELLISHIELD



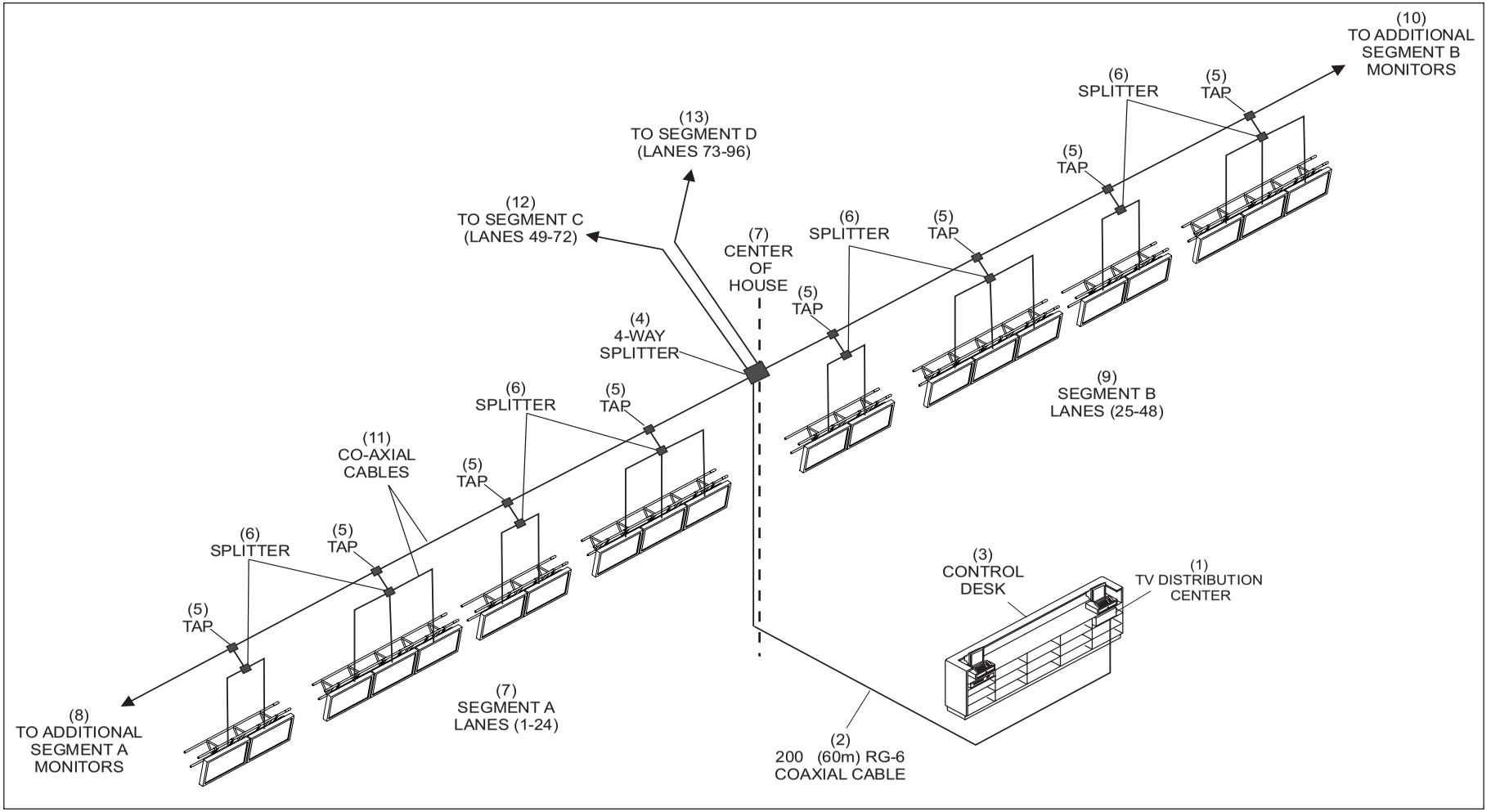
Sync Scoring Lane Pair Cabling - Dual Pedestal Tablets, Non-GS Pinsetters

(1) ETHERNET SWITCH
(2) TRIPLE OVERHEAD MONITORS W/TV ONLY
(3) DISPLAY CONTROLLER
(4) SYNC CONSOLE
(5) CAMERA
(6) OVERHEAD VIDEO CABLE
(7) PERIPHERAL CONTROLLER
(8) CAMERA POWER CABLE
(9) CONTROL CABLES
(10) CAT5E NETWORK CABLE
(11) CAMERA VIDEO CABLE
(12) TO PINSETTER / CAMERA BALL DETECT
(13) TO INTELLISHIELD



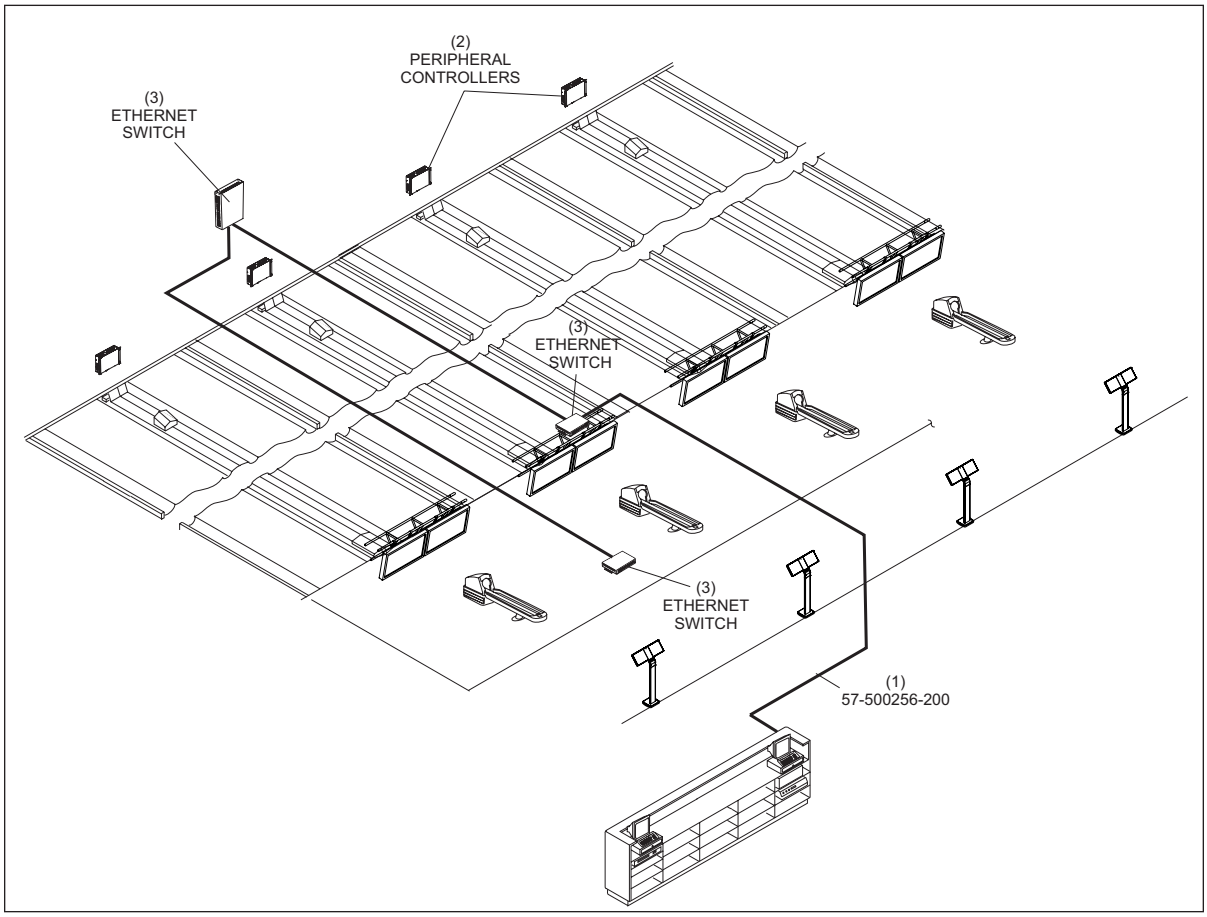
Sync Scoring Lane Pair Cabling - Dual Pedestal Tablets, GS Pinsetters

1) ETHERNET SWITCH	(2) TRIPLE OVERHEAD MONITORS W/TV ONLY	(3) DISPLAY CONTROLLER
(4) SYNC CONSOLE	(5) GS NEXGEN ELECTRONICS	(6) OVERHEAD VIDEO CABLE
(7) PERIPHERAL CONTROLLER	(8) PINSETTER DATA CABLE	(9) CONTROL CABLES
(10) CAT5E NETWORK CABLE	(11) BALL DETECT CABLE	(12) TO INTELLISHIELD



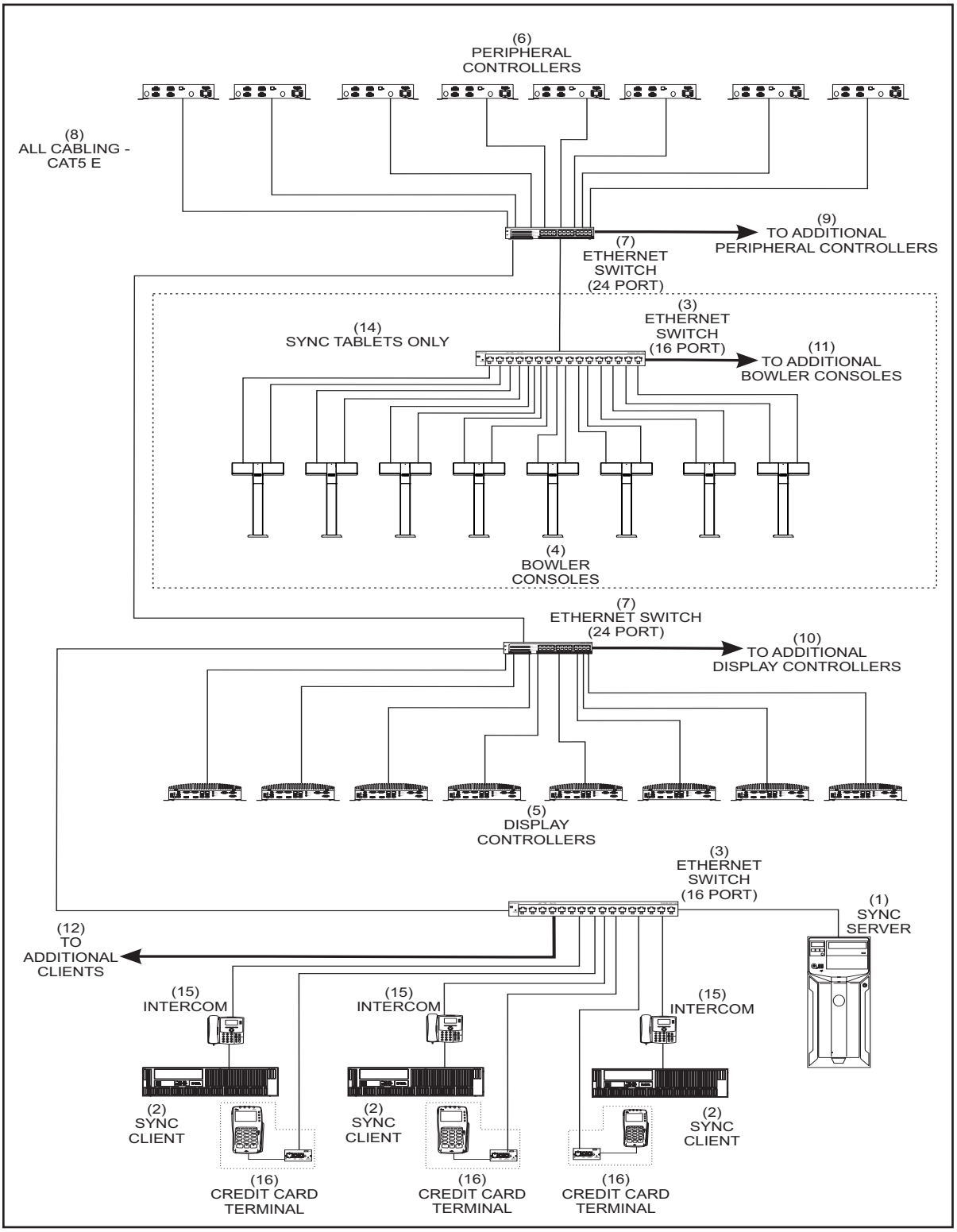
TV Video Cabling

(1) TV DISTRIBUTION CENTER
(2) 200' (60M) RG-6 COAXIAL CABLE
(3) CONTROL DESK
(4) 4-WAY SPLITTER
(5) TAP
(6) SPLITTER
(7) CENTER OF HOUSE
(8) TO ADDITIONAL SEGMENT A MONITORS
(9) SEGMENT B (LANES 25-48)
(10) TO ADDITIONAL SEGMENT B MONITORS
(11) COAXIAL CABLES
(12) TO SEGMENT C (LANES 49-72)
(13) TO SEGMENT D (LANES 73-96)



Control Desk to Ethernet Switches - Cable Routing

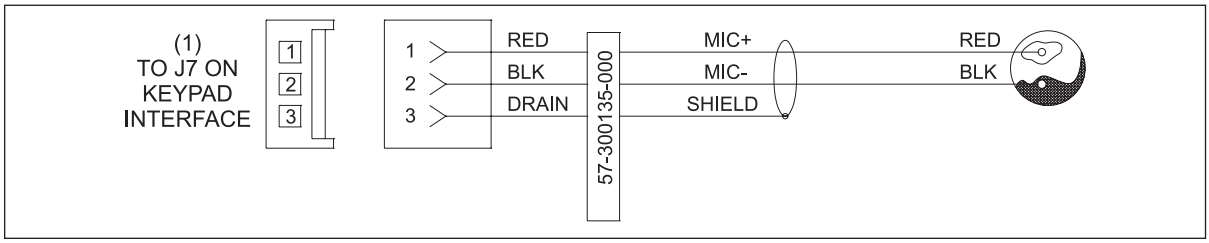
(1) 57-500256-200 ETHERNET CABLE (2) PERIPHERAL CONTROLLERS (3) ETHERNET SWITCH



Network Layout

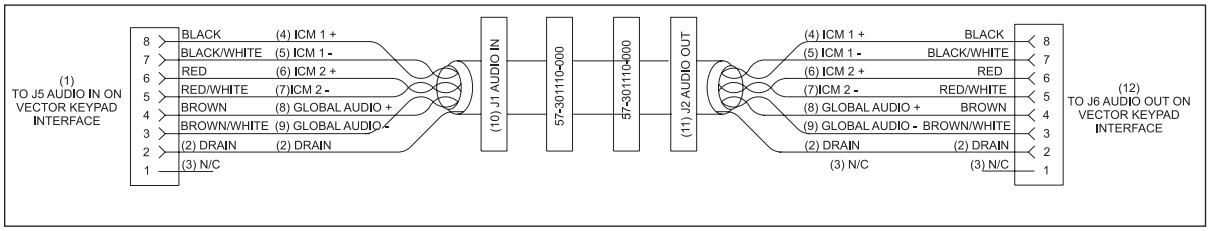
(1) SYNC SERVER
(2) SYNC CLIENT
(3) ETHERNET SWITCH (8-PORT)
(4) BOWLER CONSOLES
(5) DISPLAY CONTROLLER
(6) PERIPHERAL CONTROLLER
(7) ETHERNET SWITCH (24 PORT)
(8) ALL CABLING - CAT5E
(9) TO ADDITIONAL PERIPHERAL CONTROLLERS
(10) TO ADDITIONAL DISPLAY CONTROLLERS
(11) TO ADDITIONAL BOWLER CONSOLES
(12) TO ADDITIONAL CLIENTS
(13) ETHERNET SWITCH (16 PORT)
(14) SYNC TABLETS ONLY
(15) INTERCOM
(16) CREDIT CARD TERMINAL

CABLE DIAGRAMS



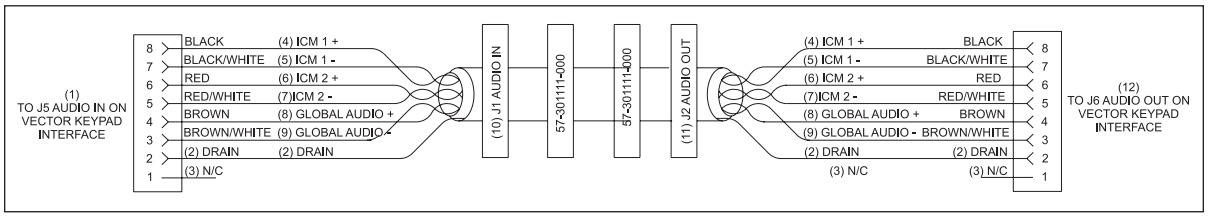
Microphone Cable - Vector Keypads (Part No. 57-300135-000)

(1) TO J7 ON KEYPAD INTERFACE



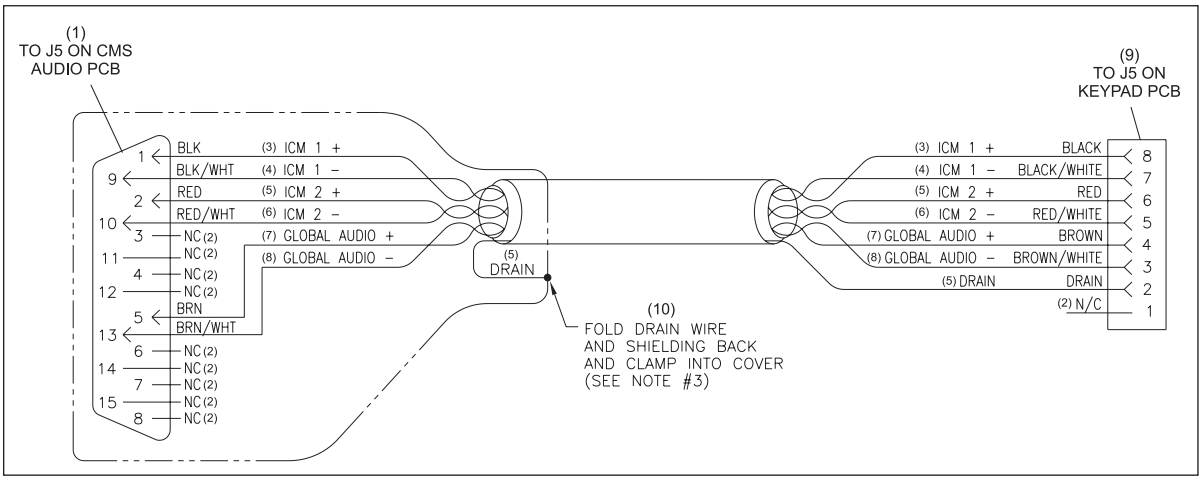
Intercom Audio Lane to Lane Cable - Vector Keypads (Part No. 57-301110-000)

(1) TO J5 AUDIO IN ON VECTOR KEYPAD INTERFACE
(2) DRAIN
(3) NO CONNECTION
(4) ICM 1 +
(5) ICM 1 -
(6) ICM 2 +
(7) ICM 2 -
(8) GLOBAL AUDIO +
(9) GLOBAL AUDIO-
(10) J1 AUDIO IN
(11) J2 AUDIO OUT
(12) TO J6 AUDIO OUT ON VECTOR KEYPAD INTERFACE



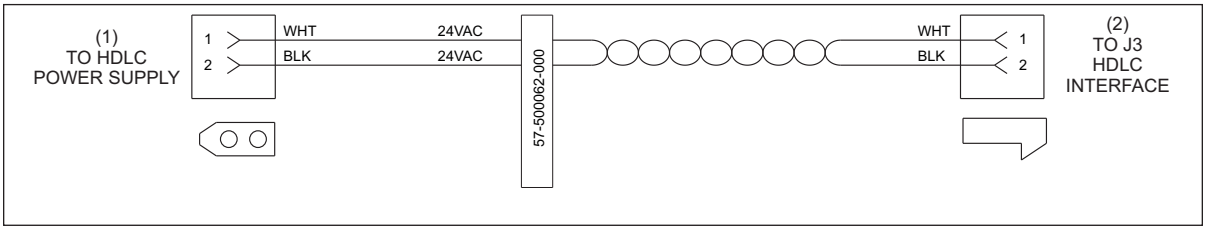
Intercom Audio Odd Lane to Even Lane Cable - Vector Keypads Pedestal Mount (Part No. 57-301111-000)

(1) TO J5 AUDIO IN ON VECTOR KEYPAD INTERFACE
(2) DRAIN
(3) NO CONNECTION
(4) ICM 1 +
(5) ICM 1 -
(6) ICM 2 +
(7) ICM 2 -
(8) GLOBAL AUDIO +
(9) GLOBAL AUDIO-
(10) J1 AUDIO IN
(11) J2 AUDIO OUT
(12) TO J5 AUDIO OUT ON VECTOR KEYPAD INTERFACE



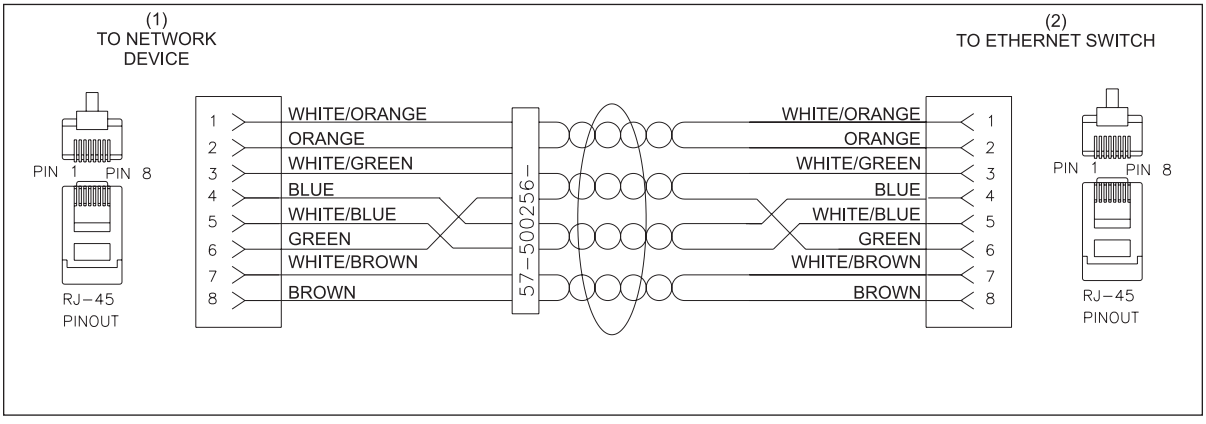
Intercom Cable Control Desk to First Scorer Audio - Vector Keypads (Part No. 57-301125-000)

(1) TO J5 ON CMS AUDIO PCB
(2) NO CONNECTION
(3) INTERCOM 1 +
(4) INTERCOM 1 -
(5) INTERCOM 2+
(6) INTERCOM 2-
(7) GLOBAL AUDIO +
(8) GLOBAL AUDIO -
(9) TO J5 ON KEYPAD PCB
(10) FOLD DRAIN WIRE AND SHIELDING BACK AND CLAMP INTO COVER (SEE NOTE 3)



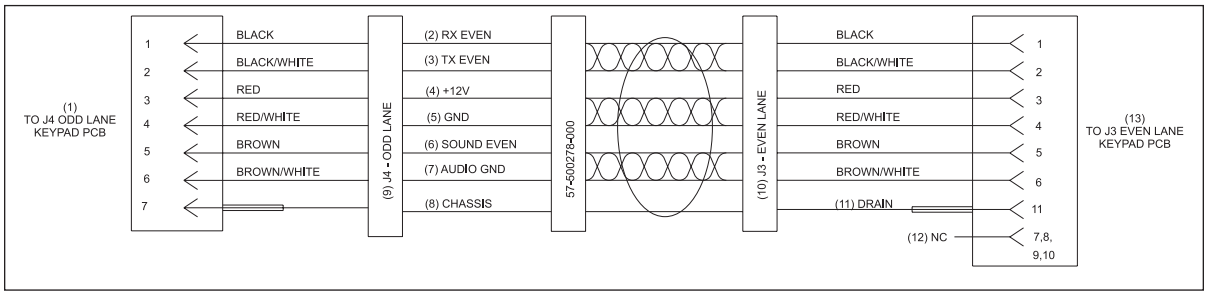
Pinsetter HDLC Power Cable (Part No. 57-500062-000)

(1) TO HDLC POWER SUPPLY
(2) TO J3 HDLC INTERFACE



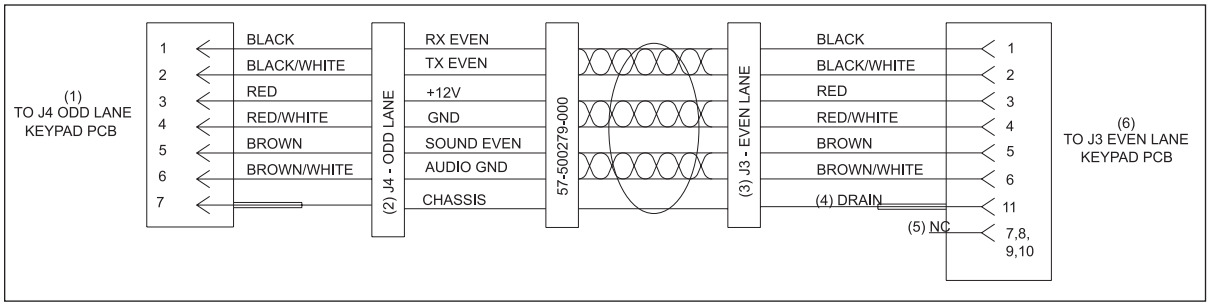
Ethernet Cable / CAT5e Cable (Part No. 57-500256-xxx)

(1) TO NETWORK DEVICE
(2) TO ETHERNET SWITCH



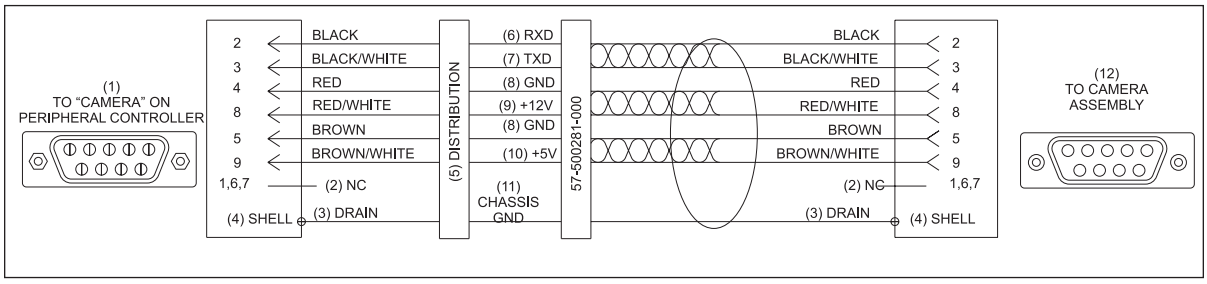
LAN Cable Odd to Even Lane- Vector Keypad Pedestal Mount (Part No. 57-500278-000)

(1) TO J4 ODD LANE KEYPAD PCB (2) RX EVEN (3) TX EVEN
(4) + 12 VOLTS (5) GROUND (6) SOUND EVEN
(7) AUDIO GROUND (8) CHASSIS (9) J4 ODD LANE
(10) J3 EVEN LANE (11) DRAIN (12) NO CONNECTION
(13) TO J3 EVEN LANE KEYPAD PCB



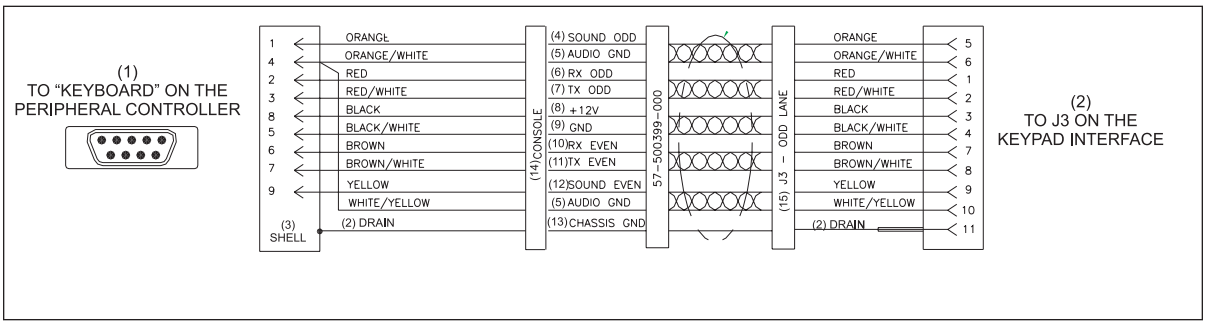
LAN Cable Odd to Even Lane Cable - Vector Keypad Table Mount (Part No. 57-500279-000)

(1) TO J4 ODD LANE KEYPAD PCB (2) J4 - ODD LANE (3) J3 EVEN LANE
(4) DRAIN (5) NO CONNECTION (6) TO J3 EVEN LANE KEYPAD PCB



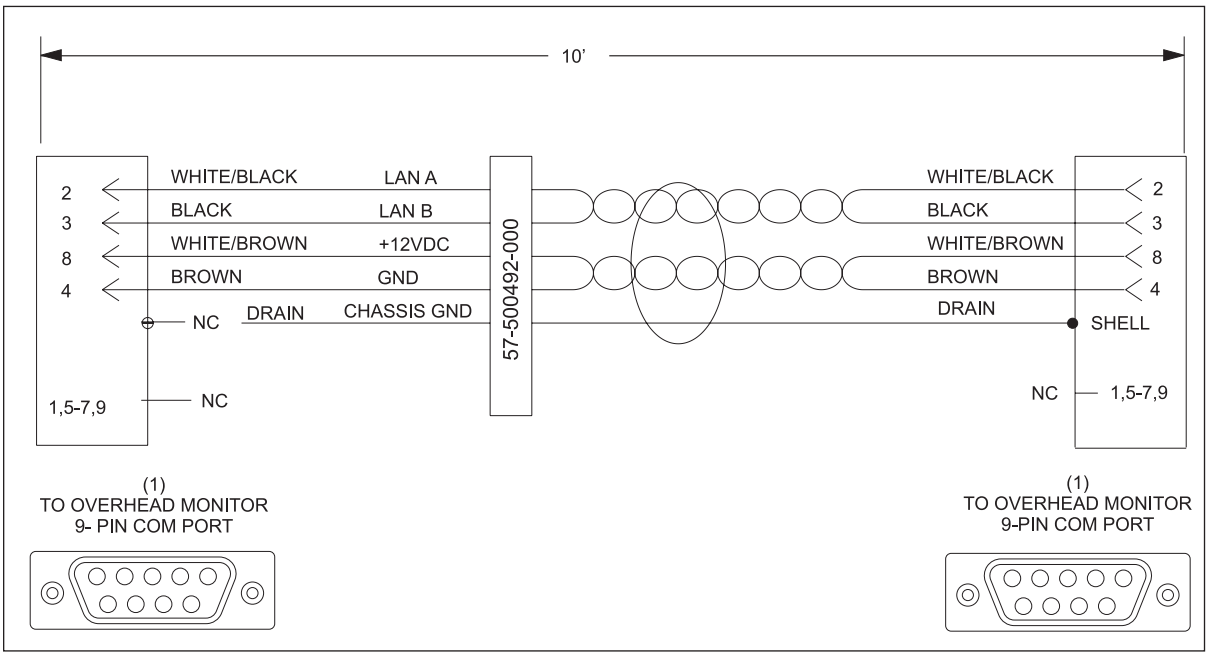
Camera Data Cable (Part No. 57-500281-000)

(1) TO "CAMERA" ON PERIPHERAL CONTROLLER (2) NO CONNECTION (3) DRAIN
(4) SHELL (5) DISTRIBUTION (6) RXD
(7) TXD (8) GROUND (9) + 12 VOLTS
(10) + 5 VOLTS (11) CHASSIS GROUND (12) TO CAMERA ASSEMBLY



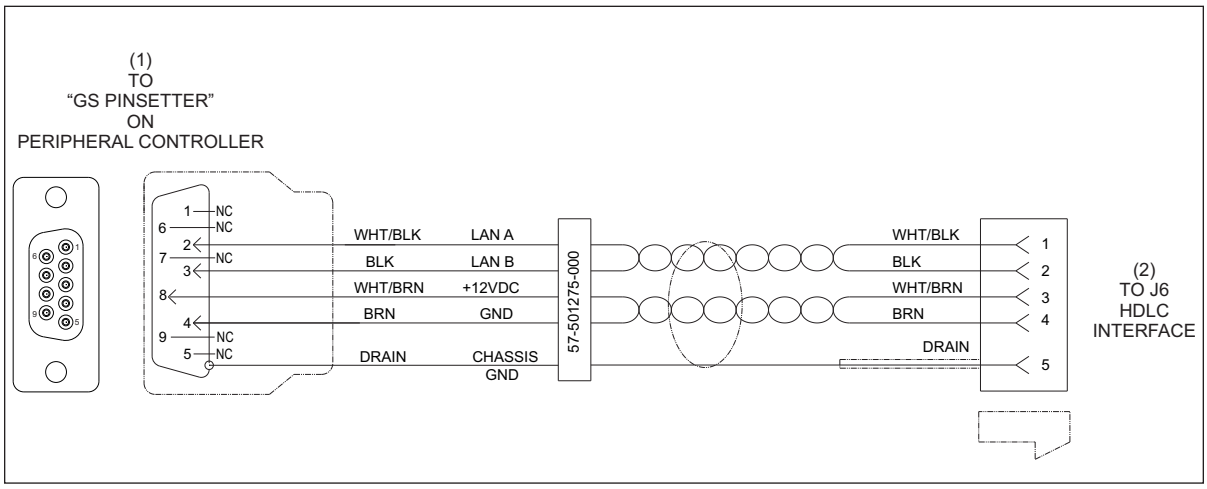
Peripheral Controller to Vector Keypad (Part No. 57-500399-000)

(1) TO "KEYBOARD" ON THE PERIPHERAL CONTROLLER
(2) DRAIN
(3) SHELL
(4) SOUND ODD
(5) AUDIO GROUND
(6) RX ODD
(7) TX ODD
(8) +12 VOLTS
(9) GROUND
(10) RX EVEN
(11) TX EVEN
(12) SOUND EVEN
(13) CHASSIS GROUND
(14) CONSOLE
(15) J3-ODD LANE
(16) TO J3 ON THE KEYPAD INTERFACE



Overhead to Overhead Serial Control Cable (Part No. 57-500492-000)

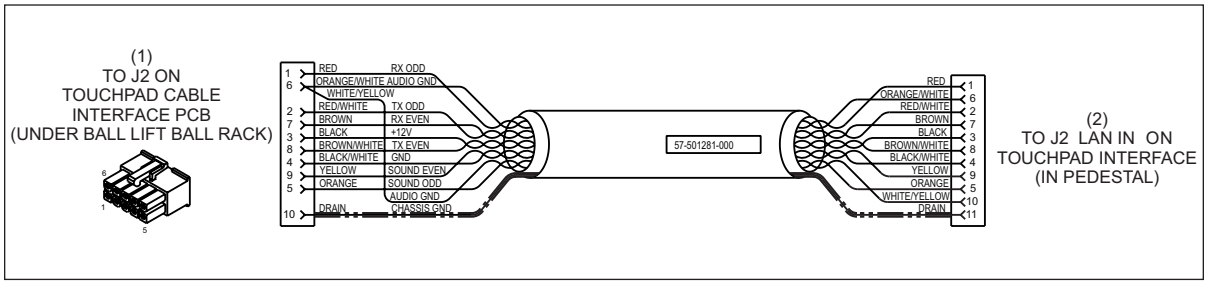
(1) TO OVERHEAD 9-PIN COM PORT



Peripheral Controller to HDLC Interface (GS Non Direct Connect) (Part No. 57-501275-000)

(1) TO "GS PINSETTER ON PERIPHERAL CONTROLLER

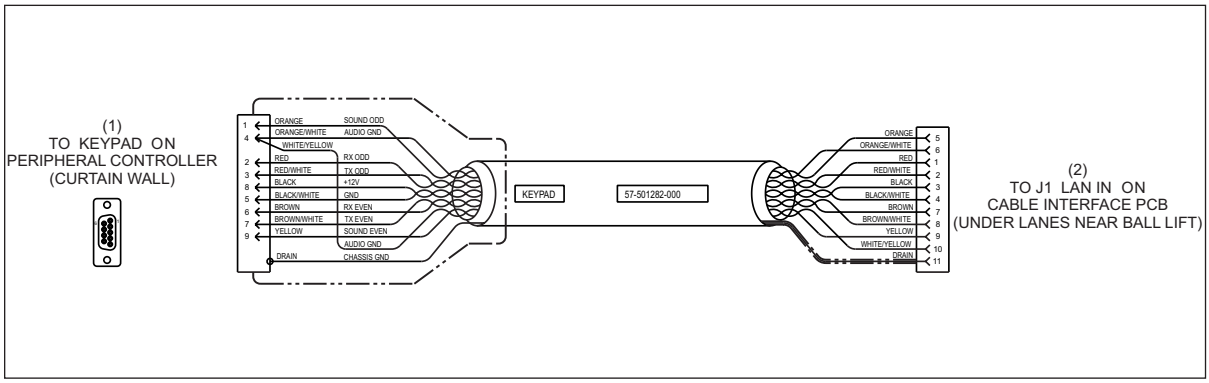
(2) TO J6 " ON HDLC INTERFACE



LAN Cable - Cable Interface to Touchpad Interface (Part No. 57-501281-000)

(1) TO J2 ON TOUCHPAD CABLE INTERFACE PCB UNDER LANES NEAR BALL LIFT)

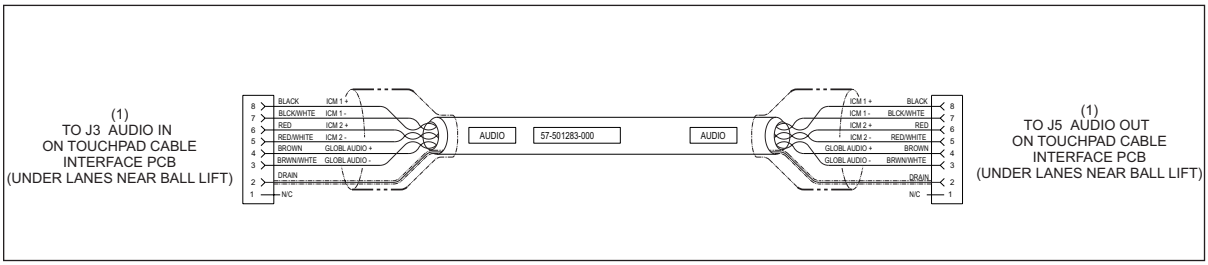
(2) TO J2 "LAN IN" ON TOUCHPAD INTERFACE (IN PEDESTAL)



LAN Cable - Peripheral Controller to Cable Interface for Dual Touchpad Pedestals (Part No. 57-501282-000)

(1) TO "KEYPAD ON PERIPHERAL CONTROLLER (CURTAIN WALL)

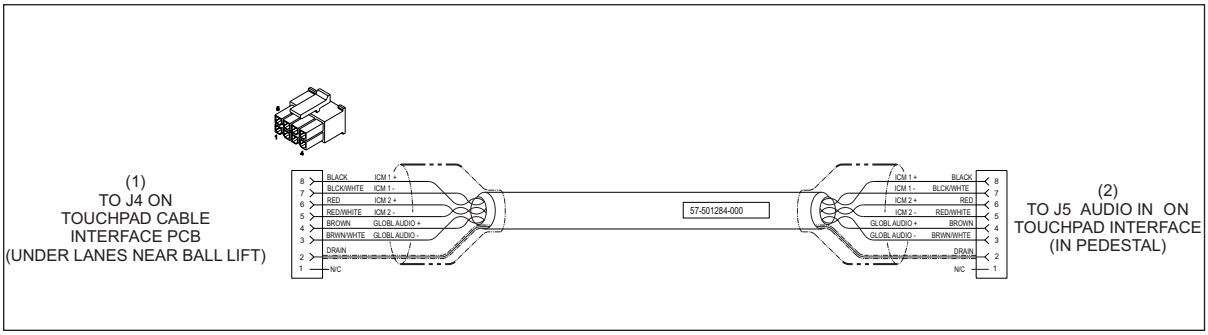
(2) TO J1 "LAN IN" ON CABLE INTERFACE PCB (UNDER LANES NEAR BALL LIFT



Audio Cable - Touchpad Cable Interface to Touchpad Cable Interface (Part No. 57-501283-000)

(1) TO J5 “AUDIO OUT” ON TOUCHPAD CABLE INTERFACE PCB (UNDER LANES NEAR BALL LIFT)

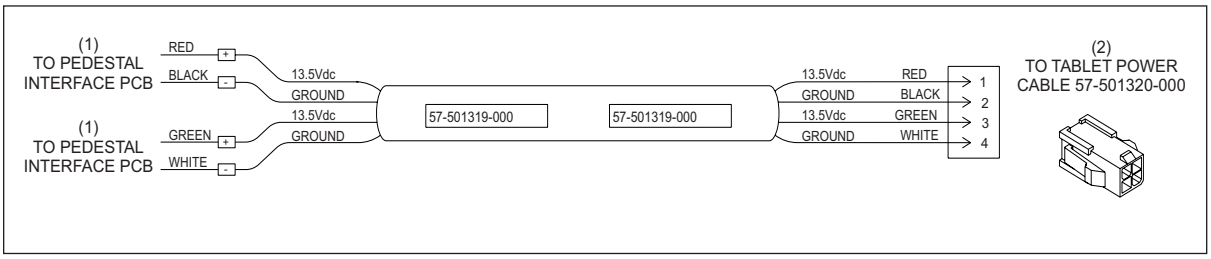
2) TO J5 “AUDIO OUT” ON TOUCHPAD CABLE INTERFACE (UNDER LANES NEAR BALL LIFT)



Audio Cable - Touchpad Cable Interface to Touchpad Interface (Part No. 57-501284-000)

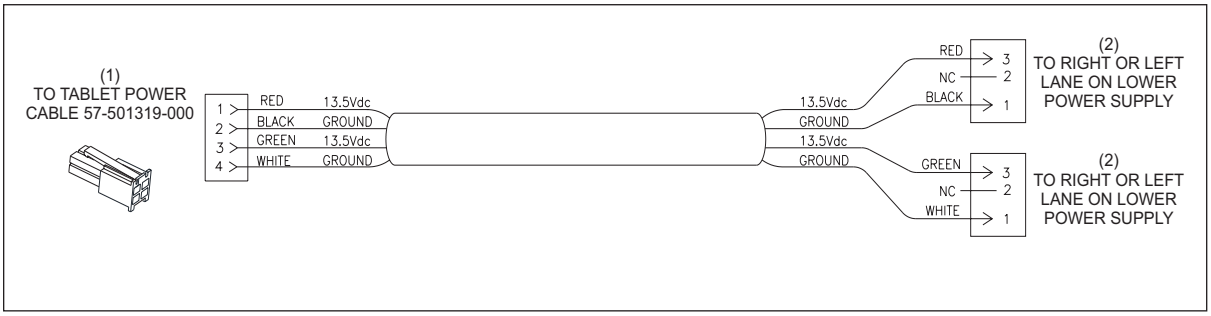
(1) TO J4 ON TOUCHPAD CABLE INTERFACE PCB (UNDER LANES NEAR BALL LIFT)

2) TO J5 “AUDIO IN” ON TOUCHPAD INTERFACE (IN PEDESTAL)



Tablet Power Cable (Part No. 57-501319-000)

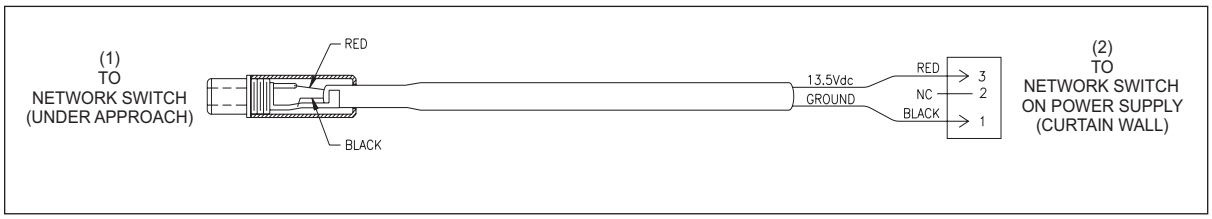
(1) TO PEDESTAL INTERFACE PCB (2) TO TABLET POWER CABLE 57-501320-000



Tablet Power Cable (Part No. 57-501320-000)

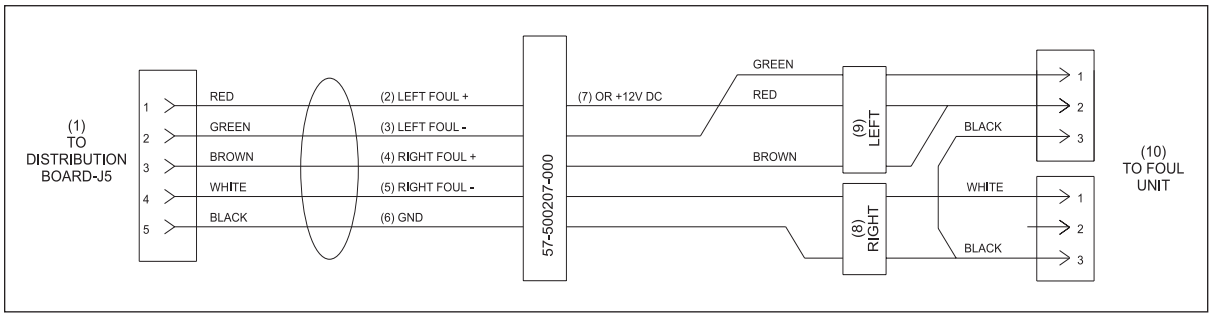
(1) TO TABLET POWER CABLE 57-501319-000

(2) TO RIGHT OR LEFT LANE ON LOWER POWER SUPPLY



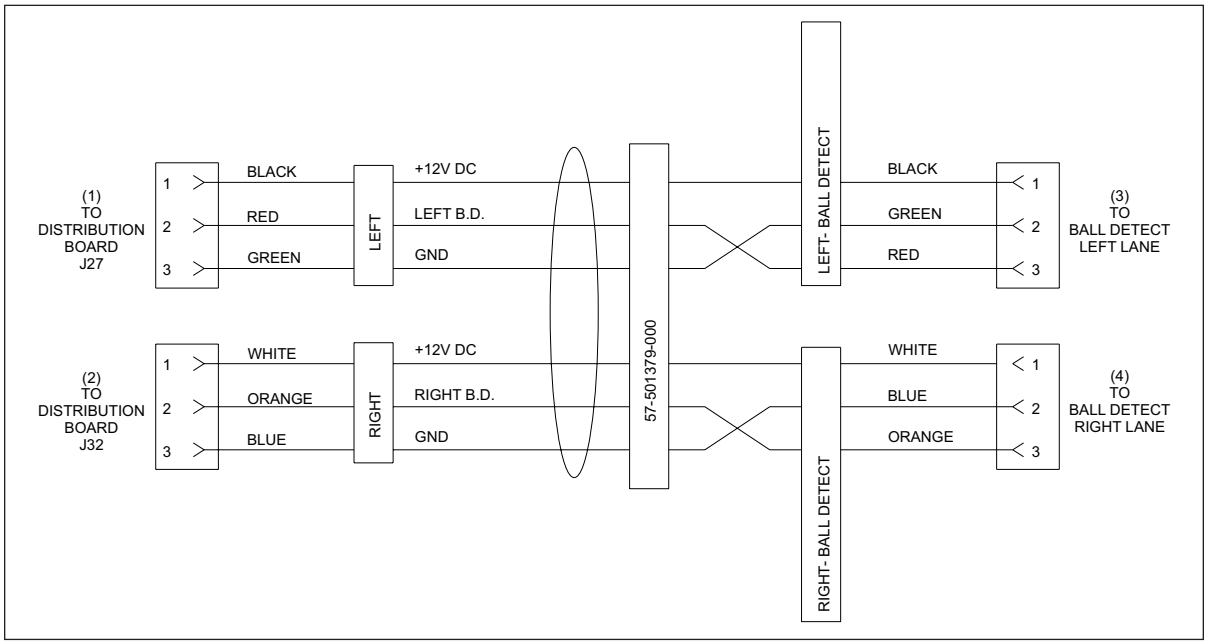
Power Cable - Table Ethernet Switch (Part No. 57-501333-000)

(1) TO NETWORK SWITCH (UNDER APPROACH)
(2) TO NETWORK SWITCH ON POWER SUPPLY (CURTAIN WALL)



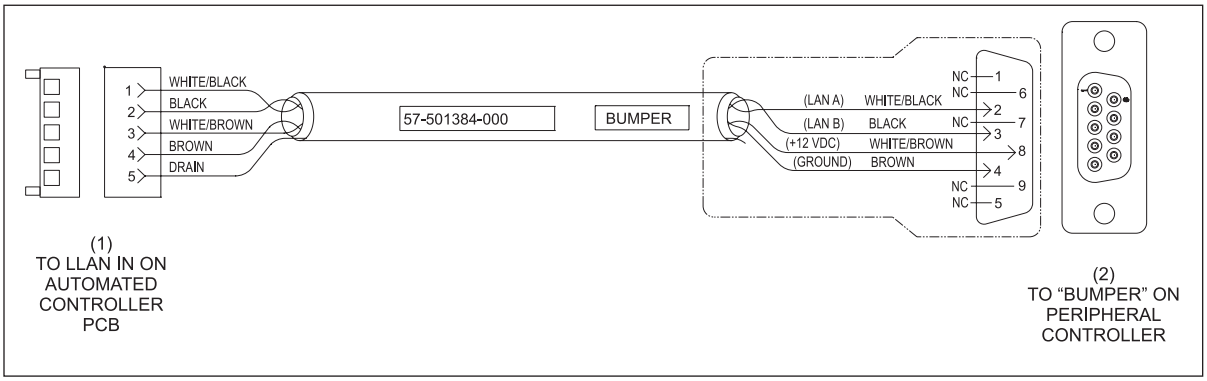
Foul Cable (Part No. 57-501378-000)

(1) TO DISTRIBUTION BOARD J5
(2) LEFT FOUL +
(3) LEFT FOUL -
(4) RIGHT FOUL +
(5) RIGHT FOUL -
(6) GROUND
(7) OR +12 VOLTS DIRECT CURRENT
(8) RIGHT
(9) LEFT
(10) TO FOUL UNIT RIGHT OUTPUT
(11) TO FOUL UNIT LEFT OUTPUT



Camera Ball Detect Cable (Part No. 57-501379-000)

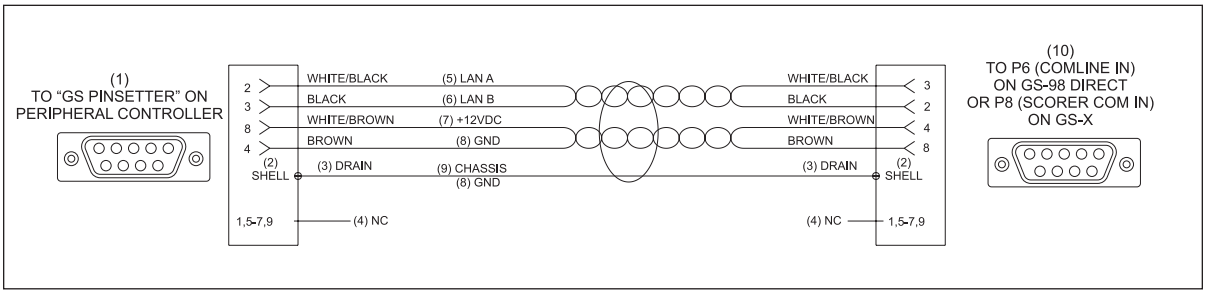
(1) TO DISTRIBUTION BOARD J27
(2) TO DISTRIBUTION BOARD J32
(3) TO BALL DETECT LEFT LANE
(4) TO BALL DETECT RIGHT LANE



Peripheral Controller to Pinball Wizard Bumpers (Part No. 57-501384-000)

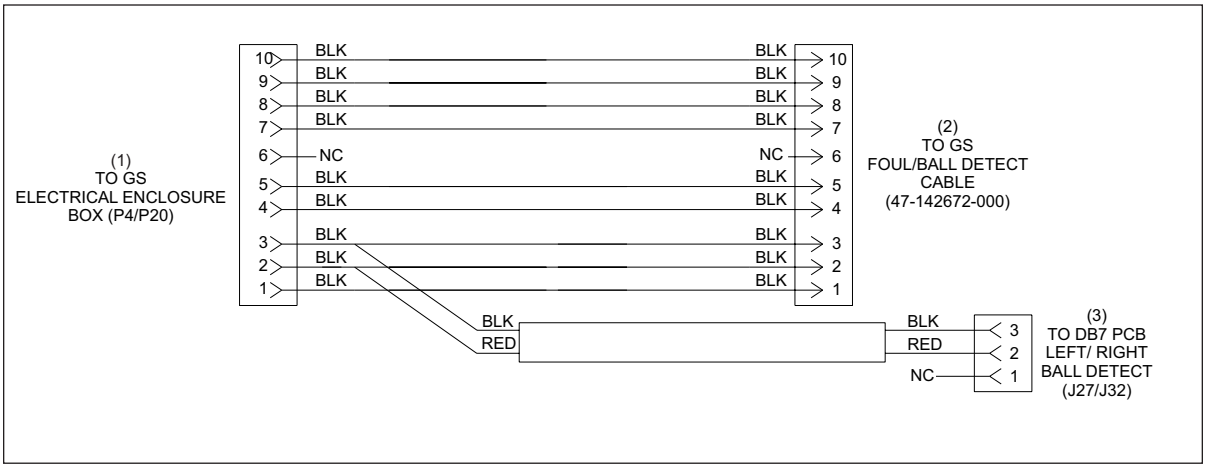
(1) TO LLAN IN ON AUTOMATED CONTROLLER PCB

(2) TO "BUMPER" ON DISTRIBUTION PERIPHERAL CONTROLLER



GS-Pinsetter Direct Connect Data Cable (Part No. 57-501385-000)

(1) TO "GS PINSETTER" ON PERIPHERAL CONTROLLER
(2) SHELL
(3) DRAIN
(4) NO CONNECTION
(5) LAN A
(6) LAN B
(7) +12 VOLTS DIRECT CURRENT
(8) GROUND
(9) CHASSIS
(10) TO P8 (COMLINE IN) ON GS-98 DIRECT OR P8 (SCORER COMLINE IN) ON GS-X

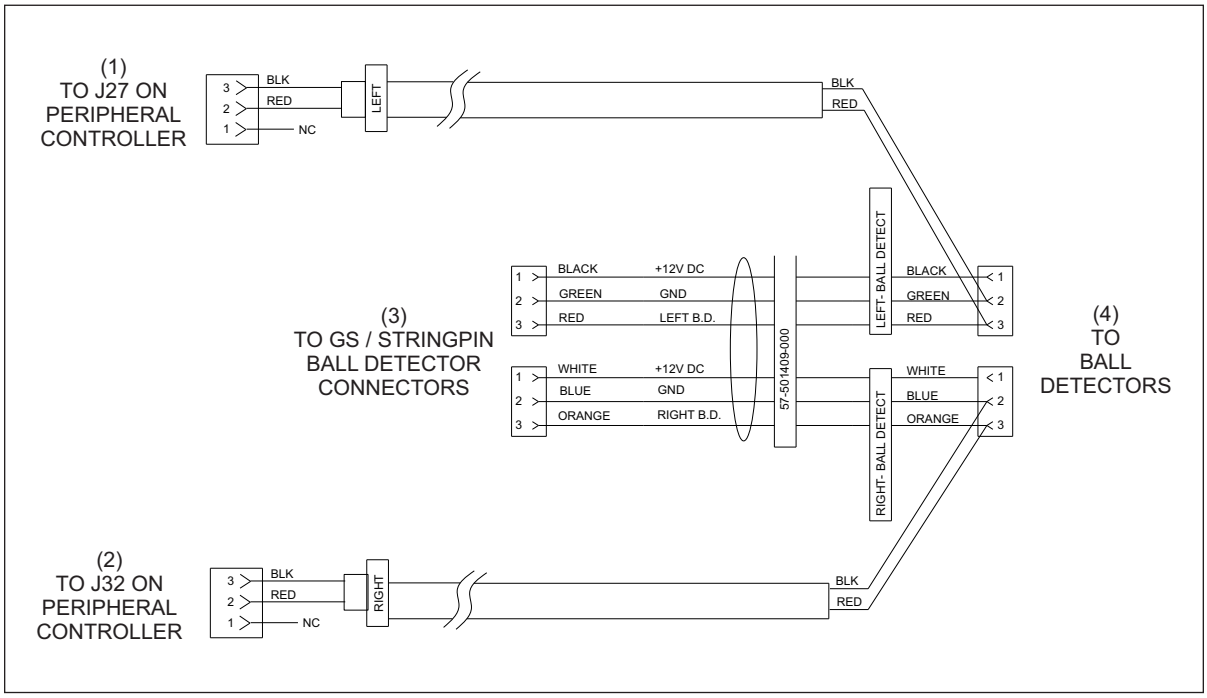


GS-Pinsetter Ball Detect Cable (Part No. 57-501391-000)

(1) TO GS ELECTRICAL ENLCOSURE BOX (P4/P20)

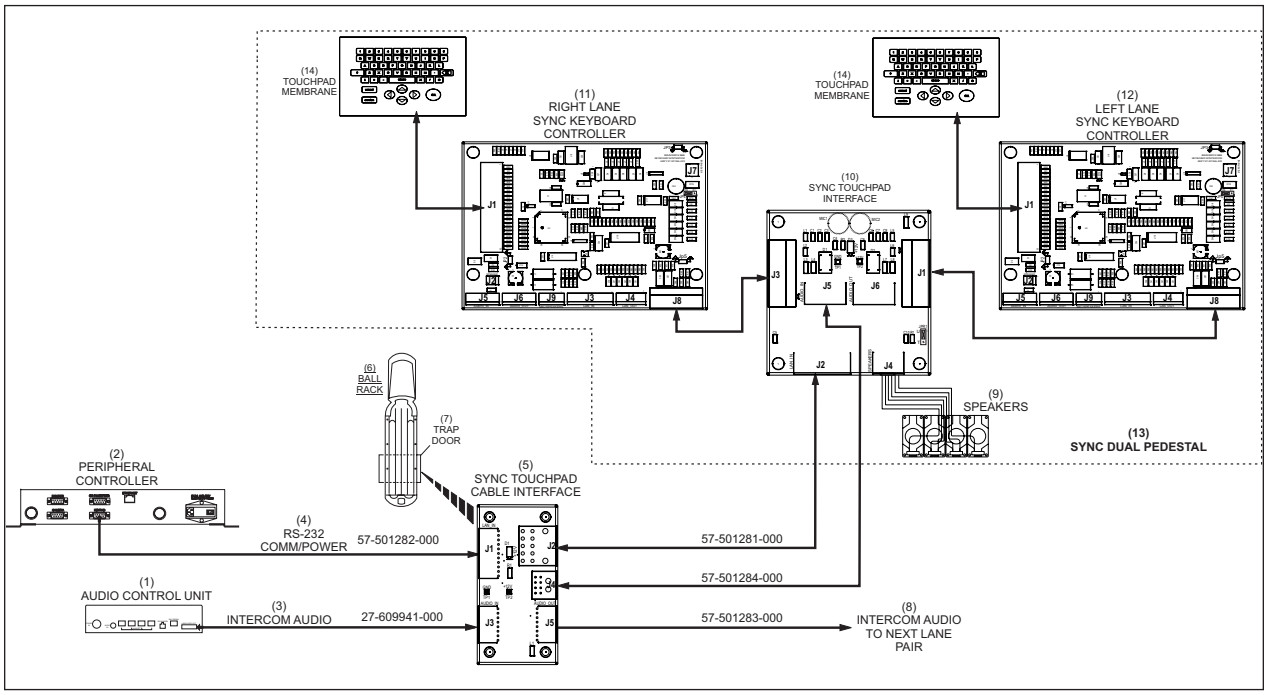
(2) TO GS FOUL/BALL DETECT CABLE (47-142672-000)

(3) TO DB7 PCB LEFT/RIGHT BALL DETECT (J27/J32)



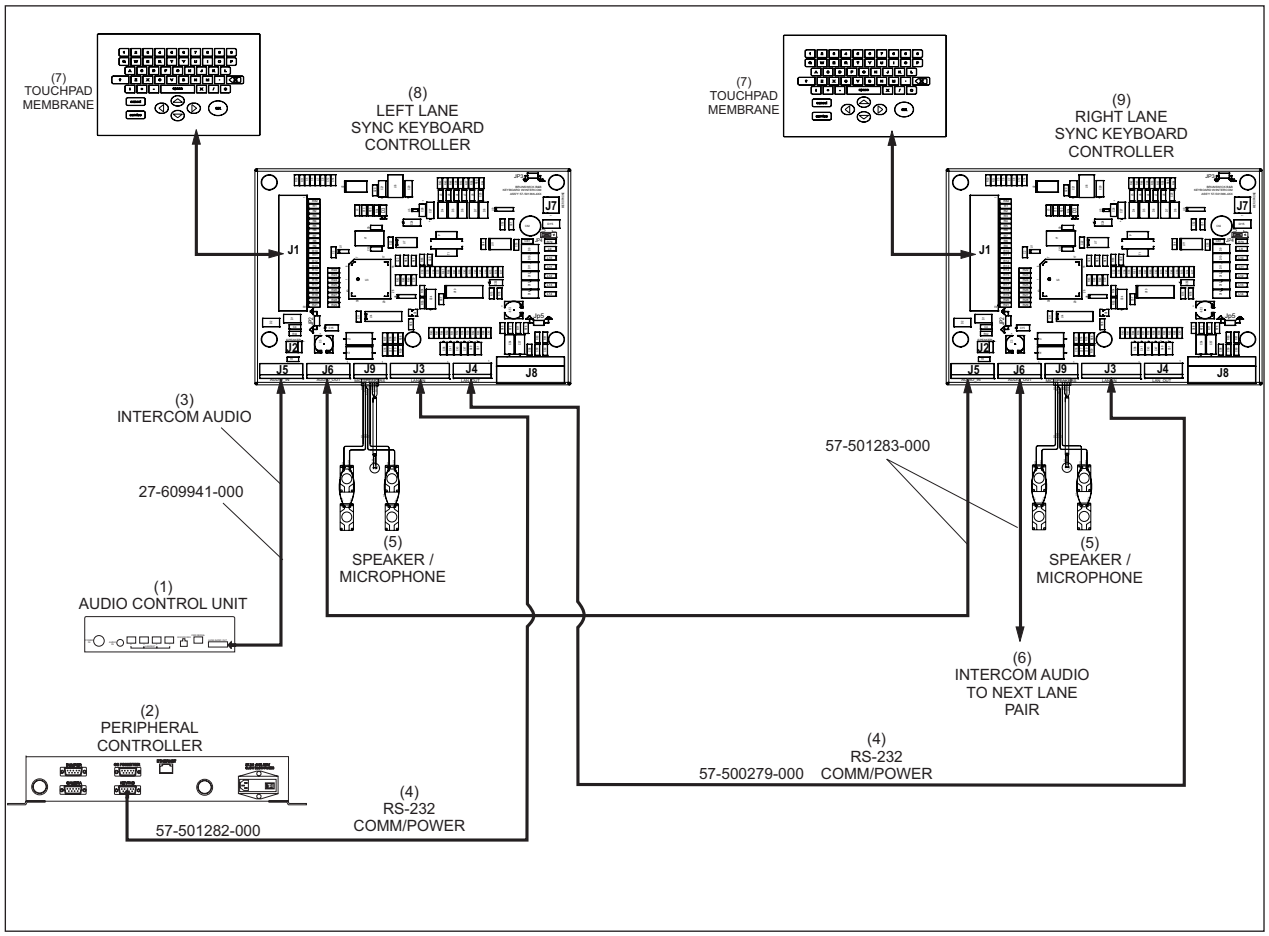
Ball Detect Universal Speed Cable (Part No. 57-501409-000)

(1) TO J27 ON PERIPHERAL CONTROLLER
(2) TO J32 ON PERIPHERAL CONTROLLER
(3) TO GS / STRINGPIN BALL DETECTOR CONNECTORS
(4) TO BALL DETECTORS



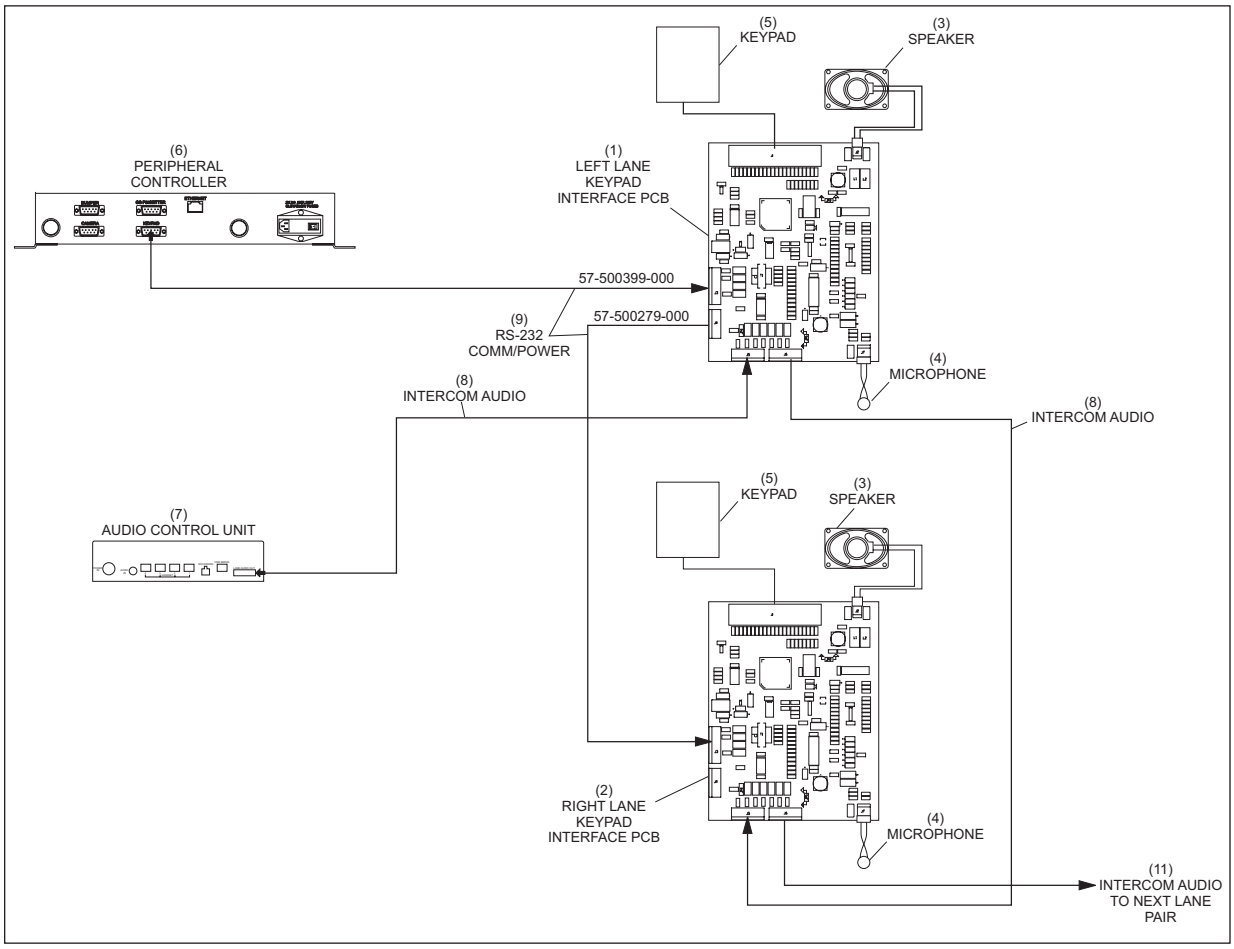
Sync Touchpad - Dual Pedestal Cabling

(1) AUDIO CONTROL UNIT
(2) PERIPHERAL CONTROLLER
(3) INTERCOM AUDIO
(4) RS-232 COMM / POWER
(5) SYNC TOUCHPAD CABLE INTERFACE
(6) BALL RACK
(7) TRAP DOOR
(8) INTERCOM AUDIO TO NEXT LANE
(9) SPEAKER
(10) SYNC TOUCHPAD INTERFACE
(11) RIGHT LANE SYNC KEYBOARD CONTROLLER
(12) LEFT LANE SYNC KEYBOARD CONTROLLER
(13) SYNC DUAL PEDESTAL
(14) TOUCHPAD MEMBRANE



Sync Touchpad - Single Lane / Table Mount Cabling

(1) AUDIO CONTROL UNIT
(2) PERIPHERAL CONTROLLER
(3) INTERCOM AUDIO
(4) RS-232 COMM / POWER
(5) SPEAKER / MICROPHONE
(6) INTERCOM AUDIO TO NEXT LANE PAIR
(7) TOUCHPAD MEMBRANE
(8) LEFT LANE SYNC KEYBOARD CONTROLLER
(9) RIGHT LANE SYNC KEYBOARD CONTROLLER



Vector Keypad Console Cabling

(1) LEFT LANE KEYPAD INTERFACE PCB	(2) RIGHT LANE KEYPAD INTERFACE PCB	(3) SPEAKER
(4) MICROPHONE	(5) KEYPAD	(6) PERIPHERAL CONTROLLER
(7) AUDIO CONTROL UNIT	(8) INTERCOM AUDIO	(9) RS-232 COMM / POWER
(10) 27-609941-000	(11) INTERCOM AUDIO TO NEXT LANE PAIR	

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