
CONTENTS

System Overview	3
Glossary of Terms	4
Control Desk Equipment.....	6
Vector Scorer System	12
Bowler's Area.....	17
LCD Wide Screen Overhead Monitors	17
Keypads.....	17
Flatscreens (Touchscreens)	17
Pinsetter Area	17
Ethernet Switch	17
Scorer Computer	17
Distribution PCB.....	18
RS-232 Converter.....	18
GS Interface	18
Control Desk/Office Area.....	18
Cash Drawer.....	18
Audio Control Unit	18
Intercom Handset	18
Scoresheet Printer.....	19
High Speed Computer(s).....	19
Bar Code Reader	19
ID Camera	19
System Signals	20
Communication/Control.....	20
Video	22
Audio.....	23

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SYSTEM OVERVIEW

The Brunswick Vector-HD scoring system consists of several pieces of equipment that can be divided into two subsystems; the Scoring System and the Control System.

The scoring system includes the electronic assemblies located in the bowler and pinsetter areas. These assemblies control the pinsetter, perform automatic scoring functions, provide the bowler with input capabilities, and display information about the game in progress.

The scoring system is available with keypads or LCD touchscreens (Flatscreens) and overhead screens equipped with Display Controllers that provide a high definition (HD) scorer display. A Scorer Computer interfaces up to 8 lanes of these devices. Additional equipment such as Distribution PCBs and Pin Cameras or GS pinsetters and automated bumpers are connected to the Scorer Computer as needed.

The control system consists of one or more computers located at the control desk and as needed various other locations around the bowling center. The main function of the control system is to provide the bowling center personnel convenient control of the scoring system and lanes from the control desk as well as point-of-sale (POS) terminals for other areas of the center.

An optional video distribution system delivers multiple high definition and/or standard definition video channels to the overhead monitors.

GLOSSARY OF TERMS

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

CAT5 (Category 5) - A twisted pair cable used for carrying signals. In the Vector system it is used in an Ethernet network to connect the Scorer Computer(s) and Control desk computer(s) through Ethernet switch(es) allowing them to communicate. In the Vector HD system, the Display Controllers also connect to the network using Cat5 cable. For Vector SD it is used to send video from the scorer computer to the overhead monitors.

Comport - Connectors on a computer that allow it to communicate with other devices using serial communication. These connections are also referred to as serial ports or RS-232 ports. Multiple comports in a computer are referred to by number such as com1 or com2. Also refer to Serial Communication.

Distribution PCB - A circuit board located behind the pin camera on each lane pair that provides power for the pin camera, controls machine on/off and reset, and handle signals needed for scoring such as foul, sweep switch, and ball detector signals. It can also control AMF short cycle and bumpers as needed. This PCB is not present in GS-Series Pinsetter installations.

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

Ethernet Switch - Device that is the central point of connection for the scorer computer(s) and Control desk computer(s) in the Ethernet network. The Switch allows data to be sent/received at full transmission speeds. Also refer to Cat5.

Hard Drive - A computer's primary storage device. The hard drive contains the programs and files that allow the computer function.

LCD Interface PCB - A optional circuit board inside the Scorer Computer that adapts the scoresheet video so that it can be displayed on lower touchscreen displays.

Motherboard - A circuit board inside a Scorer Computer or Control Desk Computer that contains the microprocessors and memory. The hard drives and most of the other PCBs in the computer connect to this board. (Also referred to as the System Board).

PCI Bus - Peripheral Component Interface Bus - A design or protocol used in many computers that defines how circuit boards connect to and use the resources provided by the motherboard. These are the medium sized, white colored slot connectors on the motherboard. The Video3 PCBs connect to the motherboard through these slots.

Power Supply - An assembly located inside a Scorer Computer that provides power to the components inside the computer, the Vector camera assembly and the Vector keypads.

Primary Patch Panel - A pair of boards located at the bottom of the Scorer Computer that provides and surge protection connections for communication for the Keypad or Touchscreen and Distribution PCB or GS Pinsetter. It also provides surge protection and connections for the overhead monitor's video for Vector SD. The primary patch panel has connections for up to 8 lanes.

RAM (Random Access Memory) - A short term storage area for information in a computer. Most computers have this type of memory installed on small circuit boards called DIMMS.

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-232 Converter - A small box used in the Vector system to translate between RS-232 and RS-485 communication. These boxes are needed for GS-Series Pinsetters and Brunswick automated bumpers.

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.

Video3 PCB - A multifunctional circuit board located in a Scorer Computer. This board processes and controls the video for the overhead monitors in the Vector SD system, processes the video received from pin cameras, provides communication for the pinsetters (Distribution PCB), and communication and audio control for the bowler’s keypads / touchscreens.

If LCD touchscreens are installed a second Video3 PCB is installed to provide video for the lower screens.

Scorer Computer - Computer(s) located at the curtain wall that control the scoring functions for a up to 8 lanes.

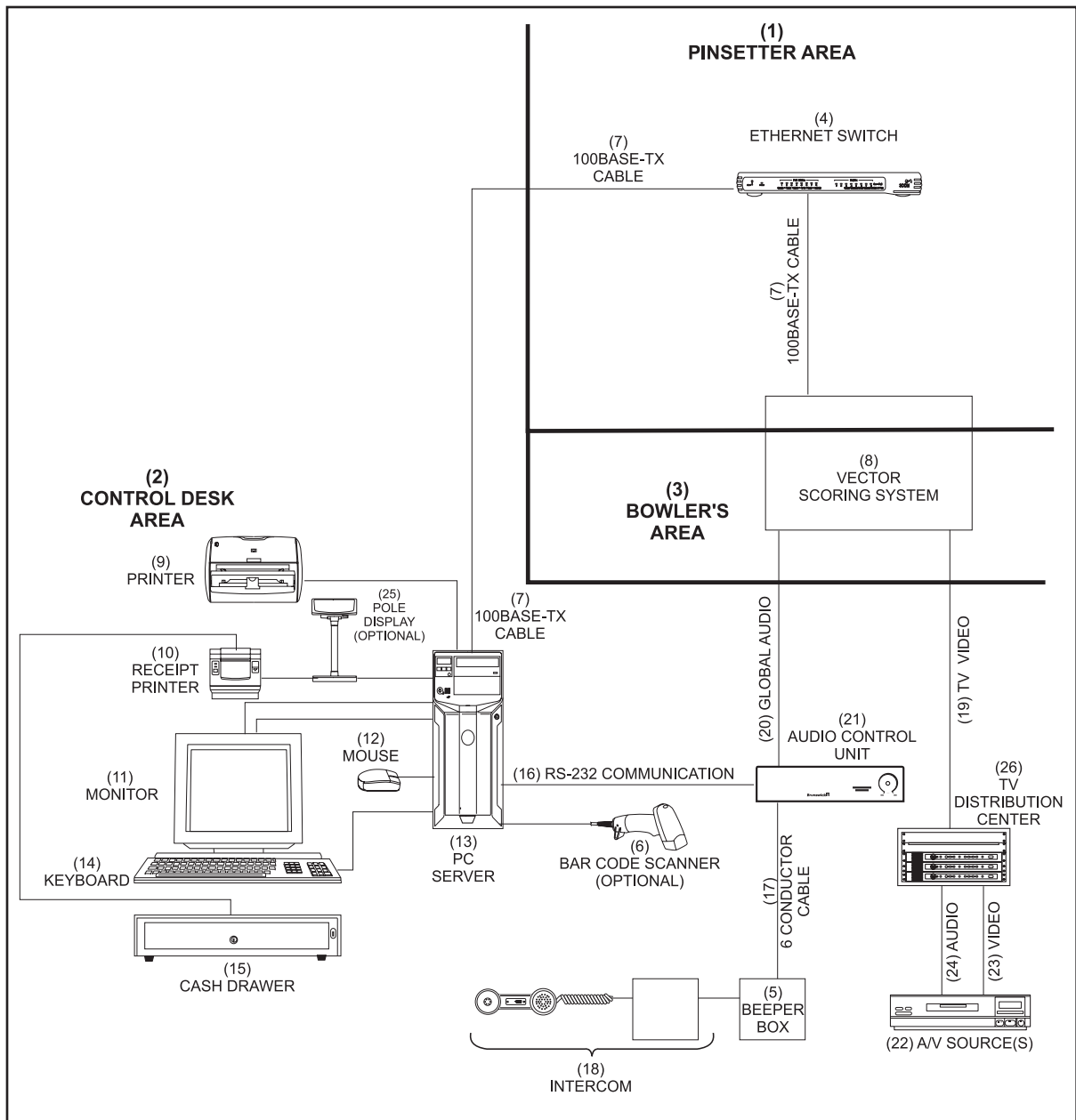
Secondary Patch Panel - An optional circuit board mounted on the right side wall of the Scorer Computer. It provides connections and surge protection for the lower LCD video. The Secondary Patch Panel has connections for 8 lanes.

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

CONTROL DESK EQUIPMENT

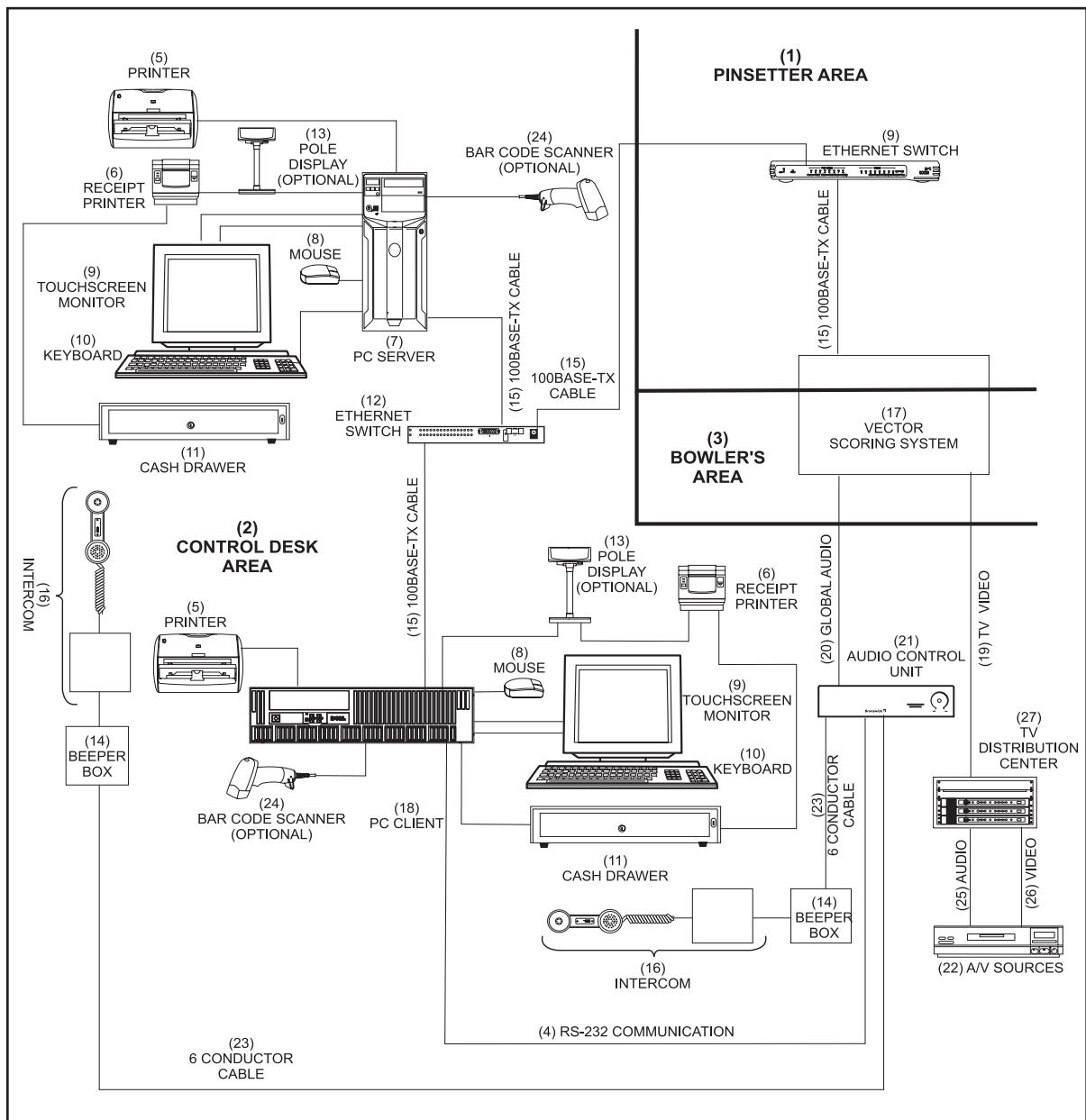
The Vector Plus control system consists of one or more computers and POS assemblies located at the control desk, and in some cases, a computer in the office. Vector Plus also provides the bowling center personnel convenient control of the scoring system while keeping track of the financial transactions and bowling activity in the center. In addition, it allows the center additional security control for the system, additional reporting of bowling activity, and an integrated league record and tournament program .

Refer to figures titled; *Vector Plus Configuration 1*, *Vector Plus Configuration 2*, *Vector Plus Configuration 3*, and *Vector Plus Configuration 4*.



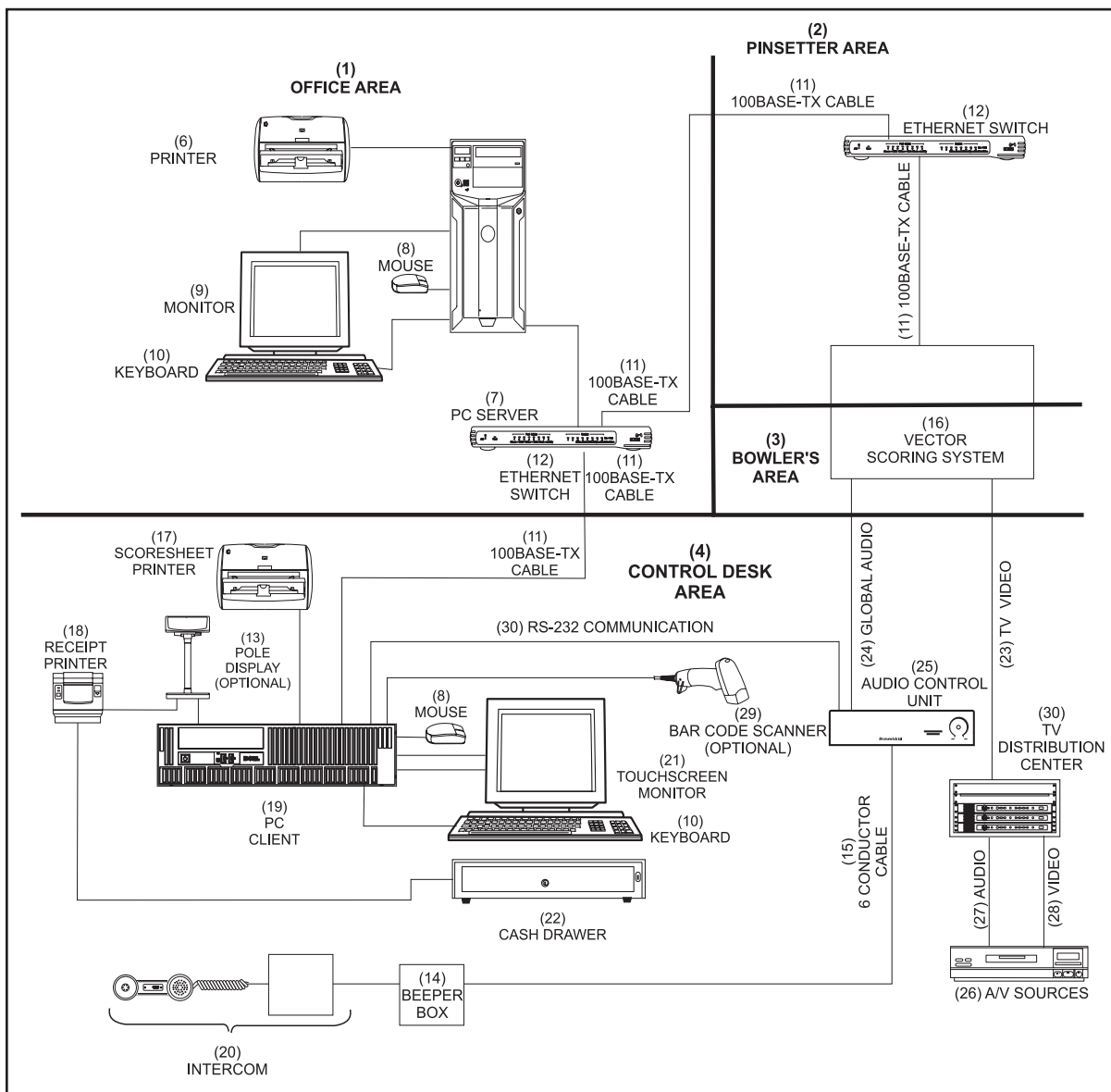
Vector Plus Configuration 1

- | | | |
|---------------------------|-----------------------------|------------------------------|
| (1) PINSETTER AREA | (2) CONTROL DESK AREA | (3) BOWLER'S AREA |
| (4) ETHERNET SWITCH | (5) BEEPER BOX | (6) BAR CODE READER OPTIONAL |
| (7) 100 BASE-TX CABLE | (8) VECTOR SCORING SYSTEM | (9) PRINTER |
| (10) RECEIPT PRINTER | (11) TOUCHSCREEN MONITOR | (12) MOUSE |
| (13) PC SERVER | (14) KEYBOARD | (15) CASH DRAWER |
| (16) RS-232 COMMUNICATION | (17) 6 CONDUCTOR CABLE | (18) INTERCOM |
| (19) TV VIDEO | (20) GLOBAL AUDIO | (21) AUDIO CONTROL UNIT |
| (22) A/V SOURCE(S) | (23) VIDEO | (24) AUDIO |
| (25) POLE DISPLAY | (26) TV DISTRIBUTION CENTER | |



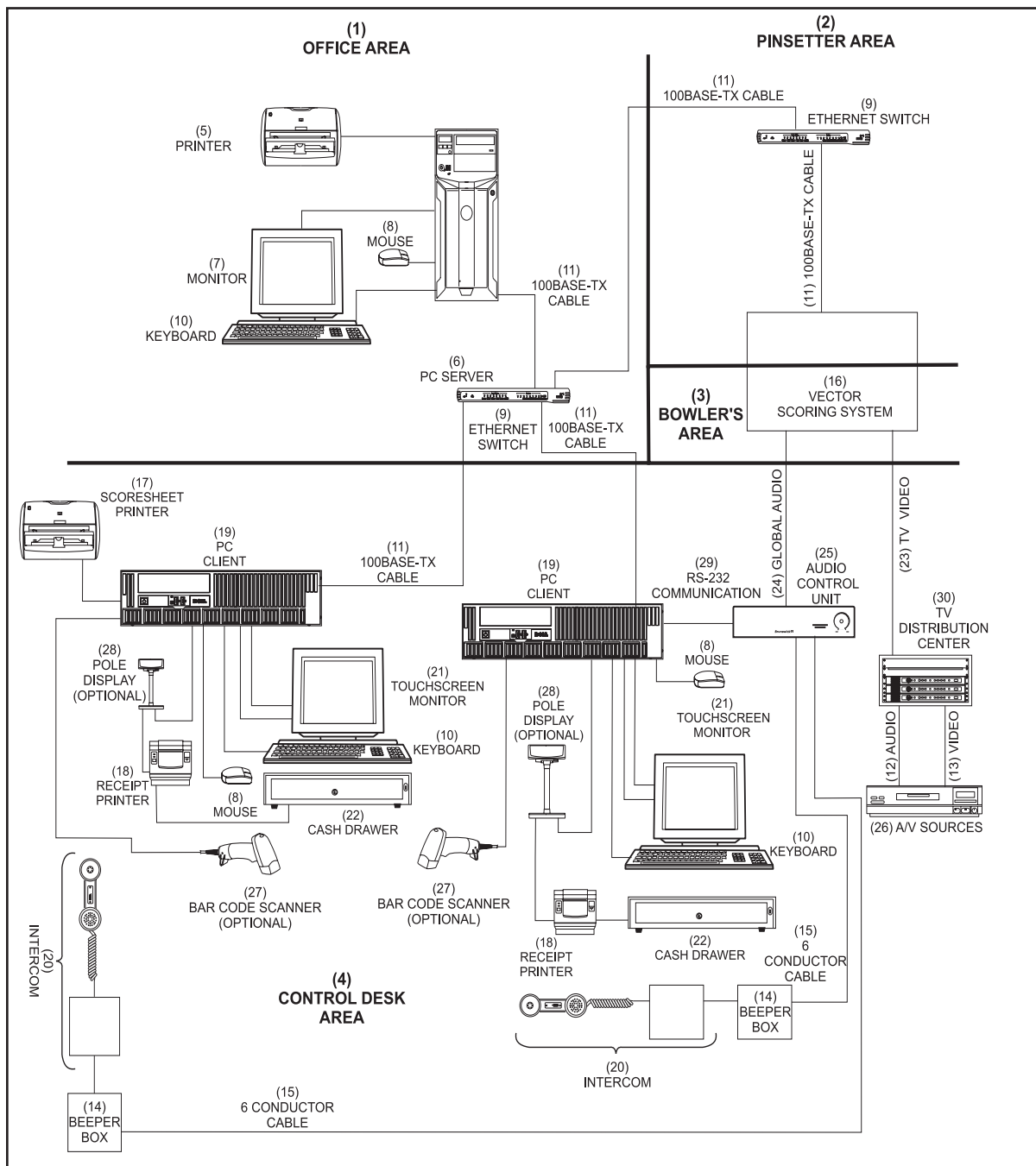
Vector Plus Configuration 2

- | | | |
|------------------------------|----------------------------|---------------------------------|
| (1) PINSETTER AREA | (2) CONTROL DESK AREA | (3) BOWLER'S AREA |
| (4) RS-232 COMMUNICATION | (5) PRINTER | (6) RECEIPT PRINTER |
| (7) PC SERVER | (8) MOUSE | (9) MONITOR |
| (10) KEYBOARD | (11) CASH DRAWER | (12) ETHERNET SWITCH |
| (13) POLE DISPLAY (OPTIONAL) | (14) BEEPER BOX | (15) 100 BASE-TX CABLE |
| (16) INTERCOM | (17) VECTOR SCORING SYSTEM | (18) PC CLIENT |
| (19) TV VIDEO | (20) GLOBAL AUDIO | (21) AUDIO CONTROL UNIT |
| (22) A/V SOURCE(S) | (23) 6 CONDUCTOR CABLE | (24) BAR CODE READER (OPTIONAL) |
| (25) AUDIO | (26) VIDEO | (27) TV DISTRIBUTION CENTER |



Vector Plus Configuration 3

- | | | |
|------------------------------|-------------------------------|-----------------------------|
| (1) OFFICE AREA | (2) PINSETTER AREA | (3) BOWLER'S AREA |
| (4) CONTROL DESK AREA | (5) RS-232 COMMUNICATION | (6) PRINTER |
| (7) PC SERVER | (8) MOUSE | (9) MONITOR |
| (10) KEYBOARD | (11) 100BASE-TX CABLE | (12) ETHERNET SWITCH |
| (13) POLE DISPLAY (OPTIONAL) | (14) BEEPER BOX | (15) 6 CONDUCTOR CABLE |
| (16) VECTOR SCORING SYSTEM | (17) SCORESHEET PRINTER | (18) RECEIPT PRINTER |
| (19) PC CLIENT | (20) INTERCOM | (21) TOUCHSCREEN MONITOR |
| (22) CASH DRAWER | (23) TV VIDEO | (24) GLOBAL AUDIO |
| (25) AUDIO CONTROL UNIT | (26) A/V SOURCES | (27) AUDIO |
| (28) VIDEO | (29) BAR CODE READER OPTIONAL | (30) TV DISTRIBUTION CENTER |



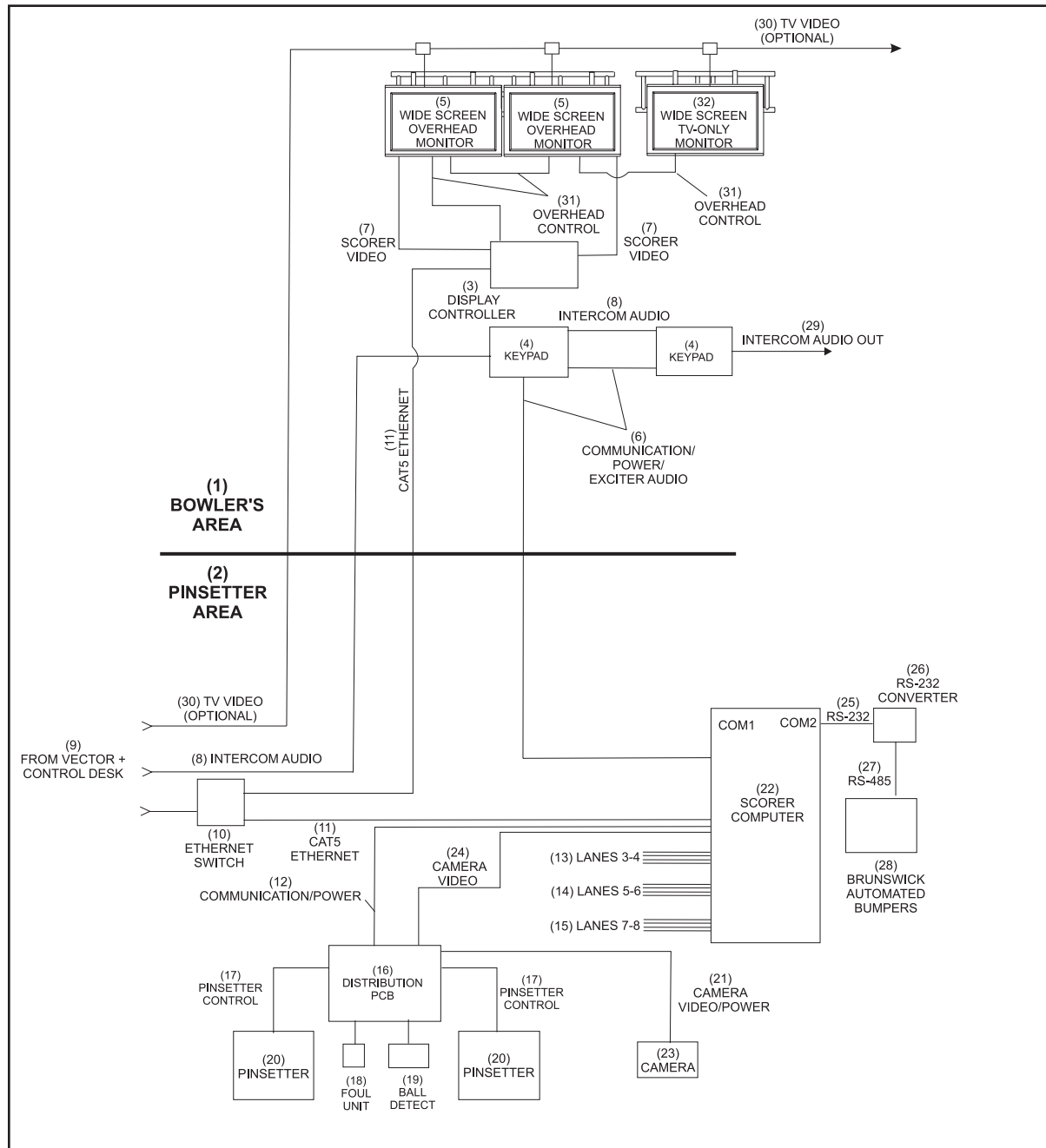
Vector Plus Configuration 4

- | | | |
|------------------------------|---------------------------|---------------------------------|
| (1) OFFICE AREA | (2) PINSETTER AREA | (3) BOWLER'S AREA |
| (4) CONTROL DESK AREA | (5) PRINTER | (6) PC SERVER |
| (7) MONITOR | (8) MOUSE | (9) ETHERNET SWITCH |
| (10) KEYBOARD | (11) 100BASE-TX CABLE | (12) AUDIO |
| (13) VIDEO | (14) BEEPER BOX | (15) 6 CONDUCTOR CABLE |
| (16) VECTOR SCORING SYSTEM | (17) SCORESHEET PRINTER | (18) RECEIPT PRINTER |
| (19) PC CLIENT | (20) INTERCOM | (21) TOUCHSCREEN MONITOR |
| (22) CASH DRAWER | (23) TV VIDEO | (24) GLOBAL AUDIO |
| (25) AUDIO CONTROL UNIT | (26) A/V SOURCES | (27) BAR CODE READER (OPTIONAL) |
| (28) POLE DISPLAY (OPTIONAL) | (29) RS-232 COMMUNICATION | (30) TV DISTRIBUTION CENTER |

VECTOR SCORER SYSTEM

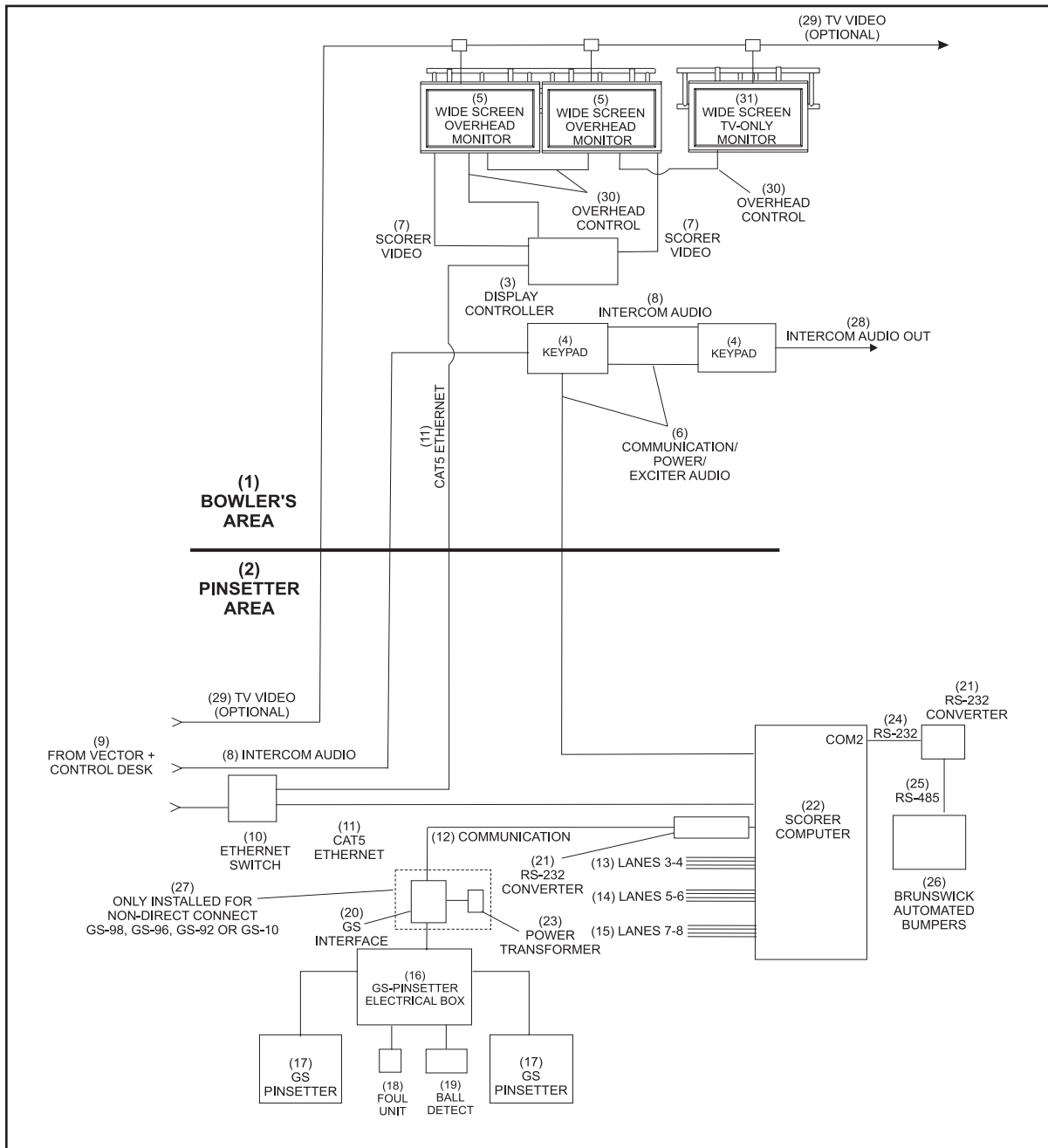
The Brunswick Vector-HD scoring system consists several pieces of equipment.

The main components in the scoring system are the Scorer Computers. Each Scorer Computer is capable of controlling the bowling functions for up to 8 lanes so the number of computers needed is dependent on the number of lanes in the center. Each computer networks with the Vector Plus control system, interfaces with bowler keypads or touchscreens, controls scorer video for the overhead monitors and interfaces with the pinsetters for its group lanes. Additionally the equipment used to connect to the pinstters and obtain scoring information is dependent on whether the center is equipped with GS pinsetters. Reference the *Vector Scoring System* figures on the following pages.



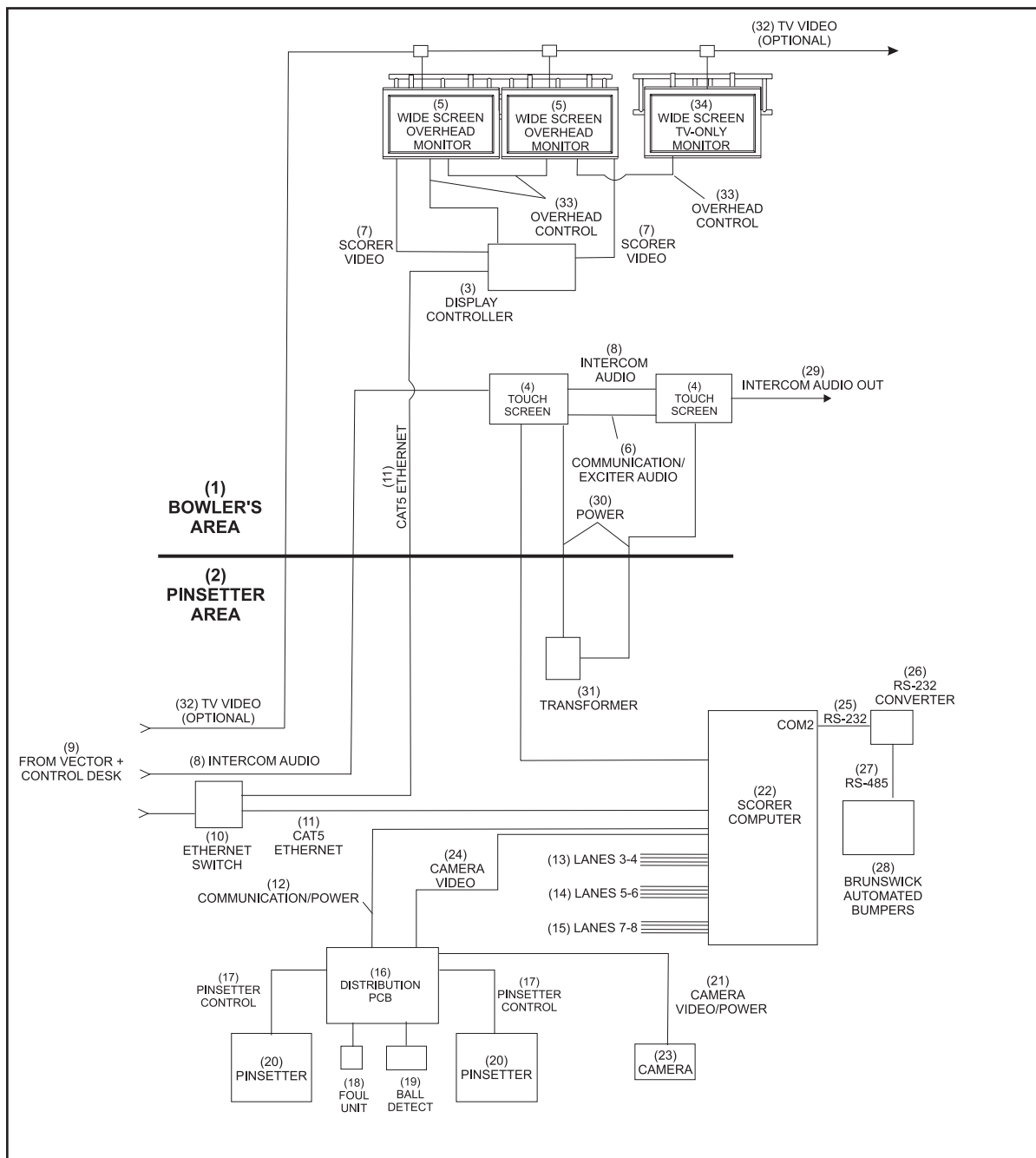
Vector HD Scoring System with Keypads and All Pinsetters Except GS-Series

- | | | |
|----------------------------------|----------------------------------|---|
| (1) BOWLER'S AREA | (2) PINSETTER AREA | (3) DISPLAY CONTROLLER |
| (4) KEYPAD | (5) WIDE SCREEN OVERHEAD MONITOR | (6) COMMUNICATION / POWER EXCITER AUDIO |
| (7) SCORER VIDEO | (8) INTERCOM AUDIO | (9) FROM VECTOR CONTROL DESK |
| (10) ETHERNET SWITCH | (11) CAT5 ETHERNET | (12) COMMUNICATION / POWER |
| (13) LANES 3-4 | (14) LANES 5-6 | (15) LANES 7-8 |
| (16) DISTRIBUTION PCB | (17) PINSETTER CONTROL | (18) FOUL UNIT |
| (19) BALL DETECT | (20) PINSETTER | (21) CAMERA VIDEO/POWER |
| (22) SCORER COMPUTER | (23) CAMERA | (24) CAMERA VIDEO |
| (25) RS-232 | (26) RS-232 CONVERTER | (27) RS-485 |
| (28) BRUNSWICK AUTOMATED BUMPERS | (29) INTERCOM AUDIO OUT | (30) TV VIDEO (OPTIONAL) |
| (31) OVERHEAD CONTROL | (32) WIDE SCREEN TV-ONLY MONITOR | |



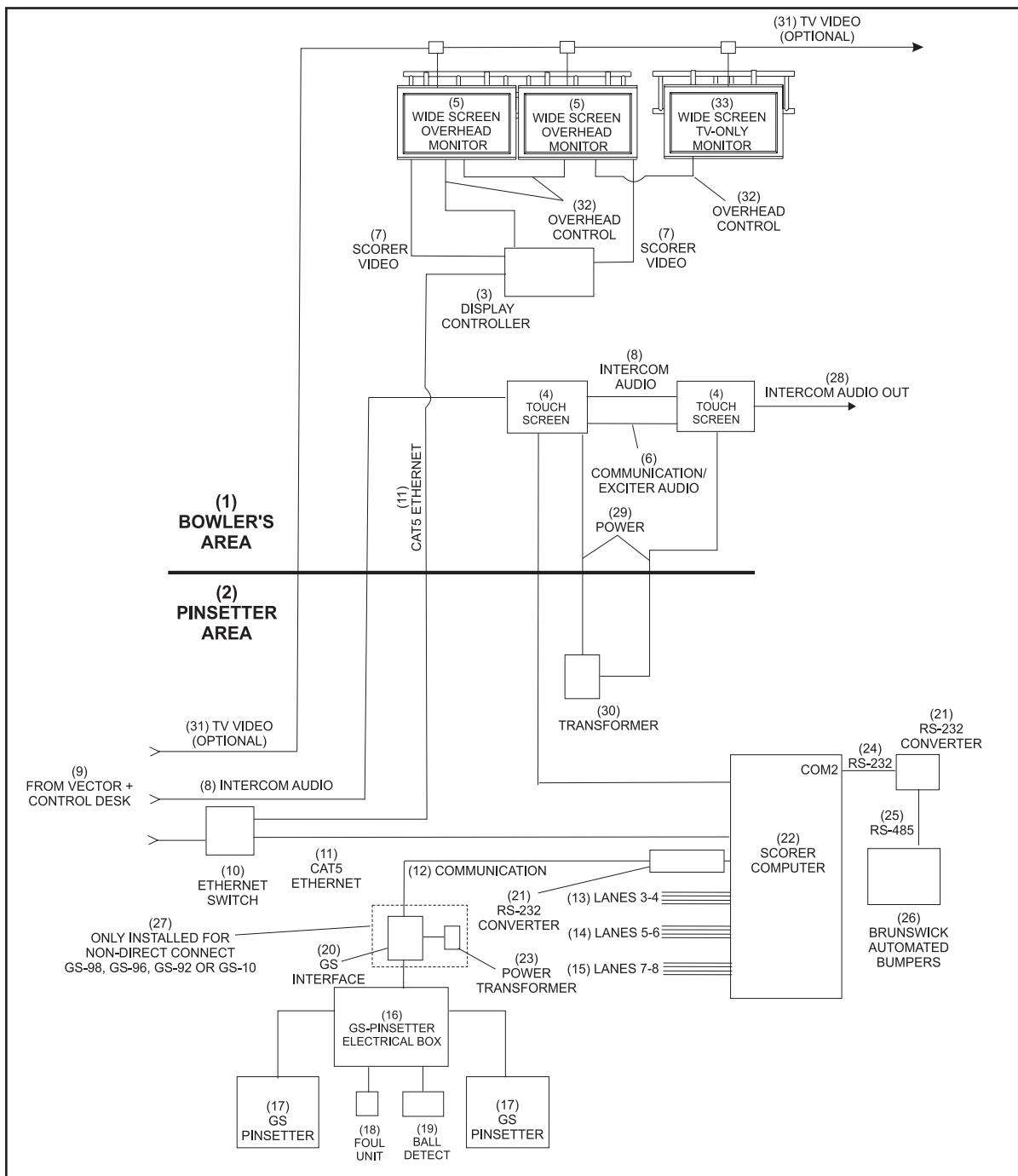
Vector HD Scoring System With Keypads and GS-Series Pinsetters

- | | | |
|----------------------------------|----------------------------------|---|
| (1) BOWLER'S AREA | (2) PINSETTER AREA | (3) DISPLAY CONTROLLER |
| (4) KEYPAD | (5) WIDE SCREEN OVERHEAD MONITOR | (6) COMMUNICATION / POWER EXCITER AUDIO |
| (7) SCORER VIDEO | (8) INTERCOM AUDIO | (9) FROM VECTOR CONTROL DESK |
| (10) ETHERNET SWITCH | (11) CAT5 ETHERNET | (12) COMMUNICATION |
| (13) LANES 3-4 | (14) LANES 5-6 | (15) LANES 7-8 |
| (16) GS PINSETTER ELECTRICAL BOX | (17) GS - PINSETTER | (18) FOUL UNIT |
| (19) BALL DETECT | (20) GS INTERFACE | (21) RS-232 CONVERTER |
| (22) SCORER COMPUTER | (23) POWER TRANSFORMER | (24) RS-232 |
| (25) RS-485 | (26) BRUNSWICK AUTOMATED BUMPERS | (27) ONLY INSTALLED FOR NON-DIRECT CONNECT GS-98, GS-96, GS-92 OR GS-10 |
| (28) INTERCOM AUDIO OUT | (29) TV VIDEO (OPTIONAL) | (30) OVERHEAD CONTROL |
| (31) WIDE SCREEN TV-ONLY MONITOR | | |



Vector HD Scoring System with Touchscreens and All Pinsetters except GS-Series

- | | | |
|----------------------------------|----------------------------------|-----------------------------------|
| (1) BOWLER'S AREA | (2) PINSETTER AREA | (3) DISPLAY CONTROLLER |
| (4) TOUCHSCREEN | (5) WIDE SCREEN OVERHEAD MONITOR | (6) COMMUNICATION / EXCITER AUDIO |
| (7) SCORER VIDEO | (8) INTERCOM AUDIO | (9) FROM VECTOR CONTROL DESK |
| (10) ETHERNET SWITCH | (11) CAT5 ETHERNET | (12) COMMUNICATION / POWER |
| (13) LANES 3-4 | (14) LANES 5-6 | (15) LANES 7-8 |
| (16) DISTRIBUTION PCB | (17) PINSETTER CONTROL | (18) FOUL UNIT |
| (19) BALL DETECT | (20) PINSETTER | (21) CAMERA VIDEO/POWER |
| (22) SCORER COMPUTER | (23) CAMERA | (24) CAMERA VIDEO |
| (25) RS-232 | (26) RS-232 CONVERTER | (27) RS-485 |
| (28) BRUNSWICK AUTOMATED BUMPERS | (29) INTERCOM AUDIO OUT | (30) POWER |
| (31) TRANSFORMER | (32) TV VIDEO (OPTIONAL) | (33) OVERHEAD CONTROL |
| (34) WIDE SCREEN TV-ONLY MONITOR | | |



Vector HD Scoring System with Touchscreens and GS-Series Pinsetters

- | | | |
|----------------------------------|----------------------------------|---|
| (1) BOWLER'S AREA | (2) PINSETTER AREA | (3) DISPLAY CONTROLLER |
| (4) TOUCHSCREEN | (5) WIDE SCREEN OVERHEAD MONITOR | (6) COMMUNICATION / POWER EXCITER AUDIO |
| (7) SCORER VIDEO | (8) INTERCOM AUDIO | (9) FROM VECTOR CONTROL DESK |
| (10) ETHERNET SWITCH | (11) CAT5 ETHERNET | (12) COMMUNICATION |
| (13) LANES 3-4 | (14) LANES 5-6 | (15) LANES 7-8 |
| (16) GS PINSETTER ELECTRICAL BOX | (17) GS - PINSETTER | (18) FOUL UNIT |
| (19) BALL DETECT | (20) GS INTERFACE | (21) RS-232 CONVERTER |
| (22) SCORER COMPUTER | (23) POWER TRANSFORMER | (24) RS-232 |
| (25) RS-485 | (26) BRUNSWICK AUTOMATED BUMPERS | (27) ONLY INSTALLED FOR NON-DIRECT CONNECT GS-98, GS-96, GS-92 OR GS-10 |
| (28) INTERCOM AUDIO OUT | (29) POWER | (30) TRANSFORMER |
| (31) TV VIDEO (OPTIONAL) | (32) OVERHEAD CONTROL | (33) WIDE SCREEN TV-ONLY MONITOR |

BOWLER'S AREA

The bowler's area contains all of the components that allow the bowlers to interface with scoring system. Components that are found in the bowler's area include:

- Overhead Monitors
- Touchscreen Flatscreens or Keypads
- Display Controllers

Overhead Monitors

The overhead monitors provided by Brunswick are individual wide screen LED flat panel monitors or in some cases LED TVs.

In a Vector-SD installation the overhead monitors are used to exclusively display the scorer video cabled from the scorer computer.

With Vector-HD, the monitors display the high definition scorer video produced by the Display Controllers. The monitors can also display video originating from the optional TV Distribution Center. A TV-Only version of the monitor that displays only the video from the Distribution Center is also available.

Keypads

The keypad is a full function keyboard 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 cost of a lower display.

Touchscreens

The flatscreen is a touch-sensitive LCD display that allows the bowler to directly select options by simply touching the screen.

Display Controllers

The Display Controllers are behind the left lane overhead monitors. The controller produces high definition scorer video and controls the on/off and video input selection for the overhead monitors of a lane pair.

Ethernet Switch

The Ethernet Switch allows communication from the Vector Network to branch to the Display Controllers. The 24 port switch connects to the 8-port ethernet switch located near the scorer computers and provides communication for up to 23 Display Controllers (46 Lanes) The switch is normally located near the overhead monitors toward the center of the bowling center .

PINSETTER AREA

The pinsetter area contains equipment used to interface the pinsetter and office computer to the lane pair. This equipment is typically mounted on a panel attached to the curtain wall. Equipment may include:

- Ethernet Switch
- Distribution PCBs
- Pin Cameras
- Scorer Computers

Ethernet Switch

The Ethernet Switch allows communication from the control desk computer(s) to branch to the individual Scorer Computers and to other switches. A typical switch splits communication into 8 branches allowing one switch to provide communication for up to 7 Scorer Computers (56 Lanes) and the Control Desk Computer. The switch is located on the curtain wall.

Scorer Computer

The Scorer Computer contains the circuit boards that controls the scoring functions for up to 8 lanes. It handles calculations for scoring, video for the monitors, and communication to the control desk.

The Scorer Computers are located on the curtain wall so that each computer can be connected for optimal performance.

Distribution PCB

The Distribution PCB is a circuit board located behind the pin camera on each lane pair. It interfaces the pin camera, A-2, and AMF pinsetters and foul signals, automated bumper control, and ball detector signals to the Scorer Computer. The distribution board is not used when GS pinsetters are installed.

RS-232 Converter

The RS-232 Converter is a small box used to convert the RS-232 communication protocol to RS-485 protocol. These boxes are used between the Scorer Computer and GS pinsetters, TV-Only monitors, Brunswick automated bumpers, and Brunswick provided widescreen overhead monitors.

GS Interface

The GS Interface box converts RS-485 communication protocol to HDLC (High Level Data Link Control). HDLC was the communication protocol used by Gamesetter box in GS-10, GS92 and GS-96 pinsetters, and the Consolidated Low Voltage box in non-direct connect GS-98 pinsetters.

CONTROL DESK/OFFICE AREA

The control desk/office area contains the equipment needed to remotely control Vector scoring system, provide point of sale (POS) capability, keep track of financial data, and interface leagues and tournaments to the scorers. It may consist of:

- Computers complete with Monitors, Keyboard, and Mouse
- Cash Drawers
- Audio Control Unit
- Intercom Handset(s)
- Scoresheet Printer(s)
- Receipt Printer(s)
- Bar Code Reader

Cash Drawer

The cash drawer opens automatically at the proper time giving the control desk operator a convenient place to put money received during transaction. The drawer gets power to open from the receipt printer.

Audio Control Unit

The audio control unit is used to adapt the intercom to Vector keypad/touchscreens.

Intercom Handset

The intercom handset provides a convenient “telephone” style communication to the touchscreens or keypads in the bowlers area. Two intercom lines are provided allowing the control desk to talk to two different lanes at the same time.

Scoresheet Printer

The scoresheet printer allows the control desk operator to obtain a hard copy of a bowler’s scores. Scoresheets can be printed for the current game as well previous games for up to 7 days.

Computer(s)

The Vector or Vector Plus control desk system consisting of one or more computer (PC) located at the control desk running the Windows XP or 2003 Server operating system and Vector/Vector Plus control desk software.

The PC has a keyboard, monitor, and mouse connected to it. Additional equipment attached to the computer can include a receipt printer, cash drawer, customer pole display, and bar code reader.

Bar Code Reader

The bar code reader allows the use of bowler cards to simplify the tracking of frequent open play bowlers. When a bowler’s card is scanned their information is retrieved from the Vector computer. The bowler’s name is automatically sent to the console when they are assigned to a lane and their scores will transfer back to the computer at the end of each game. It can also be used to scan an item’s barcode to automatically obtain pricing as part of a sales transaction.

SYSTEM SIGNALS

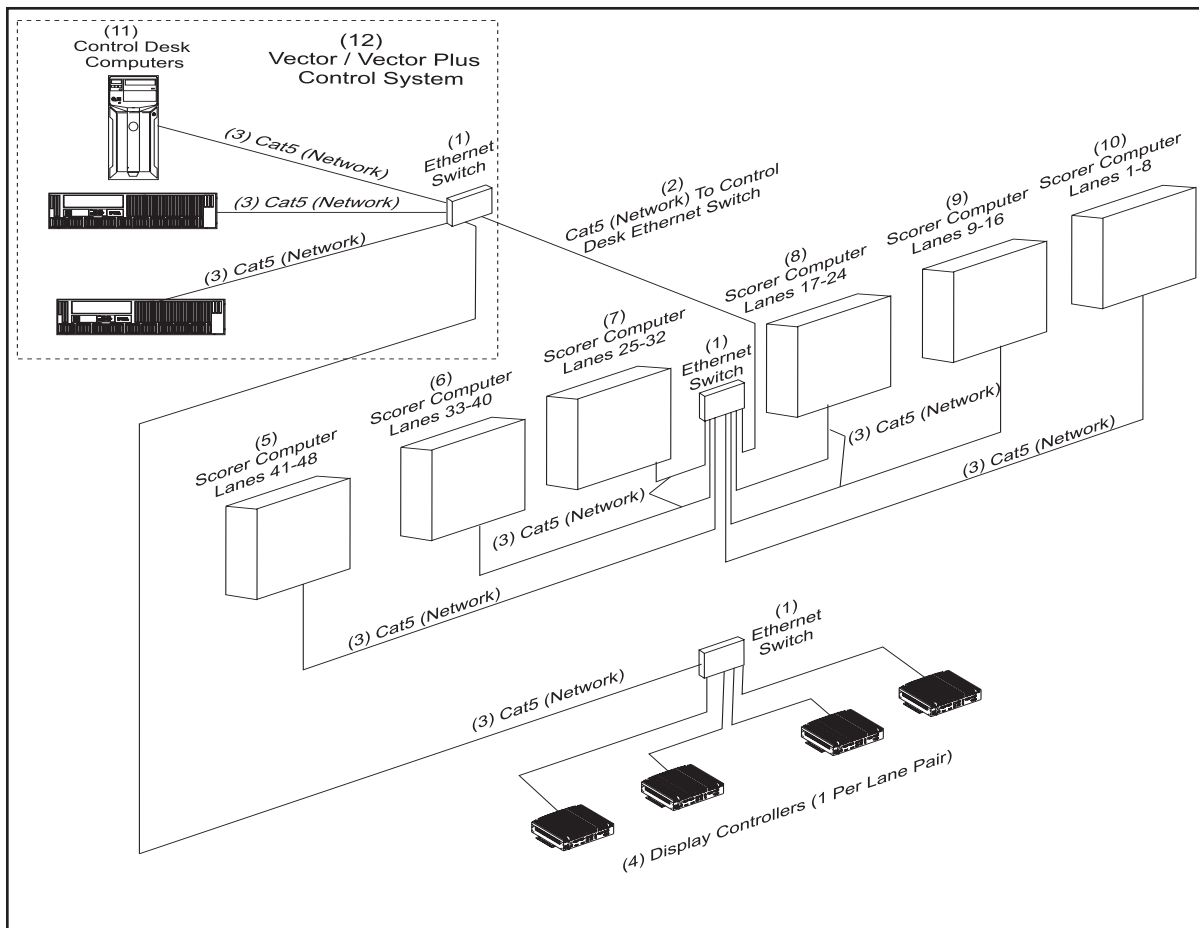
The signals used in the Vector scoring system can be divided into 3 types; Communication / Control, Video, and Audio.

Communication/Control

Communication between components in the Vector system is handled using either an Ethernet network or a serial communication.

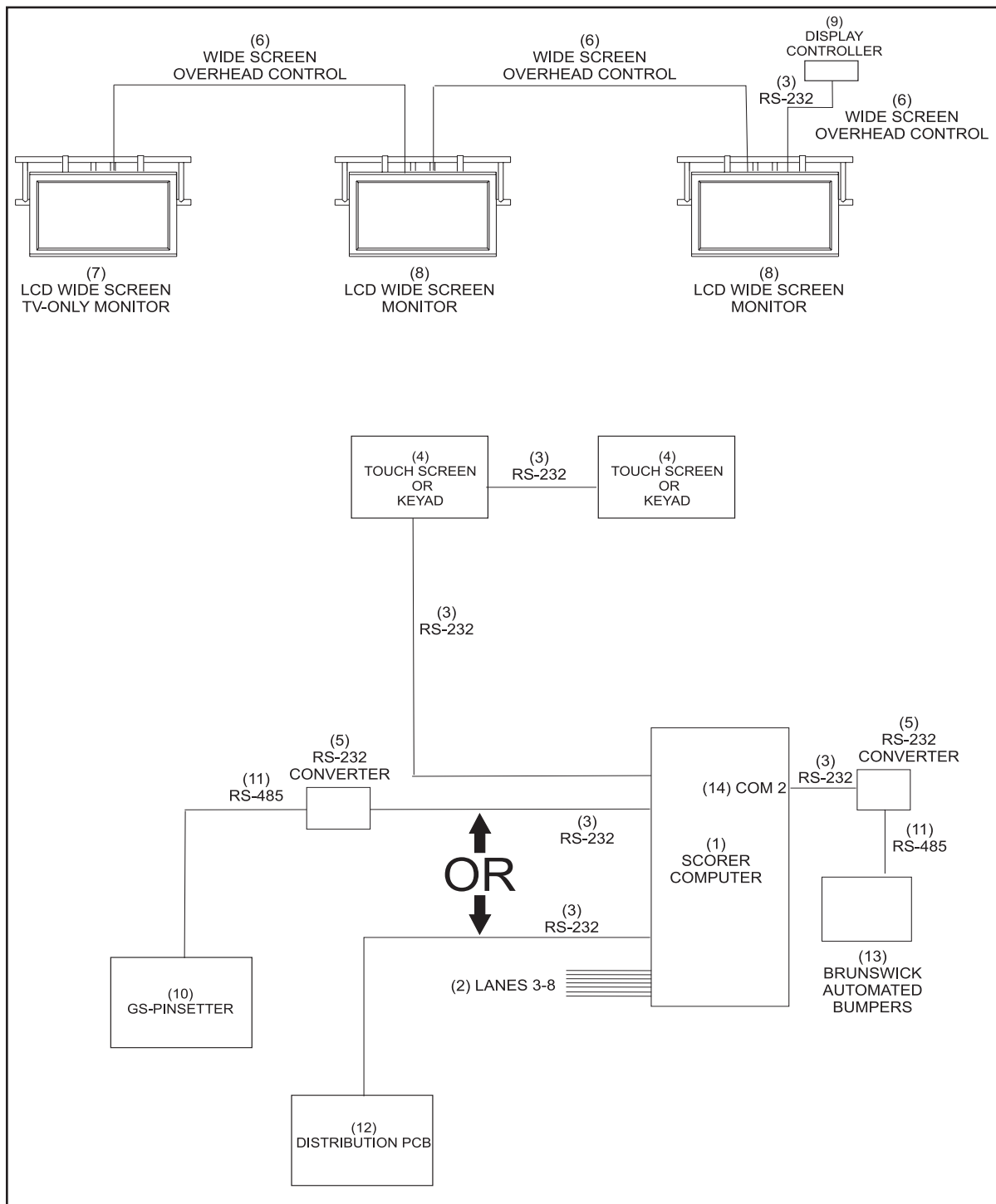
Ethernet provides communication between the control desk computer(s) and the Scorer computers and between the Scorer Computers and the Display Controllers. Refer to the figures titled *Vector Ethernet Cabling - 8 Lane Scoring Computer*.

Serial communication allows a scorer computer to communicate with components within the lane group it controls. RS-232 is used by the scorer computer to “talk” to most of these components. This signal is converted to RS-485 for GS pinsetters and Brunswick Automated Bumpers. The Display Controllers use RS-232 to turn the overhead monitors on/off and to switch video inputs. Refer to the figure titled *Vector Lane Pair Communication Cabling*.



Vector HD Ethernet Cabling

- | | | |
|--|---------------------------------|---|
| (1) ETHERNET SWITCH | (2) CAT5 CABLE TO CONTROL DESK | (3) CAT5 (NETWORK) |
| (4) DISPLAY CONTROLLERS
(ONE PER LANE PAIR) | (5) SCORER COMPUTER LANES 41-48 | (6) SCORER COMPUTER LANES 33-40 |
| (7) SCORER COMPUTER LANES 25-32 | (8) SCORER COMPUTER LANES 17-24 | (9) SCORER COMPUTER LANES 9-16 |
| (10) SCORER COMPUTER LANES 1-8 | (11) CONTROL DESK COMPUTERS | (12) VECTOR / VECTOR PLUS
CONTROL SYSTEM |



Vector - HD Lane Pair Communication Cabling (One Lane Pair Shown)

- | | | |
|-------------------------------------|-----------------------------|----------------------------------|
| (1) SCORER COMPUTER | (2) LANES 3-8 | (3) RS-232 |
| (4) TOUCH SCREEN OR KEYPAD | (5) RS-232 CONVERTER | (6) WIDE SCREEN OVERHEAD CONTROL |
| (7) LCD WIDE SCREEN TV-ONLY MONITOR | (8) LCD WIDE SCREEN MONITOR | (9) DISPLAY CONTROLLER |
| (10) GS-PINSETTER | (11) RS-485 | (12) DISTRIBUTION PCB |
| (13) BRUNSWICK AUTOMATED BUMPERS | (14) COM 2 | |

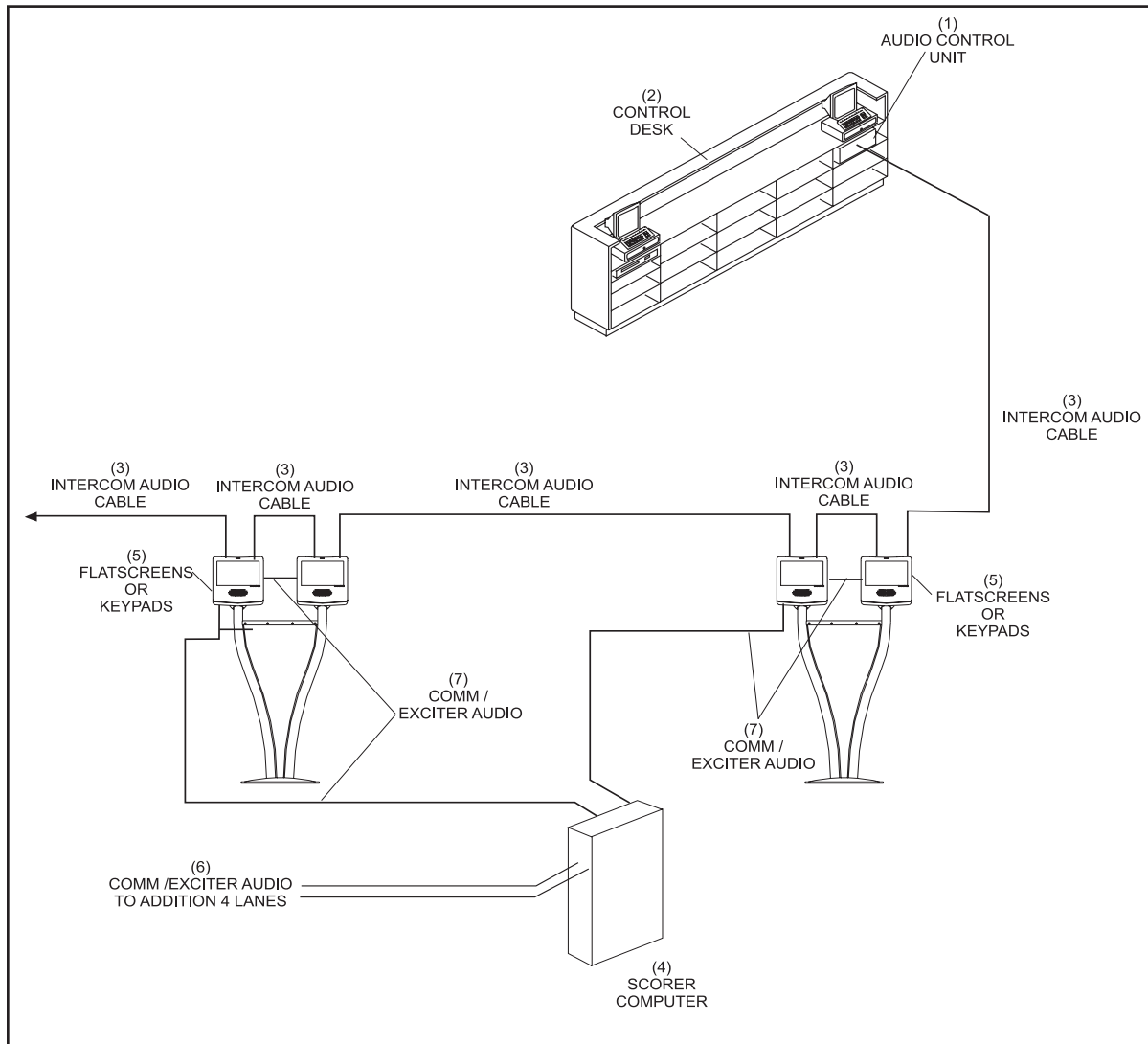
Two types of video are used in the Vector-HD system; Scoresheet and TV. The scoresheet video originates in the scorer computer and routes to optional lower flatscreen displays through a cat5 cable. Scorer video the overhead displays is generated by the Display Controller and connected to the displays through an HDMI cable. The TV signal originates at the control desk and is daisy chained to each overhead in the system. Refer to the figure titled *Vector System - Video Cabling (Wide Screen Overheads)*.



- System Overview 21

Audio

The audio for the Vector system originates from the scorer computer and the control desk's audio control unit. The scorer computer generates the exciter audio used in conjunction with the exciter graphics. This signal is integrated into the communication cable for the keypad or flatscreens. The audio control unit at the control desk provides intercom audio through a cable referred to as the global audio cable. This cable is routed to the keypad or flatscreen closest to the control desk. It then daisy-chains to the rest of the lanes. Refer to the figure titled *Vector System - Audio Cabling*.



Vector System - Audio Cabling

- | | | |
|--------------------------|----------------------------|--|
| (1) AUDIO CONTROL UNIT | (2) CONTROL DESK | (3) INTERCOM AUDIO CABLE |
| (4) SCORER COMPUTER | (5) FLATSCREENS OR KEYPADS | (6) COMM / EXCITER AUDIO TO ADDITIONAL 4 LANES |
| (7) COMM / EXCITER AUDIO | | |