VANDERBILT UNIVERSITY

Audio Visual Technology

Design Standards

Version 2.2

Contents

1.0 Change Log

Date	Version Number	Change Description
7/21/2025	2.0	Initial Release
9/11/2025	2.1	- Added Shure ANI4OUT as approved equipment in Appendix I. - Added Shure ANI4IN as approved equipment in Appendix I. - Added Audinate AVIO as approved equipment in Appendix I. - Added Lumens OIP-N60D Dante AV-H as approved equipment in Appendix I. - Added PTZ Optics Link 4K as approved equipment in Appendix I.
11/5/2025	2.2	- Removed QSC DSP as approved equipment in Appendix I. - Removed LG displays as approved equipment in Appendix I. - Specified CommScope SYSTIMAX cabling for field-built cables in section 8.0. - Clarified that all network connected equipment will need a dedicated drop in section 7.0. - Added Epson PowerLite L890U as approved equipment in Appendix I. - Added Epson EB-PU1008 as approved equipment in Appendix I. - Added Planar UltraRes P series as approved equipment display in Appendix I. - Added Planar Simplicity P series as approved equipment in Appendix I. - Added CommScope SYSTIMAX as approved equipment in Appendix I. - Added Vaddio AV Bridge Nano as approved equipment in Appendix I. - Added Biamp Desono series speakers as approved equipment in Appendix I.

2.0 Introduction

The purpose of this document is to ensure that consistency across installations is maintained in Vanderbilt University's technology enhanced learning spaces.

These guidelines will be used as the AV standard for renovations, as well as new construction projects that are managed by VUIT Classroom Technology. This is to ensure that projects meet the

needs of the faculty, staff, and students that will be using these spaces for classes as well as other academic and administrative activities.

This document is not intended to cover every type of space or scenario on campus. If there is a reason to deviate from the standards in this document, it is mandatory that the supplier consult with VUIT Classroom Technology before proceeding with work.

Additionally, this document primarily applies to spaces that are supported and maintained by VUIT Classroom Technology. Spaces at Vanderbilt University that are supported and maintained by other teams may have different standards and guidelines and should be consulted prior to any work.

3.0 Definitions

- **ADA** - The Americans with Disabilities Act which prohibits discrimination against people with disabilities in several areas, including employment, transportation, public accommodations, communications and access to state and local government' programs and services.
- **ANSI** - The American National Standards Institute (ANSI), a private, not-for-profit organization dedicated to supporting the U.S. voluntary standards and conformity assessment system and strengthening its impact, both domestically and internationally.
- **Audiovisual Integrator** - Any person or company commissioned by Vanderbilt University to perform installation, design, or service activities that is not an employee of Vanderbilt University.
- **AV Systems** - Audiovisual Systems include all equipment necessary to fulfil the intent of communicating audio and/or video content to an audience.
- **AVIXA** - A trade association representing the professional audiovisual and information communication industries worldwide.
- **Dante** - Digital Audio Network Through Ethernet is a combination of software, hardware, and network protocols that deliver uncompressed, multi-channel, low-latency digital audio over a standard Ethernet network using Layer 3 IP packets. Expanded to also include video transmission over a standard Ethernet network.
- **DSP** - Digital Sound Processor, a microprocessor that is dedicated to receiving the signal from the source and then routing it to an amplifier.
- **HDMI** - High-Definition Multimedia Interface, a proprietary audio/video interface for transmitting uncompressed video data and compressed or uncompressed digital audio data from an HDMI-compliant source device, such as a display controller, to a compatible computer monitor, video projector, digital television, or digital audio device.
- **InfoComm** - Former name of AVIXA before 2017; still seen in some publication references.
- **POE** - Power over Ethernet, a technology that lets network cables carry electrical power.
- **Rack** (cabinet, enclosure) - A frame or enclosure with mounting rails to house AV equipment.
- **RU** - Rack unit which, as defined in IEC 60297-3-100: 1 rack unit = 44.45 mm (1.75 inch) height.
- **USB-C or USB Type-C** - A 24-pin reversible connector (not a protocol) that supersedes all previous USB connectors, designated *legacy* in 2014, and also supersedes Mini DisplayPort and Lightning[3] connectors. USB-C can carry data, e.g. audio or video, power, or both, to connect to displays, external drives, mobile phones, keyboards, trackpads, mice, and

many more devices; sometimes indirectly via hubs or docking stations. It is used not only by USB technology, but also by other data transfer protocols, including Thunderbolt, PCIe, HDMI, DisplayPort, and others. It is extensible to support future protocols.
- **VU** - Vanderbilt University.
- **VUIT** - Vanderbilt University Information Technology.
- **VUIT Network Operations (NetOps)** - Unit within VUIT that designs and maintains the commercial network in use at Vanderbilt University. NetOps will also issue IP addresses and will also manage port activations for all equipment that utilizes network connections.

4.0 Space Descriptions

General Purpose Classrooms w/ movable furniture

Flat-floored space with movable furniture for flexible use. Standard technologies include lectern, display(s) (projector and/ or TVs), projector screen if needed, control, audio, wireless screen sharing, collaboration microphone and camera, microphone for voice amplification, USB-C and HDMI connections, and power. A lectern-based PC or Mac may be required depending on the academic unit that owns the space.

General Purpose Classrooms w/ fixed furniture

Flat-floored or tiered space with fixed tables. Standard technologies include lectern, display(s) (projector and/ or TVs), projector screen if needed, control, audio, wireless screen sharing, collaboration microphone and camera, microphone for voice amplification, USB-C and HDMI connections, and power. A lectern-based PC or Mac may be required depending on the academic unit that owns the space.

Computer Labs

Flat-floored lab space with computers installed on fixed tables. Standard technologies include lectern, display(s) (projector and/ or TVs), projector screen if needed, control, audio, wireless screen sharing, collaboration microphone and camera, microphone for voice amplification, USB-C and HDMI connections, and power. A lectern-based PC or Mac may be required depending on the academic unit that owns the space.

Lecture Halls

Large, tiered or sloped space. Standard technologies include lectern, display(s) (projector and/ or TVs), projector screen if needed, control, audio, wireless screen sharing, collaboration microphone and camera, microphone for voice amplification, USB-C and HDMI connections, and power. A lectern-based PC or Mac may be required depending on the academic unit that owns the space.

Active Learning Spaces

Flexible group seating space that can, but is not required to have, high-end technology. Standard technologies include lectern, display(s) (projector and/ or TVs), projector screen if needed, control, audio, wireless screen sharing, collaboration microphone and camera, microphone for voice amplification, USB-C and HDMI connections, and power. A lectern-based PC or Mac may be required depending on the academic unit that owns the space. Wireless and wired display connections and a display may also be required in each student pod.

Conference Room

A meeting space equipped with collaboration functionality, display(s), wireless and wired display connections.

Huddle/ Study Room

Small space seating one to five people. Minimal technology includes display (43"-55"), HDMI input for external source.

Multipurpose Space

Large, flat-floored space with moveable furniture that is designed to host a variety of programming. Standard technologies include lectern, display(s) (projector and/ or TVs), projector screen if needed, control, audio, wireless screen sharing, collaboration microphone and camera, microphone for voice amplification, USB-C and HDMI connections, and power. A lectern-based PC or Mac may be required depending on the academic unit that owns the space.

5.0 Display Devices

Projection Screen

Motorized electric screens mounting location will be determined during the design phase for best viewing angles. The screen can be ceiling mounted, or wall mounted depending on the design requirements of the space. Screen should be positioned 1ft away from the wall or whiteboard and must be a 16:10 aspect ratio. Screen should be tab-tensioned and conform to AVIXA/ANSI 10-2013 (DISCAS) – Display Image Size for 2D Content.

Projectors

WUXGA Laser based projectors with a minimum output of 8,000 lumens will be suitable for most locations on campus. This can vary based on the needs, size, and ambient light in a space. All projectors must have a minimum of HDMI and RS-232 control.

Projector Mounts

Projectors mounted in both hard ceilings as well as 2x2 or 2x4 grid ceilings should utilize Chief Manufacturing products and be installed using manufacturer specifications. Projector mounts should be new, unless otherwise noted, and the model chosen pre-approved by VUIT Classroom Technology.

Flat Panel Displays

Flat Panel Displays should be commercial grade, 4K displays with a minimum size of 55". Final sizing is dependent on the application and should conform to AVIXA/ANSI 10-2013 (DISCAS) – Display Image Size for 2D Content. Display should have a minimum of 3 HDMI inputs.

Flat Panel Mounts

Flat panel mounts should utilize Chief Manufacturing products and be installed using manufacturer specifications. Flat panel mounts should be new, unless otherwise noted, and the model chosen pre-approved by VUIT Classroom Technology.

6.0 Audio and Video

Audio - Voice Amplification

All learning spaces will require a minimum of one voice reinforcement microphone, typically lavalier style. The microphone will be rechargeable and stationed on the lectern top and will be placed in a charging unit when not in use. The microphone should also be tied in for voice capture for remote participants. Type and quantity will be determined during the design phase.

Audio - Voice Capture

All learning spaces will require a minimum of one ceiling-based, beam-forming microphone that will be used to capture in-room audio for remote participants. Type and quantity will be determined during the design phase.

Audio - Speakers, Amplifiers, and DSP

All learning spaces will require either ceiling speakers or wall-mounted speakers depending on the design and physical infrastructure of the space. Type and quantity of speakers, as well as the size of the DSP and amplifiers will be determined during the design phase.

Cameras

All learning spaces will require a minimum of two PTZ cameras that are capable of transmitting video via the Dante AV-H protocol without using a separate Dante AV-H encoder. One camera will be installed in the front of the space to capture a view of the in-room participants. One camera will be installed in the rear of the space to capture a view of the instructor as well as the whiteboard or chalk board. Camera control will be incorporated into the touch panel located on the classroom lectern and will be connected to the AV switcher for USB bridging.

AV Switcher

All learning spaces will utilize an AV switcher capable of ingest of HDMI, USB-A, and USB-C signals. Switcher must also be capable of serving as a USB hub for switching between USB host devices. Switcher must also be capable of USB-C connectivity to BYOD devices. HDCP and EDID settings will be set such that sources that use HDCP encryption will allow display via all output sources in the room.

Collaboration Soundbar

Meeting Rooms, Conference Rooms, and Huddle Spaces can be equipped with an all-in-one, collaboration soundbar that is capable of HDMI and USB-C connectivity. Soundbar should also have the capability to connect expansion microphones for extended range audio capture. Size and type will be determined during the design phase.

Signal Transport - AVoverIP

In learning spaces, video and audio signals will be transported between source and sink utilizing Crestron NVX transmitters (Tx) and receivers (Rx). Transmitters and receivers will be connected to the Vanderbilt network. Additional requirements will be found in section 7.0. Additionally, HDCP and EDID settings will be set such that sources that use HDCP encryption will allow display via all output sources in the room.

7.0 System Control

Crestron Enabled Spaces

Learning spaces that require a control processer and are supported by VUIT Classroom Technology will utilize Crestron based control processors. Unless otherwise specified, each space will utilize Crestron VC-4 for device control and signal routing. Each space will also require a Crestron TS series touch panel. Panel size and location will be determined during the design phase. Additionally, all touch panel GUI designs must follow VUIT GUI Guidelines **(Appendix III)**.

Conference, Meeting, and Huddle Space Control

For Conference, Meeting, and Huddle Spaces that are designed to be dedicated Microsoft Teams Rooms (MTR), a control surface will be required to enable native MTR functionality.

8.0 Network Connectivity

All equipment that requires a network connection must be connected to the Vanderbilt network. VLAN and IP information will be supplied by VUIT. Device MAC addresses are required for an IP address to be provisioned. Network port locations and counts will be determined during the design phase. **Please note that per VUIT NetOps, local switches are prohibited.** For reference, a typical classroom will require 14 network drops and each device that requires a network connection will need to be connected to a dedicated drop. Pulling a network connection from a courtesy port on another network device is not allowed.

9.0 Cabling and Equipment Rack

Cables

Cables must be bundled using Velcro and labeled at both ends. Zip ties for cable bundling is prohibited. If Zip ties are found to be used, final sign off on project completion will be withheld until zip ties are replaced with Velcro. Field built category cables must be tested and confirmed as defect-free before installation and utilize CommScope Systimax cables, part numbers can be found in **Appendix I**. Most buildings will offer CAT6 connections, but there are buildings where CAT6A is utilized. Building infrastructure will be verified during the design phase.

Conduit

Conduit should be a minimum of 1.5" and have adequate room for growth. Dedicated pathways must be coordinated with VUIT Network Design and Engineering as well as affiliated trades.

Equipment Racks

In equipment racks and lecterns, lacing bars will be used for more efficient cable management. Racks must have either rear entry, side entry, or have slide-out capability for serviceability as well as lockable. Racks should also be standard 19" width. Sufficient airflow should also be confirmed prior to deployment. Elevations should be preapproved by VUIT Classroom Technology before build out.

10.0 Touch Panel GUI

For all spaces that are supported by VUIT Classroom Technology and utilize a Crestron touch panel, the VUIT GUI guidelines **(Appendix III)** shall be followed. All GUI programming must be reviewed and approved by VUIT Classroom Technology before deployment. When a scenario exists that is not covered by the guideless, the design must be reviewed and approved by VUIT Classroom Technology before deployment.

11.0 ADA Compliance

For all spaces, ADA compliance must be taken into account in the design and placement of AV equipment.

12.0 Deliverables

At the conclusion of each project, the following items are required to be submitted to VUIT Classroom Technology.

- All as-built drawings.
- All copies of uncompiled Crestron code.
- All Crestron VT-Pro files.
- DSP programming.
- Product cut sheets.
- Lectern and mount keys.
- Equipment serial numbers.
- Crestron dealer purchase order numbers as well as digital copies of purchase orders.
- All passwords used or required to access equipment settings.

Appendix I – Standard Equipment List

The following is a list of manufacturers and in some cases specific equipment that will be specified for use in AV projects in spaces that are supported and maintained by VUIT Classroom Technology. This is not an exhaustive list, and any substitutions or use of equipment by manufacturers not listed must be pre-approved by VUIT Classroom Technology.

Equipment Type	Manufacturer	Model	Notes
Amplifier	Lab Gruppen	E Series	
Amplifier	Q-SYS	SPA2	
AV Switcher	Lightware	UCX-4x2-HC40	
AV Switcher	Lightware	UCX-4x3-HC40	
Control Processor	Crestron	VC-4	
Control Touch Panel	Crestron	TS-770	
Control Touch Panel	Crestron	TS-1070	
Document Camera	Epson	DC Series	
Document Camera	WolfVision	VZ-8neo.UHD	
Document Camera	WolfVision	VZ-3neo.UHD	
DSP	Shure	IntelliMix P300	
DSP	Biamp	Tesira	Dante only, AVB is prohibited
Ethernet Module	Crestron	CEN-IO-RY-104	
Ethernet Module	Crestron	CEN-IO-RY-102	
Flat Panel Display	Sony	BZ40L Series	
Mount - Flat Panel Display	Chief	Tempo Flat Panel Wall Mount System	
Mount - Flat Panel Display	Chief	Fusion Wall Tilt	
Mount - Flat Panel Display	Chief	Thinstall Swing Arm Display Mount	
Mount - Flat Panel Display	Chief	Fusion Pull Out Accessory	Required for all Fusion Wall Tilt installations
Mount – Computer Monitor	Chief	Kontour K1D120B	
Portable Cart - Flat Panel Display	Peerless-AV	SmartMount SR860	For 43"-75" displays
Portable Cart - Flat Panel Display	Peerless-AV	SmartMount SR898	For 55"-110" displays
Lectern	Spectrum Industries	Honors Lectern	Color and options will be project dependent
Lectern	Computer Comforts	EVOLVE Lectern	Color and options will be project dependent

Microphone - Beam-forming	Shure	MXA920	
Microphone – Charging Base	Shure	SBC200	
Microphone - Lavalier	Shure	MX185	
Microphone - Transmitter	Shure	QLXD1	
Microphone - Transmitter	Shure	QLXD2/DM58	
Microphone - Receiver Voice Amplification	Shure	QLXD4	
PDU	Middle Atlantic	RLNK-P915R	
PDU	Middle Atlantic	RLNK-P215	
Projector - Fixed Installation	Panasonic	PT-MZ682	
Projector - Fixed Installation	Panasonic	PT-MZ782	
Projector - Fixed Installation	Panasonic	PT-MZ882	
Projector - Fixed Installation	Epson	PowerLite L890U	
Projector - Fixed Installation	Epson	EB-PU1008	
Projector - Interactive Short Throw	Epson	BrightLink 1485Fi	
Projector - Short Throw	Panasonic	PT-CMZ50	
Projector - Short Throw	Epson	PowerLite 770F	
Projector - Short Throw Lens	Panasonic	ET-D3LEU101	
Projector - Short Throw Lens	Panasonic	ET-D3LEU101	
Projector Screen	Da-Lite	Tensioned Advantage Series	
Scheduling Panel	Crestron	TSS-7	
Scheduling Panel	Crestron	TSS-10	
Speakers	Q-SYS	AC-C6T	
Speakers	Crestron	SAROS IC6T	
Speakers	Biamp	Desono Series	
Speakers	JBL	Control 25 series	
Speakers	Bose	EdgeMax series	
Wireless Presentation	Crestron	AM-3200-WF	
Wireless Presentation	WolfVision	Cynap Pure Pro	For Roberts Academy Only
Wireless Presentation Connect Adapter	Crestron	AM-TX3-100	For Conference, Meeting, and Huddle Room Use Only
Cables - HDMI	Comprehensive	Integrator Series	NFHD18G (4K Model Line)
Cables - USB-C	Comprehensive	Integrator Series	USB10G (10G Model Line)

Cables - USB-A	Comprehensive	Integrator Series	
Cables - Category	CommScope	SYSTIMAX	CAT6 Non-Plenum 1071E YL
Cables - Category	CommScope	SYSTIMAX	CAT6 Plenum 2071E YL
USB Extension	Icron	Raven 3204C	
USB Extension	Icron	Starling 3251C	
USB Extension	Icron	Raven 3104	
Collaboration Bar	Logitech	RallyBar	
Collaboration Bar	Logitech	RallyBar Huddle	
Collaboration Bar	Logitech	RallyBar Mini	
Collaboration Bar	Logitech	MeetUp 2	
Collaboration Bar - Control	Logitech	TapIP	Not needed if the room will be BYOD only.
Collaboration Bar - Extension Microphone	Logitech	Rally Mic Pod	
Receiver – Dante AV-H	Lumens	OIP-N60D Dante AV-H	
Receiver – Dante	Shure	ANI4OUT	
Receiver – Dante	Audinate	AVIO	
Transmitter – Dante	Audinate	AVIO	
Transmitter – Dante	Shure	ANI4IN	
Camera – PTZ	PTZ Optics	Link 4K	
AV Bridge	Vaddio	AV Bridge Nano	

Appendix II - Supplier Expectations

- It is the responsibility of the supplier to secure parking information from Vanderbilt University Parking Services.
- Supplier will coordinate hours of work with VUIT prior to the start of a project. It is expected that the supplier will check in with a designated VUIT Classroom Technology representative when arriving on-campus for work.
- Suppliers will provide VUIT Classroom Technology with a communication plan that includes a list of contacts and project responsibilities. VUIT Classroom Technology will provide the supplier with contact they will be working with on the project.
- Supplier will make VUIT Classroom Technology aware if they will be using subcontractors and what roles those subcontractors will have on the project.
- Supplier will need to have a minimum of one full-time staff member with a Vanderbilt issued ID card to allow for building access.
- Any Supplier staff that will need to access the Vanderbilt network must have an active VUNet ID issued. VUNet ID credentials cannot be shared.
- Supplier will dispose of all trash and will leave the room in a clean condition.

- Supplier will provide required information for programmer access to Crestron VC-4 server at beginning of the project.
- To ensure timely access, all Supplier technical staff will be required to secure, in advance, access to the Vanderbilt VPN.
- Before hand off, Supplier will complete a final walk through with VUIT Classroom Technology and secure sign off on project completion from a VU representative.

Appendix III - VUIT GUI Guidelines

Elements of the GUI

The GUI is made of 5 pages and a background image. The 5 pages are the Top Page, Left Page, Center Page, Right Page, and Bottom Page. The background image is sized to fit the touch panel display area. Each section below will show the elements that go into making each page. All the pages together will display the operating needs for a Room's AV system. These settings apply to every element of the GUI unless otherwise noted.

TABLE 1-GUI SETTINGS

WIDTH	10":**1280px** 7":**1024px** 5":**800px**
HEIGHT	10":**800px** 7":**600px** 5":**480px**
GUI THEME	**CT Neo**
GUI FONT	**Crestron Sans Pro**
GUI FONT COLOR	HEX: **#ffffff** RGB: **255,255,255**

Top Page

The Top Page contains the current operating information including the Date and Time, The current Selected Input, and the Status of the Room AV System.

Figure 1-10" GUI Top Page
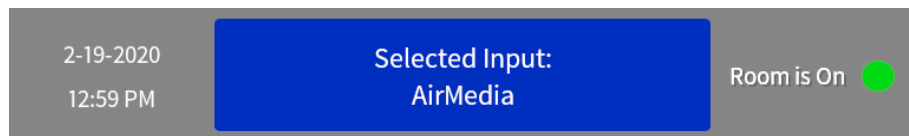
Figure 2-7" GUI Top Page
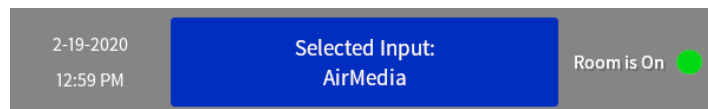
Figure 3-5" GUI Top Page

TABLE 2-GUI TOP PAGE DESIGN SETTINGS

WIDTH	10": **960px** 7": **768px** 5": **600px**
HEIGHT	10": **150px** 7": **113px** 5": **90px**
BACKGROUND COLOR	HEX: **#c0c0c0** RGB: **192,192,192**

BACKGROUND OPACITY	Percentage: **39.2**	Alpha: **100**
ALIGNMENT	**Center Top of GUI.**	

Elements in the Top Page

The Top Page is made up of three elements, a display of the Date and Time on the left, in the middle is an area to display information about the Selected Input, and an area to the right that shows the on/off status of the Room AV System.

Date and Time

The Date and Time area is made of two widgets, a Digital Date Time widget for the Date, and a Digital Date Time Widget for the Time. Both widgets are centered horizontally in the space to the left of the Selected Input button in the Top Page and the widgets are stacked on top of one another and centered vertically in the Top Page.
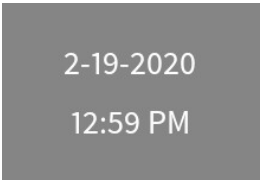
Figure 4-10" Top Page Date Time Widgets
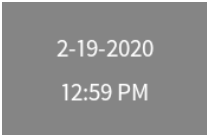
Figure 5-7" Top Page Date Time Widgets
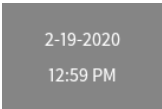
Figure 6-5" Top Page Date Time Widgets

TABLE 3-TOP PAGE DATE TIME DESIGN SETTINGS

TYPE	Widgets		
WIDTH	10": **175px**	7": **141px**	5": **110px**
HEIGHT	10": **50px**	7": **38px**	5": **30px**
BACKGROUND OPACITY	Transparent		
FONT SIZE	10": **28px**	7": **21px**	5": **16px**
FONT ALLIGNMENT	Center	Middle	
TEXT SHADOW	None		
ALIGNMENT	Centered horizontally in left of Top Page. Vertical middle of Top Page.		

Selected Input Information

The Selected Input Information area displays information about what input has been selected for display on the AV system. The Selected Input button is centered horizontally and vertically in the Top Page.

Selected Input:
AirMedia

Figure 7-10" Top Page Selected Input Area

Selected Input:
AirMedia

Figure 8-7" Top Page Selected Input Area

Selected Input:
AirMedia

Figure 9-5" Top Page Selected Input Area

TABLE 4-TOP PAGE SELECTED INPUT DESIGN SETTINGS

BUTTON STYLE	**275-Standard Advanced Button**
ICON STYLE	**168-Media Transports Light**
WIDTH	10":**525px** 7":**420px** 5":**328px**
HEIGHT	10":**125px** 7":**90px** 5":**73px**
BUTTON STATES	**7-Standard Blue Active**
FONT SIZE	10":**28px** 7":**24px** 5":15**px**
FONT ALLIGNMENT	**Center Middle**
TEXT SHADOW	**None**
ALIGNMENT	**Centered horizontally in Top Page.** **Vertical middle of Top Page.**

System Status

The System Status area shows information graphically and textually about the on/off status of the room AV system. The elements are distributed equally horizontally in the space to the right of the Selected Input button in the Top Page, and centered vertically in the Top Page.

Figure 10-10" Top Page System Status Area
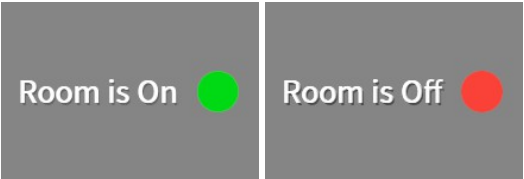
Figure 11-7" Top Page System Status Area

Figure 12-5" Top Page System Status Area
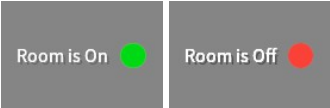
TABLE 5-TOP PAGE SYSTEM STATUS TEXT DESIGN SETTINGS

TEXT STYLE	**65-H2 Common Text**		
WIDTH	10":**139px**	7":**111px**	5":**87px**
HEIGHT	10":**88px**	7":**66px**	5":**53px**
BACKGROUND OPACITY	**Transparent**		
FONT SIZE	10":**28px**	7":**21px**	5":**16px**
FONT ALIGNMENT	**Center**	**Middle**	
TEXT SHADOW	**Yes**		
ALIGNMENT	**Evenly distributed horizontally in right of Top Page.** **Vertical middle of Top Page.**		

TABLE 6-TOP PAGE SYSTEM STATUS LED DESIGN SETTINGS

BUTTON STYLE	**276-Round Advanced Btn**		
ICON STYLE	**168-Media Transports Light**		
WIDTH & HEIGHT	10":**35px**	7":**26px**	5":**21px**
BUTTON STATES	**10-Round Green Active** **14-Round Red Up** **1-Round Common Down**		
ALIGNMENT	**Evenly distributed horizontally in right of Top Page.** **Vertical middle of Top Page.**		

Left Page

The Left Page contains the main room controls including the Home/Back button, the Picture Mute button, and the Aux Controls of the Room AV System.
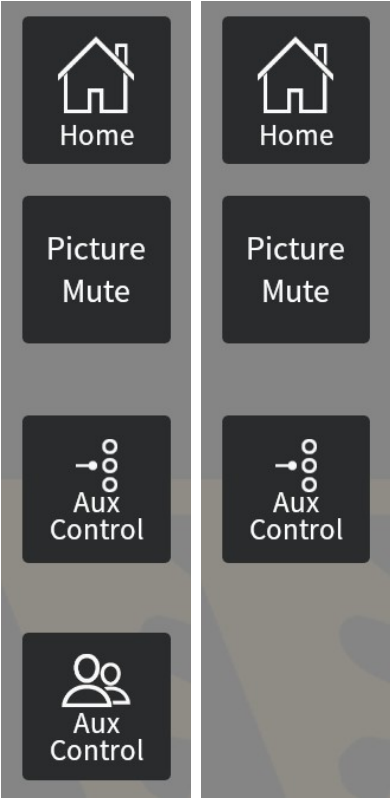
Figure 13-10" GUI Left Page
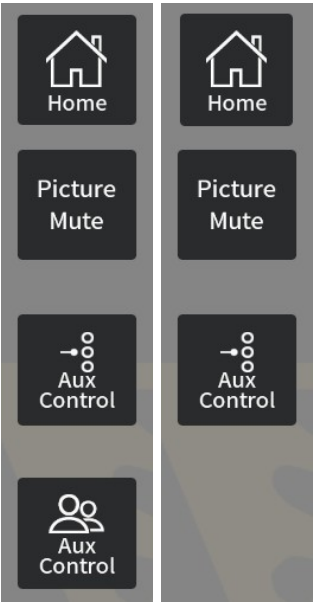
Figure 14-7" GUI Left Page
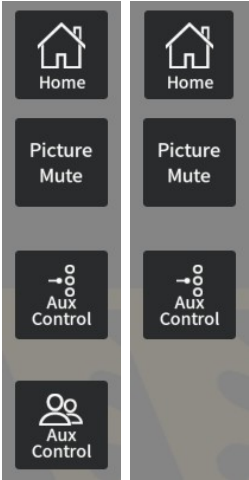
Figure 15-5" GUI Left Page

TABLE 7-GUI LEFT PAGE DESIGN SETTINGS

WIDTH	10": **160px** 7": **128px** 5": **100px**
HEIGHT	10": **675px** 7": **506px** 5": **405px**
BACKGROUND COLOR	HEX: **#c0c0c0** RGB: **192,192,192**
BACKGROUND OPACITY	Percentage: **39.2** Alpha: **100**
ALIGNMENT	**Top Left of GUI.**

Elements in the Left Page

The Left Page is made up of three elements, a Home Button for navigating to the Home Page of the GUI at the top. Next, aligned with the top of the Center Page, is the Picture Mute Button for blanking the display, and an area at the bottom, Aux Controls for extra features of the Room AV System.

Home Button

The Home Button is for navigating to the Home Page of the GUI. It is centered vertically in the space of the Top Page and centered horizontally in the Left Page.

Figure 16-10" Left Page Home Button

Figure 17-7" Left Page Home Button

Figure 18-5" Left Page Home Button

TABLE 8-LEFT PAGE HOME BUTTON DESIGN SETTINGS

BUTTON STYLE	**1-Standard Common Button**
ICON STYLE	**168-Media Transports Light**
ICON TYPE	**14-Home**
WIDTH	10": **125px** 7": **95px** 5": **75px**
HEIGHT	10": **125px** 7": **95px** 5": **75px**
FONT SIZE	10": **25px** 7": **18px** 5": **15px**
FONT ALIGNMENT	**Center** **Middle**
TEXT SHADOW	**None**
ALIGNMENT	**Centered horizontally in Left Page. Vertical middle of Top Page.**

Picture Mute

The Picture Mute Button is for blanking the video from the AV system. It is aligned vertically with the top of the Center Page and centered horizontally in the Left Page.

Figure 19-10" Left Page Picture Mute Button

Figure 20-7" Left Page Picture Mute Button

Figure 21-5" Left Page Picture Mute Button

TABLE 9-LEFT PAGE PICTURE MUTE BUTTON DESIGN SETTINGS

BUTTON STYLE	**275-Standard Advanced Button**
ICON STYLE	**168-Media Transports Light**
ICON TYPE	**None**
WIDTH	10": **125px** 7": **95px** 5": **75px**
HEIGHT	10": **125px** 7": **95px** 5": **75px**
BUTTON STATES	**0-Standard Common Up** **1-Standard Common Down** **16-Standard Red Active**
FONT SIZE	10": **25px** 7": **18px** 5": **15px**
FONT ALIGNMENT	**Center** **Middle**
TEXT SHADOW	**None**
ALIGNMENT	**Centered horizontally in Left Page.** **Aligned vertically with top of Center Page.**

Aux Controls Area

The Aux Controls are for accessing extra features of the AV system. One control is centered vertically with the middle of the Center Page and centered horizontally in the Left Page. A second control will be aligned vertically with the bottom of the Center Page and centered horizontally in the Left Page.
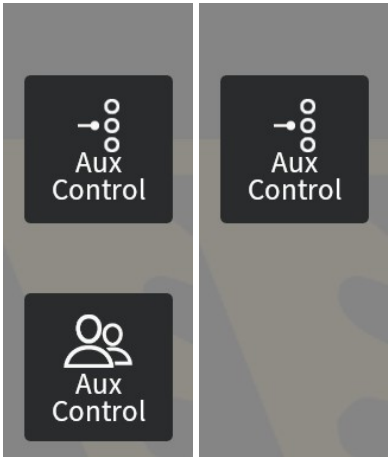
Figure 22-10" Left Page Aux Controls Area
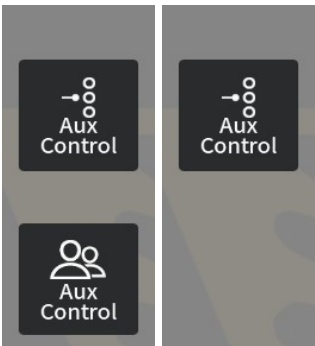
Figure 23-7" Left Page Aux Controls Area
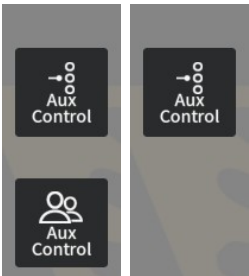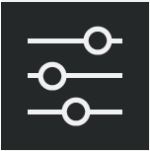
Figure 24-5" Left Page Aux Controls Area

TABLE 10-LEFT PAGE AUX CONTROLS DESIGN SETTINGS

BUTTON STYLE	**275-Standard Advanced Button**
ICON STYLE	See **Table 11-Aux Controls Buttons Icons**
ICON TYPE	See **Table 11-Aux Controls Buttons Icons**
WIDTH	10": **125px** 7": **95px** 5": **75px**
HEIGHT	10": **125px** 7": **95px** 5": **75px**
FONT SIZE	10": **25px** 7": **18px** 5": **15px**
FONT ALIGNMENT	**Center Middle**
TEXT SHADOW	**None**
ALIGNMENT	**Centered horizontally in Left Page. First button aligned vertically with middle of Center Page. Second button aligned vertically with bottom of Center Page.**

TABLE 11-AUX CONTROLS BUTTONS ICONS

MANUAL ROUTING	**119-Connector Plate**	
VIDEO CONFERENCING	**67-Users**	
RESET EQUALIZER	**78-Settings**	
CAMERA CONTROL	**54-Game**	
OVERFLOW CONTROL	**196-Settings Alt**	

Center Page

The Center Page is where most of the controls for the features of the AV System are accessed. The Page is centered horizontally and vertically in the GUI.
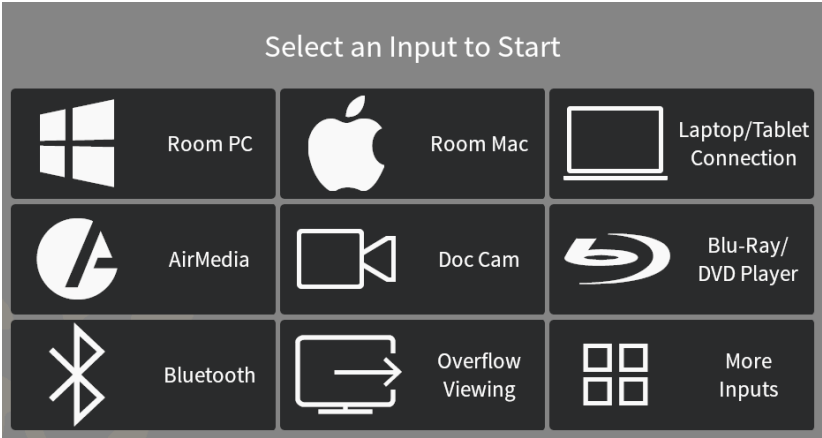
Figure 25-10" GUI Center Page
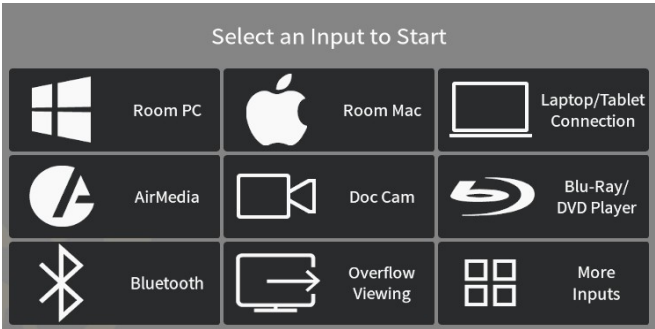
Figure 26-7" GUI Center Page
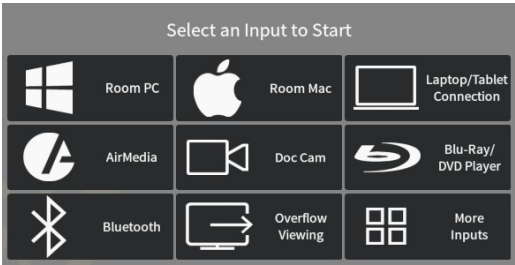
Figure 27-5" GUI Center Page

TABLE 12-GUI CENTER PAGE DESIGN SETTINGS

WIDTH	10": **930px**	7": **744px**	5": **581px**
HEIGHT	10": **495px**	7": **371px**	5": **297px**
BACKGROUND COLOR	HEX: **#c0c0c0**	RGB: **192,192,192**	
BACKGROUND OPACITY	Percentage: **39.2**	Alpha: **100**	
ALIGNMENT	**Horizontal Center of GUI. Top is 15px from bottom of Top Page.**		

Elements of the Center Page

The Center Page is a group of all the different controls needed for controlling the various elements of the AV System. The most common are the Source Select page, The Help Request & Reply page, the System Off Confirmation/On Standby page, the Laptop Source select page and the Disc Player Control page. The Center Page is also where the Aux Controls will appear such as the Advanced Routing page, Overflow Control, and Video Conferencing Control page. The Center Page also will be where the various Room Controls will be shown including Light Controls, Projector Controls, Shade Controls, and the Screen Control page. Lastly the Center Page will be where the hidden Tech Control pages are shown along with any individual Microphone Controls.

Source Select

The Source Select page is the first thing a user will normally interact with on the Vanderbilt GUI. It is displayed by default and is the preferred method to turn the AV System on. Up to nine input buttons can be displayed at once and should be arranged as depicted in the table below depending on the number of sources available in the AV System. The buttons should be centered horizontally for one button, distributed horizontally on each row in the Center Page for 3 buttons, and centered with spacing equal to that of 3 distributed buttons between them for 2 buttons. Three rows should be distributed evenly vertically in the Center Page along with the Page Title.

TABLE 13-SOURCE SELECTION ALIGNMENT GUIDE ICONS

1 button horizontally centered.

2 buttons horizontally centered.

3 buttons horizontally centered.

4 buttons horizontally centered.

5 buttons horizontally centered.

6 buttons horizontally centered.

7 buttons horizontally centered.

8 buttons horizontally centered.

9 buttons horizontally centered.

TABLE 14-SOURCE SELECT BUTTON

(LOCATION) OVERFLOW	144-VIDEO OUTPUT	
(LOCATION) (TYPE) WALLPLATE/INPUT	143-VIDEO INPUT	
AIRMEDIA	205-AIRMEDIA	
APPLE TV	111-APPLE	
BLU RAY/DVD PLAYER	2-BLU-RAY	
BLUETOOTH	116-BLUETOOTH	
CASSETTE PLAYER	CASSETTE_V3	
CD PLAYER	CD_V3	
DOC CAM	99-CAMERA	
LAPTOP/TABLET INPUT	103-LAPTOP	
LASERDISC	LD-LOGO_V2	
MORE INPUTS	128-GRID	

TABLE 15-SOURCE SELECT BUTTON/TITLE DESIGN SETTINGS

BUTTON	BUTTON WIDTH x HEIGHT TITLE HEIGHT	275-Standard Advanced
STYLE TITLE	BUTTON/TITLE FONT SIZE FONT	Button 65-H2 Common Text
STYLE ICON	ALIGNMENT	See Table 14-Source Select Button Icons
STYLE ICON TYPE	TEXT SHADOW ALIGNMENT	See **Table 14-Source Select Button Icons**

10”:**300x125px**
7”:**240x94px**

5”:**188x75px**

10”: **55px**	7”: **41px**		
	5”: **34px**		

10”: **25/35px**	7”:		
18/26px	5”:		
15/21px			

Center

Mid

dle

Buttons: **None**   Title:
**Yes Centered
horizontally in
Center Page.**

Distributed evenly in rows
and columns as above.

PHONE	**23-PHONE**
RECORD PLAYER	**PHONO-GRAPH_V1**
ROOM MAC	**111-APPLE**
ROOM PC	**145-WINDOWS**
VCR PLAYER	**30-RECORD**

Help Request & Reply

The Help Request and Reply pages give the user of the AV System several preset messages for requesting assistance with using the AV System. The Help Request page has four buttons linked with preset messages that will email those messages to a specified email address via Fusion. These buttons are equally distributed vertically with the page title in the Center Page and aligned left horizontally in the Center Page.
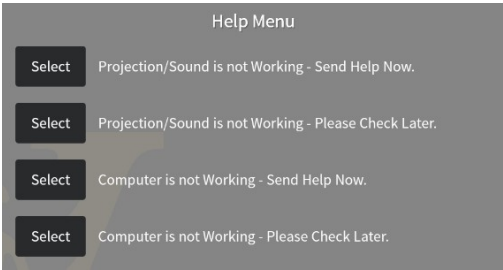
Figure 28-10" Help Request
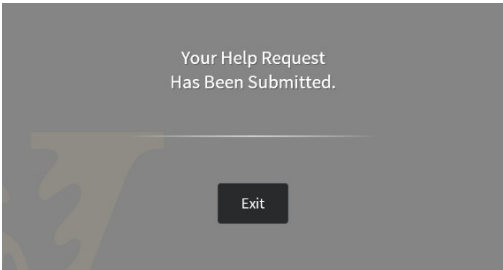
Figure 29-10" Help Reply
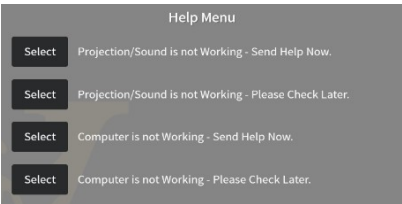
Figure 30-7" Help Request
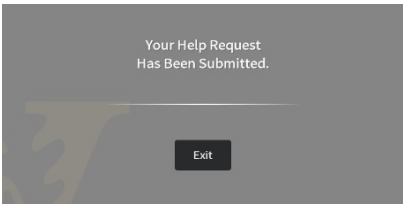
Figure 31-7" Help Reply
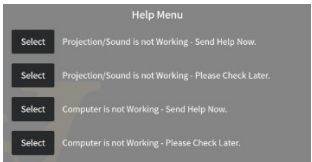
Figure 32-5" Help Request
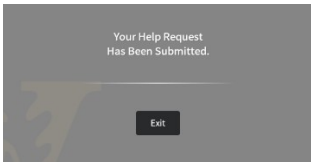
Figure 33-5" Help Reply

TABLE 16-HELP REQUEST/REPLY BUTTON/TITLE DESIGN SETTINGS

BUTTON STYLE	**1-Standard Common Button**
TITLE STYLE	**65-H2 Common Text**
ICON STYLE	**168-Media Transports Light**
ICON TYPE	**None**
BUTTON WIDTH x HEIGHT	10":**135x75px** 7":**108x56px** 5":**84x45px**
TITLE HEIGHT	10": **75px** 7": **56px** 5": **45px**
BUTTON/TITLE FONT SIZE	10": **28/35px** 7": **21/26px** 5": **16/21px**
FONT ALIGNMENT	**Center** **Middle**
TEXT SHADOW	Buttons: **None** Title: **Yes**
ALIGNMENT	**Centered horizontally in Center Page.** **Distributed evenly vertically in Center Page.**

System On Standby & System Off Confirm

The System On Wait page, and the System Off Confirm page let the user manage the power state of the AV System. The On Wait page hides other controls while the system first starts up, and notifies the user the system is starting up. The Off Confirm page gives the user a chance to be sure they want to turn the system off when the Power Button is pressed to avoid accidental presses. It contains two buttons so the user can choose to turn the system off or return to the previous screen and resume System operation. These buttons are equally distributed horizontally, and equally distributed vertically with the page title in the Center Page.


Figure 34-10" On Standby page
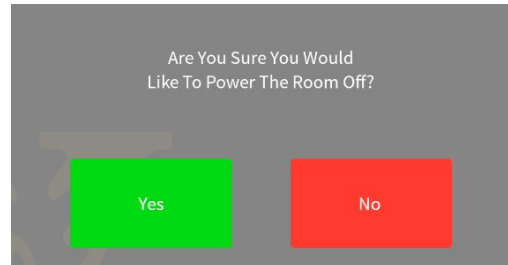
Figure 35-10" Off Confirm page

Figure 36-7" On Standby page

Figure 37-7" Off Confirm page

Figure 38-5" On Standby page
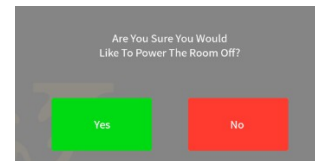
Figure 39-5 Off Confirm page

TABLE 17-ON/OFF CONFIRM BUTTON/TITLE DESIGN SETTINGS

BUTTON STYLE	**275-Standard Advanced Button**
TITLE STYLE	**65-H2 Common Text**
ICON STYLE	**168-Media Transports Light**
ICON TYPE	**None**
BUTTON WIDTH x HEIGHT	10":**135x75px** 7":**108x56px** 5":**84x45px**
TITLE HEIGHT	10": **75px** 7": **56px** 5": **45px**
BUTTON/TITLE FONT SIZE	10": **28/35px** 7": **21/26px** 5": **16/21px**
FONT ALIGNMENT	**Center** **Middle**
TEXT SHADOW	Buttons: **None** Title: **Yes**
ALIGNMENT	**Centered horizontally in Center Page.** **Distributed evenly vertically in Center Page.**

Laptop Source & Blu Ray Controls

The Laptop Source Select and the Blu Ray Controls pages are control pages for specific input sources. They appear when the source is chosen for display so the user can control these specific sources more granular controls. The Laptop Select buttons are centered horizontally, and equally distributed vertically with the page title in the Center Page. The Blu Ray Controls buttons are equally distributed/centered horizontally, and equally distributed vertically with the page title in the Center Page.

Figure 40-10" Laptop Select page
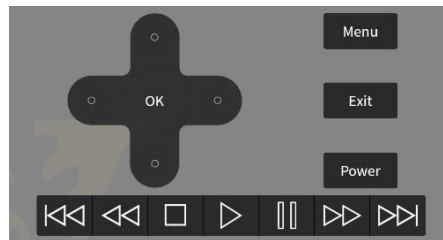
Figure 41-10" Blu Ray Controls page

Figure 42-7" Laptop Select page
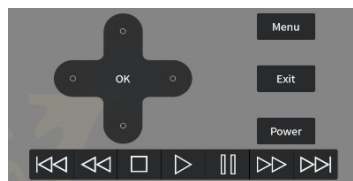
Figure 43-7" Blu Ray Controls page

Figure 44-5" Laptop Select page
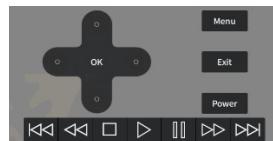
Figure 45-5 Blu Ray Controls page

TABLE 18-LAPTOP/BLU RAY BUTTON ICONS

FWD	**13-FWD**	
HDMI	**HDMI.PNG**	
MINI DISPLAY PORT	**MINI-DP.PNG**	
NEXT	**21-NEXT**	
PAUSE	**22-PAUSE**	
PLAY	**24-PLAY**	
PREVIOUS	**29-PREVIOUS**	
REW	**33-REW**	
STOP	**38-STOP**	
USB-C	**USB-C.PNG**	

TABLE 19-LAPTOP SELECT/BLU RAY BUTTON/TITLE DESIGN SETTINGS

LAPTOP/BLU RAY BUTTON STYLE	**275-Standard Advanced Button**	**1-Standard Common Button**	
BLU RAY D-PAD/HORIZONTAL TAB STYLE	**22-D-Pad-Common**	**Crestron Tab Button-Horizontal**	
TITLE STYLE	**65-H2 Common Text**		
ICON STYLE	**168-Media Transports Light**		
ICON TYPE	**Table 18-Laptop/Blu Ray Button Icons**		
LAPTOP BUTTON WIDTH x HEIGHT	10":**300x125px**	7":**240x94px**	5":**188x75px**
BLU RAY BUTTON WIDTH x HEIGHT	10":**135x75px**	7":**108x56px**	5":**84x45px**
TITLE HEIGHT	10": **55px**	7": **41px**	5": **34px**
LAPTOP BUTTON/TITLE FONT SIZE	10": **25/35px**	7": **18/26px**	5": **15/21px**
BLU RAY BUTTON/TITLE FONT SIZE	10": **28/None**	7": **21/None**	5": **16/None**
FONT ALIGNMENT	**Center**	**Middle**	
TEXT SHADOW	Buttons: **None**	Title: **Yes**	
ALIGNMENT	**Laptop centered and Blu Ray distributed evenly horizontally in Center Page. Distributed evenly vertically in Center Page.**		

Right Page

The Right Page contains the main audio controls including the Program Volume, and the Mic Volume. It also contains the Power Off button for the Room AV System.
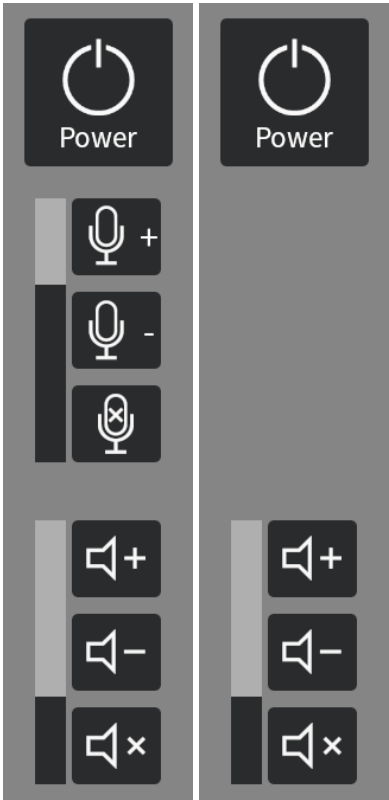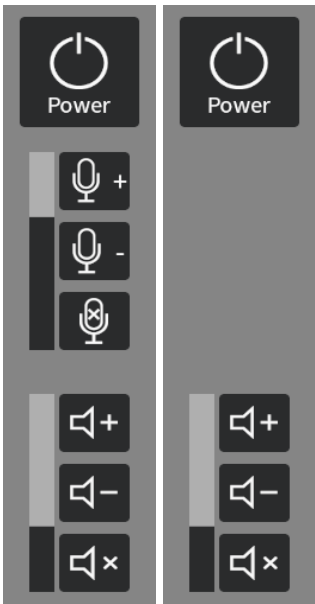

Figure 46-10" GUI Right Page
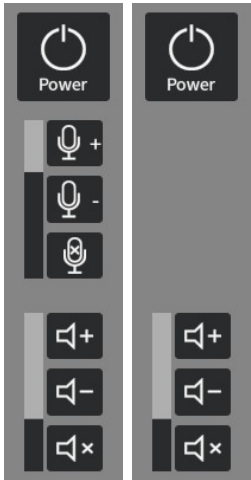

Figure 47-7" GUI Right Page

Figure 48-5" GUI Right Page

TABLE 20-GUI RIGHT PAGE DESIGN SETTINGS

WIDTH	10": **160px** 7": **128px** 5": **100px**
HEIGHT	10": **675px** 7": **506px** 5": **405px**
BACKGROUND COLOR	HEX: **#c0c0c0** RGB: **192,192,192**
BACKGROUND OPACITY	Percentage: **39.2** Alpha: **100**
ALIGNMENT	**Top Right of GUI.**

Elements in the Right Page

The Right Page is made up of three elements, a Power Button for turning the AV System off at the top. Next, aligned with the top of the Center Page, is the Mic Volume Gauge for controlling the sound level from any mics in the Room AV System, and at the bottom is the Program Volume Gauge for controlling the sound levels for the Room AV System.

Power Button

The Power Button is for turning the AV System off. It is centered vertically in the space of the Top Page and centered horizontally in the Right Page.

Figure 49-10" Right Page Power Button

Figure 50-7" Right Page Power Button

Figure 51-5" Right Page Power Button

TABLE 21-RIGHT PAGE POWER BUTTON DESIGN SETTINGS

BUTTON STYLE	**275-Standard Advanced Button**
ICON STYLE	**168-Media Transports Light**
ICON TYPE	**27-Power**
WIDTH	10": **125px** 7": **95px** 5": **75px**
HEIGHT	10": **125px** 7": **95px** 5": **75px**
BUTTON STATES	**0-Standard Common Up** **1-Standard Common Down** **0-Standard Common Up**
FONT SIZE	10": **25px** 7": **18px** 5": **15px**
FONT ALIGNMENT	**Center Middle**
TEXT SHADOW	**None**
ALIGNMENT	**Centered vertically in Left Page. Aligned horizontally with top of Center Page.**

Mic Volume

The Mic Volume Gauge is for controlling the sound level from any mics in the Room AV System. It is aligned vertically with the top of the Center Page and centered horizontally in the Right Page.
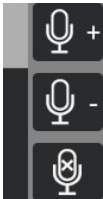

Figure 52-10" Right Page Mic Volume Gauge

Figure 53-7" Right Page Mic Volume Gauge

Figure 54-5" Right Page Mic Volume Gauge

TABLE 22-RIGHT PAGE MIC VOLUME GAUGE DESIGN SETTINGS

GAUGE STYLE	**375-Liquid Vertical Gauge Black**
GAUGE WIDTH x HEIGHT	10":**26x223px** 7":**21x1567x** 5":**16x134px**
BUTTON STYLE	**275-Standard Advanced Button**
ICON STYLE	**168-Media Transports Light**
ICON TYPES	**62-Mic** **62-Mic** **74-Mic Mute**
BUTTON WIDTHS x HEIGHTS	10":**75x65px** 7":**59x49px** 5":**47x39px**
TOP BUTTON STATES	**0-Standard Common Up** **4-Standard Accent Down** **7-Standard Blue Active**
MIDDLE BUTTON STATES	**0-Standard Common Up** **4-Standard Accent Down** **7-Standard Blue Active**
BOTTOM BUTTON STATES	**0-Standard Common Up** **4-Standard Accent Down** **16-Standard Red Active**
FONT SIZE	10": **32px** 7": **24px** 5": **19px**
FONT ALIGNMENT	**Right** **Middle**
TEXT SHADOW	**None**
ALIGNMENT	**Centered vertically in Right Page. Aligned horizontally with top of Center Page.**

Program Volume

The Program Volume Gauge is for controlling the sound level from the Room AV System. It is aligned vertically with the bottom of the Center Page and centered horizontally in the Right Page.

Figure 55-10" Right Page Program Volume Gauge

Figure 56-7" Right Page Program Volume Gauge

Figure 57-5" Right Page Program Volume Gauge

TABLE 23-RIGHT PAGE PROGRAM VOLUME GAUGE DESIGN SETTINGS

GAUGE STYLE	**375-Liquid Vertical Gauge Black**
GAUGE WIDTH x HEIGHT	10":**26x223px** 7":**21x1567x** 5":**16x134px**
BUTTON STYLE	**275-Standard Advanced Button**
ICON STYLE	**168-Media Transport Light**
ICON TYPES	**46-Volume Hi** **46-Volume Lo** **48-Volume Mute**
BUTTON WIDTHS x HEIGHTS	10":**75x65px** 7":**59x49px** 5":**47x39px**
TOP BUTTON STATES	**0-Standard Common Up** **4-Standard Accent Down** **7-Standard Blue Active**
MIDDLE BUTTON STATES	**0-Standard Common Up** **4-Standard Accent Down** **7-Standard Blue Active**
BOTTOM BUTTON STATES	**0-Standard Common Up** **4-Standard Accent Down** **16-Standard Red Active**
FONT SIZE	10": **32px** 7": **24px** 5": **19px**
FONT ALIGNMENT	**Right** **Middle**
TEXT SHADOW	**None**
ALIGNMENT	**Centered horizontally in Right Page.** **Aligned vertically with top of Center Page.**

Bottom Page

The Bottom Page contains the room controls for equipment used with the AV System including the Help button, the Room Controls of the Room AV System, and the Tech Page button/Room Name.
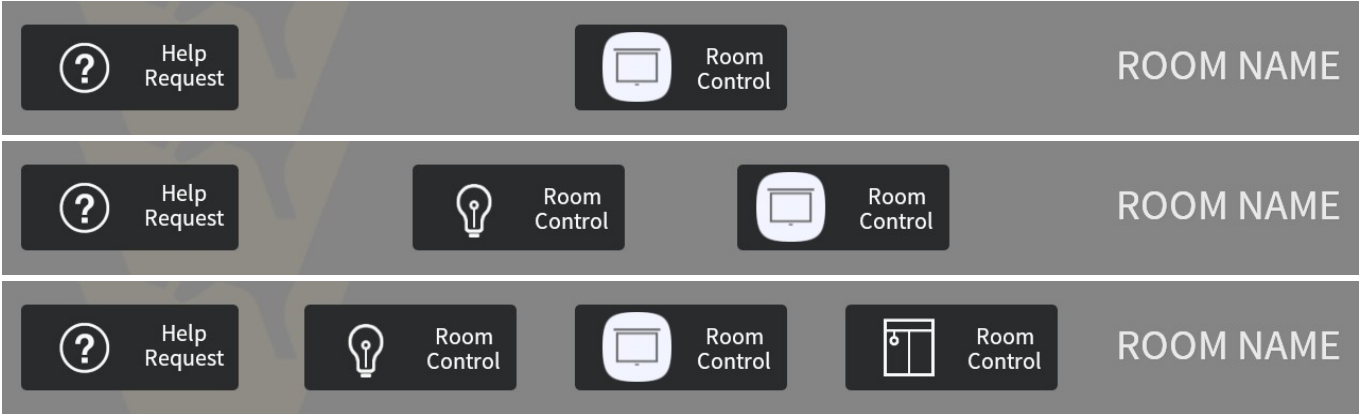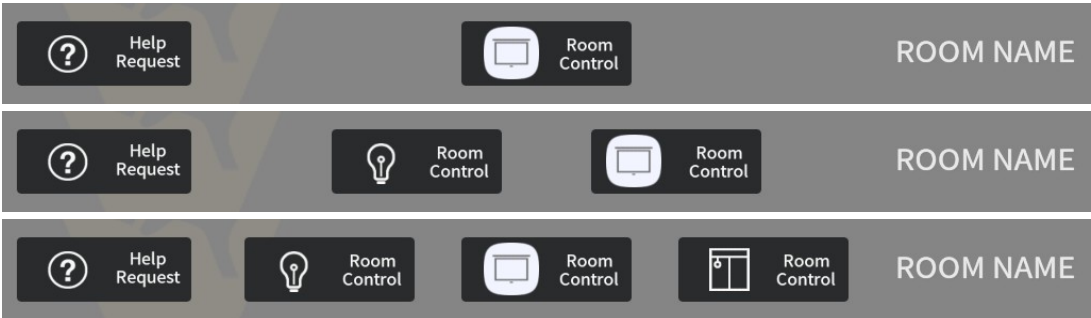

Figure 58-10" GUI Bottom Page
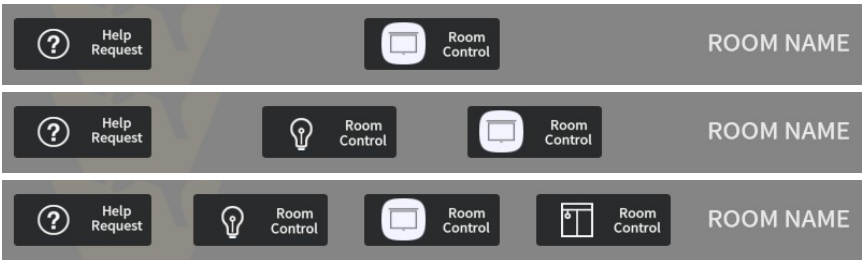

Figure 59-7" GUI Bottom Page

Figure 60-5" GUI Bottom Page

TABLE 24-GUI BOTTOM PAGE DESIGN SETTINGS

WIDTH	10": **1280px** 7": **1024px** 5": **800px**
HEIGHT	10": **125px** 7": **94px** 5": **75px**
BACKGROUND COLOR	HEX: **#c0c0c0** RGB: **192,192,192**
BACKGROUND OPACITY	Percentage: **39.2** Alpha: **100**
ALIGNMENT	**Left Bottom of GUI.**

Elements in the Bottom Page

The Bottom Page is made up of three elements, a Help Button for requesting assistance with using the AV System at the left. Next, is an area in the middle, Room Controls for equipment used with the AV System, aligned with the controls of the Center Page, and the Tech Button/Room Name for accessing the special controls for Tech personnel.

Help Button

The Help Button is for requesting assistance with using the AV System. It is centered vertically in the space of the Bottom Page and left aligned horizontally with the controls of the Left Page.
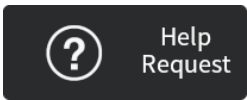
Figure 61-10" Bottom Page Help Button
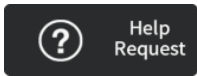
Figure 62-7" Bottom Page Help Button
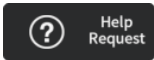
Figure 63-5" Bottom Page Help Button

TABLE 25-BOTTOM PAGE HELP BUTTON DESIGN SETTINGS			
BUTTON STYLE	275-Standard Advanced Button		
ICON STYLE	168-Media Transports Light		
ICON TYPE	57-Help		
WIDTH	10": **205px**	7": **164px**	5": **128px**
HEIGHT	10": **80px**	7": **60px**	5": **48px**
FONT SIZE	10": **22px**	7": **16px**	5": **13px**
FONT ALIGNMENT	Center	Middle	
TEXT SHADOW	None		
ALIGNMENT	Aligned horizontally with controls in the Left Page. Vertical middle of Bottom Page.		

Room Controls Area

The Room Controls are for controlling equipment used with the AV System. One control is centered horizontally vertically in the Bottom Page. Two or Three controls will be distributed evenly horizontally in the center space of the Bottom Page and centered vertically in the Bottom Page.
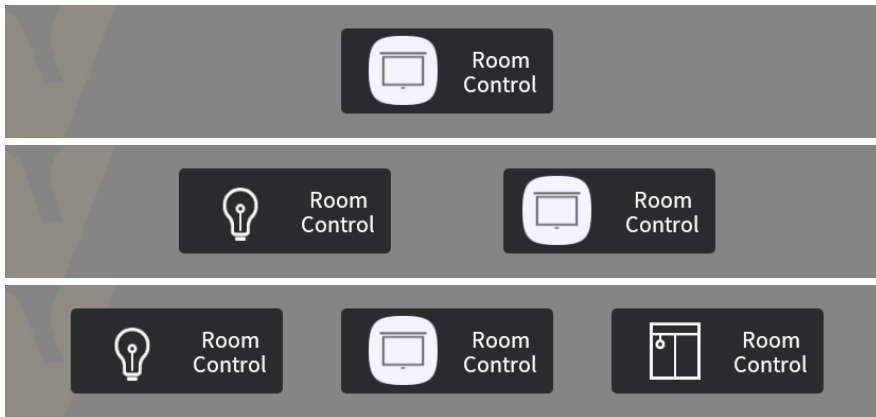
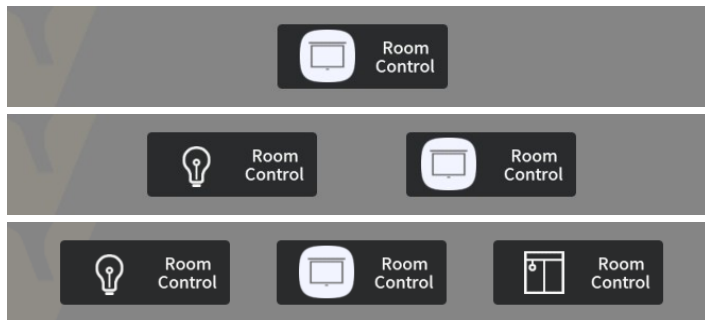*Figure 64-10" Bottom Page Room Controls Area*
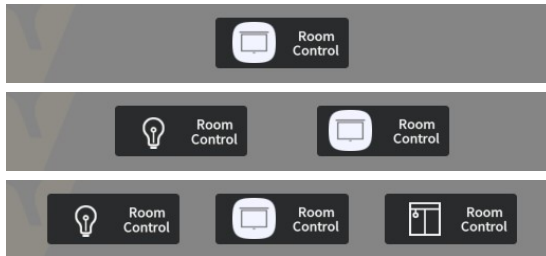

Figure 65-7" Bottom Page Room Controls Area

Figure 66-5" Bottom Page Room Controls Area

TABLE 26-ROOM CONTROLS ICONS

LIGHTS	**17-Lights**	
ROOM MODE	**192-Group**	
SCREEN(S)	**95-Icons Sm** **32-Screen**	
SHADES	**79-Shades**	
PROJECTOR(S)	**98-Projector**	
MIC(S)	**62-Mic**	

TABLE 27-ROOM CONTROLS AREA DESIGN SETTINGS

BUTTON STYLE	**275-Standard Advanced Button**		
ICON STYLE	See **Table 26-Room Controls Icons**		
ICON TYPE	See **Table 26-Room Controls Icons**		
WIDTH	10": **200px**	7": **160px**	5": **125px**
HEIGHT	10": **80px**	7": **60px**	5": **48px**
FONT SIZE	10": **22px**	7": **16px**	5": **13px**
FONT ALIGNMENT	**Center**	**Middle**	
TEXT SHADOW	**None**		
ALIGNMENT	**Centered vertically in Bottom Page.** **One button centered horizontally in Bottom Page.** **Two or Three buttons distributed evenly horizontally in the center space of the Bottom Page.**		

Tech Button/Room Name

The Tech Button/Room Name is for accessing the special controls for Tech personnel. This transparent button is horizontally aligned right with the buttons in the Right Page and vertically centered in the Bottom Page.
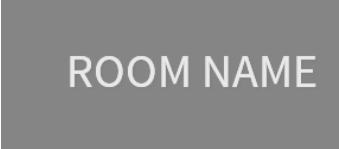

Figure 67-10" Bottom Page Tech Button/Room Name

Figure 68-7" Bottom Page Tech Button/Room Name

Figure 69-5" Bottom Page Tech Button/Room Name

TABLE 28-BOTTOM PAGE TECH BUTTON/ROOM NAME SETTINGS	
BUTTON STYLE	**264-Transparent Button**
ICON STYLE	**168-Media Transports Light**
ICON TYPE	**None**
WIDTH	10": **250px**　　7": **200px**　　5": **155px**
HEIGHT	10": **80px**　　7": **60px**　　5": **48px**
FONT SIZE	10": **44px**　　7": **33px**　　5": **26px**
FONT ALIGNMENT	**Right**　　　　　　　**Middle**
TEXT SHADOW	**Yes**
ALIGNMENT	**Right aligned horizontally with controls in the Right Page.** **Vertical middle of Bottom Page.**

Background

The background image has the Vanderbilt Branding. It should always us the Vanderbilt V logo in the specified colors. The background will be an image file provided for use in the program.

Figure 70-10" GUI Background

Figure 71-7" GUI Background

Figure 72-5" GUI Background

TABLE 29-GUI BACKGROUND DESIGN SETTINGS

WIDTH	10":**1280px** 7":**1024px** 5":**800px**
HEIGHT	10":**800px** 7":**600px** 5":**480px**
BACKGROUND COLOR	HEX: **#3e3e3e** RGB: **62,62,62**
V COLOR	HEX: **#5d5540** RGB: **93,85,64**
ALIGNMENT	**Top Left of GUI.**