



University of Colorado  
Colorado Springs

# UCCS AUDIO VISUAL SYSTEMS GENERAL STANDARDS & GUIDELINES

Prepared by UCCS OIT Academic Support

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## Introduction, References and Thanks

This document was created to ensure that all new and upgraded audiovisual spaces are made to the same standard that UCCS OIT is trying to set in conjunction with Academic Support.

If there are any questions or deviations from this document, OIT must be contacted for further consultation before any installation.

UCCS OIT uses the following documents to help with the specific guidelines of AV work performed at UCCS:

- a. **AVIXA**, F501.01:2015 *“Cable Labeling for Audiovisual System (CLAS)”*
- b. **AVIXA**, F502.01:2018 *“Rack Building for Audiovisual Systems”*
- c. **AVIXA**, V202.01:2016 *“Display Image Size for 2D Content in Audiovisual Systems”*
- d. **AVIXA**, 2M-2010 *“Standard Guide for Audiovisual Systems Design and Coordination Processes”*

We would also like to thank the University of Nebraska-Lincoln Information Technology Services Audio Visual Design Build team for letting UCCS use their “Audio Visual Systems General Standards & Guidelines” document as a template for our own.

## Definitions

**OIT**– UCCS Office of Information Technology or comparable authority.

**Active Learning Spaces** – Student centered, interactive, integrated, flexible learning spaces that are designed to be more traditional. Learning should be between students and between students and faculty.

**ADA** – American’s with Disabilities Act

**Audio Visual Integrator** – Any person or company commissioned by UCCS to perform work on audio video systems apart from UCCS Staff

**Auditorium** – A large venue theater in which the primary purpose is to teach. It should be versatile enough to accommodate large events.

**Breakout Room** – Any space on campus that seats less than 20 people and has the primary purpose of teaching. Breakout rooms are typically next to larger classrooms for group work amongst students.

**Conference Room** -- A small space designed for meetings with an AV control system. This space does not have the primary purpose of teaching.

**Film Screening Room** – The purpose of this room is for viewing films with the highest quality. This includes an upgraded 4k projector and surround sound preferably up to 7.1.

**HDBaseT** – promoted and advanced by the HDBaseT Alliance, is a consumer electronic (CE) and commercial connectivity standard for transmission of uncompressed high-definition video (HD), audio, power, home networking, Ethernet, USB, and some control signals, over a common category

cable (Cat5e or above) using the same 8P8C modular connectors used by Ethernet

**HDCP** – High-bandwidth Digital Content Protection is a form of digital copy protection developed by Intel Corporation to prevent copying of digital audio and video content as it travels across connections

**HDMI** – High-Definition Multimedia Interface is 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 International** – Trade association representing the professional audiovisual and information communication industries worldwide

**POE** –Power over Ethernet (POE) is a technology that lets network cables carry electrical power-to-power small electrical devices

**RU** – Rack unit equivalent to 1.75 inches of vertical space in an AV rack

**Standard Classroom** – Any space on campus that seats more than 20 students and has the primary purpose of teaching

**Uncontrolled Conference Room** – A small space designed for meetings with no AV control system. This space does not have the primary purpose of teaching.

**VTC** – Video Teleconference

## Physical Requirements for AV Systems

### Equipment Racks

Audiovisual equipment will be mounted in standard 19-inch racks. There needs to be a minimum clearance to one side, the front and the rear of the rack of 36 inches. Some equipment installed may not have rack mounts or the capability to attach rack mount wings/brackets to them. If this is the case a 1RU shelf needs to be installed, and the equipment must be secured using an OIT approved method.

In support of future growth at the University, only 80% of rack space shall be used. Blank panels shall be installed in those spaces that are not being utilized.

All racks and furniture must be locked with a lock/keyset provided by OIT specifications. Two keys for every lock will also be provided. If the furniture is from Spectrum Industries, then the keys provided by this manufacturer are acceptable.

The audiovisual equipment for the presenter is to be mounted in suitable 19-inch wide racks, within the lectern rack area. Specific mounting layouts will be determined during the design phase.

In those special circumstances where rear rack access cannot be provided, there must be a slide out option for easy servicing. There also must be enough width and depth for the rack and loop of cables. This is to clear any obstruction and hinges.

For equipment that cannot be installed in an AV rack (user accessible or display mounted) it is

acceptable to mount equipment behind a display or on a lectern surface, pending OIT approval. For AV systems with limited equipment requiring storage, it is acceptable to place all equipment in a backbox or other plenum-rated storage, pending OIT approval.

Rack location will be determined during the design phase and must be approved by OIT.

### Power

120V AC rack mounted power conditioners with power overload switches will be provided, as required, for equipment installed. Power conditioners will have no more than 77% of load to allow for high start-up loads. Load calculations will be provided to OIT prior to installation of equipment. Additional power conditioners must be added if additional outlets are required or load limits are reached.

Power strips and extension cords may not be used for AV installations.

### Ceiling Mounted Racks

Ceiling mounted racks should not be used in AV systems due to heat and serviceability concerns. It is preferred that floor racks or in-cabinet racks be used and suitable ventilation be provided.

### Lecterns

Each learning space must have a rack and a lectern. If a lectern is to be excluded, written permission from OIT must be provided in advance. Smaller rooms, such as [breakout rooms](#), may use a wall-mounted station for the "podium PC."

Conference rooms do not require racks or lecterns.

Lectern location will be determined during the design phase and must be approved by OIT.

Equipment being used by the faculty will be installed above the rack door and equipment not being used by the faculty will be placed below the door.

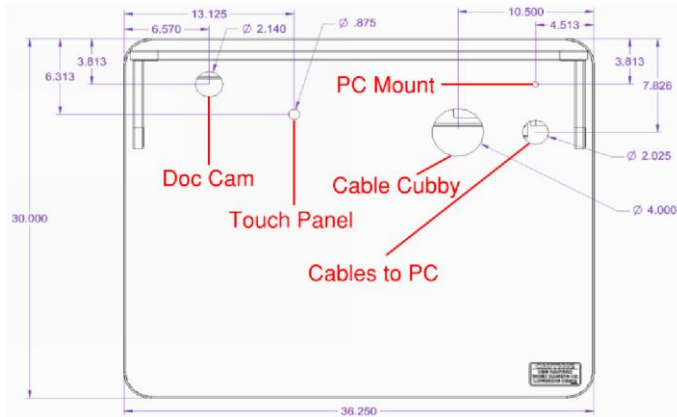
All power, network, audio, and relay cables required for the AV equipment must be terminated inside the equipment rack, not at the lectern or behind lectern kick-plates.

### ADA Lectern Layout

Cables for each device must be routed through their designated cutouts on the lectern and must be long enough to reach their destination (switcher, data port, outlet). Extension cables will not be accepted.

Right Hand: Right hand lecterns are for when the PC is on the right side of the lectern, but the lectern is

placed on the left-hand side of the classroom.



*Right-handed lectern layout*

The left-handed layout will be like the above, except lectern will be placed on the right side of the room with the equipment mirrored on the opposite side. For clarification, please contact OIT. For any clarification or instruction regarding installation of equipment please refer to manufacturer’s installation guides.

ADA Lecterns should be ordered 4-6 weeks before expected deployment as they are a custom piece of furniture.

### Ventilation

Regardless of location, there must be enough ventilation to prevent unwanted temperatures (temperatures in excess of manufacturer recommendations). With the currently standardized lecterns, this should not be a problem, except when current standard lectern cannot be used or if specialized equipment is installed.

All equipment should remain at an acceptable operating temperature to prevent the equipment from:

- a. Failure due to overheating
- b. Reduced life due to prolonged overexposure to high temperatures.

Temperatures should be managed per AVIXA Standard F502.01 Rack Building standards.

### Room Layout

Any final lectern position must comply with ADA regulations and laws. Lectern must be out of the view of any screen and positioned either stage right or stage left. Any design with a center positioned lectern will not be approved.

Sightlines must be checked in both plan and elevation documents to ensure all students have an unobstructed view of all areas of the screen and whiteboard. This includes the placement of the lectern and all mounted AV equipment.

### Projection Surfaces

#### Screen Size

Screen sizes need to be determined in advance per AVIXA “DISCAS” standards. Screens that do not meet these standards will require written permission from OIT.



## Single Screen Projection

Image and screen will be centered and provide acceptable viewing angles and sightlines to all seating positions.

Final screen position will be determined during the design consultation process, and any variation to this will not be accepted unless written permission is supplied by OIT before installation.

## Dual Screen Projection

Final screen positions need to be consulted with OIT to make sure desired specifications are achieved for maximum viewing capabilities and sightlines for students.

In dual screen projection systems, both screens must provide acceptable viewing angles and sightlines to all seating positions.

## Specialty Screens

For any screen that is not an OIT standard, consult with OIT during the design phase. These applications include screening rooms as well as huddle space rooms.

## Display Devices

All display devices must have a minimum native resolution of 1920x1080.

All display devices must be in 16:9 format.

All display devices must have the required type and number of digital inputs for the program plan of that specific space, without the use of adapters or converter boxes.

## Projectors

UCCS OIT requires laser projectors for all our classrooms and breakout rooms. Model will be determined by the room size and needs.

Projectors should be placed such that the screen can be filled with a projected image, using the standard lens for that model. If this is not possible, please consult with OIT to obtain approval for any nonstandard lens configuration.

All Projectors must have ports for RS-232C, LAN connections and HDbT as well as support for Crestron RoomView.

Final product selection and mounting position will be determined during the design consultation process and any variation to this will not be accepted unless written permission is supplied to OIT before installation.

## Flat Panel Displays

All flat panel displays must have RS-232C for controlling unit and variable audio output.

All display devices must have the required type and number of digital inputs for the program plan of that specific space, without the use of adapters or converter boxes.

## Flat Panel Display Mounts

Flat panel mounts must be installed per the manufacturers' recommended specifications and should not exceed the recommend weight capacity. Displays should be installed using a mount that is rated for a maximum capacity that is 2x the weight of the panel being used.

Final product selection and mounting position will be determined during the design consultation process

and any variation to this will not be accepted unless written permission is supplied to OIT before installation.

## AV Control and Switching

### AV Control

OIT control equipment is exclusively Crestron. If Crestron has no product able to meet specifications and needs of the room, consult with OIT to find an acceptable product. OIT will not accept a nonstandard control system from the AV integrator without written permission prior to installation.

### AV Switching

UCCS utilizes Creston switching equipment for most spaces. Any space that has been designated to be converted from analog to digital, or any space that is designated to be configured to output High Definition, will require a Crestron Room Control.

## Audio

Due to variants of room space and size, consultation with OIT must be used during the design phase to support audio for voice reinforcement and playback.

Final speaker specification and installation location must be determined in consultation with OIT during the design process. The audio in each space will need to be individually tuned to maximize the audio quality for rooms.

Microphones and lavalier mics are dependent on the room space and the room use. Please consult with OIT during design phase to see if the room requires voice reinforcement. All microphone lines must be balanced with XLR inputs.

## Lighting

All rooms with projection screens must have board lights that can be turned off.

## Standard Configurations

Each of these spaces is required to have every item listed in the feature set. If any changes are made, written approval must be provided by OIT.

All classrooms (does not apply to conference rooms) must be equipped with a telephone provided by UCCS OIT to be wall mounted at ADA height near the lectern or podium PC.

All rooms should be designed for mono audio unless specified by program plan.

## Standard Classroom

Required Features:

- Stationary ADA Lectern
- Sources
  - Podium Computer (specs provided by UCCS OIT)
  - Document Camera
  - Blu-Ray Player
  - Wireless Presentation Device
  - Cable Caddy for user input
    - HDMI

- Ethernet
  - Power
- Touch Panel AV Controller
- AV Switcher and control system
- ADA sound reinforcement input/output
- 16:9 electric recessed screen
- Laser Projector
- In-ceiling Speakers
- Occupancy sensors

### Small Classroom

These are standard classrooms that are flexible spaces in that they do not have an installed lectern and can be configured for any event, with or without the use of the AV system.

Required Features:

- Sources
  - HDMI Input
  - Wireless Presentation Device
  - Wall mounted PC (specs provided by UCCS OIT)
    - May be replaced with display built-in pc
- Display (to be determined by room size and needs)
  - Interactive Display with built-in PC
  - Short-throw interactive projector
- AV Control System with wall mounted control panel
- In-ceiling Speakers

### Large Classroom

A large classroom has an occupancy of greater than 50 people.

Requires all features of standard classroom plus:

- Wireless lavalier and handheld microphones with 2 separate receivers
- Assistive Listening System
- Multiple displays (if applicable to room usage)

### Lecture Capture (HyFlex) Add-On

To add a lecture capture system to any classroom or large classroom, the following features should be added to the base system:

- PTZ camera
- Audio DSP (or utilize control system dsp)
- Array Microphone to capture all instructors and audience members
- An AV bridge device to capture the camera, program audio, and microphone output and connect over USB to the podium PC
- Additional displays to show remote students (optional depending on room size)

### Active Learning Add-On

An active learning space includes:

- Movable chairs/tables or tables configured into groupings (often referred to as pods)

- Multiple projection/viewing systems
- Multiple whiteboards/writing surfaces

Required features include all features of a standard classroom or breakroom depending on the program plan. Additional features may include:

- Movable furniture
- Multiple displays to meet program plan needs
- Multiple inputs to meet program plan needs
- Matrix switching system or distribution amp

### Meeting Room

A Meeting Room is a small space for meeting with 2-10 people. This space does not include any control panels and automatically powers on/off based on room occupancy.

These rooms include:

- Commercial Flat Panel Display
- Wireless Presentation Device
- Occupancy Sensor
- HDMI Input at 18 inches AFF

### Conference Room

A Conference Room is a meeting space for 5-25 people. This space includes functionality for local and remote meetings with a VTC system included.

These rooms include:

- Interactive display with a built-in PC
- Camera
- Microphones
- Soundbar or Ceiling Speakers

## Network and Security Infrastructure Requirements

Registration of devices will be managed through OIT. All devices when deployed will have the latest stable version of firmware installed. Serial numbers and MAC addresses for all devices must be provided to OIT at least two weeks prior to installation.

It is preferred that network switches be included in any AV system with 3 or more network-connected devices. Switch specifications and configuration will be provided by UCCS OIT.

Devices that require POE power should receive power from the in-rack switch.

Network cabling should adhere to UCCS Construction Standards: Division 27 – IT/Communications.

### Floor Boxes

Floor boxes shall provide the interface for power, communication and/or audio/visual cabling in an above grade floor. Floor boxes shall be flush style, shall exceed UL scrub water exclusion requirements for tile and carpet floors, and shall be complete with covers, brackets and hardware to support installation as shown on Drawings.

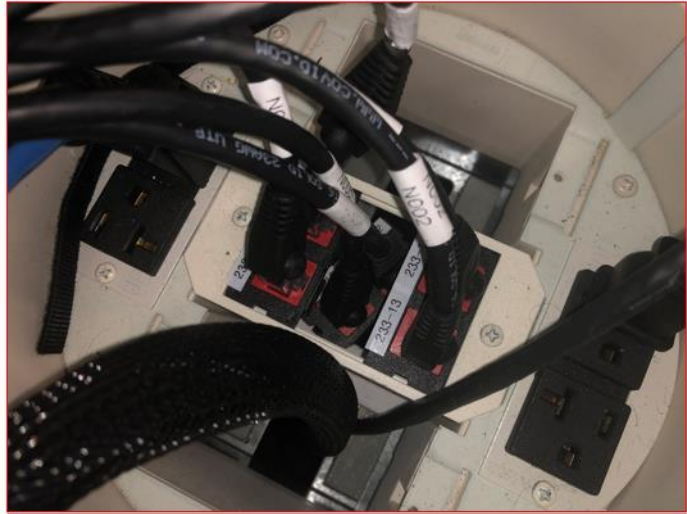
Floor boxes must be installed in a location that is determined by AV design and positioned in such a way that all AV equipment does not interfere with sight lines. Please see [Room Layout](#) specifications above.

Floor boxes may be combined for use by both power and communications where shown on the Drawings. When combined, provide metal dividers separating power from communications and provide separate conduits for power and communications.

Floor boxes shall be complete with brackets, cover plates, and/or other means to support power, communications, and/or audio-visual type connectors shown on the Drawings or called for in the Specifications. All connections in the floor box must be terminated at an interface plate. Pass through cables will not be accepted.



Acceptable: Floor box with all cables terminated at connection plates.



Not Acceptable: Floor box with unterminated cables passing through floor box.

### Phone Locations

Please consult with OIT Academic Support to determine if a phone is needed in a room. If a phone is needed, please see the following criteria.

Phones will be mounted on the wall close to the lectern or podium pc, installed to meet ADA requirements. If needed, OIT can provide a phone for assistance in determining a location for port.

### AV Equipment Passwords

All AV equipment that is on the network will be required to have the default password changed to one provided by OIT. Once the AV design is approved, OIT will provide the passwords that should be set for the specific equipment included in the design. As a standard, each type of equipment (dmps, touch panel, AirMedia, etc.) will share a password.

## Audio Visual Systems Cabling Installation Specifications

### Cabling

All cabling must be secure and routed in a way that meets AVIXA standards. Cables terminating at the equipment racks or lecterns will have 1-meter slack provided so any moving of the lectern will not damage equipment.

Cables installed in plenum spaces need to be rated properly as such. Contractor is responsible for

verifying the installation requirements.

Hook and loop fasteners must be used to secure cabling at/inside racks. Cable ties are completely unacceptable. Cables terminating at the equipment, i.e. data projectors, speakers etc. must have a 1-meter tail provided.

Any in-ceiling cabling must be suspended above ceiling tiles on cable trays. J-hooks may be used as an alternative. At least one pull string must be run from the AV rack to the ceiling space.

All connections must be to industry standard. Any terminations on site must be high quality and meet AVIXA standards.

## Cable Labeling

All cables must be labeled within a minimum of 1 inch and a maximum of 12 inches from the point where:

- The cable exits the connector or strain relief
- The outer jacket is removed
- A cut end of an unterminated cable exists

Typical label placement is about 6 inches and consideration must be given to cable bundling when placing the cable label in order to provide maximum visibility of the label on each cable.

The label should state the output location of the cable or input value if at the end of the video source. Power cables only need to be labeled at the point of connection not at the unit unless cable can be unplugged from said unit.

For example, Doc cam cable should be labeled "HDMI 1" at the document camera unit. DMPS HDMI Input 1 should be labeled "Doc Cam" at the DMPS unit.

The labeling system shall have a design life equal to or greater than the cable to which it is attached to. The labeling system shall be capable of withstanding moisture, heat, UV light, chemical elements, scratches, abrasions, and other incidents that may routinely occur at the point of the cable installation. Handwritten labels must not be used for labeling cables and will not be accepted by OIT.

Please refer to document F501.01:2015 "Cable labeling for Audiovisual System (CLAS)" from AVIXA for more specific information. Any deviations from this publication requires consultation with OIT for permission.

## Cable specifications

### Audio Visual Cable Specifications

Cables should be of high quality. If equipment is Crestron, Crestron certified cables should be used. HDMI 2.0 cables should be used to futureproof rooms for 4K resolutions.

### Network Cable specifications

For all UCCS Network cabling standards, please consult with UCCS OIT Network Team.

## ADA Compliance and Facilities Integration

Please see Facility Services for ADA Compliance. Any questions should be addressed through consultation with Facility Services prior to design.

## Facilities Integration

Many AV systems would benefit from integration with other building systems. This practice is encouraged and supported by both OIT and Facilities Services. However, both OIT and Facilities Services must be consulted before and integration is approved.

Facilities is responsible for the entire lighting/shading/occupancy sensor system. This includes the physical hardware, and programming required to operate the system, and any connection to the system. OIT is only responsible for providing the integration in AV programming.

## Lighting

Rooms with programmed lighting controls (multiple lighting “scenes”) or rooms with multiple lighting zones should have control functionality programmed into the AV touch panel. These controls should be simple to use and should include the following functionality:

- Preset lighting scenes should be selectable and should mirror the selections on wall switches.
- When projection begins board lights should turn off to enhance screen contrast (this may be override by the user).

## Shades

Rooms with programmed shade controls should have control functionality programmed into the AV touch panel. These controls should be simple to use and should mirror the selections on wall switches.

## Occupancy Sensors

Rooms with occupancy sensors should provide feedback to the AV processor. This feedback may be used for a variety of functionality including:

- Turning on/off the AV system in small spaces (conference rooms/huddle spaces) when no other AV controls are needed.
- Occupancy information for Crestron Fusion tracking
- System power off after a period of room inactivity (30 minutes)

# System Programming

## Touch Panel Interface

Please refer to the Touch Panel Interface Standards for specific requirements and layouts for the Crestron touch panel. A sample VisionTools Pro-e file will be provided by UCCS OIT for touch panel layout.

## Hardware Administrative Rights

Any device requiring admin logins will have the credentials to UCCS OIT before commissioning.

## AV Integrator Project Qualifications

See Facilities Services for specific bidder qualifications.

1. Programmer Certification: The Contractor shall have Manufacturer certified programmers for all equipment requiring programming. The Contractor shall provide evidence of the same.
2. In-House Capabilities: The Contractor shall have in-house capabilities and facilities for rack assembly, shop fabrication, and programming. The Contractor shall provide a signed statement stating the same.
3. Product Dealer Information: Provide a list of manufacturers/products for which the Contractor is a Dealer. Provide the duration of the relationship and the extent of manufacturer/product training.
4. Shipping: UCCS will not accept delivery for any equipment. The equipment must be delivered to the integrator's facility and installed by the integrator at UCCS.

## Audio Visual System Design and Installation Process

### General Guidelines

The audiovisual integrator is to install all equipment for the audiovisual system as outlined throughout this scope of work/specification. All work done should meet or exceed AVIXA standards and more importantly, with a fully functioning audiovisual system handed over at completion of the project, which includes the following:

1. All hardware supporting equipment shall be up to AV and safety standards.
2. No network/POE switches shall be installed within AV design. Each device must have its own port connected directly to the network.
3. No undesired noise should be coming out of the audio system.
4. Video on screen, projection or otherwise, is to be free of any unwanted images/artifacts/blurriness, etc. Projector must be installed in a location away from HVAC equipment, lighting, etc. If this is unavoidable, OIT must provide written permission.

### Project Coordination

The project coordination process should adhere to *ANSI/INFOCOMM 2M-2010 Standard Guide for Audiovisual Systems Design and Coordination Processes*.

### Commissioning

The audiovisual integrator must provide the University with a commissioning schedule/program before commencement of the project. The University will approve this schedule before the contractor fully commissions the system. All necessary equipment used by the audiovisual integrator to competently test and commission the system is to be outlined in its provided commissioning schedule/program. It is expected that video signals would be tested and commissioned using a video generator and audio signals would be tested using an audio generator.

### Inspection and Testing

If at any time, OIT wants to assess the works performed, OIT will coordinate with the integrator to make sure that assessment will not interfere with any work being done on the project.

The audiovisual integrator must perform a full test of all equipment, operating functions as part of



system handover. Facility Services will determine who is required to be present for this test in addition to OIT Staff. OIT will also conduct a detailed test of the system in which we will document any defect, issues and improvements. The list will be given to the integrator and will need to be followed up on within one week of document being received. This will be determined based off classroom availability.

## Operator Training

The integrator must also provide training to OIT and any other UCCS faculty/staff who are directly involved in the use of the room. This training will be done at the end of the project at the handover stage after every issue, defect and improvement has been made or accepted. Depending on the project size, training will vary in length. This will be determined at the start of the project before any installation has been done.

## Deliverables

### Programming

All complete programs in un-compiled format, including graphics files, must be supplied to the University on a USB memory stick and via email upon completion of project.

### Project Documentation

A project folder needs to be given to OIT at the end of the project. This folder needs to include the following (if applicable):

- Section 1:** A list of equipment and support numbers of manufacturers for an easy reference guide for any warranty work that may need to be done after the warranty period has ended (explained in Section 9.6). The list should include warranty end date as well as important product information (serial number, mac address, building, room number, etc.).
- Section 2:** All equipment manuals, software and all items that came with each piece of equipment.
- Section 3:** A copy of all testing and verification of system functionality performed by the integrator.
- Section 4:** A copy of the as-builts. This is usually a copy of the design documents OIT agreed upon, as deviations needed to be agreed upon by UCCS OIT. The only exception is with written permission from OIT. This should be supplied on a USB drive with the un-compiled copy of the Crestron programming/graphics.
- Section 5:** The complete, un-compiled copy of the Crestron program is to be supplied on a USB memory stick. This includes graphics as well.
- Section 6:** Any other documentation that we may have missed.

## Purchasing, registering devices and A+ Rewards

1. All purchases from Crestron equipment should include our A+ Rewards number. That number is **1009236**

## Warranty, Service Support

The audiovisual integrator will be responsible for all labor costs and transportation of equipment costs

within 100 miles of the UCCS Campus during the 12-month warranty period.

All equipment supplied under the audiovisual contract must be guaranteed free of defects in hardware and software arising from faults in materials or poor workmanship/programming for 12 months from the date of project handover.

All reasonable efforts must be made by the audiovisual integrator to have faulty equipment repaired and returned to the University within 5 working days. If a part is available, and as part of this warranty section, the integrator is required to temporarily install a University provided replacement to any faulty component, ensuring possible teaching space audiovisual system down time is kept to a minimum. This replacement process should be done within 48 hours if classroom is available. OIT will work with integrator to schedule a time that works for both parties.

### Additional Documentation

This document should be used as standard procedure for any AV installation within UCCS. If any deviation occurs from this standard, UCCS OIT must be consulted prior and written approval is needed. As part of any project, OIT may include additional documentation including an audiovisual one-line diagram. The integrator is to use this diagram in conjunction with the scope of works/specification for system configuration reference and instruction. Any variation to this system design and format will not be accepted without prior written consent from OIT.

## Acceptable Hardware List

### Display Options

#### Projectors

Type	Description	Manufacturer
Pro L-series	Laser Large Venue	Epson
L610U	Standard laser projector	Epson
Brightlink 1485	Short Throw Interactive Laser Projector	Epson
VMZ-50	Alternative Laser projector	Panasonic

#### Projection Screens Recessed

Type	Description	Manufacturer
Tensioned Advantage Electrol	Tensioned Screen for standard classrooms	Da-Lite

#### Displays

Type	Description	Manufacturer
NEC 43" C431	1080p Commercial Television	NEC
NEC C Series 4K Displays	4K UHD Commercial Display	NEC
43" SL43604K	4K UHD Commercial Display	Planar

#### Interactive Displays

Type	Description	Manufacturer
7065X	Clear Touch 7000X Series Interactive Panel w/PC Module	Clear Touch
7055X	Clear Touch 7000X Series Interactive Panel w/PC Module	Clear Touch

### AV Control & Switching Options

#### AV Controller

Type	Description	Manufacturer
DM-RMC-Scaler-C	DM Receiver	Crestron
RMC3	AV Controller	Crestron

MPC3	AV Controller	Crestron
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## User Interfaces

Type	Description	Manufacturer
TSW760 or larger	Wall and Table Touch Screen (standard rooms)	Crestron
MPC3-302-B	Physical button Media Presentation Controller	Crestron
MPC3-102-B	Touch button Media Presentation Controller	Crestron

## Video Switching

Type	Description	Manufacturer
DMPS3-4K-150-C	DMPS Digital Media Presentation System	Crestron
DMPS3-4K-250-C	DMPS Digital Media Presentation System for Multiple Screens	Crestron
DMPS3-4K-350-C	DMPS Digital Media Presentation System for Multiple Screens	Crestron

## Audio

### Audio Processor

Type	Description	Manufacturer
HD-XSP	7.1 HD Sound Processor	Crestron
HD-XSPA	7.1 4K Surround Processor	Crestron
DSP-XX	Crestron DSP Series	Crestron

### Amplifiers

Type	Description	Manufacturer
Amp-XXXX	Crestron modular amplifier for standard rooms	Crestron

### Microphones

Type	Description	Manufacturer
MX418/C	Shure Microphone Gooseneck	Shure or Audio Technica equivalent
GLX/D1/D2 w/ GLXD4 receiver	Wireless microphone (include a spare SB902 for each mic)	Shure
MXA910	In-ceiling microphone array	Shure

### Soundbars

Type	Description	Manufacturer
SAROS SB-200-P-B	Powered, uncontrolled sound bar (requires a variable Line in)	Crestron
UC-SB1-CAM	Soundbar with camera and microphone	Crestron

### Speakers

Type	Description	Manufacturer
Saros ICT Series	Ceiling In-tile Recessed Speakers	Crestron
CDD8	Surface Mounted	Martin Audio
Edgemax EM180	Ceiling Recessed Tile Speaker	Bose

### Assistive Listening System

Type	Description	Manufacturer
XLR Male	XLR Output Wall Plate	Extron
XLR Female	XLR Input Wall Plate	Extron
	Hearing loop system	Consult with UCCS

## Video

### Document Camera

Type	Description	Manufacturer
Podium	VZ-3neo	WolfVision
Podium	VZ-8	WolfVision

### Source Devices

Type	Description	Manufacturer
AM-200	Wireless Presentation Device	Crestron
BDPS1700	Blu-Ray Player	Sony

TT-101	Cable Caddy for BYOD. Includes 120V outlet plus cables	Crestron
CTI-PCMOD-PC45-XX	Clear Touch PC Module for Interactive Panel	Clear Touch

## Rack Cabinets/Frames

### Free Standing Rack

Type	Description	Manufacturer
Freedom One Equipment Rack	Attaches to Spectrum Lectern – 2x18RU	Spectrum

### Wall Mount Racks

Type	Description	Manufacturer
Consult with OIT	Consult with OIT	Consult with OIT

### Power Conditioner/Distribution

Type	Description	Manufacturer
Surge/conditioning	Power Conditioner	Furman

## Other

### Lecterns

Type	Description	Manufacturer
Freedom-One Sit-to-Stand	ADA lectern	Spectrum
Left	SKU: 55542FMFMBS2000000F3002 Reference #: 55375-20036	Spectrum
Right	SKU: 55542FMFMBS2000000F3002 Reference #: 55375-20035	Spectrum

### VTC Cameras

Type	Description	Manufacturer
RoboSHOT 12E HDBT	PTZ camera	Vaddio
UC-SB1-CAM	Soundbar with camera and microphone	Crestron

### Whiteboard or Whiteboard Material

Type	Description	Manufacturer
Idea Screen	Whiteboard	Da-Lite

### Lecture Capture Systems

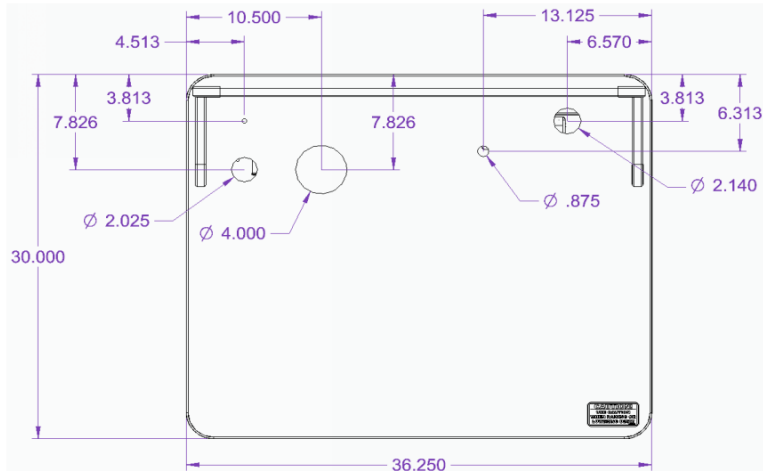
Type	Description	Manufacturer
EasyIP Ecosystem	EasyIP Mixer and switch	Vaddio
EasyIP Ecosystem	EasyIP CeilingMIC D	Vaddio
EasyIP Ecosystem	EasyIP 10 Camera	Vaddio

## Spectrum Freedom-One Sit-to-Stand Lectern SKU

Spectrum item #: 55542-20033



Item 55542-20033  
for UCCS .pdf



Layout with rack on the right side of the lectern.

## Version Revision History

V 0.1 – Draft Document – 10/27/2017 by Steven Rodela and Ben Woodroof

V 1.0 – Standards Document – 5/3/2018 by Steven Rodela

- Added definition of different classrooms
- Added Conference Room standards
- Added Typical classroom space equipment

V 2.0 – Standards Document – 4/16/19 by Matt Barsoum

- Made changes to standard room equipment
- Added standards for Conference Rooms and Breakout Rooms

V 2.1- Standards Document – 8/30/19 by Matt Barsoum

- Formatting Changes
- Updated AVIXA Standards

V 2.2 – Wireless Presentation – 10/30/2019 by Ben Woodroof

- Changed preferred wireless presentation device from Mersive Solstice Pod to Crestron AirMedia

V 2.3 – Network and Hardware – 2/27/2020 by Ben Woodroof

- Updated network section to include the use of data switches
- Updated recommended hardware list
- Updated ADA lectern section

V2.31 – Standards and Hardware – 3/5/2020 By Steven Rodela

- Updated Room Standards
- Updated recommended hardware list

V2.32 - Aspect Ratio Update – 7/31/2020 by Ben Woodroof

- Updated aspect ratio from 16:10 to 16:9 for all displays and projectors. This will allow native 1080p sources to be fill the screen without distortion. Will also allow for larger projector screens in height-limited spaces.

V2.33 – Hyflex Update – 10/21/2020 by Ben Woodroof

- Added section on hyflex rooms.