

AUDIOVISUAL SYSTEM

PART 1 - GENERAL

1.1 PROJECT DESCRIPTION

A. General Description:

1. As a part of the Santa Rosa Junior College Petaluma Campus Phase 2 expansion, several spaces in Building “K” will be outfitted with audiovisual systems. This specification defines the equipment and installation requirements for audiovisual and media production systems in spaces that have been previously wired and terminated. The following spaces are included in this scope of work:
 - a. Engineering Wireless Lab & Control Room 640/640A (Distance Learning).
 - b. Behavioral Lab 630 and three (3) Observation Rooms 630A, 630B, & 630C.
 - c. Psych Therapy Room 616.
2. The majority of the infrastructure wiring between facility equipment locations has already been installed and terminated with a previous scope of work. Wiring to receptacle plates within a space has also been provided, such as the wiring between the Engineering Wireless Lab equipment rack location and the camera locations. As-built wiring is noted on the audiovisual functional diagrams, and full infrastructure as-built conditions are also provided in a separate set of as-built drawings. Equipment racks have also been provided in the Engineering Wireless Lab Control Room 640A and the Behavioral Lab.
3. Coordination will be required with several College Furnished systems for complete integration. Some equipment will be College Provided for AV Contractor installation. Requirements for College Provided equipment are identified further in Part 2 of this specification, and on the functional diagrams.
4. The Audiovisual Contractor will work with the Design Consultant and SRJC College’s Representatives to develop an appropriate control system graphical user interface for all control systems. The graphical user interface will be developed prior to the installation of the equipment on-site. The graphical user interface development process will also specifically define all control system button requirements, button labels, preset configuration “macros,” and the level of touch panel help instructions required. Refer to the basic requirements outlined in Part 3 of this specification.

- B. Engineering Wireless Lab and Control Room (640/640A): The Engineering Wireless Lab will be used for instruction and distance learning with full-room microphone support for all students, front projection, computer and video presentation sources, speech and playback audio reinforcement, and a full touchpanel-based control system. An operator within the adjacent Control Room 640A will control cameras and sources for outbound signal management. A console equipment rack with power distribution devices and terminated

patch bays has been installed with a previous scope of work, Several College Furnished devices have been installed to support basic classroom use, and will be reintegrated as part of this scope of work.

- C. Behavioral Lab 630 and Observation Rooms 630A, 630B, & 630C: The Behavioral Lab is used as an instructional classroom setting, and will include front projection, computer and video presentation sources, speech and playback audio reinforcement, and a full touchpanel-based control system. Each Observation Room will include two (2) cameras and a microphone for recording, a split screen image processor, flat panel display, and wall-mount touchpanel for control. A full-height equipment rack has been installed with a previous scope of work. Several College Furnished devices have been installed to support basic classroom use, and will be reintegrated as part of this scope of work.
- D. Psych Therapy Room (616): This space will include two (2) cameras and a microphone for recording, with a split screen image processor and flat panel display. It will operate similar to a single Observation Room in the Behavioral Lab space.

1.2 ENGINEERING WIRELESS LAB & CONTROL ROOM 640/640A SYSTEM DESCRIPTION

- A. The Engineering Wireless Lab 640 and adjacent Control Room 640A will be used for instruction and distance learning, and are described in detail below. Refer to the functional diagram and plan drawings for specific device locations. Return existing College Furnished equipment where it is to be replaced or will remain unused with this scope of work.
- B. Audio System:
 - 1. DSP Audio Matrix Mixing System:
 - a. This room will have a DSP based audio system to support the various room uses. The audio system will not typically require any Instructor adjustment, other than simple volume control through the control system interface. The DSP Audio Matrix Mixer will combine audio sources, provide speech and playback loudspeaker equalization and volume control, and provide echo cancellation for audio teleconferencing.
 - b. Multiple DSP processing boxes will be bussed together to operate as one large DSP matrix mixer.
 - c. A telephone interface will be provided to enable audio conferencing, with calls initiated through the control system.
 - d. All ceiling-mounted student microphones pass through an automatic microphone gating preamplifier, with front panel attenuator controls. The preamplifiers will allow control room operators to manually turn down microphones to address a sudden unwanted noise within an area of the room. The mixed output will not be used.
 - 2. Microphone Systems:
 - a. Instructor and Student Ceiling Microphones: An array of hanging ceiling microphones will be installed to provide full room audio conference support

- for all student participants, with one microphone also located at the Instructor’s desk location. Microphones will be suspended within 6” of the finish ceiling, and installed through the suspended ceiling tile.
- b. **Wireless Microphone:** One wireless microphone system will be provided for Instructor mobility, with a lavalier belt-pack style transmitter. The wireless microphone will only be used for audio conferencing during a presentation to both local and remote participants.
3. A dynamic feedback equalizer is provided within the DSP processor for equalization feedback reduction with the use of the wireless microphone. All microphone audio will also be equalized to maximize gain-before-feedback within the DSP automatic microphone mixer.
 4. **Loudspeaker Systems:**
 - a. **Ceiling Loudspeakers:** Ceiling-mounted loudspeakers are distributed throughout the room to support audio conferencing.
 - b. **Playback Loudspeakers:** Left and right ceiling-mounted loudspeakers are located to either side of the main center projection screen. The loudspeakers will provide audio for all portable and installed presentation sources, and will support audio for distance learning videoconferencing. Loudspeakers and wiring to a power amplifier have been provided with a previous scope of work for reuse as part of the new systems.
 - c. **Far-End Instructor Loudspeaker:** A matching pair of loudspeakers will be provided for the ceiling-mounted far-end flat panel monitor. The loudspeakers will provide for direct reinforcement of far-end audio to the Instructor.
 5. **Hearing Assistance System:** A wireless RF audio system will accommodate assistive listening for the hearing impaired (for the Americans with Disabilities Act requirements), with an RF transmitter antenna extended for reception throughout the space.
 6. **Production Audio Support Systems:**
 - a. **Production Audiovisual Switcher:** A production video switcher with audio mixing is provided for Operator control. The DSP Audio Matrix Mixer will provide pre-mixed audio feeds to the Production Audiovisual Switcher for operator volume control of the final videoconference send and recording mixes. Delay capability is also provided for precise alignment with any video signal processing delay for synchronized recording. The videoconferencing audio signal will not include delay at the Production Audiovisual Switcher.
 - b. **Control Room Monitoring:** A stereo loudspeaker audio monitor panel with headphone output will be provided, and will monitor a mixed stereo playback and speech signal.
 - c. **Production Audio Monitor Panel:** An LED monitor panel is provided for visual verification of production audio levels. Refer to the Engineering Wireless Lab functional drawings for specific monitored signals.

- d. Talkback Microphone: A talkback microphone with a push-to-talk switch will be provided within the Control Room for operator communications back to the Engineering Wireless Lab.

C. Display Systems:

1. Front Projection Screen (Existing): A motorized front projection screen is installed along one end of the room. Low-voltage control of the screen is to be provided by the control system.
2. Video Projector: A high-resolution video projectors will support computer graphics display such as Power Point up to XGA (1,024 x 768) resolution, and all video sources. A College Furnished projector has been provided as part of a previous scope of work.
3. Instructor’s Desk LCD Telestration Monitor: A College Furnished LCD Telestration Tablet Monitor is provided to monitor the OFE Computer CPU or a portable laptop input, and will provide telestration capability for the OFE Computer CPU via software control (By Others).
4. One 32” LCD flat panel monitor will be mounted at the ceiling facing the Instructor. The display will provide far-end monitor during a distance learning videoconference.

D. Presentation Video System:

1. A VGA/Stereo Audio matrix switcher will provide input routing and distribution between all high-resolution devices. Note that the Videoconference Codec and Production Audiovisual Switcher both feature DVI-I connections in and out for high-resolution support. Passive DVI-I converters to and from VGA/RGBHV are required.
2. The College Furnished DVD/SVHS player will pass through a new close-caption decoder, which will be turned on or off as required from the control system.

E. Presentation Source Devices:

1. An existing DVD/SVHS player is provided within the Instructor’s Desk millwork equipment rack for convenient media loading access, and will be operable from the control system interface.
2. The Instructor’s Desk will include a College Furnished Computer CPU as an available display source. A second computer input is provided for portable laptop connection, with a pre-terminated cable available at the desktop surface.
3. A ceiling-mounted document camera with full frame-rate XGA output will be provided flush with the finish ceiling, and will be a selectable presentation source.

Field coordinate with the College Technical Representative for the specific installation location.

- F. Videoconferencing, Cameras, Production Audiovisual, and Recording Systems:
1. Videoconferencing System:
 - a. A multi-site videoconferencing codec will be provided within the Control Room equipment rack, with connections to all necessary audio and video inputs and outputs. The codec will provide connections to up to three (3) simultaneous sites via IP connections.
 - b. Videoconferencing will take place only in high-resolution graphic formats at the highest possible frame-rate. Video cameras will be scaled to a high-resolution graphic signal through the Production Audiovisual Switcher.
 - c. Only one DVI input and output is required to and from the videoconferencing codecs.
 - d. Collaborative document sharing will also be provided, with high-resolution graphic inputs selectable as sources to the codec by the Control Room operator.
 2. Pan/Tilt/Zoom Cameras:
 - a. A total of four pan/tilt/zoom video cameras with SDI output will be provided within the Engineering Wireless Lab. Cameras will be wall and ceiling mounted at existing receptacle plate locations. The cameras will provide video for both the Instructor and Students to support distance learning videoconferences and recording.
 - b. A dedicated hardware pan/tilt/zoom controller with preset recall will be provided for Operator camera control within the Control Room.
 - c. Existing Camera Plates and Control Cable: The existing camera control cable is to be used for looping connections between cameras, and will need to be bussed or re-terminated as required to provide bussed control between all pan/tilt/zoom cameras.
 - d. One new camera wall-mount plate is required with cables at the right front side of the room. A custom receptacle plate is required to match the existing plates installed with a previous scope of work.
 - e. One camera will be mounted from the 32” Far-Side LCD monitor, on a bracket attached to the flat panel mount. Coordinate with the Owner’s Technical Representative for an approved custom, or off-the shelf solution. This configuration has been installed at a similar location at the Santa Rosa Junior College Doyle Library, and may be referenced for the installation approach.
 3. Production Video Switching:
 - a. A Production Audiovisual Switcher will be provided for operator control to support videoconferencing and recording switching. The switcher will scale SDI camera inputs and high-resolution computer input sources to a single high-resolution display output format (1024x768) for connection to the videoconference codec. The recording output will be internally downconverted in real-time to an analog video signal for recording.

- b. All cameras will be genlocked for synchronized switching at the Production Audiovisual Switcher, and to minimize synchronization frame delay.
 - c. The switcher graphics engine introduces several frames of delay to the signal depending on conversion and graphic processing capabilities used. Audio is to be delayed to match the end-to-end video signal delay through all devices for recording.
 4. Production Video Monitoring:
 - a. Full LCD monitoring of production video sources and outputs will be provided with SDI, VGA, and composite analog monitoring.
 - b. A digital waveform/vectorscope will be provided for recording signal quality monitoring.
 5. Production Video Recording: A mini-DV/DVD-R/HDD recorder will be provided. Stereo audio with composite analog video will be recorded, with recording initiated by the Operator within the Control Room.
 - G. Patchbays:
 1. Audio and video patchbays are provided for flexible signal connections between devices and the existing cable infrastructure.
 2. Several existing patchbays include terminated facility infrastructure lines for audio, video, and general AV baseband UTP. Additional patchpoints and normalled-through terminations are required, as indicated in the Engineering Wireless Lab functional diagrams.
 3. Several UTP transmitter and receiver pairs are also patchable to facility-wide tie-lines, with connections to and from the appropriate format of matrix switchers.
 - H. Intercom System:
 1. A remote two-channel intercom master station will be provided for the Engineering Wireless Lab Operator for production communication back to the Duplication Head-End in support of large events.
 2. An audio signal from the DSP matrix mixer will be fed to the program input of the master station to allow an operator to monitor both program and intercom audio during a large production event through a single headset if desired.
 3. A beltpack and headset will be provided for each operator, with a connection available at a rackmount panel.
 - I. Control System:
 1. A control system will be provided with a simple user interface for access to all necessary room controls for day-to-day operation. A tabletop wired 10” menu driven LCD touchpanel will be provided for control of all room audiovisual

devices by the Instructor. A rackmount 7” LCD control panel is also provided for limited controls by an Operator within the Control Room 640A. Controls will include:

- a. Turning the system on and off.
- b. Volume control.
- c. Control of all playback sources, including the DVD/SVHS combination player with CATV tuning. The closed-caption decoder can also be turned on or off.
- d. Control of the mini-DV/DVD-R/HDD recorder, with finalization control.
- e. Selection of installed sources, or computer and video sources with audio for display, or videoconference collaboration.
- f. Control of the videoconference codec is to be provided, per the College standard for touchpanel codec control.
- g. Turning the projector on and off, transparent input selection to follow selected source signal type, and polling of lamp usage time.
- h. Motorized projection screen control.

2. Provide meeting time with the Owner’s Technical Representatives for touchpanel pre-design coordination. Touchpanel pages are to be submitted for review and approval prior to on-site installation.

J. Equipment Racks and Mounting Hardware:

1. Control Room Console/Full-Height Equipment Racks:
 - a. A console equipment rack and full-height equipment rack with power distribution devices and terminated patch bays have been installed with a previous scope of work.
 - b. Note that the equipment racks will require structural attachment by the AV Contractor as part of this scope of work. The equipment racks are not currently bolted, and can be moved to ease equipment installation.
 - c. A single rack-width writing surface is currently installed, and is to be replaced with a dual rack-width writing surface as part of this scope of work.
2. Instructor Desk Equipment Rack: An Instructor’s Desk with integral equipment rack space will be provided by the College, and will house local Instructor playback sources
3. Ceiling-Mount Flat Panel Monitor: No structural pipe attachments and pipe extension poles have been provided for the 32” Far Side flat panel monitor. Provide structural attachment and specific flat panel device mounting hardware for pipe attachment as required.

1.3 BEHAVIORAL LAB 630 & OBSERVATION ROOMS 630A, 630B, & 630C SYSTEM DESCRIPTION

- A. The Behavioral Lab and Observation Rooms are used as an instructional classroom setting, and are described in detail below. Several College Furnished devices have been installed to

support basic classroom use, and will be reintegrated as part of this scope of work. Refer to the functional diagram and plan drawings for specific device locations. Return existing College Furnished equipment where it is to be replaced or will remain unused with this scope of work.

B. Audio System:

1. DSP Audio Matrix Mixing System:
 - a. This room will have a DSP based audio system to support the various room uses. The audio system will not typically require Instructor adjustment, other than simple volume control through the control system interface. The DSP Audio Matrix Mixer will combine and route audio sources, provide playback loudspeaker equalization and volume control, and provide individual Observation Room volume control.
 - b. A telephone interface will be provided to enable audio conferencing, with calls initiated through the control system.
 - c. Multiple DSP processing boxes will be bussed together to operate as one large DSP matrix mixer.
2. Microphone Systems:
 - a. Instructor and Observation Room Ceiling Microphones: Each Observation Room will include a ceiling-mounted shotgun microphone to record two (2) parties at either side of the table.
 - b. One microphone is also located at the Instructor’s desk location, to be used during an audio teleconference only (no speech reinforcement required).
 - c. Ceiling microphones will be suspended to within 6” below the finish ceiling, with wiring installed through the suspended ceiling tile.
3. Loudspeaker Systems:
 - a. Playback Loudspeakers: Left and right ceiling-mounted loudspeakers are located to either side of the main center projection screen. The loudspeakers will provide audio for all portable and installed presentation sources, and will support audio for distance learning videoconferencing. Loudspeakers and wiring to a power amplifier have been provided with a previous scope of work for reuse as part of the new systems.
 - b. Observation Room External Parabolic Loudspeakers: A parabolic loudspeaker will be suspended via a wall-mount bracket outside of each of the three (3) Observation Rooms for focused monitoring audio. Each of the three (3) loudspeakers will include individual wall-mount volume/mute controls, and can also be controlled simultaneously from the Instructor’s touchpanel.
 - c. Observation Room Playback Loudspeakers: Each of the three (3) Observation Rooms will include a flat panel LCD monitor with attached loudspeakers for playback audio.
4. Production Audio Monitor Panel: An LED monitor panel is provided for visual verification of all Observation Room audio levels. Refer to the Behavior Lab functional drawings for specific monitored signals.

C. Display Systems:

1. Front Projection Screen (Existing): A motorized front projection screen is installed along one end of the room. Low-voltage control of the screen is to be provided by the control system.
2. Video Projector: A high-resolution video projectors will support computer graphics display such as Power Point up to XGA (1,024 x 768) resolution, and all video sources. A College Furnished projector has been provided as part of a previous scope of work.
3. Instructor’s Desk LCD Telestration Monitor: A College Furnished LCD Telestration Tablet Monitor is provided to monitor the OFE Computer CPU or a portable laptop input, and will provide telestration capability for the OFE Computer CPU via software control (By Others).
4. A wall-mount 40” flat panel monitor is to be provided in each of the three (3) Observation Rooms. The LCD flat panel monitor used for camera monitoring during recording if necessary, and for playback viewing of recorded sessions.
5. The Instructor’s 12” LCD control touchpanel will also include a video input interface for selectable source video source monitoring.

D. Presentation Video System:

1. All presentation video and computer inputs will be scaled to a single high-resolution display output to match the resolution of the LCD projector.
2. The College Furnished DVD/SVHS player will pass through a new close-caption decoder, which will be turned on or off as required from the control system.

E. Presentation Source Devices:

1. An existing DVD/SVHS player is provided within the Instructor’s Desk millwork equipment rack for convenient media loading access, and will be operable from the control system interface.
2. The Instructor’s Desk will include a College Furnished Computer CPU as an available display source. A second computer input is provided for portable laptop connection, with a pre-terminated cable available at the desktop surface.
3. Any of the individual Observation Room cameras or recording decks can be selected as a presentation source, with accompanying audio. Note that the individual camera selection is done through the composite video image split screen combiner, which is integrated under control system operation, and capable of recalling multiple screen setup presets (camera 1 full, camera 2 full, split image combined).

F. Cameras and Recording Systems:

1. Pan/Tilt/Zoom Cameras:
 - a. Two (2) wall-mount pan/tilt/zoom cameras will be used to record two (2) participants at either side of the table for each of the three (3) Observation Rooms.
 - b. A dedicated hardware pan/tilt/zoom controller with preset recall will be provided for camera control on a slide-out shelf within the Behavior Lab Equipment Rack.
 - c. Existing Camera Plates and Control Cable: The existing camera control cable is to be used for looping connections between cameras, and will need to be bussed or re-terminated as required to provide bussed control between all pan/tilt/zoom cameras.
2. A composite video image split screen combiner will combine the camera images onto one screen for recording. The combiner is integrated under control system operation, and capable of recalling multiple screen setup presets (camera 1 full, camera 2 full, split image combined).
3. Observation Room Video Monitoring: A triple LCD monitor will be provided within the Behavior Lab Equipment Rack. Each of the three (3) monitors will feature two (2) selectable inputs for live camera input and post-record signal video monitoring.
4. Observation Room Video Recording: A mini-DV/DVD-R/HDD recorder will be provided for each of the three (3) Observation Rooms. Mono audio with composite analog video will be recorded, with recording initiated by the Instructor, or from each individual Observation Room wall-mount control touchpanel.

G. Control System:

1. A control system will be provided with a simple user interface for access to all necessary room controls for day-to-day operation. A tabletop wired 12” menu driven LCD touchpanel will be provided for control of all room audiovisual devices by the Instructor. Each of the three (3) Observation Rooms includes a 4” wall-mount touchpanel to initiate recording, and to control pre-recorded material playback. Three (3) wall-mount volume controls are also provided to control Observation Room loudspeaker monitoring levels. Controls will include:
 - a. Turning the system on and off.
 - b. Individual volume control appropriate to each location (Behavior Lab Playback, individual Observation Room playback, individual Observation Room loudspeaker monitoring).
 - c. Control of all playback sources, including the DVD/SVHS combination player with CATV tuning. The closed-caption decoder can also be turned on or off.

- d. Control of the mini-DV/DVD-R/HDD recorder, with finalization control. Playback controls from either the individual room control panels or the Instructor’s Control Panel.
 - e. Selection of installed sources, computer and video sources with audio, or live Observation Room feeds for display.
 - f. Composite video image split screen combiner image preset recall (camera 1 full, camera 2 full, split image).
 - g. Turning the projector on and off, transparent input selection to follow selected source signal type, and polling of lamp usage time.
 - h. Flat panel display control (source selection, volume control, and power on/off).
 - i. Motorized projection screen control.
2. Provide meeting time with the Owner’s Technical Representatives for touchpanel pre-design coordination. Touchpanel pages are to be submitted for review and approval prior to on-site installation.

H. Equipment Racks and Mounting Hardware:

1. Full-Height Slide-Out Equipment Rack:
 - a. A full-height slide-out equipment rack with power distribution will be provided for the majority of the system devices.
 - b. Note that the equipment racks will require structural attachment by the AV Contractor as part of this scope of work.
 - c. Instructor Desk Equipment Rack: An Instructor’s Desk with integral equipment rack space will be provided by the College, and will house local Instructor playback sources.
2. Observation Room External Parabolic Loudspeakers: Coordinate with the College Technical Representative for an approved mounting bracket solution for the three (3) Observation Room exterior parabolic monitor loudspeakers.
3. Flat Panel Monitor Wall-Mount: Provide structurally approved wall-mount attachment and specific flat panel device mounting hardware as required for each of the three (3) Observation Room flat panel LCD monitors.

1.4 PSYCH THERAPY ROOM 616 SYSTEM DESCRIPTION

- A. Psych Therapy Room 616: This space will operate similar to a single Observation Room in the Behavioral Lab space, as described below:
- B. Audio System:
 1. A loudspeaker mounted to the flat panel display will be used for playback audio monitoring.
 2. A ceiling-mounted shotgun microphone will be used to record two (2) participants or groups at either side of the table.

C. Video System:

1. Two (2) wall-mount pan/tilt/zoom cameras will be used to record two (2) participants at either side of the table.
2. A composite video image split screen combiner will combine the camera images onto one screen for recording.

D. Display System:

1. A wall-mount 40” flat panel monitor is to be provided. The LCD flat panel monitor used for camera monitoring during recording if necessary, and for playback viewing of recorded sessions.

E. Presentation Sources:

1. A mini-DV/DVD-R/HDD recorder/player will be provided for multi-format recording, and hard-disk buffering for more reliable recording.

F. Control System:

1. A control system will be provided with a simple user interface for access to all necessary room controls for day-to-day operation. A tabletop wired 7” menu driven LCD touchpanel will be provided for control of all Psych Therapy Room audiovisual devices. Controls will include:
 - a. Turning the system on and off.
 - b. Pan/tilt/zoom camera controls for each of the two (2) cameras.
 - c. Control of the mini-DV/DVD-R/HDD recorder/player, including any finalization commands required for the DVD-R.
 - d. Playback audio volume control.
 - e. Selection of display sources.
 - f. Composite video image split screen combiner image preset recall (camera 1 full, camera 2 full, split image).
2. Provide meeting time with the Owner’s Technical Representatives for touchpanel pre-design coordination. Touchpanel pages are to be submitted for review and approval prior to on-site installation.

G. Equipment Racks and Mounting Hardware:

1. Half-Height Furniture Equipment Rack: A millwork equipment rack is to be supplied by the AV Contractor for equipment rack mounting, with finish coordination to match architectural furniture building standards.
2. Flat Panel Monitor Wall-Mount: Provide structurally approved wall-mount attachment and specific flat panel device mounting hardware as required.

1.5 ADD-ALTERNATE SYSTEM DESCRIPTION

A. Engineering Wireless Lab 640:

1. Genlock System Upgrade (External genlock reference from Duplication Head-End): This Add-Alternate option replaces the base-bid blackburst generator with a different unit that is capable of syncing to an external reference. A transmitter/receiver pair of analog composite video UTP converters are included to extend a genlock reference signal from the Duplication Head-End to the Wireless Engineering Lab.
2. Two (2) additional years of the Tandberg Customer Core Service associated with the Wireless Engineering Lab codec are to be included for Add-Alternate consideration.

1.6 SCOPE OF WORK

- A. Refer to this specification and AV drawings for included work.
- B. Refer to attached as-built system functional drawings PCD for complete existing wiring infrastructure, receptacle plate, and patchbay conditions.

1.7 AUDIOVISUAL CONTRACTOR RESPONSIBILITY

- A. Furnish and install a complete and functioning audiovisual system including cabling, receptacle plates, loudspeakers, and electronic devices. Provide and install all components including the necessary equipment, interconnections, transducers, labor, and services required to meet specifications herein and as indicated on the drawings. Any item listed in the specification or shown on the drawings is to be included as part of this scope of work.
- B. Control System Graphical Interface and Template Designs:
 1. Coordinate with SRJC College’s Representatives and the Design Consultant for specific graphical control interface requirements. This includes specific functional requirements for all devices, touch panel look and feel, page hierarchy, and other control interface design parameters. The control interface design includes all touchpanel and computer interfaces throughout the project.
 2. Provide on-site meetings as required to define the control system touch panel design prior to any on-site installation. Control system and template page layout concepts are to be defined during the construction phases of the project prior to any AV on-site work in order to provide adequate time to develop touch panel interfaces.
- C. Notify the College’s Representative in writing of any conduit, wire raceways, back boxes, and AC power receptacles that are not shown on the electrical drawings that are required for this work.

- D. Verify site conditions including dimensions, clearances, conduit sizes, and routing. Coordinate the exact location of the equipment with conceptual location plan drawings and field conditions.
- E. Verify that 120-volt AC power has been supplied near each equipment rack location. Provide connection in flex conduit from nearby AC power to equipment racks, where AC power receptacles are not located within the equipment rack enclosure. Provide and install all AC power receptacles within the equipment racks. Provide low-voltage turn-on controllers and switched outlets to activate and distribute AC power within the equipment racks.
- F. Notify the College’s Representative in writing prior to AV installation of any penetrations at walls, ceilings and floors required for the installation of audiovisual equipment and cabling.
- G. Retain at Audiovisual Contractor’s cost, a licensed structural engineer to design and document all mounting and suspension systems and details for audiovisual system components including, but not limited to, loudspeakers, equipment racks, projectors, plasma monitors, etc. Coordinate with project structural engineer for attachment points and methods.
- H. Conduct preliminary testing and adjustment. Submit documentation required by this specification. Participate in approval testing for acceptance. Perform final adjustments as required to meet specifications.
- I. Deliver bound “as-built” system documentation. Transfer all warranties and equipment guarantees and provide a written description of system operation to the College at the time of acceptance of the work by the College. Provide system operation training as specified in Section 3.05.
- J. Provide, at no additional cost, maintenance and repair services for twelve (12) months following acceptance of the system.
- K. Provide as-built drawings of all systems and modifications to the base building on 24" x 36" bond, and CAD files on CD-ROM, or storage format preferred by the College. Provide touchpanel and control system source code, DSP system configuration files, and all system initial configuration preset files to the College. Store file copies on site in the system documentation binders in disk sleeves. All files should also be stored on the main network server, in a folder designated by the College’s IT Representative.
- L. Inventory Spreadsheet:
 - 1. SRJC will furnish the Contractor with adhesive SRJC-numbered inventory tags. Contractor shall affix these tags to Contractor-provided equipment and shall provide SRJC Media Services with an Excel spreadsheet containing the following fields (provide hardcopy and electronic file):
 - a. SRJC fixed asset tag number (tags provided By College on request)
 - b. Equipment description

- c. Equipment location
 - d. Equipment manufacturer and model number
 - e. Equipment serial number
 - f. Value (*College replacement cost, non-OFE equipment only*)
2. Provide inventory data for the following items:
- a. Flat panel monitors
 - b. Instructor table display
 - c. Room Loudspeakers
 - d. Matrix Switchers and System Switchers
 - e. Audio amplifiers
 - f. VGA switchers
 - g. Distribution amplifiers
 - h. DVD/VHS Combination Players, DVCAM Players, and VHS VCRs
 - i. Closed Caption Decoders
 - j. Surround-Sound Processors
 - k. DSP Audio Processors
 - l. Control System Portable Touchpanels
3. Computers, all cables, and related connectors do not require inventory.

1.8 QUALITY ASSURANCE

- A. All materials must be newly manufactured current production models and conform with all applicable codes and the relevant standards listed below:
1. American National Standards Institute (ANSI)
 2. Electronic Industries Association (EIA)
 3. Institute of Electrical and Electronic Engineers (IEEE)
 4. Underwriters Laboratories (UL)
- B. Coordination: The Audiovisual Contractor will coordinate all other trades in scheduling work. The Audiovisual Contractor is responsible for coordination of and compensation for any work or subcontractor work including but not limited to: structural engineering, electrical, finish carpentry, metal work, drywall, and HVAC.
- C. Coordination: The Audiovisual Contractor will coordinate all other trades in scheduling work. The Audiovisual Contractor is responsible for coordination of and compensation for any work or subcontractor work including but not limited to: structural engineering, electrical, finish carpentry, metal work, drywall, and HVAC.
- D. Experience: The Audiovisual Contractor will specialize in the installation of audiovisual professional/commercial and broadcast systems. Installers and engineers must individually have a minimum of five years of documented experience in the field of audiovisual system installation.

1. The AV Contractor must be an approved vendor, or subcontract to an approved vendor for all installed components. The AV Contractor must be a trained and authorized dealer for the following major system components, or subcontract the device supply AND installation to an approved vendor:
 - a. Facility-Wide Control System (AMX)
 - b. DSP Audio Processor (Biamp)
 - c. Computer/Video/Audio Switching and Distribution Devices (Extron)
 - d. College standard Videoconferencing Systems (Tandberg)
 - e. Facility-Wide Intercom Systems (Clear-Com, or approved equal)
 2. The company must also have specific experience with the configuration, wiring, termination, and distribution of signals typically associated with digital high-definition broadcast systems. The signals and system types include:
 - a. All analogue and digital video signals, including HD/SD-SDI SMPTE259M and SMPTE292M standard signals
 - b. Broadcast Genlock Generation and Distribution (Blackburst and Tri-Level)
 - c. Waveform/Vectorscope and Test Signal Systems
 - d. Production Intercom
- E. Supervision:
1. The Audiovisual Contractor will designate a single supervisor to oversee the installation work for the duration of the project to ensure that the system is installed in accordance with the specification and drawings.
 2. The supervisor will maintain adequate staff and be responsible for installing and testing the system on schedule.
 3. The supervisor will have at least five years of documented, recent, and similar project experience.
- F. Should the Audiovisual Contractor at any time discover a discrepancy between this Specification and the project documents, with respect to significant variance between location, violation of code requirements, or any other discrepancies, the Audiovisual Contractor will notify the College for clarification and will not proceed with the work affected until this clarification has been made.
- G. The Audiovisual Contractor will promptly notify the College in writing of any difficulties that may prevent proper coordination or time of completion of this work. Failure to do so will constitute acceptance of construction site and indicate that the site is suitable in all ways for this work, except for defects that may develop in work of others after commencement of system installation.
- H. The College reserves the right to make use of the system prior to the completion of the punch list. Temporary use of the equipment will not constitute an acceptance of the system or any part. The College will not pay additional cost to the Audiovisual Contractor and the

commencement of the warranty period will not begin for the system or any device prior to the completion of the punch list and final acceptance of the system by the College.

- I. Codes: AV Contractor will comply with all applicable laws, regulations and codes.
- J. Dealership: Contractor will be a dealer for all devices provided and installed and shall offer full factory warranty on all products.

1.9 SUBMITTALS

- A. Comply with submittal provisions of Colleges Specification - Submittals.
- B. Bid Submittals: Submit the following qualification documents:
 - 1. Firm description.
 - 2. List of related projects. Related project list to include project name and location, description of project, contract amount, reference name and telephone number. One of the related projects must have been completed within the last twelve (12) months.
 - 3. Resumes of project supervisor documenting related experience. Project supervisor must have completed at least one (1) installation in the past twelve (12) months.
 - 4. Names and scope of work for any subcontractors whose work would be part of this contract, including relevant past project experience.
 - 5. Clearly describe any deviations from and exceptions to the specifications or drawings.
 - 6. For the Base Bid, provide an equipment list including all major devices, separated by room or area as indicated in the Part 1 system descriptions. The bid shall not be considered complete without this list.
 - 7. For the Add-Alternate bids, provide an equipment list including all devices for the following individual systems (Refer to specification section 2.5 for detailed equipment model numbers):
 - a. Wireless Engineering Lab (640):
 - i. Genlock System Upgrade Devices
 - ii. Tandberg Customer Core Service (Codec, additional 2 year service)
 - 8. Along with the quoted price, provide a factor for additive changes and delete changes. The add change factor should include the product, installation, engineering, tax and shipping. Delete change factor should include listed devices, installation, tax, return shipping and verified restocking charges. No change in scope will be considered without line item documentation. This will also provide a basis for product changes necessitated by product advancement between the time of the writing of this specification, and the final integration.

9. Provide an option price for maintenance contract extensions on an annual basis beyond the first twelve (12) month warranty period.

C. Construction Submittals:

1. Submit complete equipment list by manufacturer, model number, and type, including quantities to be supplied. Include all accessories, options and functional components.
2. Submit shop drawings for each building space included in this specification with the following drawings (as required by specific system):
 - a. Point-to-point functional wiring diagrams for all audio, video, control, and related signal system wiring diagrams. Must be connector pin-specific. Re-used Audiovisual Consultant design drawings with wire run numbers added are not acceptable for field construction use, with some devices and connections noted “typical” for quantity designations and not shown with pin-specific wiring connections.
 - b. All receptacle plates and panels, including rackmount panels with labeling shown for engraving.
 - c. Patch panel layouts with labels. Note that existing patchpanel drawings are to be redrawn to include all newly added patchpoints, and normalled through terminations to existing infrastructure lines. All existing patchbays, receptacle plates, and installed systems are not meant to be replicated with this as-built document package.
 - d. Equipment rack elevations.
 - e. AC line power distribution plan.
 - f. Mounting and suspension systems and details for audio system components requiring structural approval including, but not limited to: loudspeakers, ceiling-mount projectors, wall-mount flat panels, etc.
3. Control System Graphical Interface Design and Template Documentation:
 - a. Submit control system touchpanel pages and button panel engraved or keycap labeling (May be submitted via software or screen prints).
 - b. Control system touchpanel interface design will occur over the course of several meetings for full design development and approval.
 - c. Submit initial touchpanel layouts and revisions as required to reach initial design approval prior to the development of full control system source code.
4. Submit shop drawings of any proposed design changes for approval prior to fabrication. Shop drawings will be submitted to the College’s Representative for review and approval prior to fabrication and installation. Make submittals at least fifteen (15) working days prior to scheduled fabrication. Note on the submittal the dates of scheduled fabrication.
5. Submit samples of engraved labels, cable marking system, and receptacle plate/panel etching.

- D. Acceptance Test Submittals: Prior to requesting the completion of the acceptance tests, submit Preliminary Test Report including all information as specified in Section 3.8.

1.10 PERMITS AND INSURANCE

- A. Permits: Obtain any necessary permits for the execution of this work in conformance with applicable union regulations, local, State and Federal codes and regulations.
- B. Insurance: Provide evidence of insurance for the full value of equipment and material located on site. Insurance will cover all losses until the work is formally accepted. Maintain additional liability insurance to protect the supplier and/or College against damage claims for personal injury, including death, which may arise during the performance of this work.

1.11 GUARANTEES AND WARRANTIES

- A. Transfer all manufacturers’ warranties to the College at the time of acceptance.
- B. Guarantee all installation work to be free of faulty workmanship. Guarantee all components and workmanship to be free from defects for a period of twelve (12) months from the final date of acceptance, including electronic devices.
- C. Guarantee the replacement of faulty materials and workmanship within seventy-two (72) hours of notification at no cost to the College if failure occurs during warranty period.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Materials listed herein represent specific minimum levels of performance and function. These levels of performance and function are as published by the listed manufacturers. All material submitted shall be as listed, or shall be substitutions that meet or improve upon the performance and functional characteristics of the listed material. Receptacle plates and connector types are shown on the audiovisual drawings. Where conflicts exist within the specification or between the specification and the drawings contact the Design Consultant for clarification. Refer to the functional diagrams for additional information.

2.2 ENGINEERING WIRELESS LAB 640 & CONTROL ROOM 640A SYSTEM EQUIPMENT

- A. Engineer Wireless Lab & Control Room System Equipment: Devices listed below are located in either the Engineering Wireless Lab 640 or the adjacent Control Room 640A. Refer to the functional diagram and plan drawings for device locations.
 - 1. Audio Devices
 - a. DSP Audio Matrix Mixer/Processor: The following devices are bussed together as one large DSP processing engine:

- i. DSP Audio Matrix/Processor (10x4 + codec IO): Biamp Nexia VC (Quantity 1)
 - ii. DSP Audio Matrix/Processor (10x4 + phone interface IO): Biamp Nexia TC (Quantity 1)
 - iii. DSP Audio Matrix/Processor (4x8): Biamp Nexia SP (Quantity 1)
 - b. Wireless Lavalier Microphone System: Shure ULXP14/85-J1 (Quantity 1)
 - c. Instructor Ceiling Microphone: AKG HM 1000 w/CK 47 (Quantity 1)
 - d. Student Ceiling Microphone: AKG HM 1000 w/CK 47 (Quantity 8)
 - e. Left/Right Ceiling-Mount Playback Loudspeakers: TOA H-1 (Quantity 2, **College Furnished and Installed Equipment**)
 - f. Ceiling Loudspeakers (70 volt): Tannoy CMS501 BM (Quantity 8)
 - g. Instructor Far Side Flat Panel Audio Loudspeakers: NEC SP-32 (Quantity 1 pair)
 - h. Playback Loudspeaker Amplifier (2-channel): QSC CX 302 (Quantity 1)
 - i. Ceiling Loudspeaker Amplifier (70volt): Extron HPA 1001-70V (Quantity 1)
 - j. Microphone Preamplifier (8-Channel): Shure SCM810 (Quantity 1)
 - k. Push-to-Talk Page Announcement Microphone: Shure 514B with RK6MB mounting bracket (Quantity 1)
 - l. Control Room Audio Monitor Panel (with headphone out): Wohler AMP1A (Quantity 1)
 - m. Hearing Assistance System (coordinate frequency selection with College):
 - i. Hearing Assistance FM Transmitter (Antenna, with 1 Receiver): Comtek CC-216 (Quantity 1)
 - ii. Hearing Assistance FM Receiver/Headset: Comtek PR-216 w/LS-3 (Quantity 2)
 - iii. Hearing Assistance 12-Unit Charging Case: Comtek NBC 9-3-12 (Quantity 1)
 - n. Audio Monitor Panel (20-channel, Production Signal Path): Wohler MSLV-20 (Quantity 1)
 - o. Audio Patchbay (2x48x2RU): AVP (Quantity 1, **College Furnished and Installed Equipment**)
 - p. Intercom System Devices
 - i. Intercom 2-Channel Remote Station: Clear-Com RM702 (Quantity 1)
 - ii. Intercom Remote Station Gooseneck Microphone: Clear-Com GM-18 (Quantity 1)
 - iii. Intercom Beltpack Receiver (single channel): Clear-Com RS-601 (Quantity 2)
 - iv. Intercom Headset: Clear-Com CC-95 (Quantity 2)
- 2. Video Devices
 - a. VGA/Audio Matrix Switcher (12x12): Extron MVX 1212 VGA A (Quantity 1)
 - b. RGBHV Scaler: Extron DVS 304 (Quantity 1)
 - c. Closed Caption Decoder (with GPI Control): BVS CC-100GPISV (Quantity 1)
 - d. Instructor CPU/Portable Laptop VGA Line Drivers: Extron P/2 DA2xi

- (Quantity 2)
 - e. Blackburst Generator (6 Output): Extron BBG 6 A (Quantity 1)
 - f. Digital Production Switcher: Grass Valley Indigo HR, INDG01-HD, with high-resolution card installed (Quantity 1)
 - g. Standard Definition Waveform Rasterizer: Tektronix WVR6020 (Quantity 1)
 - h. Computer/Stereo Audio Universal UTP Transmitter: Magenta Research Multiview UTx #4003212-03 (Quantity 1)
 - i. Computer/Stereo Audio Universal UTP Receiver: Magenta Research Multiview AK500 #4003299-01 (Quantity 1)
 - j. Composite Video/Stereo Audio Universal UTP Transmitter: Extron MTP T AV (Quantity 1)
 - k. Composite Video/Stereo Audio Universal UTP Receiver: Extron MTP R AV (Quantity 1)
 - l. Passive DVI-VGA Adapters: Gefen, or equal (Quantity 5. Refer to functional diagrams and equipment I/O connection specifications)
 - m. Video Patchbay (2x24x2RU): AVP (Quantity 2, **College Furnished and Installed Equipment**)
 - n. RJ45 Patch Panel (Baseband UTP infrastructure patch): 24 port (Quantity 2, **College Furnished and Installed Equipment**)
3. Source/Recording Devices
- a. DVD/SVHS Combination Player: JVC Pro SR-MV45US w/Middle-Atlantic RSH-Series rackmount (Quantity 1, **College Furnished and Installed Equipment**)
 - b. MiniDV/DVD-R/HDD Recorder/Player: JVC SR-DVM700US w/Middle-Atlantic RSH-Series rackmount (Quantity 1)
 - c. Overhead Instruction Camera: Wolfvision Eye-12 with tilebridge (Quantity 1)
 - d. Recording/Distance Learning Cameras:
 - i. Pan/Tilt/Zoom Camera: Sony BRC-300 (Quantity 4)
 - ii. Pan/Tilt/Zoom Camera SDI Card: Sony BRBK302 (Quantity 4)
 - iii. Pan/Tilt/Zoom Camera Flat Panel Bracket: As required for attachment to flat panel ceiling mount (Quantity 1)
 - iv. Pan/Tilt/Zoom Camera Wall-Mount: PicturePhone Direct FREE-A001016A, or equal (Quantity 3)
4. Display Devices
- a. Ceiling-Mount Video Projector (1024x768): Epson EMP-6100 (Quantity 1, **College Furnished Equipment**)
 - b. Instructor LCD Telestration Tablet/Monitor: Hitachi 15” Starboard T-15XL (Quantity 1, **College Furnished and Installed Equipment**)
 - c. Far-End 32” LCD Flat Panel Monitor (1366x768, RS232 Control): NEC LCD3210 (Quantity 1)
 - d. Camera Preview Monitor (Quadruple 4" SDI): Marshall Electronics V-R44P-SDI (Quantity 1)
 - e. Codec/Source Monitor (Dual 8.4", DVI/VGA): Marshall Electronics V-R82DP-VGA (Quantity 1)

- f. Program/Preview & Record Monitor (Dual 8.4", DVI/VGA/Comp):
Marshall Electronics V-R82DP-HDA (Quantity 1)
5. Videoconferencing Devices
 - a. Videoconference Codec (768 ISDN/1.5 Mbps IP): Tandberg Codec 6000 MXP (Quantity 1)
 - b. Tandberg Customer Core Service (Duplication Codec, 3 year service):
Tandberg #113612S25 (Quantity of 1, for 3 years)
 - c. Videoconference Codec Dual Stream Graphic Option: Tandberg Natural Presenter Package #113828NPP (Quantity 1)
 - d. Videoconference Codec High Bandwidth Option (to 6Mbps IP): Tandberg 3 Mbps option #1138563 (Quantity 1)
 - e. Videoconference Codec Multisite Conferencing Option: Tandberg MultiSite Option #113828MS (Quantity 1)
6. Control Devices
 - a. Master Control System CPU: AMX NI-4100 (Quantity 1)
 - b. Dual Port RS232 Card: AMX NXC-COM2 (Quantity 1)
 - c. Instructor 10" Portable Wired Control Touchpanel: AMX NXT-CV10 (Quantity 1)
 - d. Operator Rackmount 7" Control Touchpanel: AMX NXD-700Vi w/NXA-RK7 (Quantity 1)
 - e. Remote Instructor's Desk IR Controller: AMX NXS-NMS enclosure with NXC-IRS4 Card (Quantity 1)
 - f. Control System Device/Buss Power Supply: AMX PSN6.5 (Quantity 1)
 - g. Power Supply Rackmount: AMX AC-RK (Quantity 1)
 - h. Control System Buss Strip: AMX ABS (Quantity 1)
 - i. Control CPU Cable Support Bracket: AMX CSB (Quantity 1)
 - j. IR Emitters: AMX CC-IRC (Quantity 2, includes two provided with AMX NI-4100 CPU)
 - k. RS232 Cables/Control Buss Splitters: Supply compatible manufacturer hardware for control communication and distribution as required.
 - l. Custom Control System Programming: To be provided by Audiovisual Contractor, or qualified subcontractor.
 - m. Camera Controller: Sony RM-BR300 (Quantity 1)
7. Equipment Rack and Mounting Hardware
 - a. Instructor's Desk/Equipment Rack: Custom (Quantity 1, **College Furnished and Installed Equipment**)
 - b. Console Equipment Rack: Middle-Atlantic SC Series (Quantity 1, **College Furnished and Installed Equipment**)
 - c. Full-Height Equipment Rack: Middle-Atlantic WRK Series (Quantity 1, **College Furnished and Installed Equipment**)
 - d. Sloped Operator Console/Equipment Rack Two Bay Worksurface: Middle-Atlantic WS2-S18-GBF (Quantity 1)
 - e. Rackmount Power Sequencer: Surge-X SX2120SEQ (Quantity 1, **College Furnished and Installed Equipment**)
 - f. Console Rack Power Distribution Strips: Middle-Atlantic PD-1020C-NS

- (Quantity 2)
- g. Rackmount Drawer (2RU): Middle-Atlantic model #D2 (Quantity 1)
- h. Rackmount Thermally Activated Fan: Middle-Atlantic UQFP-2 (Quantity 2)
- i. Equipment Rack Blank Panels: Fill in unused panel space with blank solid or ventilating panels. Middle Atlantic rolled edge steel blank panels model EB-x, and rolled edge steel vent panels model EVT-x. Refer to drawing AV5.01 for the equipment rack elevation and blank panel size recommendations. Supply in quantity required, and modify quantities and sizes during installation if required to fill all unused spaces.
- j. Flat Panel Monitor Ceiling-Mount: (Quantity 1)
 - i. Flat Panel Monitor Mount: Chief Manufacturing PCM Single Ceiling Mount with, with attachment hardware as required for final flat panel monitor model selected at time of installation.
 - ii. All Mounting Hardware: As approved by licensed structural engineer.

2.3 BEHAVIORAL LAB 630 & OBSERVATION ROOMS 630A, 630B, & 630C SYSTEM EQUIPMENT

- A. Behavioral Lab 630 and Observation Room 630A, 630B, and 630C System Equipment: Devices listed below are located in either the Behavioral Lab 630 space, or the adjacent Observation Room spaces. Refer to the functional diagram and plan drawings for device locations.

1. Audio Devices
 - a. DSP Audio Matrix Mixer/Processor: The following devices are bussed together as one large DSP processing engine:
 - i. DSP Audio Matrix/Processor (10x4 + phone interface IO): Biamp Nexia TC (Quantity 1)
 - ii. DSP Audio Matrix/Processor (4x8): Biamp Nexia SP (Quantity 1)
 - b. Instructor’s Desk Table Microphone: Shure MX 418D/S (Quantity 1)
 - c. Ceiling Microphone (Observation Rooms and Instructor Location): AKG HM 1000 w/CK 47 (Quantity 4)
 - d. Left/Right Ceiling-Mount Playback Loudspeakers: TOA H-1 (Quantity 2, **College Furnished and Installed Equipment**)
 - e. Behavior Lab Flat Panel Audio Loudspeaker: NEC SP-M40 (Quantity 3)
 - f. Playback Loudspeaker Amplifier (8-channel): QSC CX 168 (Quantity 1)
 - g. Parabolic Ceiling Loudspeaker (with 70volt Transformer):
 - i. Soundtube FP6020 w/AC-FP6-XFMR (Quantity 3)
 - ii. Custom Wall-Mount Support Bracket: Coordinate with College Technical Representative for approved wall-mount support solution. (Quantity 3)
 - h. Audio Monitor Panel (8-channel, Production Signal Path): Atlas-Sound MVXA-2008 (Quantity 1)
2. Video Devices
 - a. Video/Audio System Switcher/Scaler: Extron IN1508 (Quantity 1)

- b. Composite Video Matrix Switcher (8x8): Extron MAV 88 V (Quantity 1)
 - c. Composite Video Image Split Screen Combiner: MicroImage Video Systems PXD510E w/Middle-Atlantic RSH-Series rackmount (Quantity 3)
 - d. Closed Caption Decoder (with GPI Control): BVS CC-100GPISV (Quantity 1)
 - e. Instructor CPU/Portable Laptop VGA Line Drivers: Extron P/2 DA2xi (Quantity 2)
 - f. VGA DA (1x4): Extron P/2 DA4xi (Quantity 1)
3. Source/Recording Devices
- a. DVD/SVHS Combination Player: JVC Pro SR-MV45US w/Middle-Atlantic RSH-Series rackmount (Quantity 1, **College Furnished Equipment**)
 - b. MiniDV/DVD-R/HDD Recorder/Player: JVC SR-DVM700US w/Middle-Atlantic RSH-Series rackmount (Quantity 1)
 - c. Recording Pan/Tilt/Zoom Cameras:
 - i. Pan/Tilt/Zoom Camera: Sony EVI-D70 (Quantity 6)
 - ii. Pan/Tilt/Zoom Camera Wall-Mount: PicturePhone Direct FREE-A001016A, or equal (Quantity 6)
4. Display Devices
- a. Ceiling-Mount Video Projector (1024x768): Epson EMP-6100 (Quantity 1, **College Furnished Equipment**)
 - b. Instructor LCD Telestration Tablet/Monitor: Hitachi 15” Starboard T-15XL (Quantity 1, **College Furnished and Installed Equipment**)
 - c. Observation Room 40” LCD Flat Panel Monitor (1366x768, RS232 Control): NEC Multeos M40-AV (Quantity 3)
 - d. Camera Preview Monitor (Triple 5.6" Composite): Marshall Electronics V-R563P (Quantity 1)
5. Control Devices
- a. Master Control System CPU: AMX NI-4100 (Quantity 1)
 - b. Dual Port RS232 Card: AMX NXC-COM2 (Quantity 3)
 - c. Instructor 12” Portable Wired Control Touchpanel (with Video Input): AMX NXT-1200VG (Quantity 1)
 - d. Observation Room 4” Wall-Mount Control Touchpanel: AMX AXD-CP/A (Quantity 3)
 - e. Volume Control Button Panel (with custom buttons): AMX MIO-CLASSIC-S-WH (Quantity 3)
 - f. Control System Device/Buss Power Supply: AMX PSN6.5 (Quantity 1)
 - g. Power Supply Rackmount: AMX AC-RK (Quantity 1)
 - h. Control System Buss Strip: AMX ABS (Quantity 1)
 - i. Control CPU Cable Support Bracket: AMX CSB (Quantity 1)
 - j. IR Emitters: AMX CC-IRC (Quantity 2, includes two provided with AMX NI-4100 CPU)
 - k. RS232 Cables/Control Buss Splitters: Supply compatible manufacturer hardware for control communication and distribution as required.
 - l. Custom Control System Programming: To be provided by Audiovisual Contractor, or qualified subcontractor.

- m. Camera Controller: Sony RM-BR300 (Quantity 1)
- 6. Equipment Rack and Mounting Hardware
 - a. Full-Height Pivoting Equipment Rack: Middle-Atlantic SR-46-28 (Quantity 1)
 - b. Rackmount Power Sequencer: Surge-X SX2120SEQ (Quantity 1, **College Furnished and Installed Equipment**)
 - c. Console Rack Power Distribution Strips: Middle-Atlantic PD-1220C-NS (Quantity 2)
 - d. Instructor’s Desk Equipment Power Distribution: Furman PL-Pro D II (Quantity 1)
 - e. Rackmount Thermally Activated Fan: Middle-Atlantic UQFP-2 (Quantity 1)
 - f. Camera Controller Rackmount Slide-Out Shelf: Middle-Atlantic model #SS (Quantity 1)
 - g. Equipment Rack Blank Panels: Fill in unused panel space with blank solid or ventilating panels. Middle Atlantic rolled edge steel blank panels model EB-x, and rolled edge steel vent panels model EVT-x. Refer to drawing AV5.01 for the equipment rack elevation and blank panel size recommendations. Supply in quantity required, and modify quantities and sizes during installation if required to fill all unused spaces.
 - h. Flat Panel Monitor Wall-Mount: (Quantity 3)
 - i. Flat Panel Monitor Mount: Chief Manufacturing PSM series, with attachment hardware as required for final flat panel monitor model selected at time of installation.
 - ii. All Mounting Hardware: As approved by licensed structural engineer.

2.4 PSYCH THERAPY ROOM 616 SYSTEM EQUIPMENT

A. Media Viewing Room #1 (715, Recording Enabled):

- 1. Audio Devices
 - a. Microphone Preamp: Extron MLP 101 (Quantity 1)
 - b. Ceiling Microphone: AKG HM 1000 w/CK 47 (Quantity 1)
 - c. Flat Panel Audio Loudspeaker: NEC SP-M40 (Quantity 1)
- 2. Video Devices
 - a. Composite Video Image Split Screen Combiner: MicroImage Video Systems PXD510E w/Middle-Atlantic RSH-Series rackmount (Quantity 1)
- 3. Source Devices
 - a. MiniDV/DVD-R/HDD Recorder/Player: JVC SR-DVM700US w/Middle-Atlantic RSH-Series rackmount (Quantity 1)
 - b. Recording Pan/Tilt/Zoom Cameras:
 - i. Pan/Tilt/Zoom Camera: Sony EVI-D70 (Quantity 2)
 - ii. Pan/Tilt/Zoom Camera Wall-Mount: PicturePhone Direct FREE-A001016A, or equal (Quantity 2)

4. Display Devices
 - a. 40” LCD Flat Panel Monitor (1920x1080, RS232 Control): NEC Multeos M40-AV (Quantity 1)

5. Control Devices
 - a. Master Control System CPU: AMX NI-3100 (Quantity 1)
 - b. Control System Device/Buss Power Supply: AMX PSN6.5 (Quantity 1)
 - c. Power Supply Rackmount: AMX AC-RK (Quantity 1)
 - d. Control System Buss Strip: AMX ABS (Quantity 1)
 - e. Control CPU Cable Support Bracket: AMX CSB (Quantity 1)
 - f. Table Top 7” Control Touchpanel: AMX NXT-CV7 (Quantity 1)
 - g. IR Emitters: AMX CC-IRC (Quantity 2, includes two provided with AMX NI-3100 CPU)
 - h. RS232 Cables/Control Buss Splitters: Supply compatible manufacturer hardware for control communication and distribution as required.
 - i. Custom Control System Programming: To be provided by Audiovisual Contractor, or qualified subcontractor.

6. Equipment Racks and Mounting Hardware
 - a. Millwork Equipment Rack (16RU rollup door rack): HSA Inc. Rollrack 16RU (Quantity 1)
 - b. Equipment Rack Power Sequencer: Furman PS-PRO II (Quantity 1)
 - c. Active Millwork Fan: Active Thermal Management Coolstick 18” ***Pending College Technical Representative Approval*** (Quantity 1)
 - d. Equipment Rack Blank Panels: Fill in unused panel space with blank solid or ventilating panels. Middle Atlantic rolled edge steel blank panels model EB-x, and rolled edge steel vent panels model EVT-x. Refer to drawing AV5.01 for the equipment rack elevation and blank panel size recommendations. Supply in quantity required, and modify quantities and sizes during installation if required to fill all unused spaces.
 - e. Flat Panel Monitor Wall-Mount: (Quantity 1)
 - i. Flat Panel Monitor Mount: Chief Manufacturing PSM series, with attachment hardware as required for final flat panel monitor model selected at time of installation.
 - ii. All Mounting Hardware: As approved by licensed structural engineer.

2.5 ADD-ALTERNATE SYSTEM EQUIPMENT

A. Engineering Wireless Lab 640:

1. Genlock System Upgrade (External genlock reference from Duplication Head-End):
 - a. Genlock Generator (6 output, 1kHz tone, external reference input): Kramer SG-6005 (Quantity 1)
 - b. Composite Video/Stereo Audio Universal UTP Transmitter (Located in Duplication Head-End): Extron MTP T AV (Quantity 1)

- c. Composite Video/Stereo Audio Universal UTP Receiver: Extron MTP R AV (Quantity 1)
 - d. See section 2.2A.2.e: DELETE Blackburst Generator (6 Output): Extron BBG 6 A (Quantity 1)
2. Tandberg Customer Core Service (Duplication Codec, additional 2 year service): Tandberg #113612S25 (Quantity of 1, for 2 years)

2.6 CABLE – ALL SPACES

- A. Loudspeaker Cable (8 or 4 ohm, greater than 500 watts): West Penn Wire C210 (10 AWG, unshielded pair) or equal.
- B. Loudspeaker Cable (8 or 4 ohm, less than 500 watts): West Penn Wire C207 (12 AWG, unshielded pair) or equal.
- C. Distributed Non-Plenum Loudspeaker Cable (70volt, greater than 60 watt tap): Belden 8477 (12 AWG, unshielded pair) or equal.
- D. Distributed Non-Plenum Loudspeaker Cable (70volt, less than 60 watt tap): Extron SPK14/1000 (14 AWG, unshielded pair) or equal.
- E. Distributed Plenum Rated Loudspeaker Cable (70volt, greater than 60 watt tap): West Penn Wire 25227 (12 AWG, unshielded pair) or equal.
- F. Distributed Plenum Rated Loudspeaker Cable (70volt, less than 60 watt tap): Extron SPK14P/1000 (14 AWG, unshielded pair) or equal.
- G. Analog Microphone/Line Level Installation Cable: Belden model# 9464 (20 AWG conductor, jacketed, shielded, twisted-pair) or equal.
- H. Analog Microphone/Line Level Equipment Rack Interconnect Cable: Belden model# 8450 (22 AWG conductor, jacketed shielded, twisted-pair) or equal.
- I. AES/EBU Cable: Provide pre-terminated 110ohm interconnect cable, ProCo or equal between devices where required.
- J. Composite Video/HD-SDI Serial Digital Video/Genlock Cable (Non-Rack, Extended Length Interconnect Cable): Canare L-5CFB (18 AWG, 75 ohm coaxial conductor, shielded) or equal.
- K. Composite Video/ HD-SDI Serial Digital Video/Genlock Cable (Equipment Rack Interconnect Cable): Extron RG59 Series, Non Plenum (20 AWG, 75 ohm coaxial conductor, shielded) or equal.
- L. S-Video/Y/C Cable: Supply two (2) matched-length RG59. Extron RG59 Series, Non Plenum (20 AWG, 75 ohm coaxial conductor, shielded) or equal.

- M. RGBHV/VGA Cable: Extron RG59-3MHR-3, or equal.
- N. Production Intercom/Line Level Cable: Provide 20 AWG conductor, jacketed, shielded, twisted-pair cable. Belden model# 9402 or equal.
- O. Antenna Cable: Conductor will be 13 AWG (RG8/U) covered by braided shield. JSC model# 3040 or equal. Provide co-axial cable whose impedance matches devices requiring 50ohm antenna connection.
- P. Control System Interface Buss Cable (AMX remote device power and control): West Penn Wire C2415 (AMX Axlink buss with Category 5e) or equal.
- Q. Control System/Tally System Device Control Cables (RS232, RS422, Serial (IR), Relay or Contact Closure): Supply pre-terminated serial control cables within equipment racks. Provide West Penn Wire 1992 (4 pair) signal cable, or equal for relay or contact closure application, as required.
- R. Provide plenum rated cable for all cable where required by code. Any cable changes or substitutions must be submitted and approved prior to installation. Cable that has been installed without approval will be replaced at the AV Contractor's expense.

2.7 CONNECTORS – ALL SPACES

- A. Microphone, audio, intercom, tally, and portable control system panel-mount XLR connectors: supply metal multi-conductor panel-mount receptacles, in black metal shell. Neutrik B series. Refer to receptacle plate and panel drawings for specific connectors by plate location.
- B. Audio 1/4" panel-mount connector: Switchcraft 1/4" TS, solder back, or equal.
- C. Video, genlock, SMPTE BNC panel-mount connector: Provide a panel-mounted BNC jack with isolated ground bulkhead and compatible connector. Supply Canare BCP-C5FA male, or equal.
- D. Antenna connector: Provide receptacle plate-mounted general purpose UHF antenna connector. Coaxial bulkhead connector will match impedances of antenna cable and match style of connector on device requiring antenna. Supply Amphenol 83-1f.
- E. RS232/Control D-Shell Panel-Mount Connector: Mouser D-sub series, or equal.
- F. VGA D-Shell Panel-Mount Connector: ORA D-sub series, or equal.

2.8 MISCELLANEOUS HARDWARE – ALL SPACES

- A. Terminal cabinets and boxes: all terminal cabinets and junction boxes housing audio cabling will be metallic. Terminal cabinets are to be verified for size by audiovisual contractor prior to beginning job-site work. Size cabinets for required base-bid wiring fill. Allow forty percent (40%) additional capacity for future system growth.

- B. Provide matching manufacturer vents and blanks as required.
- C. Rack connections: ac power cables to the power strips shall be run in steel conduit. All in-going and out-going signal cabling shall be run in conduit independent of ac power conduit.
- D. Connectors: provide compatible plugs as indicated on the receptacle plate drawing sheets; all cable connectors shall have black anodized finish where available unless otherwise noted. Connector parts subject to any possible structural loading or stress shall be metal.
- E. Conduit: provide removable seals at penetrations for acoustic isolation.
- F. Receptacle plates: steel or aluminum with etched and ink-filled labeling. Confirm plate color requirements prior to fabrication with college’s representative through the submittal process. Refer to Audiovisual drawings for specific plate connector requirements.
- G. Audiovisual system faceplates: silk-screened and coated lettering shall identify individual plate mounted receptacles. Connector identification shall denote function and unique input/output number. Center lettering vertically over appropriate connector. Connector mounting will allow sufficient finger clearance for connector insertion and removal without interference from adjacent connectors.
- H. Electronic component faceplate labels: provide permanent labels on equipment to identify device, system, or control function as appropriate for operational purposes. All control knob and switch labels will be located vertically adjacent over the appropriate control. Engraved plastic labels fastened with epoxy are acceptable. Dymo type labels are not acceptable.
- I. A/V equipment rack to have placard that states “Designed by Charles M. Salter Associates, Inc. & installed by _____ (with phone and website). For repairs call _____ (with phone).” Provide as either a rackmount panel, or as a placard attached to one of the equipment racks in each major control room equipment location.

PART 3 - EXECUTION

3.1 GENERAL

- A. The following is required for acceptance of the audiovisual system by the College:
 - 1. Install complete and functioning audiovisual system specified.
 - 2. Label equipment and cables as specified and corresponding to functional diagram.
 - 3. Conduct adjustments and preliminary testing.
 - 4. Report results of preliminary testing along with system documentation.

5. Participate in acceptance test and deliver final system and documentation.
6. Conduct any adjustments or re-testing required to meet the specifications.
7. Provide training to individuals designated by the College.

3.2 GENERAL REQUIREMENTS

- A. All equipment except portable equipment shall be held firmly in place. This includes racks, conduits, cables, amplifiers, and other electronic equipment. Fastenings and supports shall be approved by a licensed structural engineer.
- B. Submit shop drawings for custom fabrications including custom panels, receptacle plates, and rack elevations to the College for review and approval. Make submittals at least fifteen (15) working days prior to scheduled fabrication. Note on the submittal the dates of scheduled fabrication.
- C. Do not commence work on any portion of the project requiring College 's approval prior to obtaining such approval. Work commenced and installed prior to review and approval shall be accepted at the College's discretion. Installation does not imply acceptance or review for acceptance.
- D. Keep at the job site an up-to-date complete record set of prints and specification. Make daily corrections and show all changes from the original contract drawings. Final as-built drawings will be required at the conclusion of the project.
- E. Keep the job adequately staffed at all times. A qualified engineer approved by the College and employed by the Audiovisual Contractor shall exercise engineering supervision over the entire installation. Unless through illness, loss of personnel, or other circumstances beyond the control of the Audiovisual Contractor, keep the same individual in charge throughout the execution of the work.
- F. Cooperate with other trades in order to achieve well-coordinated progress and satisfactory results. Watch for conflicts with work for other contractors on the job. Execute, without claim for additional payment, moderate moves or changes as necessary or required by the College prior to installation to accommodate minor design changes, rack layout changes, touchpanel control functionality changes, or to preserve symmetry and pleasing appearance.

3.3 EQUIPMENT CONNECTION

- A. Wiring: All wiring shall be installed in strict accordance with broadcast standard practices. Cabling jacket color shall be coordinated to maintain consistent identification.
- B. Cabling: Install vertical cable runs in conduit. All cable is to be continuous and without splices. Permanently label all cabling at termination points. Cables shall be bundled and laced neatly to maintain convenient access to all equipment connections. All audiovisual

signal cabling are to be separate from all power lines. ***Do not pull cable at greater than 40 percent conduit-fill capacity without first contacting the College.***

- C. Power: Power conduit to be separated from other conduits containing signal lines. Connect AC power to the equipment from junction boxes designated by the Electrical Engineer.
- D. Connectors: Connections to screw clamp or binding post terminals require flanged or snap spade type lugs appropriately color-coded. Bare wire connected to a binding post is not acceptable. Soldered connections shall be soldered with rosin core solder.
- E. Grounding: Use the equipment chassis as a common point of grounding the sound system; the equipment chassis is to be grounded to earth. Cable shields shall only be used for shielding (not signal) and connected to ground at the rack. All equipment shall be checked for ground continuity.
- F. Fasteners, Hangers, Supports: Provide fasteners, supports and seismic restraints to adequately support the load as required by local codes.
- G. Ventilation: Provide adequate ventilation in equipment racks to conform with the equipment manufacturer's temperature rise requirements or 20 degrees C maximum temperature rise, whichever is less. Provide internal equipment rack fans as required to direct the distribution of airflow within equipment racks as required to maintain proper operating temperatures.
- H. Cable Labels: Cables and wiring in racks, consoles, connector boxes and on terminal strips shall be clearly marked between 2” and 4” from end of cable gasket/harness. Provide maximum label visibility. Indicate the signal type, wire number, source and destination and jack, receptacle or socket to which connector should be mated. Use appropriate diameter clear shrink tubing over surface of label for protection and permanence. Extend shrink tubing over label by approximately 1/4” at each end.
- I. Device Labels: Label all devices including switches, control panels, monitors, and equipment, where appropriate for Operator device interaction (not required for non-user operated devices). Label to be logical and permanent with clarity and legibility. Submit samples for approval.

3.4 GENERAL INSTALLATION AND PROGRAMMING REQUIREMENTS

- A. The following installation and programming requirements apply to all spaces and subsystems throughout the project, where the described system device or configuration requirement is present. Functional requirements for individual spaces are as described in Part 1 of this specification and as indicated on the functional drawings. Specific installation and programming requirements are outlined by location in the following System Specific Installation and Programming Requirements specification section 3.5.
- B. Audiovisual Contractor will review and assess the appropriate focal length between the video projectors and the video screens to ensure optimum picture sizing and focus. The image should completely fill the screen height available.

- C. Power Sequencing: All Control System equipment is to be in an “always on” state to accept control system input, including turning power on to the equipment rack devices. Provide power up sequencing such that power amplifiers turn on last and power down first for AV systems that include power-sequencer control capability.
- D. Patchbay Installation: All patch panel jacks will be clearly and permanently. Jacks shown in close proximity on the functional diagram will be in close proximity in the patch panel. Patch panel jacks will be "normalled through" as shown. "Normalled through" jacks will be vertically adjacent.
- E. Millwork-Mounted Equipment Racks: Verify final equipment millwork clearances prior to ordering equipment racks, and provide an alternative in writing if the base-bid specified model will not fit.
- F. IT/Network Coordination: Coordinate with the College’s IT administrator for all network configuration requirements for operation on College provided networks.
- G. Ventilation: Provide adequate ventilation management within equipment racks to conform with the equipment manufacturer's temperature rise requirements or 20 degrees C maximum temperature rise, whichever is less.

3.5 SYSTEM-SPECIFIC INSTALLATION AND PROGRAMMING REQUIREMENTS

- A. Engineer Wireless Lab 640 & Control Room 640A System Equipment:
 - 1. DSP Audio Processor and Programmable Mixer Device Programming: It shall be the audiovisual contractors sole responsibility to make all adjustments to meet the functional requirements of this specification. Provide all necessary programming of DSP based audio system devices to provide the following:
 - a. Matrix Mixing/Routing: Provide all necessary setup for the use of automatic microphone mixing and stereo playback inputs. Provide required preset configurations to address all selectable output routing conditions.
 - b. Provide separate equalization for speech and playback loudspeakers and sources. Provide limiting on all drivers, and appropriate control system range for volume operation, including separate up/down/mute volume controls for both speech and playback loudspeakers in applicable room locations.
 - c. Provide equalization on microphone input channels for speech input range, with low frequency roll-off.
 - d. Dynamic Feedback Equalizer Filters: The dynamic feedback equalizer filters should be configured with several fixed feedback notches if found to be necessary during initial system testing (set after the room has been properly equalized for a flat response.) Keep a minimum of ten (10) filters unassigned to dynamically address feedback as it occurs. Dynamically assigned feedback filters should slowly reduce filter depth and return to a “flat” state once feedback has been controlled.

- e. Provide programming to address the audio teleconferencer dialing options, and include routing to the ceiling loudspeakers and volume settings as required.
 - f. Provide echo cancellation and noise reduction DSP configuration, and defeat internal codec echo cancellation for the videoconference codec. Noise reduction should not be set higher than –6dB of reduction, and only employed if no audio gating or artifacts are audible.
2. **Wireless Microphones:** Provide reliable RF reception from the wireless microphone to the wireless RF receiver located within the Control Room 640A equipment rack. Provide remote antenna extension if necessary to achieve reliable RF reception from the Instructor’s presentation location at the front of the Engineering Wireless Lab.
3. **Hearing Assistance Receivers:** Provide reliable RF reception from the RF hearing assistance transmitters located within individual equipment racks to wireless RF receivers used within the Engineering Wireless Lab. Coordinate frequency selection per manufacturer recommendations to minimize local interference sources.
4. **Audio-Follow-Video/Break-Away Switching:** All video and RGBHV/VGA inputs are to have audio support. Provide remote control programming to separately address switchers for seamless audio-follow-video switching, and breakaway matrix switching where required. Provide all software and firmware programming to configure matrix switchers to meet intended function of the systems.
5. Provide initial configuration for all Engineering Wireless Lab Control Room devices. This includes:
 - a. Provide initial routing, labeling, timing, and other system adjustments for the Digital Production Switcher. Store this base configuration as a system initialization preset. Coordinate with the College’s Technical Representative for initial preferences beyond the basic adjustments required to meet the specified routing intent.
 - b. The switcher requires special configuration to provide a simple toggle between the currently routed “to codec” signal, and the in-bound “from codec” distant site signal for video recording, and to prevent the distant site video from being resent back. The switcher is being used in this manner to feed to “program” destinations using an auxiliary output routing.
 - c. Initially adjust the audio delay for broadcast audio synchronization to compensate for the video processing latency delay. The audio delay is to provide synchronized audio and video at the recording master outputs.
 - d. Provide initial camera adjustments, including: white balancing, pan/tilt/zoom range limit adjustments, and presets.
6. **Videoconferencing Codec Configuration:** Coordinate with the College’s Technical Representative for display preferences during single and multi-site videoconferences, and other initial configuration requirements.

- ~~3-7.~~ Coordination is required with the College’s Representatives and the Design Consultant to create an acceptable control system look and feel that is intuitive to understand and operate, and designed for technical operator control. Concept system layouts (without linked hard-code) are required for College approval prior to final installation.
- a. Provide all necessary software programming to access all commonly used features for each item to be controlled. Verify device control protocols, and provide required control connection hardware.
 - b. Include appropriate service time to provide touchpanel reprogramming to address minor College requests for changes and additions after the initial touchpanel design review.
 - c. Revise touchpanels as required prior to the acceptance of the system. Provide at no extra charge, minor reprogramming of the control system or touchpanels requested by the College within thirty (30) days of acceptance of the system for user functionality issues, such as labeling changes, minor button layout configurations, etc.
 - d. Provide all necessary programming for the functions listed in part 1 of this specification via the portable touchpanel. Refer to the functional diagrams for additional information regarding devices to be controlled, and control signal type.
 - e. Control system pages for all controls are to incorporate the SRJC logo or seal as part of the start-up screen, with all control system pages provided within a variation of the SRJC official colors, and preferred fonts for non-button general text labels. Contact The College’s Representative for appropriate graphics sources.
 - f. The following control functionality is required:
 - i. Sequenced System Power On/Off: Provide a power On/Off control switch, which can be used to power up or down the equipment (except always on control devices). Provide an “Are you sure?” confirmation prompt before powering down the system.
 - ii. DSP Preset Recall: Provide required preset configurations to address all output routing conditions. Recall should occur seamlessly as a result of source selection and control selection options.
 - iii. Separate Speech and Playback Volume Controls: Provide Up/Down/Mute controls for speech and playback volume levels, with appropriate level control ranges set to prevent extremely loud playback levels.
 - iv. Source Select: Provide audio-follow-video source selection for all installed sources and receptacle plate inputs, including receptacle plate and panel locations.
 - v. Projector Control: Seamless source switching as necessary, and projector on/off/mute. Provide a projector lamp-life query upon system power-up and display this number in hours next to the projector power on button. Projector control is to be bi-directional RS232, not 1-way serial control.
- ~~v-vi.~~ Far-Side Flat Panel Control: Seamless source switching as necessary. Volume control will also be provided through the flat

- panel monitor for the Far-Side audio loudspeakers. Control is to be bi-directional RS232, not 1-way serial control.
- vii. DVD/SVHS Player: Basic transport controls (play/stop/pause/fast forward/rewind), with additional options specific to the DVD player. These should include menu navigation options, chapter skip forward/reverse, and other commonly used controls.
 - viii. Mini-DV/DVD-R/HDD Recorder/Player: Basic transport controls (play/stop/pause/fast forward/rewind), with additional options specific to the recording capabilities of the player. These should include menu navigation options, and specific recording controls, including DVD-R finalization.
 - ix. Ceiling Document Camera Control: Zoom and focus controls.
 - x. Closed Caption Decoder: Provide control selection to turn the closed captioning decoder on or off.
 - xi. The motorized projection screen will be controlled via the control system touchpanel, in parallel with any installed wall-mount low-voltage projection screen control.

B. Behavioral Lab 630 and Observation Room 630A, 630B, and 630C System Equipment:

1. DSP Audio Processor and Programmable Mixer Device Programming: It shall be the audiovisual contractors sole responsibility to make all adjustments to meet the functional requirements of this specification. Provide all necessary programming of DSP based audio system devices to provide the following:
 - a. Matrix Mixing/Routing: Provide all necessary setup for the use of automatic microphone mixing and stereo playback inputs. Provide required preset configurations to address all selectable output routing conditions.
 - b. Provide separate equalization for speech and playback loudspeakers and sources. Provide limiting on all drivers, and appropriate control system range for volume operation, including separate up/down/mute volume controls for both speech and playback loudspeakers in applicable room locations.
 - c. Provide equalization on microphone input channels for speech input range, with low frequency roll-off.
 - d. Provide programming to address the audio teleconferencer dialing options, and include routing to the ceiling loudspeakers and volume settings as required.
 - e. Provide echo cancellation and noise reduction DSP configuration. Noise reduction should not be set higher than –6dB of reduction, and only employed if no audio gating or artifacts are audible.
2. Audio-Follow-Video/Break-Away Switching: All video and RGBHV/VGA inputs are to have audio support. Provide remote control programming to separately address switchers for seamless audio-follow-video switching, and breakaway matrix switching where required. Provide all software and firmware programming to configure matrix switchers to meet intended function of the systems.

3. Provide initial camera adjustments, including: white balancing, pan/tilt/zoom range limit adjustments, and presets.
4. Configure the Composite Video Image Split Screen Combiners for an evenly divided signal, and recall this default setting when a recording is being setup.
5. Adjust microphone input gain for optimum audio recording signal level. Note that the audio cannot be played back through the Observation Room LCD flat panel loudspeaker systems when recording, or feedback will occur. A mute condition is required during recording, to be unmuted during the selection of any device for playback.

3-6. Coordination is required with the College’s Representatives and the Design Consultant to create an acceptable control system look and feel that is intuitive to understand and operate, and designed for technical operator control. Concept system layouts (without linked hard-code) are required for College approval prior to final installation.

- a. Provide all necessary software programming to access all commonly used features for each item to be controlled. Verify device control protocols, and provide required control connection hardware.
- b. Include appropriate service time to provide touchpanel reprogramming to address minor College requests for changes and additions after the initial touchpanel design review.
- c. Revise touchpanels as required prior to the acceptance of the system. Provide at no extra charge, minor reprogramming of the control system or touchpanels requested by the College within thirty (30) days of acceptance of the system for user functionality issues, such as labeling changes, minor button layout configurations, etc.
- d. Provide all necessary programming for the functions listed in part 1 of this specification via the portable touchpanel. Refer to the functional diagrams for additional information regarding devices to be controlled, and control signal type.
- e. Control system pages for all controls are to incorporate the SRJC logo or seal as part of the start-up screen, with all control system pages provided within a variation of the SRJC official colors, and preferred fonts for non-button general text labels. Contact The College’s Representative for appropriate graphics sources.
- f. The tabletop wired 12” menu driven LCD touchpanel will be provide control of all room audiovisual devices by the Instructor. Each of the three (3) Observation Room 4” wall-mount touchpanels will be used to initiate recording, and to control pre-recorded material playback. The three (3) wall-mount volume controls will control Observation Room loudspeaker monitoring levels, with mute.
- g. The following control functionality is required:
 - i. Sequenced System Power On/Off: Provide a power On/Off control switch, which can be used to power up or down the equipment (except always on control devices). Provide an “Are you sure?” confirmation prompt before powering down the system.

- ii. DSP Preset Recall: Provide required preset configurations to address all output routing conditions. Recall should occur seamlessly as a result of source selection and control selection options.
- iii. Separate Speech and Playback Volume Controls: Provide Up/Down/Mute controls for speech and playback volume levels, with appropriate level control ranges set to prevent extremely loud playback levels. Individual volume control is to be provided appropriate to each location (Behavior Lab Playback, individual Observation Room playback, individual Observation Room loudspeaker monitoring).
- iv. Projector Source Select: Provide audio-follow-video source selection for all installed sources and receptacle plate inputs, or live Observation Room feeds for display.
- v. Instructor 12” LCD Control Panel Source Select: The Instructor’s touchpanel will include video input capability, and can selectively monitor any of the video matrix switcher outputs.
- vi. Observation Room LCD Source Select: Each of the three (3) Observation Rooms will monitor the cameras for initial setup, or output of the associated mini-DV/DVD-R/HDD recorder during playback. No other sources are to be selected within each room.
- vii. Provide touchpanel control functionality per the College videoconferencing control interface standard.
- viii. Projector Control: Seamless source switching as necessary, and projector on/off/mute. Provide a projector lamp-life query upon system power-up and display this number in hours next to the projector power on button. Projector control is to be bi-directional RS232, not 1-way serial control.
- ~~v-ix.~~ Observation Room Flat Panel Control: Seamless source switching as necessary. Volume control will also be provided through the flat panel monitor for the Far-Side audio loudspeakers. Control is to be bi-directional RS232, not 1-way serial control.
- ~~vii-x.~~ DVD/SVHS Player: Basic transport controls (play/stop/pause/fast forward/rewind), with additional options specific to the DVD player. These should include menu navigation options, chapter skip forward/reverse, and other commonly used controls.
- xi. Mini-DV/DVD-R/HDD Recorder/Player: Basic transport controls (play/stop/pause/fast forward/rewind), with additional options specific to the recording capabilities of the player. These should include menu navigation options, and specific recording controls, including DVD-R finalization. Controls for each player are available from either the individual Observation Room control panels or the Instructor’s Control Panel
- xii. Closed Caption Decoder: Provide control selection to turn the closed captioning decoder on or off.
- xiii. Composite video image split screen combiner image preset recall (camera 1 full, camera 2 full, split image).

- xiv. The motorized projection screen will be controlled via the control system touchpanel, in parallel with any installed wall-mount low-voltage projection screen control.
7. Wall-Mount Parabolic Loudspeaker Installation:
 - a. Mount loudspeakers and orient for optimal coverage of the intended listener area.
 - b. Use rigid support members to prevent movements of the loudspeaker components.
 - c. All loudspeakers will be wired in positive polarity.
 - d. All components of the loudspeaker assembly will be painted as directed otherwise by the College’s Representative.
- C. Psych Therapy Room (616):
1. Configure the Composite Video Image Split Screen Combiner for an evenly divided signal, and recall this default setting when a recording is being setup. The flat panel monitor will be used to initially aim cameras, and will normally not be on during a recording.
 2. Adjust microphone input gain for optimum audio recording signal level. Note that the audio cannot be played back through the system when recording, or feedback will occur. A mute condition is required during recording, to be unmuted during the selection of any device for playback.
 3. Coordination is required with the College’s Representatives and the Design Consultant to create an acceptable control system look and feel that is intuitive to understand and operate, and designed for technical operator control. Concept system layouts (without linked hard-code) are required for College approval prior to final installation.
 - a. Provide all necessary software programming to access all commonly used features for each item to be controlled. Verify device control protocols, and provide required control connection hardware.
 - b. Include appropriate service time to provide touchpanel reprogramming to address minor College requests for changes and additions after the initial touchpanel design review.
 - c. Revise touchpanels as required prior to the acceptance of the system. Provide at no extra charge, minor reprogramming of the control system or touchpanels requested by the College within thirty (30) days of acceptance of the system for user functionality issues, such as labeling changes, minor button layout configurations, etc.
 - d. Provide all necessary programming for the functions listed in part 1 of this specification via the portable touchpanel. Refer to the functional diagrams for additional information regarding devices to be controlled, and control signal type.
 - e. Control system pages for all controls are to incorporate the SRJC logo or seal as part of the start-up screen, with all control system pages provided within a variation of the SRJC official colors, and preferred fonts for non-

- button general text labels. Contact The College’s Representative for appropriate graphics sources.
- f. The following control functionality is required:
 - i. Sequenced System Power On/Off: Provide a power On/Off control switch, which can be used to power up or down the equipment (except always on control devices). Provide an “Are you sure?” confirmation prompt before powering down the system.
 - ii. Playback Volume Controls: Provide Up/Down/Mute controls for playback volume levels, with appropriate level control ranges set to prevent extremely loud playback levels.
 - iii. Source Select: Provide audio-follow-video source selection for all installed sources and receptacle plate inputs, including receptacle plate and panel locations.
 - iv. Flat Panel Control: Seamless source switching as necessary. Control is to be bi-directional RS232, not 1-way serial control.
 - v. Mini-DV/DVD-R/HDD Recorder/Player: Basic transport controls (play/stop/pause/fast forward/rewind), with additional options specific to the recording capabilities of the player. These should include menu navigation options, and specific recording controls, including DVD-R finalization.
 - vi. Pan/Tilt/Zoom Cameras: Provide pan/tilt/zoom controls for each of the two (2) cameras.
 - vii. Composite video image split screen combiner image preset recall (camera 1 full, camera 2 full, split image).

3.6 WORKMANSHIP

- A. Installation of all work including cabling will be neat. All boxes including the loudspeaker enclosures, equipment, racks, etc., will be plumb, squarely located and, where appropriate, flush with adjacent surfaces. Replace all ceiling tiles removed for this work when the work is complete. Leave the job site clean and free from marks and blemishes.

3.7 AUDIOVISUAL CONTRACTOR’S PRELIMINARY TESTING AND ADJUSTMENTS

- A. Furnish all equipment and personnel to conduct these tests in accordance with the performance specification requirements. ANSI S1.13 and EIA Standards RS-160, RS-219 and RS-189A will apply.
- B. Audio Testing and Adjustment:
 - 1. Load a "straight-wire" algorithm into DSP Audio Matrix Mixers so that end-to-end system measurements can be made, as noted below.
 - 2. Initially adjust all system gain controls for optimum signal to noise ratio. After all adjustments required to meet specification requirements are made, measure and report the resulting system electrical signal to noise ratio at the amplifier outputs from 20 Hz -20 kHz in 1/3 octave bands.

3. System Frequency Response: Measure the sound pressure level in audience areas using a calibrated type 1 precision sound level meter as defined by ANSI S1.4. Measure using the slow time constant. Report the unequalized house curve with the equalizer controls set to "0", by space.
 4. Audio Coverage Uniformity: Scan the areas served by the system and record sound pressure level in octave bands. Perform any necessary adjustments as required to achieve coverage uniformity.
 5. Adjust the crossover settings within DSP Audio Matrix processors to provide optimal frequency distribution to each loudspeaker in accordance with manufacturer recommendations.
 6. Special adjustment of dynamic feedback equalizers shall be as follows: Low frequencies shall roll-off 3 dB per octave below 200 Hz. High frequencies shall roll-off 3 dB per octave above 8.0 kHz. Apply up to three (3) additional filters to provide smoother audio response. Leave at least half of the dynamic filters unassigned in a roaming “feedback notch” mode.
 7. Adjust the DSP based equalizers to provide “flat” frequency response (± 3 dB) throughout audience seating areas. Special adjustment of microphone input channel equalizers shall be as follows: Low frequencies shall roll-off 3 dB per octave below 200 Hz. Adjustments are to be made using a calibrated type 1 precision sound level meter as defined by ANSI S1.4. Measure using the slow time constant. Document and report the equalized house curves for both speech and playback audio where applicable and save settings as a preset on diskette.
 8. Measure the 70volt loudspeaker line impedances at each equipment rack with all loudspeakers connected and the amplifier disconnected. Report the absolute value at 1KHz.
- C. Audiovisual Contractor will review and assess the appropriate focal length between the video projectors and the projection screens to ensure optimum picture sizing and focus. Make all adjustments necessary, including projector keystone correction and lens shift to achieve the image size and shape required.
- D. Provide full video projector calibration and adjustments for optimal picture quality. Provide proper aspect ratio configuration for both 4:3 and 16:9 sources. Set all projector configuration presets required for control system recall coordination, and provide with final system documentation.
- E. Provide full flat panel monitor display calibration and adjustments for optimal picture quality. Provide proper aspect ratio configuration for both 4:3 and 16:9 sources. Set all flat panel monitor configuration presets required for control system recall coordination, and provide with final system documentation.

F. Video Testing and Adjustment:

1. Video Testing: Provide video testing of source-to-destination production signal paths through cabling and equipment input/output for composite video and SD-SDI.
2. Adjust controls and ensure that all equipment is installed in compliance with manufacturer's specifications.
3. Adjust video signal timing for coincidence within two degrees of sub-carrier and within 50 microseconds of sync at program output of SEG/switcher for any input.

G. Controls: Adjust all controls to achieve the specified performance. Provide shaft-locks or covers for all level controls, as appropriate to prevent unauthorized gain changes. Audiovisual Contractor will confirm that all control system operations are properly programmed and repeatable.

H. Testing Report: Provide a letter/report documenting the results of these preliminary tests, including amplifier gain/level settings, crossover filter settings, and AV equalization curves for review by the Design Consultant.

3.8 ACCEPTANCE TESTS

A. Qualification for Acceptance: Subsequent to completing preliminary testing, the Audiovisual Contractor shall furnish the Construction Manager with the letter/report documenting the results of the preliminary tests and two (2) copies of "as-built" wiring diagrams of the entire system including the connection numbers, and their locations. The receipt of this documentation will constitute the Audiovisual Contractor's acknowledgment that the installation is complete and conforms to this specification, and is ready to be reviewed and tested by the Design Consultant.

B. Acceptance Test: The Design Consultant, College's Representative and/or Construction Manager will be present during the acceptance testing and require the assistance and cooperation of the Audiovisual Contractor. Provide personnel who participated in the actual installation and preliminary testing and adjustment of the audiovisual systems.

1. Equipment cabinet keys and any tamper-proof fastener tools must be available to the Design Consultant. Delays associated with failure to access the equipment will be back-charged to the Audiovisual Contractor at the Design Consultant's current hourly rates.
2. Each major component shall be demonstrated to function, as specified.
3. Measurements: Further electrical and acoustical measurements may be performed at the discretion of the College and/or College's Representatives. Acoustical test equipment will be supplied by the Design Consultant. Such measurements may include sound pressure levels, uniformity of coverage, distortion, or other pertinent characteristics.

4. The Audiovisual Contractor shall provide a laptop with all manufacturer supplied configuration software necessary for communicating with the DSP Audio Matrix Mixer. A review of system settings may be required for either of the programmable units at the Design Consultant’s request, and settings may be adjusted if necessary.
- C. Such tests may be performed on any piece of equipment or system. If any test shows the equipment or system is defective or does not comply with the specifications, the Audiovisual Contractor shall perform any remedies at his expense and pay the subsequent expenses of any retesting required.
- D. Delays: If the acceptance of the system is delayed because it does not meet the specification requirements, the Audiovisual Contractor shall reimburse the College for all expenses of consultants retained to represent the College during the final acceptance testing. This will include costs associated with travel to the site, and include reimbursable business travel expenses.

3.9 SYSTEM DOCUMENTATION, TRAINING, AND FIELD SUPPORT

- A. Operation and Maintenance Manuals: For each system, provide three (3) copies of system manuals per system, two (2) for the College and one (1) for the Design Consultant. Manuals shall be in adequately sized three-ring binders, clearly labeled on spine. Manuals shall contain the following:
 1. Service Reference Cover Sheet: Provide a cover sheet with Audiovisual Contractor name, address, telephone and Fax numbers.
 2. Equipment Manuals: Include copies of individual equipment operation manuals separated by tabbed dividers. Order manuals in nominal signal path order (i.e. sources first, amplifiers/loudspeakers last), followed by control system manuals, followed by miscellaneous manuals.
 3. Equipment List: List all system equipment including, connectors and specialty hardware, by manufacturer and model.
 4. As-built Drawings: Provide reduced 11”x17” foldout "as built" functional diagrams in clear plastic binder sleeves. Fold and insert drawings so that drawing title is clearly visible at the front of the sleeve. Three (3) half or full-size drawing sets are also to be provided for clearer system reference.
 5. Provide software programmable device configuration files to the College for the following:
 - a. Control Systems (AMX source code, including any interfaces and computer-based application files)
 - b. Store files on site in the system documentation binders in disk sleeves. Provide the files on CD-ROM.

- c. All files should also be stored on the main network server, in a folder designated by the College’s IT Representative
- B. Training: Provide up to 8 hours of system training to operator(s) designated by the College. Training time is to be non-contiguous, in multiple separate sessions. Some training time is to be used as live “first event” assistance. Assist and oversee operator(s) during these events. Training sessions are to be videotaped upon College request.

END OF SECTION