Appendix J: Audiovisual Systems Commissioning Tests Checklist
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This checklist is intended to provide owners, consultants and integrators with a comprehensive and singular source of tests to determine if the audiovisual system achieves the client's goals or objectives and that the system performs in accordance with the best practices of the industry. By providing this list to the audiovisual industry, InfoComm is establishing a set of commissioning guidelines to help industry professionals and their clients communicate effectively about their expectations for system performance.

In many projects, not all tests are required for each system or circumstance. Owners and designers can elect to include or exclude certain tests, as they may not be meaningful for a particular system. In some instances, certain performance capabilities are less critical and therefore stringent review of those capabilities is unnecessary. In other circumstances, certain elements of the system may require more critical review, and the performance of that aspect of the system may need to exceed the general guidelines outlined here. The commissioning process for each system should be an agreed upon set of tests between the client and the designer.

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Download a copy of this Commissioning Tests Checklist from www.infocomm.org.

Audiovisual Systems Commissioning Tests Checklist

I	AV-PH	Physical Installation	VI	AV-V	Video Performance
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III	AV-E	Electrical	VIII	AV-AC	Acoustical Environment
IV	AV-S	Serviceability	IX	AV-DR	Verification and Documentation
V	AV-A	Audio Performance			

I AV-PH: Physical Installation

Item Number	Item Title	Description	Criteria	Responsible Party	Pass Fail	Notes
AV-PH-01	Site Inventory of AV Equipment	Is all equipment in shop or on site? List all equipment in system NOT present, and why.				
AV-PH-02	Installation Status of AV Equipment	Is all rackable equipment installed?				
AV-PH-03	AV Rack Cleanliness	Racks are "clean" - grease markings removed, etc.				
AV-PH-04	AV Rack Blanks and Vents Installation	All blanks and vents installed in unused rack spaces.				
AV-PH-05	AV Patch Bay Labeling	All patchbays labeled				

Item Number	Item Title	Description	Criteria	Responsible Party	Pass Fail	Notes
AV-PH-06	AV Patch Bay Configuration	Patchbays configured with all outputs on top rows, inputs on bottom rows				
AV-PH-07	AV Rack Thermal Gradient Performance	Thermal gradient inspected; all equipment operating within manufacturers' guidelines				
AV-PH-08	AV Rack Protective Treatments	Small racks have carpet tiles on bottom to avoid scratching credenzas				
AV-PH-09	AV Equipment Labeling	All engraved labels permanently fastened.				
AV-PH-10	AV System Cabling Verification	All peripheral equipment hooked up as per flow diagram: microphones, loudspeakers, video monitors, projectors, PC's, USB switchers, etc.				

II AV-CM: Cable Management, Termination and Labeling

Item Number	Item Title	Description	Criteria	Responsible Party	Pass Fail	Notes
AV-CM-01	AV Equipment Power Cable Management	Equipment without IEC removable power cords are not tie-wrapped to the cabinet, and there are no obstructions to the item being pulled from the front of the rack.				
AV-CM-02	Verification of AV Rack Cable Installation	Tie wraps are not too tight as to deform the cable. UTP cables are laced and bound with Velcro ties.				
AV-CM-03	Verification of AV Rack Cable Installation	Terminations are free from stress due to gravity acting on the cabling or cable dressing technique.				
AV-CM-04	Verification of AV Rack Cable Installation	Terminations have sufficient service loop, allowing a re-termination or two without having to open a cable bundle or pathway to lay in a new cable.				
AV-CM-05	Verification of AV Rack Cable Installation	Cables appropriately dressed and bundled according to cable type.				
AV-CM-06	Verification of AV Rack Cable Installation	Verify cable supports are used depending on size and stiffness of cable.				
AV-CM-07	Verification of AV Rack Cable Installation	Cables have appropriate separation according to signal type and level.				

Item Number	Item Title	Description	Criteria	Responsible Party	Pass Fail	Notes
AV-CM-08	Verification of AV Rack Cable Installation	Verify all cables are installed with an adequate bend radius as recommended by the manufacturer and general system requirements.				
AV-CM-09	AV System Cable Labeling	All cables have clearly legible, unambiguous identifying labels, and labels are oriented and positioned consistently. Labels are visible without system disassembly and are not hidden in cable bundles.				
AV-CM-10	AV System Cable Labeling	All cable labels are permanent, non-slipping and according to specification.				
AV-CM-11	AV Connector Verification	All terminations are in agreement with the equipment and system requirements.				
AV-CM-12	AV Connector Verification	All connectors are correctly seated to its mating connector.				
AV-CM-13	AV Connector Plate Labeling	All connectors on input and output plates are labeled.				
AV-CM-14	AV Connector Plate Labeling	Confirm all labeling nomenclature for consistency between drawings, touch screen labels, wall plates and other labeling of connectors, connection points and devices.				

III AV-E: Electrical

Item Number	Item Title	Description	Criteria	Responsible Party	Pass Fail	Notes
AV-E-01	AV System Power and Grounding Verification	Stray AC voltages on any equipment accessible to a user relative to ground?				
AV-E-02	AV System Power and Grounding Verification	Neutral and isolated ground current test.				
AV-E-03	AV System Power and Grounding Verification	Verify equipment is powered by correct circuits.				

IV AV-S: Serviceability

Item Number	Item Title	Description	Criteria	Responsible Party	Pass Fail	Notes
AV-S-01	AV System Serviceability	Input/output panels are easily accessible.				
AV-S-02	AV System Serviceability	If there are obstructions prohibiting the disconnection of terminations on the back of AV equipment, there must be sufficient cabling to permit the equipment to be pulled from the front, and disconnected there.				
AV-S-03	AV System Serviceability	It is relatively easy to find proper cable termination points when removed or replaced equipment is re-installed.				

Item Number	Item Title	Description	Criteria	Responsible Party	Pass Fail	Notes
AV-S-04	AV System Serviceability	Equipment can be pulled for repair or replacement without hindrance.				
AV-S-05	AV System Serviceability	Equipment must be able to be serviced indefinitely; designed with the maintenance technician in mind (he or she will "own it" longer than the person who fabricated the system initially).				

V AV-A: Audio Performance

All audio performance tests are made from all electronic system inputs (first physical output of source media, all I/O plates, mic inputs) to all electronic system outputs (all outputs connected to amplifier inputs, all connections to external facilities (to other rooms, buildings or external services such as broadcast connections).

Item Number	Item Title	Description	Criteria	Responsible Party	Pass Fail	Notes
AV-A-01	Audio System Total Harmonic Distortion	Measure total harmonic distortion of the audio system. Distortion level should not exceed best practices.				
AV-A-02	Audio System Signal-to-Noise Ratio	Measure system signal to noise ratio. Noise level should not exceed best practices.				
AV-A-03	Speech Reinforcement System Electronic Frequency Response	Measure frequency response of the audio system for speech sound reinforcement. System frequency response should be determined for the system during design process.				

Item Number	Item Title	Description	Criteria	Responsible Party	Pass Fail	Notes
AV-A-04	Audio Playback System Electronic Frequency Response	Measure frequency response of the audio system for program sound amplification. System frequency response should be determined for the system during design process.				
AV-A-05	Audio System Latency	Measure latency of the audio system. Latency should not exceed design requirements of the system.				
AV-A-06	Audio Coverage in Listener Areas	Measure audio coverage uniformity in the listener area, see InfoComm Performance Standard for test procedure and acceptable performance criteria.				
AV-A -07	Audio Level versus Background Noise Level	Measure background noise level during normal room operation. Measure audio system level during normal room operation. Audio level should exceed background noise level to provide for clear, intelligible amplified sound.				
AV-A-08	Speech Reinforcement System Headroom	Measure audio system headroom. Audio system should be capable of performing above nominal operating levels without distortion.				
AV-A-09	Program Loudspeaker Polarity	Program loudspeakers in the same system shall produce consistent polarity for a mono input signal in all channels.				

Item Number	Item Title	Description	Criteria	Responsible Party	Pass Fail	Notes
AV-A-10	Speech Reinforcement Speaker Polarity	Speech reinforcement systems shall be polarized such that a positive acoustic pressure on a microphone results in a positive acoustic pressure at all loudspeakers.				
AV-A-11	Alignment of Multiple Audio Sources	Calibrate audio system inputs so there is zero or minimal difference between any input signal level.				
AV-A-12	Audio Buzz and Rattles	There shall be no audible vibration caused by improper mechanical installation. Perform buzzes and rattles test, using continuous sweep signal (from generator or test CD) pass/ fail result or which device at what frequencies.				
AV-A-13	Audio System Gain Before Feedback	The speech reinforcement system shall be stable and operate without feedback.				
AV-A-14	Conferencing System Microphone Sensitivity and Gain Structure Alignment	For conference systems, adjust microphone input gain to demonstrate that "standard talker," positioned at each talker position in the room, produces a 0 dBu level at the output of the output bus of the audio conference DSP device. Verify signal levels for both transmit and receive using normal speech.				

Item Number	Item Title	Description	Criteria	Responsible Party	Pass Fail	Notes
AV-A-15	Audio System Equalization for Speech Intelligibility	Equalizers shall be adjusted for best intelligibility, and in accordance with the preferred acoustic level response curves. For systems with equalizers, document the “house curve” before equalization, as well as after the equalizers have been tuned, with and without microphone input filters. If requested by the Consultant, produce this documentation for systems without equalizers, as this test may apply to the preamp filter settings in cases where intelligibility can be improved.				
AV-A-16	Audio System Speech Intelligibility at Listener Positions	Audio system should provide intelligible sound above background noise levels. System design should anticipate background noise levels in the listener space.				
AV-A-17	Audio System Amplifier Loading	No power amplifier shall have its rated load exceeded. Record the impedance (and at what frequency) of each loudspeaker line of each power amplifier. 63, 250, and 1,000 Hz are recommended if available				

Item Number	Item Title	Description	Criteria	Responsible Party	Pass Fail	Notes
AV-A-18	Conferencing Echo Suppression Performance	For a system with conference capability, system shall perform at nominal operating levels in a full duplex mode without echo or latency.				
AV-A 19	DSP Signal Path Verification	All DSP programming installed and properly passing intended signal pathways and mixes.				

VI AV-V: Video Performance

All video performance tests are made from all electronic system inputs (first physical output of source media, all I/O plates) to all electronic system outputs (all outputs connected to display inputs, all connections to external facilities (to other rooms, buildings or external services such as broadcast connections).

Item Number	Item Title	Description	Criteria	Responsible Party	Pass Fail	Notes
AV-V-01	Video System NTSC Signal Gain	For NTSC sources, demonstrate a consistent 1 volt peak-to-peak test signal at each source shall produce 1 volt peak-to-peak to each destination. Verify at each destination using NTSC bars, peak white, and 5-step multiburst (0.5, 1.0, 2.0, 3.0, 3.58, and 4.2 MHz)				
AV-V-02	Video System RGBHV Signal Gain	For RGB sources, demonstrate consistent 700 mV from each source to each destination. Observe results using a flat-field pattern signal at 1024 by 768 resolution (VESA 8). Measure peak-to-peak voltage using a 200 MHz oscilloscope at each destination when a test generator with either multi-burst or H pattern is at each source location. Adjust ‘peaking’ and ‘level’ control settings on any interface at the positions whereby the 700 mV voltages were attained.				
AV-V-03	Video System Pixel Failure Tolerance	"White Purity" Test. Note number and location of stuck or lost pixels, if any.				
AV-V-04	Video Camera Image	Verify camera performance and operation.				

Item Number	Item Title	Description	Criteria	Responsible Party	Pass Fail	Notes
AV-V-05	NTSC Image Alignment	For NTSC sources, confirm optimum brightness, contrast, and color in displays using SMPTE source with PLUGE (Picture Line Up Generation Equipment) display.				
AV-V-06	Consistency of Multiple NTSC Displays	When several NTSC displays are visible, demonstrate consistencies in displays using NTSC bars with PLUGE signal to all.				
AV-V-07	Projected Display Physical Alignment	Verify that projected displays are focused, centered, and evenly-illuminated.				
AV-V-08	Projected Display Physical Alignment	For projected displays, take actual measurements of image geometry to verify image is rectangular and proportional across the entire image.				
AV-V-09	Projected Image Contrast Ratio	Measure the contrast ratio of the projected image with ambient lighting in normal operating mode.				
AV-V-10	Projected Display Brightness Uniformity	For projected displays, using a calibrated light meter, determine the image has uniform brightness across the entire image.				

Item Number	Item Title	Description	Criteria	Responsible Party	Pass Fail	Notes
AV-V-11	Multiple Resolution Performance of Video Displays	Display stable, properly scaled images, with no scaling-related visual artifacts when switching between, at a minimum, 1024 x 768, 1280 x 1024, 1280 x 720 sources, and/or all those specified in the performance criteria for this system.				
AV-V-12	Image Size Relative to Furthest Viewer	Image size relative to furthest viewer: Record each, compare to recommended multiplier.				
AV-V-13	Cable Television RF Tap Levels	Confirm TV RF levels, using the highest frequency channel of the system, with field strength meter at all system taps.				
AV-V-14	On Screen Display Settings for Video Displays	Displays have OSDs (on screen displays) "OFF", or as specified by the user.				
AV-V-15	Video Standby Screen Setting	Video projector, if any, must have 'blue screen' off, or as directed by the user.				

VII AV-N / AV-C: Control, Software and Networking

Item Number	Item Title	Description	Criteria	Responsible Party	Pass Fail	Notes
AV-N-01	Control System IP Address Assignment	All IP-controlled equipment properly configured with IP addresses, host names, time servers, Gatekeeper addresses, network configurations, and subnets as applicable. All system connections are operational and devices communication correctly.				
AV-C-02	Control System Communications	All control system programming installed and properly communicating with the equipment intended.				
AV-C-03	Control System User Interface Performance	Control system user interface conforms to user or specified requirements and all pages and buttons operate as intended.				
AV-C-04	Interfacing and Control of External Devices and Systems	Confirm control system functions not obvious from the control flow diagrams (i.e., lighting presets that are activated when the control system enters a videoconferencing mode)				

Item Number	Item Title	Description	Criteria	Responsible Party	Pass Fail	Notes
AV-C-05	Interfacing and Control of External Devices and Systems	Confirm control system interfaces exist and are functional for devices that may be outside AV scope such as drapes, shades, screens, lights, security, life safety and HVAC.				
AV-C-06	Control System Power Cycling and Recovery	The control system will restart and resume full operation following an unanticipated cycling of AC power to the control system.				

VIII AV-AC: Acoustical Environment

Item Number	Item Title	Description	Criteria	Responsible Party	Pass Fail	Notes
AV-AC-01	Acoustical Ambient Noise	Record ambient noise level with room is normal operating mode, see AV-A-07.				
AV-AC-02	Acoustical Ambient Noise	Document octave band ambient noise and calculate NC or RC per ASHRAE if NC was part of design criteria				
AV-AC-03	AV Room Reverberation Time	Document octave band reverberation times if speech intelligibility criterion is not met.				

IX AV-DR: Verification and Documentation

Item Number	Item Title	Description	Criteria	Responsible Party	Pass Fail	Notes
AV-DR-01	AV System Documentation	There is perfect agreement between the "paper model" documentation (drawings), the control system user interface (i.e., touch panel screens, push button labels, panel engravings, etc.), and the physical wiring and labeling. This includes designation strips, equipment labeling, etc.				
AV-DR-02	Video System Test Reporting	Video system tested (all pathways tested, all interconnections marked as tested on drawing).				
AV-DR-03	Audio System Test Reporting	Audio Tested (all pathways tested, all interconnections marked as tested on drawing).				
AV-DR-04	Control System Test Reporting	Control tested (all pathways tested, all interconnections marked as tested on drawing). Emulate closures for screens, motors, etc.				
AV-DR-05	AV System Commissioning Sanity Check	Sanity Check: Is there any reason why this system should NOT be turned over to the owner for use.				
AV-DR-06	Final Commissioning Report and System Turnover	Prepare document report, certifying the product, performance, and practices are in compliance, and note any exceptions. Distribute accordingly.				