

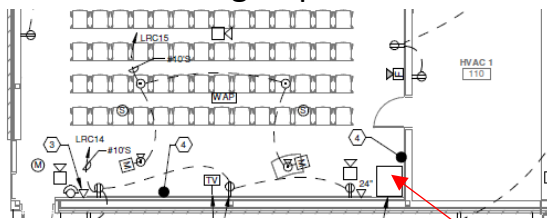
Meeting Room 106 A/V System Concerns

(Section 16600, part 2.5, Pages 786-787)

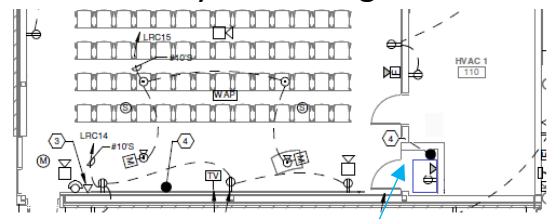
September 30, 2022

The following errors, omissions and inconsistencies have been identified by the library staff:

- 1. Location of rack.** Current blueprints call for the rack to be installed in the meeting space itself in the corner closest to the HVAC room by the podium. Ideally, it would be better if the rack were located in a closet carved into the HVAC room with a locked door and louvers at the door bottom for ventilation. Having equipment in a closet instead of a rack in the open will allow for microphones, mic stands and cords, as well as hearing-impaired and other equipment to be neatly stored together.



Existing location of A/V rack
(bolted to the corner wall at eye level)



New location of A/V rack
(inside a closet with vented door).

- 2. Non-Metal enclosed rack.** The current rack mentioned on page 787 is an Atlas/Soundolier Series 340-21B wall rack bolted to the wall. It is completely enclosed in metal with a metal locked door. The plans also call for a wireless microphone system (B.5 on page 786) and a hearing-impaired wireless system (B.12 on page 787). Both of these use antennas for transmission and reception.



Keeping these antennas in a metal enclosure creates what is known as a “Maxwell cage” effect, where radio signals are partially or completely blocked. This problem can be eliminated if we located the rack inside a locked closet as mentioned in #1 above. The rack then can be open on all sides since the closet drywall and wood will pass radio signals. Whatever rack is used, it will need to support at least 16U of equipment. *(Suggested Vevor 18U open rack is pictured on left.)*

If the plans to use a metal box are not changed, we will need to run additional antenna wires outside the metal box and onto the side wall of the meeting room.

3. **Cassette (CD?) player.** Page 786 (item B.1) specifies a Rauland MCX-325 AM/FM *digital cassette* player. This



Rauland MCX-325 is again mentioned in B.10 as an AM/FM *Compact Disc* player... an inconsistency. Google searching this device shows that it is no longer available except as a used item on EBay. It basically is a car stereo that has been fitted into a metal box, and looks like it came from the 1970s. This is outdated technology and should not be included in the A/V rack. People now stream their audio or use recorded media instead of AM/FM or cassette. Please remove this item.

4. **DVD/Blu-ray Player.** Instead of the Rauland device mentioned in item #3 above, the library staff suggests that we install a Blu-ray player such as the Tascam BD-MP1. This device would not only play video discs and CDs, but it also has the USB and SD card slot to play MP4 videos and MP3 songs from digital media. This player would also fulfil the requirement of item #11 mentioned on page 787, which specifies that a MP3 player be installed.



5. **Remove hearing-impaired amplifier.** Item B.12.d on page 787 mentions a Listen Technologies LR-100-216 amplifier. The library staff finds no use for this piece of equipment, since the transmitter and receiver (items b, c, and e) create a sufficient system. This device was intended to be used to link two meeting room racks together wirelessly. There is no need to attach another receiver to another sound system besides this one. Please remove this item.
6. **Wireless microphones.** Section B.5 on page 786 mentions 3 Shure BGX handheld wireless microphones. Doing a Google search and also visiting the shure.com website does not show this microphone. Presumably this model has been banned by the FCC way back in 2010 because it was using the same frequencies as 4G cell phones after the digital TV changeover. Shure only sells microphones in the BLX line now. The library staff recommends that only one of these microphones be handheld (Shure BLX24R/B58), and the other 2 be clip-on lapel microphones (Shure BLX14R/W85), so that actors and other presenters can be free to move and use their hands during a performance.

7. Wired microphones. While the 3 Shure PGA-48LC microphones mentioned in section B.2 on page 786 are adequate, the M-50 microphone cords listed are 50 feet long, which is too big for the room and unwieldy to store. Please reduce the microphone cables to 25 feet, and add two microphone floor stands to the project. *(The third mic will probably be attached to the podium via gooseneck connector).*

8. Mixer is insufficient. The mixer listed in item B.8.a (a JBL CSMA 180) only has 4 microphone inputs. The project manual specifies 3 wireless microphones and 3 corded microphones... a total of 6. A better solution would be to use a mixer such as the **Denon 312-X Professional**, (\$210 from Sweetwater) which does support all 6 microphones, as well as 3 stereo inputs, one of them being the Blu-ray player mentioned in #4 above. Or better yet, a **Behringer RX 1202 FX mixer** (\$399 from Amazon), which will support all this and more. Both mixers have “record out” RCA jacks that can be used to feed the hearing-impaired system.



9. Optional microphone jack removal. Due to having three wireless microphones, having four wired jacks installed is overkill. The microphone listed in the back will probably be the least used, and its function is easily replaced with a wireless handheld. Also, the Denon mixer listed above in #8 only has controls for 3 wired and 3 wireless microphones, so the fourth microphone in the back of the room would not be connected to the rack. This microphone jack can be removed from the blueprint.

10. Rear speakers, DBX Equalizer, and Speaker Amplifier. The Crown XTI-1002 amplifier listed seems ample to do the job. In the previous document from April 2, 2022 and reviewed on September 19, 2022, it was mentioned that the staff would like an additional 2 rear speakers in this room pointed towards the room center, so

that the people in the front row don't get "blasted" and the people in the rear can hear. If this is done, the volume can be reduced everywhere and microphone feedback should not be a problem. While the DBX 200i Equalizer is very nice and can "tune" the room for the speakers and room acoustics, most library staff would find it confusing to use and it will rarely be played with, especially at lower volumes. This \$750 device can be removed from the project manual.

- 11. Paging system interlock.** Section B.4 on page 786, and item 14 on page 787 discuss using an Advantage EPI (BiAmp #909-0056-00) paging interrupter to silence the system during a library-wide PA announcement. While this is nice in theory, it is not needed, since performers tend to be silent and pause when they hear an announcement. I am wondering if this exact device is even made anymore, since Google searches only find a single EBay reference for a used one priced at \$37.

If this device is mandated by law to be installed, then two of these devices will be needed, due to this being a stereo system. The PA speakers will need to be connected AFTER the 70 volt transformer and BEFORE the speaker connection to get the reduced 24 volt signal needed by this EPI device. In addition, this interlock requires an UNBALANCED A/V rack system, and the XLR jacks going into the amp should be (and are) BALANCED instead, to avoid the annoying 60 Hertz hum noises. I am not even certain this device will work because the output of the mixer is only 5 volts. Unless this device is required by law, please remove this item.

- 12. Fire alarm power shutoff.** Section 2.5.B.15 on page 787 makes a statement that the A/V rack system should automatically be turned off in case of a fire alarm. There is no mention in the design guide of a make/model for this shutoff device, nor is there any mention in the blueprints of a signal wire from the fire system into the A/V rack for this to happen. Again, if this is some sort of legal requirement, the design document should spell out exactly what is needed. Otherwise, I suggest this item be removed from the plan, since fires rarely occur from electrical audio devices.

- 13. Power conditioning strip.** As a tie-in to the previous item #12 above and for ease of use, the rack should have a single "power on/off" button instead of turning on each unit individually. The staff suggests a **Furman M 8-2** unit, which has 8 power outlets in the back, one outlet in the front (for an occasional laptop), and has its own circuit breaker protection against overloads.



14. Storage drawer. The staff recommends installing a 3U heavy metal storage drawer in the rack to store items such as the hearing-impaired receivers, batteries, microphones and small cords. *(Show Me Cables #15-200-503 pictured)*



15. Equipment shelves. We will need two 2U rack shelves to support the Cox/Satellite receiver box and the hearing-impaired transmitter, since neither one of them have “rack ears” to be directly mounted.



16. Special notes on hole #4 (E201). This access hole, which is located next to the A/V rack (and should be in the same closet), needs to have the following wires pulled through it:

- a) 2 RG6 coax wires. One wire from the data room, supplying the signal feed from the Cox cable/antenna/satellite system to the rack, and another wire that connects the A/V rack to the area behind the TV. If no cable or satellite receiver box is installed in the rack, then these two RG6 wires will be connected together behind the rack with a double female F connector for a direct connection to the TV as an antenna.
- b) 2 or 3 HDMI wires from the rack to the area behind the TV. One of these wires will connect the BD/DVD player, one connects to an optional Cox tuner/satellite box.
- c) Left and Right audio cables. Instead of using a TV sound bar, the TV’s sound output will be sent using these shielded “RCA” wires to the room’s sound system mixer and amplifier. This is a must so that the hearing impaired can also hear the TV broadcast. Depending on the TV model, we may need to run a fiber optic audio wire also if the TV uses this for audio output. *(The same holds true if we use a projector system mentioned on the last page of this document. It also has audio outputs.)*
- d) Microphone wires. The XLR microphone jacks shown in the blueprint that are located in the room’s floor will probably also be fed through this hole or possibly a different hole not mentioned in the plan or blueprints.
- e) Speaker wires. These 2 wires *(or 4 if the rear 2 speakers are used)* need to leave the rack and go into the ceiling area of the room. Due to the amount of current, these wires should be shielded and located in a different hole.
- f) Optional wires. Depending on the install needs, we may need to run the following additional wires:
 - a. An antenna wire from the hearing-impaired system *(50 ohm coax)*.

- b. A wire from the 70 volt PA system ceiling speaker for audio silencing, mentioned in item #8.
- c. A wire from the fire alarm alert system to the rack's power shutoff device, as mentioned in item #12 above.

Please make sure that this access hole is big enough to handle all these cables.

17. Meeting Room 106 television. The blueprints and walkthrough video (*from January 19, 2020 and still on the mysbpl.org website*) all show a flat screen TV mounted on the front wall by the podium. The largest TV in a reasonable price range is an 85 inch diagonal (*Sony Brava XR85X90K 4K video, 4 HDMI from Amazon for \$2,200.*) Larger flat screen TVs balloon in price into the \$12,000 to \$20,000 range (*for 90" to 120" TVs and are rare. A Samsung 98" Neo 4K is currently \$14,998 at Amazon*).

Doing calculations for this meeting room where the last seat is about 45 feet from the front indicates an optimal diagonal screen size of 200 inches, not the 85 inches that a TV provides. This screen size would have an enormous height of about 9 feet. A reasonable compromise would be to have a diagonal screen size between 100 and 150 inches (*screen height of about 5.5 feet*).

This leaves us with no alternative but a projection TV system. A Da-Light 120 inch diagonal manual pull-down screen (*Model 36465 from B&H Photo*) will cost \$320 plus shipping. For the projector, the high end would be a Sony model VPL-XW5000ES 4K laser projector costing in the \$6,000 range (*plus shipping and the projector mount of about \$250*). This laser projector has a duty life of 4 hours per day, every day, for the next 10 years before it needs replacing.

On the low end would be an LG HU70LA, 4K DLP 140" diagonal system that currently sells on Amazon for about \$2,000, plus the cost of a projector mount. This cheaper projector will most probably not be as bright and will "wash out" in a lighted room. This cheaper projector uses a light bulb that will eventually burn out and will need replacing.

So roughly, a projection TV system will cost us about \$3,800 to \$7,200. A DECISION HAS TO BE MADE before the building goes out to bid.

If the projection system option is used, it will require that the hole in shown in blueprint E201 (*item #4*) be moved back from the front wall about 12 to 15 feet to feed the wires into the projector, and an electrical outlet and a single Ethernet (for control) needs to be mounted in the ceiling, and the HDMI jack that was to be mounted on the front wall under the TV should be removed.