Report on the UCLA iSchool Media Preservation Lab

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On June 13, at the invitation of Associate Dean of Information Studies Anne Gilliland, I spent the day at the UCLA iSchool examining media preservation facilities within the Information Department Studies Research Lab, observing presentations on lab-based projects by students within the Media Archival Studies (MAS) area of the department's Master of Library and Information Science program, and discussing options for expanding the lab's equipment and teaching capabilities with department faculty and staff. The visit included conversations with Dean Gilliland, Assistant Professor of Media Archival Studies Shawn VanCour, Lab Director Diana Ascher, Development Director Helen Magid, and several MAS graduate students. Discussions focused on details of the lab's current setup, priorities for future expansion, and means of meeting growing student demand for hands-on training with media preservation equipment.

I was impressed what had been accomplished thus far with modest means. Graduate students are typically self-starters and that was evident here. The video rack was up and running, with the capability to capture content from U-matic and Betacam tape, and other formats in the works. An audio workstation was also set up, connected to a turntable. Given the challenges of setting up this sort of facility today where much of the equipment has to be scavenged and isn't always going to be working, the results were impressive. Future grad student cohorts will continue to make incremental improvements, if given the encouragement and funding needed. If taking an ad hoc, minimalist approach using a patchwork of consumer and professional-grade consumer-grade equipment, the funding required isn't enormous and is without question worthy of whatever lab or other department resources can be devoted to this purpose. However, if external grants are secured to outfit the lab with a more expansive suite of professional-grade equipment, there would be even stronger potential for expanded hands-on training, allowing students to do the type of high quality work on equipment they will be using on the job in professional preservation environments. But either way, the learning opportunities will be there.

AV preservation, by its history and perhaps even its nature, is often a bit scrappy and bootstrappy. Dealing with formats that might be decades old with hard-to-find owner's manuals, few spare parts, and no factory service departments necessitates some creativity. It isn't like running an IT operation, which is about managing budgets, deciding upgrade paths, and preparing for obsolescence and migration. As such, the iSchool should be careful not to "over professionalize" the lab by making it so that the students are afraid to make changes or tinker. There is a need for professionalism, especially in real world labs and proper standards and techniques need to be taught and learned, but there is also a need to be able to respond to the real world problems in AV preservation which often require creative thinking and solutions.

The UCLA iSchool media preservation lab is well on its way to being an attractive and useful teaching tool for students interested in media preservation. Attractive, in that this type of facility with hands on usefulness will help attract graduate students that are interested in media preservation, while also allowing students across other areas of the curriculum to develop basic media competencies that are becoming increasingly vital for a wide range of library and archiving work. Student interested in careers in media preservation are often

particularly eager to do hands-on work, especially during the early stages of the career (though many also move into other areas of the profession, making a broader MLIS training vital for long-term success). Employers, too, while looking for students with broader MLIS competencies, increasingly expect and value the kind of hands-on training gained from exposure to different media preservation equipment and preservation workflows. Finally, there remains an often unconscious bias against archival media, particularly among library administrators. The more advocates for media archives that are created by exposing MLIS students to doing research with or preserving archival media formats, the better.

Based on my site visit and inspection, I will offer some comments on a pedagogical level, an implementation level, and then specific recommendations on next steps, including equipment.

First there should be a clear understanding (though not necessarily a clear division) between a lab that is useful as a teaching tool and a lab that would be a suitable set up for archival preservation in a production environment. A teaching lab would allow students the opportunity to learn many real world skills: sourcing equipment, troubleshooting, setting up new signal flows, fixing and repairing obsolete equipment and many other tasks that are part of the operation of an actual production environment lab, but aren't the central focus. The operation of an actual production environment lab teaches many skills, such as media condition assessment, workflows, speed, quality control, and other skills that are needed to run an operational lab but are skills needed more for efficient operation of a lab and less for understanding how the lab and processes work. These are complementary, and learning both skillsets should be encouraged.

Both of these can be taught in the same facility, though it will require balancing the two needs. For example, a student who wants to change the signal flow and add playback capability for a new format, might need to take the lab offline in order to install the new equipment and cabling, revise workflows, learn the new equipment. All of these are valuable skills. But another student may wish to do a project where a small collection is preserved, with the outcome of preservation quality transfers and learning the digitization process from end to end, including solving problems as they come up, developing skill in using the equipment in handling and learning transferring techniques, which are often as much art as science. If the lab is always in state of flux, it will be difficult to do real world preservation or refine workflows and learn techniques. But if it is too stable, the student will miss out on learning valuable skills they will need to use in future jobs. Students need to be encouraged to experiment, and those who are less specialized, technically inclined, or experienced need to be mentored and encouraged to explore and try things they are unfamiliar with. It's possible to achieve these in the same facility, but ideally there might be a teaching sandbox as well as some sort of production environment that stays relatively constant over time.

On the audio side, upgrading to a fully professional transfer station would be relatively simple. Upgrading converters, adding some professional-grade equipment, and outfitting the lab with tools and test equipment would improve the lab quickly. Since audio is dominated by a relatively few formats, and most equipment is pretty cheap (with the exception of good open

reel decks) getting multiple decks, for example the 3 major brands of professional cassette players would allow the student to become familiar with the operation of the typical equipment that is found in labs around the country. The Nakamichi for example, is one of the few decks with adjustable azimuth. Having that equipment would enable students to become familiar with that process. Open reel decks pretty much all operate the same, but Studer and Ampex are the standard in most preservation labs, and familiarity with them is important. However, these professional models often don't have slow speed playback (such as 1 7/8 and 3 ¾, so low speed professional or consumer equipment might need to be sought out if work is being done on non-professional recordings. While speeds can be fixed by resampling in the DAW software, this is not ideal archival practice except in emergencies.

A checklist of equipment for the labs follows, providing both a list of equipment that could be acquired with modest ad-hoc funding, and a full complement of equipment that could be purchased with a grant.

Audio Equipment Checklist

Item	Description	Grant	Ad-hoc funding
Cassette	Playback for standard Philips compact cassettes.	Tascam 122 MkIII and Nakamichi Dragon or CR-7 and Marantz PMD502.	Marantz PMD502 or Tascam 122 MkIII.
DAT	Playback of Digital Audio Tape (DAT).	Sony PCM R-500 or Panasonic SV-####. Preferably low hours units.	Anything that works. Preferably low hours units.
Open Reel	Playback of a variety of open reel tape configurations.	Studer A80/A807/A810/A820. Mono, two track, and quarter track headblocks. Ampex ATR100 as optional second deck. Possibly low speed unit as well.	Whatever is on hand. Otari MX5050, Revox PR99, B77 etc. Just make sure it's a 2 track not quarter track (or have both).
Disc	Playback of a variety of vertical and lateral disc formats up to 16". Also cartridges and styli for playback of different formats.	Technics SP15 with 12" tonearm and cartridges and full set of expert stylus styli.	Whatever is on hand. Hopefully at least 3 styli: LP, 78 and transcription (0.7, 2.8 and 2.0 mil).
Phono preamp	EQ of disc formats	Timestep and KAB	KAB Souvenir

Other playback formats	Wire, cylinder, soudscriber discs, 8-track, Minidisc, and other formats (media and players) would be good to acquire for teaching purposes so students can understand the formats and machines, understand preservation problems, and learn transfer strategies. Probably not a critical part of each students' program.	Sourced from eBay, used equipment vendors, donors.	Sourced from eBay, donations, and thrift stores.
DAW	Workstation for capture of audio, including input card such as Lynx AES16 PCI card.	Ideal both a Mac and PC setup with as many software packages as can be purchased: Pro tools, Wavelab, Adobe audition, etc, as different shops use different software.	Current setup.
A/D converter	Outboard multi-channel analog to digital converter.	Prism ADA-8XR Dream. Industry standard.	Benchmark or other external converter.
Signal flow	Patch bays and interconnects.	Switchcraft TT with breakout cables on rear. Custom interconnects with star quad wire and high quality Neutrik XLR or TRS connectors.	Samson or Neutrik bays, molded cables.
Monitoring	A couple sets of monitors are probably ideal, to train in how monitoring can vary so much.	Dozens of options from Genelec to PMC + quality AKG headphones.	Basic Mackie monitors + quality AKG headphones.

Video presents a certain set of challenges including a wider range of formats, fundamental differences in signal (component vs composite) that potentially necessitate parallel systems. Recent professional formats recording component signals act similarly, which earlier professional and consumer formats using composite formats which operate a bit differently, with less complicated signal flow. Both need to be understood. The principles of operation of the professional formats can be understood using their composite outputs, but if actual archiving is done, it needs to be done using the component signals. For digitization work, a system should be put in place to at least allow for capture of full resolution uncompressed digital video. Recent professional gear uses BNC connectors (often three for each video signal). Consumer gear almost always uses single-cable coax connectors or sometimes S-video DIN connectors. When purchasing equipment and deciding which sets of connectors to use, professional-grade equipment with BNC video connectors and XLR audio connectors are usually preferable even for more consumer-oriented formats like VHS, since this will allowing greater interoperability with other professional equipment such as time base correctors, professional monitors and scopes, and the digitizing system. For component equipment that has options for composite video monitoring (coax or RCA output) and component output, the component output (usually 3 BNC cables) should always be used for preservation transfers as the quality is vastly higher. However, some formats, such as 8mm formats, were produced almost exclusively as consumer video formats, so depending on the range of formats the lab wishes to support, it may not be possible to purchase professional-grade playback equipment for every single video format and there will need to be an interface between consumer (yellow/red/white RCA video and audio connectors or S-video connectors) and the digitization system. Some legacy formats (like ½" EIAJ) use non-standard composite video connectors and adapters will be needed to connect them to the system.

Audio also needs to be considered, since most tape formats include audio, though different formats use different encoding systems, and connections needed for audio output can differ from one model of machine to another. Some use standard XLR with +4db balanced signals and others use low-level (-10db) unbalanced RCA cables.

Video Equipment Checklist

Component formats	Acquire decks as needed including Betacam, Digibeta, and possibly more modern digital formats like DV.	Sony or Panasonic professional decks. PBO (playback only) decks are preferable, but recording and editing decks are fine.	Anything
Composite/S-video formats	VHS, U-matic, Betamax, ½" EIAJ, 8mm formats.	Stick with Sony or Panasonic professional or prosumer decks, when possible.	Anything

Signal Processing	External Frame synchronizer/ TBC/procamp.	DPS/Leitch 575 or DPS290. Units with a SDI video output can interface directly with some digital systems.	Same
Monitors and scopes	Professional video monitors as well as waveform/vectorscope.	Very cheap used Sony Trinitron monitors or new flat panel integrated monitors.	Same
Patching and signal flow	Interconnecting both video and audio components of video.	Probably separate racks for component and composite equipment. There are video patch bays, but they tend to be specific to one type of interconnect, like BNC.	Current

The lab as teaching laboratory and as a real world operating room full of obsolete electronics will require that it be equipped with tools for maintenance, repair and installation, and test equipment for troubleshooting and repair. It's easy to buy this incrementally as you need it (trips to Home Depot, Guitar Center, or the electronics hobby shop are grad student bonding experiences); but if a grant supplies start-up funds, purchasing a full suite of tools would be useful.

Other Equipment Checklist

Tool box	Full range of tools that might be needed. Tape measure, hex wrenches, pliers, hammer, screwdrivers, soldering iron and desoldering tool, solder, flux, any tools specific to equipment such as T hex wrenches for adjusting azimuth.	Same	Same

Audio test equipment	Digital oscilloscope, Minirator, Minilyzer.	Markertek, Full Compass, Sweetwater.	Perhaps donated analog tone generator and oscilloscope. These could also be useful as they help in the understanding of test equipment.
Electrical test equipment	Multifunction meter, probes.	Electronics store.	Electronics store.
Maintenance equipment	For various equipment such as MRL adjustment tapes for open reel, tentelometer.		