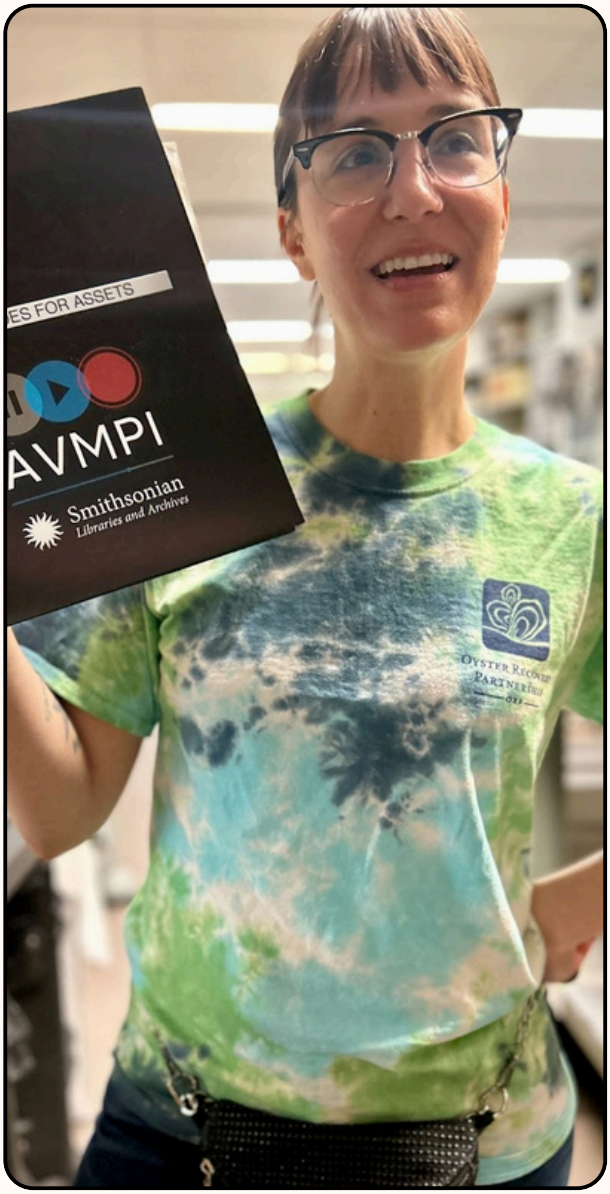
BAVC MEDIA

Above: The AVMPI Core Team at Smithsonian Institution Library and Archive: Walter Forsberg, Curator of Audiovisual Media; Kayla Henry-Griffin, Media Collections Specialist; Brianna Toth, Video Preservation Specialist; Alison Reppert Gerber, Preservation Coordinator + Head of AVMPI, Smithsonian Libraries and Archives; Siobhan Hagan, AVMPI Coordinator; Dan Hockstein, Audio Preservation Specialist

Case Study: Smithsonian Institution Audiovisual Media Preservation Initiative

A model for large-scale preservation rooted in best practices, professional education, and access

Magnetic Media Collection Size: Large collection size (215,000 items)
Staff size: Five+ full time staff, three contract staff, and one intern
Budget Size (Institutional): $1,144,000,000
Budget Size (departmental): Large budget size ($750,000)
Digitization Rate (previous year): High digitization rate (500 items)
Location: Washington, DC



Above: Siobhan Hagan (left), Alison Reppert Gerber (right)

Introduction

The Audiovisual Media Preservation Initiative (AVMPI) is an initiative of the Smithsonian Institution (SI) located within the Smithsonian Libraries and Archives (SLA). The SI is the world's largest museum complex, whose preservation work includes the care of an estimated 300,000 audiovisual items in twenty-one museums and fourteen education and research centers. AVMPI was founded in 2022 with a mission of "capturing, preserving, and sharing the history of the Smithsonian Institution." The AVMPI is the first pan-institutional program for audiovisual preservation at the SI, performing a full suite of audiovisual preservation services from inventory, curation, and digitization of analog formats to digital file management, online access, and screening events. In addition, AVMPI develops and delivers preservation education and training for units within the Smithsonian and for a community of external students and professionals. In October 2024, AVMPI won a "Digital Innovation Award" at the Smithsonian Excellence in Digital Awards.

Above: Description of AVMPI services from their webpage

> "Although we are considered a project, we are more like a department."

Mission and Model

The goals of AVMPI, as stated on their website, are:

1. Goal 1: To develop a centralized space dedicated to the conservation and preservation transfer of Smithsonian audio, video, and film collections.
2. Goal 2: To prioritize audiovisual collections for preservation based on format degradation and content value.
3. Goal 3: To create standard, pan-institutional workflows for the management of AVMPI to maximize the use of resources.
4. Goal 4: To ensure institutional preparedness for digital preservation and increased storage needs.
5. Goal 5: To promote the overall mission of the Smithsonian Institution by increasing access to digitized audiovisual collections.

History and Future of the Program

Prior to the establishment of AVMPI, museum units were individually responsible for preserving their own audiovisual collections, resulting in inconsistencies and inefficiencies across SI. Some museum units had on-site magnetic media preservation programs, and some did not.

Since the early 2000s—as part of its pan-institutional service role for other museum units—the SI Archives made available its audiovisual digitization equipment to other unit staff (and was, notably, one of the original test sites for the SAMMA Solo video digitization technology). This pan-institutional service role directly led to SI Archives hosting the initial efforts that lead to AVMPI. Staff from SI Archives secured multi-unit funding from SI's Collections Care and Preservation Fund from 2015 to 2019 in order to undertake item-level inventories across eleven museum units. The SI Archives were amalgamated with SI Libraries in 2020 as "Smithsonian Libraries and Archives" (SLA), and SLA served as the host administrative and physical space home for AVMPI since its official launch in 2021. Due to budget cuts and administrative directives from the SI's Under Secretary for Science and Research, the SLA's new leadership has decided not to financially support the AVMPI as a program beyond its current funding through Fiscal Year 2027. The initiative's funding model moving forward remains to be determined, and the AVMPI's service model future is unclear.

Economic Model

Government funding provides 51-75% of the AVMPI's budget, with 0-25% attributed to both "endowment" and "other sources." The AVMPI is required by federal government procurement rules to compete with external vendors for SI digitization contracts. Those contracts are funded primarily by the Smithsonian's National Collections Program (NCP).

Above: Posters in the AVMPI offices and digitization suites.

Staff:
AVMPI has six full-time staff members: Curator for Recorded Media, AVMPI Coordinator, Media Collection Specialist, Media Collection Specialist, Audio Digitization Specialist, Video Digitization Specialist. The Head of Preservation Program is also key and plays a central role in overseeing the program but also works on other projects. AVMPI occasionally has an intern, and hires contractors to assist in work as needed. AVMPI has assembled a staff with a high level of academic training in audiovisual preservation; many of the staff have master's degrees with audiovisual preservation concentrations, lending the program an exceptionally high level of expertise.

Community Served
AVMPI largely serves the SI itself, since the institution comprises many internal units that require preservation work. It also serves the general public through programming, which includes contributing footage to museum exhibits and hosting online screenings. AVMPI has a strong education component, providing vital training in audiovisual preservation to archivists and cultural workers. SI staff are provided with audiovisual training kits that support inventory and assessment, inventory templates, and in-person training sessions. AVMPI also works with educational organizations, such as the University of California, Los Angeles Rare Book School, to provide training to students studying audiovisual preservation.

> "The most exciting magnetic media collection is the one that we haven't digitized yet. Each one is a discovery in that regard."

Significant Collections

Smithsonian Productions: Since the 1950s, the Smithsonian produced thousands of radio programs, television shows, exhibition films, and audiovisual collection compilations, however an overwhelming amount of these remain trapped on analog format carriers (especially magnetic tape). The AVMPI has targeted Smithsonian-produced media as a preservation priority including: over 1000 episodes of the radio program *Radio Smithsonian* (1969-1991) including raw, unedited interviews with cultural figures like musician Jerry Garcia; final "master" versions of home video commercial releases held on 'degralescing' magnetic media formats like D-2 and 2" quadruplex videotape; and, exhibition media displayed in galleries and museums, starring figures like African American astronaut Guy Bluford and television chef Julia Child.

Personal Papers: The personal paper (and audiovisual media) collections of thousands of historical figures are cared for by SI museums and archival units. Digitization of magnetic media within several of these collections has been a preservation priority of AVMPI, including:

NASM's collection from astronaut and LGBTQ+ icon Sally K. Ride; the National Museum of American History Archives Center's collection from American multi-level marketing guru and Tupperware mastermind Brownie Wise; and, works within the Archive of American Art by artists like Nancy Spero and Aldo Tambellini.

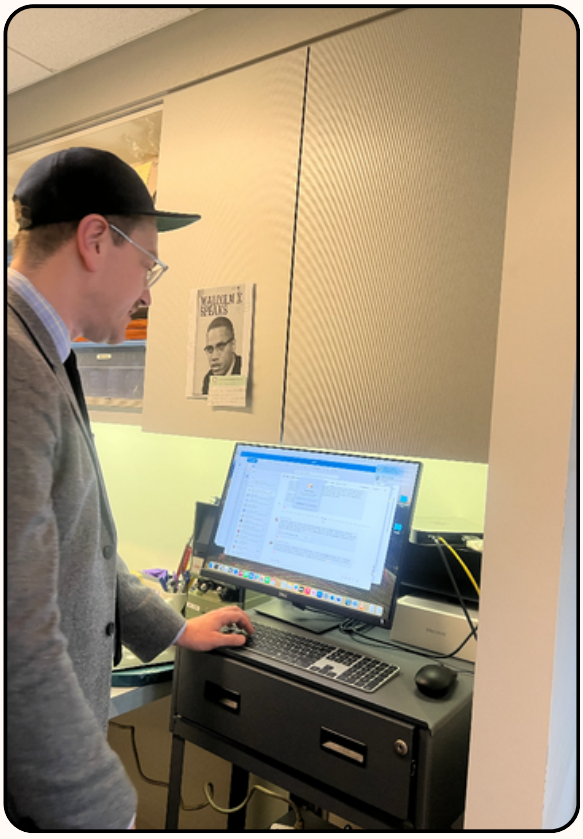
Above: Julia Child explains the universe's 'Primordial Soup' in a 1973 exhibition video held on 2" quadruplex videotape from the National Air and Space Museum (NASM) and digitized by AVMPI. Object # NASM_DB-00208.

Digitization/Preservation

Digitization Rate and Risk of Loss

Until recently, the program was developing and solidifying its workflows and digitized 500 items in the last year. Their projection moving forward is to digitize 20,000 items over the next five years (4,000 items per year). Even with that expected increase, the organization rates itself as "somewhat unconfident" that they can digitize all priority magnetic media materials. From the website: "At our current rate of preservation, the Smithsonian is facing an estimated total loss of 190,000 audiovisual assets by 2034."

Above: A 2″ quadruplex videotape television commercial from the National Museum of the American Indian (NMAI). Object # NMAI_001.003_33901000023804_p. Digitizing 'degralescing' magnetic media formats are a preservation priority for AVMPI, and the initiative has eliminated 2″ quadruplex analog videotape and D-2 digital videotape formats from its list of un-digitized 'at-risk' formats across all SI collections.



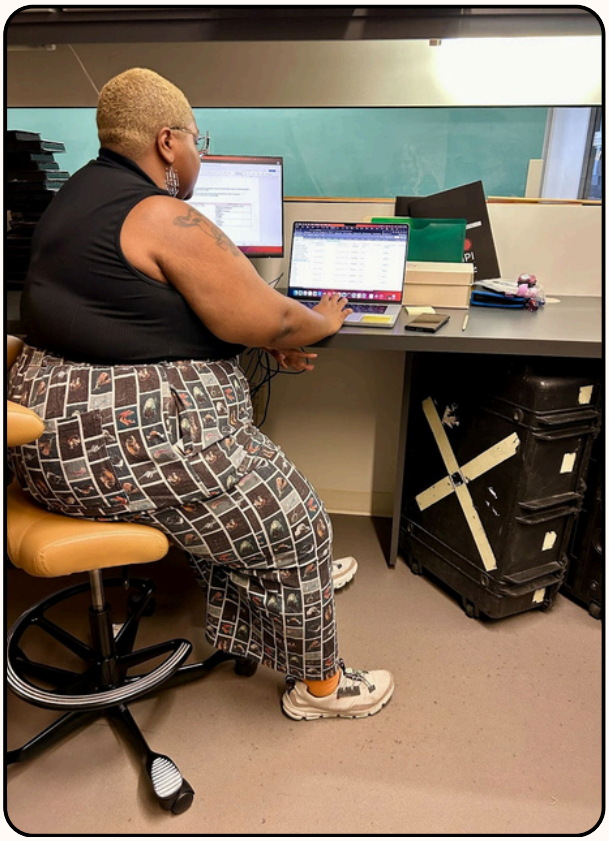
Above: Curator Walter Forsberg researches collections across the Smithsonian and advises on preservation. His guidance is based on objects' uniqueness, content, and fragility, among other considerations.

Tape to File Digitization Workflow

Decision to Digitize/Curation

An interconnected set of considerations guide preservation prioritization decisions. AVMPI has a dedicated curatorial position tasked with determining audiovisual preservation priorities throughout the institution; his research and expertise guide all program actions. The curator is also the primary development fundraiser outside AVMPI's central funding from the National Collections Program and regularly collaborates with unit stakeholders to submit collaborative project applications to internal SI pool funds and outside philanthropic sources. Staff reports that for the time being, while the AVMPI is still building their visibility and demonstrating their value to the wider institution, the curator sometimes selects projects that are "easy wins." One example of this is a unit that has a small collection of important and mission-centered tapes that are endangered, but in a unit with no audiovisual archivist—a clear case for AVMPI intervention. The list below outlines other instances of prioritization.

- Material has been prioritized by a unit curator, staff, or researcher.
- AVMPI is sending a batch of rare formats, for example D2, to an outside vendor for digital transfer. In this case, staff sends emails to other units to see if they also have materials in that format, which can be included in the batch. Frequently, units require assistance from AVMPI staff to identify formats in their collections.
- The AVMPI curator's ongoing research informs priorities; he will identify materials that are unique and fragile and will look for material related to current exhibits or events.



Above: Assets are barcoded, indexed, and boxed once they come into the AVMPI space by Kayla Henry-Griffin.

Above: Baking is mandatory for ¾″ U-matic (left). Other formats are baked as needed. Siobhan Hagan demonstrates portable air filters, used for materials that off-gas (right).

Pre-Digitization

Assets are chosen and sent to AVMPI from other unit locations. Assets are sometimes picked up and driven back to AVMPI by AVMPI staff—a time consuming task. All materials are labelled, barcoded, and placed in bins to maintain organization.

Triage, in-house versus out-of-house

Format and condition determine if an asset can be transferred in-house or will go to a vendor. Staff notes the importance of having in-house digitization labs and expertise but also note that it is useful to receive a large batch of completed transfers from a vendor. If an asset is in good condition and it is a format that can be handled by the AVMPI lab, it is transferred in-house. Moldy items, items requiring remediation, and formats for which AVMPI does not have playback equipment are sent to a vendor. Formats that can be digitized in-house include most standard cassette tapes, such as U-matic, Betacam Digi-Beta, DV, VHS, compact audio cassettes, and DAT. The audio lab can also digitize ¼″ open reel audio. The audio lab can handle multiple parallel transfers of compact audio cassettes and is working towards capacity for parallel transfers of ¼″ open reel audio to increase output. AVMPI currently has large projects at vendors to digitize D2 formats, open reel 2″ video, and ½″ inch EIAJ—formats that cannot be transferred in-house.

Intervention

Dirty tapes or materials with vinegar syndrome can be handled using portable air filtration devices. Staff can do minor tape and sometimes tape case repair. Moldy materials are sent out to a lab.

Above: VHS is Life cleaning machine (left). Audio preservation lab, Dan Hockstein (right)

Digitization Workflow

Video Digitization Workflow

This report focuses on AVMPI's magnetic media preservation efforts; however, some SI units have their own digitization stations. Digitization capabilities, workflows, and equipment vary slightly by unit. AVMPI helps other SI units develop magnetic media digitization stations and has equipped other units with similar equipment, but other units lack specialized equipment such as ovens for baking tapes or TBCs with S-Video inputs. AVMPI occasionally bakes and cleans tapes for other units, creating a collaborative workflow.

AVMPI's video transfer uses a patch bay that switches between three different VHS decks and two different TBCs to assist with troubleshooting. They use a Leitch DPS-575 and AJA FS1 TBC with a Tektronix 1780R vectorscope and waveform monitor. The AD converter is a Blackmagic Ultrastudio 4K, which will be upgraded to an UltraStudio 4K Extreme 3. AVMPI technicians work under the Mac operating system and are currently using Mac Minis from late 2018 with Intel chips, but are waiting for the newer Mac Mini (2024 M2 chip). They use vrecord and DVRescue for video transfer. Vrecord is used in conjunction with Blackmagic Desktop because it requires a Blackmagic capture device. MediaConch is used for batch-level conformance checking. MD5 checksums are created for all files AVMPI creates. For in-house transfers, they use the Smithsonian's MD5er Tool. Individual units are responsible for ingesting their own deliverables since everyone's workflow is a bit different, but AVMPI uses Volume File Copy Utility (VFCU). VFCU is a tool that was developed in-house to transfer and validate large volumes of files from a source location (vendor local store or SI network attached file store) to DAMS Staging for eventual DAMS ingest. AVMPI also uses rsync to move files to the FreeNAS.

Formats Digitized at AVMPI include:

- Umatic-S/Umatic/UmaticSP
- Betacam/BetacamSP
- Digital Betacam
- HDCAM
- MiniDV
- DVCPRO
- 8mm video (Video8, Hi8 and Digital8)
- VHS (SP/LP/EP & NTSC/PAL/SECAM)
- S-VHS

Audio Digitization Workflow

"The audio system is centered around a Mac Mini connected via Thunderbolt to a state-of-the art Lynx Aurora(n) Analog/Digital and Digital/Analog converter to support digitization duties. The Lynx unit interfaces with the analog and digital equipment situated throughout the room via balanced analog audio connections (where voltage = audio information) or digital format pipelines (where voltage = 0 or 1 = bits in a sequential stream that form digital audio information). The Lynx unit creates a digital bitstream out of the analog information or passes along the already-digital information to the computer. The computer, running Steinberg software – Wavelab for a single stereo or mono transfer, or Cubase for multiple parallel transfers occurring at once – then stores the bitstream(s) provided by the Lynx in a digital .wav file made to preservation specifications. Audio is monitored through a set of Genelec 8331 monitors, connected digitally to the Lynx. These monitors are equipped with digital signal processing that uses a microphone to calibrate and shape the sound and remove undesirable room resonances. As a result, the transfer engineer can make small adjustments according to the information present in the recording, rather than information that may be "added" by the acoustic space."

Target File formats

The staff work directly with Federal Agencies Digitization Guidelines Initiative (FADGI) in determining the target file formats.

Quality Control

The Project Coordinator notes, "One of the other biggest hurdles for us is doing quality control. We're trying to find the balance of our workflows, really to make sure that we're not spending too much time, that we're being efficient, but that we're also minimizing errors." The video digitization lab notes that due to equipment repairs and maintenance, transfers have been more consistent and increased in volume. Since the beginning of May, transfers have increased by 94% and transfer failures were eliminated by 84%.

Equipment Sourcing and Repair

AVMPI has a large range of equipment in its department, and SI has an enormous inventory of equipment throughout the organization. AVMPI implemented onsite maintenance plans for multiple units and drafted a service agreement with an outside vendor for FY2025 to reduce extensive repairs and maintenance and eliminate setbacks due to equipment failure.

SMITHSONIAN LIBRARIES AND ARCHIVES Audiovisual Media Preservation Initiative
Audio Lab Information Sheet

The team identified new repair technicians who can service video equipment onsite and created an up-to-date list of the remaining technicians in North America. This included finding the only (2) remaining technicians who can service scopes and (3) remaining technicians who can service Cathode Ray Tube (CRT) monitors.

In addition, AVMPI uses and tests equipment made by grassroots and DIY organizations, such as VHS is Life tape cleaner and T.A.P.E. Collective educational resources. They embrace DIY projects that seek to overcome challenges in the field from a fresh perspective.

File Storage

Files are ingested into SI's file storage and management system, the 'DAMS.' The OCIO (Office of the Chief Information Officer) is dedicated to long-term file storage and maintenance, and it works in close collaboration with AVMPI and other units to upload and maintain files. OCIO has the benefit of having trained audiovisual archivists on its staff who can address the specific needs of digital preservation files.

Access, Copyright, and Licensing

AVMPI facilitates access to the magnetic media collections via Smithsonian Online Virtual Archives (SOVA) page, online screenings called "Zoom with a View", and in-person events. A clear terms of use page describes how users may use the footage. The organization facilitates access to audiovisual preservation education, training, and skill sharing via training kits made for SI staff and an online resources page with publicly available templates for assessing and inventorying audiovisual media. It engages in in-person training events– for example, the weeklong seminar in Audiovisual Preservation for the California Rare Book School in 2023.

All or most streaming content includes services for the blind and hearing impaired, such as captioning.

> "Through the career of twenty years working with archival materials, I spend 75%-plus of the time explaining, educating, and lobbying for resources and support for this kind of work."

Advocacy

In addition to performing centralized preservation, AVMPI educates and trains staff across the institution managing their audiovisual collections in order to empower units—especially those without an audiovisual specialist—to better understand what they have, how they can use it, and how AVMPI can support them in preserving and accessing the content.

The project is the result of years of advocacy, surveying, planning, and strategizing by staff and consultants—all of which had significant financial support from the institution. The first AVMPI staff were hired in 2022 to pilot the program over three to four years. At the time of this report, the project is completing many of its piloting activities.

Training and Education Needs

AVMPI staff is highly trained in audiovisual preservation. They report that training in audiovisual preservation would most benefit archivists and staff in units that have audiovisual collections but do not have staff trained in the specific preservation needs of these formats.

Challenges

The primary challenge for the program is to secure ongoing funding from SI for AVMPI to continue its work. Staff also notes that it is difficult for AVMPI digitization specialists to devote their full attention to digitizing because they must attend meetings and take on other projects. They note that it is not always possible to use their preferred vendors because of restrictions in the federal procurement process. They note that working in a complex organization requires a high amount of paperwork, tracking, and a series of approvals to move forward, which can cause projects to operate slowly. Changes in leadership in several roles have impacted the level of support that AVMPI has received, along with federal budget cuts and significant changes in policy, which all staff note contribute to AVMPI's precarity.

> "If AVMPI is abandoned, the audiovisual collections across all the Smithsonian will suffer catastrophic loss."

Next steps and goals

AVMPI has built a firm foundation for preservation onsite and using vendors and a strong educational component internally and externally, positioning it as a leader in the field using a combination of established and innovative responses to solve common problems. It has created a scalable workflow that can increase preservation and discovery of collections across the largest system of museums in the world. Its next goal is to demonstrably increase productivity and efficiency by making use of the streamlined processes it has carefully put in place.