December 3, 2013 by Stella

MOMSR! THE MUSEUM OF MAGNETIC SOUND RECORDING

I recently wrote a paper, for Sarah Cunningham's Introduction to Audio Preservation and Reformatting class, on the The Museum of Magnetic Sound Recording (MOMSR), located right here in Austin, Texas. Here is an amended version of part two of that paper, presented on the blog just because I think MOMSR is pretty interesting, and you should know about it, too!

Very special thanks to MOMSR's President, Martin Theophilus.

There seems to be comparatively little professional literature regarding the preservation of obsolete audio recording technologies. Let us know explore this in more detail, through a specific recording device and its history, as preserved by MOMSR: Ampex magnetic tape recorders.

Russian engineer Alexander M. Poniatoff and Dalmo Victor company president Tim Moseley formed Ampex in 1944 "to set up a small operation outside of the mainstream of Dalmo Victor to manufacture these [electric, military-use] motors and generators." (Leslie and Snyder, 1) The name was derived from Poniatoff's initials, coupled with "ex"—and Poniatoff liked to say that 'the EX was for excellence'" (33).

Ampex headquarters in Redwood City, CA, courtesy WikiCommons

Between its founding in 1944 and its manufacturing and selling of the first generation of commercial magnetic tape recorders in 1948, Ampex hired an impressive group of engineers, including Stanford-educated former US Navy electrical engineer Myron Stolaroff ; former Shell Development Corporation and Radiation Laboratory of the University of California (now the Lawrence Berkeley National Laboratory) engineer and audiophile Harold Lindsay ; Berkeley-educated chief engineer of Pacifica's KSFH – the first FM station in the San Francisco Bay area, Walter Selsted ; and Frank Lennert , another Berkeley-educated electrical engineer and studio engineer with Selsted at KSFH; as well as working with affiliate engineers such as Jack Mullin , a former major in the US Army Signal Corps who brought to German Magnetophon recorders back to the U.S. after the war, and who was eventually instrumental in demonstrating the new technology to Palmer Films.

Former teenage Bing Crosby Enterprises employee and Mullins protégée Robert R. Phillips told his story—and Ampex's—to the Institute of Electrical and Electronics Engineers Global History Network :

> Alexander M. Poniatoff, the head of Ampex, heard one of the early demonstrations of the Magnetophon. He was in need of a new postwar product and was so taken by the recorder he decided to build one. He put his chief engineer, Harold Lindsay, in charge of the project and

asked Jack Mullin to help them.

…

Ampex by the spring of 1948 had developed their first prototype, but lacked finances to bring it to market. The banks did not have any idea about venture capital at that time. Pressure once again began to build because the Bing Crosby show needed new recorders and tape for the 1948 – 1949 season. Everyone was convinced that Ampex was the answer, and Bing sent them a check for $50,000 in just an envelope without any cover letter. It was what Ampex needed to begin production of the Ampex 200 (Phillips).

The Bing Crosby production team purchased the first two of Ampex 200s manufactured (serial numbers 1 and 2) for the 1948–49 broadcast season, and soon, added the only two portable Ampex 200 recorders built (serial numbers 13 and 14) (Phillips).

MOMSR's Ampex 200A

Once again, David Morton expertly summarizes the commercial story:

> Jack Mullin was invited to the ABC studio in Hollywood to make an experimental taping of the first Crosby show for the 1947-1948 season. After the show, he stayed in the studio to edit the tape down to its final form. ABC engineers were so impressed that they hired him to tape the rest of the shows. By the middle of the season, Mullin was short on tape, and his recorders were getting worn out. Fortunately, the Ampex

> Corporation came to the rescue, delivering the company's first two production machines to ABC studios and later supplying a dozen more. What little remained of network resistance to recording technology crumbled almost instantly with the appearance of the Ampex machines (Ibid.).

Phillips reminisced:

> Those of us in the recording room had no visible contact with what was happening. I used to sing along with Bing during the recording sessions, since I was the only one there at times. I may have sung more "duets" with him than most people, but it helped to learn his phrasing for editing.
>
> With the recording of the show, Bing was more relaxed and the audience had more fun with the adlibs, since mistakes could be repaired. The quality was equal to a live show, and the broadcast version was mistake free. With the portable recorders the show also could be taken on the road, if Bing wanted to travel. By early 1949 Ampex had begun to produce the Ampex 300, which was smaller and lighter than the Ampex 200 (Phillips).

"Jack Mullin seen above in 1949 with the Ampex 200-A and the new Ampex 300 in portable cases, head blocks showing original tape backing facing in. This was later changed to the backing facing out, as it remained throughout the remainder of reel to reel production." -MOMSR

Thus the Ampex 300 and 350/351 soon became the standard magnetic tape recorders, and were used both in the network studios and local radio stations. According to David Morton, these devices continued to be produced and were in everyday use through the mid-1980s (123).

Mullin was never financially compensated by Ampex, believing simply that it

was his duty to share the knowledge of magnetic tape recording he'd acquired while serving in the U.S. military ("at the taxpayers' expense") with anyone who might find it useful. However he did eventually become the chief engineer of Crosby Enterprises, which was also a major sales representative of Ampex Corporation (Casey and Gordon 3).

And here we turn to MOMSR.

MOMSR's holdings comprise 25 original Ampex recording devices , some of which were acquired on a trip to Salinas, California in 2010, including an Ampex 200A that was originally bought from Bing Crosby Enterprises, by Capitol Records. (Theophilus; MOMSR, "Ampex Reel to Reel Recorders in the MOMSR Collection"). This machine weights 240 pounds and has what Theophilus calls "an incredible top steel deck." Theophilus calls the Ampex 200A the machine with "the best history of all the collection" (Theophilus). The 200A was later owned by San Francisco-based audio engineer and producer Leo De Gar Kulka ("the Baron"), who is today for his recordings of Frank Sinatra, Nat King Cole, and the 1958 recording by The Champs, "Tequila" (MOMSR).[1]

MOMSR's Ampex sub-site states, "We initially were going to restore the recorder to its original state. However, after learning more about the history of the unit, we have decided to work to acquire the original electronics, but will leave the unit as is for now" (MOMSR). Their Ampex ephemera collection also includes Capitol Records' internal documents regarding the machine's 1949 upgrade to Ampex 201 specs, including replacing the original head cover and installing an Ampex 300 head cover and tape lifters. In 1954-55, the device was again updated. MOMSR also has an Ampex 300 dating to 1949 (number 1840 of 5,000 manufactured), also owned by Leo De Gar Kulka. Theophilus reports that he has cleaned both devices, but as of 2010 neither were yet running (MOMSR).[2]

"When I look around our collection, I am still amazed that it has reached this level," says Theophilus. "It's important to note that our displays are not just shelves of tape recorders (which most collections are). About 80% of the collection is wired into sound systems in the museum that enable us to demonstrate and play each recorder and discuss its attributes. We include

extensive accessories, ads, documentation and essential support items such as the 100+ mics and a variety of mic mixers" (Theophilus).

Ampex 200 brochure, part of MOMSR's ephemera collection.

However, MOMSR has recently had to turn down the opportunity to acquire further historical recording devices, as Chris and Martin Theophilus are at "full capacity" at their home studio/museum. (Ibid.) "In the past ten years we have seen many significant items on sale that we could not afford to acquire and now may be lost, " Theophilus said, "They include items like the recorders that were originally used to record Buddy Holly and Roy Orbison. The son of one of the founders of the US recorder manufacturer Magnecord have offered their archives when we have a permanent facility. The Stephens recording company [Stephens Electronics, Inc.] has done the same. The audio company that produced all the original sound for Florida's Disney World want to donate their large vintage equipment to our museum. They have agreed to store it for a year (even offered to pay for storage in Austin to preserve the historical pieces). Every week on eBay I see significant recorders (some from professional studios) that would be incredible additions to the museum" (Theophilus).

Theophilus describes MOMSR's acquisitions, preservation, and technical conservation process thus:

Due to the age of the devices, 40-60 years, I have been surprised at how many arrive in fairly good working order. For those units that I believe are essential to the collection, either for their innovation, style, or capability, we have continually traded up. Initially we may receive a unit that looks great, however is a mess inside and not been cared for, or stored too long. In these instances we have acquired another unit that can be used in combination to provide a complete example. Sometimes it may take several years before the right match comes along. In several cases we have gone through as many as 6 generations to reach a level of quality that comes close to the original. This extends to the acquisition of accessories such as dust covers and remotes as well.

For older units that used rubber belts, many arrive with melted belts

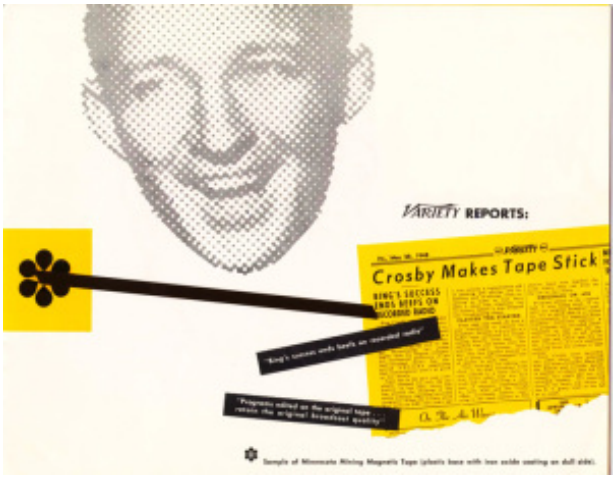
and other rubber parts either from wear or being stored in an un-air-conditioned garage or storage unit. The belts are readily available from a variety of sources. The clean up is time consuming, however most motors come back to life and run well with some adjustments.
Interestingly older units initially had motors that greatly exceeded what was required to move lightweight tape from one spool to the other.
Many of the units have capacitors that now fail and when replaced, especially in Ampex units, the unit runs great. Many of the electronic parts are now more efficient and smaller which helps.

In spite of studying in electronics from an early age, I am more able to resolve mechanical deficiencies versus electronic problems. If I am unable to resolve an electronic failure, we will either send it out for repair, which is very expensive and difficult to secure, or the unit will be replaced with a better working model (Ibid.).

As previously noted, MOMSR has applied for 501(c)3 status; after its approval, the board intends to launch a crowd-funding project to fund initial design work for a brick-and-mortar museum in Austin . MOMSR will in fact be integrated into an even larger museum, the Multi-Media Museum (Multi Media Museum). MOMSR also has staffing plans, including hiring an executive director; an archivist/librarian, to include research duties; engineering staff (restoration and maintenance, as well as studio engineers); an exhibits director (design and display evolution); and adequate tour and support staff. "We anticipate that with Austin's vibrant music community, we will receive strong support from volunteers," said Theophilus (Ibid.).

All of this will come together to make the Museum of Magnetic Sound Recording a uniquely contextualized museum. MOMSR's initial exhibition plans include demonstrations of the basic mechanical aspects of the reel tape recorders and some comparisons of the various electronic configurations, "such as sound demonstrations similar to those at the Grammy Museum , which takes a Beyoncé song and lets the visitor hear how she would have sounded on cylinder, disc, cassette and digital (sadly they bypassed reel tape recorders in the Grammy's display)" (Ibid.).

MOMSR will make multiple recorders from the various decades of magnetic tapes' heyday available to "play" with, demonstrating the variety of mechanisms and their recording qualities. Inherent in this, key staff will include maintenance experts who can and will restore and maintain the equipment, as well as be available



Ampex 200 brochure, part of MOMSR's ephemera collection.

for questions and demonstrations. MOMSR will also undertake on-site conservation, with recorders that are being restored available in an open or an accessible area so visitors can watch the work (Theophilus), much like aviation open restoration projects like those at the Museum of Flight in Seattle, Washington (Aircraft Restoration).

The staff archivist/librarian will also work to digitize analog recordings that are made available to the museum. As MOMSR's funding grows following the granting of 501(c)3 status, Theophilus expects the archivist and his or her staff to also provide assistance with external preservation projects, which he currently does only on a very limited basis due to the costs associated with maintenance of the machines. In addition to seeking 501(c)3 status, the museum also plans to follow up on expressions of interest some of the manufacturers who remain in business, including eventually securing corporate sponsorships (such as from recording device manufacturers Ampex, Otari, Sony and Teac/Tascam, as well as microphone technology companies like Electro Voice and Shure, who donated a striking statue made up of Shure 55 microphones to the Grammy Museum, where it is on display (Theophilus).

Theophilus describes "one of the most dynamic displays" envisioned for MOMSR's physical space, "which will take visitors through the evolution of sound recording. It will be educational by showing how sounds waves move, how humans and animals receive and process sound, and the innovative technologies that are improving hearing for persons with hearing disabilities. This display would also demonstrate how sound has been recorded and why the last century and even more specifically the last 60 years have been so significant to sound recording technology. Additionally there will be an area that shows how sound recording has impacted the areas of education,

broadcasting, entertainment and especially enhanced the visual impact of movies and video. Another area will deal with sound recording and the Internet with information on the most cutting edge devices and developments" (Ibid.).

MOMSR's physical museum will also provide recreated historical studios, much like the Period Rooms of the Met, where visitors can see, hear, and interact with magnetic tape recording devices contextualized in a historic studio setting, including not only tape recorders but also historical fittings, advertisements, manuals, and more. It bears repeating, "Both would be tied to the performance space and configured in such a way that musicians could book time and choose which gear they wanted to use" (Ibid.).

The MOMSR project is of special interest to professional archivists and museum professionals because of its emphasis on the recording and payback devices themselves; MOMSR's insistence that they are objects of value goes beyond the usual museum displays of "outdated" devices as mere artifacts as well as beyond stop-gap attempts made to mass digitize audio and store it in searchable database retrieval systems online.

To say this is not to imply that audio digitization is a less worthy project; in fact it is extremely important, which is why it gets so much attention. However, there is also value to be found, preserved, and appreciated, in MOMSR's view that retaining a cultural understanding of how these recordings were made, by whom, where, in what conditions, using what equipment is also very important.

MOMSR's project is a unique attempt to preserve and share an impressively broad and historically important collection of outdated magnetic audio recording technologies that would otherwise be destroyed. MOMSR's work–

and their attempt to fund and build a brick-and-mortar museum—represents a forward-thinking preservation plan that incorporates both current trends regarding digitization and web-based user access and the traditional specificity of the object-based museum. MOMSR's plans to collect, preserve, and publicly display not only a large collection of sound recordings but also their original recording and playback devices represents both a return to more traditional ways of valuing, collecting, and displaying old technologies (in a brick-and-mortar museum) while also providing an instructive example of a forward-thinking approach to audio preservation and museum work (insofar as their integration of these devices as more-than-novelties can broaden users' and visitors' understanding and appreciation of the recordings themselves). This can be applied beyond audio archives and media museums to the libraries, archives, and museums disciplines more broadly. When MOMSR is funded and inhabits a physical space, it will represent the cutting-edge of both audio preservation and museum theory, forward thinking to the past. A MOMSR-type approach to collecting and curating would provide much-needed context for future generations to better understand the history of sound, and thus, of memory.

Give to MOMSR here .

A peek inside the Ampex 200A.

[1] In addition to the technologically revolutionary history of Crosby Enterprises' involvement with the development of Ampex, another fascinating anecdote is provided by Wingo and Cowing's two reports for the Lunar Orbiter Image Recovery Project (2009, 2011): "The Lunar Orbiter Image Recovery Project (LOIRP) was formed as a result of the acquisition of the last surviving Ampex FR-900 Instrumentation tape recorders that can play the predetection recorded analog analog [sic] image data from the LO spacecraft." (2009, 1) See accompanying Power Point presentation for further information and a comparison of the images.

[2] Specs on the Ampex 200A and 300 series magnetic tape recorders are as follows, courtesy MOMSR:

Ampex 200A

Freq Response: 30 to 15,000 cycles +/- 1 db

Signal to Noise: 60 db

Speed: 30 ips

Motors: 3

Reels :14 inch

Timing accuracy: 0.2% @ 30ips

Weight: 240 pounds – tube

Price :$5,000Ampex 300

Ampex 300

Freq Response: 50 to 15,000 cycles +/- 2 db

Signal to Noise: 70 db

Speed: 7.5 & 15 ips

Motors: 3

Reels: 10.5 inch

Timing accuracy: 0.1% rms @15ips

Weight: approx 60 pounds – tube

Price: $1,595

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