

## DEALING WITH ISSUES OF TECHNOLOGICAL OBSOLESCENCE AT THE OREGON STATE ARCHIVES: DIGITIZATION OF ROLS AUDIO DICTATION TAPES

Austin Schulz, *Oregon State Archives, USA*

Archivists are frequently faced with the dilemma of how to preserve and make accessible information created using defunct technology. The archivists at the Oregon State Archives are no different. For almost two decades, landmark legislation important to Oregon's heritage, such as the 1967 and 1969 Beach Bills establishing public ownership of land along the Oregon Coast, remained inaccessible because the equipment needed to listen to the audio tape was broken and replacement machines, as well as parts, were nearly impossible to find. This is because legislative audio recordings from the 1967 and 1969 legislative sessions were recorded on a proprietary media called Rols<sup>151</sup> dictation tape created by Eastman Kodak specifically for the Rols machine, which used "2 ½ inch wide strips of Rologram, a magnetic film that could be cut off and attached to relevant documents unlike other audio formats at the time."<sup>152</sup> Each roll could take up to 30 hours of normal dictations or 7 ½ hours without pause and was designed so that notes could be written directly on the film using any pen or pencil. This film system was touted as having three main advantages over ordinary tape. It could be posted flat, filed as a permanent record, or split between several typists.<sup>153</sup>

The European machines used to record and playback Rols audio were "designed by Aparatbau of Hamburg, Germany, made in Holland by Elac and sold in Europe as Sankey Rols Office Dictating Machines. In the U.S. they were marketed beginning in the 1960s, by Sawyers Inc. of Portland, Oregon and sold as Sawyer's Rols Dictator-transcriber Machines and later by the GAF Corporation."<sup>154</sup> It was during this 1960s period that the Oregon State Legislature, who had been recording committee hearings on 7 inch reel-to-reel audio tapes, decided to adopt the new Sawyers Rols dictation machines to record all committee hearings during the 1967 and 1969 sessions. At the end of the legislative sessions for these years, the Rols recordings were transferred to the custody of the State Archivist along with a machine capable of playing the recordings for use by patrons. Written summaries rather than full transcriptions accompanied the transferred recordings. These written records summarized committee hearings and highlighted the major points of discussion. They also reflected discussion and testimony by legislators and interested parties on proposed legislative acts. Researchers use these written summaries to determine which of the audio recordings might contain information relevant to their research. When combined with the audio recordings, these materials provide legal researchers with information about the legislative intent of a proposed bill or they provide clarification for vague or ambiguous statutory language.

For many years patrons were able to use the summaries and listen to the recordings using the only Rols machine at the State Archives. However, because of the proprietary nature of both the Rologram film and Rols machine, we were not able to make duplicate copies of the audio or transfer the recordings to a more common media. This resulted in our lone machine being heavily used by researchers, taking its toll on the equipment. By the early 1990s, our Rols machine was no longer functioning and had to be sent out for repair as replacement equipment was no longer available. Unfortunately, the business that agreed to repair the non-functioning machine closed up shop suddenly and took the State Archives machine with them. At this point we no longer had a means of playing back the 1,474 Rols audio recordings produced by the Oregon State Legislature. Patrons were left with access to only the abbreviated written materials, while the audio recordings containing the only verbatim record of the 1967 and 1969 legislative sessions, sat locked away due to technological obsolescence.

151 In all of the promotional materials *rols* is not capitalized.

152 VADS University for the Creative Arts, 2008.

153 Sawyers Inc., 1965.

154 VADS University for the Creative Arts, 2008.

However, that would all change in 2007, when a researcher working on a documentary history of Oregon's Beach Bill contacted the State Archives. Although we were able to provide access to the written records from the Legislature for this important legislation, we had to explain that the audio was unavailable due to technological obsolescence. Fortunately, the researcher was able to track down a Rols machine owned by the inventor's son living in Europe. The researcher brokered a loan of the equipment to an audio restoration company in New York City, making it possible for the State Archives to get one audio recording duplicated and digitized. An estimate for digitizing all 20 of the Beach Bill Rols audio recordings by this company in 2008 was \$75,000. This was far more than the State Archives could afford to spend, especially given that only a very small portion of the audio would be digitized. We still had no feasible way to transfer the Rols audio recordings to a newer format or even a way to playback this audio for patrons to access.

During the intervening years, the researcher was able to secure a machine and donated it to the State Archives with the belief that it was functional. Unfortunately, while we were able to get the new machine to power on and briefly hear sound for one of the Rols tapes, it became clear that there was a problem with the machine. In the hope that this new player could be repaired, staff searched online and contacted local audio repair shops but were unable to locate somebody willing to work on the machine. Most of the repair shops cited the lack of parts for and information about this relatively unknown format as the reasons they were not able to attempt to repair the Rols machine. Given the lack of alternatives and using the patent drawings, we determined that one of the compression spring switches, which allowed the reading arm of the Rols player to change direction was broken. Once again, the State Archives was left without a way to play the Rols audio or transfer the audio to another medium. Our luck changed in 2013, when a functioning machine, complete with all of the accessories, was listed for sale on eBay. Realizing that we may never again see a Rols machine, let alone have the opportunity to buy a functioning machine, the State Archives purchased it for \$3,000.



Image 1. The above photo shows the working Rols audio player that was purchased with one of the Rols dictation tapes loaded onto it. The device was designed without a take-up reel so the audiotape just spools off onto the floor as it plays or records.<sup>155</sup>

<sup>155</sup> Oregon State Archives, 2013.

---

With the acquisition of the player, we were now able to listen to the recordings; but because of the rarity of the equipment, difficulty in securing parts or repair services, and the fragile condition of the recordings, the State Archives decided that patrons would not be able to use the original tapes and equipment and that staff would run the machine for them. Because of the proprietary nature of the equipment, staff members were prevented from easily transferring the audio to a more accessible format and we needed to find a solution so that all could benefit from being able to listen to these hearings.

Reference Archivist, Austin Schulz enjoys tinkering with electronics and was confident that he could create an adapter that would allow the State Archives to digitally record the audio directly from the Rols machine. However, the first step was to learn how the newly acquired device worked, since only one of our current staff members had actually used a Rols machine. This task was made much easier because of the patent diagrams, description and user's manual that were donated along with the non-functional Rols machine. These documents provided descriptions of the features and parts of the machine as well as directions on use, when the original patent was filed.

Marcel Jules Helene Staar filed his U.S. patent for the Dictating Machine Drive Mechanism used in the Rols machines on March 22, 1962.<sup>156</sup> The patent drawings provide excellent detail on nearly all parts of the Rols machine with the primary exceptions being the earphones and foot operated controls. These appear to have been considered but not incorporated at the time his patent was filed because they are only mentioned briefly in the specifications:

“The transcriber may use a headpiece, including an earphone, for listening to the dictation and may employ foot operated controls for advancing and backspacing the tape during the transcription process. It is contemplated that the same machine will be used for dictation and transcription, separate means for connecting the transcription equipment and foot controls being provided as suitable.”<sup>157</sup>



Image 2. 1968 GAF Corporation Rols machine showing microphone.<sup>158</sup>

The Rols machine, purchased by the State Archives came equipped with two accessory sockets, located side-by-side in the same positions as those in the original patent drawings. On the left was the headset socket that required the use of proprietary headphones (sold separately) that allowed one to listen to the recorded audio, but they had to be used with the secretarial

---

<sup>156</sup> Staar, 1964.

<sup>157</sup> Staar, 1964.

<sup>158</sup> Morton.

foot control (sold separately) to operate the machine playback and rewind functions. The microphone/secretarial foot control socket on the right was used for the microphone (included) or the secretarial foot control, both provided playback and rewind functions. Pressing the foot control all the way would cause the audio to rewind while applying only slight pressure would engage playback of the recorded audio.<sup>159</sup> This information provided Mr. Schulz with two possible avenues through which he might be able to digitally record the Rols audio. The first was using the microphone speaker to play back the audio and attempt to capture it through another microphone but that would require a very quiet room and likely result in lower quality audio. The second option was to attempt to connect an adapter to the proprietary headphones which would provide the best quality audio and could be done at any computer.

Mr. Schulz elected to focus on the proprietary headphones as the Reference Unit had at least three pairs and provided him with the opportunity for successfully recording the Rols audio with the best quality while not endangering the ability to provide audio playback in the future. After a bit of trial and error trying to figure out how the headset functioned, Mr. Schulz came up with a workable solution. Detaching the cord from the binaural headset speaker exposed two very small metal posts. Luckily the two posts were just far enough apart that he was able to attach thin wire leads using solid 24-gauge, 2-conductor, intercom wire and carefully wrapped the exposed copper wires around each of the two exposed metal posts. In order to playback and eventually digitize the mono audio recordings created by the Rols machine, Mr. Schulz attached the opposite ends of the wire leads into a 3.5 mm mono Male to 3.5mm stereo Female adapter.

At that point, the State Archives had a prototype adapter that would allow us to connect modern headphones or a 3.5 mm audio cable for recording the audio onto another medium. Playback of the Rols audio recordings, using this adapter required use of the secretarial foot control accessory which fortunately was included with the functional machine that was purchased. As designed, the foot control required the operator to apply a specific amount of weight in order to engage the playback function; however, too much pressure would cause the foot pedal to engage the rewind function. Due to our small staff size and reference desk duties, it was not feasible for us to have an individual constantly operating the foot control in order to digitally record the audio, so we needed a solution that would allow us to monitor the audio without constantly pressing the foot control.

This solution came in the form of a book, *Oregon Geographic Names*<sup>160</sup> which happened to be just heavy enough to engage the playback function but not cause it to rewind. With this configuration, we were able to playback the Rols audio from the Rols machine to the audio input on a computer using an audio cable from the new headphone jack. With the “hardware” problem solved, we had to select software in order to digitally record the audio and decided to use Audacity, an open source audio recording program that allowed us to record the audio and save .WAV and .MP3 formats.

Once the process was complete and shown to work, the State Archives announced that this previously unavailable audio was now ready to be heard, much to the delight of some of our patrons:

[Mary Jean Winter](#) Way to go, Austin! Your ingenuity and perseverance is directly rescuing parts of My History so my descendants can access it... Many libraries/historical societies have old equipment/data storage they just don't know what to do with, and it just sits & decays (and all its history with it). A heartfelt “Thanks” to you for saving this bit of our heritage!

[Like](#) · [Reply](#) · [1](#) · [April 4, 2013](#)<sup>161</sup>

---

<sup>159</sup> Sawyer's Inc., 1964.

<sup>160</sup> McArthur, 2003.

<sup>161</sup> Oregon State Archives, 2013.



Image 3. The above photo shows from left to right: headphones without the cable attached; Rols audio player; audio wire and its packaging; computer; and in front of that is the foot pedal used to both play the Rols audio and rewind it depending on the amount of pressure applied to the pedal. The thicker dark cable coming off of the Rols audio player goes to the foot pedal and the smaller one usually attaches to the headphones (far left) but was removed to allow staff to attach wire leads to the new headphone adapter. Finally, an audio line hooks into the new headphone adapter and plugs into the front of the computer (black cable).<sup>162</sup>

Digital recordings of the Rols tapes can only be done on a 1:1 basis — one hour of audio equals one hour to record. Because of the time it takes to adjust the recording software settings, make the digital recordings and perform some basic cleanup of the quality, we are only able to complete between 1 and 2 recordings per day. However, some of the audio recordings were damaged along the edges, where holes in the Rologram film are used to advance and rewind the recordings. In these cases, the only way to make the film advance was to repair the torn holes which we did using acid-free polypropylene film tape. Once completed, these repairs allowed the audio recordings to advance properly during playback so that digital recordings could be made.

The last steps involved identifying each digital recording with appropriate metadata and importing each recording in the Oregon Records Management Solution (ORMS), which not only ensures the audio will be accessible far into the future but also allows patrons to access the audio from their home computers. We have prioritized conversion based on importance of legislation for research use and are focusing our digitization efforts on landmark legislation, beginning with the 1967 Oregon Beach Bill. There were a total of 12 Rols dictation tapes with legislative discussions relating to 1967 HB 1601 (Oregon Beach Bill) and one reel to reel audio tape which amounted to over 20 1/2 hours of legislative committee audio that had been previously unavailable to researchers. These new digital recordings are now available on the State Archives website at: [http://sos.oregon.gov/archives/Pages/records/legislative\\_tracings.aspx](http://sos.oregon.gov/archives/Pages/records/legislative_tracings.aspx) where the patron can type in “Beach Bill” or “HB 1601” and the results are displayed on the screen. Once the result link is clicked on, the audio begins playing.

---

<sup>162</sup> Oregon State Archives, 2013.

---

In addition, this same process was used to convert many other important pieces of legislation also originally recorded on Rols format. These include the 1969 Beach Bill (over 14 hours on 9 Rols), 1969 Bottle Bill (over 14 hours on 6 Rols), 1967 Minimum Wage Law (9 hours on 5 Rols) and the 1969 Oregon Land Use Law (almost 15 hours on 8 Rols), and all are available to Oregonians and researchers everywhere via our online web portal at <http://records.sos.state.or.us/>. The State Archives continues to move forward by digitizing more Rols audio recordings of Oregon landmark legislation and in time would like to complete the digitization of the 1,474 Rols audio recordings in our holdings.

Our project to digitize the original Rols audio recordings relating to the 1967 Oregon Beach Bill, was nominated and awarded the 2014 Oregon Heritage Excellence Award, presented each year to:

“...recognize individuals, businesses and organizations for outstanding efforts on behalf of Oregon heritage, drawing public attention to these efforts and raising the quality of heritage-oriented activities. The Oregon Heritage Commission presents the Heritage Excellence Awards to honor those that have made the most of available resources and skills and are given for exceptional and meritorious work by organizations, businesses or individuals.”<sup>163</sup>

The mission of the Oregon State Archives is to preserve and make accessible the permanently valuable records of Oregon’s government. Technological obsolescence is a real issue for all archivists today and not all records can be transformed. However, in the case of the Rols audio tape, the perseverance and ingenuity of our staff has brought back to life Oregon legislation once thought to be lost forever.

## References

- McArthur, L. A. *Oregon Geographic Names*. Portland: Oregon Historical Society. 2003.
- Morton, D. *The History of Recording Technology*. Retrieved 2014-12-04 from [http://www.recording-history.org/public\\_php/recorder\\_search\\_results.php](http://www.recording-history.org/public_php/recorder_search_results.php).
- Oregon Parks & Recreation Department: Oregon Heritage: Oregon Heritage Commission. *Oregon Heritage Excellence Awards 2015*. Retrieved 2014-12-10 from [http://www.oregon.gov/oprd/HCD/OHC/Documents/2015\\_HeritageExcellenceAward\\_Application](http://www.oregon.gov/oprd/HCD/OHC/Documents/2015_HeritageExcellenceAward_Application).
- Oregon State Archives. Configuration of Rols Audio for Digitization. Salem: Oregon State Archives. 2013.
- Facebook, Oregon State Archives. Retrieved 2014-12-04 from <https://www.facebook.com/OregonStateArchives/photos/pb.328291870571259.-2207520000.1418663603./491536247580153/?type=3&theater>.
- Oregon State Archives. 2013-04-04. Rologram film being ejected from Rols playback machine. Salem.
- Sawyers Inc. *Introducing a Totally New System of Dictation... the Rols Dictator-transcriber*. Chicago: H. A. Bohm & Co. 1965.
- Sawyer’s Inc. *A Totally New System of Dictation*. Portland: Sawyer’s Inc. 1964.

---

<sup>163</sup> (Oregon Parks & Recreation Department: Oregon Heritage: Oregon Heritage Commission, 2014)



Staar, M. J. *Patent No. 3,124,360* . United States of America. 1964.

VADS University for the Creative Arts. *Vads the Online Source for Visual Arts, "Things Seen."* 2008.  
Retrieved 2014-12-04 from <http://www.vads.ac.uk/diad/article.php?title=252&year=1969&article=d.252.32>.