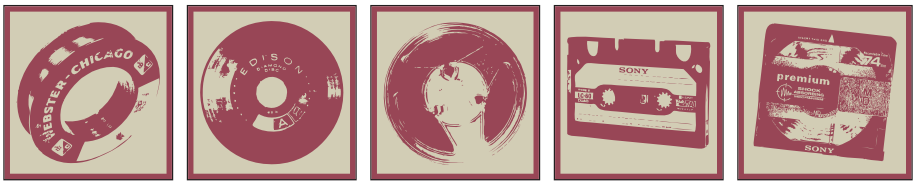
CARE & STORAGE



PROTECTING AUDIO FORMATS

COMPLIMENTS OF

Archival Sound Labs

THE CUTTING CORPORATION

Care & Storage of Audio Formats

ANALOG REEL-TO-REEL TAPES

Analog tape must always be kept away from magnetic fields and heat sources. For long term storage, metal reels with un-slotted hubs should be used. They should also be stored with the end of the program (or "tail" of the tape) on the outside of the reel. This practice is referred to as "tails out" and is done to reduce audio degradation, known as "print-through". Print-through causes a delayed or echo sound in the program and, as a result, the magnetic tape prints through onto the layer of tape spooled beneath it. Print-through distortion can also be reduced with the use of low print tape and by playing the tape one full pass yearly.

To reduce damage to the edges of the tape, reel-to-reel tapes should be stored tightly (evenly packed) in a sturdy, dust-proof tape care box. A tightly packed tape is one that is spooled snugly and evenly around its hub. Tape care boxes containing reels should be stored vertically so any stress caused by the weight of the tape rests on the hub. Storage space should kept be at a constant temperature of 50-70°F with a 40-60% RH.

Proper maintenance of your tape machine is important for achieving optimum program playback. To prevent distortion from dust, dirt and oxide shed from the tape, the tape path and magnetic heads of the machine should be cleaned prior to playback, with a 91% or higher isopropyl alcohol and cotton swabs. For reels exhibiting sticky shed syndrome, the machine's tape path should be cleaned after every pass. For severely soiled reels, playback should be stopped at program breaks and cleaned during the pass. The playback and record heads of the tape machine should also be regularly degaussed (demagnetized) after each 10-12 hours of use.

AUDIO CASSETTES

Cassettes should be kept in proper archival storage temperatures and relative humidity. They should be stored vertically (not stacked) in dust-proof plastic cases, commonly referred to as "Norelco boxes". To reduce print-through and sticky shed symptoms, casettes should be played one full pass each year. For optimum playback quality, the machine should be maintained in the same manner as a reel to reel machine (see above).

SOUND RECORDING DISCS

All grooved discs (78s, 45s, LPs, Audograph and acetate) should be handled with gloves, preferably by the center of the disc (label areas) only. Widely fluctuating temperatures or relative humidity (RH) can severely shorten the life span of recordings, so discs should be kept in medium-term storage at a constant 65-70°F with 45-50% RH. Environmental conditions should not fluctuate for more that ±10° F or ±10% RH over a 24-hour period. Disc recordings should also be kept away from light, especially sunlight and unshielded fluorescent light. Dust-proof, light-resistant disc jackets are therefore recommended.

Obsolete Discs

Memovox discs tend to be stacked horizontally in boxes because of their flexibility. Over time, however, this storage method can cause the discs to buckle and warp. The safest and most efficient way of storing Memovox discs is similar to that of vinyl records. They should be kept vertical, in protective acid-free paper sleeves.

Even with proper storage, Memovox discs can change shape over time. The relaxing grooves become extremely shallow, causing difficulty in tracking the stylus. Storing the discs in a temperature and humidity controlled environment will aid in preserving their oral data.

Because Memovox discs are made of a cellulose material, they can become infected with vinegar syndrome. To slow this type of deterioration, packets of molecular sieves (available by Kodak) can be placed in storage boxes with Memovox discs. If vinegar syndrome is suspected, the disc must be preserved at once, before the deterioration interferes with its playback.

Soundscriber and Gray Audograph discs should also be kept in acid-free paper sleeves and stored vertically to prevent warping.

Magnabelts, Dictabelts & Sonobands

In their day, magnabelts and dictabelts were stored flat in manila file folders and kept in filing cabinets. As a result, these belts often creased on the ends where the belt had been flattened and occasionally grease pencil markings are found on them for identification.

Sonobands were often stored in their original boxes and housed one inside of the other. Consequently, the outer belts tended to stretch and the inner belts often curved in and out from the weight of the other belts.

The most effective storage method for preserving belt mediums is wrapped around a piece of acid-free cardboard, inside an acid-free archival storage box. The use of cardboard keep belts from creasing and even aids in removing existing creases. Storage boxes should kept in a temperature and humidity controlled environment.

Wax Cylinders

Wax cylinders must be stored very carefully. They are extremely fragile and can shatter if impacted. Ideally, wax cylinders should be to stored in their original containers and kept vertically.

Wire Recordings

Wire recordings should be wound properly around their individual spools and stored in acid-free paper boxes. To prevent oxidation, store the wire in a temperature and humidity controlled environment.

The most common problem with wire recordings is breakage. If a wire

has a break, the best solution is to join the broken ends into a secure knot. Because most wire recorders run at 2 feet per second, only a small amount of the recording will be lost from the knot.

Damage & Deterioration Issues

MOLD GROWTH

Mold caused by the growth of fungi can cause serious distortion and physical break down in most audio formats, groove oriented and magnetic formats alike. The development of mold on an audio medium is caused by fungal action conceived from improper storage temperature, RH and present moisture. The other major agent involved in fungal action is the presence of organic material due to unclean storage areas. Mold can be cleaned to some degree using fungicide. The fungicide must be non-toxic to humans and harmless to the physical make-up of the various recording media.

POWDER RESIDUE

Powder Residue may appear on acetate or lacquer discs as dried white specks or pasty mounds on the grooves. This type of deterioration is typically caused by glue from the paper label which has spread over time onto the acetate or lacquer discs. Sometimes powder residue is mistaken for mold. Discs should be stored vertically in acid free paper sleeves and acid free storage boxes.

STICKY SHED SYNDROME

Polyester tape stock can develop a condition known as "sticky shed syndrome". This occurs when oxidation of the tape sticks to the magnetic heads of the playback machine. The heads then build up a dirty residue during playback. The resulting distortion, often referred to as "separation" or "shed loss", is very low volume levels and "fuzzy" sounding, inaudible audio. When sticky shed is apparent, baking the tape in a convection oven at varying temperatures and durations, according to the dimensions of that particular tape, can help to get an optimal pass off of the tape for preservation. This technique, however, could permanently damage the original tape and the preservation re-recording pass should be made within a 24 to 48 hour time frame.

VINEGAR SYNDROME

Cellulose acetate is subject to a slow form of chemical deterioration known as the "vinegar syndrome." The main symptoms of this form of deteroration are a vinegar-like odor, buckling, shrinking, and embrittlement of the tape or cellulose disc. Proper storage conditions can aid in slowing down the process. Cellulose acetate based formats should not be stored in air-tight boxes as this will exacerbate the condition.

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A LEADER IN SOUND PRESERVATION

The Cutting Corporation's primary goal is to make recorded audio archival collections available to listeners for years to come. One way to do that is to provide informative tools for archivists, so that they can effectively manage their collections. This guide is designed to assist archivists in the proper care and storage of their audio materials to prevent deterioration and prolong the life of these valuable materials until preservation is possible.

In this guide:

Care & Storage

- Analog Reel-to-Reel Tapes
- Audio Cassettes
- Sound Recording Discs
- Obsolete Discs
- Magnabelts, Dictabelts & Sonabands
- Wax Cylinders
- Wire Recordings

Damage & Deterioration

- Mold Growth
- Sticky Shed Syndrome
- Vinegar Syndrome
- Detecting Vinegar Syndrome

Archival Sound Labs has extensive experience with all of the formats and deterioration issues discussed here. If you have any questions concerning the information in this quide or need assistance with the preservation of your audio collection, please contact us:

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Detecting Vinegar-Syndrome

The Image Permanence Institute has developed A-D Strips, which can be used to objectively and accurately determine the presence of vinegar syndrome. Their IPI Storage Guide for Acetate Film, a four-part publication, and calculating wheel which relates film storage to how long film will last. It also explains the relationship between temperature, relative humidity and vinegar syndrome. Together, the Guide and A-D Strips make a kind of do-it-yourself film preservation kit. For more information, contact: Image Permanence Institute 70 Lomb Memorial Drive, Rochester, NY 14623-5604. Phone: (716) 475-5199.

A detection button is manufactured by Dancan in Denmark and BTT in Hamburg, Germany. When placed on the side of the can, these small buttons react with the environment inside. When the internal air reaches a certain acidic level, they turn from green to yellow, indicating that the film is deteriorating.

Molecular sieves minimize the effects of vinegar syndrome by behaving like chemical sponges, lowering the moisture level and absorbing damaging acid contaminants. For more information, contact: FPC, 6677 Santa Monica Boulevard, Hollywood, CA 90038. Phone: (800) 814-1333.

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