

Collections Research News

Fall 2000

COLLECTIONS KORNER

(Collections Korner is a regular feature of *Collections Research News*. If there is any topic you would like to see covered in the future, give us a call or drop us a line.)

Twenty Minutes to Two Hundred Years: How Long Do Compact Disks (CDs) Really Last?

This is a question that is on the minds of many in the museum community now that CD technology has allowed us to store digital images and data for fast, easy retrieval while allowing original images and artifacts to remain safely in controlled storage. Perhaps the best way to begin is to examine the structure of CDs and how they hold and make their data accessible. CDs have a laminate structure comprised of a clear polycarbonate substrate, a thin reflective layer of metal (aluminum, aluminum alloy or gold), a protective layer of lacquer and a label. Writable CDs have an extra layer of organic dye sandwiched between the substrate and reflective layer. The digital data on the CD is either pressed into the polycarbonate substrate at manufacture (audio CDs [CD-DA] and write-one-read-many times [WORM] commercial CDs) or imprinted in the dye layer (writable CDs [CD-R]) by a high intensity writing laser. Both types are read by a low intensity laser aimed through the substrate to "read" the dips or alterations by reflecting off the thin metallic layer.

So what are the factors that may shorten the manufacturers' estimate of a 200+ year life span? There are several.

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WHAT'S NEW AT CRM

It has been a busy year for us here at CRM. Our principle was in Bay City, TX this spring to teach a week-long Cataloging/ Collections Management class at the Matagorda County Museum. After which she attended to Texas Assoc. of Museums meeting in Austin, TX and the Colorado/ Wyoming Assoc. of Museums meeting in Rock Springs, WY.

This summer our principle was in SW New Mexico helping the Silver City Museum catch up on their registration and cataloging backlog. This fall she attended the Mountain-Plains Museums Assoc. meeting in Bismarck, ND and taught a week-long Cataloging/Collections Management class in Tucson, AZ.

FILEMAKER® PRO CATALOGING TEMPLATES NOW AVAILABLE FROM CRM

Collections Research for Museums has created a collection database using the commercial software FileMaker® Pro. Cataloging templates are available for object collections, photographic collections and archival collections. We will also customize a cataloging screen for those of you who have specialized collections. We can also connect your database to an imaging system to allow photographs of the collection to be incorporated into the database. Contact us for details and pricing.

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1. The environment. It is recommended that CDs be stored in the dark at a stable temperature between 50° F and 77° F and Rh between 20% to 50%. Higher humidities can result in oxidation of the metallic reflective layer or separation of the laminate structure. Light can cause fading in the dye layer and exposure to sunlight can cause warping and delamination. Deterioration of the polymer substrates and coatings is also accelerated by high temperatures and humidities. Fluctuations in the environment increase these problems, all of which can increase the chances of data error.

2. Poor handling. This is the quickest way to reduce the life span of a CD. One incident of improper handling can reduce a CD's life span to nothing. Severe flexing can cause deformation of the substrate; writing on the top surface with a ballpoint pen or other sharp instrument can cause the substrate and metallic layer to be compressed in that area or cause delamination to occur between the dye and other layers in a writable CD; removing or adding a label can cause warping; solvents can damage the protective lacquer coating; dust and dirt can scratch the surface and, along with fingerprints, can block the reading laser. All of which can cause data retrieval errors.

3. Poor storage. In addition to the environmental and handling concerns addressed above, improper storage can drastically shorten the life span of a CD. CDs should be stored in a polystyrene or polypropylene "jewel case" with a hub retainer to keep the CD in a stationary position within the case. The label side should always be up; data side down. The cases should be stored vertically and properly supported to prevent leaning. Remove any paper booklets or labels from inside the case to prevent possible acid migration from the paper or inks to the CD. The label between the holding tray and case may be left in place as identification since it

does not directly contact the CD. Do not mark the CD directly, label the jewel case instead. Never leave a CD outside its jewel case if it is not being accessed to prevent dirt, dust or light damage.

4. Natural aging of the plastic substrate. As with all polymers the polycarbonate substrate of a CD will deteriorate over time. The length of time this takes depends a great deal on the environment to which it is exposed, but do not expect this material to last as long as acid-free paper or polyester film.

5. Obsolete hardware and/or software. This is the biggest factor in determining the life span of a CD. Even if the physical structure of the CD remains intact for over 200 years, if you cannot access the data the CD becomes worthless. The speed at which technology is changing becomes a big factor in determining the effectiveness of using CDs to store vital data. A program of maintaining current hardware and software and/or migrating data from old formats to new must be a part of any long term data storage plan.

So what do we do now? What life span can we expect from our CDs? Simply put the life of a CD is over when it can no longer be read. With careful handling and storage in proper containers in an optimal environment, we can expect our CDs to last quite a while. But 200+ years? No. Obsolescence of technology will effectively limit the life span of your CDs to at best 10 to maybe 20 years. Maintaining a master copy and working copies of your CDs, verifying data accuracy every year and migrating your data to newer technologies every 5 to 10 years will increase the chances of your digital data being around and accessible into the future. But just in case, do not dispose of your original paper or film (or objects!). There is really no substitute in the end for the real thing!

For more information see *Storage of Natural History Collections: A Preventive*

Conservation Approach, p. 401-408, Rose, Hawks and Genoways, ed.; National Park Service *Conserve O Gram*, Nos. 19/19 and 19/20 or access <http://palimpsest.stanford.edu> and look for the Electronic Media Section.

SERVICES

Collections Research for Museums can now **assist small museums with computerizing their collection documentation** using off-the-shelf database software. Our current specialty is FileMaker® Pro databases (see article on Pg 1). For more information, give us a call at (303) 757-7962.

In addition, Collections Research for Museums is still offering **classes for small museums in Cataloging and Collections Management**. If you would like more information on topics covered and costs, give us a call at (303) 757-7962 or drop us a line.

We are also still offering a variety of **other services** to museums, large and small. These **range from simple inventories to complete and thorough cataloging of collections**. Feel free to contact us for more information. We still provide a **free initial consultation**.

Also, if you need help preparing your NAGPRA summaries or inventories, we can help. Give us a call.

(*Collections Research News* is a service of Collections Research for Museums, Inc, 4830 E Kansas Dr, Denver, CO 80246 (303)757-7962. Questions, comments or story suggestions are always welcome.)