Trails End Computer Club

Bulletin for the week of NOVEMBER 17, 2013

WEEKLY MEETINGS EACH Wednesday Program or Lesson 9:30 - 10:30 AM **One on One Help** 10:30-? **In the Library**	**SPECIAL INTEREST GROUPS:** If you would like to meet in a small group to discuss special computer related subjects or form a Special Interest Group lets discuss it. Our bulletin is also available on line by visiting tecc.apcug.org and clicking on bulletin.	**Our weekly program or lesson is intended to be of interest to all computer users. Following the program an allotment of time will be available for one on one help to those who want a better understanding of something done during the presentation.**

Upcoming Events

Wednesday NOVEMBER 20, 2013 Meeting
9:15 AM Set up your computer
9:30 AM Lesson
10:30 AM One on One help

CD-R and DVD+–R Longevity: How Long Will They Last?

By John Langill, Newsletter Editor, Southern Tier Personal Computing Club, NY, August 2013 issue, Rare Bits, jlangil1 (at) stny.rr.com

Although there are today many data storage alternatives, I'm sure that there are many such as me who in the past stored various kinds of information on optical media, CD-Rs in particular. To cite just two examples; I have scanned hundreds of family slides, organized the digital images, and saved them on CD-Rs. Similarly, I did the same with several hundred of digital photos from my two-month visit with my son and daughter-in-law in Australia in 2003. The purpose of doing so was to have a convenient form in which archive the digital images and to share them with other members of the family; while at the same time conserving space on the hard-disk—then a more precious commodity than it is today.

Thinking back 10 or more years, one may recall that a single CD-R then offered a relatively large data storage capacity in a form that could be easily and inexpensively mailed anywhere in the world—something that could not be accomplished via the Internet or with other "portable" media at the time.

While acknowledging that the images stored on these CD-Rs—and others even older—could now be

transcribed to another medium, I confess that I'm reluctant to devote the time and effort to doing so at this point. Accordingly, the durability and life-expectancy of the CD-Rs that I created 10, 20, and even 30 years ago, has become an increasing concern.

In the early '90s when the first CD-R discs were introduced manufacturers said the media had a data life in excess of 40 years. In the late '90s when the first DVD-R discs appeared on the scene producers proclaimed a data life of at least 100 years. However, in the time since their introduction it has been discovered that these early discs are susceptible to media "rot" (i.e., "bit rot") that can eat your information—audio, video, or data—in as little as two years after it is written. (According to research fairly recently conducted by J. Perdereau, CD-Rs may have an average life expectancy of not more than 10 years—Journal de 20 Heures, March 2008.)

Because CD-R and DVD+–R media is used to archive nearly everything today, it does make one worry; especially if these discs are the only repository in which your precious, and irreplaceable, family memories — photos and movies—as well as vital family, personal, and company data/documents are stored.

So where does the truth lie? Somewhere across the complete spectrum.

Most people who successfully burn a disc believe they have quality media. Unfortunately that only tells you the disc will be compatible (able to be played) in the vast majority of CD or DVD players. More importantly all better quality CD and DVD burners include technology called over burn/under burn protection making "coaster production" a thing of the past. The basic construction of both disc technologies enable you to burn your data in a very precise, very controlled manner.

Test Options

There are only two foolproof ways of proving the data life of the discs you use:

1. Write a few CD-Rs or DVD+–Rs, then wait about 25-50 years and check if they still hold the correct data.
2. Use a CD/DVD analyzer that is specially designed to retrieve very accurate information about your media and your data after accelerated aging in test chambers where the discs are subjected to excessive temperature and humidity tests.

The first is typically impractical. Nonetheless, from personal experience I can attest to the fact that the first CD-R I ever burned—selections from a vinyl LP album—plays just fine and the music still sounds great 25 years later. However, I have also had some CD-Rs become unplayable in just a matter of months. Fortunately, such occurrences have been few.

The second provides only theoretical limits and doesn't take into consideration how you use, handle, and store the media. However, even assuming proper handling, temperature and humidity can adversely affect the data-life of even quality media.

Between the CD-R discs produced in the early 1980s and today's double-layer DVD+-R discs there has been considerable progress in write performance, capacity, quality, and cost.

Following the test procedures of the International Standards Organization (ISO), quality media manufacturers have been able to predict data-life spans ranging from 50-200 years. But keep in mind there are wide differences between low-budget media manufacturers and quality media manufacturers. In addition variations in manufacturing methods, materials and processes/procedures can dramatically affect the data life of the media you use.

Or as auto manufacturers like to say... "Your mileage may vary."

Understanding Your Discs

It isn't vital that you understand the construction of CD-R or DVD+–R media to produce a quality disc that can be read years from now any more than you need to understand the internal combustion engine to drive a car. But understanding the difference between quality and cheap media may help you avoid losing family photos or videos later on.

Most people consider DVD+–R discs little more than overgrown CD-Rs but, while they are similar, they are also quite different. In particular, the grooves are narrower and more closely spaced and the structure (pattern) of "pits" and "lands" is very much smaller with a DVD+–R in order to enable a greater data storage capacity. Precision is very critical.

Writable CD-R and DVD+–R discs start with a piece of polycarbonate substrate into which very precise grooves are molded to guide the tracking of the laser beam. A dye layer is then precisely applied to the

substrate followed by a reflective layer and one or more protective layers. A few of the leading media manufacturers have initiated the policy of applying two very resistant layers for added data protection when the discs are used, handled, and stored.

Because of the faster read/write performance users now expect, leading manufacturers have developed new stamper technology for optimum groove (storage area) shape and ultra-precise molding technology. The molding is critical when the media must withstand being rotated at extremely high speeds during the write process—up to 52x for CD-Rs, and 8x to 16x for DVD+–Rs. The engineering margin that was once reserved for manufacturing tolerance has been used for data capacity instead, leaving no tolerance for manufacturing; for these discs to be truly compliant with the Orange Book standard, the manufacturing process must be perfect.

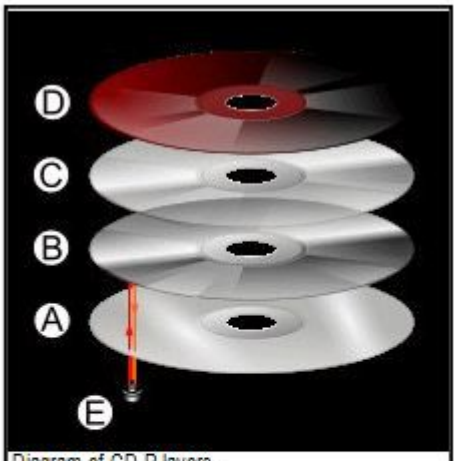

Diagram of CD-R layers.
A. A grooved polycarbonate disc layer to which a dye layer is applied to enable the encoding of data..
B. A shiny layer reflects the laser.
C. A layer of lacquer protects the shiny layer.
D. Artwork is screen printed on the top of the disc.
E. A laser beam reads the CD and is reflected back to a sensor, which converts it into electronic data

Media Problems

The quality of your media is directly related with the time the media will last without losing information. As you can see there are a number of areas where manufacturers can shave a few cents in the overall cost of the media and areas where production can go amiss to dramatically shorten the data life of your stored information. There are conflicting claims and consumer beliefs on which media is best for data retention of 30, 50, 100 years—green, gold, or blue dye; and gold or silver reflective layer. It is somewhat immaterial today. Manufacturers of quality writable discs have developed significantly improved, more sensitive and more stable dyes, and better reflective materials that virtually eliminate data loss during high-speed read/write processes and enhance long-term reliability. CD and DVD rot (i.e., bit rot) is not the problem today that it was with earlier LaserDiscs because the media use different dye technologies to store data and make it much less susceptible to that kind of degradation. The truth is that deterioration arising from delamination and oxidation is the greater problem.

Delamination and oxidation usually occur at the outer edge of the disc and are often the result of the adhesive not being properly applied and cured during the production process. This usually happens when price-oriented manufacturers use equipment that is 2 to 3 generations old and the least expensive materials possible.

When it does happen the laser is unable to read the data on the reflected layer. It is usually caused by:

• Oxidation when air comes in contact with the reflective layer
• Galvanic reaction between the layers and coatings
• Chemical reaction caused by impurities in the disc's adhesive or aluminum coating.
• Excessive heat and humidity are known to accelerate and exacerbate delamination and oxidation.

The Real Culprit

If you have purchased quality media from a quality manufacturer, you are still not assured of 50-100 years of data life!

The greatest danger to the data longevity of your personal, family, and business information is you alone; that is, by the way you handle and store your discs. The environment—temperature and humidity—can stress the materials. Gravity also can bend and stress the discs. Fingerprints and smudges can do more damage than scratches.

But by following a few Do's and Don'ts you can ensure your precious family and friend pictures, movies, family records, and business files have the maximum data life.

Do not

- Touch the surface of the disc.
- Bend the disc... especially when removing it from its case as this can cause a fine crack to develop at the rim of the hub-hole which will render the disk useless. This is a particular problem with DVDs.
- Store discs horizontally for a long time (years).
- Open a recordable optical disc package if you are not ready to record.

- Expose discs to extreme heat or high humidity.
- Expose discs to rapid temperature or humidity changes.
- Expose recordable discs to prolonged sunlight or other sources of UV light.
- Write or mark in the data area of the disc (the shiny side that the laser “reads”).
- Clean in a circular direction around the disc.

Do

- Handle discs by the outer edge or the center hole.
- Use a nonsolvent-based felt-tip permanent marker to mark the label side of the disc.
- Keep dirt or other foreign matter from the disc.
- Store discs upright (book style) in original jewel cases that are specified for CDs and DVDs.
- Return discs to their jewel cases immediately after use. Because the label side is more delicate and susceptible to damage, I recommend storing any CD or DVD disc label-side down in its jewel case.
- Leave discs in their spindle or jewel case to minimize the effects of environmental changes.
- Remove protective wrap only when you are ready to record data on the disc.
- Store in a cool, dry, dark environment in which the air is clean—relative humidity should be in the range 20% - 50% (RH) and temperature should be in the range 4°C - 20°C (approx. 40 to 70EF).
- Remove dirt, foreign material, fingerprints, smudges, and liquids by wiping with a clean cotton fabric in a straight line from the center of the disc toward the outer edge.
- Dampen the cloth with a lens cleaner to clean your discs. Dry with photo lens tissue. For tough problems use Windex or a similar glass cleaner, diluted dish detergent, or rubbing alcohol. Rinse and dry thoroughly with a lint-free cloth.
- Check the disc surface BEFORE recording.

Reliable Medium

There is a lot of cheap CD-R and DVD+-R media that has marginal quality. For some applications like games, quality isn’t critical. For irreplaceable, vital data like family photos, special events, vacations, and family/friends memories quality does matter. If you are backing up mission-critical data on your home or business computer, quality matters. Then it is important to select a brand of media that will keep your data safe, secure and available for years to come.

Quality and low prices just don’t seem to mix!

The next step to long-term data reliability is to handle and store the media with the respect your data deserves.

Some Thoughts on Windows 8

By Tom Kuklinski, President, Computer Users of Erie, PA

July 2013 issue, Horizons, www.cuerie.com, tkuklinski@gmail.com

It now has been over half a year since Microsoft released Windows 8. The operating system is actually off to a good start in terms of licenses sold. Microsoft claims over 100 million sold so far. That is not bad. In fact, that is really great. That is about what Windows 7 sold in its first six months.

What really is interesting is the lack of PC sales. Worldwide sales were down 14%. The last quarter was the worst ever for PC sales. The trend is not expected to stop.

This is causing many people in the industry to point fingers at each other. Some of the manufacturers are saying it is because people do not like Windows 8. Some are saying that consumers are not buying laptops or desktops because they are buying tablet computers instead.

To me, what is interesting is how the industry does not recognize what it created. When you look around, many sectors of industry have been affected by the 'computer'. Where is the typewriter these days? It has been replaced. Where is the encyclopedia salesman? Yes, the internet has dissolved that position. These are

paradigm shifts that were caused by the introduction of computers. These shifts are occurring now with computers itself.
Room size computers have been replaced by Desktop computers. Desktops have been replaced by laptops. Laptops are being replaced by Tablet computers. And someday, Tablet computers will be replaced by something not yet invented. That is the way it goes. Simple!
Windows 8 was introduced to be the future of computers. It was to work for desktops, laptops, tablets and phones. Microsoft developed an operating system that would cover all bases and remain consistent from one device to the other. The user would not have to stress about learning a new operating system when using these different computers. Sounds like a grand plan.
So why is Windows getting so much bad press?
Let's take a look at this for one moment.
Inside of Windows 8 is the best operating system that Microsoft has developed. It really works well. It is compatible with much of the world. When you look deeper inside its 'apps', you will find everything you are used to with previous versions of Windows. I do recommend Windows 8.
What we have is a conundrum. When you go to buy a PC computer what do you see that is being offered for sale?
Nothing attractive. The desktop looks about the same as it did twenty years ago. The 'all in one' computers are underpowered and high priced. This means it is already outdated. The laptops look basically the same as they did twenty years ago also. As you know, Windows XP, Vista and 7 look about the same. This look has been around for over twenty years. People do not like change.
Put the pieces of the puzzle together and you will better understand why Windows 8 is getting a bad rap.
Microsoft is a software company and not a hardware company. Just a few years ago, Steve Ballmer said there is no market for tablet computers. He was contented with the same and felt you should be also. For twenty years Microsoft has enjoyed it lofty place as the largest software company in the world. And for twenty years it has re-branded and resold basically the same product. HP, Dell, Asus, Acer and Lenovo are hardware companies and not software. HP and Dell have done the same.
The mouse is still the same three button device from twenty years ago. We still have ports on computers that are outdated and seldom used. These companies simply resold the same product from twenty years ago.
A company called Apple took a bold chance and introduced the iPad. It was completely different than anything being offered at the time. People loved it and bought them by the millions. It became an instant success. This is an anomaly.
For once in twenty years, Microsoft and the hardware companies now had to play catch up with Apple.
The hardware companies still sat on their laurels. Microsoft, on the other hand, went to work. In just a little over a year developed Windows 8. They did not copy what Apple had done. Because it now was their own product and not a copycat of Apple, people perceive it as different. People do not like change. Windows 8 looks different. Therefore people do not like Windows 8.
This is really too bad. Windows 8 is an enjoyable operating system. It offers everything that previous versions of Windows offered. It is rock solid and very compatible. In any case, Microsoft is not going to issue a recall. Windows 8 will be around for a long time. So to take a quote from a Star Trek show, "Resistance is Futile."

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