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Extending the Life-Cycle of Optical Media

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Optical media were supposed to be virtually indestructible. That's what proponents of the medium touted as one of its advantages. After all, the discs are made of polycarbonate -- the same substance used for bullet-proof glass. Moreover, the focusing lens could ignore smudges and minor scratches on the disc's surface because it focuses further into the substrate to read the data. The error detection and correction codes would easily compensate for any minor problems. As long as the reflective coating on the lacquer side of the disc was not damaged, the playback device should have no problem reading and reproducing the data. We now know that those claims were overstated.

Optical media of all types do suffer from the wear and tear of normal use and sustain scratches on the playing surface that impair or even prevent playback. For most of us, such discs become unusable; and they add to our coaster collection or become another piece to add to a mobile. However, there are devices available that can repair such defects to like-new condition and others that offer added protection to prevent recurrence.

Azuradisc, Inc. (28885 N. Nevada St. Suite #140, Chandler, AZ 85225 tel.: 1-800-933-4923 or 1-480-827-8786, www.azuradisc.com) patented a device in 1995 that removes scratches from a disc and repairs it to like-new condition. The company now has four models to accommodate a variety of needs from minor disc maintenance and repair to heavy-duty gouge removal.

The Model 747 (the "Money Saver"), priced at $495.00, is designed for quick maintenance or simple cleaning of standard 4.75 inch and smaller discs of all types of clear media (CD, CD-ROM, recordable media, DVD, X-Box®, Playstation® 1 and 2, DVD Compatible Game Cube® discs, business card style, and other shapes). It is designed for a long life and low per-disc cost, with consumables averaging $0.12 to $0.20 per disc.

The machine uses a dry process that does not require water. Two different polishing heads (a disc and a polishing pad with polishing compound) rotate in opposite directions, creating lower levels of friction than the Model 1600. It uses two different levels to remove fingerprints to light abrasions. The average disc cleaning time is only 20 seconds while the average disc repair time takes 40 seconds, making it the fastest disc repair machine.

The Model 1000 ($1,499.00) is an industrial strength single step polisher designed for the high-volume customer who operates in a warehouse environment and needs to clean and polish 5 inch clear discs in 1 minute or less. It uses a high speed, dry process with one polishing element and an oil-based polishing compound to remove fingerprints, scuffs, scratches, and light abrasions and to buff and polish in as little as 30 seconds. The polishing compound lubricates the process to keep the disc cool without using water. It requires minimal manual labor. It is easy to clean and inexpensive to maintain. A single polishing pad can last for thousands of repairs. Depending on operator experience, this machine can remove scuffs and abrasions quickly and yield up to 120 discs per hour.

The Model 1600, priced at $1,499.00 like the Model 1000, is referred to as the Money Maker. It is designed to be the complete solution for any disc repair situation. It handles everything from quick maintenance polishing to deep scratches. Target markets range from large libraries and independent video stores that need to maintain their collection of discs quickly to high-volume used music retailers who buy hundreds of scratched discs per week, resurface them, and resell them. This model is ideal for someone who wants to make money offering a disc repair service to the public or use it to increase store traffic.

This model uses a wet process with six different levels to clean discs and remove light abrasions, deep scratches, or even intentional gouges. Stage one uses a cleaning sponge to remove fingerprints. Stage two uses a polish buff to remove abrasions or scuff marks. Stages three to five are for micro-sanding of light, medium, and deep scratches. Gouges require an optional gouge removal stage that needs a more abrasive paper. Each stage requires about half a minute; so even repairing a disc with gouges that requires all six stages should not require more than three minutes. The timer controls the length of each cycle.

This model has an internal one-gallon water holding tank that fills up like a coffee maker; so it doesn't require a water hook-up. It uses "dual clockwise" rotation technology in which the polishing pad and the disc rotate in the same direction, creating the maximum amount of friction. This results in the fastest, most efficient repair process and removes deep scratch in the shortest amount of time, thereby making it the machine with the widest repair range on the market.

Compatible with standard 4.75 inch CD, CD-ROM, and DVD discs, the Model 1600 can also handle recordable discs, X-Box®, Playstation® 1 and 2, and smaller discs such as 3 inch Game Cube® discs, business card style, and other shapes. Double sided DVDs require specially made

abrasive papers. A business might use a single machine or multiple machines for high volume disc repair.

The Model 1600 is a semi-automatic machine. After completing the repair process, it will polish, rinse, and clean each disc and place it onto the unload spindle. The spindle can then be carried away loaded into an automated packaging machine.

The Model 1600 comes ready to repair multiple disc types right out of the box. Manually operated machines require occasional "fine tuning" to fully optimize the pressure, which determines abrasive, polish head life, and finish. An improper tuning can shorten the life of the abrasive, leave repair marks, or round the edges of a disc. Azuradisc's Fast-On™ system ($99.00 for 5" installation kit; $74.95 for 3 inch and Game Cube® discs) eliminates manual "fine tuning." It positions the discs automatically on the machine and adjusts automatically for different head heights so that all repairs get the optimum pressure for every abrasive, every polishing head, every disc, every time. A quick quarter-turn of the handle sets each disc in place and tunes the pressure automatically, insuring perfect flat repairs every time. Removing the disc only takes a quarter-of-a-turn in the other direction. Customers can have the Fast-On™ system installed at the factory at the time of purchase of the Model 1600, send the Model 1600 in to have it installed, or install the device in minutes using the installation kit.

The One Touch Professional model (priced at $14,999.00) is fully automatic. Owners can repair one disc at a time or load up to 180 discs at a time. The software informs the operator when to add or change repair supplies and tracks important statistics.

All models come with enough supplies to repair 3000 CDs. This includes the polishing compound, aqua-lube, and polishing heads for five stages of polishing. It also includes a sample of spray cleaner and wiping cloths to remove fingerprints from a disc or for quick clean up of oily or dirty discs.

RTI (Research Technology International) (4700 Chase, Lincolnwood, IL 61712-1689; tel.: 1-800-323-7520 or 847-677-3300; fax: 800-784-6733 or 847-677-1311; web: www.rtico.com; e-mail: sales@rtico.com) manufactures the DiscChek Eco-Junior™ disc repair system. It uses a wet process to remove deep scratches quickly. A simple pushbutton control lets operators select the desired disc repair stage. Microprocessor control optimizes pad speed and pressure. The control panel displays the machine status and pad number as well as the operation time and any error messages. The access door opens automatically after each repair

stage to change pads. Most discs require less than three minutes to repair; and an automatic lift feature eliminates stop marks on the disc.

The DiscChek Eco-Master™ restores CD, CD-ROM, DVD, and Game Discs without operator intervention. It uses a wet process and can load up to 50 discs at once. The operator selects the disc type on the LCD touch panel and selects the scratch repair routine. The microprocessor controls all the operating functions, automatically engaging each of the four sanding pads (coarse to fine) and a polishing pad one by one as needed. It uses a water filtration and recirculation system that eliminates the need for hoses and drains. The automatic disc repair turntable tilts up for easy pad replacement; and the cost per disc repaired is low.

Those who don't want to purchase a disc polishing machine or perform the repair work in-house can contract with a service agent like Dr. Disc Company (803 East Curry Road Suite 101 Tempe, AZ 85281 tel. 480-966-DISC, fax: 450-966-8900 email: Ryan@DrDiscCompany.com). Customers determine the average number of discs taken out of circulation due to scratches and determine an annual maintenance program that best fits their needs. For a monthly fee and a $2.00 cost per disc, they just package damaged discs in mailers provided by Dr. Disc and ship them in the mail.

Both RTI and Azuradisc also manufacture disc inspection systems to quickly determine which discs are good and which are not. RTI's DiscChek High speed electronic inspection system is fully automatic and simple to use. It checks DVDs in three minutes and CDs in two. A CRT display provides setup data and damage location.

Azuradisc's iScann high-speed disc tester ($1,899.00) is a standalone desktop unit that verifies the playability of a CD or DVD disc. It can test a disc with over 90% reliability in a minute. Adjusting the scan time can achieve a higher percentage of reliability. The iScann takes hundreds of large data samples across the whole surface of the disc data and looks for the number and concentration of hard and soft errors and for repeated requests for read retries. By comparing this information with preset limits, the tester determines if a disc will play satisfactorily in an average consumer audio or DVD player. The LCD panel displays a notice at the end of the cycle, showing the errors detected. A Pass/Fail message indicates whether a disc is likely to skip under normal playback conditions.

iScann also supports PlayStation 1 and 2 game discs as well as computer data discs. Music or data CD, CD recordables, DVD video, dual layer DVD, data DVD, DVD RAM, PlayStation 1 and 2, and any CD that uses

High Sierra or ISO 9660 format. Additional formats will be available in the future as software upgrades.

These devices can save time by identifying those discs which require repair. They can also be used to scan discs after cleaning or polishing to verify that the repair was successful. Through reliable, consistent quality control, they can increase patron or customer satisfaction.

In addition to repair and testing devices, there are products that cover the label side of the disc with a clear adhesive laminate to protect the information/foil layer which lies just beneath the silk screen printing. Once this foil layer is damaged, it cannot be repaired; so it is important to protect it from damage.

ProLine (A Division of AMI Corporation, P.O. Box 27682, Denver, CO 80227-0682, tel.: 1-800-325-0853 or 1-303-761-3999, fax: 303-761-1818 http://www.ami-proline.com/), a producer of accessories and media packaging for the home entertainment and computer environment, developed a clear disc coating that makes the data side of all disc formats more scratch resistant. The product, Disc Guard 2 (www.discguard2.com), is a liquid compound of special emulsifiable resins that simply buffs on and off the disc surface leaving oxygen-activated molecules that produce a clear layer of protection over a short period of time without restricting immediate disc use.

Application of two small drops costs just pennies per disc and creates a hard protective glass-like coating that guards against accidental scratching and fingerprints during disc handling. Repeated use of the formula provides added protection and durability because the coating takes most of the abuse while preserving the data content embedded on the disc. A new application adds continued protection, prolonging disc life.

ProLine's Disc Guard 2 (suggested retail price: $16.95) is available from the suppliers listed below in a complete kit that includes a disc-gripping applicator base, two soft application and buffing cloths, and a two fluid ounce bottle of the formula sufficient to condition more than 200 discs.

www.shopatdad.com

SUPER VIDEO
Alamo, TX
956-783-1601

BRODART
888-820-4377

DEMCO
800-356-1200

www.shopbrodart.com

www.demco.com

MIKE'S MOVIES
Boston, MA
617-266-9222

LAKES VIDEO
Forest Lake, MN
651-464-8965

THE LIBRARY STORE
800-548-7204
www.thelibrarystore.com

MOVIE WORLD
Cumberland, KY
606-589-5790

M&R SOFTWARE
Galena, OH
614-395-7858

MAJOR LEAGUE VIDEO
Houston, TX
281-447-8113

Even the smallest library can afford the products to protect its collection of optical media; but not all have collections large enough or damage severe enough to justify the purchase of a disc repair machine. Lower-priced models are adequate for fixing scratches and minor damage. Gouges and serious surface abrasion require a more expensive model. Libraries that need such equipment but find it difficult to justify purchasing their own unit can join with other libraries or members of a consortium to share the machine. Another alternative is to defray the purchase cost by providing disc repair service to patrons or members of the local community at a nominal charge. This could provide a valuable service and increase traffic in the library.