



Desktop Duplication Today

Helping you navigate the world of desktop CD-R and DVD-R duplication

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Desktop Duplication Today

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Disc Makers' ElitePro1™ wins EQ Magazine award.

Disc Makers' ElitePro1 automated CD duplicator won EQ Magazine's coveted Blue Ribbon Award for 2003 in the category of Best Duplicator. The ElitePro1 offers 48x CD-R or 4x DVD duplication and can print and duplicate 20 CD-Rs or 4 DVDs an hour. It includes a built-in PC, monitor and a 1200 dpi color printer.

EQ found the ElitePro's incredibly easy-to-use due to the built-in PC and pre-loaded software. The magazine said the ElitePro1 was "among the most powerful and flexible" CD/DVD duplicators on the market.

Other unique features cited by EQ:

- The only duplicator field-upgradable to two drives
- Large, 125-disc input capacity
- Built-in PC preloaded with Windows® XP, Padus® DiscJuggler software, and Discus label software
- Network-enabled

Call 1-888-800-4046 or visit www.discmakers.com/ddt3b for more information.

The CD-R ElitePro1 is available for only \$4,690.

The DVD-R version is only \$5,290.



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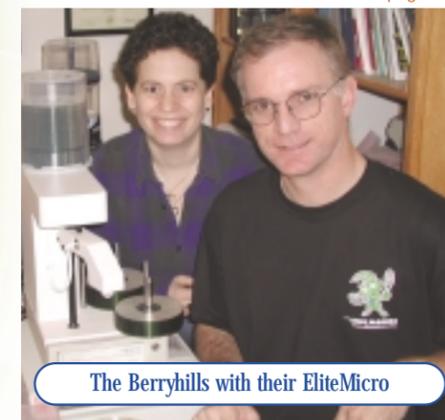
Fighting Repetition While Fighting Crime

An Automated Tale of Disc Duplication

Repetition, ergonomics experts tell us, can lead to stress injuries of the musculo-skeletal system. "It can also lead to stress injuries of the brain," Jon Berryhill says, facetiously, referring to tasks such as feeding computer discs to a CD-R drive for several hours at a time. This tedious process was necessary at one point in his business, but Berryhill has simplified the exacting evidentiary work that his business does for law enforcement agencies and attorneys using a disc duplicator and his own custom approach to automation.

Berryhill Computer Forensics, jointly run by Berryhill and his wife, extracts and stores disc images from computers that have been seized as evidence in court cases or legal actions. Using a program from Guidance Software called EnCase and a Disc Makers EliteMicro™ disc duplicator, Berryhill developed a process to automate many tasks, such as duplicating a consecutive sequence of captured image files, by controlling the disc duplicator with self-designed batch files. Berryhill continues to fine-tune the process, which will be released on his Web site when finished (www.computerforensics.com), but even now it reduces human interaction during the duplication process to a small fraction of what it used to be. "I recently worked two differ-

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The Berryhills with their EliteMicro

The Next Desktop Revolution

Cost-Effective DVD Duplication Arrives

No one knew exactly what to do with the first personal computers before Dan Bricklin and Bob Frankston launched the spreadsheet program VisiCalc. Since those days, we've witnessed a steady procession of technologies ascending to the personal computer: desktop publishing, 3D modeling, digital audio editing and sound synthesis, and, more recently, video production. Digital video producers had access to great applications for importing and editing video content, but the process broke down if the producer wanted to release video on the media of choice—DVD. While prices of recordable DVD drives finally came within reach of independent developers and producers, trying to generate a short run of discs from an embedded recorder was tedious and time-consuming. Something was missing—the thriving desktop video production industry needed an automated, cost-effective way to release high quality video content on DVD for those runs too small to justify replication.

The future is now. Disc Makers now offers an automated DVD-R duplicator, the EliteMicro™, for under \$2,000. The combination of affordable DVD duplication and a rapidly expanding base of DVD playback equipment opens up a realm of possibilities for developers, marketing organizations, training and educational groups, and other communicators. Promising new tools usually generate waves of questions on how to use them most effectively. In this article, Max Rose and Craig Hanna of Disc Makers' Multimedia Department tackle some of the common questions about enjoying the benefits and uses of DVD duplication.

While DVD duplicators can make copies of DVD-Video discs as well as DVD-ROMs (as well as compact discs in various formats), Rose and Hanna both agree that, for most applications, customers opt for producing DVD-Videos. DVD-ROM drives still represent a smaller segment of the market than the ubiq-



Disc Makers' EliteMicro automated DVD duplicator available for \$1,990.

uitous DVD players. "When burning to a DVD," Rose explained, "the recorder writes the format of the disc as UDF (Universal Disc Format). It is just a matter of selecting the right format for the disc. You can write a VIDEO_TS folder (a file organizer for DVD content) or you can write any computer data, using standard General Purpose recordable discs. The Elite duplicator can be configured with either DVD+R or DVD-R capabilities, depending on the installed drive."

Hanna agrees that audience considerations should guide the media and codec decisions. "There is always a concern for the installed base—how many people actually have the playback equipment. If customers take the DVD route, they usually do standard DVD-Video, which will play on the DVD drive in the computer or a set-top DVD player. If the content is just for distribution to computer users, we usually recommend making a CD-ROM for the wider installed base. Whether it is an old computer or a

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Fighting Repetition While Fighting Crime
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ent cases that involved the search and analysis of more than 120 computers," Berryhill said. In each case, the compressed, archived image file sets totaled more than 400 CDs. "With these tools and techniques, I can now create, verify, and archive image file sets of this size or larger with very little of my direct time necessary. With the automation, the process is also not prone to the errors that invariably occur when these large tasks are done manually. Never again will I accidentally skip a disc or make two of the same disc during the burning process only to discover the error during a laborious verification process."

Berryhill got started with computer forensics work while in the U.S. Air Force. "I was an agent for the Air Force Office of Special Investigations," he explained, "specializing in computer crime. They had hired me because of my computer skills and then they provided the investigative training and skills. When I got off active duty, my wife and I saw a hole in the industry where law enforcement staff members, usually in smaller departments, did not have the capability to handle the computer evidence. We first worked for the law enforcement community and then began doing work for attorneys and private investigators, primarily in civil cases."

"In the case of the law enforcement cases," Berryhill continued, "we're usually dealing with a computer that has been seized as evidence. We do our thing to it and give it back to the agency and it stays locked up in some evidence room somewhere. The processing of that evidence is a little different than what usually happens in the civil arena where we are going in and examining a machine to make what is called an image copy. We are basically taking a snapshot and we get everything that is on the computer. Most of the time that machine goes

back into service, so what we have is a properly documented evidentiary snapshot so that anyone can go back in time and say, 'this is what was there on the date that it was examined.' And that covers every bit and byte that is on the hard drives."

Although other hard drives and magnetic tape systems are sometimes used for storage, recordable CDs work exceptionally well in this process. "EnCase makes an image copy in specified size chunks—the size that we specify is that of a CD," Berryhill said. "We can take a set of files, each one of which is the size of a CD, and archive that onto CDs for a permanent record—one that is not alterable. Also, if other people need copies of what we have done, we can duplicate the set of discs. It makes it all duplicatable and reproducible. When dealing with

evidence, whatever somebody does has to be reproducible by somebody else; otherwise, it is not going to be valid."

Beyond the durability of the media for evidence storage and the automated convenience of the duplicator process, Berryhill sees numerous potential benefits for many other types of businesses. "Certainly, no matter what your business, if you have a need for making CDs—if you are making more than just a couple of them—the labor involved to do it by hand is an important issue. Whether you are just using a standalone duplicator or putting data in a machine and making copies, labor is an expensive commodity for companies that have employees. I don't have any employees—it's just my wife and I running this business, so my time is valuable. If I'm freed from babysitting a CD burner, I can do something else more important for my business." ■

"I don't have any employees, so my time is valuable."



Q: Do you recommend burning audio CDs at a slower speed than data discs?

A: In a word, yes.

While manufacturers strive to create 100% error-free duplication at the highest speed possible (now 52x), the fact is, the faster a disc is written, the more likely there are to be errors. Due to the three layers of error-correction built in to the yellow book CD-ROM standard, data discs can generally be written as fast as 52x with no playback problems. Audio discs, however, have only two layers of error-correction, and thus only few errors can create playback problems. The Red Book Audio disc standard recommends setting your read-in speed at 8x and your write-speed at no higher than 24x.

Have a question for our expert?
Write to ddt@discmakers.com.

The Next Desktop Revolution
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new computer, it will all be able to play a CD-ROM." Most DVD duplicators, such as the EliteMicro, also burn recordable CDs, giving digital media producers maximum flexibility in deciding how to present and duplicate their content.

Before you can turn your DVD duplicator into a desktop video production machine, some preparation is required. If you're creating a DVD-Video master for duplication, you have to perform DVD authoring (which includes designating chapter breaks, making a menu, and encoding the video to MPEG-2 format). If you're making a DVD-ROM, there's much more flexibility in the codec used for the video. Depending on the target audience, QuickTime 6, Windows Media Video (WMV), or MPEG-4 video codecs each offer pros and cons (the differences are relatively minor and beyond the scope of this article).

DVD duplication appeals to both established, experienced video producers who want to generate short runs of discs for customers, presentations, or clients, as well as less experienced producers looking to take advantage of inexpensive digital video production tools. For setting up a digital video production workstation, Rose sees simplicity and value in the new generation of DVD-enabled Macintosh computers: "Apple makes it really easy to edit video and burn DVDs, targeting the consumer or semi-professional. Using the free software on these machines, you can capture video from a DV source, edit it, make a DVD and then bring that disc over to your EliteMicro and run off copies. Most people will probably want to do the video capture and editing and authoring on a dedicated machine." With the current 4x DVD-R drives, it takes about 15 minutes to duplicate a 4.7 GB DVD.

If the DVD video encoding and authoring process seems too daunting, Disc Makers offers these services either individually or in combination with manufacturing packages. The high-end hardware-based encoders used by Disc Makers can produce better quality DVD video than you could achieve with a PC or Mac. A professionally designed menu (see below) can distinguish your DVD title from



modest homegrown productions. The popularity of automated CD recorders has been well established and these devices have become an integral part of the way many organizations distribute information. Not everyone realizes that most of these same devices now can be equipped with DVD recorders for as little as an additional \$500 per drive. With recordable DVD media costs rapidly dropping towards the \$1 a disc level, the market is ready for an explosion of independently developed DVD titles that can be produced right on the desktop. ■

Deep discounts on Duplicators at Disc Makers' Outlet!



Dear Friend,

If you're in the market for a CD or DVD duplicator or blank CDs or DVDs, and you want to save big, go to www.DiscMakersOutlet.com for incredible savings on "Open Box" duplicators, printers, and media. Be the first to get

information about these special discount offers before they sell out by signing up for our Disc Makers Outlet emails.

What is an Open Box unit? With the high volume of duplicators, printers, and blank media we sell, we occasionally have units that we've demo'd for clients, shown at a trade show, or were returned by a customer in exchange for another unit. Once they've been used even a little bit, we can't sell them as new product, hence the term "Open Box." All our Open Box machines have been Disc Makers Certified and are guaranteed to work like new. They include all necessary parts and manuals, and come with the same warranty as a new machine.

We post Open Box items on www.DiscMakersOutlet.com as they become available. Then, every Monday at noon (ET), we'll discount our Open Box inventory 10% from what it was the previous week. So, the longer a machine stays in our inventory, the lower the price gets. The price keeps dropping until it sells - there is no lowest price! All duplicators include a free as-new warranty and lifetime technical support. So visit www.DiscMakersOutlet.com today!

Sincerely,

Morris Ballen

Morris Ballen, President

P.S. Prefer a new duplicator instead? To view our complete line of new duplicators, printers, and blank CD-R and DVD media, visit www.discmakers.com/duplicators or call 1-888-800-4046 to get a free copy of our duplication catalog.

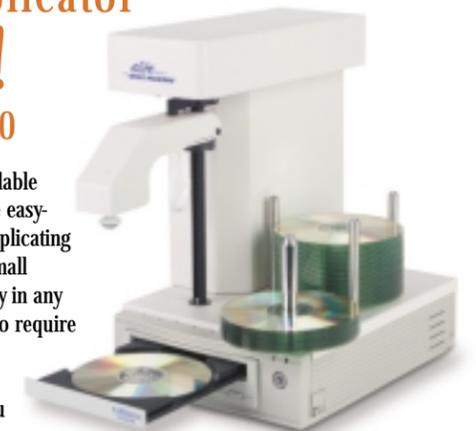
FREE catalog!



Automated DVD duplicator for only \$1,990!
with CD-R for only \$1,590

The Disc Makers EliteMicro™ is the most affordable automated duplication system you can buy. The easy-to-use Padus Discluggler application makes duplicating any CD or DVD format a snap, and the unit's small footprint will allow the system to fit comfortably in any office environment. If your duplication jobs also require unattended on-disc printing, you can add an Autograph IV 1200 dpi inkjet printer or you can connect it to any Primera inkjet printer you own for just add \$69.

- Duplicates at least 4 DVDs or 17 CDs per hour.
- Easily connects to your PC via Firewire.
- Input bin holds up to 50 discs.



Call 1-888-800-4046 or visit www.discmakers.com/ddt3c for more information.

DISC MAKERS®

EZCD on-disc color printer for only \$399!



The high-resolution color inkjet EZCD Printer delivers crisp on-disc printing in just minutes. Based on Epson's C-62 engine, the EZCD Printer is both PC and Mac compatible.

- Prints up to 30 CDs an hour at up to 2880 dpi
- 90-day manufacturer's warranty
- FREE lifetime technical support

Call 1-888-800-4046 or visit www.discmakers.com/ddt3a for more information or to order a catalog.

Reflex1 48x CD-R duplicator only \$399!



Disc Makers' Reflex1 duplicates CDs at the touch of a button. It's easier to use than a photocopier!

- Duplicates 20 CDs an hour
- No PC required
- Includes a one-year warranty
- Free lifetime technical support

For more information visit www.discmakers.com/ddt3f/ or call 1-888-800-4046