C3D – Increasing Storage Capacity

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The Products
C3D, Inc. has developed and proven the basic technology and will begin to develop end-user products over the next two years. With each of the following products, The company will seek and establish joint ventures with strategic partners who are already established with market share and manufacturing capabilities in the appropriate markets. The initial four products that C3D plans to develop over the next 12 months are:

FMD ROM (Read Only Memory) Disk
This disk takes the CD-ROM & DVD-ROM concept and takes it to the next level. The planned initial production model is a 120mm 10-layer disc with 140 Gigabyte capacity - vs. less than 18 Gigabytes for a maximum capacity DVD - giving it the capacity to store up to 20 hours of compressed HDTV film viewing. Existing CD & DVD 120mm disk and drive manufacturing equipment can be adapted with minimal re-tooling to accommodate the new technology. Also, disk manufacturing processes will in some respects be simplified as there will be no need to deposit reflective materials - the FMD storage medium is completely transparent. The new FMD drives will also be backward compatible with (i.e., capable of reading) existing CD & DVD media.

FMD Microm WORM (Write Once Read Many) Disk
The disc is a compact version of the FMD ROM, which enables the user to select information to be stored. The planned initial production model is a 30mm 10-layer disc with 4 Gigabyte capacity. It is designed to fit into devices such as laptop and hand-held computers, digital cameras, and video recorders and players, for which it will offer lightweight, high capacity storage and quick access to data. For cameras and video players, Microm WORM will not only offer the same gains as for laptop and hand-held computers but also offer higher quality video. This technology will be ideal for downloading information from the internet.

FMD ClearCard™ ROM (Read Only Memory) Card
New generations of electronic devices gain market approval by increasing functionality and versatility, and by creating greater memory. A principal obstacle to the development of small portable appliances with large data storage capacity is the lack of inexpensive small size memory carriers that can store Gigabytes of information. C3D, by using its Fluorescent Multi-layer technology, allows such storage on credit card size carriers. Access and retrieval of information will be unmatched as...
C3D Increasing Storage Capacity – Continued...

to speed, allowing the data retrieval rate to exceed 1 gigabyte per second. For the first time in the history of optical storage, C3D's technology makes these systems possible and relatively easy to build. The systems will be resilient to all kinds of shocks and will be user friendly and inexpensive. The cards will be extremely inexpensive, and therefore disposable. The potential applications for which these cards could be used are almost limitless, ranging from games and e-books to archival and navigational systems. The ClearCard will also be used in many applications where a disk is currently used.

The planned initial production model is a credit card-sized ClearCard-ROM with up to 20 layers, 400 MB/cm² data density and up to 10GB capacity - i.e. twice current single-sided DVD capacity, but at a fraction of the cost and size.

FMD ClearCard™ WORM (Write Once Read Many) Card

This is a development of the ClearCard ROM, which enables the user to select information to be stored. Writing and reading are performed using a powerful semiconductor pulse laser. The planned initial production model is a credit card-sized ClearCard-WORM with up to 10 layers and up to 1GB capacity.

Future Disks & Cards

The planned second and third generation cards and disks will have capacities up to and exceeding 1 Terabyte (1,000 Gigabytes). RAM versions of disk and card are also planned. ClearCard Technology

Where Did We Go Wrong?

Author: Cozmo Date: Sept. 1, 1999

This article springs from one of my hobbies. I like to pick up old PCs from yard sales and the like, and restore them. In today’s constant thrust for upgraded hardware I feel a vital part of our history will somehow be lost if we forget our origins. A particular interesting piece I picked up was an old Commodore 128. Cleaning off 12 some odd years of nicotine and dust I began reminiscing about the "good old days" when this PC will still cutting edge technology.

It began with me remembering the games. Was it because we typed them in from magazines, or were they just plain better? Back then there was no such thing as 3d acceleration, surround sound and the like. It was mostly gamers pounding out programs for the hell of it. You could count the number of commercial game releases on one hand for your platform per month back then. Perhaps it was because we were so desperate for something to do with these exciting machines, anything was considered manna from heaven, or perhaps the games were just better thought out. There was no such things as budgets, or production dates. You picked up a magazine and read about the latest games. Either way I remember spending days typing in basic programs from a magazine, and weeks playing the game. Hell you played it for weeks mostly because that's how long it took to load from tape drive in most cases. Even the programs typed from magazines were usually bug-free, with rarely a fix or correction posted in the magazine, unlike today's games like Tiberiuun Sun with a patch out within a week of the commercial release.

This got me to thinking about the operating systems we used back then. DOS was written into your drive on the old C64's and BASIC was burned in the ROM, so an update was a little tricky. I remember buying BASIC revision 'C' on cartridge for my Atari 800XL, to over-ride the built-in basic. Not unlike today in many cases, it wasn't for anything more than bragging rights amongst my fellow geeks. The true feat of programming magic was a little-known program called GEOS. First sold back in '86 I remember this revolution in PC usage. The GEOS desktop was document-oriented, and allowed drag-and-drop file printing, deleting, and copying. This may not sound like much, but you have to remember the date, we're talking late '86 early '87. On the PC platform such functionality wasn't offered until Windows 3.1, released 6 years later in '92. (Technically it was drag-and-drop file printing. Drag-and-drop file deleting didn't happen until Windows 95)! Ahh, Macintosh readers, don't get all full of yourselves, Macintosh didn't offer drag-and drop printing until System 7.5! Now think about this a minute, we're talking a fully operational, user-friendly graphical operating system that ran in 64K of RAM from a single 170K floppy disk drive. That's less memory than is in the on-die the cache on today's PCs. As I recall, it didn't crash daily, and a reload was simple. Turn off the PC and reboot your floppy disk. With GEOS only being on the C64 (There was an Apple II port, but it never even got as far as the C64 version) you didn't worry about drivers much. Besides, GEOS had mouse drivers, and an impressive set of printer drivers.
Where did we go Wrong? – Continued...

What about today’s applications? Word, Publisher, Corel’s Office Suite, etc. sure they’re great programs, but have we really evolved into an more functional system? What can you accomplish in these that you couldn’t with Print Shop and AtariWriter? We’re talking software developed over 10 years ago. As the technology of computers developed, so did the complexity of the programs. That in turn added to the complexity of the tasks that these programs were asked to accomplish. Each revision or new function added to the matrix, harking for more complex systems to drive this software. This in turn quickens the virtual heart rate of the hardware market, so the bloated applications can once again function smoothly, giving programmers more slack to add functions, never asking "why" instead focusing on "when". Marketing managers push the developers for new functions, updated revisions and create a hype so thick you can almost visualize the haze surrounding the next vaporware release.

Many times during my little restoration projects I’m given this opportunity to peer into the depths of history, as well as my own soul. When my system dies on me, I sometimes glance over at these ancient dinosaurs of technology. I hearken back to the era of 64k systems. No crashes, no unexplained errors, no problems. Booting up your word processor consisted in plugging in a cartridge and turning on the PC. All this technology? For what? Progress is slowing on the computer front, except for games, and let’s not forsake our computer heritage; like our human elders, they can show us the mistakes of the past, and how to best improve the interfaces for the future. Many times I’ll mess with one of these "outdated" PCs and their software, and am surprised how many keystrokes, commands and tricks I remember from these programs I haven’t ran in 11 or 12 years, but I can’t for the life of me remember how to mail merge a document in Word ’98. Perhaps I remember them better because I was young and had a greater learning capacity, perhaps it’s because today’s programs are too complex. I almost prefer these older versions of many of the programs for their lack of options, which don’t confuse the user with menus, features, and unexplained bugs; they simply function for the purpose they were designed for. Anybody know how to hook up a HP LaserJet 4 to an Atari 800?

ASTROLINK – Extraterrestrial High Speed Communications

LIBERTY MEDIA TO INVEST $425 MILLION IN ASTROLINK LLC, WORLD’S FIRST GLOBAL WIRELESS BROADBAND VENTURE

ENGELWOOD, Colo., October 25, 1999 - Liberty Media Group (NYSE: LMG.A and LMG.B) announced today that it has signed a Letter of Intent to invest US$425 million in Astrolink. Astrolink is a wireless broadband venture scheduled to become the first global, satellite-based broadband service provider in 2003, with the start of service in the Americas, Europe and the Middle East, immediately followed by Asia.

This deal comes only three months after Astrolink was formed by its three founding partners: Lockheed Martin Global Telecommunications, a wholly owned subsidiary of Lockheed Martin Corporation (NYSE: LMT); Telespazio, a company of the Telecom Italia Group (NYSE: TI); and TRW (NYSE: TRW). The founding partners invested a total of US $900 million; today’s agreement brings Astrolink’s total equity to $1.325 billion - substantially all of its equity target.

The transaction is subject to completion of definitive agreements, which the parties expect to execute within the next 30 days.
Giving effect to Liberty's investment, Astrolink's ownership will be as follows: Liberty Media 31.6 percent; Lockheed Martin Global Telecommunications 31.2 percent; Telespazio 18.6 percent; and TRW 18.6 percent.

"We are delighted to welcome Liberty Media as a new Astrolink shareholder," said Celso Azevedo, president and CEO of Astrolink. "The investment by Liberty Media represents a tremendous vote of confidence in our company's future and places Astrolink in a strong financial position."

"Liberty Media's lines of business bring tremendous strategic value to Astrolink's business, and will clearly help to propel us to the forefront of the global wireless services market," Azevedo added.

"Global demand for high speed information delivery is increasing at a record pace," said Gary S. Howard, Executive Vice President and COO of Liberty. "Astrolink provides a unique opportunity for Liberty to invest, with a strategic set of partners, in a global distribution network utilizing leading-edge technology to take advantage of this important trend that will shape the world economy in the new millennium."

Based in Bethesda, Maryland, Astrolink will build and operate a global telecom network based on next generation satellite technology. Astrolink will focus on the high-growth area of broadband data services, carrying traffic for Internet, intranet, multimedia, and corporate data networks. Customers will be able to install small satellite dishes at businesses and homes, to connect quickly and inexpensively to high-speed networks. The service will be complementary and compatible with other broadband services like fiber optic transmission and fixed wireless technologies.

Astrolink's first geostationary, Ka-band satellite is scheduled for launch in 2002, followed by the launch of three additional satellites at six-month intervals. The first two satellites will provide broadband data communications services to customers in North and South America, Europe, and the Middle East. The third and fourth spacecraft will extend the network worldwide.

Liberty Media holds interests in a broad range of video programming, communications, technology, and Internet businesses in the United States, Europe, South America, and Asia.

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Surfing On The Head Of A Pin

By Jeffrey R. Harrow, TechWeb contributor

It's fascinating to follow the trends toward ever-smaller building blocks of the Information Age, because as the things that implement our information services shrink, the opportunities to use them in many new ways proliferate. Take, for example, Web servers.

We know computers can be Web servers -- even your PC, if it's running Windows 95, 98, or NT, probably has a Web server running. (Type "http://127.0.0.1" into your browser and you'll see what you're publishing, if only to yourself.) And we've been watching how dedicated Web servers have been shrinking -- back in February, we saw a server the size of a box of matches. Then, in August, we found a complete iPIC-based Web server could be as small as the head of a match.

Now, just three months later, brought to our attention by RCFC reader Anthony Friede, we find Fredric White says he has broken the "match head barrier". This tiny Fairchild ACE 1101MT8 chip is about half the volume of the iPIC chip, and implements a restricted, special-purpose TCP/IP stack. Nevertheless, it can serve up live (if simple) Web pages, such as the one you can see here. This page displays its name "webACE Server," the state of an LED connected to it, and a hit counter. For comparison, when I wrote this, I was hit number 3,130.
"Well, all this is well and good from a bits and bytes technical standpoint," you may be thinking, "but other than as a curiosity, what could something with such limited capabilities possibly be good for?"

Don't think of Web services such as we know them today -- instead, think "appliances." This $2.12 chip could put your microwave, refrigerator, heating, and air conditioning system, and even your toaster or a light socket on your household network, providing command and control and diagnostic information to your "information furnace."

It's not necessarily about serving information-filled pages as we think of the Web today, but it's about pervasive connectivity. And it will be about far more. As the size of Web servers continues to drop, they will be able to Web-enable virtually anything.

Jeffrey Harrow is a senior consulting engineer for the corporate strategy and technology group at Compaq. A more extensive version of this discussion, as well as other discussions about the innovations and trends of contemporary computing, are available online at http://www.compaq.com/rcfoc. His opinions do not necessarily reflect those of Compaq.

Tips & Tricks – Windows 98 Optimization

**Restart Windows without Restarting your Computer**
Choosing Shut Down from the Start Menu gives you several choices, including restarting your computer. However, to restart Windows without restarting your computer, saving time and aggravation, follow this step:

1. Hold down the Shift key while pressing OK in the Shut Down box.

**To make an icon on your desktop:**
Using a text editor (such as Notepad), type the following by itself:

```plaintext
@EXIT
```

Save the file somewhere on your hard disk - call it whatever you like, as long as it has the extension .bat.

Make a shortcut to the batch file, and place it on your desktop (or wherever you want).

Right-click on the shortcut, select Properties, click the Program tab, and make sure the Close on Exit option is turned on. Then, click Advanced, and make sure MS-DOS mode is selected, and Warn before entering MS-DOS mode is turned off. Click Ok twice, and double-click on the icon to use it.

**Better Floppy Formats**
Although you can right-click on a floppy drive in Explorer or My Computer and select Format to format a floppy, there's a better way.

Type `Format a: /u` at the MS-DOS prompt (substitute A: for whatever drive letter you wish). Using DOS instead of Windows to format floppies will yield better multitasking, meaning you'll be able to do other things while formatting floppies (strange how it multitasks DOS better than Windows). Furthermore, using the `/u` parameter specifies an unconditional format, meaning that it won't save unformat information, yielding a faster format and more free diskette space.

To simply erase a floppy, type `Format a: /u/q` - this is much quicker than a full format, but will not ensure an error-free disk.

Remember, if Format reports any bad sectors, throw away that floppy immediately.

**Stop Windows 98 from Wildly Accessing your Hard Disk**
Many users have complained about Windows 98 seizing up for up to a minute because of random, pointless disk activity. This is due to the way that Windows 98 is set to handle disk caching and virtual memory. Although Windows 98 instructs you to "let Windows handle disk cache settings" for best results, this obviously does not yield the best results. Here's how to eliminate the random disk activity and improve system performance:

**Part One: Virtual Memory**
Right click on My Computer, and select Properties.

Click the Performance tab, and then click Virtual Memory

Choose Let me specify my own virtual memory settings.
Tips & Tricks – Windows 98 Optimization – Continued...

If you want to choose a different drive for your swapfile, run Disk Defragmenter first. Specify the same value for the Minimum size and the Maximum size, so Windows 98 won’t spend so much time resizing the file. A good size is roughly 2 1/2 times the amount of installed RAM (i.e. create a 40MB swapfile if you have 16MB of RAM). Press OK, and then OK again, and confirm that you want to restart your computer.

Part Two: Defragmenting the Swapfile
Once you’ve set the swapfile size to be constant (see Part One), you won’t have to worry about a fragmented (broken up) swapfile again. However, you’ll need to defragment it at least once for it to remain that way in the future. If you have Norton Utilities, you’ll be able to optimize the swapfile with Speedisk. Otherwise, if you want to take the time, you can defragment it manually: If you have more than one partition or hard disk in your system, defragment all drives first. Then, move the swapfile (using the configuration procedure in Part One above) to another drive, defragment the first one, and then move it back. Although it’s also possible to disable the swapfile entirely while you defragment the drive (and then re-enable it so it will be recreated whole), it isn’t advisable because Windows 98 may not start without a Swapfile.

Part Three: Virtual Cache (only if you have 16 megabytes of RAM or more)
Open SYSTEM.INI for editing. Add the following two lines to the [vcache] section (add the section if it’s not there):
MinFileCache=4096
MaxFileCache=4096
These values, in kilobytes, regulate the size of the VCache, so you can stop it from filling up all available RAM and paging all loaded apps to disk. If you have more than 16 MB of RAM, then set the above values (both of them) to about 25% of the amount of installed RAM.

Part Four: RAM
You may have thought we overlooked the obvious - add more RAM! The more memory you have, the less frequently Windows 98 will use your hard disk, and the better your system performance will be. Since Windows 98 isn’t very efficient or compact (by any stretch of the imagination), you’ll need to feed it as much memory as you can afford. 16 megabytes is the absolute minimum, but 32 is better. If you have the money, 64 or even 128 megabytes will literally make Windows 98 fly.

Speed up system restart
Add BootDelay=0 to the [Options] section of C:\MSDOS.SYS

Next Week on Tips & Tricks:
• In-depth breakdown of MSDOS.SYS – Find out what all those line of code mean and how to use it to your advantage!
• More Tweaks to make Windows 98 even faster!
• Have a question or Windows 98 gripe? Let us know and we’ll publish a fix, tweak, or prayer for you.