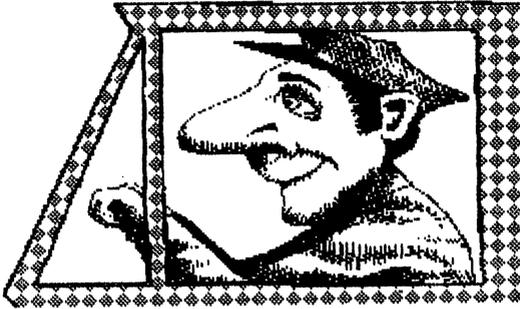


Drive Tip

By: Bob Ferguson, Club 64



Contrary to popular belief, inserting a "scratch disk" into your disk drive in order to transport it from place to place does absolutely no good! The drive comes with a specially cut card (1541 and 1571 cards differ in size) that jams the read/write head against the rear of the drive. This card keeps the head from being knocked back and forth during transport.

Using a disk instead of this card does not accomplish this feat. Even with a disk inserted, the read/write head can still move back and forth and offers no protection at all for this delicate hardware. So save your card and use it whenever you transport your drive!

Commodore + VCR

By: Bob Ferguson, Club 64

If you own a VCR and a 1702 or compatible monitor, you can watch videos on your computer screen. Using the front panel connections on your 1702, patch the VCR's audio-out to the monitor's audio-in. Then connect the VCR's video-out to the monitor's video-in. Be sure the 1702's rear panel slide switch is set for the front connections. Sit back and enjoy! Usually the picture is of much better quality than most television sets!

September Meeting

By: Bruce Morrison, CCCC

September's C64/128 meeting at St Peter & Paul Madonna Hall was the best turnout I've seen in a long time! The regular volunteers were there; to name a few: Bob Holdcraft (Member-at-Large, and Past-Secretary), Tom D'Angelo (Past-President), Tom Stubblefield (C64/128 Librarian), and

contributors and volunteers such as: Bud Smith (GEOS help), Vernon Broadway (newsletter contributor), Ted Seitz (Past-C64/128 Disk-of-the-Month Editor and current BBUG Editor), and Steve Martin (Past-Vice President and C64/128 Editor), along with various other members. (If I didn't mention your name, please forgive me!)

All the volunteers were busy from start to finish, which brings me to the next subject: **WE NEED MORE VOLUNTEERS!** If we get any busier at the meetings, and I hope we do, then we'll need more help! If you wish to help out at the meetings, please let someone know at the next meeting. You don't need any special skills or experience! Of course, we also need more members to come to the meetings to participate and support the club. So, Come on down!!!



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How Disks Are Made

By: Judy Martin, BNCUG

This article is based on my experiences while working at Sentinel Company in Hyansi, Massachusetts.

1) A computer disk starts in a BURNELL room. Here the operator prepares a bolt of vinyl and a bolt of liner. Both are sent into a machine called a Burnell. A die cutter is inserted for cutting the vinyl. The machine pulls the vinyl and liner together into it and cuts it. It then pushes the pre-cut jacket onto a roller. Usually there are two inspectors who inspect each pre-cut piece and stack them on a cart. The inspectors look for blemishes and make sure the liner is attached. The average output per shift is 75,000 to 100,000 jackets.

2) The jackets next go to the folding room. Here the operator takes a stack of jackets and inserts them into a machine called the folder, which pulls a jacket one at a time, and folds it in half. It then folds all but the top corner and heat-seals each end. The pre-made jackets exit the other end of the machine and are stacked open end up in a tote. After inspection, they are ready for a burnishing machine.

3) The burnishing machine does a two-fold job. There is one operator for six machines. The operator takes about 30 jackets at a time and fills a hopper, then fills an upper rack with media (the disk itself). For double sided disks, two ribbons are set up: green for regular, mauve for Polaroid disks. For single sided disks (rare), one ribbon is put into the machine. The machine pulls down on the media and puts it through a "burnish", opens one jacket and pops the media into it, then drops the disk into another hopper. Burnishing is basically buffing the media so that it will accept information. After a quick inspection, the disks are taken to certifying.

4) The certifiers are the machines that determine if the disks are good enough to use. After the hopper is filled, the machine pulls four disks at a time, runs them through a basic format, drops them into numbered slots, and grabs the next batch. The numbered slots are:

1. Excellent
2. Good-acceptable
3. Poor-may be a bad run
4. Unacceptable-such as no media in the jacket.

1's usually go to companies for bulk use/sale. 2's are what you buy (also called ANSI disks). 3's are re-run; if not a 1 or 2 the second time it is dumped.

5) At enfolding, the operator takes all the jackets with media and places them in a hopper at one end of a long, tilted assembly line. The disks follow the line and stop at 8 specific stops. At this time, a long bar comes down and folds the open top over the jacket. The disks are now sealed and move out the end where they are placed into a tote.

6) The next step is hubbing. The operator sets up what looks like a large roll of circular "stickers", fills a hopper with the disks and sets the speed. The machine pulls the disks one at a time into the work area, a large pad comes down, then up: a hub ring is now in the center of the disk and the disk moves to the end. The average worker can do about 88 disks a minute.

7) A group of inspectors now take a tote of disks (about 480) and visually inspect 10-20% of them. If there are more than 5 disks with flaws of any kind, the tote is rejected. The disks will eventually be hand-inspected 100%. If they are good, they'll be stacked for either duplication or packing.

8) Our duplication machines were of different types for different programs. We used MST for C= and Apple; MDC for IBM, and Mountain for any other computer. We had 8 inch drives for large disks. All machines can run any computer program depending on the type of drive installed into it. There was a hard drive for all formats used.

9) A company (say Micropose) sends a Master disk. A copy of the Master disk and a formatted copy is sent to duplications. The operator inserts the Master disk into each machine and tells it to read, then goes to the terminal and enters the format code and read for each copy machine. Next step: remove the Master copy, insert a blank disk into each machine and run one copy on each. Each disk is then verified at inspection to ensure each machine made a good working copy. If so, the machines are set up for however many copies are needed and set to run. They are then inspected. If a copy is bad, the procedures are repeated until good or declared "bad" by the technician.

10) Since the company does disks and/or programs for almost all computers, at least one of each computer is set up at

How Disks Are Made

(continued from page C4)

inspection. Each computer is then loaded with "Verify" disks, which checks the new disk with the Master disk. The inspector then pulls out 20% of a tote to verify and 20% for visual inspection. This ensures that the company is getting an exact clone of the Master disk. If not, it is re-run. Disks that are flawed are discarded.

11) At boxing and shrink wrap, the labels are put on by hand or machine, then the disks are placed into sleeves. This is time consuming because some companies want their own labels and sleeves, others just want OUR sleeves. All disks are counted in groups of 10 and are then ready for boxing. Boxes are pre-made, so you just fold, fold and fold. The Orcal Series of disks take time. There are 18 disks to the set. Each one of the 18 is placed into a box in the proper order; documentation added; the box is closed, and ready for shrink wrap.

12) The shrink wrap is basically a big oven. It's also a busy job because each box is checked again before shrink wrapping. The oven has a roll of plastic wrap on one end and the operator controls an arm that adjusts the plastic around the box. As the box is placed on the plastic, it initially looks like a bag too large for the box. The arm is pulled further down and the box travels through the machine, which shrinks the plastic around the box. The box is then inspected to ensure that the plastic is not too big or tight for the box.

13) The last step is the pack-out. Here the boxes of disks are packed for shipment to the companies that ordered them. Each box is sealed and stamped to ensure that there is no tampering.

That's the story of how disks are made and duplicated for your usage.

Drive Tid-Bits

From MCUC via CUGOS, (author unknown)

1541 Felt Pads

It has been reported that the felt pressure pad in the 1541 wears out. Yep, I imagine it does. And when this happens, the top side of the disk will get scratched, which will do bad things to flipped disks (one of the arguments for not flipping disks).

The pad can be easily replaced with a new one made with felt between 1/16th and

1/8th inch thick. Too thin, and it will wear out quickly. Too thick, and the pressure will be excessive. Go sparingly on the adhesive; none on the face of the pad!

Write Protect Tabs

Don't use the write protect tabs that come with the 5.25" disks, they are too thick and stiff for the old 1541 drives (disks won't pop out), and don't stick too well, especially if you remove and replace them often. Instead, use a 3/4 inch slice of plastic electrical tape.

(Editor's note: I also notice this problem with my 1571 drives!)

1571 & C64

The 1571 is usually considered for use with a C128, but it works great with the C64 too! The 1571 emulates a 1541 with a C64, but there is one interesting difference. In direct mode type in:

```
OPEN 15,8,15, "UO>M1" CLOSE 15
```

This will keep the 1571 in double sided mode. Format a disk, and now you have 1328 blocks available. Type:

```
OPEN 15,8,15, "UO>MO" CLOSE 15
```

to return to 1541 mode.

From the Editor

By: Bruce Morrison, CCCC

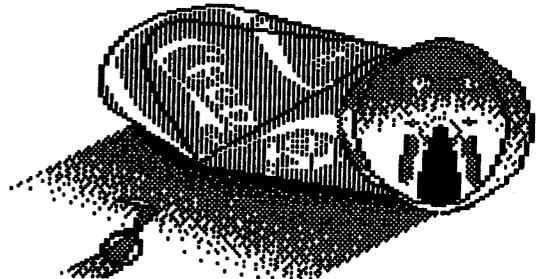
I'm sad to say that due to time constraints and not enough room in the newsletter, there will be no GEOS Page this issue! HOWEVER, next month I will make an extreme effort to include it.

Also, it would help to have new articles from our own club members sent to me. This would save me time and also give more originality to our newsletter. So put your thinking caps on and send me an article, preferably in TWS format so I don't have to re-type your article! You can mail your disk to me at the following address:

Bruce Morrison

8215 N Oracle #185

Tucson, AZ 85704



HAPPY  HALLOWEEN



NEW RAMDRIVE



by Glen Parker, News Editor of HACC

as published in MC3 Hardcopy Portland, OR

Creative Micro Designs (CMD) has done it again! They have designed an upgraded version of their RamDrive in five, That's right, 5, new sizes: 512K, 1, 2, 4 and 8 megabytes. You can arrange it in up to 30 partition that emulate the 1541, 1571, and/or 1581 disk drives. Each RamDrive has its own power supply, so you won't overload your computer's supply. And, if the power goes off (or when transporting it to meetings) it will keep your programs in memory for up to seven (7) days. Loading time is up to 400 times faster than a 1541; about 153 blocks per second. In IBM and AMIGA that's about 39K or 39,000 bits per second. Downloading time on a BBS is about 25% faster, and with very large files of over 100 blocks, is about 50% faster. When your disk gets over half full, saving usually starts slowing down because it gets harder to quickly find empty sectors on the disk. No word on when it will be available at your dealers, but keep watching for it.

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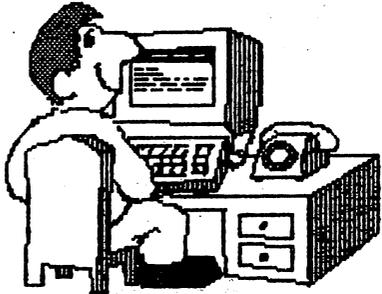
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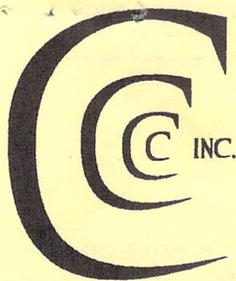
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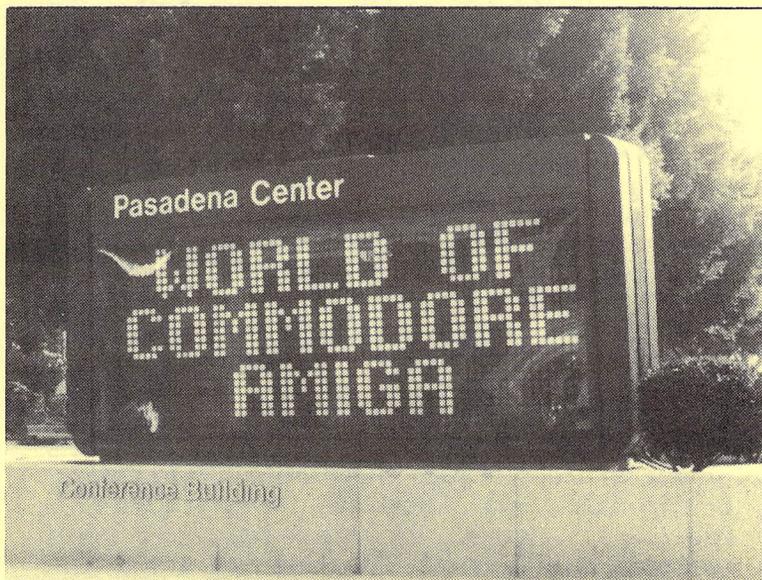
Amiga News

The Revolution Has Arrived

It just wasn't the revolution we were expecting

The Pasadena World of Commodore show heralded a major change in the Amiga world. But the introduction of the Amiga 4000 and the U.S. debut of the Amiga 600 are not the events that qualify as revolutionary. In fact, savvy Amiga users had heard about the 600 from its European introduction, and the 4000 had long been the subject of wild rumors and speculation, so their appearance was almost anti-climactic.

The revolution was evident upstairs from the show floor, in the conference room where keynote addresses were held. Here was Commodore U.S. head Jim Dionne talking about the company's marketing plans, and taking questions from users and dealers. Here was Commodore VP Louis Eggebrecht discussing Commodore's engineering work in progress. Here, in other words, was evidence that people in high places not only care about the Amiga, but understand that it's important to let users know they care.



I won't go into too much detail because a) I only attended the Friday session and b) much of the information about the Amiga's future is being widely distributed on bulletin boards and magazines, not to mention the club's September disk-of-the-month (see box.)

For those who haven't seen them, a list of the 4000's specifications is on page A-6.

I'll pass along these random observations, from presentations by Jim Dionne and the head of Commodore's business marketing, Dave Archembault.

The Amiga Market

The Amiga 600 will ultimately replace the Amiga 500, but Commodore will not stop making 500s until people stop buying them. This Christmas, look for 600s bundled with RoboCop3 games and 600HDs (the hard-disk version) with some sort of virtual-reality software.

- continued on page 4

DISK-OF-THE-MONTH ***October 1992***

WindowTool -- Use hot-keys to control windows and various WB functions.

EternalRome -- Strategy game somewhat like Avalon Hill games.

DiskReorganizer -- Reorganization utility for floppy and hard disks. One version for WB2.X only, other is 1.3 compatible.

Text -- Lots of news this month about new Amiga 4000 and about future Amiga plans - encouraging!

CountingFun1.0 -- Kid's math learning game.

HotLinks Editions 1.1

Soft-Logik branches out

It will soon be possible to develop a complete desktop-publishing system using nothing but an Amiga and products from Soft-Logik, the company that created PageStream. Several months ago, S-L introduced BME, a simple bitmap editing program, and PageLiner, a text editor. But by far the most notable S-L creation was HotLinks, which gives the Amiga the same ability to link programs that Dynamic Data Exchange gives to Windows, and Apple's System 7 gives to the Macintosh.

(Soft-Logik expects to release a structured-drawing program called Art Expression later this year, giving desktop publishers a complete set of Soft-Logik tools. Gold Disk has a similar set of programs already, including Professional Page and Professional Draw. However, they don't yet have a hot linked bitmap editor like BME.)

At first HotLinks sounds like Arexx, the inter-process language by Bill Hawes that's now a part of the AmigaDos operating system. But HotLinks and Arexx are different ideas altogether. Arexx allows programs to send *messages* back and forth while running at the same time in a multi-tasking environment. HotLinks allows programs to share the same *data*, even if they are not running simultaneously. Both are good ideas.



The original bitmapped graphic shows "jaggies" when enlarged.

HotLinks (and the similar systems on the Mac and Windows) allow you to "publish" a graphic or text file from one program, and then "subscribe" to it in another program. For example, if you've loaded a long text file into PageStream, you can avoid PageStream's laborious screen redraws by [publishing the file to PageLiner and editing it there. PageLiner even recognizes PageStream's fonts and style tags, so these can be changed as well without returning to PageStream. Once you're done, you just select the menu item labeled "update," and the new version of the file appears on your PageStream screen. If you've quit PageStream before updating the document, it's updated automatically the next time you load that document into PageStream. PageLiner even includes a spelling dictionary, to save you the hassle of trying to use PageStream's (which never seemed to work for me - it labeled many correct words as misspelled.)

I haven't been able to give the HotLinks-PageLiner-BME system a real workout since bringing them home from World of Commodore, but I can say it works as advertised. As advertised, though, PageLiner and BME are intended as adjunct programs to PageStream, not as full-featured text and graphic editing tools. In other words, I wouldn't cancel plans to buy DPaint IV or ProWrite.

BME: Not Your

See the difference between these two shamrocks? One is a piece of bitmapped clipart, great for using at a fairly small size, but crudely once it's blown up too far. The individual bits of the image are enlarged into blocky squares.

The second shamrock is what you get when you turn Soft-Logik's BME loose with its automatic trace command. BME analyzes the bitmapped graphic, then traces the outline of the image and saves it as an Amiga DR2D structured graphic file. What you get is not only an image that can be blown up to any size without getting "jaggy," but in many cases it takes up less disc space as well.

Tracing is the newest feature of Soft-Logik's BME, one of the three programs included in HotLinks editions. In fact, tracing

HotLinks is not the solution to every problem, either. For one thing, it's not Arexx. You can't use it to automate complex tasks, as you can using Arexx and ProPage, for example. Also, HotLinks is a new Amiga standard that only two software companies have signed onto. Black Belt Systems' Imagemaster and New Horizons' ProWrite now support it, and Soft-Logik is making a developer's kit available free to anyone wanting to add HotLinks to a new or existing program. Finally, HotLinks Editions (the official name for the HotLinks-BME-PageLiner package) seems aimed at the power user with a hard disk and an accelerated computer. PageLiner is slow on a plain 68000 machine, and BME is no speed demon either (see sidebar).

Should you buy HotLinks Editions? If you use PageStream for desktop publishing, and regularly "fiddle" with text or graphic files while composing a page, then it's a good deal. If you regularly do your editing *before* you lay out ages (the way it's supposed to be done), then you might be better off just keeping your present software tools.

Real-time data exchange between applications is a growing trend on other platforms, and it's nice to see the Amiga isn't being left behind. Whether it's needed is the real question, though.



No Jaggies Here -- Unlike the bitmapped image, this autotraced version can be stretched at will without showing any jaggies. It takes a few tries to get BME to trace perfectly, though, especially when an image is complex or contains type. Letters have to be traced *very* carefully to avoid distortion. HotLinks offers a variety of options designed to let you control tracing. They include curve fit, sampling rate, noise filter, and the option to produce curves, lines, or both. Also, large traces (including this one) might not print on dot-matrix printers, though they work fine on PostScript printers.

Average Paint Program

was the feature that convinced me to buy the package. I have a lot of bitmapped images I'd like to convert.

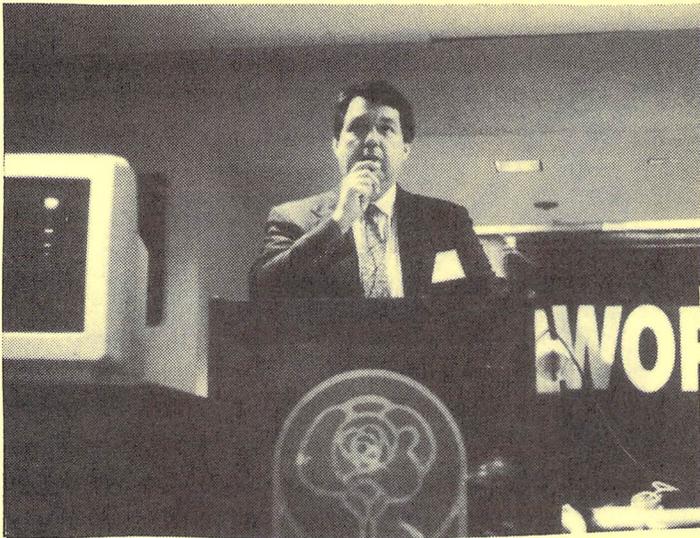
BME is like a very good programmer's text editor. Just as a text editor is perfect for generating C source code but can't begin to do a mail-merge or handle graphics, BME is great for touching up an existing graphic or converting it to a structured graphic through tracing, but it simply was not designed to generate a graphic from scratch.

BME opens on a hi-res 32-color interlaced screen, though 31 of the colors are set to shades of grey. It can accept IFF, GIF, or TIFF images up to 32,768 by 32,768 pixels big and 32 bits deep. However, despite being able to trace outlines and hot link graphics to other programs (so far, only PageStream), BME has

none of the tools we've come to expect from mainstream paint programs. There are no fancy dithered fill patterns, no sophisticated color support (you don't even see the image in color), no rotating, enlarging, or skewing of images, and no text functions.

BME shares a problem with PageLiner. Both seem designed for large, fast systems. When I removed the 68030 accelerator card, I found the trace feature suddenly stopped working - in fact trying to trace would crash my computer. Screen updates, even with two-color graphics, are slow. That's partly because BME uses a five-bitplane screen, no matter how many colors are in your graphic.

For what it's supposed to do, it's great. Just don't ask it to do something it's not supposed to do.



Commodore President James Dionne talks to users at the World of Commodore show.

Revolution - continued from page A-1

As for the 2000 and the 3000, Dionne says the 3000 will be around for many *months* to come, owing to its lower price (than the 4000). The 2000, he says, is a different animal, since the market for it is driven partly by the Video Toaster.

Jim Dionne: "Sometimes we get flak about our low-end marketing. The Amiga community is better served, the more Amigas we sell."

Dionne again, speaking to users: "I get lots of letters saying we don't know how to market. Well, why don't you guys try it?"

Current Amiga ads, the ones featuring art deco-style cartoon characters, are selling more Amigas, even though they're not the kind of "award-winning" ads Commodore has produced in the past. Commodore's plans call for two and four page spreads in audio-visual and marketing magazines. The ads have produced a lot of inquiries from dealers, who see a greater potential profit margin than with generic, low cost IBM-compatibles.

Commodore is compiling a list of high-profile Amiga users for its business marketing. A partial list includes the Pentagon, the CIA, Walt Disney Studios, and Digital Equipment Corporation (now also a reseller of Amigas). The military is using Amigas networked with DEC VAX computers for battle simulations. Some of those simulations were used in the days

before the ground war began in Iraq, as the military investigated various scenarios.

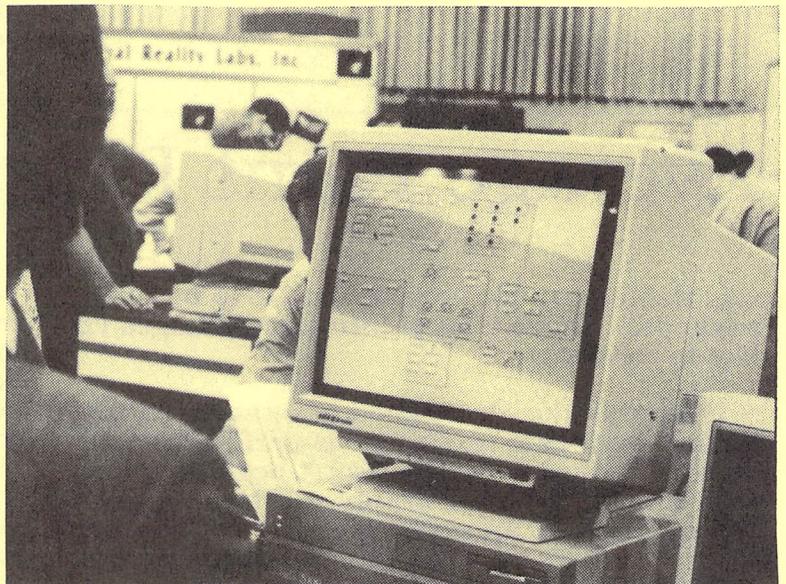
Commodore is getting back in touch with its user groups. Dionne says user groups should have received a mailing from Commodore, and he asked any groups not contacted to get in touch with the company. Dionne: "Whether we've spent millions (on advertising) or \$1 million, the number-one reason people buy an Amiga is the advice of a friend."

Why isn't CDTV doing better in the mass market? Dionne says electronics outlets could sell a lot of them, but "they're not pioneers." A TV store salesman would rather make \$100 commission selling a large-screen TV, which takes ten minutes, than demonstrating CDTV for an hour, for a much smaller commission. The stores want somebody else to pioneer the new technology.

Dionne promises "other developments are coming" for CDTV.

Amiga 4000 Compatibility

The 4000 ships with AmigaDos version 3.0, which is basically the same as 2.1, but with added support for the Advanced Graphics Architecture (AGA) chipset.



A Bigger Bench Great Valley Products Shows off its new EGS 100/24 board, with a 1280 x 1024 Workbench displayed on a 21-inch monitor. Unlike the competing DMI Resolver, the EGS runs Workbench as fast as the Amiga's native display. At \$2699, it also costs three times as much as the cheapest Resolver, and only works with a GVP accelerator board.

How do you get AGA compatibility on your current system? It's simple: just replace your current system. The AGA chips are a complete redesign (they even have different names - Denise has been replaced by Lisa) and no technical upgrade is possible. Look for some sort of trade-up program from Commodore as soon as initial A4000 sales slack off.

Is the A4000 compatible with the Video Toaster? "I hope so," says Jim Dionne, "but I'm not in charge of Toaster development." Dionne says the 4000 is not compatible with current Toasters, but he hopes NewTek will develop one that is. Why doesn't Commodore work to ensure that its computers are Toaster-compatible? Dionne says, in effect, that would be like the tail wagging the dog, since Toaster systems are but a small part of the Amiga market.

Full-scale A4000 production began in Scotland just days before the show, and the design of the plastic front panel was approved just days before that. Archembault says introduction of the machine was actually about two months earlier than originally planned.

Why does the 4000 use an AT-style IDE hard drive, instead of the SCSI drives that have become an Amiga standard? The answer, in a word, is cost. But Archembault says SCSI may be put on future 4000 motherboards, if there's a demand for it. In the meantime, anyone wanting SCSI for external drives can install a 2091 card (using one of the 4000's four expansion slots in the process.)

Hints of the Future

What good is the Amiga 4000's replaceable processor? Dionne hinted at both up- and downgrade paths. A 68030 or 68020 card would allow the new AGA chipset to be available in a more affordable machine, especially if A2000 sales start to sag. Dionne also made a point of saying that "should we develop a RISC-based (Reduced Instruction Set Computing) Amiga," it would simply be a matter of plugging in a card. RISC workstations are much faster than computers based on conventional Complex Instruction Set processors. Dionne's remark indicates such a card is at least under consideration, if not under active development.

CD-quality 16-bit sound is "imminent." Commodore will accomplish this through a replacement A4000 processor card containing a DSP (digital signal processor) chip.

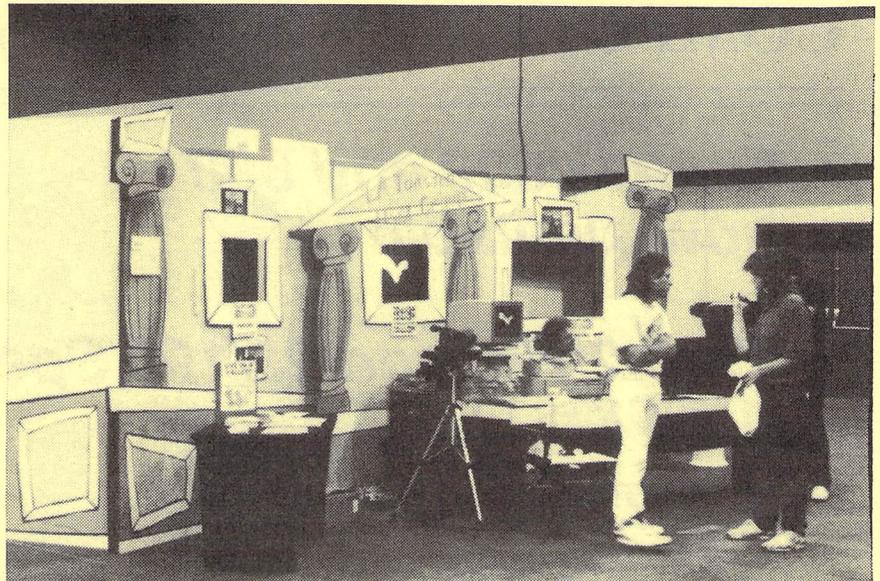
An A4000 tower is set for release in the spring.

Despite calls for a laptop Amiga, none is envisioned in the near future. A major hangup, according to Dionne, is the lack of high-quality, affordable color LCD screen technology. Dionne admits that dealers don't think a color screen is as important as he does. He says a laptop could be out in about two years.

The word "committed" was tossed about quite a bit by Commodore execs. Commodore is committed to CD-ROM technology for the 500, 2000, and 3000. Commodore is committed to providing full-motion video capability on all its Amigas. Commodore is committed to CDTV. Of course, Commodore's commitment to anything can only last as long as chairman Irving Gould is committed to it. Gould's level of commitment is not something many Amiga users trust.

The best quote of the show came from Archembault: "We do listen to what you say, occasionally."

That should be the company motto.



The L.A. Toaster User's Group exhibit was, um, unique.

AMIGA 4000:

The Official Specifications Released by Commodore

CPU:

- Motorola 68040 series 32-bit processor
- 25 Mhz clock speed
- Removable processor module

MEMORY:

- 2 MB 32-bit Chip RAM
- Up to 16 MB 32-bit Fast RAM
- Easily expandable via standard SIMM units
- Additional standard RAM is supported by the Amiga's proprietary AUTOCONFIG (TM) capability

SOFTWARE:

- 512 KB 32-bit ROM
- AmigaDOS (TM) 3.0 Multitasking Operating System
- Supports programmable resolutions
- Supports outline fonts
- Localized for multiple language/countries
- CrossDOS MS-DOS (R) file transfer utility

INTERFACES:

- Keyboard
- Mouse/Joystick/Lightpen/Tablet ports (2)
- Serial (RS-232)
- Parallel (Centronics)
- Video (RGB analog or RGBI digital)
- Right and Left stereo audio
- Internal and External floppy disk

drive ports

- Internal AT IDE port. Optional SCSI adapter

SYSTEM SLOTS:

- CPU slot (200-pin) supports high-speed memory and advanced processors
- Amiga system bus - Four 16/32-bit Zorro III expansion slots (100-pin) with AUTOCONFIG
- PC bus - Three PCAT T(M) slots

VIDEO SLOT:

- Extended 24-bit Video slot
- In line with standard 100-pin Zorro slot for easy integration of Zorro and video boards

KEYBOARD:

- Detachable
- 94 keys, including 10 function keys
- Separate numeric keypad
- Separate cursor keys (inverted "T" layout)

MOUSE:

- Opto-mechanical
- 2-button design

DISK DRIVES:

- Built-in 3.5-inch high density disk drive (880 KB/1.76 MB formatted)
- Hard Drive models pre-formatted and pre-loaded with system soft-

ware and utilities

- 2 rear and 2 front 3.5-inch drive bays
- 1 front 5.25-inch drive bay

GRAPHIC MODES:

- AGA custom chipset produces resolutions ranging from 320x200 to 1280x400 (more with overscan), including 800x600
- NTSC and PAL video resolutions
- Color palette of 16.8 million colors
- 2 to 256,000 user-definable colors displayable on screen

VIDEO DISPLAY OUTPUT:

- Works with RGB analog VGA or multiscan monitors (not all modes supported with non multiscan monitors)
- Horizontal scan rates 15 kHz - 31 kHz
- Vertical scan rates 50 Hz - 72 Hz

SOUND:

- Four channel stereo sound, capable of reproducing complex waveforms
- 8-bit D/A converters
- 6-bit volume

DIMENSIONS:

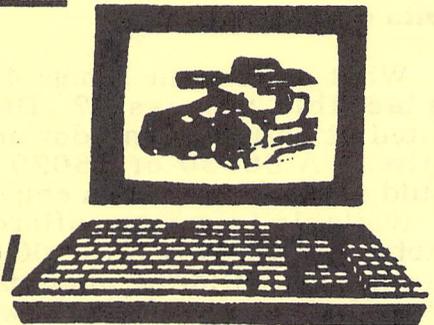
- 15 1/4" deep x 15" wide x 5" high

WEIGHT:

- Approx. 20 pounds

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