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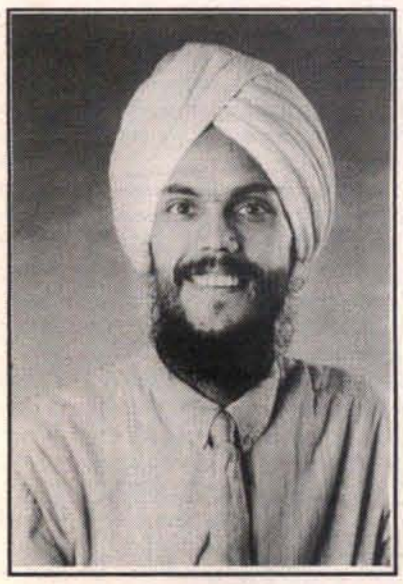
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The COMPUTER PAPER

WESTERN CANADA'S COMPUTER INFORMATION SOURCE

Vol 2 No 4 April 1989

FROM THE EDITOR



As you may have noticed, we have a couple of changes on our logo on the cover this month. The change from "B.C.'s Computer Information Source" to "Western Canada's Computer Information Source". This change reflects the fact that we now have an Alberta edition of the paper which covers Calgary and Edmonton. We realize that it may be a touch presumptuous to call B.C. and Alberta "Western Canada", but give us a little time and we will grow with it.

When we first started the paper last year in February, we began with the grandiose title of "B.C.'s Computer Information Source". We only had a circulation of 30,000 and much of that was right in Vancouver. Currently we circulate 40,000 all over the Lower Mainland, but you can find copies of our paper throughout B.C. from Telkwa to Trail and beyond. Next month our B.C. circulation will reach 50,000 and you will be able to find a copy in many new outlets. The new name gives us something to live up to.

This month we look at buying 386 computers, something that many people are considering these days. Prices are falling on these units, and they are becoming a much more reasonable alternative given their potential for large speed increases and multi-tasking abilities. A glimpse of another revolution in computing power is included in a sidebar on page 31. This is the technology of parallel processing. It has the potential of delivering mainframe computing power in a desktop computer. Exciting stuff!

In the article on CorelDraw, Nelson Ruest's obvious excitement about a new drawing package that runs on PC's under Windows is apparently shared by some heavy hitters in the industry. According to a late breaking fax from Corel Systems, IBM in the U.S. has just picked up the product for their direct sales force. The bottom line for PC users is that they are no longer the poor men on the block when it comes to graphics.

Enjoy the issue.

Kirtan Singh Khalsa
Publisher/Mitor

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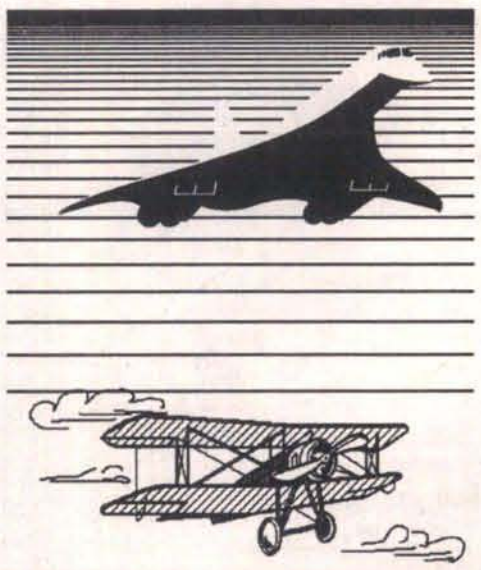
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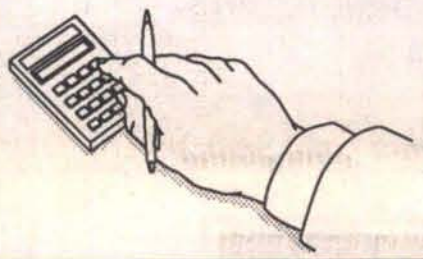
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LETTERS

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Dear Sirs:

Here at The Vancouver Desktop Publishing Centre we were surprised by the omission of our company from the "Index of Service Bureaus in the Lower Mainland" which appeared in your March issue.

We were one of the first desktop publishing service bureaus to open in Vancouver and have been in business since 1987. The founder of Vancouver Desktop has himself been a book publisher for over 20 years. He brings a wealth of experience in typography, publications design, and book production to the new house graphic artist who provides design advice to our laser typesetters.

We use Ventura Publisher on IBM and compatible computers. Ventura Publisher is capable of using data from many other MS-DOS programs which makes our system compatible with most of the businesses in the city.

Our company was the recipient of two awards at the Electronic Publishing Show "The Colour of Black" which took place last year — and, indeed, was the only company using MS-DOS machines that won a prize.

As an offshoot of desktop publishing, we also offer conversion setvices, laser printing, and systems consulting, as well as one-day courses in Ventura Publisher and Desktop Typography and Design.

Since the Vancouver Desktop Publishing Centre is such a well-established company, it is regrettable that we were not included in the "Index." We hope that any future articles of this nature will not overlook us.

Patty Osborne - Manager

Whoops - sorry Patty, definitely our oversight. You folks do so much down there. We always associate you with training in desktop publishing and baak publishing, we fargot about your service bureau side.

Buying a Clone

Dear Sirs:

Please find enclosed a cheque for a 1 year subscription to "The Computer Paper."

I wish I could have read "Buying a clone" a year ago. I ran into many of Mr. Green's misinformed "salesmen." Forumaiely, I ended up buying my AT Clone from a very well informed dealer (Delta Computers) who have provide1 excellent service and assistance.

John Simpson

Great%hite North Kh?

Dear Sir

Since December 1988 we have been receiving your paper. It is a rare window into "What is happening," and "who to contact." Often, in the great white north, we just get poor weather reports.

Thank you so much for sending us a copy of your fine paper.

Youts,

Fr. Brian Baliard O.M.I.

Third Wave

To the editor

After seeing a segment on "20/20" about people who have adopted a lifestyle with elements of Alvin Toffler's, "Third Wave", I thought this subject would warrant furdm readbng.

Perhaps your paper can do a similar feature about individuals in the Lower Mainland who have incotporated into their lifestyles such elements as: flex time, telecommuting, modems, mobile phones, laptop computets, electronic mail, satellite link-up, teleconferencing. A discussion could then be made about the implications this way of living will have for future generations.

Yours truly, T. Wallner
Plograinner
Computer Services Division
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Richmond, B.C.

One af the biggest boom areas in this Third Wave lifesty le changes has been in the growth in home offices. With fazmachines, e-mail and inaspensive vaios mail boards, iris na longer necessary ta "go to work". Watch for a coming issue an The Home Office.

WHAT'S NEW?



Sharp Releases Advanced Address Book/Calculator/Organizer

Empty your pocket or pursa Leave your diary, notepad, calculator and telephone book behind. According to Sharp Electronics, the IQ-7000, a miniaturized otgamzer will replace all of these business tools.

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IQ-7000 is priced at $399.95 ar less and is available at authorized Shatp dealers including CopyPro (604) 876-4141.

MASTHEAD

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New Centre Focuseson Entrepreneurs / Small Business

Small business has a BIG impact on our economy. Dr. David L. Birch of M.I.T. credits the sttrugth of the small businesssector as the mason the crash of '87 had such a minor impact on the U.S. economy. Latest statistics show that 8090 of net new jobs in Canada are created by small business.

Unfortunately, small businesses also have a highrateof failure,especially m the formative Sist Sve yeus.

The Douglas Centre for Enterprise Development is a 'not-for-piofit' society, seed funded by the Ministry of Advanced Education, with a mandate to help potential and existing entrepmneurs to a more certain bus iness success. They provide one-on-one counselling by experienced enttetseneurs for those en ertaining the self-employment option as well as small business operators experiencing difficulty or planning expansion. They alsoholdperiodic seminarsdesigned to ehcate potential and existing entrepreneurs as to the intricacies of sound business operation.

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Independent Computer Consultants Association Moves

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The I.C.C.A. has Membership Directories and mailmg lists available so that you may Snd the personnel, or help that you need for your projects. The association also offers a free referral help lme if you need assistance in Snding qualified people. (604) 294-HELP

VCC Offers New Program for Telecommunications Managers

Vancouver Community College has just appmved anew certificate progra to train telecomlllinicatiolls managers.

The program is the only one of its hnd offered at a public institution in British Columbia, and is being conducted in cooperation with the B.C. Institute of Technology.

The program islesigned for people already in the workplace, who may beresponsible for choosing and designing office communications systems. Studies take place on a part time basis over two years.

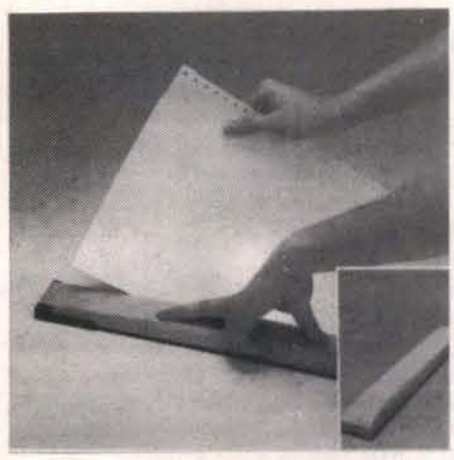
"We can teach people who to choose the most integrated snd cost efficient comnmications systems available ou the market today. They will learn how to avoidcostly mistakes in the choice of equipment and tednology." says Hal Hoare, a senior program comlitator with the College's Continuing Education Division.

Theprogram covers every kind of communications technolo-r, including telephone systems, communication networks, fax machmes and computers. Program graduates will be able to make the best choices in the industry today and will be able to plan for future applications.

Theprogram is designedboth for telecommunications managers, and those selling communications equipment. This enables bothgroups toshare their pomts of view.

The program consists of four courses and costs approximately $700.

For more information contact Hal Hoare at Continuing Education, *V sncouver* Community College. Telephone 875-8200.



"Ripper Stripper" Speeds Up Removing Pinfeed Margins

If you have ever experienced the frustrarion of tearing your printout paper along with your typed letteraud therimeinvolvedinreprinting ityou will be glad to hear of anew simpleremedy, called the "Ripper Stripper." The "Ripper Stripper" is used for removing the pinfeed margins on computer printout paper.

Simply place up to 25 sheets over the pins, close, and quickly pull paper away, leaving clean cut edges. Enor free. Strips computer paper, payroll cheques, telex paper «nd mvoices. Save time and avoidcostly reprints. Retails for $13.99 Canadian.

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Canadian Shareware Libary to offer Mac Disks

Canada Shareware Library is scheduled to be updated with a Mac Shareware Library by early April with approximately 400 disks. Available by mail order (604) 597-0881.

Survey-It! Offers Easy To Use Questionaire and Survey Analysis

Many surveys never get past the data collection stages because of the complexities of most statistical analysis programs. Conway Information Systems of Victoria is offering a solution this problem. Users simply define the questions, enter the data, the create reports and graphs. According to the company, computer programming skills are not needed. Survey It! is designed for office staff. Survey It! can be put into use as soon as it is installed. The menus, prompts and tutorial type manual provide the training and walk users through each step. Conway estimates that to complete the three steps for two hundred replies to a twenty question survey usually takes less than four hours. Developing programs for similar analysis using a statistical program or spreadsheet could take three to five days. For management presentations, Survey It reports and graphics are at a professional level.

Pricing for Survey It! is $1,195.00 Cdn. A demo version of Survey It! is $60.00 Cdn. Contact Conway Information Systems Inc., 810 Cormorant St., Victoria, B.C., V8W 1R1. Phone (604) 382-3262.



Talk to Your Mac

The Voice Navigator™ allows you to use spoken commands with your Mac Plus, SE or II to execute any function normally performed with your keyboard or mouse. Whether you're selecting menus or graphic tools, responding to dialog boxes, or entering data, the VoiceNavigator makes your Macintosh faster and easier to use.

According to Articulate Systems, the Voice Navigator can be configured to work with any application. A minimum of one megabyte of RAM is required, with 2 megs, users can also run larger programs such as HypexCard.

The system comes in two models the Voice Navigator and the Voice Navigator XA, with a larger word-recognition capability. A list of voice commands for the most popular Macintosh applications is provided with the Navigator, as well as the ability to create new word lists for other applications.

The Navigator is "trained" to recognize the user's voice when pronouncing commands for an application. It *recognizes* any voice, any accent, any language.

Contact: Articulate Systems Inc. 99 Erie St., Cambridge MA 02139 (617) 661-5994

"So, you want to go public."

These sometimes fateful words have been heard, and uttered, by almost every professional associated with the securities industry.

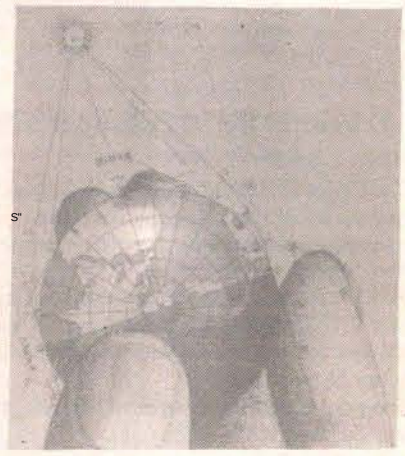
The problems, pitfalls and perils of launching a public company are many and a new Simon Fraser University program has been designed, with the support of the Vancouver Stock Exchange and the Superintendent of Brokers, to help company managers learn new developments, sharpen their practice skills and understand their exposure to liability.

The $750 course fee includes an extensive package of resource materials prepared by course instructors. A brochure with full details of the program is available from Simon Fraser University at Harbour Centre, 291-5087.

OMNI College Offers WordPerfect 5 PACK Course

OMNI Professional Computer College has added another mini-certificate course to its menu of course offerings. This time it concerns a five day intensive day-course for WordPerfect 5.0. The course offers daily instruction modules with extensive lab opportunities to work on assignments and projects. The course offers an ideal environment for students who have good typing skills and a basic understanding of personal computers. People who lack the necessary computer skills, such as a basic understanding and working knowledge of **MS-DOS**, may enter the course after first attending a one day introductory seminar.

For further information about this course call Sheila Mead, Omni Professional Computer College Inc., 300-905 West Pender Street, Vancouver, 682-6664.



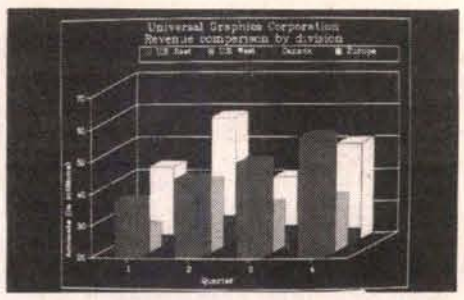
Sun Offers New Line of Mass Storage Peripherals

MARKHAM, Ont., November 21, 1988 — Sun Microsystems has added significant improvements to its line of mass storage products with the unveiling of a new high-performance disk controller for its deskside and server systems, and a companion, high-capacity disk drive for deskside applications.

The new SMD4 controller and the 688-megabyte disk drive were specifically designed for the increased processing power and compute-intensive requirements of the SunOS XM Version 4.0 UNIX (R) operating system and Sun's **SPARC**— (Scalable Processor Architecture) based Sun workstations and servers.

The SMDX is compatible with all Sun-3 and Sun-4 deskside and server systems and is available in a standalone configuration for $7,650 (Cdn.).

Contact Sun Microsystems of Canada Inc. (416) 477-6745.



Presentation Graphics for ACCPAC

Computer Associates has begun shipping ACCPAC Plus Graphic Reporting Option (GRO), an accounting add-in *product* that converts accounting data into full-colour, presentation-quality graphs that make it easy to identify trends and relationships in financial data not apparent in numeric reports alone.

GRO also works with the graphy engine of Computer Associates' popular spreadsheet program. SuperCalc 5. Novice SuperCalc 5 users can produce five additional three-dimensional and stacked area graphs with the Graphic Reporting Option. Experienced SuperCalc 5 users can marry the full graphing capabilities of the spreadsheet with their **ACCPAC** accounting data to produce hundreds of colour combinations and graphing options. Retail price of $179.

Computer Associates Canada Ltd., 1770 Burrard Street, 3rd Floor, Vancouver, B.C. V6J 3G7. Telephone (604) 733-2343. FAX: (604) 733-4129. Telex: 04-508035?.

GridMaker Featured in Step-by-Step Graphics Article

Folkstone Designs of Grantham's Landing, B.C. has recently had their software product GridMaker written up in the U.S. magazine, Step-by-Step

Graphics. The article was written by well known industry expert Simon Tuckett, and it sang the praises of the simple yet (according to him) invaluable product.

GridMaker. perspective grid construction set, provides a tool for professional graphic designers which enables them to useillustrationtools suchas Illustrator 88 and Freehand 2.0 to create three-dimensional perspinctive xmrdruings. Grid Maker uses a traditional refexence frame approach to perspectivedrawmg,providing theartist withmore creative freedom than other three-dimensional approach@ which follow an engineered approach to three-ensional construction.

$49 (US) by Folkstone Design Inc.
Contact: Soon Bleackley, Folkstone Design Inc. (604) 886-4502, Box 44 Grantlunn's Landing, B.C., VQN 1XQ.



Voice Mail Board for PCs

The TONE-TALKER TT-100 is an IBM-PC compatible full multi-hyered board which provides communication via any touch-tone telephone or telephone lme.

The TT-100 allows a touch tone telephone to inmract with commercially available software programs. Touch tones are converted to commands through the PC keyboaxd.

Communication to the telephone is by voice synthesis, text-to-speech, or via digital playback of pre-recorded voice files.

According to thedistrixlmr Chardan, programming can be accomplished by anyone who is knowledgeable in using standard DOS. No additional progranuming skills are required.

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Contact: MG Blackwell Exrterprises Inc. 922-6905

SFU Gets New Word Processing Facility for Students

Simon fraser's computing services depsnunent cm't shatdowntheirnew WordStation longenough to opell it.

WordStation, a word pxocessmg facility for students onthe second floorof the WAC. Bennett libnuy, officially opened an Tees., Mar. 21, at 11:20 am.

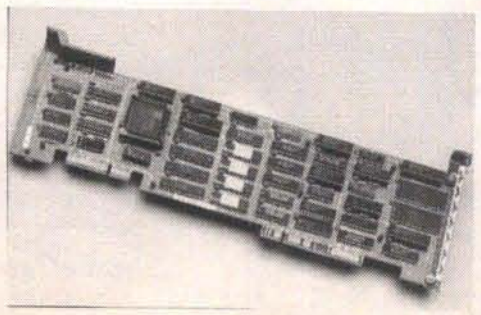
"We'xestBI busy with the 6nishing touches, but students have been using it unofficially since the first computer was hooked up," says project coordimaum Axt Stanley-Jones.

Stanley-Jones believes WordStation is thelargest centre of its kind in North America. The facility, with 150 Apple Macintosh and IBM PS2 computers, and 24 printer is open 8 Lm. to midnight Mon. through Fri., 99Q asn. to midnight on weekends.

Contact: Art Stanley-Jones, computing services, 291-3235/3234 or Florida Town, media and public relations, 291-4323.

Continuous Feed Envelopes Answer for Mass Mailings

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PS/2 Accelerator

The Hummingbird 50/60 is a 20 MHz high-speed caching power hester for the IBM PS/2 models 50,50Z and 60 that provides two to three times faster perfomrnnce. Norton mdex tests show that the slower PS/2 models run equivalent to the 20 MHz models 70 and 80 and 33% faster than the 16 MHz models 70/80.

Carrying an IBM Microchannel Adapter ID number (86A6A) the accelerator card maintains the reliaMity of the original machine and compaurbility with hardware and software, including major software application programs and operating systenls.

DPE Computers, 1112 West Pender Street, Suite 102, Vancouver, B.C. V6E 281. Tel: (604) b683-7587 or 644-09328. Fax: (604) 683-9210.

"Software B.C." Gets New Board

Software B.C. a British Colnmbia association of software developers has anew Board of Directors for 1989. The new board includes: Chaimran, Tom O'Flaherty; Secrruary, Trevor Skillen; Membership, Robin Coates; Treasurer, Bill Owen; Pmgrams, Greg Pelling; Public Relations, Ken Sadowski.

Their next meeting will take place atBrmedict's at 7:30 pm., April 20. Speaker. Bruce Stewart Admission for members is $20.00; non-members $30.00

Contact: Software B.C. 640-1190 Melville St., Vancouver V68 3W1 (604) 640-7212

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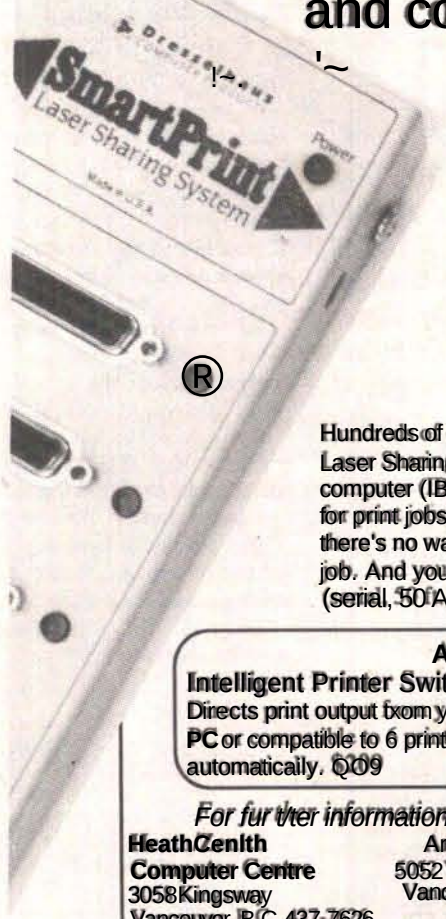
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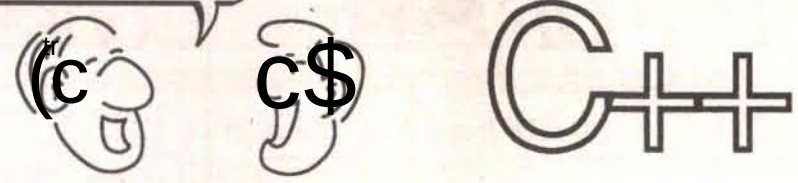
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APPLE WORLD

Apple Wins Round One In Copyright Fight With Microsoft

SAN FRANCISCO, CALIFORNIA, U.S.A., 1989 MAR 17 (NB) — A federal District Court judge has decided that Microsoft's Windows 2.03 exceeded the limits of an agreement Microsoft signed with Apple Computer in 1985, allowing it to develop the first version of Windows. The ruling by District Court Judge William Schwarzer in San Francisco, the first in a battle between Apple and Microsoft over the "look and feel" of Macintosh software, gives Apple the first victory. "The bottom line is that Windows 2.03 is not licensed under the agreement," the judge told the courtroom.

The second part of the lawsuit, expected to be heard starting April 14, will involve Apple's charge that Windows 2.03 and Hewlett-Packard's New Wave interface, both for the rival PC, violate Apple's copyright on the audio-video interface of the Macintosh.

"I am pleased by today's ruling as it validates Apple's on-going contention that Windows 2.03 exceeds our original agreement," stated Apple executive Al Eisenstadt following the ruling. There was no comment at deadline from Microsoft.

Observers say the hardest part of the case lies ahead, but when the issue is determined, it may affect other icon and window-based products which give the Macintosh icons and windows to PC software, including Presentation Manager which Microsoft developed for IBM.



This happy camper just got Apple's latest excuse to take out a 2nd mortgage on your house.

Apple Unveils Three-Slot Macintosh IIcx

SAN FRANCISCO, CALIFORNIA, U.S.A., 1989 MAR 7 (NB)— Apple Computer has introduced the smallest, most compact member of its color Macintosh family, the IIcx, plus two new monitors and a one-bit monochrome video card. The IIcx features 68030 performance, three NuBus expansion slots, and a smaller footprint than its big brothers, the II and IIx. The roll-out featured an 8-city satellite viewing of San Francisco event, held for financial analysts, developers, resellers, and government buyers. Said Apple Products President Jean-Louis Gassee, "We listened to our customers. This is a quieter Macintosh II, and takes up less space on the desktop." But the machine is more than quiet and small; it's also the computer Apple expects will become a best-seller. "The Apple IIcx will be the Apple IIe of the 90s," said Apple Chairman John Sculley.

Like the SE/30, the IIcx features a 68882 math coprocessor and a 1.4 megabyte SuperDrive which reads MS-DOS, OS/2 and ProDOS diskettes in addition to Macintosh disks. The speed is 16 MHz. The IIcx has a built-in Page Memory Management Unit [PMMU] used by advanced multitasking operating systems such as A/UX.

The machine is available now, and costs $4669 for a one megabyte random access memory [RAM] unit, $5,369 for a model with one megabyte of RAM and a 40 megabyte hard disk, $7,069 for one with four megabytes of RAM and an 80 megabyte hard disk, and $7,552 for a top-of-the-line model with four megs on the motherboard and an 80 megabyte hard disk with A/UX installed.

The machine does not come with a standard monitor. For this reason, Apple has introduced two monitors of its own, the Portrait Display, which provides a monochrome, high resolution, 15- inch screen, otherwise known as a "full page" display, and a 21-inch monitor called the Two-Page Monochrome Monitor, which allows two pages of text and graphics to be displayed side by side. The Portrait Display, available in May, carries a $1,099 price tag and its video card is an additional $599. The Two-Page monitor is $2,149 and is available immediately. The price of the video card is also $599. The design efficiency of the IIcx was demonstrated by Gassee during the presentation when he personally assembled one on stage, complete with power supply, hard disk drive, and monitor.

While Apple will announce other machines this year, the company has clearly positioned this one as an important long-term cash cow. Gassee said the machine would be a part of Apple's new thrust into the mid-range computer market and would hold an increasing market share in the 1990s. He added that future products will incorporate RISC, or reduced instruction set computer technology, but would not say from whom the RISC chips would be purchased.

At a news conference, Apple brass elaborated on upgrades, soon to be available, to convert Macintosh SEs into the newest SE/30. The price of an upgrade is now set at $1699; an exact date for availability has not been set although the firm maintains the upgrades will be available in the second quarter of this year. Additionally, new system software should be available "later this year" for all Macintoshes.

Macintosh Clones Due At Macdex

SALT LAKE CITY, UTAH, U.S.A., 1989 MAR 18 (NB) — If its legal department can stay one step ahead of Apple Computer, Powder Blue may bring the first grey-market Macintosh II clones to market. The firm is selling the BlueMAQ, a machine which looks like a PC but contains a Macintosh Plus logic board and Apple Macintosh 128K ROMs or read-only-memory chips. The various configurations range from $3,695 to $5,995. The machines come with a 65 megabyte hard drive and a 12-inch amber Samsung monitor.

Meanwhile, Akkord Technology in Taipei, Taiwan will sell its Macintosh Plus clone only in Europe, avoiding the U.S. due to the uncertainty over the legal reception to its alternative BIOS [basic input-output system] chips. The firm showed its 68000-based clone, called Jonathan, at the CeBIT computer show, otherwise known as Hanover Fair. Similar to the Power Blue Computer offering, this one also requires Macintosh 128K ROM chips to operate. The prices in Europe are slated to be some 30 percent cheaper than Apple's. Akkord does plan, however, to offer a Macintosh-compatible laptop kit in the U.S. market and will exhibit the product at MacDex in Chicago on April 10.

An Apple spokeswoman told Newsbytes that the units are being investigated by Apple's legal department. "Apple does not authorize distribution of its ROMS for use in non-Apple hardware. Apple resellers are not authorized to sell or service parts for any other use than for repair of Apple products."

Apple Canada Woos Business With Discounts

MARKHAM, ONTARIO, CANADA, 1989 MAR 7 (NB) — Apple Canada has announced rebates on some Macintoshes and peripherals, and a new leasing program for business. The announcements were made along with the Canadian launch of the Macintosh IICX.

From March 1 to May 31, buyers of Macintosh computers and peripherals can get rebates up to C$1,000. Buying a Mac SE and a LaserWriter II NTX printer would qualify for the full C$1,000. A Macintosh Plus and a 20 megabyte external disk drive would get a C$350 rebate. Purchases must be from authorized Apple dealers and the program can't be combined with any other Apple Canada rebate or discount offer.

The Apple Canada Commercial Credit program is a standard, nationwide leasing program under the Apple name. Apple is working with Dana Commercial Credit Canada to offer flexible lease terms and a variety of payment protection plans.

A base configuration of the Macintosh IICX, without a hard disk, will cost about C$8,000. With a hard disk drive and color monitor, the IICX will sell for C$12,500 in Canada. Apple's new portrait monitor will cost C$1,650 here, and the two-page display will cost C$3,200.

Apple's New 2 Page Monitor Made In Canada

MARKHAM, ONTARIO, CANADA, 1989 MAR 7 (NB) — Apple's new 21-inch two-page monochrome monitor will be made in Canada. The agreement with Philips Electronics of Toronto, Canadian subsidiary of NV Philips of The Netherlands, is one of three sizeable deals to buy Canadian which Apple announced today. The company will also be buying about $5 million worth of 3.5-inch floppy disks from Kao- Didak, which makes the disks at a factory near Ottawa. Third, Apple will be buying about 10 percent of the paper it uses for manuals from Domtar's plant near Cornwall, Ontario.

The deal with Kao-Didak will include both one-megabyte and two- megabyte diskettes. Kao-Didak plans to be the first company to manufacture two-megabyte diskettes in North America, starting in May. Kao-Didak is 80 percent owned by Kao Corp. of Tokyo, which in 1986 bought into the diskette manufacturing operations of Didak Manufacturing, a Canadian company established in 1983. The company's factory in Amprior, Ontario, is one of the world's largest diskette plants, turning out more than two million 3.5- inch diskettes a month.

NEWSBYTES is written by Wendy Woods, Wayne Yacco, Dana Blankenhorn, Jon Pepper, Steve Gold, Peter Vekinis, Ken Takahashi, Naoyuki Yazawa and Paul Zucker. News worthy press releases can be sent to Grant Buckler, CANADIAN BUREAU 859 Kennedy Road, #203 Scarborough, Ontario, 416-285-0644, E-Mail: The Source, IP2008; PC Canada PC 1176, fax 416-285-5261

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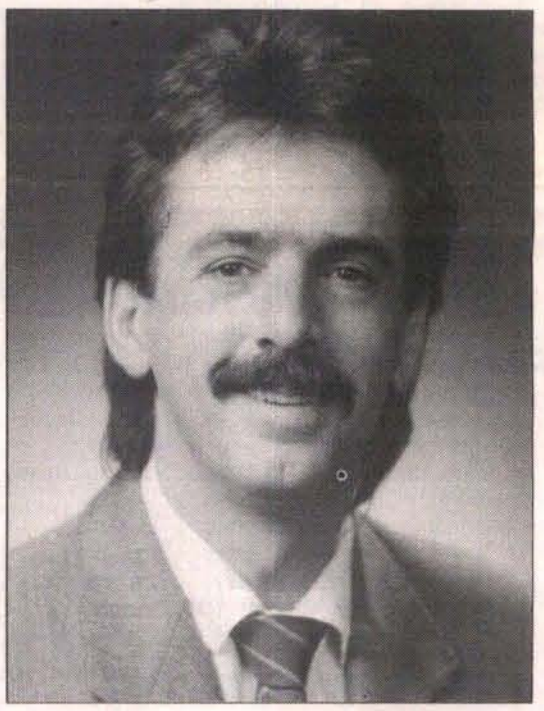
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Low-Cost $1,000 Macintosh Due

EMERYVILLE, CALIFORNIA, U.S.A., 1989 MAR 10 (NB) — Apple Chief Executive Officer John Sculley says that by 1991 or sooner, Apple will unveil a low-cost Macintosh with a price tag around $1,000. The remarks, made to Computer Currents' David Needle in a published report, included the following quote from Sculley: "What we have found in talking to large installations of...Macintoshes, is that they're not ready to put $5,000 to $10,000 computers from anybody on everybody's desk." Sculley emphasized a low-cost Macintosh would not be aimed at the home market.

"Essentially what we're going to be doing is building out the Macintosh experience from the very low end, down in the range of the $1,000 price point, out to the $10,000 price point."

Sculley said such a Macintosh would probably not have the advanced features of the SE/30 or II, nor the SuperDrive which allows Macintoshes to also read MS-DOS, ProDOS, and OS/2 diskettes. But before it's released, the budget Macintosh, said John Sculley, would involve major design and engineering changes to facilitate a low cost. "It does require some radical design implementations from a hardware standpoint. You shouldn't get any less than you get now with a Macintosh Plus," he said.

Mac Sales Will Double PC Sales

FOSTER CITY, CALIFORNIA, U.S.A., 1989 MAR 3 (NB) — Sales of Macintoshes will increase 30 percent each year between now and 1992, according to Dataquest, a market research firm based in San Jose. That's twice the 10 to 15 percent growth rate expected in the MS-DOS computer market.

The figures were released at a marketing conference sponsored by MacUser magazine. Dataquest predicts the Macintosh SE will be Apple's best seller this year, and nearly half of the sales — 46 percent — being made to businesses. Dataquest says over 1.25 million Macintoshes will be shipped worldwide in 1989. 1988 sales amounted to some 700,000 Macintoshes.

1989 will be a stronger than expected year for sales of Macintoshes, conference organizers said. Remarked Martin Mazer, publisher of MacUser magazine, "We see a vital, healthy Macintosh market with tremendous growth in the number and capabilities of Macintosh products in 1989."

Apple Protests Beatles Suit

CUPERTINO, CALIFORNIA, U.S.A., 1989 FEB 22 (NB) — Apple Computer has denied wrongdoing in a suit brought by Apple Corps Ltd., the company which managed the Beatles. The suit, filed in London, charges the computer company with infringing a previously secret agreement regarding use of the Apple name and logo. Apple spokeswoman Carleen LeVasseur calls the suit "without merit."

Apple Corps signed an agreement with Apple founders Steve Jobs and Steve Wozniak in 1981 which allowed them to use the name Apple as long as the computer company did not get involved in the music business. Now that Apple computers are being used as interfaces between electronic instruments, as well as to compose music, the terms of that agreement, says Apple Corps, have been violated.

The suit seeks an injunction against sales of all products Apple makes that violate the agreement, as well as payment of past-due royalties plus 15 percent interest on sales of all Apple computers capable of creating music. Such a demand, if upheld by the court, would amount to up to $200 million dollars, according to Apple Corps attorney Wayne Cooper.

Laptop This Summer?

SAN FRANCISCO, CALIFORNIA, U.S.A., 1989 MAR 4 (NB) — Apple Computer will unveil a relatively heavy, 15-pound portable Macintosh this summer, according to MacWeek magazine. The paper reports the laptop will have an active matrix liquid crystal display capable of producing crisp graphics, and will be able to keep up with the fast movements of a mouse without ghosting.

But the drawbacks include weight and price — 15 pounds including battery and hard disk — and a price of $6,000 for one of the laptops, says the trade paper. Further details offered include the machine's microprocessor — a CMOS [complementary metal oxide] microprocessor, the 16 MHz 68HC000 from Motorola. A mouse or trackball, Macintosh II sound chip, 1.44 megabyte floppy drive and slot for credit card-sized memory modules are expected to be standard.

John Sculley, Apple's chief executive officer, announced a laptop would be forthcoming "late in 1989" at a December computer conference, but added that such a machine would not be an important product for 1989 since it could not be produced in quantity. The main problem seems to be adequate supply of active matrix liquid crystal displays.

Apple II Finally Being Phased Out?

CUPERTINO, CALIFORNIA, U.S.A., 1989 MAR 27 (NB) — Speculation is rampant that the next incarnation of the Apple II, a IIGS upgrade expected to be unveiled at Applefest in May, will be the last for the 12-year old line. The handwriting on the wall, say observers, comes from inside Apple as well as outside — software developers are not writing much for the II these days, even the II community's flagship publication, A+, has been sold off by giant computer magazine publisher Ziff-Davis.

Apple denies all the speculation and contends the Apple II is alive and well. But industry observers disagree. Stewart Alsop, editor of P.C. Letter, remarks in his latest issue, "Apple seems to have decided that the Apple II is no longer a strategic product...I wouldn't be expecting too much more advertising, promotion, or R&D support for the computer." The II line continues to make money for Apple, $130 million in 1988, according to Storeboard Inc., a research firm in Dallas. But that's down from the $800 million Apple made selling Apple IIs in 1984.

ATARI WORLD

Atari Offers Low Prices, Handheld Computer

SUNNYVALE, CALIFORNIA, U.S.A., 1989 MAR 13 (NB) — Atari Corporation is launching a TV and print assault with a six-week saturation

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campaign sixpfxuting dealers in 20 markets, accordmgtopublicistMarty Winston. Theadvertising campaign will featme the 520 ST, 1040 ST, Mega 2 and Mega 4 systems. As a campaign spem4 Atari is lowering the price of its 1040 ST to $79995. Its Postscript - a ptible laserprinter, now shippmg, is being priced at $1,495 dming a special promotion. The printer, called the SLM-804PCV, works with Atari Mega 2 and Mega 4 systems, outputs eight pages per minute of copy with amsolutionof 300 dots-per-inch, and comes with 17 &mts.

At Comdex, Atari will show a hmdbeld computer, called Folio, which it says will ship this summer. The 128K $299 computer with built-in MS-DOS 2.11, has a 16 character by eight line hquid crystal display, and a 128 kilobytes of random accessmemory. Italso has a 63-key keyboard. Theunit,unveiled in England in late February at the Which? Computer Show, uses credit card-sizes programcanh andcomes withaspreadsheet, text editor, scheduler, and clipboard. It can link with PCs and offers some compatibility with popular PC applications, according to publicist Marty Winston. Its batteries have the potential of lasting six so eight weeks, he says. 'Ibe Folio is scheduled to ship in the second half of this year.

Meanwhile the expected sale of its Federated Group of electronics stores, and an important disiributionchannel,hasn'tdaunted the Atari sales staff. Atsxi claims it will have anothe*200* to 300 businesssxmputercentersas distributors by yeat s end snd that its dealer recruitment campaign has achieved a150-pexcentgrowthindistxibutors since November.

BC BYTES

Vancouver Firm Launching Two Help Products

VANCOUVER, 1989 FEB 23 (NB) — Pacific Firmware Maxketmg is lining up distributors and dealers for two new products aimed at DOS programmers aud usexs Doug Sauerbier, vice-president of maxketmg, said the companyis reasty to market DOS*Help*, an onlinerefexence manual for tbe operating system, and Help/Build, a utiTity to aid programmers in developing help facxTxries. Both are subsets of a larger software utihty which Pacific pumware plantolauch att he FallComdx show in Las Vegas, Nevada, this November.

Pacific Fnmwsre has been in existence for about 18 months, Sauexbfer said, and these axthe *fxst products the* company has brought to market. DOS Help will sell for $24.95 in the United States aud C$29.95 in Canada Help/Build will cost $24995 m the U.S., C$299.99 in Canada

Development Tool Designed For Prototyping Interfaces

SURREY, 1989 FEB 20 (NB) — A hardware designboardmadeforpmtotypmgcomputerinterfaces toindustrial eqmpment and scienufic instruments will appeal tohobbyists aswell, its designer says. Donald Tu», founder of Westcoast Technical and Hobby, said the Analogica-T board, his company's first product, works with IBM PC, XT and AT computers and compatibles. An interface card fits in the computer and provides 24 lines of pmgrammable input/output to the design board. About 70 percent of tbe design-board circmtry is wire- wrapped, Tutt said, so "you can play all you want."

The designboaxd btcoxporates four SK-10sold-erlessbseardboards whichreceivebuffered system signals thmugh adjacent termixsri strips. Tuu said he phms to pmvide 6,000 to 10,000 hnes of 8088 pmcessor assembly-languagecode with thebosrd. The hiefcase-sized board also provides "a lot of spsxureal estate toputyour ownchips on," he said.

The board is priced at about $820 U.S. and comes asakitwithfulldocumeutatixsn. Itis soldby mail order and can be ordered &om Westcosst Tecbnicaland Hobby,2042661GngGeorgeHwy., Surrey, B.C., Canada V3W 5C2, or Box F110-415, Blame, Wash., U.S.A. 98230. Tutt pbms to offer a fully assembled version hter. Also in the futme, Tult plans to inxosduce a similar pmduct compatible aids Apple Computer Inc.'s Macintosh, and possibly a version for IBM's Micro Channel Arcbitectme machines.

Integra Gets $18 Million Contracts

VANCOUVER, 1989 MAR 6 (NB) — Integra Systems habeenawaxdedC$13 million worthof pilot pxoject contracts. These could lead to as much as C$15 million in sales over the next two years, the maker of transaction processing terminals said. Integrahas signed apurchase order with the Bank of Montreal to develop banhng snd payment applications on itsnew Sofl'enn4terminal. It has also started pilot projects with PVS Video Services of Vancouver and Movie Track of Dallas, Texas, for terminal installations in convenience stores tbxoughout North America

Pinetree Turns Over The Mfmimizer To Spinoff

RICHMON, 1989 MAR(NB) — Piuetree Software has givennewlycreated Richmond Software exclusiverights to market andfurtheI develp The MaxIxnizer, Pmetxee's sales support software. Pinetree's marketing and software development staffs, and President Tom O'Flaherty, will move intact to Richmond Softwaxe. Pinetree will concentrate on its original business, computer software, services and consulting for the real estate business.

Richmond is a privately held company. O'Flaherty is part owner, aud venture capital came &om Vancouver-based Discovery Enterpxises.

Bedford Names Morton Senior VP

BURNABY, 1989 MAR 13 (NB) — Former Borland Inteniational vice-president Alex L. Morton has been maned senior vice-president of Bedford Software. Morton joined the accounting software vendor asice-president of marketing in October.

CANADIAN NEWS

Canada To Get Microsoft Development Center?

MISSISSAUGA,ONTARIO,1989MAR 10(NB) — Canadahas better than a 50 percent chance of being home to Microsoft's firstsoftwaredevelopment center outside the United States, according to Malcolm MacTaggsrt, Microsoft Canada's general manager. The company is almost certain to establish a new software development center outside of Redmond, Waslington, where it is based, MacTagart said. Canada "culturally and communication-wise is next m line to the U.S.," he said. Vancouver, Briush Colmbiajust across the harder &om Washmgton state, would be a likely site for the new center, MacTaggart said. Aside &om its pmximity to Microsoft headquarters, Vancouver has the warmest climate among major Canadian cities and is generally considered a good place to live.

Another factor in Canada's favor is the large number of Microsoft programmers who graduated &om the University of Waterloo in Waterloo, Ontario. MacTaggaxt said Waterloo is among Microsoft's top three sources ofprogrammers."A lot of the Watetloo people would be interested in coming home," he said.

Dell Cutting Prices On 286, 386 Models In Canada

MARIQIAM, ONTARIO, 1989 MAR 23 (NB) — Dell Computer is cutting prices on several 286- and 386-based personal computers, diskene drives,memory chips andmath coprocessoxs. All Dell PCs with a 90- or 150-megabyte hard disk drive are now C$400 cheaper, those with 100-megabyte drivearereduced C$300and those with 3 22-megabyte hard drives are marked downby C$1,950. Prices for the hard drives sold separately are sim1arly reduced. Pxices for several floppy-disk and tape driveshave beenreducd by $100 to $200, and the price of the 20-megahertz Weitek 3167 math coprocessor has been cut C$100 to $1459.

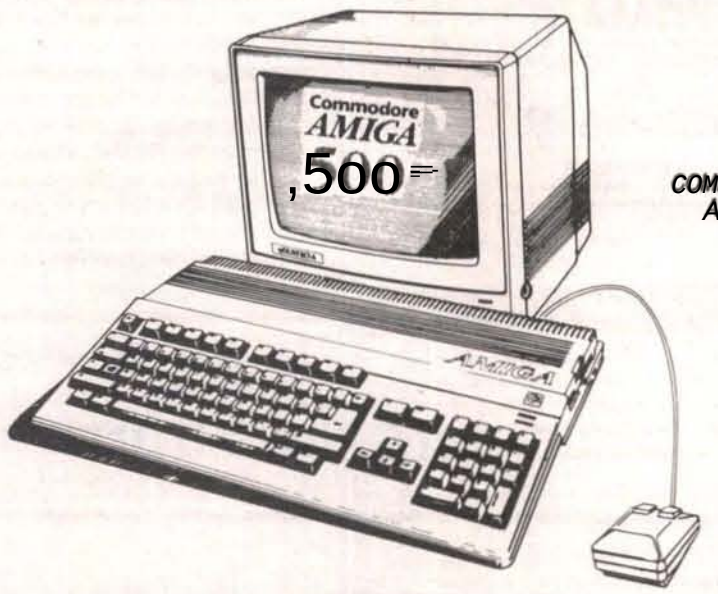
Dell also announced the appomunent of Darren Ward as nuuketing manager for its Canadian operation.

COMMODORE

Commodore News From Hanover

HANOVER, WEST GERMANY, 1989 MAR 08 (NB) — Commodore has unveiled a series of pmducts at the Hanover CeBit show. The new products include a new Commodore AT family with VGA graphics built-in sporting a4QMb hard disk, 12MHz operation, snd a total integration of all computer functions on the motherboard.

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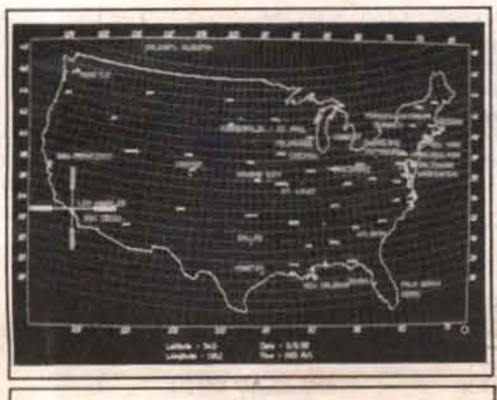
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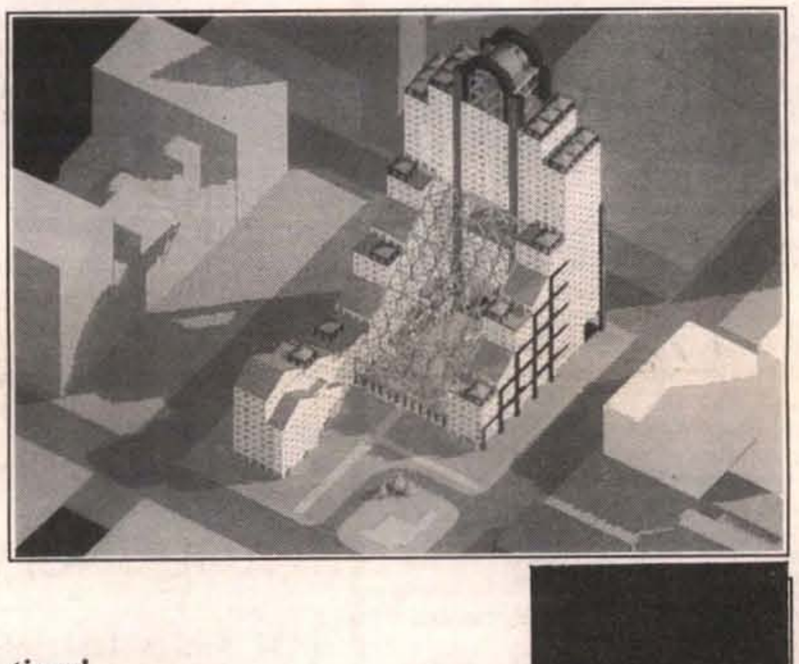
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Also introduced was a desktop publishing configuration for the Amiga 2000 which includes a computer with three megabytes of rmdom access memory, a 40 megabyte hard disk, and an NEC Siientwriter LC890 printer. The offering of 4096 colours aud full colour separation with films produced by separate Linotype machines rounds out this new system.

Commodore unveiled the Amiga 2500UX which offers AT/kT's Unix coupled with an 80MB hard disk, 3MB of RAM, a 68881 coprocessor and support for multiuser operation. The system also has a SCSI |small computer system interface) connection which allows the system to support hard disk peripherals.

And fmslly, there was the Amiga A590 expansion unit for the A500 Amiga. It contains a 20Mb hard disk and two megabytes of RAM. This product was first shown at the Which Computer? Show in the U.K. lsst monlh. European pricing has yet to be annollllcod.

Cominodore Unveils Amiga A590

BIRMINGHAM, ENGLAND, 1989 FEB 24 (NB) — Comnodore surprised the crowds last week when it unveiled the Amiga A590, an Amiga 500 with an integral 20MB hard disk plus 2MB of extra RAM. The machine will ship during the second quarter of '89, and comes in an A500-style casing.

Tucked away inside the A590's casing is a battery-backed clock- calendar card. This will, said a Commodore spokesman on the stand, save users entering the date aud time when they boot their Amiga up from Kickstart disk.

Despite a lot of intetest from the press, none on the Commodore stand was able to give an indication of the A590's pricing. Sources close to the company suggest that a price tag of between UKP 700 «nd 900 is likely, given the cast of the extra RAM and the hard disk.

Commodore West Germany has released provisional details of Kickstart 1.4, a new version of the Amiga's boot disk system. The new version will move a number of the Amiga's boot-up features from ROM and onto disk, so as to allow software updates of the operating system.

Commodore Introduces $028tp-Based Add-In Board For Amiga 2000

WEST CHESTER, PENNSYLVANIA, USGA., 1989 MAR 22 (NB) — For those who crave an Amiga but hate to lnutwi@DOS, Commodore has introduced the A2286D Bridgeboard copiucessor card that gives the Amiga 2000 the abiTily to run AT class MS-DOS programs. The new board plugs directly into the Amiga and allows the machine to run MS-DOS program. Since the Amiga is multitashng, an MS-DOS application can be ran in one window while an Amiga ptugram runs in another.

'lhe Biidgeboard cxyntaire an &0286 central pmcessing chip nmning at 8 MHz, has one megabyte of random access memory, and a socket for an 80287 math coprocessor.

Available &om Amiga dealers, the Bridgeboard costs $1$99.

DTP R GRAPHICS

Xerox Cuts Ventura Prices By Hundreds

PASADENA, CAUFORNIA, U.S.A., 1989 MAR 14 (NB) — Xerox has revealed a thus-far unannounced program which reduces the cost of Xerox Ventura Publisher by hundreds of dollars. The program has been in effect smce March 1, 1989 and runs through the end of July this year. Xerox's offer allows buyers of Ventura Publisher to also purchase either Xerox Ventura Publisher. 2.0 Professional Extension or Xerox Graph for $99 if they attend a See seminar provided by Xerox and offered (hrough its dealers.

Customers can purchase Ventura Pubhsher through the participating dealer oflheir choice but must buy the $99 bonus directly from Xerox. Any number of purchases can qualify under the plan.

The program is in effect and scheduled for formal aimouncement in the near future. An announcement may be being withheld until Xerox Graph is closer to its May shipment date.

Sign-Making Sofitware Offered To Mac Users

SCOITSDALE, ARIZONA, U.SA., 1989 FEB 24(NB) — Kroy Inc. has intmduced a program for the Apple Macintosh which allows users io produce professional quality signs. The Kroy Sign Studio Apprentice system is intended for quick print ships, copy and desktop publishing centers. Software and special card stock provided in an Apprentice Starter Kit can be used to create signs with a LaserWriter printer. Color can then be added to text and graphics using Kroy's Color Plus processor. The kit's insert or certificate stock is designed to produce standard signs and documents such as deskbars, pointwf- purchase signs and awards. Pointwf-purchase sign inserts, for example, go directly from perforated sheets into standard acrylic or metal sign holders.

Wordperect Filters For Pagemaker

OREM, UTAH, Uss~ 1989 FEB 17 (NB)- WordPerfect Cotporation and Aldus Corporation have jomtly developed a filter for Aldus PageMaker. 'lhe filter allow PageMaker users to import files fiom Wordperfect while keeping most of the

wordprocessor's formatting intact. Registered PageMskeruserscanobtainthe filter immediately for $15 dimctly from Aldus or it csn be downloaded from several online services including The Source, GEnie, and CompuServe

Seybold Laments Lack Qf Good PIM

SANTA CLARA, CAUFORNIA. U.ML, 1989 MAR 6 (NB) — Until there is a personal information manager [PIMj program which can import and export data from a wide variety of programs, the desktop computer will not be fully exploi- so says publisher Andrew Seybold, speaking before the Federalof6ce Systems Expo in Washington. Seybold, who heads Andrew Seybold's Computer Insiders, says without a good PIM, the computer is a support unit, rather than the focus of a user's workday.

"Nte key factor m the baule of the PIMs will be their sbiTity to import and export data Rom a multiplicity of sources," he said. "The company thatpermits thebestuseofdataalresdyresidingon the computer will wm the PIM war."

He said the PIM should include notepad, calendar, schedular, task organizer, message suuion, address andhone book — and these pmgrams do exist — but they dnot tmk the keycomponents of a user's work as they should. He said such a program should surface when PCs have a lot of memory and multitashng.

Liddle Belittles LeadersAt Seybold Seminar

SANFRANCISCO,CAUFORNIA, U.S.A., 1989 *MAR 13 {NB)* —The software industry "does not make a great partner," David Liddle, chaimum of Metaphor Computer Systems, told the first day' s crowd at the Seybold Seminars' five- e l e c tromc publishing conference. In a speech which lainbasted the software mdustry for "paving the cowpath," or Ming to come up with new ideas and new ways of doing old jobs, Liddle pointed to the advent of desktop publishing, saying it has done little for the quality of the printed word. "We havespe'lcheckers andgrammar checkers, butwe have no taste checkers," he said, gesturmg to a slide showing, a cartoon document of mixed type styles. We have a situation where "most memos now look like ransom notes!"

Liddle,one of the pantheon which developed the 5rst icon and windowing user interfaces at Xerox's Palo Alto Research Center, implored the indusuy to uy to create new users. "With the exceptionof desktoppublishing,the economics of the computer mdustry rest heavily ou upgrading old users. We have to escape this plateau."

He says thepublichasthreeunfulfilled software needs: access to data wherever it is, tools that can be used by everyone, and end-user application development.

Liddle's firm Metaphor is the leading suppher of data interpretation systems.

GENERAL

Singapore Firm Develops First Automatic AIDS Detection System

SINGAPORE, S.E. ASIA, 1989 MAR 16 (NB)- Yesterday saw the unveiling of the first automatic AIDS testing system by a new Singapore start-up company Life Technologies Pte. Ltd.

With the help of the Economic Development *Board* and the Singapore Institute of Standards andIndustrial Research, this small firm of just four people developed a mbot analysis system known as Robot TL-1 to hmdle the automatic analysis of biological samples to test for the presence of the AIDS virus, reducing the danger of contamination by the laboratory staff, improving the consistency of resultsv and speedirig up the testing process.

Hanover Fair Bigger Than Ever

HANOVER, WEST GERMANY, 1989 MAR 09 (NB) — *Once* again, CeBit Hanover Fane is bfeahng records for computer trade shows, with an esthnated audience this year of half a million people. Exhibiting are 516 data processing Grms, 391 ofsce equipment manufacturers, 413 companies in communications — a 34 percent increase over 1988, 460 software houses — a 38 percent increase, and 100 security equipment 6rms — up 400 percent over last year. Altogether 3,125 companies are sharing the spotlight across 2.5 million feet of floor space.

This year's show also has a decidedly intemationual flavor, with 40 percent of exhibitors =- 1,182 companies — having headquarters outside Emope. Fortypercent come fromtheUnited States with the second-largest overseas showing &om Taiwan. A total of 404 companies were &om the European Community.

A new press and convention *ceiure* has been constructed with arched elements and glass. The cemferencesons sresuspendedfromasteel frame-woik supported by four pylons. Space for 6,000 **pubES** is available with modern telephone facilities [using the ISDN network] accessed by smart cards, full video snd radio facilities.

Home Computers Now Considered Lifestyle Necessities For AfHuent

NEW YORK, NEW YORK, U.SA. 1989 FEB 27 (NB) — A new study by Doyle Graf Raj and The Roper Orgamzation shows that home coruputers, along with VCRs, microwave ovens, and answering machines, rank among the most important lifestyle necessities for households with earning incomes of $100,000 or more

42 percent of those respondmg to the survey said that they can't do without a home computer. WiHiam Doyle of the Doyle Graf Raj group said that the study shows, "the home-electronics revolutionhas become moredeeply embedded inafftuent lifestyles."

Laser Printers Most Sought-After Products

MANHASSET, NEW YORK, U.SA., 1989MAR 23 (NB) — A recent poll by Computer Reseller News and the Gallup Report ranked the most sought-after products for Fortune 1000 companies. Laser primters were the most sought-after office products, with 97 percent of the companies surveyed using laser printers. Ke other top 5veproducts usedby the Fortune 1000compsnies

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Laser Printer Specialists

are color monitors, hard drives of 80MB or less, nine-pin dot matrix printers, and platters.

92 percent of the companies reported their systems are compatible with MS-DOS, compared to 38 percent for the Mac. The survey also showed major computer store chains are the primary source for peripheral equipment.

Laser Show Raises New Caledonians' Election Speeches

SYDNEY, AUSTRALIA, 1989 MAR 13 (NB) — A Sydney-based laser display company recently assisted the French government in New Caledonia by advertising an international — on the bottom of the clouds. Laservision installs its display laser systems with Toshiba 3200 laptops so it wasn't that difficult to pack up the system and fly to New Caledonia and put on the show, all in less than 24 hours from the request.

The system can hold up to 15,000 images on its 70 megabyte hard disk. Its gas plasma screen is essential because the system is often used in the dark, as conventional liquid crystal screens would not suffice. Typical laser images consist of around 350 discrete points which the laser must scan between rapidly. Laservision's software can correct for this non-linearity due to shaping of curved surfaces carrying the projected image. Although the lasers are relatively low-powered, the bright image is due to persistence in the human eye. The company charges around AUS$6000 for a typical show, and has already handled product launches for Compaq and IBM. At present the system can control four lasers though the next version will control up to 260, either hard-wired or connected by modem.

Congress Debates Entry of HDTV

WASHINGTON, D.C., U.S.A. 1989 MAR 7 (NB) — Commerce Secretary Robert Mosbacher told a Senate Commerce Committee that private business should set the rules for public aid in developing a high definition television [HDTV] industry in the United States. The hearing was broadcast on C-Span, a cable TV service.

Rep. Edward J. Markey, a Massachusetts Democrat, asked for quarterly updates on progress towards an HDTV manufacturing capacity, which witnesses at the House hearing said was crucial to U.S. competitiveness in the next century. Markey asked Mosbacher if a government-industry consortium would help the United States overcome a big Japanese lead in technology that promises wall-sized TV screens with motion-picture clarity. The Defense Department is presently offering $30 million to private companies who will help it develop HDTV technology for military use, but Markey said, "What we would clearly like to see is a civilian orientation."

Mosbacher added the government is considering tax incentives and possible antitrust exemptions for U.S. companies that wish to band together in the HDTV effort. Establishing government policy in this area has the "highest priority" at the Commerce Department, Mosbacher added. A recommendation on how to proceed is expected in the next two months. State Department Ambassador Sonia Landau added the U.S. wants one world standard for HDTV transmission in order to protect the U.S. motion picture and TV industries, which command 85 percent of the world market.

IBM WORLD

Microsoft Stock Plunges Investors Sue

REDMOND, WASHINGTON, U.S.A., 1989 MAR 7 (NB) — Microsoft, long a darling of the investment community, got the bum's rush from Wall Street Tuesday following surprise news that it would have lower third-quarter earnings. Between the morning of the announcement and the end of the week, Microsoft stock fell from a high of $62.25 per share to a low of $51, a drop of 18 percent. To appreciate the significance of this drop, consider Microsoft founder Bill Gates, owner of some 203 million shares, who in one week lost, on paper, $226 million dollars.

In response to the bad news, Microsoft was hit with a shareholder lawsuit filed in U.S. District Court, Seattle, charging certain officers with violation of federal securities laws and related state claims. The investors, led by Bruce Adelstein, suffered losses when the stock plunged. Microsoft has stated the suit is without merit.

Microsoft says the lower earnings, expected to be "somewhat less" than last year's $37.3 million for this period, are due to technical problems which have led to delays in the release of Word 4.0 for the Macintosh and Word 5.0 for IBMs. This has affected other areas of the company, namely product supply. Because corporate planners expected to have the new Words by now, they stopped producing the current versions of the word processing programs last fall, according to Microsoft spokeswoman Connie Snyder. Now, the supplies are all but depleted.

When will products be ready to ship? Snyder tells Newsbytes that in mid-April the Macintosh version of Word should appear and the IBM version will be in the stores by May.

PC Software Sales Rose A Whopping 44 Percent Last Year

WASHINGTON, D.C. U.S.A. 1989 FEB 22 (NB) — Domestic retail sales of software for personal computers rose 40 percent to an estimated $2.87 billion in 1988, according to a survey from the Software Publishers Association. The study was based on sales from 135 publishers reported to the Arthur Andersen accounting firm. Desktop publishing sales were up 102 percent, graphics up 53 per cent, and word processing up 47 percent.

Foreign sales of $815 million brought the total to $3.45 billion.

Zenith Announces An Annual Profit And Claims Prospects Bright

GLENVIEW, ILLINOIS, U.S.A., 1989 FEB 21 (NB) — Zenith Electronics reported its first full-year profit since 1984 and predicted continued improvement for 1989 despite unexpected drops in government computer purchases. Zenith Chairman Jerry K. Pearlman said the company's 1988 profits were "very solid." The company earned $11.7 million, or 45 cents a share, on sales of $2.7 billion, compared with a loss of $19.1 million in 1987 on sales of $2.4 billion. All of the gains came during the fourth quarter, which saw net income of $20.4 million.

During the year Zenith fought off an attempt to sell off its consumer electronics division from Smokhorst Partners of New York. Pearlman, in his statement, said Zenith has been exploring actively the sale of its consumer electronics division but has come to the conclusion that "running the business is the best option we have found." Pearlman predicted Zenith will earn $15- $30 million in consumer electronics this year. The only problem right now, he said, is the continuing memory chip shortage, which is holding down production.

Compaq Deskpro Still Number One In Germany

MUNICH, WEST GERMANY, 1989 MAR 10 (NB) — Compaq's 286 Deskpro is still holding best-seller status in West Germany, closely followed by the IBM XT286, which shot up from ninth place last month. The Apple Mac II, Tandon's PCA, the Schneider PC2640, the Atari PC3, the Apple IIgs, the Commodore PC10, the PS/2 Model 30 and the Schneider PC1512 follow suit.

On the home computer front, the Commodore 64 is still number one followed by the Amiga 500 and the Amiga 1000.

Toshiba To Release High-Speed, Low-Price CD-ROM

TOKYO, JAPAN, 1989 MAR 6 (NB) — Toshiba will sell two types of low-priced compact disk read-only memory or CD-ROM drive units. Compared with current CD-ROM prices, this one is 25 to 35 percent lower. A Toshiba spokesman claims that both drives are also "two to four times faster" than offerings from competing manufacturers.

Toshiba's CD-ROM unit can be connected to Toshiba, NEC, and IBM personal computers.

The price is 99,800 yen or $770 for office use and 138,000 yen or $1,060 for factory automation. Toshiba has bet that CD-ROM will be prevalent as a large capacity external memory unit, and the company is hoping to establish a lucrative market with its low-price CD-ROM. Toshiba expects to sell 10,000 units in the initial year.

Though the total number of CD-ROM units shipped in Japan is only about 10,000, *major* manufacturers are warming up to the idea of CD-ROM drives. For instance, NEC's game machine, called PC-Engine, has the game industry's first CD-ROM drive. Sony is now offering a CD-ROM

unit with its personal computers, and Fujitsu's 32-bit FM-Towns personal computer comes standard with a CD-ROM.

Computer Giveaway Gets Clem Bill Of Health

TORONTO, ONTARIO, CANADA, 1989 FEB 21 (NB) — It's all right for Squibb Canada to give free computers to doctors who prescribe the company's drugs. That is the decision of the College of Physicians and Surgems of Ontaxio, which was concerned that the free computexs xepresented aconflict of interest. The College has asked Squibb, which is providing the computer so doctars could participate in drug surveillance studies and other company pxogranls, lo require recipients to sign a letter forbidding personal use of the computers.

Study Says Potential 1699 Percent Return On Investment Overlooked

TEMPE, ARIZONA, U.S.A., 1989 MAR 6 (NB) — MictoAge Computer Stores has sponsored a study titled "Management Measures in End-User Computing." MicroAge claims that the study, conducted by management consultants at Nolan Noxttxt Institute, a research organization of Peat Maxwick, shows organizations can achieve up to a tenfold return on investment by implenentlng microcomputer technology as a strategic resource. However, the study, released Feb. 3, shows that "productivity improvements are not dropping to the bottom line as quickly as they could be," accoxding to MicxoAge President William C, Keiper.

"Management Measures in End-User Computmg" confirmed and extended a 1987 Noltut Norton Institute effort. Based on three months of research, the study included a look at personal computmg management in large and small business orgaxuzatiorN in a variety of industry sectorL Jan Duffy of Peat Maxwick/Nolan Norton stated, "With a planned strategy and effective management, a company can realistically expect to improve its bottom line by as much as ten times its end-user computing invesunent." Furthermore, Keiper said, "It was discovered that under-utiTization of PC resources lnnits the development and execution of new business strategies."

"Few busmesses, small or large, have realized the strategic importance of the information flowing within their organization. While they have made considerable investments in computer te:hnology, they are not taking full advantage of the tedmology's bene6ts," counselled Keiper.

IBM Readies New Machines For April Launch

APRON, ENGLAND, 1989 MAR Q4 (NB)— IBM has earmarked the first week in April for a clutclof new machines to be launched, according to Newsbytes Europe sources. Included in the new machine range is a laptop which differs radically from the original 'Clamshell' design of the PC Convertible.

Certain trade newspapers in the U.K. have indicated that the spearhead of IBM's Spring 1989 range will be a 33MHz version of its PS/2 Model 70 machime, possibly called the PS/2 Model 80. IBM refutes this suggestion, with the official line being the usual "no comment."

Sources close to IBM UX repoxt that the new laptop machine will be 80286-basec4 and feature a supertwist liquidcxystal screen. Workon the fourth re-design of the PC Convertible was, Newsbytes Europe understands, halted last Autumn when IBM executives decided to change direction. The new laptop, said to due for shiptment during the se!xind quarter of '89, is likely to be siimilax in size and weight to the best-selling Toshiba T1200 Phs.

Hypercard-Like Software for *MS*-DOS

SYRACUSE, NEW YORK, U.S.A., 1989 MAR 3 (NB) — Brightbill- Roberts, creators of Show Partner F/X, has announced it will soon be shipping HyperPAD, a program that gives the huge installed base of DOS machines HyperCard-like capabTilities. The product, which is expected to be *on* the market at the end of March, *will* offer users a varied set of tools to allow then to easily create their own desktop applications.

HyperPAD, which stands for Personal Application Designer, is a set of building blocks that will allow sophisticated applicatixats to be designed and linked by non-technical users. The product is signifi csnt because unlike HyperCard, which uses a great deal of memory and neeh a sophisticated graphic-based computer, it can work on any DOS machine with only 384K of memory and a character-based screen.

According to company president Steve Brightbill, HyperPAD will be a natural product for the over 20 million DOS machines aheady on the market. "We will pxobably came out with a graphic-based version eventually," said Brightbill, "but not only the majority of the machines out there can run a graphics based prnduct with the speed and efficiency that we feel is necessary."

HyperPAD, which will sell for $99.95, will ship with over two dozen ready-made applications including a daily planner, noteyad, personal address aud phone list, aud time-biQmg system. Brightbill-Roberts also plans to introduce add-on application modules at a future date for those who want to take advantage of the capabiTities of HyperPAD without doing their own application development.

Compatible Vender Credits RAM Reductions For Price Cuts

BRAMPTON, ONTARIO, 1989 FEB 20 (NB)— Greff Computer has cut prices on all of its personal computers by up to 15 percent. The maker of IBM-compatible computers said reductions in the cost of random-access memory [RAM] chips made the price cuts possible. Greff's 12-megahertz 80286 PC now sells for C$1,599 with 640K bytes of RAM. while its top-of-the-lme 25-megahertz 386 with one megabyte of RAM goes for CN,999.

Tlte company also announced free, insured delivery of its products across Canada, and inaugurated a Corporate Computer Hotline to provide technical support between 9 am. and 5 pm. Eastern time on weekdays.

IBM's Unit Share Slips While Apple's Soars

CUPERTINO, CAUFORNIA, U.S.A., 1989 MAR 17 (NB) — Marketresearch Grn InfoCox reports that IBM began 198$ with a 17 percent share of all m i c r o c o m p u t e r n its sold and a 21 percent share of the dollaxs micro sales generated, but by year's end the mut share had slipped to 12 percent, and the dollar share was just 14 percent. That's anesrly

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20 percent **drop** m both dolhus and umts in one year.

Meanwhile, Ayyleyickcdupmorepieas its unit shue went from 17 ycxccxu in January 1988 to 28 percent in December, a 64 perceat increase.

Lotus Reveals Ver. 3 Details

SYDNEY, AUSTALIA, 1989MAR22(NB)— "Release thee will ship in Junel" said Lotus last week, addressing press and beta testers axeuad the world. **The** much~eyed hew version of the most popular PC ayylicatioa package, Lotus 1-2-3, has Gnned in spec'dicatien, and as xcyxxmd in last week's Newsbytca, will be joincd by **anew** version of release two.

Release 3.0 is aimed at the user with 2&6 and 386 machimes. It will mcoxyerate the '16M' system from Rational Systems which lets the machines operate in protected mode, taking advantage of extra system memory, such as the segment above 640K irene megabyte machines. Lotus claims that this memoxy will be seamlemly addressaMe, rather than via slow paging systems as at present.

Both DOS aad OS2 versions will be shipped with version 3.0 which will have the same US$495 yricetag as lheexistiag vexsion 2.01 aad 220 which is te ship "dard quarter." Three will have the Sxstixaplemcatatien of Blueprint which **is** code that allows two-way access to extern@ databases. It ahe includes the existing LEAF which allows independent developers to seamlessly add applications aud additional featuxes.

Main features of version 3.9 include: three dlllcasieaal werkshcets; oplhilal rccalculatiell; 1ndo; perspective mede to show three ceasccutive models; xoem; search and replace; up to 69-**line** display, depending on monitor, worksheet map; password protection; workshcet annotation; automatic data type fexmattuxg; youp formating for multiple werksheets; instant update graphs; auxltiyle worksheet graphs; aew graph types; xelational database management; external database access; yresentahoa qnality output; hlpfevcd BMcxe fsciTltg; network versioxi axid support; impmved and added bmctieas; ao copy pxetcctxen.

Version 2.9 is aa upgrade of the esistmg version and is aimed pruaarily at the 8088186 market or those users who don't want to lmua the new features of vexsioa three. It mtreduces a number ef features already ceammon on competitive products, such as multiple file linking, mmaaal recaMatiea, undo, aatexecuing macros, search and replace, better graphics aad Allways ouqxut eahmccment. System requirements are DOS 29 er higher and 384K of **RAM** l512K recommeaded).

Analysts believe that Lotus will still mamtain much of its market, despite the extended delays in bringmg new products to marker. Version 2.2 is especially welcomed as many observers feel that at least half of the mstalled base **woa'tbe** able to use version thxce due to hardware requirements. Meanwhile, competitive products, such as Suyercalc V aad Excel, continue te gainmarkct share fxum Lotus.

Lotus Still Top Seller

MUNICH, %887 **GEISQQA; 1989** MAR 10 **(NB)** —Dataquesthas yut tutus 1-2-3 as dlebestselhag US:made software package in the European market for the second year ruaaing. Microsoft %exd has taken the second position **fxem** Ashtoa-Tate's dBase which falh iam fifth place behmd **IBM** Display%rite aad Woxdpcrssct.

Thebiggest chart gain is fxum Microsoft's Excel spreadsheet package that is expected te overtake the number one spot some time next year. Syxnphmy, Multiplan, Pagemalxer **sml** Framework fmish the list. Note that this list mcludes so@ware hmdled with systems, which is why Symphony aad Multiplan occupy tep sales syots.

TRENDS 4 TECHNOLOGY

IBM Exploring New Computer Interface

Yoxktown Heights, NewYeast, USA., 1989 MAR 15 (NB) — IBM axmounced that its researchers are lookhg mto a new interface for computers that would allow pceple te write on a *Qat* surfacc— amch like a pen aad paper.

This new "Paperlike Interface" would be more convenient and natural for users than a keyboard er a mouse, the company said. In its exyerimental disylay system, the writing lqxpxuus ea a special monitor as what the compaay called electronic iak.

Handwriting-xecognition software trsaslatcs the writing aad other amrks, including numbers, musical notes, or proofreadas' marks, into computer commands.

DRAM aces Likely To Drop

TOKYO, JAPAN, 1989 MAR 7 (NB) — **The** dealing price of xme-megabit dynamic rmidem access memories [DRAM] between Japanese spot markets, such as Akibabara, **Tokyo** and overseas buyvns, such as *Heag* Keag Korea, and Taiwan, have shown sharp droys recently.

Production of **DRAMs is** increasing with exports to the Umted States sharply decreasing. Consequentl, the bahmce of demand aad supply oalhe spotmarkets has triggcreda 20 to 39 yexccxa depression of chip prices. Cuxrexa dealing prices of around 2,090 yen per chip are expected to drop to 1,500 yen by April.

Meanwhile, Japan's semiconductor giant NEC has announced mass pmduclion of four-megabit DRAMs ia its Sagamihara phmt, with 199 thousands units yer meath expected this fall. The aunouncemeat of volwne production of four-mcgabit DRAMs is expected to accelerate the DRAM raoL.

TELECOMMUNICATIONS 4 FAX

Northern Telecom, Digital Announce ISDN-Computer Link

TORONTO, ONTARIO, CANADA, 1989 MAR 14 (NB) — Northern Telecem and Digital Equipment are linking telephones le computers through **ISDN.** Digital's new CIT (Computer Integrated

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Telephony] server and VMS CIT Applications Interface software, with Northern's Integrated Serices Digital Network Applications Protocol [ISDN/AP] software, integrate computer applications with the telecommunications services of Northern's Meridian SL-1 private branch exchange. The tie-in means software can be written for DEC computers to use Northern's PBX in applications such as message desks, autodialing fiom the computer screen, telemarketing, telephone support centers and service dispatch.

Northern's ISDN/AP software is available now. Digital's new CIT products will be available in April. The VMS CIT Server software will cost C$3,643. The VMS C1T Applications Interface software will cost Rom C$546 to C$20,000, depending on the tuudware used.

Minitel-Like Network Starts In New York

NEW YORK, NEW YORK, U.S.A., 1989 MAR 17 (NB) — New York Networks — the first American Mmitel consumer service — has been launched m the Big Apple. Subscribers can access the system via PCs ar Macintoshes running software with a "Minitel mode," found on such software packages as Mirror II and MacTell. For a limited time, Baseline, the parent company of New York Networks, is offering an mtmductory three months See subscription to Netwcuks for purchasers of Mirmr II or MacTell software.

No details on exact services on the system were available at press dme, but Baseline President James Monaco emphasized the system's focus will be "entertainment and communications."

The Minitel, an online system used by millions in France, provides banhng, shopping, electronic mail, and other servims.

Compuserve Subscriber List Passes The 500,000 Mark

COLUMBUS, OHIO, U.S.A. 1989 MAR 14 (NB) — Comyuserve reyortoi March 14 it has 500,000 subscribers, and is the world's largest online service. The lead was won through consistency and persistence over ten years, according to President Charles W. McCall. "Over the years, we've seen companies eater this industry with a big bang, then find they're unable to offer a service of real value to yenxuial computer users. We've never lost sight of the value of infannatian, and we stayed the caurse of providing an online service that has ats cornerstone a very basic concept: people using their personal computers as windows on the world to share ideas, exchange mfarmation aud apply it to their own personal and professional lives."

McCsll attributea the caugmty's amsistent gmwth to several key points: CompuServe's early understanding of the power and vahe of the personal computer, the value of pmviding high quality and timely mformatian, developing innovative products and services, and staying in touch with its members. "During our early years, other companies built services focusmg on pictures and graphic images accessible only through expensive custom terminals. In contrast, CompuServe's early strategy was to create a service that was designed tu be accessible by owners of early personal camputer models," McCall said. "By bemg able to accommodate the 32 wharacter screens of that era, and then evolvmg our service to adapt to the expanded capabilities of *later* PC models, we attracted a broad audience to our wide range of value-added information sevices."

Government Agencies Have Looked Into Foreign Computers

NEW YORK, NEW YORK, U.S.A., 1989 MAR 13 (NB) — According to reports published in Time magazine, various U.S. spy agencies have entered the computers of the Soviet Uman and other nations to look for military and government secrets. The reports claims the National Security Agency and the CIA have looked into mtroducing computer viruses into those systems, but are concerned about the possibility of retaliation.

Apple's Gassee Calls For U.S. To Establish ISDN Networks

CUPERTINO, CALIFORNIA, U.S.A., 1989 FEB 24 (NB) — The U.S. should take the mitiative to encourage the creation of integrated services digital networks, or ISDN, to carry the nation's telecammuuicatians, ar it stands to become a "Third World country" in terms of computer networks, says Jean-Louis Gassee, president of Apple Computer's products division. Makmg his remarks before a DeAnza College business conference, Gassee cited countries such as Japan and Eumye where ISDN networks are being established. ISDN technology wouM allow for digital rather than analog transmission of data over the phone lines, Seeing computers fmm the canstraints of modems, which now must translate sound to data before it reaches the computer, and back again to sound in order to transmit data. Digital telephone lines would be fast, efficient "data freeways," said Gassee, and if the government builds the roads, cotnyanieu such as Apple can build the cars.

The Coming Battle Between Prodigy A Minitel For U.S. Market

LOS ANGELES, CAUFORNIA, U.S.A., 1989 MAR 24 (NB) — James Monaco has been an electmnic publisher since 1982. He spun out Baseline, an electnmic publishing company, out of his New York Zoeuope in 1982. Zoetrope publishes such tradebooks as "The Encyclopedia of TV Game Shows" and "Who's Who in American Film Now," and Monaco himself is a raxiguized author on entertainment with such titles as "The Connoisseur's Guide to the Movies" and "How to Read a Fihn."

In an exclusive interview, Monaco tald Newsbytns the real battle for the mass online market is developing now between NAPLPS-based services such as Prodigy and Minitel-based services like Baseline's New York Networks. The small &y, he says, will be appearing on gateways like Nynex's Infolook and Southwestern Bell's U.S. Videotel "One of the interesting aspects is the question of whether pure ASCII will work on a gateway. I doubt it. You may have 800,000 people in New Yark who have home computers. That's not euough" for a mass market. "The key is a cheap box my mother can use, and a simple visual protocol where I don't have to think twice." Both Prodigy and Minitel offer that. Monaco predicts Minitel will win out because it's faster, aud offers more opportunities for small information providers. In a test Infanet conducted last year, he says, the most popular offerings were hi esttertainment database and "a one-man service for the deaf. It was extremely valuable, well-targeted."

"The Last Spike" in Fiber System

THUNDER BAY, ONTARIO, CANADA, 1989 MAR 22 (NB) — Worhng the historical overtones for all they were warth, BeH Canada fused the last splice in its cmss-province fiber-optic transmission systesn. The link will ultimately be part of the National Fiber Optic Transmission System, rutmmg 7,000 kilometers across Canada. The Ontario yortion alone cost C$200 million and sook four years to complete.

On hand far the Last Splice Ceremony, along with Bell Canada Executive Vice-President Jack Sinclair, were author Pierre Berton and Ontario Minister of Culture and Communications Lily Oddie-Munro. Oddie-Munro placed a teleyhane call over the fiber link to her counterpart in neighboring Manitoba, Glen Findlay, minister responsible far the Manitoba Telephone System. Barton, one of Canada's best-known nonfiction writers aud author of numemus books on Canadian history in general and the Canadian railways in particular, drew parallels between the completion of rail links *across* the country and the buildiug of the fiber wptic syste.

UNIX

Uniforum Crowd Up By 30%, Duel Of Standard-Seekers

SANFRANCISCO, CALIFORNIA, U.S.A., 1989 FEB 27 (NB) — The fifth year of Uniforum, which took place in San Francisco fmm February 27- Mamh 2, was expected to draw 22,000 visitors, a third more than last year, a sign that interest in Unix as an operating system is on the upswing. Visitors paid $197 per ticket for the three-day event and saw some 225 vendors displayed their wares, all of wham are taking places in a two-sided battle for a standard Unix operating system.

On one hand is AT&T, creator of Unix, whose president of AT&T Data Systems Group, Robert Kavner, explained in a keynate address that AT&T's Unix International group will guide the development of future Unix system releases. On the other hand is the Open Software Foundation,

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turing of AT&T with Sun Microsystems over the next version of Unix, and has launched its own effort to design a new Unix operating system. The Open Software Foundation's members include Digital Equipment, Hewlett-Packard, and IBM.

In his keynote address, Kavner promises to meet with the sponsors of the Open Software Foundation to "hammer out how we can work toward a clear, timely, wonderful implementation of the Unix operating system."

The talk of the show, however, was a project called Open Desktop, put forth by Tandy, Santa Cruz Operation, Digital Equipment, and others, an immediate graphical interface designed to simplify and make more "user friendly" the Unix operating system, as well as to beat IBM to the punch in the area of 80386-based multiuser systems. Uniforum is sponsored by /usr/group, the international network of Unix system users, based in Santa Clara.

New Graphic UNIX Interface Pushed By Major Vendors

SAN FRANCISCO, CALIFORNIA, U.S.A., 1989 FEB 28 (NB) — The Santa Cruz Operation, in consortium with Digital Equipment, Tandy, Locus, and Relational Technology, has unveiled a product designed to make Unix more acceptable to the masses, and to offer an alternative to IBM's OS/2 for 80386-based machines. Open Desktop is basically an amalgamation of software from various suppliers who have agreed to have a standard interface between them and thus make "shrink wrap" software available for Unix systems.

SCO's Unix System V/386, Merge 386 [DOS support for Unix], SCO's TCP/IP [networking product], X windows [graphics support system], Ingres/386 [database manager], and OSF/Motif [HP's user interface which is similar to Microsoft's Presentation Manager] are the main elements of the Open Desktop.

Open Desktop will integrate a standard graphical user interface, an open structured query language database, and MI connectivity across several different operating systems and hardware architectures. It is designed to take full advantage of the 32-bit power of the Intel 80386 microprocessor.

SCO will provide Unix as licensed by AT&T, Locus will provide DOS Merge which enables Unix systems execute DOS programs, Relational Technology will provide the relational database manager called Ingres, Tandy will market the Open Desktop package on its 4000 series and 5000MC series and Digital will provide [indirectly] OSF/Motif which has been developed by Hewlett-Packard and is based on Digital's XUI tool kit.

The Open Desktop has been endorsed by many vendors such as AT&T's Unix Software Operation, Open Software Foundation, and others. It will retail for $995 and will be available from the fourth quarter of 1989.

Analysts give it a good chance of succeeding where others have failed. The Unix has some big names behind it, an established distribution channel, an aggressive marketing schedule, and an interface which is easy to use. Said Tim Bajarin, analyst at Creative Strategies, "It means a user could go from a Unix operating system to a PC operating system without any training." Says Stewart Alsop, industry observer and publisher of PC Letter, "It stands a big chance against OS/2."

AT&T And Unix International Makes Changes In UNIX Licensing

SAN FRANCISCO, CALIFORNIA, U.S.A., 1989 FEB 28 (NB) — AT&T has changed its licensing procedure for Unix V systems in response to a request from Unix International, the company responsible for making Unix accessible to international market.

The change affects the upcoming release 4 of the system and includes an early access program, starting in March 1989. Under this program members of Unix International will receive source of Release 4 for internal use. This will enable their organizations to begin porting their software as needed.

AT&T Unix Software Operation will also begin to develop a standard user interface based on accepted international standards such as X/Open, IEEE Posix and FIPS.

Finally, Unix International announced that its membership has grown with the addition of Sony, Xenix, Locus, Dupont Fiber, Prisms, Stellar Computer and Relational Technology. The company is a non-profit consortium formed to guide the future development of Unix.

Spunky SPARC-Backers Seek Standard

SAN FRANCISCO, CALIFORNIA, U.S.A., 1989 MAR 1 (NB) — Users of Sun Microsystems' SPARC [scalable process architecture] technology have banded together to promote SPARC as an industry standard. SPARC International, whose corporate members include Arix, AT&T, Definicon, Fujitsu, ICL, Metaflow, Mixer, Prisma, Ready Systems, Seiko, Solbourne, Sun Microsystems, Texas Instruments, Unisoft, Unisys, Valid Logic, Wind River Systems and Xerox, is chartered to ensure the development of technology necessary to build SPARC systems. It is also seeking to publish binary compatibility specs and institute conformance testing, direct the evolution of SPARC architecture to include multiprocessing, promote third party systems and applications and set up a demonstration center for product display. Contact is Acuity's Dona Bucknaster or Jill Arnold at 415-966-8700.

AT&T Buys Another Chunk Of Sun

MOUNTAIN VIEW, CALIFORNIA, U.S.A., 1989 FEB 27 (NB) — AT&T will buy another 3.2 million shares of Sun Microsystems stock, giving it a total of 13 percent of the workstation maker. The cost to AT&T is estimated at $79.1 million. AT&T and Sun are working together on a new version of the Unix operating system which they hope will be the next industry standard.

Sun Offers New Desktop Productivity Products

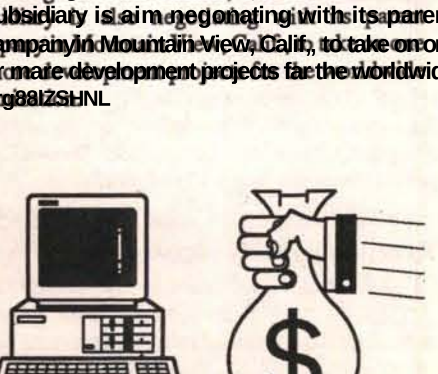
MOUNTAIN VIEW, CALIFORNIA, U.S.A., 1989 FEB 28 (NB) — Sun Microsystems has introduced SunWrite, SunPaint, and SunDraw, products based on the Open Look graphical user interface for Unix workstations drawn up by AT&T and Sun. The products have interchangeable cut-and-paste functions, offer the same "look and feel" with common menus, pop-up windows and mouse controls, and allow files to be imported between all three applications in different windows. The applications support any PostScript output device. Sold through Sun's direct sales force, the products are priced at between $495 and $695, although all three can be purchased at once for $995.

The UNIX In The Dell

AUSTIN, TEXAS, U.S.A., 1989 FEB 21 (NB) — Dell Computer Corp. [NASDAQ:DELL] is preparing to introduce two complete Unix systems that combine 386-based computers with an optimized version of AT&T's UNIX operating system. The Dell Unix systems will be announced at the UniForum Conference in San Francisco on March 2. The systems are built around Dell Unix System V/386 Release 3.2 — the first third-party version of the operating system marketed *under* AT&T's Unix trademark — and the company's System 310 and System 325 computers.

Sun Launches Unix Development Center In Canada

MONTREAL, QUEBEC, CANADA, 1989 FEB 20 (NB) — Sun Microsystems of Canada of Markham, Ontario, has set up a development center here to support and promote Unix. The center will support third-party software developers in Canada, and will work on adding French-language capabilities to Unix. Harry Porteous, director of marketing for Sun Canada, said the Canadian subsidiary is also negotiating with its parent company in Mountain View, Calif., to take on one or more development projects for the worldwide organization.



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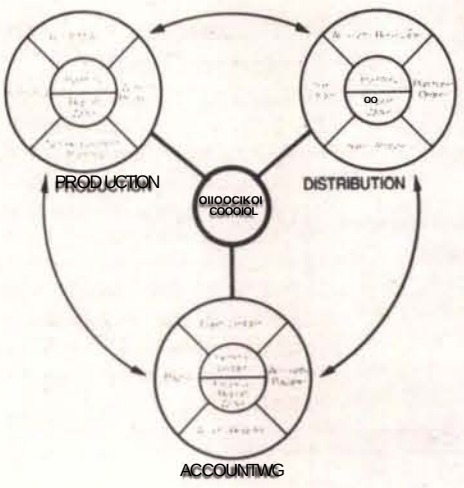
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Evaluating the 80386-Based Computer

The 386-based computers are now the leading edge of microcomputer technology. Let's take a look at the advantages and disadvantages that this generation of computer offers.

The Advantages of the 386

To begin with, the 386-based computer is a state of the art microcomputer. It is the computer of the future with many powerful features. If you purchase this computer now, you will not have to worry about having to upgrade it in the near future because you are already investing in the latest technology.

Purchasing a 386 computer can be a financially sound decision due to the productivity gains of a faster machine. If you use the computer on a professional basis, the amount of time you save in doing some time consuming task could translate into a great deal of money saved and that could make up for the 386's extra cost. Let's consider the following example. You work with a desktop publishing program on an AT and it takes 10 seconds to redraw the screen each time you move from page to page. If it only takes 5 seconds on the 386, that means a savings of 5 minutes per hour or 40 minutes per day if the screen is redrawn 60 times per hour. This could, after a year, result in the saving of $3,960, assuming a salary of $20 per hour for the computer user. Besides the straight financial savings, there is also the reduction of frustration which results from waiting for the computer to accomplish its task. The speed of the 386 could therefore lead to increased productivity and creativity.

For some software programs such as Microsoft's ***Windows 386*** and certain versions of ***UNIX***, a 386-based computer is required. These programs will not operate on older machines.

A 386 is needed to run, at maximum efficiency, graphic intensive programs such as CAD, desktop publishing, and artificial intelligence. Also, it is almost mandatory for programming, multitasking, and in large multiuser situations.

Many companies who had purchased or considered purchasing a *minicomputer* or *workstation* find that a 386-based computer is a much more cost effective solution. To begin with, the 386 hardware is much less expensive than a workstation. Software and support are also much less expensive, resulting in significant overall savings.

Finally the 386 is downward compatible with all the MS-DOS software. This means these computers can operate all the previously written software for MS-DOS, UNIX, and OS/2.

The Disadvantages of the 386

The first possible drawback of the 386 is the higher price. The price ratio between the 386 and 286 system is about two to one, so there is still a premium to pay for this type of computer. Presently, speed stands out as the 386's greatest advantage. The 386-based computers now available are certainly faster, but not dramatically so. The machines now available operate only 40 to 100% faster than the previous generation of computer.

A hardware standard for 386-based computer has not yet been clearly established. It looks as though IBM's ***PS/2 Model 80*** with the Micro Channel may eventually prevail as a hardware standard, but nothing is certain. Many other companies have released 386-based computers, but not all have followed the same design for adding expansion cards. So far, I have seen several expansion slot designs. When buying a 386, you may end up with an expensive computer which cannot accept commonly available expansion cards.

While most 386 computers can use the same expansion cards as the 8088 and 286 computers, few expansion cards that are specifically designed for this computer exist. There are actually only a few 386 memory expansion cards now available and they do not fit in all machines. Expansion cards specially designed to exploit the 386s capability will not start to proliferate until a clear hardware standard becomes established.

Several software manufacturers offer operating systems to take advantage of some of the 386's capabilities. There is ***Windows 386, OS/2, PC-MOS, UNIX***, etc. However, until a widely accepted operating system is available which takes full advantage of this computer's capabilities, the massive possibilities of the 386 will not be utilized. It may be several years before a dedicated operating system is available. Furthermore, until a widely accepted 386 operating system is available, little application software can be written for this computer.

386 Summary

If speed is paramount and translates into money saved or if you need the special features which only the 386 has to offer, this computer is definitely for you. The technology is however still under development and it will take some time until it matures.

Price Comparison

An important factor in deciding which generation of computers to purchase is the element of affordability. *(See accompanying article on 386 machines available in the local market)*

A Technical Comparison of the 8088, 286, and 386

For those readers who would like to understand the technical differences between the 8088, 286 and 386-based computers in a little more detail, the following text compares these computers in terms of memory, speed, multitasking, multiuser, and modes capabilities.

Definition of Memory

1 bit	=	the smallest unit of information understood by the computer; it is represented as either "1" or "0", (also "on" or "off").		
1 byte	=	8 bits	=	a character, i.e., A, 5, !, etc.
1 Kilobyte	=	1024 bytes	=	1/2 page of text
1 Megabyte	=	1,000 Kilobytes	=	500 pages of text
1 Gigabyte	=	1,000 Megabytes	=	2 full sets of encyclopedias
1 Terabyte	=	1,000 Gigabytes	=	2,000 full sets of encyclopedias!

Memory Capabilities

The term "memory" describes different forms of storing information. The two forms compared here are random access memory (RAM) and virtual memory. Before I go on though, it may be useful to explain how computer memory is measured.

Random-Access Memory (RAM)

RAM comprises the computer's main memory and is used for the temporary storage of data in memory chips.

With more RAM available, larger and increasingly complex software can be used. An example of how the quantity of RAM can affect your actual computing would be to consider CP/M-based computers which can access only 64K of RAM. This just barely allows the use of a word processing program. However, 64K of RAM is not sufficient to allow the use of a spelling checker or a thesaurus. The 640K memory in 8088-based computers opened the door for these time-saving programs. It also allowed the development of desktop publishing software. When the new OS/2 operating system makes available the full 16 Megabytes of RAM for the 286, it will be possible to merge desktop publishing programs with especially powerful word processing programs. Actual word definitions, which can be rapidly accessed, will also be incorporated into memory-resident dictionary and thesaurus programs. What the 4 gigabytes of the 386-based computer will be used for is anybody's guess. Perhaps there will be some wild artificial intelligence programs which directly translate human thoughts into perfect, informative, and interesting text. That could be of enormous use to poor laboring writers.

Virtual Memory

As previously mentioned, a software program is dependent on the amount of RAM available. Greater amounts of RAM allow larger, more sophisticated programs to be operated. Virual memory (simplistically speaking) is a technique in which the computer accesses other memory, such as that on a hard drive, and treats it as RAM. Large programs are therefore not limited to the availability of random access memory. This technique is new for microcomputers, although it has been employed for years in large mainframe computers. The chart on the following page compares the amount of virtual memory which each generation of computer will be capable of supporting when the proper operating systems are available.

Initially, virtual memory will not be of great significance to the average user. The first uses will be for large and complex multitasking and multiuser applications. It will, however, eventually open the door to new types of artificial intelligence programs that offer far better human interfaces than does present software. For a program to operate with minimum effort from the user's point of view, it needs to access large amounts of data rapidly. An example might be a voice recognition program which needs to understand many spoken words in a wide variety of circumstances.

Speed Capabilities

A faster computer can reduce the time you wait (while some task is being performed) from a few minutes to a few seconds. Essentially, there are four factors which determine the speed of the any computers. These factors are as follows:

- "clock rate"
- "width" of data path
- overall efficiency of the chip design
- number of "wait states"

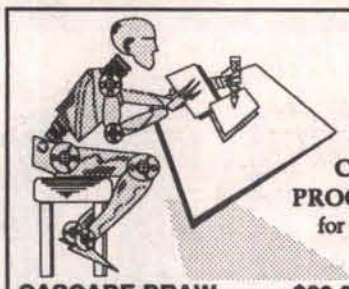
There are also other speedup techniques which are used almost exclusively on the 386-based computers. They are as follows:

- "interleaved" memory
- "shadow" RAM
- "cache" memory
- "static-column" (page-mode) RAM

Before displaying a graphic comparison of the speed at which different generations of computers can operate, each of these factors mentioned here will be briefly examined.

Clock Rate

Inside the computer, a clock "ticks" at a con-



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Rectangles	Arcs	Rotate	Scale
Mirror	Full Window	Redraw	Print
Plot			

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Example QUICK DRAW

Lines	Solid	Dash	Center
Phantom	Close	No Fill	
Move To Point	Mid Point	Tangent	Perpendicular
Rectangle & Circle	Ellipse	Polygon	Points
Move	Copy	Delete	Move Origin
Rotate	Scale	Mirror	Group
Unnest	Text	Curve	Fillets
Hatch	Arrows	Dimension	Library
Arc	Edit	ATTR Edit	Line Edit
Zoom	Pan	Full Window	Plot Fast Plot
Draw Defs.	Redraw		

Each function has more properties
LineEdit has these extra functions:
Multi segment Gap Segment Spare Segment
Linebase Move Insert or Remove Vortex Orthogonalize

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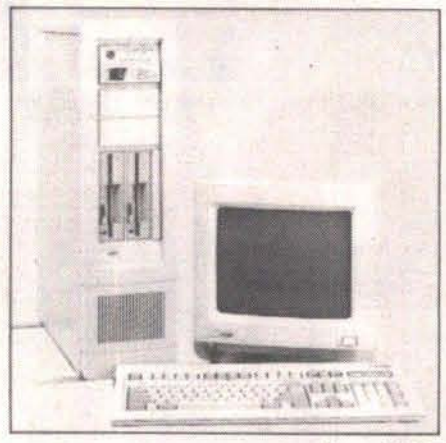
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IDM's T 386 Business Computer



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Laser 386/T

stant rate. It is analogous to a metronome pacing the tempo of a piece of music. In the computer's case, the clock serves to pace the flow of data and thereby assists in keeping order among all the circuitry. The faster the clock, the faster data can be processed. The clock rate is measured in megahertz (MHz) or "millions of cycles per second," the higher the number of megahertz, the faster the speed. Each higher generation of computer can support a faster clock rate due to improved technology. There are also variations in the clock rate within each generation of CPU.

Data Path

The data path in a computer can be likened to a freeway; the more lanes, the more traffic that can be carried. The wider the data path, the more information that can be manipulated at a time.

- 8088 computers: 8-bit data path (8 lanes)
- 8086 computers: 16-bit data path (16 lanes)
- 80286 computers:16-bit data path (16 lanes)
- 80386 computers: 32-bit data path (32 lanes)

The majority of software now available has been written for 16-bit. Since the 8088 computers have only an 8-bit data path, the flow of data is reduced by about half. When 32-bit software becomes available for 386 computers, the processing speed will automatically be increased from two to four times, depending on the type of software. This extra speed is made possible by the larger data path.

Efficiency of Design

A degree of speed is gained in each new generation of computers, merely due to improved efficiency of circuitry and overall design. Because the layout of the circuitry on the CPU is more efficient, the computer can process more data in less time. For this reason, the 286 chip is 2.5 times faster than the 8088 merely due to a better design. This means that an 8MHz 286 is automatically 2.5 times faster than an 8 MHz 8088 chip. However, no difference in efficiency of design exists between the speed of a 16 MHz 286 and a 16 MHz 386 chip, provided they are using the same 16-bit software. It should be noted that Intel issued the first 286 chips with a speed of 6 MHz, while the first Intel 386 chips operated at 16 MHz. The current upper limit on their 32-bit chip is 25 MHz.

Wait States

Wait states between the memory and the CPU Wait states are placed between the CPU and memory in an effort to slow down the transmission of data. They function similarly to pacing lights installed before a bridge or freeway — the lights turn on and off in an effort to regulate the flow of traffic. This process helps reduce traffic congestion just as the wait state reduces congestion in the computer's memory. Wait states were devised to allow slower (and thereby less expensive) memory chips to be used. When there is no wait state, the advantage is that data flows directly to and from the memory without waiting. The lack of wait states and the use of faster memory chips can increase the computer's speed by about 30%. The following table compares the speed of 386 computers, both with and without wait states using the Landmark Speed Test program.

Wait states between the CPU and expansion cards. Expansion cards usually operate at 8 or 10 MHz. If the computer is operating at higher speeds, the expansion cards may not work properly. For this reason, one or two wait states are placed between the 386 chip and the expansion cards. In the future, cards will operate at 20 MHz or faster and there will be no need for wait states. On some computers it is possible to vary the wait states so that if you are using fast expansion cards fewer wait states can be used.

Computers speed with & without wait states

CPU Clock Rate (in MHz)	1 Wait State (in MHz)	0 Wait State (in MHz)
6	6	8
8	8	10
10	10	13
12	12	16
16	16	20
20	20	26
24	24	32

Interleaved Memory

Interleaved memory is a more efficient way of placing and retrieving information in memory. It allows slower and less expensive memory chips to be used and therefore lowers the cost of the computer.

Usually the 386 CPU sends and retrieves information from the memory. Unless the memory is very fast (and expensive), the CPU must wait for the information to be processed. With the 2 *way interleaved* memory technique, the memory is divided into two portions. The CPU sends information alternately to one portion, then to the next. In the meantime, the data in the first section has been processed and is ready to be retrieved. There are presently two kinds of memory interleaving. The first is 2 *way interleaving*, where the memory is divided into two sections, and the second is *four way memory interleaving*, where the memory is divided into four sections. Four way interleaving is faster.

Shadow RAM

Shadow RAM is a technique whereby the information located in slow *"ROM BIOS"* and/or the video display's *"ROM BIOS"* is loaded into fast RAM after the computer is turned on. The BIOS information can therefore be accessed much faster.

Cache Memory

In the typical computer the majority of work is done in a relatively small part of the memory. If this memory is faster than the rest of the memory, the work can be done faster. A cache memory is a small portion of very fast memory (usually an expensive type of chip called *"static"* RAM) which stores the most often used pieces of data for quick retrieval and processing. Slower and less expensive memory chips called *"dynamic"* RAM (DRAM) are used for the rest of the memory. The typical amount of cache memory used in 386-based computers is 32K to 64K.

Static-Column (Page-Mode) RAM

Static column memory is a special type of DRAM which has been designed in a more efficient way. It is faster and more expensive than dynamic RAM but slower and less expensive than static RAM. The circuitry of a computer using static-column RAM is also more complicated to design thereby increasing the overall cost of the computer.

Measuring Speed (benchmarks)

The overall speed of any computer is a sum of all the speedup schemes mentioned so far. The more of these schemes used, the faster the computer will operate. There are actually several scales for measuring the speed of computers, they should not, however, be taken as some sort of gospel truth, since they all have some kinds of errors and inconsistencies. It is best to think of them as just rough guidelines.

The most accurate benchmark measures how many Millions of Instructions can be processed Per Second. This is referred to as MIPS. This measurement is used on all computers from mainframes down to microcomputers. However, the more common speed ratings you will see in advertisements are the Norton *System Information (SI)* and the Landmark *Speed Test*. The Landmark test is often used because it displays a nice graphic representation of speed in Megahertz relative to the AT. (The Landmark version 0.99 is a public domain program and is available through public domain channels.)

Multiuser Capabilities

Multiuser simply means that you have two or more computers connected together in a network which share information and/or peripherals. Generally, several computers are connected to one central omputer (called a file server) which has a large and fast hard drive. The information contained in the file server is then shared among all the other computers or terminals. Special software and hardware are required to connect computers together. As of today, however, there is no industry standard for connecting computers, resulting in much confusion for potential users.

The 8088-based computer is ill-at-ease with multiple users and for all practical purposes cannot act as a file server. The 286 and 386-based computers, due to their superior design, are a prime choice for use as file servers. The 386, in fact, is especially designed to do many of the networking task which previously required special hardware.

The number of terminals which can be connected to a 286 or 386 computer depends on the size and complexity of the software being used. While the number can vary greatly, generally speaking, approximately 10 terminals can be connected to a 286-based computer and up to 60 terminals to the 386-based computer.

For the average user, connecting computers is not an important issue. For the office environment, however, it could be a major advantage for efficient use of peripherals and the sharing of information.

Multitasking Capabilities

Multitasking means that multiple programs are operated at the same time by the computer. For example, while a data base program is searching for a record, a complicated spreadsheet could be calculating while the user writes a letter with the word processor, all at the same time. With multitasking, if several programs are simultaneously being operated, the computer does a piece of one...stops, does a piece of the next...stops, does a piece of the next job, and so forth. Because this process takes place very quickly, it looks to the user as if the various tasks happen at the same time. On the other hand, multiprocessing or concurrent processing (which is found on mainframe computers) means that two or more tasks are done exactly at the same time. There's no stopping and switching between tasks. This takes specially designed or parallel processor. These are processors which work literally at the same time.

I've heard that some companies are designing computers which use ten to thirty 386 chips and do parallel processing. One such company, Sequent

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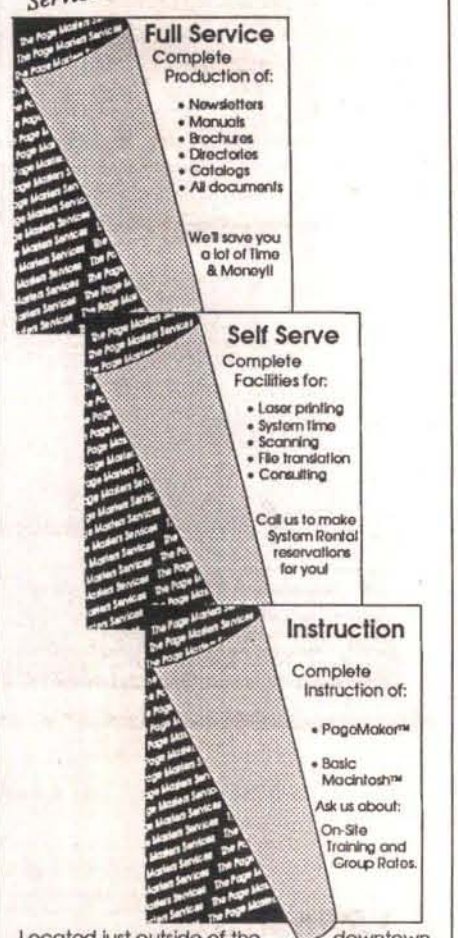
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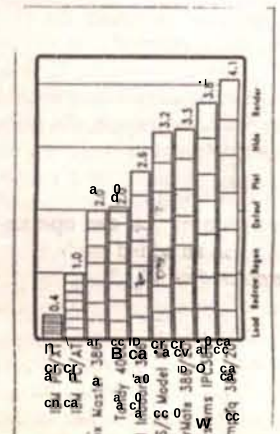
Non-Cache Model

Norton SI 4.0	23.0
Landmark 0.99	25.di
Power Meter 1.02 MIPS	X53

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Evaluation Report***



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Compute Systems, Inc. of Beaverton, Gregau is developing a computer system which uses thirty 386 chips and will do over 80 MIPS and would handleuy to 1000usersll ll Theyconfidently claim in their promotional material that "the mainframe meets the micro — and gets eaten alive." They feel, "the microprocessor revolutian will sink the Titanic ofthetraditional maixdrameandnuxicomputei pnxtucts." *(See also the accompanying arxicle on Parallel Processors page 3l)*

Multitasking in its present form is net very poyuhr. This is due to the fact the the rather limited-audwvkwaxd oyerating system (Microsoft's MS-DOS) is designed ta be a smgle taslrl standalane operatiing system. It does not lead itself weH to multitasking. With OS/2, however, the 2&6 machines have a real advantage over the 8088-basedmachines because they operate faster aad their chips are designed to do muititashng moxu efficiently. The 386 computers wiH really shine in this «pphcatien because the 386 chip has been designed with multitaskmg in mind from the glaund up.

Modes

Each generation of computer has the capaMity ofsuppertingdifferent "modes" ofeimauioxt. These modes are xefened to as "real mode," "protected mode," and "virtual 8086 mode."

Real Mode

The 8088/86-based computer can operate in just one mode; this is xefened to as real mode. In xealmode the computer can access 640K ef physical memoxy. MS-DOS exploits mal mode, md the overwhelming majorit of apylicatieu software is mitten for this mode.

Protected Mode

The 286-based computer can operate in real mode as well as in an added mode of cyeration csHed *286 protected mode*. The protected mode aeows fothe access of 16 Megabytes of physical memory and 1 gigabyte of virtual memory. It also allows the abiTity to do multitashng mere effIciently. When doing mulntashng, the individual tasks are protected fiom each other so that if one locks iip, it does not effect the ethel' pfogfauls, hence the nunc "protected" mode. {When deing multitashng in real mode, if one program locks up, the entire computer would lock up, causing you to lose all your work) Presently the pxoblem with protected mode, is that aH existing software nmst be xewritten te take advantage af it. Microsoft's OS/2 has becu designed to take advantage of the protected mode, however, *few* applications yxegrsms are yet available.

Virtual 80$6 Mode

The 386 computer can operate in real mode *and* in an enhanced 386 pretected made which aHows the access of 4 gigabytes of physical memory aud 64 texabytes of virtual memory. The 386 also suppoxts ene added mode caHed virxual 8086 made. Under this mode, you can create many mdependently operat'mg *"virtual 8086 machines"* on your one computer. In o ther wexds you can set uy separate virtual (or imaginary) computers each woxkmg vrithm a different window eu the same computer. *You* can then load an array of pmgrams mitten far the 80&8 comyuter iota each virtual machine and switch &am one pxogram to the ether. The advantage of virtual 86 mode is that aH previous software can be operated and yau can also do efHcieut muhitaskmg. $Vcndows 386 by Microsoft is a program which takes advantage of virtual mode and aHows the creation of multxple vixtusl machines.

%HICH 3% IS NEST?

At this point, you have pmbably decided that one of the 386-based computers is the appropriate machine for your needs. Them are, however, so many of these particular computers available that the buyer oftexi feels a bit outfused and overwhelmed by aH the choices. Every day it seems, another company offers a new computer on the market. What's the difference? Are they aH alikey The purge of this article is te bey'n saxtmg out the different 386's which axu avaHable.

First, it should *be mentioned* that aH the 3&6-based comyutexs are the same, to the extent that they aH more er less nm the mxne software. One major area, howevex, where they differ is in their physical design. The best way to start therefoxe, is le ammge the comyutex accexhng to their similar physical characteristics. Usmg this as the criteria, 386-based computers can be divided into seven general groups or categexieL These seveli categexies are as follows:

AT Style 386 These 386-based computers have the exact hardware dimensions as the IBM AT. Every part of this 386 is interchangeable with the AT or AT clones. These 386s are the most commonly available on the market.

Tower Design This cemyuter is designed to be a Hoor standing model. It uses the seine pans as the previous type of computer except for the case.

"Baby 386" This computer has the same dimeusiaus as the IBM XT. A "Baby 386" motherboard is used in this type of computer. Every part of an XT is interchangeable with a baby 386" and vice versa.

IBM Personal System/2 Medel 80 This is IBM's entry into the computer market. This coxnpuxu has the Micro Channel which makes it fundameatsHy different from other types of 386 computers.

Nonstandard 386 This group consists ef computers which use custom designed motherboards, power supplies, chassis, etc. These computers are usuaHy made by larger name brand companies and are physically different from the other cafegexies mentioned here.

Passive Backplane 386 This gtauy is also referred to as "motherboardless" computers. These compatibles use a modular concept and place the CPU ail support chips (which are typicaHy on the motherboard) onto an expansion card that plugs into a series of expansion slots.

Lay!cpa (or portables) These computers have a small custom design, allowing them te be poxtable. This Naup is a vast topic in itself and is as a xesult not covered in this book,

Evaluating the Categories

In mahng your decision about which category is best for your needs, it is helpM to consider the issues having ta do with the purchase of a computer. In the foeowing chart these are rated accarding ia each of the 3&6 computer categories. The ratings are ExceHent, Good, Fair, aud Poor.



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	Software Compatible	Hardware Compatible	Perfonnance	Price	ReHablety
AT Style 386	Fair to Good	Excellent	Fair to Excellent	Exceeent	Poar to Goad
Tower 386	Fair to Good	Good	Fair to ExceHeat	Good	Poor te Good
Baby 3&6	Fair to Good	Poor to Fair	Fair te Excellent	Excellent	Poor to Good
IBM PS/2 Model 80	Exceeent	Paor to Fair	Fair to Good	Poor	Fair to Good
Non-standard	Fair te Good	Poor to Pair	Fair te Exceeeut	Poor to Fair	Good
Passive	Fair to Good	Poor	Fair to Good	Poor to Fair	Fair to Good

	Interchange-abiTity	Expansion	Upgrade Path	Customixing (speculation)	Repair
AT Tyye	Exceeent	Good to Excellent	ExceHent	Excellent	Good
Tower 386	Good	Good to Excellent	Exceeent	Exce eeet	Good
Baby 386	Fair	Poor to Pair	Fair	Fair	Fair
IBM/2 Model 80	Poor	Peer to Fair	Poor	Poor	Good
Non-standard	Poor	Fair to Good	Poor	Poor to Fair	Fair to Good
Passive Backplane	Poor	Fair to Good	Poor to Fair	Poor to Fair	Fair

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Features to Look For:

Sask Configuration For ease of comparison prices are shown for snipped down models. In some cases, software aud/ca additional hardware is included, and this is shown in the table.

Reset Sutton A switch, ~hich will warm boot the computer when *CTI ALT-DEL* doesn't work. It reduces start-up wear on lhe computer.

Speed Refets fo bus clock speed.

Interleaved Memory When *CPU* speed is faster than memory, processing cau be increased by spliuing memory and seudmg data to ane portion, while anofher pornorl 1$ processing.

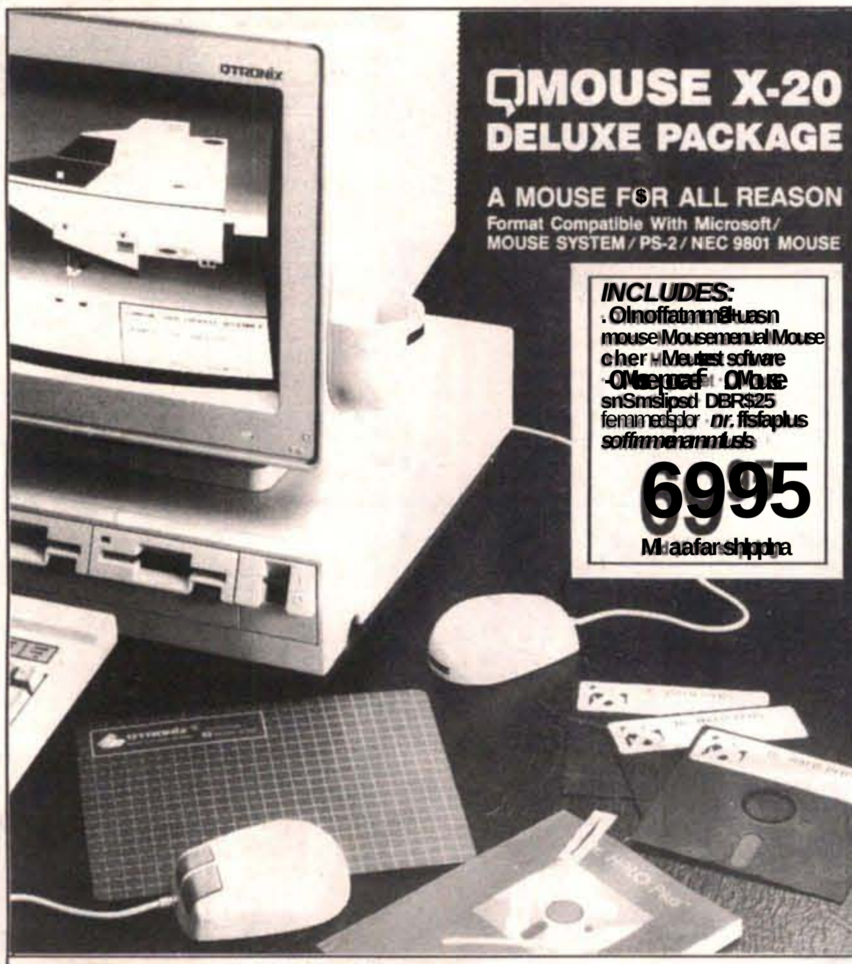
Shadow RAM This feature loads the system or video BIOS into fast RAM at the time of boot up, which enables the BIOS to oyenne faster.

Wa lt State When a manufacturer has used components that are too slow to keepup with the *CPU*, a wait state (idle *CPU* time) may be inserted to enable the comyonmts to catch up.

RAM Included The amount of RAM supplied with the basic conglnatiasL The ptuchaser of a 386 witt often specify mare memory to be installed.

Spactfkattons Specifications missing from the bable were not readily available in time for publication. Piease carefutly check specificatians for the machine you phm to buy with the dealer. The information contained in this tables should be merely a starting point for your own researc)L

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2SMHz model $6.586				2DMHz model 8A290	18 MHz BL000	16MHz $5.234	24 hr sav. turnaround	Mhxo channel			18MHz $5484	20826MHz				Model HN020 MHz model 20MHz BS500 83,8N				Kit $4,496

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Speeding Up Your Old XT

Introduction

It would be pleasant if all of us could afford to scrap our old XT clones and buy the latest 80386 machines; however, some of us are not that rich. This month I will discuss seven low-cost alternatives for breathing new life into your old XT.

The Alternatives

The alternatives in roughly ascending order of cost are:

1. [Less than $150] Accelerator software.
2. [$255] 80287 numeric co-processor.
3. [$545] Faster hard disk. (e.g. Miniscribe 40 MB, 25 ms access time).
4. [$625] Expanded RAM. (e.g. Intel Aboveboard Plus with 512K).
5. [$1060] 80386 accelerator card. (e.g. Intel Inboard accelerator with 1 MB 32-bit RAM).
6. [$1130] Replacing your XT motherboard with an AT motherboard. (e.g. ACS AT motherboard, 640K, hard disk controller, floppy controller, 1.2 MB floppy drive).
7. [$1940] Replacing your XT motherboard with an 80836 motherboard. (e.g. Hauppauge motherboard, 1 MB RAM, hard disk controller, floppy controller).

I have quoted the best street prices I could find in Vancouver. The prices are in Canadian dollars, except for the Hauppauge

1. Software Accelerators

Unfortunately, there is no such thing as a general purpose software accelerator that makes all your programs run faster. Software utilities accelerate only certain kinds of programs.

Sometimes your programs' speed will double simply by ensuring you have the latest version of the software.

Using a high speed backup program like Gazelle's Backit will save you hours and hours over the "free" Backup program that comes with DOS.

Polytron's PolyBoost CRTBoost can accelerate the screen scrolling so fast you cannot possibly read it. I use one of the option switches to slow it down a bit.

Software Disk Caching

If you have spare 256K conventional RAM or expanded RAM, MultiSoft's Super PC-Kwik or Polytron's PolyBoost DSKBoost can cache your disks. Caching programs keep the most commonly used parts of your disk in RAM, and thus are able to offer instantaneous access when you go to read those popular parts. You can read about various other caching packages in the February 14 edition of PC Magazine. DSKBoost's forte is fast read caching using a tiny RAM overhead. Super PC-Kwik excels at a mix of read and write caching.

Why use a cache? Programs with overlays or programs that access the same file over and over again such as WS Word Spell Check will especially speed up.

Software Directory Caching

Use the FastOpen program that comes free with DOS 3.3 to cache directory entries. This program tracks where the most popular files and directories are stored on the hard disk. You can then (access) any of those popular files instantaneously.

Why use FastOpen? Frequently used programs such as WS Word, that open many files, will start more quickly.

Software Alberta

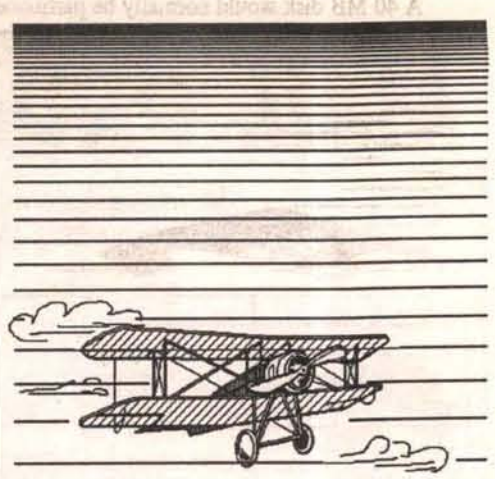
Seattle Computer originally conceived DOS before the invention of the microcomputer hard disk. Techniques originally designed to control floppy disks live on to manage 200 MB hard disks. As you might expect, some of the methods DOS uses are very inefficient for *large* files. Alberta cancel DOS's worst inefficiency — the FAT or File Allocation Table. Business Simulations Limited's Overdrive is the only Albert that has so far reached the market. Roughly speaking, an Albert is a FAT cacher.

Use an Albert if you have database files larger than one megabyte, that you access randomly or in reverse order.

Software Interleavers

Use Gibson Research's SpinRite to choose the optimal interleave for your hard disk. If the technician who originally did your low level format specified the wrong interleave, SpinRite will make your disk run at least twice as fast. If he chose the interleave correctly, SpinRite will not have any effect.

What is the interleave? When a disk runs at an interleave of 1:2, the heads read every second



sector as it goes by. While the alternate sector is going by, the disk controller transfers the data just read from the disk controller buffer into RAM. Some very fast disk controllers can operate at 1:1 interleave. These controllers can read data for one sector while they are simultaneously transferring data for the previous sector. Some very slow disk controllers cannot operate any faster than 1:6 interleave.

Why use SpinRite? If your disk has the wrong interleave, it is probably running up to five times slower than it needs to. Running SpinRite just once will correct it.

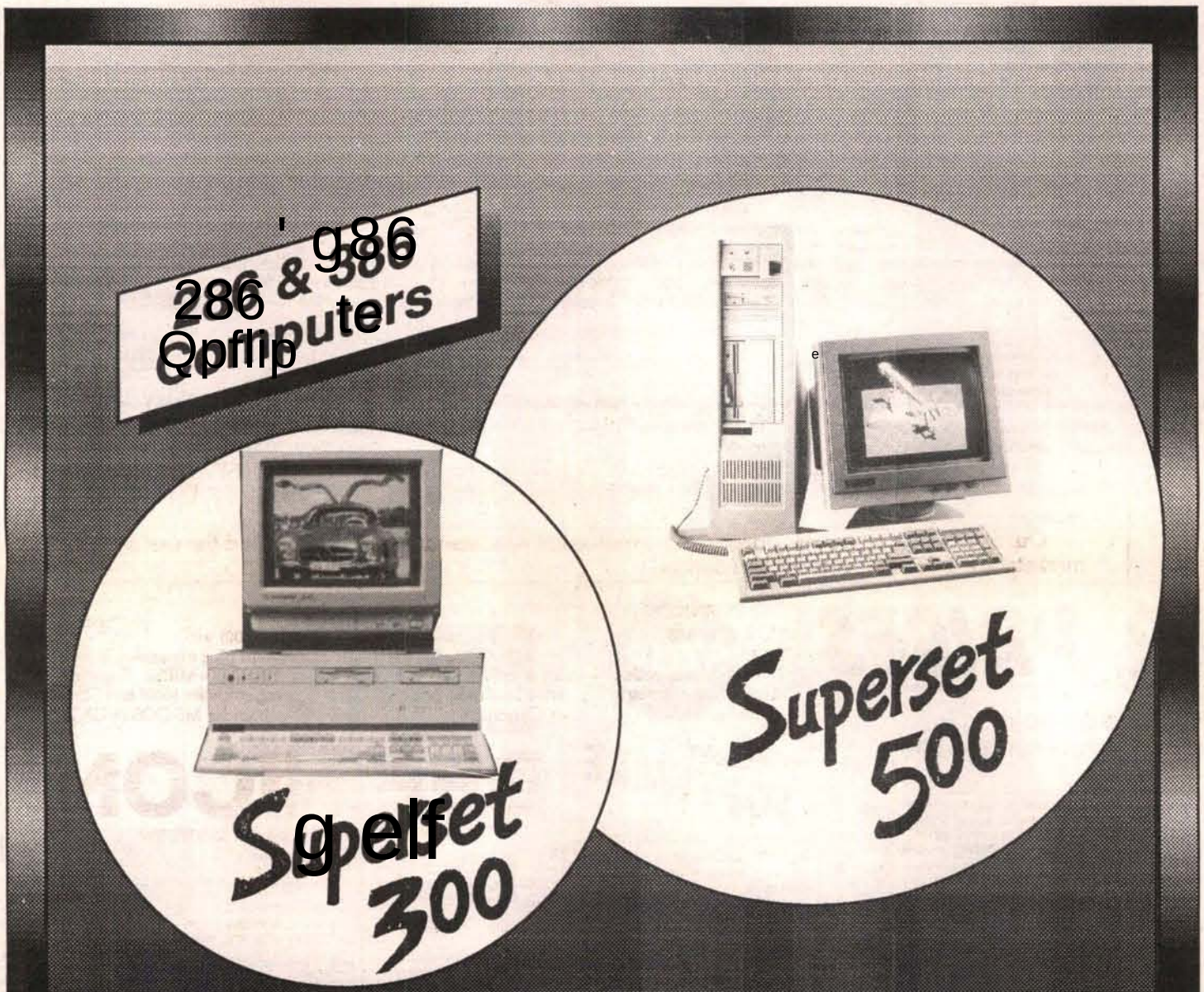
Software Defragmenters

DOS tends to scatter parts of a file hither and yon all over the hard disk. Use a defragmenter such as Norton SD (Speed Disk) to defragment your hard disk, ie. reorganize each file into a single contiguous piece. SD pulls the directories to the outer edge of the disk right next to the FAT (file allocation table). The FAT is DOS's master table that keeps track of where all the used and free disk space is. Then SD places all files that belong to the same directory, side by side.

Why use SD? When your hard disk is tidied this way, the read heads in your hard disk do not have as far to travel to get the information you want, so they can get it quicker.

Software Accelerator Pros

1. No assembly required.



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2. Your investment is protected. You can still um these tools after you upgrade to an even faster machine.

3 Low cost.

Software Accelerator Cons

1 Jtione of them will help speed up a CPV intensive task such as recalculating a spreadsheet or MS Word Repaginate.

2 Sometimes software accelerators ctm give sensational improvement, but often there is no noticeable difference.

2. 8087 Numeric Co-Processor

Adding an Intel 8087 numeric co-processor is easy. Turn off the power. Press the 8087 into the free socket next to the 8088 cpu and set dip switch 2 off.

Installing an 80S7 numeric co-processor will speed up Lotus 123 spreadsheet recalculations, though it wiH have no effect on most other programs.

N87 Numeric Co-Processor Pres

1. Computation-intensive or graphics programs that support the 8087 run about seven times faster.

2. Simple installation.

N87 Numeric Co-Processor Cons

1 Jt has no effect on most programs such as MS Word.

2 Jf you upgrade you must replace your 8087 with an 80287 or 80387 numerical co-processor.

3. The 8087 runs hot and takes a fair bit of power. This may be enough to push a flaky clone over the brink

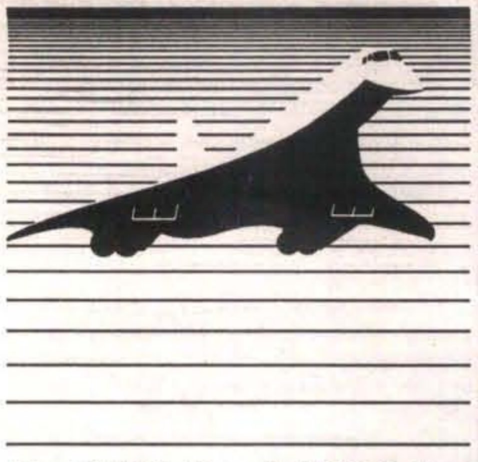
3. Suying A Faster Hard Disk

One of the simplest ways of improving your XT clone's speed is to get a faster, larger hard disk,

Make sure you buy the right kind of hard disk, MFM or RLL, to match your current disk controller, You might also want to upgrade to a faster controller at the same time.

There are two main specifications of interest in buying hard disks: the size measured in megabytes (MB), and the average access time measured in milliseconds (ms).

A 40 MB disk would normally be partitioned



into a 30 MB C: drive and a 10 MB D: drive. There is not much point in buying a drive smaller than 40MB. Software packages now come on 10+ *diskettes*, rapidly filling any hard disk,

A slow drive is 80ms. An average drive is *60* ms. A fast drive is 25 ms. A premium drive is 10 ms. Putting a drive faster than 25 ms in your XT would be as witless as putting a V8 in a Volkswagen Beetle.

Installing a Hard Disk

Installing the disk yourself is quite simple. Turn off the power. Remove the mounting screws, remove the old disk, mount the new disk and attach the two ribbon cables from the disk controller and the power cable. Make sure you put the cables on the same way up they were originally, with the red stripes next to the cutouts near pin one.

Hard Disk Pros

1 Jt will speed up programs that "rattle" the disk heads, e.g. MASM assemblies, Btrieve name lookups and DOS BAT files.

2 Jlemonably simple installation.

3. You can use the hard disk later if you upgrade to an AT machine.

Hard Disk Cons

1 Jt wiH not speed up a CPV intensive task such as recalculating a spreadsheet or MS Word Repaginate.

2 Jt wiHl not speed pure sequential disk i/o, e.g. Norton TS searching a file for a given string or MS Word Transfer Load/Save word processing files.

4. Extra Expanded RAM

You can install extra expanded RAM on your XT or AT. Expanded RAM is sometimes called LIM, EMS or multi-banked RAM. In contrast, extended RAM will work only in an AT machine.

There are three main uses for expanded RAM:

1 Disk caching.

2 RAM drives.

3 Spreadsheets too big to fit in conventional RAM.

If you buy expanded RAM, buy it all at one time from one vendor. Each of the many different kinds of expanded RAM requires a different software driver. To avoid conflicts, all your expanded RAM should be of the same type.

Expanded RAM Pres

1 Jt will allow you to use disk caching without chewing into your conventional 640K RAM.

2. Simple installation.

Expanded RAM Cons

1. The sort of extra RAM you need for upgrade AT machines wiH be 16-bit or 32-bit RAM, not 8-bit XT RAM. In future AT systems you wiH want extended, not expanded RAM. At present, most AT programs support only expanded RAM. Most boards that offer 16-bit, 32-bit or extended RAM, will not work as 8-bit expanded RAM in XTs. *One* notable exception is the Intel AboveBoard Plus that works as 8-bit RAM in XTs and as 16-bit RAM in ATs.

2 Extra RAM is quite expensive. For only a little more money you can get a true accelerator with 1 MB of 32-bit RAM.

5. Inboard 80386 Accelerators

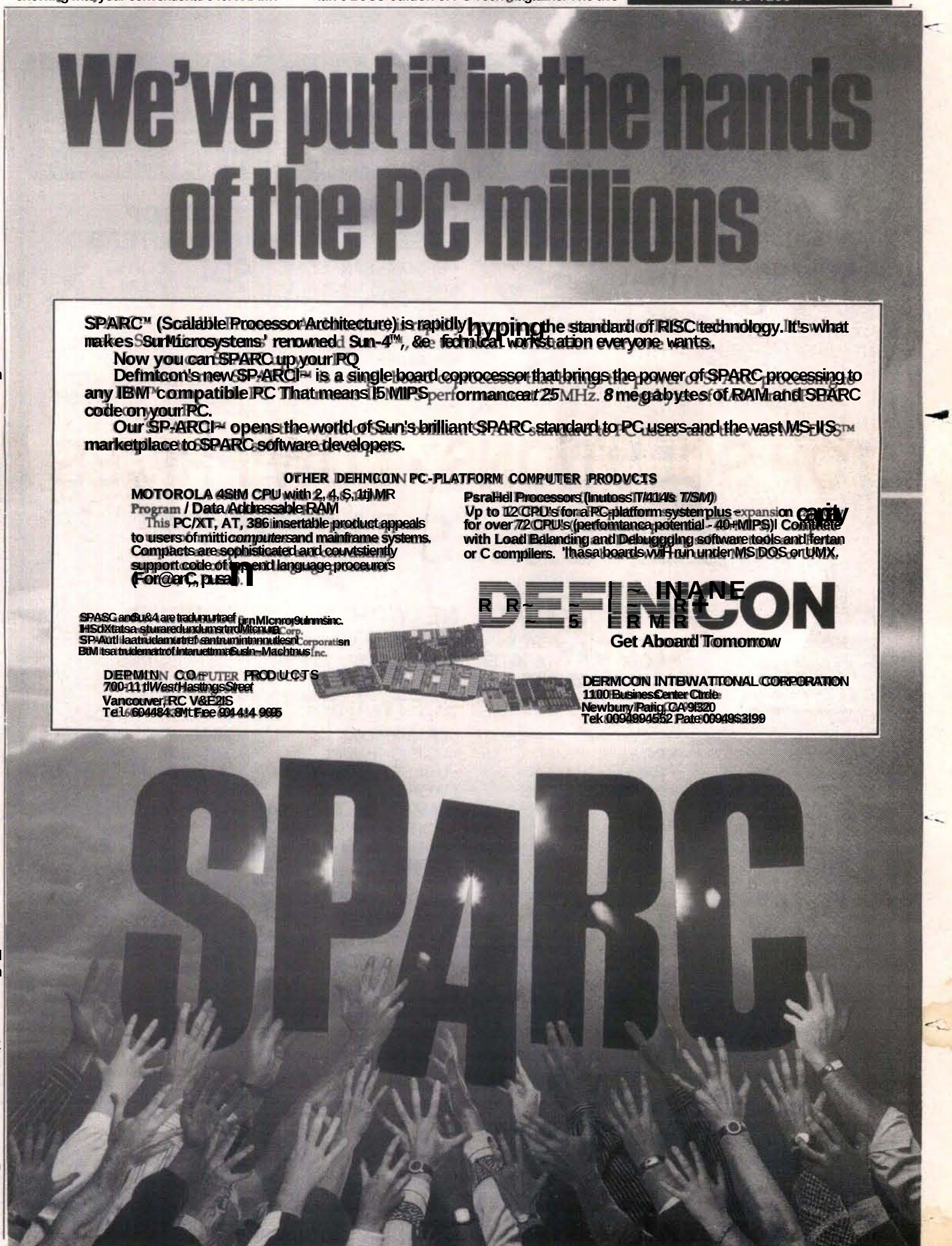
There are several brands of 80386 accelerator boards. You can read about three of them in the June 1988 edition of PC Tech Magazine. The two

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b tseH~ ~O h a l e d W i the~ Quadram @md 386XT. The Qaadram costs about 56% xnexe than the InteL

The advantage of the Qaadxam is that it comes with anew SOS36-awaxe BIOS, whereas the Intel uses your existing BIOS. The Qusdram scavenges your old slow 640K of XT RAM fer use m disk cachmgwhile offexing I MB of newfastRAM for your programs. The Quadram does net require yau te disable any of year existing RAM as the Intel Inboard does.

Inboard IaataHaSon

To install the Inbeanl, ay out the 80&S and coxmect a cable *Som the Inbemd* to the oM 8988 socket. Intel gives you a 1/4" maaual to explain this to you in psnistalting detaiL The Inboard wHI only woxkin cloaca where the 89&8 issocketed on the motherboanL It sounds simple, but to get elbow room ta remove the old 8088 and insert the cable you tenxperariiy aced to xemove half the canis.

Inboard Speed

It is exhilmahng playing with your old pxagrams wjth ibis new speedlamon. Hcae are some xeal hfe befem and after benchmarics. Note that I already had a decently hst clone. If you have aa oM4 77 MHzchmker your speedups wiH be even more dramatic.

Before: IDM XT turbo clone, 649K, 8 MHz, NEC V20 processor, 8 MHz bus, Norton SI 32.

After: Intel Inboard, 1 MB, 16 MHz, Intel &0386 pmcessur, 4.77 MHz bns, Norton SI 165.

Inboard Cempatlblaty

I have foundno cexnpahbility problem with tbe IntiL I have tested at least fifty pxegrmns. Intel told me Windows 386 standmd edition wiH NOT woxk. A special version that does work is available. Thexeasonstandmd Windows doesnetwork is that it is bafHed to Snd an XT BIGS in an AT madune. I could net test Windows because it is a RAM heg. Even with 2 MB RAM, you get only 400K left for your apphcation.

Inbeard Pres

1.The ecstasy of a Norton SI of 165. AH programs nm faster.

2.Low cost relative to a new 80386 machine.

3.$nnple mstaHation.

4.You canxun some of the new 89386-only softwme such as VM/3&6, Windows-385, Phar-Lap DOS extender and DES@-386.

Iaboaxll Cons

1.Your end product is neither *fish* nor fowL It hasyourorigmalancieatXTBIOS, numiuga slew 4.77 MHz 8-bit bus with slow 8-bit peripherals, with the latest 16 MHz 80386 processor, nmning with delicately remapped high speed RAM. Some pxegraxns may be confused by it. In particular Unix and OS/2 will not run since they do not have drivers for XT peripherals. Intel is selling a lot of Inboards, so new pregrarus wiH likely become Inboard-aware.

2.Jf you can't disable the RAM above 256K on your motherboard, yeu may damage the Inboard.

&Ieaps are annoyingly highpitched shrieks in Phoemx BIOS machines. Beepsme too shoxtm aH machines.

4.The &0386 bomd mns hot and thus causes other equlpnlelit to xun hotter than asuaL

5.Withoutcaching,yeurhaxddiskmayruaevca slightly slower than itdidbeforebecause youmust hun off the hubo switch to slow rhe bus Rom 8 MHz to 4.77 MHz.

6.You caa have amaximum of 3 MB of RAM on the Inboard. This wiH not be enough in future to run large pxagrams like OS/2, VM/386 and Unix, even with XT-style drivers.

6. Replace with an 89286 AT mntherboard

When you rephee your XT motherboard with an AT motherboard, you must fust decide which other components wHI be replaced snd which will be recyled. Depending on how much recycling you do, the new AT motherbosrd route may sometimes be cheaper than the accelerator option.

Here is a list of coniponents which can be recycied:

82986 RecyHng

Y Hmd Disk - You can keep your old disk, though you might consider replacing it if it is smaHer thea 40 MB.

2 RAM chips - You may be able xe recyle your old RAM chips. You must fmd out how fast your current ones are — the smaller the muaber, the faster the chips. "-15" aaprixtted on the chip usuaHy means 150 nanoseconds. "-12" means 120 aanoseconds. Most modern AT motherboards woxk best vrith 109 nanosecond RAM chips.

N Hmd Disk CeinfeHer - %tough it is theorehcally possible to keep your 8-bit disk controller, you would be givmg up most of the advantage ef moving to an AT if you did so. It must be xeplaced by a 16-bit canhaHer — ideally one capable of driving your dbslat 1:1 axterleave.

'2 Keyboard - if your keybemd has a switch to convert it te an AT keybeard, yea can keep it. If not, you will need a new AT style keyboardL

Y Video Card - your video card wiH work just Sne.

N Multi-i/e csnl- TMscaxd will go in the trash. UsuaHy there are serial ports and a clock on the AT motherboard so you do not need a replacement canL

N Happy CentreHer - This card too wHI go mto the trash. NonnaHy the AT Hard disk contxeHer card wHI have the floppy disk functians en it as weH.

2 360 KB Ploppy Drive - You may keep this drive. Fer backups you will want to add a le MB floppy drive, and you may want to add a IA4MB floppy drive to handle 35" diskettes.

2 Power supply — An AT power supply is usuaHy 200 watts. A good quality XT po~er supply is usuaHy 150 watts. You wiH need to upgrade your eureat power supply if it is less than 150 watts.

2Case-Some AT motherboard upgrades wiH fit into an XI' clcme case and some will not. Jf not, will have to buy an AT case. The XT and AT power supplies require XT and AT style cases respechvely, se you may then end up having to buy a new AT power supply as weH.

The new motherboard will give you a new &0286 processor, 16-bit slots, a clock, and a ROM BIOS. To wedr, eut the ecnnomics of such aa upgrade, you must determine which parts you will xecycle.

AT Motherboard Pxaa

ISvom a software point of view, the new machine lcoksjustHkearealAT, and, assuch, shoaM eventaaHyrunUnix andOS/2(with enough RAM added).

2.You can add 16-bit peripltenils into the 16-bit slots. For example you can add up to 16 MB ef extended RAM.

3.Yell cau use hanlwale accelerator products designed for ATs.

4.You wiH have junked some of the low quality XT cexnpoxxents that may have been giving you xeliability pmblems such as the multi-i/o card, the clack calendar, the infamous DMA cexxtniHar and @e interrupt coniroHer.

5.The fasbus and fast 16-bit hanl disk conhaller will speed up sequential disk i/o, such as pxogram loads, MS Word Traasfer Load/Saves, aad database searches.

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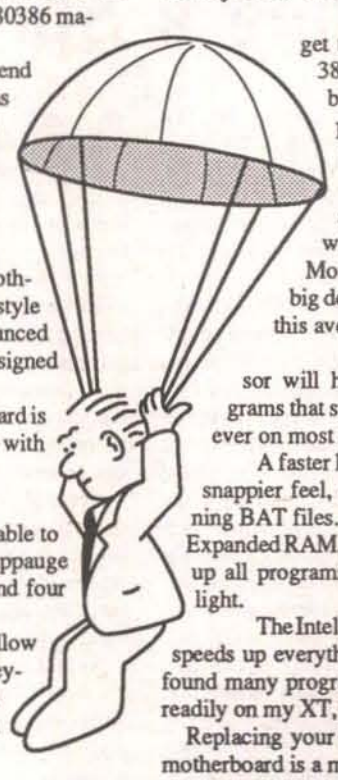
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AT Motherboard Cons

1.The replacement of a motherboard is not a job for novices to tackle. There is a good chance you will damage something in the process.

2.The result is a rather anemic 80286 AT. Some new programs will only run on the 80386 machines.

3.If you are not careful, you may end up replacing so much you might as well have just bought a new stripped down AT.



7. Replace with an 80836 motherboard

I am aware of only one 80386 motherboard designed to upgrade XT style clones - the Hauppauge (pronounced HAW-PAWG'). There are others designed for AT style cases and keyboards.

Upgrading to an 80386 motherboard is the same as upgrading to the 80286 with the following differences.

80386 Recycling

N RAM chips - You will not be able to recyle your RAM chips. The Hauppauge comes with its own 100 nanosecond four way interleaved 32-bit RAM.

Y Keyboard - Hauppauge will allow you to keep your old XT style keyboard. Hauppauge supports both XT and AT style keyboards with a special ROM BIOS.

80386 Motherboard Pros

1.This is the fastest option. You have both the screaming fast 80386 cpu and the fast 16-bit bus.

2.You have the 80386 which allows you to run all the new 80836-only software such as VM/386, Windows-386 and Unix-386.

80386 Motherboard Cons

1.The result is a not quite a standard 80386 machine because it has an XT-style keyboard. This might confuse some software.

2.The closest Hauppauge distributor in is Quebec. I know of no local distributors or retailers. Phone support means long distance to New York. If you require warranty work, there would be no local repairs.

3.The Hauppauge bus runs at a conservative 6 MHz. Most AT clones, by contrast, run at 8 to 10 MHz.

My Personal Case

Before I invested money in beefing up my two old XT clones I took a close look at WHERE my old machines were wasting my time.

I found I was twiddling my thumbs waiting for six things: 1.Abundance make holes 2.Abundance compiles 3.MS Word Repaginate 4.MS Word Print File 5.MS Word Spell Check 6.PkZip/PkUnZip (archiving/compressing/decompressing)

My Own Solution

I changed the code in the Abundance compiler to do make-holes disk i/o in 63K chunks instead of 1K chunks. Problem number 1, make-holes, went away entirely. I spent no money and 7 hours of my time.

One of our clients bought an Intel AboveBoard Plus card with 1 MB expanded RAM. I burned it in for him for a few days. It significantly improved MS Word Spell Checking, but made not much difference to my other problem areas.

I wrote some simple programs to simulate the disk i/o parts of problems 2 through 6. I timed them, then subtracted from the measured times of the actual programs. From that, I computed the proportion of time spent in disk i/o and in computing.

This proved I needed the fastest computing engine possible. My disk was already plenty fast enough.

Since I was handling characters, not floating point numbers, I knew an 8087 would not help. I had the choice of an 80836 accelerator or a new AT motherboard. The AT would give me better disk performance and a completely standard machine with no future compatibility problems, but I needed heavy duty CPU power now. A new AT would give me a Norton SI of 9.7, where the Inboard would give me a rating of 16.5. I was leaning heavily toward the Inboard.

The Clincher

I have a true blue IBM XT keyboard with the keycaps rearranged into the Dvorak layout. I would have had to give it up if I went to the AT motherboard. A replacement IBM AT keyboard would cost an outrageous $500.

This was the clincher. With the Intel Inboard 80836 accelerator card I could keep my beloved XT keyboard. I bought two Intel Inboards.

If I had it to do over I would get the more expensive Quadram 386XT cards instead, mainly because of the disabling ram problem with the Intel Inboards.

Parting Summary

The cheapest, most impressive improvements are done with software, not hardware. Most people are so eager to spend big dollars they forget to investigate this avenue.

An 8087 numeric co-processor will have startling effects on programs that support it, but no effect whatsoever on most programs.

A faster hard disk gives your machine a snappier feel, especially when you are running BAT files.

Expanded RAM, when used for caching, speeds up all programs that flash the red hard disk light.

The Intel Inboard 80386 accelerator card speeds up everything from four to ten times. I found many program that ran too slowly to use readily on my XT, now flow effortlessly.

Replacing your XT motherboard with an AT motherboard is a major undertaking, but you end up with a standard AT. Sequential disk i/o gets a boost even with the exact same hard disk.

Replacing your XT motherboard with a Hauppauge 80836 motherboard again is a major undertaking, but you end up with the fastest possible machine, with a standard 16-bit AT bus. The result is almost equivalent to a new 80386 machine.

Then of course, you could always sell your old XT for $700 and go out and buy a whole new system with the latest 33 MHz 80386, with a Harris CTX-2000 RISC Co-Processor, a 25 inch colour monitor, VGA plus video co-processor, 200 MB hard disk . .

Roedy Green is the president of Canadian Mind Products, #162 - 1020 Mainland Street, Vancouver BC, V6B 2T4, (604) 684-6529. His company writes custom software for charities and small businesses.

Adding Parallel Processing To Your PC

One way of getting the performance of a RISC workstation out of a standard PC AT box is with Definicon International Corp.'s SPARC1.

The card reportedly delivers 15 MIPS (Million Instructions Per Second) with a 25-MHz SPARC processor and packs up to 8 Mbytes of high-speed DRAM. Users can rely on the PC's, standard peripherals or add their own high-speed disks via an optional SCSI port.

Effectively, the Definicon board establishes a computer within the host PC, with the latter serving as an input/output processor. The user interfaces with the PC, which in turn interacts with the SPARC processor.

The board is designed to run applications that are written for workstations such as those of Sun and Apollo, which are based on the Motorola 68020 or 68030 microprocessor. Such applications would require recompilation from source code, as well as considerable rewriting of their hardware-specific components.

The applications, which must be ported for operation on the coprocessor board, can be loaded directly from DOS and don't require special emulations. In addition, the programs can be stored on the AT's hard disk as DOS files and do not require special Unix partitions

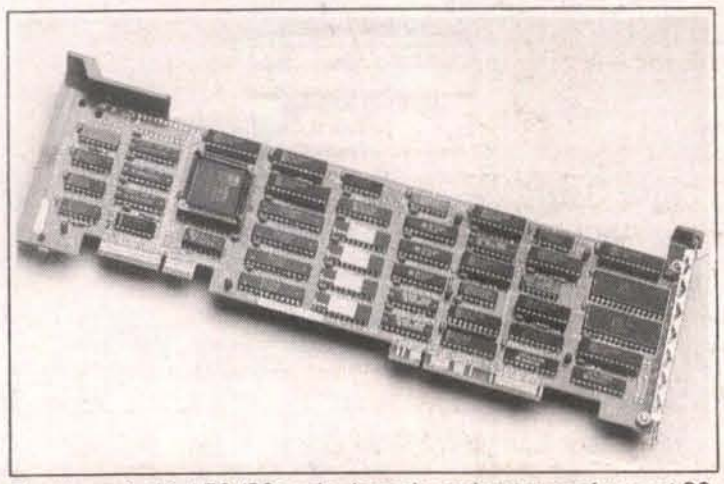
The board occupies an AT profile, making it too large to fit into a standard XT cabinet. Pricing for the DSI PM-030 with 4 megabytes of memory to sell for less than US $5,200, and the 8-megabyte version to sell for about US $2,000 more.

If you know what all that means, then this boards for you.

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Selecting a Spreadsheet

The spreadsheet market is dominated by a few programs, the most notable being *Lotus 1-2-3*, *SuperCalc5*, *Multiplan*, and the recent entry, *Excel* for the IBM-PC. In order to select a suitable spreadsheet program, it is useful to know something about the recent and quite rapid development of spreadsheet programs.

The introduction of VisiCalc in 1978 started a revolution in personal computing that some people claim assured the success of the microcomputer industry. Created by Robert Frankston and Dan Bricklin, this program developed the concept of electronic spreadsheets and set the standard for all spreadsheet products that followed. The visual presentation of computed results on screen using the cursor as a pointer made spreadsheets user-friendly. Business people could quickly master the tool and apply it in their daily work. Previously, financial modeling required the user to know about programming and command languages. *VisiCalc* run on many different microcomputers, though it did not run on machines such as Commodore, North Star or *Kaypro* 2.

In 1980, Sorcim Corporation produced SuperCalc, which had many similar features to *VisiCalc* but was a more advanced product. It quickly met with user enthusiasm. In 1982, VisiCalc Advanced *Versias* was introduced on Apple III.

About the same time, IBM announced its entry into the microcomputer market with the IBM Personal Computer (PC). Shortly thereafter, Lotus Development Corporation released *Lotus 1-2-3* for the IBM PC; it had many features in common with *VisiCalc*, making it easy for *VisiCalc users* to convert to *1-2-3*. Since the introduction of *1-2-3*, many more spreadsheet products have emerged for the IBM PC, including *SuperCalc5*, *Multiplan*, and a number of programs that are *Lotus 1-2-3* workalikes. *Recently, Lotus 1-2-3* has dominated the spreadsheet market for the IBM PC, taking a lion's share of the market.

Several other spreadsheets, meanwhile, were developed specifically for the Apple Macintosh. These include *Multiplan* and *Excel* from Microsoft Corporation and *Jazz* from Lotus Development Corporation. Of these, *Excel* has the most features and is the most popular with Macintosh users. In late 1987, Microsoft introduced *Excel* for the IBM PC, a development that is considered a significant advance in spreadsheet design.

Meanwhile, Lotus has announced substantive upgrades to the Lotus 1-2-3 program. Later in this chapter, we will review the best-selling *Lotus 1-2-3* Release 2.01, as well as Microsoft Excel and, for comparison, a low-priced program *PC-Calc*. Appendix A includes a brief summary of the announced features of *Lotus 1-2-3* Release 3.0 and annotations on other spreadsheet programs.

WHAT CAN YOU DO WITH A SPREADSHEET?

To decide which spreadsheet program is suitable for your business, you should first know some basics about what spreadsheet programs can do. If you already have a good understanding of what a spreadsheet has to offer, you may prefer to skip to the section "Determining Your Spreadsheet Requirements."

In its simplest form, the electronic spreadsheet replaces the row-and-column paper worksheet used by accountants since the days of the merchants of Venice and Genoa in the 14th century. Now, virtually any calculations done on worksheets can be performed faster, more efficiently, and more reliably using a spreadsheet program. Spreadsheet programs are particularly useful for what-if analyses, such as cash flow projections, budgets, pro forma statements, sales and profit forecasts, and tax planning.

Paper and Electronic Spreadsheets Compared

Here are some of the main differences between a row-and-column paper worksheet and an electronic spreadsheet:

Changing entries. Changes made to a paper worksheet require recalculation of all affected entries; changes made to an electronic spreadsheet will trigger automatic adjustments to the entire spreadsheet.

Moving rows and columns. Adding and deleting rows or columns on a paper worksheet calls for cutting and pasting, and eventually requires a complete rewrite of the worksheet. On an electronic spreadsheet, you can make these changes with only a few keystrokes.

Formulas. Typically, the paper worksheet will not show the mathematical formulas or logic that is the basis of the calculations. The worksheet only shows results, and this makes it difficult to verify the calculations. On an electronic worksheet, however, the formulas that underlie the figures can be instantly displayed and verified.

Format. Changing the format and style (such as decimal places, commas, and percentage form) usually requires a rewrite of a *paper* worksheet. Again, in an electronic worksheet such changes only require a few keystrokes, and you may apply them to the entire worksheet.

Repetitive calculations. You may often repeat the same formulas and formats for several worksheets and reports. Manually, you would have to repeat the calculations for every value. Electronic spreadsheets, however, can save areas as templates into which you enter new data and command the program to make the recalculation.

Sorting. It is very difficult to sort the rows or columns of a paper worksheet into a different order, but you can do it electronically in a matter of seconds.

Graphs. To graph the calculated results from a paper worksheet can be a tedious and time-consuming process. On an electronic spreadsheet, you can transform your data to graphs with only a few commands and keystokes. Furthermore, on newer programs, whenever you change your figures, you can obtain an instant update to the related graphs.

Common Features of Electronic Spreadsheet Programs

Knowing a little of the history of spreadsheets, it is not surprising that the well-established spreadsheet programs have many design features in common. In many ways, the various programs have been modelled after *VisiCalc*. The differences, which we will address later in this chapter, have to do with style, efficiency, speed, and the match of the various features to a user's preferences.

Many of the spreadsheets with smaller market shares, for instance, direct their appeal to distinct groups of buyers and design their mix of features accordingly.

All spreadsheet programs should include these features:

Cells. Each single value, whether directly entered or the result of calculation, is stored in a cell, which is the intersection of a row and column.

Cell addresses. References to values on the spreadsheet are done by referencing cell addresses, rather than cell contents.

Functions. Built-in functions are provided to automate calculations. The built-in functions of spreadsheet programs are, in effect, like advanced versions of function keys on a financial calculator, e.g., square roots, logarithms, and present values. Almost all spreadsheet programs include a core selection of built-in functions. The basic set of functions usually includes financial, mathematical, statistical, logical, and trigonometric.

Commands. Commands enable you to perform operations such as formatting, copying, or printing a spreadsheet. The form in which commands are presented to the user and the way you select them often differentiates one spreadsheet from another. Commands are an important part of the user interface.

Macros. Macros, in their simplest form, are a way to store keystroke sequences that can be played back at a later time. Some spreadsheet programs provide advanced macro commands that can enable you to automate lengthy spreadsheet operations. The macro capability of spreadsheets may also differ substantially from one program to another.

Graphics. The ability to display graphs is particularly helpful for business uses. The standard

set of graphxcausually fiumahed includes pie charts and bar and line graphs. Not all spxeadsheet programs can display graphs.

Database management. Some spreadsheet programs provide database management capabilities such as sorting records and searching for particular attributes. While the database may be set up fai any pmpose, it may be particularly useful when apreadsheet contains alargenumber ofrecards, such asinventory, acxonms receivable, or personnel records. Yau shouM cspect, however, that a spreadsheet will be not quite as facile in handling databases as a specifically designed database program

Text. Most spreadsheet programs provide xudimentaxy word processing capabilities. As with databases, you should be aware that spreadsheet programs generally have hmited word processing capabiTity. In fact, word processing capabiTities of spreadsheets tend to be much weaker than darabase capaMities. They often lack features you would consider minimal in a word processing program, such as holding, underlining, ar font changes

Advanced Functiens. There are a number of advanced fimctions that can really set a spreadsheet apart from the crowd. They include regression analysis, automatic table construction, dynamic linking af multiple spreadsheets, integration with word processing, and multidimensional spreadsheets.

DETERMINE YOUR RKQUIRKMENTS

Becausemostpreadsheetsprovidemanyof the key features described at the beginning of this chapter, the selection of a suitable spreadsheet program for your business isot too difficul. The following are the major requirements you should consider,arranged fmm basic to advancol the questians are mnmarized m table.

What hi the Maximum Size ef Your Spreadsheet?

You should estimate the size of the largest passible spreadsheet you may need to build. Saut with the manual spreadsheetyou use already and add half as many rows andcahumns. Perhaps even double the size; as it's so much easier io woHr, a spreadsheetprogmn,your elecuanic spreadsheets will probably be lafgm. Spreadsheet dimensions ambyrows and columns. Some programs offer dimensions ef 9999 rows by 255 columns; others anly allow 256rews by 64cohmms.

What Functions De Yeu UseRegularly?

Make alistof the hmctions you will need to use, stretching your hat to mclude ~ai, even exceptional requirements,not just the day-toMy ones. Remember that basic functions such as square mot, summation, maximutn,mhtimum,mam, and standard deviation sreprovidedby all spreadsheet pxogram. Do you use financial calculations? Which ones? Statistical formulas? List thea

Selecting a Spreadsheet for Your Needs

Todetennine therectuirements for aspreadsheetto match your needs, ask yourself questions such as the following:

What is the maximum size of your spreadsheets?
What functions do you use regularly?
Do you need absolute cell xefereaces?
What kind of graphics da you need?
Do you require database features?
Will you print cell formulas?
h global search and replace needed?
Do you phm to lmk several spreadsheets?
Will yau transfer spreadsheet data?
What are your special requirements?
Wiat hnd ofiann features do yo u need?

De You Need Absolute Cell References?

In businessspreadsheets, there are instances when yau want to keep the address of a cell constant, xegardless of how many other changes you make to the spreadsheet. There may be a cell in which you smre a key piece of data such as an interest rate or ctuxency conversion factor. You would want the program to ensure that any references to this absolute cell address always remain the same in formulas that may be copied and adjustedwithin thespreadsheet. The normal function ofaspreadsheetprogramistoroutinelychange any cell references relative to their position on the spreadsheet. Not all spreadsheet programs, however, make previsions for the exceptional times when you'd want an absolute cell reference.

What Kind ef Grnphics De You Need?

List whatkind of graphs you will need or would like to pmduce. Sjirecidsheet programs provide different selections of graphs, esliecially after the conventionaloffermgsof piecharts andbar graphs. What requirmnents do you have to print or plot graphs? Dgouneedhigh~typlots or are draft copies sufficient? Not all spnmidsheet programs provide support for platters. Some users never needgraphs atall andshouldnotspendalotof time loohing for spreadsheets with elaborate graphic presentation of plottmg routines.

De Yeu Require Database Features?

We mentioned in rhe previous section that spreadsheets mayperform some fimctions that are generally associated with databases. One question is whether you want to use functions such as sorting, searching, orreerganizing datafiles within your spreadsheet. For example, do youneedto sort on more tjian one key? How many? Do you need to accessBASEIIIfilesdirectly &omyourspreadsheet, or can you work through DIF (Data Interchange Format) files?

Will Yeu Prhit Cell Formulas?

Do you need to printou the formulas contained in each of the cells in a spreadsheet? Do you need to compare the formulas indifferent cell? Spreadsheetprograms have different method of printing out formulas in cells; some may be more suitable for your needs than others.

Is Gleba Search and Replace Needed?

How often would you need to search through the entire spreadsheet to replace the occurrence of a value, a formula, ar a cell reference? If you need ta perform this operation often, you must make sure yau select a slzeadsheet program that provides this facility.

9o Yeu Plan to Link Several Spreadsheets?

Spreadsheetare linked if changes made to one spreadsheet automatically affect alH the linked spreadsheetsAre the spreadsheets you typically build independent of each other, or wouldyou like to be able to link them in this way? This spreadsheet feature is not common to all proarams.

Will You Transfer Spreadsheet 9ata to Other Documents?

Do you phm to incorporate your spreadsheet data and tables into your word processed documents? Mhen youchauge thesomce spreadsheets, will yau want the caxrespcmding copies to be dumged accordingly? A few spreadsheet programs have this integration feature, which is quite usefuL Most spreadsheet programs, however, xequire you to export your spreadsheets to a disk fi1e, thentoimpoxtthe fileto your woxdpxocessing document. If you change the spreadsheet, you will need to repeat the entire process in order to keep the related document updated. (See also Chapter 10 on integrated programs.)

Whet Are Year Spednl Requirements?

Make a list of your special requirements. Far example, do you need the spreadsheet program to perform xegression analysisornot? Doyouneedto work with multidimcstsional spreadsheets? Da you need to generate one- or two-way tables to conductwhat-if analyses?

What Kind ef Macro Features De Yeu Need?

Do you needma Yes? what requirements do you have? Are simple macros sufficient, or do you need to build custom spreadsheet applications for users unfamiTiar with spreadsheet commands? If you plan to develop custom applications, you shouldcarefuly examine the macro commands provided by the spreadsheet program. Not all spreadsheet programs provide a mane facility. The syntax and use of macro commands differdrastically fmm one program to another.

NARROWING 'If HE CHOICE

There are over a hundred spreadsheet pregrams available, catering to a wide range of users. Ycm need to find some way to narrow the choice. One way is to look at some characteristics of spreadsheet operation that can quickly indicate the differextce in quality between programs. Three such program characteristics are level of perfonnance, number of built-in functions, and user interface.

The perfcmnance of a spreadsheet is usually measured m howquickly information is displayed and updatedon-screen and haw quickly calculations ate performed.

Bulk-Ng funchbns are provided in spreadsheet programs to reduce the amount of formula con-

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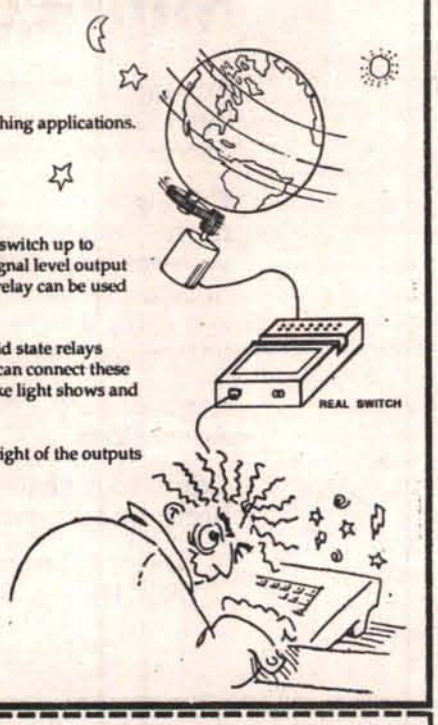
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struction by the user to solve mathematical problems. The more powerful spreadsheet programs provide a large number of built-in functions, which make it very easy for the user to construct very mathematically complex spreadsheets with a minimum of effort.

The ***user interface*** is the set of techniques by which the program provides for two-way communication with the user. Typical user-interface techniques include the command menu, the help facility, on-screen prompts, and error messages. The keyboard and mouse are also part of this interface. A well-designed user interface can be a significant factor in making a program easy to learn and use.

Another way to narrow the choice between spreadsheets is to take a closer look at how intensively you use or plan to use spreadsheets and then to identify those features that would be required for that level of usage. In our consulting work, we have recognized three distinct types of spreadsheet users. To clarify these distinctions we will call them entry-level users, professional users, and power users.

Are You an Entry-Level User?

The term ***entry-level*** has a dual meaning here. Many people who use spreadsheets on a daily basis in financial institutions, insurance companies, and other businesses are only responsible for entering data into prebuilt spreadsheets or templates. These users do not have to learn the spreadsheet functions and commands at all. The templates are set up already to do the required computation or analysis. For example, there are templates that will facilitate financial planning, tax planning, or calculation of retirement benefits.

If you are this type of entry-level user, the choice of a spreadsheet program is not determined by what the program can do. Rather, the choice is dictated by the availability of suitable pre-built spreadsheet templates for the purpose of your line of work. In fact, most template users are currently limited to *Lotus 1-2-3* because of the wide range of Lotus templates on the market.

The other type of entry-level user is the business person who is venturing into the use of spreadsheets for the first time, i.e., entering the software store at the ground floor. These people often describe themselves as "starting at square one." They may begin to use a spreadsheet program instead of a desk calculator or a paper worksheet. The entry-level user creates simple spreadsheets that typically use only the simplest functions such as addition, subtraction, multiplication, division, and summation. They may use a few basic cell references and may perhaps know about IF statements, but will seldom use one.

Minimum Spreadsheet Essentials for Entry-Level User

Numeric and Text Entry. You can enter numbers (values) or text (headings and labels) into any cells. The program must handle label spill-over, where a label longer than cell width can automatically be carried into blank cells to the right.

Basic Formulas. Formulas enable you to set up all the basic arithmetic operations (add, subtract, multiply, divide, exponentiate).

Basic Functions. The standard functions include total, maximum, minimum, average, standard deviation, round, count, square root, and IF ... THEN logic.

Basic Format Commands. These commands control the appearance of the spreadsheet such as column width and display formats including dollar signs, decimal places, and percentages.

Basic Editing Commands. These are the commands that enable you to edit, copy, and move the content of cells on the spreadsheet.

Basic File Management Commands. These are the commands to print, save, load, and delete spreadsheets or selected parts.

A simple, relatively inexpensive spreadsheet program may be quite enough for the entry-level user. Later in this chapter we review a shareware spreadsheet package called *PC-Calc* that would be quite suitable for an entry-level user to construct simple spreadsheets. A ***shareware*** program is one for which the publisher holds copyright, but grants the right to users to share the software for evaluation. If you decide to use the shareware program on a regular basis, you are asked to remit a small fee for registration and full documentation. This arrangement helps the publisher recoup some of the costs of development.

If you currently classify yourself as an entry-level user, we have an extra caution to offer you. Look ahead a few months. As you become accustomed to the capacity of the spreadsheet to handle work efficiently (and with incredible patience!), you may find that your personal spreadsheet requirements have shifted upward. Now, you will not want your growing interest to be frustrated by a spreadsheet with limited capabilities. You may find it useful, therefore, even at this stage, to read over the next section on the professional user. You may decide to select a spreadsheet program that is a little beyond your present needs but is a program you can grow with.

Summary Comparison of Three Spreadsheet Programs

Program	*PC-Calc*	*Lotus 1-2-3*	*Excel*
Version	(Version 2.0)	(Release 2.01)	(Version 2.0)
Price	US$48	US$495	US$495
Hardware required			
Microprocessor	8088	8088	80286
Math Coprocessor	cannot use	8087/80287	8087/80287
Memory	128K	256K	640K
Hard disk	1 floppy	recommended	required
Color monitor	yes	yes	yes
Expanded memory	cannot use	can use	recommended
Capacity			
Size	255 x 26	8192 x 256	16,384 x 256
Characters/cell	75	240	240
Windows	none	2	many
Functions (total)	18	89	132
Financial	1	11	13
Logical	1	7	15
Database	0	7	11
Statistical	5	7	14
Mathematical	10	17	22**
Date and time	0	11	12
Text	0	18	21
Other	1	11	24
User-defined	no	no	yes
Editing			
Point mode	no	yes	yes
Customized displa format	no	no	yes
Notes on cells	no	no	yes
Cell protection	no	yes	yes
Uses mouse	no	no	yes
Print from screen	no	no	yes
Undo command	no	no	yes
Formatting			
Hides rows	no	no	yes
Hides columns	no	yes	yes

** Including trigonometric functions.

Spreadsheet Features for Professional Users

Maximum spreadsheet size (that is, number of rows and columns) large enough to accommodate the worksheets used in your office, now and in the foreseeable future.

Editing commands for modifying and moving formulas.

Financial functions, including present value, future value, annuities, internal rate of return, compound interest, and various financial formulas.

Logic functions to perform conditional logic and table lookup.

Business graphics, including pie charts, bar and stacked-bar graphs, line graphs, and scatterplots; it must be possible to apply headings, labels, scales, and other features.

Data management functions to sort, search, and extract data records.

Windowing and title lock features to help the user move around large spreadsheets.

Format commands to control the appearance of numbers on the spreadsheet, e.g., dollar or percentage formats, dollar signs, embedded commas to separate thousands, control of decimal places, the use of minus signs or parentheses for negative numbers.

Date functions to permit calculations on date values, as in accounts payable and receivable, inventory, and payroll.

Precision control over the rounding of numbers, a task that can be done much more reliably by a spreadsheet than by hand.

Macro programming options, such as the ability to create custom menus, self-loading (autoexecute) macros, and to create macros directly by recording an actual sequence of keystrokes.

Are You a Professional User?

Professional users need spreadsheets primarily to solve business problems. These people are not programmers and generally have no intention or need to get involved in programming. For them, the spreadsheet must provide a starter set of functions that can solve the most common business calculations and perform routine analysis of figures. Some people in this group make extensive use of the financial, graphics, and data management functions in the spreadsheet program. While they do not write complex macros, they can easily learn to define simple ones; they may also load and use macros provided on a program disk.

Professional users will find many of the basic spreadsheet programs lacking in terms of their operational needs. The choice will probably narrow to the more comprehensive spreadsheet programs such as *Lotus 1-2-3* (or workalikes), *SuperCalc5*, *Multiplan*, or *Excel*.

Spreadsheet programs suitable for professional users should have features such as those listed in Table 7-3.

Advanced Spreadsheet Features for Power Users

User-definable display formats for numeric values, date values, and text entries.

Comprehensive macro language, that provides commands to control the various operations of the spreadsheet. The macro language should provide all the basic programming functions, including logical comparison, branching, looping, prompts for keyboard input, access to disk files, assigning values, displaying message, subroutine calls, and passing values into subroutines.

Menu creation facilities that simplify user access to the spreadsheet.

Security features that prevent an unskilled user from interrupting the operation of the spreadsheet.

Dynamic linking of multiple spreadsheets.

Import and export facilities providing interface with other programs.

User-defined functions.

Multiple windows for concurrent spreadsheet operations.

Are You a Power User?

A ***power user*** is one who is already skilled and experienced in using a program. Furthermore, a power user is ready to take advantage of the most advanced features available in order to increase speed, efficiency, and productivity. Power users are often quite creative. They want to solve a variety of complex application problems with the spreadsheet. They are likely to be very interested in macro programming facilities. Over and above the features required by professional users, power users will look for advanced features.

Once you have a good general understanding of what spreadsheets can do, and in particular have identified what spreadsheets might do for you and your business, you are better equipped to shop for your spreadsheet software. By narrowing your choice to fit the kind of spreadsheet user you are (or plan to become), you may have simplified the selection task another notch. The next section of this chapter provides a sample evaluation of three programs to illustrate the final phase in selecting a spreadsheet.

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Although lop of the lille spieadsIleetpfogfanls appear similar, you'll be surprised what's lurking below the surface. You can bet there are differences worth considering. The best advice for a new spreadsheet buyer is — look beyond the obvious.

The Three Don'ts

Without theluxuryof worhing for aweek or two with atleast a dozen different pmducts. choosmg the right spreadsheet from desixty so available is tough. Here are three "don'ts" to help you shift your thoughts m the right direction.

1) Don't buy a spreadsheet oply because it does the 30byounowhaveimmind. Youcanbec item that as your skills in constructing worksheets increase, so will your appetite for sophisticated programming features.

2) Don't lock yourself into a self serving product. Regardlessof your prgneeds, look for a spreadsheet that optimises transportability to databases and other programs.

3) Don't sacrifice speed for a few dollars. Earlier spreadsheets which are less expensive, are also notoriously slow. Recalculating speed in a spreadsheet is extremely important.

The unifying structure between the better spreadsheets is Lotus 123. But Lotus 123 is no longer the bestspreadsheet to buy. While sheer momentum keeps Lotus saleshead of the pack, the product hss lost its shine. Several spreadsheets exceed Lotus' perfonnance. The latest I had the pleasure to work with is Borland International Quattm.

Interface Changes to Lotus Style

Switching toQuamois easy. It'stheonlyspieadsheet that lets you change the interface. You can have either Quattro pop-up windows or if you prefer the Lotus 123menustructure, choosethatas a default. Quattm will read and write files eithe format.

Quaums' gusto and extraordimuy flexibiTity is a resultof sme 687 commands snd selections accessible through themenus,plus 600commands aud selections in the 123 mode. By comparison Lotus 123 offers only about 360 commands. To rectify some of Lotus' most glaring shortfalls, Quattro 123 mode includes an additional 240 nmunands. Because each command represents some feature, this comparison readily demonstrates Quatttos' superiority. And this is only the beginning.

Quattro has exadly 100 mathematical, statistical, financial, logical andother@functions; that's 49 more than Lotus.® functions is a resident sequence of instructions such as a mathematical formula. For example @SUM will add a designated range ofcells, audc VAR will calculatthe variance of values in the stipulated cells, @SIN calculates the sine value of the cell and son The more fimctions a spreadsheet has the greater your abiTity to build sophisticated worksheets.

Graphics 4 Macms

Graphics and Macms are two areas where Quattm really shines.

You can measure the quality of graphics by enhaticemenls to thevarious types of graphs. These inchde fills, pauems, grids, combining different graph types in one illustration, legend, label, and titles positioning, type face options, marker variety, sizing and scaling, layout and formatting and so on. You simply don't see this kind of ability in spreadsheets. Production of presentation quality graphs is normally the function of separate pmgrams.

Macros: Playback Keystrokes

Quattros' macro capability is superb. Borland expertise in computer languages is clearly visible m both, the features embedded in Quattro macro mode and the ease of execution.

In the simplest form, macros are a recorded series of keystrokes you canplay back by pressing one or twokeys. Programs sporting a macro capaMity give you this option. Macros in Quattro allow you to go far beyond these basics. You can build into your macms complete routines and subroutines such as: stopping in the middle of macro execution to ask for keyboard input; branch into other mutines; produce beeps; get information from other files; wait until something else happens; check to see if conditions are true or false,andmuchmore. Some 54 well chosen macro cotnmands give you the capability of building a complete andhighly interactive program.

An InteSgent Recalculation

To maintainspeed somespreadsheets cutuseful featmes and limit you to the bare essentials. Quattro solves the features vs. speed dilemma quite simply by recalculating only the cells affected by a change. I dug up an old spreadsheet I once used, FresCalc (found in Shareware libraries), and ran thesame worksheet on both. PreeCalc took almost one anda half hours on an 8088 machine to do what Quattm did inless than asecond. None of the comnteteial spreadsheets are that slow of course, but recalc ipeed differences of a few sccainds represent enormous cumulative time loss.

Useful Features

Quattm abounds with useful feamres. A file squeeze utility SQZ which automatically compresses and expands files ibr efficient use of disk spacL. You can open sexed vertical or horizontal window and view separate parts of a spreadsheet in synclumizedor unsynchmnized mode as you scroll thmugk The zino display set athide zeros is handy for uncluuering the screen. What-if, lets you analyse figures under various conditions, and statisticians have a full slate of cummaiuh at their disposal, likeiegression analysis. Andyoucanuse your spread@meta in other popuhr programs like dBase, Reflex and Paradox.

While none of the features represent a technological breakthrough, being all available in one pmgram is what makes Quattm a standout among the better spreadsheets.

Space does not allow to describe more of Quattro featmes. But let me say thiis; right now you won't *fmd* another spreadsheet that is more *flexible* or better equipped for performing complicated tasks as easily.

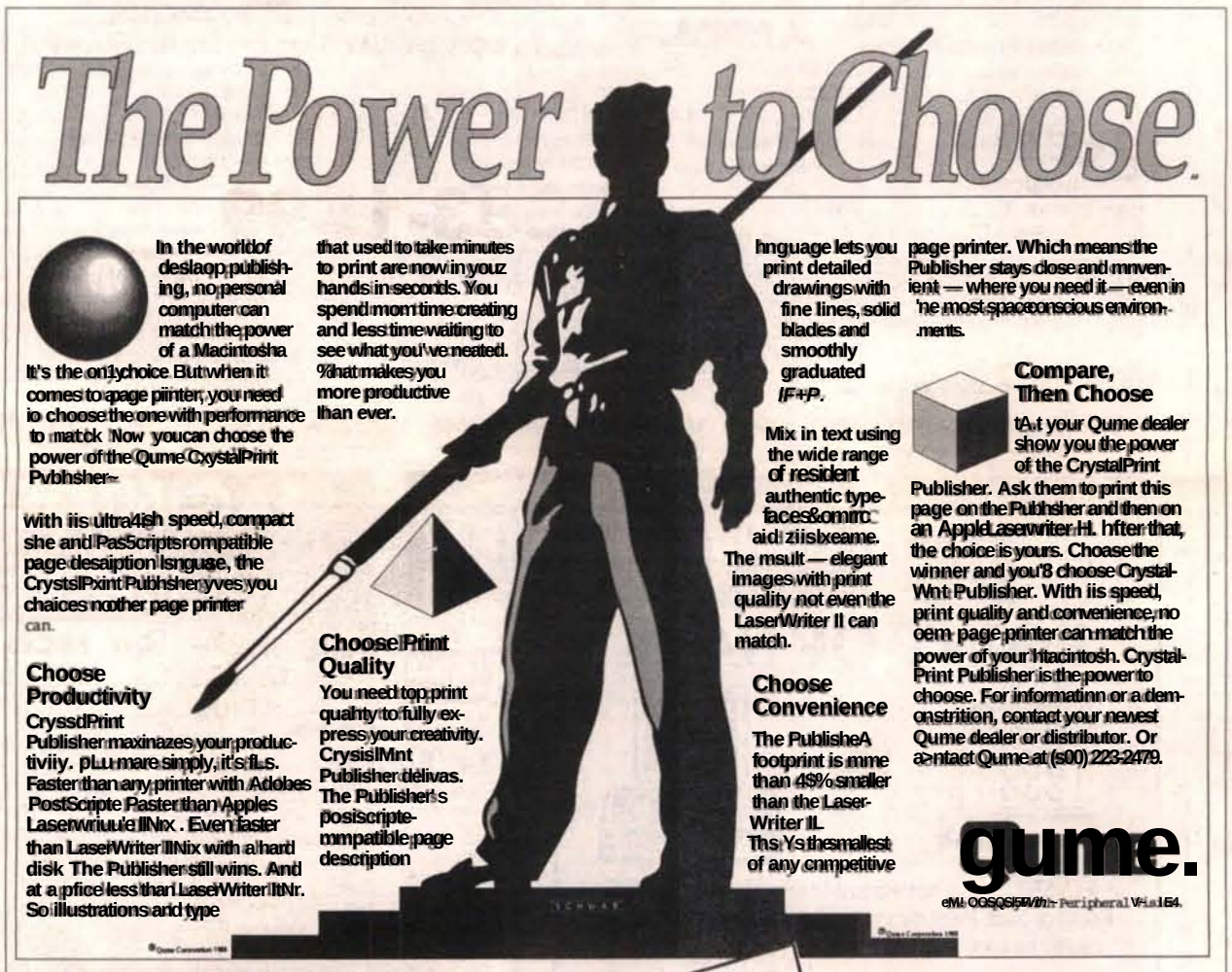
Docunienuuion

The package comes with three manuals that aim at providing simple explanation to novices and include numemus examples for the experts. Whether you find the manuah easy or difficult to follow depends on your knowledge. Unless you know about trigonometry, for example the explanation anduseof@ATABNor@ACOS fimctions won't mean anything to you.

The pmgrsm is on three disks, needs DOS 2 or later version and at least 512K of RAM. For graphics you also need a graphics cud. Although two floppy system is ok, for mom serious work a hard drive and expanded memory is necessary.

At US $247.00retail Quaumisabargain. That's just about half the price of far less able pmgrams. Most ores carry Q uauro, or you can order one direct from Borland.

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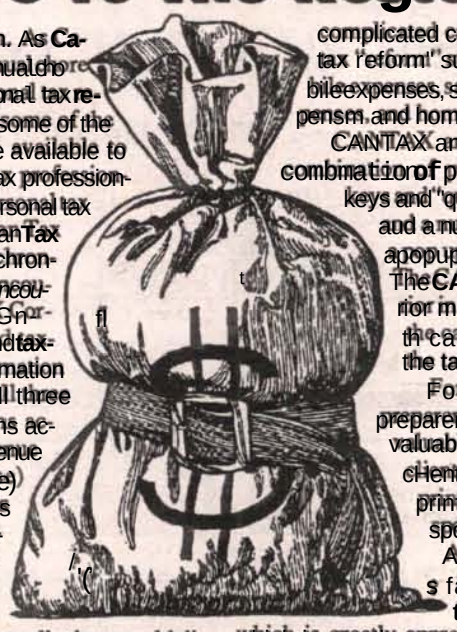
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It's that time of year again. As Canadians get ready for their annual ho of preparing their 1988 personal tax returns, it is timely to look at some of the software programs that are available to assist both individuals and tax professionals. I have looked at three personal tax software programs: Canadian Tax Calculator by Canadian Synchronics Pttxhlcls Inc of North Vancouver, CANTAX by CANTAX Gn" poration Ltd. of Calgary and taxPREP H by taxPREP Information Systems Inc. of Tomnto. All three programs generate tax forms acceptable for 61ing with Revenue Canada and (suqmise, surprise) I achieved the same results under each software package when preparing my own tax return.

In starting to review these programs, I expected that generally they would divide up into those used by pmfessional tax prepsrers and those used by hnlividuah with personal computers with the criteria being power at price. As you will see by reading on, due is not always the case.

PRODUCT: Canadian Tax Calculator
PUBUSHER: Canadian Synchtonics Products Inc of North Vancouver (804) 9SS-7SSS
PRICE: $59.95

Canadian Tax Calculator is true to its name - it automates the preparation of the T-1 personal tax form. The program guides you thmugh the tax forms in a simple question and answer fiit in the blank fashion to identify and input sources of income and available deductions aud tax credits. Calculations are automatic and the tax returnmy be viewed on screen or printed.

CTC is merm driven, easy to use and fast. It has a few opdons like a pop-up calculator and window display of key figures such as taxable income, taxes payable and refund due amounts.

CTC essentially replaces your calculator when preparing your return. It's major drawback is that it provides limited help and mfotmation in determining eligibility for certain deducuons and allows the user to overmde deduction limits without having to jusdfy the change. For instance, the pmgram allows you to take a deduction for RRSP contribution in excess of the notmal limit. Although there are certain circumstances where larger RRSP contributions are deductible, other programs (CANTAX and taxPIEP) requud you justify this situation and provide information to calculate the conect deduction. To the credit of CTC, however, the manual does strongly recommend that your return be checked by a tax professional.

At a suggested retail of $59.95, CTC is priced for the individual user. It does not possess some of the features that the professional tax preparer would also desire such as form leuers to clients with mstrucdons for 61ing, authorization leners to Revenue Canada and batch pmting for more than one talon at a time.

PRODUCT: tCANTAX
PUSUSHKR: CANTAX 665 Pump Meadow Crau., Calgary T2V SC6 403-255-8444
PRICE: $49.95

PRODUCT: taxPRW II
PUBUSHER: taxPREP II by taxPREP Information Systems Inc. of Toronto
PRICE: $800

CANTAX and taxPRRP II

I found **CANTAX** and taxPREP H to be quite similar in nrety. Although neither is as simple to follow as **CTC**, they are both fairly logical and consistent and definitely nunc powerm. In fact, it is unlikely that you will encounter tax complexlties that either one of these systems cannot handle. Both programs have a Lotus-like screen to guide the user through some of the hideously complicated calculations brought on by tax 'reform' such as deductible automobile expenses, salesmens' employment expensm and home oSice expenses.

CANTAX and taxPREP H both use a combination of pull-down menus, faction keys and "quick" keyboard commauds aud a number of opdons including a popup calculator and a notepad. The **CANTAX** calculator is superior mthat it allows you to export th cacular r total directly into the tax return field.

For the professional tax preparer, both programs provide valuable features: customizable cHenletters, single formorbatch printing, review diagnostics, spousal coupling and others. As well, both provide default information for certain common mpiit data which is greatly appreciated by people like me especially an April 30th!

In comparing these two programs, both have certain quirks and unique features which I liked or didn't like.

Advance Planning 1or Next Year

CANTAX has a Planning Module for 1989 that allows you to play amund with various tax scenarios or "what if" situadons and prints out a nice, professional looking document thar summarizes your (or a client's) possible 1989 tax posidon. It also hss a salary /dividend plaiming worksheet that will be dear so the hearts of many tax prcie sionals. The CANTAX plarming module uses 1989 indexed rates and you can export your 1988 actual data to it as a starting point. taxPREP H doem't have a separate planning module but you can certainly do "what if" analysis for 1989 by mahngup admmmy tax return. (taxPREP doesn't have 1989 mdexed amounts, however.)

Anyway ~

taxPREP H has anice feature that allows you to create a template of a tax reunn which can he very time saving when doing slot of similar returns. It also has more extensive review and diagnostics opdons than CANTAX.

Both programs have some word processing ayabiTity; taxPREP thnughit suserdeaned forms and CANTAX through it's wordprocessor. The CANTAX wordprocessor is a little more flexible, ho -ever, it uses Wordstar-like comtnands which I fmd hard to work with unless I do alot of it. Finally, CANrAX has two other worthy features that taxPREP does noc a Mling and invoice system for professional tax preparers and asimplified tax return option for basic remms.

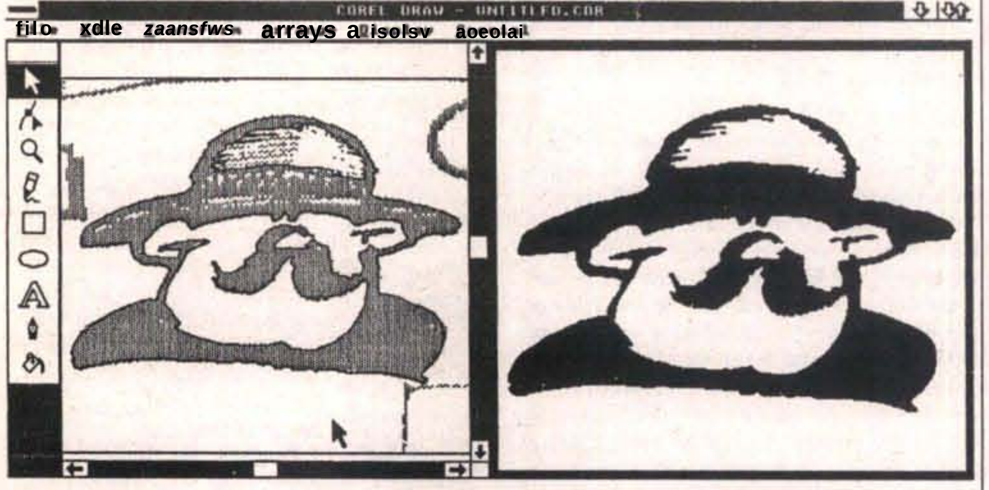
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	CTC	CANTAX	taxPREP II
Speed	5	4	3
Power	2	5	5
Simplicity	5	4	3
Prof. tax prep. options	0	4	5
Tax planning options	3	5	3
Score	14	22	19
Ptloa	$59.95	$49.95	$500.00

In simmmaty, **CANTAX** and **taxPREP** H all great tools for the tax preparer - both the professional and the individual. The biggest differ<sta between the two programs is the price-taxPREP's price of $600 is out of sight tempered to **CANTAX** which gets my highest overall rating.

LYNDA SEIGI4EURET, C.GA, is a principal with SEIGNEURET fL ASSOCIATES, Chartered Accountants, a Vancouver firm that provides accounting, tax and advisory ssrvicas to individuals and their businesses. She can be contacted at (604)SS2-5477.

Corel Draw



Corel Draw has a fully sophisticated Auto-Trace function

PRODUCT: Corel Draw
PUBLISHER: Corel Systems Corporation 1600 Carling Ave. Ottawa, Ont K1Z 8R7 (613) 728-8200
SYSTEM REQUIREMENTS: AT or 386, Windows 2.0 or higher, DOS 3.0 or higher, 640 K RAM & mouse or tablet.
PRICE: $595

The classic desktop publishing argument is over the choice of computer platform: Should you choose the PC or the Macintosh? It has been assumed in the industry that PCs are better at manipulating text while Macintoshes are better with graphics. This is no longer true!

Corel Draw, an Ottawa company's high quality illustration program designed to run under MS Windows, should change many people's preconceived ideas about graphics on the IBM PC. The program comes with 57 fonts, over 50 clip art images and 46 PostScript fill patterns with variations.

Corel Draw is a true illustration program. This means that all the logos, charts, maps, ads, etc. that most desktop publishers thought could only be created on the Macintosh, can easily be created with Corel Draw.

Printer Independence

Best of all is that any of the images created with Corel Draw can be output on any printer including dot matrix, HP LaserJet or PostScript printers. Macintosh illustration programs such as Adobe Illustrator 88 or Aldus FreeHand are clearly designed to work with PostScript printers. Since their illustrations are PostScript programs, it is difficult and sometimes impossible to use the art on other printers. Corporations which use several different types of laser printers can now have artwork such as logos designed and delivered in formats compatible with each type of printer used. This type of flexibility was not previously available from a single package.

Installation

Corel Draw installation is very straightforward. Simply insert the install disk in drive A: and type 'install.' An installation program starts and instructs you when to insert the proper disks. A warning note: you will require your own version of Windows for this program since it doesn't include any runtime version of this program. Since only three diskettes are involved, installation takes only a few minutes.

How does it work?

Like most popular illustration programs, Corel Draw gives you a drawing board which consists of a page on the screen. You then use appropriate tools to create the illustration you desire. Tools provided include the Pick Tool to choose and manipulate items, the Shape Tool to manipulate individual or groups of points, the Zoom Tool to change the viewing window, the Pencil Tool to draw straight lines, curves and freehand shapes, the Rectangle Tool, the Circle Tool, the Text Tool for adding text, the Outline Tool for choosing line widths and colours, and the Fill Tool for setting fill attributes. Each one of these tools is very easy and intuitive to use.

Corel Draw also includes a constrain key, the Ctrl Key, which can be used in conjunction with the drawing, moving and shaping tools to create proportional shapes such as squares or circles and to shape or move in specific increments. And if you want to copy a shape while moving, distorting, reducing or reshaping, you simply have to press the + key on the keypad. These shortcuts save an incredible amount of time.

Like Adobe Illustrator, Corel Draw works only in outline mode. This means that work is performed on the outline of the object you create. To view the result of your endeavours, Corel Draw provides a Preview Window which does not allow edits, but shows you what the final result will look like. This preview window includes several features. It will autotrack the drawing window to zoom in and out along with it. But since preview screen redraws take so much more time than outline redraws, Corel Draw allows you to use automatic or manual redraw for the preview window. Once set to manual, the preview window redraws only when you click into it with the mouse cursor. A most useful feature when working with complex drawings. The preview window will also redraw all objects or only those currently selected in the outline window, another time-saving feature.

Working in the Outline Window

Like most drawing programs, Corel Draw provides a set of on-screen rulers to help you position objects in your drawings. Mouse movements are tracked within the ruler to give approximate movement information. For precise information, Corel Draw provides a Status Line which constantly describes the objects selected as well as movement information in distance and angles. It also displays resizing, skewing angle, rotation angle, fill pattern and other transformation information. To help precise movement and manipulation, Corel Draw lets you set a grid pattern behind the drawing page. This grid can be set in increments as small as 1 fractional point or as large as you desire. Once turned on, the grid will then move objects in those increments you have set.

The Pick Tool

This tool acts as the item selector found in most graphic programs. But that's not its only function. It also lets you size, distort, rotate, flip and skew objects in a very convenient manner. To size or distort an object, select it – the familiar eight square buttons found in most graphic programs will be displayed. To size the object proportionally, click on one of the *corner* buttons. To distort, click on the top, bottom, left or right middle buttons. The status line will display the amount of change in percentiles. To flip an object, choose any middle button and drag it across the object. If you want this object copied, press the + key while performing the operation. And to maintain the object's size, hold down the Ctrl key while performing the operation.

The most unique feature of the Pick Tool is its ability to quickly skew and rotate objects. To do this, click on the object twice – remember that since you're working on an object's outline, you must select one of the object's lines to choose it. When double selection occurs, the familiar eight buttons change to curved double arrows in the corners and straight double arrows in the middle. The curved arrows are used to rotate and the straight arrows to skew. The Edit menu also includes a Repeat feature which will automati-

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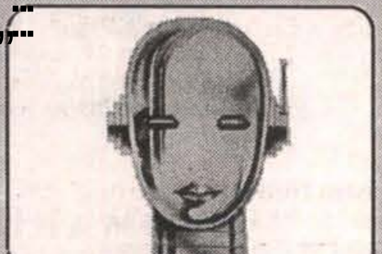
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cally repeat the last step you performed. For more complex steps, Corel Draw lets you create macros which record the operations you perform. These can be as simple as duplicating, sizing and moving an object or as complex as importing a Lotus PIC graph and changing it to a much more complex format.

The Shape Tool

This tool is used for line node editing. As with most sophisticated illustration programs, Corel Draw draws lines by placing nodes or points on a selected path and applying values to these points. The Shape tool can be used interactively or through a Node Editing Menu. For interactive use, select a point or group of points and make the change you desire by dragging the point to a new position. For curve manipulation, a selected point will display the two lines tangent to the curve. Moving the end point of either tangent will change the shape of the curve. For more complex editing, you can double click on any point to display the Node Editing Menu. this menu lets you delete, add, break or join points.

The Zoom Tool

This tool is quite useful to change the view in either the operating or the preview window. It includes a zoom in, a zoom out, a 1 to 1 ratio (for normal size), a view All and a view Full Page feature. Each feature can be selected from the pop-up menu which emerges when the Zoom tool is selected. The zoom in feature is much more useful than that found in most other programs. Most illustration programs let you zoom in through specific increments. Corel Draw's Zoom tool lets you draw a selection marquee around the object you want to zoom into and displays this marquee on the full screen. This means that you can zoom in as much or as little as you desire.

Object Addition Tools

Corel Draw includes four object adding tools: the Pencil, Rectangle, Circle and Text tools. The Pencil tool is used to draw straight lines, curves and odd shaped lines. When drawing straight lines, the Pencil tool acts as a 'click and point' device. Click in one place to start the line, then click again to end the line. You must continue the process for multiple line objects. The program includes a video which demonstrates this technique quite effectively.

The Text Tool

Text is something all desktop publishers have to create in one form or another. PageMaker and Ventura are great programs to manipulate massive amounts of text, but they don't allow enough type manipulation to create effective logotype. PageMaker also has the most annoying habit of vectorizing screen fonts when they are past a given size. This makes it very difficult to create and position drop capitals. Corel Draw, on the other hand, has very sophisticated type manipulation tools.

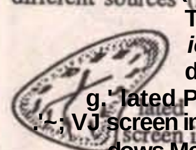
Included in the package are 57 different font outlines (24 different typefaces with their respective families: bold, italic etc.). Buying this many typefaces could range well into the thousands of dollars. Each typeface is in the form of an outline. This means that, unlike typefaces available from font manufacturers like Adobe and Bitstream, Corel Draw fonts are drawings which when printed will only send the characters actually used, not the whole character set for a given typeface (see Type Control). Corel makes typeface selection easier than other program by actually letting you see a sample character in the typeface dialogue box. Since Corel fonts are drawings, each character can be broken into a series of lines and curves through the Convert to Curves selection in the Arrange Menu which can then be edited and changed. This allows complete control of the shape of any character chosen. And finally, since typefaces are drawings, they can be output to any printing device. This combination of features clearly sets Corel Draw apart from any of its competitors.

Fill and Outline Tools

Another area where Corel Draw truly shines is in its fill patterns. Both lines and objects can be filled with an extensive selection of grey scales, Pantone colours, PostScript and radial patterns. Greyscale and radial patterns can print on any device. So will colour separations, but these print with each colour on a separate page on black & white printers. PostScript patterns – of which there are 46 different selections with variations of fill, frequency, grey content and spacing for each – will print only on PostScript printers and imagesetters. Pattern selection is easy – select an object, select the tool, select the pattern. There are so many patterns to choose from that your only problem will be deciding which to use.

Special Effects

Corel Draw includes options found in both Illustrator and FreeHand. These include an autotrace feature, the ability to import graphics from different sources (Paint, Illustrator, Lotus PIC, TIFF and other Corel *Drawings*), the ability to export to different formats (Encapsulated Postscript with or without screen images, Paint, TIFF and Windows Metafile for HP and other non-PostScript printers), the ability to bind text to curves, and some Paint and TIFF effects found *nowhere else.*



To autotrace you must import a graphic into Corel Draw. While importing, you must select the 'For Tracing' option. Once the graphic is imported, select the Pencil tool and click beside the piece you wish traced. Corel Draw also lets you control the tolerance for autotracing; if the scan or image is of good quality, you can set the tolerance higher for faster tracing or if the scan is poor, you can set it lower so that it does not stop every time it sees a gap in the object's contour lines.

Draw's Import filters are quite sophisticated. It can also be used to convert Illustrator, PIC, Lotus charts, and TIFF files. Which means that the abundance of clip art currently on the market in Illustrator format can be used with Corel Draw. A unique feature lets you import TIFF or Paint images to skew, rotate, transpose, and distort them. Corel will also fill these with any of the available patterns. Imagine, a good quality TIFF image filled with a sophisticated Postscript pattern!

Binding text is also easy. Select the text, select the object, choose Fit Text To Path from the Arrange menu. Et voila! Definitely easier than in most other programs.

The Bad News

Though version 1.0 of Corel clearly shines with capabilities and ease of use, it does include a few minor bugs. Some problems exist with complex Illustrator graphics. Corel Draw cannot properly control curves in these images. The program hangs with an error message. This has been corrected with version 1.01 which is currently shipping. (If you have Corel Draw, but haven't received the free upgrade, call Corel in Ottawa.)

There are also some features missing. The Export filters include a very good Encapsulated PostScript feature, but it doesn't include the ability to translate the PostScript code to Macintosh format. While this is not something most everyday users would need, it would give many high-end desktop publishers a viable alternative for graphic creation for any environment.

The Rulers are useful when used with a grid, but they would be even easier to use with two additional features: a zero point which could be moved anywhere on the page and pull-down guidelines such as in PageMaker. So far these are my only complaints.

Conclusion

Corel Draw is an impressive program even without its current price. Most of its competitors such as Micrografx Designer, Computer Support's Arts & Letters Editor, Digital Research's Artline, Adobe's Illustrator (PC and Mac) and Aldus FreeHand range between $700. and $1000. Corel Draw is only $595. including typefaces, Postscript patterns, and clip art. And unlike most of these other programs, Corel Draw does not require additional memory (I witnessed a recent demonstration of Illustrator Windows and it seemed quite slow on a 386 machine with 4 mega of RAM). I tested Corel Draw on a 286 with the standard 640K of RAM and found it ran quite well (memory isn't even mentioned in the reference manual). This is by far the easiest yet most sophisticated illustration program I have ever used. There is no doubt that Corel Draw is a major contender in the graphics illustration world.

Nelson Ruest is desktop publishing consultant and owner of Resolutions Enterprises. (604) 683-1599.

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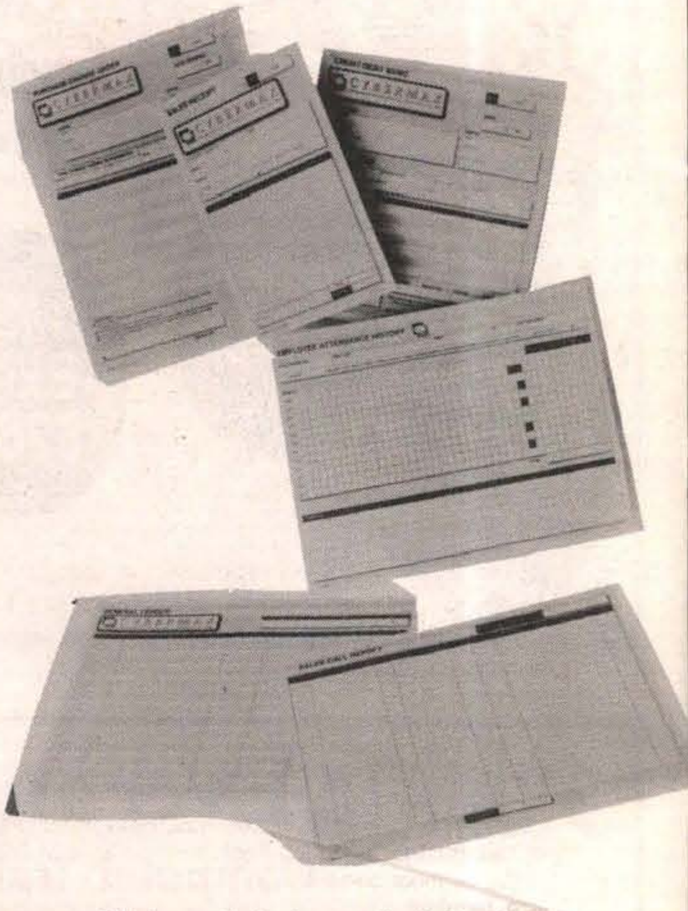
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PRICE: A single-user copy of SmartForm Assistant is included with each copy of SmartForm Designer. Additional single-user copies cost $49; a 10-user version of the package costs $399.



Forms Design: The Next Big Thing?

Claris has finally shipped its forms designing software package; The programs are Claris' first non original products after spinning off from Apple Computer.

I recently got a chance to do some experimenting with SmartForm Designer, a new forms creation program from Claris. I was expecting to be impressed. After all, what with MacDraw II, FileMaker II (not actually made by Claris) and what I've read about Claris CAD and MacWrite II, I thought this was going to be a great program.

Well, I was half right. Although evenly sprinkled with a number of well-meaning but poorly-implemented features, SmartForm Designer isn't going to replace my current forms-creating software.

As a professional forms layout person, I approached SmartForm from a point of a typographer. How well is this program suited to laying out and building forms for hand use? - Unfortunately, the answer is not very well.

Trying It Out On A Real Project

I took a real life form that I was working on and decided to compare SmartForm to PageMaker (the program I normally use, along with FreeHand).

The first thing I noticed was that new forms are set up with 10ths of an inch across the horizontal ruler and sixths of an inch down. Those are standard units for forms (computers and typewriters use the same measures when printing), and it shown that the programmers have some understanding of forms creation.

The first problem occurred at the beginning of the job. A standard approach to forms design is to allow an extra half-inch to an inch on either side of the page to print job information, corner marks and perforation marks where necessary. In the page setup dialog box, I gave my page one inch margins on all four sides. I drew my corner marks and then went to move my zero point from the top-left corner of the page to the top-left corner of my image area. Rulers weren't showing, so I had to select Show Rulers from the View Menu. There was no such command.

My search led to selecting "Grids & Ruler setup..." from the View menu, and that's when I discovered the command-key to show rulers. Why it was hidden in a dialogue box instead of having it's own position on the menu is a mystery to me, but at least I had my rulers. Unfortunately, you can't move the zero point. When I tried to I ended up dragging the rulers to a new position on the page but couldn't drag my zero point. In addition to an unmovable zero point, there are no custom ruler guides like in PageMaker. I found this to be a major oversight.

Another problem with the rulers is that they behave like an element on the page: you click and drag normally to move them, they disappear when you scroll, and even when they appear in the top-left corner, where you usually find them in PageMaker, they overlap the page. If you want to draw near the edge you'll have to move the rulers. Sloppy.

Fortunately there is a cure for these awkward rulers in SmartForm. The program has a "Show Specs" palette which gives a numeric representation of the size and position of objects that is currently being worked on. PageMaker can't do that, you need the rulers there. I turned my rulers off in SmartForm, and rejoiced in their absence.

Horray For The Specs Box?

The Specs box is a brilliant feature I'd love to see in all drawing programs. Not only can you see the dimensions of selected and grouped objects, but you can enter in the dimensions — top, bottom, width, etc. — right in the Specs box, without calling up a dialogue box. You can even select your units. Horizontal dimensions in inches, vertical in picas. Slick, quick and easy. Why did it take five years!

I wanted to make my corner marks one point wide and black— that's the default, but my perforation marks, which I drew next, perfectly positioned thanks to the Specs box, had to be 1/4 point dashed hairlines. Again, no problem. SmartForm allows you to select line weights independently of line pattern. In PageMaker I would have had to draw a dashed line with a white line covering all but a sliver of it — a cludgy solution at best.

Next I drew a box and placed a line two picas (1/3 of an inch) from the top of my box. I wanted to repeat a number of these lines, each one two picas below the other. In PageMaker I would copy the line and paste it back on the page, position it (using the rulers and, perhaps, moving my zero point), then repeat the copy and paste process. This is a much simpler operation in SmartForm.

After positioning the first line and making it a half point wide simply select Power Duplicate from the Edit menu and specify the number of duplicates and the *offset for each*. Click OK and Banal Lines exactly where you want them. If *You* wanted to lengthen or shorten those lines you could even group them, scale the group with the pointer tool and then ungroup them.

If you think these features sound familiar, they are. There is little here (other than the movable rulers and Specs Box) that you won't find in a well designed drawing program. What follows is a brief list of what is well done, and what is missing.

SmartForm alignment command is very well designed. If you had a series of horizontal lines and wanted them all to start at 2 inches along the horizontal ruler. In SmartForm. Just select them all, specify the alignment options (*left sides*) and the Align To option (2 inches). Click OK *and* Presto! There they are.

Text can be centred both horizontally (as in any program) and vertically in its own text block. That's great and I wish other programs could do that. Centering text in a row is painstaking in PageMaker and takes a number of steps including at least one test print. Text can also be rotated 90 degrees in either direction. PageMaker would require me to quit, open *FreeHand* or another drawing Program, enter and format the text, rotate it, export, quit, re-open my PageMaker file, import the graphic and position it. Editing is a repeat of all steps, but in SmartForm I can edit the rotated text easily. Fonts and sizes can be mixed in a text block, allowing me to place Dingbats such as arrows and know they align with the text. No kerning is supported, but I hardly use kerning in PageMaker when I make forms so I don't care. I miss a command to capitalize letters with a single command. I'm use to typing in upper and lower case and selecting All-Caps in PageMaker, just in case someone changes their mind, so an All-Caps style in SmartForm would be nice, but I can live without it.

One more drawback — and a big one — is that there is no support for PostScript gray screens. That means that is a gray screen is in the form it must be printed solid on a separation and then manually replaced with a screen. But with no support for spot colour separation there's no easy way to incorporate gray screen in SmartForm. I can mess around with PostScript a bit to get just the right gray value and density I want from PageMaker, but not with SmartForm.

Templates

Included with the package are a basic set of templates for Invoices, Statements, Work Orders etc. These are handy for people inexperienced in forms design to use as a model for developing their own forms. Additional templates are available from Antic Software for US $89.95 per volume of 35 stylized forms.

The Database Side

SmartForm's forte appears to be as a database layout manager. If you use FileMaker or 4th Dimension to fill out forms on the Mac you'll appreciate SmartForm's features. It's really an advanced layout editor for SmartForm Assistant. One copy of this program is

Continues On Next Page

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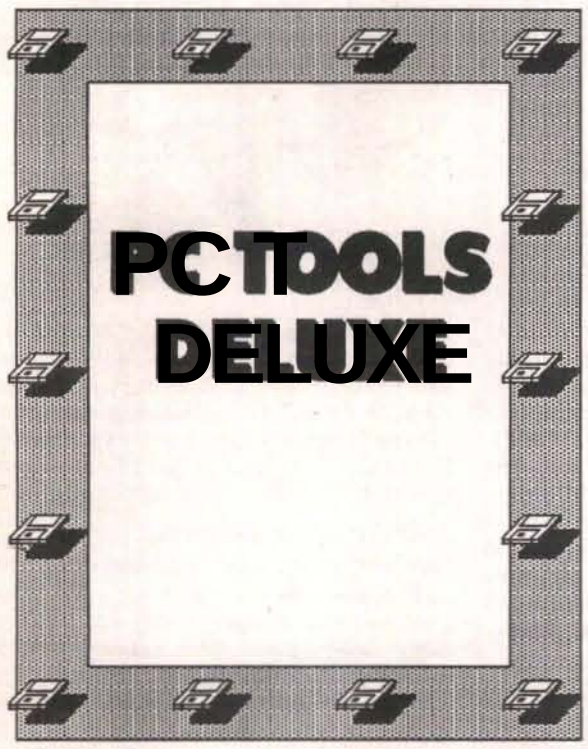
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PRICE: (list US $79.00). Introductory price, Can. $69.95

Why do you need PC Tools? The powerful DOS shell and utilities are invaluable for managing your files on a hard disk. With DOS it is all too easy to accidentally delete or overwrite important data, PC Tools warns you in any risky situation, and if you still make a mistake, provides file recovery.

PC Tools handles most DOS functions in a much better, safer and more user friendly way than DOS and provides many additional functions, such as de-fragmentation of files, undelete, and verification of files and disks. An earlier version of PC Tools was described as "one of the amazing bargains of the software world." Version 5.1 adds a host of useful new features and improvements. At the Can. $69.00 introductory price, it is a great value!

Version 5.1 comes with a new interface: horizontal menu bar, pull down menus, dialog boxes and windowing. The easy-to-learn user interface has: context sensitive on-line help, plus full mouse and keyboard support. PC Tools can be loaded as a regular DOS program or memory resident (using 9,70, 90 or 170K) and be hotkeyed while you are in another program.

All the functions are covered in three slim, well written user manuals. Installation is easy using the Setup program and instructions in the manuals.

PC SHELL

A graphic directory tree is displayed in the left window. You move the cursor to select a directory and the right window displays the list of its files. From this you can select (by cursor) files for copying, moving, deleting, printing, and changing attributes, etc. Two more windows can simultaneously display another directory and its files, e.g. the target directory for a copy or move. Directories can be sorted by name, extension, size or date, which greatly facilitates locating files.

Other utility functions include: Checking a disk for defects and marking bad sectors out of use. Searching the disk for an ASCII or HEX string. Locating all directories which contain specified files.

Disk editing and comparing disks.

Pruning and grafting the directory tree. Recovering deleted files.

Displaying a map of memory resident programs.

Additional Functions Include:

Mirror: Keeps a backup copy of the File Allocation Table (FAT) and root directory and can track deletions to facilitate recovery from accidental erasure or formatting of your hard disk.

Compress De-fragments files in such a safe manner that they can still be recovered if there is a power failure while doing so. Some rival disk packers are not so safe. Compress recognizes most copy-protection schemes and will not move hidden files. A graphic display maps the progress of the compression. Fragmented files greatly slow disk access, shorten hard drive life and impair recovery of deleted files. When first run with badly fragmented files, Compress is a bit slow, but subsequent compressions take only a few minutes. Hard disks should be frequently de-fragmented.

PC Cache: This new feature of PC Tools offers most functions of Super PC-Kwick, but saves you paying for separate disk caching software. Caching can be done in LIM expanded memory, or in AT extended memory.

PC Secure: Is another new feature, can encrypt, decrypt and compress files, to make them more compact (for storage or communications) and unreadable without the password.

PC Backup: No need to buy separate backup software, PC Backup is fast, but more important recovery is reliable. Optional selections make it ideal for full and partial backup to any DOS compatible diskette, tape or Bernoulli. Hard disks will all eventually fail. If you are not backing up, *your* omission will eventually catch up with you!

DESKTOP MANAGER

This new addition to PC Tools offers many features.

Notepads: This is a simple word processor and includes a spell checker. You can add words to its dictionary.

Outlines: For organizing your thoughts in outline form. It is similar to the outliner in Borland's Side Kick.

Data Base: Has multiple sorting capabilities for organizing information. It is compatible with dBase III files and includes an automatic phone dialer.

Appointment Scheduler: This has a calendar and diarizes your schedule. An alarm can warn you of appointments *or* start a program at a preset time.

Telecommunications: 300 to 19,200 baud and ASCII or X-MODEM protocols are supported. Procedures can be automated with script files and files transferred in background.

Calculators: This new feature of PC Tools provides: An algebraic calculator, A financial calculator that emulates the Hewlett Packard HP-12, A programmer's calculator that calculates in hexadecimal, octal, binary or decimal!

Macro Editor Lets you record and save keyboard macros. It is compatible with Prokey 4.0 and higher, and can use Prokey files.

Utilities: Options include changing the display colors and unloading TSR (terminate and stay resident) programs from memory.

What Could Be Better?

I would like to see some minor changes to the user interface in a future version. Addition of a low level hard disk formatter would be the icing on the cake.

If you have hard disk, you cannot afford to pass up so many useful and reliable utilities. You'll be amazed how much you get for such a small price. If you have an earlier version, now is the time to upgrade.

Chris J. Metten, B.Com. (325-9609) is a technical writer and Photographer, who specializes in writing software and hardware user manuals.

Continued From Previous Page

included with the SmartForm package. Presumably Claris intends to sell this package in large installations where multiple copies of the Assistant program would be purchased for massive data entry jobs. The program does not have much of a database backend, but it can import or export data in SYLK, DIF, .WKS, .DBF and other formats for further analysis.

It is interesting that Claris took this approach to forms management. They have a great flat file database product, Filemaker II. If they had added the layout features of SmartForm to Filemaker II, they would have made a great product invincible. Instead they chose to create a separate product for what is perceived by industry analysts as "the next big thing". A glimpse of the market it is targeted at is contained in the packaging. They offer site licenses for 100 to 1000 users. The orientation is towards large volume production level input for the product. Unfortunately, despite some nice features, it lacks power both as a forms manager and a forms creator.

I'll Stay With My PageMaker

If you want program to simplify the creation of forms for filling out by hand, I recommend that you use a combination of desktop publishing and drawing *programs* such as PageMaker and FreeHand. SmartForm Designer doesn't have what it takes to compete against graphics programs alone, and the unique features it does have are not enough to make me switch.

Karen Renfrew is a document production specialist and owner of FreeLance PagePrep. She has over 20 years experience in forms production. This article was prepared in conjunction with Paul Villiamy and Scott Falkner and reflects their collective opinion on the product.

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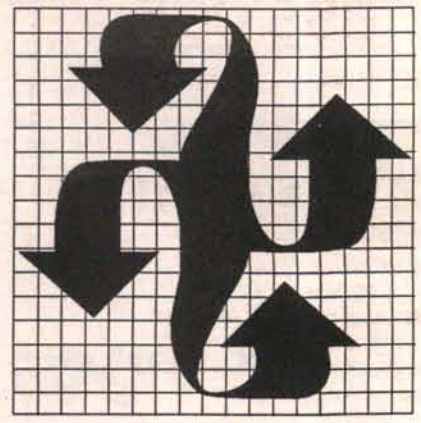
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Communication: Bridges, Gateways, and Reuters



Bridges, Gateways, Routers - sounds like some kind of "do it yourself" article doesn't it? Actually not -- these three components of a Local Area Network (LAN) are critical to the continued growth and acceptance of personal computer based LANs.

What are they? What do they do? Well, they basically all do the same thing - establish a communication link between micro, mini, or mainframe computers so that information may be shared between them. This capability is normally required by larger corporations and is becoming an issue as more firms move toward electronic interaction with their customers and suppliers.

Smaller is Easier

Before I look at the three components, let's review some basics. All computer communications are performed by transmitting "packets" of data. A packet is like an envelope to be mailed, it has a address, a return address, and inside is the data. Large data transfers are accomplished by sending many packets. Packets are small, easy to manage, and efficient. A lost or damaged packet may be easily re-transmitted. In larger communication networks, different routes may be used to transmit packets from one source to the same destination, thus taking full advantage of all resources, and distributing the communication load. Different methods of communications use incompatible types of packets. Multiple LANs connected together are referred to as an internet, each LAN a subnet of the internet. In this article, I will use internet to refer to any combination of connected LANs, mini's or mainframes.

Bridges

A bridge is used to connect two similar LAN's together. However, different topologies are possible, on each side of the bridge; one Arcnet, and the other Token Ring for example. In this case, the bridge must do some packet translation, as the packet format between two topologies is different. Bridges are dumb in that they quickly pass all packets across, regardless of the ultimate destination subnet. This can have a serious effect on performance in very complex internets and wastes transmission time if long distance communication is involved.

Intelligent Bridges

Bridge software shipped with Novell Netware incorporates sophisticated "routing" formulas. Each bridge on a Novell internet maintains a list of all other bridges, and the shortest path to each. Thus internet packets are sent across the fewest bridges, and no packets cross a bridge unnecessarily. Bridging may be done internally in a file server, or externally at a node. An external bridge will either be a proprietary unit or a workstation with the NIC's installed, running the bridge software.

Flexibility

Netware supports up to 4 topologies bridged at the file server. On a single server network, a choice of communication protocols is available to assure the most cost-effective configuration. Remote bridges connect distant LAN's via telephone lines. In this case, intelligent bridges can provide significant savings since no charges are incurred for transmitting unnecessary packets.

Gateways

Gateways connect a LAN to a "foreign" or Host computer, either a mini or mainframe. They may be directly connected to the host if in the same building, or via telephone lines for remote access. A Gateway consists of a card which is installed at a workstation and some software to operate the card. In operation, the Gateway establishes a communication path for packets from workstation(s) on the LAN to the Host, and vice-versa. A single "gateway" card/software combination will support some number of simultaneous "connections" or "sessions" from LAN workstations to the Host, thus the name "Gateway".

Just Another Terminal

Since users on the LAN are connected to a "foreign" system which is not running a personal computer based operating system such as DOS, they typically run terminal emulation software in order to trick the Host into thinking their computer is just another Host terminal. Emulating a terminal on the Host may not be all that is necessary. In many cases, the ability to transfer files to and from the Host is required, possibly with some data translation. If you are considering a Gateway, make sure that your supplier is fully aware of all your requirements.

Routers

Routers are relatively new in the LAN world. As the name implies, a router routes packets from one system to another either LAN to LAN or LAN to Host. They are intelligent, so only packets whose destination is "on the other side" are accepted for routing. In addition, several different protocols (IPX, TCP/IP, ASYNC, DECNET, Ethernet etc.) may be routed simultaneously over the same physical connection. The multi-protocol and intelligent handling of packets makes routers ideal for situations involving communications, since only one high speed line is required to service a number of different systems. Only necessary packets are transmitted, reducing the communication traffic and cost. In addition, routers are self-starting. If a power failure occurs the router would re-boot and carry on when power is re-supplied. Routers are like bridge in that they will do protocol translation; i.e. a router will translate packet types. Routers also capture statistics on traffic flow, allowing the network administrator to monitor activity and make the best use of communication resources. As more and more computing platforms become interconnected, routers will play a greater role in helping sort out the traffic.

From the USER's Perspective

An average user should be blissfully unaware of the presence of any LAN to LAN connections, and need not care if the device used is a Bridge or Router. When accessing a foreign host via a Gateway, using terminal emulation software, the user will typically be aware of the change, since screen displays, Host commands, and keyboards (particularly function keys) tend to change with each Host. Trying to train staff to understand that F20 is really a CTRL-ALT-F10 on their personal computer may be more difficult than anticipated, causing frustration and errors.

Windows of the Future

Rather than standardize keyboards and displays, the computer industry is moving towards the Macintosh approach - where pictures (icons) provide implied descriptions, and the mouse supplements the keyboard. By using pictures and mice, changing from one system to another may be noticeable, but nothing like having your keyboard change with each new connection!

Mike Wolfe is a partner with Saftrak Systems Inc., responsible for the sale, installation, and support of Novell LAN's. He also teaches introduction to LAN's through the Vancouver School Board and is Program Director of the Vancouver Netware Users Group.

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IKEK COMPUTER SOCIETY DISTINGUISHE9 SPEAKER, April 27, "Computer Networks", Contact Larry Yeuug, (604) 876-3221.

UNIX/XENIXc An In-9epth Approach, April 3,4,,5, Hotel Le Mcridien, Vancouver, B.C.

MacWorld Expcadlen. April 25-28, 1989, Washmgton, D.C., P.O. Box 155, 1200 East St., Westwood, MA 02090, Phone: 617-329-7'66, FAX 617-329-3Q68.

Mu'tiuserCenputer Shee, 2nd annual, M euo Tornto Convention Centre, May 17-19. Combines Unix &9, National user gmups, Comgraph (trade show of the Electronic Desktop Publishing Association.)

Canadian High Technology Show: Montreal, April 25-26. Contact 613-731-8361

9hcevery Enterprnes Inc. Establishmg a Market Niche and predicting Market Potential, April 13, 1989. Distribution Strategies for Entering the U.S. Marker, April 27, 1989. Discovery Park, main floor meeting toom, 3700 Gibnoce Way in Bumaby, 12.15 p.m. to 1:'5 pm. A sandwich lunch will be provided by Discovery Enteprises Inc. Call Jo-Ann Heywood '30-3533.

IEEE Infocom '89: Ottawa, April 24-27. Contact: 202-371-1013.

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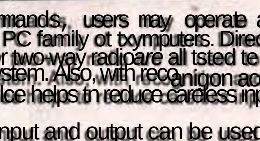
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Gord Simmonds is the owner of SIM-COM Services, a company in Surrey specializing in shareware products.

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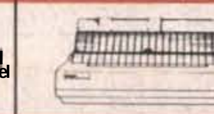


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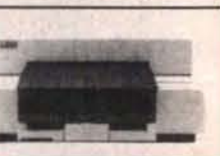


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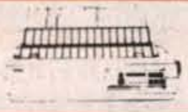


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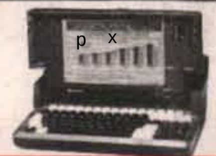
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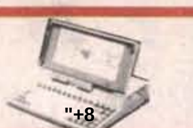




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