

im

FEBRUARY 1981 VOL. 18/NO. 2

STRIDE



*Stoneware
Advances To
400 Series*

FOR A FREE
CATALOG
CALL
1-800-368-5555
OR
313-575-1100



Red buses are a sure sign you're in London, the site of Stride's new support office.

Stride Opens U.K. Support Office

Bob Coleman, president of Stride Micro, has announced the opening of a Stride Micro Sales Support Office in the United Kingdom effective January 1, 1988, at

Stride Micro, U.K.
Cannon House
120 Regent St.
London W1B 5PA
Tel: 1 427 6888
Telex: 252950

This office is located at the heart of London's famed Old Bond Street/Dean Street shopping centers, just directly across the street from the immediate neighbors. The opening of this support office

signifies a new expansion of the distribution strategy in the United Kingdom. Previously, Stride Micro (formerly Sage Computers) was exclusively represented by TDI Limited of Great Britain, who also represents Reference Systems in the U.K. and Europe. The new sales representatives of the United Kingdom market (Stridex) in the U.K. and the multiple operating systems available on Stride and Sage, mandated additional distribution channels. Stride Micro's new strategy is to add distributors and OEM's specializing in a particular operating system. TDI Ltd. will continue to represent Stride Micro for those operating systems: the μ -System, CP/M and MS-DOS.

The U.K. office will initially be staffed on an alternating basis by Stride Micro international personnel until a general manager is selected.

For the next few months, the office's principle function will be the coordination and support of distribution activities, including both software and hardware needs, trade show and product packaging. The next phase will be additional customer support, including hardware check-in and maintenance.

The Stride Micro, U.K. office will also provide support and communications coordination to continental Europe and Scandinavia. ■

up a disk partition, RM/CDS is small enough to run on the floppy-based 400, 800 or 1600 applications programs require extensive disk space and are not designed for floppy operation.

Up to 18 users can exist on the 400 series. Each user is easily installed and requires only about 48K additional memory. The amount added per user decreases as the number of users goes up, due to conservation of resources in RM/CDS. Again, this means all 18 users can reside in 1M byte of RAM.

Users talk to RM/CDS by typing in JCL commands. JCL (Job Description Language) commands are the user's real prompt, which is two brackets []. This style is similar to that employed by UNIX, DRB, CP/M and many other systems and shows its main-frame origins. The JCL commands can

also be entered in a sequential file to be used as a batch stream. With batch streams, non-technical personnel can "launch" operations and have less to memorize. Some vertical applications use batch streams extensively, so that the operating system is totally invisible to the user.

The four manuals for RM/CDS and RM/DCDS are well written and quite thorough. Most impressive is the description of the code editor which compresses 118 pages. Each error code/patch is not just a code, but includes a good English description is given with a list of reasons why it could occur, suggestions on how to clear it up are also given.

Two editors are supported under RM/CDS. The screen editor is designed for use with video display terminals and

deals with cursor movement. Over 20 terminals including the Televideo 1900, Freedom 180, Game CRT182 and Vipe IV-80 are supported. The line editor is a breakback on TTY days, but is useful as a backup if one of the supported terminals is not available. It is also useful for editing during batch streams. Other third party editors and wordprocessors are available in RM/DCDS, but may not yet be ported to the Stride.

In conclusion, RM/COBOL and RM/CDS provide Stride with nine years of systems and applications software, offering a large body of proven business solutions. Exciting things will be happening with RM/CDS in the next year as the operating system reaches Stride users. ■

As the RM/CDS and RM/COBOL software is developed, it will be made available to other Stride users.

SAGEBRUSH

by Hyperception

GRAPHICS FOR SAGE AND STRIDE COMPUTERS

HYPERCEPTION CAN ENHANCE SAGE II, SAGE IV, AND STRIDE 400 SERIES COMPUTERS WITH VERY POWERFUL GRAPHICS AT VERY LOW COST

Besides the standard SAGEBRUSH graphics command software, Hyperception also offers business software that uses many selections to create charts and graphs from text files.

The following list of features shows why SAGEBRUSH graphics is clearly the performance-price answer for Sage and Stride systems:

• **True-bit mapped graphics and text.** Unlike standard bit-and-bit graphics, images may be transferred to another disk, used by hardware devices. SAGEBRUSH software supports hardware for popular printers. Combination of bit-mapped text and powerful software text-rendering features allow infinite variety of text fonts and sizes.

• **Fully integrated, p-System compatible software.** Some SAGEBRUSH graphics command set highlights:

ARC	arc, circles, and ellipses	DRAP	background color and rotation vector — useful for hidden line removal
AXIS	x-y-axis path with marks	HDRAW	
COPI	rotation	PHASE	quadrants generation
COORD	controls character dimensions in x and y directions independently	QUADP	user-defined to hardware device
CSLANT	character slant	LTHICK	controls line thickness
CTHICK	character thickness	LTYPE	controls line type
WINDOW	text and graphics window function ("clipping")	SCALE	scales screen to user-defined units

The disk transfer command set is equally powerful. Some disk transfer command set highlights:

DISAD	transfer disk image file to video display
DISDVE	transfer video display to disk image file
DISAD-transfer	AND, OR, and XOR disk image files with p-System array
DISDVE-transfer	read images from video display to p-System array
DISRITE	write images from p-System array to video display
DISDVE-transfer	AND, OR, and XOR video display with p-System array

• **Multi-user single display and multi-user multi display operation.** In the former case all users share a SAGEBRUSH unit and display; in the latter, each user has a dedicated unit and display. Dedicated multi-user operation is achieved by sharing SAGEBRUSH units together.

• **BRUSHRAI option can add host bus graphics entry, screen positioning capability.** BRUSHRAI connects directly to a SAGEBRUSH unit, and supports distributed multi-user operation. Option includes software.

• **Standard monochrome/composite video output** — no need for an expensive video monitor. Video output available at both options and a SPC connector.

• **Only low-cost, standard printer with dot-addressable mode necessary for hardware** (e.g. Okidata, Epson, etc.). No need for expensive color printer.

• **102 x 200 resolution (non-interlaced screen) or 112 x 112 resolution (interlaced screen).** Units may be upgraded to 102 x 112 resolution by adding memory and changing an EPROM.

• **IBM-compatible design.** Units may be upgraded from Sage to Stride operation at any time via conversion kit. Kit includes connector hardware card (for video components), and proprietary PAL.

The Hypercept business package is also available from Hyperception. An easy-to-use, menu-driven software package. Hypercept features:

• Five types of output formats (D-D-plotogram, pie chart, bar schedule, multi-variable graph, standard histogram)

• Data sets created by menu query or text-editor, modified using text-editor

• On-line HELP screen

• On-line example datasets

ALL PRICES SUGGESTED RETAIL, DEALER PRICES MAY VARY

	162 x 200 res.	112 x 112 res.	
SAGEBRUSH (Sage II, IV)	at \$1000 res.	at \$1200 res.	
SAGEBRUSH (Stride 400)	at \$1100 res.	at \$1300 res.	
Resolution upgrade	N/A	at \$200 res.	
Sage to Stride Conversion	at \$400 res.	at \$400 res.	
Stride to Sage Conversion	at \$0 res.	at \$0 res.	
Monitors	at \$175 res.	at \$175 res.	
User's Manual	at \$75 res.	at \$75 res.	
Type and mode of printer			
Method of Payment	Credit Card	COD	Check or MO (Texas residents add 8%)
Name	Company	State	ZIP
Address	City	State	ZIP
Mainframe No.	Interbank No.	Exp. Date	Exp. Date
Fax No.			

Hyperception / 3808 Lammson Ave., Suite 400 / Dallas, TX 75219 / (214) 895-1638



Alice Arthur, Stride Wiper's Manufacturing Manager.

Few things make **Alice Arthur**, Manufacturing Manager for Stride Wipers, happier than a big 400 Series production run moving through the factory. Alice is slim, energetic, gal, who likes to keep busy.

Originally from Oregon, Alice previously worked in management at Stratus Products, a Pico manufacturing house, and Lynch Communications Systems, Inc., which builds telephone communication equipment. Alice brings 29 years' worth of manufacturing experience to Stride's Pico factory.

Residing on a less serene ranch in Washed Valley (just outside Reno), Alice likes lots of living room. When even her ranch seems too small, she goes trout fishing in the Sierra Nevada mountains—always with an eye out for snowheads as she is also a "rain" trout.

Closer to home, her favorite activity is water-skiing regular on Tuesday nights. Alice has been boating almost as long as she's been manufacturing electronics, and now averages a mean 133 mph in a 21 handicap. A competent and gutsy lady, Alice is a real asset to both her boating team and Stride Wiper.



Bob Goodham, one of the three original founders of Stride.

Bob Goodham previously specialized in microcomputer development for Lynch Communications Systems, Inc., where he met Bud Coleman and Bill Gorman. The three of them eventually joined forces to create Stride Computer, now Stride Wiper. As one of the original founders of Stride, Bob has been involved in almost every aspect of the company.

Currently, Bob is Stride Micro's circuit board designer in Research and Development. He bosses a sophisticated color CAD/CAM system, juggling high performance design/interconnect board space and cost.

Everybody has their little quirk, and Bob is no exception. He rarely wears shoes. Recently this resulted in elevated feet on a steep parking trip. After being seven miles in knee-deep snow, he finally shot a deer. As this was his first time deer hunting, Goodham realizes how hard it was going to be to get that 125 lb. buck down the mountain all by himself (it took his headlamps to get down). Maybe Bob should stockpile normal heels or hang gliding, all-terrain riding, skateboarding, and, of course, computers!

How can I get a copy of the new Software Directory that describes programs available for the Stride/Sage?

As of Dec. 10, '84 all new owners who send in their registration card will receive a free copy. Otherwise, you may purchase a copy at Stride/Pico or through your Stride dealer. (D0054 \$1.50)

Is RM/005 available for Sage 817As?

Not at this time.

What happened to the toll free 800 number that used to use to call Stride?

These "Waste" lines to Reno and Boston were discontinued last month in an effort to upgrade service and support. That may sound like a paradox, but we have found that the 800 number was actually resulting in a service decline. In recent months we have noted that incoming support calls on the 800 number were often less to 10 times as long as calls on conventional lines, unnecessarily tying up personnel. We've even had customers preferring to hold instead of waiting for a callback saying, "Don't worry, I'm on your time." This meant that issues that should have been spent for support, unfortunately going to life but. The 800 lines were originally intended to allow dealers to get quick responses to their customer's support needs. However, hundreds of end users obtained the number and due to the above observations, it seriously hampered our customer support efforts. Hopefully, even though we'll now "be on your time," the increase in service will satisfy the lack of convenience.

If the floppy disk heads need cleaned, shouldn't I also clean the tape drive heads?

The manufacturer recommends that the tape drive heads be cleaned once for every two hours of tape head motion. Use a #1 cotton swab (D-16) soaked in 90% (isopropyl) alcohol and run lightly over the heads.

When will 256K RAM be available for the 400 Series?

As of Feb. 1, Stride will offer 256K RAM configurations for the 10-MHz 400 Series. The faster RAMs (120ns vs 150ns) for 10-MHz operation are not yet available.

SURELY IT WILL
COME TO PASS...

PRESENTLY SUPPORTING
STRIDE MICRO
All Models

THE
S1 THE NEXT
WORLD STANDARD
OPERATING SYSTEM

- MULTIPLE MULTITASKING PER USER
- TASKING, EVENT'S GATED
- SYNCHRONIZING Remote Login, Distributed File System, International Communications
- FULL SCREEN MANAGEMENT (Including the World's Oldest)
- FILES (Binary, Record, Read (Data, Value, Index)
- PORTABLE TO Other CPU ARCHITECTURES AND MODELS
- GOOD SYMBOLS PER FOOT, Number Of Pages Unlimited
- MULTIPROCESSING (in To IBM Processors (Continuously Running/Interrupt Table)
- SUPPORTS ALL FORMS OF MEMORY MANAGEMENT (Including Virtual Memory - Not Not Required)
- TOTALLY MODULAR Every Function is A Separate Module AND A Module Can Run On Any And Any Computer
- COMPLETELY UNIFORM AND CONSISTENT THROUGH ALL VERSIONS OF ALL HARDWARE FOR ALL USERS, ALL PROGRAMS AND ALL APPLICATIONS

ONLY S1 VENDORS & USERS
WILL SURVIVE THE NEXT REVELATION

Stride 201, 123 Franklin Street, St.
Louis, Missouri, 63101, USA
503-550-4100, Telex 527077,
COMTECH STRIDE JAPAN



Hyperception

SOFTWARE FOR SAGEBRUSH GRAPHICS ON
SAGE AND STRIDE COMPUTERS

HYPERCEPTION PRESENTS THE HYPER-SERIES: SOFTWARE SUPPORT FOR SAGEBRUSH GRAPHICS

In addition to standard Sagebrush® (registered) software, Hyperception also offers complete packages which enable immediate and effective use of the outstanding graphics provided by Sagebrush® on SAGE and STRIDE computers.

• **Hyperplot** A business-graphic package, Hyperplot features a truly friendly human interface. Using Hyperplot comes naturally, users typically do not find it necessary to refer to documentation. Some of the reasons why Hyperplot completely provides charts and graphical communications/business information without extra effort are:

- Menu-driven selections
- On-line HELP menu
- Plot types of output format: 2-D histogram, pie chart, bar chart, bar chart, multi-variable graph, standard histogram
- Data also available to menu-driven text editor, modifying text editor
- Single data set structure allowing one dataset type presented many of the five output formats
- On-line sample display
- Screen dump to printer with bit-addressable graphics mode



• **Hyperpaint** Turns a Sagebrush® display into a graphics window via the BRUSH-PAINT option (palette or mouse). In line with the software design philosophy of Hyperception, Hyperpaint also benefits an evolutionary human interface:

- On-line selections
- Free-form graphics entry (angle and varying widths of paint brush)
- Figure generation (boxes, circles, rectangles)
- Text scaling (horizontal and vertical, varying boldness)
- Disk storage and retrieval of images
- Screen dump to printer with bit-addressable graphics mode
- Constant user feedback provided by screen markers which change personalities depending on the current function



• **Hyperimage** A powerful image processing package which takes full advantage of the speed provided by 80000-based machines, Hyperimage offers a few surprises for super-processing professionals:

- Menu-driven operation in all cases
- Frequency analysis. Includes 2-D type spectrum representation with hidden line removal using the Sagebrush® foreground/background (FG-BG) or speed optional cross-hatching, vertical lines generation. Also includes FFT generation, filtering, window, and log magnitude approximation at 80000 samples, long coded for speed.
- Frequency-domain generation of complex signals using BRUSH-PAINT speed option (palette or mouse) for zero-phase transformation into the real domain.
- Tone analysis. Includes line-segment display with scaling and zoom functions. Also includes parallel line, window comparison and re-creator via three predictive coding techniques (less 80000 samples, long coded).
- Disk storage and retrieval of images
- Screen dump to printer with bit-addressable graphics mode



ALL PRICES SUGGESTED RETAIL ONLY. DEALER PRICES MAY VARY

Hyperplot	_____	at \$225.00			
Hyperpaint	_____	at \$225.00 (Free with purchase of BRUSH-PAINT option)			
Hyperimage	_____	at \$395.00			
BRUSH-PAINT	_____	at \$100.00 (Includes command and software to access analog channels and external 8-bit digitizer)			
Method of payment (New residents add 6%): <input type="checkbox"/> Credit Card <input type="checkbox"/> COD <input type="checkbox"/> Check or M.O.					
Name	_____	Company	_____		
Address	_____	City	_____		
Mastercard No.	_____	Merchant No.	_____	Exp. Date	_____
Visa No.	_____	Exp. Date	_____		

Hyperception • 2630 Lemmon Ave., Suite 600 • Dallas, TX 75218 • (214) 698-9556

SAGE and STRIDE are trademarks of Sage Microsystems.

HYPERCEPTION, SAGEBRUSH, and BRUSH-PAINT are trademarks of Hyperception, Inc.

in **STRIDE**

Editor: Verena Borham
Advertising: Diana Swain

In Stride is a monthly publication of Stride News. Subscriptions are \$24 for one year. Purchases of a Stride magazine includes a one year subscription upon receipt by Stride News of a fully completed owner's registration card. Back issues are available for \$4.00 per copy, an supply limit. Requests for subscription, reprint permission, ad rates, back orders, or cancellation of previous articles should be sent to the Editor, in Stride.

Postmaster: Change of address notices should be sent to:

Stride News Headquarters

Editor, in Stride
Stride News
4806 Energy Plaza
Reno, NV 89502
(762) 322-8888 (Mon - Sun PST)
Telex: 913399 6231

Stride News Divisions

Stride News Eastern Division
25 New England Executive Park
Suite 109
Burlington, MA 01803
978-255-8888

Stride News Southern Division
74755 Freeway Road
Suite 800
Dallas, TX 75240
(214) 382-7070

Stride News, U.K.
Chester House
128 Finsbury St.
London EC2A 4DF
Telex: 4027 8802
TL828782

©Copyright 1982-1985 Stride News.
All rights reserved.



A Faire Mix Of Gunpowder

By Verena Borham

Stride Faire 1985 is finally here. Maybe you've wondered why we go to all the fuss and bother. Obviously, it's good marketing, but few companies the size of Stride spend money on their own show. We've never been accused of being marketing specialists, so why do we do it?

I've, despite momentary hesitation and fit, everyone at Stride really enjoys the Faire. It's a great treat, but only do we really get to meet and see the people we're talking over the phone in person, but we get to shake off the work done in the last year and pick up new ideas for next year.

The real thing is some very impressive speakers — the ones we always expect to hear. An agenda of the show follows on page 7. The presentations are being taped (once only), so if it was totally impossible for you to attend, you'll still be able to get cassettes of the events that interest you. We also hope to get a few of the speakers to transform their talks into articles for future issues of *In Stride*.

It is always surprising how many international users attend. It's a long way for them to come. Some special events are always planned for the non-USA folks as they have many different equipments for displaying in their countries. The Faire provides an excellent opportunity for us to meet with them and discuss their special problems. Often, the answers are provided, not by us, but by someone from another country who faced that problem and solved it creatively.

The biggest reason for having the show is to make "gunpowder." Mixing the contributor equivalents of sulfur, saltpeter and charcoal (hardware, software, and peo-

*Inside
in Stride*

ple) sparks an explosive surge of ideas and products to charge the intellects of our Research and Development people and provide new computer toys for us in the years to come. Playing with gunpowder is dangerous, but exhilarating, and that's what gunpowder is all about.

So maybe you can understand why, for example, the agenda is a little heavy on Modula-2. Right now, Stride has no money making Modula-2 items or its product yet. Yet, because we have the vision that Modula-2 will move to prominence as a computer language, it is a major topic of the Faire. In fact, Stride may have done a better job of getting together all of those interested in Modula-2 than the partners of some of the other Modula-2 seminars held lately.

However, much of a gamble Modula-2 may seem to you, Stride is also making some sure bets. At this time, our readers use IBM's advanced Pascal (FORTRAN) — oriented, but the balance will change with the introduction of RM-0005 to the Stride. RM makes some pretty exciting claims about their system (applications run three to seven times faster than under Unix and has good multuser support), so the RM-0005 presentations should draw a good crowd. The 400 Series has the potential to be an exciting business machine, with RM-0005 being a great and true vehicle for driving it.

It must be pretty obvious by now that while the Stride Faire has a lot of good marketing reasons behind it, it's not this for love, not money, and I think one reason the Faire has sparked such a high degree of interest, is that there are a lot of other computer folk out there who feel like an elf. ■

Contest Winners

Congratulations, Martin Luszczowski of Drexel Computer Systems! You were the first to find the maximum of "Sage" in Stride's new literature. Martin found the error in the Stride 400 Series Owner Manual, Volume 1, page 83.

Another super sleuth, Bruce Labendorf with Siemens Corp., found a "blat" on page 817 of 400 Series Owner Manual, Vol. 1 and also on the diagrams for the hardware.

Both have won a free copy of the Martin Contest Program. Enjoy! ■

In Stride Contest closed February 1, 1985. High scorers are on this page in the October, November 1984 issue.



Now Macintosh speaks your language.

The Mac Advantage: UCSD Pascal. Everything the serious programmer needs to develop user-ready applications on the Mac.

Here's the development environment that helps you design fully featured programs directly under control of the Macintosh operating system. Its compiled UCSD Pascal, the serious programmer's language of choice. With immediate access to virtually all Mac ROM routines including pull-down menus, overlapping windows, clipboard, desk accessories and, of course, the mouse.

Now you can write large, fast programs for the 128K or 512K Macintosh. Or the fast, Compatible with UCSD Pascal based on Apple II/II+, Inside and other popular microcomputers.

The Mac Advantage: UCSD Pascal comes complete with powerful, easy-to-use development tools and utilities. And one feature that's really easy to like: a low price tag.

For more information, call toll-free 800-475-8888 (In California, 800-424-7667). SoftTech Microsystems publishes software, too. Interested? Call our toll-free number or mail the coupon.

SOFTTECH
MICROSYSTEMS

2075 N. Berkeley Blvd.
San Diego, California 92107

Mac Advantage: UCSD Pascal is a trademark of SoftTech Microsystems, Inc. UCSD Pascal and related materials are the property of the University of California. Usage is a trademark of Apple Computer, Inc. Macintosh is a trademark of Apple Computer, Inc.



Mail to:
Customer Sales and Support, SoftTech Microsystems, Inc.
2075 N. Berkeley Blvd., San Diego, CA 92107

- YES, I want to create Macintosh programs that speak my language. Send me information on:
- The Mac Advantage: UCSD Pascal Designer Tools
- I'm interested in SoftTech Microsystems publishing my software. Tell me more.

Name Title

Company

Address

City State Zip

Telephone ()

- Area of activity:
- Commercial Strategies Manager Developer
- Research/Dev. Educator Other
- Business/Inv. Consultant

Not available for Macintosh: The Designer Tools (SDP000017), Macintosh Development Environment, etc.



As Arley Dealey had neglected to take photos when his SAGE II froze (this photo is a mockup), he offered to recreate the event, only this time with a Strite 486 . . . Nice try, Arley.

On-line Despite Dallas Deep Freeze

It seems Texas isn't always as hot as commonly thought. Last winter Dallas had a cold spell of 100 or so consecutive days of 18 degree weather. Besides being uncomfortable, this set up a potential catastrophe for one of Strite's installed users: Arley Dealey, owner of machine 449.

It seems Dallas winter rains are not designed for such cold spells. One Saturday night an 18" rainburst in Arley's computer office, although this was during his normal working hours (don't all programmers work Saturday night?), this happened to be the one weekend he had decided to take a little time off.

By the time this break was noticed, the very large building contained a couple of hundred thousand gallons of water, filling the rooms two feet deep. Of course, all the circuit breakers tripped, shutting off the heaters on the water train.

Arley kept his Sage II on its edge under the desk on the floor, as it was thoroughly soaked and frozen. Several diskettes and programs were ruined, but Arley, luckily, had kept some backup copies off-site.

After draining the rooms and a cold week of running dehumidifiers, the building was back to normal and the Sage II had thawed out. For a day, Arley powered it up. Lo and behold, it booted and has continued to run perfectly to date. Well, almost perfectly . . . the fan apparently had all of its oil washed out and is rather noisy!

Naturally, Strite doesn't recommend immersion and deep freezing as a method for every-machine, but it's gratifying to hear a real survival story. ■

Oh, Arley, Arley Dealey is a computer expert who works for the Strite. Strite has no employees for Sage II and Arley is not a Strite user. Arley is responsible for the content of his column for this column.

SAGE-IBM PC BUS INTERFACE

- NOW SAGE II & IV OWNERS CAN USE IBM PC EXPANSION BUS CARDS INCLUDING:
 - IBM bit map graphics cards
 - MICROSOFT mouse
 - MICRON EYE video camera
- ALL IBM CARDS RUN AT FULL BUS SPEED
- LOW COST
 - SAGE-IBM conversion card with software \$350
 - expansion box for IBM cards \$450
- HIGH PERFORMANCE SOFTWARE FULLY INTEGRATED WITH UCSD P-SYSTEM INCLUDES:
 - libraries to drive graphics, mouse, and videocamera from UCSD Pascal
 - applications programs for painting, electronic design, plating & more
 - SOURCE CODE FOR ALL SOFTWARE
- FOR MORE INFORMATION CALL OR WRITE:

SYMMETRIC RESEARCH

15 CENTRAL HWY, SUITE 25, KIRKLAND WA 98033 • 206-826-6560

TRADENAME: IBM PC, MICROSOFT, MICRON EYE, SAGE II & IV



CONCURRENT MULTI-USER DATA BASE WITH INDIVIDUAL RECORD LOCKOUT! UNLIMITED NUMBER OF FIELDS, FILES AND RECORDS!



- Menu Driven Option
- Conversational Query Language
- PD-Basic (Interactive Procedure Language)
- PAGEAL, Program Access to Data
- Concurrent Multi-User Support
- Connected Multi-User Support (Byte Size Independent)
- Single Record/File Locks
- 18,000 Files/User Name
- 32 Active Files
- 2 Billion Records/File
- 2,000 Fields/Record

- 32,000 Characters/Record
- 9 Levels of Security
- Data Field Compression
- Dynamic Dictionary Definitions
- Complete Data Type/Range Checking
- Automatic Relational File Access (Hierarchical/Multi-Branch)
- Permitted System I/O
- Unlimited Sort Fields
- Unlimited Selection Criteria on Any Field
- Quick Report Generation
- Optional Mail/Data Merge Interface
- Application Developer/Dealer Program

For more information contact:

IOTC Inc.
P.O. Box 1389
Lansing, MI 48209
(313) 731-8818



IOTC Inc.

FRIDAY, FEBRUARY 4, 1988

8:00 Registration Opens

9:00 Opening Address

10:00 Product Presentations

11:00 Exhibit Hall Opens

11:30 Lunch

1:00 Jack Brown — "8000 — Past, Present, and Future"

2:00 Brian Kirk — "MOXE: The Module 2 System"

Steve Peterson — "ISA/CGS: The Commercial Operating System"

10000 Meeting

3:00 Mike Stevens — "What is 10000?"

Chris van Dusen — "486 — A Fox to Hunt"

4:00 Paul Regel — "The Build Store Approach to Software Development"

John Mason — "Multiterm Advanced DB Module on Stride Monor"

5:00 Exhibit Hall Closes

7:00 Jim Bondy — "Introduction to Module 2"

Bill Barkley — "Graphics Presentation"

SATURDAY, FEBRUARY 5, 1988

8:00 Jim Morrison — "10000: the System Users a Society and you"

Markus Singh Khosla — "Building Computers & Systems: A Successful Method"

9:00 Exhibit Hall Executive Panel

Exhibit Hall Opens

10:00 Melissa Roth — "A Fast and Compact Module 2 Computer"

11:00 Lunch — (10000)

11:30 Lunch

1:00 Tom DeLorenzo — "The 1984 Coding Style Seminar"

2:00 Perry Gashman — "The Tenor Commitments of Professional Lisp"

Dr. Richard Greenwald

Dr. Richard Hilder — "Module 2 and Object Oriented Design: The Way to Next Generation Software on Stride computer"

3:00 Tom Hovland — "A Standard Graphics Package in Module 2"

Steve Mason — "Where are We in the Market"

4:00 Roger Spitzer — "Statistical Module Information — Module 2 Support Classes"

Steve Auer — "Business Applications Based on Non-Procedure Multiterm Database Technology"

5:00 The Future of Module 2 Panel

6:00 Exhibit Hall Closes

7:00 Microstrategies — "Picks" and "3P's"

Stevens — "Advanced DB Master"

10000 Hollywood Walk of Stride Show

SUNDAY, FEBRUARY 05, 1988

8:00 Linda Posen — "Intelligent Publishing and Module 2"

Pat Lutz — "CoCoCAD on Stride Monor"

9:00 Jim Bondy — "Design of Multi-Tasking Applications on Module 2"

Jay Wagoner — "Arithmetic Number Crunching: Vector-Process Graphics and all That and"

Exhibit Hall Opens

10:00 Henry Bush — "The Module 2 Graphics Regime"

11:00 10000 Meeting

11:30 Lunch

1:00 John Barton — "The Transputer and OCCAM — The Concurrent Programming Language"

2:00 David Eastwood — "The Stride Operating System for Motorola 68000 class processors"

Metacornus Transputer — "Artificial Intelligence and LSP - The Future is Now"

3:00 Tom Hovland — "Software Modification Future Directions"

6:00 Exhibit Hall Closes

THURSDAY, FEBRUARY 7, 1988

8:00 Exhibit Hall is

8:00 Dealer Presentation

12:00 Registration Opens

7:00 MicroFinancial — "Finance"

8:00 Registration and Exhibit Hall



Simple keyboard menus clearly simplify operations.

Stoneware's Advanced DB Master Frees Computer Hostages

"Advanced DB Master was written for people who have previous information management applications but want a system that is easy to use," says John Dickinson, president of Stoneware. "Companies simply don't have the time or staff to become hostages to their software."

Data bases are one of the most frequently used computer programs, so the term "hostage" is pretty apt when you consider the amount of time spent with DBMS (Database Management System).

Unfortunately, there's a big Catch 22 in the database world: in order to set up a simple, easy-to-use DBMS for non-programming users, someone with a logical, structured view of the problems has to work through all of the database options and make a decision on what to use. The more powerful the database, the more options there are. This is always a time-consuming task, especially with a new database program. However, the time spent on the initial setup will make or break the usefulness of the system.

Fortunately, Advanced DB Master is somewhat forgiving and allows some changes to be made once the system has been set up.

The Advanced DB Master documentation provides a well-written tutorial for introducing the user to its features and powerful features. The tutorial follows the employees of the fictitious Noble To The Conclusions-Ovalled Company, as they set upon information-management systems. It first caters to lighter the straight-forward explanation.

Advanced DB Master is considered a mid-range database management system,

concentrating on providing an excellent user interface rather than access to gigabytes of information. However, the maximum file size is 1GB bytes, plenty for the majority of applications.

The original DB Master began its life in 1979 on the Apple computer. Since then, Stoneware has released two new generations of its product, the latest being Version Four. DB Master is also being sold as a selling business information management system for the Apple computer, with over 50,000 users.

"Dynamic value tables take a little time to set up but are amazingly useful."

Stoneware, however, has expanded its scope from the 8-bit world and moved to 16-bit machines with a new offering for the larger machines, "Advanced" DB Master. The folks who attended Sage Fairs thought a major review of the product. Many liked it so well that they said, "If Stoneware had a hard time not selling it until all of the features were implemented."

Advanced DB Master is one of the first programs to take full advantage of the Oracle Multuser environment and local area networking. Systems with several users can buy into Multuser license instead of several single user licenses at a considerable price savings.

Volume locking, file locking and record locking across the network keep data

secure without any special actions on the part of the users. Three password levels determine who can change files. Master, which allows full access, Read/Write, which lets users change data but not the passwords, and Read Only, which lets users look, but not touch.

Although the Stride/Sage machines have plenty of disk and floppy storage, data compression is used to make files smaller. The packing and unpacking routines to do this were re-written in 68000 Assembly Code to provide an extra order of speed just on the Stride/Sage machines. Dynamic file compression up to 32 floppies. Again, one file can store up to 1MB bytes of information. Some of the search algorithms were also re-written in 68000 Assembly to provide even faster searches and sorts.

Rather than store information in individual files that can be related (made to work together), DB Master uses a single large file. Advanced DB Master does have utilities to move information from separate files into one file, but it cannot work with several independent files of the same time.

The fact that Advanced DB Master is not a relational database is perhaps the only area where the program is weak. Plans internally are underway but even at this point a whole programming project may talk of this, the program is such a work-horse in so many other areas that this is only a minor flaw when looked at in perspective.

Advanced DB Master is really an integrated environment containing word processing capabilities, spreadsheet-like



The tutorial follows the employees of the Robinson Mass in the Greenboro Grovel Company as they set up a **DATA**.

calculations, look-up tables and great report generation. "Integrated" is one of those overused buzz words in the computer industry today, and StoneWare did not intentionally create a product they could label "integrated." They did however ensure that a non-programmer had everything needed to do the bulk of office jobs.

One of the novel features is the handling of text. Alpha-numeric fields can be up to 100 characters in length and can be edited when a change is needed, rather than having to be completely retyped. A complex text editor is built in for creating form letters and reports with database fields. The editor can handle up to 100 pages of text. Report generation is easy to design for any form up to 2000 characters in width.

Dynamic-value labels take a little better setup but are amazingly useful. Depending on the data entered into other fields in the record, specified fields will be filled automatically according to label values.

One common use of this is to fill in the price and correct name of an item once the part number has been inserted. The automatic fill-in prevents all sorts of typos and saves a lot of time entering records.

Computed fields are not new in databases, but StoneWare puts most of the power of a good spreadsheet into them. Up to 100 fields per record can be computed from the values in other fields. The formulae for each computed field can have up to 240 characters and can be quite complex. Boolean Logic (greater than, less than, etc.), math functions such as LOG, TAN and RAD (radian) numbers, branching, arithmetic nesting and references make very powerful instructions. Days between dates can also be calculated. The most powerful package built the logic and references of the formulas and ranges when entered into the fields.

Another feature, called "KeyStroke Macros" simplifies report generation. The first time the report is made, the sequence

of keystroke commands are stored. The next time the report is needed, the operator presses the single function key associated with that macro. For example, the F1 key could be set up to run macro #1. Macros can be up to 254 keystrokes and can be edited to include pauses. Macros can use other macros making very long sequences possible. In an office where complex reports are generated on a regular basis, KeyStroke Macros are not only convenient but insure that the reports are run the same way each time. They can also be used to speed or prioritize email data entry.

StoneWare has gone to a bit of trouble with their "Data Exchange" mode, a really excellent feature. Using this mode, data can be transferred between files and programs even on different computer systems. Standard ways of moving data from/to other programs such as DBASE II, Lotus 1-2-3, VisiCalc, WordStar and others are available. PC-DOS files can be converted to g-system files and back. Data structures are documented so that if needed, you can customize a file format to interface to other types of programs. This ability to exchange data is especially important to users upgrading from smaller machines.

Overall, users with jobs that require making lots to other entry will find Advanced Data Manager a good tool for their purpose. It's a workstation for handling huge amounts of information with exceptional report generating capability. ■

©1988 StoneWare DB Manager is a registered trademark of StoneWare. All rights reserved. StoneWare is a trademark of StoneWare Systems, Inc.

MicroSput Complex, Yet Efficient

By Richard McMillan

As system developers who have dealt with real time applications for a long time, our company, Techware, is in a good position to judge microcomputer hardware. Early in 1983 we found that the price/performance ratio of the Stride microcomputer makes them an ideal computer for the intensive demands of real-time process automation.

We can pack a great deal of consumer software into this machine, from multiple process control loops and equipment drivers to data logging and graphics, and still have enough CPU time left to provide a friendly system for the operator to work with. Although we do come using high level language, giving us the flexibility to design and implement a semi-custom automation system for each client and for each application.

Techware's first Sage-based automation system was installed in the Center for Materials Research at Stanford University. Our system, called "MicroSput," is used to control coating experiments performed in the Stanford reactive sputtering facility.

Reactive sputtering is a complex but efficient method of producing microscopically thin coatings of practically any material onto practically any surface. Applications of these coatings span many varied fields. Inks and window coatings are applied to glass for solar heating and cooling purposes. Transparent conductors on glass help keep windows clear of fog. Layers of metal and oxides on silicon and other wafers types are used in the semiconductor processes. Sputtering is used to coat plastic floppy discettes and hard disk surfaces with magnetic materials. Wear-resistant coatings are applied with sputtering techniques to increase the life of machinery parts.



Bruce Elin (left) and Anthony Wylfater (right) at the American Nuclear Society Conference discuss Techware products.

Without reactive sputtering as particularly exciting, demand for more computer automation because every new sputtering parameter sought under precision control allows new types of coatings to be deposited. Most existing sputtering systems are operated manually, or at best, responded through a hardware-directed series of operations using a firmware-driven microprocessor. The industry is, however, beginning to appreciate the "soft" approach of reconfigurable computer automation, implemented in a high-level language, to control every aspect of the real-time process.

MicroSput helps the materials scientist prepare exotic materials in a controlled and reproducible manner, and helps the production engineer quickly change his or her process specifications to make small quantities of various coatings economically. Techware has developed a special language, PAL (Process Automation Language), to provide the user with a simple set of commands necessary for installing and changing a sputtering process.

Each MicroSput system includes a fully configured Stride 420 or 440, a graphics terminal and printer, Techware's 2-80 based front-end processor, and all the interfacing, engineering and software necessary to bring the entire sputtering process control to fingertip commands at a video display terminal.

Communications between the Stride Sage and the front-end processor, and between the Sage Sage and the sputtering system's standard instrumentation, is done through the IEEE 488 port. The new intelligent sputtering equipment is controlled by the home microprocessor using a variety of modular analog, logic, and RS-232 ports, installed in the front-end

processor. Techware is currently making the great modifications necessary to run our applications with the IEEE 488 board available for the STRIDE.

An interesting programming tip came in a p-System Personal Assistant, several years ago, for using the p-System is tedious. The first MicroSput prototype used a 2-80 computer (no 5-1/8 system). The adaptable p-System offered the only Pascal compiler we could find at the time. The 2-80 prototype has been in daily use at the University of British Columbia since 1983. By the time the Sage was announced, we had very much reached the development limits of the original prototype. It distributed us long to decide that the Sage would meet our needs for a long while.

Techware has continued development of MicroSput on the Stride Sage using the p-System. Portions of the program are optimized using the p-System Native Code Generator. Techware is one of the increasing number of developers to use the multi-tasking features of the p-System. Our main complaint with the p-System is its inability to address more than 64k bytes of program memory. While we would prefer to remain with the p-System, the possibility of a future shift to another operating system does not concern us greatly. The Stride policy of supporting multiple operating systems means that the hardware investments made by us and by our customers are insured against possible future obsolescence of any given OS. ■

Richard McMillan is the author of *Real Time Systems: Concepts, Analysis, Design, and Implementation*. He is also the author of *Real Time Systems: Concepts, Analysis, Design, and Implementation*. He is also the author of *Real Time Systems: Concepts, Analysis, Design, and Implementation*.

Richard McMillan is the author of *Real Time Systems: Concepts, Analysis, Design, and Implementation*. He is also the author of *Real Time Systems: Concepts, Analysis, Design, and Implementation*.

Outstanding
Dealer

Softhink



Customer satisfaction is top priority in Softhink, Inc., senior partners, Roger J. Fortis (left) and Adam C. Styles (right).

The management and staff of Softhink, Inc. are proud to present the Outstanding Dealer Award to Softhink, Inc., 400 N. Washington St., Suite 200, Falls Church, Virginia.

Softhink, Inc. is a computer programming firm, specializing in computer applications for small-to-medium businesses since April of 1982. When researching the trade journals for new and worthwhile products, Roger J. Fortis, vice president of treasury, dis-

covered Softhink/Sage. They have been a dealer since 1983. Most of their consulting business is generated for Softhink users.

Softhink, Inc. aids prospective clients in the complete development and implementation of a computer system to meet their specific needs. Training support and services are an important part of their effort to give customer satisfaction.

The staff consists of four partners and an office manager. Adam C. Styles, president and a senior partner, is currently

working on developing a newspaper distribution software package. Working with financial institutions to develop banking software, is the second senior partner, Roger J. Fortis. Robert S. Stenerson is the consulting partner; Timothy Cocchi, attorney; Diane DiMarco, office manager. The five of them combine to form a highly professional group bringing many areas of expertise to their clients. ■

An article in Electronic Design, November 19, 1984, by Stephen Orr, discusses the differences between Sputter deposited magnetic coatings, plated media and gamma ferric oxide coatings on FdH—density disk drives. The article states that sputtering may never achieve these densities, and are better on plated media. Most drive makers are currently investigating many different techniques in order to gain the marked edge. One successful idea has been to use sputtering to "overcoat" the disk surface with carbon. The carbon layer protects the disk from oxidation and from droplets caused by glancing head striations.

SVS Fortran File Fix

by Peggy Lukery

When linking with SVS FORTRAN in the new CP/M 800 version 1.2, you will most likely get an error message:

```
***SYNTAX ERROR ***OPTOFF
```

This is because the SVS FORTRAN linker, svslink, is looking for a label, OPTOFF, that used to be in CP/M. However, in version 1.2 that assembly code is no longer there.

The problem is easily fixed, with the short assembly program that follows:

```
      .org 0001
      .word 0
      .end
```

Then run:

```
**** OPTOFF
*** OPTOFF=000000
```

This will assemble the code and then rename it to OPTOFF. You must also change your system file, PTT.SYS. Find the line that reads:

```
load -- + $1, $0,000 optoff
```

Change the line to:

```
load -- + $1, $0,000 optoff1
```

Be sure to save the new PTT.SYS and the OPTOFF file and use them whenever working with SVS FORTRAN. ■

A black and white line drawing of a woman with blonde hair, wearing a patterned long-sleeved top and dark leggings, riding a stationary exercise bike. She is looking forward with a slight smile. The bike is a classic upright model with a flywheel and pedals.

UCSD

Take P-codes in your Stride

UCSD (University of California) Stride has programmed 1994 and 1995 National Access to Health Information Awards. UCSD is a leader in providing access to health information. Call today for more information. <http://www.ucsd.edu/stride>

Access provides information on program performance. Tell us what your software really up to. Stride and Performance. Call today for more information. <http://www.ucsd.edu/stride>

Http P-code editor. Use with your device, access to your computer.

Access to your P-code editor. See the manual, example program and documentation.

Manufacturer: UCSD, University of California, San Diego, CA 92162-1544
Tel: 619-534-8888

PoptyserTM

Access to your P-code editor. See the manual, example program and documentation.

Access to your P-code editor. See the manual, example program and documentation.

THE WORLD OF

BOS

BUSINESS OPERATING SOFTWARE

THE PROVEN MULTI-USER SOFTWARE

Choosing the right software . . . unfortunately, most financial software that helps you grow can, itself, be quickly negated. What seems an economical choice to begin with can soon end up an expensive mistake when your needs exceed the system's capabilities. BOS software grows with you allowing up to 32 users.

BOS Reliability . . . BOS software has been used and tested for over seven years with 1000's of satisfied users all over the world — small firms, big businesses, DP departments, schools, governments, doctors and government departments. BOS software provides that assurance of security and reliability which no new software can hope to match.

BOS Portability . . . Now, you can change or upgrade your computer and avoid the costs of software conversion. BOS software is equally at home working in single user, multi-user or local networking mode and the unique BOS concept allows identical software to run on over 30 different computers with a wide range of processors.

BOS Quality . . . Designed and built by software professionals.

Choose from:

•BOS Office Software

BOS Writer — Word Processor
BOS Planner — Financial Planner
BOS Navigator — Interactive Database
BOS AutoDesk — Report Writer

•BOS Business Software

BOS Accounts Receivable and Invoicing
BOS Accounts Payable
BOS General Ledger
BOS Inventory Control
BOS Order Processing (available 1st Qtr. '85)

BOS MacroControl Programming Software

Full File-sharing, Record-locking,
Screen Formatter and Editor

*International versions available.

Please send more information

BOS Programming Software

BOS Office Software

BOS Business Software

Scribble/Sign

IBM PC, XT, AT

Other _____

Reseller

Name _____

Company _____

Address _____

City/ST/Zip _____

Telephone (____) _____

User

North America:

BOS National, Inc.
2001 Wilson Hill Lane, 4000
Dallas, TX 75202 USA
(214) 956-7122

Overseas:

BOS Software, Ltd.
87-89 Colindale Ave
London, W9 1N 0BZ, England
01-835 8831



Spring Cleaning Recommended For Floppy Drives

The Datalife kit, at left, shows the special disks used to clean floppy disk drive heads.

It is now the middle of winter, but a little bit of spring cleaning is always in order. Consider your faithful floppy disk drive. For many months, the disk heads may have been reading data OK, but they have also been collecting contaminants of one sort or another from the air or the surfaces of the diskettes.

Heads are one of the most sensitive (and expensive) parts of the drive, so it makes sense to clean them occasionally. You'll avoid those very annoying disk errors, which will happen if you let the drives go uncleaned. If there is the computer room is smoky or dusty, the heads may need cleaned as often as once a week. The more you use floppies the more often you will need to clean the heads as they will also pick-up dirt from the surface of the diskettes. Stride recommends cleaning the heads a least every month, and whenever you have floppy errors.

To clean the heads you need a special diskette like the one shown in the photo above. It is made of a paper-like fiber soaked in a cleaning solution. If you come from Sweden in a fall season or you may have to add the solution from a bottle. The diskette is inserted into a stiff jacket. Together they are inserted in the drive in the same way as a standard floppy. Some jackets have a tab which must be removed to allow cleaning of both heads in 80-track drives.

The cleaning solution evaporates rapidly, so be ready to go once you open the foil pouch on the pre-soaked disk. Generally, one diskette is enough for two to four drives. Be cautious with the instructions. Dirt that will affect a disk head may not be visible. Make a practice of only re-using the diskette only a couple of times.

You can generally buy cleaner kits at any computer store or order them through Stride. Stride carries the pre-soaked DATALIFE diskettes made by Verbatim. When ordering the first time, be sure to specify the head cleaning kit (D38800 \$79.00) which contains five jackets and two cleaning diskettes. Once you have used the two diskettes, you don't need to buy the kit again. Another part number (D38800 \$37.95) contains no jacket just another 10 cleaning diskettes.

Using The Cleaning Diskettes

Once you've inserted a cleaning diskette into the floppy disk drive, you must move the head across the surface of the diskette to clean it. A normal read command will do this, however, errors will occur as the cleaning diskette does not hold data. Therefore, a special program, CLEANCODE, is used. This turns off floppy error checking while "reading" the disk. The source code program given in p-System Pascal on the facing page.

To bring the program up on your machine, first type it in using any editor or word processor. Name the program CLEANER.PASC. The program must be changed slightly for Sage or Stride operation at the places indicated in the comments.

Find the volume where the file TOOLS.CODE (or SAGETOOLS.CODE) is on your machine. Replace the "vol" in the file with the name of this volume. If necessary, use the F1 key to transfer them from the release disks shipped with your system.

For the 400 series, change the program to reference CONFIG_1 and TOOLS.CODE. For a Sage system, change the program to reference CONFIG_SAGE and SAGETOOLS.CODE where the comments indicate. Compare the program, correcting any typing mistakes.

Disc compiled. Execute LIBRARY.CODE. Type in "CLEAN.CODE" <CR> for the output file. Type in "CLEANER.CODE" <CR> for the input file. Type "0" The output file will now place the same job as the input file does. Type "Y" then "TOOLS.CODE" <CR> for "SAGETOOLS.CODE" <CR> for a Sage. You will see a list of all names. Type in the number for CONFIG_1 and for CONFIG_SAG, then a space then a "Y". The output file should show this in its last position 1. Type "Q" to quit. At the "Endless" message, type just a RETURN key. <CR>



Over 1,000 heavy-duty applications exist in RM/COS.

Multiuser RM/COS Operating System Brings COBOL To Stride 400 Users

Most folks know that the majority of the Post-McFarland Corporation is their COBOL compiler, RM/COS. RM was started 15 years ago by Don Ryan and David McFarland and remains one of the most successful computer stores in existence today.

RM/COS has been available for some time, even on some of the newer micros. RM/COS, their multiuser operating system, is also making headway. The TR80 version has been out for over six years and a 8008 version for less years. There are over 200,000 RM/COS installations at this time, with RM/COS becoming a de facto standard for COBOL. RM/COS is also a DOS certified implementation of the ANSI X3.23-74 COBOL standard. The RM/COS COBOL environment, the new enhanced 2.5 version, is now available on the Stride 400 Series.

RM/COS cannot be seriously discounted without including RM/COS. Part of the considerable power of the RM/COS environment is that the compiler and operating system were made to operate together. One of the most impressive parts of the system is the integration of the hierarchical file system, especially to those needing multiuser operation. Not just one, but three different methods of file access: sequential, relative and indexed, are available. Multi-level indexed files may have 14 alternate keys, including duplicates. Files are locked at either the record or file level to insure multiuser operation. Each file can have a privilege level, and both delete and write protection.

This integration is one reason why the same RM/COS applications run from

three to seven times faster under RM/COS than on a UNIX system. For those using applications with extensive record keeping (including comparisons of RM/COS to TR80) on a 8008 are comparing. An RM/COS single-key write of 100 records is about 1.3 times faster than under UNIX, a three-key write of 100 records is about 12 times faster, a single-key write of 500 records is about 2.5 times faster, a single-key read of 100 records is about 11.5 times faster and a three-key read of 100 records is an incredible 25.4 times faster.

"COBOL programs are more likely to have fewer bugs than more recent PC programs."

Another reason for the speed is that the I/O subsystem uses records as the primary unit of transfer rather than characters as does UNIX. The environment was ported using the 408 Series single-user RUCS with the latest hardware drivers developed by Stride/IBM. The terminal driver, however, is RM's.

RM/COS is also quite a compact operating system requiring only about 250K bytes on the Stride (not including user space). Files are also generally smaller, about 70% of the size of COBOL files under other operating systems due to automatic data compression. The extra speed/performance and small size make RM/COS one of the few operating systems on the

Stride 400 Series that will really support up to 16 users in 100Kb of memory and four users in 512K bytes.

Compatibility and transportability are two other reasons for the large and still growing RM community. RM/COS is available on 24 other operating systems in addition to RM's OS. Applications written in other versions are compatible with RM/COS on the Stride (and with each other), however, like RM/COS, RM/COS is actually a subset of the others, with enhanced features such as a full Level 2 port/macro. Some of the 1,000 heavy-duty business applications available for RM/COS do take advantage of those enhanced features. For example, the 2.5 version supports COBOL machine language programs via an interface called COSE (pronounced "cozy"). A powerful print spooler which is not computer-bound, but file driven, is also new.

It is a fact that there are more COBOL programmers than any other language. Over 50% of all programmers write COBOL, it is still the language of choice for business. Thus, users looking for an accounting application like general ledger or inventory management will be able to choose among 15 to 20 packages instead of five or six. Note that most of these packages were developed for mini- and main-frame computers and have been "burned in" over the years. They are more likely to have an expanded set of features and fewer bugs than more recent PC-oriented programs.

A simple menu driven installation and update system is provided. On a 440 or 880 the only preparation needed is to set