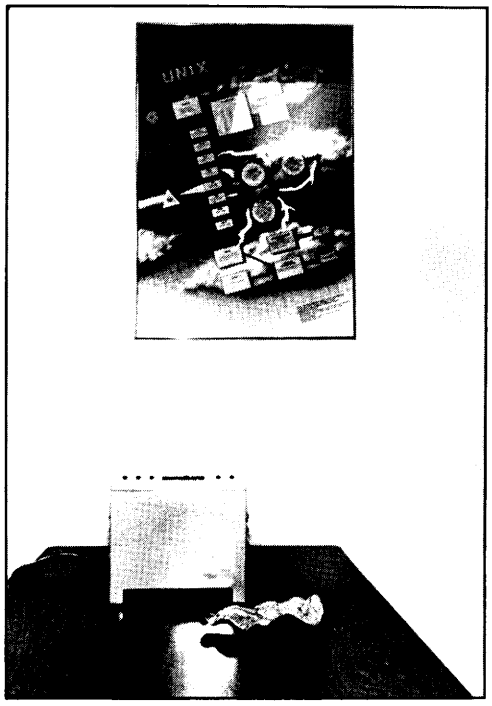
Volume One, Number One February/March 1985

THE Business Unix JOURNAL

Market Research • Business Applications Solutions • Unix™/Xenix™

Editor's Perspective

Unix systems are now emerging as a major force in the business applications market. Our Editor considers the sources and implications of this trend.



Software For Business

Two reports on specialized Unix business packages: (1) Software that automates accounting for long-distance telephone charges; and (2) An order entry/shipping system based on **nroff.**

Spreadsheet Systems For Unix

An analysis of the potential market for Unix based spreadsheet systems, as well as a close look at two popular Unix spreadsheet packages — UltraCalc and Multiplan.

The Industry: News & Profiles

New software directories from AT&T; Rumbles from Digital Research; Santa Cruz Operation offers incentives for ISVs — and other news. Two industry profiles: (1) a full service Unix time-sharing company; and (2) A TRS-Xenix applications specialist.

Software Products: Announcements & Updates

A compiler for shell scripts, software for law firms, an order entry/inventory package for Unify's dbms — and more.

PREMIER ISSUE

To continue receiving The Business Journal

SEE PAGE 31

The average cost of a personal sales call will climb to $195 in 1985

Can your business afford a quality effort at these costs?

The average cost of a personal sales call climbed 17.7% during the last year, the largest increase in six years. Since 1978, the cost of a sales call has risen over 100%. Still the most important factor in a company's success is product sales. In today's competitive business environment the need for more shelf space, faster inventory turn-over, and larger quantity orders has increased the importance of sales, not decreased it. Yet, how can the business manager justify a major sales effort with selling costs skyrocketing?

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—About the Publisher—

Business Unix Publications is an independently owned and operated company located in Lafayette, California, approximately 20 miles east of San Francisco. Editor Paul Copeland brings to his role more than ten years experience with business applications consulting, programming, and systems management. This background spans a wide variety of systems, literally from Apple to Zilog. The publisher is not affiliated with any computer software or hardware company. All the articles are written by our own staff, unless specifically noted otherwise. We operate a Codata computer (68000 CPU, Multibus, Unisoft Version 7) for production and business functions.

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THE
Business Unix
JOURNAL

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COVER PHOTO: The box under the Unix poster is a DataSafe, an electronic data collection device that is used in conjunction with TelAccount's call accounting software (article begins on page 10). The photographs in this issue form a montage on the theme of Unix systems and programmers at work. These photographs were taken by Scott Globus, who specializes in the photography of industrial and laboratory scenes.

Business Unix Arrives

Unix systems have long held a secure niche in engineering and software development environments. The migration of business applications software to Unix based systems has been more recent, and much less publicized. Today, Unix and Unix-derived systems are used widely for business and office applications. This growing segment of the Unix market has its own unique requirements for news and information resources. BUSINESS UNIX is just such a resource, a bi-monthly publication dedicated to providing essential information for users and vendors of Unix business applications.

■ Business Applications In The Unix Market

Estimates about the size and makeup of the Unix market vary from one market research expert to the next. The total count of Unix based systems appears now to be edging over 200,000. This is not to say that Unix is an overwhelming market phenomenon. Unix has not caught on as quickly as some of its most enthusiastic boosters hoped and predicted a few years ago. Nonetheless, the Unix market has shown a persistent growth pattern. One finds evidence of this growth in diverse settings. AT&T has set giant U-N-I-X letters marching across the pages of major daily newspapers. We even saw the magazine UNIX REVIEW displayed at a newsstand in a suburban shopping mall. While the debate over its technical merits and growth potential continues, Unix has clearly already arrived as a significant market force.

UNIX is now clearly a significant force in the market

Sales data from companies such as Tandy/Radio Shack, Fortune, and Altos indicate that Unix and Xenix based business computers account for a very significant percentage of all Unix systems. In fact, it may well be that the majority of installed Unix systems are now multiuser "supermicros" working in business and office environments, as opposed to engineering and research applications. This segment of the Unix marketplace offers unbeatable utility and value for small and medium sized organizations that need to use computers for real business functions, beyond stand-alone word processing and spreadsheet applications. For multiuser business applications on the latest generation of supermicros, no serious competitive alternative to Unix and its derivatives has yet emerged.

■ Savvy Buyers and Vertical Markets

What are the forces that drive the market for Unix business applications? For business users, Unix systems represent both more powerful solutions to automation requirements and larger investment outlays relative to stand-alone desktop PCs. Even at the low end of this market, buyers have a more sophisticated outlook than typical purchasers of MS-DOS systems. At least these Unix systems users have made purchase decisions independent of the media blitzkrieg and retail price wars raging in the desktop PC market.

For multiuser business applications, no serious competitive alternative to UNIX has yet emerged

Multiuser systems are a must for many business operations. This is a Unix strong suit, since the system is designed expressly for multiuser operation. Price comparisons

generally favor a multiuser Unix system against several 8088 based PCs loosely coupled on a shared hard disk—a typical lash-up that many retailers push under the guise of a so-called LAN. Moreover, when shared data applications are important, the software on a Unix system tends to be more appropriate and functional than software designed for single-user environments.

IBM's blanket embrace on the small business systems market with "the" PC has been based on personal productivity software. These are horizontal applications: spreadsheets, word processing software, and simple database systems. Many PC users might have been better served on a price-performance basis with multiuser systems and more powerful software, including vertical market applications. Unfortunately, the retail distribution channels for computers have so far largely failed to provide buyers with professional systems analysis at the point of sale. Hence, there are millions of PCs in small organizations now, but very few of these users have achieved a significant degree of automation in their primary business functions.

A major factor in the market growth of Unix based machines, has been the availability of superior vertical market applications packages. Unix systems typically deliver "big system" characteristics in a small box, with power and throughput that can't be matched by PCs. Here we are talking not about candy coating on the "user-friendly" interface, but about functionality for specific business applications at competitive prices. Users of vertical market packages are buying software solutions, and only incidentally obtaining Unix or Xenix. They are interested neither in the technical virtues nor in the blemishes of Unix, but rather in specialized application systems that happen to come bundled with Unix based computers. Unix has been a preferred vehicle for developing vertical market packages, due to its portability and programmer-friendly features. End-users are the beneficiaries, but not because of any grass-roots clamor for Unix per se.

■ Applications Software

Hundreds of business and office applications software packages are now available for Unix and Xenix systems. The "News & Profiles" section in this issue reviews several excellent software catalogs. Some of this software has migrated down from yesterday's minicomputers and some has moved up from today's stand-alone microcomputers. The tendency is for the best software to converge on Unix, because this is the operating system focal point in the domain of multiuser supermicros.

While the availability of business applications software looks good, and gets better all the time, some underlying problems remain unsolved. Unix is not quite the well-defined standard that is generally alluded to. Substantive incompatibilities exist among different Unix and Unix-like versions. Even technically compatible systems suffer from a serious media interchange problem. At the lower end of the market, 9-track tape drives are not common while floppy-disk formats and cartridge tapes are not standardized. In the face of these media incompatibilities, finding a specific software package for a particular make of machine is a difficult endeavor. The lack of compatibility has

Continued on next page

IN THE LOOP

A Call For Feedback

Letters, gripes, corrections . . . BUSINESS UNIX wants to hear from you. Feedback is crucial to our publishing effort. Tell us what you like about our content, and what you don't like. Let us know how we can improve our coverage. Most of all, if you are operating software that others might like to know about (including both positive and negative feedback), send us a letter or give us a call at the address below. We want to open lines of communication with software vendors, users, and other parties involved with business applications issues for Unix based systems.

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LOOKING AHEAD

In Coming Issues

BUSINESS UNIX has a number of articles in progress about business applications software for Unix and Xenix systems. Here is a preview of topics that will be featured in coming issues:

- Several firms are pioneering new concepts in integrated software systems for office automation applications. BUSINESS UNIX will be researching these packages as they evolve.
- A survey of accounting packages for Unix systems is slated to provide readers with background information about available software in that category. Also planned are in-depth articles on selected Unix accounting systems.
- BUSINESS UNIX has scheduled a series of articles on "do it yourself" business applications for readers on a tight budget but with some knowledge of the Unix utilities. We hope to spark your imagination with examples of things that can be done using **awk, sed, sort, dc, nroff**, and other commands.
- Look to BUSINESS UNIX for information about vertical market applications software designed for use with various powerful Unix database systems. We expect a number of software developers to take advantage of DBMS tools.

That's just a sample of the topics we are researching. BUSINESS UNIX surveys of end users will keep readers up-to-date on what other Unix and Xenix users are doing. Our policy is to interview end users so that we can report on what vendors really deliver, not just on what is promised. In each issue, BUSINESS UNIX will continue to provide readers with regular monthly features: the **Software for Business** section covers specialized vertical market applications; the **Industry News & Profiles** section reports on strategic news and the organizations that make it happen; and the **Software Products Announcements & Updates** section introduces the latest Unix software products for business systems.

Continued from previous page

thus created a marketing bottleneck, a situation in which end-users can only buy third-party software that is distributed and supported by the hardware manufacturers. Small software developers are discouraged by the chaotic distribution process. All this makes Unix applications software only "sort of" portable—maybe we should say it is transportable.

■ The Position of BUSINESS UNIX

With market acceptance growing unabated, it becomes increasingly obvious that the blemishes on the Unix rose are not fatal. Realistically, Unix has already achieved a fair measure of market success in the business world. At BUSINESS UNIX, we're not banking on immediate explosive growth in the Unix marketplace. While that could happen, there are still plenty of reasons for caution. The real impact of AT&T's marketing program remains to be seen. There is also a serious potential for IBM to stampede the market in some unforeseen direction. On the other hand, IBM may decide to back the Unix standard in a big way and surprise us all. An entirely new and fascinating battle may be shaping up with the latest generation of micros, between the IBM PC/AT and AT&T's rumored PC-7300. Despite unpredictable market forces, tens-of-thousands of Unix, Xenix, and compatible systems are already in place and hard at work providing business and office automation functions. Many more systems are bound to be added to that figure. Our charter at BUSINESS UNIX is to provide a communication forum and an information service to the users and the vendors of these systems. Greetings! BUSINESS UNIX has arrived! :•:

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THE BUSINESS UNIX JOURNAL

SEE INTRODUCTORY OFFER

ON PAGE 31

A Guru Uses nroff For Business Applications

An Order Entry/Shipping System and A Document Production Program

BUSINESS UNIX recently had the good fortune to spend some time looking over the shoulder of Bill Freiboth at Pacific Micro Tech in El Cerrito, California. Freiboth is known by many in the Unix community as the author of *The Unix Guide*, a reference book for prospective and current users. Pacific Micro Tech, aided by Freiboth's associates, has developed some innovative applications packages with the Unix utilities. We must stress at the outset that these systems were developed by Pacific Micro Tech for use in-house and are not currently available on the market. However, we were so impressed by this example of how Unix utilities can be applied to common business operations, that we wanted to describe the process for our readers. Maybe a little encouragement will persuade Freiboth to package and sell these systems.

When BUSINESS UNIX visited Pacific Micro Tech, they were running Unisoft Version 7 Unix on a 68000 based S100 computer from Dual Systems Corporation. Disk storage consisted of a 20 megabyte 8 inch hard disk and one 8 inch floppy drive. This computer was not quite a stock Dual system, Freiboth having assembled it himself with components from Dual. The system's customized software features included a flexible backup procedure that Freiboth developed for archiving data on floppies. Pacific Micro Tech also showed us a method for programming the function keys on a terminal. We were quite impressed by the use of the function keys on Freiboth's Televideo 950 in conjunction with the vi screen editor (see Figure 3). What follows is mainly about Pacific Micro Tech's use of **nroff,** the Unix text formatting utility, for some common business applications.

A simple and efficient way to process a batch of product orders—all done with system utilities

THE ORDER-ENTRY and SHIPPING SYSTEM

Pacific Micro Tech markets *The Unix Guide* through mail order sales, in addition to using bookstores and other wholesale channels. In the case of a mail order, they produce a statement for the customer and a shipping label for the book package. With minor variations, these are the basic steps in any manual or computerized order entry and shipping system. What distinguishes Pacific Micro Tech, is the way in which they use **nroff** and shell scripts, applying the Unix software tools concept to a business application. Furthermore, the approach has general applicability. Pacific Micro Tech's order entry/shipping system could be modified and adapted for other types of business record keeping functions (in fact, they also use it occasionally to produce purchase orders to suppliers).

■ The System In Use

Here's how the system operates: Freiboth runs his shell script, named inv, to enter new customer orders or to print invoices and shipping labels. These invoices are normally not bills in the usual sense, because the mail order book sales are for the most part prepaid. For the same reason, the system does not produce any sort of accounts receivable listing. It could, however, be extended to provide accounts receivable functions or, for that matter, it could even be converted into an accounts payable system using the same principles of operation.

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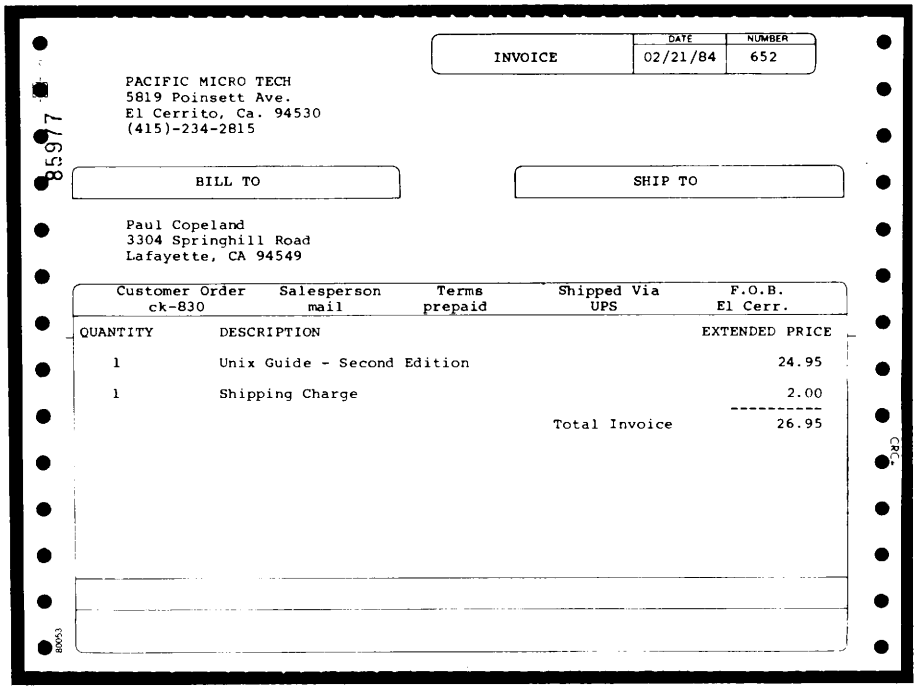

INVOICE | DATE 02/21/84 | NUMBER 652

PACIFIC MICRO TECH
5819 Poinsett Ave.
El Cerrito, Ca. 94530
(415)-234-2815

BILL TO

Paul Copeland
3304 Springhill Road
Lafayette, CA 94549

SHIP TO

Customer Order	Salesperson	Terms	Shipped Via	F.O.B.
ck-830	mail	prepaid	UPS	El Cerr.

QUANTITY	DESCRIPTION	EXTENDED PRICE
1	Unix Guide - Second Edition	24.95
1	Shipping Charge	2.00
	Total Invoice	26.95

FIGURE 1—This invoice was produced with Pacific Micro Tech's order entry/shipping system. The system also produces an address label for shipping.

Normally, a batch of orders are first entered via the entry shell script that prompts for information about each order. Once an entire batch of orders has been entered, the program automatically proceeds to the printing operation, first for the invoices and then for the shipping labels, in the same order as the invoices. If necessary, the operator can override this sequence, but the normal procedure is to enter a batch of orders, print the invoices, and finally print the shipping labels. As a result, what we have here is a simple and efficient way to process a batch of product orders —all done with common system utilities. Any Unix based computer with the **nroff** text formatting program (normally supplied with a full distribution) should be able to run the same procedures that Pacific Micro Tech uses for its order entry/shipping system.

The invoice in Figure 1 was produced by Pacific Micro Tech for the sale of one copy of *The Unix Guide* book. Line items for other products, in addition to the book, can also be listed on an invoice. The amounts from each product on the invoice are automatically totaled and printed ($26.95 in the example). The system can also list "bundled products," where several items appear with a single combined price. Sales tax, when called for, is automatically calculated and added as a line item. Figure 1 illustrates other capabilities and features of the package. The invoice number, 652 in this case, was automatically generated in sequence by the system during order entry.

The intended use is a common business application, high quality document preparation

Under "Customer Order" in the example is the number of the bank check (ck-830) that accompanied the order. This field may also be used to identify the customer's purchase order. If Pacific Micro Tech is extending terms to the buyer, as it does with some wholesale orders, the "Terms" section would show a notation to this effect. A facility to handle both bill-to and ship-to addresses is also available.

Pacific Micro Tech uses forms that are not preprinted (except for the borders). They prefer the flexibility and economy of multi- purpose forms, so they can use the same stock for purchase orders. Their system can just as easily be used with other form layouts, or with custom preprinted forms.

How The Order Entry System Works

The order-entry shell script creates a separate Unix file for each order. The example in Figure 2 illustrates the content of these order files. The file shown corresponds to the invoice in Figure 1. The order entry/shipping system later uses this file with the **nroff** program to format an invoice and a shipping label. Each line in the order record represents an **nroff** macro. Among the **nroff** macros that Pacific Micro Tech has defined are these:

.IV for invoice information (such as number and date)
.SH for shipping instructions
.SA for shipping address
.SC for shipping charge
.TX for sales tax, including the tax rate
.TB for the total amount on the invoice

Additional macros are defined for each product that will be printed on invoices. The ".UG" macro is expanded on the invoice with the name of the product, in this case "Unix Guide—Second Edition." The ".UG" macro also illustrates the way in which quantities and prices are used as parameters with the macro. In Figure 2, the quantity is one and the price is $24.95. When there are multiple units on a line

```
Oct  9 15:09 1984  652.copeland Page 1

.IV 652 02/21/84 prepaid "ck-830" mail
.SH UPS "El Cerr."
.CU "Paul Copeland" "3304 Springhill Road" "Lafayette, CA 94549"
.SA "" "" ""
.IS
.UG 1 2495
.SC 200
.TB
```

FIGURE 2—This invoice record was used to produce the invoice shown in Figure 1. Each record is a separate Unix file. After printing, these files are moved into an archive file.

V I										
	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11
upper case	window ↑	scroll ↑	PP back	Sent. back	word back	doc start	search back (ret)	prior cursor pos.	end with no changes	save changes /cont.	save changes /end
lower case	window ↓	scroll ↓	PP fwd	sent. fwd	word fwd	doc. end	search fwd (ret)	repeat search	redraw window	restore line	undo change

FIGURE 3—This template for terminal function keys was "drawn" with a Diablo 630 printer using Pacific Micro Tech's extensions to NROFF. Note the arrows and automatic centering of the text in the boxes. (The example shows how Pacific Micro Tech configures the function keys for use with the vi screen editor. The function keys are dynamically set up by a program on the Unix system.)

item, the system will calculate the price extension (i.e., quantity times price).

The system keeps track of which orders need to have invoices and shipping labels printed. After printing, the order records are moved into an on-line archive file. Archiving is required because each order initially is set up as an individual data file. The multitude of small data files is not maintained indefinitely, but the data can be retrieved later from the archive file if necessary.

■ Sweet and Simple

All of the underlying macros are completely transparent to the user. Shell files control the entire process so that the user need not even be aware that the **nroff** program is running during printing. The system is easy to use, yet powerful and flexible enough to provide substantial time savings over manual functions. This example may set other people to thinking of "software tool" solutions to common business requirements. Although the system is not as fully integrated as order entry modules in traditional accounting packages, it is also not as complicated to set up and operate. BUSINESS UNIX hopes that Bill Freiboth will consider producing a "how-to" book about the internal workings of Pacific Micro Tech's order entry/shipping system. It would serve as a fine example for others to follow in producing similar applications.

NROFF EXTENSIONS FOR DOCUMENT PRODUCTION

We saw another useful custom software package in action at Pacific Micro Tech. This one is an extension of **nroff** that provides true proportional spacing for daisy wheel printers, as well as graphics on printers and display terminals. Internally, this program is quite complex and sophisticated, but the intended use is a common business application, namely high quality document preparation. Pacific Micro Tech developed this system initially to produce *The Unix Guide*. At the time, they were unable to find the technical assistance they needed to apply **nroff** to the complex formatting requirements of their book. The procedures developed during the production of the book have now evolved into an extensive, integrated package that Pacific Micro Tech calls the "Terminal Conversion System."

■ Proportional Spacing for Daisy Wheel Printers

Current capabilities for the Diablo 630 (and compatible daisy wheel printers) include support for true proportional spacing, bold and shadow printing—shadow printing is slightly offset overstrike—and graphics for math and other special symbols (such as arrows and Greek letters). The system has also been extended for previewing documents on the Televideo 950 and Freedom 100 terminals, including support for special graphics capabilities on the TVI-950.

An outstanding example of what this system can do is *The Unix Guide* itself, which was produced entirely on a Diablo 630 printer, including many pages of tables with borders. Another example is shown in Figure 3. Here all of the borders, boxes, and arrows were produced on the 630 printer, with the text automatically centered in the boxes. We saw a daisy wheel printer go through some lively gyrations as it produced some of these graphics. The results, however, speak for themselves. ☞

BOOKS ON UNIX

The Unix Guide—Second Edition

The Unix Guide (118 pages) provides a complete overview of the Unix utilities, library functions, and system calls. The book aims to provide managers with a concise introduction to the facilities available on Unix systems, and to provide new users with a reference that is more accessible than the standard multi-volume manual set. *The Unix Guide* is especially important because it provides a comprehensive analysis of the differences between Version 7, System III, System V, Berkeley Unix, and Unisoft's Uniplus. Thorough coverage of system commands and utility software makes this book a highly useful reference guide. It also contains a 22-page table that conveniently outlines and compares the system calls and library functions available with the major versions of Unix. A well organized index serves as a reference to the Unix commands, and includes separate sections for System III and System V enhancements. *The Unix Guide* is available in some bookstores, or it can be ordered directly from Pacific Micro Tech. The single quantity price is currently $24.95 plus $2.00 shipping (prepaid orders only). A discount is available for purchasers of the previous edition.

Pacific Micro Tech
5819 Poinsett Avenue
El Cerrito, CA 94530
(415) 233-3596

TelAccount: UNIX Listens To Your PBX

Stalking the giant phone bill is an unpopular but necessary task for every organization with multiple telephones. Deregulation of the telecommunications industry brought with it new opportunities for controlling telephone costs as well as greater complexity in selecting the optimal mix of telephone services. Among the companies serving the "new" telecommunications industry, is TelAccount, Inc. This rapidly growing concern specializes in telephone call accounting software for Unix systems. Call accounting provides detailed cost information about an organization's phone usage. Call accounting reports resemble phone bills, but present information designed specifically for allocating and reducing phone expenses. Several companies offer call accounting systems. BUSINESS UNIX was particularly interested in the TelAccount system because it runs on Unix and can be configured for a wide range of end-user requirements.

■ TelAccount Covers the Bases

For an introduction to this fascinating and complex world of the deregulated phone industry, BUSINESS UNIX interviewed Dick Vento, TelAccount Vice President for Sales and Marketing. We discussed TelAccount's call accounting software, which is available on several makes of Unix systems as well as via the service bureau that TelAccount operates.

TelAccount also manufactures the DataSafe, an electronic device for use with the call accounting software. Attached to a PBX, the DataSafe stores information about each call placed through the PBX. Included are such data as the extension that placed the call, the number dialed, and the long-distance service the call utilized. A Unix system polls the DataSafe, typically at night, and transfers the collected call data to the computer's database. Periodically, normally on a monthly cycle, the TelAccount software generates cost allocation reports and other phone utilization reports.

"Thanks to UNIX, it's the same software...no matter which way you go."

Since most of the processing occurs at night, this application makes few "prime time" demands on an in-house computer. Nor is much human attention required, since day-to-day operations are automatic. At the end of the month, however, some clerical effort is required. Before processing the call data, users enter updated "master data," such as new phone extensions and overhead costs. Some disk storage and printer time are also used during the end-of-month processing. Otherwise, the host computer is available for other tasks.

The call accounting system serves two main purposes. First, it automates accounting cost allocation by reorganizing the large amount of detail contained in phone bills. Second, it helps optimize the mix of telephone services by providing cost analysis reports. Both cost allocation and optimization are extremely complex tasks for large companies with large phone bills. Some of TelAccount's customers have annual phone expenses in the tens of millions of dollars. Long-distance charges can be reduced by modifying the mix of WATS lines, TIE lines, and FX lines used for various call destinations. Large firms can afford such sophisticated solutions as private lines and private networks. Even small firms can reduce telephone charges by making use of FX lines, WATS service, and/or alternate long-distance suppliers. Large and small companies alike require accurate call data in order to analyze potential phone service changes. Call accounting can also help to reduce misuses of the phone system by employees (e.g., unauthorized long-distance calls and local calls made over WATS lines).

■ DataSafe: A Big Bug

An on-site DataSafe is used with the customer's PBX, whether the call account-

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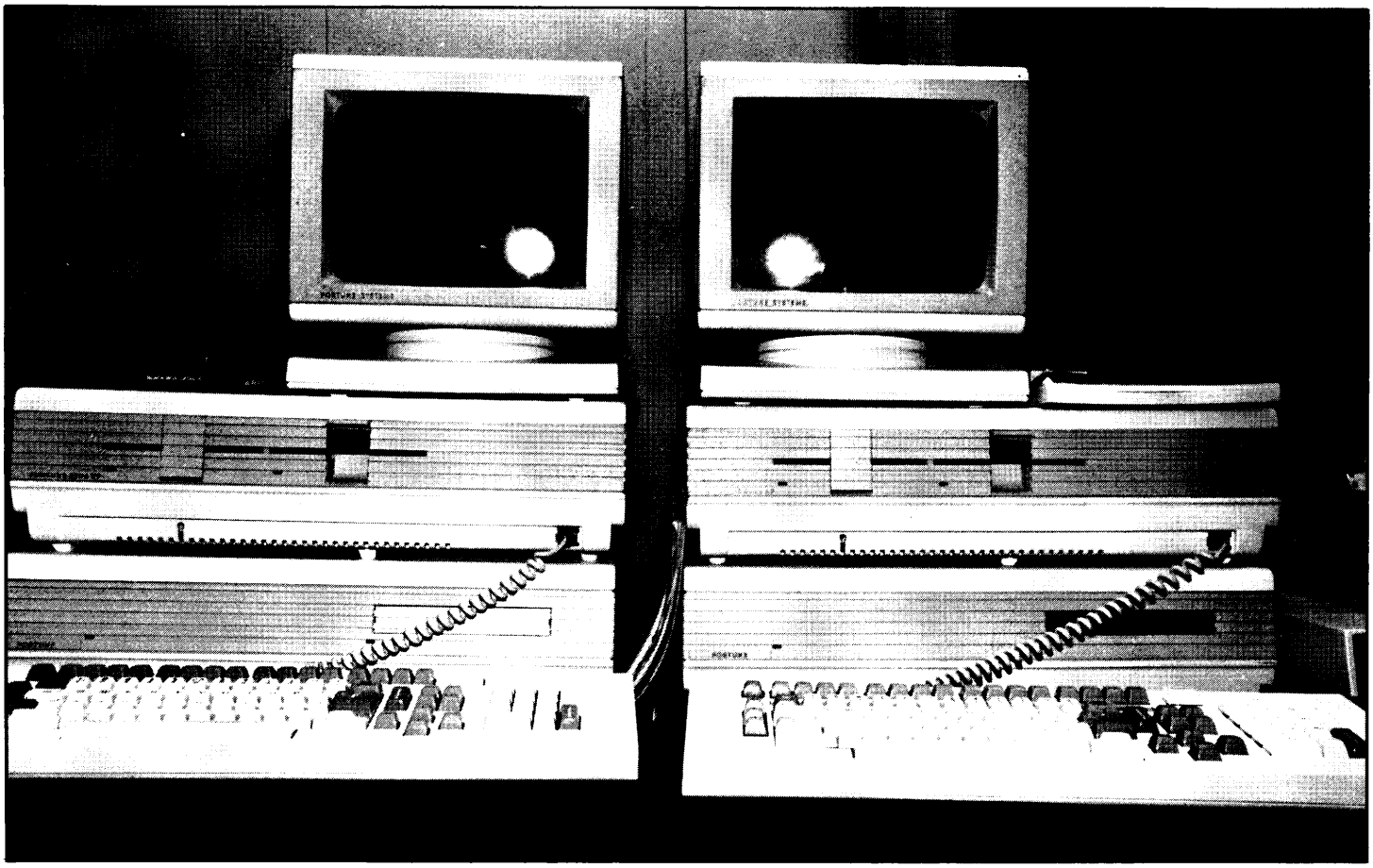

About TelAccount:

The System & The Company

TelAccount's call accounting software evolved from a system developed in 1979 by an affiliate, Schmidt Associates. Schmidt Associates also developed menu and screen software for Unix computers called "menus" and "forms." A version of these packages runs as the primary user interface on Fortune 32:16 computers.

In 1980 the call accounting software was converted to Unix on an Onyx computer, one of the first supermicro Unix systems. Originally, call accounting was provided through TelAccount's service bureau. Now the system can either be used on the service bureau or licensed for use on the customer's computer. TelAccount currently serves over 200 customers. The service bureau has grown from its beginning on the Onyx to where it now requires an Amdahl mainframe.

TelAccount is able to provide complete turnkey systems, including the computer, the Unix call accounting software, and ongoing support services. A dedicated PBX data collection device, called a DataSafe, is required for use in conjunction with the call accounting software. The software runs on computer systems from Fortune, Plexus, Perkin Elmer, and Amdahl, as well as on AT&T's entire 3B line. Referring to the portability of Unix applications, Dick Vento at TelAccount told BUSINESS UNIX, "Thanks to Unix its the same software and the same reports no matter which way you go, so we only have to maintain one copy of the software."

PRICE:

Prices for the DataSafe device range from $4,000 to $11,000. Call accounting software packages are priced from $4,000, depending on features and size of the application (up to $150,000 for an unlimited license on an Amdahl mainframe).

The service bureau can be used for as little as $200/month. TelAccount says that a phone bill of $3,000 or more per month will justify the cost of the system. A number of TelAccount's customers are large firms with very complex phone systems and multimillion dollar annual phone expenses.

CONTACT:

TelAccount systems are supplied by major PBX distributors, as well as from TelAccount's main office at: TelAccount, Inc., 7 Mount Lassen Drive, San Rafael, CA 94903. Phone: (415) 499-8881

Continued from Page 10

ing software is run on the customer's own computer or remotely on the service bureau computer. The DataSafe is an electronic device with a Z80 processor, solid state memory, and battery backup, all in a box 11 by 11 by 16 inches. The DataSafe interfaces with PBX equipment made by major firms in the telephone industry. The high reliability of the DataSafe is important in this application because any down time would result in permanent loss of phone call data. Lost call data is lost revenue, especially to resellers of long-distance services.

In addition to recording data on the originating phone extension, the number dialed, and the type of phone line used (DDD, WATS, FX, etc.), the DataSafe records the geographic location of the destination called as well as the time, date, and duration of the call. Data about incoming calls may also be tracked. The local or remote Unix system periodically polls the DataSafe and transfers the call data collected since the last time it was polled. Typically polling is done automatically each night. An error-correcting data transmission protocol is employed. The storage capacity of the DataSafe is up to 36,000 phone call records. Normally it maintains several days worth of collected data before it begins to overwrite previous information. Therefore, it can be re-polled in case the host system loses previously transferred data.

■ Tele-Track Software

TelAccount's Tele-Track software package provides internal call accounting functions for commercial organizations. According to Vento, the average business telephone carries 100 calls per month (incoming plus outgoing). This figure can run as high as 900 calls per month for occupations that involve exceptionally heavy use of the telephone. By providing reports that sort the tremendous amount of detailed call data in several ways, Tele-Track reduces the effort required to allocate telephone expenses.

Tele-Track **activity** reports provide detailed and summarized lists of calls grouped according to stations (phone extensions), departments, and divisions. The great advantage of these reports, is that they list phone call charges in a sorted order, compared to what is shown on a standard phone bill. On some of the reports for example, all the calls from a single extension are listed together, so that accurate cost allocations can be accomplished. Activity reports include the date, time, and duration of the call, the number and location (city and state) called, and the type of service (WATS, FX, etc.) used.

Costs on activity reports are compared with the "DDD equivalent" direct dial cost for measurement purposes. Overhead costs can be automatically allocated also. Cost figures in the reports are derived from a database of phone "tariffs" that TelAccount keeps up-to-date. The tariff database is customized for the user to cover worldwide charges from the user's location for all major long-distance suppliers.

Besides activity reports, several types of **traffic analysis** and **network analysis** reports can be produced. These reports summarize call statistics in formats that are convenient for analyzing cost cutting opportunities. The "Trunk Group" report summarizes call data and cost information by type of service (WATS, FX, DDD, etc.). A "Cities Called" report helps to identify opportunities for FX service and leased lines. "Busy Period" reports and histograms are useful for analyzing phone use patterns and capacity requirements. The Tele-Track package also provides analysis reports for large firms that operate their own phone networks. Network reports summarize call traffic passing through a network hub, and allocate internal costs on a per call basis over the network.

A **simulation** feature of the Tele-Track software allows the user to simulate the effect on phone costs of changing the service mix or network configuration. This is done by changing parameters and rerunning the reports with actual historical data. For example, the user could simulate the effect on costs of using a TIE line to a frequently called city. Use of the TIE line might result in underutilization of a WATS line, so the

Tele-Lingo

The computer industry has taken some heavy broadsides for its jargon. But the telephone industry, it seems, has also done a pretty fair job of extending the frontiers of the language. Here are a few definitions for tele-terms that appear in our TelAccount article:

C.O.—Central Office. A switching exchange, located in a telephone company building with telephone lines connected to it. Each such exchange has a three-digit code assigned to it, often called an "exchange prefix," but more correctly called an "office code." For example, in the telephone number 555-4857, "555" is the office code.

DDD—Direct Distance Dialing. The usual way to make long- distance calls on the publicly available network without operator assistance.

FX—Foreign Exchange. A special C.O. line for calls made to another city. FX service provides local calling rates on calls to the distant area.

PBX—Private Branch eXchange. A device that switches among internal stations (phone extensions) and connects them to outside telephone lines.

Reseller—An independent long-distance phone company that buys long-distance call capacity and resells calls to the public at competitive rates. For instance, a reseller may buy WATS lines from another long-distance company. Calls of the reseller's customers can then be routed over these lines at rates that are attractive for the customers as well as profitable for the reseller.

Station—A telephone, or just the jack, connected to a PBX (commonly called an "extension").

TIE Line—A communications channel between two PBXs. For example, a company can use a TIE line to connect large offices located in two different cities.

Trunk—A communications channel between PBX and C.O., or between two C.O.s.

WATS—Wide Area Telephone Service. A special line provided by the Bell System that allows fixed-rate calling to a broad geographical area. Incoming WATS is the familiar "800" service.

user could then simulate the effect of dropping that WATS line. Simulation allows the user to accurately gauge the effects of such changes before a change is actually made.

■ The Service Bureau Option

TelAccount's service bureau provides smaller organizations with a low initial cost alternative to purchasing a complete system. It also serves large customers that prefer not to operate their own systems. The service bureau operates with two Unix based computers, an in-house Plexus system and a third-party operated Amdahl mainframe. The Amdahl system employs a Fortune computer as a front end processor to poll customer DataSafes.

To use the service bureau, the customer periodically sends updated information about new phone extensions and other changes to TelAccount's service bureau center. Throughout the month, the service bureau automatically polls the customer's DataSafe for PBX call data. At the end of the period, the Amdahl mainframe processes the telephone data to produce the call accounting reports. Vento told BUSINESS UNIX that the Amdahl takes the large volume of detailed call data collected over the processing period and "goes crunch, in two and a half seconds." The resultant call accounting printouts are sent to the customer.

■ A New Breed: Resellers and Landlords

Tele-Bill and Tele-Tenant are extended versions of the Tele-Track package that serve special call accounting requirements. Unlike Tele-Track, these systems are not available on TelAccount's service bureau system.

A new industry has recently emerged to resell long-distance services by buying wholesale call capacity and selling at discounted retail prices. According to TelAccount's Dick Vento, there are about 450 of these reseller companies around the country. Alternate long-distance services, such as MCI and Sprint, operate their own transmission facilities. However, many smaller firms in the long-distance business do not own transmission lines; instead, they buy high volume capacity in the form of leased lines and WATS lines, and then resell long-distance services. Resellers can offer their customers competitive rates because, figuratively speaking, they buy phone calls in bulk. The reseller's customers as a group can, for example, make efficient use of a WATS line, whereas individually each customer would not be able to justify the cost of that same service.

Resellers need call accounting for their phone systems to optimize operations and maximize profitability. In addition to costing call traffic, the reseller needs to "price" each call to the customer. Finally, the reseller needs a system to produce itemized customer bills, and process the payments. Tele-Bill is TelAccount's software package that provides resellers with both costing

Continued on next page

Comments From TeleAccount Customers

BUSINESS UNIX contacted three TelAccount customers for their views and comments on the call accounting system. Two of these references are using the TelAccount software for tracking costs on very large phone systems (i.e., over 1,000 telephones). The third user is providing telephone services for commerical tenants in an office building using TelAccount's package for call accounting and billing.

Our first contact was a manager at a very large company in the telecommunications and computer industry. (This reference requested anonymity because of company policy regarding product endorsements.) The person we interviewed manages the phone system for a large customer service division of his company. The phone system in this application includes several PBXs located throughout California. They have operated the TelAccount software in-house on a Fortune computer for about 9 months. Our contact indicated that the call accounting system runs "as advertised," and "pretty much automatically." He pointed out that their application was unusually complex because it covers a statewide network with multiple PBX sites.

The second customer contacted was Roger Allen at Computer Sciences Corporation (CSC) in El Segundo, California. He told BUSINESS UNIX that his company has been using the TelAccount service bureau for about 2½ years. The application involves a PBX with 1,200 telephones. Allen told us CSC plans to bring the TelAccount system in-house soon to run on an AT&T 3B2 computer. This is being done partly to replace the service bureau charges. The move is not prompted especially by the opportunity to run other applications on the computer. Tentative plans for the future include using the system to collect call accounting data from CSC PBXs at other locations.

Allen said that when CSC evaluated call accounting vendors, TelAccount impressed them with its commitment to customer support and to continuing product development. He also mentioned that TelAccount's report format flexibility is a feature that competing products do not provide to the same extent. Allen told us that the DataSafe was attractively priced and very durably constructed; "practically bomb proof" are the words he used. Another favorable feature from CSC's point of view is that the software is not locked into one manufacturer's computer, allowing them to choose among hardware vendors.

Our third customer contact was Jim Rohrer of Bay Heritage Financial Corporation in Pleasanton, California. Bay Heritage has been using the TelAccount system since July 1983 on a Fortune 32:16 computer with a 20 MB hard disk. This application provides call accounting for tenants in an office building that includes the headquarters offices for Bay Heritage itself. Several of the tenants are in "executive suite" offices with only one phone extension each. There is a total of about 200 phone stations (extensions) in the application. The system provides monthly billing of phone charges to the tenants, including itemized listings of each call from each extension. Bay Heritage also uses the Fortune computer for processing the general ledgers for Bay Heritage and its affiliates. Rohrer told BUSINESS UNIX that Bay Heritage is considering placing additional TelAccount systems in other buildings that the company manages.

Continued from previous page

and pricing of calls, along with customer billing functions.

In a related development, some building management firms are now providing telephone services to office tenants, in effect taking the place of the "phone company" in relation to their tenants. Like commercial resellers, these building management firms can pool the phone capacity requirements of their office tenants to provide less expensive service than the tenants could individually acquire. TeleTenant, the most elaborate of the TelAccount packages, is designed for this application. It does costing of the phone system for the building management firm, as well as pricing the services and billing the tenants. In addition, it provides call accounting reports to the tenants for their own analysis and expense allocation.

TELEPHONE NUMBER
415 499-8881

TELACCOUNT INC
SAN RAFAEL, CALIFORNIA

REPORT PERIOD
4/1/84 TO 4/30/84

TRUNK UTILIZATION BY TRUNK GROUP

PAGE 1

TRUNK GROUP NAME	LEVEL	TYPE	DESTINATION (AREA)	NUMBER OF CALLS	HOURS/ TENTHS	EQUIVALENT DDD COST	USAGE SENS COST	ALLOCATED FIXED COST	TAX	TOTAL	COST /MIN
DDD	(80)	DDD	INTRA STATE	211	13 07	153 88	153 88	0 00	9 29	163 17	0 20
DDD	(80)	DDD	BAND 1	2	0 02	0 00	0 00	0 00	0 00	0 00	0 00
DDD	(80)	DDD	BAND 5	1	0 10	0 00	0 00	0 00	0 00	0 00	0 00
DDD	(80)	DDD	CARIBBEAN	2	0 06	5 07	5 07	0 00	0 31	5 38	1 34
			TOTAL	216	13 26	158 95	158 95	0 00	9 60	168 55	0 21
DDD	(80)	DDD	FREE	691	40 08	0 00	0 00	0 00	0 00	0 00	0 00
DDD	(80)	DDD	LOCAL	8045	547 39	285 28	285 28	0 00	14 46	299 74	0 00
			TOTAL	8952	600 74	444 23	444 23	0 00	24 06	468 29	0 01
METRO	(81)	FX	LOCAL	2282	124 34	694 18	1087 88	0 00	65 26	1153 14	0 15
MCI_SERV	(84)	WATS	BAND 1	516	41 20	1142 30	636 30	136 48	46 37	819 15	0 33
MCI_SERV	(84)	WATS	BAND 2	346	29 08	823 32	449 06	96 32	32 80	578 18	0 33
MCI_SERV	(84)	WATS	BAND 3	207	12 69	389 62	196 06	42 03	14 26	252 35	0 33
MCI_SERV	(84)	WATS	BAND 4	92	7 56	229 88	116 83	25 05	8 43	150 31	0 33
MCI_SERV	(84)	WATS	BAND 5	1135	92 06	2623 87	1433 17	307 21	104 35	1844 73	0 33
MCI_SERV	(84)	WATS	CANADA	7	0 39	11 02	6 68	1 30	0 45	7 83	0 32
			TOTAL	2303	183 74	5220 01	2837 50	608 39	206 66	3652 55	0 33
BAND5	(85)	WATS	BAND 1	1	0 07	2 27	1 62	86 11	5 26	92 99	18 59
			TOTAL	13538	908 90	6360 69	4371 23	694 50	301 24	5366 97	0 09

This report summarizes call counts and phone costs by "trunk group" (major categories of telephone service). In this example, four services are used as shown in the far left column: normal DDD service, an FX line, long-distance service from MCI, and WATS. As rate structures for services change, this report is used to compare shifts in costs so that adjustments can be made in order to obtain the most economical mix of services. Other more detailed reports from the system can be used to narrow down the reasons for cost and usage shifts highlighted in the Trunk Group report.

■ Reasons for Unix

The TelAccount software makes an interesting study of several of the reasons why Unix systems are gaining in popularity. This application serves a vertical market niche where the customers are motivated by the software's function, and not by any inherent benefits of Unix. The portability and software development features of Unix have been important factors in TelAccount's growing success. The application is complex, requiring a lot of computer "horsepower." Yet it can run primarily during off hours on Unix system micros such as the Fortune and 3B2, with plenty of computer resources remaining for other tasks. Although the system is not cost effective for very small organizations, there are still thousands of companies that could make beneficial use of TelAccount's software. ☐

A Termcap Entry— TRS-80 Model 100 Portable Computer

```
rl|trs100|TRS-80 Model 100:\
        :am:bs:xt:co#40:li#8:al=\EL:dl=\EM:cd=^L:ce=\EK:cl=\EE:cm=\EY%+ %+ :\
        :nd=^\:dn=^_:up=\EA:se=\Eq:so=\Ep:kl=^]:kr=^\:ku=^^:kd=^_:
```

Radio Shack's Model 100 computer was among the first true portables. The lap size computer business now seems to have almost as many competing firms as there are in the Unix systems marketplace.

The Model 100 makes a convenient remote terminal and data entry device. It has a full-size keyboard, a built-in 300 baud modem, and an RS-232 interface. Its 8-line by 40-character LCD display is smaller than those on some of the newer portables, but at discount prices as low as $399.00 the Model 100 is still the most affordable of the lot.

The Radio Shack Model 100 shows up in surprising places. A large number of these ultra-compact computers are in use. Here are the Model 100's terminal control sequences for the termcap database. If our readers send termcap entries for other portable computers, BUSINESS UNIX will print those too.

BUSINESS UNIX tested the termcap entry shown in the illustration on two Unix systems, using the *vi* screen editor as a validation program. We tested it on a Tandy Model 16 Xenix system at 9600 baud with the RS-232 interface. We also tested the termcap entry on a Codata 68000 system via the Model 100's built-in 300 baud modem. The screen refresh was a little slow at that rate, but otherwise the termcap entry worked fine with *vi*.

The illustrated Model 100 termcap entry is standard with TRS-Xenix. (Our thanks to Ray Bailey of Bailey Enterprises for helping with this test.) ✉

A Market Perspective

On Spreadsheet Systems

In this issue BUSINESS UNIX reports on two major spreadsheet systems for Unix based computers, **UltraCalc** and **Multiplan**. At least eight Unix spreadsheet packages are on the market now—if one defines a "spreadsheet" somewhat broadly and allows for a few "vaporware" products (i.e., products announced but not yet delivered). An exact count of Unix spreadsheet programs is difficult to determine because some products are known by more than one private label title. In future issues, BUSINESS UNIX will cover additional spreadsheet programs as well as Unix office automation packages that include spreadsheet modules. These reports are intended to provide a comparative reference, and to serve as an introduction to each package. The material presented is based on vendors' specifications and on discussions and demonstrations provided by end users.

■ A Brief History

By now, nearly everyone associated with the computer industry must be at least vaguely familiar with spreadsheet programs. The earliest famous program in this category was Visicalc, which some observers credit with fueling an early phase of the microcomputer boom; and especially with contributing to the demand for Apple computers. Lotus 1-2-3 later usurped the leading position of Visicalc, and probably became as important for IBM PC sales as Visicalc had been for Apple. Lotus 1-2-3, a so-called integrated product, incorporates graphics and file management capabilities along with the spreadsheet program. Neither Visicalc nor Lotus are currently available under Unix. Following the initial success of these two popular programs, dozens of competing spreadsheet systems for PCs appeared on the market. However, few of the PC contenders have been ported to the Unix environment, Multiplan being the significant exception. Beyond the land of spreadsheets there are other types of financial modeling programs, including some with mainframe antecedents dating back to the 1960s. This series of reports is restricted to spreadsheets per se (or spreadsheets within integrated office automation software systems), even though other types of modeling systems may provide similar, and perhaps even better, functionality in certain applications.

Certainly this will be an interesting competitive arena.

■ Spreadsheet Fundamentals

We define a spreadsheet here as a program that operates on a two dimensional matrix (worksheet) of "cells" containing data and formulas. The video display provides one or more windows onto the worksheet, and appears similar to an accountant's multicolumn worksheet. Cells are identified by row and column positions within the matrix (e.g., A12 for column A, row 12). Functions are provided that operate on groups of cells, such as for summing across rows or down columns. Typically, functions and arithmetic operators are combined to create formulas that determine a cell's value. The user is either in "command" mode, requesting some action from the program, or in "edit" mode, modifying a data value or formula contained within a cell. After any modification, or on command, the spreadsheet program recalculates all the interrelated cell values for the entire matrix. Other basic spreadsheet characteristics usually include options for printing out the worksheet, and various built-in capabilities for math, trigonometric, statistical, financial, and logic functions.

■ Applications and Extended Functions

The original and still primary motivation for using spreadsheets lies in performing financial modeling tasks of the sort that might also be accomplished with a pencil and accountant's multicolumn worksheet paper (e.g., budgets). Although applied primarily to financial models, spreadsheet systems are also useful in other types of applications where the data can be viewed as a table of interrelated values, such as in some statistical applications. The main advantage of a computerized spreadsheet over manual methods is that the former can rapidly and accurately recalculate an entire model after any change, a job that might

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take hours if done manually with a calculator.

One factor propelling the PC market's demand for spreadsheet systems has been this capability for rapid visual feedback. Insert a formula or change a value and the impact is immediately visible on the screen, in contrast to the long feedback loop of the program-compile-run steps in computer programming languages. In addition to speed and accuracy in recalculating a worksheet, and rapid visual feedback during development of a model, spreadsheet systems make possible a degree of complexity that exceeds what is really feasible by manual methods. This extension of feasible applications for spreadsheets is particularly evident with programs that provide "three dimensional" inter-spreadsheet linking and consolidating functions. Though spreadsheet programs make it possible to work on models that would be too cumbersome for manual methods, they are probably more often used as a convenient utility for developing common financial schedules, such as simple budgets and amortization tables.

Spreadsheets may never become as prominent as they have been for PCs.

Beyond the essential characteristics, spreadsheet systems are differentiated by various special features, including their ease of use, the number and type of functions and commands, and extensions such as the ability to display graphics. Maximum worksheet dimensions range from the typical Visicalc-like size of 254 rows by 63 columns, up to theoretically unlimited sizes. Actual size limitations are usually based on memory addressing or disk storage restrictions, rather than the specified maximum dimensions. **Display formatting** alternatives, depending on the spreadsheet package, may include dollar signs and commas in numbers, debit/credit notation, underlining, boldfacing, color highlighting, right/left justification, and other display options. Some programs provide a means of assigning **names** to cells and/or ranges of cells in the worksheet, a great aid in setting up even moderately complex models. For example, a cell might be identified by the name "sales" rather than by the default label of D12 (for column D, row 12).

Spreadsheet systems have differing capabilities for "three dimensional" operations involving multiple worksheets. Some systems provide for **linking** mechanisms to extract a cell's value from one worksheet for use in another worksheet. A feature found in some spreadsheet programs is a **consolidation** capability for overlaying two worksheets to produce a combined matrix consisting of cells summed from each. **Programmability** features vary among spreadsheet packages. Included in this category are user-defined functions, user-defined keystroke macros, and built-in functions for handling data arrays and table lookups. Some systems also provide for procedure files to carry out a repeated series of complex command operations.

■ The Market for Unix Spreadsheets

Competing spreadsheet systems share basic characteristics, differing mainly in capacity limitations, special features, and extensions. At this stage, no product is clearly the dominant Unix spreadsheet program, as Visicalc and Lotus 1-2-3 have been in the PC market. Spreadsheets have reached the status of an essential utility for business computers. Consequently, Unix vendors must provide spreadsheet programs as an option, even though existing PCs may continue in use for spreadsheets and other personal productivity applications.

Spreadsheets on Unix business systems may never become as prominent as they have been for PCs. Stand-alone spreadsheets along with word processing, and simple databases, all of which are primarily personal productivity applications, have constituted the PC's strengths. Unix systems, on the other hand, are inherently intended for a wider range of applications. Viewed as personal productivity tools only, Unix spreadsheet programs have few advantages over PC spreadsheets. One disadvantage of Unix spreadsheets is that they may respond to the user more slowly than PC based software because of timeshared CPUs and serial I/O for video displays.

In an attempt to position Unix systems in the market for office workstations, software vendors are looking for ways to package and sell office automation systems. Office automation concepts and the supporting technology are continuing to evolve. Whether office automation systems can be sold as cost-justified efficiency remains to be seen. Certainly this will be an interesting competitive arena. New opportunities are emerging for wide distribution of Unix based office automation applications. Spreadsheet programs are only one of the elements in the technology for these systems. ✉

Olympu
Ult

The UltraCalc spreadsheet system is published by Olympus Software of Salt Lake City. This product has received a fair amount of publicity, notably a favorable review in the November 1983 issue of Yates Ventures' newsletter. UltraCalc, one of the first available Unix spreadsheets, is now distributed on a wide range of Unix systems. UltraCalc has not been ported to any Xenix systems, although Olympus Software indicates there are plans for a Xenix version. The company claims there are several thousand copies in use. (Olympus says it is unable to track installations precisely, because of its OEM distribution arrangements.)

Olympus Software was started in 1982 by Dick Kreutzer. Kreutzer operated the company singlehandedly for some time, developing and marketing UltraCalc. The company now has ten employees, including six in engineering and technical positions. UltraCalc is the company's only product. It is written in C and available exclusively on Unix systems. UltraCalc's latest release, Version 3.0, is now in beta test. This version will be capable of running on several smaller Unix micros, in-

s Software's raCalc

cluding 8086 and 8088 based systems.

A demonstration package for prospective UltraCalc users is available from some distributors. The demo includes all of UltraCalc's functions except the ability to save data. User documentation consists of one 180 page manual, plus appendices for updates. The first section of the manual is organized as a tutorial. There is no pocket reference guide (Olympus maintains that the on-line help system obviates the need for a reference card). Customer support is handled by OEMs and distributors.

Input and output operations are consistent with standard Unix concepts.

■ UltraCalc System Features

UltraCalc functions in a manner similar to other popular spreadsheets. Cells in the worksheet contain Values, Labels, or Formulas. Cells are identified by the usual row/column convention, such as d5 or ab200. In addition, named cells are supported, along with named rows, columns, and blocks of the worksheet. UltraCalc's command syntax is concise and consistent. A semicolon signals the program that what follows is a command. Most commands operate on a "list" of cells, which may be a range of columns and/or rows, or even a "name" that specifies such a group of cells. In general, commands take the form: "Cell-list ;command-and-parameters," where the semicolon introduces the command name. Command names can be spelled out in full or abbreviated to one or two letters. This syntax imparts a very generalized utility to many of the commands, because a whole block of the worksheet can be moved, deleted, copied, etc. by referencing a single name.

UltraCalc seems well integrated with the Unix environment. The user can escape UltraCalc to run other commands (this is similar to the way **vi** operates). Devices such as the printer and keyboard are generally treated as special cases of files for input and output operations, consistent with standard Unix concepts.

Because of its virtual memory architecture for data storage, UltraCalc has no built-in restrictions on the size of worksheets. Olympus Software told BUSINESS UNIX that worksheet storage is entirely disk resident. Thus, the program's use of memory does not expand directly with the size of the active worksheet, as is the case with most other spreadsheet packages. Practically speaking, UltraCalc worksheet sizes are limited only by available disk space. UltraCalc performed recalculations quickly on the moderate sized spreadsheets we observed. We did not, however, observe UltraCalc's performance with a "ultra-large" virtual spreadsheet.

Some spreadsheet programs allow circular references between worksheet formulas. Such programs can recalculate the

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formulas for a set number of iterations or until some changing value approximates a preset goal. UltraCalc does **not** have this capability. UltraCalc warns the user about circular references, but only during a reordering operation. The implication is that the UltraCalc user should design models that do not involve circular references.

UltraCalc has several noteworthy ease-of-use features. A comprehensive on-line multilevel help system provides increasingly detailed help at each level. The help facility can be invoked directly at any time during command entry. A "calculator mode" performs interactive calculations on the command line without requiring that a temporary formula be entered in the worksheet. A history facility allows the user to recall and reuse any of the five previously typed entries. UltraCalc provides an option for full screen display of formulas, rather than values (this is useful for visually tracing interdependencies among cell formulas). Portions of a worksheet can be protected against accidental modification.

As mentioned earlier, most of UltraCalc's commands have a generalized and powerful syntax. For example, with the Copy command a user can: copy a single cell into many cells (replication); copy one "area" to another area; or copy a "list" of cells to another such list.

An "ultra-large" virtual spreadsheet.

UltraCalc does not provide windows in the usual sense. However, it does allow any row or column to be displayed next to any other row or column on the screen. This feature provides the appearance of windows, but does not allow these windows to be independently scrolled. A portion of the screen display can be "frozen" while other areas on the screen are scrolled. Otherwise, scrolling with multiple windows is not implemented. The ability to display rows or columns in any order lets the user make temporary comparisons of non-adjacent worksheet areas, but without the dynamic characteristics of true windows.

UltraCalc has a number of advanced **display options** as well as the usual assortment of cell formatting capabilities. Cell formats include Dollar, Fixed Decimal, Percent, Integer, and scientific notation. Column widths can be varied from 1 to 127 characters on a column-by-column basis. Text fields, such as worksheet titles and row or column labels, may automatically overlap cells to the right. Overlaid text labels are repositioned correctly even if column widths are changed. **Special video attributes**, such as color, blink, reverse, reduced, underline, and alternate character sets, may be associated with each cell independently. Graphics capabilities, which also can make use of the video attributes, are provided for horizontal or vertical bar graphs.

Links between worksheets are supported. This allows a named cell in one spreadsheet to be referenced in a second. A consolidation feature makes it possible to combine worksheets in a cumulative manner on a cell-by-cell basis.

UltraCalc has several file **import/export** capabilities. Any area—even unconnected lists of areas—may be saved or loaded with or without formulas (i.e., with values only). Cell references within formulas are optionally adjusted when cells are loaded into a worksheet. Sequential ASCII files can be input or output from UltraCalc worksheets. Data output to disk can have a "print image" format suitable for inclusion in word processing documents. Data can also be exported to ASCII files by using the Output command with a user-specified delimiter between data fields. Data in this format is perfectly suited as input to many Unix utilities.

Any number of UltraCalc commands may be saved in a file and executed as a single command. UltraCalc command files can execute other UltraCalc command files up to a maximum nesting of ten levels.

UltraCalc's built-in **functions** include: Abs, Exp, Ln, Log, Sin, Cos, Tan, Asin, Acos, Atan, Lookup, Find, Choose, Sum, Min, Max, Avg, Count, Npv, Sqrt, and Round.

As noted earlier, UltraCalc **commands** operate in a consistent manner on cells, rows, columns, or blocks, including named areas. Commands include: Go to, Copy, Blank, Protect, Edit, Load, Link, Hold Constant, Save, Output, Format, Alter Order, Justify, Insert, Delete, Width, Title, Execute, Recalc, Zap, Repeat Label,

FACTS IN BRIEF

UltraCalc

UltraCalc is a spreadsheet system that can process very large, virtual memory worksheets. Capabilities include inter-spreadsheet consolidation and linking functions. UltraCalc appears to be well integrated with the Unix environment, including facilities for moving ASCII files in and out of UltraCalc worksheets. UltraCalc is a stand-alone product, although OEMs may integrate the program with other office automation applications.

■ **Publisher:**

Olympus Software
1733 South 1100 East
Salt Lake City, Utah, 84105
Phone: (801) 487-4534

■ **Price:**

License fees vary, depending on distributors' pricing policies. Suggested prices from Olympus range from $400 for a single user system to $9,795 for a system with 128 or more users.

■ **Distribution:**

UltraCalc is marketed primarily through OEMs and distributors, with implementations for Version 7, System III, and System V Unix. Two Berkeley, California, firms, Unisoft Systems and B.A.S.I.S., distribute UltraCalc (both of these firms demonstrated the product for this article). A 4.2BSD port of UltraCalc should be available soon and a Xenix version is planned. A partial list of systems that can run UltraCalc includes:

AT&T 3Bx line
Fortune
Zilog
Plexus
Most Unisoft Unix ports.
IBM PC/IX—To be released soon.
VAX 4.2 BSD—To be released soon.

Move, and Vacate.

■ UltraCalc Users

Bennett Falk, a UNIX applications expert at B.A.S.I.S. in Berkeley, California, gave us a brief demonstration of UltraCalc, Version 2.7, on the company's Zilog system (see the profile article on B.A.S.I.S. in this issue). Bennett is an experienced Unix user, but does not use UltraCalc itself frequently. He had to set up an UltraCalc directory for this demonstration without advance notice. This required assigning about a dozen shell variables for UltraCalc, and "compiling" UltraCalc's own special binary "termcap" file for the terminal we were using. We got the impression that setting up the Unix environment for UltraCalc requires some effort the first time, especially in view of the fact that Bennett is a Unix software expert. In fairness to Olympus, it should be mentioned that their intent is to have OEMs, not end users, configure the UltraCalc environment.

In the course of the demonstration, Bennett made a number of favorable comments about UltraCalc's ease-of-use features. He noted, in particular, that the program does not produce the excess of prompting and help messages common with this type of end user applications software (although UltraCalc does have a convenient on-line help facility). Bennett also commented favorably about the general "economy of keystrokes" that UltraCalc requires of the user.

A second demonstration of UltraCalc was provided by Mr. Gershon Lewis, Vice President of Administration and Finance at **Unisoft Systems** in Berkeley, California. This demonstration was run on a Dual Systems computer, lightly loaded at the time. As a spreadsheet user, Lewis is a true heavy-weight with considerable professional experience. In the course of our discussion, he pulled several spreadsheets onto UltraCalc's display. Some of his comments were framed as comparisons of UltraCalc with SuperCalc, a popular PC spreadsheet program that Lewis also uses.

One of the spreadsheets we looked at was a 48-month amortization table that had been used in a lease versus borrow analysis. This model had fairly complex numeric computations in each of several hundred cells. When we changed the interest rate, UltraCalc took about 10 seconds to recalculate the model. Lewis exhibited UltraCalc's histogram capability on a monochrome terminal and we experimented with changing the histogram fill character.

Lewis noted that UltraCalc has good features for justifying the contents of cells. Although the entry-line history feature is useful, Lewis pointed out that there is still no general "undo" command to recover from an unintentional worksheet modification. Unfilled areas in a UltraCalc spreadsheet default to the "N/A" value so that no results are possible for formulas that directly refer to unfilled cells. Lewis pointed out that it would be preferable, in some applications, if UltraCalc treated these cells as containing the value "0," rather than as undefined.

In the course of this demonstration, we were frequently referring to the UltraCalc manual. Our impression of the manual is that it is thorough and well written, but somewhat difficult to use as a reference guide. In summary, Gershon Lewis at Unisoft appears to have made satisfactory use of UltraCalc for an array of applications that are probably more complex than what many users will normally attempt. ✉

Microsoft's Multiplan

Microsoft's Multiplan is one of the all time best seller software packages in any category, having sold over half a million copies since it was introduced in 1982. Multiplan is available on Unix and Xenix systems as well as on CP/M, MS-DOS, Apple-DOS, Apple Macintosh, and most of the Radio Shack computer line (TRSDOS). From what BUSINESS UNIX can determine, Multiplan presents a nearly identical functional interface to the user across all these systems. Moreover, versions of Multiplan apparently also exist under OEM private label titles. Prominent among distributors for Multiplan in the Unix/Xenix environment are: The Santa Cruz Operation (SCO); Radio Shack for its Xenix implementation; and AT&T for its 3B computers (SCO also distributes Multiplan for the 3B computers). When BUSINESS UNIX called Microsoft's retail sales operation to ask about Multiplan on Unix and Xenix systems, they referred us to The Santa Cruz Operation.

A self-contained environment, albeit a rich and functional one.

The Multiplan manual contains over 400 typeset pages, including a well organized reference section. Technical support is provided primarily by OEMs and distributors, rather than directly by Microsoft. The Santa Cruz Operation, for example, maintains and supports its own

implementation of Multiplan for several Unix and Xenix computer systems. Judging from our experience, SCO also has a very effective telephone hotline for end user support.

Most versions of Multiplan are written in an interpreted pseudo code. A native C version, which does not use the interpreter, is available for some Unix systems. Different implementations of Multiplan have slightly varying interfaces to the operating system. For instance, Multiplan from SCO uses the standard Berkeley **termcap** terminal control file and automatically routes printed output to the default Unix line printer.

■ Multiplan System Features

Multiplan's worksheet is displayed in the top portion of the terminal screen. The bottom four lines are reserved for menus, messages, and status information. Up to eight rectangular **windows** can be displayed at one time. Windows can be divided horizontally or vertically. The user can scroll each window independently, or multiple windows can be locked together for scrolling in unison.

Maximum worksheet dimensions are 63 columns by 255 rows. Usable worksheet dimensions depend on factors such as the the type of data and complexity of the formulas in a particular model. The effective size of Multiplan models can be extended with **inter-spreadsheet linking** facilities. (However, there is no consolidation capability for combining whole spreadsheets).

Links are uni-directional references to "named" cells or blocks of cells in a "supporting" worksheet. The "dependent" worksheet copies data in from the external supporting cells. Linking can be employed to construct elaborate networks of interrelated spreadsheets. To help the user keep track of links, Multiplan can generate a list of supporting and dependent worksheets that are linked to the spreadsheet in memory. The system has built-in mechanisms for adjusting links if the file names of any of the spreadsheets change.

Multiplan operates with a set of menus and submenus that appear on two lines at the bottom of the screen, below the worksheet display. The user first selects a command from among the twenty choices on the main menu. The selected command name is then displayed, typically along with a new subcommand menu. After selecting the command and the subcommand, the user must select responses to command "fields" (i.e., parameters). Some fields in turn have a sub-submenu of "options" to be selected. Each of these steps

Continued on next page

Continued from previous page

—command, subcommand, fields, and options—can be performed either by entering a single letter abbreviation or by moving the command cursor so that the desired command is highlighted before pressing the RETURN key. An experienced Multiplan user will cause a rapid succession of menus, sub-menus, and prompts to appear below the worksheet in response to commands. At all times during this process, the user has access to an on-line, context sensitive, help system.

Multiplan references cells in commands and functions with the form RyCx where y is the row number and x is the column number. For example, R4C12 represents the cell in row 4, column 12. This format is a departure from the cell referencing format found in most other spreadsheet systems. For instance, cell R2C2 in Multiplan is equivalent to cell B2 in systems that use the more common Visicalc method. "Relative" cell references are allowed, in the form R[+n]C[+n]. For example, R[+4]C[−1] means the cell four rows down and one column back from the cell containing the relative reference. Multiplan also allows references to cell "ranges" that define a block of cells in the worksheet. For the truly brave, "union" and "intersection" operators can be used to create combination references to cells. **Named** cells are supported, including named blocks of multiple cells. The cell referencing and naming capabilities comprise a flexible and powerful method for defining cell locations that are used in formulas. For instance, the user may name a whole block and then use the Index function to reference particular cells within the named block.

Multiplan has a full set of commands for manipulating rows, columns, and blocks in the worksheet. These include copy, blank, move, insert, and delete. Multiplan automatically adjusts cell references during operations that transform cell locations.

Display options for cell contents include left or right justified, centered, and automatic alignment (by the general rule that text is left justified and numbers are right justified). Column widths can be specified individually. Cells can be formatted for scientific notation, fixed decimal, money amounts (dollar sign and two decimal places), and percentages (with trailing "%" sign). Global defaults for cell formats and column widths can be specified. A special format for text allows titles to overlap into adjoining columns on the right (the cell on the right must be blank however).

Multiplan has an **iteration** feature for solving problems involving circular references within a spreadsheet. Examples of this sort of problem include solving simultaneous equations, calculating internal rate of return, and finding roots of polynomial equations. When the iteration feature is used, Multiplan continuously recalculates the model until a user specified completion test is satisfied. Two special functions are provided for working with iterative models: an Iteration Count function, and a Delta function that is used for calculating cell value changes during each iteration.

Printed output is routed to the line printer (default Unix spooler). From within Multiplan, the user can control margins and page length for printing. There is an option to print the underlying formulas in a worksheet, rather than the numeric results. It is also possible to print subset areas of the spreadsheet instead of the entire matrix.

Multiplan is not highly integrated with the Unix environment. There is no way to exit temporarily to the shell from within Multiplan. Directory listings can be generated with Multiplan's "Transfer Load" command. Data can be transferred from or to ASCII files in a special symbolic format (called a SYLK file), but there is no method for exporting or importing simple ASCII data. Print image ASCII files can be saved on disk and later used for word processing or other programs. Otherwise, Multiplan is a self-contained environment, albeit a rich and functional one.

Built-in Multiplan **functions** include Abs, Exp, Int, Mod, Round, Sign, Sqrt, Ln, Log10, Sin, Cos, Tan, Atan, Avg, Max, Min, Count, Sum, True, False, Not, Or, If, Index, Lookup, Len, Mid, Npv, Pi, and Stdev.

Multiplan **commands** include Blank,

A rapid succession of menus and sub-menus appear below the worksheet.

FACTS IN BRIEF

Multiplan

Multiplan is a widely available, full-featured spreadsheet program. Maximum dimensions for Multiplan worksheets are 63 columns by 255 rows. Multiplan is distinguished by the number of operating systems on which it runs with virtually identical functionality. Noteworthy features include split screen window displays, named cells, iterative recalculation capabilities, and support for "linking" related worksheets.

■ **Publisher:**
Microsoft Corporation
Bellevue, Washington

■ **Reseller for Unix and Xenix:**
The Santa Cruz Operation (SCO)
P.O. Box 1900
Santa Cruz, CA 95061
Phone: (408) 425-7222

■ **Price:**
Prices from The Santa Cruz Operation run from $495.00 to $875.00 for most 8088, 8086, Z8000, and 68000 based Unix and Xenix systems. Prices for larger minicomputers run from $1,000 to $2,600 (i.e., for machines in the Vax 11/780 and AT&T 3B20 class). Distributors other than SCO may set different prices. Multiplan support, including a customer service hotline and technical bulletins, costs $75.00 per year from SCO.

■ **Distribution:**
Multiplan is available for most computer systems running Unix, Xenix, and derivatives of Unix. Distributors include SCO, AT&T, and Tandy/Radio Shack.

Copy, Delete, Edit, Format, Goto, Help, Insert, Lock (protect cells), Move, Name, Print, Quit, Sort, Window, and eXternal (link).

■ Multiplan Users

Ray Bailey, a Xenix applications consultant, demonstrated Multiplan for BUSINESS UNIX on a Radio Shack TRS-80 Model 16B system. Bailey is a highly experienced user, having worked with Multiplan for several years on a succession of computers and operating systems. Radio Shack's implementation of Multiplan on Xenix is supplied and supported directly by Radio Shack itself. The program we saw demonstrated was identified as Multiplan version 1.06. This version of Multiplan automatically names spreadsheet files with an extension of ".mp," a convention not followed in some other Unix versions of Multiplan.

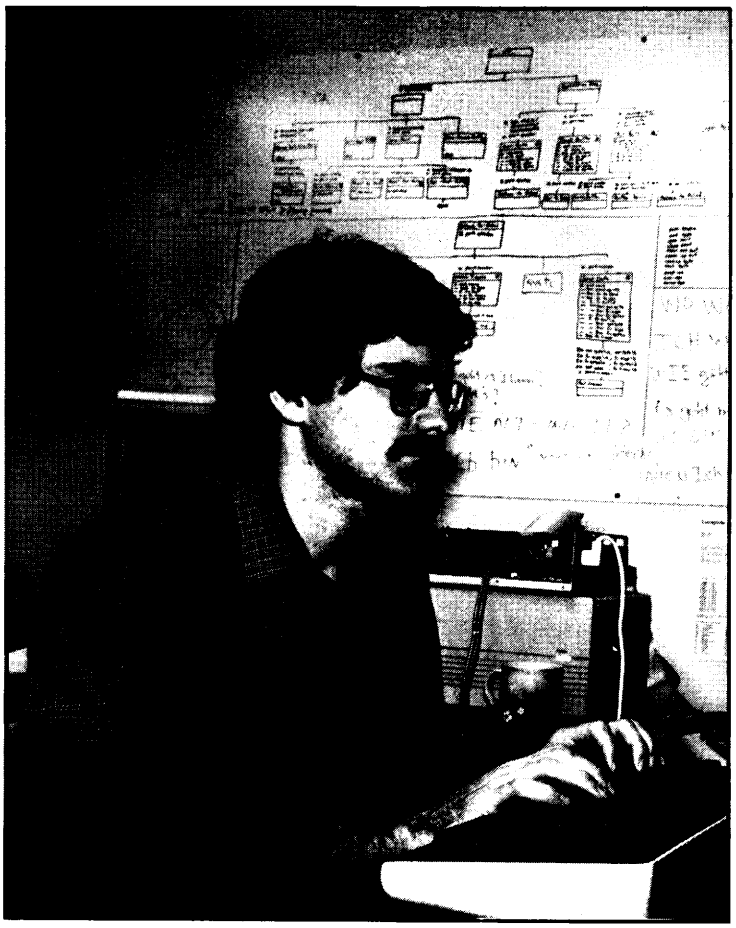
Bailey demonstrated a series of separate monthly-data spreadsheets based on a single template. These monthly spreadsheets support an annual-data summary spreadsheet using Multiplan's linking facilities. The monthly spreadsheets calculate a salesperson's earnings based on a hybrid formula that accounts for a minimum base salary plus commissions. The monthly worksheets use only about 26 rows (depending on the number of business days in a month). The user is provided with a quick and accurate view of commission performance as the month progresses. Bailey's annual earnings model extracts data from "named" cells in each of the monthly spreadsheets using Multiplan's external linking function. During the demonstration, the model picked up five external values (January through May) so rapidly that at first it was hard to believe the linked spreadsheets had been accessed at all.

A nearly identical interface to the user across all these systems.

In another demonstration, Bennett Falk at B.A.S.I.S. in Berkeley, California, showed BUSINESS UNIX an interesting use of Multiplan to solve a statistics problem. Applying a spreadsheet program to a statistics model is not as common as using this type of program for financial models. It does, however, demonstrate the fundamental versatility of spreadsheet systems. The application that Bennett showed us involved a large number of complex formulas that would have been very tedious to carry out by hand.

The statistics worksheet contained two named blocks (tables). The first table consisted of correlation values obtained from a research project. The second had formulas to calculate statistical variances using the fixed data in the first table. Use of the named blocks simplified the task of writing, and understanding, the variance formulas. Bennett demonstrated Multiplan's windowing capabilities by setting up one window for the fixed data and another for the calculated variance results. It was then possible to change cells in the first window and watch recalculated values appear in the second.

The spreadsheets demonstrated by Ray Bailey and Bennett Falk made use of many of Multiplan's capabilities, including inter-spreadsheet linking, named blocks, and windowing. Together, the two demonstrations illustrate the utility of Multiplan's rich set of functions for a wide range of applications. ✉



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Some Unix Software Guides

TWO NEW SOFTWARE DIRECTORIES FROM AT&T

AT&T and Reston Publishing (subsidiary of Prentice-Hall) are publishing two new software directories, one focused on Unix System V and the other covering software for all AT&T computers, including the 3B Unix systems and the PC 6300. AT&T appears to be devoting considerable resources to producing and distributing these two directories.

The Unix System V Software Catalog has just been released as we go to press. AT&T told BUSINESS UNIX that the catalog covers more than 235 applications packages from over 60 software vendors, with coverage of software for **all computers that run System V**, not just AT&T computers. The catalog sells for $19.95 and will be published semiannually. This catalog will be distributed through book stores, or may be ordered directly by calling the AT&T Customer Information Center in Illinois at (800) 432-6600.

Although BUSINESS UNIX has not yet received a copy of *The Unix System V Software Catalog*, we were able to discuss it with the catalog's editor at AT&T. According to this source, each listing includes a table of computers on which the program will run. Software descriptions in the catalog were provided by the Unix software vendors. Since AT&T did not evaluate or test the software listed, it may be prudent for readers to exercise caution regarding the listings. The catalog shows retail list prices along with the software publishers' names. It does not, however, give the names for distributors of the software packages. Instead, AT&T will provide a telephone hotline so that readers can get information on how to obtain particular software packages for specific machines. Regarding this last point, it seems unfortunate that AT&T places itself in the position of a filter between the buyer and seller of applications software. However, this may be the best that AT&T can do, given the complexity of software distribution for many Unix applications packages (e.g., different OEM arrangements for each computer). Developers interested in having software listed in future editions can call (800) 833-9333 for further information.

The other software directory announced by AT&T and Reston Publishing is scheduled to become available in February 1985. *The AT&T Computer Software Guide* will cover software that runs on all AT&T computers. AT&T told BUSINESS UNIX that about 30 percent of the listings will cover Unix software for the 3B line of computers, while the remaining 70 percent of the software guide will be devoted primarily to MS-DOS software for AT&T's PC 6300. In contrast to the System V catalog described above, all of the software listed in the software guide has been "reviewed" according to AT&T guidelines to determine that it will at least run on AT&T's computers. Apparently, one objective for the guide is to provide MS-DOS users with an authoritative source of information about PC compatible software for the 6300.

In addition to the two new software directories announced by AT&T, other sources of information about Unix software are the */usr/group UNIX Catalog* and Onager Publishing's *Unix Applications Software Directory*. These two directories provide complementary information. Both publications are recommended for anyone evaluating and selecting Unix software.

- */usr/group UNIX Catalog*, Fall 1983 Edition, 438 pages. This is the third edition of the /usr/group Unix products catalog, covering Unix software, hardware, consulting, and other Unix related services and products. This edition includes nearly 800 products from 276 companies. A new edition is currently being prepared. The price is $50.00 ($25.00 for /usr/group members). Ordering information can be obtained from:

  /usr/group
  4655 Old Ironsides Drive,
  Suite 200
  Santa Clara, CA 95054

- *Unix Applications Software Directory*, 2nd Edition, May 1984, 197 pages, Onager Publishing, $50.00 per copy. This thorough directory lists nearly 400 software products from 171 vendors. The directory provides expanded and improved coverage in the new edition. To inquire about ordering, write to:

  Onager Publishing
  6451 Standridge Court
  San Jose, CA 95123

HANDBOOK FOR vi PLANNED

BUSINESS UNIX has learned that Walter Zintz is writing a how-to book on the use of the **vi** editor. The book will be

titled *The vi Handbook*. Zintz is well known for his leadership role in the Uni-Ops user group and for his columns and articles on Unix subjects in several publications. A new publishing company, Alamonville Limited, has been formed to publish *The vi Handbook* and other titles. More information can be obtained from Alamonville Limited, P.O. Box 27186, Concord CA, 94527-0186.

Industry Profile

B.A.S.I.S.

Where Unix Meets the End User

Sometimes it seems as though firms in the Unix systems business are occupied mostly with selling their products to each other. Ultimately though, the industry depends upon a population of end users. B.A.S.I.S. (Bay Area Shared Interactive Systems, Inc.) is a Berkeley, California, company distinguished by the depth of its experience in delivering Unix products and services to end users. B.A.S.I.S. offers Unix timesharing along with training, consulting, software, and complete Unix systems.

The company was incorporated in September 1981, and had its first Zilog system with Unix installed in January 1982. The three founders, Pat and Merrill Shanks and Mike Denney, previously worked with Unix systems at the Survey Research Center on the University of California, Berkeley, campus. The company now operates two Zilog timesharing systems with a total of 40 terminal ports, and is a distributor (Value Added Reseller) for both Zilog and Pyramid computers.

The policy of B.A.S.I.S. is to gain experience with a software package on their timesharing system before selling the package to customers. The firm's expertise with applications software, and real-world contact with end users, has led to a number of related services, including training programs, consulting projects, and customized software packages. The people at B.A.S.I.S. can recount some interesting tales about their successes in setting up large Unix systems for very computer-naive, first-time users.

Unix products and services available from B.A.S.I.S. range from T-Shirts and posters to quarter-million-dollar machines. B.A.S.I.S. can be contacted at: 1700 Shattuck Avenue, Suite 1, Berkeley, CA 94709. Phone: (415) 841-1800.

Applications software available to B.A.S.I.S. customers for timesharing use or for licensing on end-user machines includes:

Database Management: Unify, Informix, Leverage, /rdb.
Accounting: MCBA, MBSI RealWorld.
Word Processing: Lyrix, XED.
Spreadsheets: Multiplan, SuperComp 20, UltraCalc.
PC Links: MIMIX (CP/M emulator), PCworks.
Menus: /menus & /forms.
Statistics: TRANSTAT.
Languages: Fortran-77, COBOL & COGEN (Cobol program generator), SOFTBOL (DIBOL compatible), BASIC, PASCAL.

SANTA CRUZ OPERATION OFFERS INCENTIVES FOR SOFTWARE DEVELOPERS

The Santa Cruz Operation (SCO) has announced an Independent Software Vendor (ISV) program to encourage the development of software that operates in conjunction with SCO's products. A developer of Unix systems software since 1978, SCO is Microsoft's exclusive North American alternate source for Xenix and the sole Xenix source for the Apple Lisa and IBM PC/XT, as well as for the AT&T 6300, Tandy 1200, Compaq, and other PC compatibles. SCO also distributes and supports applications software packages for Xenix and Unix systems, including systems from Zilog, AT&T, Plexus, DEC, Altos, Pyramid, Intel, Onyx, and NCR.

The primary benefit of SCO's program for ISVs is a 40% discount on SCO software used for development projects. In addition, SCO will assist the ISV in understanding and utilizing SCO software under this program. Although the ISV program does not involve extensive marketing arrangements, SCO will list the ISV's products in its ISV catalog and may advertise the availability of software developed under this program.

SCO products that qualify for the ISV program include the Xenix operating system, Micro Focus Cobol, and a number of applications packages for both Xenix and Unix, including Lyrix word processing,

Continued on next page

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Continued from previous page

Multiplan, and the Informix database system. For more information contact Kam Bargert at SCO, 500 Chestnut Street, Santa Cruz, CA 95061. Phone (408) 425-7222.

Industry Profile

Bailey Enterprises

Riding the Tandy Xenix Wave

In a recent magazine article, Yates Ventures of Los Altos, California, estimated that the Tandy/Radio Shack Model 16 computer accounts for 31,000 installations, making it the number one seller in the Unix systems market. If anything, that installed base estimate may be a bit on the conservative side. First delivered in 1982, the Model 16 is also one of the earliest micros in the Unix marketplace. The MC68000-based Model 16 runs Xenix in multiuser mode (it also runs TRSDOS, a single user operating system). This system has not attained the high visibility of other Unix/Xenix computers, such as Fortune and Altos, that are targeted toward the lower end of the market. Still, the experience with the Model 16 in the marketplace must be important to anyone interested in small Unix systems.

Consultant Ray Bailey of Bailey Enterprises in Martinez, California, has been deeply involved with the Radio Shack line of computers since their inception, including long experience with the Xenix based Model 16. Bailey worked with some of the first Model 16A Radio Shack Xenix systems. These computers had 8-megabyte hard disks—and they frequently crashed, sometimes requiring that the operating system be reloaded from distribution floppies in order to recover. The newer Model 16B, usually configured with at least one 15-megabyte hard disk, has much improved reliability. Bailey has a Model 16B in his offices, and supports several more of these systems belonging to his clients.

BUSINESS UNIX had the opportunity to observe a demonstration of Bailey's Xenix system. The core of TRS-Xenix is distributed on three 8-inch floppies. In addition, the "Development System" includes 10 more floppies. In effect, Radio Shack has been unbundling Xenix for some time, leading a trend that both AT&T and IBM are now following. The Development System includes C and many of the Unix program development and text processing utilities. Bailey has the full distribution, including **vi**, **termcap**, **finger**, **more**, and other programs. The manual set includes four big volumes in ring binders. Our impression is that Radio Shack delivers a tight Xenix system. On the basis of discussions with Bailey, it appears that Radio Shack is very thorough about supplying update versions and bug fixes for their Xenix implementation.

Bailey moderates monthly meetings of the Xenix special interest group for the TRS Nybblers, a local Radio Shack users group. His activity with the users group is rooted in a long association with personal computers and the Radio Shack product line. In 1974, while still in junior high school, Bailey built four Altair computers from kits. In 1979 he built a TRS-80 Model I with Radio Shack parts. Along the way he was employed for a couple of years in Radio Shack computer centers. His office now includes the Model I he built, a Model III, the Model 16B Xenix system (upgraded from a Model 12), and a Model 100 portable computer, plus a number of printers and terminals. The Model I, Model III, and Model 100 are all set up to operate as terminals on the Xenix system.

Ray Bailey can be reached at Bailey Enterprises: (415) 229-2323.

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SEE INTRODUCTORY OFFER
ON PAGE 31

AT&T PROVIDES SYSTEM V STANDARDS DEFINITION

AT&T has announced a System V Interface Definition program. The purpose of this program is to ensure portability for applications software across current and future implementations of System V from AT&T and System V derivatives from source licensees. The Interface Definition provides standards for the interface between applications software and the operating system, thereby assuring software developers and end users that applications software will remain compatible with future directions in System V. In summarizing the announcement, Thomas Crowley of AT&T said, "Although UNIX System V will continue to evolve, we are committed to keeping critical portions of it stable to protect future applications portability." Crowley also said that AT&T will continue to work with established standards groups to define standards for the C language and other elements of System V.

The fundamental element of the AT&T program is the "System V Interface

Definition" document that defines the relationship between an application program and System V. The document is now being distributed for review to a representative sample of licensees and members of various standards groups. According to AT&T, the document will be generally available in January 1985.

According to AT&T, the new interface standard defines a minimum set of system calls and library routines that should be common to all operating systems based on System V. Additional Unix commands and utilities have been grouped into a series of optional extensions to the basic definition. Unix utilities covered by the extensions should also conform to the interface definition so that users and developers can rely on consistent functionality.

RUMBLES FROM DIGITAL RESEARCH

BUSINESS UNIX called Digital Research, Inc. (DRI) for a status report on their "UNIX System V Library" (a joint venture between AT&T and DRI). The first thing we learned is that the name of the venture has been shortened to "The UNIX Library." The next thing we learned was that everyone at DRI was very skittish about talking to the press. UNIX Library representatives told BUSINESS UNIX that a press conference will be held at UniForum. We got the impression that a **big announcement** will be made, possibly concerning the release of the first UNIX Library software products.

Digital Research is known for developing the CP/M operating system. The UNIX Library is a cooperative enterprise between AT&T and DRI to market software developed by independent software firms. Promotional literature for this program indicates that The UNIX Library will be oriented towards Unix applications and systems software for the MC68000, Intel 80286, and AT&T 3B computers. At present, certain fundamental aspects of The UNIX Library are still unclear. Exactly how independent software firms will participate in the program, as well as how The UNIX Library plans to distribute and support software products, is as yet difficult to determine. Answers to these questions may come after the first UNIX Library products are announced.

Watch for more information on this subject after DRI's news conference on January 21st at UniForum. ✉

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SOFTWARE FOR LAW FIRMS

Guardian Automated Systems, Inc., has developed a Unix office automation package for law offices. The "UniLaw Series" software includes modules for Legal Accounting, Case Management, Appointment Scheduling, and General Ledger. The Legal Accounting module has subsystems designed specifically for law firms, including trust accounting, accounts receivable, accounts payable, management reporting, and an interface to the General Ledger module. Case Management software provides trial lawyers with a calendar of filing and due dates, as well as several reports that track case deadlines and provide other case management information. The Appointment Schedule module maintains interrelated schedules for a number of persons as well as for shared resources, such as conference rooms. The General Ledger (GL) supports multiple divisions, departments, and companies. GL reports include trial balance, income statement, balance sheet, posting ledgers, budget comparisons, and transaction history.

The UniLaw Series applications modules are written in C and based on Unicorn/DB, Guardian Automated Systems proprietary file management software. An optional Unicorn/DB utility package provides users with customized, ad-hoc access to UniLaw data files. With Unicorn/DB the user can design and generate custom reports.

UniLaw Series software is currently available for Fortune and AT&T 3B2/3B5 computers. The company projects availability for Altos, Plexus, and IBM PC/AT computers during the first quarter of 1985. UniLaw Series software was first developed for Fortune computers in 1983. Module prices on Fortune and Altos systems are $3,000 for the Case Management module, $3,750 for the Legal Accounting module, $195 for the Appointment Schedule module, and $395 for the General Ledger module. Prices are higher on other computer systems. For more information contact: Guardian Automated Systems, Liberty Bank Building, Suite 600, 420 Main Street, Buffalo, NY 14202. Phone: (716) 842-6410.

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ANOTHER COBOL FOR AT&T's 3B COMPUTERS

Under the terms of a marketing agreement with Micro Focus Inc. of Palo Alto, California, AT&T will be offering Micro Focus' LEVEL II COBOL compiler for the 3B2 and 3B5 computers. AT&T will also offer two other Micro Focus products for development and maintenance of business applications programs: ANIMATOR source level interactive debugger, and FORMS-2 source code generator.

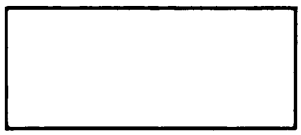
ABSOLUT SOFTWARE DELIVERS UNIFY BASED ORDER-ENTRY/INVENTORY SYSTEM

Absolut Software of Boston is now delivering its new Unix-based order-entry/inventory/billing system. The software is written in C and employs the Unify DBMS package. The system is designed for such inventory-intensive businesses as distributors, wholesalers, importers, mail-order houses, chain retailers, and distributing manufacturers. Optional modules with features for each of these applications are available. Options for the Absolut system include Multi-site Inventory Management, Serialized Inventory record keeping, Charge Card/Bank Billing, and a Point-of-Sale interface for "smart" cash registers. Other optional modules include General Ledger (GL), Accounts Payable (AP), and Accounts Receivable (AR) (the GL, AP and AR modules are provided **only** as add-on options to the base package, not as stand-alone packages). According to Absolut Software, the system's functional use of color terminals provides users with visual assistance (the software can also run with monochrome terminals).

Jack McGrath of Absolut Software told BUSINESS UNIX that the system was first installed commercially in September 1984. There are now three installations running on Plexus computers. The software has been ported to the Convergent MegaFrame, AT&T 3B2/3B5, and Pixel computers. Additional ports are planned, including a Xenix version for the IBM PC/AT and other Xenix systems. The

order-entry/inventory software is priced from $4,995 to $8,495 for a four-user system, depending on the basic configuration. Prices are higher for additional users and add-on options.

Absolut Software has been engaged in software development and consulting on a wide range of mini- and microcomputers since 1968. For more information contact Absolut Software at 2001 Beacon Street, Boston MA 02146. Phone: (617) 277-0610.



SHELL SHACC

Concentric Associates, Inc., has announced a new software product called **shacc**—Shell Accelerator—to be released in January 1985. Shacc will be demonstrated at Concentric's booth (#2218) during the January UniForum Conference in Dallas.

Shacc is a compiler for the Bourne shell. Given a Bourne shell program as input, shacc produces C code and then invokes the C compiler to produce an executable file. The generated C code is claimed to be well structured, readable, and accessible to the user. Lee Begeja of Concentric Associates told BUSINESS UNIX that shacc generates C code for the most common Unix commands, such as **cat, echo,** and **ls**. Other Unix commands within a shell program are executed using **fork** and **exec** system calls.

According to Concentric, shacc offers these benefits: shacc produced code is faster than its Bourne shell counterpart; is more resistant to piracy; is more time/space efficient and allows effective use of shared text and the sticky bit; and works properly with set-user-id files. In combination, these features make it possible to write production code in the Bourne shell, increasing the productivity of programmers. Shacc can also serve as a gateway to knowledge of the C language from an introductory knowledge of the Bourne shell.

The price for shacc ranges from $1,000 to $20,000 depending on the size of the system, with discounts for multiple copies.

Concentric Associates, Inc. is an independent firm with approximately twenty

Continued on next page

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employees. The company has been active for over two years in Unix education and training projects as well as in Unix software development. For further information, contact Jim Butz, Concentric Associates, Inc., 1 Harmon Plaza, Secaucus, NJ 07094. Phone: (201) 866-2880.

MULTIUSER UNIX TO VAX/VMS COMMUNICATIONS SOFTWARE

Creare Research and Development, Inc. has announced UltraLink, a software package for Unix to VMS communications. UltraLink provides full duplex, error-free transmission for up to eight users over a single RS-232 serial connection. The two computers may be linked locally with a three wire line, or remotely with any asynchronous modem.

BUSINESS UNIX spoke with Cliff Cary of Creare for more information about how UltraLink operates. According to Cary, a single UltraLink program on the Unix system manages transmission for multiple Unix users. An UltraLink program on the VMS system spawns a separate VMS DCL process for each user on the link and handles communication on the VMS end.

A single Unix command establishes a link to the VMS system. Files can then be transferred in both directions between the two systems. UltraLink expands wild-card file names according to Unix and VMS rules. It also permits an interactive VMS terminal session at a Unix terminal (i.e., virtual terminal capability). UltraLink commands and options conform to the familiar Unix command format.

Current Unix systems served by UltraLink are VAX/4.2BSD, VAX/Ultrix, MassComp, Sun-2, and Pyramid. UltraLink prices run from $700 to $1,100 per node. At least two nodes are required. For more information contact: Creare R&D Inc., P.O. Box 71, Hanover, NH 03755. Phone: (603) 643-3800.

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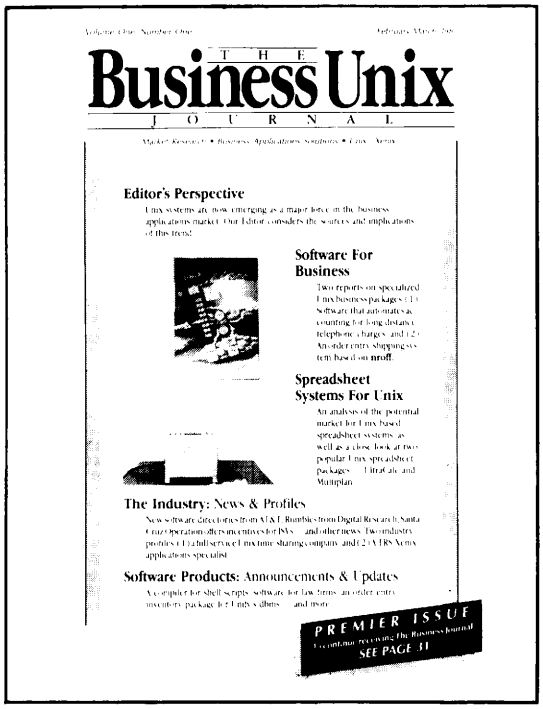
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