

The Intelligent Machines Journal

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Okidata Adds Graphics to Slimline Printers

Okidata Corporation has added new graphics capabilities to its Slimline Series of line printers. The microprocessor-controlled matrix printers are now available with a choice of 100 x 100, 70 x 72, 60 x 72, and 60 x 60 dot per inch (horizontal by vertical) densities.

The graphics option is available on the 125 and 250 lpm models of the Slimline Series. The printers can reproduce anything that can be displayed on a CRT screen, including areas of solid black, according to the company. Graphs, maps, bar codes, charts, and labels may be printed in addition to conventional text.

In addition, character sets such as Arabic, Chinese, and Farsi, which require large matrices, may be printed. Slimline printers with the graphics option are available with Dataproducers and Centronics-compatible interfaces.

The Slimline Series includes 125, 160, 250, and 300 lpm models. All feature program-controlled font selection, standard program diagnostics, and a 500,000-character lead warranty. Users



may change fonts on command, selecting from twelve different styles, including true lower case with descenders, double height, double width, and double height and width. A microprocessor-based RS-232C interface is also available with seven switch-selectable protocols, seven switch-selectable speeds, auto answer, and a choice of buffer sizes.

Prices for the 125 and 250 lpm models begin at \$2025 and \$2795, in 100-unit quantities. The standard graphics option adds \$95.

Contact Okidata Corporation, 111 Gaither Drive, Mount Laurel, NJ 08054; (609) 253-2600.

APPLE AND BELL & HOWELL ENTER EDUCATION MARKET

Apple Computer Company, Inc., has announced an agreement with Bell & Howell Company in which Bell & Howell will market a specially designed Apple II personal computer system.

Bell & Howell's initial efforts will be in the field of education, in which the use of personal computers for instruction is growing rapidly. Industry sources project that annual sales to the education market will reach in excess of \$400 million for personal computer hardware, and another \$2 billion by 1982.

The modified Apple will be a student version with added security elements, such as a tamper-proof cover and theft protection features. The changes will be cosmetic; inside, it will be a standard Apple II, a spokesman said.

Apple's Mike Markkula commented that Bell & Howell's distribution network and leadership role in marketing to education offers Apple Computer substantial access to markets difficult for retail-oriented companies to penetrate. "These strengths, combined with what we've learned about the needs of the educator, will give Apple and Bell & Howell a strong edge in a vital market," he said.

To reach these markets, the specially designed Apple II computer is being marketed through Bell & Howell's Audio Visual Products Division, an extensive distribution network which currently supplies both education and industrial markets. Bell & Howell already has representatives who call upon 100% of the public school districts in the United States.

Richard Fowkes, president of Bell & Howell's Audio Visual Products Division, said that the computer, along with software and courseware, would be dis-

tributed under the Bell & Howell name to the audio visual market. He further indicated that the company was still engaged in marketing research, but that a three-phase program to develop courseware was planned.

In the first phase, Bell & Howell would offer mathematics and science programs acquired from universities and private authors. Initially, a program in algebra for grades three through eight will be offered. The target date for this phase is fall, 1979.

In the second phase, Bell & Howell will develop its own supplemental packages for algebra, and will publish them through its subsidiary, Charles Merrill Company. In the third phase, the company will work with authors to develop full courseware. This last phase is projected for early 1981.

Fowkes also indicated that Bell & Howell's market research had revealed a desire on the part of educators to use computer courseware in the basic skills area, as well as for remedial work in such areas as reading.

For further information, contact Bell & Howell, Audio Visual Products Division, 7100 McCormick, Lincolnwood, IL 60465; (312) 673-3300.

HUH SONO TO BE PURCHASED

HUH Electronics, manufacturer of TRS-80/5-100 bus adaptor as well as other products, will soon be purchased by California Computer Systems, of Santa Clara, California. Subject to final approval, the acquisition is expected to be completed well before the middle of July, 1979.

Micro-TV Offers Cabletext to Four Million Viewers

Micro-TV, Incorporated, has begun offering teletext transmissions of wire-service news stories over a cable television network with a potential audience of over four million.

The system was described in a paper presented by Micro-TV's president, William Gross, at the IEEE's Spring Conference on Electronics, held June 4 and 5 at the Arlington Park Hilton, near the city of Chicago.

By Satellite, Cable

The system, called "Cabletext," is operated by Micro-TV and Southern Satellite Systems, a company which uses communication satellites to distribute cable television programming to cable operators across the country. Cabletext encodes alphanumeric data in the vertical retrace interval of the carrier wave for WTCG, an Atlanta "superstation." WTCG distributes its programming nationwide via satellite, using Southern Satellite Systems' uplink in Douglasville, Georgia. An estimated four million viewers can pick it up.

Cabletext uses a PDP-11/34 to supply information to Southern Satellite Systems' video processing equipment. The 11/34 can store up to 2,000 'pages' of text in a 20 x 40 format.

In practice, only 60 pages of text are transmitted at a time. The text is repeated in an endless loop, repeating itself every ten seconds.

Cabletext carries news stories from the Associated Press, United Press International, and Reuters.

Property Management Program

E.B.S. Data Processing's property management program, written Basic, is composed of several modules which can be run either as stand-alone programs or as integral parts of an overall property management profile. There are three main types of modules in the program: Property Development, Bookkeeping Functions, and Report Generation.

Included in the Property Development module are Create Property, Tenant Data, and Rent Entry. Bookkeeping and Entry Functions include Payables, Income and Expense, and End-of-Month/Year. Among the Report Generating modules are Balance Sheet, Operating Statement, Property Management Fees, Rent Report, Vacancy/Availability Report, Delinquency Report, Vendor Report, Daily Property Balance, and Check Writing capability.

An application available for the TRS-80/5-100 series will be sold with a user's manual either in machine language or in source form under a license agreement.

For further information, contact Al Alegre, E.B.S. Data Processing, Inc., 1209 Donnelly Avenue, Burlingame, CA 94010; (415) 342-7258.

Who Can Receive It?

Since the Cabletext signals are piggybacked on WTCG's carrier, they are available to any cable operator who subscribes to WTCG's programming and who wants to use them. A Micro-TV spokesman said that the service presently has three subscribers, out of about 1,000 cable distributors who pick up WTCG. He noted, however, that Cabletext is freely available to WTCG distributors, and his company would not necessarily become aware of every distributor who chose to use it.

Decoders for Sale

Micro-TV is selling set-top decoders for viewers who want to see the Cabletext data on their television sets. With the decoder, a viewer can specify the number of a Cabletext page that he wants to see; the next time that that page is transmitted, the decoder picks it up and displays it on the television screen.

A decoder presently costs about \$1,000. By using LSI teletext decoder chips when these become available, Micro-TV hopes to get the price below \$100 in about 18 months.

Micro-TV's traditional business is distributing pay television programming via a broadcasting station in the multi-point distribution service (MDS) band. For several years, it has been broadcasting experimental teletext signals along with its MDS programming.

Micro-TV may be contacted at 3600 Conshohocken Ave., Philadelphia, PA 19131; (215) 879-0900.

Southern Satellite Systems, OK may be contacted at P.O. Box 45684, Tulsa, OK 74145; (910) 664-4812.

The chicken that clucks the loudest is the one most likely to show up at the Steam Fitters' Picnic.

BOOKLET ON MASS STORAGE SYSTEMS FOR TRS-80 USERS

A booklet entitled, *Mass Storage Systems for the TRS-80*, has been released by Parasitic Engineering. In it, the authors outline the various methods which the TRS-80 user can load and store his programs off-line. The booklet describes cassette systems, mini-floppy disk systems, full-size floppy disk systems, data cartridge, high-speed cassettes, and proposed hard disk systems.

The relative advantages and disadvantages of each are discussed in detail. Aspects of compatibility, software availability, cost, ease of operation, future advantages, reliability, and versatility are examined.

Copies of the booklet are obtainable at no charge from Parasitic Engineering, Box 6314, Albany, CA 94706; (415) 527-6133.

New Proportional Space Print Wheels by Qume

Qume Corporation has introduced a family of English-language proportional space printwheels for use with any Qume daisy-wheel printer or data terminal equipped for proportional spacing.



The new family consists of seven of the best-known typefaces: Modern, Arcadia, Thesis, Title, Boldface, Boldface

Italic, and Essay Title. Each of the printwheels has a 96-character set that includes complete punctuation and numerals, and all are fully/redundantly interchangeable with one another.

Introduction of the new products brings to 82 the total number of printwheels available from Qume.

In proportional space printing, character centerline distances vary depending upon character size; for example, the letters "T" and "w" are allocated different amounts of horizontal space, unlike traditional monospace printing that allocates all characters the same space.

Pricing of the proportional space printwheel is similar to that of the company's other printwheels, with off-the-shelf availability. Qume designs and manufactures its own line of printwheels and ribbons for the Sprint Micro 3,TM WideTrack,TM TwinTrack,TM and Sprint 5TM daisy-wheel character printers.

Contact: Qume Corporation, P.O. Box 50039, San Jose, CA 95150; (408) 942-4000.

Three Pre-Conference Tutorials Offered at Comcon Fall '79

Three pre-conference tutorials will be presented on the opening day of Comcon Fall '79, sponsored by the IEEE Computer Society. The theme of the conference is "Using Microprocessors - Extending Our Reach."

Beginning at 9AM on September 4, 1979, the tutorial, "Design of Microprocessor Systems," will be presented by Dr. John M. Carson. The tutorial will stress the wide range of available microprocessor products and the development tools for microprocessor-based design, as well as the entire design effort with emphasis on system configuration, software development, and system testing.

A second tutorial is "A Practical View of Computer Communications Protocols," presented by Dr. John M. McQuillan, manager of the Systems Analysis Department at Bolt, Beranek and Newman, Inc. The tutorial will examine the fundamental design choices in computer communications systems, investigate fundamental protocol choices with

in these systems, and discuss existing offerings.

The third tutorial is "Microprocessor Project Management," a unique course which synthesizes the experience of hundreds of project managers into a practical, field-proven methodology for managing all phases of a microprocessor application. Lecturer is Eric R. Gasten, who, since 1974, has presented over 100 courses in microcomputer system design, component selection, software and hardware development, and microcomputer applications.

For a copy of the advance program describing these tutorials, as well as the 30 technical sessions to be held at Comcon Fall '79, September 4-7, at the Capitol Hilton Hotel, Washington, D.C., contact Comcon Fall '79, P.O. Box 639, Silver Spring, MD 20901; (301) 439-7007.

Mattel's New Horoscope Computer

The Mattel Electronics Horoscope Computer, which offers astrological forecasting in eight aspects of life, is expected to be nationally available in August.

One of the most popular vocations in America, astrology claims more than 40 million advocates whose forecasts are determined by mathematical formulations. Mattel's hand-held Horoscope Computer presents forecasts based on authentic astrological algorithms stored in the computer; these algorithms are valid for 8.5 years, according to the company.

The participant's astrological sign and date for the reading are punched into the unit, and the computer provides a forecast in seconds. Love, money, career, travel, friends, family, spirit, and creativity are the aspects covered by the computer.

The Horoscope Computer also provides astrological compatibility forecasting. By adding the other person's astrological sign into the computer in addition to one's own, the computer used unit flashes the answer in any of the eight life aspects.

The Horoscope Computer is expected to sell for about \$45 (batteries not included). For further information, contact Mattel Electronics, 5150 Rosecrans Avenue, Hawthorne, CA 90250; (213) 644-0411.

Eighth World Computer Congress Scheduled for Tokyo & Melbourne

The Eighth World Computer Congress (IFIP '80), sponsored by the International Federation for Information Processing (IFIP), will be held jointly in Tokyo on October 6 through 9, 1980, and in Melbourne on October 14 through 17, 1980. U.S. participants are now being sought for the technical program. The joint locations of the Congress are indicative of the global nature of this triennial event, which represents a unique opportunity for state-of-the-art information exchange, cultural and personal enrichment, and world travel.

IFIP is a multi-national federation of professional/technical societies concerned with the science and technologies of information processing. Organized in 1960, IFIP currently includes national societies from 37 different countries. Its U.S. representative society is AFIPS, the American Federation of Information Processing Societies.

Among the aims of IFIP are:

- To promote international science and technology.
- To advance international cooperation in the field of information processing.
- To stimulate research, development, and application of information processing in science and human activities.

The principal event in the IFIP program of activities is its Congress, which is held every three years, in a different part of the world.

Like previous IFIP Congresses, the

Eighth World Computer Congress will feature technical state-of-the-art developments in presentations on technology, equipment, and applications which will be delivered by information processing professionals from all around the world. In order to identify and schedule these speakers and topics, IFIP's International Program Committee has recently issued a formal call for papers, soliciting conference participants from all countries. Accepted papers will be delivered either at Tokyo or at Melbourne, and in some cases, at both locations.

Potential U.S. authors are urged to contact AFIPS to receive a copy of the official Call for Papers brochure, which clearly explains all requirements and necessary qualifications. Write to AFIPS, 210 Summit Avenue, Montvale, NJ 07645, or call (201) 391-9810.

A single registration will cover admission to all activities at both Tokyo and Melbourne. Early registration fee is \$400 Swiss Francs. Registration information can be obtained from AFIPS, at the above address.

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Percom's New Prototyping PCB Boards for SS-50 Bus

Percom Data Company has announced that the company has added two models of prototyping boards for 6800/6809 computers to their SS-50 bus product. The larger of the two cards fits the standard SS-50 bus; the smaller card fits the Southwest Technical Products Company (SWTP) I/O bus.

The Percom boards accommodate 14-, 16-, 24- and 40-pin DIP sockets, and have contacts for power regulators. Up to 70 14-pin sockets may be installed on an SS-50 bus card, and the I/O card, which is 1-1/4 inches higher than the standard SWTP I/O card, will accommodate up to 34 14-pin DIP sockets.

Both a 34-pin and a 50-pin ribbon connector may be mounted on the top edge of the SS-50 bus board, and a 10-pin Molex connector may be mounted on a side edge. The I/O size card accommodates a 34-pin ribbon connector and a 12-pin Molex connector on the top edge. Molex connectors are used on the bus edge of both cards.

Percom points out that top-edge and side-edge connectors connect easily to, and provide for, more accessible test points. Circuits may be completed using either wire wrapping pencil, or solder wiring techniques.

Power conductors are alternated to simplify chip power connections, and there are contacts for distributed capacitor by-passing. The plated wiring is 2oz copper with reflowed tin/lead plating that wets quickly for easy soldering. The substrate is FR4-G10 epoxy/glass.

The SS-50 bus cards sell for \$24.95; the I/O card sells for \$14.95. For further information, contact Percom Data Company, 211 N. Kirby, Garland TX 75042; (214) 273-3421.

New From Digital Pathways: Bank-Switched Memory for LSI-11

Digital Pathways, Inc. has announced the availability of its new family of memory modules for the DEC LSI-11 computer. Digital Pathways' modules are all bank-switchable, allowing for virtually unlimited expansion of the available memory space. At the same time, individual memory modules, when operated in their 'local' modes, are fully hardware- and software-compatible with standard DEC memory, according to the company.

Two dual-width memory modules and a dual-width controller module constitute the current membership of the family. The first of the memory modules, the RMA-032, is a 32K by 16-bit RAM system utilizing the industry

standard 250 nanosecond 16K dynamic RAM circuits, along with on-board discrete refresh. When the RMA-032



is used alone, only 28K words are accessible to the CPU. The second memory module, the RMS-016, is a 16K

word ROM board using Intel 2716 EPROM's or equivalent 2316E ROM's. When used alone, any 4K word block can be assigned to any sector of memory space by means of a jumper wire.

The key to the bank-switching system lies in the third 0-bus compatible module, the BSC-256 bank switch controller. Each of the individual memory modules may be put under the control of the BSC-256 by moving an on-board switch and connecting a daisy-chained cable. Each BSC-256 is capable of handling up to 2 megabytes of RAM or ROM in any desired mixture.

Bank switching is accomplished by means of a set of device registers on the BSC-256, each of which determines which one of 256 independent 4K

blocks of physical memory is assigned at any instant to a given 4K sector of address space. The initial block assignments corresponding to the 'power-up' condition are set on an on-board ROM by the user.

Single quantity prices are: RMA-032, \$1200; RMS-016, \$300, without EPROM's; and BSC-256, \$300. Quantity discounts are offered. The RMA-032 is also available without RAM circuits, for additional savings to OEM's.

Contact Digital Pathways, 4151 Middlefield Rd., Palo Alto, CA 94306; (415) 493-5544.

The hardest thing to disguise is your feelings when you put a lot of relatives on the plane for home.

The Northeast Personal & Business Computer Show To Be In Boston

The Northeast Personal & Business Computer Show will be held at Hynes Auditorium, Prudential Center, Boston, Massachusetts, from Friday, September 28 through Sunday, September 30, 1979.

The show hours are: Friday and Saturday, 12:00 noon to 10:00 p.m.; Sunday 12:00 noon to 6:00 p.m. General admission, including seminars and lectures, will be \$5.

Contact Northeast Exposition, P.O. Box 678, Brookline Village, MA 02147; (617) 522-4467.

APL Interpreter for Z-80 Systems

Telecomputer Integrated Systems, Inc., has announced the TIS-Z80/APL, an APL interpreter for Z-80-based micro-computer systems. The interpreter has a database management system that is modeled after several of the mainframe APL implementations, such as Sharp APL/C, Spym, and Scientific Time Sharing APL.

Some of the main features of the TIS-Z80/APL are:

- All monadic and dyadic APL functions, operators, and systems commands that are available on other APL implementations on larger machines.
- Comprehensive data management system and file functions for storing and retrieving data either sequentially or randomly.
- On-line program development with line, screen, and built-in text editor for inserting, deleting, replacing, or changing program lines.
- File organization, allowing mixed storage of scalars, vectors, or matrices of numeric or alphanumeric elements.
- I/O independent, supporting any mix of terminal types and printers.
- Extensive formatting capabilities for business applications.

TIS-Z80/APL does not require any other operating system; it is a complete system by itself, and comes with a bootstrap loader.

The workspace version of TIS-Z80/APL takes 18K of RAM, leaving a maximum of 46K workspace for the user. The file system version takes 22K of RAM, leaving a maximum of 42K of workspace. There is no limit to the file size.

For further information, contact Telecomputer Integrated Systems, 251 Spindale Avenue, Toronto, Ontario, Canada M5T 2E2; (416) 363-9295.

Modesty: the gentle art of enhancing your charm by pretending not to be aware of it.

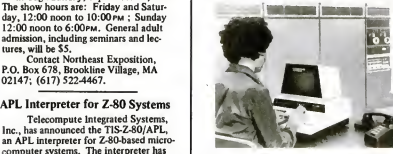


COMPUTER TERMINAL BREAKTHROUGH

\$795

BUY A PET™ AND GET A TERMINAL FREE

Commodore



This is not the first terminal built around a microprocessor, but there has never been a terminal at this price which could also be used as a complete computer system. Now the same unit you use for talking to a large time-sharing system can also be used for many other tasks without requiring outside computer support. With the proper software you can handle small jobs such as complex calculations and unsorted graphics.

Economy through mass production

If an entirely new product was designed specifically to do all the things you can do with the T/C 2001, it would have to cost thousands of dollars. NCE/COMPUMART has bypassed a lot of expensive design work by employing a mass-produced computer as the heart of the T/C 2001. The Commodore PET has now been in production for nearly two years and more than 50,000 units have been sold worldwide. There is no other computer at this price which has all these built-in features: 9" T/C monitor, 73-key keyboard (larger sizes available), cassette tape drive for loading programs and data, high-level BASIC language, four interfaces and a 24-hour clock. And it's expandable! If you find that you need faster data storage, you can plug in a floppy disk. If you want to be able to print forms or listings, you can attach a printer.

Free tape drive

The BK PET which costs \$795 comes with a built-in tape drive but its keyboard is smaller than the standard typewriter you may be used to. The \$995 16K PET and the \$1295 32K PET have a standard-sized keyboard but they require an external cassette tape drive for operation. Normally \$35, we include it free with each 16K or 32K PET. The T/C 2001 package, worth \$69 if purchased separately, is free with any PET ordered from this ad.



CAT ACOUSTIC MODEM

\$189.00

Navation's new 300 baud acoustic modem, the CAT sets a new price standard for units with originals and answer capabilities. It's the perfect T/C 2001 companion, making the final link with your time-sharing service. It's RS-232 with full or half duplex using any Bell 103 compatible modem. This amazingly compact unit comes with acoustic self-test, too.

FREE 10 DAY TRIAL
NCE/COMPUMART has been selling computers by mail since 1971 and we know our business. We know that you need to have complete confidence in the product and the company behind it so we offer you this unconditional guarantee: Try it for 10 days and if it does not meet all of your expectations, return it for a full refund of your purchase price. In addition, since the PET is one of the most reliable systems we've ever sold, we're doubling the manufacturer's warranty on machines ordered from this ad to protect you for a full 8 months against defects in parts or workmanship. You can't lose; it's our way of ensuring satisfaction to those who aren't able to visit our showroom at the NCE/COMPUMART store and warehouse in Ann Arbor.

Accessories

Cassette Tape Drive - A second cassette tape drive is required whenever you need to update long files or perform backup copy operations. It plugs directly into the PET and is accessed through the BASIC language. Note: All PET's ordered through this ad include the first tape drive.

Dual Floppy Disk Drive - Programs which take 3 minutes to load from a tape require only seconds to load from a disk. The PET 2040 Dual Floppy Disk Drive requires no extra memory or expansion box, it plugs right in for fast, reliable program and data storage up to 36K. The 2040 is compatible only with the 16K and 32K PET's.

T/C 2001 Terminal Package - If you already own a PET, you can add this valuable option by simply plugging in our special adapter and loading a program from the included tape. Please specify which model PET you have. The output is TTL in the standard serial format, input is RS-232.

How to order - Simply fill out the order blank below or call (313) 994-3200 to place charge card orders. If you don't already have our all-in 48-page NCE Mini-Computer Catalog, check the box and we'll send you one right away.

NCE/COMPUMART • P.O. Box 8610 • 1250 N. Main St. • Ann Arbor, MI 48107

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- 32K T/C 2001 \$1,295.00
plus \$10.00 shipping and handling
- Dual Floppy Disk Drive \$1,295.00
plus \$7.16 shipping and handling
- T/C 2001 Terminal Package \$69.00
plus \$3.99 shipping and handling
- CAT ACOUSTIC COUPLER \$189.00
plus \$2.35 shipping and handling
- Send me my FREE catalog

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INT'S

Lexicon's Translator Expanded to Include a Variety of Applications

The Lexicon LK-3000, originally designed as a language translator, is expanding into other applications areas as a greater variety of program modules are developed for it.

Programs dealing with a variety of subjects come in interchangeable cartridges, or 'modules.' To program, the module is inserted into its slot on the bottom of the LK-3000. Because the permanent memory and microprocessor for each program are housed in the module, diverse applications and future technological improvements can be implemented easily without making the LK-3000 obsolete, according to the company. Each module contains a 64K-bit ROM chip and its own microprocessor.

Lexicon modules are designed for use by the average person with no experience in handling electronic components. They are self-contained for protection from weather, handling, and static discharge. The LK-3000 also utilizes an LED display, on which sixteen characters can be displayed at one time. Long entries circulate from right to left, much like a theater marquee.

The LK-3000 operates on built-in rechargeable Ni-Cad batteries, and comes in a zippered vinyl carrying case, complete with one module and an international 120/240 volt adaptor/charger.

With a language module, the user enters a sentence in one language, presses a key, and the translation reads out across the display. The translation can be replayed as many times as desired, even word by word. Vocabularies contain the kind of words and phrases useful while traveling, according to the company, plus partial phrases like "I want —," which can be completed to make sentences. Each module contains about 2000 words and phrases.

Each module also has a 'dictionary' function. Entering 'B' will cause the LK-3000 to display all words in the program that begin with that letter. Enter 'BAN' and it will display 'BANK,' 'BANDIAD,' etc. Long words and phrases can be located just by entering the first few letters of the word or phrase.

A variety of modules is already available. For example, there's 'Person-to-Person,' which contains a social vocabulary in six languages. Hundreds of

words and phrases can be translated into English, Spanish, French, German, Italian, and phonetic Greek, according to the company. A pronunciation guide for all six languages is also included.

Lexicon also offers bilingual modules that feature expanded traveler's vocabularies. Currently available are English to Spanish, French, Italian, German, Portuguese, Polish, and phonetic Greek; Swedish and phonetic Russian and Japanese are soon to be added. Entering English words produces foreign ones, or vice-versa.

Each module's vocabulary is tailored to the country it represents: "bulletins" is in the Spanish dictionary and "marinated Salmon" is in the Swedish one. Languages that do not use a Roman alphabet come with special keyboard overlays that allow the user to enter an alternate alphabet. For the adventurous, each module also comes with a grammar and pronunciation guide.

Future plans include modules in Hebrew, Arabic, Dutch, and Chinese, as well as a variety of foreign pairs, such as French-Spanish. With chip technology advancing at such a rapid rate, Lexicon expects module vocabularies to expand significantly.

In addition to its language modules, Lexicon has introduced modules for other applications. The Calculator module takes the LK-3000 into a five-function calculator with memory. In addition, it functions as a metric converter and a currency converter.

As the officially licensed hand-held translator for the 1980 Olympic Games in Moscow and Lake Placid, Lexicon will offer two modules containing records and statistics of winter and summer Olympic events.

Records can be accessed in several ways: by event, by country, or by person. The user can specify men's or women's competition, and check past medal winners. A module will contain a stopwatch feature for clocking events. Plans for each module also include a Record Book for recording new records and medal winners, plus decorative stickers.

The Personal Program module turns the LK-3000 into a personal data bank. A special keyboard overlay allows the entry of numbers, letters, punctua-



tion, and symbols so that many types of information may be stored, e.g., recipes, telephone numbers, daily appointments, formulae, memos, technical jargon, special translations, etc. Handicapped persons can ease communication problems by programming the module with commonly used phrases and emergency information such as the names of relatives and doctors, special medication instructions, etc.

Lexicon has also announced that it will develop custom applications for the LK-3000 in a wide range of business, education, and technical fields. Consultation is available regarding the use and implementation of such applications.

The Lexicon 189 System is a hand-held computer for the filing and retrieval of documents of any type (medical, criminal, inventory, etc.). This system eliminates the need for pre-coding, sorting, elaborate computations, or use of an expensive computer terminal. Since records can be accessed quickly and easily without tying up a central computer, the 189 System offers an economical and efficient alternative to auxiliary card files, according to Lexicon.

A companion product which simplifies the cataloging, filing, and retrieval of scientific, industrial, and library documentation is soon to be introduced.

Lexicon offers modules that allow the LK-3000 to function as a hand-held terminal link to a computer or modem. EIA-RS-232 Standard Interface and 20 mA current loop interface will be offered. Another module turns the LK-3000

into an input/output device for microprocessor-based breadboard systems.

Base price of the LK-3000 is \$225. Modules are priced at \$65 each. Contact Lexicon Corporation, 8355 Executive Center Dr., Miami, FL 33166; (305) 592-4404.

MULTIPLE IN-CIRCUIT EMULATOR FROM INTEL

Intel Corporation has announced a software package that enables a single Intel® Microcomputer Development System to control and coordinate the operations of two in-circuit emulators. Two coordinated ICE™ units are sufficient to debug most processing and control systems containing multiple microprocessors, according to Intel.

In the past, product designers have used two development systems, each containing a single in-circuit emulator. According to Intel, the package provides a cost-saving solution to the problems of multiprocessor development. Besides saving the cost of the second development system, Multi-ICE operation eliminates the coordination and control problems that have hampered the development of multiprocessor systems in the past.

The Multi-ICE package supports



the development of products containing up to seven types of microprocessors — 8085 central processor units, as well as 8049, 8048, 8748, 8039, 8035, and 8021 single-chip microcomputers.

Future Multi-ICE enhancements will support other combinations. The package is based on a multi-tasking concept that makes it feasible to coordinate and to control multiple in-circuit emulators.

The package is a resident software option for disk-based Intel® Model 800, as well as for Series II Model 220 and Model 230 development systems. It runs under Intel's standard ISIS-II diskette operating system.

The Multi-ICE package costs \$1,750, and is available on single-density and double-density diskette for the Intel® Model 800 and Series II Models 220 and 230 development systems.

Contact Intel Corporation, 3065 Bowers Avenue, Santa Clara, CA 95051; (408) 987-8080.

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See the Want Ad Section for Details.

Heath/Schlumberger Systems

Schlumberger Products Corporation has announced the availability of the first group of its H/5 Data Systems products. Five major devices have been released, with more to follow shortly.

Among this first group of new products is the WH89 Backup Computer, incorporating two Z-80 microprocessors, a built-in 5 1/4" floppy drive, a professional video terminal (identical to the WH19 terminal shown below), a two-port serial I/O accessory, and 16K bytes of RAM (expandable to 48K). Memory diagnostics are built-in, and communication is EIA RS-232C Standard. The WH89's suggested list price is \$2,295.

The WH19 "Smart" Video Terminal has also been released. This Z-80-controlled terminal has a 25 x 80 character display format and commercial typewriter-style keyboard. All functions are controlled by keyboard or software; direct cursor addressing allows for editing and corrections at any location on the screen. The WH19 is fully VT52- and ANSI-standard compatible, features eight user-definable keys, and includes a numeric keypad in calculator format for entry of arithmetic programs. Suggested list price of the WH19 is \$995.

The WH14 Line Printer prints the standard 96-character ASCII set (upper and lower case), using a 5 x 7 dot matrix print head. The microprocessor-controlled WH14 features sprocket feed, adjustable paper width, variable pitch and lines-per-inch, and selectable baud rates from 110 to 4800. The new printer is line buffered, and interfaces via EIA RS-232C serial interface or 20mA current loop. Suggested list price of the WH14 is \$895.

The WH1A is the H/5 Data Systems' 16-bit computer utilizing the latest DEC LSI-11/2 technology, including the new KD11-HA CPU board. The WH1A is DEC PDP-11/03 compatible, contains up to 64K bytes of memory,



and comes complete with power supply and backplane. The backplane accommodates up to seven accessory cards besides the KD11-HA. The WH1A runs all applications software written for the PDP-11/03. Its disk operating system supports Basic, Fortran, and Assembler languages, all of which are available from H/5 Data Systems. The WH11A's suggested list price is \$1,895.

The WH27 is the floppy disk system designed for use with the H/1A. It incorporates a Z-80-based controller, and has two 8-inch drives with a total capacity of 512K bytes. The WH27 uses standard IBM 3740 diskettes, and is DEC RX01 compatible. An interface controller and bootstrap program is included at no extra charge. The WH27 operating system (designated HT-11) includes the following programs: Edit; Expand; Asm; and Cref; Linker; Linker; Pip; Odd; Basic Interpreter; Basic; and miscellaneous programs. Suggested list price of the WH27 is \$2,595.

H/5 Data Systems products will be marketed through selected distributors, retail chains, and DEM's throughout the nation.

Contact Schlumberger Products Corporation, Hilltop Road, St. Joseph, MI 49085.

Computer Technology School Planned for Florida

A new private school for computer technicians will open this summer in Fort Lauderdale, Florida. The school, to be known as the Total Technical Institute, has been granted a license by the state of Florida's State Board of Independent Post Secondary Vocational, Technical, Trade, and Business Schools. Classes are scheduled to begin July 9th.

The parent company, Total Technical Services, has been providing specialized computer hardware training for many of the industry's OEM and third party maintenance companies since the early 1970's. Total Technical Services is an international company training people in computer maintenance and

repair. Total Technical Institute will be an extension of that association with industry, and the school's efforts will be targeted at the individual who wishes to become a skilled and productive part of the computer industry, according to a TTI spokesman.

Unlike traditional electronics training schools, which offer a more general curriculum, Total Tech offers courses focusing on the specific hardware training needed for computer technicians. For the inexperienced individual, an eight month course of study will provide a background in computer mathematics and digital electronics, as well as specific computer and peripheral

equipment training. An 18-week curriculum will be offered for those with a background in electronics to cross-train and update their computer hardware skills.

Both courses will include classroom instruction and a significant amount of hands-on laboratory training on the Institute's several state-of-the-art computer systems. Both day and evening classes are offered.

Contact Total Technical Institute, 2880 N.W. 62nd St., Ft. Lauderdale, FL 33309; (305) 973-4760.

Second-rate judges try harder.

—Eric Bakulinsky



CSUB (Common SUBROUTINES)

Developed for North Star DOS and BASIC by Micro Mike's, Incorporated

CSUB makes North Star BASIC a much more structured language. Program modification is vastly simplified with CSUB's thoroughly tested and debugged routines. With CSUB, a programmer has no need to "re-invent the wheel" for every program written. A programmer may concentrate on his/her own code, reducing programming time dramatically. Micro Mike's programming staff, using CSUB, has written extensive, complex programs in as little as one tenth the time required B.C. (before CSUB).

With CSUB, programs are essentially self-documenting. Prompts guide the user through the program, assisting the user for input. Multiple branching menus allow the user to branch to any particular part of the program with a minimum of keystroke inputs. All programs written under CSUB appear similar in operation to the user, allowing the user to quickly familiarize himself/herself with a new CSUB-based program. The user may "back up" using CSUB if a mistake is noticed in one or more previous inputs. Every single user input is examined by CSUB to determine if it is the appropriate keystroke at any particular moment. If an inappropriate keystroke is input, an error message is displayed, and the user is given another try.

CSUB is compatible with DOSCHG (8" disk drive interface for North Star DOS and BASIC) and timesharing (for North Star Horizon only). CSUB is available immediately on 5 1/4" diskette. A complete documentation package is included.

CSUB is a multi-dimensional programming package. Among benefits CSUB offers both user and programmer are:

1. Non-destructive control positioning
2. Automatic display of error messages or bulletins
3. Strict control of all data passing between CRT and CPU, including:
 - a. Complete parameter checking of all numeric data input
 - b. Complete formatting of all numeric and alphanumeric data displayed or input
 - c. Automatic mask and data display
 - d. Automatic date input and display (automatic display of slashes between month, day and year)
- e. Complete numeric control on single character alphanumeric inputs
 1. User's ability to "back up" to last logical input.
4. Strict control of data passing between external storage devices (i.e. disk drive(s) and CPU, including:
 - a. Automatic file OPENING and CLOSING for most file accessing
 - b. Sequential file accessing
 - c. Random file accessing with automatic calculations of file vectors
 - d. Keyed file accessing with virtually no limits on number of keyfiles
 - e. Automatic sorting of keyfiles.

The following programs, written with CSUB, are presently available:

General Ledger (for accountants)	\$49.95
General Ledger (for business use)	\$49.95
Accounts Receivable (for accountants)	\$49.95
Accounts Receivable (for business use)	\$49.95
Accounts Payable	\$49.95
Payroll	\$49.95
Inventory	\$49.95

Specify Release 4 (single density) or Release 5 (double density) North Star DOS and BASIC.

All programs are shipped on 5 1/4" diskette and include documentation.

Micro Mike's, Incorporated Program Library Membership... \$500 (soon to be increased)

A one-time fee of \$500 buys for the purchaser continuous, unlimited access to programs in the Program Library. The programs listed in this ad (and many more) are available to Program Library members only. For the cost of the diskette upon which the program is transferred (currently \$4.50 each), plus postage and handling.

Write or call for brochure, price list and Micro Mike's, Inc. Program Library Newsletter.

Dealer prices: Programs, regularly \$49.95 are \$25.00 each in quantities of five or more of each program. Sorry, no mix and match.

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— Making technology uncomplicated... for People —

New Winchester-Type Disk Drive Has Tape Back-up Failsafe Feature

Microcomputer Systems Corporation (MSC) has introduced a data storage system combining into a compact package Winchester-type drive technology, backup tape cartridge, and smart controller. The MSC-5900 circumvents as much as 87.8 megabytes of sealed module storage, as well as 17.1 megabytes of removable tape storage.

While sealed-module storage devices are very reliable, they have an inherent operational flaw, i.e., if they fail, the user's data is unavailable until the failure is fixed. The MSC-5900 circumvents this flaw by providing the user with an additional 17.1 megabytes of removable tape storage. Therefore, data stored on the removable tape cartridge can be physically removed and played back on another device, providing the user with much safer storage capability, according to the company.

To solve both the first-time and the long-term subsystem cost problem, MSC integrated intelligence to oversee both system drive control and microprogrammed self-diagnosis. A built-in microprocessor controls drive functions; data formatting and buffering; dump and restore operations for the tape cartridge; and communications with the CPU. The MSC-5900's microprocessor also relieves the CPU from handling all instructions to the storage device beyond an initial command structure requesting data.

Microdiagnosis functions include self-prognosis by monitoring trends in increased seek-time, and error correction rates. Thus, the MSC-5900 can help a technician to identify potential failures and to reduce meantime-to-failure.

The primary causes of head crashes and other failures of a disk storage device are twofold: contamination of the heads or disk surface by dust or other foreign substances; and operator errors and carelessness in changing disk packs.

Sealed-module devices avoid these failures by hermetically sealing the di-



rect access storage components, including the disk stack, spindle, rotary actuator, heads, and air filtration system. The MSC-5900 contains a single spindle with four platters and up to fourteen data heads, and takes advantage of the potential reliability inherent in the Winchester-type design.

The storage capacity of the MSC-5900 is directly related to the number of data heads selected by the user. Models are available with 2, 6, 10, and 14 heads, and have storage capacities of 12.5, 37.6, 62.7, and 87.8 megabytes, respectively.

Although sealed module devices dramatically reduce failures, the user pays a penalty for the increased reliability. The data stored on a sealed module device cannot be physically transported to another unit. The consequences for the user can range from the inconvenience of having to use computer time to copy the data to an open-module system in order to transport them to another location, to the complete crippling of a key system when a unit storing critical data is down. In some cases, the data might be irretrievably lost.

The MSC-5900 alleviates this problem. In addition to its direct access storage capacity, the MSC-5900 also provides 17.1 megabytes of removable tape cartridge storage capacity.

The MSC-5900 uses a standard 3M-type tape cartridge with 450 feet of 1/4-inch tape. The tape speed is 30-

inches per second forward and reverse when reading or writing data; the speed increases to 90 ips forward and reverse when in the search mode. The data transfer rate is 1.1 megabytes per minute. Since the storage life of these cartridges is five years, one application could be for archival storage applications.

The internal microprocessor controls the drive operations, data formatting, and host communications, as well as provides resident diagnosis/prognosis for maintenance test purposes.

The resident diagnostics are switch-selectable to test search, read, and write operations for each data head. These diagnostics allow a thorough exercising of the controller and drives, and eliminate the need for expensive test equipment. LED's identify faults when they occur, and also aid in troubleshooting.

The built-in controller provides other important functions. It corrects any single-sector error up to 11 bits long, and provides an alternate-track capability, including an automatic seek to the alternate track. Full-sector data buffering is available to reduce the data bandwidth requirements on the host system. The controller includes the implementation of high-level disk commands to minimize the I/O driver overhead on the host system.

Host adapters are included on a single printed-circuit board, which makes installation into different CPU environments simple. The system interfaces consist of standard differential drivers and receivers which provide a high-speed, balanced transmission network between the storage system and the host computer. Adapter boards are available for interfacing the MSC-5900 to Digital Equipment Corporation's PDP-11, Data General's Eclipse and Nova processors, Hewlett Packard's 21-xx, and the IBM Series One mini-computer.

The 87.8 megabyte version is priced at \$8,250 in OEM quantities, and is available within 90 days.

Contact Microcomputer Systems Corporation, 432 Lakeside Drive, Sunnyvale, CA 94086; (408) 733-4200.

For the TRS-80:

Percom's Double-Density Drive

Harold Mauch, president of Percom Data Company, has announced that the firm has expanded its TFD line of add-on mini-disk systems for the TRS-80 computer to include a dual drive unit featuring double-density storage.

Designated the TFD-1000,™ the unit provides 800K bytes of on-line storage. Two systems (four drives) may be used with a TRS-80 to provide 1.6M bytes on-line.

A TFD-1000 is supplied complete with an interconnecting cable (which accommodates either one or two units), a Peripheral Adapter Module (PAM) PC card, Percom's Microdos™ operating system, and support documentation.

The PAM card replaces the RS-232-C card in the TRS-80 expansion



interface, and includes RS-232-C circuitry itself so that serial interfacing capability is retained.

The Microdos operating system, which replaces TRSDOS, the TRS-80 operating system, was developed for business and professional applications. It provides full random access capability, is faster than TRSDOS, and requires less than 7K of RAM, according to Mauch. Microdos is supplied on a system diskette that includes Basic program examples and a menu of the programs. The menu is activated on power-up or reset.

The TFD-1000, complete with cable, operating system, PAM card, and documentation, costs \$2495. Two TFD-1000 units (four drives) cost \$4950.

Contact Percom Data Company, 2111 N. Kirby, Garland, TX 75042; (214) 272-3421

Altair CP/M From Lifeboat

Lifeboat Associates has released CP/M for the Altair disk system. The basic CP/M package includes text editor, assembler, debugger, and various other system utilities, plus six users manuals. Lifeboat's CP/M operates directly with systems configured for Altair Disk Basic, and offers over 20% more storage than standard soft-sectored disk systems. All programs designed to run under CP/M will operate with this system, according to Lifeboat.

The retail price for the CP/M FDOS and utilities is \$145. As a facility to dealers, Lifeboat Associates will provide media conversion services from any non-Altair CP/M disks, at a nominal price.

Contact Lifeboat Associates, 2248 Broadway, New York, NY 10024; (212) 580-0082.

BOUNDARY: In political geography, an imaginary line between two nations, separating the imaginary rights of one from the imaginary rights of the other.

— Ambrose Bierce

DISTANCE: The only thing that the rich are willing for the poor to call theirs, and keep.

— Ambrose Bierce

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Intel's iSBC 569 'Intelligent Slave' Offloads I/O Routines from CPU

Intel Corporation has announced the iSBC 569™ Intelligent Digital Controller. The iSBC 569 controller, containing up to four processors, can operate as a stand-alone digital controller using its on-board 8085A microprocessor as a central processor or as a slave to an intelligent slave to offload other iSBC 80™ or iSBC 86™ processor boards in a standard Multibus™ system.

Intel has made provisions for the 8085A microprocessor within the iSBC 569 controller itself, by providing an I/O processing by providing space for three 8041A-type processors which can simultaneously handle pulse or frequency signals, or printer or keyboard control cards. Intel expects that designers will find applications for the iSBC 569 controller in process loop control, sequence-of-events monitoring, data logging, and many other uses requiring faster I/O response or more complex control than most single microprocessor controllers can provide.

Closely following the recent announcement of the iCS 80™ Industrial Control Series, the iSBC 569 controller is seen by Intel as an important part of its drive into the industrial control marketplace, where the acceptance of micro-computing solutions has already been extraordinary.

The iSBC 569 blends the features of microprocessors from both the Intel 80™ MCS-8™ and 86™ and 8085™ families. The iSBC 569 provides sockets for up to three intelligent interface controllers. These can be any combination of 8041A Universal Peripheral Interfaces (UPI),

8741A (EPROM version of the 8041A), or standard Intel interface controllers, such as the iSBC 941™ Industrial Digital Processor.

Each of these devices has its own ROM and RAM on-chip, along with the computer and timing circuits. They can offload the 8085A of such common time-critical and time-consuming tasks as alarm switch closure scanning and event sensing.

The iSBC 941 interface controller provides most of the normally required I/O functions for industrial control applications, such as stepper motor control, event sensing/interrupting, pulsing/period/frequency counting, and pulse to steady state outputs. These features make it suitable for detecting limit alarm switches;

pulse-counting for turbine flowmeters; monitoring the photo-detectors used for product counting on industrial conveyor belts; or outputting pulses to drive stepper motors, according to Intel.

Each iSBC 941 UPI controller provides four 4-bit I/O ports, giving the user the option of up to 48 programmable I/O lines. The interface controller frees the user from having to write these sub-routines.

In addition, the iSBC 569 board contains three programmable timers. Each of these timers can provide interval counting, interrupt-on-count, and read "on-the-fly" functions for use by the system designer. The iSBC 569 controller also provides one serial I/O port

independent of the UPI sockets.

The iSBC 569 controller board provides space for up to 16K-bytes of EPROM/ROM, a two-level interrupt control system for the 8085A, 2K-bytes of RAM, and a dual port control which allows access to memory either through the on-board 8085 bus, or through the Multibus connector to other systems boards.

The iSBC 569 controller board is available at a single-board price of \$750 (U.S. price only); the iSBC 941 UPI interface controller is \$150 each (U.S. price only).

Contact Intel Corporation, 3065 Bowers Avenue, Santa Clara, CA 95051; (408) 987-8080.

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ERUDITION: Dust shaken out of a book into an empty skull.

—Ambrose Bierce

S-100 EPROM Programmer and 4K/8K EPROM Board

Solid State Music has introduced the PBI, a programming board for 2708 and 5v 2716 EPROM's. The PBI is designed to meet all manufacturers' data sheet requirements for programming 2708's or 2716's, according to the company.

PBI has two separate programming circuits so that 2708 or 2716 (5v) EPROM's can be programmed without modifying the board. Two testpoint programming sockets are provided for easier insertion and removal



of the EPROM's being programmed. Programming voltage is generated on-board by a DC-DC converter. Programming sockets are DIP switch-addressable to any 4K boundary. Special safety features, to prevent accidental programming, include an LED indicator and an on/off switch for programming voltage. Software listings are included for checking EPROM erasure, programming, and verification.

The board also includes four additional on-board EPROM's, which are independently addressable by DIP switch to any 4K (2708) or 8K (2716) boundary above 8000 Hex. Unused sockets do not enable data bus drive. The board is fully buffered, and 0 to 4 clock cycle wait-states are available.

The PBI is available for \$145 as a kit, and \$219 assembled and tested. Contact SSM, 2116 Walsh Avenue, Santa Clara, CA 95050; (408) 246-2707.

MITA Sees Impending Government Regulation of the Micro Industry

The Microcomputer Industry Trade Association, in its recent newsletter, has warned of the increasing danger of government regulation of the microcomputer industry. Stressing the need for the industry to speak through a unified organization on matters affecting it on federal, state, and local levels, MITA has compiled a list of numerous areas of concern. Among these are:

- Current and proposed FCC regulations regarding RF shielding in microcomputer-related products
- Local ordinances prohibiting display or sale of products not having UL approval
- Fair Trade Commission investigation of possible "monopoly" of safety certification by the Underwriters Laboratories, a private corporation
- Export regulations regarding microcomputer products and software
- FCC certification of RF generators for television input
- FCC considerations regarding such issues as:
 - digital transmission via amateur and commercial radio
 - broadcasting of digital information via television vertical retrace
 - connection of consumer computers to telephones for dialing and dialogue
- Tariff-setting agencies considering special tariffs for computer-telephone connections
- Possible restraint-of-trade investigations regarding some actions by some component suppliers

For further information, contact the Microcomputer Industry Trade Association, 343 Sweet Road, Woodside, CA 94062; (415) 851-7075.

NEW LINE OF MINIPRINTERS

Centronics Data Computer Corporation has announced a seven-member grouping of Model 730 miniprinters, described by George Rea, vice president of marketing and sales, as microcomputer printers designed to meet the specific needs of professional and very small business applications.

Priced as low as \$995, Models 730-1 through 730-7 offer a three-in-one paper handling system, and use the same heavy-duty free-flight print head technology found in all Centronics 700 Series printers. Of the seven miniprinter Model 730's, two are designed for North America, four will satisfy European demands, and the seventh unit, with a Katakana character set, will be available in Japan.

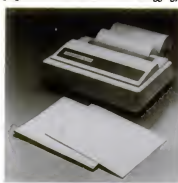
All models include, as standard features, 50 character-per-second print speed, 80-column line length at 10 characters-per-inch, a full line buffer, high speed carriage return, and high quality 7 x 7 dot matrix printing.

All Model 730's have a built-in ability to handle multipart plain paper in any one of three operator-selectable ways. The printers' typewriter-like platen takes hand-fed 8.5-inch wide sheets in letter, legal size, or longer lengths. Standard international-sized A4 sheets may also be used. Fixed pins on the platen automatically accept standard computer-grade multi-part or single-part fanfold paper nine inches wide from pin to pin. This system also allows the use of 8.5-inch wide roll paper up to five inches in diameter. A detachable paper holding rack for roll paper is standard equipment.

The Model 730's unique paper-handling features mean that if from just one output device, a user can perform a more diverse set of functions, from payroll checks on preprinted continuous forms and inventory listings on computer-grade fanfold paper, to direct-mail letters on cut sheets and general information on low-cost roll paper.

Although the 730 is aimed at personal and microcomputing systems, de-

mand document features have also been included. Its 10 character-per-inch printing capability, for example, allows the printer to accept standard forms typically used in demand document applications. With the printers' heavy-duty print head, up to three simultaneous copies are possible; and, each unit has a built-in tear bar for tear off within five lines of print. Other applications for the Model 730 include electronic mail, message logging, technical and scientific data logging,



and reservation systems.

The Model 730 offers a high quality, 7 x 7 dot matrix. The print head in the Model 730 is of the same free-flight technology as those found in all Centronics 700 Series printers. This seven-pin head operates by propelling solenoid-actuated wires against the paper in a near straight line of free flight.

The international 730 family includes two printers, for use in North America. These are the Model 730-1, which is a parallel-interfaced 60 hertz unit, priced at \$995 in single-unit quantities. The other domestic model, the 730-3, is a serial-interfaced 60 hertz unit, and is priced at \$1045. Both include a complete upper/lower case 96-character U.S. ASCII set.

In all, there will be four European Model 730 products. The Model 730-2 is a parallel-interfaced 50 hertz printer with a 96-character U.S. ASCII set; the 730-4 is a 50 hertz serial-interfaced printer, including the same 96-character set. Models 730-5 and 730-6, parallel and serial interfaced, respectively, offer five switch-selectable European character sets, as well as the 96-character U.S. ASCII code. These sets include English (U.K.), French, German, Italian, and Swedish/Danish. The seventh model, the parallel-interfaced 730-7, includes a Katakana character set, operates at 50/60 hertz and 100 volts, and is designed for Japanese markets.

Centronics' microcomputing printers range in price from \$495 to \$2000. This microcomputing family of printers now includes the Model 730 miniprinters, the P-1 and S-1 non-impact Microprinters, and the 700, 701, and 779 Models from the Centronics 700 Series.

Centronics reports that it has successfully tested carry-in service with these microcomputer printers in the past year; the company is currently establishing service pick-up points at major computer retail outlets. Due to the miniprinters' light weight and low price, they are expected to complement the firm's carry-in service policy for the microcomputer marketplace.

Centronics will sell and distribute the Model 730 both through the firm's more than 950 active resellers, and through a growing number of wholesalers, distributors, authorized dealers, and retail computer stores.

Contact Centronics Data Computer Corporation, Hudson, NH 03051; (603) 883-0111.

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Rockwell's Bubble Memory Products

In September, 1978, Rockwell International introduced its first production bubble domain memory devices and subsystems for volume markets by presenting three levels of bubble memory products:

- The basic 256K-bit bubble memory device (RBM256).
- The one-megabit linear bubble memory module (RLM658) and the programmable control module (RCM650), both based on the 256K-bit device.
- A 1/4-megabyte development system composed of two linear modules (RLM658), one control module (RCM650), and a Rockwell System 65 microcomputer development system.

The 256K-bit device is organized in binary form, which makes it widely applicable not only for data recorder and microprocessor applications, but also as replacements for fixed-head disks, according to the company.

The RLM658 linear module is designed for adaptation to systems meeting the unique requirements of a wide variety of OEM firms. The programmable RCM650 control module is equally flexible, and can control from one to 16 linear modules for subsystem capacities ranging from 1/8-megabyte to two megabytes of storage.

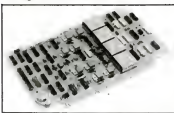
The development system was introduced so that users could both begin immediate design and evaluation with operating hardware for their OEM applications, and be "instantly" on-line in their development laboratory. The combination of one RCM650, two RLM658's, and a System 65 provides such a system with a 1/4-megabyte capacity.

At Electro '79, Rockwell introduced bubble memory compatibility in the form of the Rockwell AIM 65 board microcomputer. Through an applications software change, the RCM650 is joined by the RCMAIM to control RLM658's on the AIM 65 Expansion Motherboard.

Rockwell says that late in 1979, it will introduce a one-megabit bubble memory device which will be half the size of Intel's recently introduced device, twice as fast, and based on a megabit device Rockwell demonstrated in 1977.

The Rockwell package for the one-megabit die will be compatible with that required for the 256-bit die. Architecturally, the devices will be similar, and will have identical pin configurations. Access time versus cost trade-offs leads Rockwell to believe that both the one-megabit and the 256K-bit devices will

be the standard bubble memory elements through the mid-1980's.



Rockwell introduced the first operating megabit bubble memory device in June, 1977. One year later, it introduced a 100-megabit bubble memory system for

use in a spacecraft recorder developed for NASA. Looking to the future, John L. Archer, director of Bubble Memory Products, sees "both four- and 16-megabit devices emerging in the mid-1980's." Development of both these devices is presently underway at Rockwell, and is partially funded by government research contracts.

Two recently concluded agreements, one for second sourcing with Siemens AG, Berlin/Munich, and another for exchange of bubble memory technology with Burroughs Corporation, will solidify Rockwell's position in bubble memory technology.

Rockwell is also developing support circuits for its bubble memory products in accord with its customers' architectural requirements for volume production;

Siemens will be one source of these support circuits.

The quantity price for the RBM256, the 256K-bit device, is \$500 each. The RLM658 linear module is priced at \$2500 each; the RCM650 programmable control module, at \$1000 each.

The System 65, including two RLM658's (256K bytes) and one RCM650, is priced at \$11,400. Standard delivery is 90-120 days. The AIM 65, including one RCMAIM and one RLM658 (128K bytes), is priced at \$4150. Rockwell is now quoting quantity pricing on its bubble memory devices for delivery in 1980.

Contact Rockwell International, Electronic Devices Division, 3310 Miraloma Avenue, P.O. Box 3669, Anaheim, CA 92803.

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The Appletime, Model APT-1, from West Side Electronics, is a real time clock for the Apple II computer. Six digit time information can be displayed on the screen and printouts, or can be used for timing events, controlling other peripherals, data logging, etc.

Included with this peripheral board is an external wall transformer which keeps the clock running when the computer is turned off. Other features include 1/2/24-hour selection, AC/Crystal timebase, and BCD or ASCII data format. The Appletime plugs into any slot of the Apple II, and can be used with machine language or Basic programs. The price of \$79.95 includes U.S. postage and handling.

Contact West Side Electronics,
P.O. Box 636, Chatsworth, CA 91311.

This One



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Computer Professional Organizes to Oppose DP Activities Aiding Draft

by Tom Williams

An organization to resist government efforts to reinstitute draft registration is being formed by a member of Stanford University's Center for Information Processing. June Genis says that the idea for organizing Computer Professionals Against the Draft (CPAD) arose during a discussion of certain bills, presently before Congress, which would utilize computer records from various government agencies and educational institutions to create computerized draft registration records. She said, at one point, that if she were asked to participate in such work, she would refuse.

At present, CPAD is a contact network with no formal membership, but Genis says that the response she has received so far has encouraged her to continue, with the aim of raising money and doing a direct mail appeal. Her intention is to spread the word among data processing professionals who are opposed to aiding the draft that there is an organization willing to back them up, if necessary.

The type of resistance Genis is advocating is simple refusal to do any draft-related work. She says that the programmers she has heard from so far have not been in job positions directly related to

the draft, but expects that if educational institutions, such as universities, are asked to supply records, CPAD will be ready with information and support for those who refuse to cooperate.

Genis, who has long been active in the Libertarian Party in California, says that her opposition to the government efforts is twofold. First, she says, the draft is slavery. "What the draft is saying," she charges, "is that you don't own your own life. The government owns it . . . and I don't think any rights can survive in an assault on that most basic right."

Her second objection concerns the

Privacy Act, a law which has many implications for the use of computers in America's society. One of the central aspects of the government's attempt to reinstate the draft, she says, is the idea of requesting computerized records from other agencies such as the IRS and Social Security, to create draft records. This, she says, conflicts with provisions of the Privacy Act, which prohibits records being used for purposes for which they were not intended.

Advocates of the draft are, according to Genis, seeking declarations by Congress that records of other government agencies can be used in the future for draft registration. This, she says, is an attempt to bypass the privacy laws. And, "if they can do it for the draft, what's to stop them from doing it for any other 'noble purpose' simply by declaring that now, all of a sudden, a record that was designed for one purpose is also going to be used for this other purpose."

The aims of CPAD are to let programmers know that it is possible to refuse. Beyond that, Genis sees the organization aiding in the use of grievance procedures within companies where employees oppose doing draft-related tasks, and in extreme cases, helping people to find new jobs.

When asked if she did not think something should be done about the sagging recruitment figures for the volunteer army, Genis maintained that a volunteer force works perfectly well for a defensive policy. "What you can't do is Vietnam," she said.

For further information about CPAD, contact June Genis, Star Route Box 111, La Honda, CA 94020; (415) 851-7664.

Microsoft Announces 8086 BASIC

Microsoft Basic has now been released in a new version for the 8086 16-bit microprocessor. The new Basic-86 supports all the well-known commercial language features of Microsoft Basic.

Basic-86 was demonstrated at the National Computer Conference, on Seattle Computer Products' 8086 CPU board for S-100 bus microcomputers. Microsoft emphasized that Basic-86 is completely language-compatible with the current release 5.0 of standard Microsoft 8080 Basic. Thus, users of Microsoft 8080 Basic can upgrade to an 8086 microprocessor without having to modify existing programs.

In addition to Microsoft Basic's standard features, such as double precision arithmetic, trace facilities, full "Print Using," nested "If/Then/Else," error trapping, renumbering, and edit mode, Basic-86 supports newly added features including "While/Wend," "Chain," and "Common" statements to link programs and share variables, dynamic string space allocation, and variable names up to 40 characters in length. Basic-86 meets all the qualifications for the ANSI subset standard for Basic.

Basic-86 will be available in July, 1979, in an extended version and a stand-alone disk version, both for Intel SBC 86/12. Single copy prices are \$350 for the extended version, and \$600 for the disk version. Dealer and OEM prices will be quoted upon request.

Contact Microsoft, 10800 N.E. 8th, Suite 819, Bellevue, WA 98004; (206) 455-8080.

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5th COMPUTER FAIRE ISSUES CALL FOR PARTICIPATION

The 5th West Coast Computer Faire has been scheduled for March 14-16, 1980. It will again be held in San Francisco's Civic Auditorium & Brooks Hall, the largest convention facilities in northern California.

As with the previous four Computer Faires, the 5th Faire will include a major conference program.

The Conference Program is expected to include everything from tutorial talks for novices through state-of-the-art technical talks for experts. It will include both solo talks and panel presentations.

Everyone interested in participating in the Conference should request a Speaker's Kit, as soon as possible.

Those wishing to propose a talk of speak on a panel should plan on submitting a full-text paper — or at least a lengthy abstract — of their proposed presentation. *This must be submitted in camera-ready form on master sheets furnished by the Faire, and must be received no later than NOVEMBER 30th.*

For Speaker's Kits and further information, call or write to:

Computer Faire
333 Sweet Road
Woodside, CA 94062
(415)851-7075

Proceedings: FORTH LANGUAGE

A language currently attracting a lot of attention is Forth, which offers a clean, self-extending mode of expression combined with efficient, compact compiled code. The papers in the section "Systems Software: Forth" describe this language.

An introduction to the language is given in "Introduction to Forth," by David Boulton. "Extensibility with Forth," by Kim Harris, provides more information on the language's self-extending properties.

An international effort at standardizing the language is described in "The Forth International Standards Team," by John James.

Two particular implementations of Forth are set out in "Forth Multitasking in Urth," by Lawrence Forsley, and "ARPS: A Forth Extension for Process Control," by W. Andrew Wright.

A more general implementation of Forth, which proceeded on several machines at once, is recounted in "Forth Implementation — A Team Approach," by William Ragsdale.



4th West Coast Computer Faire held in San Francisco

Proceedings: HOME ENERGY MANAGEMENT

Environmental control for dwellings is an area in which computer technology is still in its infancy; however, rising costs of construction and of energy are likely to make it important in the future. Several papers in the section "Microcomputers, Energy Management and Environment" discuss this topic.

Several papers are concerned with the design of new computer-controlled dwellings. These include "Microcomputers Based Solar Simulator and Demonstrating Unit," by J. Robin Donaldson and Mark Miller, which describes a computer simulation of the thermal behaviour of a solar-heated dwelling, and "Dwellings ... Redesigning Them to Support Life," by Dan Vance Kimball, which discusses the rethinking of architecture necessary to accommodate efficient computer control.

"Color: A Microcomputer Simulation of Building Thermal Performance," by Thomas Tollefsen, describes a computer simulation of thermal behavior that includes solar heating, cooling by radiation, and heating by occupants. Use of the computer permits more refined techniques and more accurate results than were previously possible.

"A Real-Time Operating System that Specializes in Home Energy Management," by Fran Ferrand, proposes an operating system that could run on any standard microcomputer, and could control home energy use.

"Microcomputers in Energy Management Systems," by Mark Miller, documents a microcomputer-based system which has been incorporated into several renovations of existing housing.

Environmental control requires a change in habits, as well as habitats; "Overview of Energy Conservation Possibilities Using Home Computers," by Jack Park, considers this topic. The paper suggests ways in which computers can make people more aware of their energy consumption habits, and can help them improve those habits. "Electrical Load Management," by A.I. Halseth, surveys the need for a more efficient use of electricity in the home and the potential of microcomputers for meeting that need.

Faire Conference Proceedings Has Over 410 Pages of Reference Papers

The Best of the Computer Faires, Volume IV — Conference Proceedings of the 4th West Coast Computer Faire, is a 411-page, soft-bound, 8 1/2" x 11" reference book containing all of the papers that were submitted, backing up the tutorials and technical talks that were given at the 4th Faire in the middle of May, 1979.

Held in San Francisco's Civic Auditorium & Brooks Hall, the 4th Faire drew over 14,000 attendees and included a Conference Program of around 100 speakers. The Proceedings is the unique reference work that resulted from that Conference.

This issue of the Computer Faire's Silicon Gulch Gazette contains descriptions of most of the major sections of those Proceedings.

Proceedings: SMALL BUSINESSES

Probably the most widespread practical application of small computers is in data processing for small businesses. The section, "Inexpensive Business Computing," discusses this.

Several papers address the problem of choosing computers and software for small-business data processing. These include "Selecting General Accounting Software," by Chuck Bradley, and "Evaluating Business Software," by Greg Scott.

The more general problem of how to develop reliable, usable, and economical software is discussed in "Software for the Business Professional: A Growing Dilemma," by Dr. William Schenker. Past efforts in this area are reviewed in "Historical Development of Business Software," by Irwin Taranto.

A particular application common to every business that has employees is demystified in "W-2's the Easy Way," by Jere McEvilly of the Social Security Administration.

A more novel application, potentially widely useful, is described in "A Simulation of Proposed Strategies," by Dr. David Chereb. Simulations can be run on a small computer to predict the effects that various business strategies may have on a company's fortunes.

Some problems of the small-company business itself are discussed in "Computer Store Illusions in the Business Market," by Richard Lawrence. This paper describes some of the shortcomings of present-day computer stores as perceived by their small-business customers, and what can be done to correct them.

Proceedings: Communication Systems

The section, "Computer Communications for Human Communication: An Overview," contains two papers on ways in which computers can improve interpersonal communications.

"Personal Computer Telecommunications — An Overview," by Dave Calkins, reviews the technology, advantages, and disadvantages of several personal computer communications nets that have been implemented or proposed. It also suggests some possible social effects of such systems, and gives a bibliography of works on small-computer telecommunications nets.

"Economic Advantages of Electronic Publishing," by William Bates, outlines the ways in which digital communications can be used to create an information utility that can partially replace book/newspaper publishing. The paper also discusses several electronic publishing systems that have already been implemented.

Proceedings: DIGITAL BROADCASTING INFO

The section "Computer Communications for Human Communication: Digital Broadcasting," addresses digital transmission of information to the general public. Such transmissions, broadcast by radio or television signals, or "narrowcast" by telephone, promise computerized information utilities as widespread as telephones and television are today.

Several papers in this section describe specific digital broadcasting systems that are either proposed or in operation. "Videotext and Teletex Systems: Consumer Information Systems of the 80's," by A. Terrence Easton, discusses the characteristics and implications of consumer digital information systems, with special attention to the systems that are now in commercial operation in Europe.

"Subsidiary Communications Authority (SCA) Receivers and An Analysis of Some Receiver Problems," by Edison Schow, discusses some of the design problems with SCA receivers, including those proposed for the Digicast™ project.

Jim Warren's "The Digicast Project" describes a system, now being developed, which transmits information on an FM

signal without disturbing the signal's main (audio) component. The information can be picked up and processed by a special FM receiver connected to a small computer. The computer allows each user to perform powerful information processing operations, such as searching every item transmitted for keywords of interest. Digital broadcasting service has yet to be designed, as does digital broadcasting hardware and software. How will digital broadcasting look to a user, and what will be able to use it for?

"S-O-S to MOS: A Proposal for Computer-Oriented Mass Communications," by Eric Somers, describes five characteristics which the author feels a successful public information utility must have. The paper also describes a new information utility design based on these characteristics.

"Digicast Broadcasting of the Weather," by Dennis Baker, suggests some of the benefits that could result from digital broadcasting of weather reports, e.g., "smart" receivers would pick up only the information that a particular user is interested in.



Proceedings: COMPUTERS AND EDUCATION

The low cost of modern hardware is helping computers fulfill their promise in education, where progress has often been constrained by limited budgets. Papers in the section, "Low-Cost Educational Computing," describe some of the applications.

In "Pep Talk for Educators," Robert Jaquis raises some basic questions about the 'what' and 'why' of computers in education: what does 'computer' mean to the teacher and the student? And, what must a computer be able to do to be useful? Jaquis, a high school teacher, and a co-chairman of an Association for Computing Machinery study group, describes how this committee is dealing with these questions.

In "Computer Literacy in the Schools: A National Strategy," Arthur Luethmann reviews the progress in familiarizing a large proportion of the students with computer use, and the directions and goals which future efforts should take and aim for. More ideas are offered in "Computer Literacy: It's Not Just For Kids Any More!," by Mrs. Bobby Goodson.

"Adding Low-Cost Audio to Your Micro for CAL," by Dr. Edward Crossman, explains how a computer-aided instruction (CAL) system can be given a low-cost audio response capability.

"Networking With Several TRS-80's in Schools," by Melvin Zeddes, describes a homebrew "computer network" which permits several TRS-80 computers to share one set of peripherals.

Software, as well as hardware, is discussed in this section. "The PET-Pilot Project," by David Goldberg and Martin Kemp, describes a full standard implementation of Pilot (a programming language often used for computer-aided instruction) on the Commodore PET.

On the topic of hardware and software selection, "The Golden Egg's Hardware and Software in Our Schools," by David Stone, explains how to define requirements and how to choose products for a small education-oriented computing system. Once the hardware and software have been selected, "Getting

CONSUL: In American politics, a person who having failed to secure a office from the people is given one by the Administration on condition that he leave the country.

Started," by Flora Russ, tells how to justify and to obtain the money to buy what is needed.

Computer use is not limited to the sciences. In "Voice Synthesis for Early Elementary Computer-Assisted Instruction," M. William Dunklau describes a language-arts program in the Dallas school system, which helps Hispanic students strengthen their English-speaking skills.

Small computers are gaining favor in college instruction as well as in primary and secondary schools. "Microcomputers in the Mathematics Classroom," by Christopher Morgan and Marvin Winzenread, explains several application programs the authors have developed and used at California State University, at Hayward. "Use of a Personal Computer in the Teaching of Physics at the College Level," by Leroy Kerth, describes similar kinds of programs developed by a physics professor. "A Small Computer as an Aid to Physics Lectures," by Loren Wright, shows how a computer can be used as a teaching aid to manage demonstrations and to produce a quick display of their results in class.

"The Computer and the College Student," by Christopher Espinosa, describes what it's like to live with a computer in a college dormitory.

Education also takes place outside of school. In "Learning to Live with Computers," David and Annie Fox offer their experience in creating the Marin Computer Center, an educational corporation, the goal of which is to familiarize all sorts of people with computers, "allowing them to experience power, self-respect in relation to machines."

Proceedings: MUSIC AND MICROS

Science and art meet (or interface) in computer music, in an unusual way. Papers in the section, "Musical Computing," are concerned with this encounter.

"Learn to Play an Orchestra," by Casar Castro and Allen Heaberlin, describes a new high-performance digital music synthesizer that can be built for less than \$800.

"Computer-Controlled Percussion Music," by Jerry L. Pfister, describes a computer-controlled system for simulating percussion instruments.



Proceedings: MISC. APPLICATIONS

The section, "Microcomputer Applications," contains a variety of papers on unusual uses of computers.

"Of Microcomputers and Architecture," by Thomas Tollefsen, gives a preview of how small computers can revolutionize the practice of architecture, eliminating much of the drudgery and delay in design, experimentation, and administration of projects.

"Solving Dissection Puzzles by Computer," by David Collison, describes computer solutions for an interesting class of mathematical problems which have been little investigated in the past.

"A New Fitting Method and Its Application," by Dr. Endre Simonyi, presents a new curve-fitting algorithm which has been implemented on a small computer.

"Low-Cost Simulations of VOR and ILS Radionavigation Systems," by Robert Hueneemann, describes a computer simulation of aircraft navigation systems which has been used to test ideas for improving real systems without having to build prototypes.

Proceedings: MICROPERIPHERALS

The section, "Micro Peripherals" considers several aspects of information input and output with respect to microcomputers.

"The Microcomputer Peripheral - The Unlimited Horizon," by Jeffrey McKeever, reviews the history and characteristics of various peripherals, and suggests the direction in which the technology is going.

"A Low Cost Digital System Interface to a Color Television Set," by Tim Ahrens and Jack Browne, Jr., discusses new integrated circuits from Motorola which can be used to interface a color television as a display unit for a small computer, arcade game, or other electronic device.

"Auxiliary Processor for S-100," by Allen Heaberlin, describes a general-purpose processor which attaches to an S-100 bus and behaves as a peripheral from the main processor's viewpoint, providing a cheap and clean way of adding computing power to an existing system.

Too much of a good thing is WONDERFUL.
--Mac West

Proceedings: COMPUTERS AND OUR SOCIETY

Computer technology affects our society in many ways, and the spread of cheap computing power will further multiply its impact. "The Effect of Computing on Society" includes papers that explore the social impact of computers from a variety of viewpoints.

Computers may change the way we work, shop, and participate in public affairs. "Telecommuting Via the Personal Computer," by Jack Nilles, discusses the possibility that computers and communications will enable a large part of America's work force to work from their homes instead of commuting to offices. Effects on productivity, energy costs, and development of new service industries are studied, as well as new work habits and social patterns.

"Digital Broadcasting and the Democratic Process," by David Stodolsky, explores the prospects for using computers to make democratic institutions more effective but by increasing public access to information, and by making decision-making processes easier to participate in.

In "Computer Crime - Career of the Future?," Jay Becker, a deputy district attorney in Los Angeles, studies the problem of crimes committed thru or against computers, such as embezzlement, espionage, and theft of services. He facetiously suggests several reasons why computer crime makes an attractive (and profitable) career, and then reviews some measures that computer

managers and law enforcement agencies can take to make that career a less attractive one.

"Programmer Drift: Symptoms, Causes, and Cures," by Peter Zoll, studies a common problem in the computer industry - the tendency of programmers to move frequently from one job to another. Zoll suggests several measures that employers can take to reduce this drift.

Computers will not simply change the way we live; they will also give us new tools for dealing with our social environment. "The Personal Computer as a Social Tool," by Tony Severa, describes "The Connection Project," an effort to use a microcomputer to restore the sense of community and co-operation to towns and neighborhoods that have been fragmented by the high mobility of their residents.

"Can a Corporation Be Successful If It Operates With No Profit?" David Wortendyke's paper asks. The answer is "yes," asserts Wortendyke, president of Youth Educational Systems, Inc. (Y.E.S.). Y.E.S. is a non-profit operation the purpose of which is to develop computer systems that can be advantageously used by other non-profit organizations. The paper reviews Y.E.S.'s activities to date, and its plans for the future.

Be the first computer kid on your block to have his or her very own copy of the *Best of the Computer Faire, Volume IV* (the Conference Proceedings of the 4th West Coast Computer Faire, held in San Francisco, May, 1979).

Proceedings: PASCAL LANGUAGE

Many people believe Pascal to be the best-designed general purpose programming language for small computers yet available. Two papers in the section, "Systems Software: Pascal," discuss this language.

"K319 - The Midwiving of a Standard," by Marc Walter, reports on the development of an ANSI standard for Pascal currently under way.

"Pascal is Rolling," by Joseph Sharp, reviews the implementations of Pascal now available for micros, and answers these important questions: What is Pascal? Why is it good? How can I learn it?

Proceedings: Two-Way Digital Information Technology

The section entitled "Computer Communications for Human Communication: Bidirectional" addresses possibilities for two-way digital information utilities aided by computers.

Two papers study the design of bidirectional utilities and the ways they may be used. "Closing the Loop on One-Way Broadcast Systems," by John Pickens and Raphael Rom, discusses the prospect of combining electronic mail and digital broadcasting. The paper describes several possible configurations such a system could have, and their information-handling and economic properties.

"The Application of Two-Way Communication Technology to Information and News Systems," by Thomas Hill, discusses the forms that news distribution might take in an interactive digital information medium, and the effects the medium would have on news coverage, reporting style, and readers' habits. "Project Green Thumb," by David Wortendyke, describes a project, sponsored by the U.S. Department of Agriculture and the National Weather Service which brings agricultural information to farmers by telephone. On request, a microprocessor collects the information and displays it on a television screen.

Digital communications of any sort require a means of encoding digital information for transmission. This topic is addressed by two papers, "A Look at Telecommunications from the Terminal User's Viewpoint," by Jim Jordan, and "Bit-Oriented Protocols in Serial Data Communications," by Mitch Gooze.

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Proceedings: Medical Applications

One of the most directly useful applications for small computers is in medicine, i.e. helping physicians treat the sick, and helping handicapped people live more fully and self-sufficiently. The section "Personal Computing for Physicians and the Physically Impaired," deals with this topic.

Two papers by Yvonne Russell and Susan Phillips describe the authors' work in applying computers to aid the handicapped. "Employment Applications of Computer Related Sensory Aids for Blind and Partially Sighted Persons" surveys devices that help blind people cope with jobs and become self-supporting. "Applications of TMI-II for Employment of Blind People" explains a computer output device which enables the blind to be employed in computer-related positions by "reading" computer output to them in spelled-out form.

"A Computerized Physical Examination for Use In a Physician's Office," by Dr. Leo and Freny Berkenbile, presents an interactive program, suitable for small business computers, which guides a physician through a standard physical examination and records the results.

"Detailed Medical Billing," by Dr. Andrew Bender, describes a generalization system for automating a physician's billing procedures.

Proceedings: Computers for People

The section, "Designing Computers for Humans," discusses how to make computers both useful for, and hospitable to, their users.

"The Golemick Approach," by Lee Feinstein, introduces an alternative to robotics: golemics, in which a human operator functions as an integral part of an automatic (computerized) control system. The operator brings to the system human abilities, such as judgment and intuition, which are difficult or impossible to program.

"An Intelligent Interactive User's Assistant," by William Fought, describes a new software tool developed at the Rand Corporation. The User's Assistant acts as a filter between an interactive computer system and a user's terminal. It "understands" what the computer and user are saying to one another, and can help the user by telling him what the computer wants, what it is doing, or what results a proposed action would have.

"Ten Rules for Writing User-Oriented Programs," by Dave Ahl, publisher of *Creative Computing*, sets out guidelines for writing programs that are "friendly" to users at all experience levels.

Proceedings: AMATEUR RADIO

Amateur radio operations seems a natural application area for small computers, since it is technical and innovative, and its practitioners are already electronics oriented. Two papers in the section, "Amateur Radio and Microcomputing," deal with the topic.

"A Slow Scan Television System Using a Microcomputer," by Clayton Abrams, describes a computer-based system which enables amateur radio operators to transmit slow-scan (narrow-bandwidth) television signals with great quality and at lower cost than was possible before.

"Enhancing Amateur Radio Through Computer Control," by Leonard Silvern, discusses a computer-based information management system which reduces the record-keeping burden FCC rules place on amateur radio operators, and which enriches the content of radio contacts by making more information available to the operator as a basis for conversation.



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YOU can be a part of it!

AS A SPEAKER

Consider presenting a tutorial or technical talk in the 5th Faire's Conference Program. Speakers who have their proposed presentations accepted for inclusion in the Program will see their paper published in the 5th Computer Faire Conference Proceedings, and will receive complimentary admission for themselves and a friend.

AS A SESSION ORGANIZER

Want to see a Conference Program that includes a session on your favorite topic? Well, you can go ahead and organize it. The Faire folks will give you assistance in the form of possible contacts, and a phone budget. You can put the session together in a form that you find desirable, and probably including many of the experts you would most like to meet and hear.

AS AN EXHIBITOR

Have some hot product you'd like to show to the leaders in the microcomputing community? Exhibit it in the commercial Exhibition at the 5th Computer Faire. The Faire's Exhibitions have been the largest such shows — exclusively devoted to microcomputing products for home, business and industry. You can be a part of the next show.

WRITE OR CALL, NOW!

The deadline for the Faire's receipt of the final, camera-ready form of all proposed talks is *November 30th*. Request your Speaker's Kit as soon as possible.

If you wish to organize an entire session, start now. Remember that your speakers must have time to write and submit their papers by the November 30th deadline.

A number of exhibitors have already contracted for exhibit space in the 5th Faire. All space is available on a first-come, first-served basis. To get the better locations, you should act soon. Call or write and request an Exhibitor's Prospectus. There are inexpensive microbooths for the new entrepreneur, as well as regular exhibit spaces, and massive islands for the mighty micro people.

Computer Faire
333 Swett Road
Woodside, CA 94062
(415)851-7075

Proceedings: A POTPOURRI OF MICRO TOPICS

The section "Potpourri: Plain and Fancy" contains a medley of papers on different computing topics, present and future.

Several papers discuss aspects of computer hardware design and utilization. "Microcomputer Hardware Development to Reduce Software Costs," by Ian LeMair, points out several ways in which more sophisticated hardware, now, or soon, available, can make software easier (and cheaper) to produce. "Upward Compatibility: More Power — Less Pain," by Terry Ritter, tells how new microprocessors are being designed to be compatible with older ones, preserving users' investments in software. Several strategies for compatibility are discussed, such as object-code, source-code, and assembler language compatibility.

"Automation Begets Replication," by Wyn Kelly Swainson, proposes a computer system for replicating arbitrary objects in the same way that photocopiers 'duplicate' black-and-white images on paper. It's a far-out, science-fiction idea — or maybe not so far out, the author suggests, and hardly fiction any longer.

"An Introductory Comparison of a Personal Computer and a Large Mainframe Computer," by Stephen Freiberger, gives big-computer users a feel for what small computers are like, and what their capabilities are.

"Bottom-Up Design With LSI & MSI Components," by Chuck Hastings, presents a strategy for developing clean, economical hardware — start with existing components, and fit them into the desired architecture as gracefully as possible.

Connecting several microcomputers into a single large system is one way to gain increased computing power. Two papers address this approach: "Multiprocessor Configurations With Microprocessors," by Melvin Zeddies, and "A Distributed Micro Processor Design," by Herb Siegel.

A powerful caution for computer users is contained in "You Can't Just Plug Your Computer Into the Wall!," by James Dinky. This paper describes several unpleasant things that unfiltered line power can do to computers, and suggests some protective measures the user can take.



SOME FINAL SCENES FROM THE 4th WEST COAST COMPUTER FAIRE



Mattel Announces Intellivision Will Be Released in Time for Christmas

The master component module of Mattel Electronics' front-based Intellivision system, which was first introduced at the Winter Consumer Electronics Show, in Las Vegas, will be shipped to dealers nationwide in July. It will have a suggested retail price of \$250. Fourteen ROM program cartridges, ranging from sports, games, and strategy networks, to action and children's learning software, will be available in late 1979, according to Jeff Rochlis, president of Mattel Electronics.

Rochlis said that Intellivision's Keyboard Component, which connects to the Master Component to form a complete home computer system both for family entertainment and for practical applications, also retails for approximately \$250, excluding cassettes. The Keyboard ROM program cartridges, ranging from late fall, he said.

Intellivision's master component is a 16-bit microprocessor that delivers simulated sound effects, three-part musical harmony, and color graphics. Included with the master controller are a Football cartridge (licensed by the National Football League Properties, Inc.), two playbooks, two customized controller overlays, power card, and television connector. The unit attaches to any television set (115 volts, 60 cycles AC). Two hand-held controllers, each with a 12-button keyboard, four playaction keys, and a 16-direction control disk for movement of screen objects, are included with the master component.

To ensure authenticity, credibility of content, and merchandising effectiveness, Mattel Electronics has added several other licensee agreements to its software programming. Additional cartridges, which will retail in a range of \$20 - \$25, include:

- **Basketball** (licensed by the National Basketball Association Properties, Inc.); **Hockey** (licensed by National Hockey League Services, Inc.); **Baseball** (licensed by Major League Baseball Promotion Corp.); and **Auto Race**.
- **Action Networks** - *Space Battle* and *Armor Battle*.
- **Strategy Games** - *Backgammon* (licensed by the American Backgammon Players Association), and *Checkers*.
- **Gaming Cartridges** - *Las Vegas Roulette and Slots*, *Las Vegas Blackjack*, and *Poker*, and *Horse Race*.
- **Children's learning software** - *The Electric Company Math Fun* and *The Electric Company Word Fun* (both licensed by the Children's Television Workshop).

S-100 Active Terminator Board

Solid State Music introduces the T-1 Active Terminator Board. The T-1 is designed to reduce noise, crosstalk, and ringing on S-100 bus lines. No adjustments are needed to set termination voltage.

The 2.5 inch x 10 inch PCB board is solderless on both sides, and has gold-plated edge connector contacts. It is available for \$29 in kit form, and \$44 assembled and tested.

Contact SSM, 2116 Walsh Avenue, Santa Clara, CA 95051; (408) 246-2708.

Beneath the skin, we're all different.

—Eric Bakelinsky

Two customized overlays come with each cartridge, and fit directly over the hand-held controllers, completely in-



tegrating each unit, and making obsolete the need for additional controllers and joy sticks. "All you need to know to play a game is printed right on the overlay," according to a Mattel spokesman. Additional cartridges in all categories are being developed.

The microprocessor-controlled system accepts pre-programmed cassettes capable of handling digital and audio outputs, as well as typed and audio inputs. A microphone is included

in the keyboard component to use in those programs featuring audio input. The keyboard component gives

the user a wide selection of easy-to-use cassettes in the areas of financial planning and tax management, personal improvement, and self-education. The keyboard is a digital cassette system with automatic fast forward and tape search, and is designed to include future additions such as printers, special computer language inputs, and voice units.

The six tapes, which will be ready for distribution in the fall and are expected to retail in a range of \$30 - \$35 each, include:

Data Dog Sniffs Out News at the 4th Faire

The Adventures of Data Dog is an account of what took place at the Fourth West Coast Computer Faire, over the full moon, while the Sun was in Taurus. It was a most stimulating event, two floors of mass chatting by printers and people. Nowhere else in the whole Silicon Bay had more ideas and information been shared. The top floor got the biggest byte from Data Dog, since his favourite computer, Apple II, showed up.

Along with the best software applications, Village Electronics and Apple Computer played exchange duets in synthesized music. Software left an impression on their audience with the SoftShout - not only did the Apple talk and listen, it now has eyes! Yes, fellow micro-enthusiasts, recorded on plastic memory is a digitized picture of yourself. Wow! What an ego trip it would be to pop in diskintercomputer, prep show, and your picture as the finale!!!

Data Dog's assignment, as your roving reporter, was to seek out some of the most useful programs being implemented on the Apple II. Let's get to the meat of the feast... High Technology offers a variety of useful business software; the Point of Sale package is an inventory control and cash register simulation program. Cap'n Software just released the Text Editor we've all been waiting for. Easy-Writer is based on the powerful Electric Pencil text editor. Of course, these lines of text are written with ease using Easy-Writer. Thanks, Cap'n, for ripening the Apple!

Wow! How'd All That Stuff Get In There?, barked Data Dog? Yes, Apple heads... What's it a query-type

data base. Most fascinating, in that you communicate using pidgin English - a great program for novice micro users and professionals alike. Super-Talker, by Mountain Hardware, adds high quality voice and listen capabilities to the Apple II. You can be the first on the block to have a programmable digital tape recorder. Arf, Arf!

Among the many interesting electronics accessories displayed, Corvus Systems demonstrated an 8" Winchester hard disk, which interfaced with an Apple II or TRS-80, and displayed hi-res pictures at four per second. Skip Associates certainly knew what to do with an ordinary typewriter, and a lot of mechanical genius: "With hammers and strings, your Royal will dance and sing."

Data Dog's investigation of the most celebrated micros at the Faire revealed a tie between the Apple II and the TRS-80 - an official count of 65 for each. Coming in second was the PET, with 46 up and running. Last, but not least, folks, we even counted one Orange, a Mandarin interpretation of the Apple II. Atari demonstrated its new line of microcomputer, with beautiful hi-res graphics, which won't be on the market until September.

Data Dog extends his paw of congratulations to Jim Warren, the Master of Ceremonies behind this event. See you on the road in the Base Ship, where Data Dog will be retrieving news in the World of Micros. Remember... Data Dog's bite is worse than his bark.

presented by:
New World Communications

- **Personal Improvement Networks: Physical Fitness** (licensed by the Jack LaLanne organization) provides a reasonable, personalized fitness program based on the user's statistics and on realistic fitness goals only requiring the user to follow each exercise as it is spelled out. *Diet & Food Management* recommends a weekly, balanced diet menu based on the family's dietary considerations, food likes, special diet problems, food costs, and weekly food budget.
- **Self-Education Networks: Conversational French** teaches the language at the user's own pace by comparing the user's pronunciation of words and phrases with the correct version. *Speed Reading* teaches not only speed reading, again at the user's own pace, but also tests recall and comprehension, and will recommend when the user is ready to take the next speed increment.
- **Financial Networks: 1979 Federal Income Tax Preparation** computes the user's income tax, line by line, according to the 1979 tax form; bases computations on the user's income, expenses, and itemized deductions; and figures his tax, using the standard tax table or the rate schedule for married, single, head of household, or other status. *Family Budget & Estate Planner* suggests savings, investment and insurance plans, and annuities based upon family income, assets and liabilities, and monthly payments.

For further information, contact Mattel Electronics, 5150 Rosecrans Avenue, Hawthorne, CA 90250; (213) 644-0411.

ADDER: A species of snake, so called from its habit of feeding on turtles to the other expenses of living.

—Annrose Bierce

New File Transfer Link for National's Starplex

National Semiconductor Corporation has announced a communication link for use between the Starplex™ Development System and Intel's development systems, models 220, 230, 800, and 888. Called "Starlink™," the communications line lets users transfer files between the two systems.

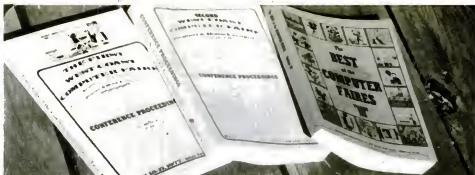
According to Larry Chioche, sales manager, many Starplex customers have older MDS systems, and this facility allows the use of the extensive Starplex software support for working with existing programs and data.

The Starlink communications facility consists of a 50-foot cable connecting the RS-232-C serial ports of the two systems plus supporting software. Two software modules reside in the Starplex and in the MDS system, and control opening, closing, deleting, reading, and writing of files. The Starplex system controls transfer between the two systems, and provides descriptive error messages when necessary.

Via the system's Help/Genkey, the Starplex system gives the user information about the Starlink facility.

The Starlink communications facility costs \$250 FOB Santa Clara, and is available two weeks ARO.

Contact National Semiconductor, 2900 Semiconductor Drive, Santa Clara, CA 95051; (408) 737-5000.



V

THE BEST OF THE COMPUTER FAIRES, VOLUME IV: Conference Proceedings of the FOURTH West Coast Computer Fair

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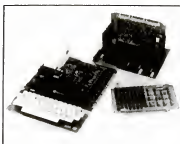
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14181851-7075

Rockwell International's AIM-65: For Learning, Design, and Recreation

The Rockwell AIM 65 (R6500 Advanced Interactive Microcomputer) is a low-cost, single module microcomputer system, and the only one to include an on-board printer. Originally developed as a microprocessor educational aid, it has been adapted by thousands of users to applications such as an R6500 product development system, a smart terminal, a process controller, and a hobbyist product.

AIM 65 features an on-board 20-column thermal printer, an on-board alphanumeric 20-character LED display, and a 54-key terminal-style keyboard. Available in 1K- and 4K-byte on-board RAM versions, AIM 65 is designed around the R6502 CPU, which is the microprocessor also used in the Apple, KIM-1, and PET microcomputer systems. The R6502 has 65K address capability, with 13 addressing modes, true indexing, and both decimal and binary



functions.

An 8K ROM-resident monitor program provides comprehensive self-prompting debug and text editor commands. Using AIM 65's mnemonic instruction entry and memory disassembly functions, programming is done at the assembly language level, making memorizing hexadecimal "opcodes" unnecessary. Assembler and Basic language in-

terpreters are also available as plug-in ROM options.

Spare sockets permit on-board program memory to be expanded to 20K-bytes, via PROM-based user programs or Rockwell's two-pass assembler and Basic interpreter ROM options.

The AIM 65 also has an edge connector that allows external access to the system bus for memory and I/O expansion. A separate application connector interfaces a TTY and two standard audio cassette recorders, and includes a user-cassembled 6522 Versatile Interface Adapter. The VIA features three 8-bit bidirectional ports (two parallel, one serial), and two 16-bit programmable interval timer/event counters.

External memory may be expanded with the buffered AIM 65 expansion motherboard, offered as another option. For example, a fully addressable, add-on mega-bit Rockwell bubble domain memory system may be attached to

the AIM 65.

Using the 128K-byte Rockwell bubble memory module, the AIM 65 can address all 128K-bytes under software control. Such a bubble memory module may be used as a permanent file director.

The AIM 65 expansion motherboard has five connector slots that can accommodate any of the Rockwell System 65 modules or Motorola Exorcisor modules, as well as add-on modules from Burr-Brown, among others. The motherboard essentially extends the AIM 65 system bus lines (address, data, and control), and buffers them to provide ample drive capability. Address decode logic for mapping internal and external addresses in 4K-byte increments is provided. Sixteen switches permit the user to define whether each 4K-byte portion of the R6502 address space (65K bytes) is internal or external to the AIM 65.

Another use for the AIM 65 with the expansion motherboard is as a distributed processing terminal. For this purpose, the AIM 65 may be connected with Rockwell's R24 2400-bps modular modem. Digital signals could be sent, for example, over ordinary wire to a SOROC IQ120 terminal.

Contact Rockwell International, 3310 Miraloma Avenue, P.O. Box 3669, Anaheim, CA 92803.

MOODY GOES INDEPENDENT

Bob Moody, the president of the Western Computer Dealers' Association, and one of the founders of the Byte Shop of Palo Alto, has spun off from Byte of Palo Alto to become an independent marketing consultant in the areas of small home and business systems. Bob may be reached at (408) 225-3341.

NEW 8080 COMPILERS FOR 'C' and MICROSOFT BASIC FROM LIFEBOAT ASSOCIATES

Lifeboat Associates, The Software Supermarket, offers two new compilers for CP/M-based microcomputer systems:

C Compiler: Supports most major features of the "C" language including structures, arrays, pointers, and recursive function evaluation. Linkable with library to 8080 binary input. Lacks data initialization, long and float type, and static and register class specifiers. "C" *Programming Language*, the Kernighan & Ritchie book, is included with documentation.

Price: \$110 (\$15 for manual alone)

Basic Compiler: Compatible with Version 5 Microsoft ANSI Basic interpreter, but has 3 to 10 times faster execution. Produces standard Microsoft relocatable binary output. Supplied with Macro Assembler which produces compatible linkable modules. In addition, Lifeboat Associates also supplies ANSI Cobol and ANSI Fortran compilers which generate compatible load modules.

Price: \$350 (\$25 for manual alone)

For further information, contact Lifeboat Associates, 2248 Broadway, New York, NY 10024; (212) 580-0082.

Weller's Law: Nothing is impossible for the man who does not have to do it himself.

copy it; post it; pass it along to friends & employers

TELL IT LIKE IT IS!

If you are writing a payroll program, ask your employer to let the payroll statements tell the employees how much taxes are *really* being withheld from them.

If you are an employer, ask your payroll programmer to revise the payroll reports format to show what the government is *really* taking from the employees.

Here's an example.

It's worked out for:

a programmer (or office worker)
\$18,000/year (\$1500/month) salary
a California resident
1 exemption

These are the real figures as of early 1979.
(And, of course, they are more outrageous for higher salaries.)

PAYROLL STATEMENT FOR: JOHN Q. PROGRAMMER

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FICA (SOCIAL "SECURITY")	91.95 (6.1%)		91.95 (6.1%)	
STATE DISABILITY INSURANCE		15.00 (1.0%)		
UNEMPLOYMENT INSURANCE			10.50 (.7%)	52.50 (3.5%)
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TOTALS:	384.15 (25.6%)	92.00 (6.1%)	102.45 (6.8%)	58.35 (3.9%)
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This implies an opinion held by the Publisher and the Editor. It does not necessarily reflect the opinions held by any of the advertisers.

Khalsa's New Word Processor for Use with the Alpha Micro

Khalsa Computer Systems has introduced the Type-Right Word Processor, a screen-oriented word processing system which uses conventional CRT terminals (e.g., Hazeltine 1500, Infoton 100, Soroc 120) in conjunction with the AM-100 system.

Text is entered into the keyboard of the CRT terminal, and appears on the terminal display device. There is no need to enter a carriage return when the end of the line is reached — Type-Right does a automatic corrections or changes are to be made, single keystroke control functions are entered to perform editing operations on the screen of the terminal. Type-Right also provides a summary of all the editing and printing control functions from the terminal, at any time, with the touch of a key.

At print time, Type-Right will display the document on the screen of the terminal as it will appear when it is printed. If it is acceptable, the user can direct Type-Right to print the document on the printer. There also exists a variety of print control functions that alter the format of the document.

Contact Khalsa Computer Systems, 500 South Lake Avenue, Pasadena, CA 91101; (213) 684-3311.

review

The BASIC Handbook: A Comprehensive Reference Source

by Tom Williams

The primary intent of *The BASIC Handbook*, by David A. Lein, is to provide users with a means of getting programs, written in a given dialect of Basic, to run on their machines. The book is intended to alleviate that feeling of frustration caused by finding a nifty listing in a book or magazine, and realizing that it contains words or statements unintelligible to your machine.

For this reason, *The BASIC Handbook* is not a programming text, but a reference book for a large number of commonly used Basic dialects. On the surface, that may not sound novel, as similar information is carried in other reference works and software manuals. What makes *The BASIC Handbook* such a useful tool is its format.

The book is designed to make liberal use of white space, giving greater clarity and order to the information presented.

Basic words are divided into four categories: commands, statements, functions, and operators. The first three categories are arranged in alphabetical order, and designated as to which type of word they are. It is also indicated whether the word is part of the proposed American National Standards Institute (ANSI) minimum Basic vocabulary.

Next to each word is a general description of what it does, and an indication of what word is specific to a certain machine. For example, PDL, a function to control the game paddles, is used only on the Apple II.

There are then examples of the way a user can employ to determine whether his machine will make use of the word. A sample run shows what the result should be.

The real boon for the frustrated user, however, is in the section entitled, "If your computer doesn't have it." When possible, a method of accomplishing the same objective, using other Basic dialects, is given. This is not always pos-

Software Testing Newsletter

Software Research Associates has introduced the availability of complimentary subscriptions to its quarterly, technology-oriented newsletter, *Testing Techniques*.

The goal of the newsletter is to provide a forum for discussion of the techniques of software testing and testing-based software quality assurance methods, according to Dr. Edward Miller, who coordinates publication of the newsletter. Complimentary subscriptions are sent to qualified individuals who make a request on their company letterhead.

Recent issues of the newsletter have included articles about the December 1978 Florida Testing and Test Documentation Workshop, about mutation testing techniques, and about current events of interest to anyone who is concerned with the quality of software. Future issues are expected to continue the flavor of high-quality testing technology, including articles relating both practice and experience of testing, as well as items dealing with more theoretical issues.

Contact Software Research Associates, P.O. Box 2432, San Francisco, CA 94126; (415) 957-1441.

Independent Telephone Service Offers News on Heath Computers

Users of personal computers made by the Heath Company may now obtain news bulletins of interest to them by calling a telephone number in Washington, D.C. The recorded announcements are provided for subscribers to *Bus: The Independent Newsletter of Heath Co. Computers*.

The publication's editor, Charles Floto, pointed out that "Unlike other telephone information exchanges for computer owners, no modem is required to use the *Bus* system."

To use the system, call (202) 544-3081, listen to the message and leave a message, if desired, after the tone. No limit is placed on the length of messages.

Bus was established in 1977 to provide an independent forum for the exchange of information of interest both to users and to prospective purchasers of Heath Company computers. The latter include machines based upon LSI-11, Z-80, 8080, and 8080 microprocessors. *Bus* features candid reports of the experiences of its readers with these systems. It covers compatible hardware and software from other vendors, as well as present and future Heath Company products. For further information, contact *Bus*, 325-J Pennsylvania Avenue, S.E., Washington, D.C. 20003.

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Though the unemployed masseuse rubbed me the wrong way, I returned because I wanted to feel kneaded.

—Eric Bekhtalinsky

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Prestel Licensed for Swiss Pilot Test

Prestel has been licensed for pilot testing in Switzerland, the British Post Office announced recently.

Switzerland becomes the third nation to import Prestel under such an agreement. Germany and the Netherlands have already taken out licenses on it for trial use; licensing negotiations are currently under way in Hong Kong.

The license agreement covers the software needed to establish a pilot system for demonstrations. Its purpose is to test out the applicability of Prestel to Swiss needs, and to develop interest among potential suppliers, distributors, and consumers of information.

Inac Data Systems, a New York-based company marketing British computer technology in the United States, is working to set up a Prestel-type service in co-operation with an American communications company.

Meanwhile, the British Post Office's Research Centre is hard at work adapting Prestel to languages with non-Roman alphabets, including Russian, Arabic, Greek, Hebrew, and Japanese (Katakana). It conducted a Russian-language demonstration in Moscow this January — the first time that Prestel was operated in an eastern European country.

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Wednesday, August 15

Algebraic Transformations and Equivalents Proofs for Functional Programming — J.W. Backus, IBM Research Fallow

Thursday, August 16

Program Transformation and Program Specification — R.M. Burstall, University of Edinburgh

Friday, August 17

Communicating Sequential Processes — C.A.R. Hoare, Oxford University

Monday, August 20

Practical Experience in the Use of the Module Concept in Programming — Niklaus Wirth, ETH, Zurich

Tuesday, August 21

Data Semantics — W.M. Turski, Warsaw University

Wednesday, August 22

The Dining Philosophers Revisited — Edsger W. Dijkstra, Research Fellow, Burroughs

Thursday, August 23

The Significance of Modeling in Building Information Systems — Michael Jackson, Michael Jackson Systems, Ltd., London

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Independent Broadcasting Authority Surveys Quality of Teletext Signals

by Jonathan Sachs

According to a recent British survey, teletext signals can be received at the vast majority of locations where conventional television can be received.

The survey was conducted by the Independent Broadcasting Authority (IBA), which supervises the operations

of Britain's 15 privately operated broadcast-casters. It was described in a paper read by Les Sherry at the IEEE-sponsored 20th Annual Chicago Spring Conference on Consumer Electronics, held in early June.

Teletext systems broadcast digital text information, such as news bulletins,

to the public, by employing an unused portion of the television signal format. The signals can be viewed on a special television set, or on a standard set which has been equipped with an adapter.

Critics of the teletext concept had predicted that it would be too sensitive to signal degradation, and would yield

poor reception in many areas. The IBA survey seems to indicate that this will not be a serious problem.

FIELD TESTING FROM A TRUCK

The survey was based on field tests conducted from an instrument-laden truck that the IBA sent to several parts of Britain. Engineers measured signal strength and quality from the truck at a multitude of points. The signals they tuned to were local television broadcasts carrying Oracle, the IBA's teletext service.

The engineers also monitored Oracle reception in subscribers' homes to determine the quality of residential reception when typical commercial antennas and receivers were used.

THE RESULTS

In London, which was selected as a typical urban area, 94% of the locations tested had adequate teletext reception. In Hampshire, chosen as a typical rural area, the figure was 96%. In the Yorkshire Dales, a hilly, rural area, the figure was again 94%.

IBA engineers analyzed the causes of inadequate reception in the subscriber-home tests. Weak signals caused 47% of the failures; reflections (which are the cause of 'ghosts' in television images) caused 32%; and a combination of the two caused the remaining 21%.

In the tests conducted from the laboratory truck, however, no failures occurred due to reflections alone. This was attributed to the truck's antenna, which was highly directional and carefully adjusted. The survey suggested that many of the subscribers' reception problems could be alleviated by using improved antennas.

RECEIVER QUALITY

The tests also indicated that improved receivers and teletext decoders can make a difference — up to a point.

The survey analyzed signal quality in terms of "eye height," i.e., a measure of how much of the modulation applied to the carrier wave at the transmitter is available at the receiver. A large eye height, approaching 100%, indicates a perfectly clear signal. A low eye height indicates a poor signal, with most of the modulation washed out by reflections and noise. A high-quality television signal, subject only to distortions in the transmitter itself, has an eye height of approximately 80%.

The teletext decoders used in the IBA's field tests had an eye height threshold of 25%, i.e., they could decode signals with an eye height of 25% or better. This is close to the lower limit for practical commercial decoders at the present state of the art.

Eye height measurements at various locations indicated that a decoder with a threshold of 50% would give satisfactory teletext reception at only approximately 73% of the locations tested. On the other hand, a decoder with a threshold of 25% would not extend teletext to many additional locations.

The eye height threshold for adequate television reception is generally approximately 50%. Thus, a teletext decoder with a threshold of 25% should be able to give adequate teletext reception in some locations where television programming is currently unusable.

FREEDOM: A political condition that every nation supposes itself to enjoy in virtual monopoly. Liberty. The distinction between freedom and liberty is not accurately known; naturalists have never been able to find a living specimen of either.

— Ambrose Bierce

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TELECOMMUNICATIONS

Antiope System Promoted in U.S.

by Jonathan Sachs

Antiope, a teletext system developed by TeleDiffusion de France (TDF), is now being promoted in the United States by AVS, Inc. AVS (Antiope Videotext Systems), an American subsidiary of SOFRATEV, is newly created to handle Antiope business in the U.S.; SOFRATEV is the French company responsible for promoting the export of Antiope.

AVS's first act was to announce an agreement between SOFRATEV and Microband National System, Inc., a communications company based in New York; SOFRATEV and Microband hope to develop an interactive information utility using Antiope and the telephone system. The generic name which AVS uses for this proposed system is "Intext."

An Intext subscriber would request information from the utility through a telephone connection between his office terminal and an Intext data bank; Intext would then transmit the information to him on a television carrier signal. Initial Intext offerings are expected to be business-oriented, although consumer-oriented services may be added later.

Microband presently operates a net of common-carrier television stations in the multipoint distribution system (MDS) band, a high-frequency band not subject to the public-access restrictions of the regular broadcast bands. Microband's stations distribute pay-television programming, educational television, and news services. Microband evidently plans to piggyback Antiope signals on its MDS carriers.

The Antiope/MDS system was demonstrated for the first time at the National Information Conference and Exposition, held April 30 through May 2, and sponsored by the Information Industry Association. The demonstration data base included such items as weather and agricultural information for farmers, current flight information from airlines, daily and hourly reports on federal legislative activity from the House Information Systems, and current commodity and stock quotations. Antiope services which have not yet been established, may be contacted through David J. Taylor, Esq., 1150 Connecticut Avenue NW, Washington, D.C. 20036; (202) 457-1020. Microband may be contacted at 655 3rd Ave., New York, NY; (212) 867-9590.

DIGICAST SYSTEM RUNS ON-THE-AIR EXPERIMENTS

The Digicast Project exhibited its prototype transmitter and receiver, running in 900-MHz data base included such items as weather and agricultural information for farmers, current flight information from airlines, daily and hourly reports on federal legislative activity from the House Information Systems, and current commodity and stock quotations. Antiope services which have not yet been established, may be contacted through David J. Taylor, Esq., 1150 Connecticut Avenue NW, Washington, D.C. 20036; (202) 457-1020. Microband may be contacted at 655 3rd Ave., New York, NY; (212) 867-9590.

The Digicast Project is proposing an electronic information utility that distributes information - text and graphics - in real time, digital form via broadcasting on FM subcarrier channels.

Viewdata: Telephone-Based Interactive Information System

The Viewdata information system, now being tested in Britain, makes available to its subscribers up to 200,000 pages of data. Each page fills a television screen with 24 lines of 40 characters each.

A Viewdata subscriber needs three pieces of equipment: a television set with a digital decoder; a 12-button keypad, which controls the service; and a telephone interface. The interface need not be connected to a telephone; it plugs directly into a wall jack.

To use Viewdata, the subscriber presses a button which makes his decoder contact a Viewdata computer through the telephone system. Then, pages of information are displayed by pressing buttons on the keypad.

Information is found through a series of indices. The subscriber starts at whatever level of detail he wants, and moves through a series of successively more detailed indices to the information he desires.

EQUIPMENT

British television manufacturers expect to offer Viewdata systems with all three elements in a single package. Adapters for existing sets will also be available.

Business subscribers will be offered a special desk-top terminal with a built-in display unit, designed primarily for Viewdata service rather than for television reception.

At the distribution end, BPO will use small computers at regional exchanges throughout the country. This will allow most subscribers to access Viewdata for the cost of a local telephone call, and will enable each local distribution center to tailor its data base to its users' interests.

The computer currently being used for distribution centers is the GEC 4080, made by GEC Limited, a British affiliate of General Electric Company. The 4080 is a 16-bit minicomputer comparable to DEC's PDP-11. Each installation includes two computers which operate simultaneously, sharing the load.

ECONOMICS

Viewdata's economic motivation comes from three sources: the BPO, electronics manufacturers, and information providers.

BPO is the moving force behind Viewdata. Its economic reason for promoting Viewdata is that it will increase utilization of the telephone system, which BPO operates. By promoting both business and consumer use between business and leisure hours.

BPO is actively promoting the Viewdata system in foreign countries. The West German Bundespost has licensed it, and plans to offer it under the name Bildschirmtext. Hong Kong Telephone Company also licensed the system, and plans to begin public service in 1980. Inscac Data Systems, of New York City, is Viewdata's American licensee. It is negotiating for implementation of a Viewdata system through a major U.S. communications company.

The electronics manufacturers are interested in Viewdata as a new consumer market for their products. The British television manufacturers believe that the market for color television sets is nearly saturated; replacing existing sets with Viewdata sets will be the primary marketing objective for the 1980's.

High-technology companies are interested in providing digital components for Viewdata sets, since it is a new, large volume market. So far, most of the decoders for Viewdata and its sister broadcast service, Teletext, have come from Texas Instruments. General Instruments, another electronics manufacturer, hopes to market its products in the U.S. once standards for Teletext-like service have been established.

POTENTIAL USES

Viewdata is initially being offered to the public as a source of consumer information and entertainment, and to business as a source of many kinds of commercial information. Its developers, however, see many other applications for a mature Viewdata system.

With a properly designed sequence of pages, the system could lead a user through a multi-step, problem-solving process as would an interactive computer. The BPO demonstrates this possibility with a sequence of pages answering the question "Am I eligible to adopt a child?" The first step of the sequence contains information about adoption rules, with references to several other pages. The user follows one of the references, depending on what his own situation is, and eventually arrives at an answer to the question.

True interactive services, including computer services, are planned as a future enhancement. The Closed User Group is an extension of Viewdata's business services facility. This allows a business user to store data, on the system, which can be seen only by designated subscribers (its own office terminals, or a subset thereof). BPO expects this facility to be used for broadcast communications to employees and customers, and for maintaining corporate data bases for reference.

A large user would have a Viewdata system in-house, on a dedicated computer system. Such a system would be interconnected to Prestel (BPO's Viewdata system) for inquiries to the public data base.

BPO's Viewdata plans also include point-to-point messages - electronic mail. The legal problems facing electronic mail in America are largely absent in Britain, since the system would be managed by the same agency that runs the telephone and postal services; BPO has no qualms about competing with itself.

IMPLEMENTATION PLANS

BPO began a limited-area market trial of Viewdata in June 1973. Approximately 700 individuals and 300 businesses are taking part. The trial areas are London, Birmingham, and Norwich, representing markets typical of large cities, small cities, and town/countrys, respectively.

The trial subscribers are using Viewdata on approximately the same basis as actual subscribers would; that is, they had to buy or lease the necessary equipment, and they are paying for the services they use. The current data base consists of about 75,000 pages.

BPO plans a transition from the trial market to public service in a limited area by late 1979; service is expected to be expanded to meet demand. By the mid 1980's, BPO officials expect, most of Britain will be "wired."

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LISTENING IN ON ARPAnet: Using a Network for Electronic Mail

Widespread use of electronic mail systems will probably be one of the most important developments in the information processing world of the 1980's. These systems will automatically route messages from a keyboard to an addressee's display screen. They promise to make communication more rapid, fluent, and economical than ever before.

Electronic mail will make possible new kinds of communication, such as "community bulletin boards" which can be perused by anyone interested in a particular topic, regardless of their location.

It is not widely known that a large electronic mail system is flourishing today within ARPAnet, a nationwide network of computer systems located mainly in academic and research institutions. A user of one ARPAnet machine can access any computer on the network through its terminal. ARPAnet users report that their seldom used message folders, the net's message facility is more convenient.

Through the good offices of a local ARPAnet user, we have obtained a printout of the community bulletin board on a computer at the Massachusetts Institute of Technology. The magic of electronics (*plus several million dollars in defense funds - ed.*) made this printout instantly available in our friend's San Jose home, 3,000 miles from its origin, for the cost of a local telephone call.

The printout is reproduced below. It has been edited to remove noise, such as the authors' account numbers, and to conceal the names of the people involved, who didn't know that they were going to get national exposure. We begin with a slice of electronic life for the 1980's.

CAR 4: RE: NOSTALGIA LAST CHANCE TO OWN AN OPERATING RELIC OF A BYGONE ERA. 1963 CADILLAC CONVERTIBLE FOR SALE AT BARGAIN BASEMENT PRICE.

PLUSES:
TOP DOESN'T LEAK
LEFT SIDE OF BODY IN GREAT SHAPE
DOESN'T BURN OIL (ABOUT 700 MILES/QT)
HAS HAD REFINED IN PAST 2 YEARS. BATTERY, STARTER, ALTERNATOR, 2 FRONT TIRES, FRONT SHOCKS, RADIATOR CORE, MAGNETO, BRAKE CYLINDERS, WHEEL BRAKE CYLINDERS, IGNITION STRINGS
YOU FEEL LIKE A KING WHILE RIDING AROUND IN THE SUMMER WITH THE TOP DOWN
WORKING ELECTRIC FLOOR: TOP, SEAT (FORWARD, BACK, UP, DOWN, TILT), ANTENNA, WINDSHIELD, RADIO
FOUR WORKING CIGAR LIGHTERS PASSED INSPECTION LAST MONTH
MILES: 115,000
11.5 MILES/GAL AT LEGAL HIGHWAY SPEEDS
RANGE OF FUEL HIDEOUS
WINDSHIELD JUST GOT HIT BY A STONE AND HAS CRACKS
RUBBER SEALS PROBABLY LAST SUMMER BUT NO GUARANTEE MUFFLERS IN BAD SHAPE
WEIGHT: 4500 LBS.

PRICE \$300 OR BEST OFFER. IF INTERESTED IN RESTORATION PROJECT THIS CAR IS IN GOOD CONDITION IS CURRENTLY GETTING ABOUT \$3500 - \$4000 IN COLLECTOR'S CAR MARKET SEE HEMMINGS MAGAZINE. MY ESTIMATE IS THAT IT WOULD TAKE ABOUT \$1500 - \$2000 TO PUT IT INTO THAT KIND OF CONDITION. NAME: CARL HENCK, WAS CAL KENNEDY WAS IN WHEN ASSASSINATED (FOR YOU MORBID FOLK OUT THERE).

APTMT 1: RE: Roommate wanted in Sept. Friendly person for 23 sought to fit vacancy to appear in our apartment this September. Apt. is the first floor of a triple-deck near the "D" and "B" schools, tree-filled neighborhood. Minimally a four bedroom apartment, currently with just three (very roomy). New year's rate is \$440. HEAT INCLUDED!!!

LSFNPA1: RE: Names for LIST as SYS:TS The latest version of LISB (1831) may be invoked by any of the names "O", "P", "L", and "LSP"; the previous version (1788) may be invoked with "O", "P", "L", or "LSP". Note that the names "NEWIO" and "ONEWIO" and "OO" are gone. Furthermore, the compiler may be invoked by "OCOMPLR", "CL", "OCOMPLR", and "OC"; the previous version may be invoked by "OCOMPLR", "OC", "L", and "OC". Note that the name "C" is used for another purpose, and the names "OOC", "OCOMPLR", "N", "NCOMPLR", and "NCOMPLR" are all gone.

ART 2: RE: Apartment Available Three BR, 1.5 bath apt available for approx. 1500. 15' x 15' kitchen, tile walk to Park St. Adult couple preferred. Rent neg.

SCRIPT 2: RE: Who knows about FONT2; 125CRP?

It is an otherwise nice script font that seems to be a variation on a script font. I have used 125CRP for an attempt at a better kerning.

JOKE 1: RE: An American Joke From the Wall Street Journal
Q: Why does it take five Americans to change a light bulb?
A: One to turn the bulb and four to file an environmental impact statement.

CAJOTE 1: RE: A California Joke
Q: Why does it take five Californians to change a light bulb?
A: One to turn the bulb and four to share the environmental impact statement.

TEACH 1: RE: one-semester part-time high school job
Anyone want to teach math next fall? Lincoln-Sudbury Regional High School? It is a contract position (i.e., teach 2 classes for fall semester. There are lots of applicants but so far they're all turkeys.

APA THY: RE: Is anyone out there awake? In a recent NYT/CBS poll, it was determined that approximately 70% of the American population doesn't know what countries are involved in the SALT II treaty. "Some people gave the wrong countries, but most just flat out admitted they didn't know."

VOLT 1: RE: inventor
Anyone have a 220-110, 1000 watt voltage converter I can borrow for several weeks starting in mid-July?

USERS 1: RE: Use RSx directories
Once again I want to thank those who use the RSx or GNUx directories. If you fill up these directories with garbage, others cannot use them and cannot even receive mail. ITS directories have a fixed size to see how full a directory is, give a command such as: \$DK\$USE USERS; (return). Policies and procedures are available in the MAIL file more than a month old, which are probably for someone who doesn't exist.

OVERN 1: RE: missing overhead projector
G.B. phoned to say that someone borrowed his overhead projector and failed to return it. If you know of its whereabouts, please return it to room 425.

NLM-LE 1: RE: JUMBO GREEN LED's
Jumbo green LED's for sale. \$0 for \$5, \$10 for \$10. ... all work.

CPUJOK 1: RE: How may 360's does it take to ASR a register?
I would hold that at 32 and 22 in BYTE and register. (Sorry all, see I'm not a BYTE and couldn't resist.) ...

MSG 1: RE: a joke
Q: What's red and green and jumps up and down?
A: A frog in a Waring blender.

---END OF FILE---
:LOGOUT

NEW CRT EDITOR FROM INTEL

'Credit', a software editing tool announced by Intel Corporation, is designed to reduce the cost of software development, a major factor in building complete microcomputer-based systems.

'Credit' was created for Intel's CRT-based development systems, and provides users with screen and command-line editing shortcuts, making a programmer's time more efficient, according to an Intel spokesman. Development programs spend a considerable part of their time writing lines of program statements (source code), then revising them using a CRT terminal attached to a microcomputer development system. Currently, microcomputers are designed into a rapidly expanding variety of products, including automobiles, industrial process control systems, and household appliances. Whereas the actual cost of software development has risen in size and hardware cost, increasing amounts of time and money must be spent to create the software necessary to control these micro-based systems.

The new text editor runs on Intel's Intellec-80 and Intellec Series-II microcomputer development systems equipped with an Intel-supplied CRT, flexible disk drive, and 64K bytes of RAM. Once loaded, it offers the user single-key control of text character insertions, deletions, and replacements. In addition, a user can move page-by-page forward or backward through the text file, and all changes are immediately displayed on the CRT screen.

Entire lines of code can be inserted, deleted, or changed using 'Credit's' command-mode editing features. A block of several lines of text can be moved from one location to another in a text file, or can be copied to a second location leaving the original block intact. Each is done with a single 'Move' or 'Copy' command. In addition, a user can quickly find a keyword starting within a file, or can find and replace a string by using the 'Search' commands. If the programmer is unsure of which command to use, he simply invokes 'Help', and 'Credit' displays a list of commands and their applications.

A sequence of commands frequently executed as a group can be labeled and subsequently called up using only the user-given name. These sequences, called "macros," enable programmers to create sets of subroutines customized to

their specific needs, thus markedly increasing their editing efficiency.

Unlike operations in the screen editing mode, those conducted in the command-editing mode are not routinely displayed on the CRT.

'Credit' is available on single- or dual-density flexible diskettes. It is loaded into the development system via the flexible disk drive, and operates under the control of the ISIS-II operating system. 'Credit' is available at a single-unit price of \$250. A diskette, which illustrates 'Credit's' capabilities, is provided at all Intel sales offices and authorized Distributor Demo Centers.

Intel Corporation, 3065 Bowers Avenue, Santa Clara, CA 94043; (408) 987-8080.

A Remote Batch Terminal Emulator

Winterhalter & Associates has announced the availability of the Universal Binary Synchronous Emulator for Intel and Zilog microcomputers running under CP/M. The Universal Binary Synchronous Emulator, known as the Remote Batch Terminal Emulator (RBTE), emulates most binary synchronous terminals, including the IBM 2780, the IBM 2770, the IBM 3741, and the IBM 3780 terminals. Provisions are being made to support the IBM 3270 by the beginning of the fourth quarter, 1979.

All of the above terminals are supported by dynamic configuration of the RBTE. Each supported terminal has a configuration file containing thirteen configuration parameters which are uniquely set to define a specific terminal. Thus, variations of the above four terminals, as well as the capability of defining new terminals, are possible. All other adjustments. The RBTE also includes a diagnostic port feature, which displays the binary framing characters on a local CRT, allowing the user to diagnose communication problems without expensive line analyzers.

The RBTE reads disk records from a CP/M file, reformats them into a binary block, and transmits them to a remote terminal. Alternatively, a binary block will be received from the remote terminal, unpacked into disk records, and written to the specified CP/M file. This is a stand-alone program that sends or receives data files to/from a CP/M disk and to/from the communication port.

Another product, the Binary Communication Driver, allows an application program to communicate directly to the Binary communication ports with simple "open", "close", "read", "write", "connect", and "disconnect" commands. This product has the same features as the RBTE, but requires that the user pack or unpack the binary block.

The RBTE and the Binary Communication Driver are each available for \$500 with single-use license. Consult the factory for OEM quantity purchases.

In the future, Winterhalter & Associates will make available emulations for the IBM 3270, SDLC, DDCMP, HSP Workstation, and X.25. Other terminal emulations will be made available on a custom basis.

The Serial Protocol Processor, a S-100 bus microprocessor communications controller with four RS-232 serial ports, will be available in late 1979. The SPP is capable of communicating asynchronously, byte-synchronously, and bit-synchronously to the RS-232 ports.

For further information, contact Greg Winterhalter at 3825 North Zeeb Road, Dexter, MI 48130; (313) 426-3029.

Multibus™ Compatible Backplane/Motherboard

Industrial Modules, Inc. has introduced a single Multibus™ backplane/motherboard with integral termination resistors on all lines to reduce reflections and noise. The INMDD-90™ provides eight slots with 6 inch spacing, and one slot with 1.2 inch spacing. The ninth slot provides the extra spacing to accommodate a single drive and wire wrap pins. If alternate sockets are left vacant, the backplane/motherboard can accommodate up to five boards with wire wrap pins, thus making it suited as a prototype vehicle for larger systems.

The five-conductor Multibus™ is available as a lower cost option, if production quantities are negotiated. In every other way, the board is fully compatible with the Intel Multibus.

The INMDD-90 costs \$115, assembled, tested and guaranteed for 90 days. Production quantities will be available in August.

Contact Industrial Modules, Inc., P.O. Box 2985, Santa Clara, CA 95051; (408) 984-7698.

Want Ads

The Intelligent Machines Journal will accept want ads for publication in future issues. 20,000 circulation is guaranteed, with much larger press runs occurring periodically. IMJ is published biweekly, with Wednesday datelines. Copy received 10 days or more preceding an issue date will appear in that issue. Want ads must be paid for on the basis of the number of typed lines of original copy. A line is 50 characters or less: 6" long on an elite (10-pitch) typewriter, 3" long on a pic (12-pitch) typewriter. The ad rate is \$10 for each such line or part of a line. This rate approximates \$20/column inch—a tenth of a cent per reader for a one-inch ad.

Want ads must be typed in upper and lower case. Payment must accompany the ad copy. Ads and payment should be sent to: IMJ, 345 Sweet Road, Woodside, CA 94062.

ALL BRAND NEW EQUIPMENT:
Soc II Q120 \$625; Centronics 719 w/ tractor \$750; 3 Vector Graphic 48K RAM boards \$450 each. Oregon (503) 673-3107 or 673-5190.

Diablo Hytype I: w/pwv supply, tractor feed, parallel ASCII, cover, operating manuals, proportional spacing. Will demonstrate. \$1150. You pickup. Pasadena, CA (213) 799-6384.

Thinker Toys Discus I - - - - - \$700
Mack Divisions Screenprinter - - - \$300
Godbout 16K Econoram - - - - - \$200
Sanyo VM4425 monitor - - - - - \$200
All items like new; will take best offer. (415) 948-9595.

Now FAST Delivery for the TRS-80 L2 16K. SEND SASE or \$14.95 to Adventure, Box 3435, Longwood, FL 32750.

ACOUSTIC ENCLOSURE for Teletype on stand. 28"x 5" x 39" h x 24" d. \$25. Phone (415) 334-1253; leave message.

UNIVERSAL DISKETTE CONTROLLER FOR iSB SINGLE-BOARD COMPUTERS

Intel® Corporation has introduced a Universal Flexible Diskette Controller, iSBC 204, which is an interface between the 8- and 16-bit iSBC Single Board Computer systems and the vast majority of the single density standard-sized and minimized flexible diskette drives currently on the market.

Using the controller, a designer can interface with his/her preferred diskette drive hardware, and then employ software to specify hardware characteristics to the controller. The iSBC 204 Universal Flexible Diskette Controller can be used with single-sided drives, or one double-sided drive, in its standard configuration. With the addition of a single plug-in component, this capacity can be doubled, according to Intel.

The new controller is supported by a full complement of software, ranging from a real-time executive language to high-level languages; in particular, the RMX/80™, the Real-Time, Multi-tasking Executive system implemented by Intel on the iSBC 80 series single-board computers.

The iSBC 204 is a key element or the iSBC 802 Basic-80 Disk-Based interpreter, which is available as an interactive software tool for 8-bit iSBC systems. The user can program in basic-80, store the program on diskette using the controller, and then recall the program and execute it directly on the system. The new Intel Basic-80 also has read-and-write capability both for disk data files and for executable programs.

The iSBC 204 controller has been designed to transfer data in a direct memory access (DMA) mode. This allows transfers and CPU operations to proceed simultaneously. In order to accommodate applications in which power consumption is a serious constraint, the controller has been designed to operate from a single +5V DC supply, at 5 amps maximum. Also, by taking full advantage of the latest LSI component capability, the iSBC 204 has been incorporated on a single Intel iLithium™ system-compatible printed circuit board.

ik Drive Compatibility

The iSBC 204 can be used to

interface with a large number of both standard-sized and minimized flexible diskette devices.

The following standard-sized devices are among those which can be interfaced with this controller: Shugart 800; Shugart 850 (dual-sided); Memorex 550; Memorex 552 (dual-sided); Wangco 765; CDC 9404; and GSI 110. In addition, the following minimized diskette devices are compatible: Shugart SA400; Wangco 82; and Pterec FD200.

The heart of the iSBC 204 is Intel's 8271 Floppy Disk Controller (FDC) chip which provides the capability to execute high-level commands, and permits easy controller expansion. The standard controller supports two single-sided drives or one double-sided drive. Addition of a second 8271 FDC circuit allows four single-sided, or two double-sided drives, to be supported. A socket for the additional 8271 FDC circuit is provided on the board.

In normal operation, data is read and written in standard IBM 5740 formats. For special applications, the iSBC 204 Universal Flexible Diskette Controller supports minidrive sector lengths of up to 2048 bytes, and standard drive sector lengths of up to 4096 bytes.

Multibus Compatibility

The iSBC 204 Universal Flexible Diskette Controller is fully compatible with the iSBC Multibus system architecture. Intel recently expanded the capability of the Multibus system with the introduction of the iSBC 86/12 Single Board Computer, which utilizes the Intel 8086 16-bit processor circuit. The iSBC 204 is designed to operate in this expanded iSBC Multibus environment, accessing a 1-megabyte memory space. The new controller also implements the latest Multibus specification of 12-bit I/O addresses for device controller registers.

Software Support

The diskette file system of RMX/80™ provides considerable software flexibility. Data and programs may be stored at user-selected sector and track addresses, or the user may choose to

An Apple Love/Hate Relationship

Dear Jim: 79 Jun 20

Why I hate my Apple II:

1. When I have a problem, they (Apple II manufacturers) do not answer my letters.
2. When I call, I'm given a number that nobody answers.
3. I was not (nor have I ever succeeded in being) put on the 'contact' newsletter dedicated to their 'goofs'.
4. Other than that, I love it.

Please publish this, then maybe they will answer my letters and phone calls!!

Dale Houseman, D.D.S.
503 Sheldon Avenue
Houghton, MI 49931

We are publishing this, as you requested. We are somewhat surprised to hear this, however—primarily because Apple seems to be doing so many things so 'right'. Our personal opinion is that Apple is the company that is leading the consumer computer market (though it appears that Atari will keep Apple from becoming too complacent). This is the only complaint we have received, to date, regarding Apple. We are publishing it, partly due to this unique character, and partly because you are obviously extremely frustrated and we'd like to assuage that upset. We think Apple will come to your aid—soon.

—JCW

allow the system software to provide all file management. Working under the full disk file system, files are named symbolically, and may be created, deleted, or changed as needed. An unlimited number of files can be opened simultaneously, and multiple tasks may read the same file concurrently.

A complete range of service functions are available under RMX/80. Since RMX/80 is a modular system, allowing functions to be implemented selectively, memory requirements are minimized, according to Intel. Diskettes processed under RMX/80 are compatible with Intel's ISIS-II system supervisor.

The 8271 Floppy Disk Controller IC makes the iSBC 204 programmable. Thus, the operating characteristics of the diskette unit selected by the designer/user are specified by the user's program.

In addition, the 8271 FDC is capable of executing high-level commands that simplify system software development. The device can read, write, and verify both single and multiple sectors; cyclic redundancy check (CRC) characters are generated and checked automatically; and up to two tracks on each surface may be designated 'bad,' and logically removed from the diskette.

Scan commands permit sectors to be searched for a specified data pattern, or 'key.' During scan operations, the pattern image from memory is continuously compared with a sector, or multiple sectors, read from the diskette. No CPU intervention is required until a match is found, and, in all specified sectors have been searched, Intel says.

All user-programmed iSBC 204 diskette operations are initiated by standard I/O port operations through an iSBC 80 or iSBC 86 Single Board Computer.

The price of the iSBC 204 Universal Flexible Diskette Controller is \$680 in single units. Quantity discounts are available. Contact Intel Corporation, 3065 Bowers Avenue, Santa Clara, CA 95051; (408) 987-8080.

Dialogue

LETTERS TO THE EDITOR

The Intelligent Machines Journal is primarily intended to serve two purposes: 1) to provide fast-turnaround news distribution for the explosively changing microcomputing community; and 2) to provide a medium for effective national dialogue that is not possible in the monthly periodicals that have a 2-6 month lead time on editorial content.

To fulfill the second purpose, the Journal actively solicits letters from the readers for publication. On the average, a letter accepted for publication will be published within a week of its receipt.

Letters for publication may address topics mentioned in previous issues of IMJ, or may focus on entirely new topics. Carefully reasoned, responsible analyses and evaluations of topics, issues, and products are particularly desired. Documentation and references, where appropriate, are also highly desirable, and will be published with the letters, when useful.

We reserve the right to edit correspondence for clarity and brevity. We will not publish correspondence that is sent anonymously, although we will withhold an author's name, upon request.

Letters for publication should be directed to:

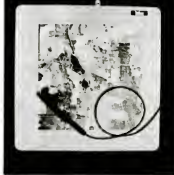
Correspondence Editor
Intelligent Machines Journal
345 Sweet Road
Woodside, CA 94062

Heat waves cause ice men to lose their cool.

—Eric Bakulinsky

NEW DIGITIZER FROM TALOS

Talos Systems has introduced the Simple II, a low-priced data tablet that has 400 lines-per-inch resolution, 10 mill accuracy, and user-controlled output of up to 240 co-ordinate pairs/second. New tapered pen stylus is totally electronic, and allows precision digitizing



in both point and run modes, according to the company.

The 11" x 11" active surface area comes in a completely self-contained package measuring 15" x 15" x 1", including electronics. Interfaces are available for most mainframe, mini, and micro computers. The price is \$1065.

Contact Talos Systems, Inc., 7419 East Helm Drive, Scottsdale, AZ 85260; (602) 948-6540.

Kodak's 'Electronic Filing Cabinet': Paperless Office System of the Future

by Jonathan Sachs

An 'electronic filing cabinet,' one possible component of the office of the future, has completed in-house testing at the Eastman Kodak Company office in Rochester, New York. The system is built around the IBM 3741 word processing system developed by DPF Incorporated.

Using additional software created by DPF, the Word Machine gave Kodak's microfilm people a chance to try out their electronic filing ideas. The resulting system was installed at Kodak's offices, and underwent its preliminary field tests from September through December, 1978.

Disrupted Word Processing

The Word Machine runs under the OS operating system on any IBM mainframe computer. Kodak's tests were performed on a 360/30 computer from DPF, which was modified to support 512K of memory.

The system uses a specially designed word processing terminal containing an Intel 8080 microprocessor. The 8080 runs programs downloaded from the mainframe, making it easy to change the terminal's 'personality' for different applications. The terminal handles all word processing functions; only communication, file storage, and document indexing are handled by the mainframe.

Microfilm Storage

Kodak microfilm documents directly from the Word Machine's files onto a Kodak Komstar microimage recorder. To the computer, the Komstar looks like a line printer. New documents are microfilmed on the Komstar once a week. One copy of each document goes onto a microfilm magazine, which is kept in a central file of the office which originated the document. Other copies go to microfiche for the people the document concerns.

Each person served by the filing system receives "his" microfiche for his private files. The microfiche cumulates all documents for the year to date, so that each week's fiche can be discarded when the next week's is received. One fiche can hold up to 300 documents.

The Word Machine keeps a permanent on-line index to documents. A person can search the index through a Word Machine terminal in a number of ways, such as by author, by keyword, or by date. The index will report by fiche number and frame number where each document is located. When the document can be read on an inexpensive reader kept on a desk.

"Smart" Readers, Too

For the centralized microfilm files, Kodak's IMT-150 microfilm terminals add an extra degree of automation. These terminals, which display microfilm frames, operate under computer control. They can position a microfilm magazine to the desired frame automatically. The software controlling the IMT-150 takes the frame number from the Word Machine's index.

The IMT-150, a commercially available product, uses an Intel 8080 microprocessor which is controlled by software kept in an 18K EPROM. IMT-150 software is under continuous development, Kodak notes, and updated versions are available to purchasers of earlier units. The unit also has a built-



in photocopier for printing microfilm frames from Kodak's offices, and the IMT-100, lacks this feature.

Present Status

When DPF's field test ended in December, the Word Machine hardware was removed from Kodak's offices, and the number of Word Machine terminals was reduced from five to two. Kodak's microfilm group continues to use the electronic filing system with the two remaining terminals and remote access to a computer at DPF's offices in Hartsdale, New York.

The Word Machine is now being beta-tested at a large government installation, and DPF plans to release it to the public this fall. The Komstar interface will be included in the released system.

Commercial Version Outlined

A paper, by Milton Rutebusch of Kodak's Business Systems Markets Division, describes what form a commercial automated filing system such as Kodak's experimental system might take. The paper, "Information Management in the Modern Automated Office," appears in the April, 1979, issue of *Information and Records Management*.

Microfiche and film are the key to automated document management, Kodak believes, because they are so much more economical than computer storage for large volumes of text. For example, a microfilm magazine for the IMT-150 holds about 25,000 documents, and costs about \$12. It is small enough to be held in one hand. Four magazines hold as many pages as a 300-megabyte disk drive. Microfilm also preserves diagrams and signatures, and provides a natural way of filing non-computerized text such as incoming mail.

The justification for the electronic filing system lies in cost reductions, Kodak's Rutebusch says. In the United States, 18 million white collar workers maintain an average of 18,000 documents each. About 4,000 new documents per worker are created each year. Filing and retrieving documents takes a major part of an employee's time. One study shows that the average professional spends 20% to 30% of his/her time retrieving information.

Businesses typically misfile 1% to 5% of the documents they process, and about half of these documents are never recovered. The average cost of misfiling one document is \$60.

Any technique that can reduce the costs of document handling is likely

to save money for its users; additional savings in filing space, filing equipment, and paper make electronic filing even more attractive, Kodak maintains.

For information about Kodak microfilm products, contact Dennis Neary, Marketing Co-ordinator, Business Systems Markets Division, Eastman Kodak Company, 343 State Street, Rochester, NY 14650; (716) 724-6410.

For information about the Word Machine, contact DPF Incorporated, 141 Central Park Avenue, South Hartsdale, NY 10530; (914) 428-5000.

Algo-2100: A Business Word Processing System

The Algo-2100 system from Algorithmics offers word processing and information processing in a single office system. The Algo-2100 system hardware includes a main processing unit with 48K bytes of high-speed memory, dual floppy disk drives, a large, 24 line by 80 character video display, and a 340 wpm letter-quality daisy wheel printer. Algorithmics word processing software is standard. New system software, periodically issued on floppy disk, keeps users abreast of current developments in word processing technology.

Menu-oriented operation provides features both new and experienced operators need. English prompts (in large, easy-to-read, 1/2-inch high characters) help an operator enter, format, save, and print documents.

Word processing features provided by the text editor include: four-way cursor movement; wordwrap; search and replace; unlimited text insertion; overstrike corrections; delete (word, line, and block); block copy; and block move. Document formatting is achieved with more than 40 automatic operations, including: repagination; centering; page titling; numbering in Arabic and Roman numerals; headers and footers; and justification.



An operator can fill in pre-printed forms and combine stock phrases into finished text. Documents are stored on floppy disks, where they are catalogued and easily retrieved. Up to 190 columns can be printed. One (or more) of 35 different type fonts, in three sizes, can be combined on a single page.

With Algorithmics' computing capabilities, a business can add its own custom word processing features, and do business processing in-house. Programming languages offered include Basic, Fortran, Cobol, and Assembler.

Single-station units are available mounted in a desk, or in convenient, portable modules. Cluster and distributed processing networks provided by Algorithmics serve multi-station requirements. The communications options support batched and interactive data transfer. System configuration prices begin at \$10,000.

Contact Algorithmics, Inc., 177 Worcester Road, Wellesley, MA 02181; (617) 237-7226.

A New CP/M-Based Disk Utility

Reformatter™ is a diskette utility program that enables data to be transferred, in either direction, between micro-computer and IBM systems. It works with any Z-80- or 8080-based system operating under CP/M and with any IBM equipment that uses the standard IBM 3741 formatted diskette or takes data input converted from IBM 3741 formatted diskette.

Reformatter does all data transfer on the microcomputer's dual floppy disk system. To prepare CP/M files for use on an IBM system, load the CP/M files under Reformatter and indicate an ASCII-to-EBCDIC transfer. It transfers the files to a diskette that can then be used on the IBM equipment. To use IBM files on a CP/M system, simply reverse the procedure.

Functions other than data transfer can also be performed under Reformatter. Prior to transfer, the contents of the directory of the diskette from which data is being transferred can be displayed. The contents of specific tracks and sectors of the input diskette can also be examined. The user can also modify the contents of the data files prior to transfer, i.e., certain information can be deleted, existing information can be changed, and new information can be added.

Subsequent to transfer, the contents of the directory of the newly created diskette, as well as the contents of specific tracks and sectors of that diskette, can be displayed. Additionally, these displays give a hexadecimal value, as well as the file name and byte of data, so that the user can verify that the correct hexadecimal representation has been made.

According to MicroTech, Reformatter provides potential for widespread interchange of data between CP/M and IBM systems, and will not be limited in interest only to those who own both IBM and microcomputer equipment. Owners of small systems, for example, will now be able to have data preparation work done by service bureaus using IBM 3741 data entry systems, since the micro-owner can run the diskettes on their CP/M system using Reformatter. Small business users might also be interested in using Reformatter because they can use it to create the right data format for submission of their W2 forms to the Social Security Administration on diskette.

Reformatter can also serve as the link in a chain of data conversions that will permit data transfer to non-IBM systems. If it is presently possible to create input to a given non-IBM system by means of existing conversion routines from data on an IBM 3741 diskette, it is now possible, using Reformatter, to transfer data between a CP/M-based system and that system. One could, for example, go from CP/M, through Reformatter, to 3741 diskette, and then from 3741 diskette to magnetic tape in preparation of a target system, thereby completing a data transfer which was otherwise impossible. Once again, the user need not own both the IBM equipment and the microcomputer equipment to use Reformatter for this application.

Reformatter's contribution is to combine the de facto standards of CP/M and the IBM 3741 diskette to augment geometrically the opportunities to transfer data between big and small computers. Reformatter is available in \$200 per copy. Contact MicroTech Experts, 912-Cowper Street, Palo Alto, CA 94301; (415) 328-1712.