By Netronics

ASCII/BAUDOT. STAND ALONE



Computer

The Netronics ASCII/BAUDOT Computer Terminal Kit is a microprocessor-controlled, stand alone keyboard/terminal requring no computer memory or software. It allows the use of her a 64 or 32 character by 16 line professional display for mat with selectable baud rate, RS232-C or 20 ma. output, full

cursor control and 75 ohm composite video output.

The keyboard follows the standard typewriter configuration and generates the entire 128 character ASCII upper/lower case set with 96 printable characters. Features include onboard regulators, selectable parity, shift lock key, alpha lock jumper, a drive capability of one TTY load, and the ability to mate directly with almost any computer, including the new Explorer/85 and ELF products by Netronics.

The Computer Terminal requires no I/O mapping and includes Ik of memory, character generator, 2 key rollover, processor controlled cursor control, parallel ASCII/BAUDOT to serial convenient to serial conversion and serial to video processing-fully rystal controlled for superb accuracy. PC boards are the nighest quality glass epoxy for the ultimate in reliability and

VIDEO DISPLAY SPECIFICATIONS

The heart of the Netronics Computer Terminal is the micro-processor-controlled Netronics Video Display Board (VID) which allows the terminal to utilize either a parallel ASCII or BAUDOT signal source. The VID converts the parallel data to serial data which is then formatted to either RS232-C or 20 ma current loop output, which can be connected to the serial 1/O on your computer or other interface, i.e., Modem.

When connected to a computer, the computer must echo the character received. This data is received by the VID which processes the information, converting to data to video suitable to be displayed on a TV set (using an RF modulator) or on a riden monitor. The VID generates the cursor, horizontal and vertical sync pulses and performs the housekeeping relative to which character and where it is to be displayed on the screen. Video Output: 1.5 P/P into 75 ohm (EIA RS-170) • Baud Rate 110 and 300 ASCII • Ontonis: RS232-C or 20 mg, current loop ASCII Character Set: 128 printable characters-

aBY&681×44E\$4+020173035÷\$[[[+++ !**"#\$%&^()*+,-,/0123456789:;**<=>? rbcdefghijklinoporstuwkyz[\]^ abcdefghijklmnopgrstuvwxyz{|}~

Cursor Modes: Home, Backspace, Horizontal Tab, Line Feed, Vertical Tab, Carriage Return. Two special cursor sequences are provided for absolute and relative X-Y cursor addressing Cursor Control: Erase, End of Line, Erase of Screen, Form Feed, Delete • Monitor Operation: 50 or 60Hz (jumper

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Please send the items checked below— Netronics Stand Alone ASCII Keyboard/Computer Terminal Kit, \$149.95 plus \$3.00 postage & handling. Deluxe Steel Cabinet for Netronics Keyboard/Terminal In Blue/Black Finish, \$19.95 plus \$2.50 postage and handling.
☐ Video Display Board Kit alone (less keyboard), \$89.95 plus \$3 postage & handling.
☐ 12" Video Monitor (10 MHz bandwidth) fully assembled and tested, \$139.95 plus \$5 postage and handling. ☐ RF Modulator Kit (to use your TV set for a monitor), \$8.95 postpaid.
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By Leslie Solomon Technical Director

MODERN MUSIC

HAVE recently had opportunities to test many computer "plug-in" music systems. Like so many other computer peripherals, music boards have been evolving rapidly and have come a long way from those that could handle only a counte of octaves in a single raspy "voice" and play only one melody for a minute or so. Now, the number of voices has increased, and the duration of the melodies depends only on the amount of RAM available. Software has also become more complex so that just about all musical parameters can be controlled. Some music programs have the appearance of high-level language and require no computer expertise.

One of the newest music systems is the ALF Music Synthesizer, which is compatible with the Apple II and is \$265 from ALF Products (1448 Estes, Denver, CO 80215; Tel: 303-234-0871). Available from Apple dealers, this single-board plug-in is a three-voice synthesizer with hardware control of pitch and volume. All other effects are controlled by software. It also takes advantage of Apple graphics in a unique manner. Audio range is eight octaves.

The system requires a 32K Apple II, a cassette recorder and an external hi-fi audio system. Stereo provisions are made and up to nine voices (using three boards) can be handled. The cassette furnished with the board contains two (integer) BASIC programs, four two- and three-voice melodies, programs for use with a disk, and an extended playing pro-

The first program, called "Introduction," explains basic music synthesizer terminology, and provides some hands-on experiments to illustrate the concepts. The second program, called "Entry," is used to enter and play melodies-either from the cassette or created by the user. When "Entry" is run, a high-resolution graphics display appears on the monitor. Since the image does not require color, a good monochrome CRT is suggested.

Unlike older music systems where nonmusical combinations of letters, digits and other symbols are used to specify a particular note or other parameter, the ALF board actually displays the treble and bass staffs. Along the bottom of the display is a set of seven musical notes (from a whole note to a 64th) a dot (time) modifier, and a "3" modifier that causes the selected note to be multiplied by 3/3. Also shown are the three incidentals (sharp, flat, and natural), a rest symbol, right and left arrows, and a speaker symbol.

An up-arrow cursor, controlled by paddle-0, can be positioned under the desired symbol, while a "flying saucer" symbol, controlled by paddle-1, can be positioned as desired on the staffs. The display is completed by three editing commands: DEL (delete), INS (insert) and TIE (tie two notes together).

To create a melody, a key is determined by typing in (for example) "KEY:3F" and the three flats appear correctly positioned on each staff. The tempo might then be selected by typing in "TIME:¾" and the large ¾ would appear in the correct position. All other parameters are determined by typed-in editing commands.

Paddle-0 is positioned to the desired note or other command, and paddle-1 is used to

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		**.											



The ALF Music Synthesizer displays treble and bass staffs and various music symbols.

POPULAR ELECTRONICS

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giving you immediate access to all software and development tools that exist for both the 8085 and its 8080A predecessor (they are 100% software compatible)—a computer which features onboard S-100 bus expansion—plus instant conversion to mass storage disk memory with either 5-1/4" diskettes or standard IBM-formatted 8" disks.

For just \$129.95 (plus the cost of a power supply, keyboard/ terminal and RF modulator, if you don't have them already). Explorer/85 lets you begin computing on a significant level... applying the principles discussed in leading computer magazines... developing "state of the art" computer solutions for both the industrial and leisure environment.

Level "A" Specifications

Explorer/85's Level "A" system features the advanced Intel 8085 cpu, an 8355 ROM with 2k deluxe monitor/operating and an \$155 ROM-1/O-all on a single motherhoad rith room for RAM/ROM/PROM/EPROM and S-100 exon, plus generous prototyping space.

(Level "A" makes a perfect OEM controller for industrial applications and is available in a special Hex Version which
can be programmed using
the Netronics Hex Keypad/ Display.)
PC Board: glass epoxy, plated

through holes with solder mask

1/0: provisions for 25-pin

(DB25) connector for termina

Level "A" at \$129.95 is a serial I/O, which can also sup-

complete operating system, port a paper tape reader perfect for beginners, hob-...provision for 24-pin DIP biests, or industrial consocket for hex keyboard/dis-

play...cassette tape recorder in play... cassette tape recorder output... cassette tape recorder in-put... cassette tape recorder output... cassette tape control output... speaker output... LED output indicator on SOD (serial output) line... printer interface (less drivers)... total of four 8-bit plus one 6-bit I/O ports *Crystal Frequency: 6.144 MHz • Control Switches: reset and user (RST 7.5) interrupt...additional provisions for RST 5.5, 6.5 and TRAP interrupts onboard • Counter/Timer: programmable, 14-bit binary • System RAM: 256 bytes located at F800, ideal for smaller systems and for use as an isolated stack area in expanded systems... RAM expandable to 64k via S-180 bus or 4K on motherboard. System Monitor (Terminal Version): 2k bytes of delux

system monitor ROM located at F800 leaving 0000 free for user RAM/ROM. Features include tape load with labeling . . . tape dump with labeling ... examine/change contents of memor insert data warm start examine and change all registers single step with register display at each break point, a debugging/training feature...go to execution address. move blocks of memory from one location to another...fill blocks of memory with a constant . . . display blocks of memory . . . automatic baud rate selection . . . variable display line length control (1-255 characters/line)...channelized I/O monitor routine with 8-bit parallel output for high speed printer... serial console in and console out channel so that monitor can communicate with 1/O ports.

System Monitor (Hex Version): Tape load with labeling...

set (if you have an RF modulator).

tape dump with labeling... ory...lnsert data...warm

registers...single step with register display at each break point...go to execution address, Level "A" in the Hex Version makes a perfect controller for industrial ar be programmed using the Netronics Hex Keypad/Display.



Hex Keypad/Display.

Specifications Calculator type keypad with 24 system defined and 16 user defined keys. 6 digit calculator type display which displays full address plus data as well as register and status information.

Level "B" Specifications

Level"B" provides the S-100 signals plus buffers/drivers to support up to six S-100 bus boards and includes: address decoding for onboard 4k RAM expansion extent able decoding for onboard 4k RAM expansion select-able in 4k blocks...address decoding for onboard 8k EPROM expansion selectable in 8k blocks . . . address and data bus drivers fo .wait state generator (jumper selectal onboard expansion to allow the use of slower memories...two separate 5 volt regulators.



Level "C" expands Explorer's motherboard with a card cage, allowing you to plug up to six \$-100 cards directly into the motherboard. Both cage and cards are neatly contained inside

Level "C" Specifications

"C" card cage. Explorer's delux steel cabinet.

Level "C" includes a sheet metal superstructure, a 5-card gold plated S-100 extension PC board which plugs into the motherboard. Just add required number of S-100 connectors Level "D" Specifications

Level "D" provides 4k or RAM, power supply regulation. filtering decoupling components and sockets to expand your Explorer/85 memory to 4k (plus the original 256 bytes located in the 8155A). The static RAM can be located anywhere from 20000 to EFFF in 4k blocks.

Level "E" Specifications

Level "E" adds sockets for 8k of EPROM to use the popular intel 2716 or the Tl 2516. It includes all sockets, power supply regulator, heat sink, filtering and decoupling components. Sockets may also be used for soon to be available RAM IC's (allowing for up to 12k of onboard RAM).

Order A Coordinated Explorer/85 Applications Pak!

Experimenter's Pak (SAVE \$12.50)-Buy Level "A" and Her Keypad/Display for \$199.90 and get FREE Intel 8085 user's manual plus FREE postage & handling!

Student Pak (SAVE \$24.45)-Buy Level "A," ASCII Keyboard/Computer Terminal, and Power Supply for \$319.85 and get FREE RF Modulator plus FREE Intel 8085 user's manual plus FREE postage & handling!

Englacering Pak (SAVE \$41.00)—Buy Levels "A," "B," "C," "D," and "E" with Power Supply, ASCII Keyboard/Computer Terminal, and six \$-100 Bus Connectors for \$514.75 and get 10 FREE computer grade cassette tapes plus FREE 8085 user's manual plus FREE postage & handling!

Business Pak (SAVE \$89.95)-Buy Explorer/85 Levels "A," "B," and "C" (with cabinet), Power Supply, ASCII Keyboard/Computer Terminal (with cabinet), 16k RAM, 12" Video Monitor, North Star 5-1/4" Disk Drive (includes North Star BASIC) with power supply and cabinet, all for just \$1599.40 and get 10 FREE 5-1/4" minidiskettes (\$49.95 value) plus FREE 8085 user's manual plus FREE postage & handling!

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ı	333 Litchfield Road, New Milford	1, CT 06676	sonalized disk operating system—just
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	Version), \$129.95 plus \$3 p&h.	Deluxe Steel Cabinet for ASCII Keyboard/Terminal, \$19,95 plus \$2,50	□ Power Supply Kit for North Star
ı	☐ Explorer/85 Level "A" Kit (Hex	p&h.	Disk Drive, \$39.95 plus \$2 p&h.
ī	Version), \$129.95 plus \$3 p&h.	☐ Power Supply Kit (±8V @ 5 amps)	Deluxe Case for North Star Disk
	☐ 8k Microsoft BASIC on cassette tape, \$64.95 postpaid.	in deluxe steel cabinet, \$39.95 plus \$2 p&h.	Drive, \$39.95 plus \$2 p&h.
	Bk Microsoft BASIC in ROM Kit	☐ Gold Plated S-100 Bus Connectors,	Experimenter's Pak (see above), \$199.90 postpaid.
	(requires Levels "B," "D," and "E"), \$99.95 plus \$2 p&h.	\$4.85 each, postpaid.	☐ Student Pak (see above), \$319.85
ı	☐ Level "B" (S-100) Kit, \$49.95 plus	RF Modulator Kit (allows you to	postpaid.
Ĭ	\$2 p&h,	use your TV set as a monitor), \$8.95 postpaid.	☐ Engineering Pak (see above), \$514.75 postpaid,
	Level "C" (S-100 6-card expander)	☐ 16k RAM Kit (S-100 Board expands	☐ Business Pak (see above), \$1599.40
	Kit, \$39.95 plus \$2 p&h. ☐ Level "D" (4k RAM) Kit, \$69.95	to 64k), \$199.95 plus \$2 p&h.	postpaid,
Ì	plus \$2 p&h.	☐ 32k RAM Kit, \$329.95 plus \$2 p&h. ☐ 48K RAM Kit, \$459.95 plus \$2 p&h.	Total Enclosed \$
Ä	Level "E" (EPROM/ROM) Kit,	☐ 64k RAM Kit, \$589.95 plus \$2 p&h.	(Conn. res. add sales tax) By— ☐ Personal Check ☐ M.O./Cashier's
ı	\$5.95 plus 50¢ p&h. ☐ Deluxe Steel Cabinet for Explorer/	☐ 16k RAM Expansion Kit (to expand	Check ☐ Visa ☐ Master Charge
í	85, \$49.95 plus \$3 p&h.	any of the above up to 64k), \$139.95 plus \$2 p&h each.	(Bank #)
•	□ ASCII Keyboard/Computer Ter-	☐ Intel 8085 cpu User's Manual, \$7.50	Acct.#
ı	minal Kit (features a full 128 character set, upper & lower case, full cursor con-	postpaid.	SignatureExp. Date
	trol, 75 ohm video output convertible	Special Computer Grade Cassette	Print
K	to baudot output, selectable baud rate, RS232-C or 20 ma. I/O, 32 or 64 char-	Tapes, \$1.90 each or 3 for \$5, postpaid. 12" Video Monitor (10 MHz band-	Name
	acter by 16 line formats, and can be	width), \$139.95 plus \$5 p&h.	Address
Ī	used with either a CRT monitor or a TV	North Star Double Density Floppy	City

System 68. A ferroresonant constant-volt-

position the "flying saucer" as desired on the staff. The other voices are entered by typing

in the Part number. Paddle pushbuttons are

used to enter the data. Thus, music is "written" in the conventional way. Once a melody

has been either created by the user or taken

from the cassette, each measure can be se-

quentially displayed and, if desired, any ele-

ment can be modified. Other than the dis-

played "menu," there is another set of com-

mands that can be typed in for more detailed

musical creations. The manual explains all of

We tested the system on our 32K Apple,

along with a monochrome monitor, a cassette

recorder, and a hi-fi audio system. A good au-

dio system should be used since the comput-

er music system can produce a wide variety

of sound effects-comparable in many re-

spects to an expensive music synthesizer.

The user has full control over attack, sustain,

Each of the four melodies provided on the

cassette was loaded and played in turn. The

audio portion is surprisingly excellent and

provides a new world of sound effects from a

low-cost computer plug-in. The video display

consists of two to six (depending on the num-

ber of voices used) horizontal lines having a

bright spot to indicate the position of middle

C. As the melody progresses, small blocks of

light "dance" in step with each voice. The

brightness of each dancing block is deter-

mined by the voice amplitude. Although

meaningless as far as the music is con-

After playing the prerecorded melodies, we

experimented with our own music. Within

about an hour, we had scored our first two-

voice fugue (from sheet music). After playing

it, we experimented with the various musical

parameters and came up with some really

strange synthesized tones. If you are serious

about computer music, we suggest the use of

two (or even three) ALF boards so that you

no computer know-how, the ALF synthesizer

will be greatly appreciated by music students

and teachers with access to an Apple II. ALF

also makes available a 16-song cassette

(\$14.95) that is not only excellent from a mu-

sic viewpoint, but also provides a good train-

ing aid in illustrating the use of six indepen-

SOL Users Group. Since the demise of

Processor Technology, many SOL users

have been lacking a source of hardware, software, and maintenance information. These

are now available from the Proteus Group,

c/o Stan Sokolow, 1690 Woodside Rd., Suite

219, Redwood City, CA 94061 (Tel:

RAM "EYE'S." According to Case Western

University Robotics Lab., you can use a 1K

dynamic RAM chip (of the 4008 family) as a

low-cost image sensor. Carefully pry off the

thin metal lid, being careful not to damage the

tiny internal wiring. Focus an image on the RAM surface and write 1's into the RAM.

When you read the RAM, where light fell on

the array, there will be 0's and where the ar-

ray was dark, the 1's will remain. The 4008 is

pin-compatible with the 2102, but it needs

-12 volts on the ground pin.

There is no doubt that, because it requires

can play six voices in stereo.

dent voices.

415-368-3331).

cerned, the display is fascinating to watch.

decay, and other music parameters.

these commands.

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Southwest Technical Products Corporation 219 W. RHAPSODY SAN ANTONIO, TEXAS 78216 age power supply drives this new computer system. It has an SS-50 motherboard that contains 15 50-pin and eight 30-pin gold-plated connectors. Built around a 6800 CPU, it can accommodate up to four 2708 PROMs and three independent programmable software timers. It comes with up to 16K of software-addressable static RAM board organized into four separately controlled 4K blocks. DIP switches are provided to permit use of existing SWTP and MSI software. Output is video, and the system uses the GMXBUG 3K ROM monitor that contains standard utility functions and routines that facilitate software development. Address: Gimix Inc., 1337 West 37 Pl., Chicago, IL 60609 (Tel: 312-927-5510).

Multiple A/D Conversion. The AIM161 features 16 100-microsecond conversion-time 8-bit analog inputs. It has a three-state output and requires one 8-bit computer output port for control and one 8-bit input port for data. Interfaces are available for PET, KIM, and TRS-80 microcomputers, with others soon to be available for other computers. The A/D converter can be provided with a number of peripherals. These data-acquisition modules (DAMs) are available for \$159 each. Address: Corihecticut Microcomputer, 150 Pocono Rd., Brookfield, CT 06804 (Tel: 203-775-9659).

Video Monitor. The Video-100 is a solid-state video black-and-white monitor using a 12" CRT. Video bandwidth is 12 MHz, and resolution is 650 lines minimum in the central portion of the CRT and 550 lines minimum beyond the central 80% of the screen. Video input is 0.5 volt composite sync at 75 ohms. The monitor is 11½" high, 16¼" wide, and 1½" deep. It weighs 14 lb, and is equipped with all conventional controls. \$149. Address: Leedex Corp., Elk Grove Village, IL 60007 (Tel: 312-364-1180).

Graphics Board. The CGS-808 is a color graphics board for the S-100 bus, or it can stand alone. It contains its own on-board microprocessor, requires no memory space, and eliminates the need for software driver routines. It generates an 8-color display with 12 different programmable and softwareselectable modes simultaneously. The alphanumeric mode has an internal character generator to display 32 characters on 16 lines, with two colors per character and inverse video. There is room for an EPROM for custom characters or graphic symbols. Up to 128 different 8-x-12-dot characters can be displayed. Two semigraphic modes have display densities of 64 × 32 and 64 × 48 elements in 8 colors. Eight different graphic modes up to 256 × 192 in two colors are available. Output is composite video at 75 ohms. R-Y, B-Y and Y signals are available for connection to a color monitor. The board comes with software. Address: Biotech Electronics, Box 485, Ben Lomond, CA 95005 (Tel: 408-338-2686).

Selectric Interface. The MP-WP Selectric Interface allows the connection of an unmodified IBM Model-50 Selectric typewriter to an SS-50 bus. Interfacing is made through a cable assembly that plugs into a connector provided on the typewriter. No solenoids or typewriter modifications are required. The typewriter is used as input and output. In-

terface and cable, fully assembled, are \$59.95, postpaid in USA. Address: Southwest Technical Products, 219 W. Rhapsody, San Antonio, TX 78216 (Tel: 512-344-0241).

Multi-System. The Cluster-One is a time-sharing disk system that uses an 8K PET as a host, and is capable of talking to as many as 30 independent and different microcomputers at the same time: Its disk storage features over 630K bytes single-sided and over 1.2 megabytes double-sided. As opposed to conventional time-sharing systems, Cluster-One allows each user to take full advantage of his own computer, so there is little degradation when the system is heavily used. Address: Nestar Systems Inc., 430 Sherman Ave., Palo Alto, CA 94306 (Tel: 415-327-0125).

Winchester Technology. Several readers have asked about the origin of the word "Winchester" when used to describe a particular disk drive. Apparently, early in the development of high-speed hard-disk system, the head was allowed to "float" 31 microinches above the magnetic surface on a cushion of air produced by the disk motion. When the disk stopped, the air cushion vanished, and the head landed on the disk, often causing damage and loss of data.

In 1973, a new design, using a trimaran head structure, allowed the head to float only 19 microinches above the disk, with the entire structure (including hard disk) enclosed in a hermetically sealed package to avoid the possibility of external contamination (dust, grease, etc.). The head loading is so light that it actually rests on the disk when it is motionless and it takes off and lands in an area of the disk reserved for that purpose.

The first such drives of this type from IBM were dual 30-megabyte configurations and ealled "30-30" systems—thus the name "Winchester." Now, even though the drive capacity has been raised to 70 megabytes, the name persists.

PET Disk. The PEDISK provides both a floppy disk and an S100 expansion chassis in one unit. The expansion feature allows extra I/O, memory, printer, telephone interface, modems, etc. to the PET, while the floppy disk portion allows up to four full-size disk drives (1 megabyte capacity). Prices range from \$799.95 up. Address: CGRS Microtech, Box 368, Southampton, PA 18966 (Tel: 215-757-0284).

SS-50 Video. The Electric Window, a memory-resident and programmable video board that can display up to 80 characters on 24 lines, is now available for 6800 system using the SS-50 bus. It has two character generators—one standard and the other for special characters (APL for example). It also features dual intensity, scrolling, descenders on lower-case letters, programmable display positioning, and programmable interfaced or non-interlaced scan. \$249.95. Address: Percom Data Co. Inc., 211 N. Kirby, Garland, TX 75042 (Tel: 214-272-3421).

Correction. The price of the Pascal Microengine described in our column of August 1979 should have been \$2995, and the correct company address is Computer Interface Technology, 201 W. Dyer Road, Unit C, Sarita Ana, CA 92707.

◇



By Leslie Solomon Technical Director

6800 File Management. INDEX (INterrupt Driven EXecutive) operates fast because it services I/O by interrupts rather than polling. I/O devices and other system peripherals are treated as disk files so new devices can be added without modifying the operating system. Besides the 19 built-in commands, INDEX can be expanded by adding utility commands and driver routines. These reside on the diskette and are loaded into memory only when needed. Files can be assigned an activity value as a parameter of file name and both ASCII and binary. Disk files are automatically created, allocated and de-allocated. Files are referenced by names and parame-

ters are added for name extension, drive number, directory level and include a file protection flag. You can also copy files, and any standard ASCII terminal is supported. There are more than 60 system entry points for program linkage, and up to 16 simultaneous active data control blocks are accommodated. Versions are available for PerCom LFD-400, SWTP MF-68, Smoke Signal BFD-68 disk systems and for the Motorola EXORciser development system. INDEX comes on two diskettes with user manual for \$99.95. Percom Data Company, 318 Barnes, Garland, TX 75042 (Tel: 214–272–3421).

Apple/8080. The Apple-80 software (on cassette) enables any Apple II computer to emulate an 8080. Running on any 16K or more Apple, the software provides singlestep, trace and run modes. It also runs 8080 object code and all 8080 registers are displayed on the screen. Trace speed is dynamically variable and can be controlled by paddie-O. The 8080 I/O ports are arranged in a table for ease of assignment. Up to 8 nondestructive breakpoints may be used for easy debugging, Eight 8080 interrupts are available and the 6502 subroutines can be called to enable use of the conventional Apple monitor. The Apple-80 cassette contains two programs. The first is a BASIC program that forms the Apple-80 manual. The second program is the Apple-80 itself. This machine-language program enables the Apple (6502) to emulate the 8080. An 8080 time-of-day clock program is also included for study. \$20 plus \$1.50 shipping and handling. California residents please add 6% sales tax. Dann McCreary, Box 16435-Y, San Diego, CA 92116

CP/M Software. An extensive 8080/Z80 disk software line in four formats has just been made available. These include North Star Double Density, Processor Technology Helios II, MITS Altair hard sector and Ohio Scientific C-3 disk systems. Formats previously implemented and still supported include North Star Single Density Micropolis, iCom, SD Systems, Dynabyte DB 8/2 and 8" IBM. Other formats are available on request. A new addition will be available for the Heath H8/H17 system. Running on CP/M, all software is \$145 and includes text editor, assembler, debugger and various other system utilities. Other packages such as FORTRAN, BASIC, COBOL, and CBASIC-2 are available as are payroll, general ledger, accounts payable and receivable, word processing and mail list packages. Lifeboat Associates, 2248 Broadway, New York, NY 10024.

LABEL-BASIC. Designed for the 6800, this language acts as a pre-processor to translate programs written in LABEL-BASIC into programs using a BASIC interpreter or compiler. As an extension of BASIC, it also provides the capability of descriptive line labels and variable names. Because line numbers can be matched, programs built from LABEL-BASIC subroutines can be appended to the main program. This procedure is similar to loading FORTRAN subroutines from a library, although using an editor at source

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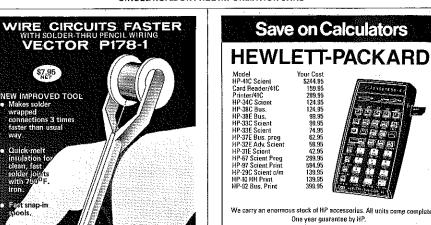
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code level is not required. The language is available for 6800-based Chieftain computers and SSB disk systems and costs \$59.95. Smoke Signal Broadcasting, 31336 Via Colinas, Westlake Village, CA 91361 (Tel: 213-889-9340).

Apple Stuff. A catalog of 50 Apple II programs includes business accounting, accounts receivable, inventory, BASIC teaching and other special business programs. The applications support disk or tape systems and are available in both Apple BASICs. Charles Mann and Associates, Micro Software Division, 1926 South Veteran Ave., Los Angeles, CA 90025 (Tel: 213-473-0244).

TRS-80 Mail List. MAILROOM PLUS is a record keeping and mail-list program written for the TRS-80. Record size can be from 1 to 255 characters, and there is no need to specify field dimensions. It can sort 500 records by category number, zip code, or last name.' A standard TRS-80 diskette (with DOS) will hold approximately 2000 records. The program will selectively search, display or print records. Print option will output in either tabular form or mailing labels. Any part of a record can be used as a search code. Thus, records can be displayed or printed by states, zip codes, names, cities or categories. Large files can be selectively separated and saved as smaller files by state or any portion of the zip code. Small files can be merged to create one large file. The program requires 32K of memory and one or more disk drives. The program is supplied on diskette for \$49.95. The Peripheral People, Box 524, Mercer Island, WA 98040

6800 Programs. A considerable number of 6800-based software packages including many games, text editors, assemblers and disassemblers, and de-bug programs are among the many offered by catalog. Technical System Consultants, Inc., Box 2574, W. Lafayette, IN 47906 (Tel: 317-463-2502).

TRS-80 Programs. A very complete line of TRS-80 programs with a broad variety of games, financial programs, chess, languages, statistics, ham radio plus a listing of hardware accessories. Catalog available from TRS-80 Software Exchange, 17 Briar Cliff Drive, Milford, NH 03055 (Tel: 603-673-5144).

Apple Assembler/Text Editor. The ASM/ED complements the facilities provided by the Apple monitor routines. It allows you to enter assembly language programs, edit them and assemble them into memory, the editor is line-numbered and allows adding new lines, deleting lines, resequencing line numbers, text listing, locating a line having a specific string, and storing the edited text on tape or disk. The assembler is one-pass (mods are provided for two-pass operation) that accepts free-format input containing labels up to six characters, the complete 6502 opcode set, and a comment field. Multiple source files may be assembled using a common symbol table. The assembler operates on a memory resident source file and produces memory resident object code. The complete package is provided on Apple cassette and requires 16K of RAM. \$29.95. In-

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cludes a 60-page manual and includes shipping within the U.S. Add \$4 for first-class shipping outside the U.S. ARESCO, Box 1142, Columbia, MD 21044, (Tel: 301-730-5186). This company also publishes the Rainbow, an Apple II newsletter.

Macro Assembler/Text Editor. Written for the 6502-based PET, APPLE-II and SYM systems, this software package is written in assembly language and occupies 8K of memory starting at 2000 hex. It provides 27 commands, 20 pseudo ops and features macro and conditional assembly support, extensive text editing commands including automatic line numbering, string search and replace, tape load/save and append commands, vectors for disc system interface, free format assembler source input, source syntax similar to MOS Technology specs, and many more functions. User manual and either PET, Apple II, or SYM (HS) cassette (please specify) available for \$35 plus \$2 shipping/handling. C. W. Moser, 3239 Linda Dr., Winston-Salem, NC 27106.

6809 Cross Assembler. Designed to operate under the FLEX disk operating system, this cross-assembler is fully compatible with both 6800 and 6809 mnemonics. Existing 6800 source listings can be directly reassembled to produce executable 6809 object code. It is also 6801 compatible. All standard mnemonics and directives are supported, as well as warning messages which may be enabled or suppressed. Available in binary form on FLEX 1.0 (8") or FLEX 2.0 (51/4") diskette. Manual and disk available for \$100 from Technical Systems Consultants, Inc., Box 2574, West Lafayette, IN 47906 (Tel: 317-463-2502),

PET Software. Series-One is a collection of 25 programs for the 8K PET. There are 16 games including Space Wars, Motorcycle Jump, Saucer Attack, Ping Pong, etc., and 9 general programs, including Mortgage Loan, Perpetual Calendar, Elementary Math, and Savings Account. \$24.95. ADP Systems, 95 West 100 South, Logan, UT 84321 (Tel: 801-752-2770).

PolyMorphic Mailist. Designed for a 2drive, 32K System 8813, this program allows the user to organize information according to the requirements of the specific mail list. The entry format may be organized to store specific data associated with the mailing name and address, which may never appear on the actual mailing label. Not only does the user organize the entry format, he also indicates by field which information is to be printed in what order. This allows letter merge. The Mailist can also be used as a general data base organizer in which the user defines a format he needs. PolyMorphic Systems, 460 Ward Drive, Santa Barbara, CA 93111 (Tel: 805-967-0468).

TRS-80 Electric Secretary. Written for the TRS-80 single or multiple disk systems, and a minimum of 32K or memory, this word processing program features a word hyphenating dictionary. Long words at the end of a line need not produce large gaps in the text. When this might occur, the program asks the user to hyphenate the word which is then stored in the dictionary with the correct

hyphenation points. The text is then printed, hyphenated and justified. File coupling permits lengthy text without memory overload. and the program is well suited for form letter generation. Available on a formatted disc at \$75. Upper/lower case conversion information is free upon request. The Peripheral People, Box 524, Mercer Island, WA 98040.

PET Software. Four new PET programs, each costing \$24.95, are now available: EN-TRY used as a general-purpose data entry program has user-definable entry format and may be used for a mail list, daily journal, general ledger, record keeping, etc.; PROCESS which is a general-purpose data process program includes SORT, EDIT, DELETE, IN-SERT and MACRO and is useful for merging large amounts of data from different input sources; DCE TEXT EDITOR/FORMATTER features full-screen editing including cursor movements with repeatable cursor scrolling of pages up and down, and user definable output margins and justification. Programs are written in machine language with 4K bytes free for user text data; and INVENTO-RY that includes item number, description, quantity on hand, reorder limit and prices. It generates inventory and low inventory reports, and can handle up to 60 items on an 8K PET. Home Computer Centre, 6101 Yonge St., Willowdale, Ontario, Canada M2M 3W2, Canada (Tel: 416-222-1165).

Program Aids for Apple. Programmers Aid #1 package is a ROM-based library of routines whose capabilities include highresolution graphics, program renumbering and linking, tape verification, tone generation, RAM testing and machine-language relocation. It is designed for use with the Apple II integer BASIC. The high-resolution graphics allow drawing from 53,000 screen locations in one of four colors (black, white, green or violet). Simple BASIC commands can create figure size, orientation and color. Additional commands plot points, clear screen and create background color. The Applelodeon portion uses a note table stored in memory and covers five timbres spanning four octaves. The package costs \$50. Apple Computer, Inc., 10260 Bandley Drive, Cupertino, CA 95014, or your local computer store.

PET Workbooks. "Getting Started with Your PET" (WB-1, \$3.95) covers PET BA-SIC, calculator and program modes, data input/ouput, data representation, and cassette storage. "PET String and Array Handling" (WB-2, \$3.95) covers string and substring search, concatenation, replacement and manipulation, limitations and features of arrays, subscripted variables and parallel sequences. "PET Graphics" (WB-3, \$4.95) covers cursor control and special graphics to create plots, histograms and sketches. "Pet Cassette I/O" (WB-4, \$4.95) covers the cassette I/O system. "Miscellaneous PET Features" (WB-5, \$3.95) covers clock, random number generation, upper- and lower-case characters, saving memory, etc. "PET Control and Logic" (WB-6, \$3.95) covers testing and branching, subroutines, logical operations. Binary-to-decimal and decimal-tobinary programs are used to demonstrate logical operations. All six books for \$19.95 plus \$1.50 shipping/handling. Total Information Services, Box 921, Los Alamos, NM

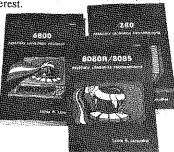
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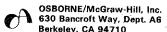
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