



# Computer Bits

## APL/S—A BETTER LANGUAGE?

THE EASIEST way to provoke a debate among a group of computer users is to claim that one high-level language is better than another. BASIC aficionados claim that their language is "human," making it easier to program and read when it comes on-screen. FORTRAN users claim all sorts of wondrous things for this language; while PILOT, FOCAL, *et al.*, users provide vociferous defense for their selection. Almost all computer users admit, however, that the language they would like to use is that tremendously powerful one—APL.

While APL may be a "first-choice" language, its popularity is restricted because a special character generator is needed to reproduce the special APL symbols required. Moreover, most people are awed at the amount of memory usually thought to be required to support APL. This need not be the case with the APL/S language soon to be introduced by Video Brain (2950 Patrick Henry Dr., Santa Clara, CA 95050; tel.: 408-988-3020). (The S in APL/S stands for "structured" or "simple.")

The new Video Brain language is a small APL. It combines the array manipulation capabilities of APL with structured control words of PASCAL. It is contained in a plug-in cartridge that has 13K of ROM. When plugged into the Video Brain computer, APL/S comes up in conventional alphanumeric characters. Price for the cartridge is to be about \$150, which will include a user and reference manual.

APL/S features such commands as LIST, ERASE, SAVE, LOAD, BACK, NEXT, PREVIOUS, and SPECIAL. It also has a large selection of statements including BARH to control bargraph height and BARC to determine bargraph colors (16), in addition to argument and reduction functions. Other features include values of variables in either scalar or array; all values stored in 4-byte floating point (the largest number is  $10^{75}$ ); seven-digit precision; and E notation in both input and output.

By Leslie Solomon, Technical Director

The same features that make APL/S a problem-solving language—it is structured, readable, and problem oriented—allow one to learn programming concepts without the bother of syntactical burdens and the unnecessary constraints of some typical computer languages. There are no line numbers in APL/S. By carefully documenting a program on paper, you essentially write it at the same time. This is similar to the approach used in PILOT. As an example, a "Lunar Lander" program that used more than 90 lines in BASIC (and lots of REMs) was easily duplicated in 28 lines of APL/S that was self-documenting and required no REMs.

**Chess and Bridge.** Personal Software (P.O. Box 136, Cambridge, MA 02138; tel.: 617-783-0694) has some news for chess and bridge players. If you have a Radio Shack Model TRS-80 computer with Level I or Level II BASIC, Microchess 1.5 (\$19.95) is for you. It offers three levels of play, every move is checked for legality, and the program handles castling and en-passant captures. Moreover, depressing "N" on the keyboard causes each square to be numbered so that play is truly simplified. If you have an 8K PET or a 16K Apple computer, there is Microchess 2.0 (\$19.95) which offers eight levels of play to examine up to six moves ahead, and includes an on-screen clock. If bridge is your game, Bridge Challenger (\$14.95) is available for the 8K PET, 16K Level-II TRS-80, and 16K Apple. This program allows you and the dummy to play four-person contract bridge using the computer as the other hands.

**Z80 for S-100 Bus.** Connecting a Z80 to an S-100 bus is easy with the "Single Card Computer" from Cromemco, Inc. (280 Bernardo Ave., Mountain View, CA 94043; tel.: 415-964-7400). Available in kit (\$395) and assembled and tested (\$450) forms, it features 4-MHz operation, 8K of PROM, and 1K of

RAM. The board also contains an RS-232 or 20-mA loop; serial interface with baud rates up to 76,800; vectored interrupts; 24 bits of bidirectional parallel I/O; and five programmable timers. Cromemco also has software to be used with the new board.

**Build a Terminal.** You can build a professional-style terminal with the ESAT 200B Communicating Terminal (\$239) as the basic element. The kit is available from Electrolabs (P.O. Box 6721, Stanford, CA 94305; tel.: 415-321-5601).

The terminal produces 80 characters on each of 34 lines on-screen. It contains a single 14" x 18" (35.6 x 20.3 cm) board that generates upper- and lower-case ASCII characters. On-board is an empty socket for an optional EPROM that allows the terminal to have two fonts of up to 120 characters per font. User-alterable fonts are programmed into 256 groups of 7 x 8 cells that are displayed contiguously. This permits the use of extended characters in two or more adjacent cells. Anything can be programmed into the cells, including Farsi and APL characters, graphic symbols, etc. Keyboard input is seven or eight bits with negative strobe. Video output is selectable composite or separate sync. Baud rates are from 110 to 19,200 at RS-232C, 20-mA or TTL levels.

**Ten Megabytes.** Alpha Micro (17881 Sky Park No., Irvine, CA 92714; tel.: 714-957-1404) has announced the Model AM-500, an S-100 bus-compatible, 10-megabyte disk system for \$7995. The system consists of a single-board controller, interconnecting cable, and a 10-megabyte Control Data "Hawk" disk drive.

A 5-megabyte fixed disk and a 5-megabyte removable cartridge are used in the system to provide the 10-megabyte capability. The controller board is interrupt driven, requires a simple interface to the CPU system, and does complete 512-byte transfers. Although it was designed for the AMOS operating system, the Model Am-500 will work on the S-100 bus. This DOS permits multiple users, multiple tasking, time sharing, and memory management. Up to four drives can be daisy-chained to one controller.

**The General.** A new computer from Xitan Inc. (1101-H State Rd., Princeton, NJ 08540; tel.: 609-921-0321), called

the "General," features a Z80A microprocessor. It also features memory-mapped interrupt-driven DMA-controlled architecture to fully support multitasking software; 630K of mass storage on two 5" (13.3-cm) disk drives; 32K of RAM; and space display is 80 characters wide on 24 lines, with blink, invert, half-intensity, zero-intensity, and underline functions. It provides three software definable character sets and interfaces.

**VIP News.** RCA "VIP" owners can now play in color, using the Model VP-500 color board (\$69), or make exciting music with the Model VP-550 Super Sound board (\$49). The color board provides up to eight colors. The music board comes with a PIN (play it now) program that permits transcribing sheet music or creation of new sounds. The board has a range of four octaves and can play two-part harmony.

Other VIP items are also available: Model VP-595 simple sound board (\$24) includes speaker and amplifier; Model VP-570 memory-expansion board (\$85) contains 4K of RAM; Model VP-580 expansion board (\$15) plugs into color board or Model VP-585 keyboard interface board (\$10) to allow two people to use the VIP in games; Model VP-560 EPROM board (\$34) allows use of two Intel 2716s; Model VP-565 EPROM programming board (\$99) allows programming Intel 2716s for Model VP-560; Model VP-700 Tiny BASIC ROM board (\$39) requires an external ASCII keyboard; Model VP-900 ASCII keyboard (\$50) has upper- and lower-case and control characters. There is also a VIP newsletter now available, called *Viper*, from Box 43, Audubon, PA 19407, at \$15 for 10 issues.

**Smart Cassette-I/O Controller.** Xeon Micro (P.O. Box 267, Hawthorne, CA 90250; Tel 213-676-8346) has announced its MS-CIO audio cassette and serial I/O controller with a built-in relocatable operating system for \$205 assembled and tested. This device, for the S-100 bus, supports two cassette tape units, and has an RS-232 or 20-mA serial port. The cassette operates at 1200, 2400, or 4800 bits/second using a modified KC format. Integral motor control drivers are provided. The cassette operating system handles motor control, file formatting, labelling, searching and generation of inter-record gaps. There is no need for control program boot-strapping. To perform a tape search, load or dump, the user calls the desired routine. ◇

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