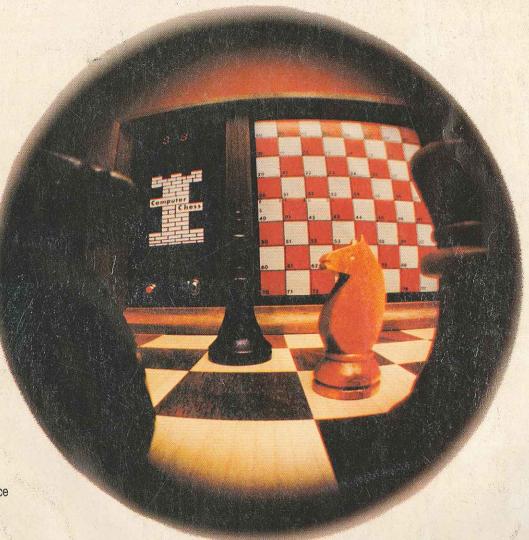
Popular Electronics MAGAZINE DECEMBER 1978/\$1

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PLUS: 1978 ARTICLE INDEX



Retailers: Notice of display-allowance plan is within last three pages.

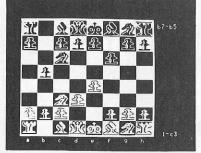


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BOX 140C RD 1
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TRS-80 PET APPLE



PLAY CHESS WITH YOUR COMPUTER!

Now you can play chess against your home computer! Microchess, a machine language program by Peter Jennings, is available for the Radio Shack TRS-80 (4K or more, Level I or II), Commodore PET (8K), and Apple II (16K). Just load it from the supplied cassette and you're ready to play. It will check your moves for legality and display the current position on a graphic chessboard. You can play White or Black, set up and play from special board positions, or even watch the computer play against itself! You can adjust the program's skill level for anything from speed chess to a long but challenging game.

To see Microchess in action, ask for a demonstration at your local computer store (for the TRS-80, at your Radio Shack store). If you're a bridge player, ask to see Bridge Challenger, which you can use to practice your game even when you can't get four people together to play! Or you can order Microchess (\$19.95) or Bridge Challenger (\$14.95) direct from our address below, by check, money order. or VISA/Master Charge. Personal Software™ offers many other exciting software packages for your computer. For a free catalog, just send a letter giving your TRS-80, PET, or Apple serial number, memory size, and your primary computer application interest.

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By Leslie Solomon

ENHANCED GRAPHICS

OT TOO long ago, when video plug-in boards for computers came along, someone discovered that novel and interesting graphics could be created using non-alphanumeric control symbols that are present in some character generators. A classic example is the VDM-1 playing Target or TREK80.

There have been many other video displays since then, each using its own special control characters for graphics. Finally, along came a computer (Pet) that had a set of dedicated graphic symbols available at the user's fingertips.

So far, however, these forms of graphics have been limited to the symbols that the chip or computer manufacturer decided to include.

Recently, Exidy Inc. (969 Maude Ave., Sunnyvale, CA 94086) introduced its Sorcerer computer (\$895), which features up to 128 user-defined graphic symbols as well as 128 upper- and lower-case ASCII characters, and 64 Petlike graphic symbols. This 64-character by 30-line display system also uses the ubiquitous S-100 bus, and has a unique set of one-stroke BASIC commands where certain keys produce BASIC instructions (FOR, NEXT, REM, STOP, etc.) for one keystroke.

The feature of the computer that intrigued us was the user-defined graphic symbols. Such an approach allows us to use certain symbols currently not available: a tilde, an umlaut, special math and APL symbols, italics and even script! It can also be used to create certain foreign-language symbols for Arabic, Hebrew, Greek, or other languages not written in "English" symbols. We can even create strange logos, swirls, whirls or stripes for special displays. In fact, we can create any symbol we desire.

Exidy provides two approaches to the creation of special symbols. In one mode, each special character is stored in eight successive memory locations between FE00 and FFFF (where the number key symbols are stored).

To create a symbol, an 8 × 8 graph is used in conjunction with a pencil to darken the blocks not required for that symbol. Each row of 8 blocks is coded as a hex digit with a dark space being a "0" and a white space a "1". Each row is then ENTERED via the monitor at the desired key address. Now, when you hit that key, the symbol appears.

The second approach uses an ingenious BASIC program that, when RUN, displays an 8 × 8 array of boxes on the screen with the cursor in the top lefthand box. After selecting the number key in which you wish the character to appear, the cursor-positioning keys are used, with a graphics key depressed, to insert a white box at the desired location to form the wanted character. The space bar is used to erase any unwanted square. After RETURN is hit, the program then POKES around in the memory to insert the 1's and 0's needed to form the special symbol.

With a little practice, one can create italics, script, or any symbol desired.

Double Disk. If you use one of the small (51/4") diskettes, then you should know that there is a relatively easy way to double the storage area of the diskette. Square-1 (614 18th Ave., Menlo Park, CA 94025; Tel: 415-325-4209) is making available its Flippy Disk kit for \$9.95. It contains a hand punch, a metal template, a pencil and a set of instructions on how to use the other side of your present diskettes. This kit will work with any diskette whose "other side" is coated and burnished (shining surface). We had occasion to try this kit with some of our diskettes and found the procedure easy to follow, and very satisfying as we wound up with double our disk space. We did have one disk that did not have the required second surface.

S-50 Parallel Interface. Available from F&D Associates (1210 Todd Rd., New Plymouth, OH 45654), the VPI-1 Versatile Parallel Interface is a 4-port I/O board for the S-50 bus. This board can support two MC6820 PIA, two

MC6522, or one of each to give a total of 40 I/O lines, 36 of which can be input or output, and four that are input only. These lines are arranged in four groups with 8 I/O lines, one I/O handshake, and one input handshake. The lines go to selected drivers and buffers that can drive up to 300 mA at up to 80 volts. Discrete transistors, SCR's, or triac's may be used. Space is provided for clamping and transient-suppression diodes. With the 6522 you also get two programmable timers that can be used for a variety of functions. The VPI-1 can replace two SWTP MP-L boards in most applications. The bare boards are \$32.50 each plus \$2.50 shipping/handling charge. Documentation only is \$5 pp. Ohio residents please add 4% sales tax.

EPROM Erasing. A couple of new ultraviolet lamp EPROM erasers are available from Spectronics Corp. (956 Brush Hollow Rd., P.O. Box 483, Westbury, NY 11590; Tel: 516-333-4840). The Model PE-14 (\$59.50) will support up to six EPROM chips at a time and will erase them in as little as 14 minutes. The UV lamp fits into a special shielded reflector and is kept at a constant distance from the EPROM's. A safety interlock prevents the unit from operating when the tray is not fully inserted. A conductive foam pad holds the chips in place. The PE-24, at \$104.50 is similar to the PE-14 but holds up to nine EPROM's and can erase them in less than 12 minutes. A 60-minute timer is also included for automatic shutoff.

Music Boards. One of the original computer music system manufacturers, Newtech Computer Systems, Inc. (230 Clinton St., Brooklyn, NY 11201; Tel: 212-625-6220) recently announced its Plus Americana music software that works with either its S-100 bus Model-6. or its SWTP-compatible Model-68 plugin boards. These boards are available for \$59.95 (assembled and tested) at your local computer store. Supplied on an MD-1NS diskette for the North Star system or an MD-1SW disk for the SWTP system (\$19.95 each), the programs feature a dozen pre-recorded melodies, including five having two voices. The diskettes also feature Jukebox, a BASIC program that allows choice of any of the musical selections. Although the two music boards come with their own small speakers, we recommend that the audio output be fed to a conventional audio system to take advantage of the improved sound. <

Write and run machine language programs at home, display video graphics on your TV set and design microprocessor circuits—the very first night—even if you've never used a computer before! ELF II featuring RCA COSMAC microprocessor/ COMPUTER \$9995 in POPULAR ELECTRONICS

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8080 Timesharing System. TEM-POS (Timed Environment Multi-Partitioned Operating System) is a newly upgraded timesharing system for 8080-based computers. The system permits the simultaneous execution of several different jobs or processes at once, including simultaneous batch and interactive use, and foreground/background processing. The package includes: OPUS/ TWO, a high-level language with features of BASIC, FORTRAN and ALGOL; TEXTED, a character-oriented text editor for use with OPUS/TWO, assembly language, or ASCII text; and utilities for assembly, file handling, file listing and a linking loader. Basic hardware requirements are an 8080 processor, 48k of RAM addressed from location 0, vectored interrupts, a real-time clock, and at least one "system console" I/O terminal. Driver software is supplied for MITS and iCOM floppy-disc drives, for MITS and IMSAI I/O boards, and for MITS and IMSAI vectored interrupt/real-time clocks. Support documentation provides for insertion of drivers or other hardware. TEMPOS is available on either MITS (hard-sectored) or iCOM (IBM 3740type) diskette, for \$787. A User's Manual is \$20. Administrative Systems Inc., 222 Milwaukee. Suite 102, Denver, CO 80206.

6502 DOS Software. KVOS is a miniature operating system for use with 6502 systems using the TIM monitor ROM, with the S.D. Sales "Versafloppy" or the CGRS Floppy I/O; it can be used with CGRS S-100/6502 systems or with other 6502 systems via the CGRS S-100 adapter card. Two versions are available: KVOS1T, which adds file-name disk commands to the TIM monitor. is available as one 2708 ROM and a diskette, at \$40. KVOS2T, with the addition of a disassembler and dynamic program tracing, is supplied on two 2708s plus diskette, at \$65. CGRS Microtech, Box 368, Southampton, PA

Z80 APL Interpreter APL is now available for Z80 based systems using Digital Group or CP/M operating systems. The APL/ Z80 interpreter includes nearly all primitive APL functions and operators. Primitives not present can be implemented as defined APL functions, according to the system's developer. Purchasers must sign and return an end user software license and nondisclosure agreement permitting use on one computer system only. \$300. Vanguard Systems Corp., 6812 San Pedro, San Antonio, TX 78216

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