

## C.E.S., continued...

generation, polyphonic tones, music synthesis and hi fi output.

Along with the 16K SuperVIC, an expanded memory version of the VIC 20, Commodore announced seven new cartridge games for the VIC. *Jupiter Lander*, *VIC Avenger*, *Superslot*, *Draw Poker*, *Super Alien*, *Midnight Drive* and *Magic Mouse* retail for \$29.95 each.

In addition to the cartridge games, Commodore released the *Home Calculation Program Pack*, a series of six programs on cassette.

Other additions to the VIC line are memory expanders and a modem. The VIC-1110, which sells for \$59.95, plugs into the memory expansion port of the VIC 20 to increase program capacity and add 8192 bytes of memory. The VIC-1210 is a 3K memory expander available for \$39.95.

Introduced as the "lowest-priced modem in the personal computing industry," the VIC Modem is a plug-in cartridge which connects to the user port of the VIC 20 and may be used with any modular style telephone. It operates at 300 baud with originate/answer and half/full duplex capabilities and retails for \$109.95.

Commodore Business Machines, Inc., Computer Services Division, 681 Moore Rd., King of Prussia, PA 19406. (215)377-7100.

## Texas Instruments

Don Bynum, manager of the home computer division of TI, keeps his TI 99/4 in an old piano. A while ago he told TI designers that the way to job security was to ensure that all new peripherals would fit in that piano. Space inside the piano is now at a premium, but the designers are said to be still employed. The reason is a peripheral expansion system slated for release in the second quarter of this year.

The unit, which measures 14" x 15" x 20" has eight slots for peripheral, board-type modules and room for one disk drive within the enclosure. Up to two additional drives can be added externally. The expansion system has a suggested retail price of \$249.95.

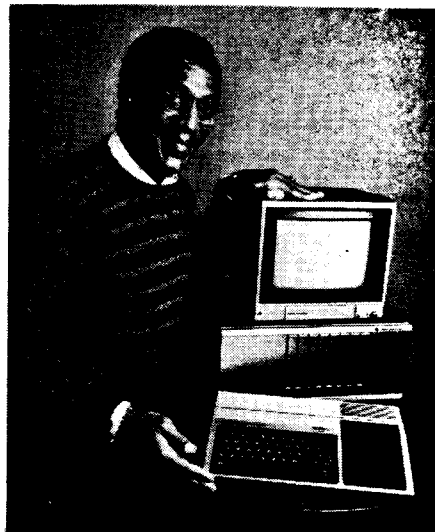
The peripheral modules to be released are a memory expansion module which adds 32K of RAM to the computer (\$249.95); a p-code module, which is used for writing Pascal programs (\$249.95); a disk controller module, which will be able to handle double-sided 5 1/4" disks (\$249.95); and an RS-232 interface module, which provides a parallel port for interfacing with printers (\$174.95).

A UCSD p-system peripheral, which is identical to the p-code module, allows users of the 99/4 and 99/4A to run UCSD Pascal Version IV.0. Price for the system is \$399.95.

Also shown for the first time at CES was a "mini-RAM" for the TI home computer.

It plugs into the cartridge slot to provide 4K of non-volatile CPU RAM. It offers ROM support and allows the user to write to or read from Basic and to call assembly language routines from Basic. The cartridge comes with a cassette containing a line-by-line assembler.

Of course, without software, hardware—whether it fits into a piano or not—might as well be a boat anchor, so TI introduced about 30 new software packages. New systems software includes a Pascal compiler; an editor, filer and utilities package for screen editing and file management; and an assembler/linker package for developing TMS 9900 assembly language programs, all for use with the p-System peripheral.



Bill Cosby poses with the TI99/4A and new peripheral expansion unit.

An *Editor/Assembler* package, priced at \$99.95, allows users to program on the machine level via TMS 9900 assembly language. Programs can be run as stand-alone programs or linked into TI Basic programs as subroutines.

Among the applications software released are ten games: *Tombstone City: 21st Century*, *TI Invaders*, *Car Wars*, *Adventure*, *Pirate Adventure*, *Munch Man*, *Draw Poker*, *Yahtzee*, *Blasto*, and *Hustle*.

New educational packages include *Speak & Spell*, *Speak & Math*, *Spell Writer*, *Addition/Subtraction I*, *Addition/Subtraction II*, *Multiplication I*, and *Teach Yourself Extended Basic*. Additions to the Business Aids Library are *Inventory Management*, *Invoice Management* and *Cash Management*. Other new packages include *Terminal Emulator II*, *Basketball Statistician*, *Bridge Bidding II*, *Bridge Bidding III*, *Structural Engineering Library* and *Electrical Engineering Library*. Prices range from \$24.95 to \$69.95.

Texas Instruments Incorporated, P.O. Box 53, Lubbock, TX 79408.

CIRCLE 299 ON READER SERVICE CARD

## Astrovision

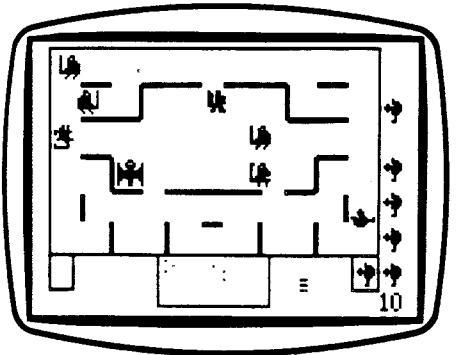
Astrovision introduced the ZGrass-32 personal computer add-on to the Astro Professional Arcade (formerly the Bally Professional Arcade). It is Z-80 based and features a full-stroke keyboard and 32K ROM. The ZGrass language, combined with a Votrax chip and Astro Arcade chips, allows users to create 256-color animation,



The ZGrass-32 personal computer from Astrovision.

sound effects, three-voice music, and speech. The ZGrass-32 is expandable to run CP/M and has interfaces for light pen, graphics tablet, disk drives, and joysticks, and includes two RS-232 ports for communication. The add-on, which carries a retail price of \$600, should be available in April.

The *Music Maker* cartridge for the Astro Arcade was scheduled for release in March. It allows users to adjust pitch, vibrato, tempo, noise, volume, attack and decay to create synthesized music or sound effects. Multi-colored pictures can be created with the *Coloring Book with Light Pen* package.



The Wizard, a new game for the Astrovision Arcade.

New to the game repertoire of the Arcade are *Munchie*, *The Wizard*, *Cosmic Raiders*, *Solar Conqueror*, *Space Fortress*, *Quest for the Orb* and *Pirate's Chase*. The cartridges will be priced at \$24.95 to \$35.95.

Astrovision, Inc., 6460 Busch Blvd., Suite 215, Columbus, OH 43229. (614)855-0130.  
CIRCLE 300 ON READER SERVICE CARD

## From the Orient

Toshiba America previewed its first personal computer, the Model T-100. The