

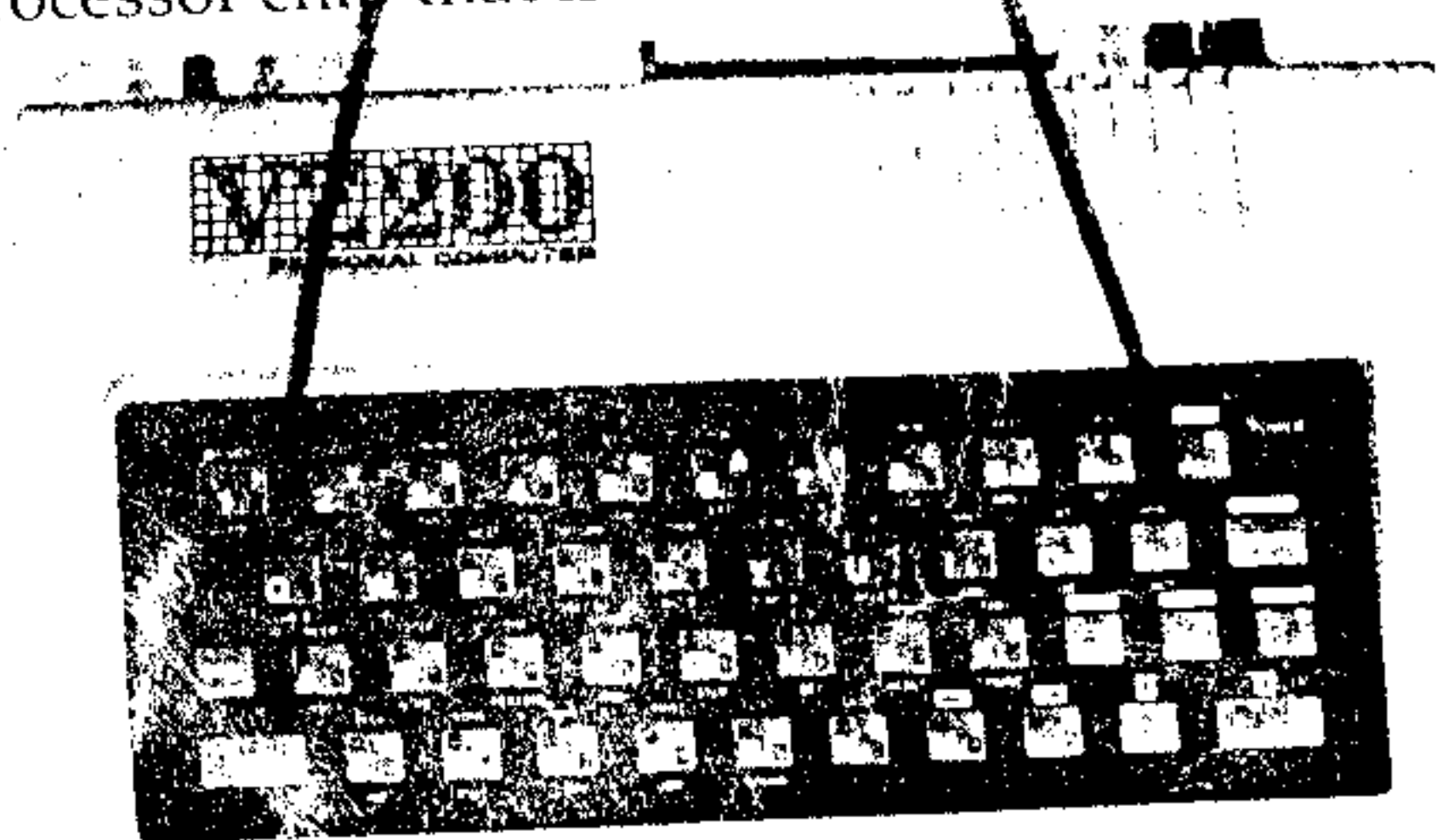
Commodore has also started marketing the C64 in the same way that it currently sells the VIC: through mass retailers. Although Commodore officials refused to discuss prices, this marketing move means discounters will begin slashing the C64's price – perhaps soon as low as \$399. Since many full service computer dealers do not compete with this kind of discounting, Commodore is releasing the new P Series exclusively to dealers. The P Series comes with 128K of RAM, expandable to 896K, and has the same 40-column screen, color graphics, and sound as the C64 (for details, see "The New Wave Of Home Computers," **COMPUTE!**, August 1982, and "Editor's Notes," July 1982). When the P Series was announced last summer, the price was set at \$995; but now Commodore says it will sell the machine for \$795.

In the manufacturing area, Commodore announced yet another important move: it has signed an agreement with Zilog to co-produce the chip manufacturer's Z 8000 microprocessor, a 16-bit version of Zilog's extremely popular Z 80 microchip. Why? Commodore plans to build a new generation of 16-bit computers around the Z 8000. Expect the first models to be announced by the end of this year.

## Under-\$100 Computers

For the past year, the \$99 Timex/Sinclair computer has had the under-\$100 market all to itself – and it has been selling by the hundreds of thousands. But that is about to end. Three new computers retailing for \$99 were shown at the show, including the first one with color.

The color model is the VZ200, the first home computer from Video Technology Ltd., a company with two factories in Hong Kong. Promised for delivery by April, the VZ200 comes with 4K of RAM, expandable to 16K (\$45) or 64K (price not yet determined). Its 12K of ROM includes Microsoft BASIC, with one-touch entry of BASIC commands from the keyboard (similar to the Timex). The Central Processing Unit (CPU) – the microprocessor chip that is the "brain" of a microcom-



Video Technology's VZ200, the first under-\$100 color computer.

puter – is the widely used eight-bit Z80.

Unlike the Timex, its established competition, the VZ200 has a real moving-key keyboard. Not quite a full-stroke typewriter keyboard, but partial-stroke, calculator-style keys made of rubber. No less than six of the new computers at the show sported rubber keyboards. The keys are soft and wiggly to the touch and feel sort of like pencil erasers.

The VZ200 has a text mode of 32 columns by 16 rows, a mixed graphics/text mode with a resolution of 64 by 32 pixels (screen dots) with nine colors, and a high resolution graphics mode of 128 by 64 pixels with eight colors. There's a single-channel sound output, also unique among under-\$100 computers. Other VZ200 features: full-screen editing; 600 baud interface to any standard cassette recorder; RF output for TV sets and video output for monitors; auto-repeat keys; keypress "beep"; and keyboard character graphics.

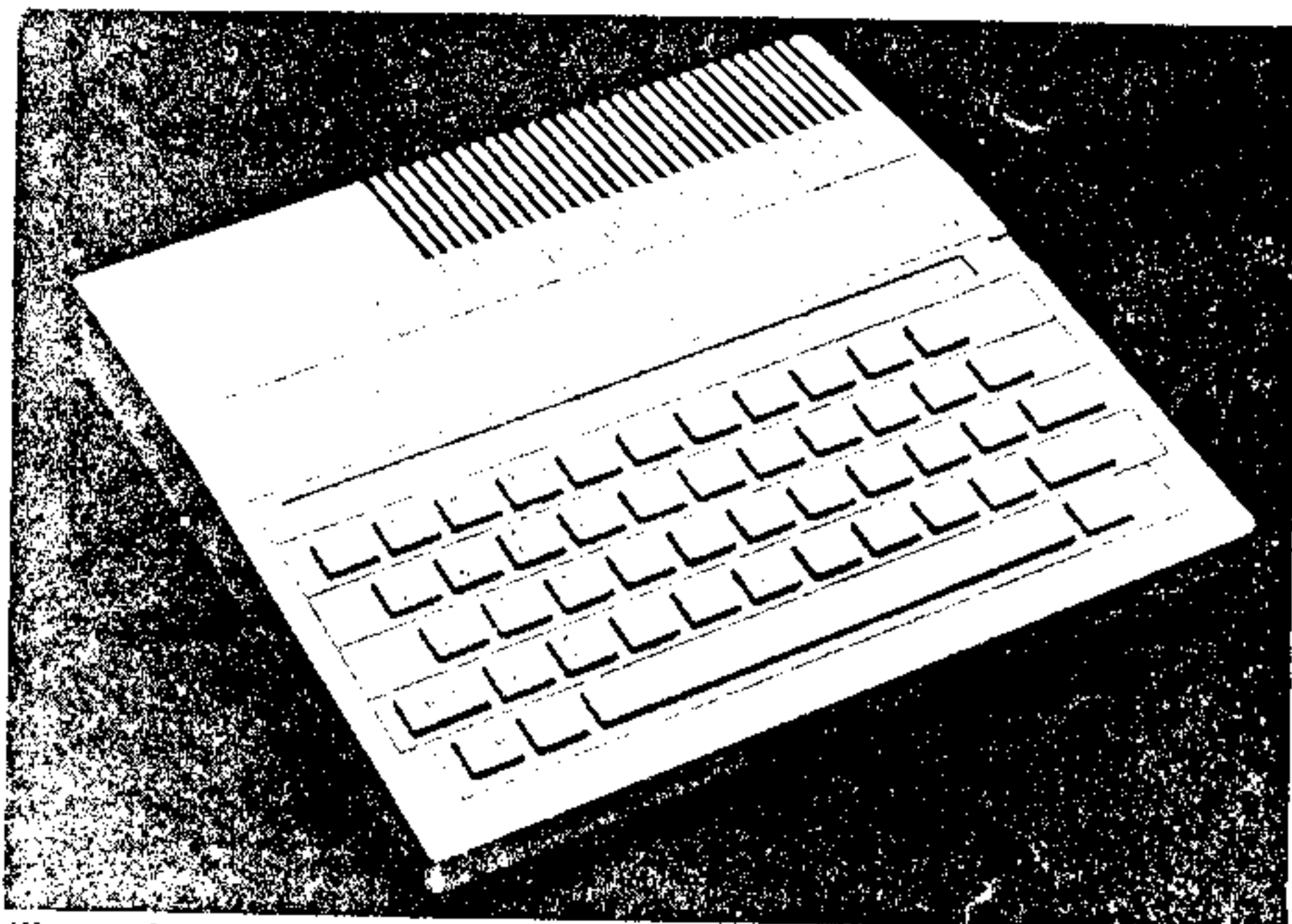
Peripherals promised for later this year include a printer interface module, printer, joysticks, light pen, telephone modem, disk drive, bar code reader, and a monitor. Video Technology is preparing 29 software packages on cassette, and says about a third will be available when the computer hits the market. The programs range from educational and entertainment to home management and simple business. They will sell for \$9.95 each.

Video Technology also is introducing to the U.S. market a video game machine convertible to a home computer which it has been selling in Europe and Australia for a year. Called the CreatiVision, the game machine will sell for \$189 and includes a membrane keyboard on the joysticks. The addition of a \$10 BASIC cartridge turns it into a 16K RAM computer, and a plug-in keyboard (with rubber keys) will be available for \$30. The video game graphics looked excellent. However, the BASIC is not compatible with the VZ200.

## Two From Texas Instruments

Another significant entry into the sub-\$100 field is the \$99.95 Texas Instruments TI-99/2, available in the second quarter of this year. It, too, has a moving-key, calculator-style, rubber keyboard. It comes with 4.2K of RAM, expandable to 36.2K. Although it lacks the color, sprite graphics, and sound of its elder cousin, the TI-99/4A, the BASIC programs are "upward-compatible" – meaning TI-99/2 programs will run on a TI-99/4A, but not necessarily vice versa.

It accepts software on cassettes or plug-in cartridges, though not the same cartridges as the TI-99/4A. Fourteen cartridges have been announced for entertainment, education, and home management. The computer's CPU is a Texas Instruments 16-bit chip – making it the first 16-bit

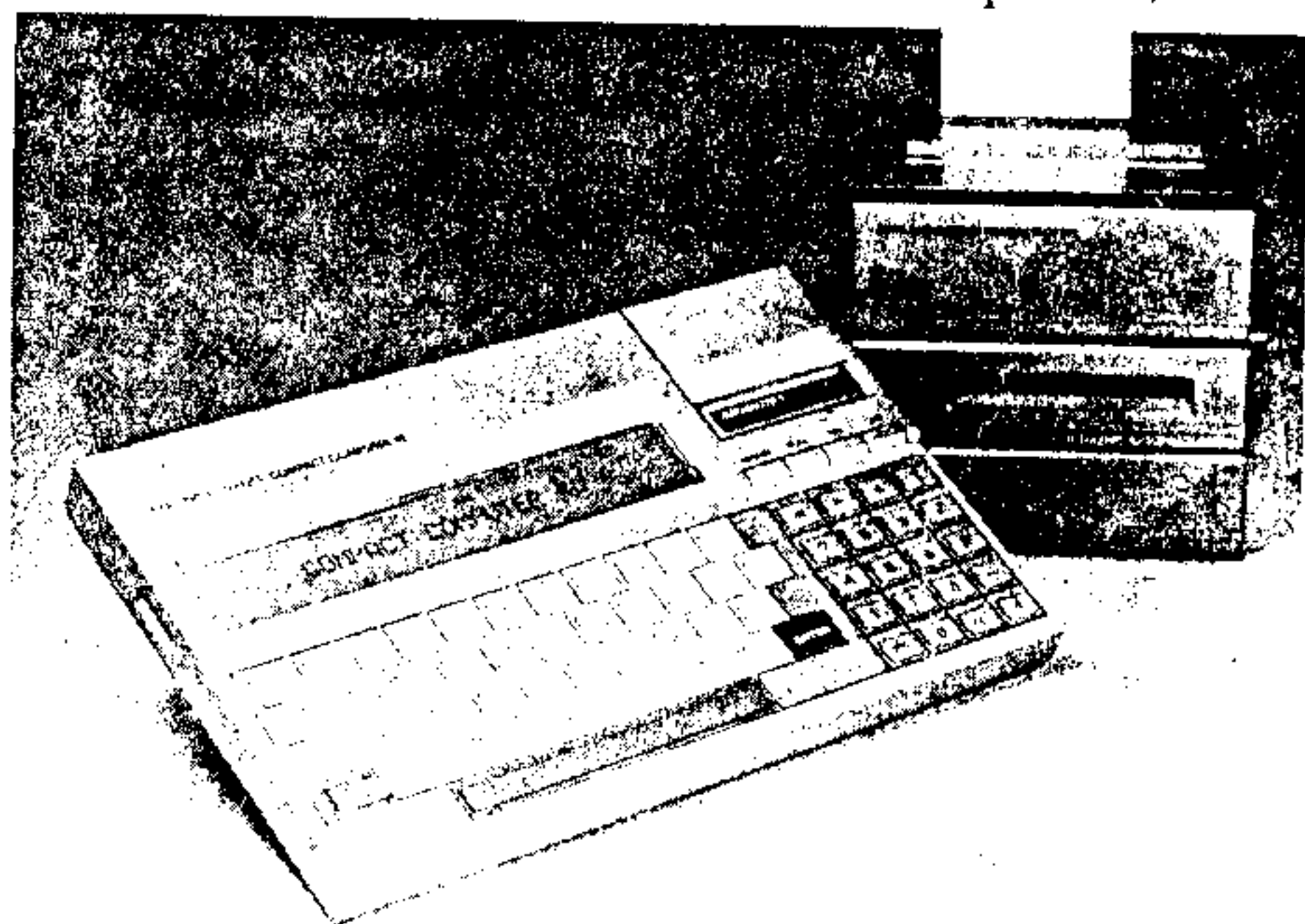


Texas Instruments TI-99/2, with 4K of memory for \$99.

computer for under \$100 – though it is not the same chip found in the TI-99/4A.

One of the most interesting things about the new TI is its line of peripherals. A connector on the back accepts a new family of add-ons, including an RS-232 interface (\$99.95), a four-color printer/plotter (\$199.95), and the Wafertape drive (\$139.95). The Wafertape drive uses "wafers," small endless-loop tape cartridges familiar for years to TRS-80 users (and now other users) as "stringy floppies." Less expensive than a disk drive, a stringy floppy drive can store up to 48K on a wafer and is sometimes faster than a disk. (See "Mass Memory: Now And In The Future," on page 54.) The peripherals also will work on TI's new portable machine, the Compact Computer 40, and on the TI-99/4A (with a \$59.95 "Hex-bus interface"). This means someone starting out with a low-end TI-99/2 can move up to a TI-99/4A without discarding the peripherals.

TI's other new computer, the Compact Computer 40, is a hand-holdable battery unit. For \$249.95, it comes with 4K of RAM (expandable to 16K); 34K of ROM containing an Enhanced BASIC compatible with TI's other home computers; a



Texas Instruments Compact Computer 40, a battery-powered 4K portable for \$249.95. At right is the new printer/plotter, Wafertape drive, and RS-232 interface.

one-line, 31-character liquid crystal display that scrolls sideways to 80 characters; upper- and lowercase; QWERTY keyboard; memory retention when switched off; and a cartridge slot for plug-in software. TI says 75 cartridges will be available by the third quarter.

The remaining \$99 entry is one of three new Japanese computers introduced at the show, the Sanyo PHC 20. This compact model has a moving-key, rubber keyboard, 4K of RAM (unexpandable for now), 8K of ROM with a Tiny BASIC, 32-character by 16-line text display, 64- by 64-pixel graphics, full-screen editing, 1200 baud interface with any cassette recorder, and a monitor output that connects to a TV with an adaptor. The CPU is a Z80A. The PHC 20 is supposed to be available immediately through Sanyo dealers.

Two similar Sanyos are also on the way. The PHC 10 is a battery-powered hand-held model with built-in liquid crystal display, 2K of RAM expandable to 4K, and a buzzer for simple sound output. Otherwise, it is almost identical to the PHC 20. No price or delivery date is available. And on the higher end is the PHC 25, a souped-up PHC 20 with 16K of RAM (expandable to 32K); 24K of ROM with a larger BASIC; additional graphics modes of 128 by 192 pixels and 256 by 192 pixels; parallel printer interface; joystick port; and three-channel sound output. It should be available at the same time as the PHC 20 for \$199.95.

## A Second Generation Timex

Another exciting low-end introduction is the Timex Sinclair 2000, the first computer that offers 48K RAM for under \$200. The T/S 2000 is basically the U.S. version of the Sinclair ZX Spectrum, until now available only in the United Kingdom.

The T/S 2000's main improvements over its popular cousin, the \$99 T/S 1000, are more memory, color, sound, and a moving-key keyboard. There are 40 rubber keys with upper- and lowercase, auto-repeat, standard Timex Sinclair character graphics, one-touch BASIC keyword entry, and the same editing functions as the T/S 1000. Separate keys control the colors of the screen foreground, background, and borders, with variable brightness and a FLASH command for blinking characters. A one-channel sound generator beeps through an internal speaker over 10 octaves. Other T/S 2000 features include a 16K extended BASIC, 256- by 192-pixel high-resolution graphics, high-speed cassette interface (16K in 100 seconds), and a 32-column by 24-line text display. Timex says the T/S 2000 will be available this spring for \$149.95 (16K) or \$199.95 (48K). With that much memory at those prices, the T/S 2000 should prove an interesting competitor.

Timex also introduced a 32-column the