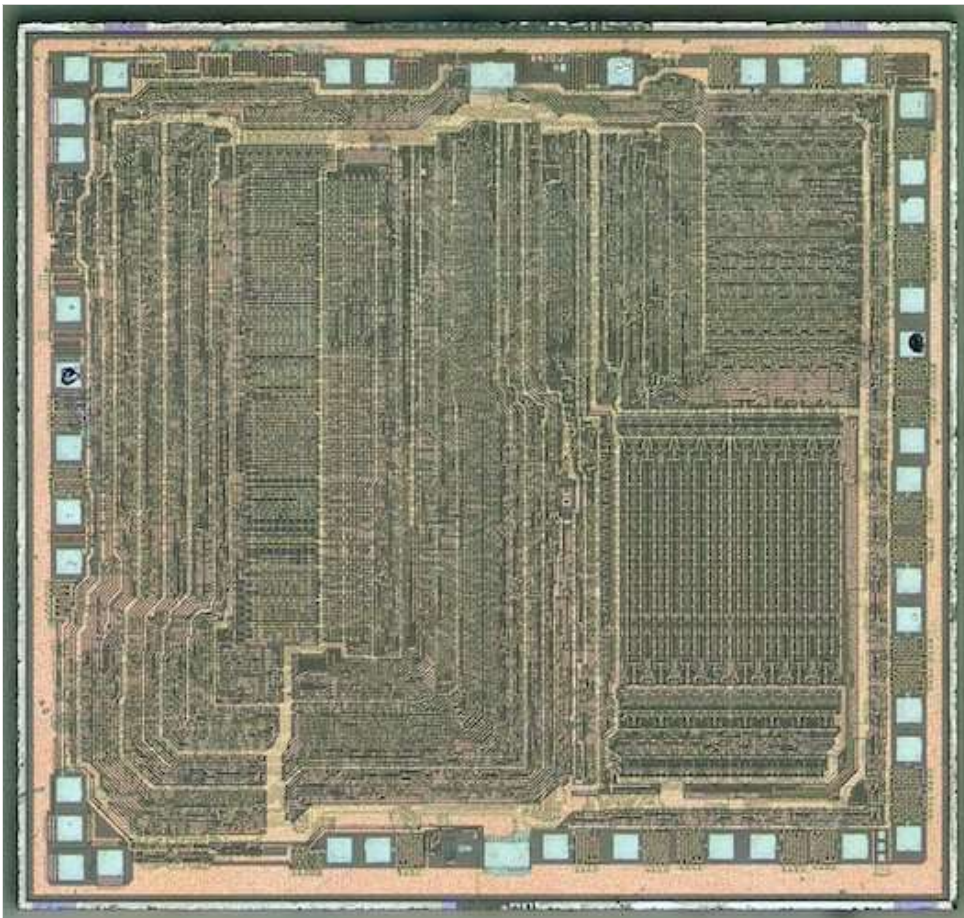


The End of an Era: Zilog Discontinues the Z80 Microprocessor

3 days ago by [Duane Benson](#)

Two years short of the Z80's 50th birthday, Zilog has called it curtains on the 8-bit MPU. What legacy does this microprocessor leave behind?

As of June 2024, the venerable Z80 microprocessor, released by Zilog in 1976, will no longer be available as a standalone part.



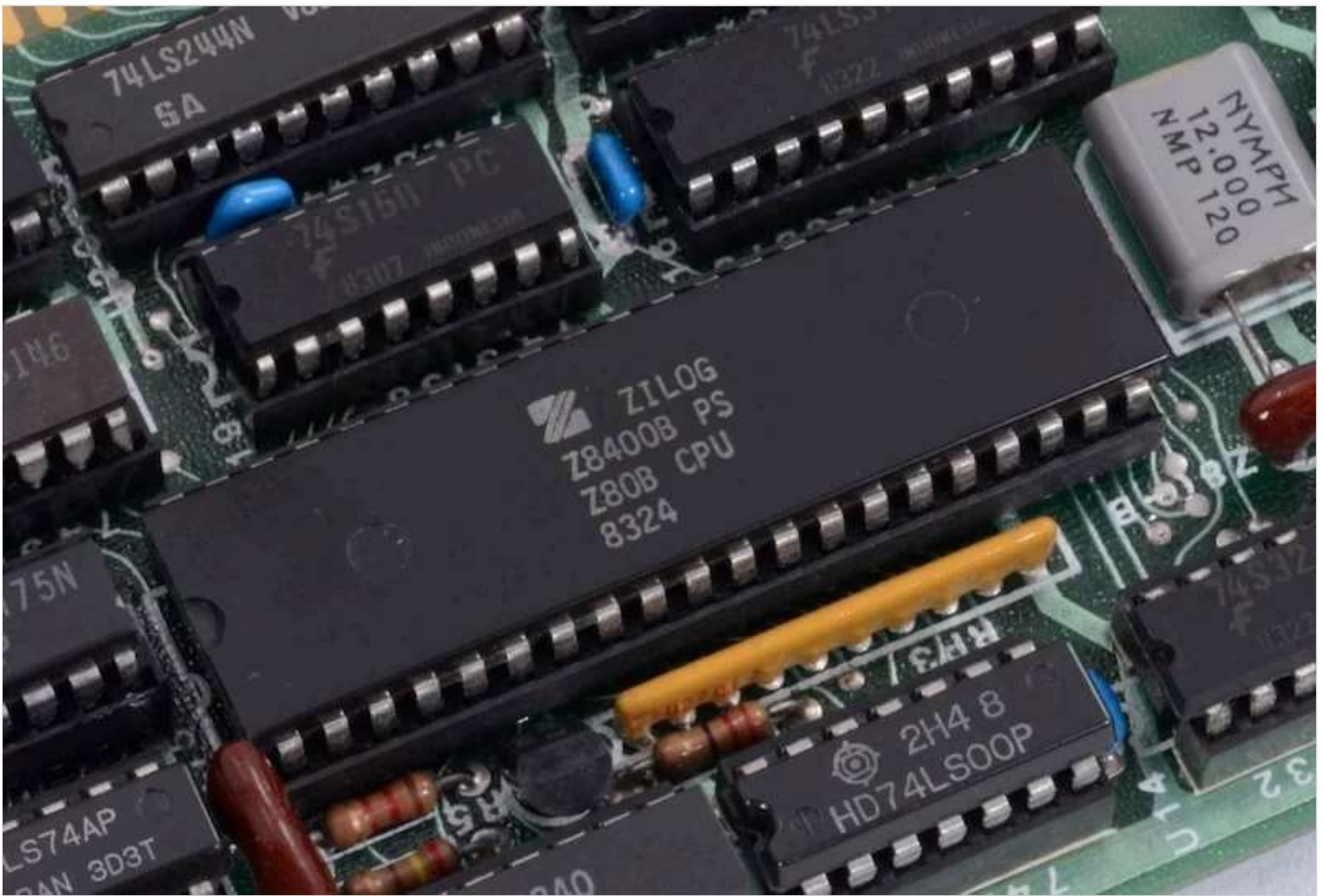
Despite the many evolutions and revolutions in the engineering industry, some silicon goes back decades. You can still hop over to DigiKey or Mouser and place an order for an NE555 timer, first produced in 1971, or an LM741 op amp from 1968. These chips are icons of the birth of integrated-circuit electronics. The lifecycle of the Z80, equally salient to that era, has now come to an end.

The Intel 8080 and the Birth of the Zilog Z80

Zilog, now owned by Littelfuse, was born from the race to the single-chip microprocessor. Zilog's principal founder, Federico Faggin, developed the 4-bit Intel 4004, generally regarded as the first commercial single-chip microprocessor, and the 8-bit Intel 8008.

He was also instrumental in improving the follow-on processors, the 4040 and 8080. The 8080, introduced in 1974, was the first high-performance 8-bit microprocessor. It was more powerful, and it could directly address 64 K of RAM. It was also easier to interface than Intel's prior microprocessor chips.

Faggin, however, wanted more for the microprocessor than Intel did at the time. As the story goes, Intel was more focused on selling static RAM and ROM and largely saw the microprocessor as a way to sell more memory chips rather than as a valuable product on its own. He left Intel in late 1974 along with Ralph Ungermann to found Zilog. The two initially set their sights on designing a low-cost, single-chip microcontroller. However, without their own fab capability, the product would not be economically viable due to strong competition and low margins. With that idea set aside, they decided to develop an improved microprocessor chip that was compatible with the popular 8080.



Z80 CPU in a 40-pin DIP package, date code 1983. Image by Duane Benson

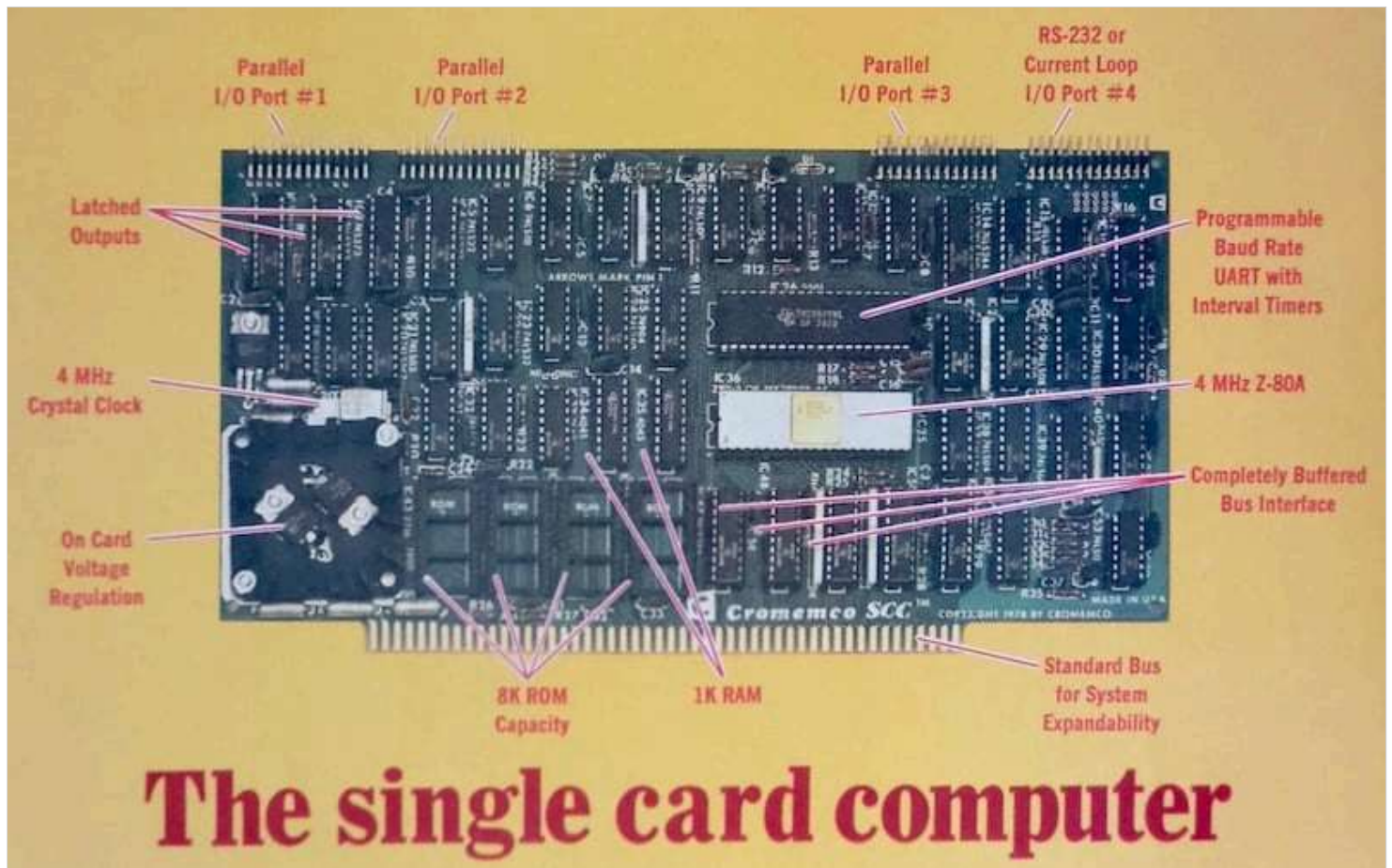
The new chip would be 8080 code compatible but with 120 more opcodes, additional registers, and separate I/O and memory space. The Z80 uses a single +5-volt power supply instead of the +5/-5/+12-volt split supply required by the 8080. It didn't require an external clock chip and could single-step for debugging. Zilog initially contracted with Mostek, developer of the competing 6502 microprocessor, to fab the Z80.

Into the Personal Computer

By the time the [Z80 was released](#), the 8080-based Altair 8800 and IMSAI 8080 desktop computers, with their S100 bus, had already become a standard platform for kit and semi-kit computers. Gary Kildall of Digital Research had also targeted the 8080 at CP/M operating systems. In other words, the platform and operating system were ready and waiting for the Z80 to arrive.

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The [Z80](#), with its 8080 binary compatibility, single supply voltage, and reduced support chip requirements, easily fits on a single card in a desktop S100 “mainframe” box. The Z80 powered the 1970s’ three most popular [S100 bus](#) small business computer lines from Cromemco, Vector Graphic, and North Star. For the first time, office users could run word processing software like WordStar or database management like dBase II without resorting to big system timeshare or expensive minicomputers.



Cromemco S100 bus single board Z80 computer as pictured in Byte Magazine, September 1979. Image used courtesy of [Internet Archive](#)

The Z80 prevailed as the most widely used 8-bit CPU through the mid-1970s until being supplanted by the Intel 8088-based IBM PC in the early 1980s. Consumers saw the first appliance-like home computer with the introduction of the Z80-powered Radio Shack TRS-80 in 1977. The TRS-80 put the Z80 up against the Mostek 6502, which drove the Apple II and the Commodore PET as contenders for the dominant personal computer CPU.

The first “portable” computers were Z80-powered. The Kaypro II and Osborn I—with their dual floppy disks, cathode ray tube (CRT) displays, and keyboards in a self-contained, luggable 25+ pound box—were powered by the Z80 and ran the CP/M operating system.

Z80 as an Embedded Device

By the mid-1980s, 8-bit CPUs were deemed inadequate in the business personal computer world against the likes of the IBM PC and Motorola 68000-based Apple Macintosh. Zilog’s attempts at 16- and 32-bit follow-on PC microprocessors in the 1980s—the Z800, Z8000, and Z80000—failed to succeed because of the entrenchment of Intel’s x86 architecture.

Still, the Z80 soldiered on. The chip had a large following of many capable programmers. It was inexpensive and easy to implement, and the embedded world benefitted from these advantages. The Z80 found homes in printers, photocopiers, fax machines, modems, and a host of industrial, commercial, and scientific equipment. One of the largest installed bases of Z80 microprocessors comes with the Texas Instruments Ti-8X series of graphing calculators. Most are powered by the Z80, putting the processor in the hands of millions of students worldwide.

Goodbye, Z80, My Old Friend

Because the aging Z80 architecture can’t compete with 8-bit RISC and low-cost 32-bit embedded processors, Zilog has decided to [discontinue the line](#). The versions of the Z80 to be discontinued come in NMOS with clock speeds ranging from 4 MHz to 8 MHz and CMOS running from 8 MHz to 20 MHz. These include:

- Z84C0006VEG
- Z84C0006PEG
- Z84C001PEG
- Z84C0008AEG
- Z84C0020VEG
- Z84C0008PEG
- Z84C0010AEG
- Z84C0010VEG00TR
- Z84C0020AEG
- Z84C0020PEG
- Z84C0006AEG

Zilog will accept last-time buy orders until June 14, 2024.

Traces of the Z80 will still live on. Z80 soft cores are available for implementation in FPGAs, and the eZ80 is an enhanced architecture derivative embedded processor that is Z80 code compatible but much faster and more modern in memory addressing and interfacing.

```
; Z80 Signing off
ORG 0000H ; Set program origin to 0000
HALT     ; So long, and thanks for all the opcodes
END
```

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