

UNLEASHING THE COMPUTER

Smaller, cheaper, more efficient components resulted in smaller cheaper computers that didn't need their own special environmental controls. Relying at first on transistors and then on more compact integrated circuits, *minicomputers* spread to many new and smaller-scale uses. From the first manned mission to the moon to operating rooms and theaters, the minicomputer went where no computer had gone before.

In 1965, Digital Equipment Corporation announced the PDP-8, one of the most popular minicomputers. This new breed of computer opened up a new universe of applications. These computers were small enough that they could be used where mainframes could never fit (including inside other pieces of equipment) and inexpensive enough that customers who could never have afforded a full-scale mainframe could buy a computer of their own.

The Surgeon and the Computer

In the early 1970s, medical researchers and surgeons at the Yale Medical School and the West Haven VA Medical Center in Connecticut began experimenting with a PDP-8e to assist in neurosurgery. Before using the PDP-8, brain surgeons had to keep patients awake during surgery and manually prod the brain to identify the cerebral cortex. Damaging the cortex could leave the patient paralyzed. By hooking the patient up to the PDP-8, the researchers could stimulate nerves in the patient's body and electronically map the cortex while the patient slept. This method was not only faster, but also much less gruelling on both patient and surgeon.

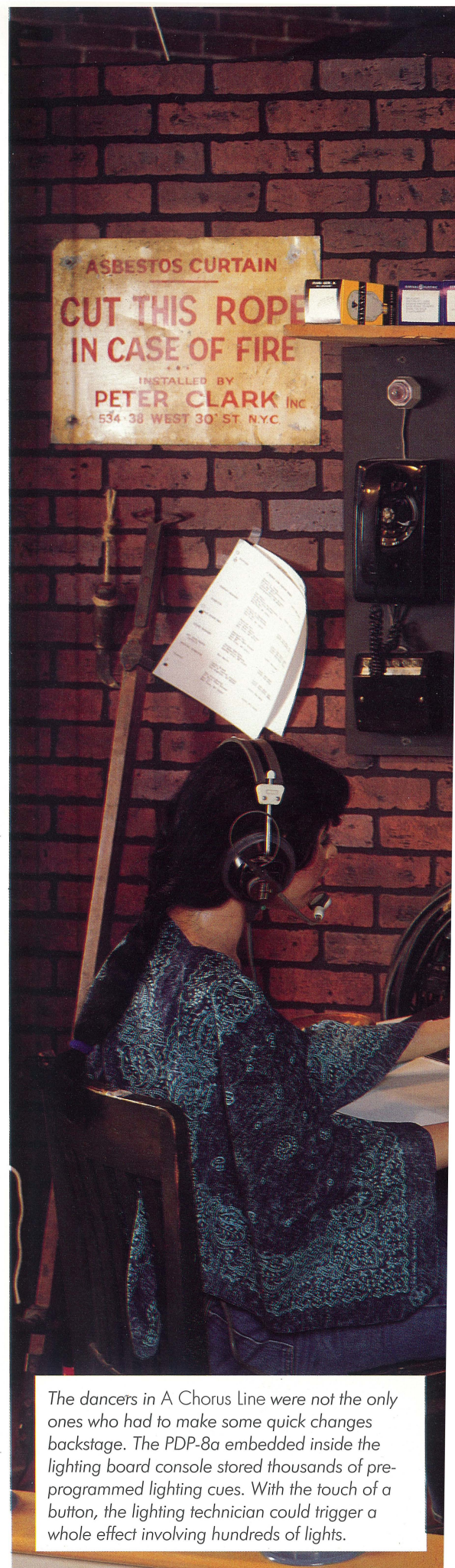
A Chorus Line

At the Shubert Theater in New York City, the Broadway show *A Chorus Line* played to sold-out audiences for years. Most of the audiences didn't know there was an electronic stage-hand on the job to help things run smoothly.

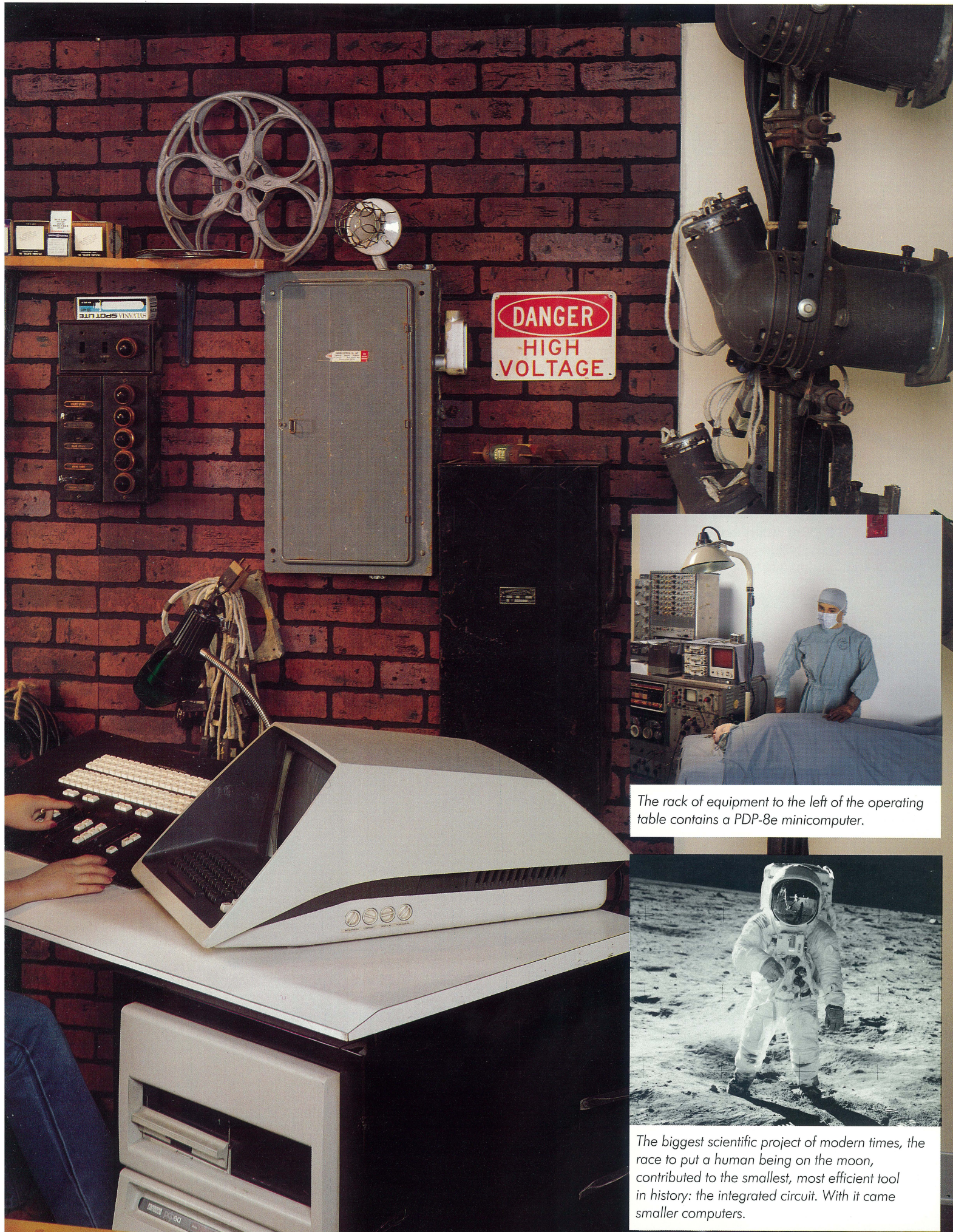
"Sam" was the nickname given to the LS-8 light controller by its operators. A lighting designer programmed Sam to remember and execute all the lighting effects for the show. Sam could flash lights faster and more precisely than any technician could by hand. That was key to running *A Chorus Line*—Sam had to keep pace with 17 whirling dancers. It would have taken eight lighting technicians to put on the show Sam and its single operator did. But computerized lighting had one drawback. If a dancer tripped or missed a cue in the middle of a special effect, Sam kept right on going.

Electronics Diversified, Inc., built the LS-8 light controller around a PDP-8a computer. The PDP-8a served as Sam's "brain" and memory. From 1975 to 1987, Sam controlled the lights for every show of *A Chorus Line* at the Shubert Theater.

Embedding a minicomputer inside another piece of equipment, be it an assembly line robot, automatic potato picker, or lighting controller, became a typical way of using computers.



The dancers in *A Chorus Line* were not the only ones who had to make some quick changes backstage. The PDP-8a embedded inside the lighting board console stored thousands of pre-programmed lighting cues. With the touch of a button, the lighting technician could trigger a whole effect involving hundreds of lights.



DANGER
HIGH
VOLTAGE

The rack of equipment to the left of the operating table contains a PDP-8e minicomputer.

The biggest scientific project of modern times, the race to put a human being on the moon, contributed to the smallest, most efficient tool in history: the integrated circuit. With it came smaller computers.