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Ingenious electronic brains are playing a vital part in air safety, highway

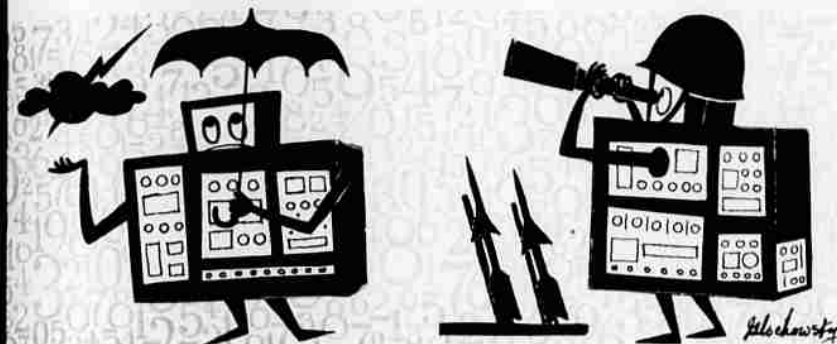
Computers Are Saving Lives and Dollars

by Phil Hirsch

IN JUNE, 1956, two transcontinental airliners collided 20,000 feet above Grand Canyon, carrying 128 passengers to their death.

It was the worst disaster in U. S. commercial aviation. Unfortunately, other such crashes have occurred. But a means of preventing them is now in sight, thanks to electronic computers.

Recently, three computers began operating in air-traffic control centers in Indianapolis, New York and Washington. Five more will be in service at other points by 1960. When completed, this system will be able to keep every airliner wrapped in a blanket of clear air space every moment it's aloft.



planning, weather forecasting, and national defense.

The air-traffic computer's role, basically, is to store—in its memory unit—the flight plans of all airliners departing from airports in a given area. Utilizing this information, the electronic brain then traces each plane's entire flight path from take-off to landing. If, at any time, this path will bring the ship dangerously close to another airliner, the computer warns the traffic controller, and he instructs the captain to figure out another route well ahead of time.

Keeping tabs on the movements of the nation's commercial airliners is a fantastically complex job. At one of the busier control centers, personnel perform more than 5,000 computations in an average day. With the growth of air travel and the recent introduction of jet airliners, this load is going to increase appreciably. Computers, however, halve the amount of manual processing required for each flight and reduce processing time from four minutes to about 20 seconds.

It is expected that when all the computers are operating, they will improve air safety significantly. As one expert puts it: "For the first time, traffic control centers will have complete control over all planes operating in the air space reserved for commercial flights. Lack of this control was a major cause of the Grand Canyon disaster, as well as virtually all the other mid-air collisions that have occurred in recent years."

Computers also are playing an important role on the ground. The United States currently is engaged in the largest public works project in its history—the \$40 billion, 41,000-mile interstate highway system—a national network of limited-access super-roads that will eliminate highway bottlenecks.

The computer is helping to determine exactly how much earth must be moved to make way for many of the new roads. In California, which is typical of several other states, electronic brains have reduced the time required for these calculations by 80 percent, and cut their cost by 40 percent.

The computer also is being used to design bridges and highway interchanges. According to an official of the U. S. Bureau of Public Roads, "The computer, when used for interchange design computations, does as much work in one hour as an engineer can perform with a desk calculator in 350 hours."

One such computer, known as the "Digital Terrain Model System," was developed at Massachusetts Institute of Technology. It uses three-dimensional pictures in its surveys. The photos are projected in red and blue lights on a machine which measures gradations in terrain and records measure-

ments for storing in the computer. The computer, in turn, stores the data in an electronic memory device. The system is being used experimentally in California, Colorado, Missouri, Ohio, Pennsylvania, Virginia, New York, and Massachusetts.

The new interstate highway system is costing every U. S. motorist approximately \$8 a year in taxes. By next year, several thousand miles will be open to traffic, and we'll be able to start collecting on our investment. We can look for a saving of up to 60 percent in travel time, and 50 percent in fuel consumption and mechanical wear and tear. Thanks to computers, such benefits will begin to materialize months, and perhaps years, sooner than would have been possible otherwise.

COMPUTERS are helping to figure out tomorrow's weather, too. For two years, one of the machines has been aiding the daily forecasts published by the U. S. Weather Bureau in Washington. Within 10 years, according to Jerome Namias, chief of the bureau's extended forecast section, electronic brains should be supplying detailed predictions for at least a month ahead. And these forecasts, according to experts, are expected to be accurate eight times out of 10.

Electronic brains are also a key factor in our national defense. There's a huge computer battery at McGuire Air Force Base, N. J., one of 29 such installations that will be in service throughout the country by 1961. If enemy aircraft ever try to attack us, data on their altitude, speed, and course—picked up far from our borders by radar—will be fed into these computers, which will plot the enemy's flight path, then launch and steer our missile or jet-plane counterpunch.

Computers also are performing a wide variety of other chores. They speed payment of some \$2 billion in dividends each year to holders of GI insurance; eliminate waiting lines in front of many airline ticket counters by giving clerks an instantaneous picture of the space available; and enable engineers designing military aircraft and missiles to run simulated flight tests of these devices without actually having to build them.

In this latter role, the computer cuts many weeks off the time required to get crucially important defense weapons into production.

Computers are aiding in the design of many consumer products as well, and have become a valuable tool in just about every field of basic research. Clearly, computers are performing jobs that touch every one of us—jobs that are going to grow significantly during the years to come.

(Advertisement)



Fashions

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by Ruth Stone, Perma-lift Foundation Stylist

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