



*SIMULATE RADAR BOMBING—To give a navigator-bombardier trainee the effect of actual flight over terrain represented by map, a simulated airplane moves over a submerged relief map in the tank room of this new trainer device.*

## AERONAUTICS

## Pinpoint-Bombing Trainer

Ultrasonic sounds from a simulated radar antenna bounce off a relief map submerged in water. The resulting picture is realistic, even to scudding clouds.

► AN ELECTRONIC machine has been developed for the Air Force to increase the pinpoint bombing skill of experienced bombardiers.

The complex instrument, which is housed in an entire building of its own, makes it possible to "bomb" actual targets anywhere in the world without leaving the ground.

Designed and built by American Machine and Foundry Company under supervision of technicians at the Wright Air Development Center, Dayton, Ohio, the trainer uses a large relief map of the area being "flown" over by the plane. The map, representing a 360,000-square-mile area, is submerged in a tank of purified, temperature-controlled water.

A simulated radar antenna is submerged in the water and emits ultrasonic sounds instead of regular radar waves. The antenna represents the plane's antenna as it scans the countryside below.

Meanwhile the student is tucked away in a special booth outfitted to resemble his position in a bomber having the latest model bombsight. The student watches the progress of the plane on his radar scope. When the target is reached, he can release his "bombs" in the customary manner. He can see on his instruments a corresponding view of what he would see if he were actually

flying. Even scudding clouds can be added to the picture.

While all this is going on, the machine makes records showing the flight path of the plane, the time the bombs were released and the curve followed by the falling bombs. In figuring out the bomb curve, the machine takes the wind speed into consideration. The records can help the trainee improve his accuracy.

Since some bombardiers also are navigators, the simulator also is equipped to reproduce "friendly" radio beacon signals. If the instructor desires, he can introduce "enemy" radar jamming to make the problem more realistic.

The technical key to the machine lies in the fact that ultrasonic waves travel through the water only 1/200,000 as fast as radar waves speed through air. By using the water tank and an ultrasonic "radar" antenna that slowly moves through it, engineers could shrink the map to 1/200,000 the size of the area it represents.

Ultrasonic waves behave in the water exactly as radar waves behave in air. They are bounced back by the features of the relief map. They are converted into a conventional picture which the bombardier sees on his radar screen.

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## MEDICINE

## Raise Blood Pressure To Help MS Patients

► TREATMENT TO raise the blood pressure and stimulate the circulation was advised for multiple sclerosis patients in a report by Dr. I. Mark Scheinker of Cornell University Medical College at a conference of the New York Academy of Sciences and the National Multiple Sclerosis Society in New York.

This so far incurable disease of the central nervous system afflicts a quarter of a million people in the 20- to 45-year-age group. Destruction of the fatty sheaths around nerve fibers in various parts of the brain and spinal cord causes the symptoms which range from double vision to such severe muscle incoordination that patients may become bedridden.

Although the cause is unknown, Dr. Scheinker believes that paralysis of the walls of small blood vessels and their engorgement with stagnant, clotting blood plays a part. He found about two-thirds of all early, microscopically small multiple sclerosis damage spots located close to blood vessels in the paralyzed and engorged condition.

Out of 250 multiple sclerosis patients, 134, more than half, had markedly low blood pressure.

These two findings led him to the idea of treatment designed to raise blood pressure and stimulate circulation so as to counteract the blood vessel trouble that results in stagnation of blood and slowing down the flow to the brain.

Science News Letter, May 9, 1953

## ELECTRONICS

## Electronic "Brain" Plans Supply Problems Faster

► BETTER AND faster planning of Navy supply problems is foreseen through use of a new logistics computer unveiled recently at George Washington University.

Such weapons as radar, guided missiles, rockets and jets have tremendously increased the paper work involved in putting and keeping them in operation. The staggering record-keeping job is, however, less important than that of relating production material requirements to national resources.

The logistics computer will greatly speed up the handling of such data. It was developed jointly by the University, the Office of Naval Research and Engineering Research Associates, Inc.

It operates in a manner quite typical of all computers. Data are put into the "brain" by coded punched tape. An arithmetical unit performs the desired calculations, storing intermediate results as they are computed. The result comes out of the computer on punched tape and is converted to typewritten data by a tape reading machine.

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