ELECTRONICS

'Beast' Hears Like Bat

A self-navigating "Beast" equipped with a sonar device that enables it to "see" with sound and find its own "food" may be important in underwater explorations.

See Front Cover

➤ THE MECHANICAL "BEAST" that can think, eat, sleep and play, all on its own, has gained another human trait, hearing.

The Beast, which looks and sounds like a hatbox full of bees, is a product of the Johns Hopkins Applied Physics Laboratory, Laurel, Md. It has been equipped with a sonic guidance system to keep it from running into people and other obstacles.

Built to survive in a natural environment without human help, the Beast is known scientifically as a mobile automaton. It wanders around the laboratory halls seeking electrical outlets, which it feeds upon by plugging into a socket and recharging its 12 silver cadium battery cells.

The sonar system enables the device to see by sound much like a bat, but not quite as well, explained Leonard Scheer, project engineer for the Adaptive Machines Group that developed the Beast.

The machine, which weighs 100 pounds and is 18 inches high, actually has four "ears"—two that transmit signals and two that receive signals. The "ears" are transducers, tiny cylinder-shaped horns one-half inch in diameter.

The transmitting ears send out a 40-kilocycle signal from two sides toward the walls 25 times each second. The reflected signals are picked up by the receiving ears so that the Beast can turn left or right to position itself on the trip down the corridor.

The machine's sonar device is being tested for possible underwater uses, such as surveying or detecting wreckage. With the sonar device a machine would not have to scrape along the muddy bottom when exploring the ocean depths. Instead, it could keep a steady position near the ocean floor.

With the sonic guidance system the machine can ramble along the middle of the corridor at a greater speed. A time-exposure photograph on this week's front cover shows Mr. Scheer watching the Beast move down a corridor at the Laurel, Md., laboratory, as light traces its path.

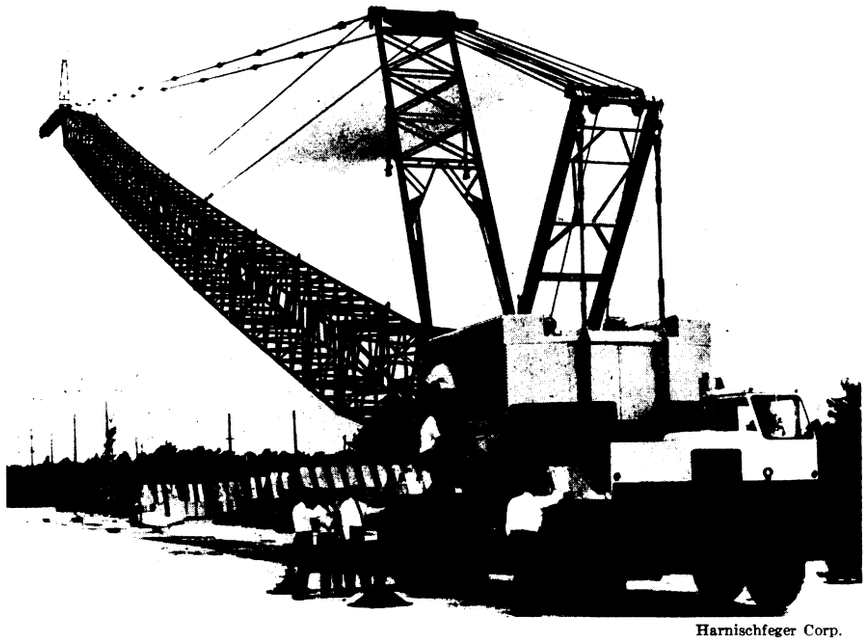
Without the guidance system operating, the machine spends its time bumping along the walls in search of electrical outlets to "feed" upon.

The machine moves approximately 12 inches a second when the sonar device is operating. At other times it averages about three inches a second.

The next step in the evolution of the Beast will be the addition of an eye.

An optical scanning device will let it identify outlet plates by appearance. The scanner will look out the side of the vehicle until it "sees" a cover plate of an electrical outlet.

• Science News Letter, 86:87 August 8, 1964



Harnischfeger Corp.

HUGE MOBILE CRANE—The "roadable" crane, developed by Harnischfeger Corporation, Escanaba, Mich., can lift a 125-ton load to the height of a three-story building. It can be stripped down from 82 tons, its working weight, to a mere 47 tons for road travel.

AGRICULTURE

Mechanized Date Picker Out-Dates Hand Method

➤ IT IS EASIER, cheaper and faster to pick dates by the bunch, and at the top of a mechanical tower.

With mechanized equipment, one man can harvest nearly 1,000 pounds of dates in an hour, while an experienced hand picker, suspended on a chain hooked to the tree, harvests only about 150 pounds in the same amount of time.

A tractor-pulled vehicle with two hydraulic operated towers, one on each side, has successfully passed tests by agricultural engineers of the California Agricultural Experiment Station, Davis, and of the Agricultural Research Service, part of the U. S. Department of Agriculture, Washington, D. C.

This is the way it works: four date pickers, two on each tower, are raised by hydraulically operated equipment as high as 45 feet to the fruit-bearing areas of the palm trees. Here they clip whole bunches of dates, instead of one date at a time.

When they have finished removing bunches from one tree, they are lowered, and the bunches are transferred to the base of the tower as the tractor moves to the next pair of palms. A mechanical vibrator shakes the individual dates from the bunches into bulk bins that can hold 1,000 pounds of fruit.

Tests indicate that dates can be handled for short periods in bulk depths of 18 or more inches without damage. With a minimum of labor and handling, the filled bulk bins are placed on a truck by a fork lift, taken to the packing house and unloaded with another fork lift.

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MEDICINE

Radiation Information Sought for Children

➤ CHILDREN and babies can take 20 times more radiation in their milk or in the atmosphere than adults, a team of scientists at the University of Cincinnati College of Medicine radioisotope laboratory has found.

The need for more accurate knowledge of radiation exposure of children when radioactive material is used in medical diagnosis, however, was emphasized by Drs. Ronald A. Seltzer, James G. Kereiakes and Eugene L. Saenger in the medical progress section of the New England Journal of Medicine, 271:84, 1964.

This type of information is frequently available for adults, the researchers pointed out, but in spite of the great concern over radiation exposure of children, information on "standard children" and their ability to withstand the effects of radiation is meager.

The average doses from radioactive isotopes during diagnosis are often smaller than those from routine studies by X-ray or fluoroscope, the investigators said, but because of certain "metabolic circumstances," the doses to selected organs may be considerably greater.

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