ELECTRONICS

One-Man Control of A-Sub

AN ELECTRONIC COMPUTER, no bigger than a breadbox, is being developed by the United States Navy to give one man total control over the complex functions of a nuclear-powered submarine.

The new system may permit reduction of A-submarine crews from the present average of 100 to only 12. It is described in *Naval Research Reviews* (Aug.).

World War II underseas craft required a control staff of eight men. Today's atomic subs are guided by three.

Known as SUBIC (Submarine Integrated Control), the system will provide the controller, or commanding officer, with visual displays of all the information he needs to run the ship, in war and peace. The data will come from five fundamental control systems — engineering, communications, weapons, environmental and ship.

These are the same systems that feed data to the numerous dials on today's instrument panels. The small, 40-pound SUBIC computer, capable of making 15,000 computations a second, will convert the raw data into simple television pictures.

In weapons control, for example, SUBIC provides a picture display that continually indicates the identity, position and movement of each target, as well as the submarine's own position and movement.

The engineering control display will indicate power-plant operation and status. In addition, SUBIC will provide an automatic means for effecting power-plant changes to compensate for changing conditions.

In communications control, SUBIC will utilize an automatic receiver-transmitter and an automatic coder-decoder unit.

Automatic monitoring, detection and elimination of air-supply contaminants will be part of the environmental control system. Also in this category will be damage detection as displayed on a television screen.

Ship control will include bathythermograph and other information on screen displays.

SUBIC is adaptable to small "killer" submarines and large ballistic-missile submarines, both of which have one-man airplane-type manual controls.

Science News Letter, August 29, 1959

PUBLIC SAFETY

"Nuclear Attack" Shows Non-Trained Can Help

A MOCK NUCLEAR ATTACK in Montgomery, Ala., demonstrated how effectively an ordinary citizen can help his injured neighbors who survive an atomic attack.

A 25-pound pack of TNT was detonated in pitch darkness, creating the effect of a nuclear explosion, complete with orange mushroom cloud. Non-medical persons treated "casualties" who had suffered the types of injuries expected to occur to persons 15 miles from the blast of a 10-megaton bomb, the equivalent of 10,000,000 tons of TNT.

Moments after the blast, "victims," some wearing moulage wounds and others wearing make-up, demonstrated such injuries as burned faces, ruptured arteries, fractured arms and legs. Some wandered aimlessly in circles, the victims of shock.

Those persons able to move about quickly began applying artificial respiration where needed and tourniquets to potential amputees. The actors in the demonstration were male and female personnel from Gunter Air Force Base.

Several men brought an emergency "buddy care" training kit, developed at the Gunter Branch of the School of Aviation Medicine, from a nearby building. Other men gathered and began bandaging the wounded, covering them with available blankets, and administering first aid.

These men had had no medical training except for instruction by other non-medical persons on the use of the medical kit.

The demonstration pointed out the probability that persons in the range of such an atomic attack will suffer injuries from fires, auto wrecks and radiation. However, some of these men and women, slightly injured, with as little instruction as 25 hours of first aid training, were able to save the lives of many of those incapacitated. Each branch of the military service now plans to include this instruction in the training program of every enlisted man.

Science News Letter, August 29, 1959

SIMULATED CASUALTIES—Men and women, with as little instruction as 25 hours of first aid training, are shown helping the injured, after a mock nuclear attack in Montgomery, Ala. The "bomb," detonated at night, was a 25-pound pack of TNT.

BOTANY

Powerful Pond Poisons Isolated by Scientists

"BLOOMING" PONDS and lakes can poison a farmer's livestock almost before he knows what is happening.

Now the complicated story behind these poisonings from scum-covered water is being simplified and some of the killer substances identified, a team of Canadian researchers told scientists at the International Botanical Congress meeting in Montreal.

A substance released when blue-green algae decompose—an endotoxin—is one of the lethal substances. It causes death quickly in very small doses, Dr. P. R. Gorham of the National Research Council of Canada reported. Huge amounts of dried algae cells were needed to extract and identify the fast-death toxin. Cells from the blue-green algae called microcystis have been mass-cultured, Dr. Gorham said, and the cells were toxic when given orally to sheep, calves and smaller animals.

Analysis and tests showed the endotoxin is an acid. Further research identified it as a toxic peptide that is quite stable.

There is also a slow-death factor, Dr. Gorham explained. This is caused by bacteria associated with the blue-green algae. Much larger doses of the bacteria are needed. One of the five bacteria found contaminating the researchers' algae culture produces the slow-death symptoms found in nature.

Co-workers with Dr. Gorham are Drs. B. Simpson, C. T. Bishop, E.F.L.J. Anet.

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