

AERONAUTICS

"Push-Button" Flying

First fully automatic flight control device is being tested by Air Technical Service Command. Has been installed on C-54 "Skymaster."

► THE FIRST FULLY automatic flight control device is now being tested by the Air Technical Service Command's All-Weather Flying Center, Columbus, Ohio.

"Push-button" flying is promised by the new instrument which will take off, fly and land an airplane by merely pushing buttons before the take-off to direct its flight. The flight controller, used in conjunction with the A-12 automatic pilot, has been installed in a giant Douglas C-54 "Skymaster" transport for first tests in actual operation.

The new development isn't a radio-controlled plane, but actually an automatic one which permits pre-selection of the course and destination. When the buttons are pushed, according to the ATSC flying experts, the plane will take off, fly a predetermined course to the place indicated by the original button pushed, and land itself automatically.

Designed to permit flights in all weather conditions, the new flight controller is declared to be "the most significant development in flight engineering" by ATSC officials.

Nerve center of the automatic flight controller is the master sequence selector, a huge automatic calculating machine that registers such variable factors as direction, distance and altitude and adjusts the flight of the ship to keep it on its course.

Placed on a runway, the plane using the flight controller can be sent on its way by a button push from the flight dispatcher, it is claimed. The plane's throttle moves up automatically to initiate the take-off. The brakes are unlocked after eight seconds and the plane is on its way.

At 800 feet, the pressure-stat operates to move back the throttle, the wheels are retracted and the aircraft climbs to its cruise altitude. The throttle is moved to cruising speed by the pressure-stat, the magnetic heading control adjusts the plane's course, and the air log records the distance covered in air miles.

As the plane reaches its destination, the air log signals approach to the airport. In landing, ATSC says, the automatically controlled plane comes down

to the selected radio compass station. It passes over a cone-of-silence marker that cuts the throttle, while the automatic pilot is being controlled by a compass locator station at the port's outer marker. A down signal fed into the elevator control causes the plane to lose altitude and come in to land in an inbound position. Then the take-off process begins to work in reverse as the plane comes down to 880 feet, report the ATSC engineers.

According to the ATSC flight experts at Wright Field who designed the automatic flight controller, the device is too bulky in its present stage of development to be used for anything but military or experimental purposes. They expect research and invention to make it more compact in time, but they will hazard no guess as to how long will be required to make the flight controller practical for commercial or private flying. Actual performance data on the automatic flight controller are still "classi-

fied material" and not available to the public, says the Army.

Emphasizing that the new development is not designed to cut down on the number of flight personnel, the ATSC says no tests have been conducted without pilots and engineers aboard the plane. The inventors of the automatic flight controller say no such tests are contemplated. They envision pilots monitoring the flight controller with engineers checking its performance. For military operations, they add, gunners will still be necessary in combat.

As the first completely automatic flying system, the "push-button" instrument does, however, promise future pilotless airlines for peace and war.

Science News Letter, February 23, 1946

CHEMISTRY-ENTOMOLOGY

DDT-Plus-Rotenone Spray Rids Cattle of Ticks

► DDT ALLIED with rotenone, one of the older insecticides, have formed a team that promises to defeat fever-bearing cattle ticks in the tropics. Applied as a fine, mist-like spray, the double-dose killer has cleaned up from 85% to 90% of the ticks on heavily infested animals over a period of a week. Both chemicals



CONTROLS FLIGHT—Push buttons on the Automatic Flight Controller installed in a giant C-54 "Skymaster" cargo plane are explained by Maj. Paul R. Biggers, project engineer on the development of fully automatic flight.

must be used for best effect; neither produces full results if used alone.

Experimental work on the new spray was carried on at the Inter-American Institute of Agricultural Sciences in Costa Rica, under the direction of Robert L. Squibb. The spraying has to be done carefully, to make sure that the droplets reach every skin fold where ticks might hide. When this is done, however, the

method seems to be fully as effective as tank dipping, the method hitherto in partial use in tropical American countries. It offers the considerable advantage over dipping that it can be used by any farmer on his home place, and does not involve driving the cattle to the tanks, which are often at quite inconvenient distances.

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forward bulkhead. They are entirely self-operative, and are actuated from regular static lines to the standard Kollsman altimeter and airspeed indicator located in front of the pilots on the instrument board.

The cabin control regulator is a fully automatic precision instrument that is set prior to flight. As the Constellation becomes airborne, the regulator begins to function and continually maintains the necessary pressure differential between the cabin and the outside at any altitude, and controls the air temperature. It relieves flight personnel of the duty of adjusting the pressure and temperature as altitude changes.

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MARINE BIOLOGY

A-Bomb Versus Fish

Results of test at Bikini atoll on fish and other animal and plant life will be investigated by biologists. Effects on fish considered most important.

► WHEN THE ATOM bombs burst over Bikini atoll in the forthcoming experimental explosions they will undoubtedly kill a lot of fish, and may do a good deal of damage to the trees and bushes on shore, and to the birds and other land animals that live among them. How extensive the damage, and how long it takes wildlife to return to a normal state afterwards, will be determined by precise and long-continued surveys that will be carried on by a group of research biologists. Plans for the study of these "bioatomic" effects are now being carefully formulated.

Effects on fish are considered most important. Elmer Higgins, chief fishery biologist of the U. S. Fish and Wildlife Service in Washington, D. C., is acting as liaison officer with the joint Army-Navy group that will conduct the bombing tests. He has designated three marine biologists chosen from the staffs of the Fish and Wildlife Service and the U. S. National Museum, who will concentrate on this one phase of the general problem. They will study the effects, both immediate and long-time, on three ecological groups of fish: inshore, offshore in the lagoon, and offshore in the open ocean.

A careful survey will be made of fish life in the area before the explosions, and at intervals for many months afterwards, to give as complete and continuous a picture as possible. A corps of expert fishermen is being recruited, to serve as assistants to the three biologists. The Navy will land small craft for use in this work, and also seaplanes for scouting schools of fish.

Although fish occupy the No. 1 position in the biological planning, they are by no means the whole story. Biological

specialists from several institutions will carry on studies on the plankton, or microscopic plant and animal life that is the ultimate source of all sea food, on the biology and geology of the coral reefs that build all atolls, on the beach and land animals, and on both marine and land plants.

Early objections to the bombing experiments, on the score of possible material harm to commercial fisheries and the whaling industry, have been overcome by the selection of Bikini atoll as the site. The fish here, though abundant enough, are too far from any possible market to be of economic significance, and the little island circle is remote from all known paths of whale migration.

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AERONAUTICS

Speed and Altitude of Plane Constantly Shown

► HOW HIGH in the air and how fast the plane is travelling will be known at all times by passengers in new giant Lockheed Constellations. Large flight instruments, placed where all may see, will give them the same information that only crew members in the pilot compartment now have. While their natural curiosity is thus being satisfied, their bodily comfort will be aided by a new automatic device that will control cabin temperature, ventilation and pressure.

Both the altitude-speed instrument and the cabin regulator are products of the Kollsman Instrument Division of Square D Company.

The two flight instruments are large and easily read, and are placed on the

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