

AERONAUTICS

TV Tubes to Replace Instruments in Cockpit

► A VERTICAL transparent television tube that may replace part of the front pane of an airplane's windshield has been developed in the Navy's long range plan to simplify cockpit design.

This revolutionary tube along with another flat plate television tube that would lie horizontally in front of the pilot is expected to replace all the scattered dials that are presently built into a plane's instrument panel.

During "blind" flying, the front tube would show an abstracted picture of what the pilot would see if there were no clouds to block his view. The bottom tube would show the geography of the area for navigation and traffic control purposes. Although the vertical screen is to be directly in the pilot's line of vision it will not interfere with his visibility, since he can see right through it, even when the image is projected. The screen is made of two plates of glass with a phosphor screen between.

Special data, such as fuel supply and power readings, could be superimposed instantly on one of the screens by pressing one of the six special levers on the instrument panel.

The Navy's ultimate goal is to replace all the dials, lights and gauges that clutter the instrument panels of modern airplanes with these two TV tubes. The principle of representing flying data in graphic form rather than with isolated dials is based on research in human engineering which has found that pictures are more quickly comprehended than conventional instruments.

The transparent screen was developed by Willys Motors, Inc., Electronics Laboratory in Palo Alto, Calif., and the entire program of simplifying cockpit design is being co-ordinated by Douglas Aircraft Company in El Segundo, Calif.

The aim of the program is to perfect the installation of these tubes, models of which are already in operation, and to reduce flying controls to two items, a throttle and a control stick. A plane with such equipment is expected to be flight tested in about 1958, a Navy spokesman said.

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METEOROLOGY

Low-Level Jet Streams Linked to Thunderstorms

► LOW-LEVEL JET streams, thin fingers of rushing air found about 1,000 feet above the ground, are linked to the formation of night thunderstorms, Dr. Alfred A. Blackadar of Pennsylvania State University told the American Meteorological Society meeting in New York.

The low-level jet is best developed at night, he said, and results from the oscillation of air no longer bound by the friction of daytime mixing.

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TRANSPARENT TV—Hand is seen through a model of a newly developed television screen which will stand vertically in pilot's line of vision. He can see through it, but flying information can also be projected on the phosphor screen.

MEDICINE

Color Test for Polio

► RED MEANS polio virus in a new detection test announced by the National Foundation for Infantile Paralysis.

The test is being used now to speed evaluation of the polio vaccine given to thousands of school children in a mass trial last summer. It could also be used to diagnose polio, though the fact that it may take seven days for a final answer in a diagnostic test limits its value for that purpose.

Dr. Jonas E. Salk, whose polio vaccine was used last summer, and his associate Dr. J. S. Youngner at the University of Pittsburgh developed the test under a March of Dimes grant. Here is the official description of how it works:

Use of the test depends on two things, monkey kidney cells and a chemical called phenol red.

Phenol red is a substance which turns yellow when acid is added to it. Monkey kidney cells produce acid when they grow and they are susceptible to the polio virus. It is a combination of these properties that makes the test possible.

In determining the presence of polio virus, phenol red is put in a tube containing monkey kidney cells. Under ordinary circumstances, as the cells grow they give off acid, and this makes the phenol change to yellow in color.

However, if material containing the polio virus is added to the mixture, the virus will kill the kidney cells. When dead, they cannot produce acid. So the fluid in the tube will remain red, a warning that it contains polio virus.

When the test is used to find the level of virus-stopping antibodies in the blood, part of the blood sample and some virus are put in the tube together. If enough antibodies are present, they prevent the polio virus from attacking the kidney cells.

Since there are three types of polio virus, many tubes of test material must be used when levels of antibody are to be precisely calculated. More than a million color tubes will be used throughout the country in the vaccine evaluation.

Before the advent of the color method, scientists were obliged to examine each tube under a microscope. The color method saves a lot of time, since one research worker can see a large number of results at a glance simply by looking at a rack of tubes.

Nevertheless, the monkey kidney cells used in the color test must be incubated for a considerable period, with the result it still may take seven days for a final report on a blood sample. Many hundreds may be run through at the same time in the same seven days but the search for an even more rapid test for polio virus, preferably one taking only a few hours, is continuing under grants from the National Foundation for Infantile Paralysis. Such a test would be of great value for prompt diagnosis of the disease.

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The brightly colored feathers of most male *ducks* are lost in summer molting and give way to a more somber plumage resembling that of the female.