

ELECTRONICS

German Tube Duplicated

In the record-breaking time of three days, American scientists duplicated a complicated radio vacuum tube left behind by the fleeing Nazis.

► AMERICAN scientists, in the record-breaking time of three days, duplicated a complicated radio vacuum tube which had never before been made in the United States so that Yank fighting forces in Europe could make use of strategic telephone communications equipment abandoned by the Nazi armies in their retreat in Belgium and France, reports the *Bell Laboratories Record*, (March).

In retreat the Germans had left their communications equipment substantially intact, except that they removed nearly all the radio tubes. They probably thought that without the tubes we could not operate the telephone equipment and there was little chance of our being able to duplicate a strange-looking tube which we had never produced before.

But, once again, the Nazi judgment was wrong.

Our Army turned a sample tube and the problem over to an official of the Office of Scientific Research and Development. It wanted 1,000 duplicates at once. Rushed to the United States, the tube was examined by engineers of Bell Laboratories and the Western Electric

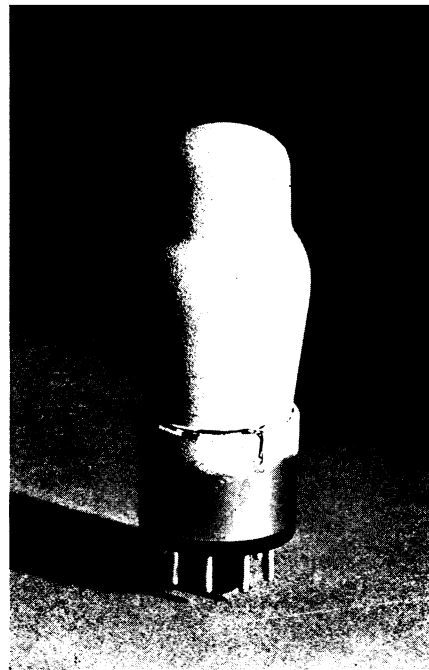
Company. Included in the group were J. O. McNally, G. T. Ford, C. Depew, and W. Gronros.

The German tube was a cathode-type pentode made by Siemens Halske. It was different from any known American tube not only in electrical characteristics and in heater voltage but also in the dimensions of the bulb and base and in the arrangement of the pins which fit into the socket base. Furthermore, as is common in Europe, the bulb of the tube was sprayed with metal for purposes of electrostatic shielding.

Within three days eight replicas of the German tube were designed from available parts used in American tubes, some of which had to be adapted, and the tubes were on their way to the battlefront in Europe. Within three weeks the entire 1,000 tubes were delivered. Equipped with these tubes, the Nazi communications equipment worked.

For the part they played in designing and making the tube, Dr. Vannevar Bush, Director of OSRD, sent a special telegram of commendation to the scientists responsible.

Science News Letter, March 31, 1945



RADIO TUBE—This is one of the thousand tubes that were duplicated to put a German telephone system to work for our Army.

in the Arctic regions show caves that are good for shelter. The Quartermaster Corps has maps keyed to the clothing they should issue in any month in any part of the world.

The paper on which Army maps are printed will stand abuse in the tropics, desert, arctic, and at high altitudes, Lt. Col. Mast revealed. It can be folded 3,540 times in one place before it will tear.

In describing the tests to which the map paper was put before it was accepted, Col. Mast stated, "We ran it through a G.I. laundry with dirty clothes, then dried it. We wet it again and tacked it on the floor for people to walk over for a day. Mud, axle grease, and paint were slathered over it, and it was dipped in gasoline. Most of these tests didn't noticeably affect it."

One of the testing engineers got a little desperate in the face of the paper's indestructibility. He took a section from the map being tested and burned it. His report concluded, "Map burns easily."

Science News Letter, March 31, 1945

The *milkweed butterfly* secretes a disagreeable fluid to keep from being eaten by birds.

Oystershell and grit not only help the hen digest food but also help supply the calcium carbonate of which the eggshell is almost wholly composed.

CARTOGRAPHY

"Handkerchief Map"

► MORE MAPS than were ever needed in any other conflict are required to fight World War II, reports Lt. Col. Frederick W. Mast, executive officer of the Army Map Service. In the Normandy invasion each soldier was supplied with over 130 square feet of maps. These maps are about equal to 40 or 50 road maps of the type distributed at gasoline stations. For this one operation about 70,000,000 maps, over 3,100 different kinds, weighing 3,480 tons, were produced.

"Every branch of our fighting forces requires special maps," Col. Mast pointed out. "Our paratroopers are supplied with maps that glow in the dark, so they don't have to use lights . . . which might give them away to the enemy. Our amphibious forces have maps that show high and low water areas, cliffs, and particu-

lar beaches that are likely to be slimy and slippery at low tide."

Speaking as the guest of Watson Davis, director of Science Service, on "Adventures in Science," a CBS radio feature. Lt. Col. Mast continued, "Perhaps one of the most interesting maps is the map now found in many air-sea rescue kits. It is printed on a Celanese pocket handkerchief which is proof against salt water and sun heat."

It was pointed out by Mr. Davis that this handkerchief map has probably saved the lives of many of our men forced down at sea.

In the battle of North Africa against Field Marshal Rommel, General Wavell had special maps which showed the probable movement of sand dunes during certain seasons. The maps our troops use