TECHNOLOGY

Radar-Proof Plane

Jets made of reinforced plastic, Fiberglas coated with a Bakelite resin, would be almost completely electronically transparent. Mass production would be up to 80% cheaper.

➤ A PLASTIC-TREATED material promises to make aircraft nearly radar-proof, to let supersonic planes fly even faster, and to slash airframe production costs by 80% by cutting down the need for skilled labor and high-priced equipment.

It even may revolutionize the present aircraft industry by pointing the way to future low-cost, high-performance plastic military bombers and supersonic fighters.

William E. Braham, chief engineer of the Zenith Plastics Co., Gardenia, Calif., told SCIENCE SERVICE that some experimental aircraft parts already have been molded of the new plastic material and have been tested successfully by his company.

Subsequent experiments showed the material is "almost completely electronically transparent." Mr. Braham, who supervised design of Lockheed's first giant Constellation transport, explained that most radar waves go right through the plastic. A small percentage is absorbed by the material. Practically none are reflected into the searching eye of a radar set.

This means that the radar target is reduced from a whole airplane to a few radar-wave-reflecting metallic parts such as would be found in the engine. The probing eye of radar would have to look pretty hard to spot a plane or guided missile made of the reinforced plastic, he said.

The material used in the laboratory tests, and which is also spotted here and there in current military aircraft, is Fiberglas coated with Bakelite plastic resins. The material offers a solution to design and high-temperature problems of supersonic aircraft, Mr. Braham reported to the Society of the Plastics Industry meeting in Washington.

High temperatures have less effect upon the reinforced plastic, as it is called, than on light metal alloys. Thus the material offers glittering promise to design engineers creating the supersonic aircraft that will be the planes of tomorrow.

Heat generated by friction when airplanes ram through air at supersonic speeds is a real problem. A plane flying 1,300 miles an hour at sea level may get as hot as 300 degrees Fahrenheit in spots. Above that temperature, the strength of aluminum alloys falls off rapidly, making the plane less reliable.

The new material, however, can withstand temperatures as high as 500 degrees Fahrenheit without sacrificing an appreciable amount of strength. Certain types of glass cloth treated with the new resin do not bend under load any more than aluminum or magnesium alloys when put on an equivalent weight basis. The plastic material is lighter than aluminum.

The economic secret of the material lies in its simplicity. Molds of wing sections or even fuselage sections are made first. Then the glass fiber is strewn over the mold in the proper thickness. The fiber is impregnated with the plastic resin and is allowed to set. This is repeated until the part takes the proper size.

All of this can be done by men who can be trained in a week to do an expert job of it. Little expensive equipment is needed.

The result is a tough substance that not only plays hide-and-seek with radar and that resists withering temperatures, but also one that is immune to corrosive effects of sea water, air, high humidities, aircraft fuels, hydraulic fluids and lubricating oils.

Mr. Braham envisions the day in the near future when whole wings and fuselages will be made by the revolutionary process. He estimated the economics of the material would cut structural design manhours 80%. A similar saving in production time seems likely. Giant assembly plants should shrink to a more reasonable size.

All this will be accompanied by a superior product, he believes. And with new Bakelite resins currently being developed, possibly airframe design and manufacturing costs will be cut even further.

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BACTERIOLOGY

Flu Germ Found More Complex Than Imagined

➤ THE INFLUENZA germ, or virus, is a complex one. When it gets into the cells of your body, it forms something scientists call elementary or inclusion bodies.

Each of those 'flu virus elementary bodies, far too small to be seen even with the most powerful light microscopes, consists of an aggregate of smaller units, several scientists have theorized from the behavior of the virus.

Now proof, or at least "support," for this theory is presented through electron microscope studies by Dr. L. Hoyle of the Public Health Laboratory at Northampton, England, and Drs. R. Reed and W. T. Astbury of the University of Leeds.

With this microscope, the scientists have found particles that carry the red blood cell agglutinating fraction of the influenza virus, and also particles that carry the complement-fixing antigen of the virus. Each particle is about 120 angstrom units in size, one angstrom unit being four billionths of an inch. The studies are reported in *Nature* (Feb. 7).

Science News Letter, February 28, 1953

NAVY'S FLYING SUIT—Latest entry in the battle to keep humans alive in the frigid, nearly airless heights above 50,000 feet is this full pressure flying suit developed for the U. S. Navy.