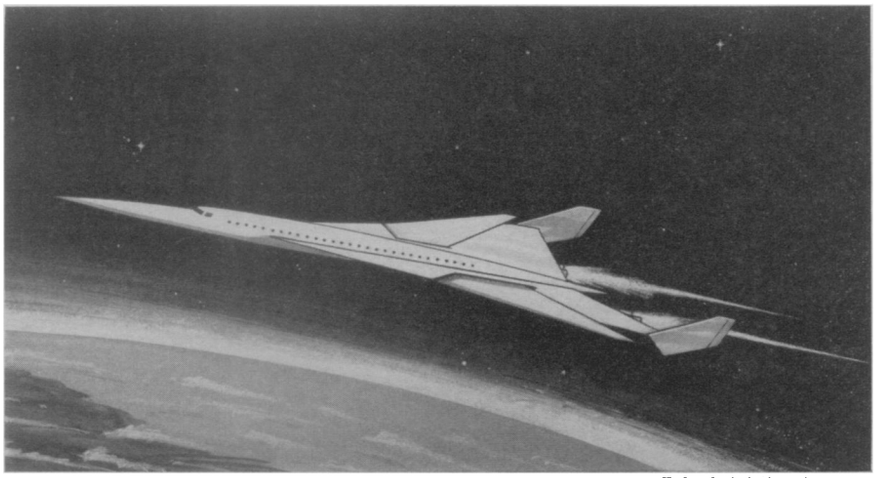

Federal Aviation Agency

SUPERSONIC FLIGHT—Shown is an artist's conception of a versatile U.S. supersonic transport flying at full speed 75,000 feet above the earth with the wings swept back. The wings are extended when the plane flies at a slower speed and closer to earth.

AERONAUTICS

Supersonic Transport Plan

The U.S. may soon develop civilian supersonic air transports that will make it possible to fly from New York to Europe in two and one-half hours, Ann Clarke reports.

➤ A FULL-FLEDGED research program for rapid development of a civilian supersonic transport in the U.S. was recommended by ten top U.S. aviation experts on the Federal Aviation Advisory Committee. Specific cost estimates are to be provided for Federal Aviation Administrator N. E. Halaby, who appointed the committee and will make recommendations on the project for President Kennedy early this summer.

In past statements Mr. Halaby has called a transport to fly two or three times the speed of sound "the single most important aircraft development."

The British and French announced plans last November to produce jointly a supersonic plane for test in 1966 and for commercial use in 1970.

The British and French plane would travel at a speed of Mach 2.2 (about 1,450 miles an hour). The U.S. is considering production of a plane that travels in ranges up to Mach 3. The first U.S. planes would probably travel about 1,700 miles per hour at an altitude of 75,000 feet, carrying about 150 persons. This would make it possible to fly from New York to Los Angeles in less than two hours and from the U.S. to Europe in two and a half hours. By 1964 or 1965 the U.S. may begin work on a plane that travels 2,500 miles per hour.

An important difference between the U.S. and the British and French supersonic transport is that the U.S. plans to use steel or titanium alloys in building such planes while the European transports will be made of aluminum. The use of steel or titanium will permit development of faster planes because the metals can withstand higher temperatures created by higher air speeds.

Thirty-one million dollars, a mere fraction of the total cost of the development of the Mach 3 planes, has already been invested in exploratory research in the U.S. The estimated cost of the U.S. project is $750 million to one billion dollars, more than one and a half times the cost of the British and French development.

The $31 million appropriated in the U.S. was to be used for extensive research by the Federal Aviation Agency, the U.S. Department of Defense and the National Aeronautics and Space Administration during the two fiscal years ending June 30, 1963. After the British and French announcement the U.S. Supersonic Transport Advisory Group turned in their recently announced report six months ahead of time.

They are now making a detailed study of costs of continued U.S. development of supersonic air transports. The report contains data on research on aerodynamics, propulsion, materials and operating problems.

Military planes are now flying at supersonic speeds. The RS-70, a 2,000-mile-per-hour "reconnnaissance-strike" Air Force plane will be tested this spring. It replaces the 1,300-mile-per-hour B-58, which was produced for the last time in 1962. The Navy has planes in the Mach 2 to 2.5 range, including the Phantom 2, the Vigilante and the Crusader.

These supersonic military planes cannot be developed into civilian supersonic transports. The military planes have greater fuel requirements than would be practical in a commercial plane, produce too much engine noise, are designed for rapid take-off and acceleration, and construction of the plane is not adequate for carrying passengers or cargo.

Civilian supersonic transports need engines that operate at subsonic speeds as well as within Mach 2 and 3 ranges. Wing design, the number of engines to be developed, and economy in operation and construction pose enough research questions to require a crash program. It is estimated that it would take at least six years to develop a supersonic airplane after a thorough basic research program was underway.

• Science News Letter, 83:54 January 26, 1963

TECHNOLOGY

"Cold Motor" Firing Provides Important Data

See Front Cover

➤ IMPORTANT INFORMATION on big motor performance under extreme low temperature conditions was provided by test firing of a large solid rocket motor.

The Spear 4, a production motor, was loaded with over 6,500 pounds of Polycarbutene-T propellant at Lockheed Propulsion Company's Potrero facility. It fired at minus 82 degrees Fahrenheit after prolonged environmental cycling to temperature extremes not heretofore imposed on a large solid motor.

Seen on this week's front cover is the Spear 4, blanket-wrapped to maintain its minus 82-degree temperature, as it burns successfully. This photograph was taken approximately two seconds after ignition.

Firing followed 40 days of cycling. The motor made two complete cycles through minus 80 degrees and plus 160 degrees. Then it was lowered to minus 100 degrees for 24 hours, after which the conditioning box was set at minus 80 degrees until the motor was removed for firing.

Data gathered through this test show that large solid motors can perform reliably under extreme environmental conditions such as those encountered in aircraft operations or in the Arctic.

Spear 4 was the fourth in a series of recent Lockheed research vehicle firings designed to provide large motor verification of new design concepts and materials.

• Science News Letter, 83:54 January 26, 1963

TECHNOLOGY

New Fast-Starting Jet Engines Used for Ships

➤ A NEW MARINE powerplant, using a modified jet (J-75) engine with a free turbine, will power ships. The new engine, designed for the advanced hydrofoil and other types of ships, produces up to 30,000 horsepower and can be brought to full power in minutes instead of the hours required by conventional steam powerplants. It was developed in joint program between the U.S. Navy Bureau of Ships and Pratt & Whitney Aircraft.

• Science News Letter, 83:54 January 26, 1963