

## AERONAUTICS

# 'No Contest' Seen For SST

The merits of the variable-sweep wing design for the supersonic transport plane are still being debated although it appears to be superior—By Jonathan Eberhart

► THE SUPPOSEDLY hard-fought supersonic transport (SST) design contest appears to be an open-and-shut case, according to many industry and airline officials.

"There's no choice," said a spokesman for a large aircraft manufacturer not competing for the two billion dollar contract. "Boeing's design is so obviously the way to go, it's ridiculous." Other industry voices have expressed similar feelings.

The Boeing Company is competing with Lockheed Aircraft Corporation for the award, which is now scheduled to be announced around Feb. 1, 1967.

The main difference between the two designs is the wings. Boeing's proposal is for a variable-sweep wing, such as that used on the F-111 fighter plane. The wing would be moved back in flight to provide less resistance during supersonic speeds. Sweeping the wings forward again would provide the higher lift needed for landings.

Lockheed uses a fixed "double-delta" wing in which the inner portions—the ones in near the fuselage—have a leading (front) edge that is much more severely swept back than the rest of the wing. The sharply-angled sections would permit the smooth airflow needed for supersonic flight, while the remainder of the "double-delta" would provide low-speed lift.

Boeing's design has about 5,000 square feet of wing area, while Lockheed's has about 9,000 square feet. This, said an airline official, produces too much drag for the other side of the sound barrier.

Frank W. Davis, president of the Fort Worth, Texas, division of General Dynamics Corp., builders of the variable-sweep F-111, cited "higher speed, quicker climb-out, more efficient loiter (low-speed flight), slower landings, smoother ride in rough air, and smaller parking space" as "important and desirable characteristics in commercial as well as in military aircraft."

## PSYCHOLOGY

## Astronauts' Vision Acute

► ASTRONAUTS have added a new "dimension" to sight, which in its physical and intellectual sense, will make possible the long-anticipated rendezvous in space, a Minnesota ophthalmologist told SCIENCE SERVICE in Arlington, Va.

"This incredibly complex maneuver of rendezvous," said Dr. W. Bruce Clark of the Nicollet Clinic, Minneapolis, "will be aided by computers, but the final fine adjustments will be dependent upon the individual astronaut's control, such as a driver has in stopping a car at the right moment or split second, and the housewife's control of the laundry machinery."

At a scientific meeting on Research to Prevent Blindness, Inc., Dr. Clark later pointed out that most of the talks at the meeting had been on abnormal or diseased eyes, whereas he was speaking of healthy eyes.

"When I speak of seeing," he explained, "I am talking about a complex process which involves intellect and experience as well as optics."

Astronaut Gordon Cooper on his Mercury shot surprised many people by relating what he saw from orbit. He used available "clues" on his retinae, Dr. Clark pointed out.

Maj. Cooper reported after flying the last Mercury capsule, Faith 7, in 1963, that he had been able to see a train with his unaided vision. This was met with considerable skepticism, so on his next space journey, aboard Gemini 5, Cooper tried to locate another train to show his co-pilot, rookie Astronaut Charles Conrad.

The train was there, Cooper reported, but unfortunately Conrad was asleep at the time. By the time the astronaut was sufficiently awake to see the train, the spacecraft had already flashed past it.

Still, reports from several astronauts of

Another reason for predictions that Boeing will win is the "share-the-wealth" system. This is not an official Government policy, but simply an idea that all the money should not go in the same pockets.

Lockheed recently won the contract to build the huge C-5A transport. This could mean that Boeing has a better chance of winning the SST design contract.

The design-winner announcement was to have originally been made on May 1, 1964. Congress appropriated \$60 million for matching and evaluation funds during fiscal 1964.

Time extensions carried the contest well into this year, and on July 1 President Lyndon B. Johnson announced an additional 18-month extension, beginning Aug. 1, for which he asked Congress for \$140 million.

With the U.S. SST program running almost three years late, competition is coming from Europe, where the joint British-French Concorde is under construction.

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GCA

**WEATHER SPHERES**—A technician inspects "Canary" meteorological spheres which self-inflate when deployed at high altitudes. Developed by GCA Corporation, Minneapolis, Minn., they permit radar tracking to obtain a number of measurements as the sphere descends to lower altitudes.

being able to see details as small as city streets support theories of good "spacesight."

"Too few of us realize that even on earth we do not have to see rails, wheels, springs, couplers and cow-catchers in order to recognize a train unless we never before have seen one and have to recognize it on the basis of a verbal description. All we need is a long, solid, dark line moving along another longer line. A steam locomotive adds another clue, the smoke appearing as a line diverging from one end of the moving dark line."

The public misconception about visual capabilities demonstrated by Astronaut Cooper and the other Gemini astronauts was caused by three things, only one of which was valid, Dr. Clark said.

The valid misconception was that much of the earth is covered by clouds. But visual capability is not restricted very long by clouds. If the mission is long enough, an unencumbered view of any specific area can be expected eventually.

The other two reasons for misapprehension were: it was anticipated by many people that the earth's atmosphere would cut down contrast to the point that vision would be useless in space; the most serious obstacle was that interpreters of key psychophysical studies failed to recognize the fact that laboratory measurements could not be the same as actual human seeing, with the variables of intelligence and experience.

The limits of our visual capability have not been reached, he believes.

"Future space crews will function at the extreme limits of their capabilities, utilizing color, shading, texture, lines, breaks in lines, two-point discrimination, lights and contrasts," Dr. Clark said. Acute vision with the naked eye adds to the usefulness of artificial devices such as telescopes and cameras.

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