WHO WANTS TO FLY AT 2,000 MPH?

A SUPersonic AIRCRAFT WILL COST $600 MILLION AND COULD CAUSE

In its list of requirements for an operational SST, the Federal Aviation Agency says any supersonic transport would have to meet certain conditions. Testing supersonic aircraft: "I'll tell you the truth. My family didn't mind it one bit. In downtown Oklahoma City, the Civic Center, where I work, we could hear the sonic booms."
In Oklahoma City an agitated housewife claimed that every time a supersonic airplane flew over her house, the resulting boom would make her jump and break her brassiere strap.

In Springfield, Ohio, the FBI arrested Gilbert Hagerman, 57, an industrialist-turned-farmer, for firing bullets into a pair of B-52s, the country’s largest operational bombers, designed to deliver nuclear weapons anywhere in the world. Hagerman claimed the planes were disturbing his livestock.

At the White Sands Missile Range in New Mexico, Gordon Bain, director of the nation’s supersonic transport (SST) program, was telling newsmen that many people who claimed their property had been damaged by sonic booms were only imagining the damage. “I believe there’s a great deal of the psychological in this,” he explained, when—WHAM! A jet fighter pilot in an F-104 broke through the sound barrier at an altitude of only 500 feet. The booming shock wave which followed blew out two 7x12-foot plate-glass windows from a dummy store front, shattered another 15 panes of glass in a near-by greenhouse.

Said Bain after the stunned reporters had collected themselves: “That’s a good illustration of what a heavy boom would do.”

The above three occurrences have one factor in common: NOISE. How much noise will the public tolerate in order to fly faster than the speed of sound, roughly 680 mph at sea level?

That’s the $600 million question currently facing the nation as a Presidential commission decides on whether to give the red or green light to the construction of a supersonic transport (SST) which will carry from 125 to 160 passengers at a cruising speed of 1,500-2,000 mph for a range of 4,000 statute miles.

When an airplane flies faster than sound, pressure waves build up around the aircraft. These pressure waves spread in all directions, like the ripples which spread when you drop a stone into a placid lake. These pressure waves cause sound when they reach your ear. A sharply cracked whip makes the same sort of sound. Any object exceeding the speed of sound—bullets, missiles, artillery shells—can make sonic booms.

The strength of a sonic boom is expressed in pounds per square foot of overpressure (pressure above the normal weight of air). Many factors determine how loud the sonic boom will be. A few of these are the size, weight, design, speed and altitude of the aircraft—also the wind, terrain, temperature and amount of moisture in the air. The heavier and faster the plane, the lower its altitude, the hotter the day—the louder the sonic boom.

In its list of requirements for an operational SST, the Federal Aviation Agency says any supersonic transport flying in this country should generate a sonic boom overpressure of two pounds or less.

Leading medical authorities have testified that two pounds of such pressure cannot injure the average person. Strong sonic booms, however, of more than two pounds can break glass or aggravate plaster cracks.

To date the Air Force has paid out $813,591 to individuals claiming damage as a result of sonic booms.

The FAA has been testing the boom in two phases designed to answer the two major questions: (1) Can people take it? (2) Can buildings take it?

The study of human tolerance to the boom phenomenon took place last year in Oklahoma City from February 3rd to July 30th. The second phase regarding the effect on buildings started November 18th in New Mexico and will end this February.

Oklahoma City endured 6 months, or 178 days, of boom runs, with 8 scheduled flights per day, from 7 A.M. to 1:20 P.M.

**HOW PEOPLE FELT ABOUT IT**

How did the people there react to the sonic noise?

Says Kyk Logan, city editor of the Daily Oklahoman: “I’ll tell you what it’s like. You know the man who moves into a house on the side of a highway? The first few weeks the traffic noise of the trucks bothers him. After a while he gets used to it.

“The first few weeks in February,” continues Logan, “people here talked about the boom all the time. We started to keep a log of complaints. After a while we gave it up. The same people griped all the time.

“For my money the sonic boom is a nuisance at the beginning, but the average community can learn to live with it. It’s like living with horn noises from an automobile. Nobody likes to get honked at, but you sure wouldn’t give up automobiles because of a little noise. I’m all in favor of an SST. That’s progress, man.”

A secretary who works in a public relations office told PARADE: “It was irritating to start with, but I got where I didn’t notice it. Some people, of course, are more sensitive than others. They kept saying, ‘What do we need this for?’ ”

A housewife’s opinion: “Some days the noise sounded like distant thunder. Other days I didn’t hear it at all. They sent planes over the city from different directions, and it all depends where you were. A lot of my neighbors felt strongly about the inconvenience, but after a few weeks I took it completely in stride.”

Mrs. Jimmie Sorrells, a switchboard operator whose home was in line with the flight path taken by the testing supersonic aircraft: ‘I’ll tell you the truth. My family didn’t mind it one bit. In downtown Oklahoma City, in the Skirvin Tower where I work, we could hardly hear or feel the booms. More people in Oklahoma City are for the SST than against the SST. Most of the people who objected to the noise were the old people. Generally they’re satisfied with things, and they’re against progress. I’m for it.”

To determine with some degree of accuracy the public reaction in Oklahoma City, the FAA established a telephone complaint center and had public opinion polls taken by the National Opinion Research Center.

Preliminary data from the Oklahoma City Sonic Boom Study shows that in the test period of 26 weeks in which approximately 600,000 people were subjected to 1,253 booms, the complaint center received 12,588 telephone calls and letters.

The peak time for complaint calls was mid-morning, and the majority of callers were housewives.

The average number of complaint calls per test day was 70.7.

A total of 2,170 formal damage claims were filed and processed as of July 30th, 1964. Approximately 160 of these were approved for a total of $8,608, or an average of $52.81. There was not a single complaint from any hospital, and all the damage claims paid pertained to plaster, glass or miscellaneous bric-a-brac breakage.

A 10 per cent sampling of the first 2 public opinion surveys revealed that of the 10,000 interviews conducted, from 10 per cent to 20 per cent of the Oklahomans questioned “indicated various degrees of negative reaction to the sonic boom.”

If it follows that 10 per cent of the nation’s resi-
Proposed Boeing SST is shown with variable-sweep wing all the way back, ready for an 1,800-mph cruise.

New Lockheed 2000 SST model features huge delta wing, 250 seating capacity, 2,000-mph flying speed.

DAMAGE WITH SONIC BOOM. SHOULD WE BUILD IT?

by ARNO JOHANSEN

The major question here is, who pays for it? The late President Kennedy felt the federal government coupled with the cost and private industry development, would be the best approach.

Phil Bono, in charge of Douglas Aircraft's advance launch vehicles section, believes McConachie may be right. Bono is working on a project called Pegasus, a
sidents find irritating the noise from supersonic aircraft, does that comprise sufficient grounds for preventing the SST from being built?

Najeeb Halaby, the brilliant flying director of the Federal Aviation Agency, thinks not. "There are three ways," he declares, "in which the problem of the sonic boom can be solved: design, distance and detour. You design a plane in terms of shape so that it produces a minimum pressure signature. You equip it with more powerful engines so that it can fly higher. Then the carpet of booms it lays can hardly be heard. You also plan the route so that you avoid sound sensitive areas."

**ENGLAND & FRANCE NOT WORRIED**

When I raised the question of the sonic boom in England and France last year—the French and British teamed up until recently to develop their own SST, the Concorde—I was told they weren't really worried about the sonic noise problem.

"Our transsonic flights from London to New York," explains Charles Gardner of the British Aviation Corporation, "will be largely over the ocean. Only the fish will hear them. The major problem facing us is not noise. It's money."

The British and French thought originally that they could develop a 1,400-mph Concorde, building only 2 prototypes for about $300 million. If they go ahead with their project—and the British Labour government has temporarily called a halt to it—a more realistic figure will be $900 million.

American aircraft manufacturers estimate that it will cost somewhere around $1 billion to research, develop and produce an SST capable of flying at 2,000 mph. Halaby thinks it can be done for $600 million.

The major question here is, who pays for it? The late President Kennedy felt the federal government might pay 75 per cent of the cost and private industry the remainder. But private industry claims it cannot risk $250 million on research and development plus further tooling costs to meet a production schedule. The aircraft manufacturers point out that since the federal government makes heavy nonrecoverable payments to support highway and maritime programs, it might as well do the same for the SST. They want a free ride, and under those terms Uncle Sam may not be willing to play ball, although those are the ground rules in Great Britain, France and Soviet Russia.

Since the building of an SST engenders problems of noise, economics and financing, several leading personalities in the aviation field believe strongly that it should never be built.

Foremost of the pessimists is Bo Lundberg, chief of Sweden's Aeronautical Research Institute and a military aircraft designer himself. Lundberg flew to Oklahoma City this past summer to witness the FAA sonic tests, then announced that what he had heard was the boom of doom. He predicted that if the various nations of the world persisted in building SSTs, Europe and the U.S. would be crisscrossed by a series of "boom belts" 20 miles wide, that hundreds of thousands of people in flight paths would find life unbearable. U.S. aviation authorities regard this as nonsense.

Even if the sonic booms were eliminated, Lundberg said, there was the safety factor to consider. A pilot flying at 65,000 feet at twice the speed of sound, he pointed out, was practically blind, had no time to take evasive action to avoid danger ahead. He claimed that knowledge of atmospheric conditions at high altitudes was scant, asked what would happen if an SST at 1,200 mph ran into a hailstorm.

The Swede also claimed that the SST would be too expensive, that passengers would find it uncomfortable, that because of its long climb and descent they would have to remain strapped in their seats most of the flight.

Grant McConachie, president of Canadian Pacific Airlines, thinks the development of a supersonic transport is a waste of time and money because such aircraft will be quickly dated in the 1980s by rocket ships capable of whisking 170 passengers and 18 tons of cargo above the atmosphere from continent to continent at 17,000 mph.

McConachie conceded that Canadian Pacific Airlines planned to spend $75 million on 3 American SSTs in 1977, "but these," he maintains, "will be obsolete by 1985."

Phil Bono, in charge of Douglas Aircraft's advance launch vehicles section, believes McConachie may be right. Bono is working on a project called Pegasus, a proposed passenger ballistic transport, a reusable one-stage rocket ship that would whisk passengers from Los Angeles to Honolulu in 18 minutes, to Tokyo in 30, to the most distant point on the globe in 45.

Bono believes that if we can put a man on the moon by 1970, and the moon is 240,000 miles from the earth, then certainly we should be able to rocket a group of passengers 12,400 miles, or halfway around the globe, by using the same or modified techniques developed during the lunar program.

"We cannot afford to dismiss rocket transport," he warns, "as a far-fetched, impractical pipe dream. Pegasus could carry passengers 20 times faster than today's jets and 7 times faster than the forthcoming supersonic transports. We must design today as if the next 10 years had already passed."

**INDIVIDUAL COUCHES**

Bono envisages his rocket ship as 114 feet high and 49 feet wide. The upper end would contain a 4-deck passenger area, and each level would be fitted with 43 individual couches on which travelers would ride during their brief flight through space. According to him, the rocket would be propelled by liquid oxygen and hydrogen and be controlled by a two-man crew; a ticket would cost little more than a ticket on today's jet, providing the cost of producing liquid hydrogen can be reduced.

Bono estimates that his Pegasus would cost $3 billion to develop, the first production model $63 million, subsequent models about half that amount.

The key figure in deciding whether or not the U.S. will go ahead with the development of a supersonic transport, for which the Federal Aviation Agency has already received 97 commercial orders, is Secretary of Defense Robert McNamara. He was recently named head of a committee to review the feasibility of the entire project.

McNamara has become President Johnson's "hatchet man." Fearless and factual, resolute yet reasonable, it was he who announced the cutback of government shipyards, military posts and the Army Reserve.

If we are not to fly at 2,000 mph in the 1970s, if the American SST is not to be built, it will be McNamara who will make the announcement.

If, on the other hand, the decision is Full Speed Ahead, the words in all probability will emanate from the White House.

Next month the nation should know.