Bottom surface reshaped
In order that the wing will still lift the airplane, the bottom edge of the wing has been shaped so that it will push the air downwards. This results in an upward push on the wing which lifts the plane and allows it to fly.

Wind tunnel tests indicate that the new wing might allow modified jets to cruise at 35,000 feet at more than 600 miles per hour air speed. That is at least 100 miles per hour closer to the speed of sound than today's fleet of passenger airplanes can fly.

For the past year North American Rockwell has been building a full-sized wing at their Los Angeles plant. The 43-foot-long wing cost $1.8 million, but if it performs as expected it should usher in a new era of subsonic jet travel—higher speed with no fuel increase, which means lower travel costs per mile flown.

But NASA will not know for sure until early next spring when the modified F-8 aircraft will fly with the new wing from NASA's Flight Research Center here.

Radical wing may undercut SST jetliner
By Eric Burgess
Staff correspondent of
The Christian Science Monitor

Edwards, Calif.

A new generation of faster passenger jets before the supersonics—that is the vision of flight-test engineers here.

They are readying a radically new wing for installation on a modified F-8 aircraft at this desert test center of the National Aeronautics and Space Administration.

The new "supercritical wing was developed by NASA's Langley Research Center, Hampton, Virginia. If it proves out as well in flight tests as it did in the wind tunnel, it may add as much as 100 miles per hour to the top speed of subsonic jet transports.

That would cut half-an-hour from cross country flights.

Today's jets carry passengers at a top air speed of about 530 miles per hour cruising at 35,000 feet. They are limited because the air flowing over the top of a curved wing must go faster than the aircraft itself to get around the curve. It is analogous to wind howling round a sharp corner.

Shock waves develop
If the air speed over the wing reaches the speed of sound, the air develops shock waves. Then it is harder to push the plane through the air, so that its efficiency falls. Like a boat plowing through rough water, more fuel is needed to travel a given distance.

And because of the roughened air flow the passengers get a rough ride; the aircraft is buffeted by severe turbulence from the self-generated waves.

An SST overcomes the problem by the brute force of going much faster than sound. Present jets travel only eight tenths of the speed of sound. Even to reach this speed, subsonic jets have to use swept back or v-shaped wings to delay the onset of the transonic forces. The swept wing helps, but not enough. And it leads to higher, structural weight of the aircraft, to control problems at low speeds, and to need for long runways for take-off and landing.

NASA says that the new supercritical wing will allow jets to fly faster by its special shape. The top surface is not curved so much as on a normal wing, so the air flow is not speeded up across the wing so much. It is like the difference between wind blowing round a smooth curve compared with a sharp corner.