

AERONAUTICS

Attempt Supersonic Speed

Several planes are under construction to beat the transonic record of the XS-1. They are designed for transonic speeds and to beat the speed of sound.

➤ SEVERAL planes, either completed or under construction, are scheduled to attempt soon to beat the transonic record of the XS-1 which, according to official announcement, travelled faster than the speed of sound in a number of test flights last October at Muroc Field, Calif.

Among these are the XS-2, under construction by Bell Aircraft with the advice of the National Advisory Committee for Aeronautics, in which are being incorporated lessons learned from the XS-1 flights during the past year. There is also the Douglas-Navy Skyrocket, an improved sister ship of the Douglas Skystreak which made the world's official speed record. Also the British have a plane about ready for a final test. Then there is a Russian plane rumored to have already beat the speed of sound.

For security reasons, details of the new XS-2 are not announced. It is to be rocket-powered like the XS-1, but is understood to be less chubby in body

and to have thin swept-back wings rather than the straight thin wings of its predecessor. It is these thin wings, inclined backward like those of a bird in flight, together with a slender body and long, sharply pointed nose, that are included in the Skyrocket to permit it to achieve transonic speeds.

The actual speed of the XS-1 when it travelled faster than sound is not revealed. Sound at sea level travels at about 760 miles an hour. At high altitudes it is less. Seven miles above the earth it is about 660 miles an hour. However, the so-called sonic barrier at any altitude depends upon the speed of sound in that region. The speed of sound depends upon the elastic limits of the air. These vary with temperature changes. In theory at least, a transonic plane could reach a higher actual speed when travelling close to the earth on a hot summer day than it could in the cold upper atmosphere.

This transonic barrier is due to the

formation of pressure waves on the wings of a plane when it approaches the speed of sound. They are the so-called shock waves that grip the plane and tend to hold it back. Their existence is not a theory. They can be actually seen in what are known as schlieren photographs, taken of the air passage over wing models in wind tunnels. These are made by passing parallel rays of light through the tunnel to focus in a camera. The air in the shock waves is denser than elsewhere; consequently the rays passing through are bent, and either a light or a dark place appears on the photograph.

Transonic speeds are important in military activities where great speeds are essential. In civilian flying, however, they are of less interest at the present time principally because present transports are not designed for these excessive speeds, and speeds can be achieved only at a great expenditure for fuel.

Science News Letter, June 19, 1948

NUCLEAR PHYSICS

Historic Cyclotron Begins Operation at New Site

➤ THE historic atom smasher with which Dr. Ernest O. Lawrence of the University of California first cracked the atom 14 years ago began operation early this month at a new site at the University of California at Los Angeles.

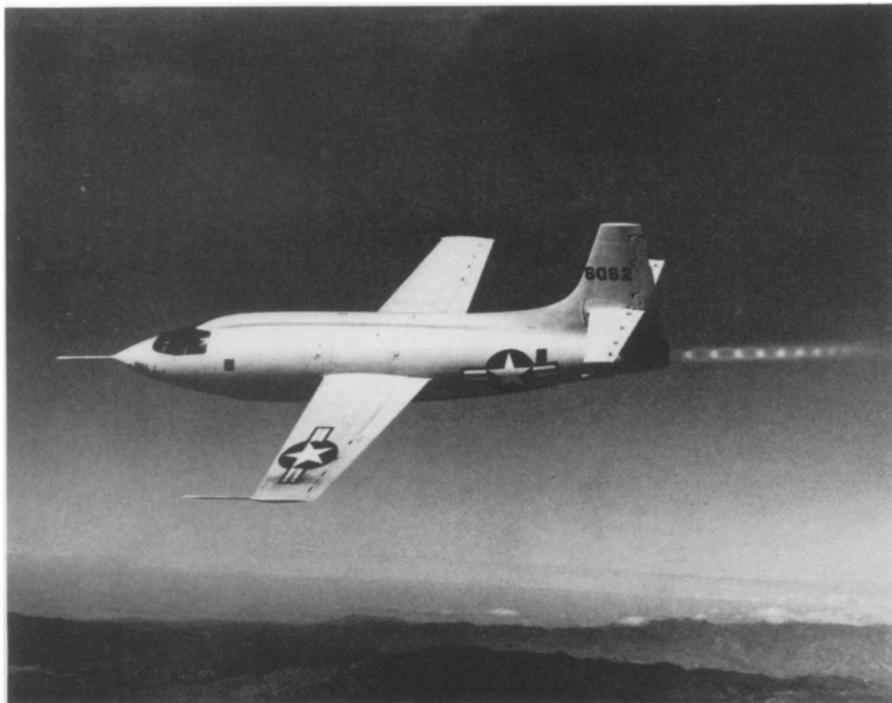
The 37-inch cyclotron which was used in making many important discoveries at Berkeley now makes Los Angeles only the second city on the Pacific Coast to boast an atom smasher.

The 37-inch machine was used in the first successful demonstration of the electro-magnetic separation of the potent uranium 235 from common uranium, an important step in the manufacture of the atom bomb.

Application of electrical frequency modulation control to a cyclotron, a process which doubled the tremendous power of the instrument, was also first adapted to this machine, making it the first synchro-cyclotron in history.

Designed originally to generate energies of 7,000,000 electron volts, the 37-inch cyclotron now accelerates atomic particles to energies of 15,000,000 electron volts.

Intensive research on the nature of the forces which hold matter together—one of the great unsolved problems confronting modern science, the production of radioactive isotopes for medical research and for experiments in nuclear



ROCKET-POWERED XS-1—In a number of test flights, this plane flew faster than the speed of sound, according to information just revealed. Several planes are scheduled to attempt to beat this record.