

## UNCLASSIFIED

apparently be excessively high, since the aspect ratio of a circular planform is only 1.27. Extension of the Prandtl theory, has also shown that the maximum possible lift coefficient to be expected from such low aspect ratio planforms should also be poor. In addition, the relatively large mean aerodynamic chord would present difficult design problems, to achieve static longitudinal stability for airfoil sections having a significant center-of-pressure travel, or for airfoil sections of so-called "stable" type, when equipped with ailerons at the trailing edge.

In the very low aspect ratio range, the Prandtl theory is probably very inaccurate. Wind-tunnel tests of very low aspect ratio airfoils indicate much less induced drag increase than expected from theory and also demonstrate very high maximum lift coefficients accompanied by extremely high stall angles. However, in general the induced drag of very low aspect ratio wings is much larger than the induced drag of conventional airplane wings, a condition which would adversely affect all performance values in flight conditions which require medium and high lift coefficients. Thus, performance in climb, at altitude, and for long-range conditions would be relatively poor, although high speed would be little affected.

Notwithstanding the predicted aerodynamic disadvantages of circular planform wings, quite a number of experimental efforts have been made to use this configuration - and not all of them by persons ignorant of aerodynamic fundamentals. Experimental wind-tunnel work at the NACA (1935) showed both maximum lift coefficients and stall characteristics much more favorable than could be anticipated.

The problem of static longitudinal stability could possibly be solved by the use of a stable airfoil section of the reflexed trailing edge type with wing tip ailerons (perhaps flexing) aerodynamically independent of the wing.

At supersonic speeds, where the induced drag is small, the circular planform offers the probability of reduced drag characteristics of low aspect ratio airfoils in the supersonic range. Also the circular planform presents a swept-back leading edge (of variable sweep along the span), which should result in a reduced effective Mach Number, with attendant reduced drag for a certain supersonic speed range.

No definite information has been received on the method of propulsion used on flying disks which have been sighted. However, because of distance factors involved in the sightings it is quite possible that either propellers or jet propulsion could have been employed without being noted by the observer.

Flying Fuselages (Torpedo or Cigar-Shaped Body)

While the shape of a torpedo-shaped body represents an efficient form for the fuselage of an airplane or the body of a guided missile,