

Figure 1

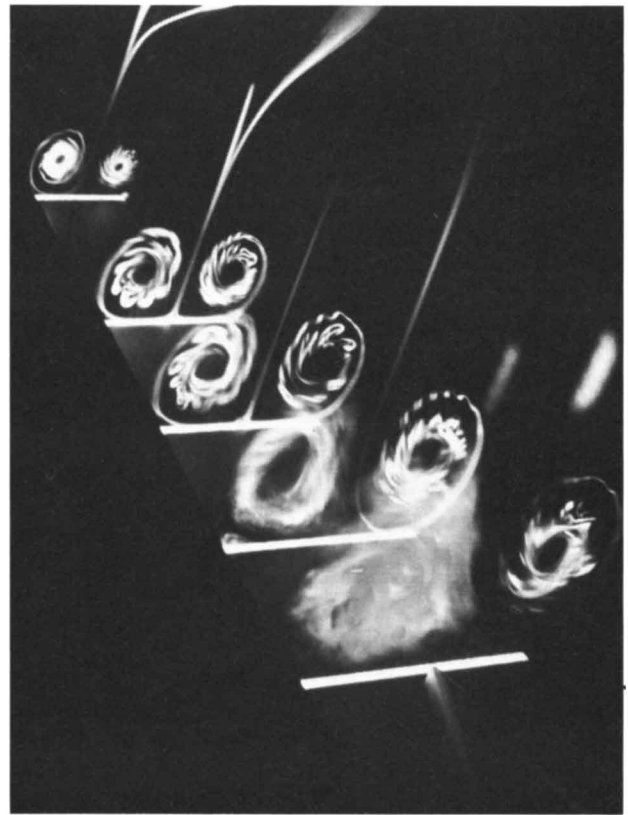


Figure 2

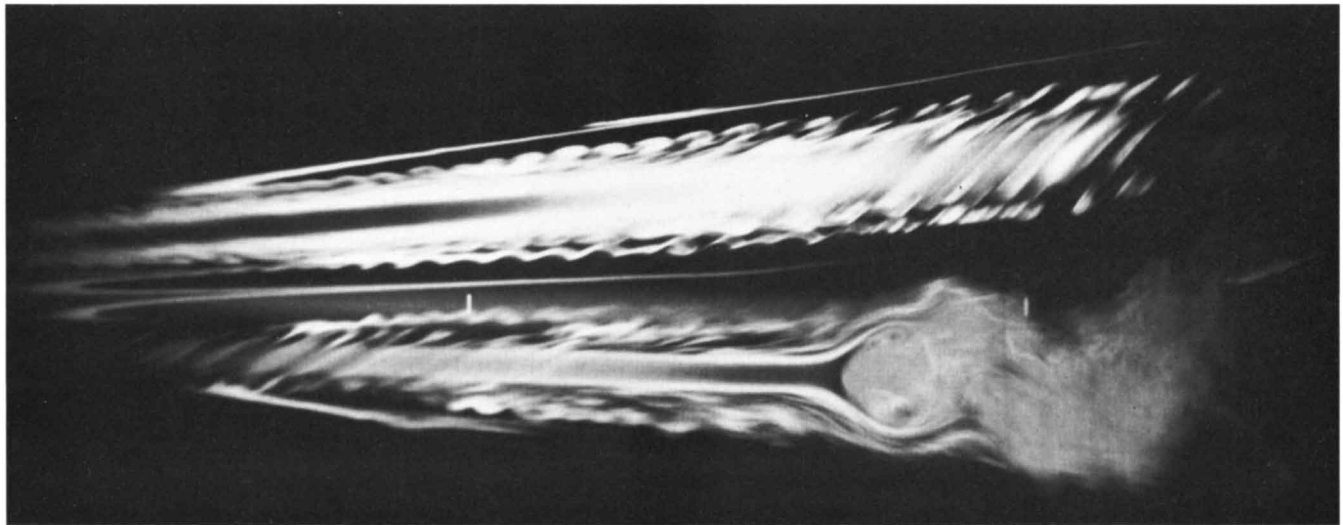


Figure 3

VORTEX BREAKDOWN ON A DELTA WING

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The above photographs show the breakdown of a leading-edge vortex on an 85° swept delta wing at a 40° angle of attack. The freestream velocity is 10 ft/sec. For highly swept wings at high angles of attack, the vortices tend to break down asymmetrically. In the photograph at the upper left, a column of smoke introduced upstream of the test section

impinges on the apex of the model and is entrained into the vortices. The right vortex is breaking down at $x/c = 0.50$. The photograph at the upper right was obtained using the laser sheet technique. It is a multiple exposure showing five lateral cross sections of the flow field. The fourth cross section from the apex is cutting directly through the "bubble" region of the breakdown. The bottom photograph is a longitudinal cross section of the vortices obtained by rotating the laser sheet by 90° . A region of high-speed axial flow occurs in the core of each vortex and appears in the photographs as an area void of smoke.