STOL/VTOL Research in Transonic Speed Range

The transonic area-rule break through and other high-speed aerodynamic refinements have made it possible to consider for high-speed flight special aircraft such as the STOL/VTOL type. Due to the uniqueness of the designs of these special type aircraft, aerodynamic problems have arisen particularly in the transonic and low supersonic speed ranges. Some of these problems are the vibration and flutter of the airframe and tail surfaces, dynamics of turning vanes or other devices to obtain lift, and the effects of gusts and buffeting at high speeds. Some research has been directed towards a better understanding and possible solution of these problems in the Langley 19-foot transonic dynamics wind tunnel branch where approximately five percent of the total research effort is used. Other problem areas are those associated with the stability and control, performance, and drag characteristics in the normal level flight attitude. These problems are being studied at transonic speeds in the Langley 8-foot transonic tunnels branch. Approximately five percent of the total research effort is utilized at present and will continue to be utilized in the future to study these problems and to arrive at solutions which will either alleviate or eliminate the problems.