Support of the Air Force C-5A Airplane Project

NASA personnel and equipment have continued to provide substantial support of the Air Force C-5A heavy cargo airplane project. Earlier this year the Air Force evaluated the relative merits of design proposals for the aircraft submitted by the Boeing, Douglas, and Lockheed Companies. At the request of the Air Force, several Langley personnel acted as consultants in the fields of low speed and high subsonic speed aerodynamics and lengthy wind-tunnel investigations were carried out in the Langley 8-foot transonic pressure tunnel to evaluate the relative aerodynamic effectiveness of the three competing designs at the cruise Mach number conditions.

The investigation in the 8-foot transonic pressure tunnel included a complex study of the effect of the support system and a theoretical and experimental evaluation of the effect of the wind-tunnel walls on the results. The results of the investigation indicated that aerodynamic efficiency at cruise for one of the contractors agreed quite well with the value submitted by him in the proposal. The efficiency for the second contractor was substantially lower than that of the proposal, while that for the third contractor was significantly higher than in the proposal. The third contractor was selected to build this cargo airplane.

Investigations are planned for early January in the 8-foot transonic pressure tunnel of the winning Lockheed design incorporating model engines which simulate the propulsive characteristics of the actual airplane. Also, investigations will be made in several Langley facilities in an attempt to develop improved landing characteristics for the Lockheed design. Later investigations will be made in the Langley transonic dynamics tunnel to evaluate the flutter characteristics of the airplane.