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Title : ESTIMATION OF STABILITY DERIVATIVES AND DYNAMIC STABILITY CHARACTERISTICS OF BASIC AND AEW HS-748 AIRCRAFT		Document No. PD AE 8803 Date of issue: March 1988
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Abstract :

Longitudinal and lateral stability derivatives of the basic and the AEW configurations of the HS-748 aircraft have been estimated. DATCOM and ESDU Data Sheet methods were employed to estimate the complete set of derivatives of the basic aircraft. Derivatives of the AEW aircraft were obtained by a judicious use of some of the measured static wind-tunnel force and moment data in the estimation scheme.

Stick-fixed and stick-free dynamic stability characteristics of the basic and the AEW aircraft were computed using the estimated stability derivatives for a range of values of the aircraft weight and C.G. location. The dynamic stability characteristics are expressed in terms of the period, damping and time-to-half-amplitude of the different modes of longitudinal and lateral motions. Both the basic and the AEW aircraft are found to be stable in all modes except the spiral mode, which exhibits a mild divergence. Damping of the lateral oscillatory mode with rudder-free, although positive, is rather low for both the basic and the AEW configurations. In general, installation of rotodome reduces the effectiveness of horizontal and vertical stabilizers and also the control effectiveness of the elevator and rudder, but it does not cause any major qualitative changes in the dynamic stability characteristics of the aircraft.