Sheet classification: OPEN

National Aeronautical Laboratory	Documentation Sheet	Document Classification: SECRET

Title	: Stability & Performance Characteristics of a Jaguar Aircraft from Post Flight Data Analysis (Revised)	Document No. PD-FC-9005 Date of issue: Mar 1990
Author(s)	: Girija Gopalratnam, V.Parameswaran, J.R.Raol & S.Srinathkumar	Contents 137 pages, 12 tables, 60 figs. (numbered as 15)
Division	: Flight Mechanics & Controls	No. of copies: 25
External participation	: ASTE; Flight Test Centre (HAL)	NAL Project No. SE-0-149
Sponsor	: Aeronautical Development Agency Bangalore	Sponsor's Project No. ---
Approval	: Head, Flight Mechanics & Controls Division	
Remarks	:	
Keywords	: Stability and Control Derivatives, Drag Polars, Maximum Likelihood Method, Modelling, Post Flight Data Analysis	

Abstract : The Aeronautical Development Agency brought together Aircraft Systems and Testing Establishment, the HAL Flight Test Centre and the Flight Mechanics & Controls Group of NAL to perform planned flight tests on a Jaguar aircraft of Indian Airforce. The aim of the programme was to generate the drag polar type performance data, stability and control derivatives for the aircraft and to make a handling quality assessment of the aircraft. This document presents a comprehensive analysis of the preprocessed flight test data at the Flight Mechanics and Controls Division. By properly exciting the necessary modalities and analysing the responses using nonlinear maximum likelihood estimation method with appropriate mathematical models, consistent aircraft parameters are generated. It is shown that the maneuvers such as the Roller Coaster, Windup turns and low speed Slow Down provide the aircraft drag polar covering full angle of attack range and full range of load factors. The document provides the Jaguar drag polars, the longitudinal/lateral stability and control derivatives and a handling quality assessment of the short period mode generated from response analysis. The results are compared with data from the aircraft manufacturer and are found to match reasonably well. This programme also demonstrates the ability of the Bangalore Aeronautical Community in addressing comprehensive flight test programmes of future aircraft like the Light Combat Aircraft. The results presented in this document supersede those reported in NAL PD-SE-8918.