

FLIGHT TECHNIQUE ANALYSIS for PROFESSIONAL PILOTS

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INTRODUCTION

Flight technique analysis is the application of aerodynamics to flight technique issues. Unlike aircraft performance and design, where aerodynamic equations provide numerical data, flight technique analysis uses aerodynamic principles to optimize the methods used to precisely fly an airplane. In this sense, aerodynamic principles are applied qualitatively rather than quantitatively.

While most technical books have many words and a few illustrations, most of the principles explained in this book utilize graphical means. Text comments are mainly used for introductory comments and the summarizing of critical points.

A new book series expands coverage of the issues in this book, including new computerized demonstrations, tools and additional related subject areas. The first book in the new series, *Advanced Airmanship Book 1 Precision Flying*, is currently available and the remaining two books are scheduled for release in 2011. Additional information on these new books and updated editions of Professor Les Kumpula's current text books is available on the publisher's web site: www.cchpublishing.com

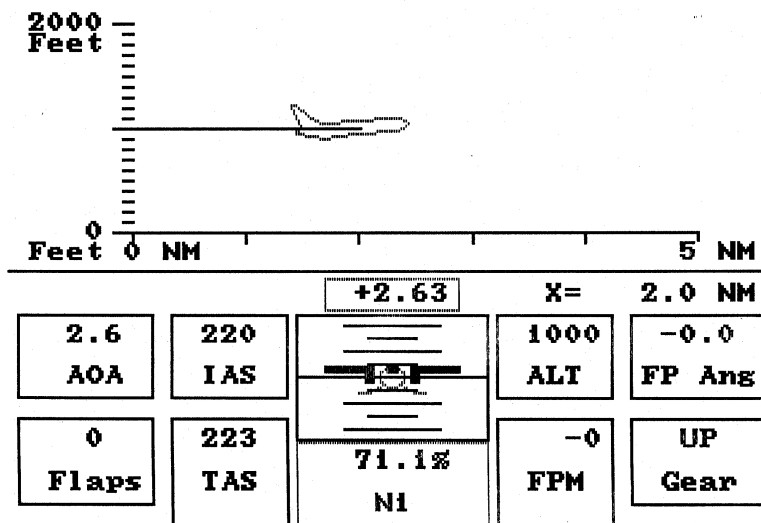
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INITIAL PLOTTING CONDITIONS

1. IAS = 220 Knots
2. Climb Angle = 0 Deg.
3. Pitch Attitude = 2.6307 Deg.
4. N1 = 71.1275 %RPM
5. Flap Setting = 0 Deg.
6. Landing Gear = UP
7. Full Scale Altitude = 2000 Feet
8. Zero Scale Altitude = 0 Feet
9. Full Scale Distance = 5 NM
10. Altitude (Y Axis) = 1000 Feet
11. Location (X Axis) = 0 NM
12. Aircraft Scale Factor = 1
13. Angle Scale Factor = 2
14. Velocity Vector Status = ON
15. Hold Mode Annunciator = ON
16. Density Altitude = Variable
17. Const. Density Alt. = 1000 Feet
18. Horiz. Dist. on Screen = ON
19. Ground Effect = OFF
20. Ground Altitude = 0 Feet
21. Pitch Rate = 2 Deg/Sec
22. Operating Engines = 2
23. ILS Glide Slope = OFF
24. Glide Slope Antennae Loc. = 5 NM
25. Gear Warning Horn = ON
26. AOA to MACH Altitude = 10000 Feet
27. Distance Counter Units = NM
28. Wind (HW= + ,TW= -) = 0 Knots
29. Gross Weight = 225000 lbs.
30. Plotting Speed Multiplier = 1
31. Delay Loop Constant = 0
32. LPRINT Plotting Interval = 1
33. Bank Angle = 0 Deg.

To Accept All Values Press RETURN Only.
To Change a Variable, Enter the Number and RETURN.?



The vertical plane simulator is used throughout this book to illustrate the flight characteristics of a common wide-body jet transport. It is a DOS-based program that is compatible with windows XP and earlier Windows versions. It is available as a download at www.cchpublishing.com

While flight data is being plotted, most variables can be changed by pressing the appropriate key, as shown below, and responding to the prompt.

KEY - Variable to be Changed

P - Pitch Attitude
 N - N1
 B - Both Pitch Attitude and N1 in the same Time Period.
 F - Flaps
 G - Landing Gear (Press for Up or Down)
 H - Altitude Hold (Press for On or Off)
 1 - One Engine Out
 2 - Both Engines Operating
 A - Altitude
 X - Location (X Axis - Nautical Miles)
 S - Indicated Airspeed
 C - Flight Path Angle (A Climb is Positive)
 R - Plots Airplane Picture on Altitude - NM Plot
 K - Plotting Speed Multiplier (Real time= 1, Max.= 3)
 E - Ends and Reruns the Program
 T - Elapsed Time and Distance Display - On and Off
 D - LPRINT Flight Data - On and Off
 / - Pitch Rotation Rate

Press the Appropriate Key Softly but Quickly - Press ENTER for Next Page

KEY - Variable to be Changed

I - IAS Hold Mode (Press for On or Off)
 V - TAS Hold Mode (Press for On or Off)
 M - Mach Hold Mode (Press for On or Off)
 O - AOA Hold Mode (Press for On or Off)
 Y - GS Hold Mode (Press for On or Off)
 Q - Brakes - Ground (Press for On or Off)
 \ - Display Horizontal Distance (X) - On and Off
 L - Time Delay Loop Constant (0 and Up - 0 = No Delay)
 W - Wind - (Press for New HW or TW)
 U - Reset to Initial Conditions - Retain Existing Plot
 J - Repeat With the Current Plotting Format
 * - Gross Weight
 Z - Freeze Action (Press for On or Off)
 - - LPRINT Plotting Interval
 = - Bank Angle & Roll Rate

U @ D ARROWS - Change Pitch Attitude by +1 Deg. or -1 Deg.
 L @ R ARROWS - Change N1 by -5 %RPM or +5 %RPM
 PgUp @ PgDn - Change Pitch Attitude by +0.1 Deg. or -0.1 Deg.
 Home @ End - Change N1 by -1 %RPM or +1 %RPM

Press the Appropriate Key Softly but Quickly - Press ENTER to Start

It is possible to examine almost any flight scenario by use of the keys shown above.

FLIGHT DECK TASK MANAGEMENT

Flight deck task management refers to the division of workload between the pilot flying and pilot not flying. This should not be confused with crew resource management, which is more concerned with human interaction among crewmembers. Flight deck task management is an every day practice for airline crews, but it is generally new information for general aviation pilots used to single pilot operations.