ATTACHMENT I

Excerpts from the AAMP Flight Training Course Material

(15 pages)

AmericanAirlines

November 16, 2001

Mr. David Ivey
Operations Group Chairman – AA 587 Investigation
National Transportation Safety Board
c/o Mr. Curt Lewis - AA
Radisson Hotel – JFK
135-30 140th Street
Room 327
Jamaica, NY 11436

Dear Dave,

Attached per your request are the American Airlines Advanced Aircraft Maneuvering Program (AAMP) training materials. The most recent AAMP Flight Training Manual that the pilots of AA 587 would have seen and been familiar with is marked with a yellow label.

Attached also for your review is a short description and general background associated with the development of the program. Please contact us if we may provide any additional information.

Sincerely,

Tim Ahern
Vice President
Safety, Security & Environmental

AA Advanced Aircraft Maneuvering Program (AAMP)

American Airlines developed AAMP in 1996 following a review of world-wide aviation industry accidents involving large, multi-engine jet transports. Among those accidents reviewed the causal factors included loss of aircraft control, controlled flight into terrain, wind shear and wake vortex encounters. It was believed that many of these accidents might have been prevented had the pilots been trained to specifically recognize and respond to aircraft upset hazards.

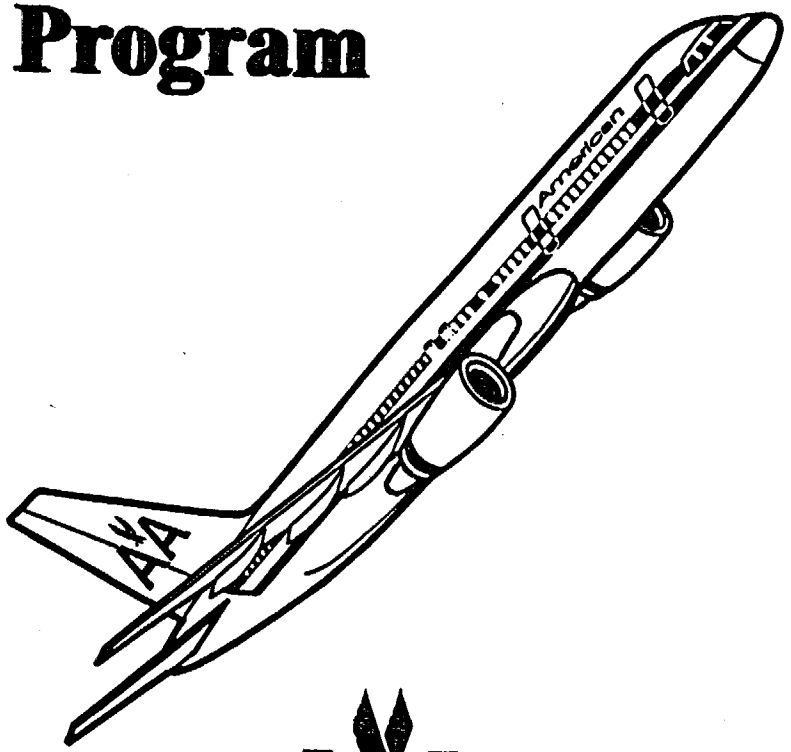
- Prior to AAMP, it was believed that many commercial airline pilots had not received unusual attitudes training in large, multi-engine jet transports. Although many airline pilots had received high performance jet training in the military or received civilian aerobatics training, these pilots had rarely been trained in recovery from upset conditions in transport category aircraft. In most cases, those that had received such training had not performed recovery maneuvers since being employed by the airlines.

- AAMP was developed with involvement from the FAA, NTSB, other airlines, aircraft manufacturers and the US military. The first AAMP conference was held in 1996 with participants from the FAA, NTSB, Airbus, Boeing, Boeing-Douglas, other airlines and several branches of the US Military. The AAMP has evolved over the last several years as additional input was received from various sources. Revisions have been made emphasizing special points of clarification.

- AAMP training programs were given to several members of the NTSB investigation staff as well as board members. Similarly, the FAA Administrator and the Associate Administrator for Regulation and Certification participated in AAMP demonstration manuevers in AA simulators. In addition, the AAMP course has been presented world-wide at the request of numerous airlines and other commercial flight operators. Several airlines have used the AA AAMP to develop similar training courses world-wide.

- The AAMP training course curriculum is presented generically, with descriptions highlighting aerodynamic differences between aircraft designs with varying engine, wing and flight control surface configurations. As in all AA training courses, the AAMP maneuvers are consistent with FAA-approved aircraft Operating Manuals.

Advanced Aircraft Maneuvering Program



AAMP

AA Flight Training

Training Development
GSWFA - JDK
5/1/00

Aerodynamic Definitions

Dihedral Effect (3)

The effectiveness of the rudder as a roll control will increase with increasing AOA.

Consider: *Crossover Angle of Attack*

Notes

Aerodynamic Definitions

Dihedral Effect (4)

- **Smooth application of coordinated rudder will improve roll response significantly at higher AOA.**
  - **Between approach AOA and the onset of stick shaker, coordinated rudder is most beneficial.**

Beyond stick shaker AOA through stall, excessive rudder can result in a departure from controlled flight.

Notes

Unusual Attitude Recovery

Whenever the aircraft is departing its intended vertical or lateral flight path, the unwritten first step in every recovery procedure is:

Autopilot and Autothrottles - Disconnect

Notes

Unusually Nose High Recovery

- **Unload with forward yoke pressure toward zero 'G' Force.**
- **Roll the aircraft toward the nearest horizon - limit bank angle to approximately 60°.**
- **Thrust - increase power (in most nose high recoveries).**
- **As aircraft symbol approaches the horizon, make a coordinated roll out to a wings level slightly nose low attitude.**
- **Check airspeed - adjust thrust and pitch as necessary.**

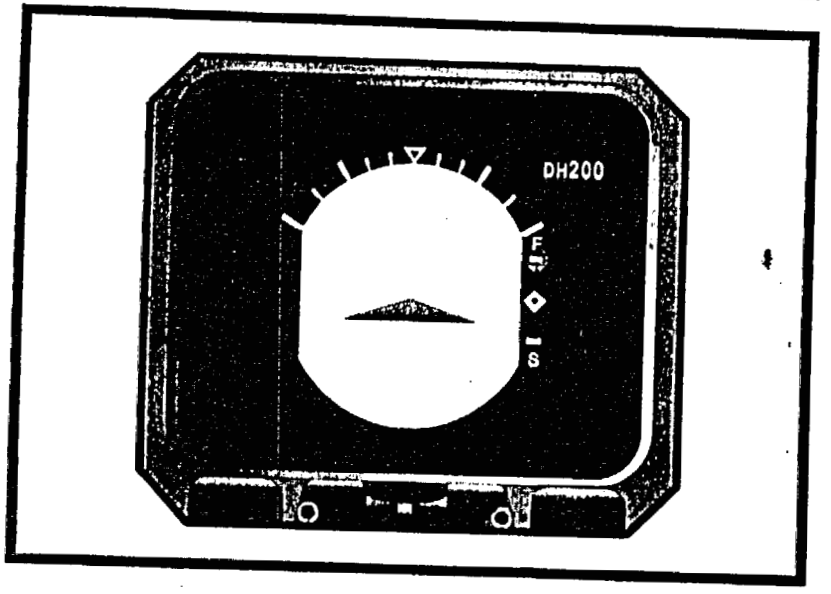
Notes

Unusually Nose Low Recovery

- Roll the aircraft in the shortest direction toward the sky pointer.
- With bank angle in excess of 90°, maintain neutral to forward yoke pressure.
- Coordinated rudder with the roll (top rudder).
- With bank angle less than 60°, increase back pressure on the yoke.
- Adjust thrust & utilize drag devices as required.
  - Any speed above or below 'corner speed' will result in excessive altitude loss.

Inverted: UNLOAD & ROLL FIRST - THEN PULL

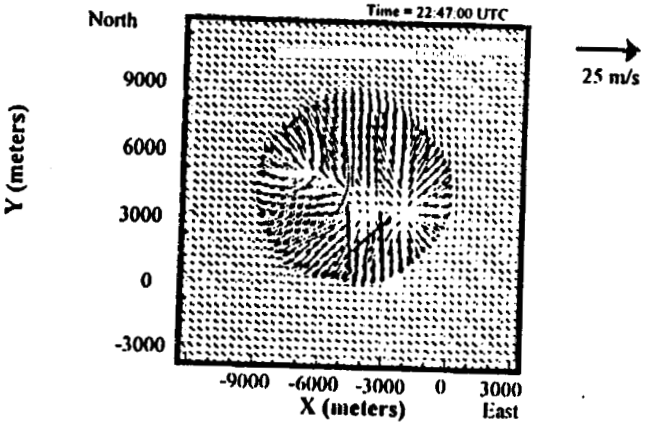
Notes



Notes

TASS CLT MICROBURST SIMULATION

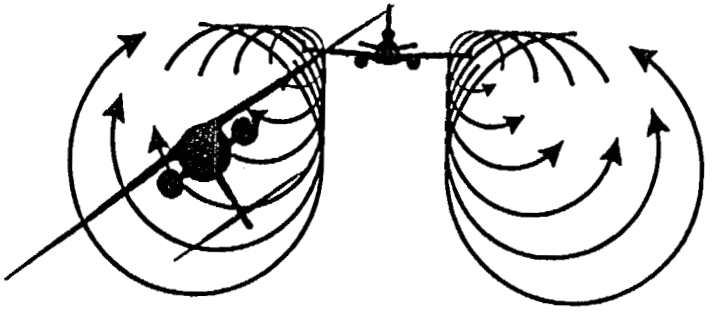
Horizontal Wind Vectors at 90 M AGL



Notes

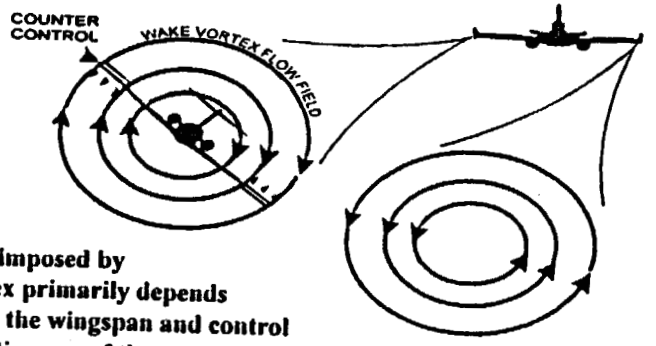
Wake Turbulence

Increasing encounters with wake vortices are causing an increase in loss of control incidents and accidents.



Notes

Wake Turbulence



Roll imposed by vortex primarily depends upon the wingspan and control effectiveness of the encountering aircraft relative to the weight, wing span and AOA of the generating aircraft.

Notes

Pilot Response to Wake Turbulence

- Rolling moment on aircraft with shorter wing spans can be dramatic.
- Resulting attitude may be nose low with more than 90° of bank.
- Apply the appropriate unusual attitude recovery procedure.
  - Do not apply any back pressure on yoke at more than 90° of bank. *ROLL FIRST - THEN PULL.*
  - High AOA = Coordinated *RUDDER*
  - Corner speed - high lift devices extended.

Notes

AAMP Continuation Training

- Recurrent Ground School Videos
  - Classroom Subjects
  - Simulator Briefing
- New Hire Pilot Program
  - Expanded AAMP Course

Notes

AAMP Simulator Training

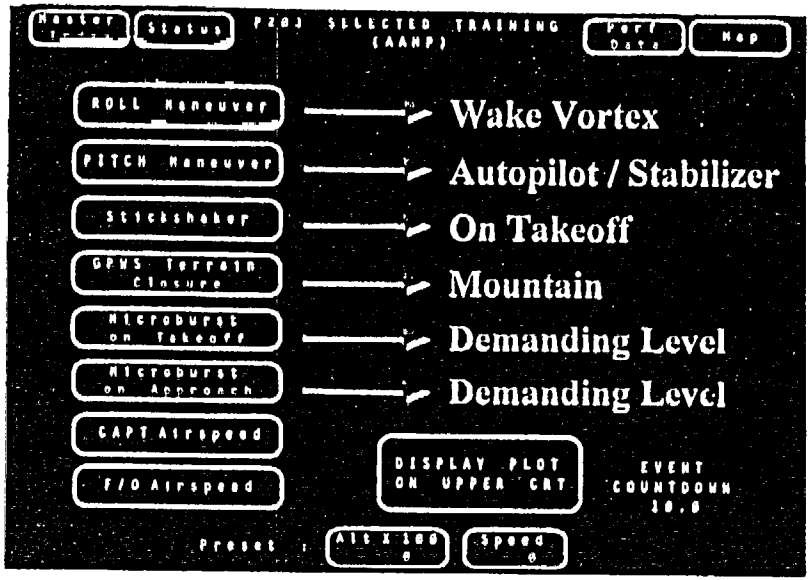
- Sim profiles designed to develop & reinforce specific flying skills.
  - High AOA maneuvering demo - NOT full stalls
  - Unusual attitudes - nose high & nose low
  - Microburst - demanding level
  - Engine failure - low altitude & low energy
  - GPWS - mode 2 'Terrain' profile
  - High altitude upset - fleet specific
- Integrated into each fleet Transition & Recurrent Training Syllabus.

Notes

AAMP Simulator Training

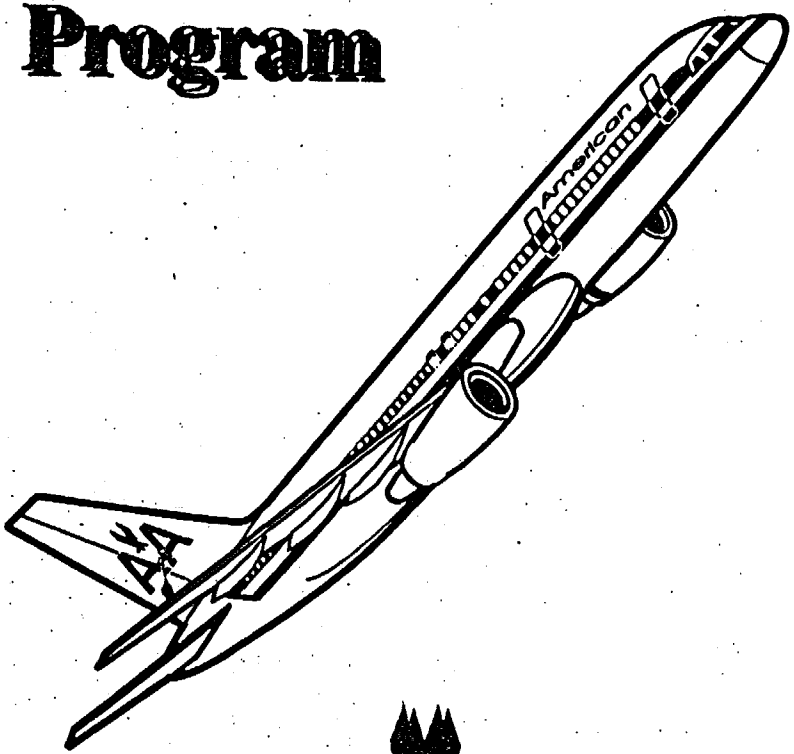
- **High AOA Maneuvering Demonstration**
  - Apply climb power
  - Maintain 15° to 30° deck angle
  - Respect the stick shaker (Fly in the PLI)
  - Now roll alternately left and right to 40° of bank - MAINTAIN HIGH AOA
    - ▲ First, use only ailerons and spoilers
      - – Note: Sluggish roll response - Developing sink rate
    - ▲ Second, use only rudder - (smoothly - note lead / lag)
      - – Note: Improved roll response - Developing climb rate
    - ▲ Third, practice combination (both aileron & rudder)
      - – Note: Optimum roll response

Notes



Notes

Advanced Aircraft Maneuvering Program



AAMP

AA Flight Training

Training Development
GSWFA - DAF
1/1/97

Aerodynamic Definitions

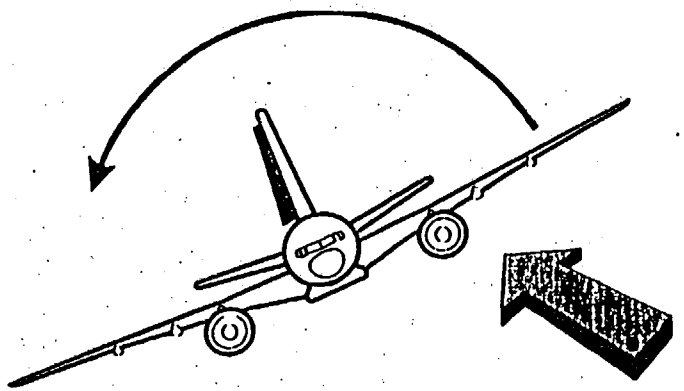
Dihedral Effect (3)

The effectiveness of the rudder as a roll control will increase with increasing AOA. At the higher angles of attack, THE RUDDER becomes the most effective roll control.

Smooth application of coordinated rudder will improve roll response significantly at higher AOA.

Notes

Dihedral Effect



Notes

Unusually Nose High Recovery

- Unload and roll the aircraft toward the nearest horizon to lower the nose while maintaining some positive 'G' force.
- Normally limit bank angle to approximately 70°.
- Thrust - increase power in most nose high recoveries.
- As aircraft symbol approaches the horizon, make a coordinated roll out to a wings level slightly nose low attitude.
- Check airspeed - adjust thrust and pitch as necessary.

Notes

AMERICAN AIRLINES - FLIGHT TRAINING
Advanced Aircraft Maneuvering Program

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- Roll the aircraft in the shortest direction toward the sky pointer.
- With bank angle in excess of 90°, maintain neutral to forward yoke pressure.
- Coordinated rudder with the roll (top rudder).
- With bank angle less than 60°, increase back pressure on the yoke.
- Adjust thrust & utilize drag devices as required.
  - Any speed above or below 'corner speed' will result in excessive altitude loss.

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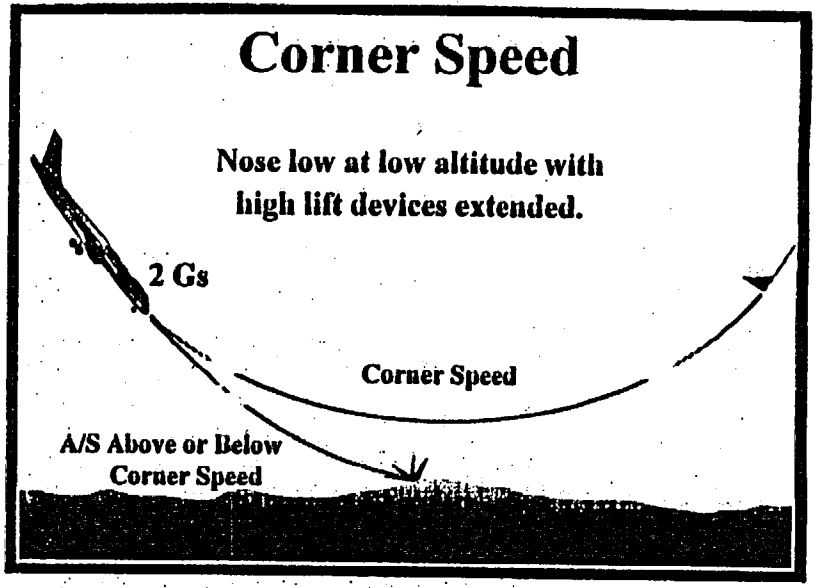
- Apply the appropriate unusual attitude recovery procedure.
  - Do not apply any back pressure on yoke at more than 90° of bank. ROLL FIRST - THEN PULL.
  - High AOA maneuvering = RUDDER.
  - Corner speed - high lift devices extended.

Notes

Corner Speed



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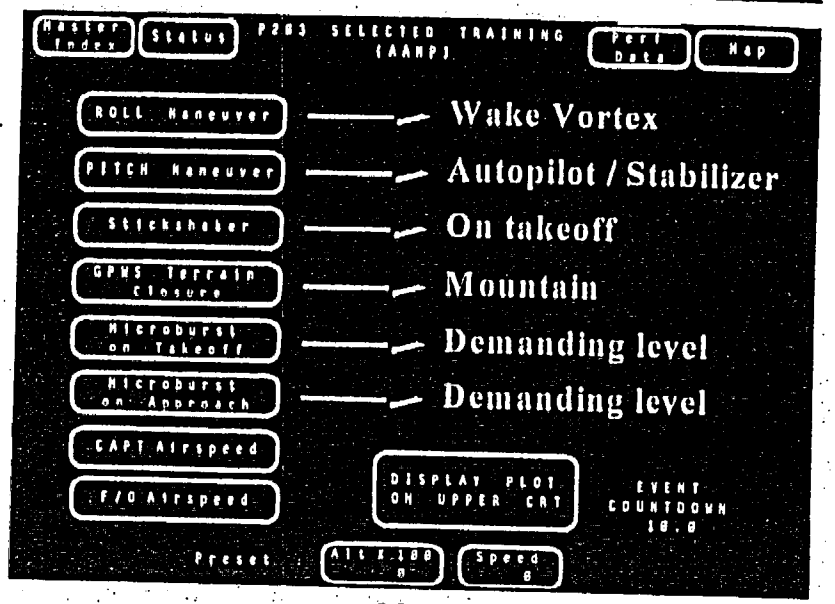

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