NATIONAL TRANSPORTATION SAFETY BOARD
Vehicle Recorders Division
Washington, D.C. 20594

October 21, 2003

Specialist's Factual Report of Investigation
Flight Data Recorder

NTSB Number:
DCA02MA001 (ancilliary)

A. EVENT

Location:	Belle Harbor, New York
Date:	November 12, 2001
Aircraft:	Boeing B747-400
Operator:	Japan Airlines (JAL)

B. GROUP

N/A

C. SUMMARY

On November 12, 2001, American Airlines flight 587 (AAL587), an Airbus Industrie A300-600, was destroyed when it crashed into the residential area of Belle Harbor, New York shortly after takeoff from runway 31L at John F. Kennedy International Airport (JFK), Jamaica, New York. The aircraft which took off directly in front of AAL587 was a Japan Airlines, JAL, B747-400. The FDR data from the JAL B747-400 were requested to assist in the AAL587 investigation.

D. DETAILS OF INVESTIGATION

The Aircraft and Railway Accidents Investigation Commission of Japan (JARAIC) obtained the FDR data from the JAL B747-400 aircraft at the request of the NTSB. The JARAIC sent a CD of the downloaded FDR data in raw binary and processed engineering unit formats. The Safety Board's Vehicle Recorders laboratory processed the raw binary data into engineering units and plotted select parameters.

Recorder Description

This FDR records Aeronautical Radio Incorporated (ARINC) 573 configuration data in a binary format onto solid state flash memory chips. The FDR records 64 words of digital information every second, with each word 12 bits in length. Each grouping of 64 words (each second) is called a subframe. Each subframe has a unique 12-bit synchronization (sync) word identifying it as either subframe 1, 2, 3, or 4. The sync word is the first word in each subframe. Each grouping of consecutive 1, 2, 3 and 4 subframes comprise a frame (i.e., four seconds of data).

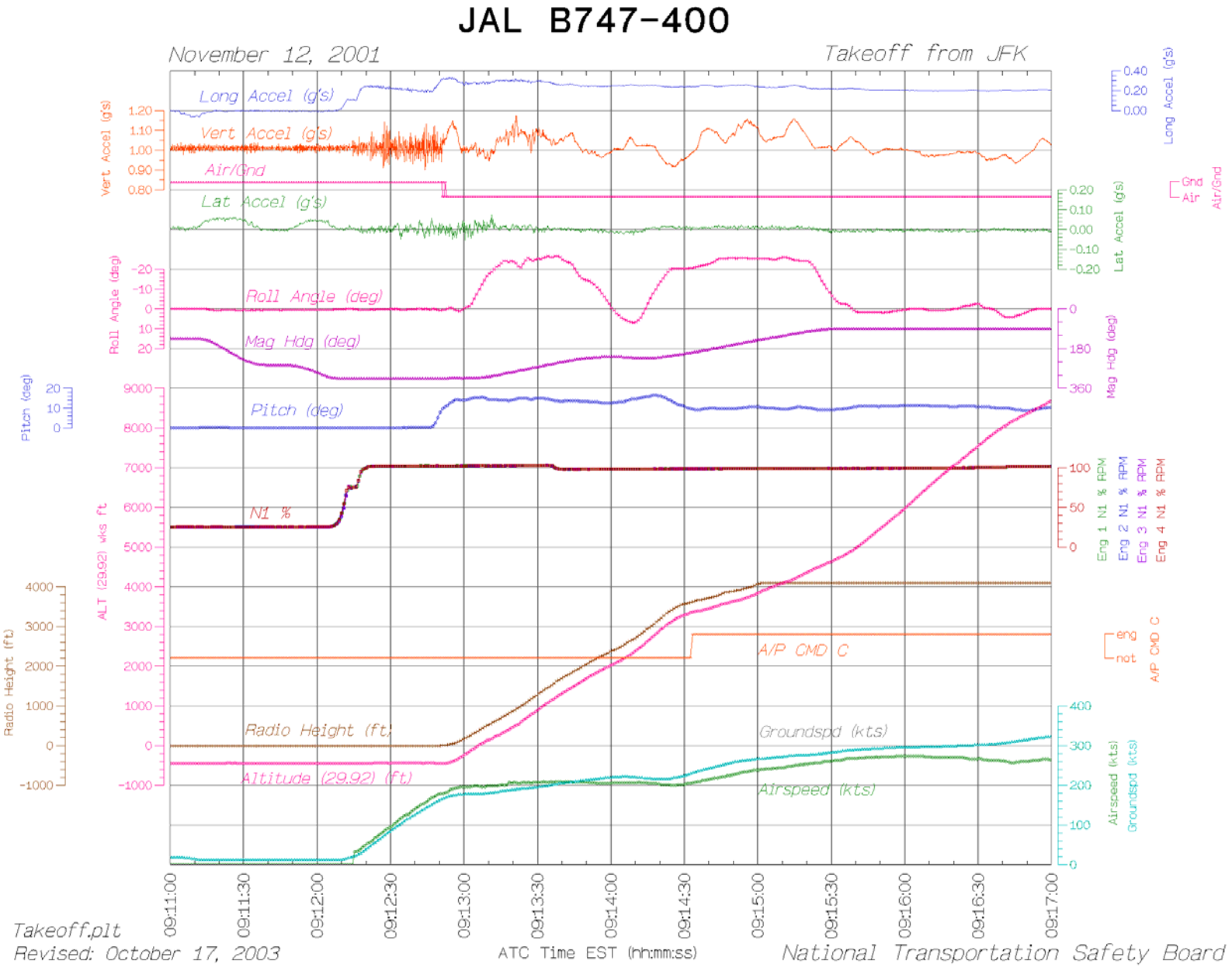
The data stream is "in sync" when successive sync words appear at the proper 64-word intervals. Each data parameter (e.g. altitude, heading, and airspeed) has a specifically assigned word number within the subframe.

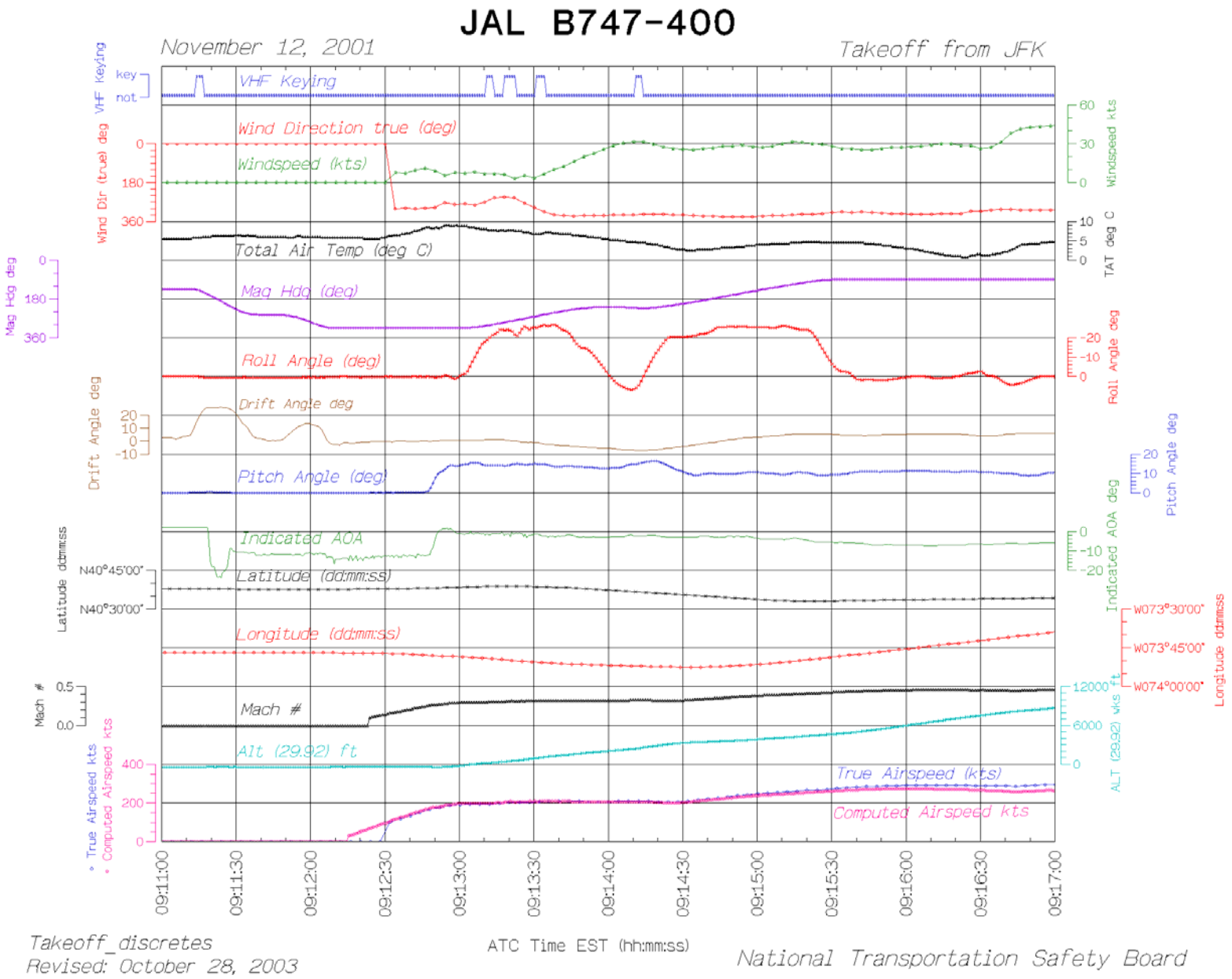
Data Description

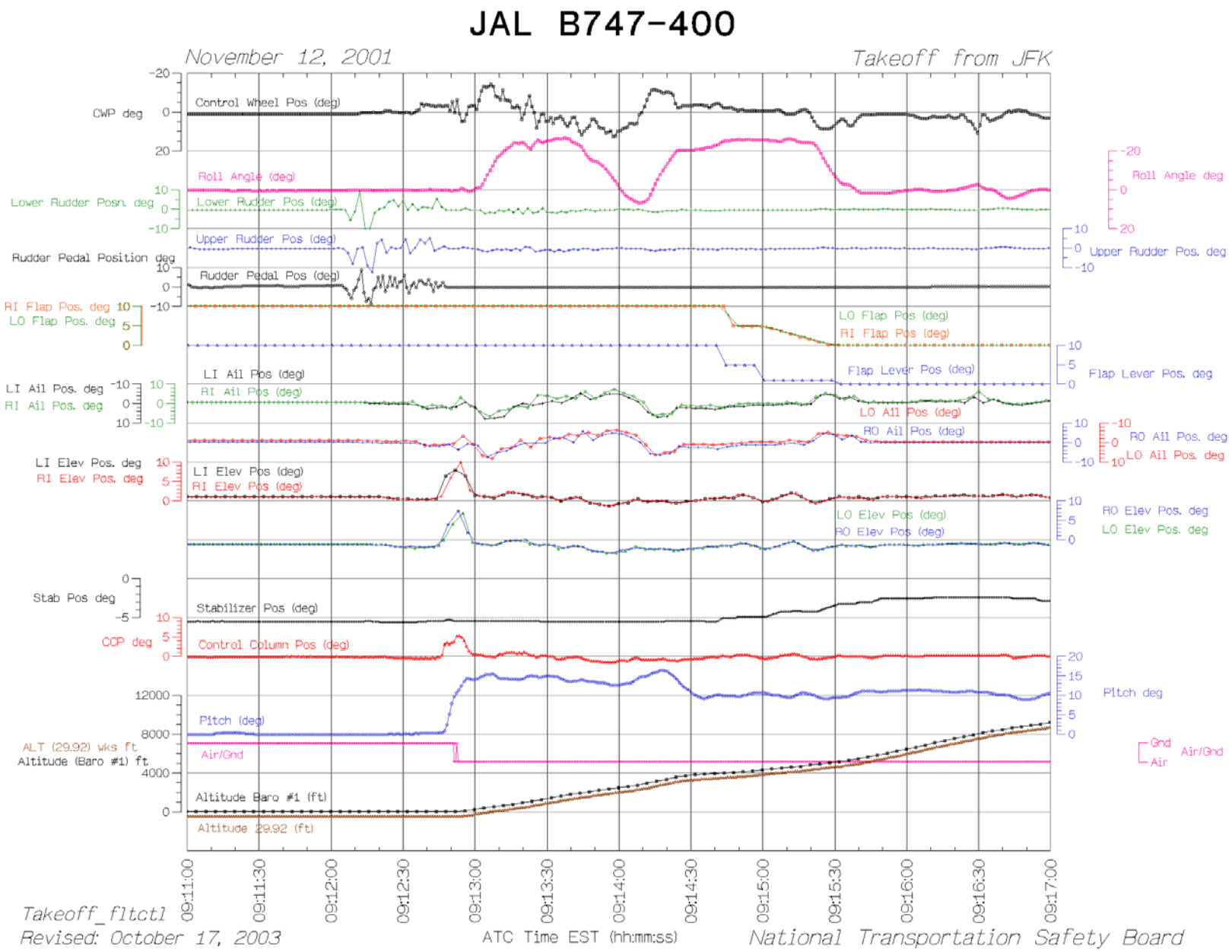
According to the recorded air/ground parameter, the aircraft took off at about 0912:52 on a magnetic heading of 313 degrees. After the aircraft's initial climb out on this heading, the aircraft began a left turn. Three plots containing select parameters for the first 6 minutes of the flight are included below.

The plotted FDR data are displayed in local eastern standard time (EST). The FDR, CVR, radar and ATC data for the AAL 587 flight were correlated to establish a common time base. The Aircraft Performance Group provided the correlation of the JAL B747 FDR data from subframe reference number[1] to EST time (09:15:41 EST corresponds to 44026.788 JAL SRN). For more information see the Group Chairman's Aircraft Performance Study for DCA02MA001.

[1] Subframe reference number (SRN) is a measure of relative time on the FDR. One SRN is equivalent to one second.


JAL B747-400
November 12, 2001
Takeoff from JFK
Long Accel (g's)
Vert Accel (g's)
Air/Gnd
Lat Accel (g's)
Roll Angle (deg)
Mag Hdg (deg)
Pitch (deg)
N1 %
A/P CMD C
Radio Height (ft)
Altitude (29.92) (ft)
Groundspd (kts)
Airspeed (kts)
Vert Accel (g's)
Long Accel (g's)
Lat Accel (g's)
Roll Angle (deg)
Mag Hdg (deg)
Pitch (deg)
ALT (29.92) wks ft
Radio Height (ft)
Eng 1 N1 % RPM
Eng 2 N1 % RPM
Eng 3 N1 % RPM
Eng 4 N1 % RPM
A/P CMD C
Airspeed (kts)
Groundspd (kts)
Gnd
Air
eng
not
09:11:00
09:11:30
09:12:00
09:12:30
09:13:00
09:13:30
09:14:00
09:14:30
09:15:00
09:15:30
09:16:00
09:16:30
09:17:00
ATC Time EST (hh:mm:ss)
Takeoff.plt
Revised: October 17, 2003
National Transportation Safety Board


JAL B747-400
November 12, 2001
Takeoff from JFK
VHF Keying
key
not
Wind Direction true (deg)
Windspeed (kts)
Wind Dir (true) deg
Windspeed kts
Total Air Temp (deg C)
TAT deg C
Mag Hdg (deg)
Mag Hdg deg
Roll Angle (deg)
Roll Angle deg
Drift Angle deg
Pitch Angle (deg)
Pitch Angle deg
Indicated AOA
Indicated AOA deg
Latitude (dd:mm:ss)
N40°45'00"
N40°30'00"
Longitude (dd:mm:ss)
W073°30'00"
W073°45'00"
W074°00'00"
Mach #
Alt (29.92) ft
ALT (29.92) kts ft
True Airspeed (kts)
Computed Airspeed kts
09:11:00
09:11:30
09:12:00
09:12:30
09:13:00
09:13:30
09:14:00
09:14:30
09:15:00
09:15:30
09:16:00
09:16:30
09:17:00
Takeoff_discretes
Revised: October 28, 2003
ATC Time EST (hh:mm:ss)
National Transportation Safety Board


JAL B747-400
November 12, 2001
Takeoff from JFK
CWP deg
Control Wheel Pos (deg)
Roll Angle (deg)
Roll Angle deg
Lower Rudder Posn. deg
Lower Rudder Pos (deg)
Upper Rudder Pos (deg)
Upper Rudder Pos. deg
Rudder Pedal Position deg
Rudder Pedal Pos (deg)
RI Flap Pos. deg
LO Flap Pos. deg
LO Flap Pos (deg)
RI Flap Pos (deg)
Flap Lever Pos (deg)
Flap Lever Pos. deg
LI Ail Pos. deg
RI Ail Pos. deg
LI Ail Pos (deg)
RI Ail Pos (deg)
LO Ail Pos (deg)
RO Ail Pos (deg)
RO Ail Pos. deg
LO Ail Pos. deg
LI Elev Pos. deg
RI Elev Pos. deg
LI Elev Pos (deg)
RI Elev Pos (deg)
LO Elev Pos (deg)
RO Elev Pos (deg)
RO Elev Pos. deg
LO Elev Pos. deg
Stab Pos deg
Stabilizer Pos (deg)
CCP deg
Control Column Pos (deg)
Pitch (deg)
Pitch deg
ALT (29.92) wks ft
Altitude (Baro #1) ft
Air/Gnd
Gnd
Air
Altitude Baro #1 (ft)
Altitude 29.92 (ft)
09:11:00
09:11:30
09:12:00
09:12:30
09:13:00
09:13:30
09:14:00
09:14:30
09:15:00
09:15:30
09:16:00
09:16:30
09:17:00
Takeoff_fltctl
Revised: October 17, 2003
ATC Time EST (hh:mm:ss)
National Transportation Safety Board

The tabular data associated with the above plots can be found as an electronic comma delimited file, JALB747_tabular.csv, in Attachment I.

Erin Gormley
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Attachments
Attachment I: Tabular Data File