

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

February 15, 2002

Specialist's Factual Report of Investigation
Digital Flight Data Recorder

NTSB Number:
DCA01MA065

A. EVENT

Location: Shanksville, Pennsylvania
Date: September 11, 2001
Aircraft: B-757-200, N591UA
Operator: United Airlines

B. GROUP

N/A

C. DETAILS OF INVESTIGATION

In support of the Federal Bureau of Investigation's (FBI's) investigation into the terrorist act of United Airlines Flight 93, which crashed in Shanksville, Pennsylvania, on September 11, 2001, the NTSB Vehicle Recorders Division received the following solid state flight data recorder (SSFDR) on September 13, 2001:

Recorder Manufacturer/Model: **Allied Signal SSFDR**

The SSFDR was examined upon receipt. The recorder displayed evidence of impact damage (figure 1). The memory board was removed and also showed signs of impact damage (figure 2).



Figure 1

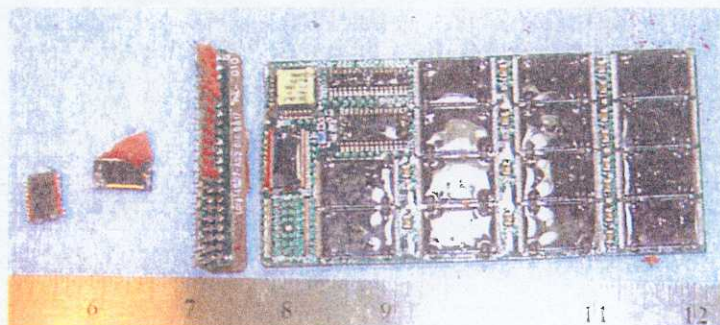


Figure 2

The memory board was taken to Honeywell facilities in Redmond, Washington for evaluation and downloading since the extent of the damage was not known. The data were extracted and electronically transferred to Safety Board headquarters. The transcribed data were reduced from the recorded binary values (0's and 1's) to engineering units (for example feet, knots, degrees, etc.) using conversion formulas obtained from United Airlines.¹ The transcribed data were processed by the Safety Board's Recovery Analysis and Presentation System (RAPS), which converted the raw data to engineering units and presented it in tabular and graphic form. An examination of the recovered data indicated that the recorder operated normally.

Only validated parameters are included in the plots and tabular data in this report. A list of these parameters is in Attachments I-1 to I-7. The remaining parameters either were not recorded properly or were not confirmed to have been recorded properly, and are not included in this report. A list of these parameters is in Attachments I-8 to I-10.

Recorder Description

This model SSFDR accepts serial bit stream data in an ARINC 573/717² format at a rate of 64 12-bit words per second. The SSFDR uses solid-state flash memory technology as the recording medium. The recording is stored in a crash survivable memory unit. A minimum of the last 25 hours of operational data is retained on the recording medium.

¹ United Airlines provided their custom data frame which is based on Boeing's 757-4 data frame, Attachment IV: 757UALmap.xls.

² Flight Data Acquisition and Recording System Characteristic, Published by Aeronautical Radio, Inc. (ARINC), 2551 Riva Road, Annapolis, Maryland

The Digital Flight Data Acquisition Unit (DFDAU) provides a means of gathering, conditioning, and converting flight data parameters to digital data. The DFDAU provides a serial binary digital data stream to the SSFDR at a rate of 768 bits/sec. A binary, or logical one, is represented by a voltage transition between clock transitions.

The DFDAU input signals are time division multiplexed, with parameter identification established by means of position or time slot addresses in the serial data stream output. This output is a continuous sequence of four-second data frames. Each frame consists of four subframes of 64 separate 12-bit words, with the first word containing a unique 12-bit synchronization (sync) word identifying it as subframe 1,2,3, or 4. The data stream is "in sync" when successive sync words appear at the proper 64-word intervals. If the data stream is interrupted, sync words will not appear at the proper interval or sequence, and the time reference will be lost until the subframe pattern can be reestablished.

Time Correlation

The SSFDR data were correlated to local time (Eastern Daylight Time (EDT)). See the Time Correlation Report for further details on the correlation between SSFDR and local time.

Data and Graphs

Attachments II-1 to II-22 contain plots of those parameters that were recorded and validated. The timeframe of the plots is from 8:39:00 EDT to 10:04:00 EDT, with the last recorded data shown at 10:03:10 EDT.

The raw file for this data set contained 2 additional subframes (seconds) of data. The first of these two contained data in words 1, 2, 3, and 4 but the rest of the subframe were zeros. Word 1, which was a sync word, and word 2, which contained a vertical acceleration value of .640 g's, appeared to be valid data. The remaining 2 words could

not be validated and the remainder of the frame was considered invalid. The next subframe was determined to be a repeat of the previous subframe and was considered invalid³. These 2 subframes were not included in the plotted or tabular data.

The data plotted in Attachment II are available in tabular format as a comma delimited (*.csv) files in Attachment III. The tabular data are separated into 4 files alphabetically based on the parameter names.



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Attachments I-1 to I-10	Parameter Listings
Attachments II-1 to II-22:	Plots of SSFDR Data
Attachment III (electronic):	DCA01MA065 tabular csv files
Attachment IV (electronic):	757UALmap.xls

³ This condition, where the last recorded subframe is repeated, is a known bug which occurs as a result of the SSFDR download software.

Attachment I

Parameter Listings

Parameters Validated

PORT NAME	PARAMETER ASSIGNMENT	PORT NAME	PARAMETER ASSIGNMENT
EFIS L/C-A-1	10 MI RANGE SEL CAPT	TMC L-D-4	A/T DISCONNECT
EFIS L/C-A-1	160 MI RANGE SEL CAPT	TMC L-D-4	A/T ENGAGE
EFIS L/C-A-1	20 MI RANGE SEL CAPT	TMC L-D-4	A/T G/A MODE ANNUN
EFIS L/C-A-1	40 MI RANGE SEL CAPT	EICAS L/R-A-1	AC BUS OFF - L
EFIS L/C-A-1	5 MI RANGE SEL CAPT	EICAS L/R-A-1	AC BUS OFF - R
EFIS L/C-A-1	80 MI RANGE SEL CAPT	EICAS L/R-A-1	AC BUS TIE ISOL - L
FCC C-A-4	A/P CAUTION	EICAS L/R-A-1	AC BUS TIE ISOL - R
FCC L-A-4	A/P CAUTION	DFDAU	ACMS S/W P/N CODE
FCC L-A-4	A/P CAUTION	ADC L/R-A-4	ADC INVALID
FCC R-A-4	A/P CAUTION	ADC SW	ADC SELECT SW-CAPT
FCC C-A-4	A/P CMD C ENGA	EFIS L/C-A-1	ADF/ VOR SEL CAPT
FCC L-A-4	A/P CMD C ENGA	EICAS L/R-A-1	AFT CARGO FIRE
FCC R-A-4	A/P CMD C ENGA	EICAS L/R-A-1	AILERON POSN-OUTER - L
MCP A-A-2	A/P CMD C ENGA	EICAS L/R-A-1	AILERON POSN-OUTER - R
FCC C-A-4	A/P CMD L ENGA	TMC L-D-4	AIR DRIVEN PUMP
FCC L-A-4	A/P CMD L ENGA	A/G RELAY	AIR/GROUND
FCC R-A-4	A/P CMD L ENGA	EFIS L/C-A-1	AIRPORTS CAPT
MCP A-A-2	A/P CMD L ENGA	EICAS L/R-A-1	ALL GEAR DOWN & LOCK
FCC C-A-4	A/P CMD R ENGA	FCC C-A-4	ALT HOLD MODE OPER
FCC L-A-4	A/P CMD R ENGA	FCC L-A-4	ALT HOLD MODE OPER
FCC R-A-4	A/P CMD R ENGA	FCC R-A-4	ALT HOLD MODE OPER
MCP A-A-2	A/P CMD R ENGA	MCP A-A-2	ALT HOLD MODE OPER
FCC C-A-4	A/P CWS C ENGA	FCC C-A-4	ALT MODE OPER
FCC L-A-4	A/P CWS C ENGA	FCC L-A-4	ALT MODE OPER
FCC R-A-4	A/P CWS C ENGA	FCC L-A-4	ALT MODE OPER
MCP A-A-2	A/P CWS C ENGA	FCC R-A-4	ALT MODE OPER
FCC C-A-4	A/P CWS L ENGA	ADC L/R-A-4	ALTITUDE (1013.25mB) COARSE
FCC L-A-4	A/P CWS L ENGA	ADC L/R-A-4	ALTITUDE (1013.25mB) FINE
FCC R-A-4	A/P CWS L ENGA	MCP A-A-2	ALTITUDE SELECTED-MAN
MCP A-A-2	A/P CWS L ENGA	EICAS L/R-A-1	ALTN EICAS COMP
FCC C-A-4	A/P CWS R ENGA	EICAS L/R-A-1	ANTI-SKID
FCC L-A-4	A/P CWS R ENGA	FCC C-A-4	APPR MODE OPER
FCC R-A-4	A/P CWS R ENGA	FCC L-A-4	APPR MODE OPER
MCP A-A-2	A/P CWS R ENGA	FCC L-A-4	APPR MODE OPER
FCC C-A-4	A/P ENGAGE DETENT	FCC R-A-4	APPR MODE OPER
FCC L-A-4	A/P ENGAGE DETENT	EICAS L/R-A-1	APU BLEED VALVE
FCC L-A-4	A/P ENGAGE DETENT	EICAS L/R-A-1	APU BUS AC VOLTS
FCC R-A-4	A/P ENGAGE DETENT	EICAS L/R-A-1	APU EGT
FCC L-A-4	A/P T.E. FLAP POSITION	EICAS L/R-A-1	APU FAULT
EICAS L/R-A-1	A/P WARN-2 BAT	EICAS L/R-A-1	APU FIRE
EICAS L/R-A-1	A/P WARN-2 NORM	EICAS L/R-A-1	APU GEN APB OPEN
FCC C-A-4	A/P WARNING	EICAS L/R-A-1	APU LOW OIL QUANT
FCC L-A-4	A/P WARNING	EICAS L/R-A-1	APU RPM
FCC L-A-4	A/P WARNING	FCC C-A-4	ATT HOLD MODE OPER
FCC R-A-4	A/P WARNING	FCC L-A-4	ATT HOLD MODE OPER

PORT NAME	PARAMETER ASSIGNMENT
FCC L-A-4	ATT HOLD MODE OPER
FCC R-A-4	ATT HOLD MODE OPER
EICAS L/R-A-1	AUTO BRAKE
EICAS L/R-A-1	AUTO SPEEDBRAKE
FCC C-A-4	AUTOLAND WARN LT
FCC L-A-4	AUTOLAND WARN LT
FCC L-A-4	AUTOLAND WARN LT
FCC R-A-4	AUTOLAND WARN LT
EICAS L/R-A-1	AUTOTHROTTLE DISC
FCC C-A-4	AUTOTRIM DOWN - ARM
FCC L-A-4	AUTOTRIM DOWN - ARM
FCC R-A-4	AUTOTRIM DOWN - ARM
FCC C-A-4	AUTOTRIM DOWN - CONT
FCC L-A-4	AUTOTRIM DOWN - CONT
FCC R-A-4	AUTOTRIM DOWN - CONT
FCC C-A-4	AUTOTRIM UP - ARM
FCC L-A-4	AUTOTRIM UP - ARM
FCC R-A-4	AUTOTRIM UP - ARM
FCC C-A-4	AUTOTRIM UP - CONT
FCC L-A-4	AUTOTRIM UP - CONT
FCC R-A-4	AUTOTRIM UP - CONT
FCC C-A-4	B/CRS MODE OPER
FCC L-A-4	B/CRS MODE OPER
FCC L-A-4	B/CRS MODE OPER
FCC R-A-4	B/CRS MODE OPER
ADC L/R-A-4	BARO COR NO. 1 (IN)
ADC L/R-A-4	BARO COR NO. 2 (IN)
EICAS L/R-A-1	BLEED DUCT PRESS - L
EICAS L/R-A-1	BRAKE TEMP LT
EICAS L/R-A-1	CABIN ALT > 10kft
EICAS L/R-A-1	CAPT INST BUS XFER
EICAS L/R-A-1	CARGO FIRE SW
GPWC L-A-1	CAUTION OBST OR OBSTAHEAD
GPWC L-A-1	CAUTION TERRAIN
GPWC L-A-1	CAUTION WINDSHEAR
EICAS L/R-A-1	CDU MENU REQUEST
EICAS L/R-A-1	C-L FUEL PUMP LT
EICAS L/R-A-1	C-L FUEL PUMP PR
TMC L-D-4	CLB MODE OPER
EFIS L/C-A-1	COMPAR ENABLE CAPT
ADC L/R-A-4	COMPUTED AIRSPEED
TMC L-D-4	CON MODE OPER
SYNCHRO	CONTROL COLUMN POSN-CAPT
SYNCHRO	CONTROL COLUMN POSN-CAPT
SYNCHRO	CONTROL WHEEL POSN-CAPT
SYNCHRO	CONTROL WHEEL POSN-CAPT
EFIS L/C-A-1	CP FAULT - LEFT

PORT NAME	PARAMETER ASSIGNMENT
EICAS L/R-A-1	C-R FUEL PUMP LT
EICAS L/R-A-1	C-R FUEL PUMP PR
TMC L-D-4	CRZ MODE OPER
CONFIG	CUSTOMER UNIQUE FRAME
CAPT CLOCK	DAY X 1
CAPT CLOCK	DAY X10
DME L-A-2	DME ANTENNA FAILURE - L
DME R-A-2	DME ANTENNA FAILURE - R
DME L-A-2	DME DISTANCE-LEFT
DME R-A-2	DME DISTANCE-RIGHT
DME L-A-2	DME FAILURE - L
DME R-A-2	DME FAILURE - R
EFIS L/C-A-1	DME SELECTED CAPT
FMC L/R-D-4	DME/DME
GPWC L-A-1	DON'T SINK
FMC L/R-D-4	DRIFT ANGLE
TMC L-D-4	ECS PACK H/L LEFT
TMC L-D-4	ECS PACK H/L RIGHT
EICAS L/R-A-1	ECS PACK OFF - L
EICAS L/R-A-1	ECS PACK OFF - R
TMC L-D-4	ECS PACK ON/OFF LEFT
TMC L-D-4	ECS PACK ON/OFF RIGHT
EICAS L/R-A-1	ECS PACK OVHT - L
EICAS L/R-A-1	ECS PACK OVHT - R
TMC L-D-4	EEC VALID - L
TMC L-D-4	EEC VALID - R
EFIS SW	EFIS SELECT SW-CAPT
EICAS L/R-A-1	EICAS ALT DISAGREE
EICAS L/R-A-1	EICAS COMPUTER
EICAS L/R-A-1	EICAS IAS DISAGREE
EICAS SW	EICAS SELECT SW
EICAS L/R-A-1	ELEVATOR FEEL SYSTEM
EICAS L/R-A-1	ELEVATOR POSN - L
EICAS L/R-A-1	ELEVATOR POSN - R
EICAS L/R-A-1	EMERGENCY LIGHTS
EICAS L/R-A-1	ENG EPR COMMAND - L
EICAS L/R-A-1	ENG EPR LIMIT-L
EICAS L/R-A-1	ENG EPR LIMIT-R
EICAS L/R-A-1	ENG EPR-ACTUAL - L
EICAS L/R-A-1	ENG EPR-ACTUAL - R
EICAS L/R-A-1	ENG FUEL CUTOFF - L
EICAS L/R-A-1	ENG FUEL CUTOFF - R
EICAS L/R-A-1	ENG FUEL FILTER - L
EICAS L/R-A-1	ENG FUEL FILTER - R
EICAS L/R-A-1	ENG FUEL FLOW - L
EICAS L/R-A-1	ENG FUEL FLOW - R
EICAS L/R-A-1	ENG FUEL VALVE - L

PORT NAME	PARAMETER ASSIGNMENT
EICAS L/R-A-1	ENG FUEL VALVE - R
EICAS L/R-A-1	ENG LO OIL PRESS - L
EICAS L/R-A-1	ENG LO OIL PRESS - R
EICAS L/R-A-1	ENG N1-ACTUAL - L
EICAS L/R-A-1	ENG N1-ACTUAL - R
EICAS L/R-A-1	ENG N2-ACTUAL - L
EICAS L/R-A-1	ENG N2-ACTUAL - R
EICAS L/R-A-1	ENG OIL FILTER - L
EICAS L/R-A-1	ENG OIL FILTER - R
EICAS L/R-A-1	ENG OIL PRES - L
EICAS L/R-A-1	ENG OIL PRES - R
EICAS L/R-A-1	ENG OIL QTY - L
EICAS L/R-A-1	ENG OIL QTY - R
EICAS L/R-A-1	ENG OIL TEMP - L
EICAS L/R-A-1	ENG OIL TEMP - R
EICAS L/R-A-1	ENG OUT RLY - L
EICAS L/R-A-1	ENG OUT RLY - R
EICAS L/R-A-1	ENG START VALVE - L
EICAS L/R-A-1	ENG START VALVE - R
EICAS L/R-A-1	ENG STARTER - L
EICAS L/R-A-1	ENG STARTER - R
EICAS L/R-A-1	ENG VIBRATION - L
EICAS L/R-A-1	ENG VIBRATION - R
EICAS L/R-A-1	ENGINE FIRE - L
EICAS L/R-A-1	ENGINE FIRE - R
EICAS L/R-A-1	ENGINE OVHT - L
EICAS L/R-A-1	ENGINE OVHT - R
EICAS L/R-A-1	EPR TARGET-FMC
EICAS L/R-A-1	F/O INST BUS XFER
EICAS L/R-A-1	FILTER 1 VIB - L
EICAS L/R-A-1	FILTER 1 VIB-R
EICAS L/R-A-1	FILTER 2 VIB - L
EICAS L/R-A-1	FILTER 2 VIB - R
EICAS L/R-A-1	FIRE EXT SWITCH - L
EICAS L/R-A-1	FIRE EXT SWITCH - R
FCC C-A-4	FL CH MODE OPER
FCC L-A-4	FL CH MODE OPER
FCC R-A-4	FL CH MODE OPER
MCP A-A-2	FL CH MODE OPER
TMC L-D-4	FL CH MODE OPER
FSEU	FLAP HANDLE POSN
FCC C-A-4	FLAP LIMIT
FCC L-A-4	FLAP LIMIT
FCC L-A-4	FLAP LIMIT
FCC R-A-4	FLAP LIMIT
TMC L-D-4	FLAP LIMIT
FCC C-A-4	FLARE OPER

PORT NAME	PARAMETER ASSIGNMENT
FCC L-A-4	FLARE OPER
FCC R-A-4	FLARE OPER
MCP A-A-2	FLARE OPER
TMC L-D-4	FLARE RETARD MODE
FCC C-A-4	FLT DIR ON-CAPT
FCC L-A-4	FLT DIR ON-CAPT
FCC R-A-4	FLT DIR ON-CAPT
MCP A-A-2	FLT DIR ON-CAPT
FCC C-A-4	FLT DIR ON-F/O
FCC L-A-4	FLT DIR ON-F/O
FCC R-A-4	FLT DIR ON-F/O
MCP A-A-2	FLT DIR ON-F/O
FCC C-A-4	FMA FAULT 1 (CWS)
FCC L-A-4	FMA FAULT 1 (CWS)
FCC L-A-4	FMA FAULT 1 (CWS)
FCC R-A-4	FMA FAULT 1 (CWS)
FCC C-A-4	FMA FAULT 2 (PTCH)
FCC L-A-4	FMA FAULT 2 (PTCH)
FCC L-A-4	FMA FAULT 2 (PTCH)
FCC R-A-4	FMA FAULT 2 (PTCH)
FCC C-A-4	FMA FAULT 3 (ROLL)
FCC L-A-4	FMA FAULT 3 (ROLL)
FCC L-A-4	FMA FAULT 3 (ROLL)
FCC R-A-4	FMA FAULT 3 (ROLL)
EFIS L/C-A-1	FMC SELECTED CAPT
DFDAU	FMC/IRU DATA SOURCE
EEC L-A-1	FOD DET - L
EEC R-A-1	FOD DET - R
EFIS L/C-A-1	FPM ENABLE CAPT
DFDAU	FRAME COUNTER
EICAS L/R-A-1	FSEU FAULT (STATUS)
EICAS L/R-A-1	FUEL CONFIG
EFIS L/C-A-1	FULL COMPASS ROSE CAPT
EICAS L/R-A-1	FWD CARGO FIRE
EICAS L/R-A-1	FWD EQUIP SMOKE
TMC L-D-4	G/A MODE OPER
FCC C-A-4	G/A MODE OPER-P
FCC L-A-4	G/A MODE OPER-P
FCC L-A-4	G/A MODE OPER-P
FCC R-A-4	G/A MODE OPER-P
FCC C-A-4	G/A MODE OPER-R
FCC L-A-4	G/A MODE OPER-R
FCC L-A-4	G/A MODE OPER-R
FCC R-A-4	G/A MODE OPER-R
FCC C-A-4	G/S MODE OPER
FCC L-A-4	G/S MODE OPER
FCC R-A-4	G/S MODE OPER

PORT NAME	PARAMETER ASSIGNMENT
MCP A-A-2	G/S MODE OPER
EICAS L/R-A-1	GEAR DISAGREE SYS 1
EICAS L/R-A-1	GEAR DISAGREE SYS 2
GPWC L-A-1	GLIDESLOPE
GPWC L-A-1	GLIDESLOPE CANCEL
CAPT CLOCK	GMT HOURS
CAPT CLOCK	GMT MINUTES
CAPT CLOCK	GMT SECONDS
FMC L/R-D-4	GPS
GPWC L-A-1	GPWC FAILURE
GPWC L-A-1	GPWS ALERT
GPWC L-A-1	GPWS ALERT
EICAS L/R-A-1	GROSS WEIGHT
GPWC L-A-1	GROUND PROX INOP
GPWC L-A-1	GROUND PROX WARNING
GPWC L-A-1	GROUND PROX WARNING
EFIS L/C-A-1	GROUNDSPEED CAPT
FCC C-A-4	HDG HOLD MODE OPER
FCC L-A-4	HDG HOLD MODE OPER
FCC R-A-4	HDG HOLD MODE OPER
MCP A-A-2	HDG HOLD MODE OPER
FCC C-A-4	HDG SEL MODE OPER
FCC L-A-4	HDG SEL MODE OPER
FCC R-A-4	HDG SEL MODE OPER
MCP A-A-2	HDG SEL MODE OPER
MCP A-A-2	HEADING SELECTED
L HF	HF-LEFT KEYING
R HF	HF-RIGHT KEYING
EICAS L/R-A-1	HYD BRAKE SOURCE
EICAS L/R-A-1	HYD GENERATOR
EICAS L/R-A-1	HYD PRES - C
EICAS L/R-A-1	HYD PRES - L
EICAS L/R-A-1	HYD PRES - R
EICAS L/R-A-1	HYD RSVR PRESS < 17 - C
EICAS L/R-A-1	HYD RSVR PRESS < 17 - L
EICAS L/R-A-1	HYD RSVR PRESS < 17 - R
EICAS L/R-A-1	HYD SYS LO PRESS - C
EICAS L/R-A-1	HYD SYS LO PRESS - C
EICAS L/R-A-1	HYD SYS LO PRESS - L
EICAS L/R-A-1	HYD SYS LO PRESS - L
EICAS L/R-A-1	HYD SYS LO PRESS - R
EICAS L/R-A-1	HYD SYS LO PRESS - R
FCC C-A-4	IAS
FCC L-A-4	IAS
FCC L-A-4	IAS
FCC R-A-4	IAS
FCC C-A-4	IAS LIMIT OPER

PORT NAME	PARAMETER ASSIGNMENT
FCC L-A-4	IAS LIMIT OPER
FCC L-A-4	IAS LIMIT OPER
FCC R-A-4	IAS LIMIT OPER
TMC L-D-4	IAS MODE OPER
EICAS L/R-A-1	IDG OIL LEVEL - L
EICAS L/R-A-1	IDG OIL TEMP-L
TMC L-D-4	IDLE THRUST OPER
EFIS L/C-A-1	ILS (MOD) MODE SEL CAPT
EFIS L/C-A-1	ILS (STD) MODE SEL CAPT
EFIS L/C-A-1	ILS SELECTED CAPT
ADC L/R-A-4	INDICATED AOA
ADC L/R-A-4	INDICATED AOA
VOR L-A-2	INNER MARKER
FMC L/R-D-4	IRS (3) MODE OPER
FMC L/R-D-4	IRS (C) MODE OPER
FMC L/R-D-4	IRS (L) MODE OPER
FMC L/R-D-4	IRS (R) MODE OPER
IRS SW	IRS SELECT SW-CAPT
FMC L/R-D-4	IRS/LOC
FMC L/R-D-4	IRS/MLS
EFIS L/C-A-1	IRU SELECTED CAPT
TMC L-D-4	ISOLATION VALVE-L
TMC L-D-4	ISOLATION VALVE-R
EICAS L/R-A-1	L BLEED DUCT LEAK
FCC C-A-4	L NAV MODE OPER
FCC L-A-4	L NAV MODE OPER
FCC R-A-4	L NAV MODE OPER
MCP A-A-2	L NAV MODE OPER
EICAS L/R-A-1	L.E. SLAT DISAGREE
EICAS L/R-A-1	L.E. SLAT DISAGREE
EICAS L/R-A-1	L.E. SLATS ASYM
FSEU	L.E. SLATS EXTEND
FSEU	L.E. SLATS EXTEND
FSEU	L.E. SLATS FAIL
FSEU	L.E. SLATS PART EXTEND
FSEU	L.E. SLATS PART EXTEND
FSEU	L.E. SLATS RETRACTED
FSEU	L.E. SLATS RETRACTED
FCC C-A-4	LAND 2 (GREEN)
FCC L-A-4	LAND 2 (GREEN)
FCC L-A-4	LAND 2 (GREEN)
FCC R-A-4	LAND 2 (GREEN)
FCC C-A-4	LAND 3 (GREEN)
FCC L-A-4	LAND 3 (GREEN)
FCC L-A-4	LAND 3 (GREEN)
FCC R-A-4	LAND 3 (GREEN)
ACCEL	LATERAL ACCELERATION

PORT NAME	PARAMETER ASSIGNMENT
ACCEL	LATERAL ACCELERATION
ACCEL	LATERAL ACCELERATION
ACCEL	LATERAL ACCELERATION
EICAS L/R-A-1	LAVATORY SMOKE (C)
EICAS L/R-A-1	LDG CONFIG - GEAR
EICAS L/R-A-1	LDG CONFIG-SPD BK
EICAS L/R-A-1	LDG GEAR LEVER
FCC C-A-4	LOC MODE OPER
FCC L-A-4	LOC MODE OPER
FCC R-A-4	LOC MODE OPER
MCP A-A-2	LOC MODE OPER
FMC L/R-D-4	LOC/DME MODE OPER
ACCEL	LONGITUDINAL ACCEL
ACCEL	LONGITUDINAL ACCEL
ACCEL	LONGITUDINAL ACCEL
ACCEL	LONGITUDINAL ACCEL
EICAS L/R-A-1	LOW FUEL QTY
LRRA C-A-2	LRRA FAILURE - C
LRRA L-A-2	LRRA FAILURE - L
LRRA R-A-2	LRRA FAILURE - R
LRRA C-A-2	LRRA REVEIVE ANTENNA - C
LRRA L-A-2	LRRA REVEIVE ANTENNA - L
LRRA R-A-2	LRRA REVEIVE ANTENNA - R
LRRA C-A-2	LRRA TRANSMIT ANTENNA - C
LRRA L-A-2	LRRA TRANSMIT ANTENNA - L
LRRA R-A-2	LRRA TRANSMIT ANTENNA - R
FCC C-A-4	MACH
FCC L-A-4	MACH
FCC L-A-4	MACH
FCC R-A-4	MACH
FCC C-A-4	MACH LIMIT OPER
FCC L-A-4	MACH LIMIT OPER
FCC L-A-4	MACH LIMIT OPER
FCC R-A-4	MACH LIMIT OPER
TMC L-D-4	MACH MODE OPER
MCP A-A-2	MACH SELECTED-MAN
EICAS L/R-A-1	MACH SPEED TRIM
EFIS L/C-A-1	MAG HEADING CAPT
EICAS L/R-A-1	MAIN CARGO FIRE
DFDAU	MANDATORY S/W P/N CODE
DFDAU	MANUFACTURER CODE
EFIS L/C-A-1	MAP MODE SELECT CAPT
EFIS L/C-A-1	MAP SOURCE CAPT
EICAS L/R-A-1	MASTER CAUTION LIGHT
WEU WARN	MASTER WARNING CAPT
WEU WARN	MASTER WARNING F/O
VOR L-A-2	MIDDLE MARKER

PORT NAME	PARAMETER ASSIGNMENT
FCC C-A-4	MIN SPEED
FCC L-A-4	MIN SPEED
FCC R-A-4	MIN SPEED
TMC L-D-4	MIN SPEED
GPWC L-A-1	MINIMUMS
EFIS L/C-A-1	MLS SELECT CAPT
EFIS L/C-A-1	MLS/ILS SOURCE SEL CAPT
CAPT CLOCK	MONTH X 1
CAPT CLOCK	MONTH X10
EFIS L/C-A-1	NAV AIDS CAPT
EFIS L/C-A-1	NAV MODE SEL CAPT
ADC L/R-A-4	NO. 1 AOA HEAT ON
ADC L/R-A-4	NO. 2 AOA HEAT ON
GPWC L-A-1	NOT USED
GPWC L-A-1	OBSTACLE WARNING
VOR L-A-2	OUTER MARKER
ADC L/R-A-4	OVERSPEED
EICAS L/R-A-1	PARKING BRAKE ON
EICAS L/R-A-1	PASS OXY ON
EFIS L/C-A-1	PITCH ANGLE CAPT
EFIS L/C-A-1	PITCH DISAGREE CAPT
EFIS L/C-A-1	PLAN MODE SEL CAPT
EICAS L/R-A-1	POWER XFER UNIT
CONFIG	PRE 97 RULE
GPWC-L-A-1	PREDICTIVE WINDSHEAR
GPWC L-A-1	PULL UP
FCC C-A-4	PVD ENABLE
FCC L-A-4	PVD ENABLE
FCC L-A-4	PVD ENABLE
FCC R-A-4	PVD ENABLE
EICAS L/R-A-1	R BLEED DUCT LEAK
EICAS L/R-A-1	R ENG BLEED OVHT
EICAS L/R-A-1	RAT UNLOCKED
TMC L-D-4	RATING 1 OPER
TMC L-D-4	RATING 2 OPER
FMC L/R-D-4	REQ'D NAV PERF-(RNP)
EEC L-A-1	REVERSER STATUS - L
EEC R-A-1	REVERSER STATUS - R
EFIS L/C-A-1	ROLL ANGLE CAPT
EFIS L/C-A-1	ROLL DISAGREE CAPT
FCC C-A-4	ROLLOUT MODE OPER
FCC L-A-4	ROLLOUT MODE OPER
FCC L-A-4	ROLLOUT MODE OPER
FCC R-A-4	ROLLOUT MODE OPER
EICAS L/R-A-1	RSV BRAKE VALVE
EFIS L/C-A-1	RTE DATA CAPT
EICAS L/R-A-1	RUDD RATIO MODULE

PORT NAME	PARAMETER ASSIGNMENT
SYNCHRO	RUDDER PEDAL POSN
SYNCHRO	RUDDER PEDAL POSN
EICAS L/R-A-1	RUDDER POSITION
EICAS L/R-A-1	RUDDER POSITION
EICAS L/R-A-1	RUDDER RATIO SYS
DFDAU	S/F CYCLE COUNT 0
DFDAU	S/F CYCLE COUNT 1
DFDAU	S/F CYCLE COUNT 2
DFDAU	S/F CYCLE COUNT 3
DFDAU	S/F CYCLE COUNT 4
DFDAU	S/F CYCLE COUNT 5
DFDAU	S/F CYCLE COUNT 6
DFDAU	S/F CYCLE COUNT 7
DFDAU	S/F CYCLE COUNT 8
DFDAU	S/F CYCLE COUNT 9
DFDAU	S/F CYCLE COUNT 10
DFDAU	S/F CYCLE COUNT 11
DFDAU	S/F CYCLE COUNT 12
DFDAU	S/F CYCLE COUNT 13
DFDAU	S/F CYCLE COUNT 14
DFDAU	S/F CYCLE COUNT 15
EFIS L/C-A-1	SG FAULT- LEFT
TMC L-D-4	SHUTOFF VALVE LEFT
TMC L-D-4	SHUTOFF VALVE RIGHT
GPWC L-A-1	SINK RATE
GPWC L-A-1	SIREN WINDSHEAR WINDSHEAR
FCC C-A-4	SPD BRK HDL POSN
FCC L-A-4	SPD BRK HDL POSN
FCC R-A-4	SPD BRK HDL POSN
MCP A-A-2	SPD BRK HDL POSN
MCP A-A-2	SPD DISPLAY BLANK
TMC L-D-4	SPD LIMIT
MCP A-A-2	SPEED SELECTED-MAN
EICAS L/R-A-1	SPOILER MODULE
EICAS L/R-A-1	SPOILER SYSTEM
FCC C-A-4	STAB POSITION
FCC L-A-4	STAB POSITION
FCC R-A-4	STAB POSITION
MCP A-A-2	STAB POSITION
EICAS L/R-A-1	STAB TRIM FAULT
EICAS L/R-A-1	STAB TRIM MODULE
ADC L/R-A-4	STATIC PRESSURE
EICAS L/R-A-1	STATOR VANE POSN - L
EICAS L/R-A-1	STATOR VANE POSN - R
EFIS L/C-A-1	SWC SELECT CAPT
DFDAU	SYNC WORD
EICAS L/R-A-1	T.E. FLAP ASYM

PORT NAME	PARAMETER ASSIGNMENT
EICAS L/R-A-1	T.E. FLAPS DISAGREE
EICAS L/R-A-1	T.E. FLAPS DISAGREE
EEC L-A-1	T/L RSLVR ANGLE-LEFT
EEC R-A-1	T/L RSLVR ANGLE-RIGHT
EICAS L/R-A-1	T/O CONFIG FLAPS
EICAS L/R-A-1	T/O CONFIG PARK BRK
EICAS L/R-A-1	T/O CONFIG SPOILER
EICAS L/R-A-1	T/O CONFIG STAB
FCC C-A-4	T/O MODE OPER-P
FCC L-A-4	T/O MODE OPER-P
FCC L-A-4	T/O MODE OPER-P
FCC R-A-4	T/O MODE OPER-P
FCC C-A-4	T/O MODE OPER-R
FCC L-A-4	T/O MODE OPER-R
FCC R-A-4	T/O MODE OPER-R
TMC L-D-4	T/O MODE OPER-R
EICAS L/R-A-1	T/R DEPLOYED - L
EICAS L/R-A-1	T/R DEPLOYED - R
EICAS L/R-A-1	T/R INTRANSIT - L
EICAS L/R-A-1	T/R INTRANSIT - R
EICAS L/R-A-1	TAT PROBE HEAT
EFIS L/C-A-1	TCAS DATA DISPLAYED CAPT
EFIS L/C-A-1	TCAS DATA SELECTED CAPT
EFIS L/C-A-1	TCAS DATA SELECTED CAPT
GPWC L-A-1	TERRAIN
GPWC L-A-1	TERRAIN AHEAD
GPWC L-A-1	TERRAIN AHEAD PULL UP
GPWC L-A-1	TERRAIN AWARENESS INOP
GPWC L-A-1	TERRAIN AWARENESS NOT AVAIL
GPWC L-A-1	TERRAIN CAUTION
EFIS L/C-A-1	TERRAIN DATA DISPLAYED CAPT
EFIS L/C-A-1	TERRAIN DATA SELECTED CAPT
EFIS L/C-A-1	TERRAIN DATA SELECTED CAPT
GPWC L-A-1	TERRAIN DISPLAY DISCRETE 1 ON
GPWC L-A-1	TERRAIN DISPLAY DISCRETE 2 ON
GPWC L-A-1	TERRAIN OVERRIDE
GPWC L-A-1	TERRAIN WARNING
TMC L-D-4	THROTTLE HLD ANNUN
TMC L-D-4	THRUST MODE OPER
TMC L-D-4	TMC VALID
TMC L-D-4	TMC V-NAV OPER
GPWC L-A-1	TOO LOW FLAP
GPWC L-A-1	TOO LOW GEAR
GPWC L-A-1	TOO LOW TERRAIN
ADC L/R-A-4	TOTAL AIR TEMP
EICAS L/R-A-1	UNSCHED STAB MOVE
EICAS L/R-A-1	UTIL BUS OFF - L

PORT NAME	PARAMETER ASSIGNMENT
EICAS L/R-A-1	UTIL BUS OFF - R
FCC C-A-4	V NAV MODE OPER
FCC L-A-4	V NAV MODE OPER
FCC R-A-4	V NAV MODE OPER
MCP A-A-2	V NAV MODE OPER
FCC C-A-4	V/S MODE OPER
FCC L-A-4	V/S MODE OPER
FCC R-A-4	V/S MODE OPER
MCP A-A-2	V/S MODE OPER
DFDAU	VENDOR DATABASE CODE
MCP A-A-2	VERT SPEED SELECTED
ACCEL	VERTICAL ACCELERATION
ACCEL	VERTICAL ACCELERATION
ACCEL	VERTICAL ACCELERATION
ACCEL	VERTICAL ACCELERATION
ACCEL	VERTICAL ACCELERATION
ACCEL	VERTICAL ACCELERATION
ACCEL	VERTICAL ACCELERATION
ACCEL	VERTICAL ACCELERATION
C VHF	VHF CENTER KEYING
L VHF	VHF LEFT KEYING
R VHF	VHF RIGHT KEYING
EFIS L/C-A-1	VOR (MOD) MODE SEL CAPT
EFIS L/C-A-1	VOR (STD) MODE SEL CAPT
VOR L-A-2	VOR FAILURE - L
VOR R-A-2	VOR FAILURE - R

PORT NAME	PARAMETER ASSIGNMENT
VOR L-A-2	VOR FREQUENCY-LEFT
VOR R-A-2	VOR FREQUENCY-RIGHT
VOR L-A-2	VOR MB FAILURE - L
EFIS L/C-A-1	VOR SELECTED CAPT
FMC L/R-D-4	VOR/DME
EICAS L/R-A-1	WHEEL WELL FIRE
FMC L/R-D-4	WIND DIRECTION TRUE
FMC L/R-D-4	WIND SPEED
GPWC L-A-1	WINDSHEAR CAUTION
GPWC L-A-1	WINDSHEAR INOP
GPWC L-A-1	WINDSHEAR WARNING
GPWC L-A-1	WINDSHEAR WARNING
TMC L-D-4	WING ANTI-ICE
EFIS L/C-A-1	WPT CAPT
EFIS L/C-A-1	WXR DATA CAPT
EFIS L/C-A-1	WXR DATA DISPLAYED CAPT
EFIS L/C-A-1	WXR DATA SELECTED CAPT
EFIS L/C-A-1	WXR DATA SELECTED CAPT
EFIS L/C-A-1	WXR SELECTED CAPT
EICAS L/R-A-1	YAW DAMPER - L
EICAS L/R-A-1	YAW DAMPER - R
EICAS L/R-A-1	YAW DAMPER MODULE
CAPT CLOCK	YEAR X 1
CAPT CLOCK	YEAR X10

Parameters Not Working or Unconfirmed

PORT NAME	PARAMETER ASSIGNMENT	PORT NAME	PARAMETER ASSIGNMENT
A/C IDENT	A/C NUMBER LSB	DFDAU	DOC DEPART MSC
A/C IDENT	A/C NUMBER LSB + 1	DFDAU	DOC DEST LSC
A/C IDENT	A/C NUMBER LSB + 2	DFDAU	DOC DEST LSC + 1
A/C IDENT	A/C NUMBER LSB + 3	DFDAU	DOC DEST MSC
A/C IDENT	A/C NUMBER LSB + 4	DFDAU	DOC FLT NUMBER LSC
A/C IDENT	A/C NUMBER LSB + 5	DFDAU	DOC FLT NUMBER LSC+1
A/C IDENT	A/C NUMBER LSB + 6	DFDAU	DOC FLT NUMBER LSC+2
A/C IDENT	A/C NUMBER MSB	DFDAU	DOC FLT NUMBER MSC
A/C IDENT	A/C TYPE LSB	DFDAU	DOC LEG NUMBER
A/C IDENT	A/C TYPE LSB+1	TCAS	DOWN ADVISORY
A/C IDENT	A/C TYPE LSB+2	EICAS L/R-A-1	EICAS DISPALY STATE
A/C IDENT	A/C TYPE LSB+3	EICAS L/R-A-1	ENG BLEED OFF - L
A/C IDENT	A/C TYPE LSB+4	EICAS L/R-A-1	ENG BLEED OFF - R
A/C IDENT	A/C TYPE LSB+5	EICAS L/R-A-1	ENG EGT-LEFT
A/C IDENT	A/C TYPE MSB	EICAS L/R-A-1	ENG EGT-RIGHT
FMC L/R-D-4	ACTUAL NAV PERF-(ANP)	EICAS L/R-A-1	ENG EPR COMMAND - R
TCAS	ADV ALT RATE	EICAS L/R-A-1	ENG FUEL PRES - L
EICAS L/R-A-1	AFT EQUIP SMOKE	EICAS L/R-A-1	ENG FUEL PRES - R
TCAS	ALTITUDE REPORTING	TMC L-D-4	ENGINE IDENT 1
TCAS	ALTITUDE SELECT	TMC L-D-4	ENGINE IDENT 10
EICAS L/R-A-1	APU BUS FREQ	TMC L-D-4	ENGINE IDENT 11
EICAS L/R-A-1	APU LOAD	TMC L-D-4	ENGINE IDENT 12
EICAS L/R-A-1	APU OIL LEVEL	TMC L-D-4	ENGINE IDENT 2
EICAS L/R-A-1	BLEED DUCT PRESS - R	TMC L-D-4	ENGINE IDENT 3
A/G RELAY	BOGIE TILT LEFT	TMC L-D-4	ENGINE IDENT 4
A/G RELAY	BOGIE TILT RIGHT	TMC L-D-4	ENGINE IDENT 5
PRESS SENSOR	BRAKE PRES ALT-LEFT	TMC L-D-4	ENGINE IDENT 6
PRESS SENSOR	BRAKE PRES ALT-RIGHT	TMC L-D-4	ENGINE IDENT 7
PRESS SENSOR	BRAKE PRES MAIN-LEFT	TMC L-D-4	ENGINE IDENT 8
PRESS SENSOR	BRAKE PRES MAIN-RIGHT	TMC L-D-4	ENGINE IDENT 9
EICAS L/R-A-1	BUS AC VOLTS L	TMC L-D-4	EPR BUG DRIVE LEFT
EICAS L/R-A-1	BUS AC VOLTS R	TMC L-D-4	EPR BUG DRIVE RIGHT
EFIS L/C-A-1	C FCC DATA FAULT CAPT	EICAS L/R-A-1	EQUIP OVHT
EFIS L/C-A-1	C IRS DATA FAULT CAPT	EVENT SW	EVENT MARKER (RESV)
TCAS	COMBINED CONT	A/C IDENT	FLEET IDENT LSB
TMC L-D-4	COWL ANTI-ICE - L	A/C IDENT	FLEET IDENT LSB + 1
TMC L-D-4	COWL ANTI-ICE - R	A/C IDENT	FLEET IDENT LSB + 2
ILS C-A-2/MMR C	DATA LINK STATUS	A/C IDENT	FLEET IDENT MSB
ILS L-A-2/MMR L	DATA LINK STATUS	EICAS L/R-A-1	FLT DECK EQ SMOKE
ILS R-A-2/MMR R	DATA LINK STATUS	EICAS L/R-A-1	FMC FAIL - L
EICAS L/R-A-1	DC BUS TIE	EICAS L/R-A-1	FMC FAIL - R
FMC L/R-D-4	DESIRED TRACK	FMC SW	FMC SELECT SW A-CAPT
EFIS L/C-A-1	DH SELECTED CAPT	FMC SW	FMC SELECT SW B-CAPT
DFDAU	DOC DEPART LSC	CONFIG	FRAME SEL LSB
DFDAU	DOC DEPART LSC + 1	CONFIG	FRAME SEL MSB

PORT NAME	PARAMETER ASSIGNMENT
EICAS L/R-A-1	FUEL QTY IND SYS
ILS C-A-2/MMR C	G/S RECEIVER FAIL - C
ILS L-A-2/MMR L	G/S RECEIVER FAIL - L
ILS R-A-2/MMR R	G/S RECEIVER FAIL - R
EICAS L/R-A-1	GEAR DOWN SYS 1 - L
EICAS L/R-A-1	GEAR DOWN SYS 1 - N
EICAS L/R-A-1	GEAR DOWN SYS 1 - R
EICAS L/R-A-1	GEN GCB OPEN - L
EICAS L/R-A-1	GEN GCB OPEN - R
ILS C-A-2/MMR C	GLIDESLOPE DEV
ILS L-A-2/MMR L	GLIDESLOPE DEV
ILS R-A-2/MMR R	GLIDESLOPE DEV
EFIS L/C-A-1	GLIDESLOPE DEV CAPT
FMC L/R-D-4	GPS HOURS
FMC L/R-D-4	GPS MINUTES
FMC L/R-D-4	GPS SECONDS
ILS C-A-2/MMR C	GS TEST/TUNE INHIBIT
ILS L-A-2/MMR L	GS TEST/TUNE INHIBIT
ILS R-A-2/MMR R	GS TEST/TUNE INHIBIT
EICAS L/R-A-1	HYD QUANT - C
EICAS L/R-A-1	HYD QUANT - L
EICAS L/R-A-1	HYD QUANT - R
EICAS L/R-A-1	HYD SYS LO QTY - C
EICAS L/R-A-1	HYD SYS LO QTY - L
EICAS L/R-A-1	HYD SYS LO QTY - R
EICAS L/R-A-1	ICE DETECTOR - L
EICAS L/R-A-1	ICE DETECTOR - R
EICAS L/R-A-1	ICING ENGINE/DETECTOR
EICAS L/R-A-1	ICING WING
EICAS L/R-A-1	IDG OIL LEVEL - R
EICAS L/R-A-1	IDG OIL TEMP-R
ILS C-A-2/MMR C	ILS FAILURE - C
ILS L-A-2/MMR L	ILS FAILURE - L
ILS R-A-2/MMR R	ILS FAILURE - R
ILS L-A-2/MMR L	ILS FREQ/MLS /GLS CHAN
ILS L-A-2/MMR L	ILS FREQ/MLS /GLS CHAN
EFIS L/C-A-1	L ADF DATA FAULT CAPT
EICAS L/R-A-1	L ENG BLEED OVHT
EFIS L/C-A-1	L FCC DATA FAULT CAPT
EFIS L/C-A-1	L FMC DATA FAULT CAPT
EICAS L/R-A-1	L MAIN PITOT HEAT
EFIS L/C-A-1	L VOR DATA FAULT CAPT
ILS C-A-2/MMR C	LOC RECEIVER FAIL - C
ILS L-A-2/MMR L	LOC RECEIVER FAIL - L
ILS R-A-2/MMR R	LOC RECEIVER FAIL - R
ILS C-A-2/MMR C	LOC TEST/TUNE INHIBIT
ILS L-A-2/MMR L	LOC TEST/TUNE INHIBIT

PORT NAME	PARAMETER ASSIGNMENT
ILS R-A-2/MMR R	LOC TEST/TUNE INHIBIT
ILS C-A-2/MMR C	LOCALIZER DEV
ILS L-A-2/MMR L	LOCALIZER DEV
ILS R-A-2/MMR R	LOCALIZER DEV
EFIS L/C-A-1	LOCALIZER DEV CAPT
EEC L-A-1	LOOP NO (BIT 2) - L
EEC R-A-1	LOOP NO (BIT 2) - R
EEC L-A-1	LOOP NO (BIT 3) - L
EEC R-A-1	LOOP NO (BIT 3) - R
EEC L-A-1	LOOP NO (BIT 4) - L
EEC R-A-1	LOOP NO (BIT 4) - R
EEC L-A-1	LOOP NO (LSB) - L
EEC R-A-1	LOOP NO (LSB) - R
EEC L-A-1	LOOP NO (MSB) - L
EEC R-A-1	LOOP NO (MSB) - R
ADC L/R-A-4	MACH
EFIS L/C-A-1	MAG/TRUE DATA CAPT
EFIS L/C-A-1	MAG/TRUE STATUS CAPT
EICAS L/R-A-1	MAIN BATT CURRENT
EICAS L/R-A-1	MAIN BATT SWITCH
PRESS SW	MAIN/ALT BRAKE SEL
	MB INNER
	MB MIDDLE
	MB OUTER
ILS C-A-2/MMR C	MLS DIR ANTSEL CMD ACK
ILS L-A-2/MMR L	MLS DIR ANTSEL CMD ACK
ILS R-A-2/MMR R	MLS DIR ANTSEL CMD ACK
EICAS L/R-A-1	N2 CORRECTED TO 2.5 - L
EICAS L/R-A-1	N2 CORRECTED TO 2.5 - R
A/G RELAY	NOSE GEAR SQUAT SW
TCAS	PILOT SL
FMC L/R-D-4	PRES POSN LAT-LSData
FMC L/R-D-4	PRES POSN LAT-MSData
FMC L/R-D-4	PRES POSN LONG-LSData
FMC L/R-D-4	PRES POSN LONG-MSData
EFIS L/C-A-1	R FCC DATA FAULT CAPT
EFIS L/C-A-1	R FMC DATA FAULT CAPT
EFIS L/C-A-1	R IRS DATA FAULT CAPT
EICAS L/R-A-1	R MAIN PITOT HEAT
LRRA C-A-2	RADIO HEIGHT LSB
LRRA L-A-2	RADIO HEIGHT LSB
LRRA R-A-2	RADIO HEIGHT LSB
EFIS L/C-A-1	RADIO HEIGHT LSB CAPT
LRRA C-A-2	RADIO HEIGHT MSB
LRRA L-A-2	RADIO HEIGHT MSB
LRRA R-A-2	RADIO HEIGHT MSB
EFIS L/C-A-1	RADIO HEIGHT MSB CAPT

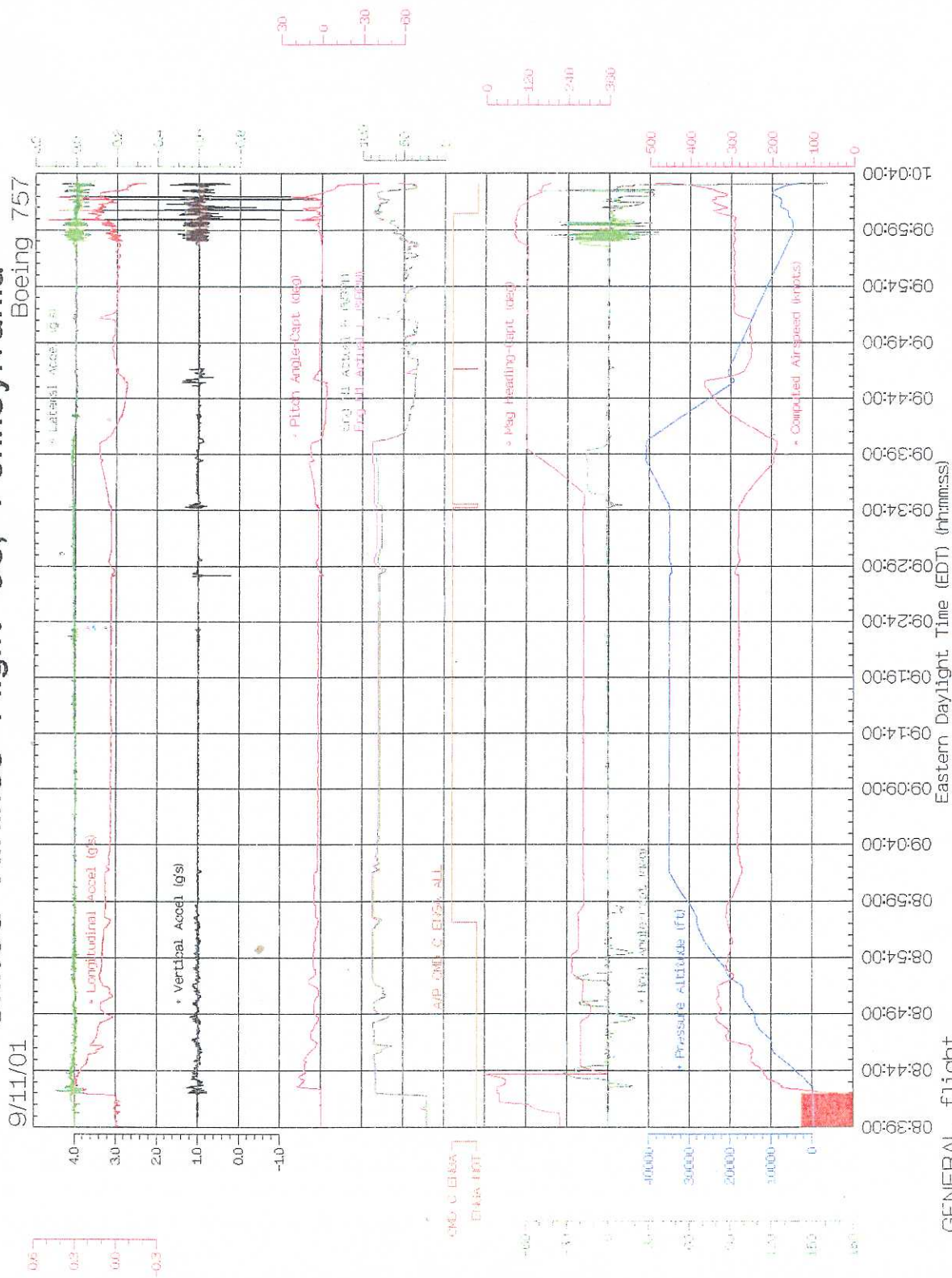
PORT NAME	PARAMETER ASSIGNMENT
TCAS	REPLY INFORMATION
EICAS L/R-A-1	RUDDER PCU
SAM	SAM TRIM DOWN CMD L
SAM	SAM TRIM DOWN CMD R
SAM	SAM TRIM UP CMD LEFT
SAM	SAM TRIM UP CMD RIGHT
ILS L-A-2/MMR L	SEL RWY HDG
VOR L-A-2	SELECTED COURSE - CAPT
VOR R-A-2	SELECTED COURSE - F/O
ILS L-A-2/MMR L	SELECTED LANDING MODE
SPD BK LEVER	SPD BRK HDL POSN ANALOG
CONFIG	SPD BRKE HDL WIRING DISC
TCAS	SPI
CONFIG	STAB ANALOG WIRING DISC
ILS L-A-2/MMR L	STANDBY MODE
ADC L/R-A-4	STATIC AIR TEMP
EICAS L/R-A-1	STBY BUS OFF
EFIS R/C-A-1	TCAS DATA DISPLAYED F/O
EFIS L/C-A-1	TCAS DISPLAY SEL CAPT
TCAS	TCAS FAILURE
TCAS	TCAS SL

PORT NAME	PARAMETER ASSIGNMENT
TCAS	TCAS SYSTEM STATUS
EFIS R/C-A-1	TERRAIN DATA DISPLYD F/O
FQPU	TOTAL FUEL QUANTITY
ADC L/R-A-4	TOTAL PRESSURE
EFIS L/C-A-1	TRUE HEADING CAPT
ILS C-A-2/MMR C	TUNING INPUT BUS ACT -C
ILS L-A-2/MMR L	TUNING INPUT BUS ACT -L
ILS R-A-2/MMR R	TUNING INPUT BUS ACT -R
TCAS	UP ADVISORY
DFDAU	VENDOR STATUS & DATA
TCAS	VERTICAL CONTROL
FMC L/R-D-4	VERTICAL DEVIATION
EICAS L/R-A-1	VIB IDENT 1 - L
EICAS L/R-A-1	VIB IDENT 1 - R
EICAS L/R-A-1	VIB IDENT 2 - L
EICAS L/R-A-1	VIB IDENT 2 - R
EFIS R/C-A-1	WXR DATA DISPLAYED F/O
YAW DMPR	YAW DAMPER ENGAGE L
YAW DMPR	YAW DAMPER ENGAGE R

Attachment II

Plots of SSFDR Data

United Airlines Flight 93, Pennsylvania



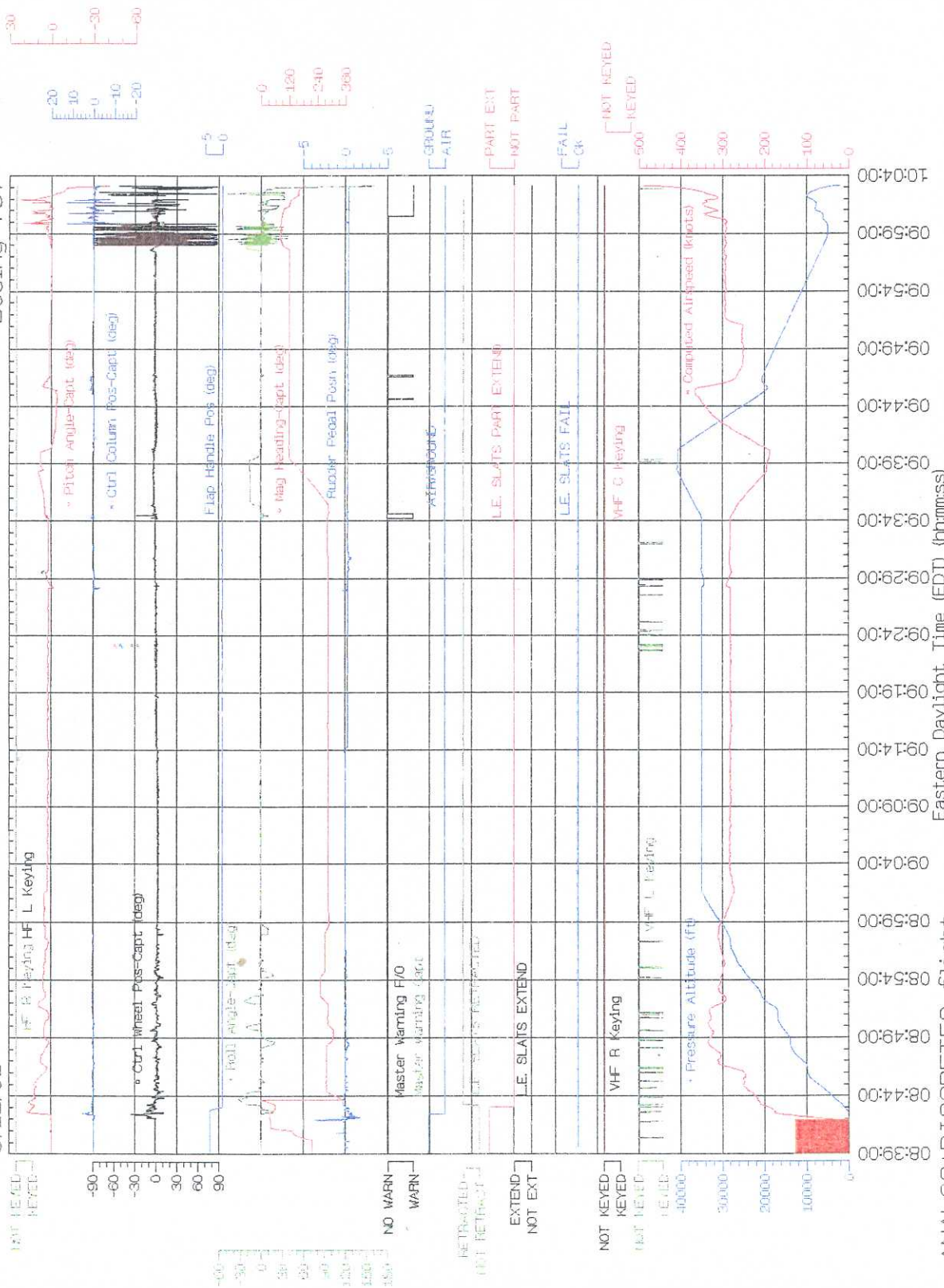
GENERAL flight
Revised: February 12, 2002

National Transportation Safety Board

United Airlines Flight 93, Pennsylvania

9/11/01

Boeing 757



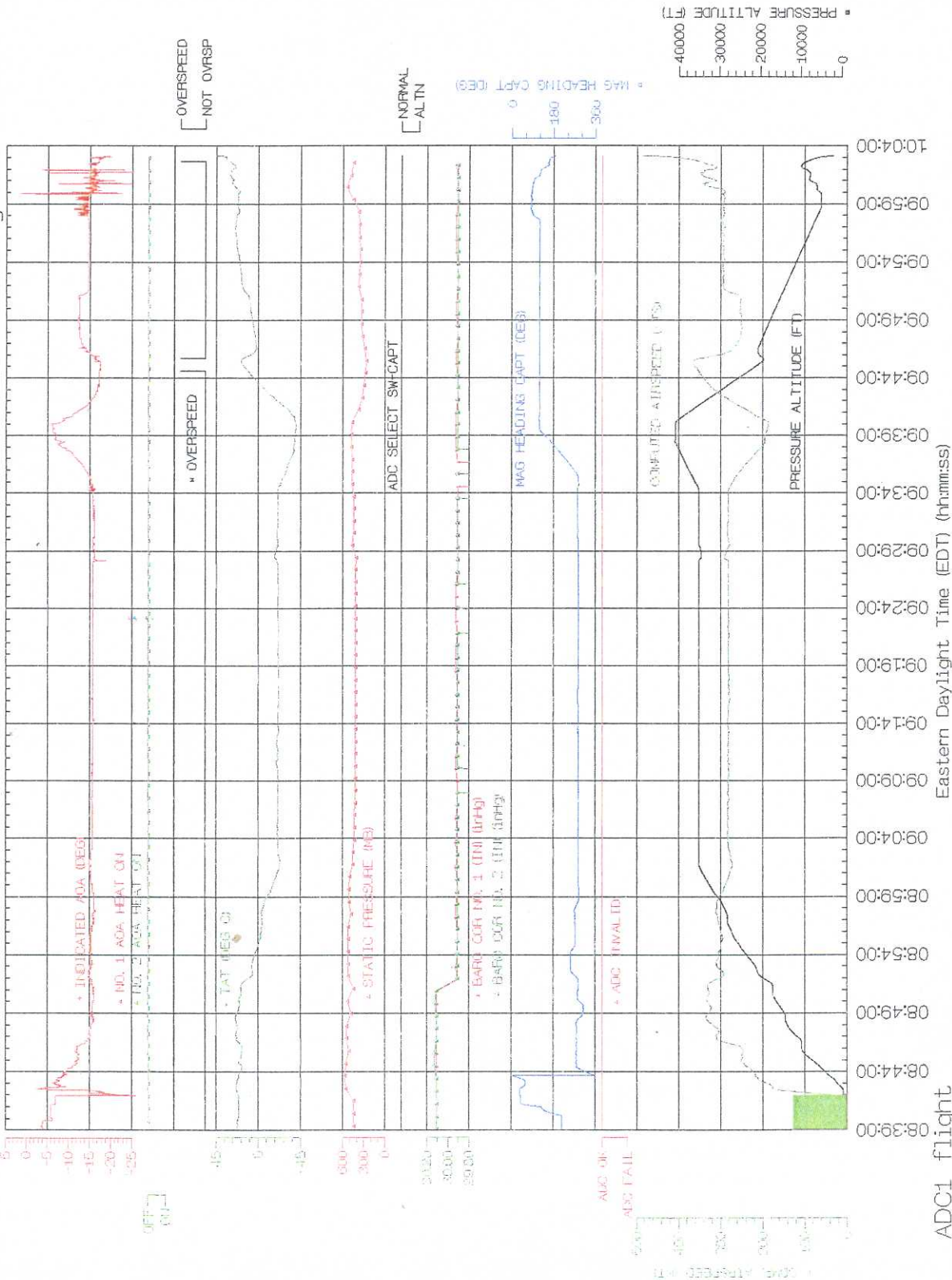
ANALOG+DISCRETES flight
Revised: February 12, 2002

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United Airlines Flight 93, Pennsylvania

9/11/01

Boeing 757



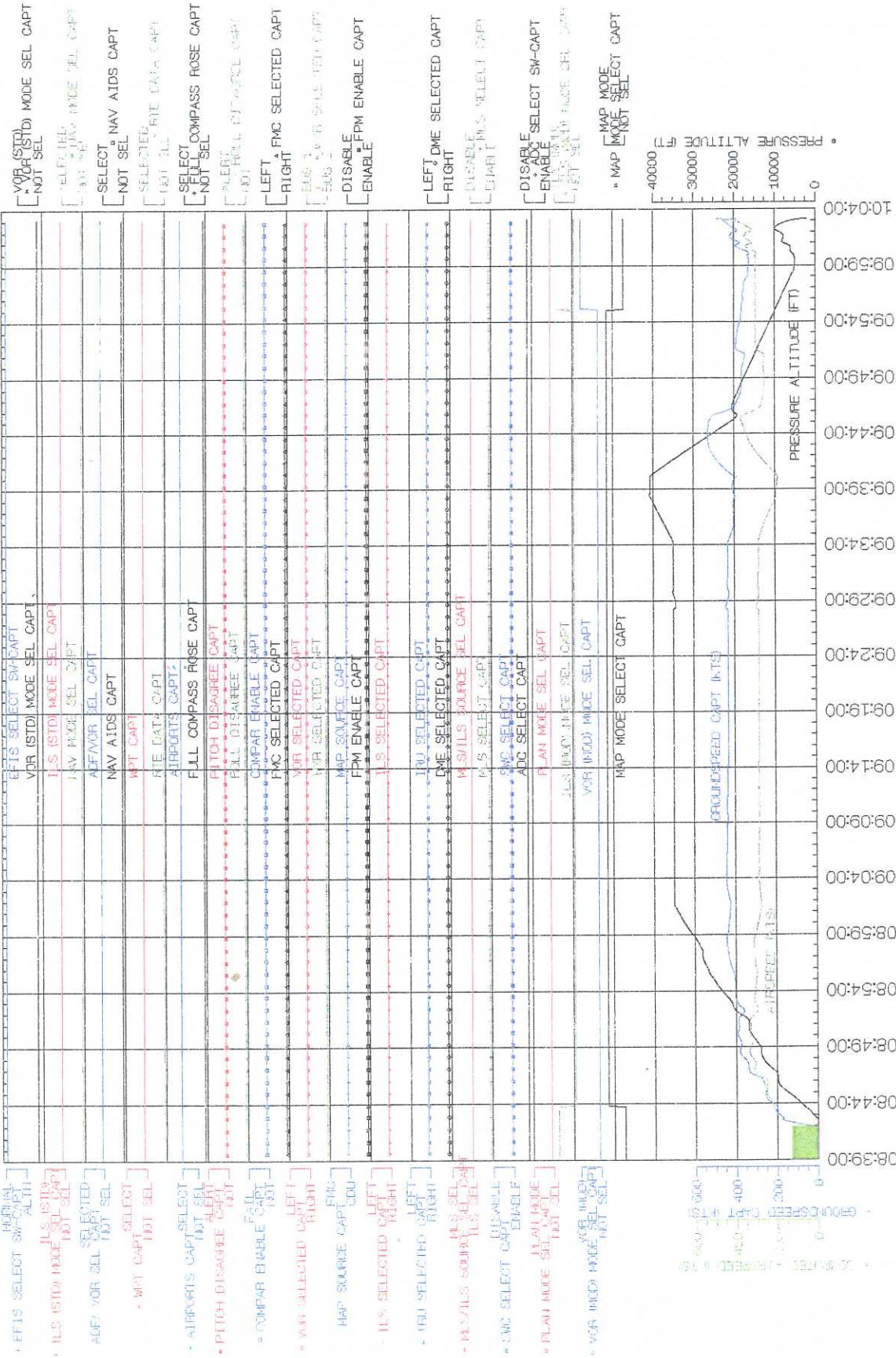
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February 12, 2002

National Transportation Safety Board

United Airlines Flight 93, Pennsylvania

9/11/01

Boeing 757



EFIS1_flight
February 13, 2002

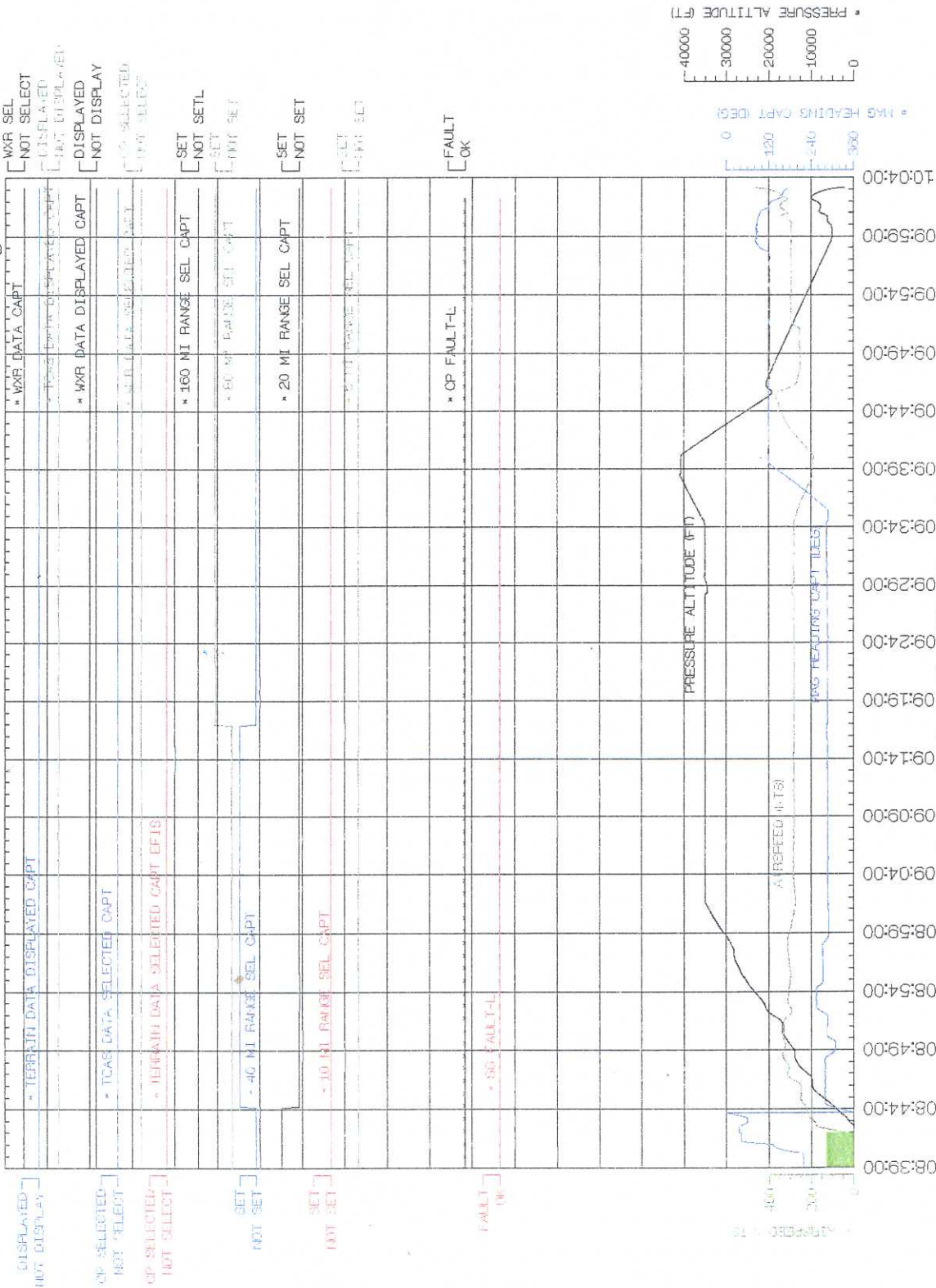
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National Transportation Safety Board

United Airlines Flight 93, Pennsylvania

9/11/01

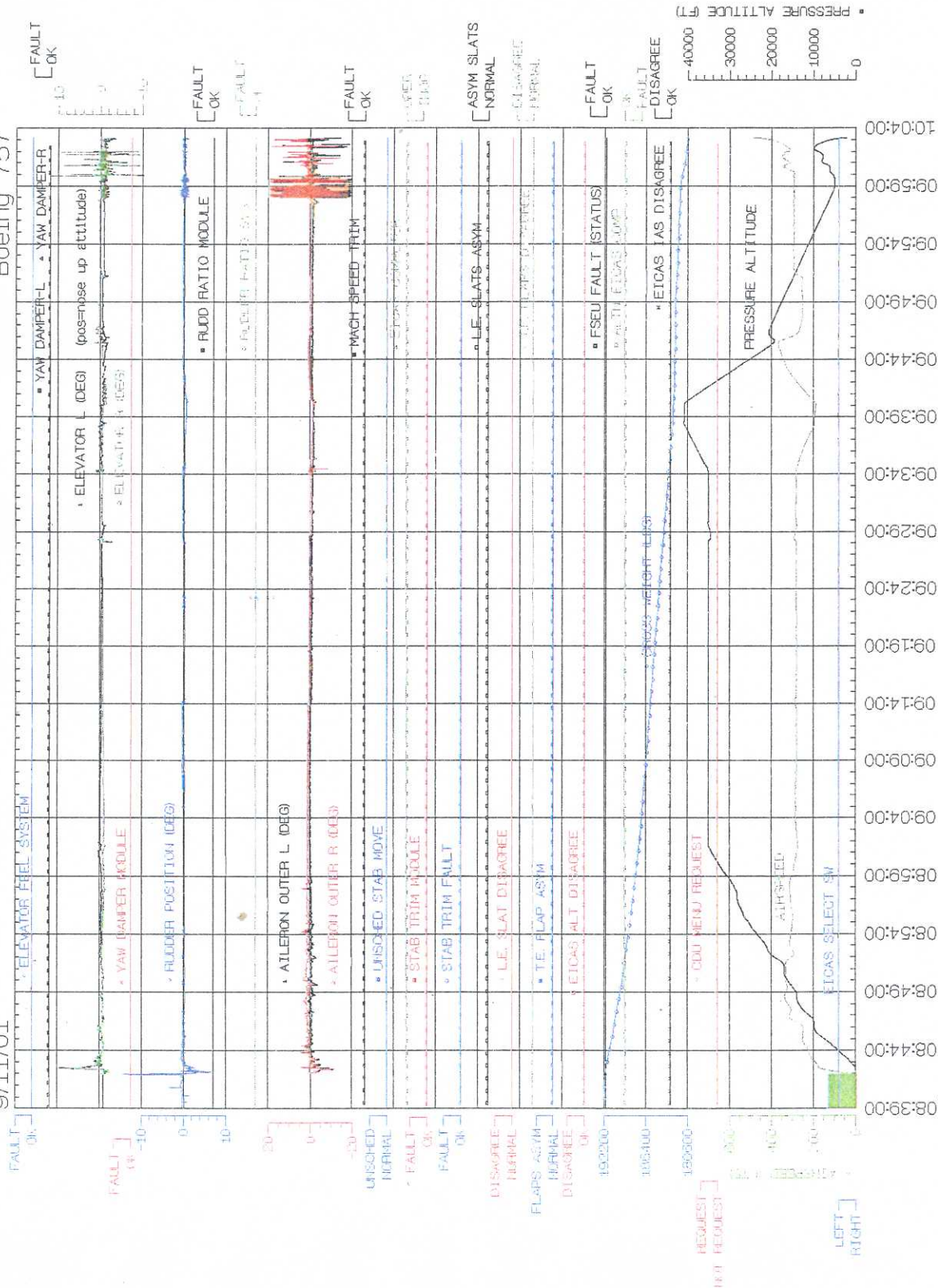
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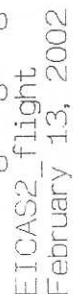
Boeing 757



EICAS1_flight
February 12, 2002

National Transportation Safety Board

Boeing 757

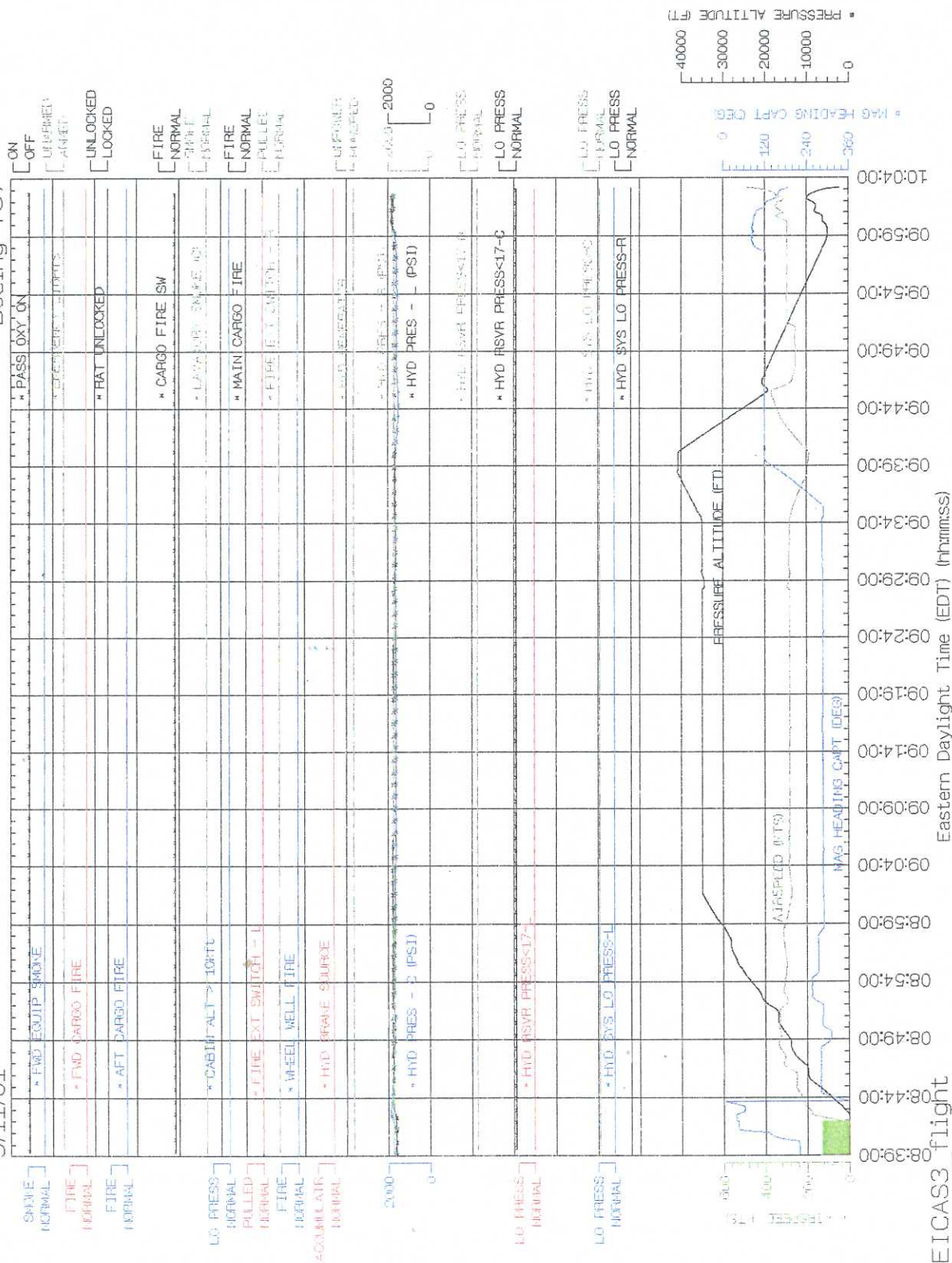


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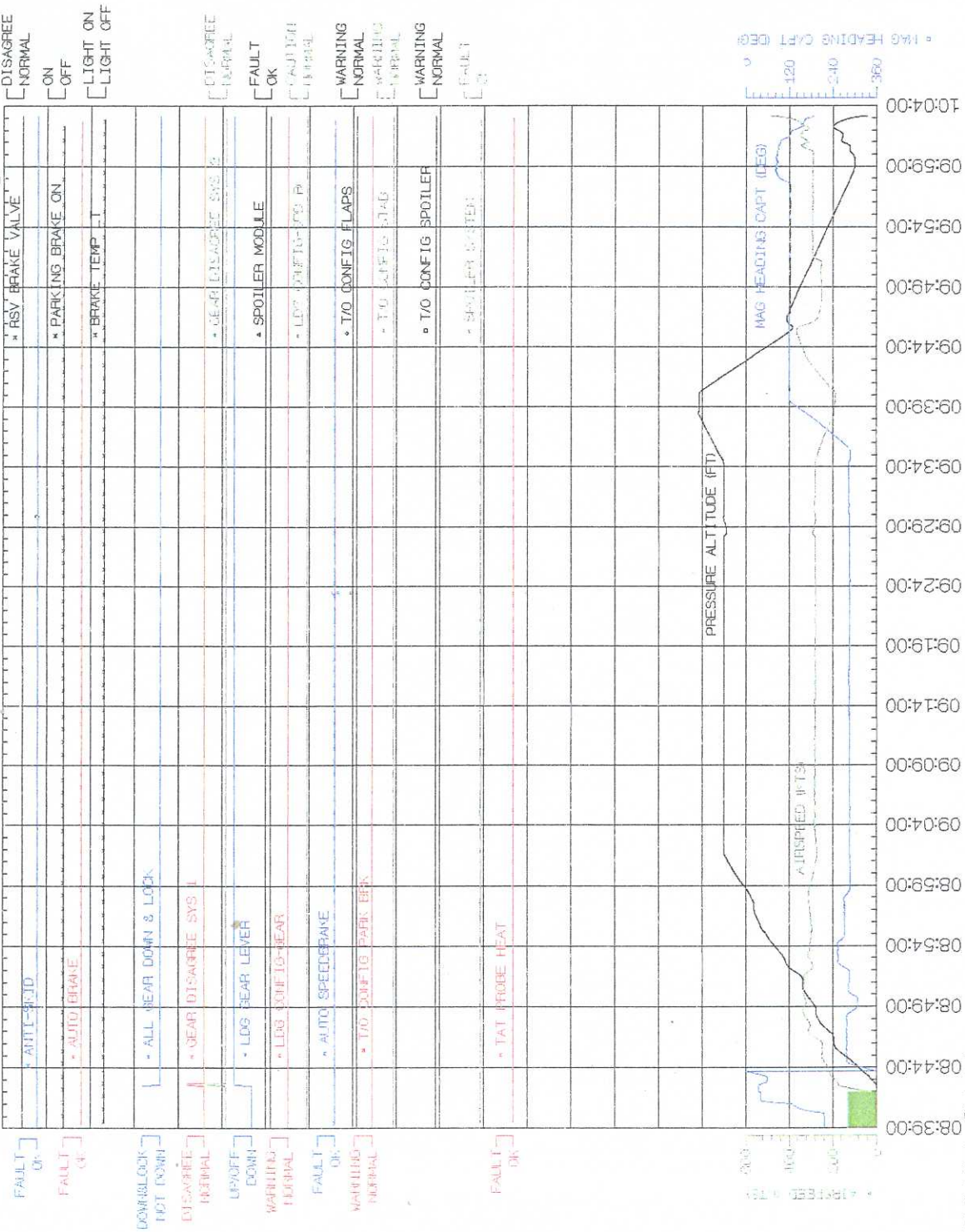
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February 12, 2002

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United Airlines Flight 93, Pennsylvania

9/11/01

Boeing 757



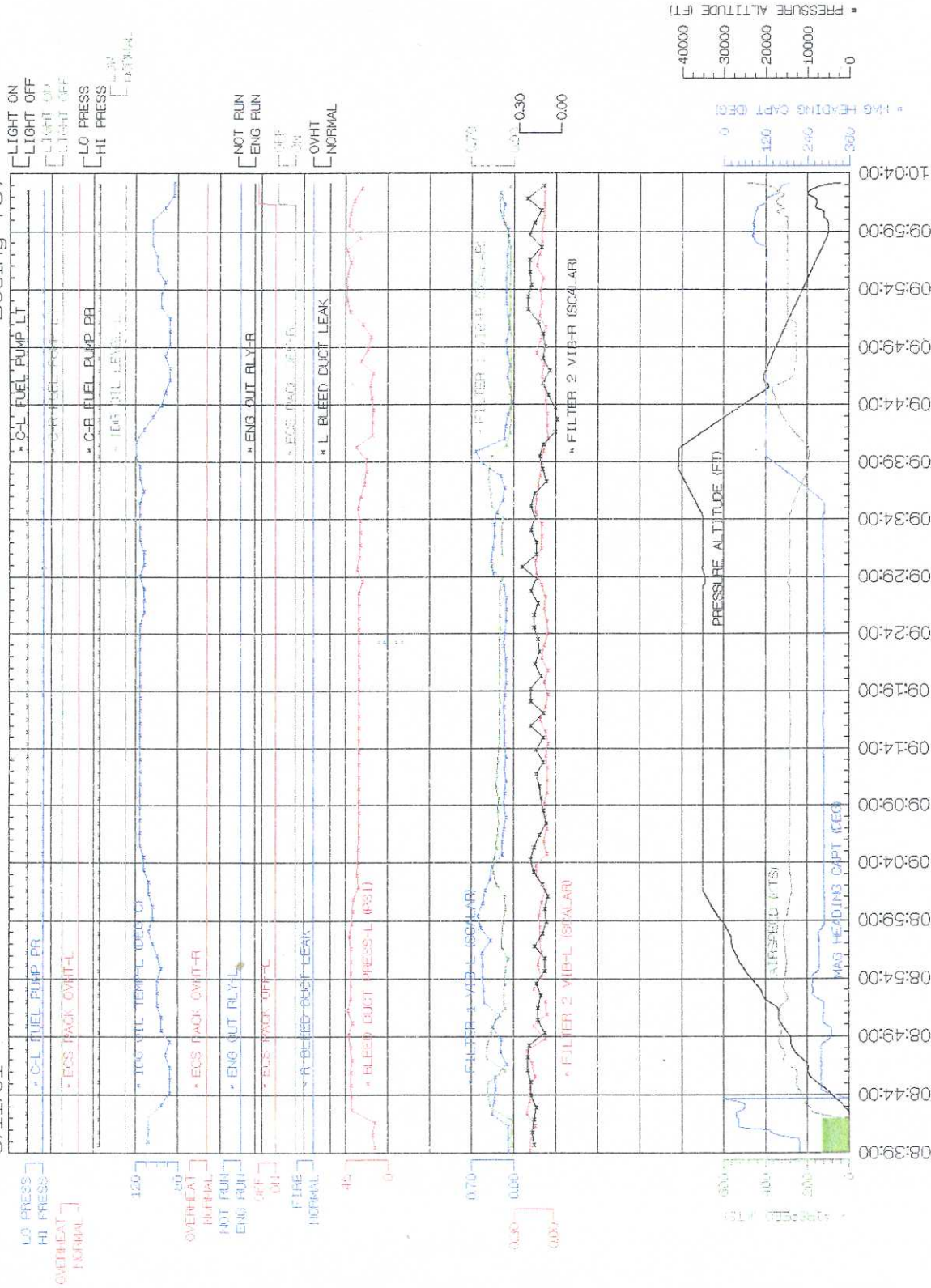
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February 12, 2002

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Boeing 757



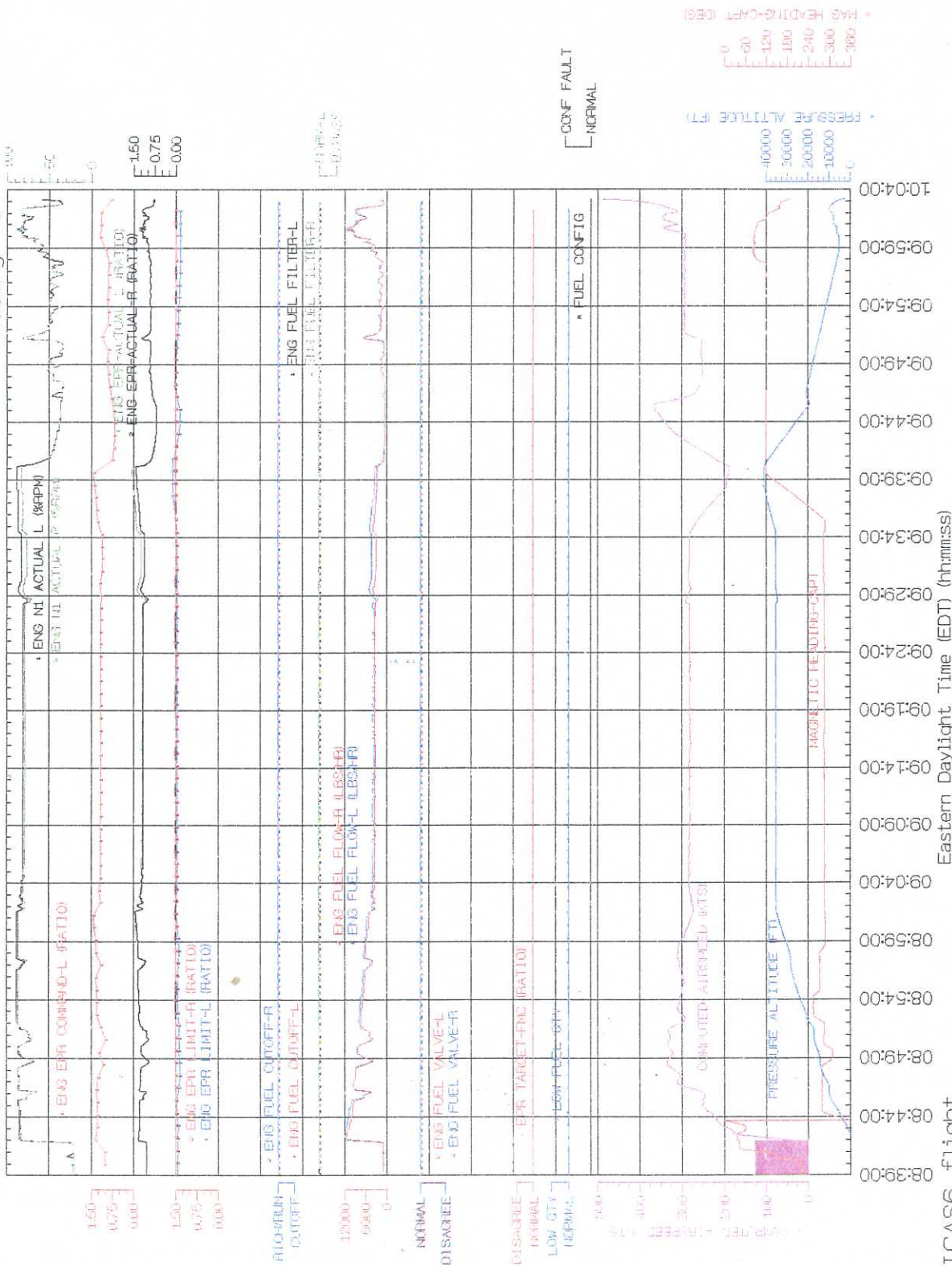
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February 12, 2002

National Transportation Safety Board

United Airlines Flight 93, Pennsylvania

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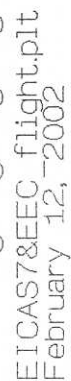
Boeing 757



EICAS6 flight
February 12, 2002

National Transportation Safety Board

Boeing 757

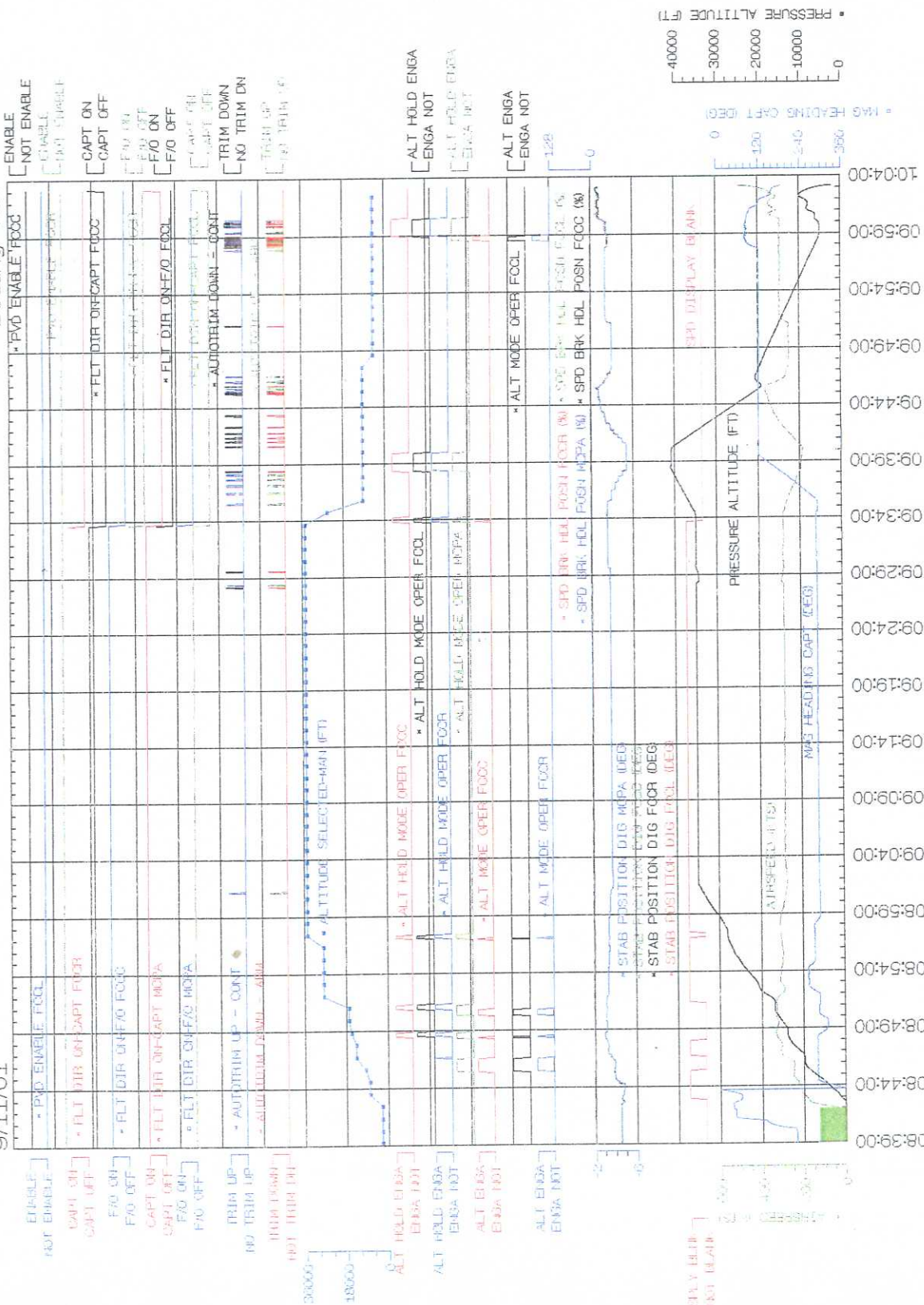


National Transportation Safety Board

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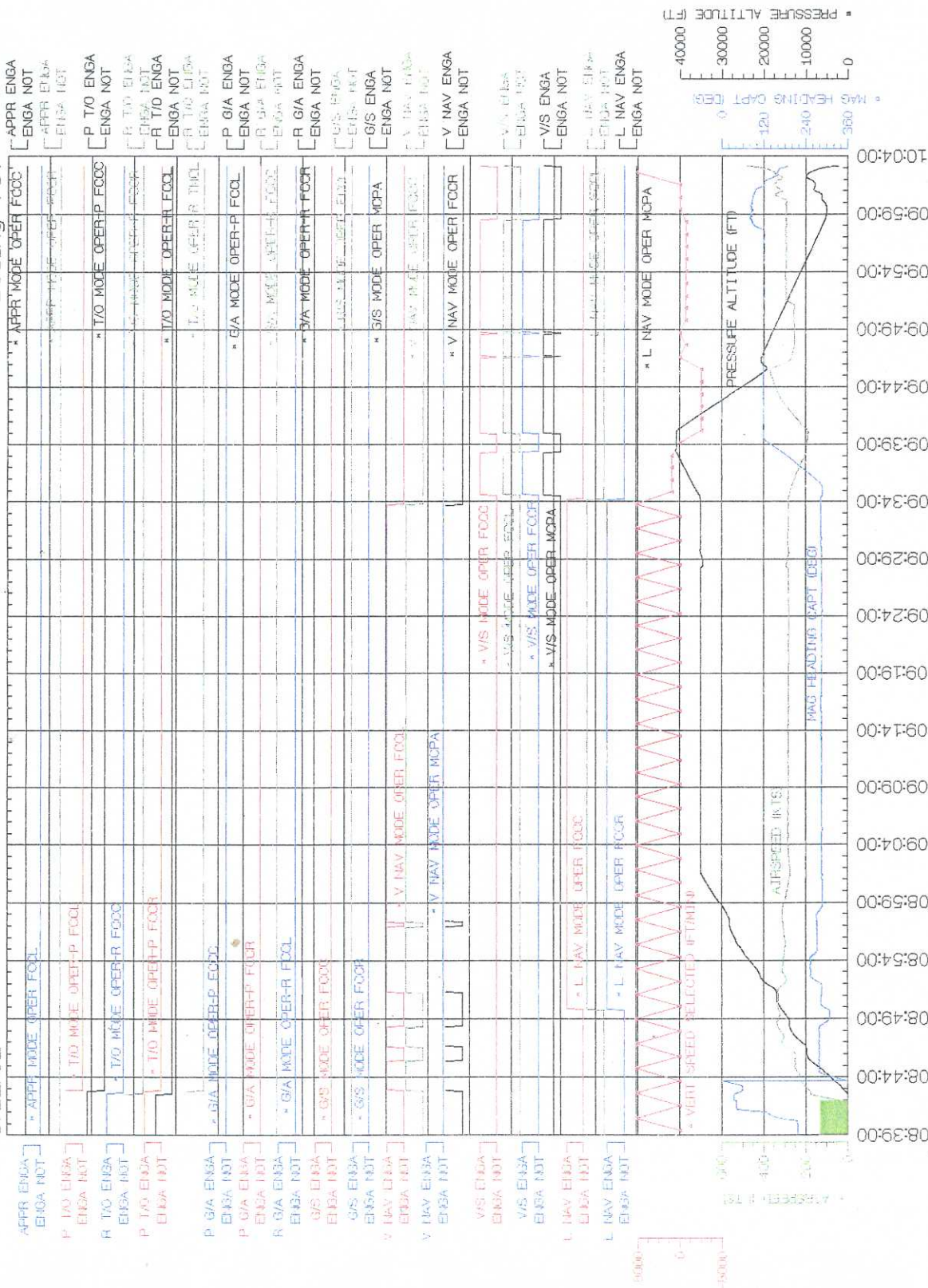
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February 12, 2002

National Transportation Safety Board

United Airlines Flight 93, Pennsylvania

9/11/01

Boeing 757



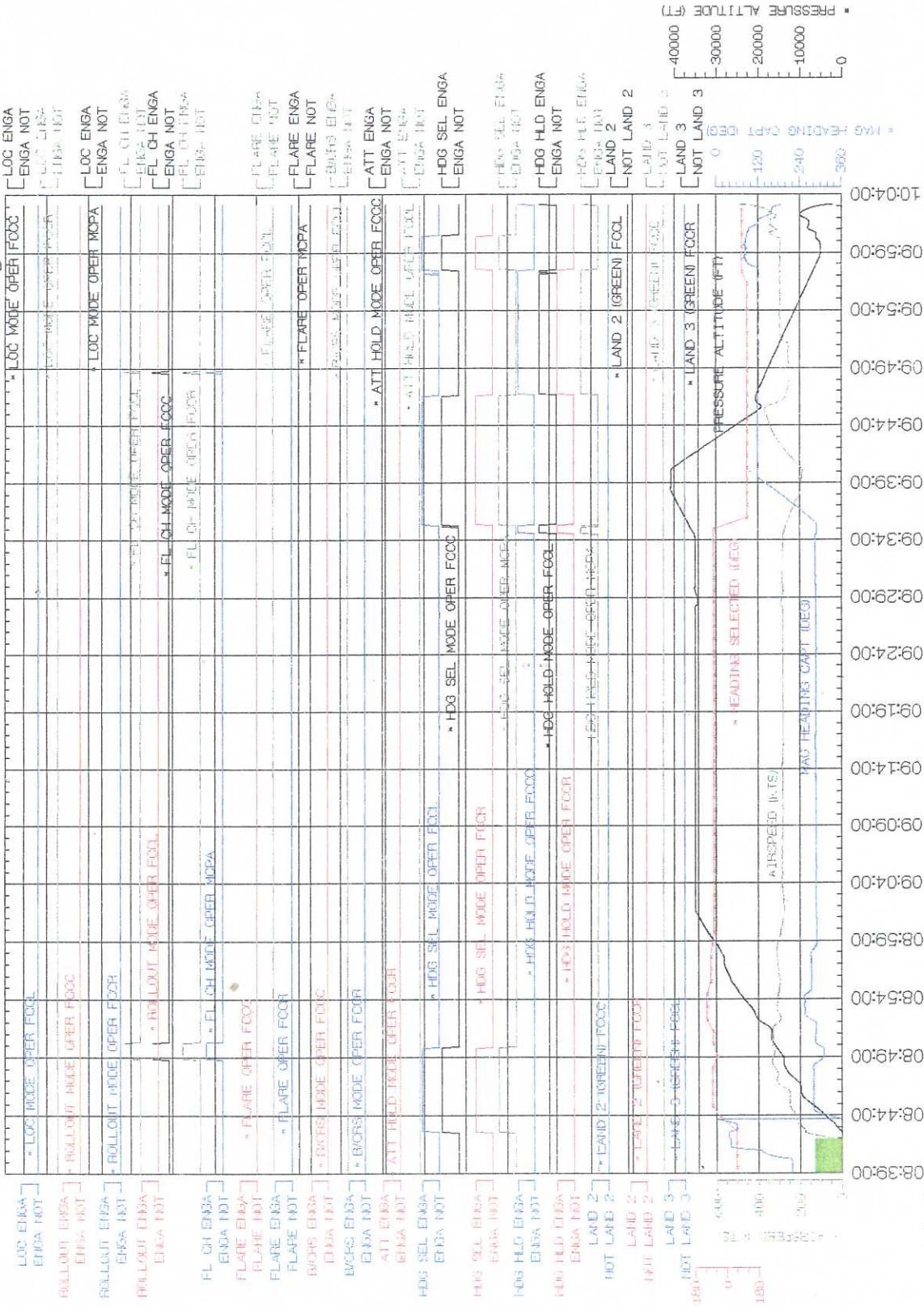
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February 12, 2002

National Transportation Safety Board

United Airlines Flight 93, Pennsylvania

9/11/01

Boeing 757



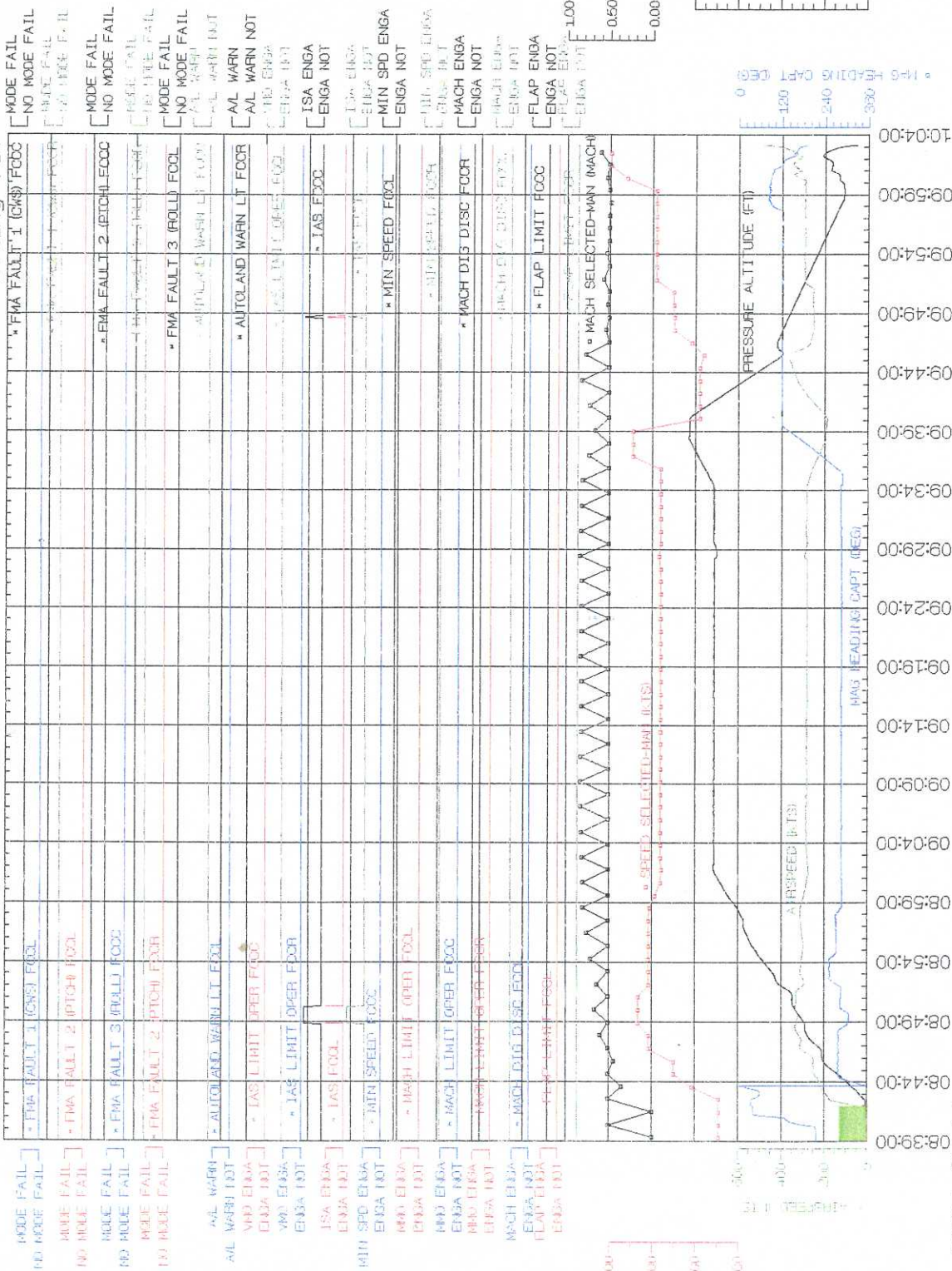
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February 12, 2002

National Transportation Safety Board

United Airlines Flight 93, Pennsylvania

9/11/01

Boeing 757



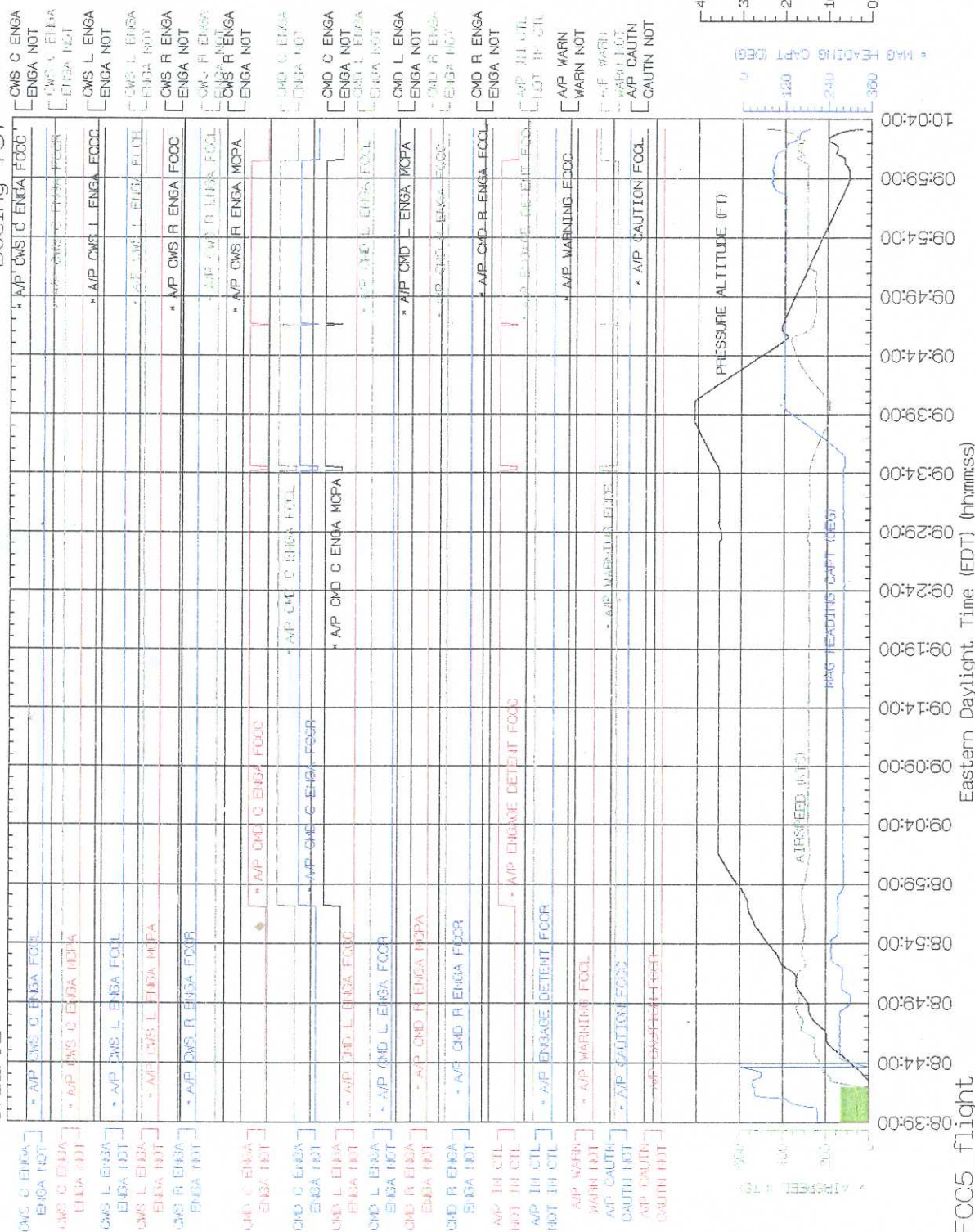
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February 12, 2002

National Transportation Safety Board

United Airlines Flight 93, Pennsylvania

9/11/01

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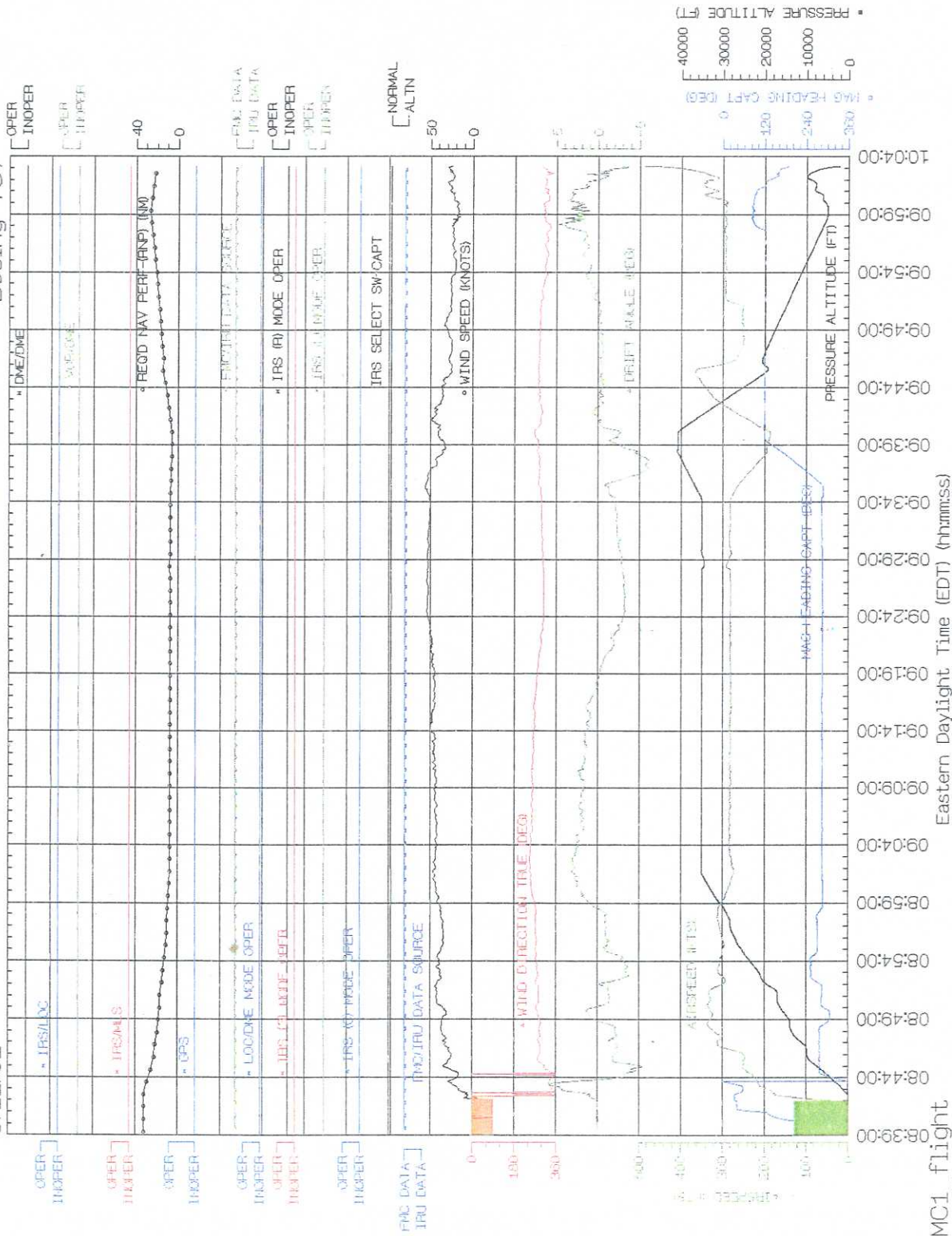
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National Transportation Safety Board

United Airlines Flight 93, Pennsylvania

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Boeing 757



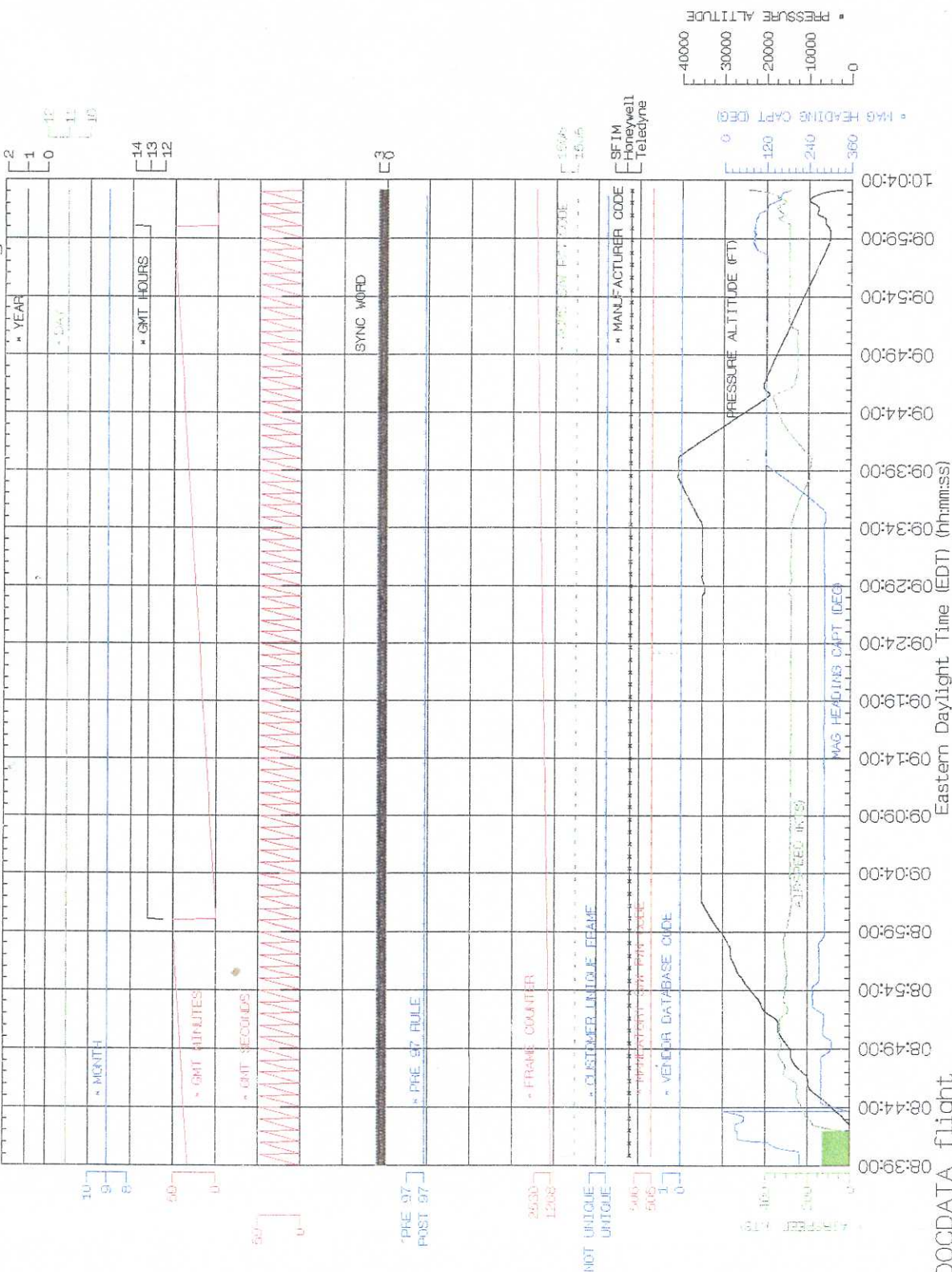
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February 15, 2002

National Transportation Safety Board

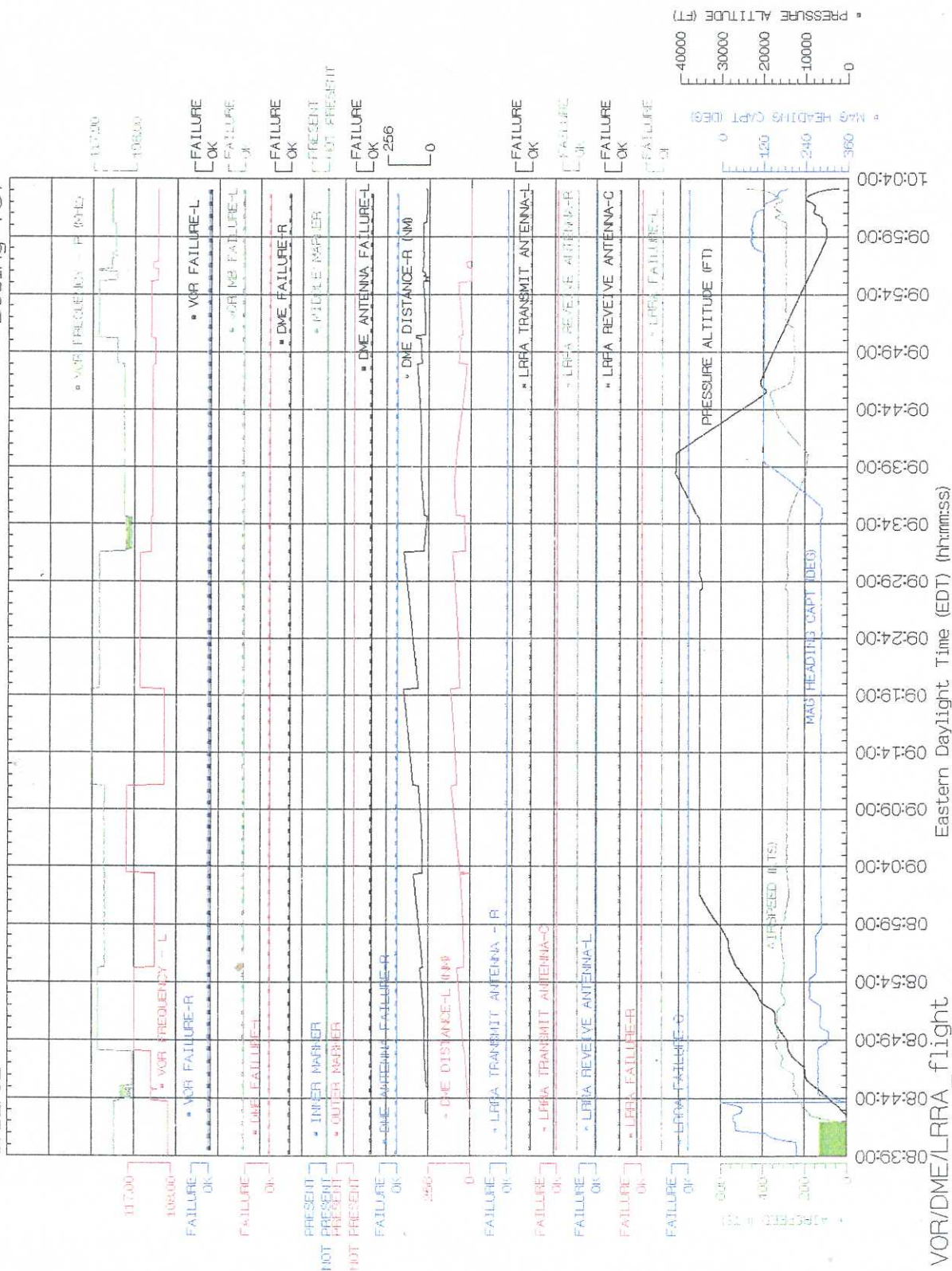
United Airlines Flight 93, Pennsylvania

9/11/01

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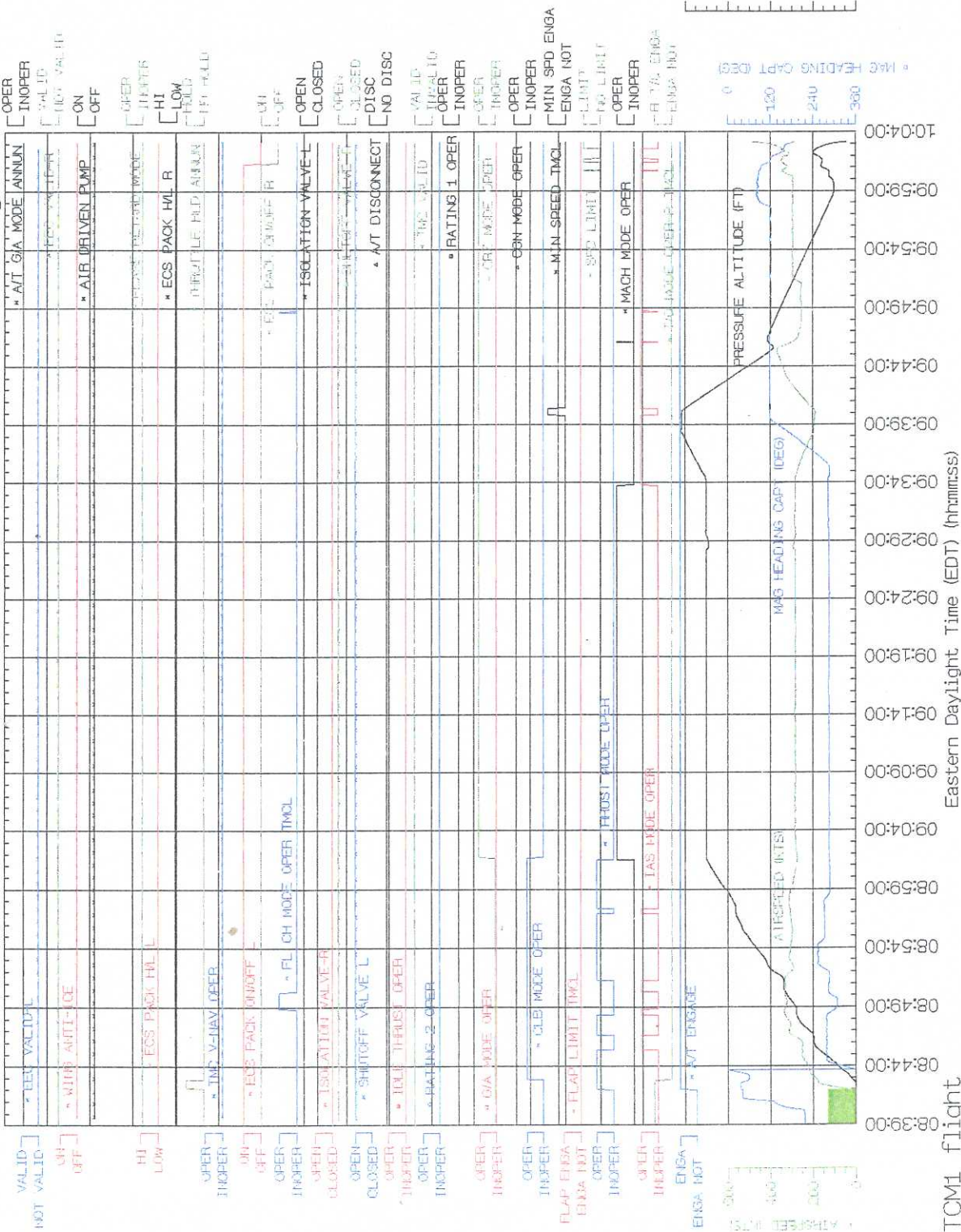


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TCM1_flight
February 12, 2002

National Transportation Safety Board

Boeing 757

GPWC1_flight
February 12, 2002

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