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DOCKET NO. **SA-510**

NATIONAL TRANSPORTATION SAFETY BOARD

WASHINGTON, D.C.

Factual Report

Air France Ancillary Quick Access Recorders

NATIONAL TRANSPORTATION SAFETY BOARD

Office of Research and Engineering
Washington, D.C. 20594

April 18, 1995

ANCILLARY QUICK ACCESS RECORDER FACTUAL REPORT

DCA-94-MA-076

A. ACCIDENT

Location : Aliquippa, Pennsylvania

Date : September 8, 1994

Time : 1904 Eastern Daylight Time (EDT)

Airplane : Boeing B737-300, N513AU

B. GROUP

The chairman and Boeing's member to the flight data recorder group convened at Boeing's Renton facility on February 2, 1995 to recover data from three Quick Access Recorder (QAR) copy tapes. The remaining members of the flight data recorder group elected not to participate in the data recovery process. They were provided with the data after the readout was accomplished. The flight data recorder group comprises:

Chairman : K. Jeremy Akel, National Transportation Safety Board
Member : Roy Beiber, USAir, Inc.
Member : H. Keith Hagy, Airline Pilots Association
Member : Martin D. Ingham, Boeing Commercial Airplane Group
Member : Jean-Marc Lapene, Bureau Enquetes - Accidents
Member : Frank Rock, Federal Aviation Administration

C. SUMMARY

On September 8, 1994, at 1904 Eastern Daylight Time (EDT), USAir flight 427, a Boeing B737-300, N513AU, crashed while maneuvering to land at Pittsburgh International Airport, Pittsburgh, Pennsylvania. The airplane was being operated on an

instrument flight rules (IFR) flight plan under the provisions of Title 14, Code of Federal Regulation (CFR), Part 121, on a regularly scheduled flight from Chicago-O'Hare International Airport, Chicago, Illinois, to Pittsburgh. The airplane was destroyed by impact forces and fire near Aliquippa, Pennsylvania. All 132 persons on board the airplane were fatally injured.

Air France reported several incidents involving rudder excursions associated with their B737 aircraft. After these rudder excursions, Air France personnel retrieved the Penny & Giles QARs from the airplanes and performed readouts. The QAR data were copied to 1/2-inch magnetic tapes and sent to the Vehicle Performance Division's laboratory at the National Transportation Safety Board on January 27, 1995 for readout and further evaluation.

The copy tapes contained data from two aircraft:

1. Registration: F-GHVM
   Production Number: PP911
   Serial Number: 24026
   Aircraft Type: B737-300
   Incident Date: 20-August-1993 / Copy Tape #621
   Incident Date: 24-June-1993 / Copy Tape #623

2. Registration: F-GFUA
   Production Number: PP902
   Serial Number: 23635
   Aircraft Type: B737-300
   Incident Date: 24-August-1993 / Copy Tape #624

The airplanes' QARs were configured to record the data parameters presented in attachment I (B737-I configuration).

Data from the incident involving F-GHVM on June 24, 1993 indicated that as the airplane was descending through 21,300 feet msl, a rudder deflection of 1.5 degrees nose right occurred. One second later, rudder position was observed at -1.0 degrees nose left. One second after that, rudder deflection values returned to 1.5 degrees nose right and remained constant for 13 seconds. Rudder position values returned to neutral 19 seconds after the initial nose right deflection.

Data from the incident involving F-GHVM on August 20, 1993 indicated that during the take-off roll, after an increase in longitudinal acceleration was observed, several significant rudder deflections occurred. The last significant rudder deflection was observed at -10 degrees trailing edge left, 3.5 seconds prior to nose rotation.

Data from the incident involving F-GFUA on August 24, 1993 indicated two rudder excursions. The first occurred during climbout from 6,700 feet msl. The data

indicated an initial rudder deflection of -3.5 degrees trailing edge left. Following the initial rudder deflection, rudder deflections of equivalent magnitude were observed for 17 seconds. Rudder deflection values then returned to near neutral. The second excursion occurred while the data indicated that the airplane was at an altitude of 31,000 feet msl. The initial deflection was observed at -3.0 degrees trailing edge left. The initial rudder deflection was followed by others. The total sequence lasted for 17 seconds.

D. DETAILS OF THE INVESTIGATION

1. Description of Data

This model (Penny & Giles, P/N D50761/1) quick access recorder records aircraft data as a function of elapsed time in digital format on 1/4-inch magnetic tape. The QAR records 64 12-bit words of digital data every second. Each grouping of 64 words is called a subframe. A group of four subframes comprise one frame. Each subframe has a 12-bit synchronization (sync) word in the first word slot which marks the beginning of a subframe. The data stream is "in sync" when successive words appear at 64-word intervals. Each data parameter has a specifically assigned word number within the subframe.

A minimum of 37.2 hours of operational data are retained on the recording medium on a total of four tracks. Data is recorded by erasing the oldest data simultaneously while sampling new data.

2. Examination and Read-out

a. Examination

The QAR copy tapes were examined upon receipt and were found to be in good physical condition with no signs of damage.

b. Read-out

The raw data from the copy tapes were initially downloaded to a VAX system at the Boeing Integrated Avionics Systems Lab (IASL). The three downloaded data files were then transferred to three 3.5" floppy diskettes. The floppy diskettes were transported to AACO (Seattle, WA) where the data reduction was conducted.

The flight data were reduced from the recorded decimal values (0-4095) to engineering units (e.g., feet, knots, etc.) by conversion formulas obtained from Boeing. The actual conversion is accomplished by an automated process that incorporates a computer and associated software.

Relative (elapsed) time, recorded by the internal clock of the QAR was used as a time base for all data output.

The complete data were recovered using the B737-I parameter list. This recovered data were saved in ASCII format on floppy diskette. The data reduction process was completed on February 3, 1995.

E. DATA TABLES

Attachment II contains tabular data of selected parameters. The four tables each represent 80 seconds of data. Individual data sets are identified with the date of occurrence on the header (e.g., 2408B = 24-August-1993, 2nd excursion).

F. DATA PLOTS

Plots of the tabular data are presented in attachment III. The elapsed time on the plots represents the total elapsed seconds from the beginning of the QAR data file.

[redacted]

K. Jeremy Akel
Aerospace Engineer

ATTACHMENT I
(QAR configuration)

APPENDIX B
DATA FRAME FORMAT
AIRCRAFT DATA FRAME: 737-1

WORD	S/F	BITS	PARAMETER	PORT	SOURCE	A/C TYPE	COMMENTS	REV
1	1-4	12-1	SYNC WORD					
2	1-4	12-1	VERTICAL ACCELERATION	A 1	ACCEL		SEE NOTE 1D	
3	1-4	12-3	PITCH ANGLE	D10	EFIS L-1	EFIS	SEE NOTE 10C	A
		12-3	PITCH ANGLE	D11	EFIS R-1	EFIS	SEE NOTE 10C	A
		12-3	PITCH ANGLE	D15	IRU L-1	NONEFIS	SEE NOTE 10C	
		12-3	PITCH ANGLE	D16	IRU R-1	NONEFIS	SEE NOTE 10C	
		2	VHF RIGHT KEYING	B 4	R VHF			
		1	VHF LEFT KEYING	B 3	L VHF			
4	1-4	12-3	N1-LEFT	A27	N1 GAUGE		SEE NOTE 15D	
		2	HF-LEFT KEYING	B 7	L HF			
		1	VHF CENTER KEYING	B 5	C VHF			
5	1-4	12-3	N1-RIGHT	A28	N1 GAUGE		SEE NOTE 15D	
		2	EVENT MARKER (RESV)	B 1	EVENT SW		SEE NOTE 1E	
		1	HF-RIGHT KEYING	B 8	R HF			
6	1-4	12-3	TOTAL AIR TEMP	D 5	DADC-L-4			
	1	2	FLAP 3 INTRANSIT	B 47	L.E. F/S MOD			
	2	2	FLAP 4 INTRANSIT	B 48	L.E. F/S MOD			
	3	2	FLAP 3 INTRANSIT	B 47				
	4	2	FLAP 4 INTRANSIT	B 48				
	1	1	FLAP 1 INTRANSIT	B 45	L.E. F/S MOD			
	2	1	FLAP 2 INTRANSIT	B 46	L.E. F/S MOD			
	3	1	FLAP 1 INTRANSIT	B 45				
	4	1	FLAP 2 INTRANSIT	B 46				
7	1-4	12-3	SPARE POT	A39				
	1	2	T/R UNLOCK L INBOARD	B 11	ENG ACC UNIT			
	2	2	T/R UNLOCK R OUTBOARD	B 12	ENG ACC UNIT			
	3	2	T/R UNLOCK L INBOARD	B 11				
	4	2	T/R UNLOCK R OUTBOARD	B 12				
	1	1	T/R UNLOCK L OUTBOARD	B 17	ENG ACC UNIT			
	2	1	T/R UNLOCK R INBOARD	B 18	ENG ACC UNIT			
	3	1	T/R UNLOCK L OUTBOARD	B 17				
	4	1	T/R UNLOCK R INBOARD	B 18				
8	1-4	12-3	COMPUTED AIRSPEED	D 5	DADC-L-4			
	1	2	T/R DEP L OUTBOARD	B 14	ENG ACC UNIT			
	2	2	T/R DEP R INBOARD	B 16	ENG ACC UNIT			
	3	2	T/R DEP L OUTBOARD	B 14				
	4	2	T/R DEP R INBOARD	B 16				
	1	1	T/R DEP L INBOARD	B 13	ENG ACC UNIT			
	2	1	T/R DEP R OUTBOARD	B 15	ENG ACC UNIT			
	3	1	T/R DEP L INBOARD	B 13				
	4	1	T/R DEP R OUTBOARD	B 15				
9	1-4	12-1	LONGITUDINAL ACCEL	A13	ACCEL		SEE NOTE 9D	
10	1-4	12-1	VERTICAL ACCELERATION	A 1	ACCEL			
11	1-4	12-3	ANGLE OF ATTACK	D12	DSWC-L-1			
	1	2	FLAP 3 EXTEND	B 51	L.E. F/S MOD			
	2	2	FLAP 4 EXTEND	B 52	L.E. F/S MOD			
	3	2	FLAP 3 EXTEND	B 51				
	4	2	FLAP 4 EXTEND	B 52				
	1	1	FLAP 1 EXTEND	B 49	L.E. F/S MOD			
	2	1	FLAP 2 EXTEND	B 50	L.E. F/S MOD			
	3	1	FLAP 1 EXTEND	B 49				
	4	1	FLAP 2 EXTEND	B 50				
12	1-4	12-3	RUDDER POSITION	A20	SYNCHRO		SEE NOTE 13D	
	1	2	SLAT 3 INTRANSIT	B 55	L.E. F/S MOD			

APPENDIX B
DATA FRAME FORMAT
AIRCRAFT DATA FRAME: 737-1

WORD	S/F	BITS	PARAMETER	PORT	SOURCE	A/C TYPE	COMMENTS	REV
12	2	2	SLAT 4 INTRANSIT	B 56	L.E. F/S MOD			
	3	2	SLAT 3 INTRANSIT	B 55				
	4	2	SLAT 4 INTRANSIT	B 56				
	1	1	SLAT 1 INTRANSIT	B 53	L.E. F/S MOD			
	2	1	SLAT 2 INTRANSIT	B 54	L.E. F/S MOD			
	3	1	SLAT 1 INTRANSIT	B 53				
	4	1	SLAT 2 INTRANSIT	B 54				
13	1-4	12-1	ROLL ANGLE	D10	EFIS L-1	EFIS	SEE NOTE 10C	A
		12-1	ROLL ANGLE	D11	EFIS R-1	EFIS	SEE NOTE 10C	A
		12-1	ROLL ANGLE	D15	IRU L-1	NONEFIS	SEE NOTE 10C	
		12-1	ROLL ANGLE	D16	IRU R-1	NONEFIS	SEE NOTE 10C	
14	1-4	12-3	T.E. FLAP POSN-LEFT	D13	FCC-L-1			
	1	2	SLAT 1 MID EXTEND	B 59	L.E. F/S MOD			
	2	2	SLAT 2 MID EXTEND	B 60	L.E. F/S MOD			
	3	2	SLAT 1 MID EXTEND	B 59				
	4	2	SLAT 2 MID EXTEND	B 60				
	1	1	SLAT 5 INTRANSIT	B 57	L.E. F/S MOD			
	2	1	SLAT 6 INTRANSIT	B 58	L.E. F/S MOD			
	3	1	SLAT 5 INTRANSIT	B 57				
	4	1	SLAT 6 INTRANSIT	B 58				
15	1-4	12-2	LATERAL ACCELERATION	A 3	ACCEL		SEE NOTE 3D	
		1	TO/GA	D 8	FCC R-1		SEE NOTE 10C	
		1	TO/GA	D13	FCC L-1		SEE NOTE 10C	
16	1-4	12-2	TRUE HEADING	D10	EFIS L-1	EFIS	NOTE 7C,10C	A
		12-2	TRUE HEADING	D11	EFIS R-1	EFIS	NOTE 7C,10C	A
		12-2	TRUE HEADING	D15	IRU L-1	NONEFIS	NOTE 7C,10C	A
		12-2	TRUE HEADING	D16	IRU R-1	NONEFIS	NOTE 7C,10C	A
		12-2	MAG HEADING	D10	EFIS L-1	EFIS	NOTE 7C,10C	A
		12-2	MAG HEADING	D11	EFIS R-1	EFIS	NOTE 7C,10C	A
		12-2	MAG HEADING	D15	IRU L-1	NONEFIS	NOTE 7C,10C	
		12-2	MAG HEADING	D16	IRU R-1	NONEFIS	NOTE 7C,10C	
		1	G/S ENGAGE	D 8	FCC R-1		SEE NOTE 10C	
		1	G/S ENGAGE	D13	FCC L-1		SEE NOTE 10C	
17	1-4	12-1	ALTITUDE (29.92)	D 5	DADC-L-4			
18	1-4	12-1	VERTICAL ACCELERATION	A 1	ACCEL			
19	1-4	12-3	PITCH ANGLE	D10	EFIS L-1	EFIS	SEE NOTE 10C	A
		12-3	PITCH ANGLE	D11	EFIS R-1	EFIS	SEE NOTE 10C	A
		12-3	PITCH ANGLE	D15	IRU L-1	NONEFIS	SEE NOTE 10C	A
		12-3	PITCH ANGLE	D16	IRU R-1	NONEFIS	SEE NOTE 10C	A
	1	2	SLAT 3 MID EXTEND	B 61	L.E. F/S MOD			
	2	2	SLAT 4 MID EXTEND	B 62	L.E. F/S MOD			
	3	2	SLAT 3 MID EXTEND	B 61				
	4	2	SLAT 4 MID EXTEND	B 62				
	1	1	SLAT 5 MID EXTEND	B 63	L.E. F/S MOD			
	2	1	SLAT 6 MID EXTEND	B 64	L.E. F/S MOD			
	3	1	SLAT 5 MID EXTEND	B 63				
	4	1	SLAT 6 MID EXTEND	B 64				
20	1-4	12-3	N2-LEFT	A18	N2 GAUGE		SEE NOTE 11D	
	1	2	SLAT 3 FULL EXTEND	B 67	L.E. F/S MOD			
	2	2	SLAT 4 FULL EXTEND	B 68	L.E. F/S MOD			
	3	2	SLAT 3 FULL EXTEND	B 67				
	4	2	SLAT 4 FULL EXTEND	B 68				
	1	1	SLAT 1 FULL EXTEND	B 65	L.E. F/S MOD			
	2	1	SLAT 2 FULL EXTEND	B 66	L.E. F/S MOD			
	3	1	SLAT 1 FULL EXTEND	B 65				
	4	1	SLAT 2 FULL EXTEND	B 66				

APPENDIX B
DATA FRAME FORMAT
AIRCRAFT DATA FRAME: 737-I

	WORD	S/F	BITS	PARAMETER	PORT	SOURCE	A/C TYPE	COMMENTS	REV
*	21	1-4	12-3	ELEVATOR POSN-RIGHT	A 8	SYNCHRO		SEE NOTE 7D	
		1-4	2	SINK RATE	D 4	GPWC-L-1		"OR" INPUT	
			2	PULL UP	D 4	GPWC-L-1		"OR" INPUT	
			2	TERRAIN	D 4	GPWC-L-1		"OR" INPUT	
			2	DON'T SINK	D 4	GPWC-L-1		"OR" INPUT	
			2	TOO LOW GEAR	D 4	GPWC-L-1		"OR" INPUT	
			2	TOO LOW FLAP	D 4	GPWC-L-1		"OR" INPUT	
			2	TOO LOW TERRAIN	D 4	GPWC-L-1		"OR" INPUT	
			2	TERRAIN PULL UP	D 4	GPWC-L-1		"OR" INPUT	
		1	1	SLAT 5 FULL EXTEND	B 69	L.E. F/S MOD			
		2	1	SLAT 6 FULL EXTEND	B 70	L.E. F/S MOD			
		3	1	SLAT 5 FULL EXTEND	B 69				
		4	1	SLAT 6 FULL EXTEND	B 70				
	22	1-4	12-1	FUEL FLOW-LEFT	A33	FF GAUGE		SEE NOTE 17D	
	23	1-4	12-3	THR LEVER ANGLE-LEFT	D 1	A/T-1			
			2	WINDSHEAR	D 4	GPWC-L-1			
			1	GLIDESLOPE	D 4	GPWC-L-1			
	24	1-4	12-3	SPD BRK HDL POSN	A15	SYNCHRO		SEE NOTE 10D	
			2	MIDDLE MARKER	B 81	LAMP			
			1	INNER MARKER	B 79	LAMP			
	25	1-4	12-1	LONGITUDINAL ACCEL	A13	ACCEL			
	26	1-4	12-1	VERTICAL ACCELERATION	A 1	ACCEL			
*	27	1-4	12-3	AILERON POSN-LEFT	A10	SYNCHRO		SEE NOTE 8D	
			2	MASTER CAUTION	B 6	LAMP			
			1	OUTER MARKER	B 80	LAMP			
*	28	1-4	12-3	AILERON POSN-RIGHT	A11	SYNCHRO		SEE NOTE 8D	
		1	2	HYD SYS A ENG - 1	B 38	LAMP			
		2	2	HYD SYS B ENG - 2	B 39	LAMP			
		3	2	HYD SYS A ENG - 1	B 38				
		4	2	HYD SYS B ENG - 2	B 39				
		1-4	1	AIR/GROUND	B 37	A/G RELAY			
	29	1-4	12-2	RADIO ALTITUDE	A29	RA-L	NONEFIS	SEE NOTE 16D	
			12-2	RADIO HEIGHT	D10	EFIS L-1	EFIS	SEE NOTE 10C	A
			12-2	RADIO HEIGHT	D11	EFIS R-1	EFIS	SEE NOTE 10C	A
		1	1	HYD SYS A ELEC	B 40	LAMP			
		2	1	HYD SYS B ELEC	B 41	LAMP			
		3	1	HYD SYS A ELEC	B 40				
		4	1	HYD SYS B ELEC	B 41				
	30	1-4	12-3	GLIDESLOPE DEV	A61	ILS-L	NONEFIS	SEE NOTE 21D	
			12-3	GLIDESLOPE DEV	D10	EFIS L-1	EFIS	SEE NOTE 10C	A
			12-3	GLIDESLOPE DEV	D11	EFIS R-1	EFIS	SEE NOTE 10C	A
		1-4	2	LEFT GEAR DOWN	B 19	LAMP			
		1	1	EFIS SELECT SW-CAPT	B 27	EFIS SW	EFIS	SEE NOTE 10C	A
			1	SPARE DISC	B 27		NONEFIS		
		2	1	HYD SYS STANDBY	B 42	LAMP			
		3	1	IRS SELECT SW-CAPT	B 10	IRU SW		SEE NOTE 10C	A
		4	1	HYD SYS STANDBY	B 42				
	31	1-4	12-2	LATERAL ACCELERATION	A 3	ACCEL			
			1	NOSE GEAR DOWN	B 20	LAMP			
	32	1-4	12-3	LOCALIZER DEV	A62	ILS-L	NONEFIS	SEE NOTE 22D	
			12-3	LOCALIZER DEV	D10	EFIS L-1	EFIS	SEE NOTE 10C	A
			12-3	LOCALIZER DEV	D11	EFIS R-1	EFIS	SEE NOTE 10C	A
			2	TRIM UP - A/P	B 33	FCC			
			1	TRIM UP MANUAL	B 21	PILOT SW			

APPENDIX B
DATA FRAME FORMAT
AIRCRAFT DATA FRAME: 737-1

WORD	S/F	BITS	PARAMETER	PORT	SOURCE	A/C TYPE	COMMENTS	REV
33	1	12-8	GMT HOURS	D 7	CAPT CLOCK			A
		7-2	GMT MINUTES	D 7	CAPT CLOCK			A
		1	PAD ZERO					A
	2	12-2	VOR/ILS FREQ-LEFT	D 9	DAA-L-2		SEE NOTE 5C	
		1	VOR/ILS SELECT-LEFT	D 9	DAA-L-2			
	3	12-8	PAD ZERO					
		7-2	GMT SECONDS	D 7	CAPT CLOCK			
		1	PAD ZERO					
	4	12-1	DME DISTANCE-LEFT	D 9	DAA-L-2			
34	1-4	12-1	VERTICAL ACCELERATION	A 1	ACCEL			
35	1-4	12-3	PITCH ANGLE	D10	EFIS L-1	EFIS	SEE NOTE 10C	A
		12-3	PITCH ANGLE	D11	EFIS R-1	EFIS	SEE NOTE 10C	A
		12-3	PITCH ANGLE	D15	IRU L-1	NONEFIS	SEE NOTE 10C	A
		12-3	PITCH ANGLE	D16	IRU R-1	NONEFIS	SEE NOTE 10C	A
		2	TRIM DOWN - A/P	B 28	FCC			
		1	TRIM DOWN MANUAL	B 34	PILOT SW			
36	1-4	12-3	THR LEVER ANGLE-RIGHT	D 1	A/T-1			
		2	A/T LIMIT	D 1	A/T-1			
		1	A/T ENGAGE	D 1	A/T-1			
37	1	12-1	SPARE LLDC	A41				
	2	12-1	SPARE SYNCHRO	A42				
	3	12-1	SPARE LLDC	A43				
	4	12-1	SPARE POT	A44				
38	1	12-2	LATITUDE MSH	D15	IRU L-1		SEE NOTE 10C	
		12-2	LATITUDE MSH	D16	IRU R-1		SEE NOTE 10C	
		1	N1	D 1	A/T-1			
	2	12-11	PAD ZERO					
		10-2	LATITUDE LSH	D15	IRU L-1		SEE NOTE 10C	
		10-2	LATITUDE LSH	D16	IRU R-1		SEE NOTE 10C	
		1	MIN SPEED	D 1	A/T-1			
	3	12-2	LATITUDE MSH	D15	IRU L-1		SEE NOTE 10C	A
		12-2	LATITUDE MSH	D16	IRU R-1		SEE NOTE 10C	A
		1	N1	D 1	A/T-1			
	4	12-11	PAD ZERO					
		10-2	LATITUDE LSH	D15	IRU L-1		SEE NOTE 10C	A
		10-2	LATITUDE LSH	D16	IRU R-1		SEE NOTE 10C	A
		1	MIN SPEED	D 1	A/T-1			
39	1-4	12-3	SPARE SYNCHRO	A47				
	1	2	HDG SELECT	D 8	FCC R-1		SEE NOTE 10C	
		2	HDG SELECT	D13	FCC L-1		SEE NOTE 10C	
	2	2	MCP SPEED	D 8	FCC R-1		SEE NOTE 10C	
		2	MCP SPEED	D13	FCC L-1		SEE NOTE 10C	
	3	2	HDG SELECT	D 8	FCC R-1		SEE NOTE 10C	A
		2	HDG SELECT	D13	FCC L-1		SEE NOTE 10C	A
	4	2	MCP SPEED	D 8	FCC R-1		SEE NOTE 10C	A
		2	MCP SPEED	D13	FCC L-1		SEE NOTE 10C	A
	1-4	1	A/T MANUAL DISC	B 26	A/T DISC SW		SEE NOTE 4E	
40	1	12-3	LONGITUDE MSH	D15	IRU L-1		SEE NOTE 10C	
		12-3	LONGITUDE MSH	D16	IRU R-1		SEE NOTE 10C	
	2	12-3	LONGITUDE LSH	D15	IRU L-1		SEE NOTE 10C	
		12-3	LONGITUDE LSH	D16	IRU R-1		SEE NOTE 10C	
	3	12-3	LONGITUDE MSH	D15	IRU L-1		SEE NOTE 10C	A
		12-3	LONGITUDE MSH	D16	IRU R-1		SEE NOTE 10C	A
	4	12-3	LONGITUDE LSH	D15	IRU L-1		SEE NOTE 10C	A
		12-3	LONGITUDE LSH	D16	IRU R-1		SEE NOTE 10C	A
	1-4	2	CWS B	D 8	FCC R-1		SEE NOTE 10C	
		2	CWS B	D13	FCC L-1		SEE NOTE 10C	

APPENDIX B
DATA FRAME FORMAT
AIRCRAFT DATA FRAME: 737-1

WORD	S/F	BITS	PARAMETER	PORT	SOURCE	A/C TYPE	COMMENTS	REV
40	1-4	1	CWS A	D 8	FCC R-1		SEE NOTE 10C	
		1	CWS A	D13	FCC L-1		SEE NOTE 10C	
41	1-4	12-1	LONGITUDINAL ACCEL	A13	ACCEL			
42	1-4	12-1	VERTICAL ACCELERATION	A 1	ACCEL			
43	1-4	12-3	ANGLE OF ATTACK	D12	DSWC-L-1			
		2	ALT ACQUIRE	D 8	FCC R-1		SEE NOTE 10C	
		2	ALT ACQUIRE	D13	FCC L-1		SEE NOTE 10C	
		1	ALT HOLD	D 8	FCC R-1		SEE NOTE 10C	
		1	ALT HOLD	D13	FCC L-1		SEE NOTE 10C	
44	1-4	12-3	RUDDER POSITION	A20	SYNCHRO			
		2	CWS PITCH	D 8	FCC R-1		SEE NOTE 10C	
		2	CWS PITCH	D13	FCC L-1		SEE NOTE 10C	
		1	CWS ROLL	D 8	FCC R-1		SEE NOTE 10C	
		1	CWS ROLL	D13	FCC L-1		SEE NOTE 10C	
45	1-4	12-1	ROLL ANGLE	D10	EFIS L-1	EFIS	SEE NOTE 10C	A
		12-1	ROLL ANGLE	D11	EFIS R-1	EFIS	SEE NOTE 10C	A
		12-1	ROLL ANGLE	D15	IRU L-1	NONEFIS	SEE NOTE 10C	A
		12-1	ROLL ANGLE	D16	IRU R-1	NONEFIS	SEE NOTE 10C	A
46	1-4	12-3	T.E. FLAP POSN-RIGHT	D 8	FCC-R-1			
		2	F/D A ON	D 8	FCC R-1		SEE NOTE 10C	
		2	F/D A ON	D13	FCC L-1		SEE NOTE 10C	
		1	F/D B ON	D 8	FCC R-1		SEE NOTE 10C	
		1	F/D B ON	D13	FCC L-1		SEE NOTE 10C	
47	1-4	12-2	LATERAL ACCELERATION	A 3	ACCEL			
		1	FLARE ENGAGE	D 8	FCC R-1		SEE NOTE 10C	
		1	FLARE ENGAGE	D13	FCC L-1		SEE NOTE 10C	
48	1-4	12-3	DRIFT ANGLE	D15	IRU L-1		SEE NOTE 10C	
		12-3	DRIFT ANGLE	D16	IRU R-1		SEE NOTE 10C	
		2	CMD B	D 8	FCC R-1		SEE NOTE 10C	
		2	CMD B	D13	FCC L-1		SEE NOTE 10C	
		1	CMD A	D 8	FCC R-1		SEE NOTE 10C	
		1	CMD A	D13	FCC L-1		SEE NOTE 10C	
49	1-4	12-3	PITCH TRIM POSITION	A 2	SYNCHRO		SEE NOTE 2D	
	1	2	L NAV MODE OPER	D 8	FCC R-1		SEE NOTE 10C	
		2	L NAV MODE OPER	D13	FCC L-1		SEE NOTE 10C	
	2	2	V/S MODE	D 8	FCC R-1		SEE NOTE 10C	
		2	V/S MODE	D13	FCC L-1		SEE NOTE 10C	
	3	2	L NAV MODE OPER	D 8	FCC R-1		SEE NOTE 10C	A
		2	L NAV MODE OPER	D13	FCC L-1		SEE NOTE 10C	A
	4	2	V/S MODE	D 8	FCC R-1		SEE NOTE 10C	A
		2	V/S MODE	D13	FCC L-1		SEE NOTE 10C	A
	1	1	EFIS/NONEFIS SELECT	B 35	CONFIG			
	2	1	TRUE/MAG SWITCH	B 29			SEE NOTE 7C	A
	3	1	91/NOT 91 RULE SEL	B 71	CONFIG			
	4	1	TRUE/MAG SWITCH	B 29			SEE NOTE 7C	A
50	1-4	12-1	VERTICAL ACCELERATION	A 1	ACCEL			
51	1-4	12-3	PITCH ANGLE	D10	EFIS L-1	EFIS	SEE NOTE 10C	A
		12-3	PITCH ANGLE	D11	EFIS R-1	EFIS	SEE NOTE 10C	A
		12-3	PITCH ANGLE	D15	IRU L-1	NONEFIS	SEE NOTE 10C	A
		12-3	PITCH ANGLE	D16	IRU R-1	NONEFIS	SEE NOTE 10C	A
		2	N1 LIMIT MODE	D 2	FMC-01		SEE NOTE 1C	
		1	N1 LIMIT MODE	D 2	FMC-01		SEE NOTE 1C	
52	1-4	12-3	N2-RIGHT	A19	N2 GAUGE		SEE NOTE 11D	

APPENDIX B
DATA FRAME FORMAT
AIRCRAFT DATA FRAME: 737-1

WORD	S/F	BITS	PARAMETER	PORT	SOURCE	A/C TYPE	COMMENTS	REV
52	1-4	2	N1 LIMIT MODE	D 2	FMC-01		SEE NOTE 1C	
		1	N1 LIMIT MODE	D 2	FMC-01		SEE NOTE 1C	
53	1-4	12-3	ELEVATOR POSN-LEFT	A 7	SYNCHRO		SEE NOTE 7D	
		2	RIGHT GEAR DOWN	B 9	LAMP			
		1	A/P OFF	D 8	FCC R-1		SEE NOTE 10C	
		1	A/P OFF	D13	FCC L-1		SEE NOTE 10C	
54	1-4	12-1	FUEL FLOW-RIGHT	A34	FF GAUGE		SEE NOTE 17D	
55	1-4	12-3	EGT-LEFT	A35	EGT GAUGE		SEE NOTE 18D	
		2	SINGLE CHANNEL	D 8	FCC R-1		SEE NOTE 10C	
		2	SINGLE CHANNEL	D13	FCC L-1		SEE NOTE 10C	
		1	VOR/LOC ENGAGE	D 8	FCC R-1		SEE NOTE 10C	
		1	VOR/LOC ENGAGE	D13	FCC L-1		SEE NOTE 10C	
56	1-4	12-3	EGT-RIGHT	A36	EGT GAUGE		SEE NOTE 18D	
		2	SPARE DISC	B 24				
		1	SPARE DISC	B 32				
57	1-4	12-1	LONGITUDINAL ACCEL	A13	ACCEL			
58	1-4	12-1	VERTICAL ACCELERATION	A 1	ACCEL			
59	1	12-3	OIL PRESSURE LEFT	A37	OIP GAUGE		SEE NOTE 19D	
	2	12-3	OIL PRESSURE RIGHT	A38	OIP GAUGE		SEE NOTE 19D	
	3	12-3	OIL TEMP LEFT	A45	TEMP BULB		SEE NOTE 20D	
	4	12-3	OIL TEMP RIGHT	A46	TEMP BULB		SEE NOTE 20D	A
	1-4	2	V NAV MODE OPER	D 8	FCC R-1		SEE NOTE 10C	
		2	V NAV MODE OPER	D13	FCC L-1		SEE NOTE 10C	
		1	MCP SPEED	D 1	A/T-1			
60	1-4	12-3	GROUNDSPEED	D15	IRU L-1		SEE NOTE 10C	
		12-3	GROUNDSPEED	D16	IRU R-1		SEE NOTE 10C	
		2	YAW DAMPER DISENGAGE	B 22	YAW DMPR			
		1	SPARE DISC	B 23				
61	1	12-2	VOR/ILS FREQ-RIGHT	D 6	DAA-R-2		SEE NOTE 5C	
		1	VOR/ILS SELECT-RIGHT	D 6	DAA-R-2			
	2	12-1	MACH	D 5	DADC-L-4			
	3	12-1	DME DISTANCE-RIGHT	D 6	DAA-R-2			
	4(1)	12-9	PAD ZERO					
		8-1	LEFT CN1 (FAN) VIB	D 3	AVM L-A-1			
	4(2)	12-9	PAD ZERO					
		8-1	LEFT CN2 (HPC) VIB	D 3	AVM L-A-1			
	4(3)	12-9	PAD ZERO					
		8-1	LEFT TN1 (LPT) VIB	D 3	AVM L-A-1			
	4(4)	12-9	PAD ZERO					
		8-1	LEFT TN2 (HPT) VIB	D 3	AVM L-A-1			
	4(5)	12-9	PAD ZERO					
		8-1	RIGHT CN1 (FAN) VIB	D 3	AVM L-A-1			
	4(6)	12-9	PAD ZERO					
		8-1	RIGHT CN2 (HPC) VIB	D 3	AVM L-A-1			
	4(7)	12-9	PAD ZERO					
		8-1	RIGHT TN1 (LPT) VIB	D 3	AVM L-A-1			
	4(8)	12-9	PAD ZERO					
		8-1	RIGHT TN2 (HPT) VIB	D 3	AVM L-A-1			
	4(9)	12-9	PAD ZERO					
		8-1	LEFT N1 BALANCE ANGLE	D 3	AVM L-A-1			
	4(10)	12-9	PAD ZERO					
		8-1	LEFT N1 BALANCE MASS	D 3	AVM L-A-1			
	4(11)	12-9	PAD ZERO					
		8-1	RIGHT N1 BALANCE ANGLE	D 3	AVM L-A-1			
	4(12)	12-9	PAD ZERO					
		8-1	RIGHT N1 BALANCE MASS	D 3	AVM L-A-1			

APPENDIX B
DATA FRAME FORMAT
AIRCRAFT DATA FRAME: 737-I

WORD	S/F	BITS	PARAMETER	PORT	SOURCE	A/C TYPE	COMMENTS	REV
61	4(13)	12-1	DISTANCE TO GO	D 2	FMC-01			
	4(14)	12	PAD ZERO					
		11-10	DAY MSB	D 7	CAPT CLOCK			A
		9-6	DAY LSB	D 7	CAPT CLOCK			A
		5	MONTH MSB	D 7	CAPT CLOCK			A
		4-1	MONTH LSB	D 7	CAPT CLOCK			A
	4(15)	12-1	GROSS WEIGHT	D 2	FMC-01			
	4(16)	12-1	TOTAL FUEL QUANTITY	D 9	DAA-L-2			
62	1	12	PAD ZERO					
		11	PAD ZERO					
		10	ISOLATION VALVE	D 2	FMC-01			
		9	WING ANTI-ICE	D 2	FMC-01			
		8	COWL ANTI-ICE RIGHT	D 2	FMC-01			
		7	COWL ANTI-ICE LEFT	D 2	FMC-01			
		6	ECS PACK H/L RIGHT	D 2	FMC-01			
		5	ECS PACK H/L LEFT	D 2	FMC-01			
		4	ECS PACK ON/OFF RIGHT	D 2	FMC-01			
		3	ECS PACK ON/OFF LEFT	D 2	FMC-01			
		2	ENGINE BLEED NO. 2	D 2	FMC-01			
		1	ENGINE BLEED NO. 1	D 2	FMC-01			
	2	12-5	WIND SPEED	D15	IRU L-1		SEE NOTE 10C	
		12-5	WIND SPEED	D16	IRU R-1		SEE NOTE 10C	
		4-2	PAD ZERO					
		1	LOCAL LIMITED MASTER	D 8	FCC R-1		SEE NOTE 10C	
		1	LOCAL LIMITED MASTER	D13	FCC L-1		SEE NOTE 10C	
	3	12	PAD ZERO					
		11	PAD ZERO					
		10	ISOLATION VALVE	D 2	FMC-01			
		9	WING ANTI-ICE	D 2	FMC-01			
		8	COWL ANTI-ICE RIGHT	D 2	FMC-01			
		7	COWL ANTI-ICE LEFT	D 2	FMC-01			
		6	ECS PACK H/L RIGHT	D 2	FMC-01			
		5	ECS PACK H/L LEFT	D 2	FMC-01			
		4	ECS PACK ON/OFF RIGHT	D 2	FMC-01			
		3	ECS PACK ON/OFF LEFT	D 2	FMC-01			
		2	ENGINE BLEED NO. 2	D 2	FMC-01			
		1	ENGINE BLEED NO. 1	D 2	FMC-01			
	4	12	PAD ZERO					
		11-3	WIND DIRECTION TRUE	D15	IRU L-1		SEE NOTE 10C	
		11-3	WIND DIRECTION TRUE	D16	IRU R-1		SEE NOTE 10C	
		2	PAD ZERO					A
		1	FAA/ICAO SELECT	B 36	CONFIG			A
63	1-4	12-2	LATERAL ACCELERATION	A 3	ACCEL			
		1	SPARE DISC	B 25				
64	1	12-1	FRAME COUNTER					
	2(1)	12-1	VENDOR STATUS & DATA					
	2(2)	12-1	VENDOR STATUS & DATA					
	2(3)	12-1	VENDOR STATUS & DATA					
	2(4)	12-1	VENDOR STATUS & DATA					
	2(5)	12-1	VENDOR STATUS & DATA					
	2(6)	12-1	VENDOR STATUS & DATA					
	2(7)	12-1	VENDOR STATUS & DATA					
	2(8)	12-1	VENDOR STATUS & DATA					
	2(9)	12-1	VENDOR STATUS & DATA					
	2(10)	12-1	VENDOR STATUS & DATA					
	2(11)	12-1	VENDOR STATUS & DATA					
	2(12)	12-1	VENDOR STATUS & DATA					
	2(13)	12-1	VENDOR STATUS & DATA					
	2(14)	12-1	VENDOR STATUS & DATA					
	2(15)	12-1	VENDOR STATUS & DATA					
	2(16)	12-1	VENDOR STATUS & DATA					
	3(1)	12-9	S/F CYCLE COUNT 0					

APPENDIX B
DATA FRAME FORMAT
AIRCRAFT DATA FRAME: 737-1

WORD	S/F	BITS	PARAMETER	PORT	SOURCE	A/C TYPE	COMMENTS	REV
64	3(1)	8-1	FDEP MONTH MSC				SEE NOTE 3F	
	3(2)	12-9	S/F CYCLE COUNT 1					
		8-1	FDEP MONTH LSC				SEE NOTE 3F	
	3(3)	12-9	S/F CYCLE COUNT 2					
		8-1	FDEP DAY MSC				SEE NOTE 3F	
	3(4)	12-9	S/F CYCLE COUNT 3					
		8-1	FDEP DAY LSC				SEE NOTE 3F	
	3(5)	12-9	S/F CYCLE COUNT 4					
		8-1	FDEP DEPART MSC				SEE NOTE 3F	
	3(6)	12-9	S/F CYCLE COUNT 5					
		8-1	FDEP DEPART LSC + 1				SEE NOTE 3F	
	3(7)	12-9	S/F CYCLE COUNT 6					
		8-1	FDEP DEPART LSC				SEE NOTE 3F	
	3(8)	12-9	S/F CYCLE COUNT 7					
		8-1	FDEP DEST MSC				SEE NOTE 3F	
	3(9)	12-9	S/F CYCLE COUNT 8					
		8-1	FDEP DEST LSC + 1				SEE NOTE 3F	
	3(10)	12-9	S/F CYCLE COUNT 9					
		8-1	FDEP DEST LSC				SEE NOTE 3F	
	3(11)	12-9	S/F CYCLE COUNT 10					
		8-1	FDEP FLT NUMBER MSC				SEE NOTE 3F	
	3(12)	12-9	S/F CYCLE COUNT 11					
		8-1	FDEP FLT NUMBER LSC+2				SEE NOTE 3F	
	3(13)	12-9	S/F CYCLE COUNT 12					
		8-1	FDEP FLT NUMBER LSC+1				SEE NOTE 3F	
	3(14)	12-9	S/F CYCLE COUNT 13					
		8-1	FDEP FLT NUMBER LSC				SEE NOTE 3F	
	3(15)	12-9	S/F CYCLE COUNT 14					
		8-5	FDEP LEG NUMBER				SEE NOTE 3F	
		4	FLEET IDENT MSB	B 91	A/C IDENT			
		3	FLEET IDENT LSB + 2	B 90	A/C IDENT			
		2	FLEET IDENT LSB + 1	B 89	A/C IDENT			
		1	FLEET IDENT LSB	B 88	A/C IDENT			
	3(16)	12-9	S/F CYCLE COUNT 15					
		8	A/C NUMBER MSB	B 99	A/C IDENT			
		7	A/C NUMBER LSB + 6	B 98	A/C IDENT			
		6	A/C NUMBER LSB + 5	B 97	A/C IDENT			
		5	A/C NUMBER LSB + 4	B 96	A/C IDENT			
		4	A/C NUMBER LSB + 3	B 95	A/C IDENT			
		3	A/C NUMBER LSB + 2	B 94	A/C IDENT			
		2	A/C NUMBER LSB + 1	B 93	A/C IDENT			
		1	A/C NUMBER LSB	B 92	A/C IDENT			
	4(1)	12	A/C TYPE MSB	B 87	A/C IDENT			
		11	A/C TYPE LSB+4	B 86	A/C IDENT			
		10	A/C TYPE LSB+3	B 85	A/C IDENT			
		9	A/C TYPE LSB+2	B 84	A/C IDENT			
		8	A/C TYPE LSB+1	B 83	A/C IDENT			
		7	A/C TYPE LSB	B 82	A/C IDENT			
		6-1	MANUFACTURER CODE				SEE NOTE 1F	
	4(2)	12-1	MANDATORY S/W P/N CODE				SEE NOTE 2F	
	4(3)	12-1	ACMS S/W P/N CODE				SEE NOTE 2F	
	4(4)	12-1	CLIMB N1 LIMIT #1	D 2	FMC-01			
	4(5)	12-1	CLIMB N1 LIMIT #2	D 2	FMC-01			
	4(6)	12-1	IMPACT PRESSURE	D 5	DADC-L-4			
	4(7)	12-1	STATIC AIR TEMP	D 5	DADC-L-4			
	4(8)	12-1	STATIC PRESSURE	D 5	DADC-L-4			
	4(9)	12-1	TARGET N1 NO. 1	D 2	FMC-01			
	4(10)	12-1	TARGET N1 NO. 2	D 2	FMC-01			
	4(11)	12-1	N1 BUG DRIVE NO. 1	D 2	FMC-01			
	4(12)	12-1	N1 BUG DRIVE NO. 2	D 2	FMC-01			
	4(13)	12-9	FLIGHT NUMBER MSB	D 2	FMC-01			
		8-5	FLIGHT NUMBER LSB + 2	D 2	FMC-01			
		4-1	FLIGHT NUMBER LSB + 1	D 2	FMC-01			
	4(14)	12-6	PAD ZERO					
		5	FMC/IRU DATA SOURCE		DFDAU		SEE NOTE 4F	

APPENDIX B
DATA FRAME FORMAT
AIRCRAFT DATA FRAME: 737-1

WORD	S/F	BITS	PARAMETER	PORT	SOURCE	A/C TYPE	COMMENTS	REV
64	4(14)	4-1	FLIGHT NUMBER LSB	D 2	FMC-01			
	4(15)	12-9	PAD ZERO					
		8-5	NDB EFFECTIVITY YR*10	D 2	FMC-01			
		4-1	NDB EFFECTIVITY YR*1	D 2	FMC-01			
	4(16)	12	PAD ZERO					
		11	NDB EFFECTIVITY MN*10	D 2	FMC-01			
		10-7	NDB EFFECTIVITY MN*1	D 2	FMC-01			
		6-5	NDB EFFECTIVITY DAY*10	D 2	FMC-01			
		4-1	NDB EFFECTIVITY DAY*1	D 2	FMC-01			

APPENDIX D
NOTES AND ANALOG SCALING

ANALOG SCALING AND NOTES (continued)

NOTE 7D (continued)

RIGHT ELEVATOR
EQUATION: Elev Posn = -3.957499 + 0.5637946*S
+ 7.532202E-4*S^2 - 1.505623E-5*S^3

$ERROR^2$ = 0.0385634

Synchro = 6.989732 + 1.745108*EP
- 2.883902E-3*EP^2 + 1.736321E-4*EP^3

$ERROR^2$ = 0.1007624

NOTE 8D

Port A10 AILERON POSITION LEFT AND RIGHT (737)
A11

	AILERON SURFACE POSN DEGREES	LEFT AILERON SYNCHRO DEGREES	RIGHT AILERON SYNCHRO DEGREES
UP	21.0	32.9	-32.9
	20.0	31.3	-31.3
	15.0	23.0	-23.0
	10.0	15.2	-15.2
	5.0	7.5	- 7.5
	0.0	0.0	0.0
	- 5.0	- 7.5	7.5
	-10.0	-15.2	15.2
	-15.0	-23.0	23.0
	-20.0	-31.3	31.3
DOWN	-21.0	-32.9	32.9

LEFT AILERON

EQUATION: Ail Posn = 1.157714E-7 + 0.665017*S
+ 2.194582E-10*S^2 - 2.543954E-5*S^3

$ERROR^2$ = 6.069703E-3

Synchro = 4.264114E-7 + 1.501309*A
- 3.570623E-9*A^2 + 1.523644E-4*A^3

$ERROR^2$ = 1.498852E-2

ANALOG SCALING AND NOTES (continued)

NOTE 8D (continued)

RIGHT AILERON
EQUATION: Ail Posn = 1.157714E-7 - 0.665017*S
+ 2.194582E-10*S^2 + 2.543954E-5*S^3

$ERROR^2$ = 6.069703E-3

Synchro = -4.264114E-7 - 1.501309*A
+ 3.570623E-9*A^2 - 1.523644E-4*A^3

$ERROR^2$ = 1.498852E-2

NOTE 9D

Port A13 LONGITUDINAL ACCELERATION

LINEAR FROM 0.2 Volts = -1 G's TO
5.0 Volts = +1 G's

EQUATION: G's = -1.083333 + 0.4166666V
Volts = 2.6 + 2.4G's

NOTE 10D

Port A15 SPEEDBRAKE HANDLE POSITION (737)

SPEEDBRAKE HANDLE ANGLE	SYNCHRO DEGREES	NOTES
0.0	0.00	FULL FORWARD
4.0	- 3.99	ARMED
24.0	-24.80	
29.0	-30.25	
38.0	-40.38	INFLIGHT
40.0	-42.70	STRAIGHT UP
48.0	-52.23	FULL UP

EQUATION: SPBRK = 4.211426E-3 - 1.00589*S
- 1.424789E-3*S^2 + 4.604459E-6*S^3

$ERROR^2$ = 8.059793E-5

Synchro = 8.361816E-3 - 0.9979248*SB
- 1.070023E-3*SB^2 - 1.680851E-5*SB^3

$ERROR^2$ = 5.705839E-4

ATTACHMENT II
(Data Tables)

time	alt	ias	head	rudpos1	rudpos2	pitch1	pitch2	pitch3	pitch4	aoa1	aoa2	lelev	relev	roll1	roll2	lail	rail
1914	-64	45	289.7	-0.82	-1.02	-0.18	-0.18	-0.18	-0.18	0.53	0.53	0.44	-7.88	0.09	0.09	0.58	0.47
1915	-64	45	289.7	-0.82	-1.02	-0.18	-0.18	-0.18	-0.18	0.53	0.53	0.64	-7.88	0.09	0.09	0.58	0.47
1916	-64	45	289.7	-1.08	-1.27	-0.18	-0.18	-0.18	-0.18	0.53	0.53	0.64	-7.88	0.09	0.09	0.58	0.47
1917	-64	45	290	-1.08	-1.52	-0.18	-0.18	-0.18	-0.18	0.53	0.53	0.64	-7.69	0.09	0	0.58	0.47
1918	-64	45	290.4	-1.08	-1.27	-0.18	0	-0.18	0	0.53	0.53	0.84	-7.88	0	0	0.58	0.47
1919	-64	45	290.7	-0.82	1.27	0	0	0	-0.18	0.53	0.53	0.64	-8.07	-0.09	0.09	0.58	0.47
1920	-64	45	290.9	17.19	12.18	0	0	0	0	0.53	0.53	0.44	-8.07	0.09	-0.09	0.58	0.47
1921	-64	45	291.8	1.71	-0.76	0	0	0	0	0.53	0.53	1.05	-7.69	-0.09	-0.18	0.58	0.47
1922	-64	45	292.5	-3.62	-0.51	0.18	0.18	0.18	0	0.53	0.53	0.44	-7.88	0	-0.09	0.58	0.47
1923	-64	45	293.4	-0.57	-0.25	0	0.18	0.18	0.18	0.53	0.53	0.64	-8.07	0	-0.09	0.58	0.47
1924	-32	45	293.6	-0.57	-0.76	0.18	0	0	0.18	0.53	0.53	0.44	-7.88	-0.18	-0.09	0.58	0.47
1925	-32	45	294.1	-2.6	-1.27	0.18	0.18	0.18	0	0.53	0.53	0.64	-7.88	-0.09	-0.09	0.58	0.47
1926	-32	47	294.4	-2.85	-2.54	-0.18	0	0.18	0.18	0.53	0.7	0.64	-7.69	-0.09	-0.09	0.58	0.47
1927	-32	53	294.4	-7.68	-11.93	0.18	0.18	0.18	0.18	0.88	0.18	0.44	-8.07	0.09	0	0.58	0.47
1928	-32	59	294.1	-9.2	-0.51	0.18	0.18	0.18	0.35	0.7	0.53	0.64	-8.07	0.09	0.18	0.58	0.47
1929	-32	65.5	292.7	-1.84	-5.08	0.35	0.18	0.18	0.18	0.53	0.7	0.84	-7.88	-0.09	0.79	0.58	0.47
1930	-32	71.5	292	-0.57	3.3	0.18	0.18	0.35	0.35	0.53	0.18	0.64	-7.88	0.18	0.26	0.58	0.47
1931	-32	75.5	291.1	1.21	-0.76	0.35	0.18	0.18	0.18	0.35	0.35	0.64	-7.88	0.18	0.09	0.58	0.47
1932	-32	79.5	291.1	0.95	-2.03	0.35	0.35	0.35	0.35	0.53	0.53	0.64	-7.69	0.18	0.26	0.58	0.47
1933	-32	83.5	292.1	-3.11	-3.05	0.18	0.18	0.18	0.35	0.35	0.35	0.64	-7.88	0.18	0.26	0.58	0.47
1934	-32	87.5	292.9	-1.84	-1.27	0.35	0.53	0.53	0.35	0.35	0.53	0.64	-7.88	-0.09	0.26	0.58	0.47
1935	-32	91	293.6	-0.57	-0.51	0.35	0.53	0.53	0.53	0.53	0.88	0.64	-7.69	-0.26	-0.26	0.58	0.47
1936	-32	96.5	293.7	-0.06	0	0.53	0.53	0.35	0.35	0.53	0.53	0.64	-7.69	0.18	-0.18	0.58	0.47
1937	-32	97.5	293.6	-0.57	-1.27	0.35	0.35	0.53	0.53	0.53	0.35	0.64	-7.69	-0.09	0.09	0.58	0.47
1938	-32	103	293.7	-4.38	-4.57	0.53	0.53	0.53	0.35	0.53	0.35	0.84	-7.69	-0.09	0.35	0.58	0.47
1939	-32	108	293.4	-1.08	0.25	0.35	0.35	0.35	0.18	0.35	0.53	0.84	-7.69	0	0.26	0.58	0.47
1940	-32	111	292.3	0.7	-0.76	0.18	0.18	0.18	0.18	0.88	0.53	0.64	-7.69	-0.18	0.09	0.58	0.47
1941	-32	115.5	291.3	-0.32	1.27	0.18	0.18	0.18	0.18	0.53	0.88	0.64	-7.69	0.09	0.18	0.58	0.47
1942	-32	123	291.1	0.19	-1.78	0.18	0.18	0.35	0.18	1.05	0.7	0.84	-7.69	-0.35	-0.26	0.82	0.47
1943	-32	125	292.5	0.95	-9.9	0.18	0.18	0.18	0.18	2.81	1.05	0.44	-7.1	-0.44	-0.09	0.58	0.47
1944	-32	132.5	294.4	1.21	2.03	0.18	0.18	0.18	0.18	0.88	0.35	0.84	-7.49	0.26	-0.35	0.12	1.17
1945	-32	133	292.7	0.7	-0.76	0.35	0.35	0.53	0.53	0.18	0.7	1.05	-7.49	0	0	0.58	0.94
1946	-32	142.5	292.1	-0.06	-1.27	0.53	0.53	0.53	0.53	1.05	0.53	0.84	-1.17	0.09	-0.44	0.58	0.7
1947	-64	148.5	291.8	-1.33	-1.52	0.88	1.23	1.93	2.99	1.05	2.11	8.94	-1.97	-0.09	0.18	0.82	0.7
1948	-64	147.5	291.8	-1.59	-1.27	4.04	5.27	6.15	7.21	6.5	9.67	5.5	-3.76	0	0.26	1.05	0.94
1949	-64	150	292.1	-0.06	-0.51	8.96	9.49	9.84	10.02	11.43	11.6	6.31	-0.77	0.26	0.79	1.05	1.17

1950	-64	154.5	292.1	-0.82	-0.76	10.2	10.37	10.55	10.72	11.43	11.43	9.14	0.04	1.05	0.62	1.99	0.23
1951	-32	157	292.1	-1.08	-1.52	11.6	12.3	13.01	13.71	11.95	13.36	7.32	-1.97	0.26	-0.09	1.75	0.47
1952	-32	162	292.3	-0.82	-0.76	14.24	15.12	15.64	16	12.66	13.54	4.28	-4.55	0.26	0.62	2.69	-0.23
1953	32	162.5	292.3	-0.57	-0.25	16.7	16.88	17.05	17.05	12.66	12.48	3.47	-4.95	0.53	-0.44	1.75	0.7
1954	64	158.5	292	-1.33	-2.03	17.23	17.4	17.4	17.4	11.07	9.84	2.86	-5.73	-1.41	-2.2	-1.05	3.27
1955	96	161	292.5	-1.84	-1.52	17.58	17.75	17.93	18.28	10.37	11.43	2.46	-6.91	-2.81	-3.08	-2.45	4.67
1956	160	161	292.9	-0.57	-1.02	18.46	18.46	18.46	18.46	9.67	10.72	1.25	-7.49	-2.46	-1.93	-2.45	4.67
1957	192	160.5	293.2	-1.08	-1.52	18.46	18.28	18.28	18.11	9.32	9.67	0.64	-7.69	-0.88	0.35	-0.82	2.8
1958	256	160	293.4	-0.06	0	18.11	17.93	17.75	17.58	9.32	8.44	1.05	-7.49	2.37	3.43	1.05	1.17
1959	320	159	293	-0.32	-1.02	17.4	17.23	17.23	17.05	7.73	7.73	1.05	-7.3	3.69	3.6	-0.12	2.34
1960	352	157	293	-1.08	-1.78	17.05	17.05	17.05	17.05	7.38	7.56	1.05	-7.3	2.9	2.72	-0.82	2.8
1961	416	156	293.6	-1.08	-1.27	17.05	17.05	17.05	17.23	8.26	8.44	1.05	-7.49	2.81	2.81	0.58	1.4
1962	448	155	293.9	-1.08	-1.52	17.23	17.23	17.23	17.23	8.96	9.49	0.84	-7.49	2.46	2.64	1.05	0.94
1963	480	152.5	294.3	-0.82	-0.76	17.23	17.23	17.23	17.05	9.67	9.32	0.84	-7.49	2.99	3.52	3.39	-1.17
1964	544	154	294.6	-0.57	-0.76	17.05	16.88	16.7	16.52	9.49	9.84	0.84	-7.49	3.69	3.16	5.25	-3.04
1965	576	156	294.6	-0.57	-0.25	16.17	16	15.82	15.47	8.96	8.44	0.84	-7.3	2.9	2.72	5.94	-3.74
1966	640	156	294.6	-0.06	-0.25	15.29	15.12	14.94	14.77	7.91	7.56	1.05	-6.52	1.49	1.14	5.02	-2.8
1967	672	156	294.4	-0.06	-0.51	14.59	14.59	14.59	14.59	8.09	8.26	2.05	-6.52	1.32	1.14	5.94	-3.74
1968	704	157.5	293.9	-0.32	-1.02	14.77	14.77	14.94	14.94	7.91	11.07	1.85	-7.49	-0.35	-1.58	1.52	0.47
1969	736	159.5	293.7	-0.82	-1.78	15.29	15.47	15.29	15.29	10.2	9.32	0.64	-7.49	-2.2	-2.72	-1.29	3.5
1970	768	161	293.9	-2.09	-1.78	15.12	14.94	14.94	14.77	8.79	7.91	1.05	-7.49	-4.39	-5.36	-3.85	6.06
1971	832	161	294.4	-1.59	-0.51	14.77	14.59	14.59	14.41	8.44	7.73	1.25	-7.3	-4.92	-2.64	-1.75	3.97
1972	864	163	294.6	-0.06	-0.51	14.41	14.24	14.24	14.24	7.91	7.38	0.84	-7.49	1.14	2.37	1.99	-0.23
1973	928	166	294.4	-0.57	-1.78	14.06	14.06	14.06	14.06	8.79	7.38	0.84	-7.49	2.46	2.29	1.05	0.94
1974	960	163.5	294.4	-1.08	-1.02	14.24	14.24	14.24	14.24	7.03	8.09	1.25	-6.52	3.16	2.37	4.09	-1.87
1975	992	164.5	294.6	-1.84	-1.02	14.41	14.94	15.12	15.47	7.73	9.32	1.85	-6.91	1.58	1.67	5.25	-3.27
1976	1056	165	295	-0.32	-1.02	15.82	16	16.17	16.35	8.44	8.96	1.05	-7.49	1.76	0.97	4.09	-1.87
1977	1088	165	294.8	-0.82	-1.27	16.35	16.52	16.52	16.7	8.79	9.32	0.64	-7.88	0.26	-0.62	3.39	-1.17
1978	1152	166.5	295.1	-0.82	-0.25	16.7	16.52	16.52	16.35	8.44	6.15	-0.16	-8.65	-1.41	-2.02	2.92	-0.94
1979	1184	167	295	-0.06	-0.25	16	15.47	15.29	15.12	4.75	5.63	0.24	-8.07	-2.72	-3.08	0.35	1.87
1980	1248	166	294.6	-0.32	-0.25	15.12	15.12	15.12	15.29	5.8	6.5	0.64	-7.88	-2.02	-0.88	0.35	1.64
1981	1280	166	293.9	-0.32	-0.76	15.29	15.47	15.47	15.47	6.5	8.26	0.44	-7.69	-0.09	0.44	0.35	1.64
1982	1312	164.5	293.4	-1.08	-1.78	15.64	15.82	15.82	15.82	9.32	8.79	0.44	-7.88	1.32	1.76	0.82	1.4
1983	1376	162	293.2	-1.08	-1.27	15.82	15.64	15.64	15.64	7.91	8.44	0.44	-7.88	2.11	1.85	0.82	1.17
1984	1408	167	293	-1.59	-1.27	15.64	15.64	15.47	15.47	8.79	8.61	0.64	-8.65	-0.97	-1.58	-1.75	3.97
1985	1472	168	293.2	-1.08	-1.27	15.47	15.12	14.77	14.59	7.91	6.68	-0.16	-8.65	-1.58	-1.23	-1.52	3.74
1986	1504	164	293.2	-0.57	-0.76	14.24	13.89	13.71	13.54	6.33	6.33	0.04	-7.69	0.35	0.7	0.82	1.17

1987	1568	165.5	292.9	-1.84	-2.03	13.54	13.36	13.36	13.54	5.63	5.63	0.44	-7.88	-0.09	-0.88	-2.22	4.43
1988	1600	167.5	293.2	-1.08	-1.27	13.54	13.71	13.71	13.89	6.68	6.33	0.44	-8.27	-0.18	1.32	-3.15	5.13
1989	1632	170.5	293.2	-1.08	-1.27	13.89	13.71	13.71	13.54	6.33	5.8	0.04	-8.07	2.2	2.64	-1.05	3.04
1990	1696	172.5	293.6	-1.33	-1.78	13.54	13.54	13.54	13.54	5.98	5.98	0.24	-7.88	2.2	1.67	-1.05	3.27
1991	1728	173	293.9	-1.59	-1.52	13.71	13.89	14.06	14.24	6.5	8.09	0.24	-8.07	1.32	1.23	-1.29	3.5
1992	1760	177	294.8	-0.82	-1.52	14.41	14.59	14.59	14.59	8.44	8.09	0.24	-8.27	1.49	1.32	-0.12	2.34
1993	1792	177.5	295.3	-1.33	-0.76	14.59	14.59	14.41	14.41	6.5	5.98	0.04	-7.88	0.97	1.05	1.05	1.17

time	verg1	verg2	verg3	verg4	verg5	verg6	verg7	verg6	long1	long2	long3	long4	latg1	latg2	latg3	latg4	mach
1914	0.986	0.998	0.993	1.009	0.991	0.993	1.002	0.993	-0.011	-0.011	-0.011	-0.009	-0.004	-0.005	-0.005	-0.004	0.15
1915	1.007	0.991	0.998	1	0.998	1.005	0.993	1.005	-0.003	0.001	0.005	0.011	-0.002	-0.004	-0.004	-0.005	0.15
1916	0.998	0.991	0.995	0.995	1.005	0.986	1.005	0.991	0.023	0.031	0.049	0.061	-0.006	-0.006	-0.004	-0.002	0.15
1917	1.007	0.998	1.002	1.011	0.986	0.984	1.03	1.025	0.08	0.096	0.116	0.127	0.002	-0.008	-0.006	-0.001	0.15
1918	0.989	0.984	0.993	1.021	1.002	0.977	1.018	1.053	0.149	0.158	0.185	0.183	-0.013	-0.001	-0.004	-0.013	0.15
1919	0.993	0.938	0.986	1.062	1.023	0.943	0.984	1.06	0.205	0.207	0.238	0.233	-0.009	0.007	0.001	-0.009	0.15
1920	1.048	0.963	0.947	1.016	1.06	1.032	0.963	0.961	0.261	0.26	0.272	0.291	-0.003	0.01	0.008	0.004	0.15
1921	1.037	1.018	0.998	1.021	0.998	0.957	0.966	1.021	0.296	0.291	0.293	0.291	0.009	0.005	0.003	0.01	0.15
1922	1.071	1.023	0.975	1.018	1.05	1.009	0.929	0.986	0.281	0.28	0.283	0.275	0.002	-0.002	-0.003	0.018	0.15
1923	1.043	1.08	0.998	0.986	1.076	1.025	0.924	0.936	0.271	0.279	0.278	0.282	0.016	-0.011	0	0.01	0.15
1924	1.055	1.096	1.011	0.966	1.002	1.046	1.021	0.982	0.269	0.281	0.278	0.284	0.001	-0.002	0.01	0.005	0.15
1925	0.968	1.018	1.064	1.011	0.947	0.979	0.993	1.046	0.277	0.276	0.28	0.275	0.001	0.011	-0.001	-0.005	0.15
1926	1.011	1.014	1.034	0.993	0.924	0.95	1.039	1.053	0.282	0.278	0.283	0.275	0.006	-0.001	-0.025	-0.016	0.15
1927	0.986	1.002	0.961	0.975	1.03	1.046	1.009	0.936	0.274	0.275	0.267	0.275	0.007	-0.013	-0.02	-0.021	0.15
1928	0.979	1.034	1.062	1.002	1.021	1.021	0.961	0.991	0.263	0.258	0.258	0.259	-0.022	-0.036	-0.032	-0.027	0.15
1929	1.014	0.986	1.021	1.011	0.961	1.048	1.055	1.016	0.264	0.264	0.25	0.255	-0.041	-0.035	-0.009	-0.025	0.15
1930	1.055	1.034	1.041	0.95	0.924	0.966	1.021	1.053	0.246	0.25	0.253	0.252	-0.043	-0.047	-0.037	-0.035	0.15
1931	1.05	1.002	0.977	0.968	1.002	1.005	1.014	1.021	0.248	0.247	0.251	0.243	-0.035	-0.037	-0.041	-0.015	0.15
1932	1.016	1.023	0.979	0.824	0.908	1.112	1.167	1.11	0.237	0.25	0.241	0.231	-0.015	-0.028	0.003	-0.01	0.15
1933	0.929	0.815	0.908	1.082	1.137	1.071	0.938	0.922	0.261	0.243	0.241	0.253	-0.014	0.003	0.006	-0.006	0.15
1934	0.993	1.089	1.085	0.961	0.938	1.011	1.011	1.064	0.233	0.249	0.238	0.236	0.005	0.021	0.021	0.016	0.15
1935	1.082	1.021	1.005	0.95	0.938	0.998	1.007	0.998	0.237	0.241	0.237	0.239	0.011	0.014	0.007	-0.004	0.15
1936	1.025	1.005	0.989	1.002	1.007	1.069	1.016	0.883	0.231	0.228	0.222	0.242	-0.004	-0.001	-0.011	-0.006	0.1543
1937	0.856	1.034	1.144	1.076	0.929	0.876	0.911	1.032	0.236	0.228	0.239	0.227	0.003	0.002	0.024	0.035	0.1585
1938	1.119	0.991	0.892	0.918	1.002	1.014	1.066	1.023	0.225	0.235	0.231	0.223	0.044	0.038	0.035	0.013	0.1628
1939	0.89	0.886	0.977	1.027	1.046	0.986	0.993	1.011	0.232	0.225	0.223	0.22	0.007	-0.003	-0.027	-0.039	0.167
1940	1.06	1.023	0.991	0.954	0.957	0.984	1.06	1.119	0.217	0.21	0.22	0.208	-0.048	-0.04	-0.034	-0.049	0.175
1941	1.025	0.908	0.911	1.073	1.101	1.023	1.002	0.957	0.225	0.206	0.216	0.207	-0.052	-0.058	-0.061	-0.061	0.183
1942	1.002	1.053	1	0.938	0.924	1.043	1.08	1.05	0.199	0.217	0.213	0.207	-0.06	-0.066	-0.035	-0.049	0.191
1943	1.039	0.991	0.952	0.984	0.975	1.041	1.048	1.043	0.203	0.184	0.217	0.228	-0.031	0.067	0.211	0.17	0.199
1944	1.03	0.929	0.975	1.055	1.085	1.021	0.897	1.053	0.217	0.188	0.203	0.194	0.046	-0.013	-0.004	0.026	0.2045
1945	1.085	0.984	0.957	1.021	1.163	1.05	0.851	0.815	0.189	0.208	0.21	0.2	0.013	-0.007	-0.008	-0.023	0.21
1946	0.991	1.156	1.108	1.027	0.888	0.789	0.902	1.168	0.18	0.191	0.199	0.188	-0.021	-0.034	-0.015	-0.001	0.2155
1947	1.286	1.03	0.808	0.702	0.876	1.064	1.144	1.053	0.211	0.211	0.229	0.255	-0.03	-0.01	0.007	-0.008	0.221
1948	1.037	1.037	0.989	1.053	1.066	1.06	1.085	1.119	0.268	0.292	0.302	0.313	0.003	0.01	-0.005	-0.004	0.2268
1949	1.119	1.149	1.149	1.133	1.137	1.149	1.144	1.121	0.325	0.323	0.32	0.315	-0.016	-0.021	-0.011	0.005	0.2325

1950	1.11	1.096	1.126	1.151	1.149	1.144	1.137	1.163	0.308	0.308	0.306	0.308	-0.005	-0.013	-0.021	-0.011	0.2383
1951	1.158	1.137	1.163	1.195	1.231	1.254	1.279	1.295	0.312	0.323	0.333	0.335	-0.011	0.01	0.005	0.001	0.244
1952	1.295	1.291	1.3	1.327	1.346	1.334	1.309	1.295	0.331	0.338	0.339	0.329	-0.005	0.001	-0.008	-0.01	0.244
1953	1.295	1.268	1.222	1.22	1.236	1.222	1.208	1.176	0.316	0.318	0.32	0.306	-0.001	-0.003	-0.022	-0.029	0.244
1954	1.14	1.117	1.108	1.064	1.08	1.082	1.041	1.043	0.294	0.288	0.28	0.276	-0.027	-0.035	-0.026	-0.004	0.244
1955	1.055	1.055	1.06	1.101	1.126	1.108	1.11	1.096	0.28	0.292	0.29	0.286	-0.004	0.006	0	0.005	0.244
1956	1.057	1.046	1.046	1.034	1.069	1.08	1.078	1.027	0.275	0.27	0.275	0.278	-0.002	-0.013	-0.01	-0.022	242.5
1957	1.009	1.005	1	1.039	1.043	1.048	1.053	1.009	0.266	0.263	0.276	0.276	-0.026	0.003	0.026	0.02	241
1958	0.993	0.993	0.954	0.922	0.913	0.929	0.913	0.895	0.27	0.261	0.255	0.256	0.001	-0.005	0.002	-0.011	239.5
1959	0.902	0.895	0.87	0.883	0.902	0.892	0.872	0.865	0.253	0.252	0.258	0.255	-0.016	-0.014	-0.017	-0.019	0.238
1960	0.865	0.856	0.856	0.851	0.863	0.856	0.858	0.872	0.252	0.257	0.261	0.265	-0.015	-0.011	-0.011	-0.01	0.2368
1961	0.879	0.902	0.913	0.915	0.906	0.906	0.924	0.927	0.272	0.273	0.275	0.282	-0.007	-0.012	-0.013	-0.01	0.2355
1962	0.938	0.938	0.947	0.95	0.968	0.968	0.961	0.954	0.285	0.288	0.291	0.295	-0.009	-0.008	0.005	0.016	0.2343
1963	0.947	0.961	0.957	0.943	0.959	0.94	0.943	0.938	0.295	0.292	0.29	0.286	0.001	0.002	-0.005	-0.008	0.233
1964	0.936	0.943	0.943	0.947	0.961	0.952	0.947	0.963	0.285	0.288	0.291	0.294	0.007	0.007	0.002	0.008	0.2345
1965	0.968	0.959	0.938	0.927	0.913	0.902	0.899	0.888	0.29	0.28	0.276	0.276	0.007	0.006	0.006	0.017	0.236
1966	0.892	0.892	0.881	0.879	0.865	0.863	0.863	0.86	0.282	0.274	0.272	0.275	0.013	0.007	-0.001	-0.005	0.2375
1967	0.881	0.902	0.906	0.922	0.927	0.934	0.945	0.929	0.277	0.276	0.281	0.282	-0.001	0.006	0.002	-0.004	0.239
1968	0.929	0.924	0.906	0.915	0.982	1.053	1.101	1.089	0.276	0.278	0.297	0.302	-0.007	0.001	-0.007	-0.016	0.2418
1969	1.066	1.085	1.055	0.998	1.002	1.009	0.991	0.993	0.295	0.288	0.283	0.281	-0.041	-0.042	-0.026	-0.017	0.2445
1970	1.009	0.984	0.961	0.943	0.943	0.913	0.908	0.94	0.283	0.281	0.274	0.277	-0.014	-0.008	-0.005	0.019	0.2473
1971	0.947	0.952	0.982	0.993	0.993	0.998	0.94	0.931	0.286	0.288	0.272	0.271	0.009	0.009	0.008	-0.006	0.250
1972	0.947	0.92	0.934	0.961	0.954	0.938	0.957	0.943	0.286	0.264	0.264	0.258	-0.016	0.002	0.004	-0.009	0.2513
1973	0.92	0.918	0.952	0.947	0.952	0.927	0.927	0.943	0.258	0.268	0.269	0.262	-0.009	-0.018	-0.017	-0.009	0.2525
1974	0.936	0.924	0.938	0.911	0.892	0.924	0.938	0.959	0.263	0.259	0.259	0.259	-0.009	-0.02	-0.021	0.001	0.2538
1975	0.986	0.993	0.995	0.991	1.021	1.071	1.092	1.078	0.275	0.275	0.283	0.286	0.023	0.017	0.017	-0.008	0.255
1976	1.064	1.071	1.046	1.041	1.011	1.002	1.03	1.078	0.276	0.276	0.274	0.281	-0.01	-0.014	-0.011	-0.007	0.2558
1977	1.073	1.055	1.037	1.023	1.041	1.071	1.078	1.057	0.281	0.276	0.282	0.282	-0.004	-0.006	-0.004	0.003	0.2565
1978	1.064	1.062	1.03	1.002	0.947	0.883	0.844	0.819	0.276	0.272	0.253	0.244	0.01	0.025	0.019	0.007	0.2573
1979	0.817	0.785	0.773	0.815	0.833	0.849	0.858	0.881	0.239	0.242	0.245	0.25	0.004	0.011	0.01	0.014	0.258
1980	0.902	0.899	0.89	0.892	0.902	0.918	0.934	0.938	0.255	0.254	0.265	0.258	0.018	0.004	-0.004	-0.004	0.2585
1981	0.938	0.952	0.938	0.92	0.963	0.986	1.002	1.025	0.258	0.256	0.264	0.275	0.001	0	-0.02	-0.026	0.259
1982	1.069	1.112	1.085	1.053	1.043	1.034	1.03	0.991	0.285	0.28	0.28	0.274	-0.016	-0.006	-0.001	-0.012	0.2595
1983	0.968	0.959	0.966	0.998	1.021	1.03	1.016	1.023	0.27	0.271	0.263	0.277	-0.021	-0.022	-0.022	-0.011	0.260
1984	1.078	1.094	1.053	1.048	1.046	1.034	1.048	1.037	0.268	0.276	0.275	0.271	0.006	-0.004	-0.013	-0.01	0.2595
1985	1.021	0.993	0.963	0.938	0.938	0.911	0.881	0.867	0.261	0.258	0.255	0.252	-0.006	0.001	-0.002	0.001	0.259
1986	0.849	0.828	0.817	0.821	0.808	0.817	0.851	0.837	0.248	0.242	0.242	0.239	-0.011	-0.025	-0.048	-0.046	0.2585

1987	0.819	0.81	0.817	0.833	0.826	0.84	0.872	0.874	0.24	0.238	0.245	0.255	-0.006	-0.009	0.005	-0.013	0.258
1988	0.931	0.959	0.963	0.929	0.938	0.95	0.95	0.936	0.264	0.251	0.245	0.245	-0.016	-0.024	-0.026	-0.013	0.262
1989	0.929	0.938	0.931	0.934	0.934	0.927	0.927	0.913	0.246	0.244	0.244	0.24	-0.012	-0.009	-0.019	-0.025	0.266
1990	0.906	0.906	0.892	0.895	0.899	0.892	0.902	0.92	0.239	0.239	0.237	0.243	-0.033	-0.032	-0.024	-0.025	0.27
1991	0.931	0.929	0.95	0.986	1.005	1.05	1.096	1.096	0.244	0.245	0.26	0.263	-0.026	-0.017	-0.009	-0.016	0.274
1992	1.108	1.128	1.114	1.119	1.119	1.073	1.041	1.034	0.259	0.261	0.255	0.252	-0.026	-0.029	-0.019	0.004	0.274
1993	1.025	0.984	0.975	0.968	0.975	0.968	0.954	0.95	0.246	0.243	0.248	0.245	0.001	0.016	0.014	0.003	0.274

time	alt	ias	head	rudpos1	rudpos2	pitch1	pitch2	pitch3	pitch4	aoa1	aoa2	lelev	relev	roll1	roll2	lail	rail
9873	21952	296.5	19.5	-0.82	-1.02	-1.76	-1.76	-1.76	-1.76	0.35	0.35	1.05	-7.49	0.62	0.53	3.15	2.34
9874	21920	296.5	19.5	-0.57	-1.02	-1.76	-1.76	-1.76	-1.76	0.35	0.35	1.05	-7.49	0.53	0.53	3.15	2.34
9875	21856	296.5	19.5	-0.57	-1.02	-1.76	-1.76	-1.76	-1.76	0.35	0.35	1.05	-7.49	0.44	0.44	3.15	2.34
9876	21824	296.5	19.5	-0.82	-1.02	-1.76	-1.76	-1.76	-1.76	0.35	0.35	1.05	-7.49	0.44	0.35	3.15	2.34
9877	21792	296.5	19.5	-0.82	-1.02	-1.76	-1.76	-1.76	-1.76	0.35	0.35	1.05	-7.49	0.26	0.26	3.15	2.34
9878	21728	296.5	19.5	-0.82	-1.02	-1.76	-1.76	-1.76	-1.76	0.35	0.35	1.05	-7.3	0.18	0.18	2.92	2.34
9879	21696	296.5	19.5	-0.82	-1.02	-1.76	-1.58	-1.58	-1.58	0.35	0.35	1.05	-7.49	0.18	0.18	2.92	2.34
9880	21664	297	19.5	-0.57	-1.02	-1.58	-1.58	-1.58	-1.58	0.35	0.35	1.05	-7.49	0.18	0.26	2.92	2.34
9881	21600	297	19.7	-0.82	-1.02	-1.58	-1.58	-1.58	-1.58	0.35	0.35	1.05	-7.49	0.26	0.26	3.15	2.34
9882	21568	297	19.7	-0.82	-1.02	-1.58	-1.58	-1.58	-1.58	0.35	0.35	1.05	-7.49	0.35	0.35	3.15	2.34
9883	21536	297	19.7	-0.57	-1.02	-1.58	-1.58	-1.58	-1.58	0.35	0.35	1.05	-7.49	0.44	0.35	3.15	2.34
9884	21472	297	19.7	-0.57	-1.02	-1.58	-1.58	-1.58	-1.58	0.35	0.35	1.05	-7.49	0.35	0.35	3.15	2.34
9885	21440	297	19.7	-0.57	-1.02	-1.58	-1.58	-1.58	-1.58	0.35	0.35	1.05	-7.49	0.26	0.26	3.15	2.34
9886	21408	297	19.7	-0.82	-1.02	-1.58	-1.58	-1.58	-1.58	0.35	0.35	1.05	-7.49	0.18	0.18	3.15	2.34
9887	21344	297	19.7	-0.82	-1.02	-1.58	-1.58	-1.58	-1.58	0.35	0.35	1.05	-7.49	0.18	0.18	2.92	2.34
9888	21312	297	19.9	-0.82	-1.02	-1.58	-1.58	-1.58	-1.58	0.35	0.35	1.05	-7.49	0.18	0.18	2.92	2.34
9889	21280	297	19.9	-0.82	1.52	-1.58	-1.58	-1.58	-1.58	0.35	0.35	1.05	-7.3	0.18	0.18	3.15	2.34
9890	21216	297	20.6	1.71	-1.52	-1.58	-1.58	-1.58	-1.58	0.18	0.18	1.05	-7.69	-0.09	1.76	5.02	0
9891	21152	296	22.1	1.46	1.08	-1.76	-1.76	-1.58	-1.58	0.18	0.35	1.05	-7.3	5.01	4.92	7.56	-2.57
9892	21152	296.5	20.9	1.46	1.33	-1.41	-1.41	-1.41	-1.58	0.53	0.35	1.05	-7.3	1.85	-0.97	3.15	2.34
9893	21056	296	22.9	1.46	1.33	-1.58	-1.58	-1.58	-1.58	0.18	0.35	1.45	-7.3	1.41	5.89	7.56	-2.8
9894	21024	295.5	22.9	1.46	1.33	-1.58	-1.41	-1.41	-1.41	0.53	0.53	1.05	-7.49	8.09	5.98	7.79	-2.57
9895	21024	295.5	22.5	1.46	1.33	-1.41	-1.58	-1.58	-1.76	0.35	0	1.05	-7.69	3.08	0.7	4.32	0.94
9896	20960	295	23.7	1.46	1.33	-1.76	-1.76	-1.93	-1.93	-0.18	0	1.05	-7.69	1.32	4.39	6.64	-1.64
9897	20928	295	23.9	1.46	1.33	-1.93	-1.93	-1.93	-1.93	0	0.18	1.05	-7.49	5.98	5.89	7.56	-2.57
9898	20864	295	23.7	1.46	1.33	-1.93	-2.11	-2.11	-2.11	0.18	0	1.25	-7.3	4.57	2.81	6.17	-1.17
9899	20832	295.5	24.8	1.46	1.27	-2.11	-2.11	-2.29	-2.11	0	0.18	1.45	-6.71	3.08	4.04	7.33	-2.34
9900	20768	295.5	25.1	1.46	1.27	-2.11	-1.93	-1.76	-1.58	0.53	0.7	1.85	-7.3	4.66	4.13	7.56	-2.34
9901	20736	295.5	25.3	1.46	1.27	-1.58	-1.58	-1.76	-1.93	0.53	0.35	1.45	-6.91	3.6	3.69	6.87	-1.64
9902	20672	295.5	25.8	1.46	1.27	-1.76	-1.76	-1.76	-1.58	0.35	0.53	1.65	-6.91	3.87	3.25	7.56	-2.34
9903	20640	295.5	26.2	1.46	1.27	-1.58	-1.41	-1.41	-1.23	0.53	0.7	2.05	-6.71	2.81	2.46	7.33	-2.1
9904	20608	295	26.5	1.46	1.02	-1.05	-1.05	-0.88	-0.88	0.88	0.88	1.85	-7.1	2.11	2.29	7.79	-2.57
9905	20544	294	26.7	0.95	0.76	-0.88	-0.88	-0.88	-1.05	0.7	0.53	1.65	-7.1	2.02	1.49	7.1	-1.87
9906	20544	293.5	26.4	0.95	1.02	-1.05	-1.05	-1.05	-0.88	0.53	0.53	1.45	-7.1	0.7	-0.35	6.17	-0.94
9907	20480	293	26.5	0.44	0	-0.88	-0.88	-1.05	-1.05	0.53	0.35	1.45	-7.3	-0.44	0.35	5.71	-0.47
9908	20480	292.5	26.2	-0.82	-1.27	-0.88	-0.88	-0.88	-0.88	0.53	0.7	1.45	-7.3	1.32	1.67	4.78	0.7

9909	20448	292.5	24.8	-0.82	-1.02	-0.88	-0.88	-0.88	-0.88	0.7	0.7	0.84	-7.49	0.35	-1.32	1.29	3.97
9910	20416	292.5	25.1	-0.82	-1.02	-1.05	-1.05	-1.05	-1.05	0.35	0.35	1.25	-7.49	-2.37	-2.02	2.45	2.8
9911	20352	292	25.5	-0.82	-1.02	-1.05	-0.88	-0.88	-0.88	0.53	0.7	1.25	-7.3	-0.26	0.44	4.32	1.17
9912	20352	291.5	24.6	-0.82	-1.02	-0.88	-0.88	-0.88	-0.88	0.7	0.7	1.05	-7.49	0.09	-0.97	2.92	2.57
9913	20288	291	24.8	-0.82	-1.02	-0.88	-0.88	-0.7	-0.7	0.7	0.7	1.05	-7.49	-2.2	-2.11	2.69	2.8
9914	20256	290.5	25	-0.82	-1.02	-0.7	-0.7	-0.7	-0.53	0.7	0.7	1.05	-7.3	-1.41	-0.7	2.92	2.34
9915	20224	290.5	24.4	-0.82	-1.02	-0.53	-0.53	-0.53	-0.53	0.88	0.88	1.25	-7.1	-0.53	-0.97	2.92	2.34
9916	20192	290	24.4	-0.82	-1.02	-0.35	-0.18	-0.18	-0.18	1.05	1.05	1.25	-7.3	-1.49	-1.85	2.92	2.57
9917	20160	289.5	24.6	-0.82	-1.02	-0.18	-0.18	-0.18	0	1.05	0.88	1.25	-7.3	-1.58	-1.14	2.92	2.34
9918	20160	289.5	24.3	-0.82	-1.02	0	0.18	0.18	0.18	0.88	0.88	1.05	-7.49	-0.88	-0.79	2.92	2.34
9919	20128	289	24.1	-0.82	-1.02	0	0	0	0	0.88	0.7	1.05	-7.49	-1.05	-1.23	2.92	2.34
9920	20096	288.5	24.1	-0.82	-1.02	0	0	0	0	0.7	0.7	1.05	-7.49	-1.14	-0.88	2.92	2.34
9921	20064	288	23.9	-0.82	-1.02	0	0	0	0	0.7	0.7	1.05	-7.49	-0.53	-0.44	2.92	2.34
9922	20064	287.5	23.9	-0.82	-1.02	0	0	0	0	0.7	0.7	1.05	-7.49	-0.53	-0.53	2.92	2.34
9923	20032	287.5	23.9	-0.82	-1.02	0	0	0.18	0.18	0.7	0.88	1.25	-7.49	-0.35	-0.26	2.92	2.34
9924	20000	287	23.9	-0.82	-1.02	0.18	0.18	0.18	0.18	0.88	0.88	1.05	-7.69	-0.18	-0.26	2.92	2.34
9925	19968	286.5	23.7	-0.82	-1.02	0.18	0.18	0	0	0.88	0.7	0.84	-7.69	-0.35	-0.35	2.92	2.34
9926	19968	286	23.7	-0.82	-1.02	0	0	0	0	0.7	0.7	0.84	-7.49	-0.44	-0.44	2.92	2.34
9927	19936	286	23.7	-0.82	-1.02	-0.18	-0.18	-0.18	-0.18	0.7	0.7	0.84	-7.69	-0.53	-0.53	2.92	2.34
9928	19904	285.5	23.7	-0.82	-1.02	-0.18	-0.18	-0.18	-0.18	0.7	0.7	0.84	-7.69	-0.62	-0.62	2.92	2.34
9929	19872	285	23.6	-0.82	-1.02	-0.18	-0.18	-0.18	-0.18	0.7	0.7	0.84	-7.69	-0.53	-0.53	2.92	2.34
9930	19872	284.5	23.6	-0.82	-1.02	-0.18	-0.18	-0.18	-0.18	0.7	0.7	1.05	-7.69	-0.53	-0.62	3.15	2.34
9931	19840	284.5	23.4	-0.82	-1.02	-0.35	-0.35	-0.35	-0.35	0.7	0.7	0.84	-7.49	-0.79	-1.05	3.15	2.1
9932	19808	284	23.4	-0.82	-1.02	-0.35	-0.35	-0.35	-0.35	0.7	0.7	1.05	-7.49	-1.14	-1.32	2.92	2.34
9933	19776	283.5	23.4	-0.82	-1.02	-0.35	-0.35	-0.35	-0.35	0.7	0.88	1.05	-7.49	-1.32	-1.32	2.92	2.34
9934	19744	283.5	23.2	-0.82	-1.02	-0.35	-0.35	-0.35	-0.53	0.88	0.88	1.05	-7.49	-1.32	-1.41	2.92	2.34
9935	19712	283	23	-0.82	-1.02	-0.53	-0.53	-0.53	-0.53	0.88	0.88	1.05	-7.49	-1.67	-1.85	3.15	2.1
9936	19680	283	23	-0.82	-1.02	-0.53	-0.53	-0.53	-0.53	0.88	0.88	1.05	-7.49	-2.02	-2.11	3.15	2.1
9937	19648	283	22.9	-0.82	-1.02	-0.53	-0.53	-0.53	-0.53	0.88	0.88	1.05	-7.49	-2.37	-2.46	3.15	2.34
9938	19616	283	22.7	-0.82	-1.02	-0.53	-0.53	-0.53	-0.7	0.88	0.88	1.05	-7.49	-2.64	-2.72	2.92	2.34
9939	19584	283	22.5	-0.82	-1.02	-0.7	-0.7	-0.7	-0.7	0.88	0.88	1.05	-7.49	-2.9	-2.99	2.92	2.34
9940	19552	282.5	22.5	-0.82	-1.02	-0.7	-0.7	-0.7	-0.7	0.88	0.88	1.05	-7.49	-3.08	-2.99	2.92	2.34
9941	19520	282.5	22.1	-0.82	-1.02	-0.7	-0.7	-0.7	-0.7	0.88	0.88	1.05	-7.49	-3.08	-3.08	2.92	2.34
9942	19488	282	22	-0.82	-1.02	-0.88	-0.88	-0.88	-0.88	0.88	0.88	1.05	-7.49	-3.25	-3.34	2.92	2.34
9943	19456	282	22	-0.82	-1.02	-0.88	-0.88	-0.88	-0.88	0.88	0.88	1.05	-7.49	-3.52	-3.6	2.92	2.34
9944	19424	282	21.8	-0.82	-1.02	-0.88	-1.05	-1.05	-1.05	0.88	0.88	1.05	-7.49	-3.6	-3.52	2.92	2.34
9945	19392	282	21.4	-0.82	-1.02	-1.05	-1.05	-1.05	-1.05	0.88	0.88	0.84	-7.49	-3.6	-3.69	2.92	2.34

9946	19360	281.5	21.4	-0.82	-1.02	-1.05	-1.23	-1.23	-1.23	0.88	0.88	1.05	-7.69	-3.78	-4.04	3.85	1.4
9947	19328	281.5	21.1	-0.82	-1.02	-1.23	-1.23	-1.23	-1.23	0.88	0.88	1.05	-7.49	-4.57	-4.75	2.92	2.34
9948	19264	281.5	20.9	-0.82	-1.02	-1.23	-1.23	-1.41	-1.41	0.88	0.88	1.05	-7.49	-4.75	-4.75	2.92	2.34
9949	19232	281.5	20.6	-0.82	-1.02	-1.41	-1.41	-1.41	-1.41	0.88	0.88	0.84	-7.69	-4.83	-4.83	2.92	2.34
9950	19200	281.5	20.4	-0.82	-1.02	-1.41	-1.41	-1.58	-1.58	0.88	0.88	0.84	-7.69	-4.83	-4.83	2.92	2.34
9951	19168	282	20	-0.82	-1.02	-1.58	-1.58	-1.58	-1.58	0.88	0.88	0.84	-7.69	-4.92	-5.01	2.92	2.34
9952	19104	282	19.9	-0.82	-1.02	-1.58	-1.76	-1.58	-1.58	0.88	0.88	1.05	-7.3	-5.01	-4.92	2.92	2.34

time	verg1	verg2	verg3	verg4	verg5	verg6	verg7	verg8	long1	long2	long3	long4	latg1	latg2	latg3	latg4	mach
9873	0.979	0.979	0.982	1.016	1.023	1.023	1.011	1.005	-0.071	-0.074	-0.075	-0.073	-0.006	-0.006	-0.007	-0.005	0.667
9874	0.989	0.986	0.986	0.975	0.979	0.975	0.975	0.984	-0.069	-0.07	-0.07	-0.07	-0.005	-0.005	-0.004	-0.004	0.667
9875	0.986	0.984	0.989	0.991	0.993	0.995	0.998	0.993	-0.07	-0.07	-0.069	-0.069	-0.006	-0.007	-0.008	-0.006	0.6668
9876	0.984	0.993	0.984	0.977	0.986	1.014	1.009	1.009	-0.068	-0.07	-0.074	-0.075	-0.005	-0.005	-0.005	-0.006	0.6665
9877	1.021	1.021	1.016	1.027	1.027	1.025	1.025	1.011	-0.074	-0.074	-0.073	-0.072	-0.006	-0.008	-0.006	-0.004	0.6663
9878	0.991	0.989	0.989	0.986	0.998	0.993	0.991	0.991	-0.069	-0.07	-0.071	-0.07	-0.006	-0.006	-0.007	-0.007	0.666
9879	1.027	1.018	1.009	1.007	1.002	1.002	0.993	0.993	-0.074	-0.07	-0.068	-0.069	-0.006	-0.007	-0.006	-0.006	0.6655
9880	0.995	0.991	0.993	0.991	0.989	0.991	1	1.002	-0.07	-0.07	-0.071	-0.07	-0.005	-0.004	-0.006	-0.006	0.665
9881	1.007	1.027	1.002	0.993	0.993	0.984	0.986	1.005	-0.074	-0.069	-0.069	-0.074	-0.006	-0.005	-0.006	-0.004	0.6645
9882	1.005	0.982	0.982	0.982	0.986	0.984	0.989	0.993	-0.071	-0.071	-0.071	-0.07	-0.003	-0.005	-0.005	-0.007	0.664
9883	0.993	0.991	0.982	0.984	0.979	0.975	0.975	0.973	-0.07	-0.069	-0.07	-0.07	-0.006	-0.005	-0.004	-0.003	0.6635
9884	0.966	0.984	0.982	0.984	0.986	0.984	0.991	0.989	-0.071	-0.071	-0.07	-0.069	-0.006	-0.006	-0.008	-0.007	0.663
9885	0.984	0.979	0.982	0.986	0.995	0.989	0.968	0.975	-0.069	-0.069	-0.074	-0.071	-0.006	-0.007	-0.005	-0.004	0.6625
9886	0.979	0.979	0.984	0.986	0.982	0.991	0.989	0.984	-0.071	-0.07	-0.07	-0.07	-0.007	-0.007	-0.008	-0.006	0.662
9887	1.011	1.009	0.982	0.973	0.975	0.979	0.984	0.986	-0.074	-0.07	-0.071	-0.072	-0.005	-0.005	-0.006	-0.007	0.661
9888	0.986	0.986	0.989	0.993	0.989	0.989	0.986	0.977	-0.07	-0.07	-0.069	-0.07	-0.008	-0.008	-0.006	-0.006	0.66
9889	0.986	0.977	0.977	0.977	0.986	0.984	0.986	0.982	-0.07	-0.071	-0.085	-0.079	-0.004	-0.005	-0.022	-0.002	0.659
9890	0.973	0.966	0.975	0.977	0.995	1.011	1.002	1.025	-0.072	-0.066	-0.051	-0.042	0.043	0.083	0.206	0.113	0.658
9891	1.027	1.021	1.007	1	1.009	1.009	1.039	1.048	-0.074	-0.081	-0.082	-0.086	-0.004	-0.018	-0.023	-0.028	0.657
9892	1.039	1.03	1.007	0.984	0.963	0.943	0.934	0.963	-0.082	-0.072	-0.068	-0.064	-0.008	0.032	0.073	0.1	0.656
9893	0.993	1.014	1.057	1.076	1.087	1.078	1.073	1.062	-0.062	-0.063	-0.065	-0.069	0.113	0.106	0.093	0.063	0.655
9894	1.057	1.064	1.027	1.023	1.011	0.998	0.989	0.975	-0.073	-0.072	-0.075	-0.076	0.032	0.006	-0.002	0.003	0.654
9895	0.963	0.95	0.943	0.943	0.931	0.95	0.938	0.952	-0.075	-0.074	-0.071	-0.068	0.018	0.038	0.062	0.083	0.6535
9896	0.95	0.929	0.934	0.973	0.97	0.97	0.954	0.954	-0.063	-0.067	-0.07	-0.069	0.091	0.088	0.073	0.059	0.653
9897	0.954	0.954	0.963	0.984	0.982	0.952	0.945	0.947	-0.071	-0.075	-0.073	-0.073	0.041	0.028	0.021	0.024	0.6525
9898	0.94	0.934	0.938	0.936	0.94	0.94	0.968	0.975	-0.073	-0.073	-0.07	-0.073	0.03	0.039	0.055	0.067	0.652
9899	0.963	0.959	0.943	0.954	0.979	0.984	1.002	1.025	-0.07	-0.067	-0.07	-0.071	0.07	0.072	0.071	0.063	0.6515
9900	1.05	1.066	1.094	1.11	1.119	1.126	1.13	1.108	-0.072	-0.07	-0.07	-0.069	0.053	0.047	0.044	0.043	0.651
9901	1.076	1.066	1.037	1.005	0.982	0.968	0.973	0.968	-0.068	-0.068	-0.068	-0.069	0.048	0.051	0.057	0.06	0.6505
9902	0.975	1.011	1.03	1.046	1.055	1.073	1.076	1.069	-0.07	-0.07	-0.07	-0.069	0.061	0.059	0.056	0.054	0.650
9903	1.076	1.08	1.101	1.082	1.094	1.082	1.082	1.101	-0.066	-0.069	-0.066	-0.063	0.052	0.052	0.054	0.055	0.6483
9904	1.137	1.124	1.119	1.137	1.147	1.135	1.112	1.092	-0.068	-0.064	-0.067	-0.06	0.057	0.06	0.069	0.067	0.6465
9905	1.064	1.069	1.039	1.027	1.011	1.009	1	0.995	-0.064	-0.064	-0.066	-0.068	0.054	0.042	0.033	0.03	0.6448
9906	0.993	0.998	0.998	1	0.998	0.998	0.995	1.002	-0.069	-0.07	-0.067	-0.066	0.028	0.031	0.037	0.049	0.643
9907	1.011	1.025	1.023	1.021	1.023	1.021	1.002	1.009	-0.066	-0.066	-0.066	-0.064	0.059	0.055	0.046	0.033	0.642
9908	1.025	1.037	1.048	1.025	1.027	1.037	1.034	1.032	-0.07	-0.066	-0.067	-0.07	0.016	-0.007	-0.034	-0.054	0.641

9909	1.027	1.023	1.007	0.993	0.973	0.963	0.947	0.936	-0.07	-0.07	-0.069	-0.068	-0.061	-0.054	-0.035	-0.011	0.64
9910	0.92	0.924	0.929	0.929	0.943	0.963	0.979	0.986	-0.066	-0.064	-0.062	-0.061	0.01	0.024	0.03	0.027	0.639
9911	1.005	1.016	1.016	1.021	1.021	1.018	1.009	1.011	-0.061	-0.063	-0.064	-0.066	0.012	-0.003	-0.017	-0.027	0.6403
9912	1.011	1.016	1.011	1.002	0.993	0.993	0.993	0.991	-0.068	-0.068	-0.068	-0.066	-0.033	-0.032	-0.025	-0.015	0.6415
9913	0.991	0.991	0.991	1.007	1.011	1.016	1.023	1.014	-0.064	-0.063	-0.066	-0.066	-0.002	0.008	0.012	0.013	0.6428
9914	1.032	1.039	1.037	1.034	1.023	1.037	1.037	1.039	-0.066	-0.067	-0.064	-0.064	0.006	-0.002	-0.011	-0.019	0.634
9915	1.034	1.039	1.039	1.037	1.034	1.039	1.037	1.039	-0.064	-0.063	-0.062	-0.063	-0.022	-0.021	-0.017	-0.01	0.633
9916	1.041	1.055	1.092	1.085	1.085	1.064	1.062	1.062	-0.062	-0.066	-0.062	-0.06	-0.003	0.003	0.006	0.006	0.632
9917	1.057	1.057	1.057	1.055	1.048	1.048	1.048	1.055	-0.06	-0.061	-0.06	-0.06	0.003	-0.002	-0.003	-0.005	0.631
9918	1.053	1.048	1.037	1.032	1.023	1.016	1.011	1.005	-0.062	-0.062	-0.063	-0.064	-0.009	-0.011	-0.011	-0.01	0.630
9919	1.005	0.998	0.998	0.995	0.993	0.998	0.993	0.986	-0.063	-0.064	-0.062	-0.061	-0.008	-0.005	-0.003	0	0.629
9920	0.993	0.986	0.991	0.984	0.986	0.991	0.984	0.986	-0.062	-0.062	-0.063	-0.063	0.001	0.001	-0.002	-0.006	0.628
9921	0.989	0.991	1	1.002	1.002	0.998	0.998	0.998	-0.063	-0.063	-0.062	-0.062	-0.01	-0.009	-0.01	-0.007	0.627
9922	0.991	0.986	0.979	0.982	0.986	0.984	0.984	0.986	-0.062	-0.062	-0.062	-0.062	-0.005	-0.002	-0.003	-0.004	0.626
9923	0.993	0.998	0.989	0.998	1.002	1	1.011	1.014	-0.062	-0.061	-0.06	-0.06	-0.006	-0.007	-0.006	-0.006	0.6248
9924	1.005	1.007	1	1.002	1.002	0.998	1.005	1.009	-0.06	-0.061	-0.062	-0.068	-0.007	-0.006	-0.009	-0.008	0.6235
9925	1.021	1.007	1.007	0.975	0.968	0.968	0.961	0.961	-0.067	-0.062	-0.061	-0.061	-0.008	-0.008	-0.006	-0.006	0.6223
9926	0.954	0.954	0.954	0.959	0.957	0.961	0.966	0.961	-0.062	-0.062	-0.063	-0.063	-0.005	-0.004	-0.008	-0.008	0.621
9927	0.97	0.979	0.975	0.973	0.973	0.973	0.968	0.961	-0.063	-0.061	-0.06	-0.061	-0.009	-0.009	-0.006	-0.006	0.62
9928	0.952	0.954	0.957	0.957	0.959	0.963	0.961	0.973	-0.062	-0.062	-0.061	-0.061	-0.005	-0.005	-0.006	-0.004	0.619
9929	0.97	0.975	0.968	0.966	0.959	0.959	0.952	0.954	-0.06	-0.06	-0.061	-0.061	-0.006	-0.008	-0.007	-0.007	0.618
9930	0.957	0.957	0.963	0.963	0.963	0.973	0.963	0.968	-0.062	-0.062	-0.062	-0.061	-0.008	-0.008	-0.009	-0.01	0.617
9931	0.97	0.959	0.961	0.954	0.952	0.952	0.957	0.954	-0.06	-0.06	-0.061	-0.061	-0.007	-0.006	-0.003	-0.005	0.616
9932	0.959	0.959	0.959	0.968	0.963	0.966	0.973	0.968	-0.061	-0.06	-0.06	-0.059	-0.008	-0.007	-0.008	-0.006	0.615
9933	0.973	0.966	0.961	0.963	0.961	0.966	0.973	0.975	-0.06	-0.059	-0.06	-0.061	-0.004	-0.003	-0.006	-0.01	0.614
9934	0.977	0.975	0.975	0.982	0.984	0.982	0.975	0.968	-0.06	-0.062	-0.059	-0.059	-0.01	-0.01	-0.01	-0.006	0.613
9935	0.968	0.966	0.963	0.959	0.957	0.961	0.963	0.97	-0.059	-0.059	-0.06	-0.06	-0.005	-0.003	-0.005	-0.006	0.6125
9936	0.97	0.979	0.977	0.977	0.982	0.982	0.979	0.975	-0.06	-0.059	-0.058	-0.058	-0.008	-0.007	-0.006	-0.004	0.612
9937	0.975	0.968	0.963	0.968	0.968	0.975	0.975	0.975	-0.059	-0.06	-0.06	-0.06	-0.005	-0.006	-0.006	-0.008	0.6115
9938	0.984	0.982	0.982	0.975	0.975	0.977	0.97	0.973	-0.06	-0.058	-0.059	-0.059	-0.008	-0.009	-0.007	-0.007	0.611
9939	0.959	0.961	0.961	0.959	0.963	0.97	0.968	0.973	-0.059	-0.06	-0.06	-0.059	-0.005	-0.006	-0.006	-0.006	0.6103
9940	0.979	0.979	0.97	0.968	0.968	0.963	0.957	0.957	-0.059	-0.058	-0.059	-0.059	-0.006	-0.006	-0.005	-0.005	0.6095
9941	0.957	0.957	0.961	0.966	0.968	0.97	0.977	0.984	-0.06	-0.06	-0.06	-0.061	-0.007	-0.009	-0.009	-0.01	0.6088
9942	0.993	0.966	0.966	0.966	0.957	0.961	0.954	0.954	-0.059	-0.059	-0.059	-0.059	-0.009	-0.008	-0.007	-0.005	0.608
9943	0.963	0.961	0.968	0.966	0.97	0.968	0.97	0.963	-0.059	-0.059	-0.059	-0.059	-0.005	-0.004	-0.005	-0.004	0.6073
9944	0.957	0.954	0.957	0.957	0.954	0.961	0.959	0.968	-0.058	-0.059	-0.059	-0.06	-0.005	-0.004	-0.005	-0.008	0.6065
9945	0.966	0.968	0.968	0.973	0.966	0.966	0.961	0.957	-0.059	-0.06	-0.059	-0.058	-0.008	-0.009	-0.008	-0.005	0.6058

9946	0.959	0.954	0.954	0.947	0.95	0.95	0.954	0.954	-0.058	-0.059	-0.059	-0.06	-0.004	-0.002	-0.003	-0.004	0.605
9947	0.954	0.961	1.002	0.989	0.986	0.966	0.961	0.959	-0.059	-0.063	-0.058	-0.058	-0.005	-0.006	-0.005	-0.004	0.6048
9948	0.959	0.95	0.952	0.952	0.95	0.954	0.957	0.961	-0.059	-0.059	-0.06	-0.06	-0.004	-0.005	-0.006	-0.007	0.6045
9949	0.963	0.968	0.963	0.961	0.959	0.961	0.957	0.95	-0.059	-0.058	-0.058	-0.058	-0.007	-0.005	-0.003	-0.004	0.6043
9950	0.95	0.947	0.947	0.947	0.957	0.961	0.961	0.961	-0.059	-0.06	-0.06	-0.06	-0.004	-0.006	-0.008	-0.008	0.604
9951	0.963	0.963	0.961	0.961	0.952	0.957	0.947	0.947	-0.059	-0.058	-0.059	-0.059	-0.007	-0.005	-0.003	-0.001	0.604
9952	0.943	0.95	0.947	0.968	0.977	0.984	0.991	0.995	-0.059	-0.059	-0.058	-0.057	-0.002	-0.003	-0.005	-0.008	0.604

time	alt	ias	head	rudpos1	rudpos2	pitch1	pitch2	pitch3	pitch4	aoa1	aoa2	lelev	relev	roll1	roll2	lail	rail
1457	5184	248.5	338.6	-0.06	-0.25	9.32	9.32	9.49	9.49	2.64	2.46	-5.73	-5.93	0.18	0.26	0.58	1.46
1458	5216	249	338.6	-0.06	-0.25	9.49	9.67	9.67	9.67	2.46	2.29	-5.73	-5.93	0.26	0.35	0.35	1.46
1459	5280	249	338.6	-0.06	-0.25	9.67	9.84	9.84	9.84	2.29	2.29	-5.93	-6.13	0.62	0.79	0.58	1.46
1460	5312	249	338.4	-0.06	-0.25	9.84	9.84	9.84	9.84	2.11	2.11	-5.93	-6.13	0.88	0.88	0.58	1.46
1461	5376	248.5	338.2	-0.06	-0.25	9.84	9.84	10.02	10.02	2.29	2.29	-5.93	-5.93	0.79	0.7	0.58	1.23
1462	5440	248	338.4	-0.06	-0.25	10.02	10.02	10.02	10.02	2.11	2.11	-5.93	-5.93	0.44	0.26	0.12	1.69
1463	5472	248.5	338.6	-0.06	-0.25	10.2	10.2	10.2	10.2	2.29	2.11	-5.93	-5.93	0.53	0.7	0.58	1.23
1464	5536	248	338.6	-0.06	-0.25	10.2	10.2	10.2	10.2	2.11	2.11	-5.73	-5.73	0.79	0.79	0.82	0.99
1465	5600	248	338.6	-0.06	-0.25	10.2	10.2	10.2	10.2	2.29	2.29	-5.54	-5.73	0.26	-0.18	0.58	1.23
1466	5664	248	338.7	-0.06	-0.25	10.2	10.37	10.37	10.37	2.11	2.11	-5.54	-5.93	-0.26	-0.18	0.58	1.23
1467	5696	248	338.9	-0.06	-0.25	10.37	10.2	10.2	10.2	2.11	1.93	-5.73	-5.73	0.18	0.44	0.58	1.23
1468	5760	247.5	338.7	-0.06	-0.25	10.2	10.02	10.02	10.02	2.11	2.11	-5.73	-5.73	0.44	0.26	0.58	1.23
1469	5824	247	338.6	-0.06	-0.25	10.02	10.02	10.02	10.02	1.76	1.93	-5.34	-5.54	0.09	0	0.58	1.23
1470	5888	246.5	338.7	-0.06	-0.25	10.02	10.02	10.02	10.02	1.76	2.11	-5.34	-5.34	-0.18	-0.18	0.58	1.23
1471	5920	246.5	339.1	-0.06	-0.25	10.02	10.02	10.02	10.2	2.11	2.11	-5.14	-5.34	0.09	0.44	0.58	1.23
1472	5984	246	338.9	-0.06	-0.25	10.2	10.2	10.2	10.2	2.11	2.11	-5.34	-5.34	0.7	0.88	0.58	1.23
1473	6048	246	338.7	-0.06	-0.25	10.2	10.02	10.02	10.2	2.11	2.29	-5.34	-5.34	0.88	0.44	0.58	1.23
1474	6112	245.5	338.7	-0.06	-0.25	10.2	10.2	10.02	10.02	2.29	2.29	-5.34	-5.54	0.18	0.35	0.58	1.23
1475	6144	245.5	338.7	-0.06	-0.25	10.02	9.84	9.84	9.84	2.11	2.11	-5.34	-5.54	0.62	0.88	0.58	1.23
1476	6208	245.5	338.6	-0.06	-0.25	9.84	9.67	9.67	9.67	2.11	2.11	-5.34	-5.54	1.23	1.14	0.58	1.23
1477	6272	245.5	338.6	-0.06	-0.25	9.67	9.67	9.67	9.67	2.11	1.93	-5.34	-5.54	0.88	0.62	0.35	1.23
1478	6304	244.5	338.6	-0.06	-0.25	9.67	9.67	9.67	9.67	1.76	1.93	-5.34	-5.34	0.62	0.7	0.35	1.23
1479	6368	245	338.6	-0.06	-0.25	9.67	9.67	9.67	9.84	2.29	2.29	-5.34	-5.34	0.79	0.79	0.35	1.46
1480	6432	245.5	338.6	-0.06	-0.25	9.84	9.84	9.84	9.84	2.29	2.29	-5.14	-5.34	0.7	0.44	0.12	1.69
1481	6464	246	338.7	-0.06	-0.25	9.84	9.84	9.84	9.84	2.29	2.29	-5.14	-5.34	0.35	1.05	-1.05	2.86
1482	6528	246	338.9	-0.06	-0.25	9.84	9.67	9.67	9.84	2.11	2.29	-5.14	-5.34	1.76	2.55	-1.99	3.56
1483	6560	246.5	339.1	-0.06	-0.25	9.84	9.84	9.84	9.84	2.29	2.29	-5.14	-5.34	3.34	4.31	-1.05	2.86
1484	6624	247	339.4	-0.06	-1.27	9.84	9.84	9.84	9.84	2.29	2.29	-5.14	-5.14	5.1	6.42	-3.39	5.19
1485	6688	247	339.8	-2.6	-2.79	9.84	10.02	10.02	10.37	2.11	2.46	-4.95	-5.34	8.09	10.9	-3.39	5.19
1486	6720	247	338	-2.85	-2.79	10.55	10.72	10.72	10.37	2.99	2.81	-5.54	-5.34	11.25	9.4	-3.39	5.19
1487	6784	247.5	337.5	-2.35	0.51	10.2	10.02	9.84	9.67	2.46	1.93	-5.54	-5.54	6.68	3.16	-4.09	5.65
1488	6848	247.5	340.5	0.7	0.25	9.49	9.49	9.32	9.32	1.58	1.58	-5.14	-5.14	2.81	5.01	3.62	-2.04
1489	6880	246.5	343.8	-4.63	-4.06	9.32	9.32	9.49	10.02	2.11	2.64	-4.55	-5.54	7.65	8.7	6.87	-4.61
1490	6944	246.5	339.3	-0.57	3.55	10.2	10.55	10.55	9.84	3.34	3.16	-6.13	-5.34	6.5	1.32	-3.85	5.65
1491	7008	248.5	338.9	-1.84	-5.33	9.32	8.96	8.96	8.96	2.11	0.7	-5.14	-5.73	-5.01	-7.47	-1.99	3.56
1492	7040	247.5	342.8	0.95	2.28	8.96	8.79	8.79	8.96	1.23	1.93	-5.14	-5.14	-3.52	0.09	0.35	1.46

1493	7104	247.5	340.5	2.73	2.03	9.14	9.14	9.32	9.32	2.64	2.11	-4.95	-4.95	1.32	1.41	-0.82	2.4
1494	7168	248.5	342.8	0.7	0.25	9.49	9.67	9.67	9.84	2.46	2.64	-4.55	-4.95	2.72	5.54	3.85	-1.81
1495	7200	248	343.8	-0.82	-1.27	10.02	10.02	10.2	10.37	2.46	2.64	-4.55	-4.35	8.61	10.2	5.36	-3.44
1496	7264	248	341.2	-0.82	-1.52	10.72	11.07	11.43	11.6	3.16	3.69	-5.14	-5.93	8.17	4.39	-0.35	2.63
1497	7328	248	340.8	-0.32	-0.51	11.43	11.07	10.72	10.37	3.16	1.58	-6.13	-5.93	1.23	0.26	-3.85	5.42
1498	7392	248	342.9	-0.32	-0.25	10.02	9.84	9.84	9.84	0.88	1.41	-5.34	-5.54	1.41	3.25	0.12	1.46
1499	7456	247.5	343.3	1.71	1.27	9.84	9.84	10.02	10.02	1.58	1.93	-5.34	-5.34	5.27	7.82	-3.15	4.73
1500	7520	247.5	344	1.46	1.27	10.02	10.02	10.02	10.02	2.11	2.29	-4.95	-4.75	9.67	11.78	-1.29	3.1
1501	7584	247.5	345.9	1.21	0.76	10.02	10.2	10.37	10.55	2.46	2.99	-4.16	-4.16	13.89	16.96	2.22	-0.18
1502	7616	247	347.5	0.19	0	10.9	11.07	11.43	11.78	3.34	3.52	-4.75	-5.14	18.37	18.9	2.45	-0.18
1503	7680	247.5	347.7	0.44	0	11.95	11.95	11.78	11.6	3.16	2.46	-5.14	-5.14	18.9	18.28	0.12	1.69
1504	7776	247.5	348.8	-0.06	-0.25	11.6	11.43	11.43	11.07	2.29	1.93	-5.34	-5.54	17.93	17.75	0.58	1.23
1505	7840	247.5	350.2	-0.06	-0.25	11.07	11.07	11.07	10.9	2.29	2.11	-5.34	-5.14	17.84	17.58	0.58	1.23
1506	7904	248	351	-0.06	-0.25	10.9	10.9	10.9	11.07	1.93	2.64	-4.95	-5.14	17.84	17.75	1.99	0.06
1507	7968	246	351.9	-0.06	-0.25	11.25	11.25	11.25	11.25	2.46	2.81	-5.14	-5.34	17.05	16	0.58	1.46
1508	8032	246	353.1	-0.06	-0.25	11.07	11.07	11.07	11.07	2.46	2.29	-5.14	-5.54	15.64	15.56	1.05	0.76
1509	8096	246	354.4	-0.06	-0.25	10.72	10.72	10.55	10.37	2.11	2.11	-5.54	-5.54	15.29	15.56	0.58	1.23
1510	8160	246	355.3	-0.06	-0.25	10.37	10.37	10.2	10.2	1.76	1.93	-5.34	-5.54	15.56	15.73	-0.12	1.93
1511	8224	244.5	356	0.19	0	10.02	10.02	10.02	10.02	2.11	2.11	-5.54	-5.54	16.08	16.44	-0.82	2.63
1512	8256	244.5	357	0.19	0	9.84	9.84	9.67	9.49	2.11	1.76	-5.34	-5.14	17.23	17.84	-0.35	2.16
1513	8320	245	358.4	0.19	0	9.32	9.32	9.32	9.49	1.93	2.29	-4.95	-5.14	18.28	18.81	0.58	1.23
1514	8384	247	359.6	0.19	0	9.49	9.49	9.67	9.67	2.29	2.46	-5.14	-5.34	19.95	20.65	0.58	1.23
1515	8416	247.5	0.5	0.19	0	9.67	9.67	9.67	9.49	2.99	2.46	-5.34	-5.14	20.74	20.48	0.35	1.69
1516	8480	247	1.9	-0.06	-0.25	9.32	9.14	8.96	8.96	1.93	2.11	-4.75	-4.95	19.34	18.63	1.99	-0.18
1517	8544	246.5	4	-0.06	-0.25	8.96	9.14	9.14	9.32	2.64	2.64	-4.55	-4.75	18.72	19.95	1.75	0.06
1518	8576	248.5	5.4	-0.06	-0.25	9.49	9.67	9.84	10.02	2.64	3.16	-4.75	-4.95	20.39	18.9	4.78	-2.51
1519	8640	247	6	-0.06	-0.25	10.2	10.2	10.02	10.02	2.99	2.46	-5.14	-5.14	16.44	14.85	1.29	0.76
1520	8704	248.5	7.7	-0.06	-0.25	9.84	9.84	9.84	9.84	2.46	2.81	-4.95	-5.34	13.8	13.45	4.32	-2.51
1521	8736	246.5	8.4	-0.06	-0.25	9.84	9.84	9.84	9.84	2.11	2.11	-5.34	-5.34	12.57	11.6	1.52	0.29
1522	8800	247	9	-0.06	-0.25	9.84	9.84	9.84	9.84	2.29	2.29	-5.14	-5.54	10.99	10.46	2.92	-0.88
1523	8864	248	9.1	-0.06	-0.25	9.84	9.84	9.84	9.67	2.11	2.11	-5.34	-5.34	9.4	7.82	3.62	-1.81
1524	8928	247.5	9.7	-0.06	-0.25	9.67	9.67	9.67	9.67	2.11	2.11	-5.14	-5.34	5.1	3.87	1.52	0.53
1525	8960	246.5	10.4	-0.06	-0.25	9.67	9.84	9.84	9.84	2.11	2.29	-5.14	-5.34	3.52	3.43	3.15	-1.34
1526	9024	245.5	10.2	-0.06	-0.51	9.84	10.02	10.02	10.02	2.46	2.46	-5.14	-5.93	2.9	1.76	2.45	-0.41
1527	9088	245	9.8	-0.06	-0.25	10.02	9.84	9.67	9.49	2.29	1.93	-5.73	-5.54	0.53	-0.53	0.58	1.23
1528	9152	245	10	-0.06	-0.25	9.32	9.32	9.32	9.32	1.58	1.93	-5.14	-5.34	-1.23	-1.14	-0.35	2.16
1529	9184	244.5	10.2	-0.06	-0.25	9.49	9.49	9.49	9.49	2.11	2.11	-5.34	-5.54	-0.62	-0.18	0.35	1.46

1530	9248	243.5	9.8	-0.06	-0.25	9.32	9.14	9.14	8.96	1.93	1.76	-4.75	-5.54	0.09	0	0.35	1.46
1531	9312	243.5	9.7	-0.06	-0.25	8.96	8.96	8.79	8.61	1.76	1.58	-5.54	-5.54	-0.09	-0.09	0.35	1.46
1532	9344	243	9.8	-0.06	-0.25	8.44	8.26	8.26	8.09	1.41	1.58	-5.14	-5.14	0.09	0.26	-0.12	1.93
1533	9408	243	9.7	-0.06	-0.25	8.09	8.26	8.26	8.26	1.76	1.93	-4.95	-5.14	0.62	0.79	0.58	1.23
1534	9440	243.5	9.5	-0.06	-0.25	8.26	8.09	8.09	8.09	2.11	1.93	-5.14	-5.14	0.62	0.35	0.58	1.23
1535	9472	244	9.5	-0.06	-0.25	7.91	7.91	7.73	7.73	1.93	1.76	-4.95	-4.95	0.09	-0.09	0.58	1.23
1536	9536	244.5	9.7	-0.06	-0.25	7.73	7.73	7.73	7.91	1.93	2.11	-4.75	-4.95	-0.18	-0.09	0.58	1.23

time	verg1	verg2	verg3	verg4	verg5	verg6	verg7	verg8	long1	long2	long3	long4	latg1	latg2	latg3	latg4	mach	wndsp	wndir	drftang
1457	1.057	1.069	1.085	1.085	1.085	1.066	1.055	1.046	0.154	0.154	0.154	0.153	0.01	0.006	0.007	0.009	0.413	3	221	0.53
1458	1.048	1.041	1.043	1.048	1.046	1.055	1.048	1.048	0.153	0.152	0.153	0.154	0.013	0.016	0.01	0.01	0.413	3	221	0.53
1459	1.041	1.034	1.021	1.021	1.016	1.007	1	1.011	0.151	0.152	0.148	0.148	0.009	-0	-0	0	0.413	3.25	221	0.88
1460	1.011	1.002	1.002	1.005	1.011	1.002	0.995	1.002	0.149	0.149	0.149	0.148	0	0.008	0.008	0.005	0.414	3.5	221	1.05
1461	1.011	1.018	1.023	1.025	1.018	1.011	1.016	1	0.15	0.15	0.15	0.15	0.002	-0	-0	0	0.414	3.75	219.3	1.05
1462	0.986	0.979	0.975	0.982	0.991	1	1.011	1.011	0.148	0.149	0.15	0.15	0.006	0.007	0.006	0.013	0.414	4	217.5	0.88
1463	1.016	1.009	1.021	1.023	1.023	1.014	1.011	1.002	0.151	0.151	0.15	0.15	0.017	0.01	0.009	0.004	0.414	4	215.8	0.88
1464	1.002	1	0.993	0.989	0.984	0.986	0.998	1.011	0.149	0.15	0.149	0.149	0.004	0.003	-0.01	-0.01	0.414	4	214	1.05
1465	1.014	1.016	1.011	1.011	1.011	1.002	1	0.995	0.15	0.152	0.152	0.152	-0.01	0.009	0.014	0.013	0.414	4	213	0.88
1466	0.991	0.986	1.005	1.021	1.014	1.002	1.005	0.998	0.151	0.152	0.152	0.151	0.011	0.014	0.016	0.013	0.414	4	212	0.7
1467	1.002	0.991	0.984	0.989	0.984	0.975	0.947	0.945	0.15	0.149	0.149	0.149	0.012	0.007	0.003	-0	0.414	4	211	0.88
1468	0.988	0.975	0.975	0.979	0.975	0.979	0.979	0.957	0.15	0.149	0.15	0.147	0	0.001	-0	0.009	0.414	4	210	1.05
1469	0.938	0.947	0.947	0.961	0.975	0.975	0.945	0.94	0.15	0.15	0.148	0.15	0.005	-0	-0	0.001	0.413	4	208	0.88
1470	0.95	0.938	0.938	0.943	0.954	0.95	0.975	0.986	0.148	0.148	0.146	0.147	0.004	0.008	0.011	0.017	0.413	4	206	0.7
1471	0.998	0.998	1.011	1	1	0.989	0.989	0.991	0.151	0.153	0.152	0.151	0.017	0.022	0.02	0.017	0.413	4.5	204	0.53
1472	0.998	0.993	0.993	0.998	0.991	0.982	0.975	0.97	0.151	0.152	0.153	0.152	0.007	0.01	-0	-0.01	0.414	5	202	0.88
1473	0.952	0.961	0.973	0.986	0.998	1.009	1.027	1.009	0.15	0.15	0.154	0.154	-0	-0	0.003	0.003	0.414	5.5	203.5	1.05
1474	0.982	0.984	0.986	0.973	0.961	0.975	0.993	0.998	0.152	0.152	0.153	0.153	0.009	0.018	0.016	0.006	0.414	6	205	1.05
1475	1.005	0.998	0.968	0.952	0.938	0.94	0.966	0.975	0.152	0.152	0.15	0.149	0.012	0.003	0.006	0	0.414	6.75	206.5	1.23
1476	0.952	0.954	0.975	0.97	0.968	0.975	0.988	0.963	0.151	0.15	0.15	0.15	-0	0.002	0.006	0.003	0.414	7.5	208	1.41
1477	0.966	0.966	0.954	0.954	0.938	0.931	0.936	0.922	0.15	0.15	0.152	0.152	0.001	0.005	0.01	0.012	0.414	8.25	207.5	1.41
1478	0.918	0.929	0.929	0.94	0.95	0.968	0.979	0.984	0.152	0.151	0.153	0.153	0.013	0.017	0.009	0.001	0.414	9	207	1.58
1479	0.995	1.007	0.991	0.979	0.984	0.984	1.016	1.03	0.151	0.152	0.154	0.154	-0.01	-0	0.002	0.003	0.415	8.75	206.5	1.58
1480	1.027	1.005	0.984	0.966	0.982	0.979	0.984	0.991	0.153	0.15	0.151	0.152	0.001	0.011	0.004	0.007	0.417	8.5	206	1.58
1481	0.995	1.005	1.002	0.998	0.993	0.984	0.989	0.993	0.152	0.153	0.152	0.152	0.014	0.018	0.009	-0	0.418	8.25	208	1.41
1482	0.991	0.989	0.984	0.995	1.007	1.005	0.993	1.009	0.154	0.154	0.153	0.153	-0.01	-0	0.005	0.007	0.419	8	210	1.41
1483	1.027	1.016	1.011	1.014	1.014	1.023	1.023	1.016	0.153	0.152	0.153	0.155	0.007	0.009	0.007	0.001	0.42	11.5	212	1.41
1484	1.011	1.005	1.005	1.018	1.032	1.007	1.011	1.021	0.152	0.152	0.15	0.157	-0	0.004	0.014	0.031	0.421	15	214	1.41
1485	1.002	0.993	1.005	1.039	1.039	1.048	1.053	1.076	0.16	0.16	0.157	0.154	0.017	-0.02	-0.06	-0.1	0.422	18.5	188.5	2.81
1486	1.085	1.089	1.071	1.053	1.053	1.023	0.991	0.975	0.153	0.151	0.149	0.149	-0.13	-0.14	-0.14	-0.12	0.423	22	163	4.75
1487	0.931	0.906	0.908	0.899	0.881	0.881	0.876	0.87	0.149	0.137	0.139	0.145	-0.09	-0.1	-0.04	0.017	0.424	22.25	137.5	2.99
1488	0.856	0.865	0.892	0.915	0.952	0.975	0.979	0.995	0.151	0.152	0.159	0.166	0.066	0.103	0.125	0.131	0.424	22.5	112	-0.88
1489	1.002	1.002	1.014	1.048	1.064	1.112	1.137	1.151	0.179	0.178	0.172	0.156	0.158	0.08	-0.03	-0.14	0.425	22.75	139.3	1.41
1490	1.156	1.158	1.149	1.119	1.073	1.027	0.954	0.879	0.147	0.135	0.123	0.129	-0.24	-0.31	-0.27	-0.14	0.425	23	166.5	5.8
1491	0.833	0.799	0.78	0.755	0.741	0.75	0.785	0.828	0.159	0.157	0.172	0.172	0.043	0.155	0.214	0.158	0.426	18.5	193.8	-0.35
1492	0.876	0.913	0.957	0.986	0.998	1.005	1.016	1.018	0.154	0.147	0.134	0.136	0.053	0.002	-0.05	-0.06	0.426	14	221	1.76

1493	1.021	1.03	1.048	1.016	0.998	1.014	1.027	1.027	0.138	0.14	0.149	0.154	-0.05	-0.01	0.039	0.074	0.427	9.5	223.5	1.23
1494	1.041	1.076	1.112	1.14	1.13	1.14	1.137	1.137	0.168	0.171	0.174	0.171	0.113	0.12	0.117	0.09	0.427	5	226	-0.7
1495	1.13	1.11	1.092	1.089	1.094	1.101	1.114	1.133	0.166	0.159	0.155	0.153	0.058	0.007	-0.04	-0.07	0.427	5.5	228.5	1.93
1496	1.14	1.167	1.176	1.195	1.195	1.183	1.169	1.149	0.154	0.154	0.157	0.158	-0.1	-0.1	-0.08	-0.06	0.428	6	231	3.87
1497	1.098	1.034	0.968	0.913	0.865	0.828	0.808	0.794	0.15	0.147	0.145	0.146	-0.04	-0.01	0.025	0.047	0.428	6.5	218.8	2.29
1498	0.805	0.815	0.808	0.847	0.888	0.902	0.931	0.938	0.147	0.149	0.149	0.148	0.061	0.061	0.047	0.017	0.428	7	206.5	1.05
1499	0.959	0.957	0.954	0.954	0.963	0.961	0.982	0.998	0.143	0.144	0.143	0.145	-0	-0.01	0.002	0.011	0.429	7.25	194.3	1.58
1500	0.998	1.002	1.011	1.021	1.03	1.043	1.046	1.066	0.15	0.151	0.153	0.158	0.023	0.03	0.043	0.052	0.429	7.5	182	0.53
1501	1.08	1.076	1.092	1.11	1.137	1.167	1.199	1.217	0.158	0.163	0.167	0.17	0.051	0.052	0.046	0.046	0.43	7.75	192.5	0
1502	1.22	1.224	1.234	1.24	1.238	1.236	1.206	1.195	0.171	0.168	0.164	0.162	0.038	0.02	-0	-0.01	0.43	8	203	1.05
1503	1.181	1.172	1.13	1.08	1.041	1.055	1.016	1.007	0.158	0.153	0.154	0.154	-0.03	-0.02	-0.01	-0	0.43	8.75	213.5	1.93
1504	0.993	1.002	0.998	0.979	0.97	0.963	0.966	0.954	0.152	0.15	0.152	0.152	0.004	0.003	0.013	0.017	0.43	9.5	224	1.58
1505	0.984	1.007	1.005	1	0.993	0.968	0.998	0.989	0.152	0.15	0.151	0.15	-0.01	0.01	0.013	0.02	0.43	10.25	224.8	1.76
1506	0.963	0.973	1.002	1	1.021	1.039	1.055	1.053	0.152	0.15	0.148	0.152	0.003	-0.01	-0.02	-0.02	0.43	11	225.5	2.11
1507	1.055	1.034	1.027	1.03	1.016	0.998	0.991	1	0.153	0.154	0.153	0.148	-0.01	-0.01	-0.01	0	0.43	11	226.3	2.11
1508	0.984	1.021	1.034	1.021	1.027	1.011	1.002	0.993	0.152	0.155	0.154	0.151	-0.01	-0	0.007	0.01	0.43	11	227	1.76
1509	0.95	0.938	0.954	0.954	0.968	0.954	0.952	0.957	0.15	0.15	0.147	0.149	0.012	-0	0.009	0.002	0.43	11	228	1.76
1510	0.954	0.929	0.915	0.918	0.94	0.954	0.947	0.929	0.147	0.148	0.147	0.149	0.013	0.013	-0.01	-0.01	0.43	11	229	1.93
1511	0.929	0.947	0.947	0.936	0.947	0.938	0.952	0.998	0.15	0.148	0.147	0.153	-0.02	0.003	-0	-0	0.431	11.5	230	2.11
1512	1.021	1.007	0.952	0.957	0.934	0.904	0.911	0.934	0.154	0.155	0.151	0.147	0.002	0	-0	0.012	0.432	12	231	1.93
1513	0.92	0.936	0.947	0.991	1.041	1.039	1.034	1.005	0.152	0.154	0.154	0.154	0.019	0.025	0.03	0.024	0.433	12.5	228	1.76
1514	0.989	1.011	1.043	1.076	1.069	1.076	1.05	1.027	0.155	0.156	0.157	0.151	0.006	-0.01	-0.02	-0.02	0.434	13	225	2.29
1515	1.064	1.087	1.064	1.092	1.064	1.041	1.016	0.979	0.151	0.154	0.152	0.15	-0.02	-0.04	-0.06	-0.05	0.435	13	222	2.64
1516	0.963	0.947	0.931	0.938	0.979	1.002	1	1.018	0.148	0.148	0.153	0.162	-0.02	0.031	0.049	0.049	0.435	13	219	1.41
1517	1.076	1.092	1.085	1.101	1.076	1.053	1.108	1.133	0.166	0.166	0.16	0.154	0.063	0.048	0.017	-0	0.436	13	221.8	1.23
1518	1.092	1.11	1.128	1.137	1.158	1.169	1.144	1.11	0.155	0.158	0.157	0.16	-0.03	-0.03	-0.03	-0.01	0.436	13	224.5	2.11
1519	1.092	1.076	1.094	1.105	1.055	1.03	1.007	0.998	0.157	0.155	0.154	0.153	-0.01	-0.01	0.001	0.022	0.437	13.25	227.3	1.93
1520	0.989	1.009	1.043	1.046	1.027	1.043	1.064	1.057	0.153	0.154	0.153	0.153	0.029	0.007	0.005	0.014	0.438	13.5	230	1.58
1521	0.975	0.984	0.973	0.957	0.963	0.975	0.973	0.979	0.155	0.154	0.152	0.151	0.007	-0	0.007	0.01	0.439	13.75	230.8	1.93
1522	0.989	1.027	1.016	1.021	1.021	1.03	1.03	1.021	0.153	0.154	0.151	0.151	-0.01	-0.01	-0	-0.01	0.44	14	231.5	2.29
1523	1.002	0.977	0.977	0.97	0.97	0.984	1	1.007	0.15	0.146	0.147	0.148	-0.01	-0.02	-0.03	-0.02	0.439	15	232.3	2.64
1524	0.995	0.968	0.957	0.954	0.959	0.961	0.968	0.984	0.149	0.15	0.151	0.152	0	0.02	0.028	0.03	0.438	16	233	2.11
1525	1	0.998	0.993	0.998	0.998	1.002	1.011	1.011	0.154	0.154	0.154	0.152	0.033	0.032	0.023	0.01	0.437	17	233.3	2.11
1526	1.016	1.037	1.043	1.037	1.034	1.025	1.03	1.007	0.151	0.151	0.151	0.149	-0	-0.01	-0.01	-0.01	0.436	18	233.5	2.99
1527	0.984	0.975	0.966	0.952	0.934	0.918	0.89	0.883	0.149	0.149	0.147	0.147	-0.01	-0.01	-0	0.006	0.436	18.25	233.8	2.99
1528	0.883	0.874	0.886	0.918	0.934	0.957	0.97	0.973	0.147	0.147	0.15	0.152	0.014	0.016	0.016	0.014	0.436	18.5	234	2.64
1529	0.975	0.979	0.979	0.975	0.975	0.963	0.959	0.947	0.153	0.152	0.151	0.149	0.013	0.01	0.006	-0	0.435	18.75	233.5	2.64

1530	0.924	0.915	0.906	0.881	0.881	0.899	0.908	0.924	0.148	0.147	0.146	0.147	0.001	0	-0.01	-0	0.435	19	233	2.99
1531	0.927	0.911	0.899	0.886	0.876	0.87	0.858	0.856	0.148	0.147	0.146	0.147	0.002	0.007	0.007	0.007	0.436	19.75	232.5	2.99
1532	0.844	0.84	0.84	0.844	0.842	0.856	0.876	0.892	0.147	0.146	0.146	0.147	0.01	0.011	0.006	0.004	0.436	20.5	232	2.99
1533	0.911	0.911	0.924	0.938	0.94	0.947	0.957	0.963	0.149	0.15	0.149	0.15	0.005	0.005	-0	-0	0.437	21.25	231.5	3.16
1534	0.963	0.954	0.95	0.943	0.929	0.92	0.918	0.915	0.15	0.151	0.148	0.148	-0.01	-0	0.001	-0	0.437	22	231	3.34
1535	0.929	0.936	0.931	0.929	0.931	0.918	0.924	0.924	0.149	0.149	0.149	0.148	0	0.004	0.009	0.01	0.437	22	230.5	3.16
1536	0.94	0.959	0.968	0.97	0.979	0.982	0.984	0.989	0.15	0.151	0.153	0.152	0.01	0.013	0.013	0.008	0.437	22	230	2.99

time	alt	ias	head	rudpos1	rudpos2	pitch1	pitch2	pitch3	pitch4	aoa1	aoa2	lelev	relev	roll1	roll2	lail	rail
2157	31008	278	10	-0.32	-0.51	2.11	2.11	1.93	1.93	0.35	0.53	-2.77	-3.16	-0.79	-0.7	0.12	1.93
2158	31008	278.5	10	-0.32	-0.51	1.93	2.11	2.11	1.93	0.53	0.53	-2.77	-2.96	-0.35	-0.09	0.35	1.46
2159	31008	278.5	9.8	-0.32	-0.51	1.93	1.93	1.93	1.93	0.53	0.53	-2.77	-2.96	-0.26	-0.53	-0.12	2.16
2160	31008	279	10.2	-0.32	-0.51	1.93	1.93	1.93	2.11	0.53	0.53	-2.57	-2.96	-0.62	-0.18	0.35	1.46
2161	31008	278.5	10.2	-0.32	-0.51	2.11	2.11	2.11	2.11	0.53	0.53	-2.77	-2.96	0.26	0.35	0.82	1.23
2162	31008	278	10	-0.32	-0.51	2.11	2.11	2.11	2.11	0.53	0.53	-2.77	-2.96	0.09	-0.53	0.35	1.69
2163	31008	278	10	-0.32	-0.51	2.11	2.11	2.11	2.11	0.53	0.35	-2.77	-2.96	-0.62	-0.44	0.35	1.69
2164	31008	278.5	10.2	-0.32	-0.51	2.11	2.11	2.11	2.11	0.53	0.53	-2.77	-3.16	-0.18	-0.09	0.58	1.23
2165	31040	278.5	10	-0.32	-0.51	2.11	1.93	1.93	1.93	0.53	0.53	-2.77	-3.16	-0.18	-0.44	0.12	1.69
2166	31040	278.5	10	-0.32	-0.51	1.93	1.93	1.93	1.93	0.53	0.53	-2.77	-3.16	-0.62	-0.44	0.35	1.69
2167	31040	278.5	10.2	-0.32	-0.51	1.93	1.93	1.93	1.93	0.35	0.35	-2.77	-3.16	-0.09	0.18	0.58	1.23
2168	31040	279.5	10	-0.32	-0.51	1.93	1.93	1.93	1.93	0.53	0.35	-2.77	-2.96	0.18	-0.35	0.12	1.69
2169	31040	279	10	-0.32	-0.51	1.93	1.93	1.93	1.93	0.35	0.53	-2.77	-2.96	-0.44	-0.44	0.35	1.69
2170	31040	279.5	10.2	-0.32	-0.51	1.93	1.93	1.93	1.93	0.35	0.53	-2.77	-2.96	-0.26	-0.09	0.58	1.46
2171	31040	279.5	10	-0.32	-0.51	1.93	1.93	1.93	1.93	0.35	0.35	-2.77	-3.16	-0.09	-0.18	0.58	1.46
2172	31040	279.5	10	-0.32	-0.51	1.93	1.93	1.93	1.93	0.35	0.35	-2.77	-3.16	-0.35	-0.53	0.35	1.69
2173	31040	279.5	10.2	-0.32	-0.51	1.93	1.93	1.93	1.93	0.35	0.35	-2.77	-3.16	-0.44	-0.26	0.58	1.46
2174	31040	279.5	10	-0.32	-0.51	1.93	1.93	1.93	1.76	0.35	0.35	-2.77	-3.16	-0.18	-0.35	1.05	0.99
2175	31040	279.5	10	-0.32	-0.51	1.76	1.76	1.76	1.76	0.35	0.35	-2.77	-3.16	-0.79	-1.32	2.22	-0.41
2176	31040	279	10	-0.32	-0.51	1.76	1.76	1.76	1.76	0.35	0.35	-2.77	-2.96	-2.11	-3.87	3.62	-1.81
2177	31040	279	9.8	-0.32	-2.28	1.76	1.76	1.76	1.76	0.35	0.53	-2.77	-3.16	-5.36	-6.86	4.09	-2.04
2178	31040	279	9	-2.85	-3.05	1.76	1.76	1.58	1.58	0.53	1.05	-2.57	-2.37	-8.53	12.92	2.22	-0.18
2179	31040	279	6	-0.82	0.06	1.58	1.41	1.41	1.93	1.41	1.23	-2.17	-2.57	18.19	22.76	-4.55	6.12
2180	31008	279.5	7.4	0.44	-1.21	2.29	2.64	2.81	2.99	0.88	0.53	-2.57	-3.16	24.79	16.96	-4.09	5.89
2181	31008	278.5	8.3	-1.08	2.35	2.64	2.46	2.11	1.93	0.35	0.7	-2.17	-2.77	-8.09	-3.25	2.22	-0.41
2182	31040	279	4.9	1.97	5.39	2.11	2.11	2.11	2.29	0.88	0.18	-3.16	-3.16	-4.39	10.46	-3.15	4.73
2183	30944	278.5	11.3	0.7	0.06	2.46	2.64	2.46	1.23	-0.18	0.18	-2.57	-2.57	-6.33	5.45	3.27	-1.58
2184	30976	277.5	9.8	-0.82	-0.44	0.88	1.23	1.93	2.64	-0.18	0.88	-2.77	-3.96	20.21	21.27	5.36	-3.21
2185	31008	278.5	3.7	-0.32	-0.44	2.99	2.64	1.76	0.88	1.23	0	-2.17	-1.77	10.11	-0.88	-1.17	2.86
2186	30976	279	9.5	-0.82	-0.7	1.05	1.58	1.93	1.93	-0.35	0.7	-2.17	-2.57	-7.91	0.53	0	1.69
2187	30976	278	9.7	-0.57	-0.7	1.93	1.93	1.93	2.11	0.88	0.88	-2.17	-2.96	9.05	11.69	4.9	-3.21
2188	31008	279	5.6	-0.57	-1.21	2.29	2.11	1.93	1.76	1.23	0.7	-2.37	-2.37	6.94	-5.98	-3.04	4.73
2189	30976	279.5	8.8	-1.08	-0.95	1.76	1.93	2.11	2.29	0.53	0.7	-2.17	-2.57	-7.65	-4.31	0.23	1.46
2190	30976	278.5	8.4	-0.82	-0.7	2.29	2.29	2.29	2.29	0.88	1.05	-2.57	-2.77	0.09	0.79	0.23	1.69
2191	31008	279	6.3	-0.32	-0.19	2.29	2.29	2.29	2.29	0.88	0.53	-2.57	-2.77	-2.72	-5.1	-4.2	5.89
2192	30976	278.5	8.8	-0.32	-0.44	2.46	2.64	2.64	2.64	0.53	0.53	-2.57	-2.96	-4.57	-1.41	2.34	-0.64

2193	31008	278	8.6	-0.32	-0.7	2.46	2.46	2.46	2.46	0.53	0.53	-2.77	-3.16	3.69	4.31	1.4	0.53
2194	31008	278.5	7	-0.57	-0.44	2.29	2.29	2.11	2.11	0.53	0.35	-2.96	-2.96	2.64	0.09	-2.57	4.26
2195	31008	278	8.4	-0.32	-0.44	2.11	2.11	2.29	2.29	0.35	0.35	-2.77	-3.16	-0.7	0.62	1.17	0.53
2196	31008	278	8.4	-0.32	-0.44	2.11	2.11	2.11	2.11	0.53	0.53	-2.96	-3.16	2.46	2.99	2.1	-0.18
2197	31008	278.5	7.4	-0.32	-0.44	2.11	2.11	1.93	1.93	0.53	0.35	-2.96	-2.96	0.88	-0.7	-1.17	2.86
2198	31008	278.5	8.1	-0.32	-0.44	1.93	2.11	2.11	2.11	0.35	0.53	-2.77	-3.16	-1.49	-1.05	0.58	1.23
2199	31008	278	8.3	-0.32	-0.44	2.11	2.11	2.11	2.11	0.53	0.53	-2.77	-3.16	0.26	0.26	1.75	0.06
2200	31008	278	7.7	-0.32	-0.44	1.93	1.93	1.93	1.93	0.53	0.53	-2.77	-3.16	-0.62	-1.85	-0.12	1.93
2201	31008	278	7.9	-0.32	-0.44	1.93	1.93	1.93	1.93	0.53	0.53	-2.77	-2.96	-2.72	-2.37	0.12	1.69
2202	31008	278	8.1	-0.32	-0.51	1.93	1.93	1.93	1.93	0.53	0.53	-2.77	-2.96	-1.67	-1.32	0.58	1.23
2203	31008	278	7.6	-0.32	-0.51	1.93	1.93	1.93	1.93	0.53	0.53	-2.77	-2.96	-1.67	-2.11	0.12	1.93
2204	31008	278	7.6	-0.32	-0.51	1.93	1.93	1.93	1.93	0.53	0.53	-2.77	-2.96	-2.37	-2.37	1.05	0.99
2205	31008	277.5	7.7	-0.32	-0.51	1.93	1.93	1.93	1.93	0.53	0.53	-2.77	-2.96	-2.37	-2.72	1.99	0.06
2206	31008	278	7.4	-0.32	-0.51	1.93	1.93	1.93	1.93	0.53	0.53	-2.77	-2.96	-3.52	-4.57	1.75	0.29
2207	31008	278	7.2	-0.32	-0.51	1.93	1.93	1.93	1.93	0.53	0.53	-2.57	-2.96	-6.06	-6.68	1.99	-0.18
2208	31008	277.5	7	-0.32	-0.51	2.11	2.11	2.11	2.11	0.53	0.53	-2.57	-2.96	-7.29	-8	2.45	-0.41
2209	31008	277.5	6.5	-0.32	-0.51	1.93	1.93	1.93	1.93	0.53	0.7	-2.57	-2.96	-9.49	10.46	1.99	-0.18
2210	31008	277.5	6	-0.32	-0.51	1.93	2.11	2.11	2.11	0.7	0.7	-2.57	-2.77	11.51	12.39	1.99	-0.18
2211	31008	277	5.4	-0.32	-0.51	2.11	2.11	2.11	2.11	0.7	0.7	-2.57	-2.96	13.54	14.15	1.99	-0.18
2212	31008	277.5	4.7	-0.32	-0.51	2.11	2.11	2.11	2.11	0.7	0.7	-2.57	-2.96	14.94	15.56	1.05	0.76
2213	31008	277	4	-0.32	-0.51	2.11	2.11	2.11	2.11	0.7	0.7	-2.77	-2.96	16.35	16.52	0.82	1.23
2214	31008	277	3.3	-0.32	-0.51	2.11	2.11	1.93	1.93	0.7	0.7	-2.77	-2.96	16.61	16.7	0.58	1.23
2215	31008	277	2.5	-0.32	-0.51	1.93	1.93	1.93	1.93	0.7	0.7	-2.77	-2.96	16.88	16.88	0.58	1.46
2216	31008	277	1.9	-0.32	-0.51	1.93	1.93	1.93	1.93	0.7	0.7	-2.77	-2.96	16.96	16.96	0.58	1.46
2217	31008	277	1.1	-0.32	-0.51	1.93	1.93	1.93	1.93	0.7	0.7	-2.77	-2.96	16.96	16.96	0.58	1.46
2218	31008	277	0.5	-0.32	-0.51	1.93	1.93	1.93	1.93	0.7	0.7	-2.77	-2.96	16.88	16.7	0.58	1.23
2219	31008	277	359.5	-0.32	-0.51	1.93	1.93	1.93	1.93	0.7	0.7	-2.77	-2.96	16.7	16.79	0.58	1.46
2220	31008	277	358.9	-0.32	-0.51	1.93	1.93	1.93	1.93	0.7	0.7	-2.77	-3.16	16.96	17.05	0.35	1.46
2221	31008	277	358.2	-0.32	-0.51	1.93	1.93	1.93	1.93	0.7	0.7	-2.77	-3.16	16.88	16.79	0.58	1.23
2222	31008	277.5	357.5	-0.32	-0.51	1.93	1.76	1.76	1.76	0.7	0.7	-2.77	-3.16	16.7	16.79	0.58	1.46
2223	31040	277.5	356.7	-0.32	-0.51	1.76	1.76	1.76	1.76	0.7	0.7	-2.77	-2.96	16.96	17.05	0.35	1.46
2224	31008	277.5	356.1	-0.32	-0.51	1.76	1.76	1.76	1.76	0.7	0.7	-2.77	-3.16	17.05	16.96	0.58	1.46
2225	31040	277.5	355.3	-0.32	-0.51	1.76	1.76	1.76	1.76	0.7	0.7	-2.77	-2.96	16.79	16.96	0.35	1.46
2226	31008	277.5	354.7	-0.32	-0.51	1.76	1.76	1.76	1.76	0.7	0.7	-2.77	-2.96	17.23	17.23	0.35	1.69
2227	31008	278	354	-0.32	-0.51	1.76	1.76	1.76	1.76	0.7	0.7	-2.77	-2.96	16.88	16.7	0.58	1.23
2228	31008	278	353.3	-0.32	-0.51	1.76	1.76	1.76	1.76	0.7	0.7	-2.77	-2.96	16.7	16.7	0.58	1.23
2229	31008	278	352.4	-0.32	-0.51	1.76	1.76	1.76	1.76	0.7	0.7	-2.77	-2.96	16.88	16.96	0.58	1.46

2230	31008	278	351.9	-0.32	-0.51	1.76	1.76	1.76	1.76	0.7	0.7	-2.77	-2.96	16.96	16.96	0.58	1.46
2231	31008	278	351	-0.32	-0.51	1.76	1.76	1.76	1.76	0.7	0.7	-2.77	-2.96	16.96	16.88	0.58	1.46
2232	31008	278	350.5	-0.32	-0.51	1.76	1.76	1.76	1.76	0.7	0.7	-2.77	-2.96	16.88	16.96	0.58	1.46
2233	31008	277.5	349.6	-0.32	-0.51	1.76	1.76	1.76	1.76	0.7	0.7	-2.77	-2.96	16.88	16.79	0.35	1.69
2234	31008	277	348.9	-0.32	-0.51	1.76	1.76	1.76	1.76	0.7	0.88	-2.77	-3.16	16.7	16.52	-0.35	2.16
2235	31040	278	348.4	-0.32	-0.51	1.76	1.93	1.93	1.93	0.88	0.7	-2.96	-3.16	15.91	15.91	-1.29	3.33
2236	31008	277.5	348.2	-0.32	-0.51	1.93	1.76	2.11	2.11	-0.18	0.53	-2.77	-3.36	15.47	14.41	0.58	1.46

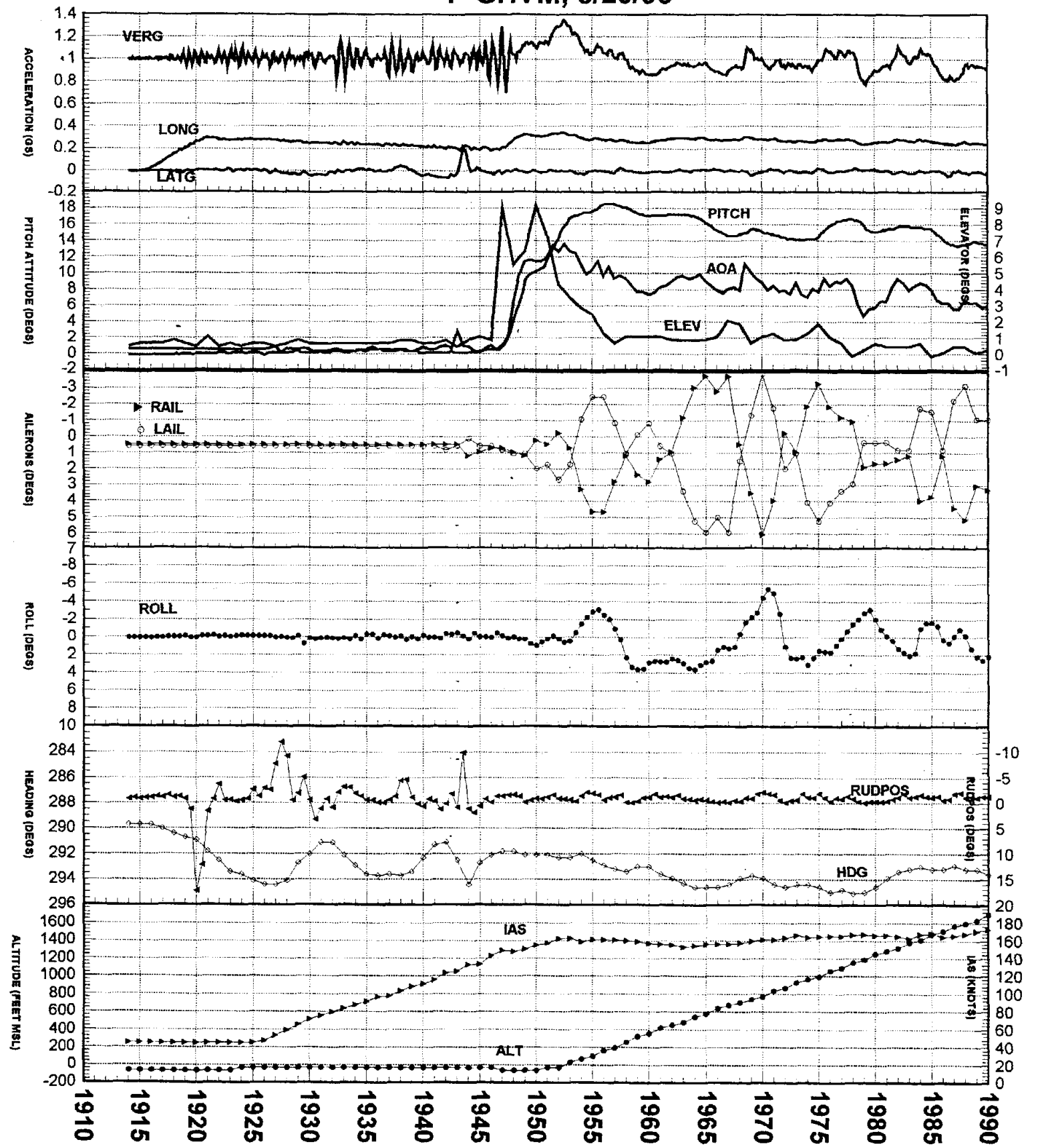
time	verg1	verg2	verg3	verg4	verg5	verg6	verg7	verg8	long1	long2	long3	long4	latg1	latg2	latg3	latg4	mach	wspd	wnddir	drftag
2157	0.975	0.966	0.95	0.968	0.984	0.973	0.989	0.998	-0.01	-0	-0.01	-0.01	0.006	0.007	0.007	0.004	0.754	75.25	219	4.92
2158	0.998	1.009	0.998	0.995	0.995	1.009	1.009	1.016	-0	-0	-0.01	-0	0.007	0.002	-0	-0.01	0.754	75	219	4.92
2159	1.016	1	1.002	1.002	1.009	0.998	0.995	0.998	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	0.003	0.004	0.754	74.75	219	4.92
2160	1.002	1.002	1.007	1.002	0.998	0.995	1	1.014	-0	-0	-0	-0.01	0.007	0.013	0.01	0.004	0.754	74.5	219	4.75
2161	1.025	1.034	1.023	1.021	1.016	1.009	1.005	1	-0.01	-0	-0.01	-0	0.001	-0	0	-0.01	0.753	74.25	219.8	4.92
2162	1.002	1.005	1	0.998	0.995	0.984	0.975	0.975	-0.01	-0	-0.01	-0.01	-0.01	-0.01	0.003	0.007	0.753	74	220.5	4.92
2163	0.982	0.993	0.993	1.002	0.998	0.998	0.998	0.998	-0.01	-0	-0	-0	0.007	0.011	0.011	0.009	0.753	73.75	221.3	4.75
2164	0.991	0.998	1.011	1.009	1.002	1.005	0.991	0.984	-0.01	-0.01	-0	-0.01	0.003	0.003	-0.01	-0	0.753	73.5	221	4.92
2165	0.977	0.982	0.986	0.982	0.982	0.982	0.979	0.984	-0.01	-0.01	-0.01	-0.01	-0.01	-0	0	0.007	0.753	73.25	221	4.92
2166	0.975	0.977	0.982	0.989	0.993	0.993	0.995	0.991	-0.01	-0.01	-0	-0	0.005	0.008	0.007	0.012	0.753	73	221	4.75
2167	0.979	0.977	0.963	0.975	0.984	1.002	0.998	0.993	-0.01	-0.01	-0.01	-0.01	0.012	0.002	0.001	-0.01	0.754	72.75	221	4.75
2168	1.005	1.005	0.991	0.998	0.995	0.989	0.984	0.984	-0.01	-0.01	-0.01	-0.01	-0	-0	-0	0.004	0.755	72.5	221	4.92
2169	0.984	0.975	0.97	0.975	0.989	0.998	1.014	1.016	-0	-0.01	-0.01	-0.01	0.007	0.005	0.006	0.006	0.756	72.25	220.8	4.75
2170	0.998	0.991	0.986	0.984	0.998	1.011	1.009	1.007	-0	-0.01	-0.01	-0.01	0.007	0.007	0.003	0	0.757	72	220.5	4.75
2171	1	0.995	0.993	0.984	0.982	0.977	0.979	0.989	-0.01	-0.01	-0.01	-0.01	-0	0	0	-0	0.757	72	220.3	4.75
2172	0.991	0.991	0.986	0.984	0.982	0.982	0.984	0.989	-0.01	-0.01	-0.01	-0.01	0	0.005	0.008	0.007	0.757	72	220	4.75
2173	0.993	0.993	0.991	0.989	0.998	0.984	0.991	0.993	-0.01	-0.01	-0.01	-0.01	0.007	0.008	0.007	0.002	0.756	72	220.3	4.75
2174	0.993	0.998	0.998	0.984	0.975	0.963	0.963	0.97	-0.01	-0.01	-0.01	-0.01	-0	-0	0	0	0.756	72	220.5	4.75
2175	0.975	0.984	0.986	0.986	0.979	0.982	0.979	0.984	-0.01	-0.01	-0.01	-0.01	0.003	0.007	0.011	0.011	0.756	75.75	220.8	4.75
2176	0.989	0.991	0.998	0.993	0.984	0.979	0.975	0.968	-0.01	-0.01	-0	-0.01	0.008	0.007	0.009	0.008	0.756	79.5	221	4.75
2177	0.977	0.982	0.991	0.993	0.993	0.991	0.984	0.984	-0.01	-0.01	0.001	0.005	0.005	0.005	0.034	0.021	0.756	83.25	218.8	5.1
2178	0.995	1.014	1.03	1.05	1.073	1.085	1.108	1.126	0	-0	-0.01	-0.01	-0.02	-0.07	-0.11	-0.15	0.756	87	216.5	7.21
2179	1.133	1.124	1.103	1.094	1.085	1.082	1.071	1.062	-0.01	-0.01	-0.01	-0	-0.15	-0.1	-0.04	0.033	0.756	87.75	214.3	6.68
2180	1.043	1.034	1.016	1.023	1.025	1.048	1.073	1.082	0.003	0.011	0.022	0.019	0.096	0.15	0.149	0.113	0.755	88.5	212	3.52
2181	1.06	1.039	1.018	1.014	1.018	1.043	1.062	1.085	0.008	-0	-0.03	-0.04	0.031	-0.05	-0.19	-0.17	0.755	89.25	217.8	6.86
2182	1.092	1.076	1.041	1.002	0.929	0.87	0.821	0.824	-0.03	-0.03	-0.02	0.004	-0.11	-0.05	0.084	0.229	0.754	60	223.5	3.52
2183	0.851	0.934	1.021	1.087	1.098	1.114	1.05	0.979	0.052	0.054	0.039	0.025	0.407	0.357	0.26	0.138	0.754	61	229.3	-0.35
2184	0.897	0.831	0.815	0.872	0.959	1.048	1.082	1.085	0.004	-0.01	-0.03	-0.03	-0.03	-0.22	-0.34	-0.37	0.753	62	235	8.44
2185	1.037	0.959	0.87	0.817	0.755	0.707	0.638	0.631	-0.03	-0.02	-0	0.011	-0.31	-0.17	-0	0.137	0.753	63	231	5.98
2186	0.693	0.778	0.89	1.03	1.121	1.19	1.222	1.224	0.026	0.032	0.031	0.02	0.226	0.242	0.188	0.102	0.752	64	227	1.76
2187	1.199	1.167	1.133	1.114	1.103	1.112	1.114	1.114	0.005	-0.01	-0.02	-0.03	-0.01	-0.11	-0.19	-0.21	0.753	68	223	7.03
2188	1.101	1.076	1.037	0.993	0.947	0.892	0.872	0.872	-0.02	-0.01	-0	0.003	-0.19	-0.1	-0	0.078	0.754	72	219	5.63
2189	0.918	0.984	1.053	1.082	1.112	1.133	1.14	1.142	0.01	0.014	0.013	0.006	0.117	0.12	0.098	0.04	0.754	76	217.8	3.69
2190	1.137	1.126	1.114	1.103	1.11	1.105	1.101	1.076	-0	-0.01	-0.02	-0.02	-0.03	-0.08	-0.12	-0.12	0.755	80	216.5	6.33
2191	1.053	1.009	0.961	0.943	0.94	0.943	0.97	0.998	-0.02	-0.01	-0	0.004	-0.09	-0.04	0.023	0.077	0.755	77.75	215.3	4.92
2192	1.021	1.034	1.053	1.064	1.073	1.076	1.062	1.05	0.007	0.008	0.006	0.003	0.105	0.1	0.074	0.035	0.754	75.5	214	3.69

2193	1.039	1.023	1.011	1	0.998	0.993	0.984	0.979	-0	-0.01	-0.01	-0.01	-0.01	-0.05	-0.07	-0.08	0.754	73.25	216.3	5.8
2194	0.975	0.959	0.938	0.915	0.915	0.913	0.924	0.943	-0.01	-0.01	-0.01	-0	-0.06	-0.03	0.001	0.034	0.753	71	218.5	5.1
2195	0.952	0.963	0.97	0.977	0.991	1.002	1.011	1.021	0.001	0.002	0.001	-0	0.056	0.06	0.049	0.029	0.753	70.75	220.8	4.22
2196	1.011	1.002	0.993	0.984	0.979	0.973	0.975	0.975	-0	-0.01	-0.01	-0.01	0.004	-0.02	-0.04	-0.05	0.753	70.5	223	5.45
2197	0.973	0.97	0.963	0.947	0.931	0.931	0.938	0.943	-0.01	-0.01	-0.01	-0	-0.04	-0.02	-0.01	0.013	0.753	70.25	222.3	5.27
2198	0.957	0.968	0.975	0.984	0.989	0.998	1.009	1.016	-0	-0	-0	-0	0.027	0.035	0.031	0.019	0.753	70	221.5	4.57
2199	1.018	1.014	1.009	0.998	0.991	0.986	0.979	0.984	-0	-0.01	-0.01	-0.01	0.006	-0.01	-0.02	-0.02	0.753	70.5	220.8	5.1
2200	0.984	0.986	0.982	0.973	0.961	0.952	0.957	0.966	-0.01	-0.01	-0.01	-0.01	-0.02	-0.01	0	0.008	0.753	71	220	5.1
2201	0.973	0.977	0.979	0.977	0.979	0.973	0.989	0.998	-0	-0	-0	-0	0.014	0.02	0.018	0.01	0.752	71.5	219.8	4.75
2202	1	1.011	1.011	1.005	1.002	0.998	0.993	0.993	-0	-0.01	-0.01	-0.01	0.002	-0	-0.01	-0.01	0.752	72	219.5	5.1
2203	0.998	1.005	1.002	0.991	0.993	0.991	0.984	0.986	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0	0.006	0.752	72	219.3	5.1
2204	0.989	0.989	0.998	0.998	1.002	1	0.998	1.007	-0	-0	-0	-0	0.007	0.012	0.013	0.011	0.752	72	219	4.92
2205	1.009	1.018	1.021	1.023	1.021	1.011	1.005	1.002	-0.01	-0	-0	-0.01	0.004	-0	-0	-0	0.752	72	219.5	5.1
2206	1.005	1.007	1.005	1.016	1.011	1.005	1.002	1	-0.01	-0.01	-0.01	-0	-0.01	-0.01	-0	0.007	0.752	72	220	5.1
2207	0.991	0.995	0.998	1.002	1.011	1.011	1.016	1.011	-0	-0	-0	-0	0.009	0.009	0.012	0.013	0.752	72.25	220.5	5.1
2208	1.002	1.014	1.018	1.023	1.023	1.027	1.023	1.025	-0	-0	-0.01	-0	0.011	0.007	0.003	0.004	0.751	72.5	221	5.27
2209	1.016	1.007	1.011	1.016	1.016	1.018	1.023	1.023	-0	-0	-0.01	-0	0.003	0.001	0.001	0.005	0.751	72.75	221	5.45
2210	1.021	1.011	1.011	1.016	1.018	1.021	1.032	1.027	-0	-0	-0	-0	0.009	0.01	0.009	0.009	0.750	73	221	5.45
2211	1.021	1.023	1.027	1.018	1.021	1.027	1.034	1.041	-0	-0	-0	-0	0.01	0.009	0.007	0.005	0.75	73.25	221	5.63
2212	1.043	1.046	1.039	1.034	1.03	1.032	1.037	1.048	-0	-0	-0	-0	0.004	0.006	0.006	0.006	0.75	73.5	221	5.8
2213	1.055	1.055	1.057	1.057	1.046	1.043	1.048	1.039	-0	-0	-0	-0	0.008	0.01	0.008	0.004	0.75	73.75	221	5.8
2214	1.037	1.037	1.037	1.03	1.023	1.016	1.025	1.025	-0	-0	-0	-0	0.005	0.006	0.008	0.005	0.750	74	221	5.98
2215	1.03	1.037	1.041	1.039	1.034	1.03	1.034	1.039	-0	-0	-0	-0	0.004	0.006	0.009	0.007	0.75	74.25	221	5.98
2216	1.039	1.037	1.053	1.05	1.048	1.043	1.034	1.027	-0	-0	-0	-0	0.005	0.004	0.006	0.007	0.75	74.5	221	6.15
2217	1.032	1.027	1.027	1.041	1.037	1.032	1.03	1.034	-0	-0	0	-0	0.006	0.004	0.008	0.01	0.743	74.75	221	6.15
2218	1.027	1.03	1.027	1.027	1.032	1.027	1.027	1.032	-0	-0	-0	-0	0.008	0.005	0.006	0.006	0.749	75	221	6.33
2219	1.027	1.03	1.027	1.027	1.032	1.037	1.037	1.037	-0	-0	-0	-0	0.004	0.003	0.003	0.003	0.75	74.75	221	6.33
2220	1.032	1.027	1.021	1.021	1.023	1.027	1.032	1.037	-0	-0	-0	-0	0.006	0.007	0.007	0.01	0.75	74.5	221	6.33
2221	1.034	1.03	1.027	1.023	1.023	1.027	1.03	1.034	0	-0	-0	-0	0.011	0.009	0.003	0.003	0.751	74.25	221	6.5
2222	1.037	1.03	1.03	1.021	1.016	1.016	1.021	1.023	-0	-0	-0	-0	0.003	0.005	0.003	0.002	0.751	74	221	6.5
2223	1.021	1.037	1.037	1.034	1.03	1.023	1.023	1.027	-0	-0	-0	-0	0.003	0.007	0.011	0.009	0.751	73.75	221	6.5
2224	1.03	1.041	1.039	1.034	1.034	1.027	1.023	1.03	-0	-0	-0	-0	0.008	0.008	0.008	0.004	0.752	73.5	221	6.68
2225	1.034	1.048	1.046	1.05	1.046	1.039	1.034	1.037	-0	-0	-0	-0	-0.01	-0.01	-0	0.003	0.752	73.25	221	6.68
2226	1.021	1.016	1.03	1.027	1.05	1.048	1.043	1.039	-0	-0	-0	-0	0.009	0.009	0.011	0.012	0.752	73	221	6.68
2227	1.039	1.034	1.041	1.048	1.053	1.053	1.055	1.055	-0	-0	-0	-0	0.01	0.007	0.004	0.005	0.752	73	221	6.68
2228	1.048	1.039	1.034	1.043	1.041	1.043	1.037	1.048	-0	-0	-0	-0	0.007	0.007	0.003	0.002	0.752	73	221	6.86
2229	1.05	1.048	1.043	1.039	1.041	1.043	1.046	1.041	-0	-0	-0	-0	0.007	0.007	0.006	0.004	0.752	73	220.5	6.86

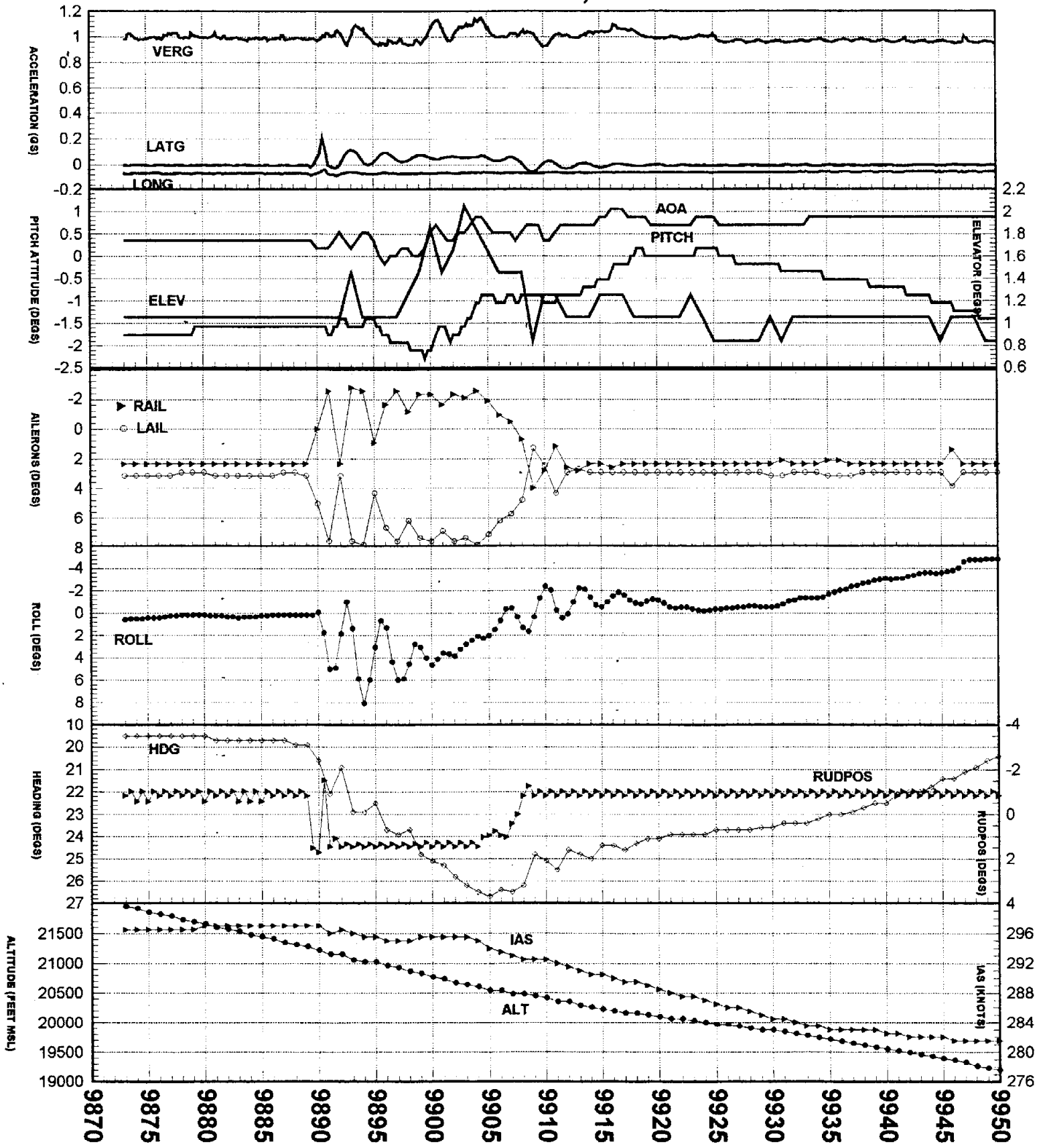
2230	1.048	1.043	1.039	1.034	1.027	1.025	1.027	1.03	-0	-0	-0	-0	0.004	0.007	0.008	0.005	0.752	73	220	7.03
2231	1.037	1.043	1.041	1.043	1.041	1.039	1.037	1.041	-0	-0	-0	-0	0.003	0.006	0.009	0.005	0.752	73	219.5	7.03
2232	1.053	1.057	1.062	1.053	1.041	1.034	1.03	1.03	-0	-0	-0	-0	0.005	0.005	0.008	0.009	0.751	73	219	7.03
2233	1.03	1.039	1.041	1.041	1.05	1.053	1.053	1.05	-0	-0	-0	-0	0.006	0.002	0.002	0.003	0.751	73	218.8	7.21
2234	1.053	1.037	1.011	1.016	1.048	1.066	1.037	0.966	-0	-0	-0	-0	0.006	0.008	-0.01	0.001	0.750	73	218.5	7.21
2235	0.975	1.043	1.076	1.094	1.153	1.085	1.039	0.895	-0.01	-0	-0.01	-0.01	-0.01	-0.02	-0.01	0.036	0.75	73	218.3	6.86
2236	0.771	0.81	0.89	0.977	1.018	1.085	1.085	1.085	-0	-0	0.005	0.005	0.032	0.047	0.038	0.012	0.75	73	218	6.68

ATTACHMENT III
(Data Plots)

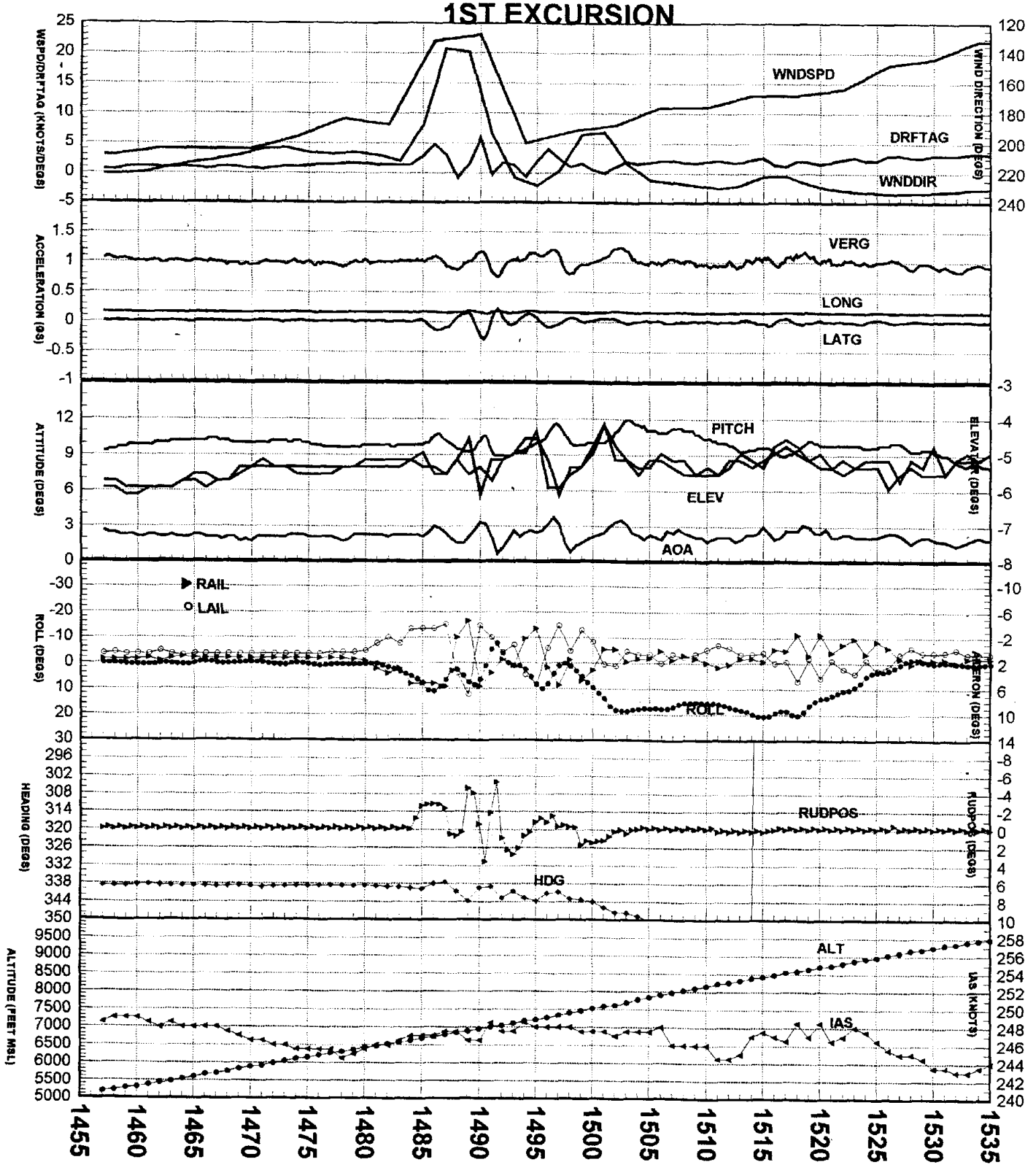
RUDDER INCIDENT
F-GHVM, 8/20/93



RUDDER INCIDENT
F-GHVM, 6/24/93



RUDDER INCIDENT
F-GFUA, 8/24/93
1ST EXCURSION



RUDDER INCIDENT
F-GFUA, 8/24/93
2ND EXCURSION