NATIONAL TRANSPORTATION SAFETY BOARD
Office of Research and Engineering
Washington, D.C. 20594

November 5, 1997

Digital Flight Data Recorder Factual

Specialist's Report of Investigation
by Cassandra Johnson

A. INCIDENT

Location:	Newark, NJ
Date:	July 31, 1997
Time:	0131 Eastern Daylight Time(EDT)
Aircraft:	McDonnell Douglas MD-11, N611FE
NTSB#:	DCA97MA055

B. GROUP

Chairperson:	Cassandra Johnson National Transportation Safety Board
Member:	Mr. John Fraley Federal Express Corporation
Member:	Mr. Shem Malmquist Federal Express Pilots Association
Member:	*Mr. William Steelhammer* Boeing Commercial Airplane Group, Douglas Products Division

C. SUMMARY

On July 31, 1997, at 0130 eastern daylight time (EDT), Federal Express cargo flight 14, a McDonnell Douglas MD-11, N611FE, crashed while landing on runway 22R at Newark IAP, Newark, NJ. The airplane landed became airborne and touched down a second time. At some point during this sequence of events, portions of the right main landing gear structure failed and the right main landing gear collapsed. A fire broke out and destroyed the airplane. Visual flight rules (VFR) conditions prevailed at the time, and the two pilots and three other occupants of the aircraft received minor injuries. The instruments flight rules (IFR) flight originated at Anchorage, AK.

The digital flight data recorder (FDR), a Sundstrand Data Control model UFDR, serial number 2222, was removed from the main wreckage and sent to the Safety Board's laboratory in Washington, D.C. for readout and evaluation.

Using Safety Board's transcription equipment and computer software, a successful FDR readout was performed. Attachments I-1 to I-17 contain the FDR

parameter listing information for the accident airplane. The last 3 minutes (175[1] seconds to 355 seconds) of selected FDR data are presented in attachments III-1 to III-5 for the accident landing in graphical format. Selected FDR data in attachments IV-1 to IV-4 graphically show, in greater detail, the accident landing (335 seconds to 353 seconds). Attachments V-1 to V-27 comprise the tabular data for attachments III and IV. Lastly, attachments VI-1 to VI-3 contain a tabular listing of selected discrete parameters for the last 3 minutes (175 seconds to 355 seconds) from the accident landing. The cross hatched area in attachments III and IV represent the data interruption that occurred between 347.55 seconds and 349 seconds.

D. DETAILS OF THE INVESTIGATION

Section I - Description of Data

This model flight data recorder records aircraft data in a digital format on ¼-inch magnetic tape. The digital FDR records 64 separate 12-bit words of digital information every second from the Digital Flight Data Acquisition Unit (DFDAU). Each grouping of 64 words is called a subframe. A group of four subframes comprise one frame. Each subframe has a unique 12-bit synchronization (synch) word identifying it as subframe 1, 2, 3, or 4. The synch words are the first word in each subframe. The data stream is "in synch" when successive synch words appear at 64-word intervals. Each data parameter (for example altitude, heading, airspeed) has a specifically assigned word and bit location within the subframe. Attachments I-1 to I-17 comprise the parameter information as supplied by the Boeing Commercial Airplane Group Douglas Products Division. A minimum of the last 25 hours of operational data are retained on the recording medium. This is accomplished by erasing the oldest data and replacing it with the newest.

Section II - Examination of Recorder

The recorder box was destroyed by the post impact fire. The outer sleeve of the flight data recorder showed extensive thermal damage (see figures 1 and 2). The underwater locator beacon was torn off and not recovered with the recorder (see figure 2). The outside of the armored enclosure and the circuit boards showed extensive thermal damage (see figures 3 and 4). The inside of the armored enclosure showed no evidence of thermal damage or impact damage (see figures 5 and 6). During tape removal, it was discovered that the magnetic tape was adhering slightly to the four heads (two erase heads and two recording/write heads) due to thermal exposure. Therefore, four small indentations were evident once the tape was removed.

Section III - Readout and Evaluation

The digital FDR data were transcribed from the magnetic tape media to hard disk for further analysis using the National Transportation Safety Board's readout

[1] All times are FDR subframe reference number in seconds.

equipment. The transcribed data were reduced from the recorded binary values (0's and 1's) to engineering units (for example feet, knots, degrees, etc.) using conversion formulas obtained from the Boeing Commercial Airplane Group Douglas Products Division (see attachments I-1 to I-17). The actual conversion is accomplished by an automated process that incorporates the National Transportation Safety Board's computers and associated software. The accident landing was located during the transcription.

Examination of the Recorded Binary Values (0's and 1')

Examination of the recorded binary values (0's and 1's) indicates the FDR was receiving data from the DFDAU up to and including word 34 of subframe 347. At word 35 of subframe 347, the FDR recorded 480 0's (the FDUA stopped sending data to the FDR) and then the FDR started recording 0's and 1's (the FDUA was re-initializing). Approximately 560 bits after the FDUA began re-initializing, the sync code identified with the first subframe was recorded and three full seconds (subframes 349, 350 and 351) of FDR data were recorded. At what should have been the synch code for subframe 352 was a non-synch code word and then the FDR recorded 35 words of 0's (the FDUA stopped sending data to the FDR). The next word was the beginning of the erase gap (this is where the FDR had erased the oldest data so to write the newest data). The erase gap was approximately 8 seconds long and then the oldest data began.

Left Brake Pedal Position

After reviewing the FDR data, the left brake pedal position indicated a negative 11.7 degrees offset from neutral position during flight mode. Therefore, 11.7 degrees was added to the left brake pedal position.

Right Brake Pressure Position

After reviewing the FDR data, the right brake pressure position indicated approximately positive 195 pounds per square inch (psia) offset from neutral position during flight mode. Therefore, 195 psia was subtracted to the right brake pressure position.

Section IV - Plots and Data Printout

The last 3 minutes (175 seconds to 355 seconds) of selected FDR data are presented in attachments III-1 to III-5 for the accident landing in graphical format. Selected FDR data in attachments IV-1 to IV-4 graphically show, in greater detail, the accident landing (335 seconds to 353 seconds). Attachments V-1 to V-27 comprise the tabular data for attachments III and IV. Lastly, attachments VI-1 to VI-3 contain a tabular listing of selected discrete parameters for the last 3 minutes (175 seconds to 355 seconds) for the accident landing. The cross hatched area in attachments III and

IV represent the data interruption that occurred between 347.55 seconds and 349 seconds.

[redacted]
Cassandra L. Johnson
Mechanical Engineer

Enclosures:

Attachments I-1 to I-17:	FDR Parameter Information
Attachments II-1 to II-3:	Pictures of the FDR
Attachments III-1 to III-5:	Last 3 Minutes of Selected FDR Data in Graphical Format
Attachments IV-1 to IV-4:	Last 18 Seconds of Selected FDR Data in Graphical Format
Attachments V-1 to V-27:	Selected FDR Data in Tabular Format for Attachments III and IV
Attachments VI-1 to VI-3:	Selected FDR Discrete Data in Tabular Format

Attachments I - FDR Parameter Information

MD-11 DFDR PARAMETERS

CONFIG ~~A1 & A2~~ A5 VERSION: 113093

PARA NO	PARAMETER TITLE	UNITS DISCRETE	RANGE MNEUMONICS	SLOPE	SMPL RATE	SUB/FR REPS	DFDR WORD	DFDR BITS	COMMENTS
	PERFORMANCE PARAMETERS								
016*	COMPUTED AIRSPEED	KNOTS	0/512	0.5	1/SEC	1234	10	3-12	
462*	GROUND SPEED	KNOTS	0/2048	2	1/SEC	1234	18	3-12	
001*	PRESSURE ALTITUDE	FEET	0/131072	1	1/SEC	1234,13	41,42	1-6,1-12	
006*	RADIO ALTITUDE 1	FEET	-30/4065	1	1/SEC	1 3	9	1-12	OFFSET=30 CNTS
007*	RADIO ALTITUDE 2	FEET	-30/4065	1	1/SEC	2 4	9	1-12	OFFSET=30 CNTS
300*	ROLL ATTITUDE	DEG	±180	.35156	2/SEC	1234	14	3-~~11~~12	+ ANR (RWD)
302*	PITCH ATTITUDE	DEG	±180	~~.35136~~.35156	4/SEC	1234	13	3-~~11~~12	+ ANU
139*	LEFT ANGLE OF ATTACK 1A	DEG	±90	.17578	1/2 SEC	1 3	11	3-12	+ ANU
140*	LEFT ANGLE OF ATTACK 1B	DEG	±90	.17578	1/2 SEC	2 4	11	3-12	+ ANU
141*	RIGHT ANGLE OF ATTACK 2A	DEG	±90	.17578	1/2 SEC	2 4	43	3-12	+ ANU
142*	RIGHT ANGLE OF ATTACK 2B	DEG	±90	.17578	1/2 SEC	1 3	43	3-12	+ ANU
304*	MAGNETIC HEADING	DEG	0/360	~~.35136~~.35156	1/SEC	1234	30	3-12	
305*	VERTICAL ACCELERATION	G'S	-3/6	.00229	8/SEC	1234	4	1-12	SEE APP I
306*	LATERAL ACCELERATION	G'S	±1.0	.00203	4/SEC	1234	5	3-12	SEE APP I
307*	LONGITUDINAL ACCELERATION	G'S	±1.0	.00203/532	4/SEC	1234	6	3-12	SEE APP I
003*	TOTAL AIR TEMPERATURE	DEG C	+256	.125	1/2 SEC	1 3	51	1-12	
314*	CENTER OF GRAVITY	%MAC	0/51.2	.1	1/64 SEC	4	26	4-12	10/733 (TELEDYNE)
314*	CENTER OF GRAVITY	%MAC	0/51.2	.1	1/64 SEC	4	26	3-12	10/733 (SUND)
782*	GROSS WEIGHT	KLBS	0/655.4	.160	1/64 SEC	4	26	1-12	9/773
850*	TOTAL FUEL QUANTITY	KLBS	0/409.6	.200	1/64 SEC	4	50	2-12	13/773

MD-11 DFDR PARAMETERS

CONFIG ~~A1 & A2~~ A5 — VERSION: 113093

PARA NO	PARAMETER TITLE	UNITS DISCRETE	RANGE MNEUMONICS	SLOPE	SMPL RATE	SUB/FR REPS	DFDR WORD	DFDR BITS	COMMENTS
	CONTROL SURFACES								
097*	ELEVATOR POSITION LEFT OB	DEG	±45	.08789	1/SEC	1234	64	3-12	+ ANU (TEU)
102*	ELEVATOR POSITION LEFT IB	DEG	±45	.08789	1/SEC	1234	16	3-12	+ ANU (TEU)
103*	ELEVATOR POSITION RIGHT OB	DEG	±45	.08789	1/SEC	1234	48	3-12	+ ANU (TEU)
096*	ELEVATOR POSITION RIGHT IB	DEG	±45	.08789	1/SEC	1234	32	3-12	+ ANU (TEU)
106*	STABILIZER POSITION 1	DEG	±45	-.0440	1/2 SEC	1 3	25	3-12	~~+ ANU (TEU)~~ + AND (TED)
107*	STABILIZER POSITION 2	DEG	±45	-.0440	1/2 SEC	2 4	25	3-12	~~+ ANU (TEU)~~ + AND (TED)
099*	AILERON POSITION LEFT OB	DEG	±45	.08789	1/SEC	1234	56	3-12	+ RWD (TED)
104*	AILERON POSITION LEFT IB	DEG	±45	.08789	1/SEC	1234	8	3-12	+ RWD (TED)
105*	AILERON POSITION RIGHT OB	DEG	±45	.08789	1/SEC	1234	40	3-12	+ RWD (TEU)
098*	AILERON POSITION RIGHT IB	DEG	±45	.08789	1/SEC	1234	24	3-12	+ RWD (TEU)
110*	SPOILER POSITION L3	DEG	-25/65	TABLE	1/2 SEC	1 3	17	3-12	+ TEU, SEE APP I
108*	SPOILER POSITION L5	DEG	-25/65	TABLE	1/2 SEC	2 4	17	3-12	+ TEU, SEE APP I
109*	SPOILER POSITION R3	DEG	-25/65	TABLE	1/2 SEC	2 4	49	3-12	+ TEU, SEE APP I
114*	SPOILER POSITION R5	DEG	-25/65	TABLE	1/2 SEC	1 3	49	3-12	+ TEU, SEE APP I
100*	LOWER RUDDER POSITION	DEG	±45	-.0879	1/SEC	1234	59	3-12	~~± ANR (TER)~~ + ANL (TEL)
101*	UPPER RUDDER POSITION	DEG	±45	-.0879	1/SEC	1234	27	3-12	~~± ANR (TER)~~ + ANL (TEL)
121*	FLAP POSITION LEFT OB	DEG	0/180	.17578	1/4 SEC	2	62	3-12	+ TED
120*	FLAP POSITION LEFT IB	DEG	0/180	.17578	1/4 SEC	1	62	3-12	+ TED
123*	FLAP POSITION RIGHT OB	DEG	0/180	.17578	1/4 SEC	3	62	3-12	+ TED
124*	FLAP POSITION RIGHT IB	DEG	0/180	.17578	1/4 SEC	4	62	3-12	+ TED
122*	SLAT DISAGREE	AGREE		DISAGR	1/SEC	1234	64	2	
135*	SLAT SENSOR LEFT 4A&B	TRANSIT TRANSIT RETRACT EXTEND			1/SEC	1234	8	1-2	MALU TYPE
136*	SLAT SENSOR LEFT 2A&B	TRANSIT TRANSIT RETRACT EXTEND			1/SEC	1234	40	1-2	MALU TYPE
137*	SLAT SENSOR RIGHT 4A&B	TRANSIT TRANSIT RETRACT EXTEND			1/SEC	1234	24	1-2	MALU TYPE

CONFIG A1~~-A~~-~~A2~~ A5 VERSION: 113093

PARA NO	PARAMETER TITLE	UNITS DISCRETE	RANGE	SLOPE MNEUMONICS	SMPL RATE	SUB/FR REPS	DFDR WORD	DFDR BITS	COMMENTS
138*	SLAT SENSOR RIGHT 2A&B	TRANSIT TRANSIT RETRACT EXTEND			1/SEC	1234	7	1-2	MALU TYPE
	MISC A/C CONFIGURATIONS PARAMETERS								
409	LOWER YAW DAMPER A	ON		OFF	1/2 SEC	1 3	54	2	
410	UPPER YAW DAMPER A	ON		OFF	1/2 SEC	1 3	54	1	
413	LOWER YAW DAMPER B	ON		OFF	1/2 SEC	2 4	54	1	
414	UPPER YAW DAMPER B	ON		OFF	1/2 SEC	2 4	54	2	
125*	CONFIG WARN FLAPS - T/O	LEGAL		ILLEGL	1/SEC	1	33	2	
127*	CONFIG WARN STAB OUT OF TRIM	INAC		ACTIVE	1/4 SEC	4	33	2	
128*	CONFIG WARN SPOILERS ARMED	UNARM		ARMED	1/4 SEC	3	33	2	
126	CONFIG WARN PARKING BRAKE SET	OFF		BRAKON	1/SEC	2	33	2	
	LANDING GEAR								
115*	NOSE GEAR COMPRESSED LEFT	NOTCOM		COMPRS	1/SEC	1234	16	1	14/773
116*	NOSE GEAR COMPRESSED RIGHT	NOTCOM		COMPRS	1/SEC	1234	16	2	15/773
422*	NOSE GEAR DOWN AND LOCKED	NOTLCK		DWNLCK	1/4 SEC	3	61	1	
423*	NOSE GEAR UNSAFE	SAFE		UNSAFE	1/4 SEC	4	61	1	
420*	LH GEAR DOWN AND LOCKED	NOTLCK		DWNLCK	1/4 SEC	1	61	1	
421*	LH GEAR UNSAFE	SAFE		UNSAFE	1/4 SEC	2	61	1	
424*	RH GEAR DOWN AND LOCKED	NOTLCK		DWNLCK	1/4 SEC	1	61	2	
425*	RH GEAR UNSAFE	SAFE		UNSAFE	1/4 SEC	2	61	2	
426*	CENTER GEAR DOWN AND LOCKED	NOTLCK		DWNLCK	1/4 SEC	3	61	2	
427*	CENTER GEAR UNSAFE	SAFE		UNSAFE	1/4 SEC	4	61	2	
131*	BRAKE PRESSURE RIGHT	PSIA	0/5000	4.8876	1/2 SEC	2 4	3	3-12	SEE APP I
132*	BRAKE PRESSURE LEFT	PSIA	0/5000	4.8876	1/2 SEC	2 4	35	3-12	SEE APP I
133*	BRAKE PEDAL POSITION RIGHT	DEGS	0/19.4	-.0868	1/4 SEC	1 3	3	3-12	SEE APP I
134*	BRAKE PEDAL POSITION LEFT	DEGS	0/19.4	-.0868	1/4 SEC	1 3	35	3-12	SEE APP I

MD-11 DFDR PARAMETERS

CONFIG ~~A1 A A2~~ A5 VERSION: 113093

PARA NO	PARAMETER TITLE	UNITS DISCRETE	RANGE MNEUMONICS	SLOPE	SMPL RATE	SUB/FR REPS	DFDR WORD	DFDR BITS	COMMENTS
ENGINES									
207	APU N1	%RPM	0/128	.5	1/64 SEC	4	26	5-12	SEE APP II
208	APU N2	%RPM	0/128	.5	1/64 SEC	4	42	5-12	SEE APP II
225*	THROTTLE RESOLVER ANGLE ENG 1	DEG	±180	.3512	1/SEC	1234	7	3-12	
226*	THROTTLE RESOLVER ANGLE ENG 2	DEG	±180	.3512	1/SEC	1234	31	3-12	
227*	THROTTLE RESOLVER ANGLE ENG 3	DEG	±180	.3512	1/SEC	1234	55	3-12	
194*	N1 ENGINE 1 (GE)	%RPM	0/128	0.125	1/SEC	1234	15	3-12	
195*	N1 ENGINE 2 (GE)	%RPM	0/128	0.125	1/SEC	1234	39	3-12	
196*	N1 ENGINE 3 (GE)	%RPM	0/128	0.125	1/SEC	1234	63	3-12	
200*	N1 ENGINE 1 (PW,RR)	%RPM	0/128	0.03125	1/64 SEC	4	58	1-12	3/773
201*	N1 ENGINE 2 (PW,RR)	%RPM	0/128	0.03125	1/64 SEC	4	58	1-12	4/773
202*	N1 ENGINE 3 (PW,RR)	%RPM	0/128	0.03125	1/64 SEC	4	50	1-12	5/773
231*	N2(PW,GE)/N3(RR) ENGINE 1	%RPM	0/128	0.125	1/2 SEC	1 3	2	3-12	
232*	N2(PW,GE)/N3(RR) ENGINE 2	%RPM	0/128	0.125	1/2 SEC	1 3	26	3-12	
233*	N2(PW,GE)/N3(RR) ENGINE 3	%RPM	0/128	0.125	1/2 SEC	1 3	50	3-12	
197*	THRUST EPR ENGINE 1 (PW,RR)	EPR	0/4	0.00391	1/SEC	1234	15	3-12	
198*	THRUST EPR ENGINE 2 (PW,RR)	EPR	0/4	0.00391	1/SEC	1234	39	3-12	
199*	THRUST EPR ENGINE 3 (PW,RR)	EPR	0/4	0.00391	1/SEC	1234	63	3-12	
219*	FUEL FLOW ENGINE 1	PPH	0/32768	8.0	1/64 SEC	4	58	1-12	8/773
220*	FUEL FLOW ENGINE 2	PPH	0/32768	8.0	1/64 SEC	4	58	1-12	9/773
221*	FUEL FLOW ENGINE 3	PPH	0/32768	8.0	1/64 SEC	4	58	1-12	10/773
222*	EGT ENGINE 1	DEG	0/2048	0.5	1/4 SEC	1	58	0-12	
223*	EGT ENGINE 2	DEG	0/2048	0.5	1/4 SEC	2	58	0-12	
224*	EGT ENGINE 3	DEG	0/2048	0.5	1/4 SEC	3	58	0-12	
182*	THRUST REVERSER ENGINE 1	STOWED UNLOCK DEPLOY DEPLOY			1/SEC	1234	11	1-2	
183*	THRUST REVERSER ENGINE 2	STOWED UNLOCK DEPLOY DEPLOY			1/SEC	1234	27	1-2	

MD-11 DFDR PARAMETERS

CONFIG A1 ~~& A2~~ A5 — VERSION: 113093

PARA NO	PARAMETER TITLE	UNITS DISCRETE	RANGE MNEUMONICS	SLOPE	SMPL RATE	SUB/FR REPS	DFDR WORD	DFDR BITS	COMMENTS
184*	THRUST REVERSER ENGINE 3	STOWED UNLOCK DEPLOY DEPLOY			1/SEC	1234	43	1-2	
209*	OIL QUANTITY ENGINE 1	QTS	0/256	1.0	1/64 SEC	4	50	5-12	0/773
210*	OIL QUANTITY ENGINE 2	QTS	0/256	1.0	1/64 SEC	4	50	5-12	1/773
211*	OIL QUANTITY ENGINE 3	QTS	0/256	1.0	1/64 SEC	4	50	5-12	2/773
212	OIL PRESSURE LOW ENGINE 1	NOTLOW		PRSLOW	1/SEC	1234	57	4	
213	OIL PRESSURE LOW ENGINE 2	NOTLOW		PRSLOW	1/SEC	1234	57	5	
214	OIL PRESSURE LOW ENGINE 3	NOTLOW		PRSLOW	1/SEC	1234	57	6	
279	OIL TEMPERATURE ENGINE 1	DEG	±2048	1	1/64 SEC	4	42	1-12	0/773
280	OIL TEMPERATURE ENGINE 2	DEG	±2048	1	1/64 SEC	4	42	1-12	1/773
281	OIL TEMPERATURE ENGINE 3	DEG	±2048	1	1/64 SEC	4	42	1-12	2/773
286*	OIL PRESSURE ENGINE 1	PSIA	0/512	4	1/64 SEC	4	26	6-12	0/773
287*	OIL PRESSURE ENGINE 2	PSIA	0/512	4	1/64 SEC	4	26	6-12	1/773
288*	OIL PRESSURE ENGINE 3	PSIA	0/512	4	1/64 SEC	4	26	6-12	2/773
	ENGINE CONFIG AND ALERTS								
042	FADEC CHANNEL SELECT ENG 1	CHNL A		CHNL B	1/SEC	1234	32	1	
043	FADEC CHANNEL SELECT ENG 2	CHNL A		CHNL B	1/SEC	1234	56	1	
044	FADEC CHANNEL SELECT ENG 3	CHNL A		CHNL B	1/SEC	1234	64	1	
380	EAD - FMC THRUST MODE MATRIX	NONE	0/15	1	1/64 SEC	4	50	1	12/773
	MATRIX STATE VALUES:	0 = NONE OR IDLE			3 = G/A				
		4 = T/O			5 = ALT T/O				
		6 = T/O FLEX			8 = CLIMB				
		10= CRUISE			11= MAX CONT TRUST				
381	EAD - FUEL OFF ENGINE 3	CLOSED		OPEN	1/64 SEC	4	50	4	12/773
382	EAD - FUEL OFF ENGINE 2	CLOSED		OPEN	1/64 SEC	4	50	3	12/773
383	EAD - FUEL OFF ENGINE 1	CLOSED		OPEN	1/64 SEC	4	50	2	12/773

MD-11 DFDR PARAMETERS

CONFIG ~~A1 & A2~~ A5 VERSION: 113093

PARA NO	PARAMETER TITLE	UNITS DISCRETE	RANGE MNEUMONICS	SLOPE	SMPL RATE	SUB/FR REPS	DFDR WORD	DFDR BITS	COMMENTS
282	APU FIRE WARN	NOFIRE		ENGFIR	1/2 SEC	1 3	57	7	
283	FIRE WARN ENGINE 1	NOFIRE		ENGFIR	1/SEC	1234	57	1	
284	FIRE WARN ENGINE 2	NOFIRE		ENGFIR	1/SEC	1234	57	2	
285	FIRE WARN ENGINE 3	NOFIRE		ENGFIR	1/SEC	1234	57	3	
	SYSTEMS-CONFIG & DISCRETES								
289*	HYDRAULIC 1 PRESS LOW WARN	P<2500		P>2500	1/SEC	1234	59	1	
290*	HYDRAULIC 2 PRESS LOW WARN	P<2500		P>2500	1/SEC	1234	59	2	
291*	HYDRAULIC 3 PRESS LOW WARN	P<2500		P>2500	1/SEC	1234	34	1	
320*	HYDRAULIC OIL QUANTITY ENG 1	QTS	0/16	.125	1/64 SEC	4	42	6-12	0/773
321*	HYDRAULIC OIL QUANTITY ENG 2	QTS	0/16	.125	1/64 SEC	4	50	6-12	0/773
322*	HYDRAULIC OIL QUANTITY ENG 3	QTS	0/16	.125	1/64 SEC	4	58	6-12	0/773
315	CABIN ALTITUDE	FEET	±65536	32	1/64 SEC	4	50	1-12	5/773
017	AIR-CONDITIONING PACK 1	OFF		ON	1/4 SEC	1	19	1	
018	AIR-CONDITIONING PACK 2	OFF		ON	1/4 SEC	2	19	1	
019	AIR-CONDITIONING PACK 3	OFF		ON	1/4 SEC	3	19	1	
028	AIR BLEED 1 OFF	ON		OFF	1/4 SEC	1	19	2	
029	AIR BLEED 2 OFF	ON		OFF	1/4 SEC	2	19	2	
030	AIR BLEED 3 OFF	ON		OFF	1/4 SEC	3	19	2	
728	ANTI-ICE WING VALVE	ON		OFF	1/4 SEC	4	49	1	
798	ANTI-ICE ENGINE 1 VALVE	ON		OFF	1/4 SEC	1	49	1	
799	ANTI-ICE ENGINE 2 VALVE	ON		OFF	1/4 SEC	2	49	1	
800	ANTI-ICE ENGINE 3 VALVE	ON		OFF	1/4 SEC	3	49	1	
026	TAT PROBE HEAT	OFF		ON	1/4 SEC	12	34	2	
296	CAPTAIN PITOT STATIC HEAT	ON		OFF	1/4 SEC	1	34	2	
297	F/O PITOT STATIC HEAT	ON		OFF	1/4 SEC	3	34	2	
298	AUXILIARY PITOT STATIC HEAT	ON		OFF	1/4 SEC	4	34	2	

MD-11 DFDR PARAMETERS

CONFIG ~~A1 & A2~~ A5 — VERSION: 113093

PARA NO	PARAMETER TITLE	UNITS DISCRETE	RANGE MNEUMONICS	SLOPE	SMPL RATE	SUB/FR REPS	DFDR WORD	DFDR BITS	COMMENTS
	AVIONICS-CONFIGS								
170	ILS-1/MLS-1 SELECT	MLS-1		ILS-1	1/SEC	1234	49	2	
171	ILS-2/MLS-2 SELECT	MLS-2		ISL-2	1/SEC	1234	53	2	
172	CAPTAIN FMC SELECT	ON 1		ON 2	1/4 SEC	1	56	2	
173	F/O FMC SELECT	ON 1		ON 2	1/4 SEC	2	56	2	
174	FLIGHT DIRECTOR ACTIVE (FCC)	INAC		ACTIVE	1/4 SEC	1234	62	1	
175	CAPTAIN FLIGHT DIRECTOR (FCC)	ON 1		ON 2	1/4 SEC	4	63	1	
176	F/O FLIGHT DIRECTOR (FCC)	ON 1		ON 2	1/4 SEC	4	63	2	
177	CAPTAIN IRU SELECT	ON 1		ON 3	1/4 SEC	3	63	1	
178	F/O IRU SELECT	ON 2		ON 3	1/4 SEC	3	63	2	
179	CAPTAIN DEU SELECT SWITCH	DEU2 DEU3 DEU1 DISALW=DISALLOW			1/4 SEC	2	49	1-2	
180	F/O DEU SELECT SWITCH	DEU2 DEU3 DEU1 DISALW			1/4 SEC	1234	49	1-2	
325	CAPTAIN BARO SET	INHG	0/4095	1	1/64 SEC	4	50	1-12	11/773
332	F/O BARO SET	INHG	0/4095	1	1/64 SEC	4	50	1-12	14/773
330	SELECTED HEADING	DEG	±180	.08789	1/64 SEC	4	26	1-12	14/773
331	SELECTED FLIGHT PATH ANGLE	DEG	±90	.04394	1/64 SEC	4	42	1-12	14/773
313	SELECTED RUNWAY HEADING	DEG	±180	.0879	1/64 SEC	4	26	1-12	0/773
316	SELECTED ALTITUDE	FEET	0/65536	32	1/64 SEC	4	26	1-12	6/773
317	SELECTED AIRSPEED	KNOTS	0/512	.125	1/64 SEC	4	42	1-12	6/773
318	SELECTED BARO MINIMUM (DH) #1	FEET	±65536	32	1/64 SEC	4	50	1-12	6/773
319	SELECTED BARO MINIMUM (DH) #2	FEET	±65536	32	1/64 SEC	4	58	1-12	6/773

MD-11 DFDR PARAMETERS

CONFIG ~~A1 & A2~~ A5 — VERSION: 113093

PARA NO	PARAMETER TITLE	UNITS / DISCRETE	RANGE / MNEUMONICS	SLOPE	SMPL RATE	SUB/FR REPS	DFDR WORD	DFDR BITS	COMMENTS
AVIONICS-FLIGHT MODE ANNUCIATOR DISPLAY									
147	FMA DISPLAY FORMAT ROLL ARMED	-			1/SEC	1234	23	10-12	MALU TYPE
		NODISP = NO DISPLAY			NAVARM = NAV ARMED				
		VORARM = VOR ARMED			LOCARM = LOCALIZER ARMED				
		LNDARM = LAND ARMED							
148	FMA DISPLAY FORMAT ROLL	-			1/SEC	1234	23	6-9	MALU TYPE
		NODISP			NAV1				
		NAV2			VOR1				
		VOR2			VOR1CR = VOR1 CRUISE				
		VOR2CR = VOR2 CRUISE			LOCONL = LOCALIZER ONLY				
		LOCWHT = LOCALIZER WHITE			LOCGRN = LOCALIZER GREEN				
		ROLWT = ROLL WHITE			ROLLGN = ROLL GREEN				
		T/O			HEADING				
		TRACK			ALNWH = ALIGN WHITE				
		ALNGRN = ALIGN GREEN							
149	FMA DISPLAY FORMAT SPEED	-			1/SEC	1234	23	1-4	MALU TYPE
		NODISP			PTCH/W = PITCH WHITE				
		PTCH/M = PITCH MAGENTA			TRST/M = THRUST WHITE				
		TRST/M = THRUST MAGENTA			RET/W = RETARD WHITE				
		IDLE/M = IDLE THRUST MAGENTA			WIND/W = WINDSHEAR WHITE				
151	FMA DISPLAY SPEED FLASHING	NOFLSH	FLASH		1/SEC	1234	31	2	
153	FMA DISPLAY ROLL FLASH	NOFLSH	FLASH		1/SEC	1234	30	2	
155	FMA DISPLAY VERTICAL	NOFLSH	FLASH		1/SEC	1234	45	2	
156	FMA DISPLAY VERTICAL ALERT	NODISP	ALERT		1/SEC	1234	46	1	
157	FMA DISPLAY LAND ARMED	NODISP	LNDARM		1/SEC	1234	46	2	
158	FMA DISPLAY GND PROX	NODISP	DISPLY		1/SEC	1234	55	1	
159	FMA DISPLAY PROF	NODISP	DISPLY		1/SEC	1234	55	2	

CONFIG ~~A1 & A2~~ A5 VERSION: 113093

PARA NO	PARAMETER TITLE	UNITS RANGE SLOPE DISCRETE MNEUMONICS	SMPL RATE	SUB/FR REPS	DFDR WORD	DFDR BITS	COMMENTS
160	FMA DISPLAY ASP ENGAGED	NODISP EGD/WT	1/SEC	1234	39	1	
161*	FMA DISPLAY FORMAT LAND MODE	-	1/SEC	1234	47	1-12	
		NODISP					
		SINGLD = SINGLE LAND					
		DUALLD = DUAL LAND					
		APPR = APPROACH					
162*	FMA DISPLAY FORMAT VERTICAL	-	1/SEC	1234	47	8-10	MALU TYPE
		NODISP		CLBWHT = CLIMB THRUST WHITE			
		CLBMG = CLIMB THRUST MAGENTA		G/SWHT = GLIDE SLOPE WHITE			
		G/SGRN = GLIDE SLOPE GREEN		G/AWHT = GO AROUND WHITE			
		G/AMAG = G/A MAGENTA		FLAREW = FLARE WHITE			
		FLAREG = FLARE GREEN		FPA = FPA WHITE			
		HOLDWT = HOLD WHITE		HOLDMG = HOLD MAGENTA			
		IDLECP = IDLE CLAMP		IDLEMG = IDLE CLAMP MAGENTA			
		PROF/M = PROF MAGENTA		ROLL/W = ROLLOUT WHITE			
		ROLL/G = ROLL OUT GREEN		T/OTHR = T/O THRUST WHITE			
		T/OCLW = T/O CLAMP WHITE		T/OCLM = T/O CLAMP MAGENTA			
		V/SWHT = WIND SHEAR WHITE		V/SMAG = VERTICAL SPEED MAGENTA			
		WIND/R = WIND SHEAR RED		MCTWHT = MCT WHITE			
		MCTMAG = MCT THRUST MAGENTA		G/A TW = GO AROUND THRUST WHITE			
		G/A TM = G/A THRUST MAGENTA		CRZ TW = CRUISE THRUST WHITE			
		CRZ TM = CRUISE THRUST MAGENTA		T/O TM = T/O THRUST MAGENTA			
163*	FMA DISPLAY FORMAT AUTO THROTTLE	-	1/SEC	1234	47	4-5	MALU TYPE
		NODISP		ATSWHT = AUTO THROTTLE SYS WHITE			
		ATSAMB = AUTO THRTL SYS AMBER		ASTRED = AUTO THRTL SYS RED			
164*	FMA DISPLAY FORMAT AUTO PILOT	-	1/SEC	1234	47	1-3	MALU TYPE
		NODISP		AP1			
		AP2		AP			
		APOFFW = AUTO PILOT OFF WHITE		APOFFA = AUTO PILOT OFF AMBER			
		APOFFR = AUTO PILOT OFF RED					

MD-11 DFDR PARAMETERS

CONFIG ~~A1 & A2~~ A5 — VERSION: 113093

PARA NO	PARAMETER TITLE	UNITS DISCRETE	RANGE MNEUMONICS	SLOPE	SMPL RATE	SUB/FR REPS	DFDR WORD	DFDR BITS	COMMENTS
	AVIONICS-MISC DISCRETES								
023*	TCAS DISPLAY MATRIX	OTHER STBY TAONLY TA/RA			1/SEC	1234	21,13	1-2,2	MALU TYPE
024*	TCAS SENSITIVITY LEVEL	SL	0/7	1	1/SEC	1234	13,5	1,1-2	MALU TYPE
031	EMERGENCY LIGHTS DISARMED	ARMED		DISARMED	1/4 SEC	4	19	1	
|040	CAPT PVD LEFT	ON		OFF	1/SEC	1234	29	1	**DELETED**
|041	F/O PVD RIGHT	ON		OFF	1/SEC	1234	29	2	**DELETED**
	AVIONICS-NAV								
308*	LATITUDE POSITION	DEG	±180	.00137	1/4 SEC	2	42,51	1-12,1-6	
309*	LONGITUDINAL POSITION	DEG	±180	.00137	1/4 SEC	2	50,51	1-12,7-12	
323*	TRUE WIND DIRECTION	DEG	0/360	.08789	1/64 SEC	4	42	1-12	9/773
324*	WIND SPEED	KNOTS	0/256	.0625	1/64 SEC	4	50	1-12	9/773
310*	NAV FREQUENCY 1	MHZ	0/4095	1	1/64 ~~1/4~~ SEC	4	26	1-12	VAL*10K=MHZ,3/773
311*	NAV FREQUENCY 2	MHZ	0/4095	1	1/64 ~~1/4~~ SEC	4	~~42~~ 26	1-12	VAL*10K=MHZ,3/773
478*	DRIFT ANGLE	DEG	±180	.35156	1/4 SEC	1234	19	3-12	
328*	DME 1 DISTANCE	NAUT MI	0/512	.125	1/64 ~~1/4~~ SEC	4	~~26~~ 42	1-12	13/773
329*	DME 2 DISTANCE	NAUT MI	0/512	.125	1/64 ~~1/4~~ SEC	4	42	1-12	13/773
405*	LOCALIZER DEVIATION 1	DDM	±0.4	.00078	1/2 SEC	1 3	33	3-12	DDM = DIFF IN
406*	LOCALIZER DEVIATION 2	DDM	±0.4	.00078	1/2 SEC	2 4	33	3-12	DEPTH MODULATION
407*	GLIDESLOPE DEVIATION 1	DDM	±0.8	.00156	1/2 SEC	1 3	34	3-12	
408*	GLIDESLOPE DEVIATION 2	DDM	±0.8	.00156	1/2 SEC	2 4	34	3-12	
411*	OUTER MARKER BEACON	OFF		ON	1/SEC	1234	10	1	
412*	MIDDLE MARKER BEACON	OFF		ON	1/SEC	1234	10	2	

MD-11 DFDR PARAMETERS

CONFIG ~~A1 & A2~~ A5 — VERSION: 113093

PARA NO	PARAMETER TITLE	UNITS RANGE DISCRETE	SLOPE MNEUMONICS	SMPL RATE	SUB/FR REPS	DFDR WORD	DFDR BITS	COMMENTS
	AVIONICS-NAVIGATION DISPAY							
370	ND - MAP MODE	NOTSEL	MAPSEL	1/64 SEC	4	26	1	12/773
371	ND - VOR MODE	NOTSEL	VORSEL	1/64 SEC	4	26	2	12/773
372	ND - APPR MODE	NOTSEL	APRSEL	1/64 SEC	4	26	3	12/773
373	ND - PLAN MODE	NOTSEL	PLNSEL	1/64 SEC	4	26	4	12/773
374	ND - WX OFF	WX ON	OFF	1/64 SEC	4	26	5	12/773
375	ND - MAP FAIL	OK	FAIL	1/64 SEC	4	26	6	12/773
376	ND - NO PLAN MODE	PLAN	NOPLAN	1/64 SEC	4	26	7	12/773
377	ND - CDI FAIL	OK	FAIL	1/64 SEC	4	26	8	12/773
378	ND - HDG FAIL	OK	FAIL	1/64 SEC	4	26	9	12/773
379	ND - HDG MISCOMPARE	OK	MISCMP	1/64 SEC	4	26	10	12/773
384	ND - POSITION MISCOMPARE	OK	MISCMP	1/64 SEC	4	26	11	12/773
	AVIONICS-PRIMARY FLIGHT DISPLAY							
350	PFD - FT/METE SELECT	FEET	METER	1/64 SEC	4	26	1	4/773
351	PFD - HDG/TRACK SELECT	HDG	TRACK	1/64 SEC	4	26	2	4/773
352	PFD - IAS/MACH SELECT	IAS	MACH	1/64 SEC	4	26	3	4/773
353	PFD - V/S/FPA SELECT	V/S	FPA	1/64 SEC	4	26	4	4/773
354	PFD - MAG/TRU SELECT	MAG	TRU	1/64 SEC	4	26	5	4/773
355	PFD - IN/HP SELECT	IN	HP	1/64 SEC	4	26	6	4/773
356	PFD - IAS MISCOMPARE	OK	MISCOM	1/64 SEC	4	42	1	4/773
357	PFD - ALT MISCOMPARE	OK	MISCOM	1/64 SEC	4	42	2	4/773
358	PFD - ATT MISCOMPARE	OK	MISCOM	1/64 SEC	4	42	3	4/773
359	PFD - HDG MISCOMPARE	OK	MISCOM	1/64 SEC	4	42	4	4/773
360	PFD - ATT FAIL	OK	FAIL	1/64 SEC	4	42	5	4/773
361	PFD - HDG FAIL	OK	FAIL	1/64 SEC	4	42	6	4/773
362	PFD - FD FAIL	OK	FAIL	1/64 SEC	4	42	7	4/773
363	PFD - AIRSPEED FAIL	OK	FAIL	1/64 SEC	4	42	8	4/773
364	PFD - MACH FAIL	OK	FAIL	1/64 SEC	4	42	9	4/773
365	PFD - ALT FAIL	OK	FAIL	1/64 SEC	4	42	10	4/773
366	PFD - VERT SPEED FAIL	OK	FAIL	1/64 SEC	4	42	11	4/773

MD-11 DFDR PARAMETERS

CONFIG ~~A1 & A2~~ A5 — VERSION: 113093

PARA NO	PARAMETER TITLE	UNITS RANGE DISCRETE	SLOPE MNEUMONICS	SMPL RATE	SUB/FR REPS	DFDR WORD	DFDR BITS	COMMENTS
AVIONICS-RADIOS								
400*	VHF 1 KEYING	XMIT	RECVD	1/SEC	1234	14	1	
401*	VHF 2 KEYING	XMIT	RECVD	1/SEC	1234	14	2	
402*	VHF 3 KEYING	XMIT	RECVD	1/SEC	1234	30	1	
403*	HF 1 KEYING	XMIT	RECVD	1/SEC	1234	22	1	
404*	HF 2 KEYING	XMIT	RECVD	1/SEC	1234	22	2	
AVIONICS-SYSTEM DISPLAY								
340	SYSTEM DISPLAY FORMAT - STATUS	0\15	1	1/SEC	4	50	1-4	4/773
	MATRIX STATE VALUES:	0 = INVALD		1 = SEC ENG				
		2 = HYDRAULIC		3 = G/A				
		4 = T/O		5 = ALT T/O				
		6 = T/O FLEX		7 = MISC PAGE				
		8 = STATUS		9 = CONSEQUENCES				
		10= NAV						
341	SYSTEM DISPLAY - DU 1 OFF	DU1 ON	DU1OFF	1/64 SEC	4	50	5	4/773
342	SYSTEM DISPLAY - DU 2 OFF	DU2 ON	DU2OFF	1/64 SEC	4	50	6	4/773
343	SYSTEM DISPLAY - DU 3 OFF	DU3 ON	DU3OFF	1/64 SEC	4	50	7	4/773
344	SYSTEM DISPLAY - DU 4 OFF	DU4 ON	DU4OFF	1/64 SEC	4	50	8	4/773
345	SYSTEM DISPLAY - DU 5 OFF	DU5 ON	DU5OFF	1/64 SEC	4	50	9	4/773
346	SYSTEM DISPLAY - DU 6 OFF	DU6 ON	DU6OFF	1/64 SEC	4	50	10	4/773
AVIONICS-WARNINGS								
295*	MASTER WARN	NOTSET	SET	1/SEC	1234	57	10	
004	OVERSPEED WARNING	NOWARN	OVRSPD	1/SEC	1234	17	1	
005	STALL WARNING	NOWARN	STALL	1/SEC	1234	17	2	
010	DECISION HEIGHT WARNING	OFF	ON	1/SEC	1234	33	1	
013*	GPWS PULLUP WARN	INAC	ACTIVE	1/SEC	1234	25	1	

MD-11 DFDR PARAMETERS

CONFIG ~~A1 A2~~ A5 — VERSION: 113093

PARA NO	PARAMETER TITLE	UNITS DISCRETE	RANGE MNEUMONICS	SLOPE	SMPL RATE	SUB/FR REPS	DFDR WORD	DFDR BITS	COMMENTS
797	FORWARD CARGO HEAT	NOHEAT		HEAT	1/4 SEC	1	57	9	
292	AFT CARGO HEAT WARN	SMOKE		HEAT	1/4 SEC	2	57	9	
293	CABIN SMOKE WARN	NOSMOK		SMOKE	1/4 SEC	3	57	9	
294	LAVATORY SMOKE WARN	NOSMOK		SMOKE	1/4 SEC	4	57	9	
027	CABIN PRESSURE WARN	>10KFT		<10KFT	1/4 SEC	1234	57	8	
011	LSAS RIGHT INBOARD FAIL	NOFAIL		FAILED	1/SEC	1234	6	1	
012	LSAS RIGHT OUTBOARD FAIL	NOFAIL		FAILED	1/SEC	1234	3	2	
014	LSAS LEFT INBOARD FAIL	NOFAIL		FAILED	1/SEC	1234	6	1	
015	LSAS LEFT OUTBOARD FAIL	NOFAIL		FAILED	1/SEC	1234	3	2	
MISC									
333*	A/C IDENTIFICATION	N/A	0/255	1	1/SEC	4	26	5-4	15/773
327	FLEET IDENTIFICATION	N/A	0/15	1	1/SEC	4	26	1-4	15/773
780	DAY/MONTH	DAY/MO	0/4095	1	1/SEC	4	26	1-12	11/773
889*	GMT (HOURS) GMT (MINUTES)	HR:MI:SEC			8/SEC	4	2,42	1-12,1-7	11/773
773	SUPER FRAME COUNTER	COUNTS	0/15	1	1/4 SEC	4	2	1-4	
776*	SYNCH WORD	COUNTS	0/1000	TABLE	1/SEC	1234	1	1-12	

H-13

Explantions of Notes:

X/773: Denotes Sub-Subcom parameters. This sequence specifies the value (x) of the super frame counter (parameter 773). Ex: 10/773 == Super Frame Counter is 10 for this parameter.

MALU TYPE: Mode Annunciator Logic Unit multi-bit discrete composed of individual discrete bits from the annunciator logic unit that together relate to alpha-numeric expression. In cal, value-expression is list left to right starting at 0.

Ex: [0=] NODISP [1=]AP1
[2=] AP2 [3=]APOFF

APPENDIX I
ATTACHMENT - CLARIFICATION OF CALIBRATION INFORMATION

	INPUT SOURCE	PARAMETER TITLE	RANGE (EU)	SIGNIF BITS	RESOLUTION (EU/CNT)	OFFSET (CNTS)	COMMENTS
1	Tri-Axial Accel	Vertical Accel	-3.375/6.0	12	0.002289	1475	-3.375 G=0VDC*, 6 G = 5VDC
2	Tri-Axial Accel	Lateral Accel	-1.083/1.0	10	0.0020345	532	-1.083 G=0VDC*, 1 G = 5VDC
13	Tri-Axial Accel	Long Accel	-1.083/1.0	10	0.0020345	532	-1.083 G=0VDC*, 1 G = 5VDC
8	Rt Brk Pdl Pos Xmtr	Rt Brk pdl pos	0/19.4	10	~~.08689~~ +.08681	~~511~~ 512	OATP TXR8300 for offset
9	Lft Brk Pdl Pos Xmtr	Lft Brk pdl pos	0/19.4	10	~~.08689~~ +.08681	~~511~~ 512	OATP TXR8300 for offset
	Rt Brk Pdl Xducer	Rt Brk Press	0/5000	10	4.8876	0	0 Psia = 0V, 5000 Psia= 5V
	Lft Brk Pdl Xducer	Lft Brk Press	0/5000	10	4.8876	0	0 Psia = 0V, 5000 Psia= 5V
	Position Xmiter	Spoiler Pos L3	-25/65	10	Table	-	
	Position Xmiter	Spoiler Pos L5	-25/65	10	Table	-	
	Position Xmiter	Spoiler Pos R3	-25/65	10	Table	-	
	Position Xmiter	Spoiler Pos r5	-25/65	10	Table	-	

* extrapolated from the DFDAU analog input section of Report K1521 Rev G

CALCULATIONS:

Accelerometers:

Resolution = (|high_range| + |low_range|)/2^n, where n = sig bits

Offset = (0 - e.u.0VDC)/Resolution

Example:

Vertical Accel resolution = (6.0 + 3.375)/4096 = 0.002289

Vertical Accel offset = (0 - - 3.375)/.002289 = 1475

APPENDIX II
ERROR MESSAGES AND CLARIFICATIONS

PARA NO	TITLE	EXPLANATIONS & MESSAGES
XXX*		PARAMETERS WHOSE PARAMETER NUMBER IS FOLLOWED BY AN ASTERIC "*" ARE THE "FAA REQUIRED PARAMETERS" CALLED OUT ON THE CURRENT AAO.
207 208	APU N1 APU N2	BOTH APU N-SPEEDS WILL DISPLAY AN ALTERNATING VALUE OF 0 AND 54 AT FOUR SECOND INTERVALS WHEN THE APU IS OFF. THIS CORRESPONDS TO THE "NO DATA" MESSAGE FROM THE DFDAU AND IS THEREFORE NOT AN INDICATION OF AN ANOMALY WITH THE APU.
100	LOWER RUDDER POSITION	OCT 312 FCC-1. THE SIGN CONVENTION IS REVERESED FROM NORMAL FLIGHT TEST CONVENTION OF UP & TO THE RIGHT IS POSITIVE. FOR THIS PARAMETER, A/C NOSE LEFT (SURFACE TEL) IS A POSITIVE DEFLECTION.
101	UPPER RUDDER POSITION	OCT 312 FCC-2. THE SIGN CONVENTION IS REVERESED FROM NORMAL FLIGHT TEST CONVENTION OF UP & TO THE RIGHT IS POSITIVE. FOR THIS PARAMETER, A/C NOSE LEFT (SURFACE TEL) IS A POSITIVE DEFLECTION.
106	STABILIZER POSITION 1	OCT 315 FCC-1. THE SIGN CONVENTION IS REVERESED FROM NORMAL FLIGHT TEST CONVENTION OF UP & TO THE RIGHT IS POSITIVE. FOR THIS PARAMETER, A/C NOSE DOWN (SURFACE TED) IS A POSITIVE DEFLECTION. NOTE THAT THIS IS A DIFFERENT CONVENTION THAN THE ELEVATORS WHICH FOLLOW THE CONVENTIONAL SYSTEM OF POSTIVE A/C NOSE UP (SURFACE TEU).
107	STABILILER POSITION 2	OCT 315 FCC-2. THE SIGN CONVENTION IS REVERESED FROM NORMAL FLIGHT TEST CONVENTION OF UP & TO THE RIGHT IS POSITIVE. FOR THIS PARAMETER, A/C NOSE DOWN (SURFACE TED) IS A POSITIVE DEFLECTION. NOTE THAT THIS IS A DIFFERENT CONVENTION THAN THE ELEVATORS WHICH FOLLOW THE CONVENTIONAL SYSTEM OF POSITIVE A/C NOSE UP (SURFACE TEU).

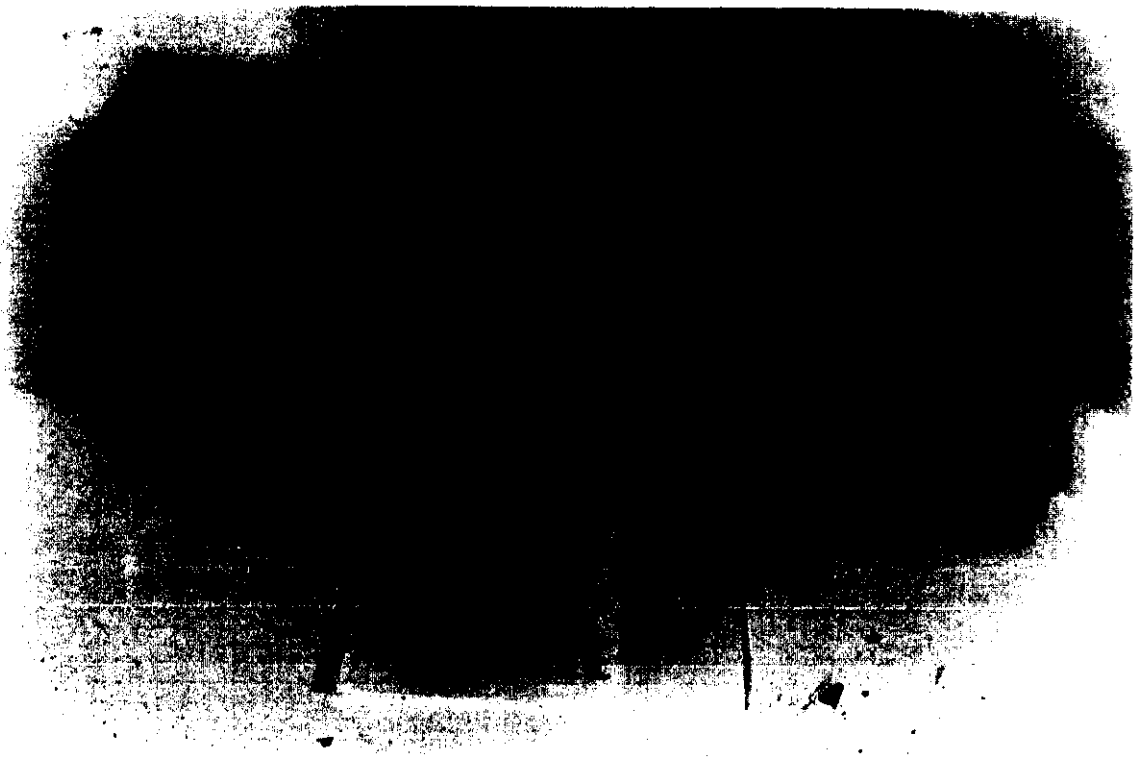


Figure 1. Flight Data Recorder With the Outer Sleeve

Figure 2. Flight Data Recorder With the Outer Sleeve

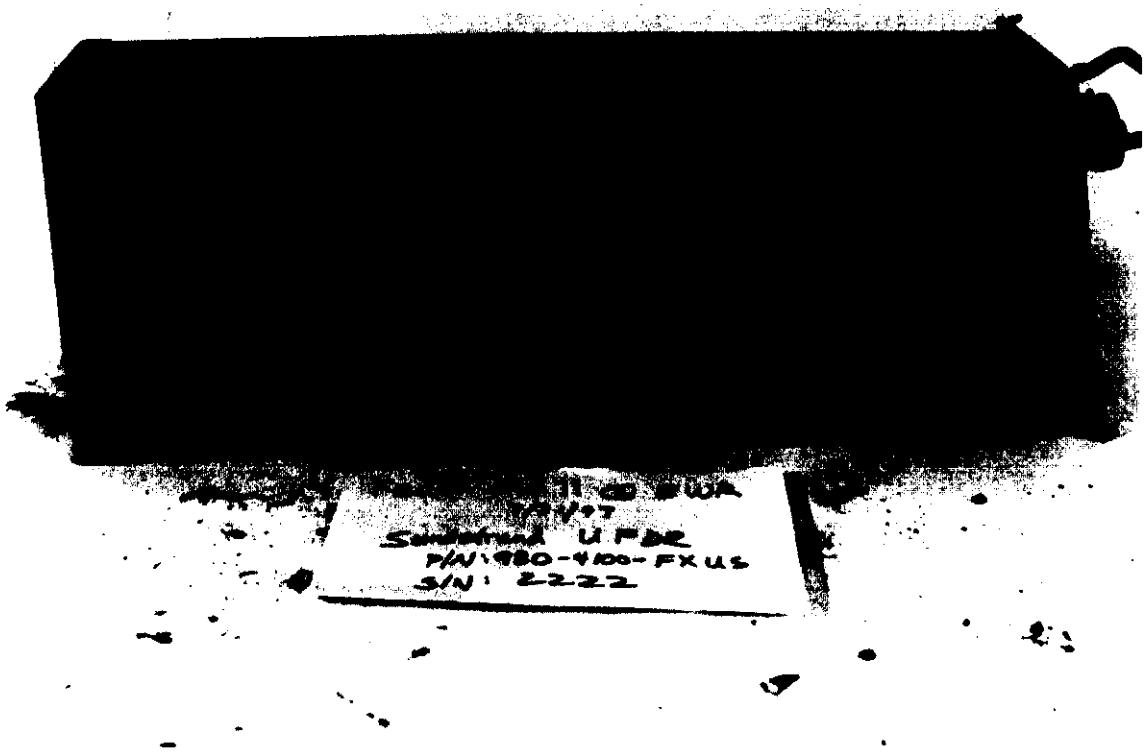


Figure 3. Flight Data Recorder Without the Outer Sleeve

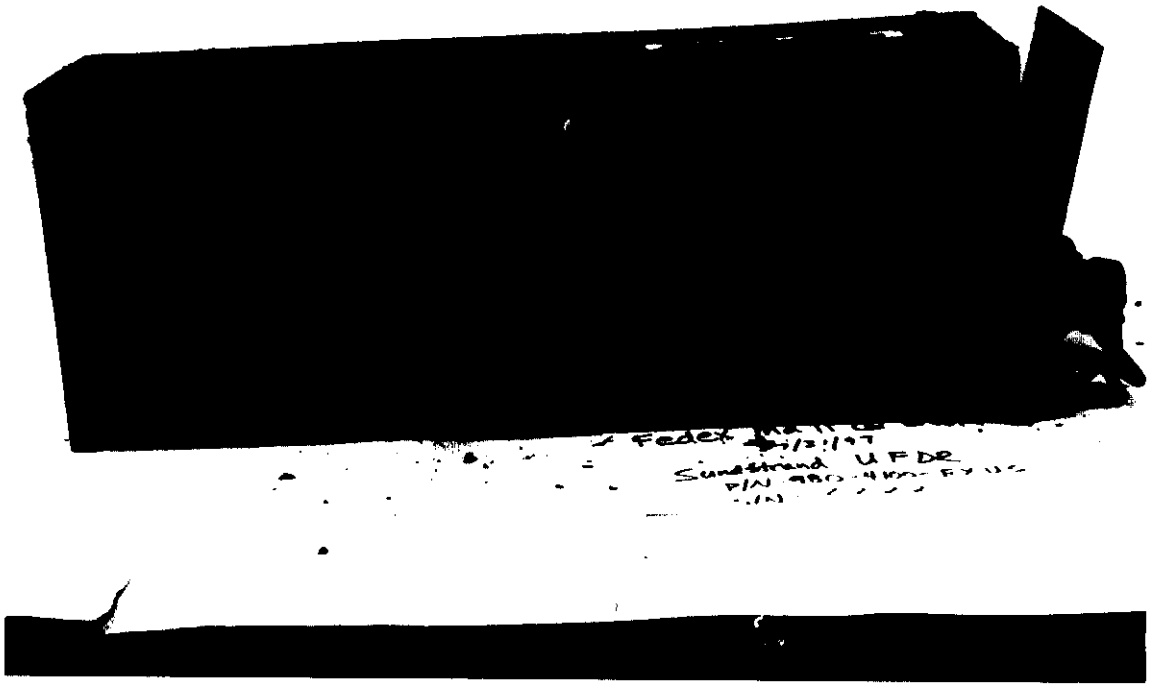


Figure 4. Flight Data Recorder Without the Outer Sleeve

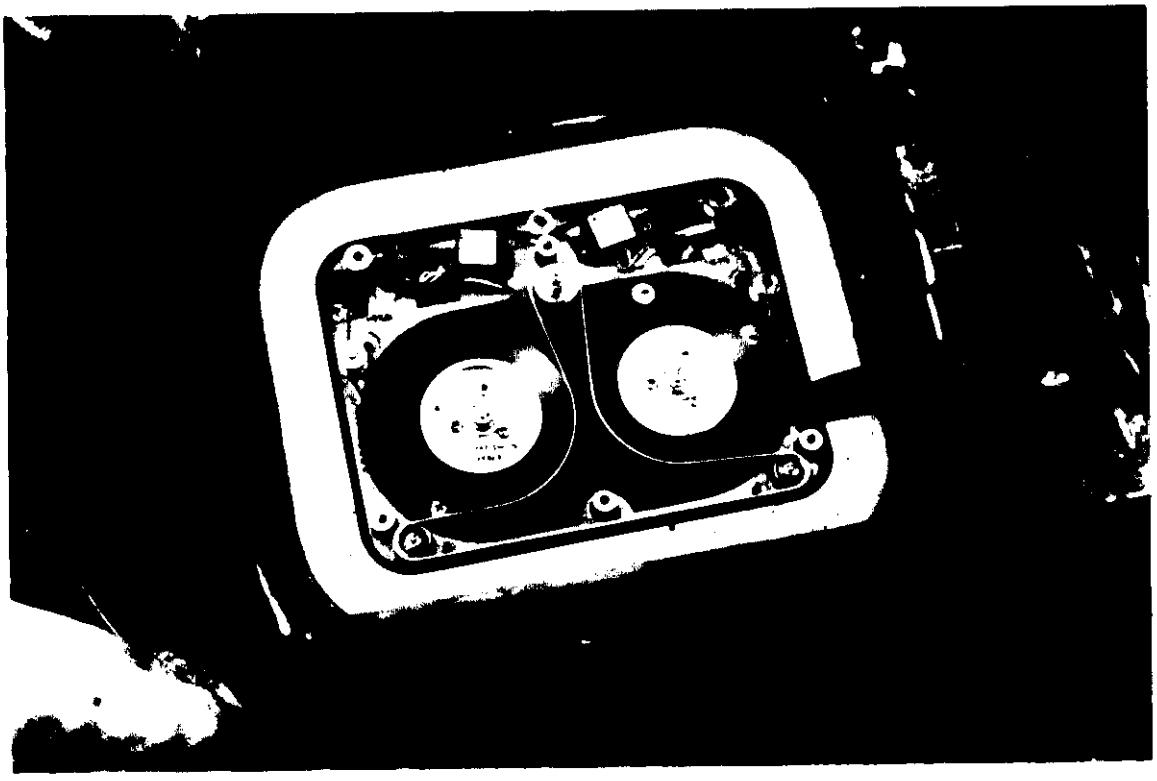


Figure 5. Inside the Bottom Half of the Flight Data Recorder's Armored Enclosure

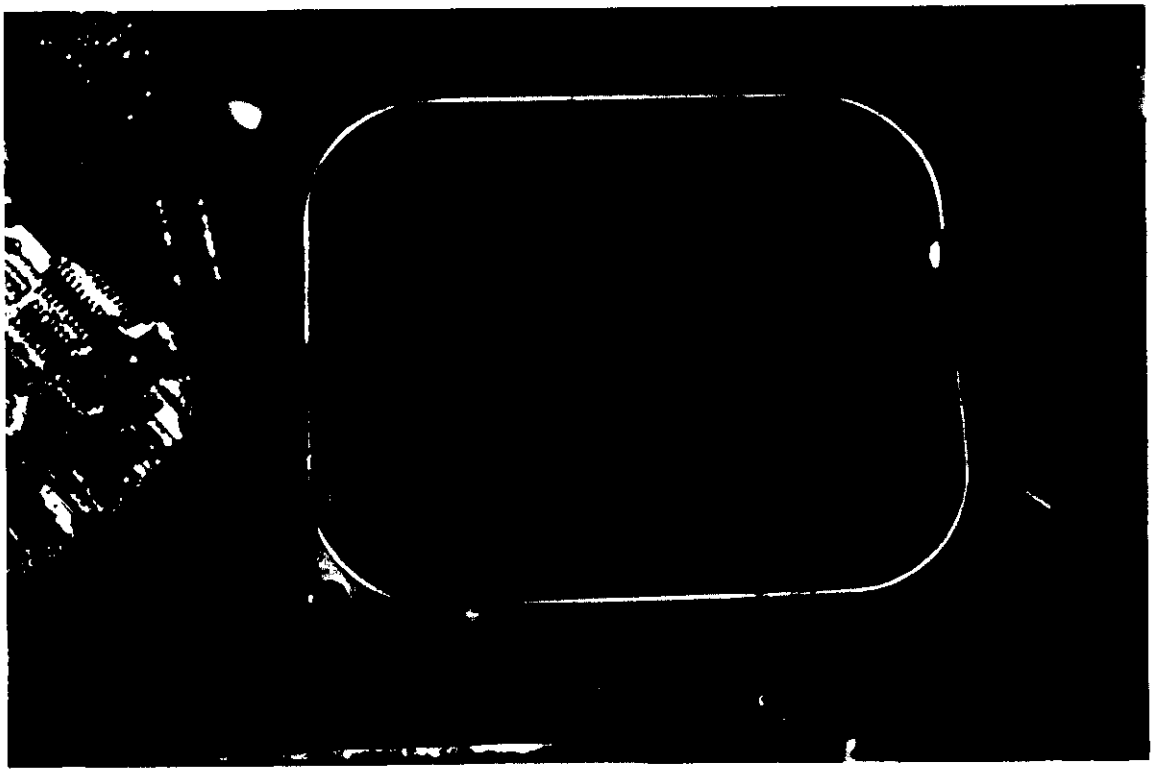
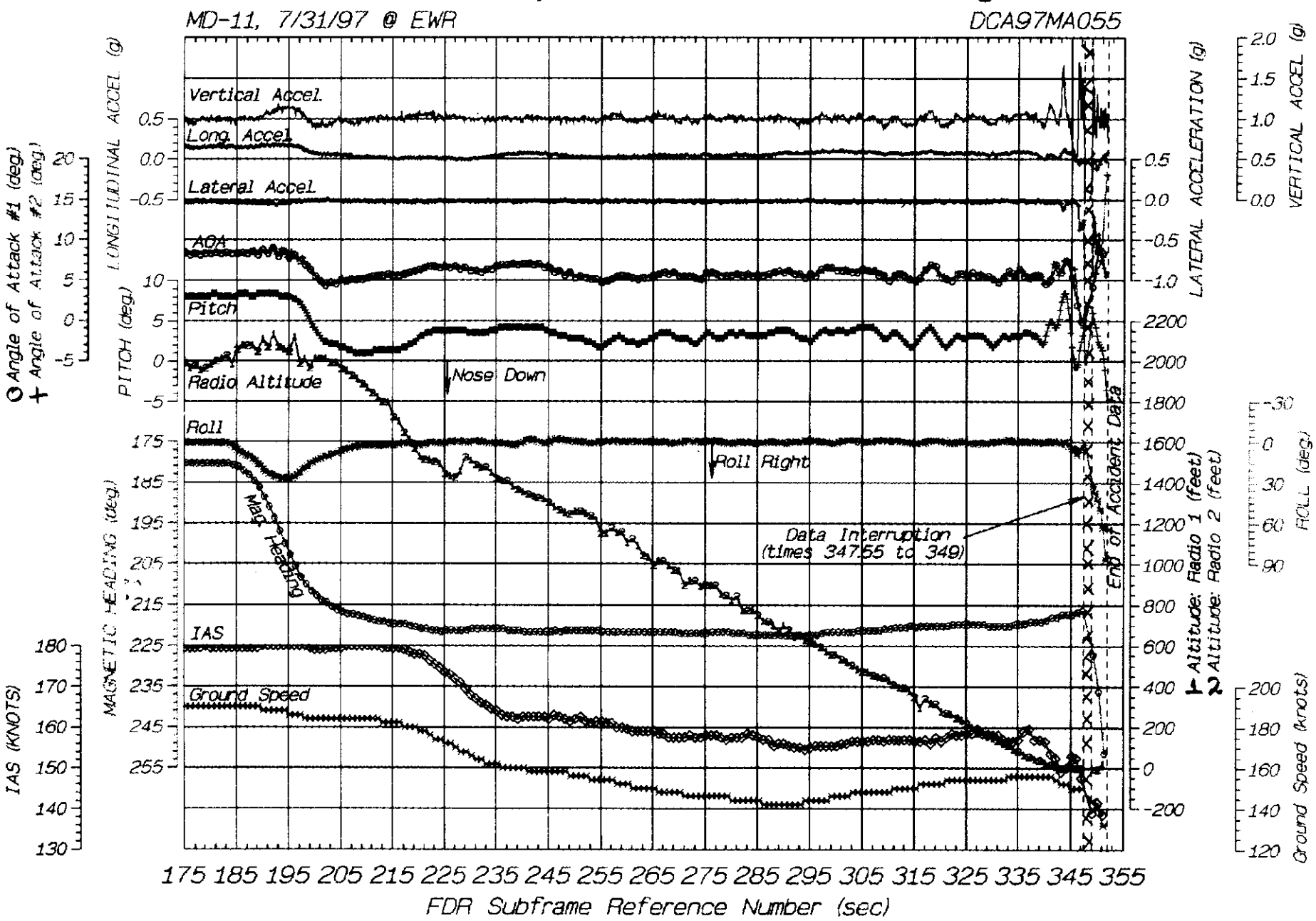


Figure 6. Inside the Top Half of Flight Data Recorder's Armored Enclosure

Attachments III - Last 3 Minutes of Selected FDR Data in Graphical Format

Federal Express Accident Landing



plt1p_3min_final

Revised: October 23, 1997

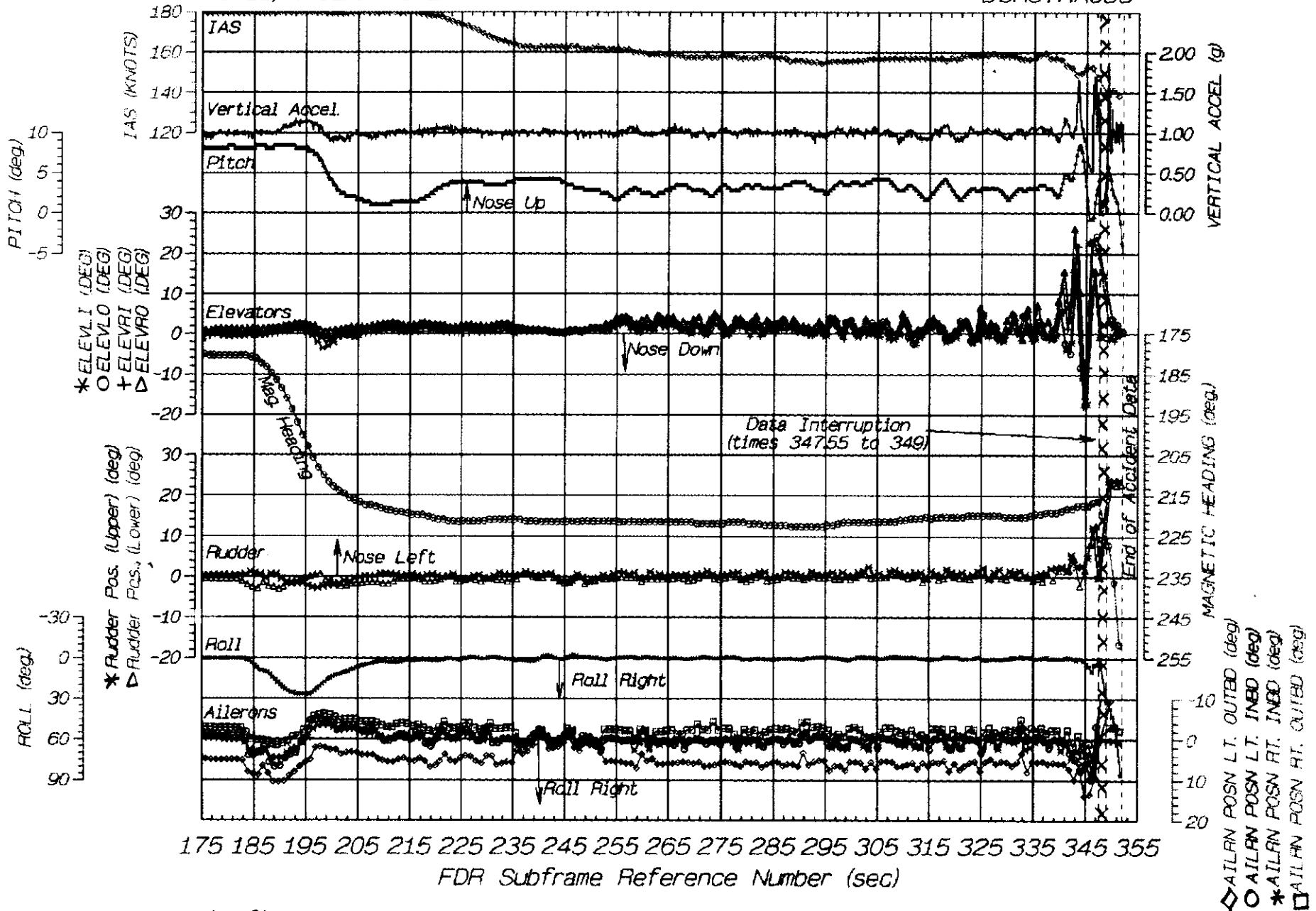
National Transportation Safety Board

III-1

Federal Express Accident Landing

MD-11, 7/31/97 @ EWR

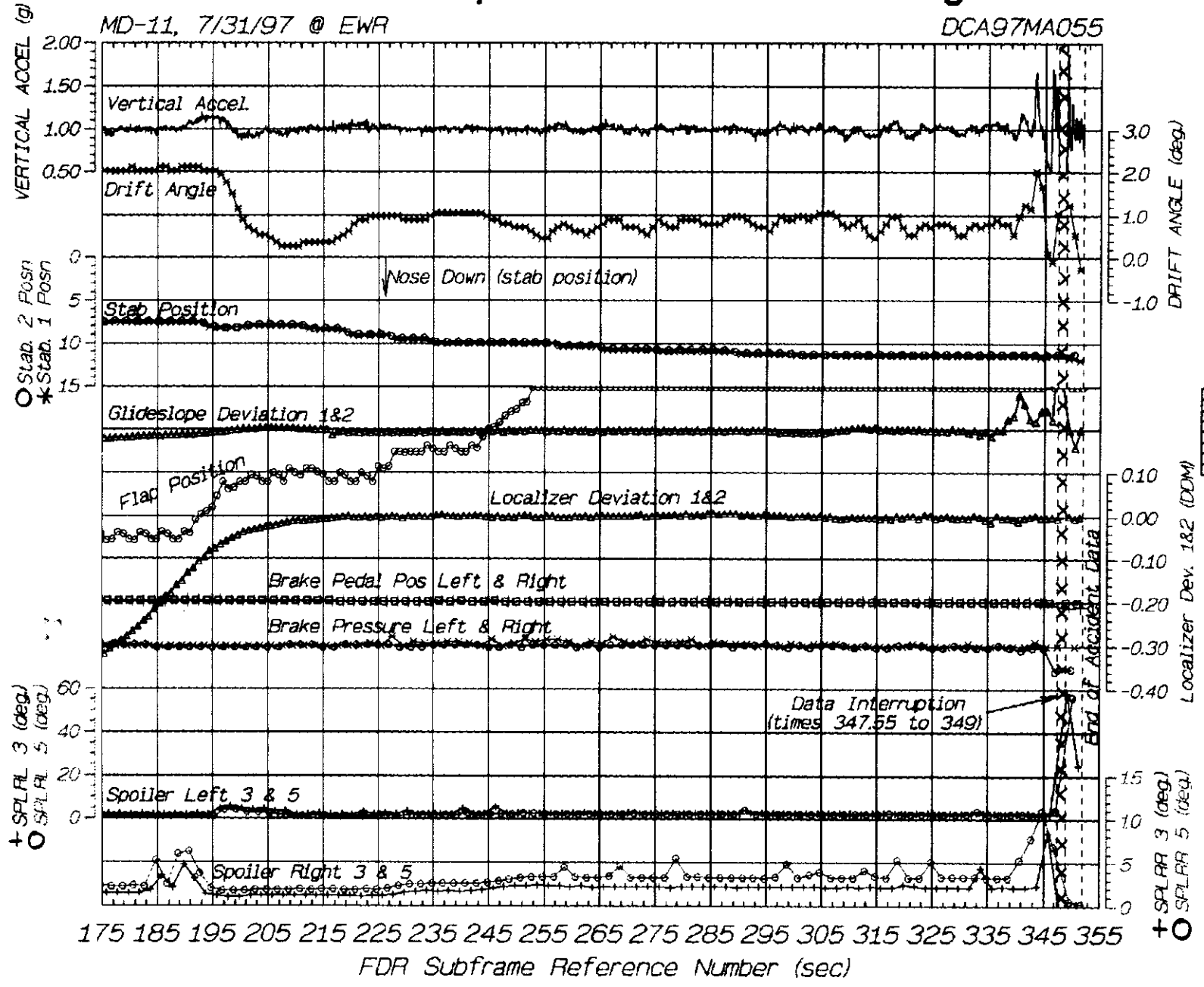
DCA97MA055



plt2p_3min_final
Revised: October 23, 1997

National Transportation Safety Board

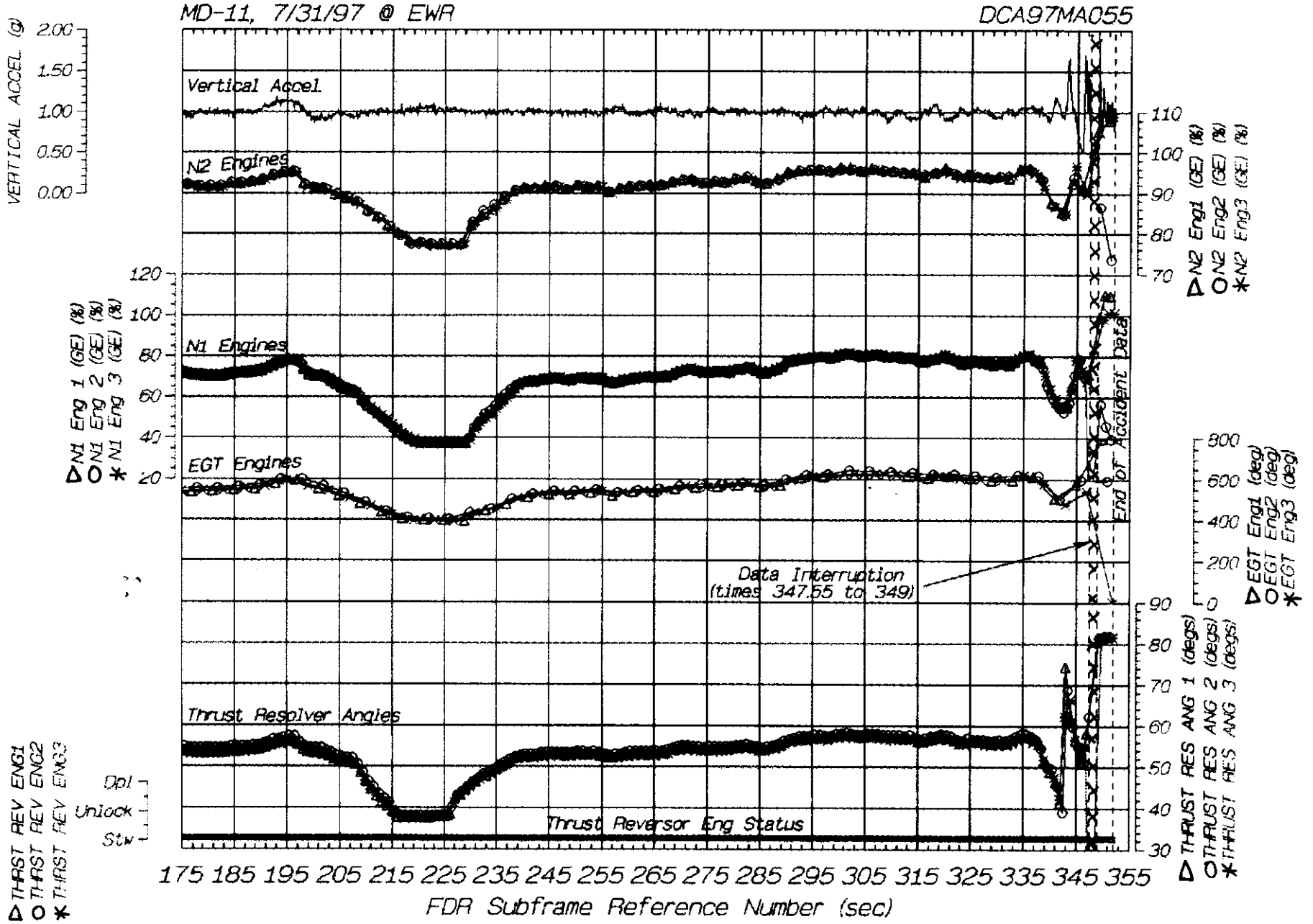
Federal Express Accident Landing



plt3p_3min_final
Revised: October 23, 1997

National Transportation Safety Board

Federal Express Accident Landing



plt4p_3min_final
Revised: October 23, 1997

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Federal Express Accident Landing

plt5p_3min_final
Revised: October 23, 1997

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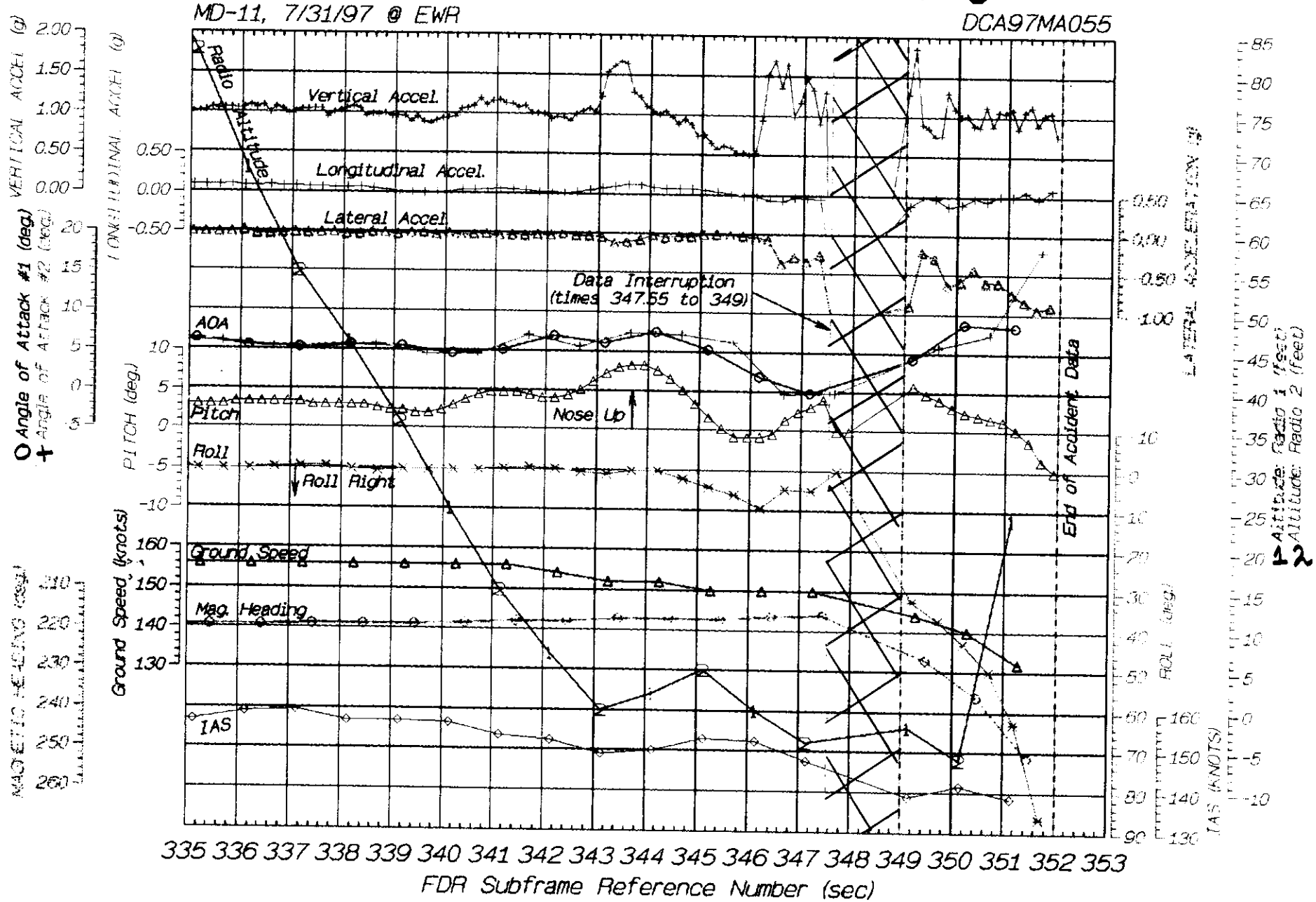
Attachments IV - Last 18 Seconds of Selected FDR Data in Graphical Format

Federal Express Accident Landing



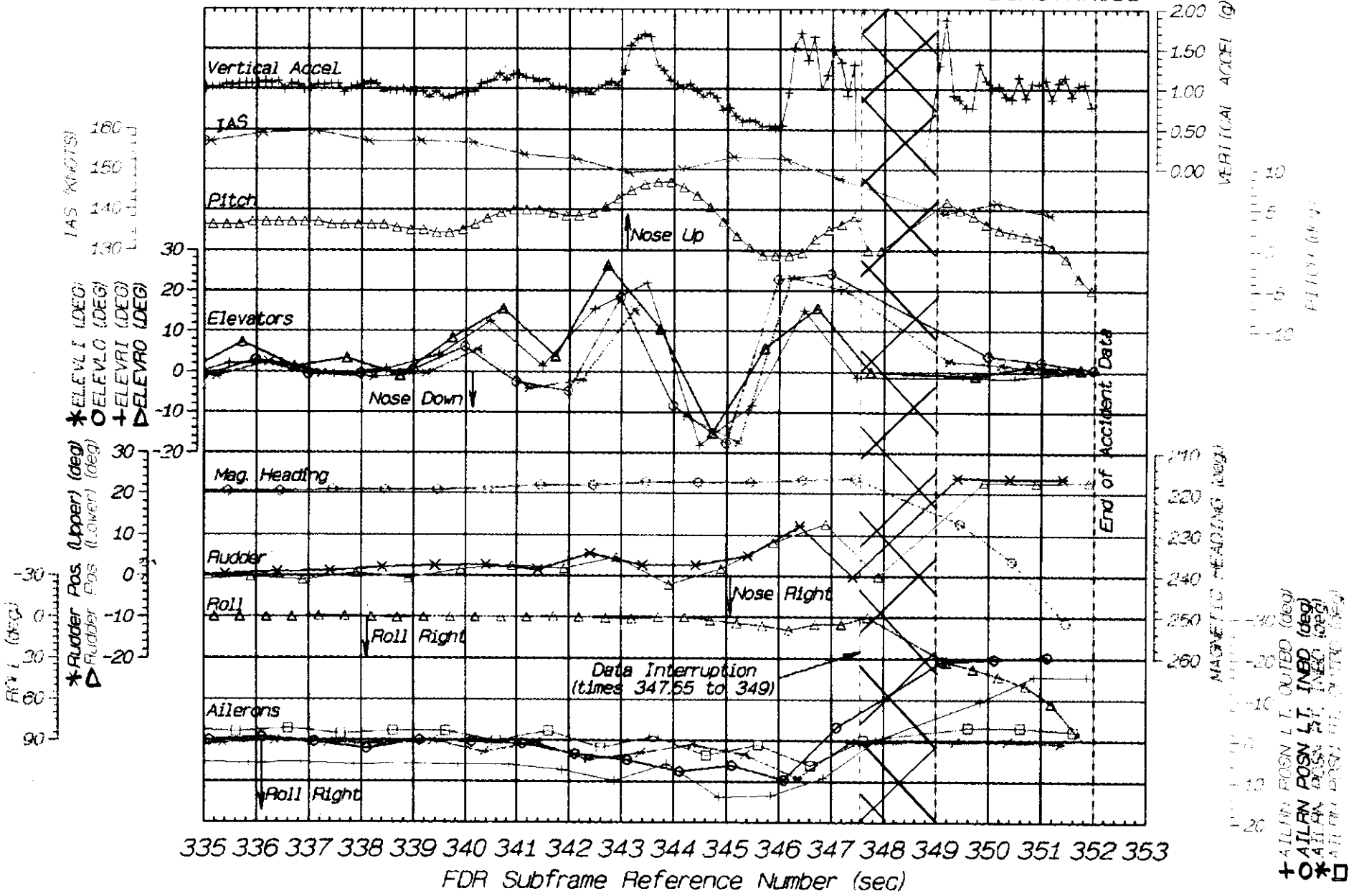
plt1p_18sec_final
Revised: October 23, 1997

National Transportation Safety Board

Federal Express Accident Landing

MD-11, 7/31/97 @ EWR

DCA97MA055



plt2p_18sec_final
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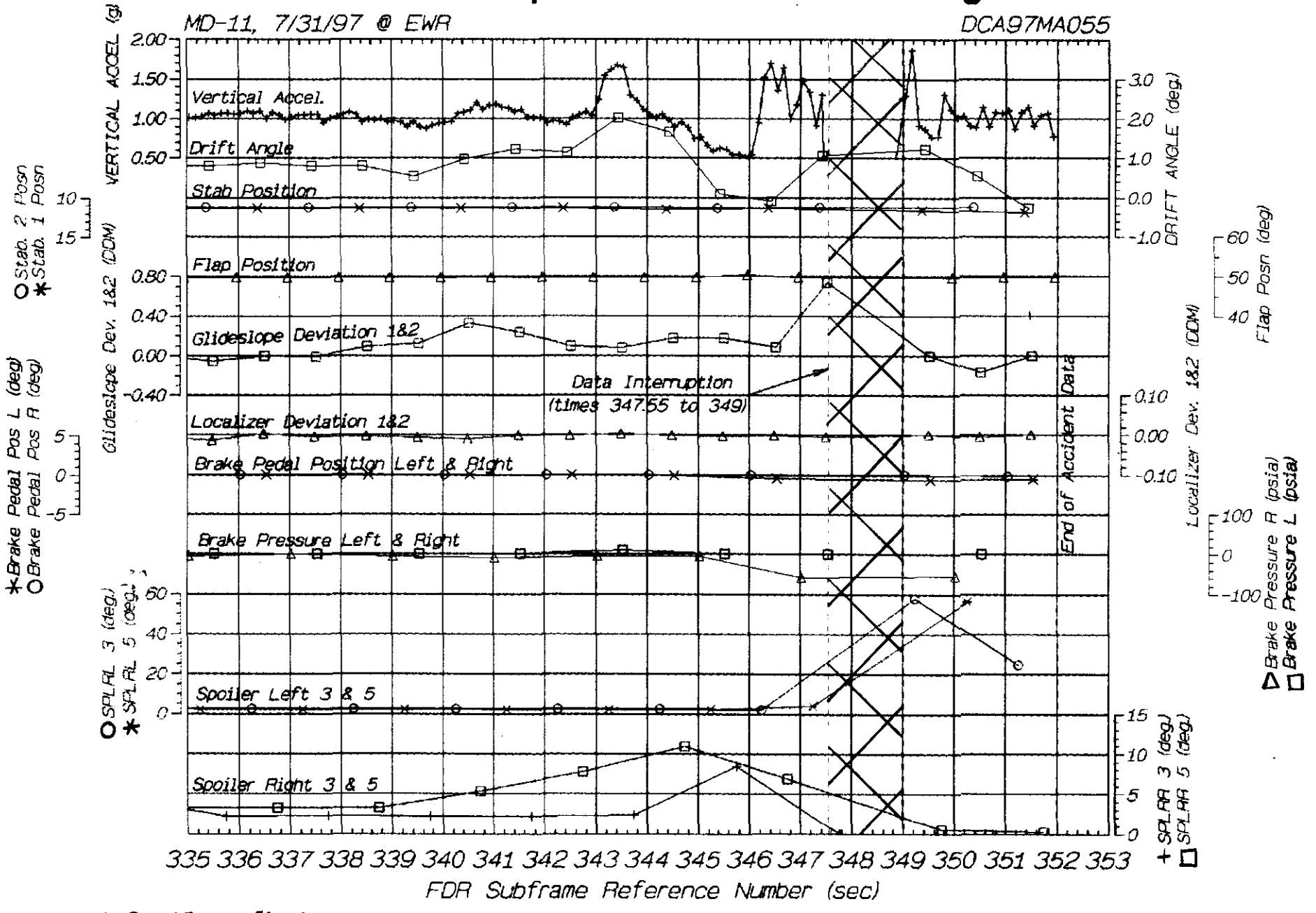
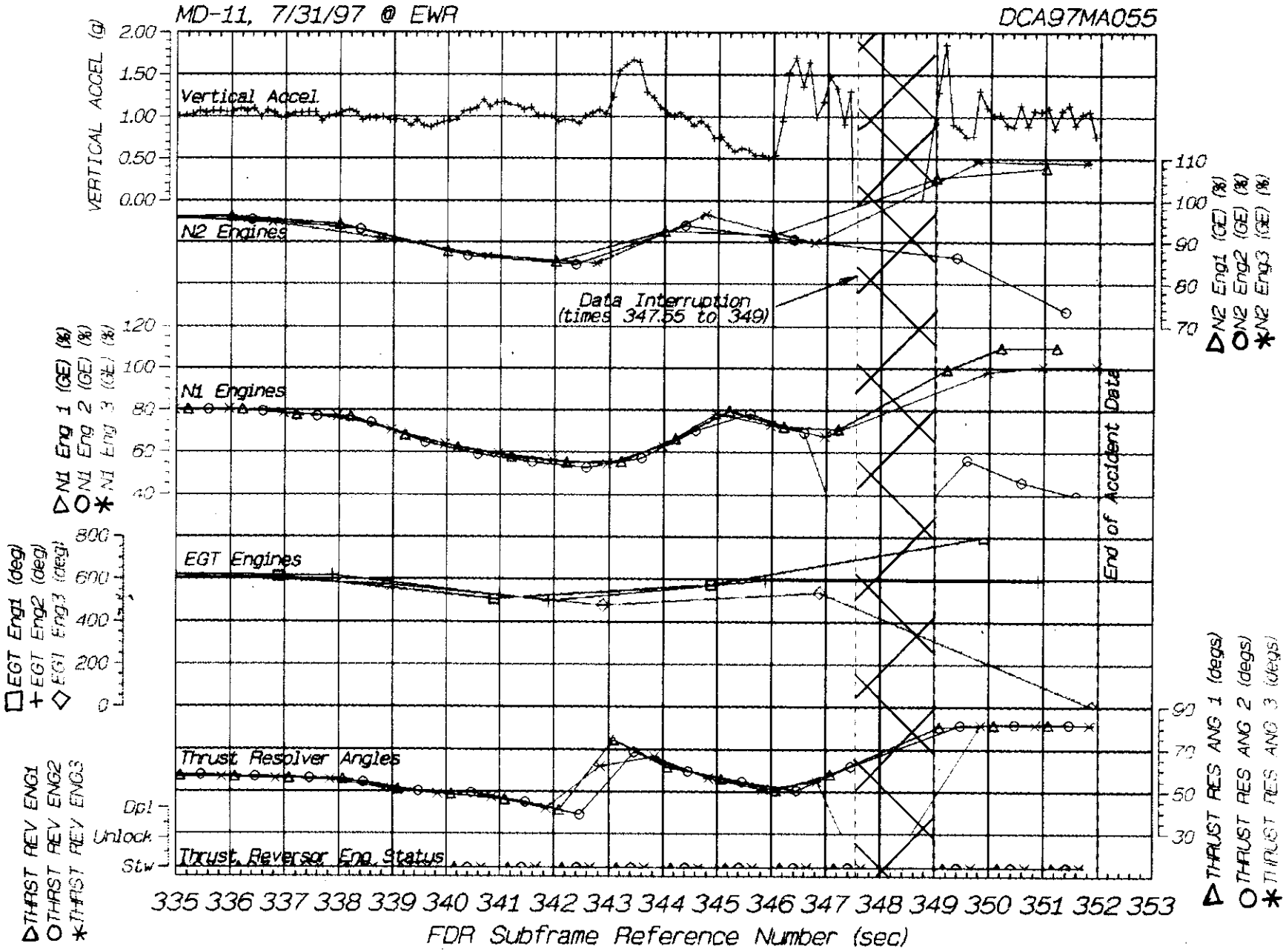
Federal Express Accident Landing



plt3p_18sec_final
Revised: October 23, 1997

National Transportation Safety Board

Federal Express Accident Landing



plt4p_18sec_final
Revised: October 23, 1997

National Transportation Safety Board

Attachments V - Selected FDR Data in Tabular Format for Attachments III and IV

FDR Subframe Reference Number	Altitude: Radio (feet)	MAGNETIC HEADING (deg.)	VERTICAL ACCEL (g)	ROLL (deg.)	PITCH (deg.)	LONGITUDINAL ACCEL (g)	Angle of Attack #1 (deg.)	Angle of Attack #2 (deg.)	IAS (KNOTS)	LATERAL ACCELERATION (g)	Ground Speed (knots)	Altitude: Radio 1 (feet)	Altitude: Radio 2 (feet)	ELEVLI (.DEG)	ELEVLO (.DEG)	ELEVRI (.DEG)	ELEVRO (.DEG)	Rudder Pos. (Lower) (deg)	Rudder Pos. (Upper) (deg)
175.00	1991.00	180.09	0.9962 1.0007 0.9870 1.0259 0.9618 0.9916 0.9114 0.9549	0.35 0.35	8.09 8.09 8.09 8.09	0.1454 0.1596 0.1454 0.1616	8.44	8.26	179.50	-0.0215 -0.0337 -0.0255 -0.0377	190.00		1991.00	-1.41	0.26	-0.53	1.05	-0.44	0.26
176.00	1965.00	180.44	0.9870 0.9366 0.9778 0.9824 0.9572 0.9091 0.9755 0.9504	0.35 0.35	8.09 8.09 8.09 8.09	0.1372 0.1555 0.1291 0.1515	8.09	8.26	179.50	-0.0215 -0.0398 -0.0235 -0.0377	190.00	1965.00		0.00	0.53	-0.53	1.05	-0.44	0.35
177.00	1976.00	180.44	0.9275 0.9847 0.9962 0.9687 0.9778 0.9755 0.9847 0.9984	0.35 0.35	8.09 8.09 8.09 8.09	0.1393 0.1535 0.1413 0.1433	8.26	8.09	179.50	-0.0174 -0.0235 -0.0072 -0.0296	190.00		1976.00	0.26	0.70	-0.35	1.32	-0.44	0.35
178.00	1953.00	180.44	0.9733 0.9939 1.0282 1.0191 1.0351 0.9870 1.0099 0.9824	0.35 0.35	8.09 8.09 8.09 8.09	0.1433 0.1515 0.1474 0.1576	8.09	8.26	179.50	-0.0255 -0.0418 -0.0174 -0.0154	190.00	1953.00		0.26	0.79	-0.26	1.32	-0.44	0.35
179.00	1965.00	180.44	0.9733 0.9939 1.0007 1.0191 0.9664 1.0099 0.9618 0.9984	0.35 0.35	8.09 8.09 8.09 8.09	0.1474 0.1555 0.1494 0.1576	8.26	8.26	180.00	-0.0276 -0.0276 -0.0255 -0.0215	190.00		1965.00	-0.44	0.79	-0.26	1.32	-0.44	0.35
180.00	1985.00	180.44	1.0076 1.0442 0.9847 0.9962 0.9847 0.9962 0.9984 0.9755	0.35 0.35	8.44 8.44 8.44 8.44	0.1576 0.1433 0.1576 0.1555	8.26	8.44	179.50	-0.0174 -0.0276 -0.0255 -0.0235	190.00	1985.00		-0.70	0.62	-0.18	1.41	-0.44	0.35
181.00	2000.00	180.44	1.0168 0.9572 1.0282 0.9870 0.9755 1.0374 0.9687 0.9824	0.35 0.35	8.44 8.09 8.09 8.09	0.1555 0.1677 0.1576 0.1494	8.44	8.26	179.50	-0.0154 -0.0357 -0.0276 -0.0377	190.00		2000.00	-0.70	0.53	-0.18	1.41	-0.44	0.35
182.00	2010.00	180.44	1.0076 0.9733 1.0053 0.9916 0.9939 1.0191 0.9801 0.9664	0.35 0.35	8.09 8.09 8.09 8.09	0.1474 0.1576 0.1576 0.1413	8.26	8.44	179.50	-0.0235 -0.0377 -0.0235 -0.0235	190.00	2010.00		-0.53	0.53	-0.18	1.32	-0.88	0.44
183.00	2030.00	180.44	1.0076 1.0213 0.9664 0.9870 1.0191 0.9939 1.0191 0.9343	0.35 1.05	8.09 8.09 8.09 8.09	0.1474 0.1677 0.1596 0.1576	8.44	8.26	179.50	-0.0296 -0.0255 -0.0398 -0.0296	190.00		2030.00	-0.44	0.44	-0.18	1.41	-1.85	0.62
184.00	1985.00	180.79	1.0076 0.9916 1.0030 0.9755 0.9595 0.9229 0.9939 1.0076	2.11 3.52	8.09 8.09 8.09 8.09	0.1718 0.1576 0.1454 0.1433	8.26	8.26	179.50	-0.0296 -0.0337 -0.0337 -0.0377	190.00	1985.00		-0.18	0.53	-0.18	1.41	-2.46	1.05

1-A

FDR Subframe Reference Number	Altitude: Radio (feet)	MAGNETIC HEADING (deg.)	VERTICAL ACCEL (g)	ROLL (deg.)	PITCH (deg.)	LONGITUDINAL ACCEL (g)	Angle of Attack #1 (deg.)	Angle of Attack #2 (deg.)	IAS (KNOTS)	LATERAL ACCELERATION (g)	Ground Speed (knots)	Altitude: Radio 1 (feet)	Altitude: Radio 2 (feet)	ELEVLI (.DEG)	ELEVLO (.DEG)	ELEVRI (.DEG)	ELEVRO (.DEG)	Rudder Pos. (Lower) (deg)	Rudder Pos. (Upper) (deg)
185.00	2060.00	181.14	0.9755 0.9847 0.9893 1.0007 1.0259 1.0122 0.9801 0.9870	5.27 6.68	8.09 8.44 8.44 8.44	0.1657 0.1494 0.1454 0.1596	8.26	8.26	179.50	-0.0255 -0.0459 -0.0357 -0.0357	190.00		2060.00	-0.26	0.53	-0.18	1.41	-2.72	0.88
186.00	2080.00	182.20	1.0282 0.9962 1.0259 0.9687 1.0374 1.0213 0.9984 1.0007	8.44 9.14	8.44 8.44 8.44 8.44	0.1433 0.1474 0.1535 0.1535	8.44	8.26	179.50	-0.0418 -0.0296 -0.0377 -0.0316	190.00	2080.00		-0.35	0.62	-0.18	1.41	-1.32	0.53
187.00	2080.00	183.25	0.9939 0.9824 1.0168 1.0191 1.0282 0.9824 1.0007 1.0213	9.84 10.55	8.44 8.09 8.09 8.09	0.1454 0.1454 0.1738 0.1596	8.26	8.61	179.50	-0.0459 -0.0316 -0.0377 -0.0398	190.00		2080.00	-0.35	0.62	-0.18	1.49	-2.29	-0.44
188.00	2080.00	184.66	0.9824 0.9939 0.9984 0.9641 0.9824 1.0076 0.9893 1.0191	11.95 14.06	8.09 8.09 8.09 8.44	0.1454 0.1454 0.1657 0.1637	8.61	8.09	179.50	-0.0459 -0.0398 -0.0357 -0.0499	190.00	2080.00		0.35	1.14	-0.09	1.49	-2.37	0.70
189.00	2050.00	186.41	1.0191 1.0145 0.9710 1.0236 1.0419 1.0374 1.0236 1.0007	16.17 17.93	8.44 8.44 8.44 8.44	0.1494 0.1576 0.1555 0.1881	8.09	8.61	179.50	-0.0398 -0.0459 -0.0499 -0.0479	190.00		2050.00	1.41	1.32	0.00	1.76	-2.90	0.62
190.00	2110.00	188.52	1.0374 1.0305 1.0328 1.0694 1.0534 1.1038 1.0809 1.0694	20.04 21.80	8.44 8.44 8.44 8.44	0.1759 0.1718 0.1576 0.1779	8.79	8.26	180.00	-0.0479 -0.0520 -0.0499 -0.0479	188.00	2110.00		1.49	1.67	0.35	1.93	-2.37	-0.53
191.00	2070.00	190.98	1.0534 1.0969 1.0603 1.0488 1.0809 1.0648 1.0969 1.1152	23.20 24.26	8.44 8.44 8.44 8.44	0.1759 0.1657 0.1657 0.1800	8.26	8.96	180.00	-0.0560 -0.0601 -0.0540 -0.0438	188.00		2070.00	2.02	1.76	0.44	2.02	-1.32	-1.23
192.00	2130.00	193.80	1.1152 1.0694 1.1198 1.0786 1.0878 1.1404 1.0878 1.1198	25.31 25.66	8.44 8.44 8.44 8.44	0.1637 0.1820 0.1840 0.1718	8.96	8.09	180.00	-0.0540 -0.0459 -0.0682 -0.0703	188.00	2130.00		2.37	2.02	0.70	2.37	-1.14	-1.67
193.00	2070.00	196.96	1.1839 1.1175 1.1404 1.1152 1.1358 1.0694 1.1129 1.1542	26.37 26.72	8.09 8.09 8.09 8.09	0.1820 0.1657 0.1698 0.1820	7.91	8.79	180.00	-0.0479 -0.0499 -0.0540 -0.0479	188.00		2070.00	2.72	2.29	0.88	2.55	-0.88	-1.76
194.00	2060.00	200.13	1.1313 1.1175 1.1496 1.1198 1.1381 1.1358 1.1336 1.1473	26.72 26.72	8.09 8.09 8.09 8.09	0.1657 0.1738 0.1677 0.1616	8.61	7.73	180.00	-0.0479 -0.0520 -0.0459 -0.0357	188.00	2060.00		1.32	2.11	0.88	2.55	-0.09	-1.76

V-2

FDR Subframe Reference Number	Altitude: Radio (feet)	MAGNETIC HEADING (deg.)	VERTICAL ACCEL (g)	ROLL (deg.)	PITCH (deg.)	LONGITUDINAL ACCEL (g)	Angle of Attack #1 (deg.)	Angle of Attack #2 (deg.)	IAS (KNOTS)	LATERAL ACCELERATION (g)	Ground Speed (knots)	Altitude: Radio 1 (feet)	Altitude: Radio 2 (feet)	ELEVLI (.DEG)	ELEVLO (.DEG)	ELEVRI (.DEG)	ELEVRO (.DEG)	Rudder Pos. (Lower) (deg)	Rudder Pos. (Upper) (deg)
195.00	2050.00	202.94	1.1496 1.1152 1.1427 1.1450 1.1358 1.1519 1.1267 1.1244	26.72 26.37	8.09 8.09 7.73 7.73	0.1840 0.1738 0.1759 0.1555	7.73	8.44	180.00	-0.0438 -0.0459 -0.0337 -0.0255	186.00		2050.00	0.26	1.14	0.70	2.20	0.18	-2.29
196.00	2120.00	205.75	1.1404 1.0923 1.0305 1.1244 1.1152 1.1313 1.1152 1.0878	25.66 24.26	7.73 7.73 7.38 7.38	0.1657 0.1515 0.1576 0.1657	8.09	7.56	180.00	-0.0255 -0.0276 -0.0316 -0.0296	186.00	2120.00		-0.53	0.88	0.35	2.02	0.53	-2.55
197.00	1990.00	208.21	1.1290 1.0832 1.0969 1.0145 1.0603 1.0786 1.0878 1.0305	22.50 20.74	7.38 7.03 6.68 6.68	0.1474 0.1515 0.1433 0.1169	7.38	7.73	180.00	-0.0133 -0.0316 -0.0316 -0.0215	186.00		1990.00	-2.29	-0.53	-0.62	0.97	0.79	-2.81
198.00	2010.00	209.97	1.0488 1.0259 0.9984 0.9687 1.0076 0.9549 0.9847 0.9412	19.34 17.58	6.33 5.98 5.62 5.27	0.1087 0.1149 0.1067 0.0884	6.86	6.86	180.00	-0.0174 -0.0215 -0.0092 -0.0174	184.00	2010.00		-3.78	-1.32	-1.05	0.53	-0.70	-2.46
199.00	1965.00	211.73	0.9870 0.9755 0.9229 0.9801 0.8862 0.9343 0.9046 0.9435	16.17 14.77	4.92 4.57 4.22 4.22	0.0864 0.0803 0.0864 0.0660	6.33	5.80	179.50	-0.0215 -0.0072 -0.0133 -0.0255	184.00		1965.00	-3.16	-0.79	-1.14	0.70	-0.97	-2.11
200.00	2010.00	212.78	0.8656 0.9412 0.9275 0.9458 0.9000 0.9549 0.9000 0.9046	13.71 12.66	3.87 3.52 3.52 3.16	0.0640 0.0701 0.0640 0.0599	5.45	5.10	179.00	-0.0154 -0.0154 -0.0092 -0.0235	184.00	2010.00		-2.29	0.00	-0.88	0.97	-1.76	-2.02
201.00	2010.00	213.84	0.9481 0.9000 0.9275 0.9984 0.9343 0.9229 0.9183 0.8931	11.95 11.25	2.81 2.81 2.46 2.46	0.0660 0.0498 0.0538 0.0701	4.92	4.39	179.00	-0.0174 -0.0133 -0.0133 -0.0113	184.00		2010.00	-0.88	0.44	-0.70	1.23	-2.20	-1.76
202.00	2010.00	214.54	0.9366 0.8908 0.9206 0.8862 0.9091 0.9389 0.9755 0.9229	10.90 10.20	2.46 2.46 2.11 2.11	0.0518 0.0559 0.0640 0.0538	4.39	4.57	179.00	-0.0092 -0.0072 0.0030 -0.0174	184.00	2010.00		-0.53	0.62	-0.26	1.58	-2.11	-1.14
203.00	1992.00	215.59	0.9572 0.9549 0.8885 0.9504 0.9549 0.9733 0.9549 0.9687	9.49 8.79	2.11 2.11 2.11 2.11	0.0518 0.0599 0.0579 0.0579	4.75	4.57	179.50	-0.0194 -0.0215 -0.0113 -0.0113	184.00		1992.00	-0.62	0.79	-0.18	1.67	-1.67	-1.23
204.00	1991.00	216.30	0.9664 0.9870 0.9984 0.9916 1.0328 0.9778 0.9733 0.9733	8.09 7.03	2.11 2.11 1.76 1.76	0.0416 0.0701 0.0579 0.0457	4.57	4.92	179.50	-0.0215 -0.0194 -0.0092 -0.0154	184.00	1991.00		-1.14	0.70	-0.09	1.67	-1.49	-0.62

FDR Subframe Reference Number	Altitude: Radio (feet)	MAGNETIC HEADING (deg.)	VERTICAL ACCEL (g)	ROLL (deg.)	PITCH (deg.)	LONGITUDINAL ACCEL (g)	Angle of Attack #1 (deg.)	Angle of Attack #2 (deg.)	IAS (KNOTS)	LATERAL ACCELERATION (g)	Ground Speed (knots)	Altitude: Radio 1 (feet)	Altitude: Radio 2 (feet)	ELEVLI (.DEG)	ELEVLO (.DEG)	ELEVRI (.DEG)	ELEVRO (.DEG)	Rudder Pos. (Lower) (deg)	Rudder Pos. (Upper) (deg)
205.00	1963.00	216.65	0.9549 0.9664 0.9801 0.9481 0.9664 0.9733 0.9801 0.9939	6.33 5.62	1.76 1.76 1.76 1.76	0.0436 0.0436 0.0538 0.0457	5.10	4.75	179.50	-0.0154 -0.0255 -0.0276 -0.0194	184.00		1963.00	-0.53	0.70	-0.09	1.67	-1.41	-0.18
206.00	1950.00	217.35	0.9618 0.9595 0.9664 0.9458 0.9710 0.9824 0.9710 0.9206	5.27 4.92	1.41 1.41 1.41 1.41	0.0477 0.0396 0.0477 0.0457	4.92	5.10	180.00	-0.0174 -0.0276 -0.0113 -0.0296	184.00	1950.00		0.44	0.97	0.00	1.67	-1.23	0.09
207.00	1928.00	217.35	0.9687 0.9366 0.9664 0.9252 0.9068 0.9229 0.9343 0.9412	4.22 3.87	1.41 1.05 1.05 1.05	0.0477 0.0335 0.0253 0.0233	5.10	4.92	180.00	-0.0235 -0.0194 -0.0154 -0.0235	184.00		1928.00	1.23	1.32	0.09	2.02	-1.23	0.00
208.00	1912.00	217.70	0.9481 1.0099 0.9091 0.9755 0.9366 0.9572 0.9435 1.0168	3.16 2.81	1.05 1.05 1.05 1.05	0.0335 0.0253 0.0335 0.0152	5.10	5.10	180.00	-0.0215 -0.0174 -0.0215 -0.0215	184.00	1912.00		1.85	1.85	0.35	2.20	-1.23	0.18
209.00	1886.00	218.06	0.9916 0.9893 0.9733 0.9962 0.9778 1.0168 0.9824 0.9572	2.46 2.46	1.05 1.05 1.05 1.05	0.0213 0.0172 0.0314 0.0152	5.10	5.10	180.00	-0.0235 -0.0235 -0.0154 -0.0194	184.00		1886.00	2.29	2.02	0.62	2.46	-1.58	0.79
210.00	1869.00	218.41	0.9870 1.0030 0.9343 0.9641 1.0213 0.9801 1.0191 1.0236	2.46 2.81	1.05 1.05 1.05 1.05	0.0396 0.0274 0.0274 0.0253	5.27	5.27	180.00	-0.0235 -0.0296 -0.0276 -0.0174	184.00	1869.00		2.37	2.29	0.70	2.55	-1.76	0.79
211.00	1842.00	218.76	0.9595 1.0030 1.0145 1.0099 1.0236 0.9916 0.9801 0.9664	2.81 2.81	1.05 1.41 1.41 1.41	0.0294 0.0213 0.0131 0.0152	5.45	5.45	180.00	-0.0276 -0.0215 -0.0316 -0.0296	184.00		1842.00	1.76	2.37	0.97	2.90	-1.05	0.70
212.00	1822.00	219.11	1.0236 0.9572 1.0419 1.0145 1.0351 1.0442 1.0374 0.9893	3.16 2.81	1.41 1.41 1.41 1.41	0.0233 0.0213 0.0213 0.0213	5.62	5.62	180.00	-0.0215 -0.0296 -0.0194 -0.0235	184.00	1822.00		0.88	2.02	0.97	2.64	-0.44	0.62
213.00	1801.00	219.11	1.0236 0.9893 1.0213 0.9893 0.9893 1.0419 1.0442 0.9664	2.81 2.46	1.41 1.41 1.41 1.41	0.0172 0.0111 0.0091 0.0172	5.62	5.62	179.50	-0.0174 -0.0316 -0.0418 -0.0215	182.00		1801.00	0.18	1.41	0.70	2.29	-0.44	0.26
214.00	1797.00	219.46	1.0076 1.0305 1.0053 0.9801 0.9984 1.0007 0.9939 1.0442	2.11 1.76	1.41 1.41 1.41 1.41	0.0009 -0.0011 0.0152 0.0050	5.80	5.62	179.50	-0.0255 -0.0235 -0.0296 -0.0215	182.00	1797.00		0.88	1.41	0.44	2.11	-0.35	0.35

Y-4

FDR Subframe Reference Number	Altitude: Radio (feet)	MAGNETIC HEADING (deg.)	VERTICAL ACCEL (g)	ROLL (deg.)	PITCH (deg.)	LONGITUDINAL ACCEL (g)	Angle of Attack #1 (deg.)	Angle of Attack #2 (deg.)	IAS (KNOTS)	LATERAL ACCELERATION (g)	Ground Speed (knots)	Altitude: Radio 1 (feet)	Altitude: Radio 2 (feet)	ELEVLI (.DEG)	ELEVLO (.DEG)	ELEVRI (.DEG)	ELEVRO (.DEG)	Rudder Pos. (Lower) (deg)	Rudder Pos. (Upper) (deg)
215.00	1727.00	219.81	1.0030 1.0213 1.0168 1.0030 0.9847 0.9687 1.0213 0.9733	1.76 1.76	1.41 1.41 1.41 1.41	0.0111 0.0091 0.0009 -0.0052	5.62	5.62	179.50	-0.0255 -0.0255 -0.0316 -0.0215	182.00		1727.00	1.49	1.76	0.44	2.20	-0.18	0.62
216.00	1705.00	219.81	0.9893 1.0213 1.0168 0.9710 1.0969 0.9847 0.9984 0.9801	1.76 1.41	1.41 1.41 1.76 1.76	-0.0011 0.0050 0.0111 0.0111	5.62	5.62	179.50	-0.0479 -0.0194 -0.0255 -0.0235	182.00	1705.00		2.29	1.93	0.44	2.20	-0.53	0.26
217.00	1648.00	219.81	0.9755 0.9412 1.0328 1.0397 1.0213 1.0488 1.0328 1.0282	1.05 1.05	1.76 1.76 1.76 2.11	0.0030 0.0213 0.0152 0.0192	5.80	5.80	179.00	-0.0316 -0.0215 -0.0316 -0.0296	180.00		1648.00	2.90	2.02	0.53	2.37	-1.05	-0.18
218.00	1612.00	220.16	1.0007 1.0648 1.0053 0.9687 1.0168 1.0465 1.0397 1.0557	1.05 1.05	2.11 2.11 2.11 2.46	0.0009 0.0233 0.0131 0.0152	5.98	5.98	178.50	-0.0255 -0.0276 -0.0418 -0.0337	180.00	1612.00		2.72	2.11	0.62	2.37	-1.14	0.35
219.00	1567.00	220.52	1.0397 1.0122 1.0442 1.0648 0.9458 0.9939 0.9824 1.0786	1.41 1.76	2.46 2.46 2.81 2.81	0.0172 0.0030 0.0091 0.0030	6.15	6.15	178.00	-0.0276 -0.0377 -0.0174 -0.0215	180.00		1567.00	2.20	2.02	0.70	2.37	-0.88	0.62
220.00	1529.00	220.87	1.1061 1.0397 1.0534 1.0351 1.0511 1.0603 1.0419 1.0419	2.11 1.76	3.16 3.16 3.16 3.16	0.0274 0.0030 0.0131 0.0233	6.33	6.33	178.00	-0.0235 -0.0235 -0.0276 -0.0235	178.00	1529.00		1.41	1.49	0.62	2.20	-0.53	0.26
221.00	1516.00	220.87	1.0580 1.0717 1.0488 1.0671 0.9916 1.0671 1.0786 1.0488	1.41 0.70	3.52 3.52 3.52 3.52	0.0131 0.0091 0.0213 0.0111	6.50	6.68	177.50	-0.0377 -0.0316 -0.0276 -0.0377	178.00		1516.00	0.62	1.32	0.44	2.02	0.18	-0.09
222.00	1513.00	221.22	1.0442 1.0878 1.0878 1.0099 1.0168 1.1038 0.9847 1.0786	0.35 0.00	3.52 3.52 3.87 3.87	0.0192 0.0192 0.0131 0.0131	6.68	6.68	176.50	-0.0255 -0.0174 -0.0276 -0.0194	176.00	1513.00		0.88	1.23	0.18	1.76	0.18	0.18
223.00	1506.00	221.22	0.9549 1.0030 1.0282 0.9824 1.0076 1.0671 1.0442 1.0419	0.35 0.70	3.87 3.87 3.87 3.87	0.0172 0.0091 0.0172 0.0009	6.68	6.50	175.50	-0.0296 -0.0255 -0.0235 -0.0113	174.00		1506.00	1.32	1.14	0.09	1.67	-1.14	0.62
224.00	1494.00	221.57	1.0442 1.0145 1.0007 1.0122 1.0374 0.9778 0.9733 1.0145	1.05 1.05	3.87 3.87 3.87 3.87	0.0131 0.0009 0.0172 0.0009	6.50	6.68	174.50	-0.0154 -0.0133 -0.0255 -0.0255	174.00	1494.00		1.76	1.23	0.09	1.76	-1.05	-0.44

FDR Subframe Reference Number	Altitude: Radio (feet)	MAGNETIC HEADING (deg.)	VERTICAL ACCEL (g)	ROLL (deg.)	PITCH (deg.)	LONGITUDINAL ACCEL (g)	Angle of Attack #1 (deg.)	Angle of Attack #2 (deg.)	IAS (KNOTS)	LATERAL ACCELERATION (g)	Ground Speed (knots)	Altitude: Radio 1 (feet)	Altitude: Radio 2 (feet)	ELEVLI (.DEG)	ELEVLO (.DEG)	ELEVRI (.DEG)	ELEVRO (.DEG)	Rudder Pos. (Lower) (deg)	Rudder Pos. (Upper) (deg)
225.00	1443.00	221.22	1.0717 1.0076 1.0374 1.0580 1.0007 1.0007 1.0488 1.0442	0.70 0.35	3.87 3.87 3.87 3.87	0.0050 0.0131 0.0091 0.0172	6.68	6.50	173.50	-0.0235 -0.0194 -0.0255 -0.0296	172.00		1443.00	2.11	1.41	0.09	1.85	-0.79	-0.79
226.00	1434.00	221.22	0.9916 1.0191 1.0213 1.0305 1.0488 1.0282 1.0534 1.0465	0.00 -0.35	3.87 3.87 3.87 3.87	0.0030 0.0091 0.0111 0.0009	6.50	6.68	173.00	-0.0235 -0.0215 -0.0215 -0.0255	172.00	1434.00		2.20	1.49	0.09	1.85	-0.35	-0.62
227.00	1426.00	221.22	0.9984 1.0145 1.0259 1.0213 1.0236 1.0122 1.0076 1.0030	-0.70 -0.70	3.87 3.87 3.87 3.87	0.0030 -0.0052 -0.0031 0.0030	6.68	6.50	172.00	-0.0235 -0.0235 -0.0255 -0.0154	170.00		1426.00	2.02	1.58	0.18	1.93	-0.79	0.18
228.00	1454.00	221.22	1.0488 1.0236 1.0030 1.0099 1.0236 1.0191 0.9984 0.9320	-0.35 0.00	3.87 3.87 3.87 3.87	0.0091 -0.0092 0.0009 -0.0072	6.33	6.50	171.00	-0.0174 -0.0215 -0.0255 -0.0235	168.00	1454.00		0.62	1.41	0.18	2.02	-1.05	0.35
229.00	1527.00	221.22	1.0145 0.9893 0.9893 1.0030 1.0122 1.0122 1.0099 1.0213	0.35 0.35	3.87 3.52 3.52 3.52	-0.0031 0.0050 -0.0031 0.0070	6.50	6.15	169.50	-0.0235 -0.0215 -0.0235 -0.0215	168.00		1527.00	0.53	1.32	0.18	1.93	-0.44	-0.18
230.00	1512.00	220.87	0.9755 0.9618 1.0030 0.9916 0.9824 1.0213 0.9641 0.9962	-0.35 -0.70	3.52 3.52 3.52 3.52	-0.0052 -0.0011 0.0091 0.0131	6.15	6.15	168.00	-0.0276 -0.0215 -0.0235 -0.0255	166.00	1512.00		1.05	1.76	0.18	1.93	-0.44	-0.53
231.00	1488.00	220.87	1.0007 0.9893 0.9778 0.9984 1.0122 0.9847 0.9939 1.0099	-0.70 -0.70	3.52 3.52 3.52 3.52	0.0091 0.0009 0.0111 0.0111	6.15	5.98	167.00	-0.0438 -0.0255 -0.0296 -0.0215	164.00		1488.00	2.37	1.93	0.35	2.29	-0.70	0.26
232.00	1473.00	220.87	1.0030 1.0145 1.0099 0.9893 0.9916 1.0099 0.9068 0.9939	-0.35 0.00	3.52 3.52 3.52 3.52	0.0111 0.0172 0.0172 0.0131	5.98	6.15	166.00	-0.0194 -0.0255 -0.0255 -0.0276	164.00	1473.00		2.46	2.02	0.62	2.46	-0.70	0.97
233.00	1478.00	220.87	0.9733 1.0168 0.9733 1.0191 1.0351 0.9641 0.9641 0.9710	0.35 0.70	3.52 3.52 3.87 3.87	0.0274 0.0213 0.0355 0.0355	6.33	6.33	165.50	-0.0316 -0.0174 -0.0174 -0.0337	162.00		1478.00	2.55	2.20	0.70	2.46	-1.05	0.53
234.00	1451.00	220.87	1.0305 0.9710 0.9847 1.0305 0.9595 0.9778 0.9549 0.9916	0.70 1.05	3.87 3.87 3.87 3.87	0.0396 0.0314 0.0436 0.0477	6.33	6.50	164.50	-0.0316 -0.0235 -0.0174 -0.0276	162.00	1451.00		1.93	1.49	0.44	2.02	-0.53	0.44

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FDR Subframe Reference Number	Altitude: Radio (feet)	MAGNETIC HEADING (deg.)	VERTICAL ACCEL (g)	ROLL (deg.)	PITCH (deg.)	LONGITUDINAL ACCEL (g)	Angle of Attack #1 (deg.)	Angle of Attack #2 (deg.)	IAS (KNOTS)	LATERAL ACCELERATION (g)	Ground Speed (knots)	Altitude: Radio 1 (feet)	Altitude: Radio 2 (feet)	ELEVLI (.DEG)	ELEVLO (.DEG)	ELEVRI (.DEG)	ELEVRO (.DEG)	Rudder Pos. (Lower) (deg)	Rudder Pos. (Upper) (deg)
235.00	1421.00	220.87	1.0030 0.9801 1.0122 0.9962 1.0213 1.0007 1.0030 1.0191	1.05 1.05	3.87 4.22 4.22 4.22	0.0314 0.0498 0.0375 0.0477	6.68	6.68	164.00	-0.0276 -0.0337 -0.0255 -0.0255	162.00		1421.00	-0.18	1.41	0.44	1.58	-0.62	0.35
236.00	1409.00	220.87	0.9595 1.0099 1.0236 0.9984 1.0305 0.9847 0.9847 1.0374	1.05 1.05	4.22 4.22 4.22 4.22	0.0538 0.0538 0.0559 0.0599	6.86	6.68	163.00	-0.0255 -0.0296 -0.0255 -0.0276	160.00	1409.00		0.53	1.14	0.53	1.58	0.53	0.44
237.00	1409.00	221.22	1.0236 1.0259 1.0099 1.0122 0.9458 0.9870 0.9595 1.0030	1.76 2.11	4.22 4.22 4.22 4.22	0.0620 0.0660 0.0620 0.0579	6.86	6.86	162.50	-0.0174 -0.0174 -0.0235 -0.0215	160.00		1409.00	0.53	0.88	0.44	1.23	0.53	1.23
238.00	1382.00	221.22	1.0122 1.0030 1.0053 1.0030 1.0305 0.9962 1.0305 0.9824	2.46 2.46	4.22 4.22 4.22 4.22	0.0559 0.0660 0.0620 0.0620	7.03	6.86	162.50	-0.0357 -0.0438 -0.0276 -0.0316	160.00	1382.00		0.44	0.79	0.53	1.14	0.00	0.79
239.00	1364.00	221.22	0.9962 0.9939 0.9916 1.0168 0.9549 0.9641 0.9962 0.9893	2.11 1.05	4.22 4.22 4.22 4.22	0.0620 0.0864 0.0762 0.0701	6.86	7.03	162.00	-0.0296 -0.0255 -0.0296 -0.0276	160.00		1364.00	0.44	0.70	0.53	0.97	-0.18	0.44
240.00	1356.00	221.57	0.9526 1.0076 1.0007 1.0305 0.9893 1.0488 1.0374 1.0030	0.00 -1.41	4.22 4.22 4.22 4.22	0.0721 0.0803 0.0660 0.0803	7.03	6.86	162.50	-0.0235 -0.0174 -0.0296 -0.0357	160.00	1356.00		0.53	0.70	0.62	0.88	-0.18	0.35
241.00	1342.00	221.57	1.0488 1.0236 1.0076 1.0397 0.9847 0.9847 1.0442 0.9481	-2.11 -2.11	4.22 4.22 4.22 4.22	0.0660 0.0823 0.0721 0.0823	7.03	7.03	162.50	-0.0194 -0.0194 -0.0235 -0.0215	158.00		1342.00	0.53	0.44	0.62	0.79	0.70	0.70
242.00	1331.00	221.57	1.0007 1.0145 0.9962 0.9893 1.0213 1.0351 0.9641 1.0351	-1.76 -1.05	4.22 4.22 4.22 4.22	0.0640 0.0701 0.0742 0.0660	6.86	7.03	162.50	-0.0235 -0.0174 -0.0113 -0.0154	158.00	1331.00		0.35	0.35	0.35	0.53	-0.09	0.70
243.00	1323.00	221.57	1.0122 0.9984 0.9984 1.0168 0.9893 0.9939 0.9916 1.0122	-0.35 0.35	4.22 4.22 4.22 4.22	0.0701 0.0620 0.0681 0.0599	7.03	6.68	162.50	-0.0215 -0.0255 -0.0255 -0.0194	158.00		1323.00	0.00	0.18	0.18	0.35	-1.14	-0.18
244.00	1320.00	221.57	1.0122 1.0191 0.9984 0.9824 0.9893 0.9893 1.0076 0.9755	0.70 0.70	3.87 3.87 3.87 3.87	0.0640 0.0742 0.0599 0.0477	6.50	6.68	162.50	-0.0276 -0.0235 -0.0235 -0.0255	158.00	1320.00		0.18	0.18	0.18	0.26	-1.41	-0.97

FDR Subframe Reference Number	Altitude: Radio (feet)	MAGNETIC HEADING (deg.)	VERTICAL ACCEL (g)	ROLL (deg.)	PITCH (deg.)	LONGITUDINAL ACCEL (g)	Angle of Attack #1 (deg.)	Angle of Attack #2 (deg.)	IAS (KNOTS)	LATERAL ACCELERATION (g)	Ground Speed (knots)	Altitude: Radio 1 (feet)	Altitude: Radio 2 (feet)	ELEVLI (.DEG)	ELEVLO (.DEG)	ELEVRI (.DEG)	ELEVRO (.DEG)	Rudder Pos. (Lower) (deg)	Rudder Pos. (Upper) (deg)
245.00	1300.00	221.57	1.0030 0.9710 0.9504 1.0145 0.9778 0.9962 0.9801 1.0191	0.35 -0.70	3.52 3.52 3.52 3.52	0.0518 0.0579 0.0396 0.0579	6.50	6.33	162.00	-0.0377 -0.0357 -0.0215 -0.0357	158.00		1300.00	0.00	0.70	0.53	0.53	-1.32	-0.97
246.00	1281.00	221.22	1.0053 1.0099 0.9847 0.9847 1.0259 0.9984 0.9824 1.0397	-1.76 -2.46	3.52 3.52 3.16 3.16	0.0559 0.0559 0.0620 0.0436	5.98	6.15	163.00	-0.0316 -0.0296 -0.0316 -0.0255	158.00	1281.00		0.53	0.79	0.62	0.88	-0.09	-0.88
247.00	1266.00	221.57	0.9778 0.9893 0.9137 0.9824 0.9916 1.0122 1.0053 1.0122	-2.11 -1.41	3.16 3.16 3.16 3.16	0.0416 0.0538 0.0477 0.0375	6.15	5.80	162.50	-0.0194 -0.0133 -0.0296 -0.0154	158.00		1266.00	0.62	0.44	0.35	0.79	0.26	0.62
248.00	1254.00	221.22	1.0236 1.0053 0.9618 0.9343 1.0145 1.0053 0.9939 0.9595	-1.05 -0.70	3.16 3.16 2.81 2.81	0.0396 0.0477 0.0396 0.0355	5.62	5.98	162.00	-0.0072 -0.0154 -0.0255 -0.0255	158.00	1254.00		0.62	0.88	0.70	0.97	-1.58	-0.26
249.00	1246.00	221.22	0.9962 0.9824 0.9778 1.0076 1.0007 0.9275 1.0168 1.0053	-0.70 -0.70	2.81 2.81 2.81 2.81	0.0274 0.0274 0.0396 0.0253	5.98	5.45	161.50	-0.0235 -0.0316 -0.0316 -0.0194	156.00		1246.00	0.97	1.32	1.05	1.49	-1.14	-1.05
250.00	1261.00	221.22	0.9801 0.9893 1.0030 0.9733 0.9984 0.9664 0.9870 0.9664	-0.35 -0.35	2.81 2.81 2.81 2.81	0.0294 0.0294 0.0294 0.0253	5.27	5.45	162.00	-0.0296 -0.0296 -0.0235 -0.0235	156.00	1261.00		1.23	1.41	1.32	1.58	-0.97	-0.70
251.00	1259.00	221.22	0.9962 0.9893 1.0236 0.9824 1.0328 1.0374 0.9320 1.0328	-0.35 0.00	2.81 2.81 2.81 2.46	0.0274 0.0375 0.0253 0.0253	5.45	5.27	162.50	-0.0194 -0.0337 -0.0296 -0.0357	156.00		1259.00	1.14	1.14	1.32	1.49	-0.09	-0.53
252.00	1248.00	221.22	1.0145 1.0007 0.9916 0.9824 0.9870 1.0259 0.9939 0.9733	0.70 0.70	2.46 2.46 2.46 2.46	0.0314 0.0213 0.0172 0.0335	5.27	5.27	161.50	-0.0235 -0.0255 -0.0398 -0.0357	156.00	1248.00		1.05	1.85	0.62	2.46	-0.62	0.44
253.00	1239.00	221.22	1.0007 0.9435 0.9893 1.0213 0.9962 0.9824 1.0007 0.9664	0.70 0.70	2.46 2.11 2.11 2.11	0.0172 0.0253 0.0131 0.0253	5.10	5.10	161.00	-0.0296 -0.0316 -0.0235 -0.0215	154.00		1239.00	0.88	2.29	0.53	2.64	-0.35	0.00
254.00	1217.00	221.22	0.9275 0.9664 0.9618 0.9641 0.9504 0.9870 1.0053 0.9687	0.35 0.00	1.76 1.76 1.76 1.76	0.0294 0.0213 0.0192 0.0152	5.10	4.75	161.50	-0.0296 -0.0377 -0.0296 -0.0316	154.00	1217.00		1.49	3.25	1.67	3.96	-0.09	0.79

FDR Subframe Reference Number	Altitude: Radio (feet)	MAGNETIC HEADING (deg.)	VERTICAL ACCEL (g)	ROLL (deg.)	PITCH (deg.)	LONGITUDINAL ACCEL (g)	Angle of Attack #1 (deg.)	Angle of Attack #2 (deg.)	IAS (KNOTS)	LATERAL ACCELERATION (g)	Ground Speed (knots)	Altitude: Radio 1 (feet)	Altitude: Radio 2 (feet)	ELEVLI (.DEG)	ELEVLO (.DEG)	ELEVRI (.DEG)	ELEVRO (.DEG)	Rudder Pos. (Lower) (deg)	Rudder Pos. (Upper) (deg)
255.00	1153.00	221.57	0.9939 0.9504 1.0213 1.0213 0.9939 1.0442 0.9618 1.0351	-0.35 -0.35	1.76 1.76 2.11 2.11	0.0050 0.0131 0.0131 0.0172	4.75	4.75	161.50	-0.0276 -0.0133 -0.0316 -0.0215	154.00		1153.00	2.46	3.96	2.02	4.22	0.09	1.05
256.00	1152.00	221.57	1.0099 0.9962 1.0213 1.0168 1.0328 0.9801 1.0626 0.9847	-0.35 -0.70	2.11 2.46 2.46 2.46	0.0294 0.0131 0.0314 0.0213	4.92	4.92	161.00	-0.0154 -0.0194 -0.0255 -0.0337	154.00	1152.00		3.16	3.87	2.46	4.39	-0.26	0.88
257.00	1178.00	221.57	1.0442 1.0374 1.0786 1.0626 1.0557 1.0671 1.0351 1.0168	-0.70 -1.05	2.81 2.81 2.81 2.81	0.0294 0.0233 0.0233 0.0233	5.10	5.27	161.00	-0.0255 -0.0337 -0.0337 -0.0174	154.00		1178.00	2.90	2.37	1.05	3.34	-0.26	0.62
258.00	1154.00	221.57	1.0671 1.0648 1.0442 1.0145 1.0282 1.0900 1.0236 1.0580	-0.70 -0.35	3.16 3.16 3.16 2.81	0.0294 0.0477 0.0335 0.0274	5.45	5.62	160.00	-0.0337 -0.0235 -0.0276 -0.0215	152.00	1154.00		1.58	0.97	1.05	2.55	-0.26	0.88
259.00	1160.00	221.57	0.9824 1.0305 0.9710 1.0168 0.9801 0.9710 0.9962 1.0007	0.00 0.00	2.81 2.81 2.46 2.46	0.0274 0.0436 0.0152 0.0314	5.62	5.45	160.00	-0.0235 -0.0194 -0.0133 -0.0255	152.00		1160.00	0.26	1.85	0.18	3.34	-1.05	-0.18
260.00	1107.00	221.57	0.9641 0.9481 0.9893 1.0076 0.9916 0.9572 0.9893 0.9687	-1.05 -1.05	2.46 2.46 2.46 2.46	0.0233 0.0172 0.0213 0.0253	5.45	5.27	159.50	-0.0357 -0.0276 -0.0337 -0.0215	152.00	1107.00		1.14	2.11	2.11	4.04	-0.53	-0.09
261.00	1126.00	221.57	0.9962 0.9733 0.9458 1.0168 0.9939 0.9710 0.9366 0.9939	-0.70 -0.35	2.46 2.46 2.11 2.11	0.0253 0.0538 0.0335 0.0131	5.27	5.10	159.00	-0.0154 -0.0357 -0.0276 -0.0316	150.00		1126.00	0.97	1.67	1.41	2.29	-0.53	1.23
262.00	1091.00	221.57	0.9641 0.9572 0.9939 0.9687 1.0099 0.9984 0.9755 0.9847	-0.35 -0.35	2.11 2.11 2.11 2.46	0.0416 0.0253 0.0253 0.0253	5.10	5.27	159.00	-0.0296 -0.0113 -0.0194 -0.0194	150.00	1091.00		0.88	4.39	2.81	4.57	-0.62	0.18
263.00	1044.00	221.57	0.9801 1.0053 0.9641 1.0030 1.0351 1.0465 0.9870 1.0168	0.00 0.00	2.46 2.46 2.46 2.46	0.0375 0.0335 0.0253 0.0335	5.27	5.27	159.00	-0.0255 -0.0194 -0.0316 -0.0377	150.00		1044.00	2.37	2.29	2.37	3.52	-0.53	0.62
264.00	1034.00	221.57	1.0328 0.9687 1.0259 0.9710 0.9481 1.0076 1.0580 1.0213	0.00 0.00	2.81 2.81 2.81 2.81	0.0498 0.0457 0.0294 0.0396	5.27	5.45	159.00	-0.0276 -0.0235 -0.0194 -0.0276	150.00	1034.00		1.49	3.34	2.02	4.13	-0.62	0.18

Tab 9

FDR Subframe Reference Number	Altitude: Radio (feet)	MAGNETIC HEADING (deg.)	VERTICAL ACCEL (g)	ROLL (deg.)	PITCH (deg.)	LONGITUDINAL ACCEL (g)	Angle of Attack #1 (deg.)	Angle of Attack #2 (deg.)	IAS (KNOTS)	LATERAL ACCELERATION (g)	Ground Speed (knots)	Altitude: Radio 1 (feet)	Altitude: Radio 2 (feet)	ELEVLI (.DEG)	ELEVLO (.DEG)	ELEVRI (.DEG)	ELEVRO (.DEG)	Rudder Pos. (Lower) (deg)	Rudder Pos. (Upper) (deg)
265.00	994.00	221.57	1.0122 1.0397 1.0626 1.0168 1.0534 1.0580 1.0213 1.1084	0.00 0.00	2.81 3.16 3.16 3.16	0.0314 0.0477 0.0396 0.0436	5.62	5.45	159.00	-0.0194 -0.0418 -0.0276 -0.0235	150.00		994.00	2.29	2.99	2.29	4.13	-0.44	0.35
266.00	1016.00	221.57	1.0236 1.0671 1.0374 1.0397 1.0236 1.0397 1.0236 1.0603	-0.35 0.00	3.52 3.52 3.52 3.52	0.0477 0.0559 0.0355 0.0355	5.80	5.98	158.50	-0.0154 -0.0276 -0.0235 -0.0194	148.00	1016.00		1.58	1.67	2.11	2.55	-0.09	0.53
267.00	1015.00	221.57	1.0076 1.0099 1.0671 1.0236 1.0122 0.9939 0.9847 0.9939	0.00 0.00	3.52 3.52 3.52 3.52	0.0620 0.0457 0.0335 0.0375	5.98	5.98	158.50	-0.0194 -0.0194 -0.0235 -0.0194	148.00		1015.00	0.88	2.46	1.14	2.99	-0.35	0.44
268.00	993.00	221.57	1.0465 1.0282 1.0168 1.0145 1.0007 1.0534 1.0259 1.0351	0.70 0.70	3.52 3.52 3.16 3.16	0.0498 0.0416 0.0436 0.0375	5.80	5.98	157.50	-0.0194 -0.0154 -0.0276 -0.0276	148.00	993.00		1.05	0.44	1.05	2.20	-0.97	0.62
269.00	971.00	221.57	0.9870 0.9939 0.9297 0.9710 0.9847 0.9733 0.9435 0.9526	0.70 0.35	3.16 2.81 2.81 2.81	0.0375 0.0355 0.0518 0.0314	5.98	5.62	157.50	-0.0296 -0.0316 -0.0337 -0.0194	148.00		971.00	-0.09	2.37	0.70	3.69	-0.70	0.00
270.00	966.00	221.92	0.9481 0.9847 0.9366 0.9435 1.0145 1.0168 1.0076 0.9824	0.35 -0.35	2.81 2.81 2.81 2.81	0.0416 0.0477 0.0498 0.0436	5.45	5.27	157.50	-0.0215 -0.0255 -0.0316 -0.0215	148.00	966.00		1.58	1.76	2.11	4.13	-0.26	0.53
271.00	898.00	221.92	0.9984 1.0145 0.9847 1.0580 1.0030 1.0168 0.9733 0.9916	-0.70 -0.70	2.81 2.81 2.81 2.46	0.0498 0.0498 0.0559 0.0396	5.45	5.45	157.50	-0.0296 -0.0337 -0.0235 -0.0215	146.00		898.00	0.44	0.00	1.41	1.32	0.44	0.62
272.00	920.00	221.92	0.9801 0.9618 0.9572 0.9160 0.9526 0.9870 0.9595 0.9710	-0.70 -0.70	2.46 2.46 2.11 2.11	0.0355 0.0396 0.0335 0.0477	5.45	5.45	158.00	-0.0174 -0.0174 -0.0377 -0.0377	146.00	920.00		-0.62	1.41	-0.09	3.25	0.35	1.41
273.00	920.00	221.92	0.9618 0.9847 0.9664 0.9275 0.9939 0.9435 0.9664 1.0053	-0.35 0.00	2.11 2.11 2.46 2.46	0.0436 0.0294 0.0375 0.0335	5.27	5.10	157.50	-0.0377 -0.0215 -0.0194 -0.0174	146.00		920.00	3.52	4.22	2.29	5.10	-0.44	0.70
274.00	891.00	221.92	0.9962 0.9984 1.0122 1.0122 1.0099 1.0397 1.0557 1.0557	0.00 0.00	2.81 2.81 3.16 3.16	0.0498 0.0498 0.0701 0.0538	5.10	5.45	157.50	-0.0296 -0.0377 -0.0316 -0.0296	146.00	891.00		3.69	2.64	1.85	2.72	-0.53	0.18

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FDR Subframe Reference Number	Altitude: Radio (feet)	MAGNETIC HEADING (deg.)	VERTICAL ACCEL (g)	ROLL (deg.)	PITCH (deg.)	LONGITUDINAL ACCEL (g)	Angle of Attack #1 (deg.)	Angle of Attack #2 (deg.)	IAS (KNOTS)	LATERAL ACCELERATION (g)	Ground Speed (knots)	Altitude: Radio 1 (feet)	Altitude: Radio 2 (feet)	ELEVLI (.DEG)	ELEVLO (.DEG)	ELEVRI (.DEG)	ELEVRO (.DEG)	Rudder Pos. (Lower) (deg)	Rudder Pos. (Upper) (deg)
275.00	902.00	221.92	1.0168 0.9824 1.0053 1.0328 1.0511 1.0053 1.0648 1.0626	-0.35 -0.35	3.52 3.52 3.52 3.52	0.0538 0.0599 0.0457 0.0477	5.98	5.62	158.00	-0.0133 -0.0296 -0.0357 -0.0255	146.00		902.00	1.76	0.09	-0.26	1.76	-0.26	0.44
276.00	897.00	221.57	1.0191 1.0191 1.0374 1.0099 1.0007 1.0259 0.9870 0.9755	-0.70 -0.70	3.16 3.16 3.16 2.81	0.0538 0.0335 0.0396 0.0375	5.98	5.98	158.00	-0.0296 -0.0235 -0.0194 -0.0194	146.00	897.00		-0.26	0.88	-0.62	1.41	0.00	0.53
277.00	895.00	221.57	0.9870 0.9687 0.9984 1.0053 1.0213 0.9687 1.0076 0.9297	-0.70 -0.70	2.81 2.81 2.81 2.81	0.0457 0.0396 0.0457 0.0436	5.80	5.62	158.00	-0.0235 -0.0194 -0.0255 -0.0398	146.00		895.00	0.53	2.81	1.23	3.96	0.18	0.88
278.00	854.00	221.57	0.9939 1.0030 0.9962 1.0145 1.0191 1.0236 0.9824 1.0053	-0.35 0.35	2.81 2.81 3.16 3.16	0.0416 0.0274 0.0375 0.0335	5.45	5.45	157.50	-0.0377 -0.0255 -0.0316 -0.0215	146.00	854.00		2.20	3.08	1.58	3.87	-0.62	1.05
279.00	849.00	221.57	1.0099 1.0648 1.0145 1.0191 1.0488 1.0328 1.0099 1.0259	0.70 0.70	3.16 3.52 3.52 3.52	0.0457 0.0436 0.0396 0.0518	5.62	5.62	157.00	-0.0276 -0.0296 -0.0255 -0.0255	146.00		849.00	2.29	2.29	1.41	2.11	-1.05	-0.44
280.00	826.00	221.92	1.0442 1.0511 1.0511 0.9526 1.0351 1.0374 0.9595 0.9458	0.70 0.70	3.52 3.52 3.16 3.16	0.0498 0.0559 0.0599 0.0742	5.62	5.80	157.50	-0.0215 -0.0296 -0.0194 -0.0418	144.00	826.00		1.14	2.99	-0.79	1.67	-0.53	0.18
281.00	843.00	221.92	1.0007 1.0053 1.0328 0.9962 1.0007 1.0580 1.0442 0.9595	0.35 0.00	3.16 3.52 3.52 3.52	0.0436 0.0518 0.0477 0.0538	5.80	5.62	157.50	-0.0154 -0.0276 -0.0316 -0.0235	144.00		843.00	2.55	2.37	1.14	4.48	0.09	0.62
282.00	777.00	221.92	1.0419 0.9962 1.0328 0.9916 0.9733 1.0030 0.9755 1.0030	0.00 0.00	3.52 3.52 3.16 3.16	0.0498 0.0436 0.0721 0.0538	5.62	5.62	157.50	-0.0276 -0.0255 -0.0174 -0.0377	144.00	777.00		1.76	0.09	-0.70	1.67	0.35	1.14
283.00	774.00	222.27	1.0099 1.0191 0.9916 0.9916 1.0122 1.0236 0.9939 0.9801	0.35 0.70	3.16 3.16 3.16 3.16	0.0599 0.0396 0.0457 0.0436	5.80	5.45	158.50	-0.0154 -0.0235 -0.0235 -0.0255	144.00		774.00	1.41	2.81	0.00	3.43	-0.88	1.14
284.00	776.00	222.27	1.0099 0.9847 0.9962 1.0007 1.0030 0.9595 0.9916 0.9733	0.70 0.70	3.16 3.16 3.16 3.16	0.0375 0.0498 0.0396 0.0375	5.45	5.62	158.00	-0.0235 -0.0255 -0.0235 -0.0154	144.00	776.00		1.93	1.93	1.05	2.29	-0.79	-0.09

FDR Subframe Reference Number	Attitude: Radio (feet)	MAGNETIC HEADING (deg.)	VERTICAL ACCEL (g)	ROLL (deg.)	PITCH (deg.)	LONGITUDINAL ACCEL (g)	Angle of Attack #1 (deg.)	Angle of Attack #2 (deg.)	IAS (KNOTS)	LATERAL ACCELERATION (g)	Ground Speed (knots)	Attitude: Radio 1 (feet)	Attitude: Radio 2 (feet)	ELEVLI (.DEG)	ELEVLO (.DEG)	ELEVRI (.DEG)	ELEVRO (.DEG)	Rudder Pos. (Lower) (deg)	Rudder Pos. (Upper) (deg)
285.00	749.00	222.27	1.0351 1.0076 1.0076 1.0007 0.9801 1.0305 1.0168 0.9893	0.70 0.70	3.16 3.16 3.16 3.16	0.0518 0.0396 0.0396 0.0518	5.62	5.45	157.50	-0.0316 -0.0255 -0.0357 -0.0357	144.00		749.00	1.05	2.64	0.26	2.37	-0.62	0.18
286.00	723.00	222.27	0.9710 1.0328 1.0030 1.0076 0.9962 0.9916 1.0053 1.0122	0.35 0.00	3.16 3.16 3.16 3.52	0.0498 0.0457 0.0559 0.0416	5.62	5.62	157.00	-0.0337 -0.0255 -0.0215 -0.0255	142.00	723.00		1.58	3.69	1.23	3.52	0.09	0.26
287.00	719.00	222.27	1.0397 0.9710 1.0442 1.0213 1.0282 1.0282 1.0030 1.0236	0.00 0.00	3.52 3.52 3.52 3.52	0.0620 0.0498 0.0518 0.0498	5.80	5.62	157.00	-0.0337 -0.0255 -0.0276 -0.0215	142.00		719.00	2.55	1.76	1.05	1.93	0.18	1.05
288.00	700.00	222.63	0.9435 1.0419 1.0076 0.9595 0.9984 1.0259 1.0717 1.0282	0.00 0.00	3.52 3.87 3.87 3.87	0.0640 0.0538 0.0681 0.0721	5.98	5.98	155.50	-0.0215 -0.0133 -0.0154 -0.0316	142.00	700.00		1.76	2.99	1.23	3.52	-0.09	0.88
289.00	674.00	222.63	1.0511 1.0374 1.0099 0.9526 1.0397 1.0076 1.0099 0.9916	0.35 0.70	3.87 3.87 3.87 3.87	0.0742 0.0701 0.0782 0.0660	6.15	5.98	156.00	-0.0235 -0.0174 -0.0255 -0.0337	142.00		674.00	1.58	1.23	0.18	2.11	-0.18	0.79
290.00	703.00	222.63	1.0191 1.0259 1.0099 1.0099 1.0053 1.0053 0.9893 0.9526	0.70 0.70	3.87 3.87 3.87 3.87	0.0843 0.0864 0.0803 0.0823	5.98	6.15	156.00	-0.0194 -0.0276 -0.0215 -0.0154	142.00	703.00		0.35	0.79	0.44	1.93	-0.53	0.44
291.00	679.00	222.63	1.0099 0.9962 1.0259 0.9687 0.9962 0.9618 1.0076 0.9572	0.00 -0.35	3.87 3.52 3.52 3.52	0.0782 0.0762 0.0640 0.0681	6.15	5.80	155.50	-0.0337 -0.0235 -0.0215 -0.0194	142.00		679.00	-0.18	0.88	-0.18	1.67	0.44	-0.09
292.00	646.00	222.63	0.9962 1.0076 0.9206 0.9160 0.9183 0.9664 0.8656 0.9893	-0.35 -0.35	3.16 3.16 3.16 2.81	0.0701 0.0782 0.0782 0.0660	5.80	5.80	155.00	-0.0255 -0.0194 -0.0154 -0.0215	142.00	646.00		-0.18	0.44	-0.53	1.32	0.26	1.32
293.00	651.00	222.63	0.9481 0.9641 0.9618 0.9526 1.0305 0.9389 0.9572 0.9641	-0.70 -0.70	2.81 2.81 2.81 2.81	0.0660 0.0660 0.0640 0.0742	5.80	5.27	155.00	-0.0276 -0.0215 -0.0194 -0.0113	142.00		651.00	1.05	2.20	0.35	3.08	-0.18	0.70
294.00	632.00	222.63	0.9595 0.9870 0.9297 0.9526 0.9939 0.9297 1.0076 0.9710	-0.70 -1.05	2.81 2.81 2.46 2.46	0.0803 0.0843 0.0823 0.0701	5.27	5.62	154.50	-0.0133 -0.0154 -0.0113 -0.0194	144.00	632.00		1.23	0.35	-0.53	1.32	-0.26	0.62

A-13

FDR Subframe Reference Number	Altitude: Radio (feet)	MAGNETIC HEADING (deg.)	VERTICAL ACCEL (g)	ROLL (deg.)	PITCH (deg.)	LONGITUDINAL ACCEL (g)	Angle of Attack #1 (deg.)	Angle of Attack #2 (deg.)	IAS (KNOTS)	LATERAL ACCELERATION (g)	Ground Speed (knots)	Altitude: Radio 1 (feet)	Altitude: Radio 2 (feet)	ELEVLI (.DEG)	ELEVLO (.DEG)	ELEVRI (.DEG)	ELEVRO (.DEG)	Rudder Pos. (Lower) (deg)	Rudder Pos. (Upper) (deg)
295.00	618.00	222.27	0.9504 0.9847 0.9962 0.9618 1.0053 0.9870 1.0213 0.9893	-1.05 -1.05	2.46 2.46 2.81 2.81	0.1006 0.0904 0.0701 0.0884	5.80	5.45	155.00	-0.0235 -0.0255 -0.0154 -0.0215	144.00		618.00	-0.44	4.04	1.76	4.04	0.09	0.70
296.00	610.00	222.27	1.0282 1.0191 1.0076 1.0236 1.0145 0.9389 1.0442 1.0534	-0.70 -0.35	3.16 3.16 3.52 3.52	0.0762 0.0965 0.0843 0.0864	5.45	6.15	155.50	-0.0215 -0.0357 -0.0194 -0.0276	144.00	610.00		2.64	3.25	2.46	3.78	-0.44	1.05
297.00	592.00	221.92	1.0374 1.0923 1.0442 1.0397 1.0259 1.0259 1.0419 1.0328	-0.35 0.00	3.52 3.87 3.87 3.87	0.0884 0.1149 0.0884 0.1006	6.33	6.15	155.50	-0.0255 -0.0337 -0.0235 -0.0174	144.00		592.00	2.11	0.97	0.44	1.05	-0.35	0.26
298.00	575.00	221.57	1.0580 1.0053 1.0145 1.0122 1.0145 1.0145 0.9641 0.9984	0.00 0.70	3.87 3.52 3.52 3.52	0.0986 0.0904 0.0904 0.0843	6.50	6.50	155.50	-0.0357 -0.0337 -0.0235 -0.0154	144.00	575.00		-0.88	2.81	-1.32	1.05	0.18	1.05
299.00	556.00	221.57	0.9412 0.9824 1.0351 0.9939 0.9916 1.0763 0.9939 1.0168	1.05 1.05	3.52 3.52 3.52 3.87	0.0945 0.1067 0.1006 0.1006	6.50	6.33	155.50	-0.0296 -0.0235 -0.0337 -0.0398	146.00		556.00	2.46	3.34	2.55	3.25	-0.62	0.44
300.00	558.00	221.57	0.9572 1.0534 1.0168 1.0099 1.0328 1.0030 1.0374 1.0488	0.35 0.00	3.87 3.87 3.87 3.87	0.0965 0.0925 0.1067 0.1047	6.15	6.15	155.50	-0.0276 -0.0357 -0.0499 -0.0438	146.00	558.00		1.93	-0.09	0.44	1.76	0.09	0.35
301.00	533.00	221.57	1.0465 1.0603 0.9939 0.9916 1.0259 0.9847 1.0030 0.9755	-0.70 -1.05	3.87 3.87 3.52 3.52	0.1087 0.1067 0.0864 0.1026	6.15	6.33	156.00	-0.0215 -0.0296 -0.0194 -0.0418	146.00		533.00	-0.97	0.97	-0.62	0.53	1.05	1.23
302.00	520.00	221.57	0.9664 0.9755 0.9664 0.9320 1.0122 1.0511 1.0236 1.0099	-1.41 -1.41	3.52 3.52 3.87 3.87	0.0965 0.0864 0.0945 0.0986	6.15	5.98	156.00	-0.0316 -0.0316 -0.0276 -0.0438	146.00	520.00		0.35	0.70	2.72	3.87	0.88	1.58
303.00	501.00	221.57	1.0374 1.0236 1.0282 0.9984 1.0076 0.9801 1.0419 1.0580	-0.70 -0.70	3.87 3.87 3.87 4.22	0.0904 0.0803 0.0864 0.0803	5.98	5.98	156.50	-0.0215 -0.0174 -0.0174 -0.0276	148.00		501.00	-0.26	2.90	0.26	1.23	-0.18	2.37
304.00	489.00	221.22	1.0053 1.0763 0.9984 1.0717 1.0488 1.0030 1.0168 1.0305	-0.70 -0.35	4.22 4.22 4.22 4.22	0.0904 0.0945 0.0864 0.1067	5.98	6.33	156.50	-0.0438 -0.0276 -0.0235 -0.0337	148.00	489.00		1.67	0.09	-0.35	0.79	0.09	0.62

FDR Subframe Reference Number	Altitude: Radio (feet)	MAGNETIC HEADING (deg.)	VERTICAL ACCEL (g)	ROLL (deg.)	PITCH (deg.)	LONGITUDINAL ACCEL (g)	Angle of Attack #1 (deg.)	Angle of Attack #2 (deg.)	IAS (KNOTS)	LATERAL ACCELERATION (g)	Ground Speed (knots)	Altitude: Radio 1 (feet)	Altitude: Radio 2 (feet)	ELEVLI (.DEG)	ELEVLO (.DEG)	ELEVRI (.DEG)	ELEVRO (.DEG)	Rudder Pos. (Lower) (deg)	Rudder Pos. (Upper) (deg)
305.00	472.00	221.22	1.0053 0.9618 0.9641 0.9824 0.9962 0.9984 0.9824 0.9962	0.00 0.00	4.22 4.22 4.22 4.22	0.0986 0.0843 0.0843 0.0864	6.33	6.15	156.50	-0.0337 -0.0255 -0.0357 -0.0235	148.00		472.00	-0.70	2.99	0.53	2.02	0.09	0.88
306.00	474.00	221.22	1.0122 1.0374 0.9687 1.0007 1.0397 1.0328 1.0259 1.0511	0.00 -0.35	4.22 4.22 4.22 4.22	0.0986 0.0986 0.0843 0.0843	6.15	5.98	156.50	-0.0255 -0.0276 -0.0357 -0.0316	148.00	474.00		1.67	0.09	1.32	3.25	0.00	0.18
307.00	453.00	221.22	0.9595 1.0351 1.0282 0.9916 0.9870 0.9526 0.9687 0.9824	-1.05 -1.41	4.22 3.87 3.87 3.52	0.0843 0.0864 0.0823 0.0803	6.15	6.15	157.00	-0.0337 -0.0235 -0.0194 -0.0235	148.00		453.00	-1.32	-0.18	-1.23	0.62	0.97	1.49
308.00	450.00	221.22	0.9778 0.9458 0.9710 0.9595 0.9778 0.9366 0.9091 0.8565	-1.41 -1.41	3.52 3.16 3.16 2.81	0.0823 0.0823 0.0640 0.0721	5.62	5.80	157.00	-0.0174 -0.0276 -0.0215 -0.0215	148.00	450.00		-1.32	0.26	-1.14	0.62	0.79	1.67
309.00	441.00	220.87	0.9389 0.9458 0.8794 0.9252 0.9504 0.9481 0.9114 0.9481	-1.41 -1.05	2.81 2.81 2.81 2.81	0.0599 0.0620 0.0721 0.0701	5.62	4.92	156.50	-0.0276 -0.0092 -0.0296 -0.0276	148.00		441.00	-0.35	4.13	2.02	5.01	0.35	1.14
310.00	430.00	220.87	0.9595 0.9962 1.0282 1.0191 0.9504 1.0328 0.9618 1.0191	-1.05 -0.70	3.16 3.16 3.52 3.52	0.0762 0.0823 0.0823 0.0762	4.92	5.27	157.00	-0.0255 -0.0296 -0.0296 -0.0215	148.00	430.00		3.34	-0.79	1.85	2.90	-0.09	0.62
311.00	410.00	220.52	1.0397 1.0419 0.9549 0.9572 1.0122 1.0351 0.9984 0.9916	-1.05 -1.05	3.52 3.52 3.52 3.16	0.0803 0.0823 0.0803 0.0762	5.62	5.80	157.00	-0.0276 -0.0235 -0.0255 -0.0296	150.00		410.00	-1.23	-2.37	-0.97	0.00	0.18	0.70
312.00	397.00	220.52	0.9824 1.0030 0.9595 0.9687 0.9252 0.9366 0.9435 0.9183	-1.05 -0.70	3.16 2.81 2.81 2.46	0.0701 0.0782 0.0599 0.0599	5.80	5.80	157.00	-0.0276 -0.0133 -0.0194 -0.0255	150.00	397.00		-2.81	0.09	-0.79	1.23	0.62	1.14
313.00	393.00	220.52	0.9091 0.9641 0.9595 0.8908 0.9366 0.9206 0.9481 0.9183	0.00 0.35	2.46 2.11 2.11 1.76	0.0640 0.0681 0.0681 0.0701	5.62	5.10	157.00	-0.0255 -0.0235 -0.0296 -0.0194	150.00		393.00	-0.88	1.23	-0.79	0.97	-1.05	1.14
314.00	379.00	220.16	0.9275 0.9526 0.9206 0.9046 0.9252 0.9458 0.9389 0.9068	0.35 0.35	1.76 1.76 1.76 2.11	0.0762 0.0681 0.0782 0.0742	5.10	4.92	157.00	-0.0377 -0.0255 -0.0235 -0.0316	150.00	379.00		0.79	1.93	1.05	3.08	-0.18	0.18

FDR Subframe Reference Number	Altitude: Radio (feet)	MAGNETIC HEADING (deg.)	VERTICAL ACCEL (g)	ROLL (deg.)	PITCH (deg.)	LONGITUDINAL ACCEL (g)	Angle of Attack #1 (deg.)	Angle of Attack #2 (deg.)	IAS (KNOTS)	LATERAL ACCELERATION (g)	Ground Speed (knots)	Altitude: Radio 1 (feet)	Altitude: Radio 2 (feet)	ELEVLI (.DEG)	ELEVLO (.DEG)	ELEVRI (.DEG)	ELEVRO (.DEG)	Rudder Pos. (Lower) (deg)	Rudder Pos. (Upper) (deg)
315.00	350.00	220.52	0.9526 0.9801 0.9114 0.9595 1.0053 0.9824 1.0213 1.0534	0.35 0.70	2.11 2.46 2.46 2.81	0.0640 0.0762 0.0721 0.0803	4.92	4.75	156.50	-0.0133 -0.0377 -0.0316 -0.0235	150.00		350.00	1.14	2.90	2.02	4.04	0.53	1.49
316.00	296.00	220.16	1.0488 1.0236 0.9801 1.0397 1.0282 0.9595 0.9870 1.0603	0.35 0.35	3.16 3.16 3.52 3.52	0.0803 0.0864 0.0965 0.0884	5.27	5.98	156.50	-0.0235 -0.0316 -0.0418 -0.0276	152.00	296.00		1.85	1.67	1.58	2.64	-0.62	0.79
317.00	343.00	220.16	1.0717 1.0145 1.0580 1.0603 1.1015 1.1038 1.0648 1.0900	0.00 -0.70	3.87 3.87 4.22 4.22	0.0864 0.0864 0.0945 0.1047	6.33	6.50	157.00	-0.0357 -0.0337 -0.0296 -0.0296	152.00		343.00	0.97	-1.05	1.14	1.58	-0.18	0.35
318.00	320.00	220.16	1.0900 1.0923 1.1084 1.0786 1.0213 1.0030 1.0076 0.9526	-1.41 -1.41	4.22 3.87 3.52 3.52	0.1067 0.1006 0.0803 0.0762	6.86	6.68	156.00	-0.0316 -0.0194 -0.0235 -0.0174	152.00	320.00		-2.20	-0.62	-1.41	-1.23	1.23	1.93
319.00	314.00	220.16	1.0351 0.9710 0.9870 0.9801 0.9893 0.9664 0.9023 0.9137	-1.05 -0.70	3.16 2.81 2.81 2.46	0.0843 0.0742 0.0742 0.0782	6.68	5.62	157.50	-0.0174 -0.0194 -0.0215 -0.0113	152.00		314.00	-1.14	-0.09	-0.97	0.70	0.18	1.41
320.00	279.00	220.16	0.8908 0.9458 0.9183 0.8931 0.9320 0.8931 0.9137 0.9549	-0.70 -0.70	2.11 2.11 1.76 1.76	0.0823 0.0762 0.0599 0.0742	5.27	5.45	156.50	-0.0316 -0.0296 -0.0418 -0.0296	152.00	279.00		-1.14	3.25	-0.18	1.93	-0.18	0.79
321.00	270.00	220.16	0.9366 0.8817 0.9618 0.9366 0.9412 0.9366 1.0076 0.9458	0.00 0.35	1.76 2.11 2.11 2.46	0.0660 0.0640 0.0721 0.0762	5.10	4.92	157.50	-0.0215 -0.0194 -0.0174 -0.0154	154.00		270.00	2.46	3.25	1.49	3.25	-0.18	1.23
322.00	265.00	219.81	0.9801 0.9710 0.9572 1.0465 1.0488 1.0740 1.0763 1.0397	0.35 0.35	2.46 2.81 2.81 3.16	0.0782 0.0701 0.0660 0.0843	4.92	5.27	158.50	-0.0215 -0.0276 -0.0276 -0.0255	154.00	265.00		2.02	-1.67	1.76	1.76	-0.35	0.18
323.00	243.00	219.81	1.0465 1.0557 1.0419 1.0053 1.0191 1.0145 0.9984 1.0213	0.00 -0.35	3.16 3.16 3.16 2.81	0.0803 0.0782 0.0803 0.0762	5.80	5.80	158.00	-0.0235 -0.0235 -0.0255 -0.0296	154.00		243.00	-2.64	-0.44	-1.85	-1.14	0.53	0.53
324.00	237.00	219.81	0.9641 0.9641 0.9893 1.0122 0.9847 1.0213 1.0030 1.0168	-1.05 -0.70	2.81 2.81 2.81 3.16	0.0681 0.0559 0.0782 0.0823	5.80	5.80	158.00	-0.0215 -0.0194 -0.0296 -0.0357	154.00	237.00		-1.41	5.36	2.02	6.33	0.79	1.49

S1-T-15

FDR Subframe Reference Number	Altitude: Radio (feet)	MAGNETIC HEADING (deg.)	VERTICAL ACCEL (g)	ROLL (deg.)	PITCH (deg.)	LONGITUDINAL ACCEL (g)	Angle of Attack #1 (deg.)	Angle of Attack #2 (deg.)	IAS (KNOTS)	LATERAL ACCELERATION (g)	Ground Speed (knots)	Altitude: Radio 1 (feet)	Altitude: Radio 2 (feet)	ELEVLI (.DEG)	ELEVLO (.DEG)	ELEVRI (.DEG)	ELEVRO (.DEG)	Rudder Pos. (Lower) (deg)	Rudder Pos. (Upper) (deg)
325.00	218.00	219.81	1.0328 1.0557 1.0191 1.0282 1.0419 1.0053 1.0374 1.0717	0.35 0.70	3.16 3.16 3.16 3.16	0.0782 0.0701 0.0803 0.0904	5.62	5.45	158.50	-0.0194 -0.0113 -0.0255 -0.0418	154.00		218.00	4.48	0.09	1.49	0.88	0.79	2.20
326.00	202.00	219.81	1.0557 1.0534 1.0488 1.0236 1.0374 1.0259 1.0122 0.9984	1.05 0.70	3.16 3.16 3.16 3.16	0.0782 0.0782 0.0660 0.0579	5.98	5.62	158.50	-0.0337 -0.0418 -0.0276 -0.0357	154.00	202.00		-0.62	1.41	-0.88	2.81	-0.18	-0.62
327.00	174.00	219.81	1.0236 1.0053 1.0374 1.0511 1.0259 1.0236 1.0305 0.9824	0.35 0.00	3.16 3.16 3.16 3.16	0.0782 0.0782 0.0599 0.0762	5.62	5.80	159.50	-0.0296 -0.0337 -0.0377 -0.0296	154.00		174.00	0.79	-0.88	0.53	2.11	0.53	1.05
328.00	180.00	219.81	1.0053 1.0488 0.9664 1.0191 0.9733 0.9526 0.9458 0.9389	0.70 0.70	3.16 2.81 2.81 2.46	0.0701 0.0701 0.0620 0.0599	5.45	5.27	158.50	-0.0316 -0.0215 -0.0398 -0.0174	154.00	180.00		-1.85	-1.41	-1.05	-0.62	-0.09	1.93
329.00	165.00	220.16	0.9778 0.9252 0.9618 0.9504 0.9137 0.9389 0.9343 0.9435	0.70 0.35	2.46 2.11 2.11 1.76	0.0538 0.0436 0.0559 0.0864	5.45	5.27	158.00	-0.0255 -0.0276 -0.0255 -0.0296	154.00		165.00	-1.85	0.88	-0.79	3.34	-0.44	0.44
330.00	151.00	220.16	0.9641 0.9320 0.9481 0.9710 0.9252 1.0099 0.9755 1.0145	0.00 -0.35	1.76 2.11 2.11 2.46	0.0660 0.0477 0.0518 0.0538	5.10	4.75	158.00	-0.0154 -0.0154 -0.0235 -0.0174	154.00	151.00		0.70	4.66	1.58	5.19	0.70	1.49
331.00	136.00	220.16	0.9962 1.0191 0.9962 1.0191 1.0374 1.0648 0.9778 1.0534	-0.35 -0.70	2.46 2.81 2.81 3.16	0.0660 0.0559 0.0681 0.0640	4.75	5.10	158.00	-0.0194 -0.0337 -0.0072 -0.0194	154.00		136.00	2.64	0.35	3.52	1.49	0.26	1.14
332.00	123.00	220.16	1.0351 1.0236 1.0351 1.0488 0.9641 1.0442 0.9870 1.0122	-0.70 -1.41	3.16 3.16 3.16 2.81	0.0701 0.0803 0.0681 0.0742	5.27	5.80	157.00	-0.0154 -0.0113 -0.0072 -0.0052	154.00	123.00		-0.18	4.48	-1.49	-1.49	0.09	1.58
333.00	107.00	220.16	0.9320 1.0122 0.9847 1.0259 0.9824 0.9847 1.0465 1.0213	-1.76 -1.05	2.81 2.81 3.16 3.16	0.0579 0.0742 0.0843 0.0864	6.15	5.45	156.50	-0.0215 -0.0235 -0.0194 -0.0194	156.00		107.00	4.31	1.67	0.62	6.50	0.18	0.62
334.00	94.00	219.81	1.0580 1.0694 1.0397 1.0694 1.0626 1.0671 1.0557 0.9778	-0.70 -0.35	3.16 3.16 3.16 3.16	0.1006 0.0843 0.0986 0.0945	5.62	6.15	156.50	-0.0316 -0.0235 -0.0337 -0.0276	156.00	94.00		1.23	-1.23	-1.67	0.26	-0.79	0.09

FDR Subframe Reference Number	Altitude: Radio (feet)	MAGNETIC HEADING (deg.)	VERTICAL ACCEL (g)	ROLL (deg.)	PITCH (deg.)	LONGITUDINAL ACCEL (g)	Angle of Attack #1 (deg.)	Angle of Attack #2 (deg.)	IAS (KNOTS)	LATERAL ACCELERATION (g)	Ground Speed (knots)	Altitude: Radio 1 (feet)	Altitude: Radio 2 (feet)	ELEVLI (.DEG)	ELEVLO (.DEG)	ELEVRI (.DEG)	ELEVRO (.DEG)	Rudder Pos. (Lower) (deg)	Rudder Pos. (Upper) (deg)
335.00	83.00	219.46	1.0122 1.0191 1.0259 1.0626 1.0442 1.0626 1.0671 1.0580	0.00 0.00	3.16 3.16 3.16 3.52	0.0904 0.0884 0.0864 0.0986	6.33	6.15	157.00	-0.0194 -0.0174 -0.0154 -0.0154	156.00		83.00	-1.23	2.99	2.02	7.21	-0.26	0.35
336.00	68.00	219.46	1.0671 1.0900 1.0671 1.0969 0.9962 1.0717 1.0488 0.9893	0.00 -0.35	3.52 3.52 3.52 3.52	0.0843 0.0843 0.0925 0.0843	5.45	5.45	159.00	-0.0031 -0.0398 -0.0337 -0.0316	156.00	68.00		2.37	-0.62	2.02	1.23	-0.88	0.88
337.00	55.00	219.11	1.0168 1.0488 1.0465 1.0557 1.0557 0.9549 1.0122 1.0305	-0.70 -0.70	3.52 3.16 3.16 3.16	0.0803 0.0742 0.0681 0.0660	5.27	5.27	159.50	-0.0215 -0.0255 -0.0215 -0.0215	156.00		55.00	-0.62	-0.53	-0.70	3.25	0.79	1.14
338.00	46.00	219.11	1.0534 1.0855 1.0603 0.9641 0.9870 0.9778 0.9984 0.9664	0.00 0.35	3.16 3.16 2.81 2.46	0.0640 0.0701 0.0538 0.0375	5.62	5.80	157.00	-0.0377 -0.0357 -0.0072 -0.0174	156.00	46.00		-1.41	0.44	0.70	-0.97	-0.62	2.11
339.00	36.00	219.11	0.9687 0.9641 0.8931 0.9618 0.9000 0.8794 0.9160 0.9481	0.00 0.00	2.46 2.11 2.11 2.46	0.0172 0.0172 0.0070 0.0030	5.45	4.57	157.00	-0.0357 -0.0194 -0.0133 -0.0398	156.00		36.00	-0.53	6.15	4.04	8.26	1.67	2.37
340.00	25.00	218.76	0.9572 0.9641 1.0626 1.0763 1.1061 1.1931 1.1107 1.1725	0.00 0.00	3.16 3.87 4.57 4.92	0.0111 0.0477 0.0396 0.0538	4.57	4.57	156.50	-0.0174 -0.0438 -0.0316 -0.0296	156.00	25.00		5.36	-2.46	12.48	15.56	2.55	2.72
341.00	15.00	218.06	1.1816 1.1381 1.1267 1.0855 1.1129 1.0213 1.0191 1.0076	-0.35 -0.70	4.92 4.92 4.57 4.22	0.0620 0.0498 0.0436 0.0253	5.10	7.03	153.50	-0.0438 -0.0357 -0.0398 -0.0296	156.00		15.00	-4.13	-4.83	1.41	3.60	1.85	1.58
342.00	7.00	218.06	0.9435 0.9687 0.9664 0.9275 1.0076 1.0465 1.0855 1.0419	-0.35 0.35	4.22 4.57 5.27 6.33	0.0213 0.0152 0.0274 0.0498	6.86	5.62	152.50	-0.0337 -0.0133 -0.0337 -0.0377	154.00	7.00		-2.20	18.37	15.56	26.10	4.66	5.45
343.00	0.00	217.35	1.2320 1.5412 1.6190 1.6740 1.6465 1.2916 1.2251 1.1084	1.05 0.00	7.38 8.09 8.44 8.44	0.0823 0.1006 0.1230 0.1230	5.98	7.38	149.00	-0.0540 -0.1293 -0.1130 -0.0845	152.00		0.00	15.03	-8.26	21.80	10.37	-2.11	2.72
344.00	2.00	217.35	1.0511 1.0076 1.0603 0.9778 0.8977 0.9526 0.8862 0.7443	0.00 2.11	7.73 6.68 5.27 3.52	0.0884 0.0803 0.0823 0.0782	7.38	7.21	150.00	-0.0255 -0.0540 -0.0357 -0.0377	152.00	2.00		-10.90	-17.49	-18.02	-15.12	1.93	2.55

L1-17

FDR Subframe Reference Number	Altitude: Radio (feet)	MAGNETIC HEADING (deg.)	VERTICAL ACCEL (g)	ROLL (deg.)	PITCH (deg.)	LONGITUDINAL ACCEL (g)	Angle of Attack #1 (deg.)	Angle of Attack #2 (deg.)	IAS (KNOTS)	LATERAL ACCELERATION (g)	Ground Speed (knots)	Altitude: Radio 1 (feet)	Altitude: Radio 2 (feet)	ELEVLI (.DEG)	ELEVLO (.DEG)	ELEVRI (.DEG)	ELEVRO (.DEG)	Rudder Pos. (Lower) (deg)	Rudder Pos. (Upper) (deg)
345.00	5.00	217.35	0.7694 0.6664 0.5885 0.6229 0.6023 0.5359 0.5404 0.5107	4.22 5.98	1.76 0.35 -0.70 -0.70	0.0620 0.0457 0.0192 -0.0113	5.27	6.33	153.00	-0.0194 -0.0092 -0.0154 -0.0255	150.00		5.00	-17.49	22.76	-8.26	5.80	8.35	4.92
346.00	0.00	216.65	0.5427 0.9572 1.5229 1.6992 1.3580 1.6511 0.9962 1.1748	9.49 4.57	-0.70 -0.35 1.41 2.46	-0.0174 -0.0560 -0.0662 -0.0255	1.93	-0.18	152.50	-0.0479 -0.0764 -0.3815 -0.2941	150.00	0.00		23.12	24.17	15.12	15.64	12.74	12.13
347.00	-4.00	216.30	1.4816 1.3351 0.9160 1.3030 -3.3777 -3.3777 -3.3777 -3.3777	4.92 0.00	3.16 4.22 0.00 0.00	-0.0296 -0.0418 -1.0834 -1.0834	-0.18	0.00	147.50	-0.3531 -0.2595 -1.0834 -1.0834	150.00		-4.00	20.21		-1.32	0.00	0.00	-0.09
348.00 349.00	-2.00	227.20	1.2916 1.8641 0.9183 0.8679 0.7649 0.7717 1.3099	32.34 37.27	5.98 4.92 4.22 3.16	-0.1130 -0.0092 -0.0235 -0.1252	4.22	5.80	139.00	-0.9023 -0.2168 -0.2941 -0.6358	144.00	-2.00		2.46	3.87	-1.41	-0.97	22.85	23.82
350.00	-6.00	236.34	1.1107 1.0145 1.0282 0.9046 0.8839 1.1404 0.8931 1.0717	42.89 49.92	2.46 2.11 1.76 1.41	-0.0967 -0.0154 -0.0499 0.0192	8.61	7.38	141.50	-0.5870 -0.4344 -0.5992 -0.6053	140.00		-6.00	1.67	2.29	-1.58	1.23	22.76	23.64
351.00	24.00	251.45	1.0626 1.1061 0.8702 1.0740 1.1427 0.9068 1.0374 1.0626	62.93 86.48	0.35 -1.05 -3.52 -4.92	0.0091 0.0599 -0.0215 0.0884	8.26	18.11	138.50	-0.7457 -0.8474 -0.9512 -0.9003	132.00	24.00		0.09	0.53	-0.35	0.44	22.85	23.64
352.00 353.00 354.00 355.00			0.7740																

FDR Subframe Reference Number	AILRN POSN LT. INBD (deg)	AILRN POSN LT. OUTBD (deg)	AILRN POSN RT. INBD (deg)	AILRN POSN RT. OUTBD (deg)	Stab. 1 Posn	Stab. 2 Posn	Flap Posn Left IB (deg)	Flap Posn Left OB (deg)	Flap Posn Right IB (deg)	Flap Posn Right OB (deg)	Brake Pressure L (psia)	Brake Pressure R (psia)	Brake Pedal Pos L (deg)	Brake Pedal Pos R (deg)	Glideslope Dev. 1&2 (DDM)	Localizer Dev. 1&2 (DDM)	SPLRL 3 (deg.)	SPLRL 5 (deg.)	SPLRR 3 (deg.)	SPLRR 5 (deg.)
175.00	-1.58	4.83	-0.26	-3.08		7.48			14.41		0.00	0.50			-0.08	-0.32		1.14	1.50	
176.00	-1.49	4.92	-0.35	-3.08	7.52		14.59						0.17	0.17						
177.00	-1.41	5.01	-0.18	-2.90		7.44		16.17		15.82	0.00	0.50			-0.08	-0.31	2.11			2.20
178.00	-1.41	5.01	-0.09	-2.90	7.52								0.17	0.17	-0.08	-0.30		1.14	1.50	
179.00	-1.41	4.92	0.09	-2.90		7.44			14.59		0.00	0.50			-0.07	-0.29	2.11			2.20
180.00	-1.49	5.01	0.09	-2.90	7.52			14.41					0.17	0.17	-0.07	-0.28		1.14	1.50	
181.00	-1.49	4.92	0.09	-2.90		7.44					0.00	0.50			-0.06	-0.27	2.11			2.29
182.00	-1.49	5.27	0.09	-2.81	7.52			16.17		15.82			0.17	0.17	-0.06	-0.26		1.14	1.50	
183.00	-0.44	8.09	0.88	-1.67		7.44			14.59		0.00	0.50			-0.06	-0.24	2.11			2.20
184.00	3.96	8.61	2.64	-0.09	7.52		14.59						0.17	0.17	-0.06	-0.23		1.14	1.85	
185.00	3.96	8.70	3.43	0.18		7.44		16.35		15.82	0.00	-4.38			-0.05	-0.22	2.02			5.19
186.00	3.08	6.42	3.25	0.09	7.52								0.17	0.17	-0.06	-0.20		1.14	3.43	
187.00	1.85	8.35	2.99	0.44		7.44			14.59		0.00	-4.38			-0.05	-0.19	2.02			2.46
188.00	5.54	10.46	4.48	1.32	7.52		14.59						0.17	0.17	-0.05	-0.18		1.06	2.11	
189.00	6.68	10.37	4.66	1.49		7.44		16.35		16.00	0.00	-4.38			-0.05	-0.16	2.02			5.98
190.00	6.50	10.28	4.57	1.05	7.52								0.17	0.17	-0.05	-0.15		1.06	4.75	
191.00	4.66	8.88	3.34	0.35		7.44			19.16		0.00	-4.38			-0.04	-0.13	2.02			6.24
192.00	3.69	8.09	2.37	-0.70	7.52		20.57						0.17	0.17	-0.04	-0.12		1.14	3.17	
193.00	3.34	6.68	2.02	-0.88		7.74		21.27		22.15	0.00	-4.38			-0.04	-0.11	2.11			3.69
194.00	0.70	5.80	0.97	-2.37	8.05								0.17	0.17	-0.04	-0.10		0.97	1.41	
195.00	-0.44	5.01	-0.26	-3.43		8.10			24.78		0.00	-4.38			-0.03	-0.08	1.94			2.02
196.00	-4.75	1.93	-2.46	-5.71	8.18		27.95						0.17	0.17	-0.02	-0.07		0.70	1.14	
197.00	-5.01	1.85	-3.34	-6.06		8.14		26.37		26.72	0.00	-4.38			-0.02	-0.07	4.66			1.76
198.00	-5.19	1.93	-3.43	-6.24	8.18								0.17	0.17	-0.01	-0.06		3.96	0.97	
199.00	-4.04	2.55	-3.43	-5.98		8.14			27.95		0.00	-4.38			0.00	-0.05	5.54			1.76
200.00	-4.13	2.64	-2.81	-5.54	8.10		27.95						0.17	0.17	0.00	-0.04		4.22	0.97	
201.00	-2.37	3.60	-2.20	-4.83		7.88		29.53		29.36	0.00	-4.38			0.01	-0.04	4.93			1.76
202.00	-2.90	3.34	-2.37	-5.01	7.88								0.17	0.17	0.01	-0.03		3.08	1.14	
203.00	-3.34	3.16	-2.46	-5.01		7.79			27.95		0.00	-4.38			0.01	-0.03	4.13			1.85
204.00	-3.43	3.34	-2.55	-5.01	7.88		27.95						0.17	0.17	0.01	-0.03		2.90	1.14	
205.00	-2.37	3.87	-1.76	-4.39		7.79		30.06		29.53	0.00	-4.38			0.02	-0.02	4.40			1.85
206.00	-2.20	3.96	-1.41	-4.31	7.88								0.17	0.17	0.02	-0.02		2.11	1.14	
207.00	-2.46	3.96	-1.41	-4.31		7.79			27.95		0.00	-4.38			0.02	-0.02	3.69			1.85
208.00	-2.37	4.83	-1.49	-4.22	7.88		31.11						0.17	0.17	0.02	-0.02		1.76	1.14	
209.00	-0.70	5.27	-0.79	-3.43		7.79		30.06		29.53	0.00	0.50			0.01	-0.01	3.61			1.85
210.00	0.26	5.54	-0.09	-2.99	7.92								0.08	0.17	0.01	-0.01		1.14	1.14	
211.00	0.35	5.54	-0.18	-3.08		7.92			31.11		0.00	0.50			0.01	-0.01	1.76			1.94
212.00	-0.26	4.92	-0.70	-3.78	8.27		31.11						0.08	0.17	0.01	-0.01		1.06	1.14	
213.00	-1.14	4.66	-1.41	-4.04		8.23		30.23		29.71	0.00	0.50			0.01	-0.01	1.85			1.85
214.00	-0.35	5.19	-1.23	-3.78	8.32								0.08	0.17	0.00	-0.01		1.32	1.14	
215.00	-0.09	5.36	-0.26	-3.16		8.23			27.95		0.00	-4.38			0.00	-0.01	2.55			1.94
216.00	-1.76	4.57	-0.53	-3.60	8.32		27.95						0.08	0.17	0.00	-0.01		1.06	1.14	
217.00	-0.97	5.36	-0.18	-2.90		8.23		30.06		29.53	0.00	-4.38			-0.05	0.00	1.76			1.94
218.00	1.14	6.86	0.62	-2.20	8.45								0.08	0.09	-0.02	0.00		1.06	1.14	
219.00	1.76	6.59	1.14	-1.93		8.71			27.95		0.00	0.50			-0.02	0.00	1.76			1.85
220.00	0.00	5.45	-0.18	-2.99	8.98		27.95						0.08	0.09	-0.02	0.00		1.06	1.14	
221.00	-2.55	3.78	-1.49	-4.31		8.93		30.06		29.36	0.00	0.50			-0.02	0.00	1.76			1.85
222.00	-1.58	5.19	-0.18	-2.90	8.98								0.08	0.09	-0.03	0.00		1.06	1.06	
223.00	-0.26	5.54	0.18	-2.72		8.93			27.95		4.89	0.50			-0.02	0.00	3.34			1.94
224.00	-0.62	4.66	0.18	-2.81	9.02		31.64						0.08	0.09	-0.03	0.00		1.06	1.14	
225.00	-2.37	4.04	-1.41	-4.04		8.93		31.11		31.64	0.00	0.50			-0.02	0.00	1.76			1.85
226.00	-2.37	4.22	-1.23	-3.96	8.98								0.08	0.09	-0.03	0.00		1.32	1.14	
227.00	-0.97	5.36	-0.18	-2.90		9.20			34.98		19.55	0.50			-0.02	0.00	2.90			2.02
228.00	0.26	5.89	0.44	-2.55	9.46		34.98						0.08	0.09	-0.03	0.00		1.32	1.32	
229.00	-1.32	4.04	0.44	-2.72		9.37		34.80		34.98	0.00	-4.38			-0.02	0.00	2.11			2.29
230.00	-3.08	4.04	-1.41	-3.96	9.46								0.08	0.09	-0.03	0.00		1.50	1.58	
231.00	0.88	6.24	0.18	-2.64		9.37			34.98		9.78	-4.38			-0.02	0.00	3.61			2.46
232.00	0.79	5.89	0.44	-2.72	9.46		34.98						0.08	0.09	-0.03	0.00		1.76	1.67	
233.00	-0.26	5.54	-0.09	-2.81		9.37		36.56		35.68	4.89	-4.38			-0.02	0.00	2.29			2.46
234.00	-0.09	5.71	-0.09	-2.81	9.68								0.08	0.09	-0.02	0.00		1.76	1.76	
235.00	0.09	2.72	-0.44	-1.49		9.86			34.98		4.89	0.50			-0.01	0.00	2.37			2.55
236.00	1.32	3.69	1.14	0.62	9.94		34.98						0.08	0.17	-0.02	0.00		1.76	1.67	
237.00	2.46	2.90	1.14	0.88		9.86		36.56		35.68	9.78	0.50			-0.01	0.00	2.29			2.55
238.00	0.79	1.41	0.18	0.00	9.94								0.08	0.09	-0.02	0.00		1.76	1.76	
239.00	-1.32	-0.35	-0.35	-0.79		9.86			34.98		9.78	0.50			-0.01	0.00	2.29			2.55
240.00	-2.46	-0.79	-2.37	-2.20	9.94		34.98						0.08	0.17	-0.02	0.00		1.76	1.67	
241.00	-0.44	2.29	-0.79	-0.70		9.86		36.56		35.86	4.89	0.50			-0.01	0.00	4.93			2.55
242.00	0.62	2.11	0.62	0.53	9.94								0.08	0.09	-0.02	0.00		2.64	1.76	
243.00	0.53	1.76	1.05	1.05		9.86			38.50		0.00	0.50			-0.01	0.00	2.37			2.55
244.00	-0.26	0.88	0.09	-0.09	9.94		40.43						0.08	0.09	-0.02	0.00		1.85	1.85	
245.00	-1.32	-0.62	-2.55	-2.64		9.86		40.78		41.84	14.66	-4.38			-0.01	0.00	2.46			2.73
246.00	-1.41	1.93	-2.55	-2.02	9.94								0.08	0.17	-0.02	0.00		2.20	2.02	
247.00	1.05	2.99	1.58	1.41		9.86			43.42		0.00	-4.38			-0.01	0.00	5.72			2.90
248.00	1.23	0.88	-0.53	-0.88	9.94		44.30						0.08	0.09	-0.02	0.00		2.29	2.20	
249.00	-0.53	1.41	-0.62	-0.53		9.86		45.00		46.41	4.89	0.50			-0.01	0.00	2.73			3.08
250.00	0.00	1.85	0.35	0.44	9.94								0.08	0.09	-0.01	0.00		2.37	2.29	
251.00	1.67	3.34	1.32	1.41		9.86			46.58		14.66	-4.38			0.00	0.00	2.73			3.25
252.00	2.29	5.54	0.09	-2.55	9.94		49.92						0.08	0.09	-0.01	0.00		2.46	2.29	
253.00	-0.18	5.45	-0.09	-2.55		9.90		49.92		49.92	9.78	0.50			0.00	0.00	2.73			3.34
254.00	-0.18	5.54	0.00	-2.55	9.94								0.08	0.09	-0.01	0.00		2.46	2.37	
															0.00	0.00	2.73			3.34

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FDR Subframe Reference Number	AILRN POSN LT. INBD (deg)	AILRN POSN LT. OUTBD (deg)	AILRN POSN RT. INBD (deg)	AILRN POSN RT. OUTBD (deg)	Stab. 1 Posn	Stab. 2 Posn	Flap Posn Left IB (deg)	Flap Posn Left OB (deg)	Flap Posn Right IB (deg)	Flap Posn Right OB (deg)	Brake Pressure L (psia)	Brake Pressure R (psia)	Brake Pedal Pos L (deg)	Brake Pedal Pos R (deg)	Glideslope Dev. 1&2 (DDM)	Localizer Dev. 1&2 (DDM)	SPLRL 3 (deg.)	SPLRL 5 (deg.)	SPLRR 3 (deg.)	SPLRR 5 (deg.)
255.00	-0.09	5.62	0.26	-2.37		9.86			49.92		14.66	0.50			-0.01	0.00		2.37	2.29	
256.00	0.35	5.89	0.44	-2.11	9.94		49.92						0.08	0.09	0.00	0.00	2.73			3.34
257.00	0.09	5.89	0.44	-2.20		10.21		49.92			14.66	0.50			-0.01	0.00		2.29	2.29	
258.00	0.26	7.03	2.99	-0.09	10.34					49.92			0.08	0.09	0.00	0.00	2.73			4.49
259.00	-0.35	3.78	1.05	-2.46		10.21			49.92		9.78	0.50			-0.01	0.00		2.29	2.20	
260.00	-2.20	5.45	0.26	-2.11	10.34		49.92						0.08	0.09	0.00	0.00	2.73			3.34
261.00	1.41	4.75	2.81	-0.26		10.21		49.92			0.00	-4.38			-0.02	0.00		2.29	2.29	
262.00	-0.18	6.15	0.70	-1.85	10.30					49.92			0.08	0.09	-0.01	0.00	2.81			3.25
263.00	1.05	6.06	1.41	-1.85		10.21			49.92		9.78	0.50			-0.02	0.00		2.29	2.11	
264.00	0.35	5.98	0.62	-2.11	10.34		49.92						0.08	0.09	-0.01	0.00	2.64			3.25
265.00	0.97	5.89	0.35	-2.37		10.47		49.92			4.89	-4.38			-0.02	0.00		2.29	2.20	
266.00	1.49	5.71	1.05	-1.41	10.69					49.92			0.08	0.09	-0.01	0.00	2.73			3.43
267.00	-0.09	5.54	0.18	-1.32		10.60			49.92		19.55	0.50			-0.02	0.00		2.29	2.20	
268.00	2.46	5.71	0.88	-2.37	10.69		49.92						0.08	0.09	-0.01	0.00	2.73			4.66
269.00	0.35	5.98	0.26	-2.29		10.60		49.92			9.78	0.50			-0.01	0.00		2.29	2.20	
270.00	0.18	5.62	-0.35	-3.87	10.69					49.92			0.08	0.09	0.00	0.00	3.08			3.25
271.00	0.18	6.68	0.18	-2.46		10.60			49.92		4.89	0.50			-0.02	0.00		2.64	2.20	
272.00	1.14	6.42	0.88	-2.29	10.69		49.92						0.08	0.09	0.00	0.01	2.64			3.25
273.00	0.26	6.33	0.79	-4.39		10.60		49.92			14.66	0.50			-0.01	0.00		2.29	2.20	
274.00	0.18	5.89	0.70	-2.37	10.69					49.92			0.08	0.09	-0.01	0.00	2.64			3.25
275.00	1.32	5.54	0.09	-2.64		10.74			49.92		9.78	0.50			0.00	0.00		2.29	2.20	
276.00	0.00	5.80	0.09	-2.64	10.87		49.92						0.08	0.09	-0.02	0.00	2.64			3.25
277.00	0.09	6.06	0.79	-1.41		10.78		49.92			9.78	0.50			-0.01	0.00		2.29	2.11	
278.00	1.85	6.77	2.81	-0.18	10.87					49.92			0.08	0.09	-0.02	0.00	2.64			5.45
279.00	0.00	5.54	0.88	-2.55		10.74			49.92		9.78	0.50			-0.01	0.00		2.29	2.20	
280.00	0.09	5.89	1.14	-1.93	10.87		49.92						0.08	0.09	0.00	0.01	2.64			3.34
281.00	0.09	5.80	0.35	-2.37		10.74		49.92			14.66	0.50			-0.01	0.00		2.29	2.20	
282.00	0.09	6.86	1.58	-0.97	10.87					49.92			0.08	0.09	-0.01	0.00	2.64			3.34
283.00	1.85	6.06	1.23	-2.02		10.74			49.92		0.00	0.50			-0.02	0.00		2.20	2.20	
284.00	0.53	5.80	0.53	-2.46	10.87		49.92						0.08	0.09	-0.01	0.01	2.64			3.25
285.00	0.00	5.54	0.09	-2.64		10.74		49.92			9.78	0.50			-0.02	0.01		2.29	2.20	
286.00	0.00	6.50	0.00	-2.55	10.87					49.92			0.08	0.09	-0.01	0.00	2.64			3.25
287.00	1.32	6.06	0.35	-2.64		10.78			49.92		4.89	5.39			-0.01	0.01		2.29	2.20	
288.00	0.00	6.15	0.26	-2.20	10.87		49.92						0.08	0.09	-0.01	0.01	2.64			3.25
289.00	1.05	6.77	0.88	-1.76		11.00		49.92			4.89	-4.38			-0.01	0.01		2.20	2.11	
290.00	0.88	3.34	-0.62	-4.13	11.13					49.92			0.08	0.09	0.00	0.00	2.73			3.25
291.00	-1.58	6.33	-2.20	-4.39		11.04			49.92		4.89	0.50			-0.01	0.01		4.31	2.20	
292.00	0.09	5.62	0.00	-2.99	11.13		49.92						0.08	0.09	0.00	0.00	2.64			3.25
293.00	-0.79	5.27	-0.70	-3.16		11.04		49.92			0.00	0.50			-0.01	0.00		2.29	2.20	
294.00	-1.32	5.27	-0.62	-2.81	11.13					49.92			0.08	0.09	0.00	0.00	2.81			3.17
295.00	-0.35	7.56	0.26	-2.29		11.04			49.92		0.00	5.39			-0.01	0.00		2.11	2.20	
296.00	1.58	6.42	2.20	-0.70	11.13		49.92						0.08	0.09	-0.01	0.00	2.64			3.34
297.00	0.70	6.50	1.23	-1.32		11.04		49.92			0.00	0.50			-0.02	0.00		2.11	2.20	
298.00	1.76	7.65	2.37	-0.62	11.13					49.92			0.08	0.09	-0.02	0.00	2.64			4.84
299.00	1.85	5.62	2.37	-2.64		11.13			49.92		4.89	-4.38			-0.03	0.00		2.20	2.20	
300.00	-0.18	5.54	0.09	-3.08	11.31		49.92						0.08	0.09	-0.02	0.00	2.64			3.25
301.00	0.09	5.80	0.18	-2.46		11.22		49.92			0.00	0.50			-0.03	0.00		2.20	2.20	
302.00	0.44	7.21	1.85	-0.88	11.35					49.92			0.08	0.09	-0.02	0.00	2.64			3.61
303.00	1.85	5.62	2.72	-0.44		11.22			49.92		4.89	-4.38			-0.03	0.00		2.20	2.20	
304.00	-0.18	7.29	0.09	-0.79	11.31		49.92						0.08	0.09	-0.02	0.00	2.64			3.87
305.00	1.93	5.45	1.23	-1.93		11.22		49.92			4.89	0.50			-0.03	0.00		2.20	2.11	
306.00	-0.44	5.45	-0.09	-2.81	11.31					49.92			0.08	0.09	-0.01	0.00	2.64			3.25
307.00	-0.09	5.54	0.00	-2.90		11.22			49.92		4.89	0.50			-0.01	0.00		2.20	2.11	
308.00	-0.53	6.68	0.53	-2.11	11.35		49.92						0.08	0.09	0.00	-0.01	2.64			3.25
309.00	0.97	6.50	1.23	-1.76		11.22		49.92			0.00	0.50			0.00	0.00		2.20	2.20	
310.00	0.97	6.06	1.58	-1.32	11.35					49.92			0.08	0.09	0.02	0.00	2.64			3.25
311.00	0.18	5.80	0.62	-2.37		11.22			49.92		0.00	-4.38			0.01	0.00		2.20	2.11	
312.00	0.79	7.29	2.02	-0.88	11.35		49.92						0.08	0.09	0.02	0.00	2.64			4.05
313.00	1.85	5.71	1.93	-1.23		11.22		49.92			0.00	0.50			0.01	0.00		2.20	2.20	
314.00	-0.09	6.50	0.18	-0.44	11.35					49.92			0.08	0.09	0.02	0.00	2.64			3.43
315.00	2.46	5.54	0.26	-2.72		11.22			49.92		0.00	-4.38			0.00	-0.01		2.20	2.11	
316.00	-0.18	5.80	0.00	-2.72	11.35		49.92						0.08	0.09	0.01	0.00	2.64			3.25
317.00	-2.11	5.27	0.00	-2.64		11.22		49.92			0.00	-4.38			0.00	-0.01		2.73	2.11	
318.00	-0.09	7.82	1.85	-0.70	11.35					49.92			0.08	0.09	0.01	0.00	2.73			5.28
319.00	2.37	5.98	2.55	-2.72		11.22			49.92		0.00	0.50			0.00	0.00		2.11	2.37	
320.00	-0.18	7.38	1.49	-0.97	11.35		49.92						0.08	0.09	0.01	0.00	2.64			3.25
321.00	2.02	6.42	2.02	-0.79		11.22		49.92			4.89	0.50			0.00	0.00		2.20	2.29	
322.00	0.00	5.71	0.18	-2.64	11.35					49.92			0.08	0.09	0.01	0.00	2.55			3.25
323.00	-0.26	5.45	0.18	-2.55		11.26			49.92		0.00	0.50			-0.01	0.00		2.20	2.11	
324.00	0.09	7.82	0.09	0.18	11.35		49.92						0.08	0.09	-0.01	0.00	2.64			5.10
325.00	3.08	5.54	2.20	-1.67		11.22		49.92			0.00	-4.38			-0.01	0.00		2.20	2.11	
326.00	-0.35	4.83	0.00	-2.81	11.35					49.92			0.08	0.09	0.00	0.00	2.73			3.34
327.00	-1.23	5.89	0.53	-1.76		11.26			49.92		0.00	-4.38			-0.01	0.00		2.29	2.11	
328.00	1.85	5.45	2.29	-1.14	11.35		49.92						0.08	0.09	0.01	0.00	2.73			3.34
329.00	-0.35	5.54	-0.09	-2.55		11.26		49.92			0.00	0.50			-0.01	0.00		2.29	2.11	
330.00	0.00	6.42	0.53	-2.11	11.35					49.92			0.08	0.09	0.00	0.00	2.64			3.34
331.00	-0.09	5.62	0.79	-2.46		11.22			49.92		4.89	-4.38			-0.03	0.00		2.29	2.11	
332.00	-0.26	3.43	-2.29	-5.01	11.35		49.92						0.08	0.09	-0.01	0.00	2.73			3.34
333.00	-2.81	8.00	2.55	0.18		11.26		49.92			0.00	-4.38			-0.05	0.00		3.69	4.40	
334.00	-0.18	5.45	1.93	-2.81	11.35					49.92			0.08	0.09	-0.01	-0.01	2.55			3.25

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FDR Subframe Reference Number	AILRN POSN LT. INBD (deg)	AILRN POSN LT. OUTBD (deg)	AILRN POSN RT. INBD (deg)	AILRN POSN RT. OUTBD (deg)	Stab. 1 Posn	Stab. 2 Posn	Flap Posn Left IB (deg)	Flap Posn Left OB (deg)	Flap Posn Right IB (deg)	Flap Posn Right OB (deg)	Brake Pressure L (psia)	Brake Pressure R (psia)	Brake Pedal Pos L (deg)	Brake Pedal Pos R (deg)	Glideslope Dev. 1&2 (DDM)	Localizer Dev. 1&2 (DDM)	SPLRL 3 (deg.)	SPLRL 5 (deg.)	SPLRR 3 (deg.)	SPLRR 5 (deg.)
335.00	-0.09	5.54	0.62	-2.20		11.26			49.92		0.00	-4.38			-0.06	-0.01		2.20	2.11	
336.00	-0.88	5.36	0.09	-2.81	11.35		49.92						0.08	0.09	0.00	0.00	2.64			3.25
337.00	0.35	5.98	0.70	-1.49		11.26		49.92			0.00	0.50			-0.01	0.00		2.11	2.20	
338.00	1.93	5.71	0.88	-2.37	11.35					49.92			0.08	0.09	0.10	0.00	2.64			3.25
339.00	-0.09	5.98	0.18	-2.37		11.26			49.92		0.00	-4.38			0.13	-0.01		2.20	2.11	
340.00	0.26	5.98	2.99	0.18	11.35		49.92						0.08	0.09	0.33	-0.01	2.64			5.28
341.00	0.62	7.29	0.53	-2.29		11.26		49.92			0.00	-9.27			0.24	0.00		2.20	2.11	
342.00	3.25	9.93	4.75	1.76	11.35					49.92			0.08	0.09	0.10	0.00	2.55			7.74
343.00	4.75	5.71	3.08	-1.05		11.22			49.92		9.78	-4.38			0.08	0.00		2.02	2.29	
344.00	7.65	13.80	1.05	3.78	11.53		49.92						-0.01	0.09	0.18	0.00	2.64			10.91
345.00	6.06	13.54	3.43	1.05		11.35		50.45			0.00	-4.38			0.18	0.00		2.20	8.44	
346.00	9.67	9.14	9.23	6.15	11.40					49.92			-0.36	0.09	0.09	0.00	2.29			6.86
347.00	-3.16	0.00	0.53	0.00		11.26					0.00	-58.15			0.74	0.00		3.96	0.00	
348.00																				
349.00	-19.16	-9.67	0.35	-2.99	11.66		49.92						-0.62	0.09	0.00	0.00	58.05			0.53
350.00	-19.78	-15.56	0.26	-3.08		11.26		49.92			0.00	-53.26			-0.17	0.00		56.20	0.00	
351.00	-20.30	-15.56	0.79	-2.11	11.88					49.92			-0.53	-0.09	0.00	0.00	24.63			0.26
352.00																				
353.00																				
354.00																				
355.00																				

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FDR Subframe Reference Number	DRIFT ANGLE (deg.)	N1 Eng 1 (GE) (%)	N1 Eng 2 (GE) (%)	N1 Eng 3 (GE) (%)	N2 Eng1 (GE) (%)	N2 Eng2 (GE) (%)	N2 Eng3 (GE) (%)	EGT Eng1 (deg)	EGT Eng2 (deg)	EGT Eng3 (deg)	THRUST RES ANG 1 (degs)	THRUST RES ANG 2 (degs)	THRUST RES ANG 3 (degs)	THRST REV ENG1	THRST REV ENG2	THRST REV ENG3
175.00	2.02	71.88	72.62	71.75							54.08	54.79	53.38	Stw	Stw	Stw
176.00	2.02	71.38	71.75	70.88	92.38	92.25	91.75	535.00			53.73	54.44	53.03	Stw	Stw	Stw
177.00	2.02	70.88	71.50	70.75					558.00		53.73	54.44	53.03	Stw	Stw	Stw
178.00	2.02	70.62	71.25	70.38	91.88	92.00	91.50			539.00	53.38	54.44	53.03	Stw	Stw	Stw
179.00	2.02	70.38	71.00	70.38							53.38	54.44	53.03	Stw	Stw	Stw
180.00	2.11	70.38	71.12	70.25	91.75	92.00	91.50	538.00			53.38	54.44	53.03	Stw	Stw	Stw
181.00	2.02	70.38	71.12	70.25					559.00		53.38	54.44	53.03	Stw	Stw	Stw
182.00	2.02	70.38	71.12	70.38	91.75	92.00	91.62			540.00	53.38	54.44	53.03	Stw	Stw	Stw
183.00	2.02	70.50	71.38	71.25							53.73	54.44	53.38	Stw	Stw	Stw
184.00	2.02	71.38	72.12	71.50	92.50	92.75	92.38	547.00			53.73	54.79	53.38	Stw	Stw	Stw
185.00	2.11	71.62	72.12	71.62					566.00		53.73	54.79	53.38	Stw	Stw	Stw
186.00	2.11	71.62	72.38	71.75	92.38	92.75	92.38			549.00	53.73	54.79	53.38	Stw	Stw	Stw
187.00	2.02	71.88	72.62	72.12							54.08	54.79	53.73	Stw	Stw	Stw
188.00	2.02	72.25	72.88	72.50	92.88	93.00	92.75	552.00			54.08	55.14	53.73	Stw	Stw	Stw
189.00	2.11	72.62	73.25	73.12					575.00		54.08	55.14	53.73	Stw	Stw	Stw
190.00	2.11	73.00	73.88	73.75	93.38	93.50	93.38			562.00	54.44	55.49	54.44	Stw	Stw	Stw
191.00	2.11	74.25	75.25	75.25							54.79	55.84	54.79	Stw	Stw	Stw
192.00	2.11	75.62	76.50	76.25	94.50	94.62	94.38	577.00			55.49	56.54	55.14	Stw	Stw	Stw
193.00	2.02	76.62	77.38	77.12					603.00		55.84	56.54	55.49	Stw	Stw	Stw
194.00	2.02	77.38	78.00	77.88	95.25	95.12	95.00			593.00	55.84	56.89	55.84	Stw	Stw	Stw
195.00	2.02	78.00	78.50	78.25							56.19	57.25	55.84	Stw	Stw	Stw
196.00	1.93	78.25	78.62	78.25	95.50	95.38	95.00	596.00			56.19	57.25	55.84	Stw	Stw	Stw
197.00	1.76	77.88	76.50	74.50					602.00		55.49	55.84	54.08	Stw	Stw	Stw
198.00	1.49	73.50	73.00	71.38	92.38	92.12	91.50			560.00	54.08	54.79	53.38	Stw	Stw	Stw
199.00	1.14	71.12	71.25	70.12							53.73	54.44	53.03	Stw	Stw	Stw
200.00	0.88	70.25	70.75	70.12	91.12	91.50	91.38	549.00			53.38	54.44	53.03	Stw	Stw	Stw
201.00	0.70	70.25	71.00	70.25					569.00		53.38	54.44	52.68	Stw	Stw	Stw
202.00	0.62	70.00	69.88	68.62	91.25	91.12	90.50			539.00	53.03	53.73	52.33	Stw	Stw	Stw
203.00	0.53	68.12	68.25	66.88							52.68	53.38	51.63	Stw	Stw	Stw
204.00	0.53	66.38	66.62	65.12	89.75	89.88	89.25	515.00			51.98	52.68	51.28	Stw	Stw	Stw
205.00	0.44	64.75	65.25	64.00					531.00		51.63	52.33	50.92	Stw	Stw	Stw
206.00	0.35	63.88	64.25	63.12	88.88	89.12	88.50			502.00	51.28	51.98	50.57	Stw	Stw	Stw
207.00	0.26	62.88	63.50	62.12							50.92	51.98	50.22	Stw	Stw	Stw
208.00	0.26	61.88	61.25	59.25	88.12	87.88	86.88	478.00			50.57	50.57	48.47	Stw	Stw	Stw
209.00	0.26	58.12	57.38	56.88					487.00		48.47	48.47	46.36	Stw	Stw	Stw
210.00	0.26	55.75	55.00	55.00	85.75	85.50	85.25			463.00	46.36	46.36	44.25	Stw	Stw	Stw
211.00	0.35	54.00	52.88	53.00							44.60	44.95	42.85	Stw	Stw	Stw
212.00	0.35	52.00	51.00	50.88	84.12	83.88	83.38	437.00			42.85	43.20	41.44	Stw	Stw	Stw
213.00	0.35	49.88	48.75	48.62					443.00		41.44	42.14	40.39	Stw	Stw	Stw
214.00	0.35	47.62	46.62	46.50	82.12	81.88	81.25			422.00	40.39	41.09	39.33	Stw	Stw	Stw
215.00	0.35	45.00	44.38	44.50							38.98	38.98	37.58	Stw	Stw	Stw
216.00	0.35	42.88	41.75	42.62	80.25	79.62	79.38	405.00			37.58	37.93	37.58	Stw	Stw	Stw
217.00	0.44	41.00	40.00	41.00					413.00		37.58	37.93	37.58	Stw	Stw	Stw
218.00	0.53	39.25	38.50	39.12	78.25	77.62	77.38			393.00	37.58	37.93	37.58	Stw	Stw	Stw
219.00	0.62	37.88	38.00	37.88							37.58	37.93	37.58	Stw	Stw	Stw
220.00	0.79	37.62	38.00	37.62	77.88	78.00	77.12	400.00			37.58	37.93	37.58	Stw	Stw	Stw
221.00	0.88	37.50	37.75	37.50					409.00		37.58	37.93	37.58	Stw	Stw	Stw
222.00	0.88	37.38	37.75	37.38	77.50	77.50	76.75			392.00	37.58	37.93	37.58	Stw	Stw	Stw
223.00	0.97	37.38	37.75	37.38							37.93	37.93	37.58	Stw	Stw	Stw
224.00	0.97	37.38	37.75	37.38	77.62	77.62	76.88	395.00			37.93	37.93	37.58	Stw	Stw	Stw
225.00	0.97	37.38	37.62	37.38					406.00		37.93	37.93	37.58	Stw	Stw	Stw
226.00	0.97	37.38	37.62	37.38	77.50	77.62	76.75			389.00	38.63	40.04	41.09	Stw	Stw	Stw
227.00	0.97	37.38	37.62	37.38							42.50	42.85	42.85	Stw	Stw	Stw
228.00	0.97	37.38	37.62	37.38	77.50	77.50	76.75	393.00			43.20	43.90	43.90	Stw	Stw	Stw
229.00	0.88	37.50	39.62	38.62					433.00		44.60	44.95	44.95	Stw	Stw	Stw
230.00	0.88	42.25	44.88	43.88	82.00	82.88	82.00			434.00	45.66	46.01	46.01	Stw	Stw	Stw
231.00	0.88	46.12	48.12	47.00							46.36	47.06	46.71	Stw	Stw	Stw
232.00	0.88	49.50	51.88	49.38	84.50	85.62	83.75	445.00			47.76	48.11	47.41	Stw	Stw	Stw
233.00	0.88	52.00	53.38	50.75					454.00		47.76	48.47	48.11	Stw	Stw	Stw
234.00	0.97	53.12	55.88	53.88	85.75	87.12	86.12			453.00	48.82	49.17	48.82	Stw	Stw	Stw
235.00	1.05	56.62	59.00	56.88							49.52	50.22	49.52	Stw	Stw	Stw
236.00	1.05	59.12	61.62	59.38	88.38	89.12	88.00	475.00			50.22	50.92	50.22	Stw	Stw	Stw
237.00	1.05	61.75	63.75	62.12					503.00		50.92	51.63	50.92	Stw	Stw	Stw
238.00	1.05	64.38	65.62	65.50	90.38	90.62	90.62			501.00	51.98	52.33	51.63	Stw	Stw	Stw
239.00	1.05	66.25	67.00	66.88							52.33	52.68	51.98	Stw	Stw	Stw
240.00	1.05	67.50	67.62	67.50	91.38	91.12	90.88	510.00			52.68	53.03	51.98	Stw	Stw	Stw
241.00	1.05	67.88	67.75	67.62					529.00		52.68	53.03	51.98	Stw	Stw	Stw
242.00	1.05	67.75	67.75	67.88	91.38	91.00	91.12			519.00	52.68	53.03	52.33	Stw	Stw	Stw
243.00	1.05	68.25	68.62	68.75							53.03	53.38	52.33	Stw	Stw	Stw
244.00	0.97	68.88	68.88	69.12	91.88	91.50	91.50	524.00			53.03	53.38	52.68	Stw	Stw	Stw
245.00	0.88	69.00	69.12	69.25					542.00		53.03	53.38	52.68	Stw	Stw	Stw
246.00	0.88	69.25	69.25	69.12	91.88	91.62	91.38			532.00	53.03	53.38	52.33	Stw	Stw	Stw
247.00	0.79	69.12	68.75	68.50							53.03	53.38	52.33	Stw	Stw	Stw
248.00	0.79	68.38	68.12	68.12	91.12	90.88	90.75	523.00			53.03	53.38	52.33	Stw	Stw	Stw
249.00	0.70	68.38	68.62	68.88					544.00		53.03	53.38	52.68	Stw	Stw	Stw
250.00	0.70	69.38	69.50	69.62	92.00	91.88	91.75			537.00	53.38	53.73	52.68	Stw	Stw	Stw
251.00	0.70	69.62	69.50	69.50							53.38	53.73	52.68	Stw	Stw	Stw
252.00	0.62	69.25	69.00	68.88	91.62	91.38	91.12	530.00			53.03	53.38	52.68	Stw	Stw	Stw
253.00	0.53	68.88	69.12	69.25					549.00		53.03	53.73	52.68	Stw	Stw	Stw
254.00	0.44	69.50	69.38	69.00	92.00	91.62	91.25			535.00	53.38	53.38	52.33	Stw	Stw	Stw

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FDR Subframe Reference Number	DRIFT ANGLE (deg.)	N1 Eng 1 (GE) (%)	N1 Eng 2 (GE) (%)	N1 Eng 3 (GE) (%)	N2 Eng1 (GE) (%)	N2 Eng2 (GE) (%)	N2 Eng3 (GE) (%)	EGT Eng1 (deg)	EGT Eng2 (deg)	EGT Eng3 (deg)	THRUST RES ANG 1 (degs)	THRUST RES ANG 2 (degs)	THRUST RES ANG 3 (degs)	THRST REV ENG1	THRST REV ENG2	THRST REV ENG3
255.00	0.44	68.50	67.88	67.50							52.68	53.03	51.98	Stw	Stw	Stw
256.00	0.62	67.25	67.00	66.75	90.38	90.25	90.00	518.00			52.33	52.68	51.98	Stw	Stw	Stw
257.00	0.70	66.75	66.88	67.25					537.00		52.33	53.03	51.98	Stw	Stw	Stw
258.00	0.79	67.62	68.00	68.25	91.12	91.12	91.25			531.00	52.68	53.03	52.33	Stw	Stw	Stw
259.00	0.70	68.38	68.25	68.62							53.03	53.38	52.33	Stw	Stw	Stw
260.00	0.62	68.75	69.12	69.25	91.62	91.62	91.62	534.00			53.03	53.73	52.68	Stw	Stw	Stw
261.00	0.62	69.25	69.38	69.38					548.00		53.38	53.73	52.68	Stw	Stw	Stw
262.00	0.53	69.38	69.50	69.88	91.88	91.75	91.88			539.00	53.38	53.73	52.68	Stw	Stw	Stw
263.00	0.62	69.88	70.00	69.88							53.38	53.73	52.68	Stw	Stw	Stw
264.00	0.70	69.88	69.62	69.75	92.12	91.62	91.62	536.00			53.38	53.73	52.68	Stw	Stw	Stw
265.00	0.79	69.75	70.00	70.12					555.00		53.38	53.73	53.03	Stw	Stw	Stw
266.00	0.88	70.00	70.12	69.88	92.25	92.00	91.75			541.00	53.38	53.73	52.68	Stw	Stw	Stw
267.00	0.88	69.88	70.00	70.62							53.38	54.08	53.03	Stw	Stw	Stw
268.00	0.88	71.12	71.50	71.88	92.75	92.75	92.75	550.00			54.08	54.44	53.73	Stw	Stw	Stw
269.00	0.70	72.12	72.38	72.62					569.00		54.08	54.79	53.73	Stw	Stw	Stw
270.00	0.70	72.88	73.25	73.50	93.38	93.38	93.38			563.00	54.44	55.14	54.08	Stw	Stw	Stw
271.00	0.70	73.62	73.88	73.88							54.79	55.14	54.08	Stw	Stw	Stw
272.00	0.62	73.62	73.25	72.88	93.50	93.00	92.62	559.00			54.44	54.79	53.73	Stw	Stw	Stw
273.00	0.53	72.75	72.62	72.38					575.00		54.44	54.79	53.73	Stw	Stw	Stw
274.00	0.70	72.25	72.12	71.88	92.62	92.50	92.12			558.00	54.08	54.44	53.73	Stw	Stw	Stw
275.00	0.88	72.00	72.25	72.38							54.08	54.79	53.73	Stw	Stw	Stw
276.00	0.79	72.50	72.50	72.62	93.00	92.88	92.75	561.00			54.44	54.79	53.73	Stw	Stw	Stw
277.00	0.70	72.62	72.62	72.50					576.00		54.44	54.79	53.73	Stw	Stw	Stw
278.00	0.70	72.38	72.25	72.25	92.75	92.50	92.38			560.00	54.44	54.79	53.73	Stw	Stw	Stw
279.00	0.88	72.25	72.50	73.12							54.44	54.79	54.08	Stw	Stw	Stw
280.00	0.88	73.62	73.88	73.88	93.62	93.50	93.38	570.00			54.79	55.14	54.08	Stw	Stw	Stw
281.00	0.88	73.75	73.75	73.75					584.00		54.79	55.14	54.44	Stw	Stw	Stw
282.00	0.88	74.25	74.75	74.62	93.88	94.00	93.88			577.00	55.14	55.49	54.44	Stw	Stw	Stw
283.00	0.79	74.25	74.00	73.62							54.79	55.14	54.08	Stw	Stw	Stw
284.00	0.79	73.38	72.88	72.38	93.12	92.62	92.25	562.00			54.44	54.79	53.73	Stw	Stw	Stw
285.00	0.79	72.00	71.88	71.75					574.00		54.08	54.44	53.73	Stw	Stw	Stw
286.00	0.79	71.88	72.12	72.50	92.38	92.50	92.62			563.00	54.08	54.79	54.08	Stw	Stw	Stw
287.00	0.88	72.88	73.38	73.88							54.79	55.14	54.08	Stw	Stw	Stw
288.00	0.97	73.75	73.88	74.50	93.62	93.25	93.62	571.00			54.79	55.49	54.79	Stw	Stw	Stw
289.00	0.97	75.00	76.38	77.50					603.00		55.49	56.19	55.49	Stw	Stw	Stw
290.00	0.97	77.50	77.50	77.50	95.38	94.88	94.50			592.00	56.19	56.54	55.84	Stw	Stw	Stw
291.00	0.88	77.62	78.00	78.50							56.54	56.89	56.19	Stw	Stw	Stw
292.00	0.79	78.62	78.88	79.00	95.62	95.50	95.38	605.00			56.89	57.25	56.19	Stw	Stw	Stw
293.00	0.70	79.00	78.88	79.00					624.00		56.89	57.25	56.19	Stw	Stw	Stw
294.00	0.70	79.12	79.50	79.62	95.75	95.75	95.62			612.00	56.89	57.25	56.54	Stw	Stw	Stw
295.00	0.62	79.62	79.50	79.75							56.89	57.60	56.54	Stw	Stw	Stw
296.00	0.79	79.62	79.88	79.62	95.88	95.75	95.50	614.00			57.25	57.60	56.54	Stw	Stw	Stw
297.00	0.97	79.75	79.62	79.50					631.00		57.25	57.25	56.19	Stw	Stw	Stw
298.00	0.88	79.12	79.25	79.75	95.50	95.25	95.50			614.00	56.89	57.25	56.89	Stw	Stw	Stw
299.00	0.88	80.12	80.75	81.12							57.60	57.95	56.89	Stw	Stw	Stw
300.00	0.97	81.12	80.88	81.00	96.50	95.88	95.62	623.00			57.60	57.95	57.25	Stw	Stw	Stw
301.00	0.97	81.38	81.62	81.62					649.00		57.95	58.30	57.25	Stw	Stw	Stw
302.00	0.88	81.12	81.00	80.62	96.25	95.88	95.50			624.00	57.60	57.95	56.89	Stw	Stw	Stw
303.00	0.97	80.75	80.38	80.12							57.60	57.60	56.89	Stw	Stw	Stw
304.00	1.05	80.00	80.00	80.12	95.50	95.38	95.25	623.00			57.25	57.60	56.89	Stw	Stw	Stw
305.00	1.05	80.38	80.62	80.88					644.00		57.60	57.95	56.89	Stw	Stw	Stw
306.00	1.05	80.88	80.88	81.00	96.12	96.00	95.88			627.00	57.60	57.95	57.25	Stw	Stw	Stw
307.00	0.97	81.00	80.88	80.75							57.60	57.95	56.89	Stw	Stw	Stw
308.00	0.79	80.50	80.12	79.88	95.75	95.50	95.12	622.00			57.25	57.60	56.54	Stw	Stw	Stw
309.00	0.70	79.75	79.75	79.75					639.00		57.25	57.60	56.54	Stw	Stw	Stw
310.00	0.79	80.00	79.88	79.88	95.50	95.38	95.25			620.00	57.25	57.60	56.54	Stw	Stw	Stw
311.00	0.88	79.88	79.75	79.38							57.25	57.60	56.54	Stw	Stw	Stw
312.00	0.70	79.38	79.38	79.50	95.12	95.00	95.00	618.00			56.89	57.25	56.54	Stw	Stw	Stw
313.00	0.53	79.50	79.62	79.62					637.00		57.25	57.60	56.54	Stw	Stw	Stw
314.00	0.44	79.38	78.75	78.12	95.25	94.75	94.25			611.00	56.89	56.89	55.84	Stw	Stw	Stw
315.00	0.62	77.75	77.38	77.25							56.19	56.54	55.84	Stw	Stw	Stw
316.00	0.79	77.25	77.62	78.12	94.12	94.38	94.75	608.00			56.19	56.89	56.19	Stw	Stw	Stw
317.00	0.97	78.50	78.62	78.88					629.00		56.89	57.25	56.19	Stw	Stw	Stw
318.00	0.97	78.88	79.00	79.38	95.25	95.00	95.38			613.00	56.89	57.25	56.54	Stw	Stw	Stw
319.00	0.70	79.75	80.38	80.75							57.60	57.95	56.89	Stw	Stw	Stw
320.00	0.53	80.62	80.00	79.38	96.25	95.50	95.00	617.00			57.25	57.60	56.54	Stw	Stw	Stw
321.00	0.53	79.12	78.75	78.50					630.00		56.89	57.25	56.19	Stw	Stw	Stw
322.00	0.70	78.25	77.62	76.88	94.75	94.38	93.75			603.00	56.54	56.54	55.49	Stw	Stw	Stw
323.00	0.79	76.62	76.25	76.62							55.84	56.19	55.49	Stw	Stw	Stw
324.00	0.70	77.00	77.62	77.75	94.25	94.62	94.75	606.00			56.19	56.89	55.84	Stw	Stw	Stw
325.00	0.79	77.88	77.50	77.38					620.00		56.54	56.54	55.84	Stw	Stw	Stw
326.00	0.79	77.25	77.12	77.00	94.25	94.12	94.12			599.00	56.19	56.54	55.84	Stw	Stw	Stw
327.00	0.79	77.12	77.25	77.00							56.19	56.54	55.49	Stw	Stw	Stw
328.00	0.70	76.75	76.38	76.12	94.12	93.75	93.62	595.00			55.84	56.19	55.14	Stw	Stw	Stw
329.00	0.53	76.00	76.38	76.50					614.00		55.84	56.19	55.49	Stw	Stw	Stw
330.00	0.53	76.62	76.75	76.75	94.25	94.25	94.12			597.00	56.19	56.54	55.49	Stw	Stw	Stw
331.00	0.70	76.50	76.12	76.00							55.84	56.19	55.14	Stw	Stw	Stw
332.00	0.79	76.00	76.38	77.00	93.62	93.88	94.38	597.00			55.84	56.54	55.84	Stw	Stw	Stw
333.00	0.70	77.62	78.38	79.12					624.00		56.54	57.25	56.54	Stw	Stw	Stw
334.00	0.79	79.50	79.75	80.25	95.88	95.75	96.00			617.00	57.25	57.95	56.89	Stw	Stw	Stw

V-23

FDR Subframe Reference Number	DRIFT ANGLE (deg.)	N1 Eng 1 (GE) (%)	N1 Eng 2 (GE) (%)	N1 Eng 3 (GE) (%)	N2 Eng1 (GE) (%)	N2 Eng2 (GE) (%)	N2 Eng3 (GE) (%)	EGT Eng1 (deg)	EGT Eng2 (deg)	EGT Eng3 (deg)	THRUST RES ANG 1 (degs)	THRUST RES ANG 2 (degs)	THRUST RES ANG 3 (degs)	THRST REV ENG1	THRST REV ENG2	THRST REV ENG3
335.00	0.79	80.50	80.50	80.62							57.60	57.95	56.89	Stw	Stw	Stw
336.00	0.88	80.38	79.62	78.62	96.25	95.50	94.75	613.00			57.25	57.25	55.84	Stw	Stw	Stw
337.00	0.79	78.00	77.50	77.00					622.00		56.54	56.54	55.49	Stw	Stw	Stw
338.00	0.79	77.00	74.50	70.62	94.25	93.25	91.00			576.00	55.84	54.44	51.63	Stw	Stw	Stw
339.00	0.53	68.38	64.88	63.75							51.28	50.22	48.82	Stw	Stw	Stw
340.00	0.97	62.38	59.50	59.38	87.75	86.88	86.62	507.00			48.82	49.52	47.41	Stw	Stw	Stw
341.00	1.23	58.00	55.50	56.25					502.00		46.36	45.30	42.14	Stw	Stw	Stw
342.00	1.14	55.25	53.12	54.38	85.38	84.75	84.88			476.00	41.44	38.98	62.16	Stw	Stw	Stw
343.00	2.02	55.50	57.38	63.25							74.45	68.84	66.38	Stw	Stw	Stw
344.00	1.67	66.38	70.88	78.25	92.62	93.88	96.62	577.00			61.81	59.70	56.54	Stw	Stw	Stw
345.00	0.09	79.75	78.50	73.00					599.00		56.54	54.79	51.28	Stw	Stw	Stw
346.00	-0.09	72.25	69.62	67.50	91.62	90.50	89.75			538.00	50.92	50.92	54.79	Stw	Stw	Stw
347.00	1.05	71.25	0.00								58.30	62.16	0.00	Stw	Stw	Stw
348.00																
349.00	1.23	99.12	56.75	98.00	105.38	86.50	109.38	799.00			80.78	81.48	81.48	Stw	Stw	Stw
350.00	0.53	109.88	46.12	100.88					597.00		81.48	81.83	81.48	Stw	Stw	Stw
351.00	-0.26	109.62	39.88	100.88	107.88	73.75	108.88			0.00	81.83	81.83	81.48	Stw	Stw	Stw
352.00																
353.00																
354.00																
355.00																

FDR Subframe Reference Number	Oil Quant Eng1 (qts)	Oil Quant Eng2 (qts)	Oil Quant Eng3 (qts)	Oil Pressure Eng1 (psia)	Oil Pressure Eng2 (psia)	Oil Pressure Eng3 (psia)	Oil Pressure Status Eng1	Oil Pressure Status Eng2	Oil Pressure Status Eng3	Oil Temp Eng1 (deg)	Oil Temp Eng2 (deg)	Oil Temp Eng3 (deg)	Fuel Flow 1 (lb/hr)	Fuel Flow 2 (lb/hr)	Fuel Flow 3 (lb/hr)
175.00		14.00			48.00		NOTLOW	NOTLOW	NOTLOW		95.00				
176.00							NOTLOW	NOTLOW	NOTLOW						
177.00							NOTLOW	NOTLOW	NOTLOW						
178.00							NOTLOW	NOTLOW	NOTLOW						
179.00			13.00			48.00	NOTLOW	NOTLOW	NOTLOW			92.00			
180.00							NOTLOW	NOTLOW	NOTLOW						
181.00							NOTLOW	NOTLOW	NOTLOW						
182.00							NOTLOW	NOTLOW	NOTLOW						
183.00							NOTLOW	NOTLOW	NOTLOW						
184.00							NOTLOW	NOTLOW	NOTLOW						
185.00							NOTLOW	NOTLOW	NOTLOW						
186.00							NOTLOW	NOTLOW	NOTLOW						
187.00							NOTLOW	NOTLOW	NOTLOW						
188.00							NOTLOW	NOTLOW	NOTLOW						
189.00							NOTLOW	NOTLOW	NOTLOW						
190.00							NOTLOW	NOTLOW	NOTLOW						
191.00							NOTLOW	NOTLOW	NOTLOW						
192.00							NOTLOW	NOTLOW	NOTLOW						
193.00							NOTLOW	NOTLOW	NOTLOW						
194.00							NOTLOW	NOTLOW	NOTLOW						
195.00							NOTLOW	NOTLOW	NOTLOW						
196.00							NOTLOW	NOTLOW	NOTLOW						
197.00							NOTLOW	NOTLOW	NOTLOW						
198.00							NOTLOW	NOTLOW	NOTLOW						
199.00							NOTLOW	NOTLOW	NOTLOW						
200.00							NOTLOW	NOTLOW	NOTLOW						
201.00							NOTLOW	NOTLOW	NOTLOW						
202.00							NOTLOW	NOTLOW	NOTLOW						
203.00							NOTLOW	NOTLOW	NOTLOW				6240.00		
204.00							NOTLOW	NOTLOW	NOTLOW						
205.00							NOTLOW	NOTLOW	NOTLOW						
206.00							NOTLOW	NOTLOW	NOTLOW						
207.00							NOTLOW	NOTLOW	NOTLOW					5272.00	
208.00							NOTLOW	NOTLOW	NOTLOW						
209.00							NOTLOW	NOTLOW	NOTLOW						
210.00							NOTLOW	NOTLOW	NOTLOW						
211.00							NOTLOW	NOTLOW	NOTLOW						3576.00
212.00							NOTLOW	NOTLOW	NOTLOW						
213.00							NOTLOW	NOTLOW	NOTLOW						
214.00							NOTLOW	NOTLOW	NOTLOW						
215.00							NOTLOW	NOTLOW	NOTLOW						
216.00							NOTLOW	NOTLOW	NOTLOW						
217.00							NOTLOW	NOTLOW	NOTLOW						
218.00							NOTLOW	NOTLOW	NOTLOW						
219.00							NOTLOW	NOTLOW	NOTLOW						
220.00							NOTLOW	NOTLOW	NOTLOW						
221.00							NOTLOW	NOTLOW	NOTLOW						
222.00							NOTLOW	NOTLOW	NOTLOW						
223.00							NOTLOW	NOTLOW	NOTLOW						
224.00							NOTLOW	NOTLOW	NOTLOW						
225.00							NOTLOW	NOTLOW	NOTLOW						
226.00							NOTLOW	NOTLOW	NOTLOW						
227.00							NOTLOW	NOTLOW	NOTLOW						
228.00							NOTLOW	NOTLOW	NOTLOW						
229.00							NOTLOW	NOTLOW	NOTLOW						
230.00							NOTLOW	NOTLOW	NOTLOW						
231.00							NOTLOW	NOTLOW	NOTLOW						
232.00							NOTLOW	NOTLOW	NOTLOW						
233.00							NOTLOW	NOTLOW	NOTLOW						
234.00							NOTLOW	NOTLOW	NOTLOW						
235.00	14.00			40.00			NOTLOW	NOTLOW	NOTLOW	89.00					
236.00							NOTLOW	NOTLOW	NOTLOW						
237.00							NOTLOW	NOTLOW	NOTLOW						
238.00							NOTLOW	NOTLOW	NOTLOW						
239.00		14.00			48.00		NOTLOW	NOTLOW	NOTLOW		95.00				
240.00							NOTLOW	NOTLOW	NOTLOW						
241.00							NOTLOW	NOTLOW	NOTLOW						
242.00							NOTLOW	NOTLOW	NOTLOW						
243.00			14.00			48.00	NOTLOW	NOTLOW	NOTLOW			92.00			
244.00							NOTLOW	NOTLOW	NOTLOW						
245.00							NOTLOW	NOTLOW	NOTLOW						
246.00							NOTLOW	NOTLOW	NOTLOW						
247.00							NOTLOW	NOTLOW	NOTLOW						
248.00							NOTLOW	NOTLOW	NOTLOW						
249.00							NOTLOW	NOTLOW	NOTLOW						
250.00							NOTLOW	NOTLOW	NOTLOW						
251.00							NOTLOW	NOTLOW	NOTLOW						
252.00							NOTLOW	NOTLOW	NOTLOW						
253.00							NOTLOW	NOTLOW	NOTLOW						
254.00							NOTLOW	NOTLOW	NOTLOW						

SE-K

FDR Subframe Reference Number	Oil Quant Eng1 (qts)	Oil Quant Eng2 (qts)	Oil Quant Eng3 (qts)	Oil Pressure Eng1 (psia)	Oil Pressure Eng2 (psia)	Oil Pressure Eng3 (psia)	Oil Pressure Status Eng1	Oil Pressure Status Eng2	Oil Pressure Status Eng3	Oil Temp Eng1 (deg)	Oil Temp Eng2 (deg)	Oil Temp Eng3 (deg)	Fuel Flow 1 (lb/hr)	Fuel Flow 2 (lb/hr)	Fuel Flow 3 (lb/hr)
255.00							NOTLOW	NOTLOW	NOTLOW						
256.00							NOTLOW	NOTLOW	NOTLOW						
257.00							NOTLOW	NOTLOW	NOTLOW						
258.00							NOTLOW	NOTLOW	NOTLOW						
259.00							NOTLOW	NOTLOW	NOTLOW						
260.00							NOTLOW	NOTLOW	NOTLOW						
261.00							NOTLOW	NOTLOW	NOTLOW						
262.00							NOTLOW	NOTLOW	NOTLOW						
263.00							NOTLOW	NOTLOW	NOTLOW						
264.00							NOTLOW	NOTLOW	NOTLOW						
265.00							NOTLOW	NOTLOW	NOTLOW						
266.00							NOTLOW	NOTLOW	NOTLOW						
267.00							NOTLOW	NOTLOW	NOTLOW				6304.00		
268.00							NOTLOW	NOTLOW	NOTLOW						
269.00							NOTLOW	NOTLOW	NOTLOW						
270.00							NOTLOW	NOTLOW	NOTLOW						
271.00							NOTLOW	NOTLOW	NOTLOW					6976.00	
272.00							NOTLOW	NOTLOW	NOTLOW						
273.00							NOTLOW	NOTLOW	NOTLOW						
274.00							NOTLOW	NOTLOW	NOTLOW						
275.00							NOTLOW	NOTLOW	NOTLOW						6872.00
276.00							NOTLOW	NOTLOW	NOTLOW						
277.00							NOTLOW	NOTLOW	NOTLOW						
278.00							NOTLOW	NOTLOW	NOTLOW						
279.00							NOTLOW	NOTLOW	NOTLOW						
280.00							NOTLOW	NOTLOW	NOTLOW						
281.00							NOTLOW	NOTLOW	NOTLOW						
282.00							NOTLOW	NOTLOW	NOTLOW						
283.00							NOTLOW	NOTLOW	NOTLOW						
284.00							NOTLOW	NOTLOW	NOTLOW						
285.00							NOTLOW	NOTLOW	NOTLOW						
286.00							NOTLOW	NOTLOW	NOTLOW						
287.00							NOTLOW	NOTLOW	NOTLOW						
288.00							NOTLOW	NOTLOW	NOTLOW						
289.00							NOTLOW	NOTLOW	NOTLOW						
290.00							NOTLOW	NOTLOW	NOTLOW						
291.00							NOTLOW	NOTLOW	NOTLOW						
292.00							NOTLOW	NOTLOW	NOTLOW						
293.00							NOTLOW	NOTLOW	NOTLOW						
294.00							NOTLOW	NOTLOW	NOTLOW						
295.00							NOTLOW	NOTLOW	NOTLOW						
296.00							NOTLOW	NOTLOW	NOTLOW						
297.00							NOTLOW	NOTLOW	NOTLOW						
298.00							NOTLOW	NOTLOW	NOTLOW						
299.00	13.00			52.00			NOTLOW	NOTLOW	NOTLOW	91.00					
300.00							NOTLOW	NOTLOW	NOTLOW						
301.00							NOTLOW	NOTLOW	NOTLOW						
302.00							NOTLOW	NOTLOW	NOTLOW						
303.00		14.00			52.00		NOTLOW	NOTLOW	NOTLOW		96.00				
304.00							NOTLOW	NOTLOW	NOTLOW						
305.00							NOTLOW	NOTLOW	NOTLOW						
306.00							NOTLOW	NOTLOW	NOTLOW						
307.00			13.00			52.00	NOTLOW	NOTLOW	NOTLOW			94.00			
308.00							NOTLOW	NOTLOW	NOTLOW						
309.00							NOTLOW	NOTLOW	NOTLOW						
310.00							NOTLOW	NOTLOW	NOTLOW						
311.00							NOTLOW	NOTLOW	NOTLOW						
312.00							NOTLOW	NOTLOW	NOTLOW						
313.00							NOTLOW	NOTLOW	NOTLOW						
314.00							NOTLOW	NOTLOW	NOTLOW						
315.00							NOTLOW	NOTLOW	NOTLOW						
316.00							NOTLOW	NOTLOW	NOTLOW						
317.00							NOTLOW	NOTLOW	NOTLOW						
318.00							NOTLOW	NOTLOW	NOTLOW						
319.00							NOTLOW	NOTLOW	NOTLOW						
320.00							NOTLOW	NOTLOW	NOTLOW						
321.00							NOTLOW	NOTLOW	NOTLOW						
322.00							NOTLOW	NOTLOW	NOTLOW						
323.00							NOTLOW	NOTLOW	NOTLOW						
324.00							NOTLOW	NOTLOW	NOTLOW						
325.00							NOTLOW	NOTLOW	NOTLOW						
326.00							NOTLOW	NOTLOW	NOTLOW						
327.00							NOTLOW	NOTLOW	NOTLOW						
328.00							NOTLOW	NOTLOW	NOTLOW						
329.00							NOTLOW	NOTLOW	NOTLOW						
330.00							NOTLOW	NOTLOW	NOTLOW						
331.00							NOTLOW	NOTLOW	NOTLOW				7912.00		
332.00							NOTLOW	NOTLOW	NOTLOW						
333.00							NOTLOW	NOTLOW	NOTLOW						
334.00							NOTLOW	NOTLOW	NOTLOW						

A-36

FDR Subframe Reference Number	Oil Quant Eng1 (qts)	Oil Quant Eng2 (qts)	Oil Quant Eng3 (qts)	Oil Pressure Eng1 (psia)	Oil Pressure Eng2 (psia)	Oil Pressure Eng3 (psia)	Oil Pressure Status Eng1	Oil Pressure Status Eng2	Oil Pressure Status Eng3	Oil Temp Eng1 (deg)	Oil Temp Eng2 (deg)	Oil Temp Eng3 (deg)	Fuel Flow 1 (lb/hr)	Fuel Flow 2 (lb/hr)	Fuel Flow 3 (lb/hr)
335.00							NOTLOW	NOTLOW	NOTLOW					8856.00	
336.00							NOTLOW	NOTLOW	NOTLOW						
337.00							NOTLOW	NOTLOW	NOTLOW						
338.00							NOTLOW	NOTLOW	NOTLOW						
339.00							NOTLOW	NOTLOW	NOTLOW						8632.00
340.00							NOTLOW	NOTLOW	NOTLOW						
341.00							NOTLOW	NOTLOW	NOTLOW						
342.00							NOTLOW	NOTLOW	NOTLOW						
343.00							NOTLOW	NOTLOW	NOTLOW						
344.00							NOTLOW	NOTLOW	NOTLOW						
345.00							NOTLOW	NOTLOW	NOTLOW						
346.00							NOTLOW	NOTLOW	NOTLOW						
347.00							NOTLOW	NOTLOW	NOTLOW						
348.00															
349.00							NOTLOW	NOTLOW	NOTLOW						
350.00							NOTLOW	NOTLOW	NOTLOW						
351.00							NOTLOW	NOTLOW	NOTLOW						
352.00															
353.00															
354.00															
355.00															

IV-37

Attachments VI - Selected FDR Discrete Data in Tabular Format

Time (seconds)	SPOILER ARM (1-armed)	Nose Gear Compr LH	Nose Gear Compr RH	Nose Gear DWN&LCK	Nose Gear Unsafe	Gear DWN&LCK-LH	Gear DWN&LCK-RH	Gear DWN&LCK-Center	Gear Unsafe-LH	Gear Unsafe-RH	Gear Unsafe-Center	FMA Format AutoPilot	FMA Format AutoThrottle	Slats Disagree	FMA Display Land Armed
175.00		NOTCOM	NOTCOM		SAFE						SAFE	AP1	No Display	Agr	No Display
176.00		NOTCOM	NOTCOM			NOTLCK	NOTLCK					AP1	No Display	Agr	No Display
177.00		NOTCOM	NOTCOM						SAFE	SAFE		AP1	No Display	Agr	No Display
178.00	Unarm	NOTCOM	NOTCOM	NOTLCK				NOTLCK				AP1	No Display	Agr	No Display
179.00		NOTCOM	NOTCOM		SAFE						SAFE	AP1	No Display	Agr	No Display
180.00		NOTCOM	NOTCOM			NOTLCK	NOTLCK					AP1	No Display	Agr	No Display
181.00		NOTCOM	NOTCOM						SAFE	SAFE		AP1	No Display	Agr	No Display
182.00	Unarm	NOTCOM	NOTCOM	NOTLCK				NOTLCK				AP1	No Display	Agr	No Display
183.00		NOTCOM	NOTCOM		SAFE						SAFE	AP1	No Display	Agr	No Display
184.00		NOTCOM	NOTCOM			NOTLCK	NOTLCK					AP1	No Display	Agr	No Display
185.00		NOTCOM	NOTCOM						SAFE	SAFE		AP1	No Display	Agr	No Display
186.00	Unarm	NOTCOM	NOTCOM	NOTLCK				NOTLCK				AP1	No Display	Agr	No Display
187.00		NOTCOM	NOTCOM		SAFE						SAFE	AP1	No Display	Agr	Land Armed
188.00		NOTCOM	NOTCOM			NOTLCK	NOTLCK					AP1	No Display	Agr	Land Armed
189.00		NOTCOM	NOTCOM						SAFE	SAFE		AP1	No Display	Agr	Land Armed
190.00	Unarm	NOTCOM	NOTCOM	NOTLCK				NOTLCK				AP1	No Display	Agr	Land Armed
191.00		NOTCOM	NOTCOM		SAFE						SAFE	AP1	No Display	Agr	Land Armed
192.00		NOTCOM	NOTCOM			NOTLCK	NOTLCK					AP1	No Display	Agr	Land Armed
193.00		NOTCOM	NOTCOM						SAFE	SAFE		AP1	No Display	Agr	Land Armed
194.00	Unarm	NOTCOM	NOTCOM	NOTLCK				NOTLCK				AP1	No Display	Agr	Land Armed
195.00		NOTCOM	NOTCOM		SAFE						SAFE	AP1	No Display	Agr	Land Armed
196.00		NOTCOM	NOTCOM			NOTLCK	NOTLCK					AP1	No Display	Agr	Land Armed
197.00		NOTCOM	NOTCOM						SAFE	SAFE		AP1	No Display	Agr	Land Armed
198.00	Unarm	NOTCOM	NOTCOM	NOTLCK				NOTLCK				AP1	No Display	Agr	Land Armed
199.00		NOTCOM	NOTCOM		SAFE						SAFE	AP1	No Display	Agr	Land Armed
200.00		NOTCOM	NOTCOM			NOTLCK	NOTLCK					AP1	No Display	Agr	Land Armed
201.00		NOTCOM	NOTCOM						SAFE	SAFE		AP1	No Display	Agr	Land Armed
202.00	Unarm	NOTCOM	NOTCOM	NOTLCK				NOTLCK				AP1	No Display	Agr	Land Armed
203.00		NOTCOM	NOTCOM		SAFE						SAFE	AP1	No Display	Agr	Land Armed
204.00		NOTCOM	NOTCOM			NOTLCK	NOTLCK					AP1	No Display	Agr	Land Armed
205.00		NOTCOM	NOTCOM						UNSAFE	UNSAFE		AP1	No Display	Agr	Land Armed
206.00	Unarm	NOTCOM	NOTCOM	NOTLCK				NOTLCK				AP1	No Display	Agr	Land Armed
207.00		NOTCOM	NOTCOM		UNSAFE						UNSAFE	AP1	No Display	Agr	Land Armed
208.00		NOTCOM	NOTCOM			NOTLCK	NOTLCK					AP1	No Display	Agr	Land Armed
209.00		NOTCOM	NOTCOM						UNSAFE	UNSAFE		AP1	No Display	Agr	Land Armed
210.00	Arm	NOTCOM	NOTCOM	NOTLCK				NOTLCK				AP1	No Display	Agr	Land Armed
211.00		NOTCOM	NOTCOM		UNSAFE						UNSAFE	AP1	No Display	Agr	Land Armed
212.00		NOTCOM	NOTCOM			NOTLCK	NOTLCK					AP1	No Display	Agr	Land Armed
213.00		NOTCOM	NOTCOM						UNSAFE	UNSAFE		AP1	No Display	Agr	Land Armed
214.00	Arm	NOTCOM	NOTCOM	NOTLCK				NOTLCK				AP1	No Display	Agr	Land Armed
215.00		NOTCOM	NOTCOM		UNSAFE						UNSAFE	AP1	No Display	Agr	Land Armed
216.00		NOTCOM	NOTCOM			NOTLCK	NOTLCK					AP1	No Display	Agr	Land Armed
217.00		NOTCOM	NOTCOM						UNSAFE	UNSAFE		AP1	No Display	Agr	Land Armed
218.00	Arm	NOTCOM	NOTCOM	DWNLCK				NOTLCK				AP1	No Display	Agr	Land Armed
219.00		NOTCOM	NOTCOM		SAFE						SAFE	AP1	No Display	Agr	Land Armed
220.00		NOTCOM	NOTCOM			NOTLCK	NOTLCK					AP1	No Display	Agr	Land Armed
221.00		NOTCOM	NOTCOM						UNSAFE	UNSAFE		AP1	No Display	Agr	Land Armed
222.00	Arm	NOTCOM	NOTCOM	DWNLCK				DWNLCK				AP1	No Display	Agr	Land Armed
223.00		NOTCOM	NOTCOM		SAFE						SAFE	AP1	No Display	Agr	Land Armed
224.00		NOTCOM	NOTCOM			DWNLCK	DWNLCK					AP1	No Display	Agr	Land Armed
225.00		NOTCOM	NOTCOM						SAFE	SAFE		AP1	No Display	Agr	Land Armed
226.00	Arm	NOTCOM	NOTCOM	DWNLCK				DWNLCK				AP1	No Display	Agr	Land Armed
227.00		NOTCOM	NOTCOM		SAFE						SAFE	AP1	No Display	Agr	Land Armed
228.00		NOTCOM	NOTCOM			DWNLCK	DWNLCK					AP1	No Display	Agr	Land Armed
229.00		NOTCOM	NOTCOM						SAFE	SAFE		AP1	No Display	Agr	Land Armed
230.00	Arm	NOTCOM	NOTCOM	DWNLCK				DWNLCK				AP1	No Display	Agr	Land Armed
231.00		NOTCOM	NOTCOM		SAFE						SAFE	AP1	No Display	Agr	Land Armed
232.00		NOTCOM	NOTCOM			DWNLCK	DWNLCK					AP1	No Display	Agr	Land Armed
233.00		NOTCOM	NOTCOM						SAFE	SAFE		AP1	No Display	Agr	Land Armed
234.00	Arm	NOTCOM	NOTCOM	DWNLCK				DWNLCK				AP1	No Display	Agr	Land Armed
235.00		NOTCOM	NOTCOM		SAFE						SAFE	AP	No Display	Agr	No Display
236.00		NOTCOM	NOTCOM			DWNLCK	DWNLCK					AP	No Display	Agr	No Display
237.00		NOTCOM	NOTCOM						SAFE	SAFE		AP	No Display	Agr	No Display
238.00	Arm	NOTCOM	NOTCOM	DWNLCK				DWNLCK				AP	No Display	Agr	No Display
239.00		NOTCOM	NOTCOM		SAFE						SAFE	AP	No Display	Agr	No Display
240.00		NOTCOM	NOTCOM			DWNLCK	DWNLCK					AP	No Display	Agr	No Display
241.00		NOTCOM	NOTCOM						SAFE	SAFE		AP	No Display	Agr	No Display
242.00	Arm	NOTCOM	NOTCOM	DWNLCK				DWNLCK				AP	No Display	Agr	No Display
243.00		NOTCOM	NOTCOM		SAFE						SAFE	AP	No Display	Agr	No Display
244.00		NOTCOM	NOTCOM			DWNLCK	DWNLCK					AP	No Display	Agr	No Display
245.00		NOTCOM	NOTCOM						SAFE	SAFE		AP	No Display	Agr	No Display
246.00	Arm	NOTCOM	NOTCOM	DWNLCK				DWNLCK				AP	No Display	Agr	No Display
247.00		NOTCOM	NOTCOM		SAFE						SAFE	AP	No Display	Agr	No Display
248.00		NOTCOM	NOTCOM			DWNLCK	DWNLCK					AP	No Display	Agr	No Display
249.00		NOTCOM	NOTCOM						SAFE	SAFE		AP	No Display	Agr	No Display
250.00	Arm	NOTCOM	NOTCOM	DWNLCK				DWNLCK				AP	No Display	Agr	No Display
251.00		NOTCOM	NOTCOM		SAFE						SAFE	AP	No Display	Agr	No Display
252.00		NOTCOM	NOTCOM			DWNLCK	DWNLCK					AP	No Display	Agr	No Display
253.00		NOTCOM	NOTCOM						SAFE	SAFE		OFF RED	No Display	Agr	No Display
254.00	Arm	NOTCOM	NOTCOM	DWNLCK				DWNLCK				OFF RED	No Display	Agr	No Display

Time (seconds)	SPOILER ARM (1-armed)	Nose Gear Compr LH	Nose Gear Compr RH	Nose Gear DWN&LCK	Nose Gear Unsafe	Gear DWN&LCK-LH	Gear DWN&LCK-RH	Gear DWN&LCK-Center	Gear Unsafe-LH	Gear Unsafe-RH	Gear Unsafe-Center	FMA Format AutoPilot	FMA Format AutoThrottle	Slats Disagree	FMA Display Land Armed
255.00		NOTCOM	NOTCOM		SAFE						SAFE	OFF RED	No Display	Agr	No Display
256.00		NOTCOM	NOTCOM			DWNLCK	DWNLCK					OFF AMBER	No Display	Agr	No Display
257.00		NOTCOM	NOTCOM						SAFE	SAFE		OFF WHITE	No Display	Agr	No Display
258.00	Arm	NOTCOM	NOTCOM	DWNLCK				DWNLCK				OFF WHITE	No Display	Agr	No Display
259.00		NOTCOM	NOTCOM		SAFE						SAFE	OFF WHITE	No Display	Agr	No Display
260.00		NOTCOM	NOTCOM			DWNLCK	DWNLCK					OFF WHITE	No Display	Agr	No Display
261.00		NOTCOM	NOTCOM						SAFE	SAFE		OFF WHITE	No Display	Agr	No Display
262.00	Arm	NOTCOM	NOTCOM	DWNLCK				DWNLCK				OFF WHITE	No Display	Agr	No Display
263.00		NOTCOM	NOTCOM		SAFE						SAFE	OFF WHITE	No Display	Agr	No Display
264.00		NOTCOM	NOTCOM			DWNLCK	DWNLCK					OFF WHITE	No Display	Agr	No Display
265.00		NOTCOM	NOTCOM						SAFE	SAFE		OFF WHITE	No Display	Agr	No Display
266.00	Arm	NOTCOM	NOTCOM	DWNLCK				DWNLCK				OFF WHITE	No Display	Agr	No Display
267.00		NOTCOM	NOTCOM		SAFE						SAFE	OFF WHITE	No Display	Agr	No Display
268.00		NOTCOM	NOTCOM			DWNLCK	DWNLCK					OFF WHITE	No Display	Agr	No Display
269.00		NOTCOM	NOTCOM						SAFE	SAFE		OFF WHITE	No Display	Agr	No Display
270.00	Arm	NOTCOM	NOTCOM	DWNLCK				DWNLCK				OFF WHITE	No Display	Agr	No Display
271.00		NOTCOM	NOTCOM		SAFE						SAFE	OFF WHITE	No Display	Agr	No Display
272.00		NOTCOM	NOTCOM			DWNLCK	DWNLCK					OFF WHITE	No Display	Agr	No Display
273.00		NOTCOM	NOTCOM						SAFE	SAFE		OFF WHITE	No Display	Agr	No Display
274.00	Arm	NOTCOM	NOTCOM	DWNLCK				DWNLCK				OFF WHITE	No Display	Agr	No Display
275.00		NOTCOM	NOTCOM		SAFE						SAFE	OFF WHITE	No Display	Agr	No Display
276.00		NOTCOM	NOTCOM			DWNLCK	DWNLCK					OFF WHITE	No Display	Agr	No Display
277.00		NOTCOM	NOTCOM						SAFE	SAFE		OFF WHITE	No Display	Agr	No Display
278.00	Arm	NOTCOM	NOTCOM	DWNLCK				DWNLCK				OFF WHITE	No Display	Agr	No Display
279.00		NOTCOM	NOTCOM		SAFE						SAFE	OFF WHITE	No Display	Agr	No Display
280.00		NOTCOM	NOTCOM			DWNLCK	DWNLCK					OFF WHITE	No Display	Agr	No Display
281.00		NOTCOM	NOTCOM						SAFE	SAFE		OFF WHITE	No Display	Agr	No Display
282.00	Arm	NOTCOM	NOTCOM	DWNLCK				DWNLCK				OFF WHITE	No Display	Agr	No Display
283.00		NOTCOM	NOTCOM		SAFE						SAFE	OFF WHITE	No Display	Agr	No Display
284.00		NOTCOM	NOTCOM			DWNLCK	DWNLCK					OFF WHITE	No Display	Agr	No Display
285.00		NOTCOM	NOTCOM						SAFE	SAFE		OFF WHITE	No Display	Agr	No Display
286.00	Arm	NOTCOM	NOTCOM	DWNLCK				DWNLCK				OFF WHITE	No Display	Agr	No Display
287.00		NOTCOM	NOTCOM		SAFE						SAFE	OFF WHITE	No Display	Agr	No Display
288.00		NOTCOM	NOTCOM			DWNLCK	DWNLCK					OFF WHITE	No Display	Agr	No Display
289.00		NOTCOM	NOTCOM						SAFE	SAFE		OFF WHITE	No Display	Agr	No Display
290.00	Arm	NOTCOM	NOTCOM	DWNLCK				DWNLCK				OFF WHITE	No Display	Agr	No Display
291.00		NOTCOM	NOTCOM		SAFE						SAFE	OFF WHITE	No Display	Agr	No Display
292.00		NOTCOM	NOTCOM			DWNLCK	DWNLCK					OFF WHITE	No Display	Agr	No Display
293.00		NOTCOM	NOTCOM						SAFE	SAFE		OFF WHITE	No Display	Agr	No Display
294.00	Arm	NOTCOM	NOTCOM	DWNLCK				DWNLCK				OFF WHITE	No Display	Agr	No Display
295.00		NOTCOM	NOTCOM		SAFE						SAFE	OFF WHITE	No Display	Agr	No Display
296.00		NOTCOM	NOTCOM			DWNLCK	DWNLCK					OFF WHITE	No Display	Agr	No Display
297.00		NOTCOM	NOTCOM						SAFE	SAFE		OFF WHITE	No Display	Agr	No Display
298.00	Arm	NOTCOM	NOTCOM	DWNLCK				DWNLCK				OFF WHITE	No Display	Agr	No Display
299.00		NOTCOM	NOTCOM		SAFE						SAFE	OFF WHITE	No Display	Agr	No Display
300.00		NOTCOM	NOTCOM			DWNLCK	DWNLCK					OFF WHITE	No Display	Agr	No Display
301.00		NOTCOM	NOTCOM						SAFE	SAFE		OFF WHITE	No Display	Agr	No Display
302.00	Arm	NOTCOM	NOTCOM	DWNLCK				DWNLCK				OFF WHITE	No Display	Agr	No Display
303.00		NOTCOM	NOTCOM		SAFE						SAFE	OFF WHITE	No Display	Agr	No Display
304.00		NOTCOM	NOTCOM			DWNLCK	DWNLCK					OFF WHITE	No Display	Agr	No Display
305.00		NOTCOM	NOTCOM						SAFE	SAFE		OFF WHITE	No Display	Agr	No Display
306.00	Arm	NOTCOM	NOTCOM	DWNLCK				DWNLCK				OFF WHITE	No Display	Agr	No Display
307.00		NOTCOM	NOTCOM		SAFE						SAFE	OFF WHITE	No Display	Agr	No Display
308.00		NOTCOM	NOTCOM			DWNLCK	DWNLCK					OFF WHITE	No Display	Agr	No Display
309.00		NOTCOM	NOTCOM						SAFE	SAFE		OFF WHITE	No Display	Agr	No Display
310.00	Arm	NOTCOM	NOTCOM	DWNLCK				DWNLCK				OFF WHITE	No Display	Agr	No Display
311.00		NOTCOM	NOTCOM		SAFE						SAFE	OFF WHITE	No Display	Agr	No Display
312.00		NOTCOM	NOTCOM			DWNLCK	DWNLCK					OFF WHITE	No Display	Agr	No Display
313.00		NOTCOM	NOTCOM						SAFE	SAFE		OFF WHITE	No Display	Agr	No Display
314.00	Arm	NOTCOM	NOTCOM	DWNLCK				DWNLCK				OFF WHITE	No Display	Agr	No Display
315.00		NOTCOM	NOTCOM		SAFE						SAFE	OFF WHITE	No Display	Agr	No Display
316.00		NOTCOM	NOTCOM			DWNLCK	DWNLCK					OFF WHITE	No Display	Agr	No Display
317.00		NOTCOM	NOTCOM						SAFE	SAFE		OFF WHITE	No Display	Agr	No Display
318.00	Arm	NOTCOM	NOTCOM	DWNLCK				DWNLCK				OFF WHITE	No Display	Agr	No Display
319.00		NOTCOM	NOTCOM		SAFE						SAFE	OFF WHITE	No Display	Agr	No Display
320.00		NOTCOM	NOTCOM			DWNLCK	DWNLCK					OFF WHITE	No Display	Agr	No Display
321.00		NOTCOM	NOTCOM						SAFE	SAFE		OFF WHITE	No Display	Agr	No Display
322.00	Arm	NOTCOM	NOTCOM	DWNLCK				DWNLCK				OFF WHITE	No Display	Agr	No Display
323.00		NOTCOM	NOTCOM		SAFE						SAFE	OFF WHITE	No Display	Agr	No Display
324.00		NOTCOM	NOTCOM			DWNLCK	DWNLCK					OFF WHITE	No Display	Agr	No Display
325.00		NOTCOM	NOTCOM						SAFE	SAFE		OFF WHITE	No Display	Agr	No Display
326.00	Arm	NOTCOM	NOTCOM	DWNLCK				DWNLCK				OFF WHITE	No Display	Agr	No Display
327.00		NOTCOM	NOTCOM		SAFE						SAFE	OFF WHITE	No Display	Agr	No Display
328.00		NOTCOM	NOTCOM			DWNLCK	DWNLCK					OFF WHITE	No Display	Agr	No Display
329.00		NOTCOM	NOTCOM						SAFE	SAFE		OFF WHITE	No Display	Agr	No Display
330.00	Arm	NOTCOM	NOTCOM	DWNLCK				DWNLCK				OFF WHITE	No Display	Agr	No Display
331.00		NOTCOM	NOTCOM		SAFE						SAFE	OFF WHITE	No Display	Agr	No Display
332.00		NOTCOM	NOTCOM			DWNLCK	DWNLCK					OFF WHITE	No Display	Agr	No Display
333.00		NOTCOM	NOTCOM						SAFE	SAFE		OFF WHITE	No Display	Agr	No Display
334.00	Arm	NOTCOM	NOTCOM	DWNLCK				DWNLCK				OFF WHITE	No Display	Agr	No Display

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Time (seconds)	SPOILER ARM (1-armed)	Nose Gear Compr LH	Nose Gear Compr RH	Nose Gear DWN&LCK	Nose Gear Unsafe	Gear DWN&LCK-LH	Gear DWN&LCK-RH	Gear DWN&LCK-Center	Gear Unsafe-LH	Gear Unsafe-RH	Gear Unsafe-Center	FMA Format AutoPilot	FMA Format AutoThrottle	Stats Disagree	FMA Display Land Armed
335.00		NOTCOM	NOTCOM		SAFE						SAFE	OFF WHITE	No Display	Agr	No Display
336.00		NOTCOM	NOTCOM			DWNLCK	DWNLCK					OFF WHITE	No Display	Agr	No Display
337.00		NOTCOM	NOTCOM						SAFE	SAFE		OFF WHITE	No Display	Agr	No Display
338.00	Arm	NOTCOM	NOTCOM	DWNLCK				DWNLCK				OFF WHITE	No Display	Agr	No Display
339.00		NOTCOM	NOTCOM		SAFE						SAFE	OFF WHITE	No Display	Agr	No Display
340.00		NOTCOM	NOTCOM			DWNLCK	DWNLCK					OFF WHITE	No Display	Agr	No Display
341.00		NOTCOM	NOTCOM						SAFE	SAFE		OFF WHITE	No Display	Agr	No Display
342.00	Arm	NOTCOM	NOTCOM	DWNLCK				DWNLCK				OFF WHITE	No Display	Agr	No Display
343.00		NOTCOM	NOTCOM		SAFE						SAFE	OFF WHITE	No Display	Agr	No Display
344.00		NOTCOM	NOTCOM			DWNLCK	DWNLCK					OFF WHITE	No Display	Agr	No Display
345.00		NOTCOM	NOTCOM						UNSAFE	SAFE		OFF WHITE	No Display	Agr	No Display
346.00	Unarm	NOTCOM	NOTCOM	DWNLCK				DWNLCK				OFF WHITE	No Display	Agr	No Display
347.00		COMPR	COMPR		SAFE						SAFE	No Display	No Display		No Display
348.00															
349.00		NOTCOM	NOTCOM			DWNLCK	NOTLCK					OFF WHITE	ATS OFF Red	Disagr	No Display
350.00		NOTCOM	NOTCOM						SAFE	UNSAFE		OFF WHITE	ATS OFF Red	Disagr	No Display
351.00	Unarm	NOTCOM	NOTCOM	DWNLCK				DWNLCK				OFF WHITE	ATS OFF Red	Disagr	No Display
352.00															