11 July 2015

F-16C 96-0085 (CC-207) Midair – Shaw AFB South Carolina
7 July 2015

The Digital Flight Control System (DFLCS) seat data recorder (SDR) PN 16C0200-813, SN OWEC9C0653 was hand carried to Lockheed Martin for a data download. The SDR was received in good condition with exterior damage limited to the external connector back-shell and paint scraping. The external connector was packed with soil and grass which is typical for a ground impact. The SDR was disassembled for a visual inspection of the internal circuit cards. The SDR contains two identical circuit cards. One is referred to as the P2 circuit card and the other is referred to as P3. Both cards have a single memory integrated circuit (IC), U9, which can store 4k of data. A close visual inspection found both circuit boards to be in good condition with no physical damage. Had damage to either board been observed, the memory ICs would have been removed for downloading using an engineering host circuit card with IC sockets. Since the circuit cards were in good condition, the memory ICs were not removed and data download was conducted using the incident circuit cards. Both P2 and P3 circuit cards downloaded successfully to a host PC using a Lockheed Martin Engineering Seat Data Recording Interface (SDRI). The data was then processed using Lockheed Martin Engineering Seat Data Recorder Interface (SDRI) program which produced the printout labeled "Aircraft 96-0085 (CC-207) # 01, (Sorted)."

GENERAL RECORDING INFORMATION

The DFLCS memory is recorded in two different formats. Flight Profile records airspeed, altitude and heading[i] every 15 seconds after takeoff, and is stored on the P2 circuit card; this data is referred to as either "Flight Profile" or "P2 data." Flight Profile data can store 1320 recordings (330 minutes; 5 hours and 30 minutes) before it fills the register, wraps-around, and starts to overwrite the oldest data. System Status records airspeed, altitude, heading, attitude, radar altitude (truncated), normal acceleration, angle-of-attack, surface positions (flaperons, horizontal tails and rudder), stick force (pitch and roll), and data bits (relating to switch positions, control law changes and system failures). The System Status data is stored on the P3 circuit card and is referred to as either "System Status" or "P3 data." System Status is event driven and only records at the end of a half second time period, when any one of these data bits (with exception of a few bits[ii]) changes state during that time period. System Status data can store 132 recordings (events) before it fills the register, wraps-around and starts to overwrite the oldest data.

ANALYSIS OF DATA

Pages 1 through 6 of the printout labeled "Aircraft 96-0085 (CC-207) # 01, Sorted" and titled Flight Profile Discrete Data Sheet contains Time, Heading, Pressure Altitude, Airspeed and 38 data bits is referred to as the Flight Profile (FP) printout. Pages 7 and 8, titled System Status Discrete Data Sheet contains Time and 64 discrete data bits is referred to as the System Status (SS) printout. Page 9 is titled Specific Parameters Group One and contains Time, Heading, Airspeed, Pseudo Radar Altitude (not applicable for this AGCAS configured aircraft), Pressure Altitude, Pitch and Roll Attitudes and Angle-of-Attack. Page 10 is titled Specific Parameters Group Two and contains Time, Forward Pitch and Roll Side Stick Controller Inputs, Normal Acceleration, and the 5 primary surface positions.

The values of time on the FP printout that are preceded with an asterisk are 15 second timed recordings from the P2 data file (Heading, Pressure Altitude & Air Speed). The times that do not have an asterisk are event driven recordings caused by a switching action or system failure, and will have a corresponding frame of System Status and Specific Parameter data associated with that time; these are sourced from the P3 data file. Also, on the FP printout, only full seconds of time are printed (the half seconds are dropped). FP time is hr:min:sec after weight off main landing gear on the initial takeoff.

The analysis of the mishap flight, using the Flight Profile printout time and location (LOC) as the reference follows:

- Time 0:00:00 (LOC 1) shows a normal takeoff with the landing gear handle (FP bit 4) down and main landing gear wheel speed (SS bit 60) greater than 60 knots. The DFLCC Automatic Ground Collision Avoidance System (AGCAS) Operational Flight Program (OFP) 06NE set the Obstacle Warning (SS bit 34) at power up during software initialization. This bit will clear when any of the following modes are engaged; A/P, PARS flyup and AGCAS flyup.

- Time 0:00:02 (LOC 2) resulted from the landing gear handle (FP bit 4) being raised. The Wheel speed (SS bit 60) had cleared indicating the wheel speed was below 60 kts.

- Time *0:00:15 thru *0:02:00 (LOC 3 thru 10) are 15 second interval timed recordings showing a climb to a pressure altitude range of 8,970 to 9,121 feet and normal flight activity with no failures or control law switching taking place. Only the Obstacle Warning (SS bit 34) remained set during this period.

- Time 0:02:15 (LOC 11) resulted from the Obstacle Warning (SS bit 34) clearing due to the engagement of autopilot as described above. Pitch Autopilot (SS bit 53) setting indicates activation of the autopilot. The combination of Pitch Autopilot (SS bit 53) being set and Pitch Attitude Hold (SS bit 54) <u>not</u> being set indicates Pitch Altitude Hold was selected. The combination of Roll Autopilot (SS bit 55) being set and Roll Attitude Hold (SS bit 56) <u>not</u> being set indicates the Heading Select mode was selected.

  A matrix to show the various autopilot modes selections are provided here for the reader's convenience:

	Pitch A/P (SS Bit 53)	Pitch Att Hold (SS Bit 54)	Roll A/P (SS Bit 55)	Roll Att Hold (SS Bit 56)
Pitch Altitude Hold	Set (0)	Not Set (1)	NA	NA
Pitch Attitude Hold	Set (0)	Set (0)	NA	NA
Roll Attitude Hold	Set (0)	NA	Set (0)	Set (0)
Roll Heading Select	Set (0)	NA	Set (0)	Not Set (1)
Roll Steering Select	Set (0)	NA	Not Set (1)	Not Set (1)

- Time *0:02:15 thru *0:03:15 (LOC 12 thru16) are 15 second interval timed recordings of routine flight with no failures.

- Time 0:03:25 (LOC 17) resulted from the pilot depressing the paddle switch (FP bit 8) which overrides the autopilot.

- Time *0:03:30 thru *0:04:00 (LOC 18 thru 20) are 15 second interval timed recordings, showing normal flight activity with no failures while at an easterly heading of 101 degrees at approximately 300 KCAS, and climbing to a pressure altitude range of 11,305 to 11,467 feet.

- Time 0:04:00 (LOC 21) (SS Time 0:04:00.5) resulted from the pilot releasing the paddle switch (FP bit 8) and turning off the autopilot (SS bit 53).

- Time *0:04:15 thru *0:14:45 indicates routine flight with a descent from a pressure altitude range of 14,535 to 14,715 feet to a range of 1,253 to 1,371 feet. Also during this time range, the paddle switch (FP bit 8) was toggled and the autopilot (SS bits 53 & 55) was turned on and off by the pilot.

- Time 0:14:52 (LOC 75) resulted from the landing gear handle (FP bit 4) being lowered and the autopilot (SS bits 53 & 55) being turned off.

- Time 0:14:56 (LOC 76) resulted from the paddle switch (FP bit 8) being released.

- Time *0:15:00 thru *0:16:00 (LOC 77 thru 81) are 15 second interval timed recordings indicating a descent to a pressure altitude range of -29 to 85 feet with the landing gear handle (FP bit 4) down.

- Time 0:16:12 (LOC 82) resulted from the landing gear handle (FP bit 4) being raised at a pressure altitude rage of -257 to -144 feet and a range of 218 to 226 KCAS.

- Time *0:16:15 thru *0:22:15 (LOC 83 thru 108) are 15 second intervals, with the exception of time 0:18:21 (LOC 92) where the autopilot was turned on. The aircraft climbed and maintained a pressure altitude range of 1,611 to 1,731 feet.

- Time 0:22:28 (LOC 109) thru *0:23:45 (LOC 117) resulted from the paddle switch (FP bit 8) being depressed (0:22:28, LOC 109), the landing gear handle (FP bit 4) being lowered (0:22:37, LOC 111), the autopilot (SS bits 53 & 55) being turned off at 0:22:38 (LOC 112) and 15 second interval timed recordings. The aircraft descended to a pressure altitude range of 200 to 315 feet.

- Time 0:23:58 (LOC 118) resulted from the landing gear handle (FP bit 4) being raised at a pressure altitude range of -29 to 85 feet and an airspeed range of 226 to 235 KCAS.

- Time *0:24:00 and 0:24:00 (LOC 119 & 120) resulted from a 15 second timed recording followed by the paddle switch (FP bit 8) being released.

- Time *0:24:15 thru *0:25:30 (LOC 121 thru 126) resulted from 15 second timed recordings. The aircraft climbed to a pressure altitude range of 4,886 to 5,019 feet.

- Time 0:25:42 (LOC 127) resulted from Category Stores switch (FP bit 5) being positioned to Cat III. Note; Category III Stores selection remained throughout the remainder of the recordings.

- Times *0:25:45 thru *0:26:45 (LOC 128 thru 132) are 15 second interval timed recordings with the aircraft descending to a pressure altitude range of -29 to 85 feet with the landing gear handle (FP bit 4) up.

- Times *0:27:00 thru *0:40:30 (LOC 133 thru 198) resulted from 15 second interval timed recordings and momentary depressions of the paddle switch (FP bit 8), and turning the autopilot (SS bits 53 & 55) on and off.

- Time 0:40:38 (LOC 199) (SS 0:40:38.5) resulted from a momentary setting of the CADC pass bit (SS bit 48). This is an indication of a momentary loss of 115VAC power to the CADC which is powered by Emer AC Bus #1. The Emer AC Bus #1 appears to have self-recovered in approximately ½ second, as opposed to be being powered by the Emergency Power Unit (EPU) which typically takes approximately 2 seconds to spool up and supply the bus. This is the first failure indication of the flight. As previously mentioned, half second time values are truncated in the Flight Profile Discrete Data Sheet. The time of the associated recording on the System Status Discrete Data Sheet & Specific Parameters is 0:40:38.5 (h:mm:ss.d).

- Time 0:40:39 (LOC 200) resulted from the clearing of the CADC Pass (SS bit 48) and setting of multiple bits as follows: The CADC INU Data Good bit (SS bit 49) relates to a DFLCC monitor of 1553 bus traffic from the CADC and the Embedded GPS/INS (EGI). When communication from either the CADC or EGI are invalid or stale for more than 453 milliseconds, this monitor will set. It should be noted that DFLCS recorded information sourced from the EGI includes Heading, Pitch and Roll Attitude. All EGI information appears to be stale (inactive) and no updated EGI information (other than zeros) is recorded for the remainder of the flight. The System Wide Integrity Monitor (SWIM) Flyup (SS bit 37) set due to a loss of valid (or stale) EGI 1553 information; this does not cause an actual fly up for this AGCAS configured aircraft. The AP Fail (SS bit 52) sets due to a loss of either EGI and/or CADC 1553 information and turns off the autopilot. The paddle switch (FP bit 8) was momentarily depressed.

- Time 0:40:40 (LOC 201) resulted from the paddle switch (FP bit 8) being released and the Angle Of Sideslip (AOS) monitor (SS bit 16) setting. The AOS monitor sets with a loss of valid EGI information or a miscompare between EGI and pneumatic sideslip information.

- Time *0:40:45 (LOC 202) is a 15 second interval timed recording. Heading appears stale since it remained constant at 196 degrees (with the INU & CADC Data Good [SS bit 49] set) at a pressure altitude range of 1,134 to 1,253 feet and a range of 218 to 226 KCAS.

- Time 0:40:46 (LOC 203) (SS time 0:40:46.5) resulted from the INU & CADC Data Good (SS bit 49) clearing. This indicates the EGI is reporting via 1553 that its MUX information is valid. At this time, the recorded value of Heading, Pitch and Roll Attitudes were all zeros. Heading is listed on both the Flight Profile Discrete Data Sheet and the Specific Parameters Group One Sheet. Pitch and Roll Attitude are listed on the Specific Parameters Group One Sheet. It should be noted that following a momentary power loss, the EGI can sometimes fail and incorrectly indicate valid in its 1553 validity word while sending zeros in its 1553 parameters. The recorded FLCS data indicates this occurred and it is likely that the HUD was displaying a frozen (fixed) Heading, Pitch and Roll Attitude of zero degrees.

- Times *0:41:00 thru *0:42:30 (LOC 204 thru 210) are all 15 second interval timed recordings of Heading, Airspeed and Altitude and show the aircraft descended from a pressure altitude range of 898 to 1,016 feet to a range of 315 to 431 feet, and airspeed peaked at a range of 189 to 199 KCAS, and then decreased to range of 167 to 179 KCAS. The recorded Heading remained fixed at 0 degrees.

- Time *0:42:45 (LOC 211) is a 15 second interval timed recording and was the last recording from the incident flight. The recorded pressure altitude was a range of 200 to 315 feet, airspeed was range of 155 to 167 KCAS and Heading remained fixed at 0 degrees. Crew ejection occurred between *0:42:45 and the next scheduled 15 second recording of *0:43:00.

SUMMARY OF RECORDED DATA

A momentary interruption in Emer AC Bus #1 power resulted in a loss of valid EGI sourced heading and attitude information via 1553 multiplex bus. While the loss of EGI information terminated autopilot operation, it did not degrade manual control of the flight control system.

There were no indications of a drop in hydraulic power. When either of the two hydraulic systems drop below approximately 1,700 PSI, the five flight control Integrated Servo Actuators (ISAs) will close one of two electrical switches. No pressure switch closures were recorded, indicating the engine continued to drive the accessory drive gear box and its two hydraulic pumps up to the point of crew ejection, at which time the seat data recorder departed the aircraft. There were no flight control system, electrical power or hydraulic power failures recorded prior to the momentary power interruption cited above.

[i] All references to Heading values are True Heading.
[ii] Data bits that do not generate un-timed recordings are indicated in the bit assignment listing on the FP and SS printouts.

*** DIGITAL FLIGHT DATA - 06NE OFP ***

FLIGHT PROFILE DISCRETE DATA SHEET

BELOW ARE THE BIT ASSIGNMENTS FOR THE MANCHESTER DATA WORD

1	RESET	20	ALL ISA PS1 FAIL MFL
2	WOW MLG	21	RHT ISA PS2 FAIL MFL
3	WOW NLG	22	RHT ISA PS1 FAIL MFL
4	LANDING GEAR	23	LHT ISA PS2 FAIL MFL
5	CAT I STORES	24	LHT ISA PS1 FAIL MFL
6	AIR REFUEL CLOSED	25	RF ISA PS2 FAIL MFL
7	ALT FLAPS SWITCH	26	RF ISA PS1 FAIL MFL
8	PADDLE SWITCH FWD	27	LF ISA PS2 FAIL MFL
9	PADDLE SWITCH AFT	28	LF ISA PS1 FAIL MFL
10	MPO FWD	29	RUD ISA PS2 FAIL MFL
11	MPO AFT	30	RUD ISA PS1 FAIL MFL
12	LEF LOCK SWITCH	31	DISCRETE A FAIL MFL
13	LEF LOCKED MFL	32	DISCRETE B FAIL MFL
14	MTF DISABLE SWITCH	33	DISCRETE C FAIL MFL
15	MTF DISABLE MFL	34	DISCRETE D FAIL MFL
16	DFLCC FIRST FAIL MFL	35	GCAS FLYUP
17	DUAL FAIL MFL	36	GCAS END-OF-FLYUP
18	CCM FAIL MFL	37	GCAS DEACTIVATE
19	ALL ISA PS2 FAIL MFL	38	GCAS PARS ENGAGE
EOF	END OF FLIGHT		

* INDICATES TIMED 15 SECOND RECORDING
^ INDICATES BIT CHANGE DOES NOT CAUSE UN-TIMED RECORDING
LOGIC 1 IS THE NORMAL PILOTED <RESET> STATE AND
LOGIC 0 IS THE FAILED <SET> STATE.

TIME	TRUE HEADING <DEG>	PRESSURE ALTITUDE <FEET>	AIR SPEED <KCAS>	38 DATA BITS 11111111112222222222333333333 12345678901234567890123456789012345678	E O F	LOC
0:00:00	214	-29	179	11101111111111111111111111111111111111	0	1
0:00:02	214	-29	199	11111111111111111111111111111111111111	0	2
*0:00:15	216	200	316	11111111111111111111111111111111111111	0	3
*0:00:30	142	1491	310	11111111111111111111111111111111111111	0	4
*0:00:45	92	2462	338	11111111111111111111111111111111111111	0	5
*0:01:00	82	2709	353	11111111111111111111111111111111111111	0	6
*0:01:15	102	3461	363	11111111111111111111111111111111111111	0	7
*0:01:30	101	5019	373	11111111111111111111111111111111111111	0	8
*0:01:45	101	6935	368	11111111111111111111111111111111111111	0	9
*0:02:00	101	9121	353	11111111111111111111111111111111111111	0	10
0:02:15	101	9730	363	11111111111111111111111111111111111111	0	11
*0:02:15	101	9730	363	11111111111111111111111111111111111111	0	12
*0:02:30	101	9730	353	11111111111111111111111111111111111111	0	13
*0:02:45	101	9730	343	11111111111111111111111111111111111111	0	14

				11111111112222222222333333333		
	<DEG>	<FEET>	<KCAS>	12345678901234567890123456789012345678		

TIME	TRUE HEADING <DEG>	PRESSURE ALTITUDE <FEET>	AIR SPEED <KCAS>	38 DATA BITS 11111111112222222222333333333 12345678901234567890123456789012345678	E O F	LOC
*0:03:00	101	9730	332	11111111111111111111111111111111111111	0	15
*0:03:15	101	9730	327	11111111111111111111111111111111111111	0	16
0:03:25	102	9730	316	11111101111111111111111111111111111111	0	17
*0:03:30	101	9730	310	11111101111111111111111111111111111111	0	18
*0:03:45	101	10507	292	11111101111111111111111111111111111111	0	19
*0:04:00	101	11467	304	11111101111111111111111111111111111111	0	20
0:04:00	101	11467	304	11111111111111111111111111111111111111	0	21
*0:04:15	102	12624	304	11111111111111111111111111111111111111	0	22
*0:04:30	101	13827	304	11111111111111111111111111111111111111	0	23
*0:04:45	102	14715	304	11111111111111111111111111111111111111	0	24
0:04:48	102	14535	304	11111111111111111111111111111111111111	0	25
*0:05:00	101	14715	304	11111111111111111111111111111111111111	0	26
*0:05:15	101	14715	298	11111111111111111111111111111111111111	0	27
*0:05:30	101	14715	298	11111111111111111111111111111111111111	0	28
*0:05:45	102	14715	292	11111111111111111111111111111111111111	0	29
*0:06:00	102	14535	292	11111111111111111111111111111111111111	0	30
*0:06:15	102	14535	285	11111111111111111111111111111111111111	0	31
*0:06:30	102	14715	279	11111111111111111111111111111111111111	0	32
*0:06:45	102	14535	279	11111111111111111111111111111111111111	0	33
*0:07:00	102	14715	272	11111111111111111111111111111111111111	0	34
0:07:11	102	14715	265	11111101111111111111111111111111111111	0	35
0:07:14	102	14535	265	11111101111111111111111111111111111111	0	36
0:07:14	102	14535	265	11111101111111111111111111111111111111	0	37
*0:07:15	102	14715	272	11111101111111111111111111111111111111	0	38
0:07:19	102	14357	272	11111111111111111111111111111111111111	0	39
*0:07:30	102	13827	272	11111111111111111111111111111111111111	0	40
*0:07:45	102	12963	265	11111111111111111111111111111111111111	0	41
*0:08:00	102	12289	265	11111111111111111111111111111111111111	0	42
*0:08:15	102	11467	272	11111111111111111111111111111111111111	0	43
*0:08:30	102	10665	265	11111111111111111111111111111111111111	0	44
*0:08:45	102	10038	265	11111111111111111111111111111111111111	0	45
*0:09:00	102	9272	265	11111111111111111111111111111111111111	0	46
*0:09:15	102	8523	265	11111111111111111111111111111111111111	0	47
*0:09:30	104	7791	265	11111111111111111111111111111111111111	0	48
*0:09:45	104	7076	272	11111111111111111111111111111111111111	0	49
*0:10:00	94	6376	272	11111111111111111111111111111111111111	0	50
*0:10:15	71	5420	265	11111111111111111111111111111111111111	0	51
*0:10:30	70	4754	265	11111111111111111111111111111111111111	0	52
*0:10:45	70	3972	258	11111111111111111111111111111111111111	0	53
*0:11:00	70	3334	258	11111111111111111111111111111111111111	0	54
*0:11:15	70	2585	250	11111111111111111111111111111111111111	0	55
0:11:29	70	1852	250	11111101111111111111111111111111111111	0	56
*0:11:30	70	1852	250	11111101111111111111111111111111111111	0	57
0:11:38	71	1731	235	11111101111111111111111111111111111111	0	58
0:11:38	71	1731	235	11111101111111111111111111111111111111	0	59

TIME	TRUE HEADING <DEG>	PRESSURE ALTITUDE <FEET>	AIR SPEED <KCAS>	38 DATA BITS 11111111112222222222333333333 12345678901234567890123456789012345678	E O F	LOC
*0:11:45	71	1731	235	11111110111111111111111111111111111111	0	60
0:11:50	71	1731	243	11111111111111111111111111111111111111	0	61
*0:12:00	70	1731	250	11111111111111111111111111111111111111	0	62
*0:12:15	70	1731	258	11111111111111111111111111111111111111	0	63
*0:12:30	70	1731	265	11111111111111111111111111111111111111	0	64
*0:12:45	70	1731	258	11111111111111111111111111111111111111	0	65
*0:13:00	77	1731	250	11111111111111111111111111111111111111	0	66
*0:13:15	80	1731	243	11111111111111111111111111111111111111	0	67
*0:13:30	80	1731	235	11111111111111111111111111111111111111	0	68
*0:13:45	104	1731	235	11111111111111111111111111111111111111	0	69
0:13:50	116	1731	235	11111110111111111111111111111111111111	0	70
*0:14:00	140	1491	235	11111110111111111111111111111111111111	0	71
*0:14:15	142	1371	243	11111110111111111111111111111111111111	0	72
*0:14:30	142	1371	258	11111110111111111111111111111111111111	0	73
*0:14:45	172	1371	258	11111110111111111111111111111111111111	0	74
0:14:52	168	1371	258	11101110111111111111111111111111111111	0	75
0:14:56	167	1253	250	11101111111111111111111111111111111111	0	76
*0:15:00	167	1253	243	11101111111111111111111111111111111111	0	77
*0:15:15	167	898	209	11101111111111111111111111111111111111	0	78
*0:15:30	170	664	199	11101111111111111111111111111111111111	0	79
*0:15:45	168	315	189	11101111111111111111111111111111111111	0	80
*0:16:00	170	85	189	11101111111111111111111111111111111111	0	81
0:16:12	167	-144	218	11111111111111111111111111111111111111	0	82
*0:16:15	168	-144	226	11111111111111111111111111111111111111	0	83
*0:16:30	167	-144	298	11111111111111111111111111111111111111	0	84
*0:16:45	168	547	316	11111111111111111111111111111111111111	0	85
*0:17:00	185	1134	298	11111111111111111111111111111111111111	0	86
*0:17:15	245	1371	258	11111111111111111111111111111111111111	0	87
*0:17:30	292	1611	243	11111111111111111111111111111111111111	0	88
*0:17:45	276	1611	243	11111111111111111111111111111111111111	0	89
*0:18:00	266	1731	235	11111111111111111111111111111111111111	0	90
*0:18:15	296	1731	235	11111111111111111111111111111111111111	0	91
0:18:21	315	1731	235	11111111111111111111111111111111111111	0	92
*0:18:30	339	1731	235	11111111111111111111111111111111111111	0	93
*0:18:45	342	1731	250	11111111111111111111111111111111111111	0	94
*0:19:00	342	1731	265	11111111111111111111111111111111111111	0	95
*0:19:15	342	1731	265	11111111111111111111111111111111111111	0	96
*0:19:30	342	1731	265	11111111111111111111111111111111111111	0	97
*0:19:45	342	1731	258	11111111111111111111111111111111111111	0	98
*0:20:00	342	1731	243	11111111111111111111111111111111111111	0	99
*0:20:15	342	1731	243	11111111111111111111111111111111111111	0	100
*0:20:30	342	1731	235	11111111111111111111111111111111111111	0	101
*0:20:45	5	1731	258	11111111111111111111111111111111111111	0	102
*0:21:00	43	1731	265	11111111111111111111111111111111111111	0	103
*0:21:15	80	1731	265	11111111111111111111111111111111111111	0	104

TRUE PRESSURE AIR 38 DATA BITS E LOC

TIME	HEADING	ALTITUDE	SPEED		O
				11111111112222222222333333333	F
	<DEG>	<FEET>	<KCAS>	12345678901234567890123456789012345678	
*0:21:30	81	1731	265	1111111111111111111111111111111111111111	0 105
*0:21:45	95	1731	265	1111111111111111111111111111111111111111	0 106
*0:22:00	136	1731	250	1111111111111111111111111111111111111111	0 107
*0:22:15	142	1731	243	1111111111111111111111111111111111111111	0 108
0:22:28	142	1731	243	1111111011111111111111111111111111111111	0 109
*0:22:30	147	1731	243	1111111011111111111111111111111111111111	0 110
0:22:37	171	1731	243	1110111011111111111111111111111111111111	0 111
0:22:38	170	1731	243	1110111011111111111111111111111111111111	0 112
*0:22:45	171	1611	235	1110111011111111111111111111111111111111	0 113
*0:23:00	174	1371	218	1110111011111111111111111111111111111111	0 114
*0:23:15	168	1016	209	1110111011111111111111111111111111111111	0 115
*0:23:30	168	547	199	1110111011111111111111111111111111111111	0 116
*0:23:45	168	315	189	1110111011111111111111111111111111111111	0 117
0:23:58	167	85	226	1111111011111111111111111111111111111111	0 118
*0:24:00	167	85	235	1111111011111111111111111111111111111111	0 119
0:24:00	167	85	235	1111111111111111111111111111111111111111	0 120
*0:24:15	167	-144	321	1111111111111111111111111111111111111111	0 121
*0:24:30	178	85	382	1111111111111111111111111111111111111111	0 122
*0:24:45	313	2833	265	1111111111111111111111111111111111111111	0 123
*0:25:00	349	3716	285	1111111111111111111111111111111111111111	0 124
*0:25:15	67	5286	265	1111111111111111111111111111111111111111	0 125
*0:25:30	157	5019	285	1111111111111111111111111111111111111111	0 126
0:25:42	252	3844	250	1111011111111111111111111111111111111111	0 127
*0:25:45	270	3461	250	1111011111111111111111111111111111111111	0 128
*0:26:00	344	1491	250	1111011111111111111111111111111111111111	0 129
*0:26:15	47	1016	258	1111011111111111111111111111111111111111	0 130
*0:26:30	168	898	285	1111011111111111111111111111111111111111	0 131
*0:26:45	172	85	395	1111011111111111111111111111111111111111	0 132
*0:27:00	171	200	447	1111011111111111111111111111111111111111	0 133
*0:27:15	228	5690	343	1111011111111111111111111111111111111111	0 134
*0:27:30	234	5826	368	1111011111111111111111111111111111111111	0 135
*0:27:45	233	5826	373	1111011111111111111111111111111111111111	0 136
0:27:52	233	5826	358	1111011111111111111111111111111111111111	0 137
*0:28:00	233	5826	338	1111011111111111111111111111111111111111	0 138
*0:28:15	233	5826	298	1111011111111111111111111111111111111111	0 139
*0:28:30	233	5826	250	1111011111111111111111111111111111111111	0 140
*0:28:45	231	5826	226	1111011111111111111111111111111111111111	0 141
*0:29:00	233	5690	235	1111011111111111111111111111111111111111	0 142
*0:29:15	231	5826	226	1111011111111111111111111111111111111111	0 143
*0:29:30	233	5826	226	1111011111111111111111111111111111111111	0 144
*0:29:45	233	5826	226	1111011111111111111111111111111111111111	0 145
*0:30:00	231	5826	235	1111011111111111111111111111111111111111	0 146
*0:30:15	233	5826	258	1111011111111111111111111111111111111111	0 147
*0:30:30	233	5826	272	1111011111111111111111111111111111111111	0 148
*0:30:45	233	5826	279	1111011111111111111111111111111111111111	0 149
				11111111112222222222333333333	
	<DEG>	<FEET>	<KCAS>	12345678901234567890123456789012345678	

TIME	TRUE HEADING	PRESSURE ALTITUDE	AIR SPEED	38 DATA BITS	E O	LOC

				11111111112222222222333333333 F
	<DEG>	<FEET>	<KCAS>	12345678901234567890123456789012345678
*0:31:00	233	5826	292	11110111111111111111111111111111111111 0 150
*0:31:15	233	5826	292	11110111111111111111111111111111111111 0 151
*0:31:30	233	5826	285	11110111111111111111111111111111111111 0 152
*0:31:45	233	5826	272	11110111111111111111111111111111111111 0 153
*0:32:00	233	5826	265	11110111111111111111111111111111111111 0 154
*0:32:15	233	5826	258	11110111111111111111111111111111111111 0 155
*0:32:30	233	5826	250	11110111111111111111111111111111111111 0 156
*0:32:45	233	5826	243	11110111111111111111111111111111111111 0 157
*0:33:00	233	5826	243	11110111111111111111111111111111111111 0 158
*0:33:15	233	5826	235	11110111111111111111111111111111111111 0 159
*0:33:30	251	5826	243	11110111111111111111111111111111111111 0 160
*0:33:45	251	5826	243	11110111111111111111111111111111111111 0 161
*0:34:00	251	5826	243	11110111111111111111111111111111111111 0 162
*0:34:15	251	5826	250	11110111111111111111111111111111111111 0 163
*0:34:30	251	5826	258	11110111111111111111111111111111111111 0 164
*0:34:45	251	5826	265	11110111111111111111111111111111111111 0 165
*0:35:00	252	5826	272	11110111111111111111111111111111111111 0 166
0:35:13	251	5826	265	11110110111111111111111111111111111111 0 167
0:35:15	251	5826	265	11110110111111111111111111111111111111 0 168
*0:35:15	251	5826	265	11110110111111111111111111111111111111 0 169
0:35:16	251	5826	265	11110110111111111111111111111111111111 0 170
0:35:26	252	5420	265	11110111111111111111111111111111111111 0 171
*0:35:30	252	5286	265	11110111111111111111111111111111111111 0 172
*0:35:45	252	4622	250	11110111111111111111111111111111111111 0 173
*0:36:00	252	3972	243	11110111111111111111111111111111111111 0 174
*0:36:15	252	3334	243	11110111111111111111111111111111111111 0 175
*0:36:30	251	2585	235	11110111111111111111111111111111111111 0 176
*0:36:45	251	1973	235	11110111111111111111111111111111111111 0 177
0:36:54	251	1491	226	11110110111111111111111111111111111111 0 178
*0:37:00	251	1371	250	11110110111111111111111111111111111111 0 179
0:37:02	251	1371	250	11110110111111111111111111111111111111 0 180
0:37:03	251	1371	250	11110110111111111111111111111111111111 0 181
0:37:06	251	1371	250	11110111111111111111111111111111111111 0 182
*0:37:15	251	1371	258	11110111111111111111111111111111111111 0 183
*0:37:30	251	1371	258	11110111111111111111111111111111111111 0 184
*0:37:45	252	1371	258	11110111111111111111111111111111111111 0 185
*0:38:00	252	1371	250	11110111111111111111111111111111111111 0 186
0:38:04	252	1371	250	11110110111111111111111111111111111111 0 187
0:38:12	251	1371	250	11110111111111111111111111111111111111 0 188
*0:38:15	252	1371	258	11110111111111111111111111111111111111 0 189
*0:38:30	251	1371	258	11110111111111111111111111111111111111 0 190
*0:38:45	252	1371	250	11110111111111111111111111111111111111 0 191
*0:39:00	251	1371	250	11110111111111111111111111111111111111 0 192
*0:39:15	252	1371	243	11110111111111111111111111111111111111 0 193
*0:39:30	252	1371	243	11110111111111111111111111111111111111 0 194

				11111111112222222222333333333
	<DEG>	<FEET>	<KCAS>	12345678901234567890123456789012345678

	TRUE	PRESSURE	AIR	38 DATA BITS	E	LOC
TIME	HEADING	ALTITUDE	SPEED		O	
				11111111112222222222333333333 F		

	<DEG>	<FEET>	<KCAS>	123456789012345678901234567890123456		
*0:39:45	252	1371	235	1111011111111111111111111111111111111111	0	195
*0:40:00	251	1371	243	1111011111111111111111111111111111111111	0	196
*0:40:15	252	1371	243	1111011111111111111111111111111111111111	0	197
*0:40:30	218	1253	243	1111011111111111111111111111111111111111	0	198
0:40:38	196	1253	235	1111011111111111111111111111111111111111	0	199
0:40:39	196	1371	235	1111011011111111111111111111111111111111	0	200
0:40:40	196	1253	235	1111011111111111111111111111111111111111	0	201
*0:40:45	196	1253	218	1111011111111111111111111111111111111111	0	202
0:40:46	0	1253	209	1111011111111111111111111111111111111111	0	203
*0:41:00	0	1016	179	1111011111111111111111111111111111111111	0	204
*0:41:15	0	664	189	1111011111111111111111111111111111111111	0	205
*0:41:30	0	547	189	1111011111111111111111111111111111111111	0	206
*0:41:45	0	431	189	1111011111111111111111111111111111111111	0	207
*0:42:00	0	431	179	1111011111111111111111111111111111111111	0	208
*0:42:15	0	431	167	1111011111111111111111111111111111111111	0	209
*0:42:30	0	431	167	1111011111111111111111111111111111111111	0	210
*0:42:45	0	315	155	1111011111111111111111111111111111111111	0	211

				11111111112222222222333333333
	<DEG>	<FEET>	<KCAS>	123456789012345678901234567890123456

SYSTEM STATUS DISCRETE DATA SHEET

BELOW ARE THE BIT ASSIGNMENTS FOR THE MANCHESTER DATA WORD

1	RESET	33	ROLL WINGS LEVEL
2	WOW MLG	34	OBSTACLE WARNING
3	COMPUTER FAIL MFL	35	PULLUP WARNING
4	POWER SUPPLY FAIL MFL	36	PITCH FLYUP
5	TEMP SENSOR FAIL MFL	37	SWIM FLYUP
6	DFLCC HOT MFL	38	ATTD ESTIMATOR FAIL MFL
7	FWD STICK FAIL MFL	39	NAV POD DATA BAD MFL
8	AFT STICK FAIL MFL	40	AMUX WRAPAROUND FAIL MFL
9	FWD RUDDER PEDAL FAIL MFL	41	SDC MONITOR FAIL MFL
10	AFT RUDDER PEDAL FAIL MFL	42	BELOW SET CLRNC FAIL MFL
11	TRIM FAIL MFL	43	CARA DATA BAD
12	ACCELEROMETER FAIL MFL	44	NVP SELF MODE FAIL MFL
13	PITCH RATE GYRO FAIL MFL	45	NVP ATA SEL MON FAIL MFL
14	ROLL RATE GYRO FAIL MFL	46	CYCLIC TEST MON FAIL MFL
15	YAW RATE GYRO FAIL MFL	47	GPS/INS MON FAIL MFL
16	AOS FAIL MFL	48	CADC PASS
17	AOA LEFT FAIL MFL	49	INU & CADC DATA GOOD
18	AOA RIGHT FAIL MFL	50	AUTOPILOT DISCONNECT
19	AOA SIDEMOUNT FAIL MFL	51	AUTOPILOT DEGRADED MFL
20	AOA DUAL FAIL MFL	52	AUTOPILOT FAIL MFL
21	AOA < 35 DEG	53	PITCH AUTOPILOT
22	STALL WARNING	54	^PITCH ATTITUDE HOLD
23	AIR DATA FAIL MFL	55	^ROLL AUTOPILOT
24	AIR DATA DUAL FAIL MFL	56	^ROLL ATTITUDE HOLD
25	INVERTED ANTI-SPIN	57	^CONSTANT HEADING
26	ADVANCED MODES	58	^AIRSPEED < 402 KCAS
27	TF DATA GOOD	59	^AUTOMATIC LEF
28	TF ALLOWED	60	^WHEEL SPINUP < 60 KNOTS
29	ATA COMMANDING	61	MUX FAIL MFL (BIT)
30	ATF NOT ENGAGED	62	INTERLOCK EXCEEDED MFL (BIT)
31	NAVPOD REQUESTING TFR MODE	63	DISCRETE FAIL MFL (BIT)
32	TF - INVERTED FLIGHT	64	AOA FAIL MFL (BIT)
EOF	END OF FLIGHT		

^ INDICATES BIT CHANGE DOES NOT CAUSE UN-TIMED RECORDING
LOGIC 1 IS THE NORMAL PILOTED <RESET> STATE AND
LOGIC 0 IS THE FAILED <SET> STATE.

```
  TIME                              64 DATA BITS                                E
                                                                                O
                    1111111111222222222233333333334444444444555555555566666 F
           12345678901234567890123456789012345678901234567890123456789012345678901234

 0:00:00.0  11111111111111111111111111111110111111111111111111111111101111 0
 0:00:02.0  11111111111111111111111111111110111111111111111111111111111111 0
 0:02:15.0  11111111111111111111111111111111111111111111111111111010111111111 0
 0:03:25.5  11111111111111111111111111111111111111111111111111111010111111111 0
 0:04:00.5  11111111111111111111111111111111111111111111111111111111111111111 0

                    1111111111222222222233333333334444444444555555555566666
           12345678901234567890123456789012345678901234567890123456789012345678901234
```



```
  TIME                              64 DATA BITS                                E
```

```
                                                                            O
                    1111111111222222222233333333334444444444555555555566666 F
           1234567890123456789012345678901234567890123456789012345678901234

0:04:48.5  1111111111111111111111111111111111111111111111111111010111111111 0
0:07:11.0  1111111111111111111111111111111111111111111111111111010111111111 0
0:07:14.0  1111111111111111111111111111111111111111111111111111111111111111 0
0:07:14.5  1111111111111111111111111111111111111111111111111111010111111111 0
0:07:19.5  1111111111111111111111111111111111111111111111111111000111111111 0
0:11:29.0  1111111111111111111111111111111111111111111111111111010111111111 0
0:11:38.0  1111111111111111111111111111111111111111111111111111111111111111 0
0:11:38.5  1111111111111111111111111111111111111111111111111111010111111111 0
0:11:50.5  1111111111111111111111111111111111111111111111111111010111111111 0
0:13:50.5  1111111111111111111111111111111111111111111111111111010111111111 0
0:14:52.5  1111111111111111111111111111111111111111111111111111111111111111 0
0:14:56.0  1111111111111111111111111111111111111111111111111111111111111111 0
0:16:12.5  1111111111111111111111111111111111111111111111111111111111111111 0
0:18:21.5  1111111111111111111111111111111111111111111111111111010111111111 0
0:22:28.5  1111111111111111111111111111111111111111111111111111010111111111 0
0:22:37.5  1111111111111111111111111111111111111111111111111111010111111111 0
0:22:38.0  1111111111111111111111111111111111111111111111111111111111111111 0
0:23:58.0  1111111111111111111111111111111111111111111111111111111111111111 0
0:24:00.5  1111111111111111111111111111111111111111111111111111111111111111 0
0:25:42.5  1111111111111111111111111111111111111111111111111111111111111111 0
0:27:52.5  1111111111111111111111111111111111111111111111111111010111111111 0
0:35:13.0  1111111111111111111111111111111111111111111111111111010111111111 0
0:35:15.0  1111111111111111111111111111111111111111111111111111111111111111 0
0:35:16.5  1111111111111111111111111111111111111111111111111111010111111111 0
0:35:26.5  1111111111111111111111111111111111111111111111111111000111111111 0
0:36:54.0  1111111111111111111111111111111111111111111111111111010111111111 0
0:37:02.5  1111111111111111111111111111111111111111111111111111111111111111 0
0:37:03.0  1111111111111111111111111111111111111111111111111111010111111111 0
0:37:06.5  1111111111111111111111111111111111111111111111111111010111111111 0
0:38:04.0  1111111111111111111111111111111111111111111111111111010111111111 0
0:38:12.5  1111111111111111111111111111111111111111111111111111010111111111 0
0:40:38.5  1111111111111111111111111111111111111111111111101111010111111111 0
0:40:39.0  1111111111111111111111111111111111110111111111110110111111111111 0
0:40:40.0  1111111111111110111111111111111111110111111111110110111111111111 0
0:40:46.5  1111111111111110111111111111111111110111111111111110111111111111 0

                    1111111111222222222233333333334444444444555555555566666
           1234567890123456789012345678901234567890123456789012345678901234
```

SPECIFIC PARAMETERS GROUP ONE

TIME	TRUE HDG <DEG>	AIR SPEED <KCAS>	PSEUDO RADAR ALT <FT>	PRESS ALT <FT>	PITCH ATT <DEG>	ROLL ATT <DEG>	ANGLE OF ATTACK <DEG>
0:00:00.0	214	179	0	-29	7.0	-1.4	7.11
0:00:02.0	214	199	0	-29	9.8	-1.4	9.85
0:02:15.0	101	363	0	9730	4.2	0.0	3.83
0:03:25.5	102	316	0	9730	4.2	-1.4	4.92
0:04:00.5	101	304	0	11467	12.7	0.0	5.47
0:04:48.5	102	304	0	14535	4.2	0.0	4.92
0:07:11.0	102	265	0	14715	7.0	-1.4	7.11
0:07:14.0	102	265	0	14535	2.8	-1.4	4.92
0:07:14.5	102	265	0	14535	1.4	-1.4	4.38
0:07:19.5	102	272	0	14357	1.4	-1.4	6.56
0:11:29.0	70	250	0	1852	1.4	-1.4	8.21
0:11:38.0	71	235	0	1731	8.4	1.4	8.21
0:11:38.5	71	235	0	1731	7.0	0.0	8.21
0:11:50.5	71	243	0	1731	8.4	0.0	8.21
0:13:50.5	116	235	0	1731	8.4	26.7	10.94
0:14:52.5	168	258	0	1371	4.2	-7.0	7.11
0:14:56.0	167	250	0	1253	1.4	-5.6	5.47
0:16:12.5	167	218	0	-144	8.4	-1.4	9.30
0:18:21.5	315	235	0	1731	8.4	32.3	10.94
0:22:28.5	142	243	0	1731	7.0	-1.4	8.21
0:22:37.5	171	243	0	1731	5.6	29.5	8.21
0:22:38.0	170	243	0	1731	5.6	22.5	8.21
0:23:58.0	167	226	0	85	4.2	-1.4	7.66
0:24:00.5	167	235	0	85	4.2	1.4	7.11
0:25:42.5	252	250	0	3844	-11.3	61.9	14.22
0:27:52.5	233	358	0	5826	2.8	-2.8	3.83
0:35:13.0	251	265	0	5826	5.6	-1.4	6.56
0:35:15.0	251	265	0	5826	2.8	-1.4	4.92
0:35:16.5	251	265	0	5826	1.4	0.0	4.92
0:35:26.5	252	265	0	5420	1.4	0.0	7.11
0:36:54.0	251	226	0	1491	1.4	-2.8	8.75
0:37:02.5	251	250	0	1371	8.4	0.0	9.30
0:37:03.0	251	250	0	1371	8.4	-1.4	8.21
0:37:06.5	251	250	0	1371	7.0	-1.4	6.56
0:38:04.0	252	250	0	1371	7.0	-4.2	7.11
0:38:12.5	251	250	0	1371	7.0	-1.4	7.11
0:40:38.5	196	235	0	1253	7.0	-33.8	9.30
0:40:39.0	196	235	0	1371	7.0	-33.8	0.00
0:40:40.0	196	235	0	1253	7.0	-33.8	14.77
0:40:46.5	0	209	0	1253	0.0	0.0	15.86

SPECIFIC PARAMETERS GROUP TWO

	FCP STICK FORCE		NORMAL	FLAPERON		HORIZONTAL TAIL		RUDDER
TIME	PITCH	ROLL	ACCEL	LEFT	RIGHT	LEFT	RIGHT	
	<LBS>	<LBS>	<G's>	<DEG>	<DEG>	<DEG>	<DEG>	<DEG>
0:00:00.0	7.04	2.24	0.93	20.59	18.22	-2.89	-3.43	-1.02
0:00:02.0	-2.56	6.40	0.93	20.59	10.19	-1.82	-4.50	-3.32
0:02:15.0	0.00	-0.16	0.93	0.51	-0.22	-1.82	-2.18	0.00
0:03:25.5	5.12	-1.12	0.93	0.69	-0.40	-2.00	-2.18	0.00
0:04:00.5	0.32	-0.16	0.93	0.69	-0.59	-2.00	-2.36	-0.26
0:04:48.5	0.00	-0.48	0.93	-0.04	0.51	-1.82	-2.18	0.00
0:07:11.0	-1.60	0.00	0.93	0.69	-0.22	-1.82	-2.18	0.00
0:07:14.0	-5.76	-0.16	0.56	0.69	-0.40	-1.82	-2.18	-0.26
0:07:14.5	-4.48	-0.80	0.56	0.69	-0.22	-1.82	-2.18	0.00
0:07:19.5	0.00	-0.32	0.93	0.51	-0.04	-1.82	-2.18	0.00
0:11:29.0	3.52	0.32	0.93	0.69	-0.22	-1.82	-2.18	-0.26
0:11:38.0	2.24	0.16	0.84	0.69	-0.22	-1.82	-2.18	-0.26
0:11:38.5	5.12	-0.32	0.84	0.69	-0.59	-1.82	-2.36	-0.26
0:11:50.5	0.32	0.32	0.84	-0.77	1.24	-2.18	-2.18	0.26
0:13:50.5	-3.20	1.92	1.12	0.87	-0.40	-1.29	-2.00	-0.26
0:14:52.5	-5.76	-1.12	0.93	2.33	1.60	-1.64	-2.18	-0.26
0:14:56.0	-0.64	0.80	1.02	19.13	17.13	-1.11	-2.00	0.51
0:16:12.5	-2.56	3.84	1.12	20.41	13.47	-0.22	-2.18	-1.02
0:18:21.5	0.96	0.16	1.12	0.69	-0.40	-1.46	-2.18	-0.51
0:22:28.5	1.60	10.08	0.93	6.72	-5.88	-0.39	-3.78	-2.30
0:22:37.5	-4.80	-6.08	0.93	-1.87	2.52	-2.36	-1.82	1.02
0:22:38.0	-2.56	-3.36	1.02	3.25	1.60	-1.82	-2.18	-0.26
0:23:58.0	1.92	1.92	1.02	20.41	16.03	-1.82	-2.54	-0.26
0:24:00.5	0.96	-2.88	0.84	7.26	6.35	-2.54	-3.07	-0.26
0:25:42.5	8.64	0.00	1.67	1.24	-0.77	0.68	-0.22	-0.26
0:27:52.5	0.00	1.12	0.93	0.51	-0.22	-1.82	-2.18	0.00
0:35:13.0	-7.04	0.32	0.93	0.51	-0.22	-1.11	-1.64	0.00
0:35:15.0	-5.12	1.44	0.65	0.69	-0.40	-1.82	-2.18	-0.26
0:35:16.5	-3.20	0.48	0.65	0.69	-0.22	-1.82	-2.18	0.00
0:35:26.5	0.00	0.32	1.02	-0.40	0.69	-1.82	-2.00	0.26
0:36:54.0	2.24	0.16	0.93	0.69	-0.22	-1.46	-2.00	-0.26
0:37:02.5	-0.32	1.76	1.21	0.87	-0.40	-0.22	-1.11	-0.26
0:37:03.0	-4.80	4.16	1.02	2.15	-1.50	-1.11	-2.18	-0.51
0:37:06.5	1.28	1.12	0.84	0.87	-0.59	-1.64	-2.18	0.00
0:38:04.0	1.92	0.32	0.93	0.51	-0.22	-1.64	-2.00	0.00
0:38:12.5	0.32	0.80	0.93	0.51	-0.22	-1.82	-2.18	0.00
0:40:38.5	-10.24	-1.92	2.88	1.42	-0.95	0.32	-0.75	-0.51
0:40:39.0	26.56	5.44	0.00	3.25	-2.60	-18.59	-19.66	1.53
0:40:40.0	-20.16	-0.96	1.67	-0.59	1.06	19.23	20.30	-2.04
0:40:46.5	23.36	-4.48	1.58	-0.95	1.42	1.03	1.21	1.79

96-0085 (CC-207) #01 (SDR) Sorted, Shaw AFB A/C, Class A — 7 July 2015

LOC Flight Profile	Time	FLIGHT PROFILE						SYSTEM STATUS										COMMENTS
		True Heading	Pressure Altitude	Air Speed	LANDING GEAR HANDLE DOWN	CAT III STORES	PADDLE SWITCH FWD	AOS FAIL MFL	OBSTACLE WARNING	SWIM FLYUP	CADC PASS	INU & CADC DATA GOOD	AUTOPILOT FAIL MFL	PITCH AUTOPILOT	PITCH ATTITUDE HOLD	ROLL AUTOPILOT	WHEEL SPIN UP >60KTS	● Discrete was set during indicated time frame ○
	(H:MM:SS.D)	DEG	FEET	KCAS	4	5	8	16	34	37	48	49	52	53	54	55	60	
1	0:00:00.0	214	-29	179	●				●								●	Take off (weight off wheels), Wheelspeed >60 knots. Obstacle Warning Bit set at power up (normal).
2	0:00:02.0	214	-29	199					●									Landing gear handle is raised, Wheelspeed <60 knots.
3-10	*0:00:15 thru *0:02:00	-	200 to 9,121	-					●									15 second scheduled recordings of airspeed, altitude and heading, showing ascent through 9,121 feet.
11-16	0:02:15.0 thru *0:03:15	101	9,730	363 to 327										●		●		Obstacle Warning Bit cleared due to the engagement of autopilot. Pitch Autopilot (SS-53) set without Pitch Attitude Hold (SS-54) set indicates Pitch Altitude Hold selected. Roll Autopilot set without Roll Attitude Hold indicates Heading Select mode was selected. Five 15 second timed recordings.
17-20	0:03:25.5 thru *0:04:00	102 to 101	9,730 to 11,467	-			●							●		●		Paddle Switch depressed and overrode autopilot. 15 second timed recordings show normal flight activity with no failures.
21-74	0:04:00.5 thru *0:14:45	-	-	-			○							○	○	○		Paddle Switch is toggled multiple times and autopilot is turned off and on multiple times.
75	0:14:52.5	168	1,371	258	●		●											Paddle Switch remains depressed, landing gear handle is lowered and the autopilot is turned off.
76-81	0:14:56.0 thru *0:16:00	-	1,253 to 85	250 to 189	●													Paddle Switch is released followed by 15 second timed recordings of routine flight with the landing gear handle down.
82-108	0:16:12.5 thru *0:22:15	-	-144 to 1,731	-										○		○		Landing gear handle is raised (0:16:12) at a pressure altitude of -144 feet and 218 KCAS. Autopilot is turned on at 0:18:21. Aircraft ascended to a pressure altitude of 1,731 feet.
109-117	0:22:28.5 thru *0:23:45	-	1,731 to 315	243 to 189			●							○		○		Paddle Switch was depressed (0:22:28), landing gear handle was lowered (0:22:37), autopilot turned off (0:22:38) and 15 second timed recordings.
118-120	0:23:58.0 thru 0:24:00.5	167	85	226 to 235	○		○											Landing gear handle was raised (0:23:58.0) at a pressure altitude of 85 feet followed by a 15 second interval timed recording. Paddle switch was released (0:24:00.5).
121-125	*0:24:15 thru *0:25:15	-	85 to 5,286	-														15 second timed recordings, aircraft climbed to 5,286 feet.
126-132	*0:25:30 thru *0:26:45	-	5,019 to 85	-		○								○		○		Category III Stores was selected (0:25:42.5). 15 second timed recordings as aircraft descended to 85 feet.
133-198	*0:27:00 thru *0:40:30	-	-	-		●	○							○	○	○		Paddle Switch was toggled multilple times and autopilot was turned on and off multiple times. 15 second timed recordings of routine flight without any faults.

96-0085 (CC-207) #01 (SDR) Sorted, Shaw AFB A/C, Class A — 7 July 2015

LOC Flight Profile	Time	FLIGHT PROFILE						SYSTEM STATUS										COMMENTS
		True Heading	Pressure Altitude	Air Speed	LANDING GEAR HANDLE DOWN	CAT III STORES	PADDLE SWITCH FWD	AOS FAIL MFL	OBSTACLE WARNING	SWIM FLYUP	CADC PASS	INU & CADC DATA GOOD	AUTOPILOT FAIL MFL	PITCH AUTOPILOT	PITCH ATTITUDE HOLD	ROLL AUTOPILOT	WHEEL SPIN UP >60KTS	● Discrete was set during indicated time frame ○
	(H:MM:SS.D)	DEG	FEET	KCAS	4	5	8	16	34	37	48	49	52	53	54	55	60	
199	0:40:38.5	196	1,253	235		●					●			●		●		CADC pass bit sets. This is an indication of a loss of 115VAC power to the CADC. First failure indication of the flight. Autopilot was on at this time.
200	0:40:39.0	196	1,371	235		●	●			●		●	●					Paddle Switch was depressed. The INU & CADC Data Good bit set due to a DFLCC 1553 data validity/stale monitor of CADC and Embedded GPS/INS (EGI) information. This set the Autopilot Fail MFL (SS-52) (turning off the autopilot) and the SWIM Flyup (SS-37). The CADC Pass bit cleared indicating 115VAC was restored.
201	0:40:40.0	196	1,253	235		●		●		●		●	●					Paddle Switch released. The Angle Of Sideslip (AOS) monitor set which was caused from a loss of valid EGI information.
202	*0:40:45	196	1,253	218		●		●		●		●	●					15 second timed recording and showed a constant (stale) True Heading of 196 degrees.
203	0:40:46.5	0	1,253	209		●		●		●			●					INU & CADC Data Good bit cleared indicating the EGI was reporting via 1553 that its MUX information was valid. The recorded value of True Heading, Pitch and Roll Attitudes became all zeros and indicates the EGI did not recover from the momentary power loss.
204-211	*0:41:00 thru *0:42:45	0	1,016 to 315	-		●		●		●			●					15 second timed timed recordings. The aircraft descended from a pressure altitude of 1,016 feet to the final recorded value of 315 feet. Airspeed peaked at 189 KCAS and then decreased to a final recorded value of 155 KCAS. True Heading remained 0 degrees. Crew ejection occurred between *0:42:45 and *0:43:00.