

#### 4.0 FLIGHT TEST OPERATION

Data were gathered in 45 flights totaling 131.2 hours. Four of these flights were devoted to ground controls testing and equipment calibrations, and another flight was devoted to thrust stand measurements at Edwards Air Force Base (EAFB). Also included in the 45 flights were the initial checkout flight, ground aborts due to aircraft malfunctions, and ferry flights between Wright Patterson Air Force Base (WPAFB), Edwards Air Force Base (EAFB), and Altus Air Force Base (AAFB). Not included in the above total is the final ferry flight from AAFB to WPAFB for decommissioning. The final ferry flight took 2.0 hours bringing the total flight time used for the test project to 133.2 hours. KSR was responsible for all data acquisition and analysis. The test airplane was provided by USAF MAC and was of standard production configuration. Controls rigging was checked prior to delivery by USAF personnel at Norton AFB, CA.

A summary of the total flight test program is given in Table 4.0.1. The airplane was delivered 14 Nov 1989. Data system installation and calibration were completed in four weeks. During the period for instrumentation, both a Technical Review Board (TRB) and Safety Review Board (SRB) were held. The TRB Table Top Discussion was held on 17 Nov 89 and the SRB was held on 07 Dec 89. Upon completion of the instrumentation, a Physical Configuration Inspection (PCI) was conducted by Air Force Personnel. Airspeed and alpha calibration, and the remainder of the program were completed in seven and one-half weeks. This period included a week of special testing at EAFB including thrust stand calibrations, weight and balance, and airspeed/alpha calibrations. A Post Flight Review was held the week of 19 Feb 1990. Post-program calibrations were also performed during that week.

Additional flying was conducted during the period between 23 Feb 90 and 27 Feb 90. The aircraft was then ferried back to WPAFB, Ohio, on 27 Feb 90 and decommissioned. A final PCI was conducted by Air Force personnel and the Functional Check Flight (FCF) completed 14 March 1990. The aircraft was returned to Norton Air Force Base, CA, and normal flying status on 15 March 1990.

Thirteen days during the program were lost due to weather. Crew rest accounted for another three days. Additional delays due to aircraft and/or KSR instrumentation malfunctions, accounted for the total or partial loss of another eight days.

A typical flight began with a ground transducer check. Every parameter was checked for operation and its value hand recorded. The flight test engineer and program manager briefed the pilots on the maneuvers to be flown. Before takeoff, preflight runs were recorded on the DAS which included a zero run, controls sweeps, and an engine run. A "zero" data run was recorded with the airplane static, engines not running, pitot and static ports covered and the controls locked in position. Controls sweeps consisted of six data runs. Each data run consisted of one controls extreme (i.e. tab operable full right roll or tabs normal climbing right turn with full right rudder). An engine run-up to 90%  $N_1$  was use to check engine parameters. At this time the cockpit engine indications were hand recorded. After the flight these steps were repeated in reverse order. The values from the "zero" runs were used to correct bias errors in some parameters, such as angular rates, air data, and forces.

**TABLE 4.0.1 USAF C-141B Flight Program Summary**

DATE (1989-90)	FLT. NO.	FLT. TIME	PURPOSE					REMARKS
			TG	S&C	PERF	TOLGE	MISC	
20 Dec	1	1.0						Skakedown flight
21 Dec	2	---						Ground Abort
05 Jan	3	3.8	0.5				3.3	Takeoff, landing, stalls, airspeed calibrations
07 Jan	4	4.9	1.7					Ferry to EAFB
09 Jan	5	---						Thrust stand
11 Jan	6	1.6					1.6	Airspeed calibration trailing cone & pace
12 Jan	7	4.3	2.3				2.0	Airspeed calibrations
13 Jan	8	4.1	3.5					Ferry to AAFB
17 Jan	9	3.8			3.8			
17 Jan	10	2.6			2.6			
---	11	---						
21 Jan	12	3.8	3.8					
22 Jan	13	1.0		1.0				In flight abort
23 Jan	14	---						Ground abort
24 Jan	15	2.3		2.3				
25 Jan	16	2.9		2.9				
26 Jan	17	5.7	.2	5.5				
27 Jan	18	4.5		4.5				
28 Jan	19	3.7				3.7		
29 Jan	20	5.0		5.0				
30 Jan	21	2.6		2.6				
31 Jan	22	2.0		2.0				
31 Jan	23	4.6		4.6				
06 Feb	24	3.9	3.9					
07 Feb	25	4.1	4.1					
07 Feb	26	---						Ground
08 Feb	27	6.0	5.2		.8			
---	28	---						Ground

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DATE (1989-90)	FLT. NO.	FLT. TIME	PURPOSE					REMARKS	
			TG	S&C	PERF	TOLGE	MISC		
---	29	---						Ground	
10 Feb	30	1.9				1.9			
10 Feb	31	5.9	4.9		1.0				
11 Feb	32	6.5	5.8		.7				
12 Feb	33	5.1	4.4		.7				
16 Feb	34	2.1			1.3		.8		
17 Feb	35	1.3				1.3			
17 Feb	36	5.7	5.1	.3	.3				
18 Feb	37	2.0				2.0			
18 Feb	38	2.3	.9		1.4				
23 Feb	39	1.9				1.9			
23 Feb	40	0.4	0.4						
23 Feb	40	3.1	3.1						
24 Feb	41	1.3				1.3			
24 Feb	41	3.3	3.3						
24 Feb	42	4.6	4.6						
25 Feb	43	2.7		1.8			.9		
26 Feb	44	2.9	1.9	1.0					
	45	---							
27 Feb	Ferry	2.0							
Totals		133.2	59.6	31.5	12.6	14.1	8.6		

Notes:      TG            = Test Guide (Includes ATG)  
               S&C           = Stability and Control  
               PERF        = Performance  
               TOLGE      = Take-off, Landing and Ground Effect  
               MISC        = Miscellaneous