

FLIGHT TEST OPERATION

3.1 FLIGHT PROGRAM SUMMARY

Data was gathered for the C-141B and KC-135R combination on 22 refueling flights, 3 C-141B free air flights, and 3 KC-135R free air flights. Also, some C-141B free air data was collected on flights 20, 31, and 34, which were related to flight testing with another Tanker.

The free air flights were needed to collect baseline data at the aerial refueling flight conditions. The total number of data collection hours was 65.6 out of 96.2 hours of total flight time for the C-141B. The total number of data collection hours was 69.0 out of 105.5 hours of total flight time for the KC-135R. This includes 21 test points, accounting for 3.5 hours of flight time, taken from a previous flight test program; the objectives of which are presented in reference 15. The difference in flight hours and data hours is due to time between flight test points and transition to and from the test area. Six C-141B flights were devoted to ground controls data collecting, equipment calibrations, engine tests, and preliminary instrumentation checks.

As mentioned, the KC-135R Tanker airplane was used for a previous flight test program.

The same instrumentation system was used for the aerial refueling effort, with a slightly

modified parameter list. The only additional instrumentation needed for aerial refueling was the RPMS system and boom instrumentation. As mentioned, some data collected during the previous KC-135R flight test program met data requirements for the Aerial Refueling flight tests with the C-141B. Specifically, flights 3, 5, 8, 10, 15, 21, 24, 26, 29, 33, 35, 36, 39, 41, 44, and 45 for the previous KC-135R tests in reference 16 contained 21 free air points that were used to satisfy data requirements for points listed in the test plan (reference 9).

On 26 March 1996, the C-141B airplane was provided to the contractor and installation of the instrumentation system began. After installation was complete, an engine run-up and functional DAS check were performed in May 1996. A shakedown flight was flown on 17 May 1996. Data collection was completed on 15 November 1996. After testing was complete and the instrumentation system was removed, the C-141B aircraft was returned to AMC on 16 December 1996.

A summary of flights for the data collection program is given in Table 3.1.1. A summary of data collection and flight time for each flight is given in Table 3.1.2. The numbers in the C-141B flight sequence skip due to canceled flights and flight numbers associated with other testing. Several data points that were specified in the Reference 9 (*Master Test Plan*), in

Appendix B, Table B-8, were not completed. The point numbers and corresponding explanations are listed in Table 3.1.3. Several data points were also deleted during the program. These points and corresponding explanations are listed in Table 3.1.4.

Some additional data points were accomplished at configurations other than those specified in the test plan. This occurred for various reasons, but the most common discrepancy was due to the Tanker being at a slightly different weight than what was outlined in the Test Plan. Specifically, Tanker Flight #64 contained run numbers nine through twelve that were recorded with the Tanker at a heavy weight condition. They were listed in the Test Plan as 8.A.1.a, 8.B.1.a, 8.B.1.a, and 8.C.1.a. Due to the weight difference, they classify as 8.A.10.a, 8.B.10.a, 8.B.10.a, and 8.C.10.a, respectively. These points were recorded at the proper weight configuration on later flights.

Table 3.1.1 KC-135R/C-141B Flight Program Summary

Date	C-141B Flt#	KC-135 Flt#	Comments
17 May 96	001		C-141B Shakedown flight.
23 May 96		060	KC-135 Shakedown flight.
29 May 96	002	061	AR Shakedown flight - No Air Data C-141B PX_STATIC inop.
7 June 96	003	062	Flight shortened due to Boom interphone cable inop.
11 June 96	004	063	Ground Heading Cal on both airplanes
12 June 96	005	064	Flight shortened due to Boom interphone cable inop.
18 June 96	007	066	KC-135/C-141B AR Data Flight - Trims and Azimuth Sweeps
27 June 96	008	067	C-141B DAS hard disk crash.
10 July 96	009	068	Radio modem overheat problem no data collected.
12 July 96	010	069	KC-135/C-141B AR Data Flight - Trims and Elevation Sweeps
17 July 96	011	070	KC-135/C-141B AR Data Flight - Trims and Longitudinal Sweeps
19 July 96	012	071	KC-135/C-141B AR Data Flight - Boom Limits, Closures, Separations
20 July 96	013	072	KC-135/C-141B AR Data Flight - Min Wt Closures, Separations
25 July 96	014	073	KC-135/C-141B AR Data Flight - Boom Sweeps, Trims, Azimuth Sweeps
26 July 96	015	074	KC-135/C-141B AR Data Flight - Sound Points, Boom Sweeps, Closures
30 July 96	016	075	KC-135/C-141B AR Flight -C-141B Eng#2 Changed Due to Comp. Stalls
1 Aug 96	017		C-141B Thrust Stand - Thrust Stand Data Not Digitally Recorded
2 Aug 96	018		C-141B Thrust Stand
13 Aug 96	019		C-141B Free Air
16 Aug 96	020		C-141B Free Air Pts After Flight With KC-10A Tanker
24 Aug 96	022		C-141B Free Air
27 Aug 96	023	076	KC-135/C-141B AR Data Flight - Closure, Separation, Emergency Sep
28 Aug 96	024	077	KC-135/C-141B AR Data Flight - Trims, Boom Limits, Bow Wave
30 Aug 96	025	078	KC-135/C-141B AR Data Flight - Trims, Turning Flight
4 Sep 96	026	079	KC-135/C-141B AR Data Flight - Boom Limits, Turns, Closures
19 Sep 96	030	082	KC-135/C-141B AR Data Flight - Flight Shortened
23 Sep 96	031		C-141B Free Air Pts After Flight With KC-10A Tanker
25 Sep 96	032	085	KC-135/C-141B AR Data Flight - Reflys, Boom Limits, Disconnects
04 Oct 96	034		C-141B Free Air Pts After Flight With KC-10A Tanker
4 Nov 96	036		C-141B Ground Statics
5 Nov 96	037	091	KC-135/C-141B AR Data Flight - High Altitude, Sound, Reflys
13 Nov 96	040	093	KC-135/C-141B AR Data Flight - Sound, Flow Field Sweeps, Reflys
15 Nov 96	041	094	KC-135/C-141B AR Data Flight - Heavy Weight Reflys, Sound
2 Apr 97		119	KC-135 Free Air
22 Aug 97		155	KC-135 Free Air

Table 3.1.1 KC-135R/C-141B Flight Program Summary

Date	C-141B Flt#	KC-135 Flt#	Comments
3 Sept 97		156	KC-135 Free Air