

3.1 FLIGHT PROGRAM SUMMARY

Data was gathered for the C-141B and KC-10A combination on 11 refueling flights, 2 C-141B free air flights, and 2 KC-10A free air flights. Also, some C-141B and KC-10A free air data was collected during 32 other flights related to other testing (20 for the KC-10A and 12 for the C-141B). The free air test points were needed to collect baseline data at the aerial refueling flight conditions. The total number of data collection hours was 50.3 out of 73.25 hours of total flight time for the C-141B. The total number of data collection hours was 43.05 out of 56.66 hours of total flight time for the KC-10A. 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-10A Tanker airplane was used for a previous flight test program (References 16 and 17). 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 free air data collected during the previous KC-10A flight test program met data requirements for

the Aerial Refueling flight tests with the C-141B. Specifically, KC-10A flights 3, 5, 6, 10, 13, 15, 17, 19, 22, 24, 26, 31, 34, 35, 45, 52, 64, 89, 100, and 113 for the previous KC-10A tests in reference 17 contained 91 free air points that were used to satisfy data requirements for points listed in the test plan (reference 10).

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 on the C-141B was completed on 15 November 1996. After AR testing was complete and the instrumentation system was removed, the C-141B aircraft was returned to AMC on 16 December 1996. The KC-10A continued testing to accomplish other flight test efforts past this date.

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 10 (*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. Volume II of this document contains data related to test points accomplished at conditions other than those described in Reference 10.

Table 3.1.1 KC-10A/C-141B Flight Program Summary

| Date | C-141B Flt# | KC-10A Flt# | Comments |
|-----------|-------------|-------------|--|
| 26 Apr 96 | --- | 003 | KC-10A Free Air Flight. 3 runs used for C-141B AR data req. |
| 29 Apr 96 | --- | 005 | KC-10A Free Air Flight. 6 Runs used for C-141B AR data req. |
| 30 Apr 96 | --- | 006 | KC-10A Free Air Flight. 3 Runs used for C-141B AR data req. |
| 8 May 96 | --- | 010 | KC-10A Free Air Flight. 1 Run used for C-141B AR data req. |
| 10 May 96 | --- | 011 | KC-10A Ground Statics |
| 13 May 96 | --- | 013 | KC-10A Free Air Flight. 2 Runs used for C-141B AR data req. |
| 17 May 96 | 001 | --- | C-141B Shakedown flight. |
| 21 May 96 | --- | 015 | KC-10A Free Air Flight. 1 Run used for C-141B AR data req. |
| 23 May 96 | --- | 017 | KC-10A Free Air Flight. 1 Run used for C-141B AR data req. |
| 29 May 96 | --- | 019 | KC-10A Free Air Flight. 3 Runs used for C-141B AR data req. |
| 29 May 96 | 003 | --- | C-141B Free Air - Data Problems |
| 12 Jun 96 | 005 | --- | C-141B 1 Free Air Pt After AR with KC-135 |
| 27 Jun 96 | 008 | --- | C-141B 3 Free Air Pts - DAS hard disk crash. |
| 2 Jul 96 | --- | 022 | KC-10A Free Air Flight. 1 Run used for C-141B AR data req. |
| 9 Jul 96 | --- | 024 | KC-10A Free Air Flight. 2 Runs used for C-141B AR data req. |
| 12 Jul 96 | 010 | --- | C-141B 1 Free Air Pt After AR with KC-135 |
| 13 Jul 96 | --- | 026 | KC-10A Free Air Flight. 1 Run used for C-141B AR data req. |
| 17 Jul 96 | 011 | --- | C-141B 1 Free Air Pt After AR with KC-135 |
| 19 Jul 96 | --- | 031 | KC-10A Free Air Flight. 2 Runs used for C-141B AR data req. |
| 19 Jul 96 | 012 | --- | C-141B 2 Free Air Pts After AR with KC-135 |
| 20 Jul 96 | 013 | --- | C-141B 13 Free Air Prs After AR with KC-135 |
| 25 Jul 96 | 014 | --- | C-141B 1 Free Air Pt After AR with KC-135 |
| 1 Aug 96 | 017 | --- | C-141B Thrust Stand - Thrust Stand Data Not Digitally Recorded |
| 2 Aug 96 | 018 | --- | C-141B Thrust Stand |
| 9 Aug 96 | --- | 034 | KC-10A Free Air Flight. 3 Runs used for C-141B AR data req. |
| 10 Aug 96 | --- | 035 | KC-10A Free Air Flight. 2 Runs used for C-141B AR data req. |
| 13 Aug 96 | 019 | --- | C-141B Free Air |
| 16 Aug 96 | 020 | 038 | KC-10A/C-141B Shakedown flight after KC-10A AR mod finished. |
| 20 Aug 96 | 021 | 040 | KC-10A/C-141B AR Data Flight |
| 24 Aug 96 | 022 | --- | C-141B Free Air |
| 26 Aug 96 | --- | 045 | KC-10A Free Air Flight. 3 Runs used for C-141B AR data req. |
| 27 Aug 96 | 023 | --- | C-141B 11 Free Air Pts After AR with KC-135 |
| 4 Sep 96 | 026 | --- | C-141B 5 Free Air Pts After AR with KC-135 |
| 7 Sep 96 | --- | 052 | KC-10A Free Air Flight. 1 Run used for C-141B AR data req. |
| 10 Sep 96 | 027 | 053 | KC-10A/C-141B AR Data Flight |

Table 3.1.1 KC-10A/C-141B Flight Program Summary

| Date | C-141B Flt# | KC-10A Flt# | Comments |
|-----------|-------------|-------------|--|
| 12 Sep 96 | 028 | 055 | KC-10A/C-141B AR Data Flight |
| 17 Sep 96 | 029 | 058 | KC-10A/C-141B AR Data Flight |
| 23 Sep 96 | 031 | 061 | KC-10A/C-141B AR Data Flight |
| 26 Sep 96 | --- | 064 | KC-10A Free Air Flight. 4 Runs used for C-141B AR data req. |
| 2 Oct 96 | 033 | 067 | KC-10A/C-141B AR Data Flight - C-141B Control Wheel Problem |
| 4 Oct 96 | 034 | 068 | KC-10A/C-141B AR Data Flight |
| 31 Oct 96 | 035 | 075 | KC-10A/C-141B AR Data Flight |
| 4 Nov 96 | 036 | --- | C-141B Ground Statics |
| 5 Nov 96 | 037 | --- | C-141B 6 Free Air pts After AR with KC-135 |
| 6 Nov 96 | 038 | 080 | KC-10A/C-141B AR Data Flight |
| 7 Nov 96 | 039 | 081 | KC-10A/C-141B AR Data Flight |
| 13 Nov 96 | 040 | --- | C-141B 13 Free Air Pts After AR with KC-135 |
| 15 Nov 96 | 041 | --- | C-141B 5 Free Air Pts After AR with KC-135 |
| 3 Dec 96 | --- | 089 | KC-10A Free Air Flight. 3 Runs used for C-141B AR data req. |
| 7 Mar 97 | --- | 100 | KC-10A Free Air Flight. 52 Runs used for C-141B AR data req. |
| 22 Aug 97 | --- | 113 | KC-10A Free Air Flight. 1 Run used for C-141B AR data req. |