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XC-142A,

VTOL TRANSPORT PROGRAM.

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INTRODUCTION

This report has been prepared in accordance with the requirements of Item 7 of the Contract Number AF33(657)-7868 and is the fifty-seventh in a series of monthly reports covering activity on the XC-142A VTOL Transport Aircraft Program.

This report is devoted specifically to a summary of progress for the month of September 1966.

SUMMARY

Two flights were conducted on No. 1 aircraft early in September, accomplishing hover and stability and control work. The aircraft was then placed in a layup status for the remainder of the month for a mandatory inspection of various components after having acquired an additional 12 1/2 hours of flight time and to incorporate a modification to the right hand main IGC's as a result of an idler gear failure in the No. 2 aircraft. At the end of the month, the No. 1 aircraft had accumulated a total of 120 flights and 96:01 flight time.

The No. 2 aircraft accomplished three flights during the month which included functional checkout, stability and control work and pilot familiarization. During pre-flight runs on this aircraft on 7 September, an idler gear in the No. 3 position integral gearcase failed as the result of inadequate support of an aluminum pin which serves as an axle for the idler gear. The resultant field rework of the right hand IGC's prevented further flights on XC-142A aircraft until 29 September. At the end of September, this aircraft had accumulated a total of 69 flights and 50:46 flight time. The No. 3 aircraft fuselage remained at the Contractor's facility during the month in a dormant status.

Following a layup period for a 75 flight hour inspection, the No. 4 aircraft was in pre-flight status at the beginning of September; however, as the result of the corrective action necessary to the right hand IGC's, this aircraft did not achieve flight status during the month. Consequently, the status remained at 76 flights and 71:29 flight time. Two flights were conducted on the No. 5 aircraft at the end of the month, which included functional checkout and pilot familiarization. These flights brought the totals at the end of the reporting period to 37 flights and 28:25 flight time.

Flight status of the five XC-142A aircraft at the end of September 1966
was as follows:

	<u>Flights</u>	<u>Flight Time</u>
Category I Tests	244	169:27
Category II Tests	<u>122</u>	<u>124:32</u>
TOTAL	366	293:59

ITEM 1.A DEVELOPMENT OF KC-142A AND FABRICATION OF FIVE PROTOTYPE MODELS
(Completed)

ITEM 1.B FABRICATION OF STATIC TEST ARTICLE (Completed)

ITEM 2 FABRICATION OF MOCKUP (Completed)

ITEM 3 GROUND TEST PROGRAM

3.1 STRUCTURAL TESTS (Completed)

3.2 TRANSMISSION SYSTEM TESTS (Completed)

3.3 SYSTEM TESTS - Status of system tests the same as last month. All component and system tests are complete with the exception of the wing incidence screw-jack actuator qualification tests, heat and ventilating system, and rain removal system tests. Tests of the wing incidence actuator are expected to be complete in December. Tests of the heat and vent and rain removal are planned to be conducted utilizing No. 1 airplane following return of the airplane to the Contractor in October 1966.

ITEM 4 ENGINEERING DATA

During September the Engineering effort continued to be devoted to support of the flight test program involving airplanes 1, 2, 4, and 5. Work continued to be centered around design changes to correct discrepancies uncovered during flight testing. Data concerning changes were forwarded to ASD for review

and disposition and to WRAMA for assignment of TCIC numbers. Two retrofit changes were established and approved during September. The most significant of these was TCIC 659 which provides for modification of the idler gear support in the propeller gear reduction assembly, P/W 582833 and 582834. The change stemmed from an idler gear failure which occurred in the No. 3 position main IGC (Serial No. 222942) during ground runs of the No. 2 aircraft on 7 September. An investigation revealed that support of the idler gear was inadequate resulting in mis-alignment of the gear and eventual gear failure. The change was incorporated in all aircraft on an expedited basis.

The second change covered modification of the pitch trim actuator which consists of replacing the existing emergency trim motor with one which incorporates an electrically operated brake. The change was in response to an AFFTC UR.

Design work was undertaken to incorporate rescue hoisting provisions in the No. 1 aircraft in preparation for simulated rescue tests over water to be conducted in October. Provisions will be incorporated for hoisting from the lower forward escape hatch and from the tail gate.

ITEM 5 DESIGN DATA

STATUS OF DESIGN DATA

Status of design data at the close of the reporting period was as follows:

	<u>Design Data</u>	<u>Surveillance</u>	<u>Total</u>
Total Submissions to Date	216	248	464
Total Submissions to Go	3	4	7
Grand Total	219	252	471
Percent Complete	98%	98%	98%

SCN STATUS

As of 30 September, a total of 295 specification change notices against contract reports had been submitted. Of these, 237 were approved and 18 were disapproved.

ITEM 6 FLIGHT TEST

With aircraft No's. 1, 2, 4 and 5 at DAFE, there was no Category I flight testing accomplished during September. Flight testing at the Contractor's facility is expected to resume in October, with return of the No. 1 aircraft to Dallas. Category I flight test status at the end of September remained:

244 Flights 159:27 Flight Time

ITEM 7 REPORTS

The Program Progress Report for the month of August, 1966 was submitted on 15 September and the Financial Report for the month of August submitted on 26 September.

ITEM 8 SPARE PARTS FOR FIVE PROTOTYPE AIRPLANES

Spare parts status at the end of the reporting period was as follows:

1223 total line items scheduled for shipment to bonded warehouse (increase of 27 since last report)
291 total line items scheduled for direct shipment to vendor for overhaul (decrease of one since last report)

1514 total line items on order to date

ITEM 9 DEVELOPMENT AND FABRICATION OF AGE

The status of AGE development and fabrication at the end of September was as follows:

<u>Through September</u>	<u>Submitted</u>	<u>Approved</u>	<u>Demonstrated</u>
CFE AGERD	173	123	113
GFE AGERD	<u>64</u>	<u>59</u>	<u>33</u>
TOTAL	237	182	146

ITEM 10 SPARE PARTS FOR AGE - No activity in September.

ITEM 11 TRAINING AND TRAINING EQUIPMENT (Completed)

ITEM 12 CONTRACTOR SUPPORT OF FLIGHT TEST PROGRAM

Two flights were conducted on the No. 1 aircraft in early September for hover and stability and control work. The aircraft was then placed in a brief layup period for a mandatory inspection as the result of having accumulated an additional 12 1/2 hours of flight time. However, before returning to flight status, a modification to the right hand main integral gearcases was required as the result of a failure of an idler gear experienced in the No. 2 aircraft. No additional flights were achieved on the aircraft during the month:

<u>EAFB Flight In.</u>	<u>Date</u>	<u>Time</u>	<u>Crew</u>
33	9-1	0:49	Jones/Barrett
34	9-1	1:04	Chubby/Jacobs

The No. 2 aircraft returned to flight status on 2 September following a layup period for repairs after the landing incident mentioned in the report for last month. Three flights were conducted early in the month, which included functional checkout, pilot familiarization, hover power checks and stability and control work. During pre-flight runs on this aircraft on 7 September, an idler gear in the No. 3 position IGC failed requiring replacement of the IGC. Subsequent investigation revealed that an aluminum pin, serving as an axle for this gear, was inadvertently supported at one end, resulting in misalignment of the gear and eventual gear failure. A design change was released

which allowed modification of the affected area in all right-hand IGC's without removal of the IGC's from the aircraft. The three flights conducted during the month accumulated 2:36 of flight time as follows:

<u>EAFB Flt. No.</u>	<u>Date</u>	<u>Time</u>	<u>Crew</u>
4	9-2	1:06	Larsen/Chubboy
5	9-6	1:00	Jones/Barrett
6	9-7	0:30	Larsen/Odneal

Following a layup period for a 75 hour inspection, the No. 4 aircraft was in prop rigging at the beginning of month. However, as the result of the field rework required on the right hand IGC's, there were no flights conducted on the aircraft during the month.

At the end of September, subsequent to the field work to the right hand main IGC's, two flights were conducted on the No. 5 aircraft:

<u>EAFB Flt. No.</u>	<u>Date</u>	<u>Time</u>	<u>Crew</u>
26	9-29	0:18	Chubboy/Jones
27	9-30	0:54	Jones/Jacobs

At the end of the reporting period, total flight activity on the XC-142A aircraft in the Category II program was as follows:

<u>Aircraft No.</u>	<u>Category II Flights</u>	<u>Category II Flt. Time</u>
1	34	33:08
2	6	7:42
3	14	14:12
4	41	47:12
5	<u>27</u>	<u>22:18</u>
TOTAL	122	124:32

ECP INDEX

<u>ECP No.</u>	<u>Title</u>	<u>Status</u>
1	Fuselage, Installation of Aft Fuselage Escape Doors	Disapproved
2	Electrical, Installation of 35 KVA Generators	Disapproved
3	Electronics, Additional AT-256A/ARC UHF Communications Antenna; Installation of	Disapproved
4	Flight Tests, Category I Inflight Load Survey; Elimination of	Authorized
5	Ground Tests, Escape System Sled Tests; Elimination of	Authorized
6	Fuel System, Ferry Fuel Tank; Elimination of	Authorized
7	Escape System, Douglas Escapac 1-C Ejection Seat in Lieu of LW-1 (Modified) Seat; Installation of	Cancelled
8	Furnishings; Cargo, Troop Accessories for Four Airplanes, Elimination of	Authorized
9	Ground Test, Wing Fatigue Test; Elimination of	Authorized
10	Structural Demonstrator Instrumentation, Addition of	Authorized
11	Ground Test, Structural Failing Load Test, Elimination of	Authorized
12	Navigation Equipment, AN/ARC-21C in Lieu of AN/ARN-52 (V); Provisions for	Disapproved
13	Propulsion System, Integral Gearbox Propeller System Test; Reduction of	*
14	Drawing Quality Requirements; Reduction of	*
15	Weight Control Policy; Revision of	Disapproved
16	Main Propeller IGC Bearing Change	Authorized

<u>ECP No.</u>	<u>Title</u>	<u>Status</u>
17	Aluminum Forging Treatment to Improve Corrosion Resistance	Cancelled
18	Redesign Main Propeller Blade; Full Scale Test at NASA-Ames	Authorized
18-1	Redesign Main Propeller Blade; 0.60 Scale Test at NASA-Ames	Authorized
19	Elimination of Engine Nacelle Anti-Icing	Cancelled
20	Deletion of Category I Flight Tests on No. 4 Aircraft	Authorized
21	Cargo Compartment Trim; Elimination of	Disapproved
22	Revision to Engine Throttle Control Mechanism	Authorized
23	Extension of Category I Flight Test Program	Disapproved
24	Retrofit of Power Takeoff Engine Units	Authorized

* No longer identified as ECP.

CCN INDEX

<u>CCN No.</u>	<u>Title</u>	<u>Date</u>
1	Substitute 35 KVA Generator for 25 KVA Generator	12-19-62
2	Reduction in Data Requirements and Engine Designation Change	4-26-63
3	Substitute 25 KVA Generator for 35 KVA Generator	2-04-63
4	Reduction in IGB Propeller Testing	5-03-63
5	Approval of ECPs 4-9	6-05-63
6	Elimination of Structural Failing Load Tests	7-23-63
7	Approval of ECPs 5, 6, 8, 9, 16	7-23-63
8	Additional Electronic Support Equipment	7-19-63
9	Cancellation of CCNs 5 and 7 and Approval of ECPs 5, 6, 8, 9, 16	8-02-63
10	Partial Cancellation of CCN No. 2 and Reinstatement of Reduction in Data Requirements	8-22-63
11	Partial Cancellation of CCN No. 2 and Reinstatement of Engine Designation Change	8-22-63
12	Approval of ECP 18-1	9-30-63
13	Approval of ECPs 4 and 10	11-13-63
14	Approval of ECP 18	11-19-63
15	Approval of Revision to Contract Data Requirements Document	12-05-63
16	Approval of ECP 20	2-19-64
17	Approval of Inspection of Damaged Engine	3-16-64
18	Incorporation of Revision A to Detail Spec into Item 1 of Basic Contract	6-04-64

CCN INDEX

<u>CCN No.</u>	<u>Title</u>	<u>Date</u>
19	Approval of ECP-24	6-15-64
20	Dynamic Analysis of VTOL Thrust Stand	11-9 -64
21	Maintenance of Flight Control Simulator	12-4 -64
22	Revision of Maintenance Manual for Addition of Repair Data	2-15-65
23	Flight and Maintenance Manuals Revision	4-05-65
24	In-Flight Load Measurement Program	5-10-65
25	Cool Suit Provisions	5-28-65
26	Category II Instrumentation Modifi- cation on Aircraft Numbers 1 and 3	6-22-65
27	Study for Reduction of STOL Landing Distance	6-15-65
28	Improved Braking System	6-15-65
29	Category II Instrumentation Modifi- (Canceled) cation on Aircraft Numbers 1 and 3 (by CCN #) (44)	6-22-65
30	Conditional Acceptance of No. 4 Aircraft	7-07-65
31	Removal of Parts from Flight Control Simulator	7-26-65
32	Conditional Acceptance of No. 3 Aircraft	7-27-65
33	Addition of Hydraulic Quantity Indicators	1-31-66
34	Unprepared Surface Operations	1-31-66
35	Installation of Improved Brake System	1-31-66
36	Technical Manual Change	1-31-66
37	Cargo Loading and Aerial Delivery	1-31-66

CCN INDEX

<u>CCN No.</u>	<u>Title</u>	<u>Date</u>
38	Open Cargo Doors in Flight	1-31-66
39	Repair of No. 2 Aircraft	2-09-66
40	Unprepared Surface Operations (Cancels CCN 34)	3-07-66
41	Cargo Loading and Aerial Delivery Tests	3-11-66
42	Delivery Configuration of No. 5 Aircraft	4-15-66
43	Maintenance and Data Reduction Services on No. 1 Aircraft	4-25-66
44	Instrumentation of Aircraft Nos. 1 and 3	5- 5-66
45	Repair of Aircraft No. 4	5-24-66
46	Repair of No. 2 Aircraft (Cancels CCN No. 39)	6-16-66
47	Repair of Additional Damage to No. 4 Aircraft	7-6-66
48	Acceptance Configuration for No. 2 Aircraft	8-12-66
49	Data Reduction Support for Aircraft No. 2	8-24-66

LIST OF ABBREVIATIONS

A/C	Aircraft
AGE	Aerospace Ground Equipment
AGERD	Aerospace Ground Equipment Requirements
AMC	Army Material Command
APU	Auxiliary Power Unit
ASD	Aeronautical Systems Division
ATC	Air Training Command
CCN	Contract Change Notice
CFE	Contractor Furnished Equipment
CSD	Constant Speed Drive
DIET	Design Information Element Test
EAFB	Edwards Air Force Base
ECP	Engineering Change Proposal
GFE	Government Furnished Equipment
IGC	Integral Gear Case
PERT	Program Evaluation and Review Technique
PITS	Propulsion Integrated Test Stand
QEC	Quick Engine Change
SPO	Systems Program Office
TBP	Time Between Overhauls
UHT	Unit Horizontal Tail
WRAMA	Warner Robbins Air Material Area
TCFO	Time Compliance Technical Order
FCF	Functional Check Flight