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XC-142A

VTOL

TRANSPORT

MONTHLY PROGRESS REPORT

VOLUME NO. 54

CONTRACT NO. AF33(657)-7868

LTV LING-TEMCO-VOUGHT, INC.

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VTOL TRANSPORT PROGRAM

15 ~~CONFERENCE NO. AF33(657)-7868~~

9 MONTHLY PROGRESS REPORT, NO. 54 for Jun 66.

LTV VOUGHT AERONAUTICS DIVISION

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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-fourth in a series of monthly reports covering activity on the XC-142A VTOL Transport Aircraft Program.

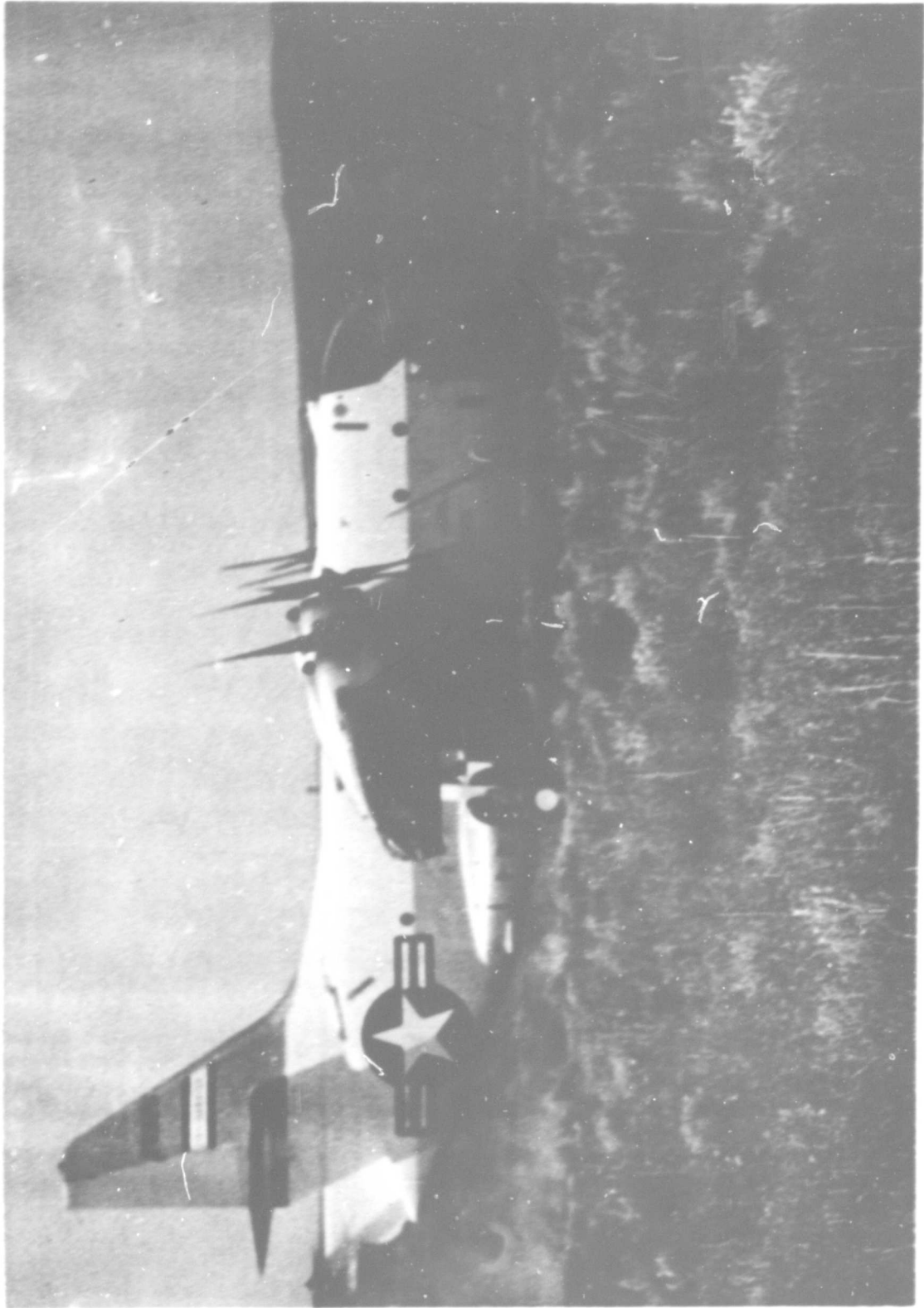
This report is devoted specifically to a summary of progress for the month of June 1966.

SUMMARY

The XC-142A remained essentially on schedule during the month of June. The No. 1 aircraft returned to flight status on 2 June, following a post-delivery layup period for inspection and fuel calibration and was flown to Pt. Mugu, California for hover performance and STOL work. In mid-June, the aircraft was ferried to Bishop, California for performance evaluation at altitude (approximately 4100 feet). Following hover and STOL operations at this location, the aircraft was flown to Lake Tahoe on 21 June for similar operations at higher altitude (approximately 5200 feet). A significant milestone occurred on this ferry flight with the No. 1 aircraft becoming the first XC-142A to have accomplished 100 flights. During the week, STOL circuits were conducted at this location, with the aircraft returning to Edwards Air Force Base on 26 June. At the end of the month, the aircraft was placed in layup for a mandatory 25 hour inspection.

Repair of the No. 2 aircraft was essentially completed in mid-June and the aircraft moved to the airport area on 16 June for initiation of pre-flight operations. Return to flight status was expected in late July and delivery to EAFB by August 1966. The No. 3 aircraft fuselage was received at the Contractor's facility on 19 June from EAFB for utilization as design change mockup and trial installation pending a repair decision.

The No. 4 aircraft remained at El Centro, California during the month undergoing repairs with return to flight status estimated for mid-July. On 2 June, the No. 5 aircraft was flown to Pt. Mugu off-runway STOL work. During a five day period, a number of STOL operations from the sod were conducted with various wing/flap settings. The aircraft was then flown to EAFB where a number of STOL takeoffs and landings were made from unprepared



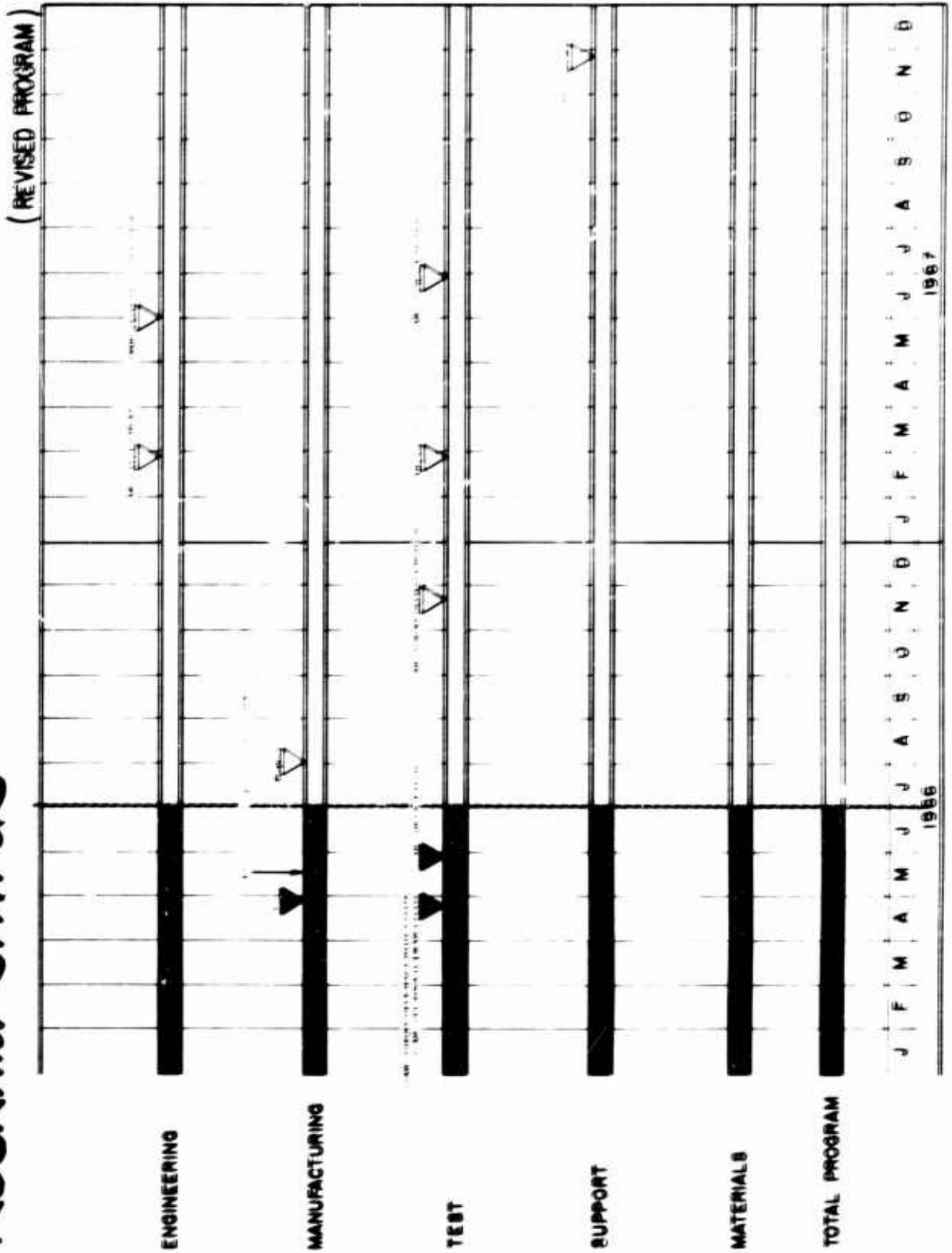
XC-142A No. 5 Aircraft Operating in Unprepared Desert at EAFB 9 June 1966

desert. The entire operation was good with acceptable visibility on virtually all takeoffs and landings. The aircraft was placed in layup for the mandatory 25 hour inspection on 10 June and was in pre-flight checks at the end of the month with next flight expected by mid-July.

At the end of the reporting period, flight status of the five aircraft was as follows:

Category I Tests	237 Flights	164:34 Flight Time
Category II Tests	93 Flights	94:23 Flight Time
TOTAL	330 Flights	258:57 Flight Time

V/S²T[®]L - XC-142A LTV AEROSPACE CORP. PROGRAM STATUS



ITEM 1A DEVELOPMENT OF XC-142A AND FABRICATION OF FIVE PROTOTYPE MODELS

Repair of the No. 2 aircraft was essentially completed on 16 June and the aircraft moved to the airport area for initiation of pre-flight operations. Return to flight status was anticipated for late July and delivery to HAFB by 1 August as scheduled.

ITEM 1B 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 - All component and system tests are complete with exception of the wing incidence screw-jack actuator qualification tests, heat and ventilating system, and the rain removal system tests. Tests of the wing incidence actuator are continuing. Tests of the heat and vent and rain removal systems are planned to be conducted utilizing the No. 1 airplane following return to the Contractor later this year.

ITEM 4 ENGINEERING DATA

During June, the Engineering effort continued to be devoted to support of the flight test program involving airplanes Nos. 1, 4 and 5 and repair of airplane No. 2.

Special attention was focused on repair of minor damage to the No. 1 nacelle area and left hand fuselage skin of No. 4 airplane following a power turbine blade failure of No. 1 engine on 27 June. The incident occurred during ground engine runs. The engine power turbine failure was caused by operation above limit RPM. The overspeed failure was precipitated by an internal failure in the overrunning clutch assembly allowing the power turbine to operate

under a no load condition. This clutch failure alone would not have caused any consequential damage, but misinterpretation of the overspeed control protection circuit by ground crew personnel allowed the power turbine RPM to increase until failure occurred. Action to repair the damage has been initiated.

At the request of ASD, following an hydraulic leak in No. 1 nacelle of No. 1 aircraft on 30 June, a safety analysis was initiated by the Contractor to determine necessary measures to prevent leakage. The request stemmed from concern over possibility of development of fire in the nacelle similar to the incident experienced on No. 4 airplane in May 1966. Results of the analysis will be forwarded in July.

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	264
Total Submissions to Go	3	4	7
Grand Total	219	252	471
Percent Complete	95%	95%	95%

During June, test reports covering the long stroke flap actuator and UHT trim actuator were submitted to ASD for approval.

SCN STATUS

As of 30 June, a total of 254 specification change notices against contract reports had been submitted. Of these, 232 were approved, 18 were disapproved, and 4 were pending.

ITEM 6 FLIGHT TEST

No Category I flights were accomplished during June 1966. The

Category I total flight time remained at 16⁴ hours and 3⁴ minutes accumulated in a total of 237 flights.

The repair of the nacelle fire damage of No. 4 aircraft was essentially completed and ground checkout runs were being accomplished on 27 June when the aircraft sustained minor damage from an overspeed failure of the No. 1 engine power turbine (see paragraph 4).

No. 2 aircraft is expected to return to flight status at the Contractor's facility in July and to be delivered to the Air Force by 1 August.

ITEM 7 REPORTS

The Program Progress Report for the month of May 1966 was submitted on 29 June and the Financial Report for the month of May was submitted on 24 June.

ITEM 8 SPARE PARTS FOR FIVE PROTOTYPE AIRPLANES

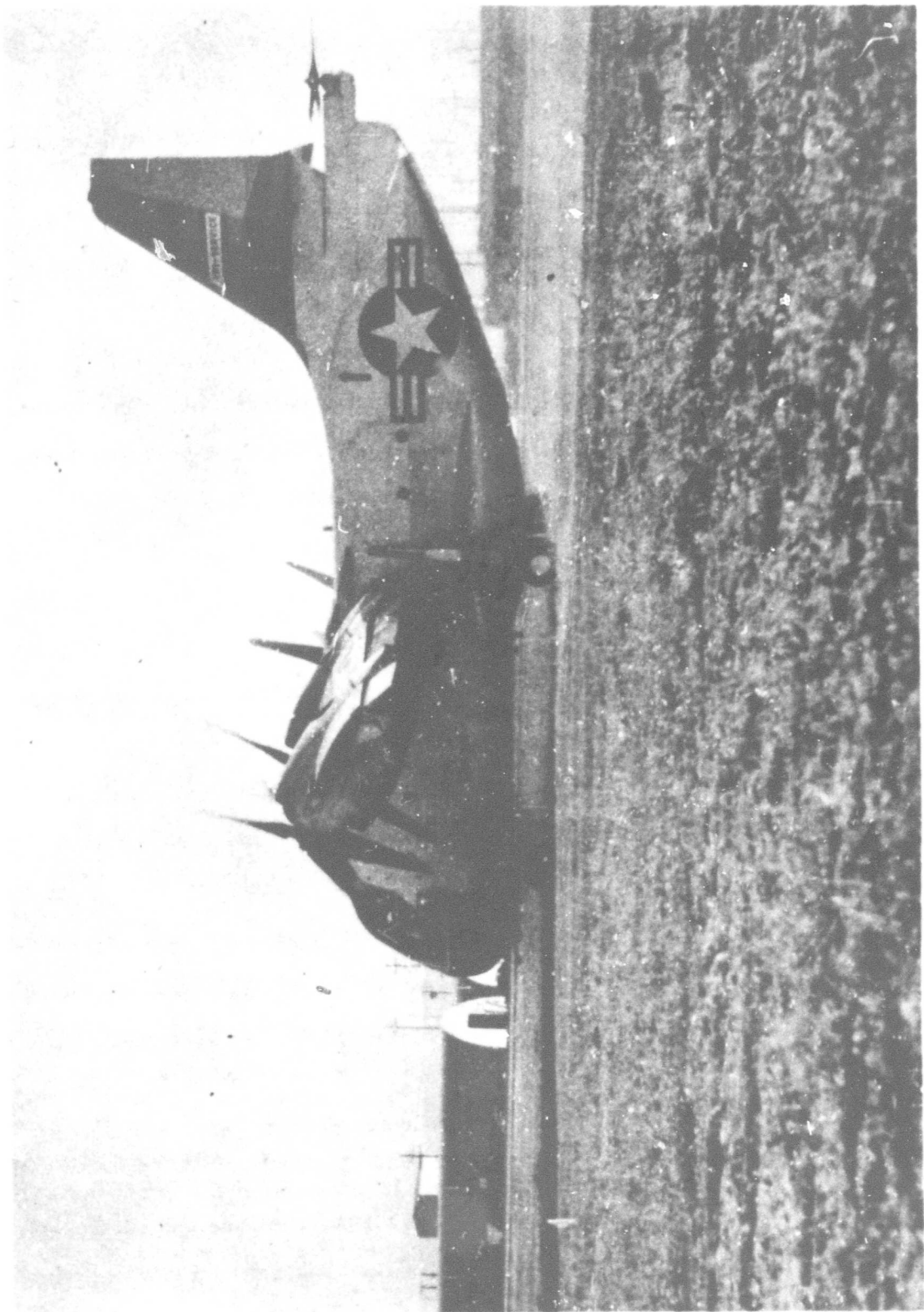
Spare parts status at the end of the reporting period was as follows:

1149 Total line items scheduled for shipment to bonded warehouse (increase of 27 since last report)
292 Total line items scheduled for direct shipment to vendor for overhaul (increase of 54 since last report)
1441 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 June was as follows:

<u>Through June</u>	<u>Submitted</u>	<u>Approved</u>	<u>Demonstrated</u>
CFE-AGERD	171	125	113
GFE-AGERD	<u>64</u>	<u>59</u>	<u>32</u>
	235	184	145



XC-142A No. 5 Aircraft Operating from Sod at Pt. Mugu

- ITEM 10 SPARE PARTS FOR AGE - No activity in June.
- ITEM 11 TRAINING AND TRAINING EQUIPMENT (Completed)
- ITEM 12 CONTRACTOR SUPPORT OF FLIGHT TEST PROGRAM

The Category II flight test program continued to be supported by the Contractor during the reporting period with approximately the same level of effort as in May.

The No. 1 aircraft returned to flight status on 2 June, following a post-delivery layup period for inspection and fuel calibration. The aircraft was flown to Pt. Mugu, California where a series of flights were conducted to accomplish pilot familiarization, short take-offs and landings and hover. On 6 June, the aircraft returned to EAFB and placed in work status for inspection and work-off of discrepancies. The aircraft was ferried to Bishop, California on 13 June for evaluation at an altitude of approximately 4100 feet. In addition to hover work, the aircraft performed STOL circuits at various gross weights. On 21 June, the aircraft was flown to Lake Tahoe for operations at a higher altitude (6200 feet). A significant milestone occurred on this flight with the No. 1 aircraft becoming the first XC-142A to have accomplished 100 flights. During the week, STOL circuits were conducted at this location with the aircraft returning to EAFB on 26 June. After one subsequent flight for stability and control data at 200K, the aircraft was placed in layup for a mandatory 25 hour inspection.

The fuselage from the No. 3 aircraft was sent from EAFB to the Contractor's facility during the reporting period for utilization in mock-up of design changes and trial installations for retroactive kits pending a repair decision.

The No. 5 aircraft was flown to Pt. Mugu on 2 June for off-runway STOL work, accomplishing a series of operations from the sod with various wing/flap settings. Subsequently, the aircraft was returned to EAFB for STOL takeoffs



Desert Floor at EAFB

and landings from unprepared desert. The site was approximately 400 feet wide and covered with brush of about two feet in height. The soil was very loose and had what appeared to be pea gravel and dead grass cover. The loose sand or dirt was estimated to be five inches deep.

At the end of June, a total of 93 flights and 94:23 flight time had been accomplished during Category II flight testing.

VISITS TO CONTRACTOR FACILITY DURING JUNE

<u>Date</u>	<u>From</u>	<u>Purpose</u>
14	DCS Operations, Allied Air Force	Program briefing
23-24	Hq. USAF, AFSC, ASD, RTD WRAMA, TAC, ATC, AFFTC	Status review of C-142 Configuration Evaluation
24	DDR&E, NASA, AFR&D	Program Status Review

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 Macelle 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 Modification 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 Modification on Aircraft Numbers 1 and 3 (by CCN #)	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

CCH INDEX

<u>CCH 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 CCH 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

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
CPE	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
PERI	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
TCTO	Time Compliance Technical Order