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CHAL 0334 ✓
Cy / of 6
23 September 1958

MEMORANDUM TO: SPECIAL ASSISTANT TO THE DIRECTOR
FOR PLANNING AND DEVELOPMENT

SUBJECT : Edwards Test Program

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1. Attached hereto is a resumé of the activity being conducted by the CHALICE/[] unit at North Edwards Air Force Base.

2. The test program is, by its nature, subject to change as the test progresses, so a comprehensive report will be rendered by the Operations Directorate from time to time to keep you abreast of developments as they occur.

3. As the need for new test programs arises, this Directorate will determine the desirability and feasibility of the test and establish the desired perimeters. The recommendation will then be sent to you for approval, disapproval, or further guidance.

4. In this regard it has become necessary to obtain a command decision on the following recommendations:

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[Redacted]

b. Establish the minimum IRAN time for the U-2 as 500 hours.

c. Establish the maximum IRAN time for the U-2 as 1000 hours.

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[Redacted]

Colonel, USAF
Director of Operations

Encl:
Resumé

APPROVED:

Outdated - not approved

R. M. BISSELL, JR.

DPS/DCI/RHC:aem

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Dist.:

1 & 2 - addressee

4 - Ops Chal file

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EDWARDS TEST PROGRAM

1. Engine Tests (360)

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a. Problem: Reliability of the P-31 engines is not consistent. P & W representative () has singled out specific engines for quantitative flight testing and possible rework. To date, the reworked engines are not as good (reliability and performance) as either the prototype or the early production engines. Engine reliability and performance is a continuing project and very time consuming.

b. Problem: High outside air temperature is a suspected cause of flameouts. IAC Service Bulletin #317 requires the installation of outside temperature gauges in all U-2 aircraft. This will enable Edwards to use the data of all detachments to determine the degree of correlation and make appropriate fixes. The gauges will also assist in gathering weather information and assist in detection of contrails.

c. Problem: The EGT (exhaust gas temperature) harness, on occasion, has been found to be scorched and shorted out. EGT, at the present time, is the prime indicator of power. Since the engine is normally operated at full power, the EGT measurement must be accurate and reliable. Fixes to obtain and provide the degree of accuracy and reliability desired are required.

d. Problem: A minimum safe power indication is required. The Pressure Ratio Gauge used for this purpose is not a reliable indication of available power. Two different exhaust gas total pressure probes have been tried in an effort to eliminate this problem. It is necessary to slowly reduce power while in cruise climb in order to keep the EGT within allowable limits. A reduction beyond certain limits causes flame out. Since the Pressure Ratio Gauge is the only instrument available, a more reliable fix is required. Replacement of the pressure ratio gauge with a fuel flow gauge is one possible solution since it is felt that it is a good indication of engine power, simpler, and more reliable. A secondary benefit would be a visual presentation of fuel flow for the pilot.

2. Cameras (343)

a. All Project camera service tests are complete.

b. Acceptance/delivery tests on FOG "B" cameras are approximately 80% complete.

c. Two "C" camera tests of the new series have been accomplished. Results were good (12 to 15 ll/mm) but this does not approach the design specifications 35 ll/mm. R & D, as well as acceptance flight tests, will be required.

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d. A-2 and B cameras will require major overhaul due to wear and tear. Overhauled cameras will require acceptance flight tests.

3. Film Tests (343)

a. Red dot flights, flown for EK, are an attempt to improve overall quality. Tracker and A-2 tests are complete. "B" red dot tests will begin week of 15 September. "C" red dot tests have been proposed and the decision will rest with FOG. Assignment of a "C" camera for this work may require more time than SAC 3 would care to relinquish.

4. System IV Acceptance Tests (358)

a. Project System IV acceptance testing is complete. FOG System IV, number 105, is at Edwards at the present time. System IV improvements are evidenced on each new unit. Serial number 104 (FOG) had only minor problems during acceptance tests.

b. Noise elimination

Hycon is working with R-W in an attempt to lower noise level that is being fed from the tracker and other cameras into System IV and System VI. Progress to date indicates that most, but not all, noise can be eliminated.

c. Weight reduction - Product Improvement

(1) The need of a weight reduction program is evident in that in a long flight, the U-2 will normally run out of elevator trim at about the two-thirds point in a long flight.

(2) All project System IV's should be product improved to the same degree as the latest one coming off the production line. A program of further refinement in increase in its sensing and D.F.'ing capability should be investigated. Improvement should be consistent and/or compatible with the characteristics of any follow on vehicle.

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6. Zoom Climb (349)

As soon as F-104 aircraft are available at Edwards, tests will begin on the zoom climb program. In general, the problem is: What can be done to a U-2 to lower the probability of intercept by high performance

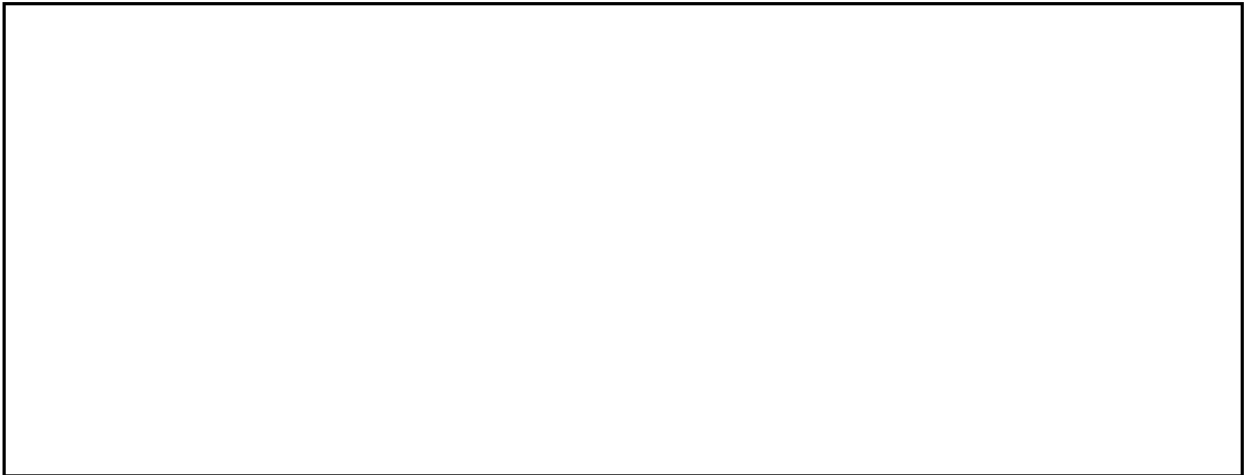
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fighters? This includes camouflage paint, [redacted] evasive tactics, U-2 pilot monitoring, [redacted] This program should be expedited, be comprehensive, as pertains to all features mentioned above and is considered to be more important than all of the others. Information obtained will be applicable to any follow-on vehicle.

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8. [redacted]

Initial tests complete. Informal (ARDC) information indicates that flight tests involving product improvement and/or newer types of equipments and techniques are being formalized.

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9. [redacted]

Serial #16 is at Edwards at the present time. These are production acceptance tests and will be complete in November 1958.

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10. [redacted]

Current activity limited to theoretical and model aspects of the program. Provisions should be made for the possibility that camouflage material might be available during the second half of FY 1959 and would require a U-2 for pole and flight tests.



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12. IRAN

a. Aircraft #343 received a 1000 hour inspection and no significant deficiencies were found. A FOG U-2 was found to have

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considerable wear and required extensive work. It is recommended that minimum IRAN time be 500 hours with a maximum IRAN time of 1000 hours. This would be dependent on type of flying accomplished, location, and inspection reports. A minimum of three maintenance flight tests are required for each aircraft coming out of IRAN before it is unconditionally released for operational use.

b. Repairs due to minor accidents, replacement of skin, bulkheads, support membranes and other modifications requiring over 100 hours of work should be accomplished at Edwards.

13. Training and Proficiency (344)

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b. In the case of pilots already checked out, the degree and type of proficiency that should be maintained depends on their planned utilization.

(1) Operational utilization--four flights per month required. (Two maximum range or endurance flights with primary mission capabilities and two short flights to accomplish air work such as instruments, landings, T. O.'s etc.)

(2) Ferry and flight test utilization--four flights per month required averaging 4 - 6 hours.

14. EWP, Ferry and Tactical Situations (378-344-349)

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Edwards will maintain two U-2 aircraft in operational condition at all times. These aircraft will be ferried to areas of interest as designated by by Edwards. The aircraft will supplement the B and C detachments when these units are dispersed and/or deployed. Edwards personnel will augment the operational units during these conditions. These aircraft will also replace damaged or lost U-2's, U-2's brought back for IRAN or extensive modification in addition to being utilized for equipment testing and proficiency flying.

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16. Personnel Equipment and Safety of Flight (378-344-349)

In most cases, this aspect will be flown in conjunction with other programs. Cases involving aerodynamic instrumentation, violent maneuvers, new or modified oxygen systems will require flights that are limited to the specific problem. This aspect will increase in importance and significance when the decision for a follow-on-vehicle has been made. Pressure suits, oxygen systems and escape systems will require extensive flight testing.

17. New U-2 A/C

Five new aircraft are scheduled for EAFB production acceptance test January thru March 1959.

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AIRCRAFT AND PROJECT STATUS

343	IN	Configs	
344	--	Being assembled	
349	IN	Ready for ferry to "C"	
358	OUT	Strut leaks	
360	IN	Instrumentation (Engine - Paint	25X1A
378	IN	A & E Ready for deploy	
376	OUT	FOG A/C Stall checks	
389	IN	A & E † 	25X1A

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<u>TESTS</u>	<u>DATE ASSIGNED</u>	<u>ESTIMATE DATE COMP.</u>	<u>% COMP.</u>
	Sept '55	NA	NA
Engine	Jun '55	NA	NA
Paint	11 Jun '58	15 Sept	100 %
B	Jan '56	NA	95
Sys 4	Oct '56	7 Dec '58	40
Sys 6	Mar '56	NA	NA
C	21 Dec '56	NA	NA
Red Dot	Sept '56	NA	NA
Sys 1	Oct '55	NA	NA
Zoom Climb	Jun '58	UKN	0
	Aug '58	UKN	0

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U-2 UTILIZATION

Each U-2 will be programmed for approximately 30 hours each month. Average utilization of U-2 aircraft flown at EAFB for the period February-July 58 was 20 hours.

Following is the schedule for each A/C assigned EAFB for the present test effort:

<u>A/C</u>	<u>Program</u>	<u>Est. Monthly Fly Hrs.</u>
343	2	10
	3	10
344	EWP-STANDBY 14-10-16 13	20
349	6- 14-10-16 13	20
358	4-5	10
	8-9	10
360	1	10
	9	5
	7	5
378	6- 14-10-16 13	20

Projects 12 & 17 require flight testing by personnel but do not involve permanently assigned aircraft.

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