

SECRET

21 January 1966

MEMORANDUM FOR THE RECORD

SUBJECT : U-2R Airplane Proposal

Reference: (a) LAC Report No. SP-937, "Proposal for U-2R Airplane"

(b) LAC Report No. SP=179, "Flight Test Development of the Lockheed U-2C Airplane"

(c) Flight Manual for Models U-2C and U-2F Aircraft dated 15 December 1965.

1. Viewing the reference (a) proposal strictly from an aerodynamic and performance standpoint, the U-2R represents a modification to the U-2C. The primary goal of the modification is to take advantage of the increased thrust of the J75P-13B engine in the form of an increase in cruising altitude before reaching the stall/mach buffet boundary. To do this, it is proposed to increase the wing area from 600 square feet to 1000 square feet thereby generating the necessary lift at a lower lift coefficient and hence avoid the stall/mach buffet boundary. Although the theory and the approach are reasonable, the complete lack of both aerodynamic and engine data precludes an independent analysis to confirm the final results. However, assuming that the Lockheed performance calculations are correct, certain observations can be made.

2. Reference (b) and (c) present flight test results and flight manual data for the U-2C with wing slipper tanks. A comparison between these data and the U-2C performance presented in reference (a) reveals differences which can be significant unless resolved. Specifically, figure 5 of reference (a) presents a maximum altitude range mission of the U-2C of 3000 n.m. with the altitude varying from 66,000

25X1

feet [] References (b) and (c) on the other hand state the U-2C maximum altitude range as ³⁴⁷⁰~~3350~~ n.m. with an altitude variation from 66,000 feet []

25X

Comparing this U-2C performance with the U-2R performance, for the normal take-off weight, the altitudes are very similar and the only substantive performance difference is the U-2R

25X1

range of [] compared to the U-2C range of ³⁴⁷⁰~~3350~~ n.m. The U-2R cruises at []

25X

Reference (a) also presents a 3000 n.m. U-2R mission at a reduced gross weight with the altitude varying from []

25X

25X1

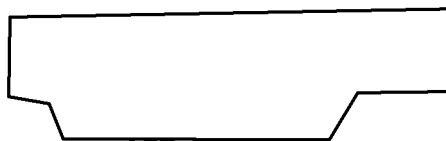
[] It should be noted that the U-2C at a reduced gross weight would show a corresponding increase in initial cruise altitude.

3. The overload take-off weight for the U-2R is 36,750 pounds. This configuration includes fuel in the inboard wing as well as the outboard wing. In this configuration the initial cruise altitude for the maximum altitude mission is 64,000 feet and does not reach 70,000 feet until 2750 n.m.

have been flown. The total range for this mission is 25X
n.m. The maximum range for the overload weight is 25X
but, at best, can probably be viewed only as a ferry mission
since the entire altitude profile extends only from 55,000
to 69,000 feet. It should be noted that all ranges are
based on zero fuel at the end of the mission. Consequently, any
realistic profile will result in both a reduced altitude and
a reduced range.

4. In order to fully evaluate the validity of the
performance estimates of this proposal it is necessary to
have the flight test drag of the U-2C, the estimated drag
increments between the U-2C and the U-2R and complete installed
engine performance. In addition, the proposal is completely
lacking in data for any of the sub-systems, such as, naviga-
tion, auto-pilot, hydraulic, electrical, etc. If these are
identical to the U-2C, it should be so stated.

5. In summary, there do not appear to be appreciable
performance gains for the U-2R over the U-2C. However, one
very significant improvement is that the U-2R will not be
flying in the stall/mach buffet corner thereby significantly
improving the handling qualities.


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RANGE COMPARISON OF U-2R AND U-2C

	<u>U-2R</u>			<u>U-2C</u>		
	<u>Partial Fuel</u>	<u>Normal Fuel</u>	<u>Overload Fuel</u>	<u>From U-2R Proposal</u>	<u>U-2C Flight Manual</u>	
Zero Fuel Weight - Lbs.	17,400	17,400	17,400	12,890	12,890	
Fuel Weight - Lbs.	9,390	12,730	19,350	10,166	10,166	
Take-Off Weight - Lbs.	26,790	30,130	36,750	23,056	23,056	
Maximum Altitude Range - N.M.	3,000			3,000	³⁴⁷⁰ 3,350	25X1
Cruise Altitudes - Ft.						
Maximum Range - N.M.						
Cruise Altitudes - Ft.						55,000 - 69,000