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2349-63

Copy 1 of 15

29 JUL 1963

MEMORANDUM FOR: Assistant Director for Research
and Development, DDR

THROUGH: Acting Deputy Director (Research)

SUBJECT: Map and Chart Destruct System

1. This memorandum contains a recommendation for concurrence by the Acting Deputy Director (Research). Such recommendation is contained in paragraph 6.

2. At a meeting called by General Doolittle in his capacity as Special Advisor to the President, the subject of destruct systems was thoroughly reviewed. At the conclusion of this meeting, General Doolittle stated that the ultimate goal for all concerned is to completely destroy beyond recognition the entire vehicle involved in covert reconnaissance, but since this degree of destruction implies use of nuclear energy, it must be considered out of the question at this time. He then stated that as a matter of first priority, destruct systems must be developed and employed to deny information to hostile elements which could be gained from maps, charts and payload systems.

3. Considerable development work has been accomplished on the destruction of maps and charts through the medium of water soluble papers. In spite of the efforts expended by Lockheed Aircraft Corporation (LAC), Technical Services Division (TSD) and the Aeronautical Chart and Information Center (ACIC), at this time the system is not available for use in the IDEALIST or OXCART programs. Certain technical aspects of the system require continued development work, and closer monitoring of the program is essential.

4. An allied destruct problem within the OXCART program is the destruction of the primary navigation system's 35 MM film strips. This requirement was formally established on 9 August 1962, and sporadic efforts have been made to develop this capability; however, to date, a satisfactory destruct system is not available.

Handle via
Control System

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5. It is suggested that the Office of Research and Development (ORD/DDR) has the technical capability to continue this development program to a successful conclusion. Assumption of this program by ORD will allow an "in house" supervision of development and testing in order that an operational capability can be expedited, and it should be noted that [redacted] formerly with TSD and now a member of ORD, has the necessary clearances and field trip experience to aggressively continue with this program.

6. It is recommended that ORD complete development and testing of map and film destruct systems for the Office of Special Activities in accordance with the following time schedule:

- a. IDEALIST: Map and chart destruct system as soon as possible on a first priority basis.
- b. OXCART: Map and chart, and 35 MM film strip destruct systems complete by 1 October 1963.

(Signed) Jack C. Ledford

JACK C. LEDFORD
Colonel USAF
Assistant Director
(Special Activities)

CONCUR:

Original signed by
E. B. Gitter

ADD/R

C O P Y

OXG - 0261-60

26 January 1960

MEMORANDUM FOR: Deputy Director (Plans)
THROUGH : Chief, Development Branch, DPD
THROUGH : Acting Chief, DPD
SUBJECT : Review of Proposed Photographic System for OXCART
REFERENCE : Evaluation of Reconnaissance Proposals for GUSTO
GUS-0188, dated 19 March 1959

1. It has been ten (10) months, and we have spend [] since Perkin-Elmer was selected as the contractor to furnish the photographic equipment for this program. In view of the progress reported, the comments made in Washington and Boston last week, and the apparent floundering of P & E in trying to find a satisfactory approach to the problem, I would feel derelict in my duty if I did not express my deep concern over the progress being made. 25X1

2. At the time P & E was selected as the contractor to furnish this equipment, they did seem to have the best approach to the problem, and I quote from the reference:

"The P & E proposal is extremely well done and represents the product of a great amount of advanced thinking as well as a considerable amount of engineering effort in order to come up with a system that is sophisticated and well planned. This system, without a doubt, has the greatest ^{potential} and can be scaled up or down to allow maximum utilization of the air frame selected."

These comments at the present time are not considered true ones. P & E seems to be on a Schmidt or reflecting optical system "jag" that tends to ignore other requirements for a good reliable photographic system. The

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higher resolution advantages of the reflecting system are understood, but it seems doubtful that it can be made to operate satisfactorily when it ignores simplicity, reliability, weight, desired focal length, and stereo coverage requirements to get it in the vehicle. In short, it can only be said that after ten (10) months of effort, P & E can only propose a very complex system of minimum focal length that weighs over 500 pounds and does not give stereo coverage for the minimum photographic flight line distance. In view of the above facts and the proposal for a photographic system submitted by EK on 21 January 1960 for OXCART, it is felt that the 24-inch system now being studied by P & E must be carefully evaluated before they are instructed to proceed.

3. Because of my deep concern for the progress presently being made, I have reviewed all of the original proposals, including the excellent proposal received from EK, which shows they have a fine understanding of the problem. To show the soundness and feasibility of the EK system a comparison of major characteristics of this system and the one that Rod Scott indicated he had in his hip pocket and that he could proceed with are as follows:

<u>ITEM</u>	<u>EK</u>	<u>P & E</u>
Camera Type	Panoramic	Panoramic
Installation Type	Split-vertical	Split-vertical
Lens Type	Refracting	Catadioptric
Lens Speed	f4	f4
Focal Length	21"	18"
Ground Resolution	Approx 1½ ft	Approx 1½ ft
Shutter Speed	1/200 sec	1/50 sec
Format Size	7.4" x 34"	4.4" x 28"
Film Width	8"	5"
Flight Line Photo Distance	2500	2500
Lateral Coverage	126°	135°
Forward Overlap	60% for 2500 mi	75% for 1,000 mi 50% for 1,500 mi
Stereo	for complete flight line distance	1,000 miles and 5 miles each side of nadir for additional 1500 miles
Convergence Coverage	30° each side of nadir	None
Weight (Complete System)	500 lbs.	570 lbs.
Window	1	2
Window Size	23" x 24"	Approx 20" x 24" ea.

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Items such as simplicity and reliability, of course, cannot be tabulated and can only be determined by review of the system layout. It can be readily seen by the attached photo that the film path in the proposed EK system is much simpler than that of Rod Scott's, which requires four 90° turns in the film path, thus insuring better equipment reliability. Also of great importance and not shown above is vibration. Due to the greater distances between large glass elements and the rotating 10-inch mirrors, P & E's system will be more susceptible to internal vibration.

4. It should also be pointed out that EK is proposing to use only one window, approximately one (1") inch thick, with no attempt to cool it. The equipment bay is purged with helium allowing excellent transmission of the light rays from the window to the focal plane. Only the film compartment (supply, take up spools and focal plane) will be pressurized and cooled to about 120° F.

5. The above is not an attempt to indicate that EK has a trouble-free system, but I do feel they are proposing a simpler, more reliable, and a better system than any of those of Rod Scott's. Without an improvement in effort, or progress at P & E, I can see us going down the "C" Configuration road.

STAT

6. [Redacted]

heartily recommend that the photographic equipment be given a complete review with serious consideration being given to the EK Proposal.

[Redacted]
Major USAF
Development Officer

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DPD-DD/E [Redacted]

ATTACHMENT:
Photograph

Distribution:
O&I-Addressee w/att
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1-CH/DB/DPD wo/att
1-Mr. Kiefer, wo/att
1-DB/DPD/LEW, wo/att
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27 November 1962

NRO REVIEW COMPLETED

MEMORANDUM FOR : Deputy Director (Research)

SUBJECT : Status of RBX-RX Program

REFERENCE : Memo from DD/R to DCI, Dated 26 November 1962;
Same Subject [redacted]

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1. In connection with the reference, Leo Geary tells me that there is a certain amount of confusion with regard to the status of the RX proposal within the Air Force itself. Apparently, according to Geary who has discussed this with Dr. Charyk, the paper which went to the White House contains little or no definitive information regarding the RX configuration.

2. For example, Leo quoted Dr. Charyk as saying that there was not even agreement within the Air Force as to how many people there should be in the aircraft crew, and further that the figure of two is highly conditional as are any figures on weight and rescaling of the A-12 itself.

3. With regard to my "membership" on a Charyk committee to study the effects of the RX on the A-12 (OXKART), Leo says that Charyk does not intend to convene such a group unless and until the RX paper is returned from the White House with indications that the President favors moving ahead with the whole program. Leo seemed of the opinion that what the Air Force has really accomplished by this device is to set the design parameters of the RX configuration without regard to the validity of any operational requirement. I could be a little more confused about this, but I am not sure how. Just thought you might wish to know that there appears to be a certain amount of confusion within NRO itself on this whole business.

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Distribution:

JAMES A. CUNNINGHAM, JR.
Acting Assistant Director
(Special Activities)

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24 August 1961

MEMORANDUM FOR THE RECORD

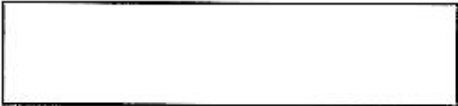
SUBJECT : Weight of OXCART Electronic Equipment

A study has been made of the various electronic equipments intended to be installed in OXCART as stated in the Lockheed A-12 specification. The various equipments together with their weights are listed below:

<u>Equipment</u>	<u>Use</u>	<u>Weight</u>
AN/ARN-58	I.L.S.	20 lbs.
AN/ARC-51	UHF Communications	30 lbs.
AN/ARN-41	Radio Compass	32 lbs.
AIC-10	Interphone	6 lbs.

The above weights do not include any necessary interconnecting cabling or aircraft wiring.

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Development Branch
DPD-DD/P

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