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WDD Control of Lockheed Aircraft Corporation  
Presentations on WS 117L

OCT 17 1956

WDGS

WDTR

F. C. E. Oder/ls/1344

1. The Lockheed Aircraft Corporation has been and probably will continue to be requested to give presentations on WS 117L, the Advanced Reconnaissance System, to other governmental agencies. Typical of such presentations was the one recently presented to Dr. Furnas, and that requested by the Air University.

2. Under SDD No. 117L, WDD is charged with maintaining special security precautions on a strict need-to-know interpretation concerned with the divulging of information on the ARS. Furthermore, we are required to maintain a list of those people who require need-to-know of all of the sensitive aspects of the program. From a practical point of view, it is very difficult for an effective presentation to be given by Lockheed which does not at least infer the nature of some of these sensitive aspects of the program.

3. It is requested that Lockheed be advised that in the future, all requests for presentations on WS 117L be referred to WDD for approval. In each case, the proposed list of attendees must be completely specified in order that this office can determine whether or not a need-to-know exists. It is further requested that the instructions to Lockheed be phrased in such a way as to prevent them from voluntarily including discussions of their role in WS 117L on any presentation on over-all company activities.

4. This DF is classified SECRET because it quotes portions of SDD No. 117L, which are similarly classified.

SIGNED

FREDERIC C. E. ODER  
Lt Colonel, USAF  
Assistant for WS 117L  
Technical Operations

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DECLASSIFIED AFTER 12 YEARS  
DOD DIR 5200.10

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WDTR 56-182

WDTR  
F C E Oder

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Presentations on WS 117L

AFCOM-A  
Lt. Colonel Ahola

WDR

OCT 17 1956

Lt. Colonel Oder/1343

1. At the request of Hq. USAF, WDD, in the person of Lt. Colonel Oder, aided by Commander Truax, will give a presentation to the OSD Coordinating Committee on Guided Missiles (OASD) (R&D) on 26 October 1956. The presentation will be given a dry run in General Swafford's office on 25 October 1956.

2. It has come to the attention of WDD, that it would be fruitful to advise key personnel of the Directorate of Plans (AFOPD) on WS 117L. It is requested that you contact Colonel James B. Tipton, Chief of Long Range Objectives and Programs Group in Room 4C967, with a view to inviting Colonel Tipton to attend one of the two presentations indicated above. Since this will be a TOP SECRET presentation, and accordingly, attendance at the OSD presentation will be quite limited, it is suggested that you determine whether or not Colonel Tipton could not attend the dry run in General Swafford's office on the 25 October 1956.

3. It is presently planned that the briefing team will arrive on the day time Statesman on 24 October 1956, they will be carrying material up to TOP SECRET. It is requested that arrangements be made for the securing of this material beginning with the night of 24 October 1956 and that Colonel Oder be advised as to what arrangements have been made in this regard.

HAROLD W. NORTON  
Colonel, USAF  
Asst Deputy Commander

CHARLES H. TERHUNE, JR.  
Colonel, USAF  
Deputy Commander  
Technical Operations

**Request for Security Investigation in Re  
Magazine Release**

**OCT 15 1956**

**WDSI**

**WDTR**

**F. C. E. Oder/1a/1344**

1. Your attention is invited to the article which appears on the lower right hand side of page 15 on the October 1956 issue of the magazine, "Missiles and Rockets", which is published monthly by American Aviation Publications, Inc., Washington, D.C., in which lists as the managing editor, Erik Bergaust.

2. The article referred to, has as its caption, "Navy's Truax, Guides AF Satellite Work". The article deals with the fact that Commander Truax is assigned to WDD. Discusses his career briefly and states that he is a nominee for the American Rocket Society's Presidency. The problem with the article lies both in the caption and in the last sentence, which states, "Informed sources believe Commander Truax is guiding WDD's satellite work".

3. The fact that the AF (WDD) is engaged in development of a satellite is classified SECRET. Furthermore, WS 117L has special security measures directed by SDD No. 117L. The need for such measures is apparent, in that the premature compromise for a Reconnaissance effort such as this, could easily result in serious national embarrassment and a resulting loss of the investment in the project as well as a denial of the potential results thereof.

4. Accordingly, it is requested that an investigation be conducted to ascertain the circumstances surrounding this release and the determination of responsibility for the classified information concerned appearing in public print. It is further requested that this office be advised as to what steps can be taken to prevent future occurrences of this nature.

**SIGNED**

**FREDERIC C. E. ODER  
Lt Colonel, USAF  
Assistant for WS 117L  
Technical Operations**

cc: WDCS

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**WDTR-56-180**

**WDTR  
F C E ODER**

**1a**

**1344**

[REDACTED]

Selection of WS 117L Guidance Scheme and/or Contractor.

OCT 15 1956

WDTLG  
WDTI

WDR

Lt. Herther/ls/1344

(In Turn)

*see comment nr 2*

*dt 30 Oct 56*

*comment nr 3*

1. WS 117L, being a satellite-borne reconnaissance system, leans heavily on the Ballistic Missile Program for placing the vehicle on orbit. For instance, the ICDM provides almost 85% of the velocity required for a 300 mile satellite. The basic scheme is to replace the nose cone with a powered third stage. The USAF approved WS 117L Development Plan is based on the use of the SM 65C as a booster, although the SM 68 appears to offer the possibility of more payload on orbit, which may be required in the future.

2. Autonetics and MIT have been involved in parallel guidance and control studies for the satellite for the past seven years. Now that WS 117L is an approved weapon system, with Lockheed Aircraft Corporation about to receive a contract for the System Development, the immediate selection of a guidance contractor is imperative.

3. In the most general case, the question of who the guidance contractor will be can be broken down into two categories, those who are and those who are not in the ballistic missile programs. The answer must be weighed in light of the following:

- a. Cost of putting a new contractor in the ballistic missile guidance business.
- b. Allowable degree of interference to the three other WDD programs.
- c. Degree of relative independence of ballistic missile programs desirable by WS 117L for its optimum development program.
- d. Overall economy to be effected by going to one of those contractors in the other programs which offers the best WS 117L solution.
- e. Relative degree of reliability of a guidance system which will have been flight tested for one of the other programs vs a new item developed for WS 117L alone, which must have allowance for separate flights for guidance tests.

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WDR 56-178

WDR

ls

Lt Herther

1344

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4. None of the guidance schemes under development for the other programs will fulfill the satellite application without modifications, although some are more easily adapted than others. Based on technical promise and early availability to meet WS 117L launch dates, ACSP seems to be best suited of the WDD guidance contractors.

5. R-W has performed a short study and the results are included in inclosure #1. Since these results were presented, however, Mr. Schulman visited the WS 117L study group at MIT and seems to concur in the general idea of making use of as much as possible of AC production units, meanwhile, having MIT perform the necessary R&D to make the system compatible with the SM 65 and the WS 117L orbital vehicle, hence minimizing early engineering interference at AC.

6. Specifically, it is visualized that AC IREM production platforms (IMU) and associated electronics will be used "as is" with modifications of the computer only being required for WS 117L use. These hardware modifications could be performed by AC with little or no interference.

7. WDTR, in the best interest of the Air Force, feels that the possibility of using an MIT-AC spark plug combination for WS 117L guidance contractors should be fully investigated in detail, prior to selecting another contractor such as NAA.

8. Because of the long lead time involved on guidance development, it is requested that this question of feasibility of utilizing AC for WS 117L guidance system production be answered as soon as is practical.

9. The MIT contract for WS 117L study terminates 1 Nov 56, hence, it is desired that the question be resolved in time to extend their contract without a work stoppage, if they are to continue. If this scheme is not satisfactory, this group at MIT will contract with the Navy for a development of a shipborn inertial reference system for Jupiter launchings.

10. WDTR would like to have a discussion between AC-MIT-WDTLG-WDTR representatives to perform this detailed analysis of exactly what is required of AC and the degree of interference with WS 315A.

**SIGNED**

FREDERIC C. E. ODER  
Lt Colonel, USAF  
Assistant for WS 117L  
Technical Operations

1 Incl  
Memo from F.A. Ford to J.G. Fletcher  
5 Sep 56, subj: Inertial Guidance for  
WS 117-L

WDTR  
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1344

WDTR 56-178

[REDACTED] [REDACTED]

V

Subject: Request for Proposal, PR 57-4DD-196  
Lockheed Aircraft Company

OCT 15 1956

TO: MCPTS  
Attn: Major Rowland

FROM: WDTR

COMMENT NO. 2  
Cmdr Truax/dh/1344

1. Lockheed's Proposal of 28 September 1956 (MSD/20302) to the Ballistic Missiles Office suggested a number of changes to the USAF Development Plan of 2 April 1956 for WS 117L. It is not considered necessary that these changes be accepted or rejected prior to issuance of a letter contract, however, the approach should be determined in some detail for the purpose of the definitive contract to follow.

2. The Development Plan of 2 April 1956 was based on that submitted by Lockheed Aircraft Corporation in March 1956. The latter document contained much material to substantiate the program presented. No supporting information has been presented regarding the proposed changes. It is requested that such information be supplied either as special reports or as part of the regular reporting system. This information should be supplied prior to any significant expenditures along the lines of the program changes mentioned. In particular, the following data should be included: (Numbers refer to Inclosure (a) of MSD/20302)

A-1

including: 1a. Characteristics of the X-17 as an environmental test vehicle

Cost	State of development
Payload	Launch facilities and location
Altitude	Availability (interference)
Accelerations	Crew training status
Stability	

These characteristics should be compared with the Aerobee-HI.

b. The same information is required for the ATV, with comparable data for Redstones. If it is desired that the number 13 be included in the development plan, a test annex should also be provided showing a test schedule and the general payload and test objectives of each flight.

c. It is assumed that the number of vehicles mentioned was determined by the estimated availability of SM 65's. The time period needs to be fixed more accurately and the test payload and objectives outlined as described for the ATV. In addition, further explanation of the idea of proceeding from simple to complex payloads is desired. In view of the cost of each launching, it would appear that the complexity of the payload should be limited only by the availability or reasonably well ground-tested components or by the reduced success probability for the flight. Whether this last factor actually enters or not would depend on how a given test item interacts with other items.

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2. It is not expected that a firm weight limitation for the SM 65 can be established prior to about 1 November 1956. The Western Development Division agrees with the general principal of increasing the orbiting vehicle weight so long as worthwhile gains in payload accrue from such increase.

3. The Western Development Division is particularly interested in a detailed comparison of the Hustler and second stage Vanguard engines. Rough calculations indicate that an inconsequential gain in payload will result from using the more costly and complicated Hustler System. The comparison should include appraisal of the following:

- (a) Relative reliability
- (b) Relative cost
- (c) Payload differences for a realistic gross weight and trajectory due to:
  - (1) Specific impulse including propellant consumed by turbo-pump.
  - (2) Propulsion system weight
  - (3) Different mixture ratio/control tolerances (different propellant utilization).
  - (4) Difference in weight of thrust carry-through structures because of different thrusts of the two engines.
- (d) Summary of problems in Hustler engine because of different attitudes.
- (e) Relative difficulty of varying propulsion program.
- (f) Differences in count-down time launch crew requirements, checkout equipment, etc.
- (g) Guidance and control problem engendered by turbine during coast-down.
- (h) Adequacy of residual gas pressure for post-cut off control for both Systems. (if used)
- (i) Effect of difference in thrust on guidance accuracy and trajectory.

A-4. No special requirement other than a complete evaluation of competing systems.

A-5. Availability of Minitrack system should be considered.

A-6. No additional data required

A-7. No additional data required.

[REDACTED]

3. The request for Lockheed Aircraft Corporation for 2.6 million of government financing for the Captive Systems Test facility is at variance with their cost estimate of March 1956. Since Lockheed stated willingness to provide all brick and mortar at or near their plant had a considerable influence in their selection as contractor, it is felt that further pressure should be brought to bear to encourage them to provide all non severables for this System Test Facility.

4. WDTR has no comment at this time on the selection of subcontractors. It is believed that the Air Force should not signify approval or disapproval of the proposed team until it is reasonably complete.

### SIGNED

1 Incl:  
Contractor's Proposal  
subject as above.

FREDERIC G. E. ODER  
Lt. Colonel, USAF  
Assistant for WS 117L  
Technical Operations

WDTR dh  
Cndr Truxx 1344

*QAR, 16 Oct 56*

[REDACTED]

WD 56-04021



[REDACTED]

[REDACTED]

8CT 1 0 1956

WDTR

**SUBJECT:** Request for Study of Optimum Method for Acquisition and Tracking of the WS 117L Orbital Vehicle

**TO:** Ramo-Wooldridge Corporation  
Attn: Dr. James C. Fletcher

1. It is requested that Ramo-Wooldridge perform an immediate short study to determine the optimum technique for acquisition and tracking of an orbital vehicle. This study should assume an orbital altitude of 300 miles, and that radar "skin-tracking" will not be used.

2. It is desired that the various systems, i.e., radar interferometer, etc., would be compared with respect to the following general specifications:

- a. Estimated cost.
- b. Ground and support facility requirements.
- c. Vehicle weight and power requirements.
- d. Growth capability, i.e., ability to handle increasing number of vehicle passes.
- e. Settling time, i.e., a measure of the tracking system accuracy vs the number of vehicle passes.
- f. System complexity and/or reliability.
- g. Susceptibility to jamming.
- h. Lead time for obtaining recommended system.
- i. Any other comparison deemed pertinent.

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WDTR 56-170

3. It is desired that the results of this study be transmitted to WDTR by 25 October 1956. The system comparisons should be furnished in tabular form with the assumptions and recommendations presented in letter form in sufficient quantity (5 copies) to WDTR. Not more than 2 man-months shall be devoted for this study.

SIGNED

FREDERIC G. E. ODOR  
Lt. Colonel, USAF  
Assistant for WS 117L  
Technical Operations

*How all this  
to be accomplished  
without interference  
with 107A + 2/5*

*10 working days  
2 man mos = 60  
6 men  
Don't enter time  
!!*

[REDACTED] [REDACTED]

**Subject: Project RAND Recommendation to the Air Staff**

**TO:**  
WDTL  
WDT (In Turn)

**FROM:**  
WDTR

**OCT 10 1956** COMMENT NO. 2  
Capt. Coolbaugh/dh/1344

1. The inclosed RAND Recommendation has been reviewed by WDTR, and WDT has discussed it with WDTL.

2. As far as WS 117L is concerned, the subject of infrared is not new since the application of infrared techniques to WS 117L is being given serious consideration by both WDTR and Lockheed Missile Systems Division. In fact, Lockheed Missile Systems Division has issued a report, "Preliminary Study of WS 117L Warning System Against ICBM Attack", MSD 1929, dated 6 September 1956, which deals entirely with using infrared detection techniques. This volume should be examined by the people who are concerned with acting on RAND's Recommendation, because the information contained in it is closely related and in some cases is applicable to the RAND defensive system. One copy of the report is inclosed for such use.

3. The attached report, MSD 1929, does not present a firm program which is being incorporated as a part of WS 117L. Rather, the report should be read with Lockheed's introductory qualification in mind, "This system is admittedly not the optimum one, and it is offered here solely for the purposes of discussion".

4. The discussion with Colonel Ely (WDTL) brought out the fact that there are no provisions in the existing programs at WDO to conduct experiments such as RAND suggests. He did state that, possibly, such experiments could be incorporated in the various test programs, and they might even serve a useful function, e.g., tracking of missiles by infrared equipment. The results of these experiments could also be used by WS 117L to better define an infrared reconnaissance system capable of warning of an impending ICBM attack by enemies of this country.

5. No discussions have been held with WDO on this matter.

3 Incls:

1. RAND Reccm. to the Air Staff  
WD 56-02919 (SECRET)

2. Lockheed MSD 1929, Preliminary Study of WS 117L Warning System Against ICBM Attack (DSIT-56-1539 (SECRET))

3. Memo fr Gen. Stranathan above subject, dtd 12 Sep 56

**SIGNED**

FREDERIC C. E. ODER  
Lt. Colonel, USAF  
Assistant for WS 117L  
Technical Operations

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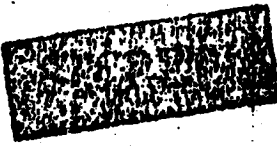
dh

Capt. Coolbaugh

1344

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WD 56-02919



WDTL

8 October 1956

MEMORANDUM FOR GEN SCHRIEVER  
THRU: Col Terhune

SUBJECT: Report on "Ballistic Missiles, Satellites, and Space Vehicles - 1956 to 1976"

1. Attached is a revised copy of the subject report for your information.

2. With the exception of the recommendations, nearly all of the material has been used in one place or another in the preparation of the draft of the final report of the Ballistic Missile and Space Vehicle Committee.

3. It is interesting to note that, although, many people from R-W, RAND, and WDT have contributed to the material and have discussed technical details at length, there has been little or no controversial discussion about the estimated development program and time schedule. This obviously does not make it correct, but it would indicate that it might not be too far out of line.

4. I plan to distribute copies to the RAND and R-W personnel who contributed, if you have no objection.

WDT

*Lawrence D. Ely*

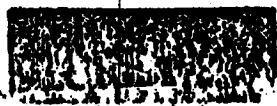
1 Incl  
Report, "Ballistic  
Missiles, Satellites,  
and Space Vehicles,  
1956 to 1976"  
WDTL 56-40

LAWRENCE D. ELY  
Colonel, USAF  
Asst for Technical Groups  
Deputy for Technical Operations

When inclosures are withdrawn the  
classification of this correspondence  
will be downgraded to *Secret*  
in accordance with AFR 208-1.

WDTL

ba



Col Ely

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WDTL 56-42

SUBJECT: Semi-Annual TOP SECRET Inventory

TO: Chief, WDTX FROM: WDTT (Maj Urban) DATE: **OCT 5 1956** COMMENT NO. 3  
 Major Urban/bmg/439

1. In accordance with instructions contained in Paragraph 1, Comment No. 1, the following is a tabulation, by office, of Top Secret documents in WDT as of 30 September 1956:

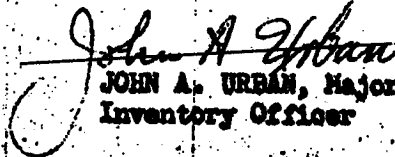
<u>Office</u>	<u>WDD Control No.</u>	<u>Unclassified Title (Long or Short)</u>
a. WDT, WDTD, WDTX	None	None
b. WDTG	WDD-55-TS-46	Proj. Atlas Prog. Progress (cy 5)
	WDD-56-TS-48	WS 117L Dev. Plan (cy 21)
	WDD-55-TS-76 (cy 42)	System 107A Proj. Atlas Dev. Plan
	WDD-55-TS-103 (cy 52)	System 107A Proj. Atlas Dev. Plan
	WDD-55-TS-85 (cy 3)	GOR ICBM Weapons System
c. WDTT	WDD-56-TS-48 (cy 19)	WS 117L Dev. Plan, Supplement
d. WDTG	None	None
e. WDTB	None	None
f. WDTI	WDD-56-TS-25 (cy 30)	AFSWP Report SWP/56-53, 2 pgs, w/ Incl. Letter 27 Feb '56
g. WDTR	WDD-56-TS-48 (cy 7 & 17)	WS 117L Dev. Plan
	WDD-56-TS-41.2A (Slide)	Contribution of ARS Program
	WDD-56-TS-48B (Slide)	Augmented 117L Flight Schedule
	WDD-56-TS-73B (cy 2 & 3)	Air Force Recon Systems
	WDD-56-TS-78B (cy 2)	Augmented 117L Flight Schedule
	WDD-56-TS-77B (cy 2 & 3)	Contribution of ARS Program
	WDD-56-TS-28 (cy 15)	Pied Piper Dev. Plan
	WDD-56-TS-42 (cy 1, 3, 4, & 5)	WS 117L Dev. Plan, Supplement
	WDD-56-TS-31 (cy 12)	Hand Report Letter 12 March 56
	WDD-56-TS-74 (cy 2)	DAPTSC #1212
	WDD-56-TS-75 (cy 1)	AFDAP #1241
	WDD-56-TS-81 (cy 1)	Dupliat Master
	WDD-56-TS-76 (cy 1)	Letter 9 July re ASD 56-TS 004
	WDD-56-TS-39 (cy 1)	DPO Cy No. 4 of 4 series A
WDD-56-TS-116 (cy 1)	Pied Piper 1st qtr Prog. Rpt (cy 30)	
WDD-56-TS-42.2 (cy 1)	One 8g by 11 Valum Chart	
	Augmented ARS Flight Schedule	
WDD-56-TS-38C (cy 1)	Proposed schedule of flights	
WDD-56-TS-26 (cy 15)	Systems Dev. Plan ARS	
h. WDTL	None	None

WDTT

SUBJECT: Semi-Annual TOP SECRET Inventory

i. WDTLA	WDD-56-13-72.1 WDD-56-13-57 WDD-56-13-65 (cy 36)	2 cys numbers 1 and 2 of 3 Memo dated 16 May 56 AFSFAAWTPaaa 100,000 A
j. WDTLG	None	None
k. WDTLP	None	None
l. WDTM (AFMTC Project Off)	<u>WDD-56-13-48 (cy 27)</u>	<u>Supplement ARS, 2 April 1956</u> * Confirmed by telecon w/Haj Zinn
m. WDTN (Edwards Rocket Base)	<u>WDD-56-13-48</u>	<u>Supplement ARS, 2 April 1956</u> * In possession of Edwards Base Adjutant

2. I certify that the above-listed material constitutes a complete and accurate inventory of Top Secret in WDTT as of 30 September 1956.

  
JOHN A. URBAN, Major, USAF  
Inventory Officer

[REDACTED]

[REDACTED]

OCT 4 1956

WDTR

SUBJECT: Use of SM-65A Missiles in the WS 117L Flight Test Program

TO: Lockheed Aircraft Corporation,  
Missile Systems Division  
Attn: Mr. J. H. Carter  
P.O. Box 504  
Sunnyvale, California

1. Reference is made to the paragraph at the bottom of page 7 in Pied Piper Progress Report for August, MSD 1958, dated 1 September 1956, in which it is stated that a study is being made of the performance of SM-65A to determine its capabilities as a booster for an orbiting Pioneer Vehicle, "on the assumption that the SM-65A may be available in quantities sufficient to provide a wealth of valuable test data early in the WS 117L program even if only a meager payload can be placed on orbit".

*for*  
2. Because the Weapon System Project Office lacks assurance that the above assumption is correct and, in fact, there is reason to believe that the number of SM-65A's available to the WS 117L Program will be small, the Missile Systems Division is requested to limit the quantity of SM-65A's to be used in the flight test program to a very small number.

3. In the event a few SM-65A missiles are made available to the WS 117L Program, they will be considered as "bonus" test vehicles to be incorporated in the established flight test program. In all probability, their use should be limited to non-orbiting flights and, certainly, because of the lack of assurance of getting them, the Pioneer Vehicle's design must not be biased in order that orbiting flights can be made by using the SM-65A as a booster.

FOR THE COMMANDER:

R. C. TRUAX  
Commander, USN

*for*  
FREDERICK G. E. ODER  
Lt. Colonel, USAF  
Assistant for WS 117L  
Technical Operations

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WDTR

Capt. Coolbaugh

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WDTR 56-163