[redacted] [redacted]

B

UNCLASSIFIED / 68∅

[illegible] WS117L

ARPA Exercise

(HISTORY OF ACTIONS ON WS 117L - OCT 1958)

DECLASSIFIED IAW E.O. 12958

REVIEWED BY [signature]

DATE 9 Jun [illegible]

DOWNGRADED AT 12 YEAR INTERVALS; NOT AUTOMATICALLY DECLASSIFIED. DOD DIR 5200.10

[redacted]

WDGK

18 OCT 1958
(in Washington)

Lieutenant General S. E. Anderson
Commander
Air Research and Development Command
Andrews Air Force Base
Washington 25, D. C.

Dear General:

During the past few months visits to this Division by ARPA and other OSD personnel of all levels have increased to the point where I am convinced that they are interfering with key members of my staff to the extent of reducing our ability to accomplish our primary mission.

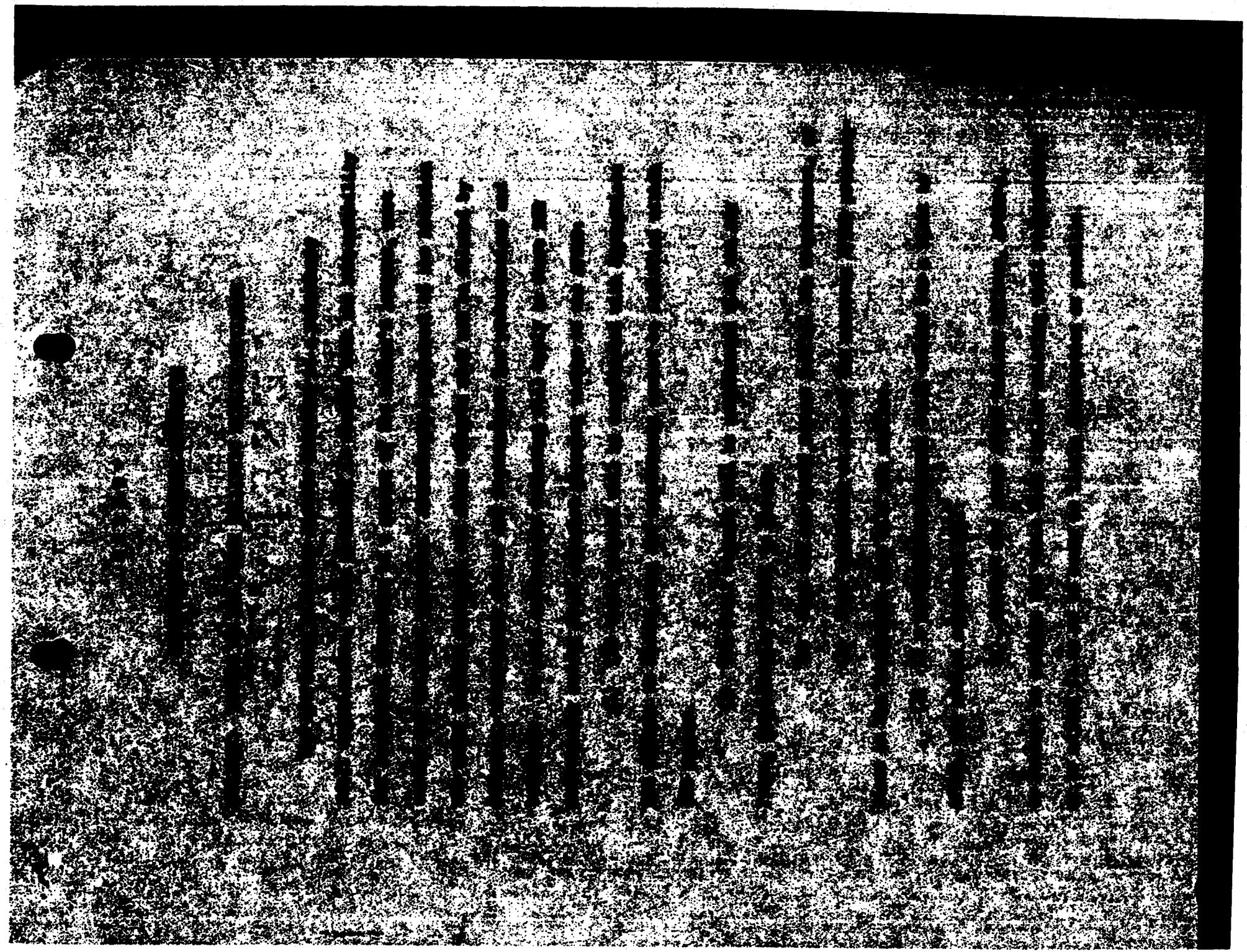
During the first week of this month alone, we had ten separate and distinct visits involving twenty-four OSD personnel. As you know, these are by no means our only category of visitors. We are never consulted as to the best time to fit them into our overcrowded schedule.

These OSD visitors often arrive with little or no notice, with no indication as to the purpose of their visit, an inadequate background in the subject to be discussed, and an over-ambitious program involving minute examination of the most minor technical details of our projects. Since they often attempt to revise in a matter of hours the product of months of the most careful, complicated and professional engineering planning, such visitors require the attention of my top people. Colonel Terhune, my Deputy Commander, Ballistic Missiles, estimates he spends one-tenth of his time with OSD visitors alone.

Usually these visits are in themselves only a beginning, resulting in further requirements for special reports, presentations, and briefings.

Some specific examples and details are in order. Two weeks ago an ARPA Ad Hoc Group met with members of my WS 117L Project Office. The following points are of interest regarding this visit:

WDGK Mary Peck
Maj Pee 2461



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EZ ERASE

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TAB NO.	IDENTIFICATION
A	AFCGM TWX 54161 dated 8 August 1958
B	AFCGM TWX 56504 dated 28 August 1958
C	Letter from ARPA to Commander, AFBMD dated 10 Sept 58, Subject: Re-definition of WS 117L
D	Telecon - Major Zelenka and Major Johnson, Hq USAF, on 18 Sept 58
E	15 Sept 58 Development Plan Briefing Charts
F	Sentry Program, Statement of Requests to BMD by ARPA Ad Hoc Project Group
G	Memorandum for Commander, AFBMD from ARPA dated 25 Sept 58, Subj: ARPA Ad Hoc Group on Project Sentry and Follow-on Program
H	Memorandum for Record dated 29 Sept 58, Subject: Guidance Concerning ARPA Memorandum, 25 Sept 58, "ARPA Ad Hoc Group on Project Sentry and Follow-on Program"
I	FY 59-60 Costs for SENTRY/THOR Program Presented to ARPA Group
J	Memo to Col Oder dated 17 Oct 58, subject: Items Covered with ARPA on Facilities
K	Memo to Col Evans, subj: ARPA Briefing on Subsystem B
L	Memo to Col Evans, subj: Subsystem C Comments to ARPA Committee, 3 Oct 58
M	Memo to Col Evans, subj: Subsystem E Information Given to ARPA Committee
N	Memos to Col Evans, subj: ARPA Briefing for Subsystems F and H
O	Memo to Col Evans, subj: Information Presented to ARPA Committee on Subsystem I
P	Memo to Col Evans, subj: ARPA Visit, Subsystem J

TAB NO.	
Q	Memo for Record, subj: Expressed Views of ARPA Ad Hoc Group
R	Memo for Col Seay dated 3 Oct 58, subj: ARPA Ad Hoc Group
S	Letter from Commander, AFBMD to Director, ARPA, dated 9 Oct 58, relative to re-definition of WS 117L
T	Letter to ARPA from Commander, AFBMD (not signed)

COPY

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[redacted]

106495

RECEIVED WDDARDC
ACTION WDTSR
6 Aug 1958

HQA011
PP RJWZBK
DE RJEPHQ 180

P 061938Z ZEX
FM HQ USAF WASH DC
TO RJWZBK/COMAFBMD ARDC INGLEWOOD CALIF
INFO RJEZFF/COMARDC ANDREWS AFB MD
BT

DOWNGRADED AT 12 YEAR INTERVALS; NOT AUTOMATICALLY DECLASSIFIED. DOD DIR 5200.10

//SECRET//FROM AFCCM 54161
RECENT INSTRUCTIONS PASSED TO DEPT OF THE AF FROM ARPA RE WS-117L PROGRAM ARE PROMULGATED FOR YOUR COMPLIANCE.

MSG IN FOUR (4) PARTS.

PART I. PROCUREMENT OF LONG-LEAD TIME ITEMS FOR ADDITIONAL THOR-WS 117L VEHICLES.

1. IN VIEW OF LONG LEAD-TIME REQUIREMENTS, IT APPEARS DESIRABLE TO AUGMENT PLANNED THOR-WS 117L VEHICLE FIRING SCHEDULE AT THIS TIME. AUGMENTATION WILL CONSIST OF 9 VEHICLES IN ADDITION TO THE 10 CURRENTLY AUTHORIZED. NEW BASIS FIRING SCHEDULE TO BE 1 PER MONTH BEGINNING NOVEMBER 1958 AND 2 PER MONTH BEGINNING APRIL 1959.

2. YOU ARE AUTHORIZED AND DIRECTED TO TAKE SUCH ACTION AS NECESSARY TO PROCURE LONG-LEAD TIME ITEMS TO SUPPORT THIS FIRING SCHEDULE. MINOR ADJUSTMENTS OF THE TOTAL AND CHANGES OF ALLOCATION OF FIRINGS BETWEEN PROGRAMS MAY BE EXPECTED AS THESE REQUIREMENTS ARE REVIEWED FURTHER. BASIC INTENT FOR UTILIZATION OF ADDITIONAL VEHICLES IS BIO-MEDICAL EXPERIMENTATION, ALTHOUGH NOT AT THIS TIME LIMITED TO BIO-MEDICAL USE. SEVERAL SPECIAL PAYLOADS MAY BE SPECIFIED AT A LATER DATE TO INVESTIGATE AND MEASURE CERTAIN SUSPECTED SPACE PHENOMENA.

3. AFBMD AND LOCKHEED MISSILE SYSTEMS DIVISION WILL PROVIDE SECURE ARRANGEMENTS SO THAT THESE PAYLOADS CAN BE HANDLED ON A SENSITIVE BASIS.

4. IN CONNECTION WITH SOME POSSIBLE PAYLOADS, IT APPEARS THAT THE LOAD CARRYING CAPABILITY OF THE VEHICLE SYSTEM WILL BE TAXED. THIS IS TURN WILL DICTATE LOW ALTITUDE ORBITS.

PART II. WS117L DEVELOPMENT PLAN.

1. THE ARPA HAS PROGRAMMED $215 MILLION FOR OBLIGATION IN FY 1959 ON BEHALF OF THE WS 117L PROGRAM.

2. THE TOTAL OF $215 MILLION IS INTENDED TO COVER THE FOLLOWING:

[redacted]

[redacted]

WDSMCC-58-2109
Series B
Cy 1 of 3

COPY

[redacted]

106495
REC'D WDDARDC
ACTION WDTSR
6 Aug 58

PAGE TWO
P 061938Z ZEX
FM HQ USAF WASH DC
TO RJWZBK/COMAFBMD ARDC INGLEWOOD CALIF

PART II. (CONTINUED)

A. THE 117L PROGRAM PRESENTED TO ARPA ON 24 JUNE 1958.

B. GEN FLICKENGER'S PROGRAM (SUBSYSTEM L - ESTIMATED AT $7.9 MILLION).

C. $18.0 MILLION WORTH OF LONG-LEAD TIME ARTICLES NECESSARY TO ACCOMPLISH THE PROGRAM IIA AUGMENTATION PLAN REFERENCED IN PART I, THIS MESSAGE.

($13.0 MILLION IS BEING PROGRAMMED BY ARPA IN FY 1960 TO COMPLETE THE PURCHASE OF THIS AUGMENTATION PROGRAM.)

3. MR. GISE OF ARPA HAS REQUESTED THAT THE REVISED DEVELOPMENT PLAN REFLECT THE SAME P-300 COSTS AS PRESENTED TO ARPA ON 24 JUNE 1958 ($23.4 MILLION).

4. DESIRE YOU EXPEDITE SUBMISSION OF NEW DEVELOPMENTAL AND FUNDING PLAN IN AMOUNT OF $215 MILLION TOGETHER WITH AN ASSESSMENT OF THOSE ELEMENTS OF THE PROGRAM THAT COULD BE CONDUCTED ON A MORE OPTIMUM BASIS IF ADDITIONAL FUNDS WERE MADE AVAILABLE, AND THE AMOUNT REQUIRED THEREFOR.

PART III. REQUEST THIS HEADQUARTERS BE ADVISED:

1. FEASIBILITY OF MEETING NEW THOR-WS117L FIRING SCHEDULE OUTLINED IN PART 1.

2. EARLIEST DATE ANTICIPATED FOR SUBMISSION OF NEW DEVELOPMENT PLAN.

PART IV. BUDGET HAS COORDINATED.

WDSMCC-58-2109
Series B
Cy 1 of 3

[redacted]

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[redacted]

HQA020
PP RJWZBK
DE RJEZHQ
P R 281947Z
FM HEDUSAF WASH DC
TO RJWZBK/COMAFBMD ARDC INGLEWOOD CALIF
INFO RJEZFF/COMARDC ANDREWS AFB MD
RJWZPK/ASST. CINCSAC MIKE INGLEWOOD CALIF
INFO: SAC MIKE
BT

1C7281
RECEIVED
WDT-WDGE
28 Aug 58

//SECRET// FROM AFCGM 56504
REFERENCE MSG THIS HQ 54161 DATED 5 AUGUST 1958.
THIS MSG IN THREE (3) PARTS.
P
PART I.

1. IT IS DESIRED THAT AFBMC BE BRIEFED, PRIOR TO FORMAL PRESENTATION TO ARPA, ON REVISED WS-117L DEVELOPMENT PLAN ENCOMPASSING $215 MILLION FY 1959 FUNDING LEVEL AND FY 1960 COST ESTIMATES. AFBMC BRIEFING IS SCHEDULED FOR 1430 HOURS, 24 SEP 58.

2. REVISED PLAN SHOULD BE DEVELOPED ALONG FOLLOWING LINES:

A. WITHIN PARAMETERS OUTLINED IN MSG REFERENCED ABOVE.

B. UTILIZE AS FUNDING CRITERIA THE "GENERAL GUIDE FOR REPRESENTATIVE WORK ITEMS -- FOR ARPA PROJECTS" CURRENTLY IN YOUR POSSESSION ON AN INFORMAL BASIS. ARPA HAS FORMALIZED USE OF THIS CRITERIA 27 AUG 58. DIRECTION AND ADDITIONAL COPIES FORWARDED BY ARPA SAME DATE.

C. ITEMS TO BE FINANCED WITH AF FUNDS SHOULD BE SPLIT-OUT SEPARATELY FROM OVERALL $215 MILLION FUNDING.

D. FY 1960 FUNDING ESTIMATES SHOULD BE INCLUDED AND BROKEN OUT BY CATEGORY.

3. YOU SHOULD BE PREPARED TO MAKE RECOMMENDATIONS TO AFBMC FOR ANY CHANGES CONSIDERED DESIRABLE IN THE FUNDING CRITERIA, REFERENCED IN PARAGRAPH 2B ABOVE, I.E., CHANGES WHEREIN CERTAIN ESSENTIALLY SUPPORT ITEMS, PRESENTLY SHOWN AS REIMBURSABLE FROM ARPA FUNDS, LOGICALLY MIGHT BE FUNDED BY THE AIR FORCE IN THE INTEREST OF EXPEDITING AND INCREASING RELIABILITY OF THE PROGRAM. INCREASE IN "HARD CORE" R&D EFFORT, AS RESULT OF ADDITIONAL AF ABSORPTION OF SUPPORT COSTS, SHOULD BE SHOWN.

4. IT IS DESIRED THAT REVISED DEVELOPMENT PLAN DOCUMENTS BE FORWARDED IN TIME TO REACH THIS HQ NOT LATER THAN 7 DAYS PRIOR TO SCHEDULED AFBMC BRIEFING.

PART II.

5. TO INSURE EARLY INCLUSION OF WS-117L R&D SUPPORT OF WS-117L R&D PROGRAM FOR FY 60. FUNDING CATEGORY BREAKDOWN IS DESIRED.

A. AN ESTIMATE OF FY 60 AIR FORCE OPERATIONAL COSTS, DEVELOPED IN COORDINATION WITH SAC AN[redacted] SAC ATTAINMENT OF A LIMITED 117L IOC

[redacted] 58-2343 - Series A - Cy 1 of 6

[redacted] COPY [redacted]

1 JAN 1961, AGAIN BROKENOUT BY FUNDING CATEGORY.

PART III.

6. ARPA HAS BEEN INFORMED OF PART I THIS MESSAGE.

[redacted]

[redacted]

NDSMCC-58-2343

Series A

Cy 1 of 6

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ADVANCED RESEARCH PROJECTS AGENCY
WASHINGTON 25, D.C.

SEP 10 1958

MEMORANDUM FOR COMMANDER, AIR FORCE BALLISTIC MISSILE DIVISION
AIR RESEARCH AND DEVELOPMENT COMMAND
INGLEWOOD, CALIFORNIA

SUBJECT: Re-definition of WS-117L

For reasons of budget justification and program management, the ARPA wishes to separate, and assign different terminology to, the several programs being conducted under WS-117L. It is requested that use of the term WS-117L be abandoned and the name SENTRY be applied only to those operational capabilities previously designated as Pioneer Visual (Program II) and Pioneer Ferret (Program III). All items required to complete development of these systems will be budgeted as the SENTRY program. All other items will be budgeted not as systems, but as subsystems and/or components. Systems work applicable to advanced systems, and other items which cannot be identified with any specific component or subsystem will be budgeted separately. A suggested breakdown is attached as Incl #1.

In any case where common costs cannot, on any reasonable basis, be pro-rated between the SENTRY project (as defined above) and advanced work, the entire cost should be retained as part of SENTRY.

Since preparation of the FY 1959 development plan and FY 1960 budget is essentially complete, this procedure will become effective with the preparation of any future fiscal documents. However, for immediate program management and budgetary purposes, an addendum to your current development plan and budget should be supplied at an early date, summarizing the adjustments in estimates necessary to place them on the new basis.

The BMD should take necessary action to insure that the above policy can be fully effective by FY 1960. At such time as the nature and operational dates of advanced systems become fairly firm, it may be advisable to assign them separate names.

The above discussion relates only to work covered by the current WS-117L development plan and existing contracts. Any new work requires review and approval by ARPA.

[redacted]

/s/ Roy W. Johnson

ROY W. JOHNSON
Director

1 Incl
Suggested Breakdown

[redacted]

WD-58-06315
Series A

COPY

[redacted] [redacted]

SUGGESTED BREAKDOWN

SENTRY - Consisting of:

Pioneer Systems Work

Pioneer Vehicle
- Airframe
- Propulsion
- Guidance
- APU

) Only items that can reasonably be expected to be incorporated in the initial operational capability.

Pioneer Visual Payload

Pioneer Ferret Payload

Ground-Space Communications

Data Processing

Facilities for Pioneer Systems

Boosters for Flights Having Pioneer Missions

Pro-rated Management Costs

Improved Military Space Subsystems

Systems Work

Visual Payloads

Ferret Payloads

Infrared Payloads

Propulsion Systems

Booster Modifications

Airframes

Guidance

G/S Communications

Data Processing [redacted]

Management Costs

[redacted]

WD-58-06315
Series A
Cy 1 of 2

[redacted]

IC-74 SERIES ____

17 SEP 58

TELECONFERENCE BETWEEN MAJOR ZELENKA AFBMD AND MAJOR JOHNSON HQ USAF

SUBJECT: BUDGET FORMAT FOR ARPA REPORT

AFBMD ITEM 1 /SECRET

THE FOLLOWING MATERIAL IS FOR GENERAL SCHRIEVER ONLY PD NO COPIES ARE TO BE MADE WHICH ARE NOT DELIVERED TO GENERAL SCHRIEVER PD TRANSMITTED FOR YOUR INFORMATION IS FOLLOWING FROM MR JOHNSON CMM DIRECTOR CMM ARPA PD QUOTE MEMO FOR COMDR AFBMD ARDC INGLEWOOD CALIFORNIA

SUBJECT CLN RE-DEFINITION OF WS 117L
FOR REASONS OF BUDGET JUSTIFICATION AND PROGRAM MANAGEMENT CMM THE ARPA WISHES TO SEPARATE CMM AND ASSIGN DIFFERENT TERMINOLOGY TO CMM THE SEVERAL PROGRAMS BEING CONDUCTED UNDER WS 117L PD IT IS REQUESTED THAT USE OF THE TERM WS 117L BE ABANDONED AND THE NAME SENTRY BE APPLIED ONLY TO THOSE OPERATIONAL CAPABILITIES PREVIOUSLY DESIGNATED AS PIONEER VISUAL /PROGRAM II/ AND PIONEER FERRET /PROGRAM III/PD ALL ITEMS REQUIRED TO COMPLETE DEVELOPMENT OF THESE SYSTEMS WILL BE BUDGETED AS THE SENTRY PROGRAM PD ALL OTHER ITEMS WILL BE BUDGETED NOT AS SYSTEMS CMM BUT AS SUB-SYSTEMS AND/OR COMPONENTS PD SYSTEMS WORK APPLICABLE TO ADVANCED SYSTEMS CMM AND OTHER ITEMS WHICH CANNOT BE IDENTIFIED WITH ANY SPECIFIC COMPONENT OR SUBSYSTEM WILL BE BUDGETED SEPARATELY PD A SUGGESTED BREAKDOWN IS ATTACHED AS INCL NR 1 PD IN ANY CASE WHERE COMMON COSTS CANNOT CMM ON ANY REASONABLE BASIS CMM BE PRO-RATED BETWEEN THE SENTRY PROJECT/AS DEFINED ABOVE/ AND ADVANCED WORK CMM THE ENTIRE COST WOULD BE RETAINED AS PART OF SENTRY PD SINCE PREPARATION OF THE FY 1959 DEVELOPMENT PLAN AND FY 1960 BUDGET IS ESSENTIALLY COMPLETE CMM THIS PROCEDURE WILL BECOME EFFECTIVE WITH THE PREPARATION OF ANY FUTURE FISCAL DOCUMENTS PD HOWEVER CMM FOR IMMEDIATE PROGRAM MANAGEMENT AND BUDGETARY PURPOSES CMM AN ADDENDUM TO YOUR CURRENT DEVELOPMENT PLAN AND BUDGET SHOULD BE SUPPLIED AT AN EARLY DATE CMM SUMMARIZING THE ADJUSTMENTS IN ESTIMATES NECESSARY TO PLACE THEM ON THE NEW BASIS
THE BMD SHOULD TAKE NECESSARY ACTION TO INSURE THAT THE ABOVE POLICY CAN BE FULLY EFFECTIVE BY FY 1960 PD AT SUCH TIME AS THE NATURE AND OPERATIONAL DATES OF ADVANCED SYSTEMS BECOME FAIRLY FIRM CMM IT MAY BE ADVISABLE TO ASSIGN THEM SEPARATE NAMES PD THE ABOVE DISCUSSION RELATES ONLY TO WORK COVERED BY THE CURRENT WS 117L DEVELOPMENT PLAN AND EXISTING CONTRACTS PD ANY NEW WORK REQUIRES REVIEW AND APPROVAL BY ARPA PD SIGNED ROY W JOHNSON DIRECTOR UNQUOTE
REFERENCE YOUR CONVERSATIONS 17 SEPT WITH COL EVANS REGARDING CONTENTS ABOVE AND SUBSEQUENT TELECONS MR GISE ARPA AND COL EVANS ON 16 SEP AND 17 SEP 58 PD PREPARED FOR YOUR USE IN EVENT NECESSARY IS BREAKDOWN OF FY 60 FUNDING AS PER FORMAT AND BREAKDOWN SUGGESTED BY ARPA PD ARPA SHOULD USE THESE FIGURES FOR BUDGETING PURPOSES ONLY AND NOT AS A FINANCIAL PLAN PD THE FIGURES ARE BASED UPON 15 SEPT 58 DEVELOPMENT PLAN SUBMISSION BOTH AS TO BUDGET AND SCHEDULE PD SINCE ADVANCED VISUAL IS SCHEDULED FOR NOV 61 AND ADVANCED FERRET IS SCHEDULED FOR APRIL 1961 FLIGHT HARDWARE COSTS FOR THESE EFFORTS ARE NOT CONTAINED IN FY 60 BUDGET PD THE COSTS UNDER HEADING OF IMPROVED MILITARY SUBSYSTEMS ARE TO COVER RESEARCH AND DEVELOPMENT EFFORTS ONLY PD

		SENTRY	IMPROVED MILITARY SPACE SYSTEMS
A.	SYSTEMS WORK	42.118	14.000
B.	1/AIRFRAME	7.107	-0-
	2/Propulsion	8.974	4.100
	3/GUIDANCE	7.830	-0-
	4/APU	6.083	2.000

[redacted]

[redacted]

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[redacted]

[redacted]

C, E/PAYLOAD COST	21.082	15.000
D. F/PAYLOAD COST	11.872	6.000
3. H/ COST COMPLETE APPLIED TO IOC	30.426	5.000
F. DATA PROCESSING IN SUPPORT OF IOC	13.000	6.000
G. FACILITIES IN SUPPORT OF IOC INCLUDES INDUSTRIAL FACILITIES	16.463	-0-
H. ALL BOOSTER COSTS	27.869	-0-
I. PRORATED MANAGEMENT COSTS	4.942	-0-
J. OTHER		
1/SUBSYSTEM L	7.178	-0-
2/GROUND SUPPORT	16.437	-0-
3/MIT	-0-	2.070
4/AFCRC	1.020	-0-
5/STL	1.000	-0-
6/MIPR/MISC	.900	-0-
7/SUPPORT	18.505	-0-
SUB TOTAL	242.806	54.170

TOTAL PROGRAM COST CLN 296.976
NOTE CLN SUBSYSTEM "G" TO BE SUBMITTED SEPARATELY
END AFBMD ITEM 1 ?SECRET/

[redacted]

[redacted]

SENTRY

WD2 WS-4647

[redacted] [redacted]

MISSION SENTRY WEAPONS SYSTEM

RESPONSIBLE FOR THE DESIGN, DEVELOPMENT, TECHNIQUES, AND FABRICATION OF A SATELLITE RECONNAISSANCE WEAPONS SYSTEM TO INCLUDE:

(1) THE CAPABILITY TO PERFORM WORLD-WIDE RECONNAISSANCE BY VISUAL, FERRET AND OTHER METHODS OF OPPORTUNITY.

(2) A GROUND ENVIRONMENT COMPOSED OF SUITABLE COMMUNICATIONS AND FACILITIES TO LAUNCH, PLACE IN ORBIT, MONITOR, AND CONTROL SATELLITE WHILE IN ORBIT.

(3) THE CAPABILITY TO COLLECT RESULTING RECONNAISSANCE DATA, PROCESS THE DATA AND DISSEMINATE THE RESULTING INTELLIGENCE INFORMATION IN A MANNER RESPONSIVE TO THE NEEDS OF THE USER.

[redacted] [redacted]

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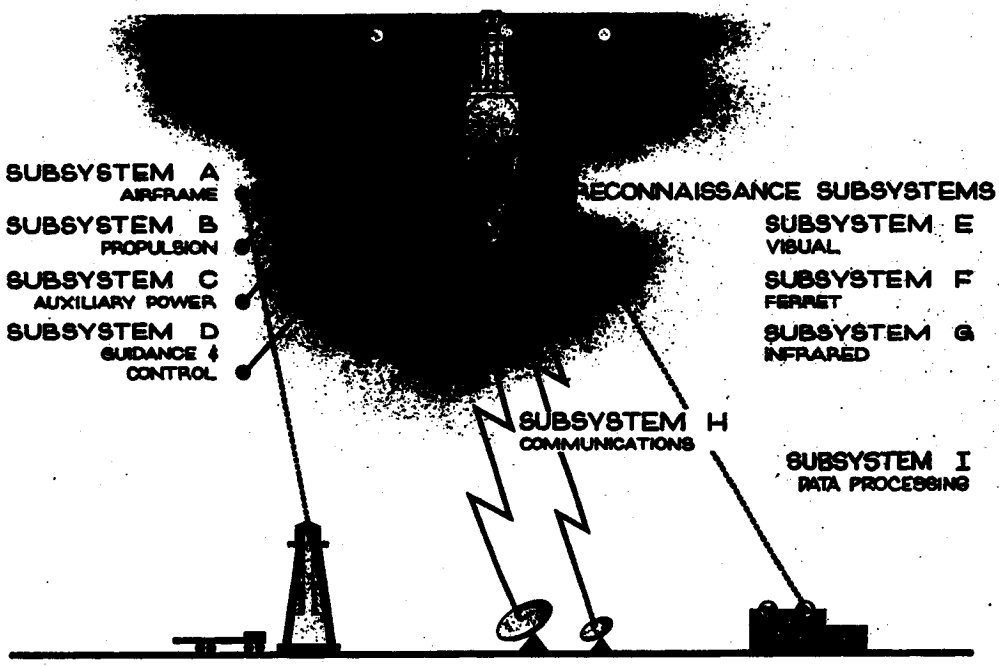

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SENTRY [redacted] SUBSYSTEMS

A. AIRFRAME

- TANKAGE
- FAIRINGS & STRUCTURE
- LM&D FURNISHED MOD. ITEMS FOR BOOSTER

B. PROPULSION

- ENGINES (1 MAIN; 2 ULLAGE)
- PROPELLANT SYSTEM
- GIMBALS
- ENGINE START AND STOP

C. AUXILIARY POWER

- ALL ELECTRIC POWER
  - EARLY FLIGHTS – SILVER-ZINC BATTERIES
  - LATER FLIGHTS – SOLAR; NUCLEAR

D. GUIDANCE AND CONTROL

- DURING BOOST
  - PROVIDE TRAJECTORY
  - TERMINATE BOOSTER THRUST
  - SEPARATE SATELLITE
- DURING COAST AND ORBITAL BOOST
  - STABALIZE
  - DIRECT
  - INITIATE AND TERMINATE ORBITAL BOOST

[redacted]

[redacted]

WDZW1 -467

[redacted] [redacted]

SENTRY SUBSYSTEMS

E- VISUAL RECONNAISSANCE

- IN VEHICLE- COLLECT, PROCESS, STORE, AND CONVERT VISUAL INTELLIGENCE FOR TRANSMISSION
- ON GROUND-RECONSTITUTE SIGNALS INTO USEFUL INFO

F- FERRET

- COLLECT, PROCESS, STORE, AND CONVERT FOR TRANSMISSION ELECTRONIC INTELLIGENCE (50-40,000 MC)

G- INFRARED RECONNAISSANCE

- COLLECT, PROCESS, STORE, AND CONVERT FOR TRANSMISSION INFRARED INTELLIGENCE (1-12 MICRON)

H - GROUND-SPACE COMMUNICATION

- DETERMINE POSITION
- PROGRAM & COMMAND PAYLOAD FUNCTIONS
- RECEIVE, MONITOR, & ENCODE DATA FROM SUBSYSTEMS
- COMMUNICATE WITH VEHICLE
- COMMAND & ADMINISTRATIVE GROUND COMM. NETWORK

[redacted] [redacted] WDZ W 51 167

[redacted] [redacted]

SENTRY SUBSYSTEMS

I. INTELLIGENCE DATA PROCESSING
- *ACCEPT & PROCESS DATA TO PROVIDE :*
  - *INTERPRETATION REPORTS*
  - *TRANSCRIPTION OF RECONNAISSANCE DATA*
  - *FEEDBACK OF INFORMATION TO VEHICLE FOR OPTIMUM OPERATION*

J. GEOPHYSICAL ENVIRONMENT
- *ENVIRONMENTAL INFORMATION ON:*
  - *METEOR PHYSICS*
  - *DENSITY*
  - *ULTRA-VIOLET & X-RAY RADIATION*
  - *THERMAL RADIATION*

K. QUALITATIVE PERSONNEL REQUIREMENTS INFORMATION (QPRI)
- *QPRI ON PERSONNEL TO OPERATE & MAINTAIN SYSTEM*

L. BIOMEDICAL RECOVERY CAPSULE
- *RECOVER LIVING SPECIMENS*
- *STUDY PSYCHO-PHYSIOLOGIC RESPONSE*
- *GAIN EXPERIENCE & CONFIDENCE IN RECOVERY*

[redacted]

[redacted]

[redacted] [redacted]

OTHER MAJOR WORK AREAS

GROUND SUPPORT EQUIPMENT (GSE)

- EQUIPMENT TO SUPPORT SENTRY VEHICLE FROM FACTORY TO LAUNCH.
  - INCLUDES:
    - LAUNCH MONITOR & CONTROL
    - SYSTEM & SUBSYSTEM CHECKOUT SERVICING & HANDLING.
  - EXCLUDES:
    - GSE FOR BOOSTER

TEST OPERATIONS

- WIND TUNNEL
- SUBSYSTEMS
- GSE
- CAPTIVE
- FLIGHT

FACILITIES

- LAUNCH FACILITIES
- ASSEMBLY BUILDINGS
- TRACKING & TELEMETRY STATIONS
- INTELLIGENCE CENTER

[redacted] [redacted]

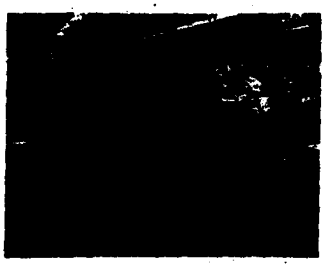
WDZW(3)-#4

[redacted]

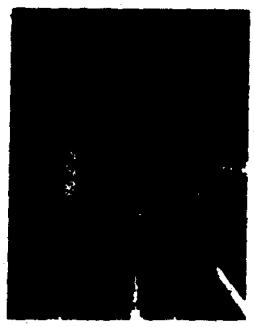
9086 10

SENTRY VEHICLE DEVELOPMENT

SENTRY VEHICLES IN VARIOUS STAGES OF ASSEMBLY AND INSPECTION ON THE ASSEMBLY LINE AT THE LOCKHEED MISSILE SYSTEM DIVISION.







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WDZ WSI 467

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9087 10

SENTRY VEHICLE DEVELOPMENT

PROPELLANT TANK INSTALLATION, MATING OF MID-BODY SECTIONS & ALIGNMENT OF VEHICLE AIRFRAME SECTION.

STACKING OF FORWARD MID-BODY SECTIONS, PRIOR TO MATING WITH THE AFT-BODY SECTION.

AIRFRAME SECTIONS OF THE FIRST FLIGHT ARTICLE ASSEMBLED.

FINAL STAGE, GIMBAL MOUNTED ENGINE

[redacted]

WDZW58 .47

[redacted]

HISTORY OF 1 JULY 1958 DEV PLAN (197.9)

ITEM	DATE	$	MAIN POINTS
I DEV PLAN FCI. SCHED: 9 ATLAS AFNTC 10 THOR COOKE 1ST VISUAL COOKE 1ST FERRET COOKE	15-MAR-58 BEGINNING JUNE 59 BEGINNING NOV 58 BEGINNING MAR 60 BEGINNING APR 60	214.9	BASIS SCHED ATLAS IN, THOR OUT
II TWX AFCGM 59270	10-APRIL-58	152.0	PLAN ON 152.0; REMAIN FLEXIBLE
III LTR BMD TO USAF	21-APRIL-58	(a) 152.0 (b) 152.0 (c) 185.9	ATLAS AND THOR IN; DOMESTIC CUTS ATLAS AND THOR OUT; REDUCE PROGRAM ATLAS & THOR OUT; UDMH IN; DPACHED
IV TWX AFCVC 50190	29-APRIL-58	185.9	BASIS FOR IIIc APPROVED; START AT 152.0; STAY FLEXIBLE.
V TWX AFCGM 51207	23-MAY-58	(a) 220.9 (b) 185.9 (c) 152.0	GIVE BRIEFING; INCLUDE ALL COSTS WITHIN EACH TOTAL.
VI TWX RDZGW 6-32-E	25-JUN-58	197.9	QUOTES JOHNSON, QUARLES, McELROY. APPROVE $197.9 FOR OPTION V b. THIS MOD OPTION V c INCLUDED THOR & ATLAS COSTS AND FOLLOWING POINTS: (1) DELETE 4 ATLAS LAUNCHES AT AFNTC (2) SLIP 1ST VISUAL MAR-MAY 60 (3) SLIP 1ST FERRET APR.-AUG 60 (4) NO BIOMEDICAL COSTS.

[redacted]

WDZW(

[redacted] [redacted]

DIRECTIVES SUBSEQUENT TO 1 JULY 58 DEL PLAN

		TABULATION ITEM	TABULATION RUNNING TOTAL
I TWX AFCGM 54161: 8 AUG 58	1. SETS PROGRAM AT $215. CONSISTS OF:		
	a. WORK COVERED IN 24 JUNE 58 PRESENTATION	197.9	197.9
	b. $18.0 FOR 9 ADDITIONAL THOR/ATL	18.0	215.9
	C. BIOMEDICAL (COSTED AT $7.9)	7.9	223.8
	2. INVITES RECOMMENDATIONS FOR INCREASES IN PROGRAM		
II TWX AFCGM 56504: 28 AUG 58	1. DIRECTS NEW DEV PLAN AS FOLLOWS:		
	a. $215. TOTAL, SAME WORK AS ABOVE		
	b. USE 27 AUG 58 ARPA-USAF SUPPORT AGREEMENT	7.4	231.2
	C. INDENTIFY AF-FUNDED ITEMS SEPARATELY		
	d. NO CHANGE IN FACILITIES ($23.4)		
	2. DIRECTS AFBMD TO RECOMMEND CHANGES TO 27 AUG 58 AGREEMENT (MORE AF SUPPORT) AND STATE EFFECT ON PROGRAM		

[redacted] WDJ [redacted]

[redacted] [redacted]

ANALYSIS OF SENTRY PROGRAM COSTS

BASIC I JULY 58 DEVELOPMENT PLAN————————197.9

CHANGES:

	−	+	
BIOMEDICAL		7.9	
9 ADDITIONAL THOR/117L'S		18.0	
LOCKHEED ESTIMATE VARIATION		19.0	
INCREASED SUPPORT COSTS		7.4	
CANCELLATION OF AFMTC LAUNCHES	19.0		
TOTAL	19.0	52.3	281.2

[redacted] [redacted]

WDZW-467

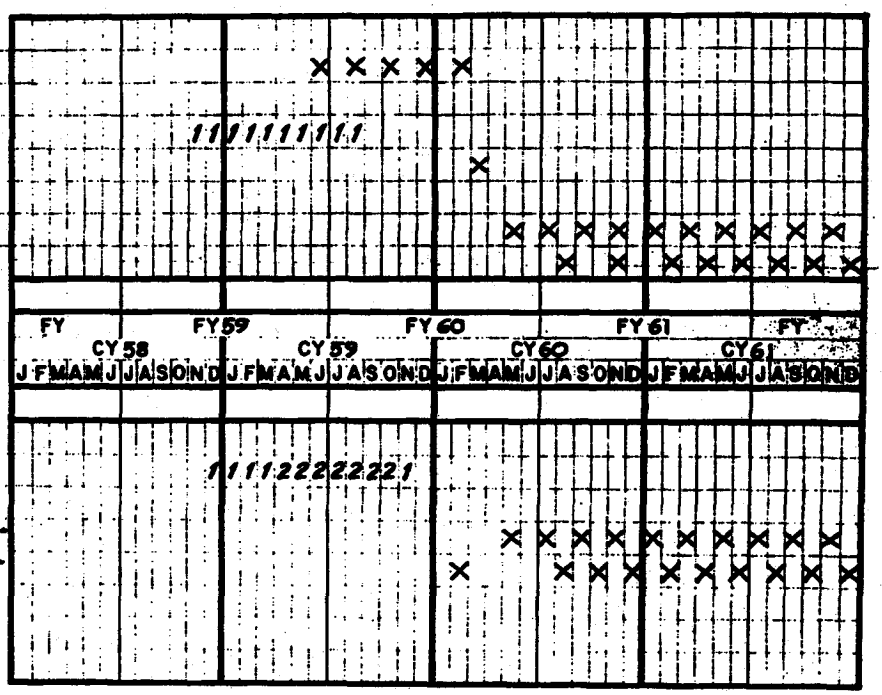
[redacted]

SENTRY PROGRAM SCHEDULE

1 JULY 1958
$187.9

AFMTC
- ATLAS

COOKE AFB
- THOR
- ATLAS ORBIT CAPABILITY
- ATLAS :
  - VISUAL RECONNAISSANCE SS "F"
  - FERRET RECONNAISSANCE SS "F"



15 SEPT 1958
$231.2

COOKE AFB:
- THOR BOOSTED PROGRAM
- ATLAS BOOSTED PROGRAM
- VISUAL RECONNAISSANCE REV. SS "F"
- FERRET RECONNAISSANCE REV. SS "F"

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WDZLY 3-467

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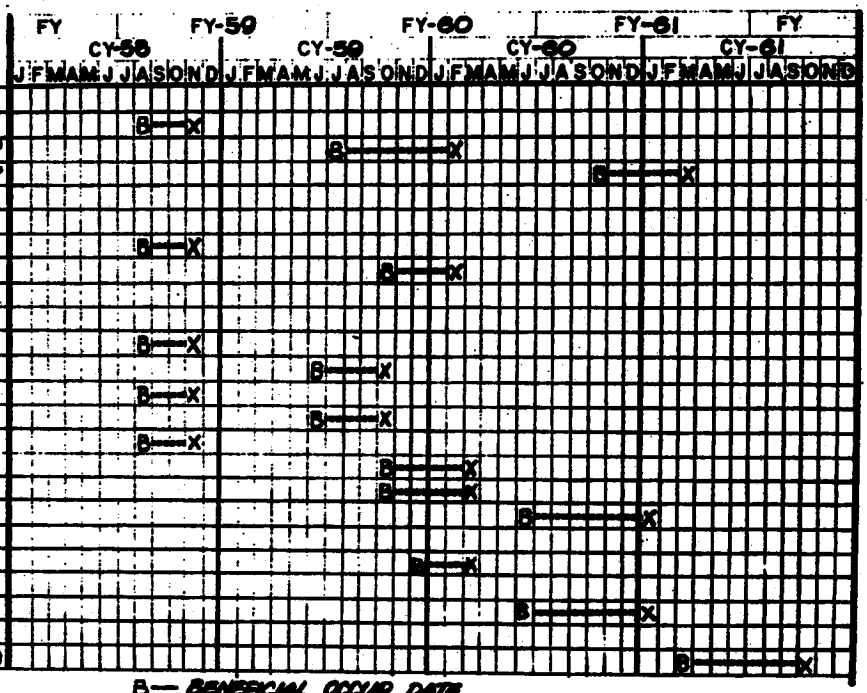
9082 10
R-1

SENTRY FACILITIES SCHEDULE

15 SEPT. 1958



B— BENEFICIAL OCCUP. DATE
X— FULL CAPABILITY

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WDZW58 467

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SENTRY FUND PROGRAM

	FY 59	FY 60
TECH		
P-100	110.181	169.489
P-200	49.478	55.118
P-300	23.387	10.770
P-600	35.715	43.094
SUB-TOTAL TECH	218.761	278.471
SUPPORT		
P-100	.850	1.045
P-200	2.400	4.853
P-400	.880	3.685
P-600	8.332	8.922
SUB-TOTAL SUPPORT	12.462	18.505
PROGRAM TOTAL	231.223	296.976

[redacted]

WDZWS 44

[redacted]

FACILITIES FUNDING SUMMARY FOR SENTRY

ITEM CATEGORY	BUDGET ESTIMATE				
	PRIOR YRS	FY 59	FY 60	FY 61	TOTAL
LAUNCH PATRICK AFB MISSILE SUPPORT PATRICK AFB	.049				.049
LAUNCH COOKE AFB		6.300	6.000		12.300
MISSILE SUPPORT COOKE AFB	.225	3.000			3.225
TRACKING & TELEMETRY (TEST) COOKE AFB	3.193				3.193
TRACKING & TELEMETRY (TEST) HAWAIIAN IS.	2.200				2.200
TRACKING & TELEMETRY (RECOVERY) ALASKA	.080				.080
TRACKING & TELEMETRY (TEST) NAMTC PT. MUGU	.020				.020
TRACKING & TELEMETRY (DATA-ACQ) FT. STEVENS		3.369			3.369
TRACKING & TELEMETRY (DATA-ACQ) N.W. USA		3.369			3.369
TRACKING & TELEMETRY (DATA-ACQ) CENTRAL USA		3.369			3.369
DEVELOPMENT CONTROL & INTELL. CENTERS-VARIOUS		2.780	4.120		6.900
ADVANCED PROJECT PLANNING ALL ITEMS	.390	1.200	.650		2.240
TOTALS	6.157	23.387	10.770		40.314

[redacted]

WD-[illegible]

[redacted] [redacted]

SENTRY SUPPORT COSTS

	1 JULY DEV. PLAN	FY 59	INCREASE FY59	FY60
AMC LOGISTICS				
C-P ITEMS	$738	$2.400	$1.662	$4.953
OTHER SUPPORT		.0		1.680
COMMUNICATIONS				
LEASED LINES & RECURRING CHARGES	1.460	1.460	0	2.200
INSTALLATION & ENGINEERING	.322	.375	53	1.500
LONG DISTANCE TELEPHONE	0	.050	50	.030
TRANSPORTATION				
AIRLIFT	0	.700	.700	.850
SURFACE	0	.205	.205	.205
RECOVERY PROGRAM				
AERIAL RECOVERY	0	1.522	1.522	.982
SURFACE RECOVERY	0	1.750	1.750	2.100
TELEMETRY SHIP	0	1.100	1.100	.940
SITE & FIELD OFFICE SUPPORT	2.500	2.500	0	2.700
PROPELLANTS	0	.150	.150	.195
PERSONNEL TRAVEL	0	.250	.250	.250
TOTAL [redacted]	$5.020	$12.462	$7.442	$18.505

[redacted]

WD3W [illegible]

[redacted]

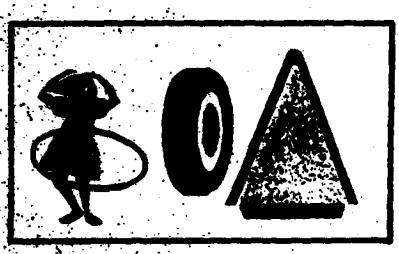
9160.10

RECOMMENDED INCREASE IN FUNDS

ADDITIONAL $29.0 MILLION TO BE APPLIED AGAINST SENSOR AND DATA PROCESSING SUBSYSTEMS TO:

A. MOVE UP AVAILABILITY OF ADVANCED SENSORS BY 6-10 MONTHS.

B. INCREASE RELIABILITY OF PAYLOAD EQUIPMENTS TO ENHANCE EARLY ATTAINMENT OF OPERATIONAL CAPABILITY.



C. PERMIT FLEXIBILITY OF APPROACH IN SENSOR DEVELOPMENTS AS NECESSARY TO EXPLOIT SATELLITE CAPABILITY.

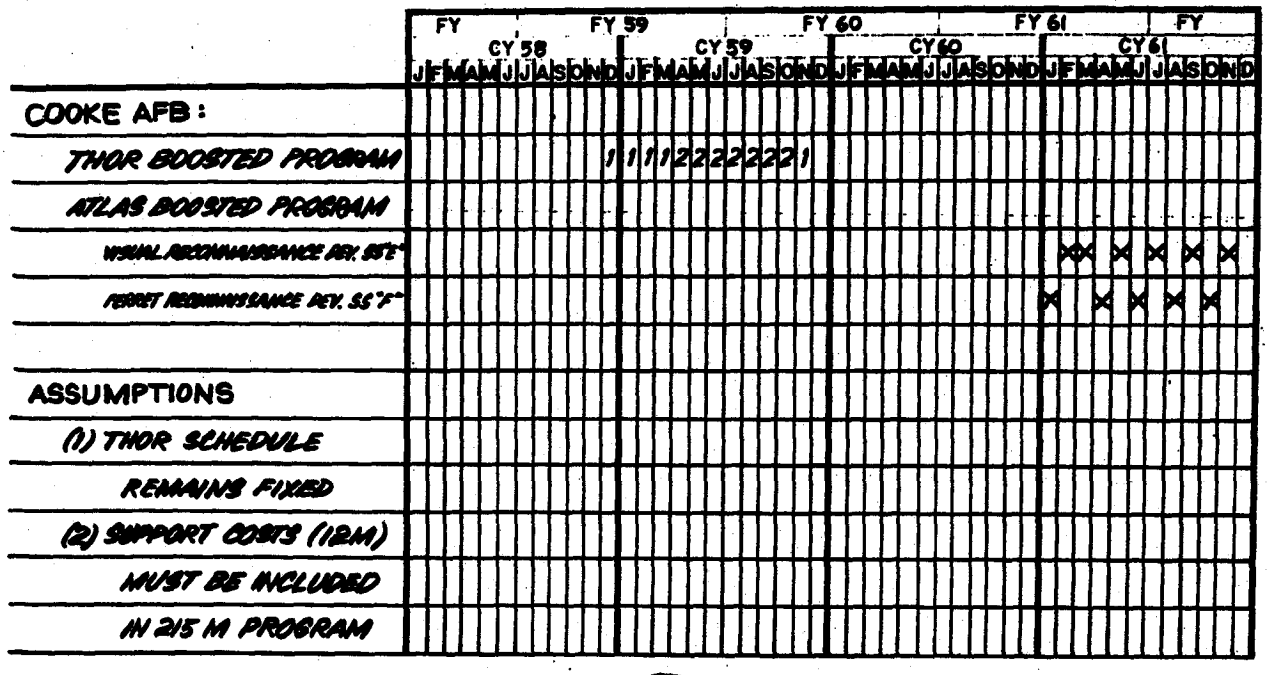
[redacted]

WDZWS 767

[redacted]

SENTRY PROGRAM SCHEDULE

215 M CEILING



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WDZW 5-469

9159 10

REDUCTION OF FY59 SENTRY PROGRAM FROM $231.2 TO $215.0

COSTS FOR BASIC THOR/117L PROGRAM				
LOCKHEED	18.5		18.5	
THOR BOOSTERS	15.2		15.2	
ASSOCIATE CONTRACTORS	2.6		2.6	
SUPPORT COSTS	16.5		16.5	
SUB TOTAL		128.8		128.8
FACILITIES		28.8		28.8
COSTS FOR ATLAS/117L PROGRAM				
LOCKHEED PRIME CONTRACT COSTS				
FEE	3.5		2.8	
SYSTEM MGMT & ENGRG	12.0		10.0	
VISUAL RECON	11.0		8.0	
FERRET RECON	6.3		3.9	
COMMUNICATIONS	10.0		8.0	
OTHER COSTS	9.1		8.0	
ASSOCIATE CONTRACTORS COSTS				
GUIDANCE	1.9		1.9	
INTELL SUBSYSTEM	2.0		2.0	
ATLAS BOOSTER COSTS				
GSE	6.8		6.8	
ENGRG & VEHICLE PRODUCTION	2.0		1.0	
SUB TOTAL		73.6		[illegible]
TOTAL PROGRAM COSTS		231.2		[illegible]

[redacted] [redacted]

25 September 1958

SENTRY PROGRAM

Statement of requests to BMD by ARPA Ad Hoc Project Group

Attendance: Col Evans, BMD
R. Cesaro
L. L. Lind
J. R. Irvine
Capt. R. C. Truax, USN

1. Investigate USAF support costs for FY 1959 and FY 1960.

2. $215 million budget is firm for FY 1959.

3. Break-out the cost of THOR/117L program on a FY 1959 & FY 1960 basis. Also add costs in prior years.

4. ARPA to define ground rules for separating costs of the FY 1959 and FY 1960 programs into R&D vs operational.

5. Why is Hawaii shown as a permanent installation.

6. Why is there an 11 month gap at a cost of $16 million as indicated in the $215 million budget limit for FY 1959.

7. Cost out the cancellation of the last three THORS in the THOR schedule on the basis of a 15 Oct decision date.

8. Review weather conditions that may be anticipated in the middle of the THOR launching schedule.

9. Explain the $19 million variation on Lockheed in the FY 1959 budget.

10. In the $150 million Lockheed figure break out the cost of the subcontractor, associate contractors, and identify the delivered goods.

[redacted]

WDZW 58-557
Cy 1 of 3 Cys

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COPY

ADVANCED RESEARCH PROJECTS AGENCY
WASHINGTON 25, D. C.

SEP 25 1958

MEMORANDUM FOR THE COMMANDER, BALLISTIC MISSILES DIVISION, ARDC

SUBJECT: ARPA Ad Hoc Group on Project Sentry and Follow-on Program

I am unable to approve the current development plan for the subject program as submitted to ARPA and as explained in today's briefing to my staff. In general, the reasons are as follows: the FY 1959 funding plan as presented exceeds the ceiling previously established; the FY 1960 budget is in excess of what is considered a realistic funding level; and finally, achievement of major objectives in the program have been delayed substantially, in spite of the fact the proposed funding level for FY 1959 has been increased.

So that I may have a more intimate knowledge of the technical aspects of the program, and in the light of special security considerations, I have established an ARPA Ad Hoc Project Group for the purpose of investigating, evaluating, and recommending an ARPA Sentry and follow-on program. This group will comprise the following: Mr. Richard S. Cesaro, Chairman; Mr. Lambert L. Lind; Mr. Jack Irvine; and Captain Robert C. Truax, USN. These men have been cleared to pursue all aspects of this program.

It is my intention that this group will visit BMD on September 29th and will remain there as long as is necessary for ARPA to establish complete coordination with BMD on the technical objectives, launching schedules, and future cost levels of the program. Concurrently, my office will work with the Air Staff to resolve any questions of support charges to you from other elements of the Air Force.

Until I can take action on the group's recommendations, you should take immediately those measures necessary to limit FY 1959 obligations to the fund availability of $192 million ($215 million less $23 million reserved for construction).

COPY

It will be appreciated if you will provide office accommodations for this group within your facility. Your cooperation will be most helpful.

/s/ Roy W. Johnson

ROY W. JOHNSON
Director

cc: Asst Sec AF (R&D)
Commander, ARDC

WDZW

SEP 29 1958

MEMORANDUM FOR RECORD

SUBJECT: Guidance concerning ARPA Memorandum, 25 September 58, "ARPA Ad Hoc Group on Project Sentry and Follow-on Program."

1. In a meeting in General Ritland's office at 1400, 29 Sept 58, attended by General Ritland, Colonel Curtin, Colonel Sheppard, Colonel Evans, Colonel Ely and Colonel Oder, there was discussion of the briefing of ARPA by AFBMD on WS 117L on 25 Sept 1958, the subject memorandum (copy attached) and the forthcoming visit of the ARPA Ad Hoc Group.

2. The general, somewhat negative reaction of ARPA to the financial and programing problems raised during the 25 Sept briefing were reviewed.

3. The subject letter was carefully reviewed. Colonel Evans pointed out that certain questions had been given him at ARPA on the afternoon of 25 Sept which would be covered by the group. These are attached.

4. Colonel Evans asked for specific guidance on the fourth paragraph of the subject memorandum. He pointed out that our proposed program was larger than the ARPA figure by approximately $16 million of which approximately $12.5 was the controversial support cost figure. General Ritland stated that the assumption should be made that the support cost problem will be resolved favorable, i.e., that these costs (estimated at $12.5 million) will not have to be absorbed within the $215 million. Since the difference is within about 1% of the program, Colonel Evans felt that in view of General Ritland's guidance, the subject memorandum did not require reguidance of the contractors effort in terms of expenditure reduction.

5. WDZW was asked to advise Hq., USAF of the need for BMD participation in identification of support costs. This was done in a telephone call to Mr. Lew Meyer, Hq., USAF, who arranged for Mr. Faber, RDSCB (Hq ARDC) to represent him at BMD during the week of 30 Sept and collect these data. Mr. Meyer will visit AFBMD during the week of 6 October.

FREDERIC C. E. ODER
Colonel, USAF
Deputy Director for
WS 117L

2 Incl:
1. Questions to be raised by ARPA Ad Hoc Group
2. ARPA Memorandum dated 25 Sept 58 Subj: ARPA Ad Hoc Group on Proj. Sentry and Follow-on Program (Unclassified)

Questions to be raised by ARPA Ad Hoc Group

1) Hawaii Facility.

2) a. Thor/117L Costs.

b. Savings realized by cancellation of last 3 Thor flights.

3) Why such a drastic slip in flight schedule if program is reduced from $231 million to $215 million.

4) Explain LAC estimate variation of $19 million.

9/25/58

MEMORANDUM FOR THE COMMANDER, BALLISTIC MISSILES DIVISION, ARDC

SUBJECT: ARPA Ad Hoc Group on Project Sentry and Follow-on Program

I am unable to approve the current development plan for the subject program as submitted to ARPA and as explained in today's briefing to my staff. In general, the reasons are as follows: the FY 1959 funding plan as presented exceeds the ceiling previously established; the FY 1960 budget is in excess of what is considered a realistic funding level; and finally, achievement of major objectives in the program have been delayed substantially, in spite of the fact the proposed funding level for FY 1959 has been increased.

So that I may have a more intimate knowledge of the technical aspects of the program, and in the light of special security considerations, I have established an ARPA Ad Hoc Project Group for the purpose of investigating, evaluating, and recommending on ARPA Sentry and follow-on programs. This group will comprise the following: Mr. Richard S. Cleave, Chairman; Mr. Lambert L. Lind; Mr. Jack Irvine; and Captain Robert C. Truax, USN. These men have been cleared to pursue all aspects of this program.

It is my intention that this group will visit BMD on September 29th and will remain there as long as is necessary for ARPA to establish complete coordination with BMD on the technical objectives, launching schedules, and future cost levels of the program. Concurrently, my office will work with the Air Staff to resolve any questions of support charges to you from other elements of the Air Force.

Until I can take action on the group's recommendations, you should take immediately those measures necessary to limit FY 1959 obligations to the fund availability of $192 million ($215 million less $23 million reserved for construction).

It will be appreciated if you will provide office accommodations for this group within your facility. Your cooperation will be most helpful.

Roy W. Johnson
Director

cc: Asst Sec AF (R&D)
Commander, ARDC

[redacted]

MEMORANDUM FOR RECORD

OCT 10 1958

SUBJECT: ARPA Briefing 30 September 1958

1. In my presentation two subjects were discussed with the ARPA committee, the savings from eliminating the last three Thor flights and the cost of the FY 1959 Thor Program. A copy of the chart used in explaining the savings from deleting the last three Thor flights is attached and self explanatory.

2. To explain the FY 1959 costs of the Thor Program it was pointed out that costs such as boosters, subsystem L, support and certain associate contractor costs are strictly identifiable with the Thor program. Since most of the effort in subsystems A, B, and C is associated with producing vehicles to be launched in FY 1959, a best judgement estimate was used in these subsystems and subsystem D. To arrive at a percentage to be used in prorating costs in such areas as management and systems engineering, it was assumed that the -181 costs in FY 1959 are essentially the Thor program. These costs are $98 million out of a proposed LAC allocation of $150 million in FY 1959. Approximately this percentage was then used in prorating costs in the remaining areas. A copy of the chart used is attached.

Norbert J. Walecka

NORBERT J. WALECKA
Captain, USAF

2 Incls:
1. (S) Chart, Subj: Savings from Deleting Last Three Thor Flights, 1 pg, WDZW-58-546
2. (S) Chart, Subj: Cost of the Thor FY 1959 Program, 1 pg WDZW-58-546

[redacted]

WDZW-58-546

Cy 1 of 3 Copies

[redacted]

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SAVINGS FROM DELETING

LAST THREE THOR FLIGHTS

SENTRY VEHICLE:

DELIVERY 2 MONTHS BEFORE LAUNCH

LEAD TIME 8 MONTHS

17 PRODUCTION MONTHS SAVED IN FY 59

SENTRY VEHICLE COSTS $2.0 MILLION

SENTRY SAVINGS IN FY 1959 $ 4.250

THOR BOOSTER:

DELIVERY 2 MONTHS BEFORE LAUNCH

LEAD TIME 12 MONTHS

29 PRODUCTION MONTHS SAVED IN FY 59

THOR BOOSTER COSTS $ 1.2 MILLION

THOR SAVINGS IN FY 1959 $ 2.900

TOTAL SAVINGS FROM DELETING LAST THREE THOR FLIGHTS $ 7.150

[redacted]

[redacted]

WDZW-58-546

Cy 1 of 3 Copies

2 of 3

[redacted] [redacted]

COST OF THE THOR FY 1959 PROGRAM

IMSD	
PROGRAM MANAGEMENT	$ 3.100
SYSTEMS ENGINEERING, Data Control, and Direct Charges	22.800
SUBSYSTEMS	
A	8.000
B	14.600
C	2.600
D	2.500
H	30.000
L	7.900
GROUND SUPPORT EQUIPMENT	7.000
SUBTOTAL IMSD	98.500
ASSOCIATE CONTRACTORS	2.600
BOOSTERS	15.200
SUPPORT	12.462
TOTAL	$ 128.762

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WDZW-58-546

Cy 1 of 3 Copies

[redacted] [redacted]

WDZW

OCT 10 1958

MEMORANDUM FOR RECORD

SUBJECT: Briefing to ARPA on Effects of Reducing FY 59 Budget from $231.2 to $215

On 30 September 1958, as part of a general orientation for the ARPA Ad Hoc Committee, I gave a short talk on the effects of trying to live with the $215 ceiling. The chart used in this presentation was from the "Sentry" briefing, titled "Reduction of Sentry Program from $231.2 to $215" (copy attached). The gist of the discussion was:

a. Thor-boosted program is costed at $128.8 in FY 59.

b. Facilities (industrial and MCP) will cost $28.8. This cannot be changed.

c. The Atlas-boosted portion has $73.6 under the $231.2 program, but only $57.4 under the $215 ceiling. Therefore, serious cuts in payload for atlas flights will occur at the $215 level, and the result is a slippage of the reconnaissance capability of about ten (10) months.

DAVID D. BRADBURN
Captain, USAF

[redacted]

[redacted]

WDZW-58-542
Cy 1 of 3

SHEET #2

LMSD	FY 59 15 March Dev. Plan	FY 59 1 July Dev. Plan	FY 59 15 Sept. Dev. Plan	FY 59 15 Sept. $215 Ceiling	FY 60 15 Sept. Dev. Plan
Program Management	4,100	4,100	4,100	4,100	4,942
System Engineering, Data Control and Direct Charges	30,437	30,437	35,500	32,777	56,118
Subsystems A	11,935	10,935	8,935	7,835	7,107
B	11,827	10,827	15,490	15,490	13,074
C	3,185	3,185	3,560	3,560	8,083
D	5,803	5,803	6,675	6,675	7,830
E	24,713	13,000	11,730	8,730	36,082
F	8,320	6,320	6,675	4,275	17,872
G	2,086	2,086	430	430	- - -
H	33,814	31,300	39,580	37,580	35,426
L	- - -	- - -	7,900	7,900	7,178
Ground Support Equipment	- - -	- - -	9,899	9,899	16,437
AFCRC - SS "J"	2,000	1,500	1,200	1,200	1,020
RADC - SS "I"	11,200	7,700	9,000	7,000	19,000
MIT	1,500	1,500	1,900	1,900	2,070
BOOSTERS	35,000	34,500	26,000	23,000	27,869
FACILITIES	28,787	28,787	28,787	28,787	16,463
STL	- - -	900	600	600	1,000
SUPPORT	- - -	5,020	12,462	12,462	18,505
MISCELLANEOUS	200	- - -	800	800	900
TOTAL	214,907	197,900	231,223	215,000	296,976

ANALYSIS OF STATION JIPMENT COSTS

BASIS: 1) 15 Sep 58 Development Plan Schedule.
2) Equipment costs only. No R & D or prototype costs.
3) Stations equipped as of December 1961.
4) No operating costs, except Comm Net.

		FY 1960	
Equipment at each T/A Site (NE, NW, Central	S/S E	2.0	
	S/S F	.9	
	S/S H	2.0	
TOTAL FOR 3 SITES:			14.7
Equipment at Intel Center	S/S E	4.0	
	S/S F	1.8	
	S/S H	1.0	
	S/S I	8.3	
	Computer	.8	
TOTAL INTEL CENTER			15.9
Comm Net	Terminal Equipment	4.8	
	Leased Lines	6.7	
TOTAL COMM NET			11.5
GRAND TOTAL ALL COSTS			42.1

[redacted]

[redacted]

The costs developed for Advanced Military Space Systems Costs were computed on the basis that all efforts beyond those associated with the Pioneer Visual and Pioneer Ferret programs were considered as advanced Military Space Systems. Further, efforts which are mutually identifiable with pioneer and advanced programs are costed in the pioneer program, purportedly titled Sentry.

[redacted]

[redacted]

WDZW 58-533
Series A

	FY 59	FY 60	
LMSD			
System Engineering, Data Control and Direct Charges	.700	14.000	An approximate percent of the total.
Subsystems: B	-	4.100	Work on development of an advanced engine.
C	.756	3.683	Advanced work represents effort on nuclear and high energy batteries.
D	.200	.500	Costs for MIT guidance system to be put into production by Lockheed.
E	2.100	15.000	Cost represents work on 36 inch camera.
F	.150	6.000	Cost represents work on advanced ferret subsystem.
G	.430	-	Studies.
H	.100	6.000	Microwave System plus minor amount of communication studies.
RADC	-	6.000	Studies and prototypes for automatic storage devices and advanced processing techniques for the automatic correlation of ferret and photo data. Commitments for extra numbers of hardware to handle anticipated increase in data from additional satellites in orbit.
MIT	.500	1.570	Work on development of advanced guidance system.
TOTAL	4.936	56.853	

[redacted]

THOR PROGRAM FY 1959 COSTS

The ground rules used in developing the costs for the Thor program in FY 1959 were:

1) Contract -181 costs in FY 59 are essentially the Thor program, and they are approximately $[illegible] million out of a proposed LAC allocation of $130 million for FY 59.

2) This gives an approximate percentage of the total available to LMSD during FY 59 to be used in pro-rating costs for project management and systems.

3) In Subsystems A, B, C and D best judgment was used in developing costs. Most of the effort in A, B, and C has to be associated with producing vehicles to be launched in FY 59.

4) Thor booster costs, Subsystem "L", support and certain associate contractor costs are all strictly identifiable with the Thor program.

DOWNGRADED AT 12 YEAR INTERVALS; NOT AUTOMATICALLY DECLASSIFIED. DOD DIR 5200.10

[redacted]

WDZW 58-492

	FY 1959		FY 1960	
	15 Sept. Development Plan	Thor Program	15 Sept. Development Plan	Thor Program
LMSD				
Program Management	4.100	3.100	4.942	1.000
System Engineering Data Control and Direct Charges	35.500	22.800	56.118	10.000
Subsystems A	8.935	8.000	7.107	2.000
B	15.490	14.600	13.074	3.000
C	3.560	2.600	8.083	2.000
D	6.675	2.500	7.830	1.000
E	11.730	-	36.082	-
F	6.675	-	17.872	-
G	.430	-	-	-
H	39.580	30.000	35.426	-
K	7.900	7.900	7.178	7.178
Ground Support Equipment	9.899	7.000	16.437	-
AFCRC	1.200	1.200	1.020	-
RADC	9.000	-	19.000	-
MIT	1.900	-	2.070	-
BOOSTERS	26.000	15.200	27.869	4.500
FACILITIES	28.787	-	16.463	-
STL	.600	.600	1.000	-
SUPPORT	12.462	12.462	18.505	6.500
MISCELLANEOUS	.800	.800	.900	-
TOTAL	231.223	128.762	296.976	37.178

WDZW 58-92
Copy 12 of 50

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FY 1960 THOR PROGRAM COSTS

The ground rules used in computing these costs were:

1) Certain costs are completely chargeable to the Thor program such as the cost of the Thor booster, Subsystem L, and certain support costs.

2) In the vehicle subsystem area a best judgment estimate was made with a corresponding charge against Program Management and Systems Engineering.

[redacted]

WDZW 58-492
Copy 12 of 50

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OCT 17 1958

MEMORANDUM FOR COLONEL ODER:

SUBJECT: Items Covered With ARPA -- 29-30 September

1. Question - "Why is Hawaii a permanent station?"

a. To understand all aspects of the problem a definition of permanent facility was given, and reasons why permanent type construction was used. Specific areas covered were:

(1) Permanent construction - planned use of facility for 15 to 20 years.

(2) Kaena Point facility not in this category.

(3) Concepts of construction called for most economical construction and maintenance.

(4) Factors involved in selection of permanent type construction.

(a) Available materials in Hawaii.

(b) Most expensive part of construction is site preparation, roads, utilities -- access is limited.

b. Conclusions reached -- planned use (thru development of 117L) pointed to economy of using permanent type structure.

2. Question - "Why a permanent Hawaiian Station?" (operationally)

Answer -

a. Early History.

(1) Early program planned flights from AFMTC.

(2) Early restrictions on High latitude orbits, i.e., no over flight of iron curtain territory.

(3) Early launches from west coast launch site were to be low latitude orbits.

Conclusion Hawaii station, Vandenberg station - Tracking at AFMTC provided for full capability required for R&D low latitude tests.

b. Past Sputnik History.

(1) Flights from AFMTC still required from Hawaiian Station.

(2) High latitude restriction on West Coast launches removed.

(3) Very useful for Thor launches from AFMTC and Vandenberg.

(4) Useful for first pass tracking of Vandenberg launches.

[redacted] WD3N 58-1

[redacted]

[redacted]

Conclusion - Plans completed. Money approved - Construction starting April 1959.

3. Present Construction Status.

a. Facilities for Program IIA complete.

b. Second increment of construction to go under contract 6 Oct.

4. Cost - Interim facilities --

Brick and mortar - cost $1.2 M. Completed second increment $.8 M for a total of $2.0 M. for Kaena Point facility.

5. Question -- "How many $ to equip for Program IIA, Program II and for full data readout capability".

This material was gathered but never presented. Available from Major Rehbein.

Mr. Runge and Col. Riepe's conversation with ARPA --

Question. "Relationship of Exit Azimuths to Range Safety - vehicle weight - Performance."

No real answers were given -- referred to Col. Battle.

QUENTEN A. RIEPE
Lt Colonel, USAF

[redacted]

[redacted]

WDZW 58-1

[redacted] [redacted]

WDZW

OCT 15 1958

MEMORANDUM FOR COLONEL EVANS

SUBJECT: ARPA Briefing on Subsystem B

1. A breakout of costs was given to the ARPA representatives by engine type and fiscal year. These costs were estimated to some extent because there were no breakouts available in the form requested.

	FY 59
In Plant Subsystem R&D, PTA & TVA Testing, Component Development, Component Procurement and Handbooks	2.779
JP-4 Development, Preliminary Flight Rating Test, Completion of JP-4 hardware	.772
UDMH Development, PFRT, Conv JP-4 Engines and thrust chambers, 14 UDMH Engines and 7 Thrust Chambers, Reliability Program and Tooling	7.988
22 UDMH Engines	3.030
Spares	.281
Field Servicing Training Personnel, etc.	.378
Aerojet Ullage Rocket Development	.262
TOTAL:	15.490

	FY 60
In Plant Subsystem Dev., Component Hardware, Component Dev., Testing, Etc.,	3.00
Bell Engine Modification and Improvement - 14 Engines	4.76
Bell Field Services, Support, etc.	.3
New Engine Development (Advanced System Requirement)	4.1
	12.16

[redacted]

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WDZW 58-531
Copy 2 of 5

[redacted] [redacted]

TOTAL BROUGHT FORWARD:	12.16
Fee	.914
TOTAL:	13.074

2. In FY 60, it was explained that the actual requirements for the new engine development were at present undefined. However, there are extensive studies underway to optimize the engine and determine characteristics and propellants best suited for the mission.

3. Various technical questions were asked about the propulsion system, the engine performance, improvements in performance by going from JP-4 to UDMH. The changes in the engine that were required in changing propellants and some of the development problems that have been experienced, were explained.

4. A short discussion was held on the performance degradation that has come about due to increase weight in Thor flights, particularly flights 3 and 4 and efforts being made to improve performance. Engine selection for the Thors was discussed and the I_{sp} for the first five flights was given to ARPA.

Edward F. Blum

EDWARD F. BLUM
Lt Colonel, USAF

[redacted]

[redacted]

WDZW 58-531
Copy 1 of 5

[redacted] [redacted]

WDZW OCT 6 1958

MEMORANDUM FOR COLONEL EVANS

SUBJECT: Subsystem C Comments to ARPA Committee, 3 Oct 1958.

1. Data furnished to the committee showed a cumulative expenditure through FY 59 of $3,500,000 on Subsystem C. It was pointed out that this figure overstates the actual expenditure on Subsystem C because of the method of accounting employed by LMSD. The costs of the modification and checkout operation for the entire vehicle were arbitrarily sprayed over a number of subsystems. The Subsystem C "share" was $500,000. If interpreted literally, this is a ridiculously large charge against Subsystem C, for which modification and checkout operations are minor. The charge should be regarded only as a way of keeping books. This should be kept in mind when appraising the dollar effort in auxiliary power.

2. The $3.5 M total also includes another charge which should have appeared elsewhere in the cost accounting. This was a $276,000 subcontract for an environmental test chamber which will be utilized for general purposes and is not identified as a specific Subsystem C requirement. It was emphasized, therefore, that only $2.7 M has really been allocated to Subsystem C, and that the $3.5 M shown includes costs which more appropriately belong under "SYSTEMS". It was further emphasized that $2.7 M has been grossly inadequate to accomplish anything of significance in secondary power other than development of the battery energized system. It has not been enough to allow us to meet commitments to the AEC, which is separately financing development of SNAP units, nor has it permitted sufficient emphasis on solar development.

3. Two-thirds of the $2.7 M ($1.8 M) will have been spent for development of batteries, inverters, regulators, and other components of the battery APU, including sufficient hardware for 14 Thor flights (plus three spares) and 4 Atlas flights. Subsystem C hardware for Thor and Atlas systems were estimated at $15,000 and $75,000 per flight vehicle respectively. Of the remaining $.9 M, $350,000 has been used for shielding studies in connection with integration of SNAP units, $350,000 for solar work, and the remainder for fuel cell studies, secondary battery development, and miscellaneous investigations.

4. Considerable interest by the ARPA Committee was evident concerning solar APU's. If Program I (Atlas) flights are cancelled, it was acknowledged that the objectives of Program IIA will have to be re-examined to determine how solar experiments which had been planned in Program I can be accomplished. The experiments will involve about 90 pounds of solar payload and will require primary flight objective

WDZW 58-519
Cy 1 of 5

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[redacted]

status. No consideration has yet been given to such re-programming. The experiments themselves could probably be ready for the first vehicles with UIMH engines. (March 1959).

5. On the question of "Sentry" vs "Advanced" phases of the program, it was stated that this office desires the solar approach to remain in the Sentry program. About $2.0 M is desired in FY 1960 for solar development. Another $2.5 M will be necessary for a SNAP facility, as well as $.75 M for further SNAP integration work. About $1.5 M will be needed to develop a prototype [redacted] components will require $2.5 M in FY 1960.

George E. Austin

GEORGE E. AUSTIN
Major, USAF

2.0
.75
1.5
2.5
7.5

WDZW 58-519
Cy 1 of 5

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WDZW

OCT 7 1958

MEMORANDUM FOR COLONEL EVANS

SUBJECT: Subsystem E Information Given to the ARPA Committee, 1 Oct 58

1. The Subsystem E total of 11.7 for FY 59 was broken down as follows:

a.	Pioneer Program	8.4 +
	Advanced	2.1 +
b.	Pioneer Breakdown	
	General Subsystem	2.5
	Vehicle	3.7
	Ground	1.9
	Simulation	.092

c. The task breakdown of the general subsystem work was described without giving any cost figures.

d. An approximate figure of 800k was given in answer to a question as to how much was being spent in FY 59 on the camera.

2. The committee was told that LMSD had been asked for a cost breakdown by task of the Subsystem E work, but the answer had not arrived.

3. The letter requesting LMSD to look into longer focal length systems in the Pioneer Program was discussed. Questions were raised on this matter but no definite answers could be given since LMSD has not yet answered our letter.

EDWARD J. CONWAY
Major, USAF

WDZW 58-522
Cy 1 of 4

[redacted] [redacted]

[redacted] [redacted]

WDZW

OCT 15 1958

MEMORANDUM FOR COLONEL EVANS

SUBJECT: ARPA Briefing for Subsystem F

1. The ferret subsystem for FY 59 and FY 60 is scheduled for implementation in two phases designated F-1 and F-2. Basically, the F-2 is a more sophisticated version of F-1 providing more accurate measurement of geographical location, pulse repetition frequency, pulse width, and frequency. The F-1 system will be flown in February 1960 utilizing X and S band scanning superheterodyne receivers with a digitizer, recorder and data link. Data handling equipment will be provided at the tracking and acquisition and central stations to append a time reference and confidence factor to the received information prior to transmission to the Data Processing subsystem for analysis.

2. Calibration stations will be provided near the tracking and acquisition stations to transmit accurate known signals to the vehicle which can be read out to determine the accuracy of the vehicle equipment.

3. The F-2 equipment will include the S and X band receivers plus a VHF receiver and will provide more accurate measurement of the parameters mentioned above.

4. Particular emphasis has been placed on providing a system with flexible frequency coverage capability due to the rapidly changing requirements in this area. The major subcontractors are the Airborne Instrument Laboratories for hardware manufacture and Haller, Raymond and Brown for assessment of requirements of the intelligence community. Costs for FY 59 are $6,675,000, the majority of which is assigned to the AIL for the development of F-1 hardware. Of this amount approximately $1.5 million is for ground equipment and $100,000 for advanced system studies. It is estimated that $17.8 million dollars will be required in FY 1960 to implement the F-2 hardware program including $4 million for ground equipment.

JOHN O. COPLEY
Major, USAF

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WDZW 58-574
Cy 1 of 5

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WDZW

OCT 15 1958

MEMORANDUM FOR COLONEL EVANS

SUBJECT: ARPA Briefing on Subsystem H

1. A brief description of the Thor boosted and Atlas boosted program in Subsystem H was given including location of ground tracking and aquisition stations and control centers. It was stated that the Thor boosted program was an interim program using principally off-the-shelf items, particularly for the ground T/A stations and that this equipment was necessarily expensive in order to meet the requirements of the earliest possible firing dates. This equipment is not the same type as the developmental/operational types being produced for the Atlas boosted system. It is not as sophisticated or accurate as the latter but is designed to prove orbital capability, gather certain scientific data and provide a recovery capability. The accuracy of the radar tracking equipment for the Thor boosted flights is about 1 milliradian in angle and 1/2 mile in range whereas in the Atlas boosted program utilizing passive UHF tracking and phase comparison ranging equipment accuracies in the neighborhood of .1 milliradian in angle and 100 yards in range can be anticipated. The tracking equipment in this program is not compatible with other types of space-track equipment in that it performs several functions in addition to tracking, such as transmitting commands to the vehicle, receiving telemetry calibration data, and receiving wide-band reconnaissance data. The Atlas system is a conservative one in that it makes multiple use of many of the components. For example, the command transmitter transmits the ranging tone in addition to vehicle programming, and the same antenna is utilized for receiving telemetry data and reconnaissance data.

2. A breakdown of the costs for FY 59 between the Thor and Atlas programs was presented indicating that of the 39 million dollars required, approximately 25 million was for the Thor program and the balance for the Atlas program. No money was included in these figures for advanced planning. A breakdown of these costs is included as inclosure no. 1.

JOHN O. COPLEY
Major, USAF

1 Incl:
Cost breakdown (S)
2 pg, WDZW 58-573

WDZW 58-573
Cy 1 of 5

[redacted]

[redacted]

[redacted] [redacted]

APPROXIMATE BUDGETARY INFO - ARPA BRIEFING

SUBSYSTEM H

PHILCO SUBCONTRACT

ITEM	AMOUNT In 1,000 of Dollars
Beacons	900
Direction Finder & Telemetry Receiver (TLM-18)	3,000
Velort Radars (Modified MOD II, SCR-584)	5,300
Computer Rental	200
Inter & Intra Station Communications Planning	2,000
Field Instrumentation Planning	550
Station Manning	800
Training	40
Human Engineering	350
Instrumentation & Maintenance Equipment	1,600
Ground Station Test	400
Engineering Services	600
Reliability	200
Direction Finder Kit (Inferometer, Aquisition)	100
UHF Tri-Helix Receiving System	800
Command & Data Control Vans	2,600
Signal Density Studies	200
Vehicle Systems Testing	250
Status & Data Display	250
[redacted] [redacted]	20,140

WDZW 58-573
Cy# 1 of 5 Cys.

[redacted] [redacted]

LOCKHEED IN-HOUSE ITEMS	In 1,000 of Dollars
Ground Station Communication Planning	700
Programmer	400
Antennas	200
Ground Telemetry	108
Hardware	3,000
	4,408

GRAND TOTAL . . 24,548

[redacted]

[redacted]

[redacted]

[redacted]

OCT 15 1958

WDZW

DOWNGRADED AT 12 YEAR
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MEMORANDUM FOR COLONEL EVANS

SUBJECT: Information Presented to the ARPA Investigating Committee

1. This memorandum summarizes the discussions and material presented on 2 Oct 1958, to the ARPA Committee concerning Subsystem I, as well as the rationale in arriving at the operational center cost estimates prepared especially for this group.

2. The meeting lasted for approximately 2 hours, the main part of which was spent in response to questions, qualitatively explaining the functions and objectives of Subsystem I as covered in the Development Plan and the "Report on Operational Requirements and Technical Approach for WS 117L Visual and Ferret Subsystems", dated 19 September 1958. It was necessary to detail the product inputs to Subsystem I from Subsystems E, F, and H, and to generally track these through the system. It was further necessary to explain for comparison purposes, how the data, collected by most present-day reconnaissance systems, is processed, and to elaborate on the differences required for WS 117L.

The questions asked displayed a keen lack of knowledge and appreciation for the problems involved in the reconnaissance payload subsystem as well as in Subsystem I, and more seriously displayed little appreciation for the important intelligence needs a successful WS 117L program will fulfill.

3. In view of the committee's deliberate concentration and almost singular concern with the "Pioneer" versions of the program, the observation was volunteered that the main "Intelligence worth" of the system is inextricably tied to its ability for providing timely repeated coverage of any and all points on the earth (surveillance) which implies multi-Satellite operation of improved and mixed sensors. This will be realized only much further downstream than Programs II and III. In this era the associated problems in Subsystem I as well as Subsystems E, F, and H will be magnified accordingly.

4. It was pointed out that the FY 59 budget of nine million dollars allocated to Subsystem I from within the 231.2 million dollar total was 1.7 million dollars short of the minimum amount required to do the specified job. Table No. 1 attached, contains the FY-59 and FY-60 general budget breakdown information presented to the group.

5. Within the FY-59 and 60 budget breakdowns presented and from the FY-61 budget, costs have been estimated for the equipping of the

WDZW 58-532
Copy 1 of 5

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[redacted]

[redacted]

operational facility at Offutt to be ready for operation approximately 1 November 1961. These costs were given in summary form, Table No. 2, to Captain Bradburn for inclusion in the ARPA data. The equipments proposed will be production versions of the equipment to be installed in the Denver R & D facility. The System for which the estimates are made will be capable of simultaneously handling inputs from a maximum total of 6 vehicles, i.e., 2-3 Visual, 2-3 Ferret, and/or 2-3 IR. These estimates have assumed three-shift operation. If the number of satellites in the air were reduced, it would probably not be desirable to reduce the equipment complement, but rather to reduce the number of shifts worked.

The estimates are the production costs of the equipment and do not include such items as programming, training, maintenance, etc. Obviously these costs will be high and will be principally absorbed in the Denver Operation.

A. In the Visual case the following estimates and assumptions were used to determine quantities:

(1) The average daily take per satellite = 700 each 9x9 equivalent (12 lines/mm) photos of which probably 50% will be of no value (Wx, malfunctions, etc.). Therefore, in the extreme case (3 Visual Satellites) about 1000 new usable 9x9 equivalent photos will be received per day.

(2) On the conservative assumption that each equivalent useful photo will require an average of 30-minute interpretation, about 500 hours of PI time per day are needed. The 30-minute total would cover all requirements for Indicator, Search, Support, Photogammetry, and Indexing and Re-titling Interpretation.

(3) It has been estimated that a PI should be involved in actual interpretative operations about 4 hours per day. It would thus be necessary to have about 3 shifts of 40 PI's per day to handle the photo take of 3 Visual Satellites.

For the Photo Interpretation Phases the estimate totals 3,750K.

For the Photo Conversion and Photo Processing Phases the estimate totals 3,750K.

B. In the Ferret case, it was assumed that the early advanced versions would collect analog data, hence the estimate is based upon:

10 Ferret Consoles @ 150K	1500K
Analog Reduction Center	1500K
TOTAL:	3000K

[redacted]

[redacted]

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C. In the Display area, assuming input to the collection control function from Subsystem I and that a Commander's control room would be required, coupled with display requirements within and limited external to the center costs were estimated at 1000K.

D. Within the Library function, it was assumed that some use of automatic search and retrieval devices would be required when the number of birds operating simultaneously surpassed 3-5 total. Based on Minicard Service Test Unit Costs the estimate of 3000K was used.

E. In the Central Data processor area it was estimated that a processing group (1 computer, 2 buffers and 5 tape units) would be capable of servicing about 5 interpreters. With about 60 combined interpreters using the system at one time, 12 such processor groups are needed. The master control console will include inter-computer and inter-center communications (direct address). Cost estimates totaled 11,000K.

F. In the Infrared area there are no sure requirements except for the timeliness aspects. Hence, a contingency allowance estimate of 6000K was made for this area.

H. F. Wienberg

HAROLD F. WIENBERG
Major, USAF

2 Incls
1. Table No. 1, S/S I - FY59, Fy60, Budget Breakdown.
2. Table No. 2, Summary of Operational Equipment - Cost Estimate, FY-59, 60, 61 S/S I.

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Copy 1 of 5

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TABLE NO. 2
SUMMARY OF
"OPERATIONAL EQUIPMENT" COST ESTIMATE
FY-59, 60, 61 - SUBSYSTEM I

Photo Interpretation	3,750
Photo Conversion and Processing	3,750
Ferret	3,000
Display	1,000
Library	3,000
Central Data Processor and Communications	11,000
Infrared and Contingencies	6,000
TOTAL:	31,500K

The mix of these costs would be none in FY-59, 10 million in FY-60, [redacted] All equipment would be delivered and installed in a government-furnished facility at Offutt AFB prior to 1 July 1961.

[redacted]

WDZW 58-532
Inclosure #2

[redacted]

[redacted]

TABLE NO. 1
"SUBSYSTEM I - FY-59, FY-60
BUDGET BREAKDOWNS"

	%	FY-59 (On Basis of 9.0×10^6)	FY-60
System Design, Management, Integration and Evaluation	8.5	765,000	1,680,000
Reports, Drawings, Maintenance and Operation, Inst. Manual, etc.	6.5	585,000	1,270,000
System Testing and Human Factors Mockups Simulation Materials QPRI CPX's	4.5	405,000	855,000
Photo Subsystem Processing Conversion Interpretation Photogammetry	30%	2,700,000	5,600,000
Ferret Subsystem	10%	900,000	1,900,000
Central Data Processor Tape Units Logical Buffers Computing Units Flexowriters High Speed Printer High Speed Plotter Tape-to-Tape Converter Control Console	25%	2,250,000	4,550,000
Library	4%	360,000	760,000
Displays Photo (Internal) Ferret (Internal) Collection Control	6%	450,000	1,140,000
Communications (Internal Control Console Switchgear Unit-to-Unit Access, Etc.	6.5	585,000	1,255,000
TOTALS:	100%	9.0×10^6	19×10^6

WDZW 58-532
Inclosure #1

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[redacted]

WDZW

MEMORANDUM FOR COLONEL EVANS

SUBJECT: ARPA vist, 29 September - 3 October 1958

1. Briefed the ARPA Group on Subsystem J on Friday afternoon, 3 October 1958.

2. Their first reaction was "Why is this being done under WS 117L?" I discussed and defended our actions by pointing out that we were not conducting a general Geophysics Program, but that each area of endeavor had resulted from requirements from LMSD for environmental design information.

3. I next briefly discussed each of the parameters being measured and why the information was important to Systems Design; further, in response to a query by one of the group, I explained that the major portion of this year's funds in this area would be used for fabrication of flight instruments and rocket flight services such as data reduction and field services. I forgot to mention that $80,000 will be used to procure 4 Exos rockets.

In discussion among members of the group, it appeared that they felt that the Subsystem J might well be funded by the Air Force. Lt Colonel Battle agreed.

GEORGE P. JONES
Lt Colonel, USAF

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Copy 1 of 2

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WDZW

OCT 6 1958

MEMORANDUM FOR RECORD

DOWNGRADED AT 12 YEAR INTERVALS; NOT AUTOMATICALLY

SUBJECT: Expressed views of ARPA Ad Hoc Group

1. Reference is made to Director, ARPA Memorandum to AFBMD, 25 September 1958 "ARPA Ad Hoc Group on Project Sentry and Follow-on Program."

2. The group consisting initially of Mr. Richard Cesaro (Chairman), Mr. Lambert Lind, Mr. Jack Irvine and Captain (USN) Robert Truax (who were joined for 2 October by Mr. Davis Young) visited AFBMD, 30 September - 3 October inclusive. During this time they conducted a detailed and sometimes confusing review of all aspects of WS 117L. Not only were the discussion ground rules changed quite often but also many requests were made for various combinations of figures over several future years in quite fine detail. Details of figures furnished are on file in WDZWP.

3. During the discussion, views were expressed by the ARPA group on the composition of the overall WS 117L program:

a. The program should be split into separate sensory systems, i.e., a separate system for visual, a separate ferret program and a separate IR program. The view was expressed that "Lockheed has too much of the program" by both Mr. Cesaro and Mr. Lind.

b. Both Mr. Cesaro and Mr. Lind clearly indicated that the IR approach to ICBM attack alarm (Subsystem G) would be a program completely separate from Sentry; that it would probably involve other than the Sentry vehicle and different contractors.

4. It was repeatedly and detailedly pointed out to them that for several years the WS 117L program had been planned and conducted in a fashion that the sensors would be integrated in their operational application toward the Air Force goal of a surveillance capability as expressed in GOR 80.

FREDERIC C. E. ODER
Colonel, USAF
Deputy Director for WS 117L

1 Incl:
ARPA Memorandum dtd 25 Sept 58
Subj: ARPA Ad Hoc Group on Proj. Sentry and Follow-on Program (Unclassified)

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WDZW 58-536
copy 1 of 3

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WDZW

OCT 3 1958

MEMORANDUM FOR COL SEAY

SUBJECT: ARPA Ad Hoc Group

1. Reference is made to:

a. The attached memorandum from Director ARPA, 25 Sep 1958.

b. The attached memorandum from Lt Col Battle.

2. In view of our forthcoming negotions on the -181 contract definitization, a fact which has been brought to the attention of the subject group several times during their visit this past week, I feel that a definite impropriety (reference 1b) has been committed. There is nothing in the group's charter (reference 1a) which could be extended to this action.

3. I suggest this be brought to General Funk's attention. Other facets of the group's actions as well as this are being brought to General Schriever's attention.

/s/ Frederic C. E. Oder

FREDERIC C. E. ODER
Colonel, USAF
Deputy Director for WS 117L

2 Incls
1. Memo ARPA, 25 Sep 58
2. Memo Lt Col Battle, 3 Oct 58

Copy furnished:
Col Curtin, WDZ

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WDZW 3 Oct 1958

MEMORANDUM FOR COLONEL ODER

SUBJECT: ARPA Ad Hoc Committee

1. On 2 Oct 1958, at the request of the ARPA Ad Hoc Committee, Mr. Jack Carter of LMSD appeared before the group. Although the stated reason for the interview was to obtain information about Subsystem "L", the questions related primarily to determining the contractor's opinion on the general military objectives of the program. I protested the line of questioning on the grounds that it bypassed the responsibilities of the Air Force and the AFBMD Project Office. This protest was disregarded.

2. Mr. Cesaro, chairman of the group, took the following actions which might possibly be considered from the standpoint of propriety:

a. He revealed to Mr. Carter the figure submitted by AFBMD in the FY 1960 budget estimate, in spite of the knowledge that the WS 117L Project Office is about to enter negotiation with LMSD. I had previously informed the chairman that the budget had not been revealed to the contractor.

b. He advised the contractor to perform certain studies not ordered by the Project Office and stated that the studies would relate to important pending decisions at ARPA affecting the amount of support the program would receive.

c. He informed the contractor that Subsystem "G" would not be supported as part of the Sentry program and advised him to take his proposal directly to ARPA.

3. It would appear that these actions have been prejudicial to effective management of the WS 117L program by AFBMD and extend beyond the authority and responsibility of the ARPA organization. It should be emphasized that only the group chairman performed the actions described above. No other members of the group participated.

/s/ C. L. Battle

C. L. BATTLE
Lt. Colonel, USAF

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ADVANCED RESEARCH PROJECTS AGENCY
WASHINGTON 25, D. C.

SEP 25 1958

MEMORANDUM FOR THE COMMANDER, BALLISTIC MISSILES DIVISION, ARDC

SUBJECT: ARPA Ad Hoc Group on Project Sentry and Follow-on Program

I am unable to approve the current development plan for the subject program as submitted to ARPA and as explained in today's briefing to my staff. In general, the reasons are as follows: the FY 1959 funding plan as presented exceeds the ceiling previously established; the FY 1960 budget is in excess of what is considered a realistic funding level; and finally, achievement of major objectives in the program have been delayed substantially, in spite of the fact the proposed funding level for FY 1959 has been increased.

So that I may have a more intimate knowledge of the technical aspects of the program, and in the light of special security considerations, I have established an ARPA Ad Hoc Project Group for the purpose of investigating, evaluating, and recommending an ARPA Sentry and follow-on program. This group will comprise the following: Mr. Richard S. Cesaro, Chairman; Mr. Lambert L. Lind; Mr. Jack Irvine; and Captain Robert C. Truax, USN. These men have been cleared to pursue all aspects of this program.

It is my intention that this group will visit BMD on September 29th and will remain there as long as is necessary for ARPA to establish complete coordination with BMD on the technical objectives, launching schedules, and future cost levels of the program. Concurrently, my office will work with the Air Staff to resolve any questions of support charges to you from other elements of the Air Force.

Until I can take action on the group's recommendations, you should take immediately those measures necessary to limit FY 1959 obligations to the fund availability of $192 million ($215 million less $23 million reserved for construction).

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It will be appreciated if you will provide office accommodations for this group within your facility. Your cooperation will be most helpful.

/s/ Roy W. Johnson

ROY W. JOHNSON
Director

cc: Asst Sec AF (R&D)
Commander, ARDC

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OCT 9 1958

WDZW

Mr. Roy Johnson, Director
Advanced Research Projects Agency
Washington 25, D. C.

Dear Mr. Johnson:

In a memorandum to me, dated 10 September 1958, you proposed certain actions be taken to re-define the Advanced Reconnaissance System, WS 117L. I want to express my concern over the actions you propose.

The terminology Weapons System 117L is an Air Force term properly applied to the program underway to achieve the Advanced Reconnaissance System. The approach, the timing of sequential events, the concurrent actions, the considerations and planning on all aspects of the program such as flight hardware, facilities, communications networks, personnel, etc., are all essential in establishing a total system. Such actions are aimed at attaining, at the earliest possible time, a functioning, integrated system in satisfaction of an Air Force requirement published as GOR 80 (2A-2C).

You have proposed that the initial capabilities identified as pioneer visual and pioneer ferret reconnaissance be considered as the Sentry Program and that any activity beyond this arbitrary point be considered as advanced, improved military space subsystems. I cannot overemphasize, that to cut the program off as an integrated system effort at this point will not satisfy Air Force requirements. The goal within the design of the WS 117L program is to achieve a surveillance capability in the visual and ferret reconnaissance areas. The same is true in the infrared reconnaissance area.

The sequencing of sensors and related ground equipments and techniques capable of ever increasing and different intelligence collection is a step-wise evolution in the achievement of the GOR requirements. Not until the realization of full surveillance capability can

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Series A

Cy 1 of 3

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we say that we have exploited to the maximum possible extent the capabilities of this system. One cannot at arbitrary points, within the evolution of this capability, say that henceforth any additional effort is to be identified as advanced work. Subjecting such elements of the program to separation seriously jeopardizes the satisfaction of USAF requirements.

The management of the WS 117L is an integrated process of control wherein a myriad of inter-related activities are kept in scheduled sequence. The management in being is based upon employment of the full weapons system concept. This pre-supposes dynamic, centralized management of every aspect of the weapons system.

To abandon this concept of management, as you propose, would prejudice effective control of all elements of the program, introduce new complexity into an already complex program, and perturb the smooth functioning of an established Industry - Air Force team.

In an effort to assist you in preparing your immediate budget defense, I have submitted to you, through Mr. Richard Cesaro, information on the FY 59 and FY 60 WS 117L budgets as per the formats and according to the rules you defined in your memorandum to me.

I strongly recommend that you reconsider the proposals you have made on re-defining WS 117L so that we may continue to vigorously pursue a system oriented program. I am convinced this will provide our country the earliest achievement of true surveillance capability in the Visual, the Ferret and the Infrared Reconnaissance areas.

Sincerely,

/s/ B. A. Schriever

B. A. SCHRIEVER
Major General, USAF
Commander

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Mr. Roy Johnson, Director
Advanced Research Projects Agency
Washington 25, D. C.

Dear Mr. Johnson:

In a memorandum to me, dated 25 September 1958, in which you established an ARPA Ad Hoc Group on Project Sentry and Follow-on Program, certain statements you made lead me to believe a misunderstanding may still exist regarding the funding and scheduling of WS 117L.

The FY 59 funding plan presented to your staff on the 25th of September indeed does exceed the previously established ceiling of $215 million by $16.2 million. I believe an adequate and factual explanation of why such an increase was necessary was made during the presentation. Certain additional work efforts were added to the WS 117L program which were not a part of the program presented on 1 July 1958, then costed at $197.9 million dollars. As an example, biomedical efforts at an additional $7.9 million; additional Thor/117L flights were added to the program at an additional $18.0 million dollars, support costs resulting from the ARPA - Air Force agreement on support activities resulted in an additional $7.4 million dollars, etc.

As to the FY 60 budget being in excess of what is considered a realistic funding level, I can only comment that our FY 60 estimate is based upon an identifiable effort and schedule of testing which is required to achieve the capabilities desired. I do not know the basis upon which the statement "unrealistic funding level" was predicated other than that an arbitrary ceiling was established in advance of any presentation we have made.

A statement to the effect that major program objectives have been delayed substantially is entirely in error. An examination of the inclosed schedule information will indicate that the major program objectives have been maintained on schedule and in matter of

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fact the Ferret Reconnaissance schedule has been moved forward.

Recalling that the WS 117L Program was accelerated as of February 1958, I feel that the perturbations in programming we have experienced are minor by comparison to those encountered in other major programs. I am sure that as soon as a stabilized program is established, the perturbations in programming will in effect disappear.

I am inclosing, for your use, a copy of the briefing material used by my staff on the 25th of September. Similar material was presented to the members of your Ad Hoc Group.

I want to reiterate that the WS 117L program in being is one which is based upon General Operating Requirements established by the Air Force as GOR 80 (SA-2C). The technical objectives are those which will permit the earliest achievement of those capabilities dictated by the GOR. Changing those technical objectives, in effect, would act to negate the requirements established by the USAF. I do not believe this to be your intention.

Eminently qualified technical people have reviewed the program design. Careful consideration and detailed engineering review went into every step along the way. My staff prepared and delivered for your use a detailed report on this matter under the title of "Report on Operational Requirements and Technical Approach for WS 117L Visual and Ferret Subsystems", dated 19 September 1958.

It has been the desire of the Commander ARDC and in turn my desire that members of my staff cooperate with your office insofar as was possible. I trust this has been the case. I am aware of the volume of information which was presented to your Ad Hoc Group during the week of 29 September 1958. The group departed AFBMD not having presented any conclusions they may have made.

I request you give the foregoing your personal attention, so that we may all strive for the early achievement of a satellite surveillance capability for the United States.

Sincerely,

1 Incl:
1 Set, (20 pages), Sentry
Briefing ozalids, (SECRET)
19 pgs. - WDZW-58-467
1 pg. - WDTSR-58-222

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WDZW 31 October 1958

MEMORANDUM FOR RECORD

SUBJECT: Telephone Conversation with Mr. Irvine, ARPA

1. Mr. Jack Irvine, ARPA, called me this morning and stated that certain ARPA people, together with some representatives of the Navy are going to San Diego on 5 November to listen to presentations by CONVAIR Aircraft on the possible use of Azuza System for the ARPA navegatibnalsatellite program. Mr. Irvine suggested that the Azuza System might be utilized by the Sentry Program and requested that appropriate personnel from AFBMD, LAC and their subcontractors attend the briefing at CONVAIR at San Diego to be held at 0900, 5 November.

2. This Memorandum for Record takes note of the fact that Mr. Irvine is a CONVAIR employee presently serving with ARPA on a one year assignment.

HARRY L. EVANS
Colonel, USAF
Director for WS 117L

Copy Furnished
Col Oder
Lt Col Battle

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