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HISTORY OF WS 117L - ROUGH DRAFT

1970

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BY

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CHAPTER I

Introduction

During World War II pertinent German research came to the attention of American military personnel and under the sponsorship of the Army Air Forces, the RAND Corporation* undertook feasibility studies of earth satellites. *and issued a preliminary study on 12/27/46* The Air Force made a preliminary study and evaluation of the RAND satellite reports, ~~which were issued 1 February 1947 and~~ *reported in* September 1947 that a satellite was technically feasible. ¹

In 1948 the Air Force ~~(established 17 September 1947 in accordance with the National Security Act of 1947 approved 26 July 1947)~~ requested

* Commanding General of the Army Air Forces, General H. H. Arnold was among the first to see the need for such an organization as RAND, and was the first to offer a way to finance it. *- in early 1947* The Douglas Aircraft Company, Inc., Santa Monica, California, gave a home to the new research activity during the early years and finally, in 1948, ~~in 1948~~, with financial support from The Ford Foundation, The RAND Corporation was formed as an independent nonprofit research organization.

*... that created a ...
 ... was signed ... H. S. Truman ...
 on 26 July ... The Air Force became official ...*

SMEH-100-1

RAND to establish a program for the further investigation of possible satellite development.² On 1 March 1954, after RAND had studied the project for several years, ~~RAND published its report~~ ^{it released a} under the nickname "Feed Back" ~~to which it reported that~~ ^{and "no didn't say" the conclusion of which was that} a space vehicle could be placed in an earth orbit by a rocket powered booster and that existing system component development problems would ^{with} ~~not~~ require radically new technology nor enormous costs.

On 14 September 1954, after RAND had completed its study on Project Feed Back, Air Research and Development Command ^{instructions} issued Development Directive Number 1115 ^{to} that directed implementation and execution, within certain limitations, ^{an "Advanced Reconnaissance System," or} ~~Development Plan Number 1115, 30 August 1954,~~ ^{approved in Development Plan Number 1115, dated 30 August 1954,} ~~subject "Advanced Reconnaissance System."~~ Project 1115 was originally approved on 12 May 1953. Air Research and Development Command ^(ARDC) assigned primary responsibility for implementation and execution of the development plan to Wright Air Development Center, Dayton, Ohio.³

Air Force personnel initiated further studies under such divergent titles as: television techniques, intelligence parameters, attitude and

** Project 1115 was originally approved on 12 May 1953
by the Air Research and Development Command. It was later
re-evaluated.*

guidance control, auxiliary power plant, effects of nuclear radiation on electronic components, etc. By 1955 the Air Force had obtained sufficient data from the "in house" ARDC feasibility studies to insure that component problems were surmountable and began design studies. ⁵

Consequently, in that year, Wright Air Development Center awarded design study contracts to Radio Corporation of America, Glenn L. Martin

Company, and Lockheed Aircraft Corporation ~~for the purpose of determining~~ ^{to} if a reconnaissance satellite system could be developed within a time

span which ~~would~~ ^{to} warrant a full scale development effort. ⁶ ~~The~~ On 17 December 1954

the reconnaissance satellite system, designated Weapon System 117L_{1A}

~~designation reserved for use in ultimate system development~~ ^{proposal destined} ~~acquired~~

a new nickname, "Pied Piper", ~~on 17 December 1954 for administrative~~ ^{Major Quentin A. Riepe, Major} System Officer for Project MX-2226, at Wright Air Development Center, ~~purposes at the request of Major Quentin A. Riepe, who was Weapon~~ ^{wanted to use the nickname} ~~ment Center~~, ^{as an administrative convenience.}

System Officer for Wright Air Development Center Project MX-2226. Project 1115 ~~and~~ acquired the MX number, along with its unclassified

title "Advanced Reconnaissance System", on 8 January 1954. ⁷

During the time the advanced reconnaissance satellite system was under study the Air Force also had under consideration a guided missile,

the Atlas. Effective 8 April 1954 the Air Force established the Office of the Assistant Chief of Staff for Guided Missiles and directed ~~the~~ ^{that}

~~Assistant Chief of Staff for Guided Missiles~~ to accelerate the Atlas program ^{under the highest Air Force priority.} ~~and awarded the highest priority in the Air Force to the program.~~

The Air Force assigned ~~field responsibility for~~ the Atlas program during development and test, ^{to} ~~to~~ Air Research and Development Command and directed ~~to~~ ^{Command} establish a field office on the West Coast with a general officer in command. ⁸

The Air Force appointed Brigadier General Bernard A. Schriever, Assistant to the Director of Research and Development/for Project Atlas. Air Research and Development Command established the Western Development Division at Los Angeles, California, effective 1 July 1954 with ~~B. A.~~ Schriever in command. ⁹

In the fall of 1954 ~~the~~ Western Development Division, in addition to creating a management organization, and recruiting civilian and military personnel for staffing the new organization, ^{made} ~~made~~ a staff study for Lieutenant General Thomas S. Power (Commander ARDC) ^{covering study} ~~covering study~~ of the inter-actions of the existing Atlas program with a 1500-mile Tactical Missile and ^{the} ~~the~~ satellite program. Wright Air Development Center

was working on the latter two projects.¹⁰

In June 1955 the Department of Defense Satellite Committee (Mr. Donald A. Quarles, Director of Defense, had appointed the committee within DOD to study the best method of providing the United States with a satellite between the dates ~~June~~ ^{June} 1957 and December 1958. The committee was known as the "Stewart Committee," named after its Chairman, Dr. Homer J. Stewart.)^{*} visited Western Development Division for a briefing on the Atlas Program. At the request of Headquarters Air Research and Development Command, Dr. B. D. Fried of Ramo-Wooldridge Corporation (contractor for Western Development Division ~~contractor~~ for technical direction and systems engineering) presented to the committee a technical analysis of the Atlas capabilities of placing a 500-lb or greater payload in a satellite orbit. Colonel Harold W. Norton, Assistant Deputy Commander, Technical Operations, presented ^{The Committee} a ten-minute talk on the Atlas Program.¹¹

Colonel Norton and Dr. Fried again presented a briefing to the Homer J. Stewart Committee on 7 July 1955. On 12 August 1955, Mr. Trevor

^{*}Members of the Stewart Committee, 1955 were: Dr. Homer J. Stewart (Chairman) Professor, California Institute of Technology; Dr. Richard Porter, Chairman of the Earth Satellite Panel of the U. S. National Committee for the IGY; Dr. R. McMath, Professor, Astronomy, University of Michigan, Director, McMath-Hubert Observatory; Dr. C. C. Lauritsen, Professor, California Institute of Technology; Dr. J. Kaplan, Chairman, United States Committee for the IGY, National Academy of Sciences; Dr. C. Furnas, Chancellor, University of Buffalo; Dr. J. B. Rosser, Professor, Cornell University; Mr. George Clement, RAND Corporation, Santa Monica, California; Mr. R. Buchheim, RAND Corporation, Santa Monica, California.

Gardner, Special Assistant Secretary (Research and Development) of the Air Force, and others attended a meeting at Western Development Division at which time an Air Force position was established as a result of the Stewart Committee report. The International Geophysical Year (IGY) satellite was assigned to the Navy with the Martin Viking (a high altitude sounding rocket, not a weapon, which later became Vanguard), to be an integral part. Inasmuch as the ^{Research} Advanced Satellite-vehicle was also a satellite, it had become involved in top governmental discussions, and control in the scientific satellite program.¹²

Throughout the next few months other pertinent meetings were held with the result that "considerable heat" was generated by Air Research and Development Command, Wright Air Development Center, and Holloman Air Development Center on the subject of the IGY and the advanced reconnaissance satellite. Neither project could proceed without utilization of the Atlas missile as a booster.¹³

On 17 October 1955 Air Research and Development Command issued Systems Requirement Number 5 making Western Development Division responsible agent for Advanced Reconnaissance System (WS 117L) Effective 6 February 1956

Western Development Division

(continued on next page)

established the office of Assistant for Weapons System 117L (WDTS) and appointed Colonel Otto J. Glasser as Acting Assistant, ^{and} Navy Commander Robert C. Truax* as the Acting Deputy Assistant. During the following months military satellite management functions phased from the Wright Air Development Center (ARDC), Dayton, Ohio, to the Western Development Division (ARDC).

A joint Air Research Development Command/Western Development Division/Wright Air Development Command/Air Materiel Command contractor evaluation board met 12-20 March 1956 at Wright-Patterson Air Force Base to evaluate WS 117L design studies prepared by Radio Corporation of America, Glenn L. Martin Company, and Lockheed Aircraft Corporation. The board found Lockheed as best qualified and recommended award of prime contract to Lockheed for development of WS 117L.¹⁵ However it

*)
was 29 October 1956* before letter contract AF 04(647)-97 was finally
awarded to Lockheed Aircraft Corporation for the development of WS 117L
that was to provide continuous surveillance (visual, electronic and
infrared) coverage of the USSR and USSR-dominated countries.

Systems Requirement Number 5 (which made Western Development
Division responsible agent for WS 117L) also directed that Western
Development Division, with the support of the centers, submit a systems
development plan to Headquarters USAF by 1 April 1956. With the combined
efforts and talents of the centers, Western Development Division submitted
a development plan for WS 117L on 2 April 1956.* On 22 May 1956, Commander,
Air Research and Development Command notified Commander, Western Development
Division, that Air Staff was reviewing the development plan but neither
Air Research and Development Command nor USAF FY 1957 financial plans
carried funds for WS 117L, and OSD FY 1957 emergency funds were being
investigated. Authority to initiate contractual action for systems develop-
ment was not granted because FY 1957 funding had not been resolved. Western
Development Division was authorized to announce contract or

*)

note about 7-10-56
* Memo Report 18, 18-11-56 and Col Charles H. Derhine
date for contract award
5-11-56

selection and expend remaining Project 1115 funds to maintain continuity
of engineering study by Lockheed. ¹⁶ Western Development Division notified
the winning and losing contractors on 25 May 1956, and on 12 June 1956
issued a Contract Change Notice (CCN), financed with \$322,245 of
Project 1115 funds to extend Lockheed's contract to 1 October. ¹⁷

The Scientific Advisory Committee on Ballistic Missiles to the
Secretary of Defense held its fourth meeting 16-18 July 1956 at Western
Development Division at which time the committee recommended approval
of the WS 117L program. The program the makers of the develop^{ment} plan
envisioned consisted of three operational systems with somewhat different
capabilities as follows: (1) Pioneer System; (2) Advanced System; and
(3) Ultimate Systems. The advanced reconnaissance system proposed development
consisted of eight phases. The development plan specified a two stage
vehicle composed of an ICBM Intercontinental Ballistic M44 Missile booster
for the first stage and a vehicle complete with a propulsion system and
internal controls for the second stage. The first stage of the two stage
vehicle to be launched from United States' territory was for boosting the
first stage for a distance of approximately 3,000 miles from the launch
pad and then drop away from first stage after engine burn-out. The second

stage propulsion system was for furnishing the necessary power to propel the second stage vehicle to an altitude of about 300 miles where it would assume an orbit after which internal controls would orient the vehicle into its proper attitude. ~~The/~~

The Scientific

/Advisory Committee's approval of the WS 117L program did not include an approval of a booster for the system because of its development interference with the ICBM program and reported that it was not yet clear whether the Atlas (Strategic Missile-65) or the alternate ICBM , Titan (Strategic Missile-68)* would eventually turn out to furnish the more suitable WS 117L booster.

* USAF (AFDDC) granted authority to ARDC on 2 May 1955 to immediately proceed with second airframe configuration development of ICBM that would provide for the Tactical Ballistic Missile (TBM) (General Operating Requirement 50 TA-1c-1-59). The GOR was later (27 Sep 55) amended to specify a Medium Range Ballistic Missile Weapon System. WDD issued^o letter contract AF 04(645)-56 for development of the alternate airframe on 27 Oct 1955 to Martin Aircraft Company, Denver, Colorado. On 27 November 1955 WDD issued letter contract AF 04(645)-65 to Douglas Aircraft Company, Inc, Santa Monica, California, to develop the Thor, an Intercontinental Range Ballistic Missile (IRBM) based on GOR 50-TA-1c-1-59, which required a missile capable of delivering a 2,500 pound warhead nose cone combination.

On 24 July 1956, Headquarters USAF approved Development Plan¹⁸ for WS 117L dated 2 April 1956 and on 3 August 1956 issued Development Directive Number 85 for Weapon System 117L Advanced Reconnaissance System. D. D. No. 85 was applicable to General Operations Requirement Number 80 dated 15 March 1955, and assigned 1A priority (assigned when action is essential to the successful completion of combat or direct combat support operations) and I-6 precedence rating (priorities 1A, 2A, and 3A) to the system.¹⁹

D. D. No. 85 constituted the authority to initiate such developments that could be supported with Fiscal Year 1957 funds limited to \$3.0 million.

The development plan had specified \$32.1 million for Fiscal Year 1957.

On 28 August 1956 Western Development Division requested from Deputy Chief of Staff (Development), USAF, thru ^{the} Commander, ARDC, who strongly supported the request, additional FY 1957 funds in the amount of \$21.9 million: \$11.4 million for guided missiles and related equipment (P-620); \$8.5 million for strategic missiles (P-131); and \$2.0 million for guided missile ground handling equipment (P-244).

On 11 October 1956 Commander, Air Research and Development Command sent a follow-up message to Headquarters, USAF, requesting information on the funding program as outlined in the letter of 28 August 1956 because negotiations with Lockheed as prime system contractor for WS 117L were seriously hampered by lack of definite information on the funding program for FY 57. On 22 October 1956 Headquarters, USAF replied to both the letter of 28 August 1956 and the message of 11 October 1956, stating that \$3.0 million (the amount of funds formerly allocated) constituted total funds available at that time, but that the headquarters contemplated reprogramming additional \$7.0 million during FY 57 from P-600 (research and development) funds. Headquarters USAF advised that development plan should be revised to reflect an annual \$10.0 million rate of expenditures and that a determination should be made of extent and specific application of FY 57 and FY 58 non P-600 funds. At that time no non P-600 funds were programmed for WS 117L. 20

LtCol Frederic C. E. Oder. (who had succeeded Acting Assistant for WS 117L, Colonel Otto J. Glasser as Assistant for WS 117L on 13 August 1956) briefed Putt on 7 November 1956 on the planned program for research and development and engineering test of WS 117L for the balance of FY 1957, utilizing \$10.0 million in P-600 funds. Later in the month, ~~Air Force~~ Western Development ~~Ballistic-Missile~~ Division requested additional funds deemed necessary in the development of essential components of ~~the~~ WS 117L program during the remainder of FY 1957. ARDC strongly supported the request for funds for P-100 (aircraft and related procurement) and P-200 (procurement other than aircraft) as well as additional funds for research and development (P-600).²¹ Putt responded to the request by announcing on 10 December 1956 that the \$3.0 million originally funded for WS 117L had been increased to a total of \$5.0 million. Putt also announced that it was the intention of Headquarters USAF to add another \$5.0 million P-600 funds during the fiscal year.²² On 8 January 1957 \$5.0 million in P-600 funds was released.²³

Although WDD again wrote USAF for funds on 30 January 1957 and ARDC strongly urged USAF to make every effort to obtain P-100, P-200 and P-300

funds for FY 1957 and FY 1958 as requested earlier, there were no funds available until 11 April 1957 when Office of Secretary of Air Force approved release of \$3.9 million in P-100 funds ²⁴ which made a total of \$13.9 million for WS 117L in FY 1957. The P-100 funds was the amount requested in message from Commander, WDD, Western Development Division, on 15 March 1957, for immediate requirements to be used as follows:

10 each Bell Hustler engines	\$1.5 million
AC Spark Plug (Thor) guidance platform, Type 20 Inertial Guidance Gyros, accelerometers, mechanical control, equipment and associated gyro, and accelerometer electronic components	\$0.26 million
Gimbal components for Bell Engines	\$0.16 million
Propellants for ground propulsion tests	\$0.10 million
3 WS 117L Satellite airframes	\$0.60 million
Assorted airborne communications equipment	\$0.30 million
Procurement of Aerobee HI Rockets, beacons, telemetry equipment, biaxial pointing controls, airborne timing equipment and power supplies for geophysical environmental test flight program	\$0.80 million
7 units of battery auxiliary power units	\$0.18 million
TOTAL	\$3.90 million

On 1 February 1957, Headquarters USAF, in response to request from DOD, had requested WDD to furnish information, including fund breakdown regarding possible use of WS 117L for International Geophysical Year.

Western Development Division's reply was that the most logical approach to achieve such a capability was the same as represented in fund requirement letters of 21 November 1956 and 30 January 1957.²⁵

In answer to Western Development Division's letter of 30 January 1957 and Air Research and Development Command's urgent request for P-100, P-200 and P-300 funds contained in first indorsement, Putt wrote Commander, Air Research and Development Command, that FY 1957 P-100 and P-200 funds were already programmed and that WS 117L program had to proceed with P-600 funds already available. However, Putt wrote that another review would be made in April to determine if \$4.67 million in P-100 and \$4.02 million in P-200 funds could be obtained for FY 1957. Putt further requested the Development Plan under revision be amended to indicate no orbital testing before January 1960. Putt also wrote that he envisioned ~~that~~ development would be along conventional lines, which dictated ~~the~~ need for ~~the~~ establishment of a Weapon System Project Office within WDD. ARDC's response was that ARDC requested Commander, WDD, initiate action to establish a Weapon System Project Office within WDD concurrently upon receipt of P-100 and P-200 funds.²⁶

The Office of Assistant for Weapons System 117L that had been established on 6 February 1956* when Colonel Otto J. Glasser was assigned acting Assistant and Navy Commander Robert C. Truax was assigned acting Deputy Assistant to Deputy Commander, Technical Operations, had further enlarged by assignment of three officers (all formerly assigned to Pied Piper office at WADC) on 1 May 1956. Captain James S. Coolbaugh was assigned as Project Officer (Aerodynamics), Integration Office; Captain William O. Troetschel was assigned as Project Officer (Facilities), Facilities and Equipment Office; and First Lieutenant John C. Herther was assigned as Assistant Project Officer (GFE), Facilities and Equipment Office.²⁷ On 24 June 1956 Lieutenant Colonel Quentin A. Riepe (formerly Weapon System Officer for Project-MS-222- Pied Piper, WADC) was assigned Project Officer (Schedules) Plans and Program Office. On 2 July 1956, Major Raymond E. Zelenka was assigned Project Officer (Programs), Plans and Program Office.²⁸ On 13 August 1956 Lieutenant Colonel Frederic C. E. Oder, former Project Liaison Officer at ARDC, Office of Assistant to Commander, WDD, was assigned primary duty as Assistant for WS-117L, thereby relieving Colonel Glasser.²⁹

* White note

In September 1956, Colonel Oder planned a build-up of personnel by 1 January 1957 to include 14 additional officers making a total of 21. Further planned build-up to 1 July 1957 included 9 additional officers, making a total of 30 assigned officer personnel. However, as of July 1957 when the Offices of Assistant to the Deputy Commander for Technical Operations were redesignated Directorates, only three additional officers had been assigned to Directorate WS 117L making a total of 10 officers. Captain Edward J. Conway had been assigned primary duty as Project Officer (Budget), Plans and Program Office effective 21 September 1956.³⁰ had been Major Harold F. Wienberg was assigned primary duty as Project Officer (GFE) Facilities and Equipment Office effective 19 December 1956.³¹ Captain David D. Bradburn was assigned Project Officer, Facilities and Equipment Section, Facilities and Test Branch effective ~~1 July~~ ^{20 June} 1957.³² In addition to the officers on board as of 1 July 1957 there were three civilians, one of whom was Mrs. Elizabeth M. Hawkins who had been assigned to the office when it was established in February 1956.

In addition to the Weapon System 117L office that had been established within the Air Force Ballistic Missile Division, a Weapon

System Project Office was formally established in Ballistic Missiles Office (Air Materiel Command) effective 1 July 1957 with Lieutenant Colonel James S. Seay assigned as chief of the branch, making a formal joint ARDC/AMC Weapon System Project Office for administration of the WS 117L program. ³³

Whereas WS 117L program progress was by way of DOD's extremely conservative approach with a target date no earlier than 1 January 1960³⁴ for the initial orbital test, the ICBM and IRBM programs, although cut short by economy cutbacks for Fiscal Year 1957, had made appreciably more rapid progress. The Atlas ICBM program, with the highest national priority, and reached flight test launch stage as Air Force Ballistic Missile Division (having been designated on 1 June 1957 from Western Development division) ³⁵ had launched the first Atlas on 11 June 1957 *from Cape Canaveral*. However, the flight test launch was a failure because after the missile wobbled due to a motor malfunction, it was destroyed after 25 seconds of flight. The second Atlas flight missile that was already scheduled to be erected about the middle of July was launched on 25 September 1957 but it was also destroyed. The alternate ICBM Titan was not flight tested until 6 February 1959.

The Thor program had ^{advanced} advanced quite rapidly as on 3 October 1957

Air Force Ballistic Missile Division had launched the sixth Thor IRBM

missile from Cape Canaveral. Air Force Ballistic Missile Division had launched

the first Thor on 25 January 1957 from Cape Canaveral just 13 months

after the contract date. Only the fifth launch on 20 September 1957 was a successful launch.

By October 1957, although little progress had been made with its limited funds, Program WS 117L had to its advantage the contractor team that had been assembled as well as the management offices, Directorate of WS 117L in Air Force Ballistic Missile Division/^(ARDC) and the Weapon System Project Office in Ballistic Missiles Office (AMC).

Organizationally, as a whole, Air Force Ballistic Missile Division and Ballistic Missiles Office personnel consisted of "hand-picked" military personnel and civilian employees of unusual dedication. Major General Bernard A. Schriever commanded AFBMD and as Assistant to Commander, Air Research and Development Command had directive and authority of Air Research and Development Centers. Schriever also, through Brigadier General Ben I. Funk, Commander, Ballistic Missiles Office, was able to control at one location the logistic, contracting, procurement, and other responsibilities normally exercised through Headquarters, Air Materiel

Command at Dayton, Ohio.

The 1st Missile Division that was stationed at Cooke Air Force Base and later transferred effective 1 January 1958 to Strategic Air Command with Major General David Wade in command, had been organized and staffed by Air Force Ballistic Missile Division. The members of the 1st Missile Division had been planning operational requirements concurrently with research and development.

As a member of the management structure for Air Force Ballistic Missile and Space Programs, the Guided Missile Research Division* of the Ramo-Wooldridge Corporation, the contractor for technical direction and system engineering for Air Force Ballistic Missile Division, was a scientific group whose educational achievements consisted of approximately 18% doctorate, 40% master and 39% baccalaureate degrees.

The wide geographic dispersed industrial team whose manpower numbered approximately 41 thousand employees was composed of contractors that had been selected by a selective competition process. ^{Altogether} Although Air Force

* Through reorganization the Guided Missile Research Division became a subsidiary corporation on 22 November 1957, and renamed Space Technology Laboratories.

Ballistic Missile Division administered 21 Major contracts and over 200 subcontracts indirectly.

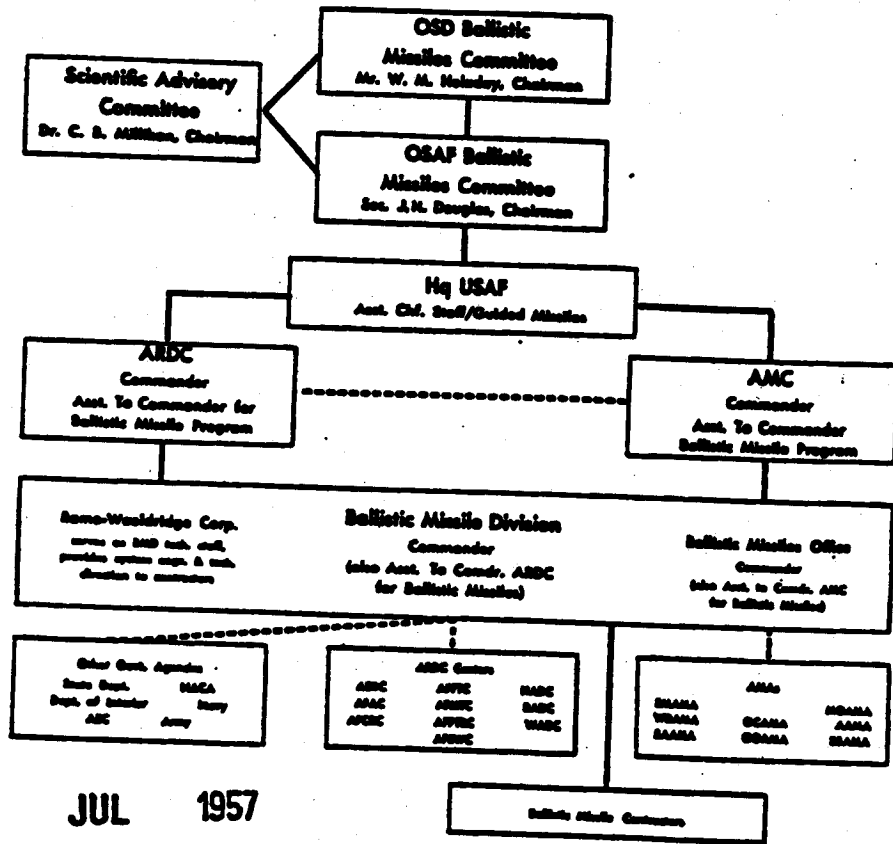
Ramo-Wooldridge was not the only scientific group whose services were available. ~~The Millikan Committee~~ ^{The Scientific Advisory Committee} was a group of the nation's top scientists who acted both as a scientific advisory group to the Air Force and to the Department of Defense.³⁶

Time lost in research and development of WS 117L Program because of lack of national interest and mounting fund deficiencies was time lost that could hardly be regained but Air Force Ballistic Missile Division with its management structure and (see figure 1) and contractor teams already in operation was somewhat prepared for program acceleration when Soviet Sputnik I was launched on 4 October 1957. The

* Dr. Clark B. Millikin, California Institute of Technology was chairman of ~~Scientific Advisory Committee~~ Prior to 1 April 1957, Dr. John von Neumann, Commissioner, Atomic Energy Commission, was chairman. Other members ~~of Scientific Advisory Committee~~ were
Dr. Hendrik W. Bode, Bell Telephone Laboratories, Inc.
Dr. Hugh Dryden, National Advisory Committee for Aeronautics
Dean John Dunning, Columbia University
Dr. Darol K. Froman, Los Alamos Scientific Laboratory
Mr. William B. Graham, RAND Corp.
Dr. George B. Kistiakowsky, Harvard University
Dr. Charles C. Lauritsen, California Institute of Technology
Brig. Gen. Charles A. Lindbergh, Darien, Conn.
Dr. Robert R. McMath, University of Michigan
Dr. James W. McRae, Sandia Corp.
Dr. J. Barkley Rosser, Cornell University
Prof. Jerome B. Wiesner, Massachusetts Institute of Technology
Dr. Herbert F. York, University of California
Mr. Carroll L. Zimmerman, Offutt Air Force Base, Nebr.
Dr. L. A. Hyland, Hughes Aircraft
Mr. James O. Spriggs (executive secretary). ORT

Figure 4

**Management Structure
AF Ballistic Missile Program**



JUL 1957

180 pound Soviet Satellite, whirling around the earth in an orbit of 560 miles apogee and 145 miles perigee at 18,000 miles each hour caused nation-wide alarm.

Although newspapers had been filled with columns about satellites and guided missiles, people knew little about what they were or what they meant to the national defense. Within hours after Sputnik I was launched, Congress began to assemble information for use in a full, complete and exhaustive inquiry into the state of defenses and the steps that would have to be taken to meet the challenge imposed by Russia's competence in rocket technology and her threat to United States national security.

Acceleration

On 16 July 1957, Air Force Ballistic Missile Division ~~(having~~

~~been redesignated on 1 June 1957 from Western Development Division)~~

submitted its second WS 117L (new nickname "New Horizon" had been assigned

on 10 July 1957) development plan* for the year. The plan specified

that if the current level of funding continued, September 1958 would be

a realistic target date for the first launch. However, a more desirable

level of funding--\$47.0 million for FY 1958 and \$142.5 million for

FY 1959--would enable a first launch in March 1959. The Air Force Council**

recommended the "desirable level" of funds but before the Department of

Defense gave its approval the Soviet Union launched Sputnik I on 4 October 1957

* Development Plan dated 16 July 1957 is no longer available at SSD. The plan was inadvertently destroyed in the program office.

** "Probably the most important development affecting policy-making in the headquarters USAF was the establishment of the Air Force Council in 1951. Composed of the Vice Chief of Staff, the five deputy chiefs of staff, and the Inspector General, the council had responsibility for drawing up Air Force policies and objectives, reviewing and approving programs, and giving guidance to the Air Staff. The council relieved the Chief of Staff of much of the detailed work of policy-making, presenting to him for approval only formal recommendations. This permitted the Chief of Staff to devote more of his time to interservice and international problems." A History of the United States Air Force 1907-1957 by Alfred Goldberg (Editor) p 110

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XX mgmt Report 6 Jun 58 discusses and midair 1906-1959

which caused widespread alarm and concern over the security of the
the country's
United States and/loss of ~~the country's~~ prestige. The President,
Congress and Secretary of Defense began to study and debate the status
of existing space-related activities, long-range space programs and
whether the space program should be civilian or military.

A few days after Sputnik I was launched, Secretary of the Air Force
James H. Douglas approved the program as recommended by the Air Council
as a planning objective subject to a later review with the understanding
deputy secretary of defense, Mr. Quarles, and perhaps the President
would have an opportunity to review the plan. 37

On 11 October 1957, \$35.1 million P-100 funds were established and
transferred to Commander, Air Materiel Command. No. P-200 funds were
available but early release of funds was anticipated. 38 However by
18 October the funds were limited to \$15.5 million through January 1958,
although planned rate of effort through January 1958 was not limited. 39

40
In May 1957, Lieutenant General Putt had requested the Scientific
Advisory Board establish a special study group to review studies underway
by Ramo-Wooldridge Corporation, in conjunction with Western Development

Division and Headquarters USAF, as well as studies in progress at the RAND Corporation and problems under consideration by industry groups. The Scientific Advisory Board ad hoc Committee on Advanced Weapons Technology and Environment* had met at RAND Corporation on 29-31 July 1957 at which time the ~~committee was briefed by~~ the Air Force and industry representatives briefed the committee members. On 9 October 1957, the Committee published its report which covered a range from specific military weapons systems to scientific experiments. The committee reported that "Military satellites for reconnaissance and intelligence missions appears to deserve the next priority amongst military weapons systems in the cis-lunar region." 41

* Members were Dr. H. Guyford Stever, Chairman; Professor Joseph Kaplan; Dr. Clark B. Millikan; Dr. Mark M. Mills; Professor W. H. Radford; Dr. Simon Ramo; Dr. Clayton S. White and Mr. Chester N. Hasert, Secretary.

Although orbiting Sputnik I had brought on more national appreciation and consideration of use of space for national defense, Deputy Secretary of Defense Mr. Donald A. Quarles still seemed rather cold on the planned program for WS 117L when General Putt briefed him on 16 October 1957. At the meeting were other high level officials including Secretary of the Air Force Mr. James H. Douglas and Assistant Secretary of Defense (R&D) General Curtis LeMay. After the meeting Generals Putt and LeMay met with Mr. Douglas who expressed the desire "that the Air Force look into all possible schemes that we might permit the Air Force to do something spectacular in the satellite field." ⁴² The next day, General Putt directed Commander, ARDC to call upon industry to consider ways to counteract world reactions to Sputnik I. As a result, the committee composed of members of AF Scientific Advisory Board, the aircraft industry and ARDC personnel met 21 and 22 October under the chairmanship of Dr. Edward Teller.*

* Other members were: (See attached list)

Dr. E.J. Barlow
Mr. J. Beerer
Mr. K.J. Bossart
Mr. G.H. Clement
Dr. E.B. Doll
Dr. W.R. Dornberger
Dr. K. Ebricke
Dr. C. Faulders
Mr. C.L. Forrest
Dr. D.T. Griggs
Mr. M.D. Hunter
Dr. J. Isenberger
Mr. T.G. Lauphler, Jr.
Mr. F. O'Greez
Mr. W.F. Parker
Dr. L.D. Riderour
Mr. R.J. Sandstrom
Mr. M. Sherman
Mr. W.M. Sitt
Mr. E. Sprauitz
Dr. E.A. Steinhoff
Mr. G.S. Trimble, Jr.

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North American Aviation
Lockheed Aircraft Corp
Bell Aircraft Corp
North American Aviation
Bell Aircraft Company
Douglas Aircraft Corp
Aerophysics
Green L. Martin Co.

~~SECRET~~
Dr. G.E. Valley

Dr. T.F. Walkowicz

Mr. R.H. Widmer

Mr. R.G. Wilson

Chief Scientist, USAF

L.S. Rockefeller Staff

Convair

North American Aviation

Sub-committee members saw of the "Teller" ad Hoc Committee.

The Teller Committee recommended (1) consolidation of organizations from Secretary of Defense on down, including efforts of all services and (2) "Put the ballistic missile and space flight programs on a maximum effort basis in all its aspects, without reservation as to time, dollars, or people used. Most important of all, provide a realistic assurance that the entire program has the priority of governmental and national interest required by the threat."

On ~~11~~ December 1957, after the Teller Committee ^{published its} report was

~~published~~ on 29 October 1957, the Secretary of Defense published a draft directive establishing the Department of Defense Advanced Research Project Agency (ARPA) that would manage certain advanced research and development projects. The ^{SOD} ~~draft~~ ^{the draft on} revised 29 November 1957 and later published as DOD Directive No. 5105.15 dated 7 February 1958.

on 18 Oct 57, just two

~~Two~~ days after General Putt had briefed Quarles, the "Stewart Committee" met at RAND Corporation at which time the complexity of the WS 117L program was discussed. Although none of the members of the committee could tell in any way, shape or fashion just how to go about reducing the complexity of the development of WS 117L and still meet the

provisions of General Operating Requirement No. 80 under which the

⁴³
program office had to operate.

At the time the design contractors made their studies, the Missile Systems Division, Lockheed Aircraft Corporation, Sunnyvale, California, and its subcontractors, Columbia Broadcasting System Laboratories and Eastman Kodak Company, prepared a Development Plan, Volume I of which was a system plan but Volume II was prepared in twelve volumes, one volume for each subsystem. The subsystems, all technically different which required many subcontractors, were as follows:

- A. Airframe
- B. Propulsion
- C. Auxiliary Power
- D. Guidance and Control
- E. Visual Reconnaissance
- F. Electronic Reconnaissance
- G. Infrared Reconnaissance
- H. Vehicle Electronics
- I. Airborne Test Systems
- J. Vehicle Intercept and Control Ground Station
- K. Ground Data Processing
- L. Vehicle Ground Support

The 2 April 1957 AFEMD development plan system description included

the following subsystems:

- A. Airframe Vehicle (Project #1755)
- B. Propulsion (Project #1756)
- C. Auxiliary Power (Project #1757)
- D. Guidance and Control (Project #1758)
- E. Visual Reconnaissance (Project #1759)
- F. Electronic Reconnaissance (Project #1760)
- G. Infrared Reconnaissance (Project #1761)
- H. Ground-Space Communications (Project #1762, Formerly H & J combined.)
- I. Data Processing (Project #1763)
- J. Geophysical Environment Data (Project #1764)
- K. Personnel Operations (Project #8728)

In addition to discussing the complexity of the program, the Stewart Committee considered the IRBM (Thor) and how it could be put

to use in military and/or scientific satellite program. ⁴⁴ Use of the

Thor was again considered when the ~~Armed-Forces-Policy-Council~~ Air Force ^{add memo Nov 57} briefed the ~~Armed Forces Policy Council~~* on 5 November 1957.

Following the ~~USAF~~ briefing of the ~~Armed Forces Policy Council~~, Assistant Secretary of the Air Force, Richard E. Horner notified secretary of defense that WS 117L could be accelerated by using as the basic booster,

* WS 117 next page

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Add

In addition to discussing the complexity of the program, the Stewart Committee considered the IREM (THOR) and how it could be put to use in military and/or scientific satellite program.⁴⁴ How Thor could be used was settled on 5 November 1957 at an Armed Forces Policy Council Meeting.

On 2 November, Headquarters, USAF, requested AFBMD's assistance in preparing a presentation to the Armed Forces Policy Council^{*} on USAF capabilities and plans for space flight testing. On 3 November representatives from AFBMD, Ramo-Wooldridge Corporation, and Douglas Aircraft Company, Inc., met to "prepare a joint AFBMD/RW/DAC position on the capabilities of THOR for this mission." The group reviewed the findings of the "Barlow" Sub-Committee (Report of Sub-committee Number Four) of the "Teller" Ad Hoc Committee and agreed "to the proposal made by DAC [Douglas Aircraft Company] that the use of the Vanguard third stage plus THOR could realize the earliest practical capability for a large satellite or for a moon rocket."⁴⁵

change to note as discussed 5:05 PM 2 Jan 57

⁴⁵ MFR, LtCol Sidney Greene, WS-315A Missiles Development Division, AFBMD (WDTIS) 8 Nov 57.

On 4 November, Lieutenant Colonel Sidney Greene of the AFBMD WS-315A (THOR) Program Office, assisted, at the Pentagon, in preparation

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