VI. [redacted] TRAINING

(U) JUPITER training followed the circuitous path of the development program, and considering its late start the accomplishment was probably more difficult. This was borne out by the fact that when the program was first approved there was no clear delineation as to which service would employ the land-based version. Quite naturally in the first months after system authorization, the Army expended considerable effort to secure approval to employ the system. OSD-BMC appeared to accept the concepts, but the Assistant Secretary of Defense withheld $6.8 million proposed for FY 1957 GSE funds, and contended that ABMA had no mission to develop GSE. This decision left the Agency with permission to develop just enough GSE to support the development program and train a small cadre of Army and Navy personnel. Thus, other than a research and development mission, operational employment and training plans were at an impasse.[1]

(U) Notwithstanding this apparent block, ABMA acted in November 1956 to establish a separate division for training with a specific responsibility for heavy ballistic missile troop training. Ironically, the Training Division began to function on 26 November, the date of the Wilson roles and missions memo. Not only did the Agency have to struggle to get a training plan formulated, but they had to fight for the very life of the JUPITER program. In keeping with the classic "one-two" pattern, the Navy dropped out of the JUPITER development program shortly

1. JUP Story, prepared by Gen Medaris for S/A, 14 Dec 59, Hist Off files.

after the Secretary's decision, and it began to appear unlikely that a training program would ever get under way.

(U) Despite the bleak outlook, the new Training Division moved along as efficiently as the situation would allow. For example, they investigated requirements for Ordnance officer training and prepared a tentative training outline, identified specific skills that were necessary to attain missile specialty ratings, arranged for instructor factory training, and provided OJT instruction in the ABMA laboratories. With these efforts a nucleus of personnel from activities associated with the program were trained. In this respect, men from the Maintenance Operating Procedures Shop (MOPSHOP) were given three months training at the Ordnance Guided Missile School (OGMS) in the Ordnance Individual Specialist Course, and two months OJT at Chrysler in Detroit. Additionally, approximately 44 students per month were receiving the OGMS one-week Ballistic Missile Orientation Course.[2]

(U) After operational control of the JUPITER had been given to the Air Force, the Training Division sought information from AFBMD in order that an efficient training program could be planned. At the briefing for General Schriever in June 1957, they presented a complete plan to meet the JUPITER portion of the Air Force IRBM IOC requirement. This proposal was built around the Air Force's static site employment concept. Also, maximum utilization of Air Force specialists would be made. On another point, it was stated that personnel and facilities for

2. Hist of the JUP Tng Pro, pp. 16-17, Hist Off files.

assembling and servicing special weapons warheads would be furnished by an Aviation Depot Squadron. The plan went on to cover each facet of the training program from factory training of instructors until the troops were ready to man the missile in the field.[3]

(U) Army and Air Force representatives made a comparison of JUPITER and THOR training plans in early July. As for the special weapon warheads, the Army adjusted its plan to the Air Force method of placing this function directly with the Strategic Missile Squadron (SMS - later called Technical Training Squadron - TTS). AFBMD also provided other material such as the training cycle, and firing unit and specialists training. ABMA adjusted its proposed training program and submitted it to the Air Force in August, but at that time it appeared that one of the two IRBM's, and quite probably the JUPITER, would be dropped. Thus, the Air Force expressed no interest in the Army presentation. This situation remained until 17 October when the Air Force was told by the Secretary of Defense to cooperate in the development and deployment of the JUPITER. From that time on, studies on the ways and means of attaining a JUPITER personnel force became serious.[4]

(U) To meet a deployment date of December 1958, General Medaris proposed that REDSTONE training equipment be used and Army personnel scheduled into this training be used to man the JUPITER in the initial

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3. Present, Briefing for Cmdr & Staff, AFBMD, 18-19 Jun 57, Hist Off files.
4. Hist of the JUP Tng Pro, p. 17; Fact Book, subj: JUP Project Rqmts, Tab IIc, 14 Oct 57, Hist Off files.

phases of the program. Later these personnel would be replaced by those from the Air Force. This idea was rejected.[5]

(U) In early January 1958, the training program became more defined. During a general conference on the over-all weapon system, it was decided to start entering Air Force personnel into ABMA courses in February 1958. This plan involved 20 airmen for 16 weeks in propulsion and structure training, 20 for the same length of time in G&C, 20 to Ft. Belvoir for LOX maintenance and operation, and the entrance of the 864th SMS commander and 20 other officers into general training beginning with a one-week REDSTONE orientation course. On the 13th of January, these plans were further refined, and the actual training of USAF personnel did not begin until March.[6]

(U) According to the Army-Air Force agreement, ABMA would provide individual training to the degree that a man became proficient in performing a particular task associated with the handling and operation of the JUPITER. The Strategic Air Command (SAC) was responsible for conducting crew or integrated weapon system training (IWST) at Cooke* Air Force Base, California. The Army's portion comprised 20 courses: 16 being conducted at OGMS; three at the Army Engineer School, Ft. Belvoir, Virginia; and a special weapons course at Lowry AFB, Colorado.[7]

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* Later renamed Vandenberg.

5. DF, Cont Off to ORDAB-D, et al., 25 Nov 57, subj: Early Opnl Capability, Hist Off files.
6. MFR, 9 Jan 58, subj: Opnl Planning Conf for Utilization of the JUP Msl Wpn Sys; SACOP 1-58, 4 Mar 58, subj: SM-78 (JUP) Opnl Plan, Hist Off files. Appendix 12 contains a resumé of JUPITER individual training courses.
7. SACOP 1-58, 4 Mar 58, subj: SM-78 (JUP) Opnl Plan; Hist of the JUP Tng Pro, p. 28

(U) In July 1958, the Air Force scrapped its plans to conduct IWST at Cooke. Instead, this training was conducted at Redstone. This action pressed the installation to prepare the site and secure the necessary training equipment. A strike by construction workers further complicated the problem. It was September before a settlement was effected, and November before the IWST area was available. The December deployment date was close at hand, but agreements had not been signed with the host country. So it was realized that the training portion would not be too pressed.[8]

(S) From the outset, the training program was hampered by a lack of equipment. Thus, at the beginning the REDSTONE program had to furnish the nucleus, but many courses were unsatisfactory "paper and pencil" affairs. Eventually, excellent synthetic trainers were fabricated, but even this phase was delayed by the late delivery of the manufacturers. This, and other problems having a bearing, caused frequent rescheduling of the training. To make up for some of the unsatisfactory conditions, ABMA development laboratories were used to the extent possible. Still this was not sufficient to acquaint students with checkout and maintenance procedures.[9]

(S) Because of the lack of an agreement with the NATO countries, toward the end of 1958, it was necessary to make major changes to the training plans. It was realized that NATO troops could be used to man the second and third squadrons. Thus, this left ABMA with one USAF-manned

8. JUP Prog Rpt for Jul 58, 8 Aug 58; JUP Prog Rpt for Sep 58, 8 Oct 58, Hist Off files.
9. Hist of the JUP Tng Pro, pp. 36-37.

and two NATO squadrons to plan for. In fact, planning was the only thing that could be accomplished because of the lack of an agreement. However, before the entry of foreign students into the course, the opportunity was afforded to remove Restricted Data information from the texts and training program.[10] In many ways, at the end of 1958 the JUPITER program was at an impasse, a situation it had experienced many times before.

(U) For all practical purposes, little in the way of training was accomplished during the first half of 1959, although several false starts were made. For one thing a government-to-government agreement was concluded with Italy on 27 March, and it was thought that deployment could commence. However, there were still problems to be resolved with the host nation such as siting and fabrication of some components, and, thus, a technical or service-to-service agreement had to be concluded. It was several months before this was accomplished, and, in the meantime, training plans had to be revised a number of times.[11]

(U) One of the first major revisions came in February 1959, when the Secretary of Defense issued a schedule disclosing that the first squadron would be USAF-manned and the second squadron would be manned by the Italian Air Force (IAF). Right away, SAC proposed that entry into training for second squadron purposes be stopped. Shortly thereafter, the 865th and 866th TTS's were deactivated. This left only one USAF squadron--the 864th--and this unit had completed its IWST on 24

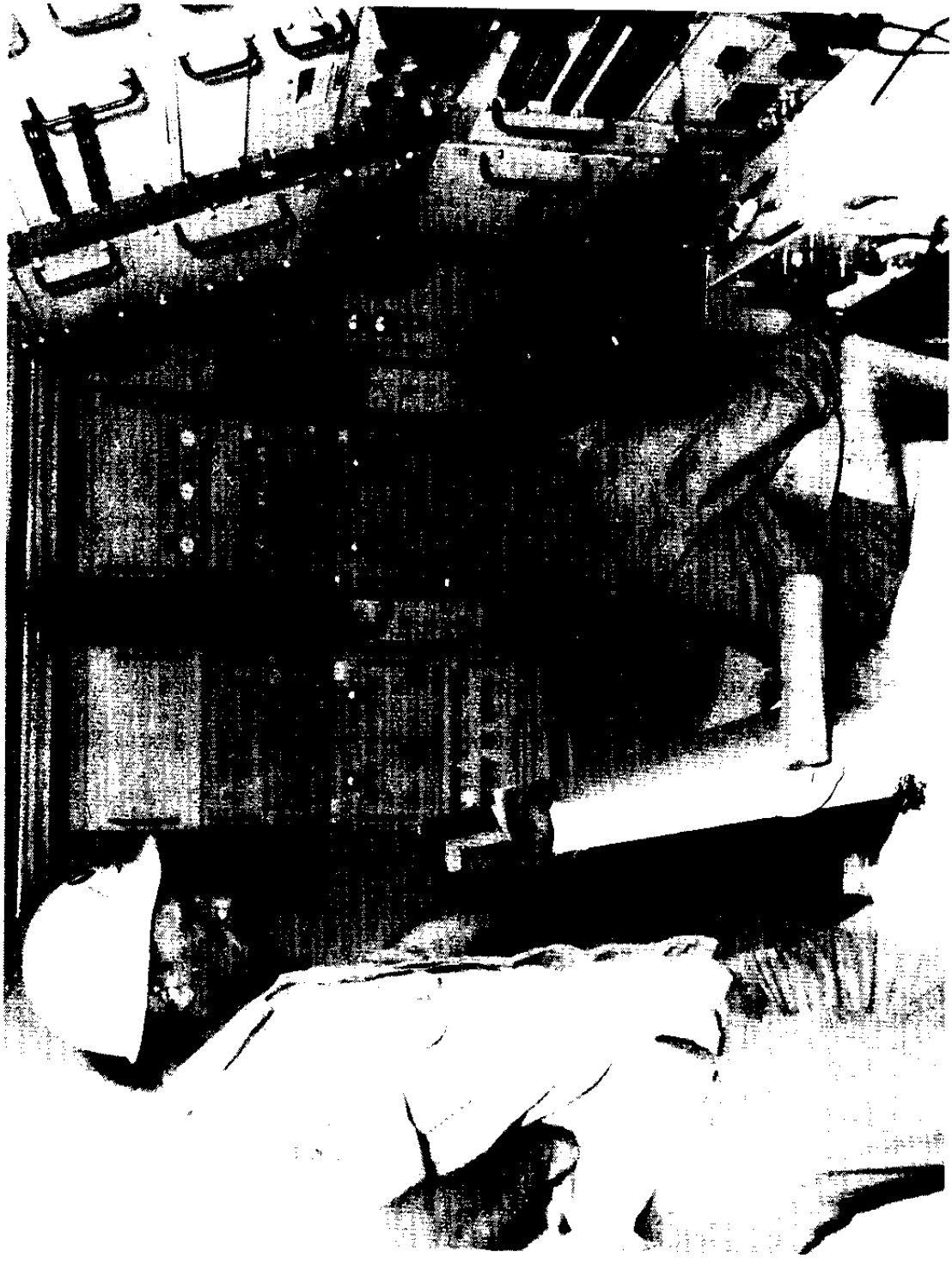
10. Hist, ABMA, Jul-Dec 58, pp. 19-20, Hist Off files.
11. Hist of JUP Tng Pro, pp. 45-46.

February 1959, but had no site to deploy to. So these personnel were entered into refresher courses, especially in areas where a lack of training equipment had been the general condition the first time around.[12]

(U) A change in the maintenance concept forced another major revision in early 1959. Originally, it had been planned to have a receipt, inspection, and maintenance (RIM) area somewhat to the rear of the emplacements, and roving mobile maintenance teams would perform cyclic and emergency maintenance. As time went by, this did not appear to be a wise plan, for in the event of an emergency the maintenance and repair capability needed to be on-site. Based on this, the "fire-house" concept was devised. In a sense, the personnel now had to be both operators and maintenance technicians. This change brought a reduction in manpower requirements, which carried over to the training workload.[13]

[redacted] Thereafter, an organizational change, prompted at the insistence of NATO I, further reduced the manpower requirements. USAF had envisioned that the two squadrons in Italy would operate as separate entities, each having its own headquarters function. It was also believed that four crews at the emplacements would be necessary for around-the-clock operations. To the Italians' way of thinking, a single headquarters and a pool of supporting activities were sufficient. This was called the "2 in 1" concept and was adopted. Moreover, only

12. Ibid., pp. 46-47.
13. Ibid., p. 48.



IAF TRAINING

after lengthy discussion did the Italians agree that even three crews were necessary per site. Here, again, the training requirements were reduced.[14]

(U) Although the technical agreement was not signed, resolution of the structure of the organization paved the way for the entry of the Italians into JUPITER training. In June 1959, the first increment of students reported to Lackland AFB, Texas, to begin their language training, and in September they entered the individual training courses at Redstone. The English comprehension level (ECL) of the first group was relatively good, but oncoming personnel did not register so high in ECL. To compensate for this, the courses were lengthened and a little more night work was accomplished. In the meantime, August 1959 marked the signing of the technical agreement with Italy, and the way was at last clear for the deployment of the JUPITER missile. Thanks to the lengthy period of negotiation, it was now possible to man both squadrons in Italy with IAF personnel, and the 864th TTS, on a reduced basis, became a floating training team.[15]

(U) Two months after they had entered into individual training courses, the first group of Italians began IWST on 9 November 1959 and completed the course on 19 January 1960. By October 1960, the Italian phase of training in the United States had been completed.[16] Judging by the records, that is, based on the CTL firings of 1961 and 1962, the quality of the JUPITER training program was quite satisfactory.

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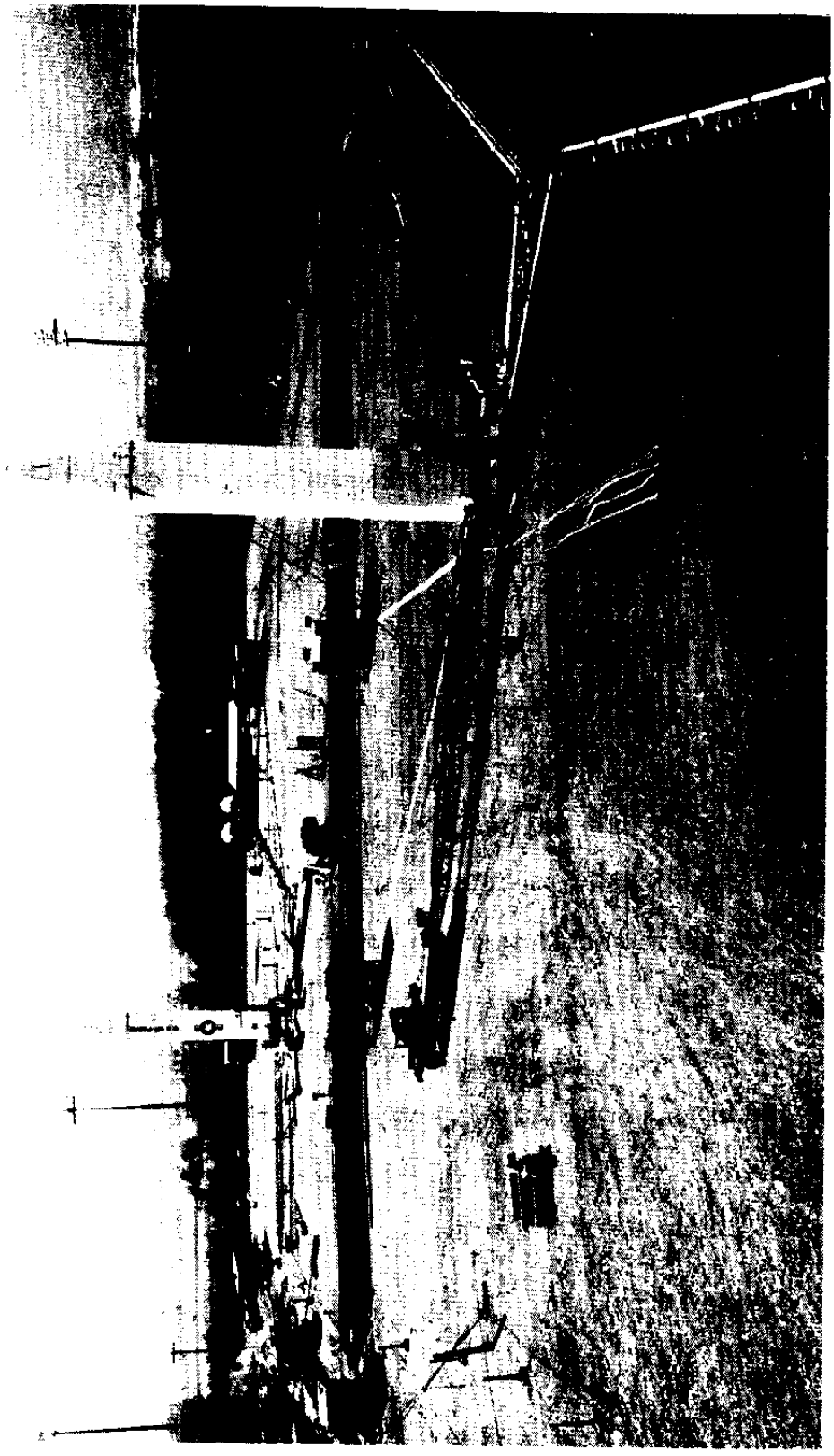
14. Hist, ABMA, Jan-Jun 59, pp. 6-8, Hist Off files.
15. Ibid.; Hist of JUP Tng Pro, pp. 49-51.
16. Hist of the JUP Tng Pro, p. 57.



JUPITER IWST SITE AT OGMS

(U) With the location of the first two squadrons settled, attention was focused on siting the third squadron. On 28 October 1959, a government-to-government agreement was concluded with Turkey for deployment of the remaining squadron. Tentatively, the US programmed a USAF-manned squadron in the third quarter of FY 1961. Some months later--May 1960--the two countries concluded the technical agreement. This document specified that Turkish personnel would be trained to man the missile at the earliest possible date, but that the JUPITER would be manned by USAF personnel.[17]

(U) Thus, the training school at Redstone that had experienced a slight lull at the end of the IAF program had to prepare for the influx of Turkish Air Force (TAF) students. Because the educational level of the TAF personnel was somewhat lower than IAF, language, individual, and IWST courses were lengthened. For example, USAF furnished six months of language training in Turkey before the students departed for Lackland where they received an additional six months of instruction. By the same token, the technical courses were lengthened.[18]

(U) Training of USAF personnel for NATO II deployment began on 30 November 1961. The Turkish portion of the individual technical training program started on 28 June 1961. This phase and the IWST part were to be completed in December 1963.[19]

17. Ibid., pp. 55-56.
18. Ibid., pp. 57-58.
19. JUP Qtrly Rpt for 2d Qtr CY 61, 14 Jul 61, Hist Off files.

[redacted]

VII. (C) DEPLOYMENT

(U) When the Army and Navy first started the JUPITER development program, the tentative plan called for deployment of the weapon system on or before June 1960. The location of the deployed missile was undefined, and this was the status for better than two years. From time to time the Army attempted to obtain a deployment plan, but was unable to do so. As earlier mentioned, even the GSE development program was held up, and, without this equipment, deployment was impossible.

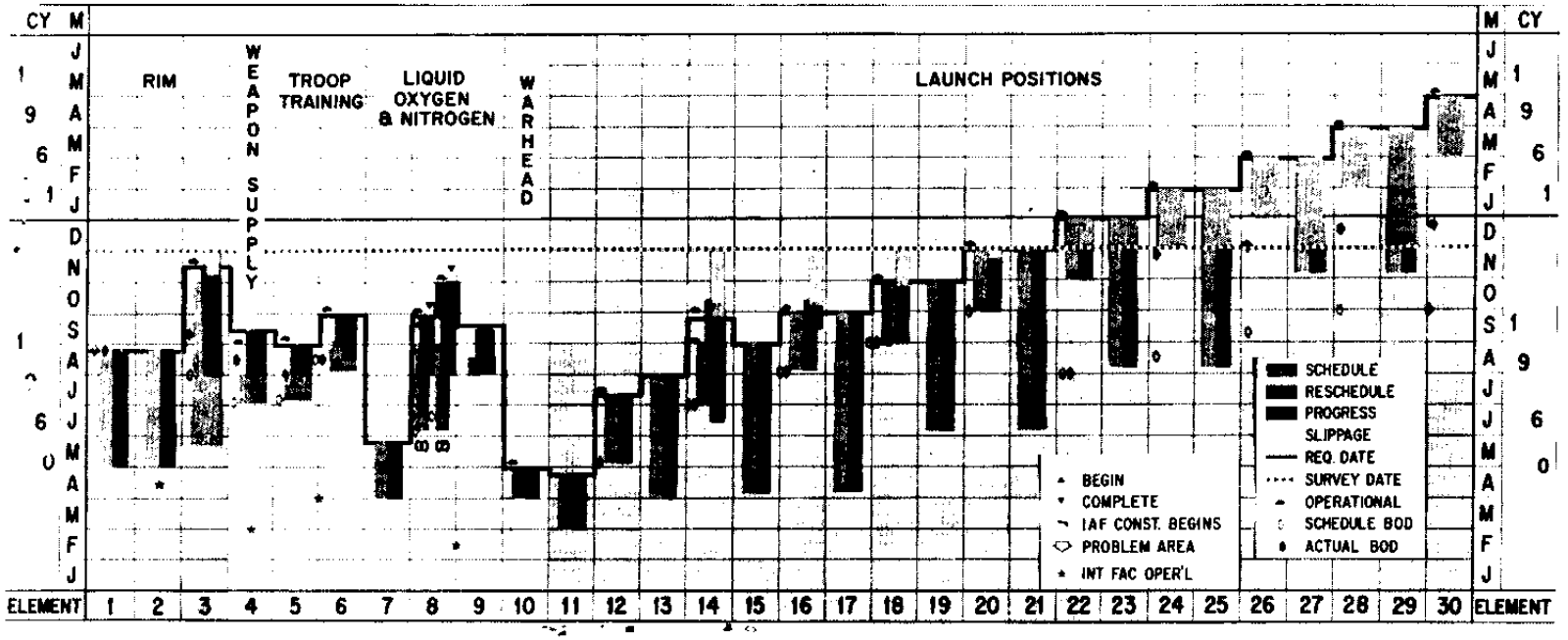
(U) The orbiting of SPUTNIK and the decision by OSD to develop both IRBM's brought the deployment aspects of the JUPITER closer to definition, although a specific site was not indicated. The directive simply stated that deployment was to be effected by December 1958. SAC's operational plan of March 1958 mentioned that the emplacements would be located on "the periphery of the Sino-Soviet Bloc," but stated there would be much effort involved in effecting the bilateral agreement with host countries.[1] In June of 1958, Air Force representatives were discussing possible deployment with French NATO personnel,[2] but France did not become a participant in the JUPITER program.

(U) By July 1958, the successful deployment of the missile during the year appeared rather unlikely. ABMA had estimated that an initial site selection had to be made by 25 July in order to gain a partial deployment of the first squadron. This date was based on the fact that

1. SACOP 1-58, 4 Mar 58, subj: SM-78 (JUP) Opnl Plan, Hist Off files.
2. Hist, ABMA, Jan-Jun 58, p. 79, Hist Off files.

[redacted]

JUPITER DEPLOYMENT PLAN



1 CONSTRUCT FACILITIES
2 STAGE EQUIPMENT
3 INSTALL & CHECKOUT
4 BINS, PARTS, TRANSCEIVER EQUIP. INSTALLED
5 INSTALL 1ST SET OF EQUIPMENT
6 INSTALL 2ND SET OF EQUIPMENT
7 STAGE 25 T/D PLANT
8 INSTALL PLANTS
9 INSTALL GSE
10 INSTALL EQUIPMENT
11 STAGE LP-1 EQUIPMENT (1)
12 INSTALL & CHECKOUT LP-1 EQUIP.
13 STAGE LP-2 EQUIPMENT (2)
14 INSTALL & CHECKOUT LP-2 EQUIP.
15 STAGE LP-3 EQUIPMENT (5)
16 INSTALL & CHECKOUT LP-3 EQUIP.
17 STAGE LP-4 EQUIPMENT (4)
18 INSTALL & CHECKOUT LP-4 EQUIP.
19 STAGE LP-5 EQUIPMENT (3)
20 INSTALL & CHECKOUT LP-5 EQUIP.
21 STAGE LP-6 EQUIPMENT (7)
22 INSTALL & CHECKOUT LP-6 EQUIP.
23 STAGE LP-7 EQUIPMENT (8)
24 INSTALL & CHECKOUT LP-7 EQUIP.
25 STAGE LP- 8 EQUIPMENT (9)
26 INSTALL & CHECKOUT LP- 8 EQUIP.
27 STAGE LP-9 (6)
28 INSTALL & CHECKOUT LP-9 EQUIP.
29 STAGE LP-10 EQUIPMENT (10)
30 INSTALL & CHECKOUT LP-10 EQUIP.

DOWNGRADED AT 3 YEAR INTERVALS
DECLASSIFIED AFTER 12 YEARS.
DOD DIR 5200.10

[redacted]

the contractor needed 215 days to set up the LOX, RIM, munition, and six emplacement areas. Each day beyond the decision cutoff resulted in a corresponding day of slippage.[3] As it turned out, slippage became the rule rather than the exception, for it was long past 25 July 1958 before the necessary agreements were signed.

(U) In view of the protracted delays, a question of manning the squadrons arose in September. Conferences with the proposed host country--Italy--revealed a desire that eventually manning would be completely from the allied nation. Thus, tentative plans indicated USAF manning for the first squadron and NATO manning for the second and subsequent squadron.[4] Later, in November, USAF questioned the advisability of the manning plan unless the agreements were signed by 10 December. To gain the early operational capability, they believed that the second squadron would have to be manned by USAF personnel, as well.[5]

(S) Deployment plans were based on a "floating M date" during the latter part of 1958. In other words, from the time the agreement was signed, two missiles and supporting GSE would be deployed to be in place 60 days later, and at T-15 readiness at the end of 75 days. The remaining four missiles would be in place at M plus 120 days, and in a combat readiness state at 135 days. This particular plan was of short duration, for in early 1959, changes were made to the effect that the total squadron of 15 missiles would deploy. Schedules used a 150-day

3. JUP Prog Rpt for Jul 58, 8 Aug 58, Hist Off files.
4. JUP Prog Rpt for Sep 58, 8 Oct 58, Hist Off files.
5. JUP Prog Rpt for Nov 58, 8 Dec 58, Hist Off files.

[redacted]

factor between the signing of a technical agreement and shipment of the first equipment, with first 1 March 1959 and then 1 April designated as M-Day. The signing of the government-to-government (GTG) agreement on 26-27 March confirmed the 1 April date for planning purposes.[6]

With the signing of the document, it appeared that the program was under way, but this was not the case. Italy insisted that the GTG agreement lacked sufficient detail and a technical agreement would have to be signed between the IAF and USAF. Points of contention involved funding matters, site construction by Italian contractors, and some component fabrication by Italian industry. Discussions on these matters began to stretch out, and by June it was realized that the 1 April M-Day was no longer compatible with a realistic program. DOD rescinded the date on 1 July and indicated that the new M-Day would coincide with the signing of the technical agreement. At the same time, it was realized that IAF personnel could man both squadrons.[7]

The signing of the technical agreement on 10 August removed the last major roadblock in the NATO I program. Although from time to time there were instances that threatened delays, the course was relatively smooth when compared with past history. Shortly after the signing, United States Air Forces, Europe (USAFE), notified ABMA that the beneficial occupancy date (BOD) for the first position was 1 April 1960. This meant that deployment planning was no longer based on the 190-day factor, but was based on specific BOD's furnished by the IAF.[8]

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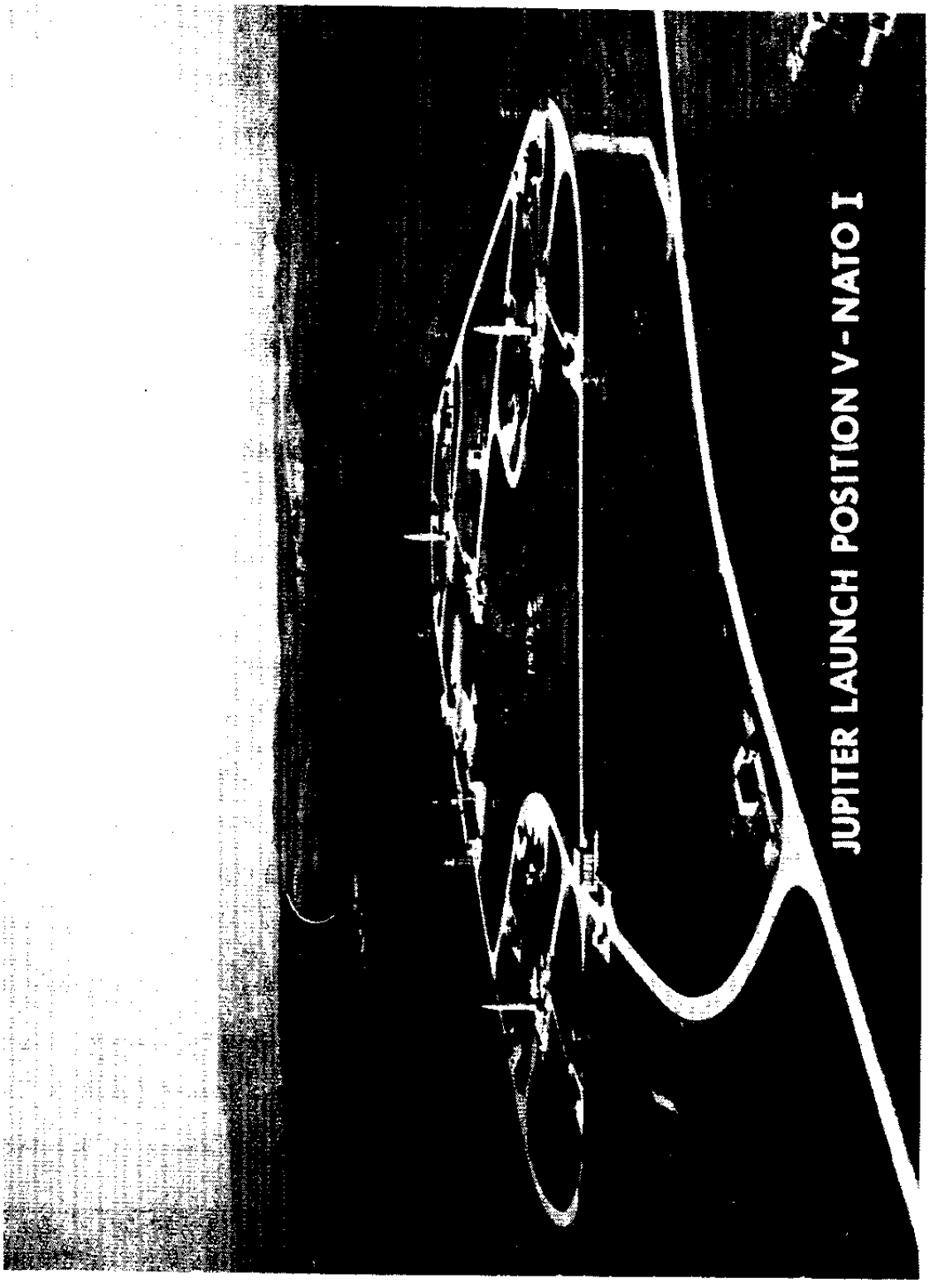
6. Hist, ABMA, Jan-Jun 59, pp. 4-5; JUP Prog Rpt for Dec 58, 8 Jan 59, Hist Off files.
7. JUP Prog Rpt for Apr 59, 8 May 59; JUP Prog Rpt for Jun 59, 8 Jul 59, Hist Off files.
8. JUP Prog Rpt for Aug 59, 8 Sep 59, Hist Off files.


JUPITER LAUNCH POSITION V - NATO I

[redacted] Once the program was settled, events occurred rather systematically, for on 20 June 1961 the tenth and last launch position was turned over to the IAF ten days before the scheduled date. Each position consisted of three missile emplacements, and the turn-over dates were as follows:[9]

Position	Date Turned Over to IAF
1	11 July 1960
2	26 April 1961
3	14 April 1961
4	24 March 1961
5	13 February 1961
6	7 June 1961
7	3 March 1961
8	13 June 1961
9	29 April 1961
10	20 June 1961

[redacted] On 28 October 1959, the location of the third and final JUPITER squadron was settled when the GTG agreement was signed with Turkey. Thereafter, the two countries engaged in conferences to complete technical arrangements, plan the facilities, and select the emplacement sites. Tentatively, 1 June 1961 was set as the BOD for the first launch position. To attain this capability in NATO II, initial manning by USAF personnel was required. This arrangement was

9. JUP Qtrly Prog Rpt for 2d Qtr CY 61, 14 Jul 61, Hist Off files.

[redacted] (U)

agreed to by the Turkish government in the technical agreement, which was signed on 1 June 1960. By April 1962, all positions were to be ready and manned, and this objective was attained.[10]

(U) In many ways deployment posed quite a problem to ABMA, although the Agency was not directly involved in consummating the agreements with the host countries. Basically, the trouble with NATO I was site selection and who was going to man the squadrons once they were in place. All during 1958, it was quite a strain to have a deployment capability by December 1958. Then, the switch to NATO I manning placed a further tax on ABMA training facilities. In summation, when viewing the development and deployment "ups and downs," it was indeed fortunate that time did not become critical and that all the emplacement positions were readied and manned.

10. Hist, ABMA, Jul-Dec 59, p. 15, Hist Off files; Interview, Mr. Prince Danley, REDSTONE-CORPORAL-JUPITER Project Off, AOMC, 11 Jul 62.

[redacted]

VIII. [redacted] PROGRAM DIVIDENDS - SATELLITES

(U) Usually, any given program having a specific objective can be adapted and used for another closely related project. There was no departure from this fact in the IRBM development program. The idea to develop long-range missiles and satellite vehicles and the approval of such action was almost simultaneous. And without the missile, the satellite concept was impossible. Hence, the two programs remained almost inseparable throughout the ICBM and IRBM R&D stage. Also equally parallel to the missile portion, the Army met with the same maddening rebuffs in that the initially selected satellite program was based on the theoretical possibilities of a completely new program as opposed to one that could be based on proven hardware.

(U) All during 1954 and 1955, when proposals for the long-range missile were being made, Dr. von Braun was offering suggestions for the orbit of a satellite. By December 1954, the Army and Navy met in a conference to consider the advisability of establishing a satellite program. Attending representatives concluded that an inert slug approximately two feet in diameter and weighing five pounds could be injected into orbit by existing hardware. REDSTONE was to be used as the basic booster, with clusters of LOKI rockets forming the second and third stages. The fourth and top stage would be a single LOKI. This proposed project became known by the names of Project ORBITER and Project SLUG.

(U) Interest in such an undertaking was prompted by several factors. For one thing, intelligence had revealed that the Russians

were definitely working toward satellites, so the project had a politico-technological value to this nation. Besides that, there was a high-altitude aircraft development project--the X-15--that was slated to attain heights of from 100 to 150 miles, and little data was available as to the environment the pilot or the aircraft would face. Thus, a minimum satellite (uninstrumented) could be launched to perfect launching techniques, study orbital behavior, and devise tracking methods. Once this was accomplished, more sophisticated satellites could be placed in orbit that had the capability to gather data on conditions outside the sensible atmosphere. The artificial satellites could also be a part of the International Geophysical Year (IGY).[1]

(U) Just prior to the time that a decision was made as to the course the program would follow, the Air Force and Navy presented DOD with a new instrumented concept based on the VIKING missile. This became known as the VANGUARD program. DOD appointed an ad hoc committee to weigh all the proposals, and the committee chose the VANGUARD approach, based on the contention that the cost would be less and that the Army plan was marginal in assuring success. Their main complaint was against the 75,000-pound thrust REDSTONE power plant.[2] Ironically, when EXPLORER I was boosted into orbit, a slightly more efficient fuel was used to boost the thrust to 83,000 pounds.[3]

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1. Memo to Rear Adm F. R. Furth & Maj Gen L. E. Simon, 14 Dec 54, subj: Conf on Project Orbiter, and attachments, Hist Off files.
2. Rpt of the Ad Hoc Advisory Group on Spec Capabilities, OASD (R&D), Aug 55, Hist Off files.
3. Hist, ABMA, Jan-Jun 58, p. 102, Hist Off files.

(U) Reclama to the committee findings was made by the Ordnance Corps to show that the REDSTONE was more than just an adequate booster but offered growth potential as well. Besides, the Jet Propulsion Laboratory (JPL) had been successful in scaling down SERGEANT motors that would provide greater specific impulses to the upper stages than the LOKI.[4] No deviation was made by the committee from the decision.

(U) Next, the Ordnance Corps asked that its hardware be considered for Phase II of the satellite program when the heavier vehicles would be placed in orbit. Army R&D replied that it was not wise for the Army to apply for such work in view of the priority programs that had been placed on Redstone Arsenal, for at that time DOD had made the decision to develop the JUPITER.[5]

(U) While the Army and Navy had been engaged in ORBITER planning, some engineering had been accomplished on REDSTONE test vehicles so that these missiles were suitable to test re-entry nose cones and launch a satellite. The death of ORBITER caused these missiles to be momentarily set aside, but the almost immediate decision to develop JUPITER brought these vehicles to the fore again for the re-entry test program. In fact, 12 missiles were so modified, but by the firing of the third JUPITER C re-entry test vehicle, the nose cone problem was solved and ABMA was ready to test a full-scale JUPITER re-entry body. All during 1956 and 1957, the Army made known to authorities that the JUPITER C was able to orbit a satellite to serve as a backup for VANGUARD.

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4. Memo, OCO to ASD (R&D), 15 Aug 55, subj: Scientific Sat Project, Hist Off files.
5. DF, COFORD to DA R&D, 8 Nov 55, subj: Scientific Sat & Cmt, DA R&D to COFORD, 8 Dec 55, same subj, Hist Off files.

[redacted]

Presentations were made to the Ad Hoc Study Group on Special Capabilities on 23 April 1956, but, in May, the group stated that the VANGUARD program was not meeting with any serious difficulty, and backup was not contemplated at that time. The Army was to make no plans using either the JUPITER or REDSTONE for scientific satellites.[6]

(U) From time to time, however, during 1957, information was requested on Redstone satellite capabilities from such individuals as Dr. C. C. Furnas of the ad hoc group. Additionally, Dr. Ernst Stuhlinger presented a paper to the Army Science Symposium on 28 June on the ABMA potential in an earth satellite project. In a conversation between Maj. Gen. Andrew P. O'Meara of Army R&D and General Medaris, General O'Meara stated that DOD had questioned how ABMA had gotten satellite money. General Medaris replied that the JUPITER C's were re-entry vehicles.[7]

[redacted] When the Russians launched SPUTNIK I, to the shock of the United States, Secretary Brucker three days later once again offered Army capabilities to hoist a satellite. He pointed out there were eight JUPITER C's that could be used that had proved to be excess to the re-entry program subsequent to the August 1957 recovery of the scaled-down nose cone. In fact, the re-entry tests had proven three stages of the four-stage rocket that was considered necessary to launch a satellite. DOD then asked the Army in what way they could support the launching of the 21-pound VANGUARD sphere. The Army's reply:

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6. Ltr, ABMA to COFORD, 9 Jul 57, subj: Potential Sat Capability of ABMA; Present by Col [J. C.] Nickerson to Ad Hoc Study Group on Spec Capabilities, 23 Apr 56; Memo, QASD to Army R&D, 15 May 56, subj: Army Capabilities for Scientific Sats, Hist Off files.
7. Msg, ORDAB-C-46-1, ABMA to Army R&D, 31 Jan 57; Present, Potential Contribution to Earth Sat Project by ABMA & JPL, 3 Jul 57; MFR by Maj Gen A. P. O'Meara, 22 Jun 57, subj: Conversation with Gen Medaris at RSA, Hist Off files.

[redacted]

by June 1958, using a vehicle such as the JUPITER. However, before that time, launching was possible by repackaging the instrumentation into a cylindrical container and using the JUPITER C's. Proposals were made to launch two vehicles of this type; one in February 1958 and one in April. In fact, during the month of October 1957, the Secretary of the Army outlined a multi-phase satellite program. The first would consist of the launchings just mentioned. The second would involve launching five JUPITER C satellites carrying television equipment, in view of the fact that the Russians rejected President Eisenhower's "Open Skies" proposal. And the third phase would be a 300-pound surveillance satellite, using the JUPITER as a booster.[8]

(U) On 8 November 1957, the Secretary of Defense gave his permission for the Army to plan for the launching of two JUPITER C's by March 1958, and $3.5 million was made available. By 20 November 1957, the Secretary of the Army was able to provide launching dates of 30 January and 6 March 1958.[9]

(U) As communication media of all types have recorded, EXPLORER I, the Free World's first artificial satellite, was placed in orbit on 31 January 1958. The hardware used was essentially the same that had been available during 1956, but the United States had missed the opportunity of a "first."

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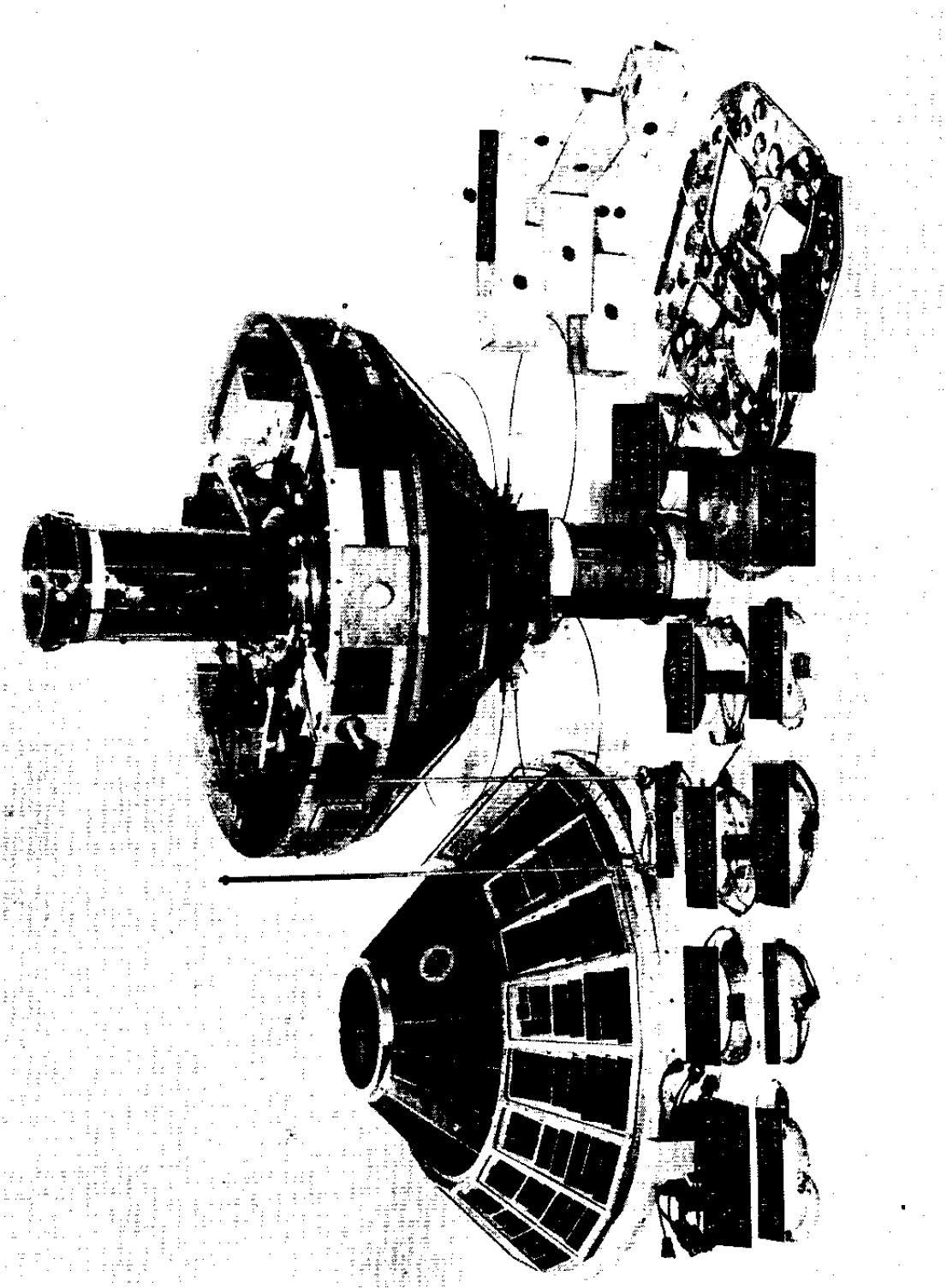
8. Memo, S/A to S/D, 7 Oct 57, subj: Soviet Sat; Memo, S/A to S/D, 23 Oct 57, subj: Army Spt of VANGUARD Pro; Memo, S/A to Spec Asst for Guided Msls, DOD, subj: Mil Sat, Hist Off files.
9. Memo, S/D to S/A, 8 Nov 57, subj: Scientifc Sat Pro; Memo, S/A to S/D, subj: Scientific Sat Pro, Hist Off files.

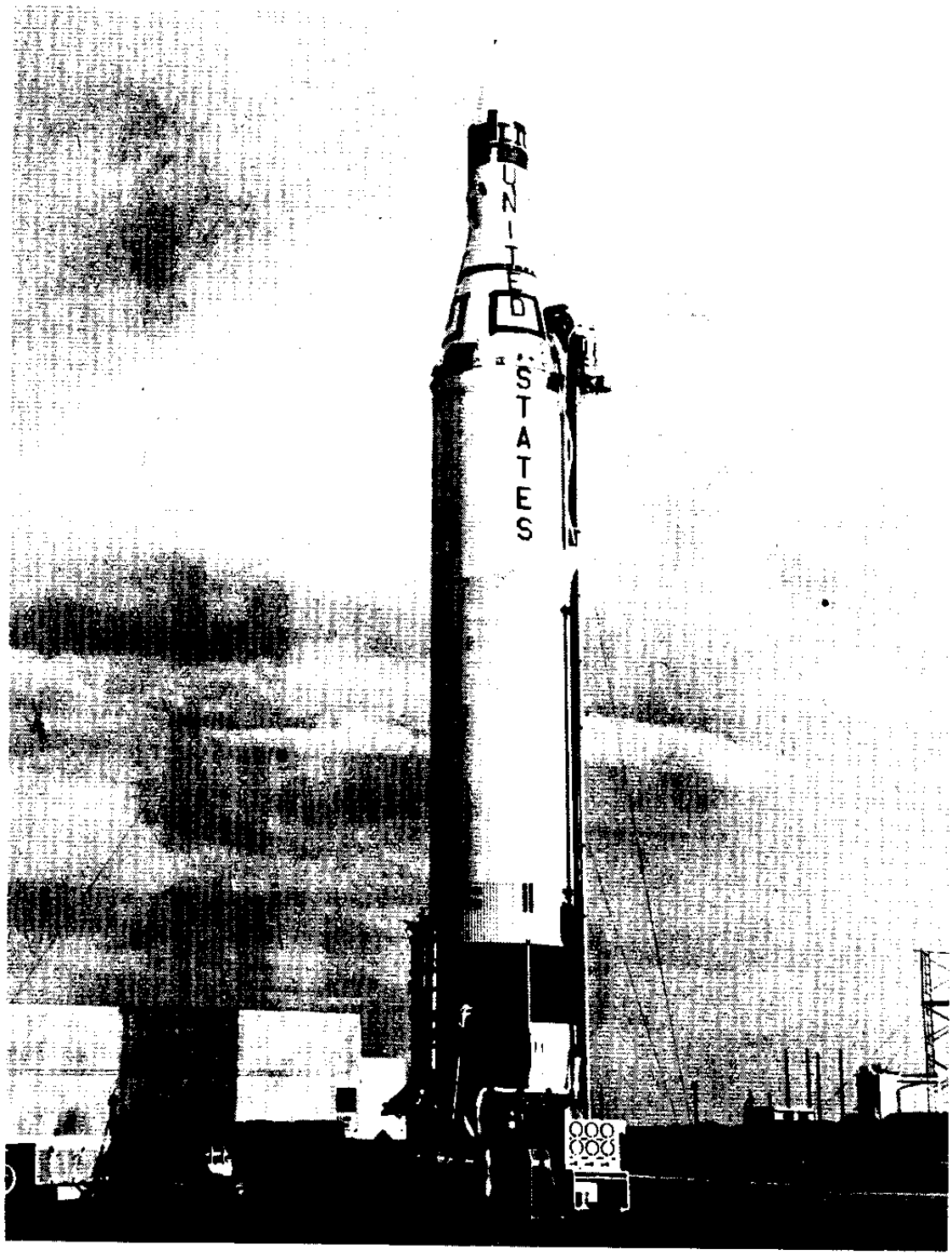
[redacted]

(U) From the initial launching, the Army's JUPITER C and JUPITER missiles participated in an extensive scientific satellite program. In fact, JUPITER 13, with primates Able and Baker aboard, marked the successful beginning of this nation's life-in-space program. A detailed listing of the over-all Army contributions to the satellite program may be found in Appendix 13.

[redacted]



JUNO II PAYLOAD



JUPITER-JUNO II SERIES

GLOSSARY OF ABBREVIATIONS

-A-

ABMA--Army Ballistic Missile Agency

ABMC--Army Ballistic Missile Committee

AEC--Atomic Energy Commission

AFBMD--Air Force Ballistic Missile Division

AFF--Army Field Forces

AF(JUPLO)--Air Force (Jupiter Liaison Office)

AFMTC--Air Force Missile Test Center

AFSWC--

AMC--Air Materiel Command

AMR--Atlantic Missile Range

AOMC--Army Ordnance Missile Command

ARDC--Air Research & Development Command

ASD--Assistant Secretary of Defense

Asst--Assistant

Auth--Authority

Appdx--Appendix

-B-

Ball--Ballistic

Bet--Between

BMC--Ballistic Missile Committee

BMO--Ballistic Missile Office

BOD--Beneficial Occupancy Date

BuOrd--Bureau of Ordnance (Navy)

-C-

CCMD--Chrysler Corporation Missile Division

CG--Commanding General

Chf(s)--Chief(s)

Cmdr--Commander

Cmt--Comment

COE--Corps of Engineers

COFORD--Chief of Ordnance

Conf--Conference

Const--Construction

Cont--Control

Corp--Corporation

CPE--Circular Probable Error

C/S--Chief of Staff

CTL--Combat Training Launch

CY--Calendar Year

-D-

DA--Department of the Army

DCSOPS--Deputy Chief of Staff for Operations

Def--Defense

Dep--Deputy

Dept--Department

Dev--Development

Dir--Director

Dist--Distribution

Div(s)--Division(s)

-E-

ECL--English Comprehension Level

-F-

Facil--Facilities

FBM--Fleet Ballistic Missile

FICo--Ford Instrument Company

FLDO--Field Office

FY--Fiscal Year

-G-

G&C--Guidance & Control

GM(DD)--Guided Missile (Development Division)

GO--General Order

GOR--General Operational Requirements

Govt--Government

GSE--Ground Support Equipment

GTG--Government-to-Government

-H-

Hist--History, Historical

-I-

IAF--Italian Air Force

ICBM--Intercontinental Ballistic Missile

IGY--International Geophysical Year

Info--Information

IO--Industrial Operations

IOC--Initial Operational Capability

IRBM--Intermediate Range Ballistic Missile

IWST--Integrated Weapon System Training

-J-

JAN(BMC)--Joint Army Navy (Ballistic Missile Committee)

JCS--Joint Chiefs of Staff

JEFO--JUPITER European Field Office

JPL--Jet Propulsion Laboratory

JUP--JUPITER

-L-

LOD--Launch Operations Directorate

LST--Live System Test

Ltr--Letter

-M-

MCA--Military Construction, Army

MC's--Military Characteristics

Memo--Memorandum

MFR--Memorandum for Record

Mgmt--Management

Mil--Military

Mo--Monthly

MOAMA--Mobile Air Materiel Area

MSFC--Marshall Space Flight Center

Msg--Message

Msl(s)--Missile(s)

Mtg--Meeting

-N-

NAA--North American Aviation

NACA--National Advisory Committee for Aeronautics

NASA--National Aeronautics & Space Administration

NATO--North Atlantic Treaty Organization

NIRAP--Naval Industrial Reserve Aircraft Plan

NM--Nautical Mile

Nr--Number

NSC--National Security Council

-O-

OASD--Office, Assistant Secretary of Defense

OCAFF--Office, Chief of Army Field Forces

OCO--Office, Chief of Ordnance

OCRD--Office, Chief of Research & Development

Off--Office

OGMS--Ordnance Guided Missile School

OJT--On-the-Job Training

OML--Ordnance Missile Laboratories

Opnl--Operational

Ord--Ordnance

Org--Organization

OSD--Office, Secretary of Defense

-P-

PAFB--Patrick Air Force Base

Pam--Pamphlet

P&P--Procurement & Production

Pers--Personnel

Present--Presentation

Prog--Progress

Propel--Propellant

Prop(s)--Proposal(s)

Pro(s)--Program(s)

-Q-

Qtr(ly)--Quarter(ly)

-R-

R&D--Research & Development

Ref--Reference

Res--Research

RIG--Radio Inertial Guidance

RIM--Receipt, Inspection & Maintenance

Rkt--Rocket

Rpt--Report

Rqmts--Requirements

RS--REDSTONE

RSA--Redstone Arsenal

-S-

S/A--Secretary of the Army

S/AF--Secretary of the Air Force

SACOP--Strategic Air Command Operational Plan

Sat(s)--Satellite(s)

S/D--Secretary of Defense

SINS--Ship Inertial Navigation System

SMS--Strategic Missile Squadron

S/N--Secretary of the Navy

SO--Special Order

Spec--Special

SPO--Special Project Office (Navy)

Spt(ing)--Support(ing)

ST--Statute

Subj--Subject

Svcs--Services

Sys('s)--System(s)

-T-

TAF--Turkish Air Force

Tech--Technical

Tng--Training

-U-

USAF--United States Air Force

USAFE--United States Air Forces, Europe

-V-

Vol--Volume

-W-

WDD--Western Development Division

Wpn--Weapon

WSMR--White Sands Missile Range

WSPO--Weapons Systems Project Office

APPENDIX I

CONSOLIDATED CHRONOLOGY OF SIGNIFICANT EVENTS IN THE JUPITER PROGRAM

1955

JUNE

13 Two alternate proposals for the 1,000 NM ballistic missile:

a. Single stage liquid fueled rocket (one engine).

b. Powered with two liquid fuel engines and has greater range capability using solid booster.

JULY

1 Initial Army proposal for a 1,500 NM missile.

SEPTEMBER

(Approx) Presentation by Dr. von Braun briefing the Secretary of Defense on Long Range Missile pointed out that the 1,500 NM missile was a logical extension of the REDSTONE.

22 Proposal for an Army-Navy 1,500 mile missile and a plan for development.

OCTOBER

An account of the schedule acceleration in development of the 1,500 NM missile; made proposal on possible simplification of guidance methods.

26 The C/S, DA announced to the Army Staff a plan for executing the 1,500-mile missile program in case the Army was assigned program responsibility. The plan provided for:

a. Formation of the ABMA

b. Assignment of personal responsibility to the CG, ABMA for the REDSTONE and the 1,500-mile missile programs.

c. Assignment to ABMA of those elements of Redstone Arsenal necessary to the execution of the ABMA mission.

1955 (Cont'd)

OCTOBER

26

d. The CG, ABMA to have direct access to the C/S, DA.

e. The CG, ABMA to have authority to issue instructions to other Army agencies capable of assisting him in the execution of his mission.

NOVEMBER

2 The JCS reviewed and agreed that there was a requirement for an IRBM.

8 The Secretary of Defense directed the S/A & S/N to establish an IRBM and a Joint Army-Navy Committee to direct the program.

16 Army assigned the project to execute the IRBM #2 program.

22 Maj Gen John B. Medaris designated CG, ABMA.

25 The CG (designate), ABMA presented a development plan to the JANBMC which provided for:

a. Preliminary design characteristics of the system.

b. A development program for testing JUPITER components on REDSTONE missiles to begin in March 1956 and for firing the first JUPITER in May 1957.

c. Funding requirements for FY 1956 and estimates for FY 1957.

DECEMBER

1 A presentation to the NSC on the JAN IRBM #2 1,500 mile missile program. The CG (designate), ABMA, representing the DA and DN, discussed:

a. The development of an IRBM of 1,500 NM range from the Army REDSTONE missile Program.

b. The development of the missile by the highly experienced REDSTONE team of ballistic missile scientists and technicians.

c. Proposed configuration of the missile.

d. Proposed employment of an all-inertial guidance system and development of a radio-inertial system.

1955 (Cont'd)

DECEMBER

1 e. Navy selection of a contractor to design a shipborne system for marine launching capability.

The NSC approved the program, followed by Presidential approval of the highest National priority for the program.

2 The S/A and S/N set forth terms of reference for development of a dual land-based and sea-based IRBM. Essentially, these were:

a. Army and Navy will agree upon the MC's of a single missile.

b. The basic missile system to be developed by ABMA.

c. Equal priority will be given the sea-based and land-based capability.

d. Navy selection of a contractor to provide a Naval Weapon System.

e. Provisions for Army-Navy technical liaison personnel.

f. Provisions for JAN Executive Committee to resolve problems.

g. Provisions for a flow of information to Army-Navy on progress of the IRBM #2 by establishing a Joint IRBM Committee together with an Executive Committee.

h. Provisions for an OSD-BMC to review and approve IRBM plans and waive OSD directive procedures.

i. Designation of the established ICBM Scientific Advisory Panel (later known as DOD Scientific Advisory Committee) to provide scientific reviews.

6 The C/S, DA, announced that execution and organization of the 1,500-mile missile program would be established according to the plan announced on 26 October 1955 as soon as practical.

20 Memo from Deputy OSD to Chairman JANBMC releasing authorization for the IRBM #2 to proceed generally in accordance with the 28 November 1955 presentation. Also included were requirements within Army-Navy budgets:

1955 (Cont'd)

DECEMBER

20

FY 56	Army	Navy
R&D	10.0 M	8.0 M
P&P	16.0 M	
Facilities	7.7 M	
Appropriations Not Determined		9.1 M
	$33.7 M	$17.1 M

FY 57	Army	Navy
R&D	18.0 M	
P&P	38.0 M	
Facilities	14.6 M	
Appropriations Not Determined		40.5 M
	$70.6 M	40.5 M

22 ABMA established as a Class II activity under the jurisdiction of the Chief of Ordnance at Redstone Arsenal, Alabama.

1956

JANUARY

11 Gen J. B. Medaris drew up an agreement with Maj Gen B. Schriever, Western Development Division, governing the type engines to be used in both IRBM #1 and IRBM #2.

17 The S/A delegated extraordinary authorities to the Chief of Ordnance with power of redelegation to the CG, ABMA the execution of the IRBM #2 program.

19 OSD-BMC approval of Army request for IRBM #2 facilities at PAFB, Florida. AF was directed to include cost ($2.628 million) of facilities in a supplementary program for ICBM and IRBM #1. Facilities approved included:

a. Missile Assembly Building

b. Laboratory and Engineering Building

c. Launching Facility

d. Igloo and Solid Rocket Propulsion Building

23 Memo from the Chief of Ordnance to CG, ABMA, redelegated all authority contained in Memo from S/A to Chief of Ordnance, dated 17 January 1956.

27 The C/S, DA announced:

a. That the development of the 1,500-mile missile has top priority in the Army.

b. The establishment of the ABMA, with Maj Gen J. B. Medaris as the Commanding General.

c. The organization and its relationship to other Army agencies.

d. The authority of the CG, ABMA to obligate funds, including executing and amending contracts without review by higher authority other than that required by law which prohibits delegation.

e. That allocation of funds would be made on request of CG, ABMA, and in advance of his requirement.

1956 (Cont'd)

FEBRUARY

1	ABMA activated at Huntsville, Alabama, with Maj Gen J. B. Medaris Commanding.
(Approx)	Original IRBM #2 Firing Plan (code named JUPITER in April 1956) established, including Navy missile requirements.
10	First meeting between ABMA-Navy-AEC representatives on nose cone and warhead; resulted in establishing the JUPITER Warhead Committee.
10	Chief of Ordnance directed the attention of all commanders to Ordnance Corps Order 3-56, dated 19 January 1956, which provided for utilization, on a priority basis, for other Ordnance installations to expedite the missile development program.
14	The Secretary of Defense Wilson made a decision that IRBM #2 (later JUPITER) would have a compromise--a 105 inch diameter.
21	The CG, ABMA, on recommendation of the IRBM #2 Warhead Committee, approved the design and specifications for the JUPITER nose cone.
23	ABMA submitted its fiscal plan to the JANBMC for development of IRBM #2 for FY 56-Fy 57).

MARCH

7	Military Liaison Committee approved MC for high yield warhead for use in JUPITER.
12	JANBMC approved JUPITER solid propellant program.
14	JUPITER A Missile 18, an adopted REDSTONE, was the first missile launched from Cape Canaveral, Florida, following activation of ABMA.

APRIL

(Approx)	The IRBM #2 was named JUPITER.
4	The Secretary of Defense in a Memo to the Chairman, JANBMC, authorized the Navy to proceed with system studies and component development, including propulsion flight testing necessary to determine weapon system feasibility of a solid propellant version of the IRBM #2.

1956 (Cont'd)

APRIL

6 The ASD (R&D) requested the Chairman, AEC, to join the Department of Defense in a Joint Feasibility Study for a JUPITER warhead to achieve a full operational capability by January 1959 and operational status by January 1960.

9 The JANBMC designated the Army the cognizant agency for the radio-inertial guidance program, to include all missile-borne items and all surface equipment common to the land-sea-based systems.

18 Naval Design Requirements for JUPITER made available to ABMA from the local Navy office.

MAY

11-18 OCRD, DA, made a presentation to Dr. E. V. Murphree, Special Assistant to Secretary of Defense for Guided Missiles and to OSD-BMC on the Army employment of JUPITER scheme.

19 The CG, ABMA, recommended to the Dep D/S for Military Operations, DA, a stockpile-to-target sequence doctrine and organizational mobility concept to be used as a basis for Army employment of medium range ballistic missiles.

22 Maj Gen J. B. Medaris made a preentation, "JUPITER Program," to the Symington Subcommittee for the Senate Armed Services Committee; traced the history of the Army in ballistic missiles and the JUPITER development plan.

25 The OSD-BMC took the following action with respect to the JUPITER program:

a. Disapproved proposal to introduce a new contractor into the program aimed at developing an improved JUPITER liquid propellant engine.

b. Requested ASD (R&D) to review long-range rocket engine development.

c. Stopped any JUPITER ground support equipment obligations.

JUNE

6 Allocation of space within the JUPITER nose cone for warhead and major components of the adaption kit approved.

1956 (Cont'd)

JUNE

22 ABMA furnished the JAN Executive Committee the JUPITER Missile Development Plan which included provisions for:

a. 82 R&D JUPITER test missiles

b. 10 R&D spare missiles

c. 31 JUPITER A component evaluation tests

d. 12 JUPITER nose cone re-entry tests

26-27 Navy sponsored a JUPITER Symposium to present FBM solution problems and to acquaint Army-Navy personnel with the problems.

JULY

20 Policy meeting held at ABMA between top management of ABMA and Special Projects, BuOrd (Navy) to establish policy decisions on responsibility of the Army-Navy land- and sea-based missile test operations, and to define respective responsibilities relative to control, maintenance, and scheduling Navy sponsored activities associated with the JUPITER program.

26 The CG, ABMA, and the Dir of Special Projects, BuOrd (Navy) signed a Memo of Agreement setting forth:

a. Criteria to be met in the JUPITER test program to insure FBM shipboard application.

b. Division of responsibility for the test program

c. Division of responsibility for facilities provided PAFB, Florida, for the FBM program.

30 The Dir, BuOrd (SP) and CG, ABMA, approved a Navy Fleet Ballistic Missile Committee structure, together with Terms of Reference for the committee.

31 Total authorized JUPITER funds through FY 56 were:

R&D 10.720 M

P&P 29.000 M

MCA 0

1956 (Cont'd)

AUGUST

8 Construction of the largest static test stand in the US for testing rocket motors was completed at Redstone Arsenal and slated for use in the JUPITER IRBM program.

SEPTEMBER

30 A review of the JUPITER program indicated such success that the program could be accelerated and, therefore, resulted in a change to the firing schedule as follows:

a. JUPITER C #29 and #23 were removed from the schedule because of the successful flight of JUPITER C #27.

b. JUPITER Missile #1A and #1B were added to the schedule, thus permitting the first JUPITER missile firing some three months earlier than originally scheduled.

OCTOBER

1 Proposal for the FBM JUPITER Submarine Application document which presents a summary of conclusions and recommendations resulting from preliminary studies of an IRBM system capable of delivering high-yield weapons on land targets from submarines.

4-5 JUPITER Symposium held at ABMA.

NOVEMBER

7 Conference between Staff Members, House Appropriation Committee, and representatives of Navy Liaison Office, ABMA, discussed Navy utilization of JUPITER missile.

26 Secretary of Defense issued a Memo to members of the Armed Forces Policy Council fixing the roles and missions of the three Armed Services in the development of missiles. Those affecting the IRBM were: USAF, operational employment of the land-based system; Navy, operational employment of the ship-based system; Army, operational employment of the 200-mile range system.

DECEMBER

7 Secretary of Army in a Memo to Secretary of Defense recommended that the JUPITER program be continued through CY 1957 to permit an intelligent choice between THOR and JUPITER.

1956 (Cont'd)

DECEMBER

8 The Secretary of Defense in a Memo to the Secretary of Navy authorized the Navy to delete the liquid-propelled JUPITER from its IRBM program; abolish the JANBMC; and proceed with the solid propelled POLARIS IRBM.

Department of the Navy, BuOrd, SP, notified ABMA that, with DOD approval of the POLARIS solid propellant missile, the Navy would proceed in an orderly withdrawal from the JUPITER program.

1957

JANUARY

8 CG, ABMA, officially announced Navy withdrawal from the JUPITER program.

14 Presentation of the JUPITER program made to OSD Scientific Advisory Group. Particular emphasis placed on JUPITER inertial guidance system.

29 Chief, R&D, DA, furnished information on possible satellite use of JUPITER C missiles.

31 The JUPITER program was revised after Navy disassociation to 43 development flight missiles, plus 4 spares. All missiles to be assembled in ABMA laboratories.

FEBRUARY

1 ABMA informed Chief, R&D, DA, that Army JUPITER satellite could accommodate instrumentation of the VANGUARD payload, but not the sphere itself.

APRIL

2 Memo for Chairman, ABMC, from Special Assistant to Secretary of Defense for Guided Missiles stated OSD-BMC had approved Army proposed JUPITER program for 1 July 1957 through 30 November 1957.

JUNE

11 Presentation of the JUPITER program to the OSD-Scientific Advisory Group giving the progress of JUPITER program and firings to date.

18-19 JUPITER technical briefing on JUPITER missile and system.

JULY

30-31 Presentation to members BMD at ABMA on the JUPITER system concept in terms of AF operational requirements.

31 Total authorized JUPITER funds for FY 57:

R&D 25.0 M

P&P 115.9 M

MCA 17.2 M

1957 (Cont'd)

AUGUST

7 ABMA Message to Chief, R&D, DA, in four parts: Part I set forth effects expected from an arbitrary decision to cancel JUPITER effective 31 August 1957; Part II estimated costs incurred by the JUPITER program and recoverable funds; Part III, effects of overtime on the development schedule; Part IV emphasized that to arbitrarily cancel JUPITER without assigning challenging programs to ABMA would cause the nation to lose a valuable asset--a group capable of developing almost any type ballistic missile, anti-ballistic missile, or satellite system.

21 The success of RS-40 brought about a decision to discontinue flight tests of JUPITER-C re-entry type missiles. Missile hardware on hand was to be stored to constitute a shelf-life test applicable to the REDSTONE program.

OCTOBER

7 The S/A sent a Memo to the Secretary of Defense pertaining to the significance of SPUTNIK I launch and recommending use of JUPITER C for early satellite launch.

ABMA submitted to AFBMD proposed schedule for planning and developing JUPITER weapon system; however, AFBMD declined responsibility for review or approval.

19 The Secretary of Defense verbally directed the CG, ABMA, as a matter of highest national urgency, to proceed with all actions required to prepare for JUPITER IOC missile production and to immediately undertake fabrication of prototypes of JUPITER peculiar GSE

31 Presentation of the JUPITER program to OSD Scientific Advisory Group on firings, growth potentials of JUPITER to 2,000 KM range, and production facilities at ABMA.

NOVEMBER

6-8 JUPITER training conference held at AFBMD.

7 President Eisenhower announced U. S. had solved missile re-entry problem.

8 Secretary of Defense ordered ABMA to prepare a JUPITER C missile for launching a satellite as part of the IGY program.

1957 (cont'd)

NOVEMBER

20 S/A recommended to Secretary of Defense that 30 January and 6 March 1958 be approved as launching dates for first two JUPITER C satellites. These dates were approved on the same date.

22 Dir of GM, OSD, directed DA to launch JUPITER C satellites to carry the cosmic radiation package prepared by Dr. James Van Allen of the University of Iowa.

27 Secretary of Defense directed AF to proceed with operational development of both THOR and JUPITER missile systems.

DECEMBER

5 R&D, DA informed that increase in time-at-site (Project HARDTACK) would jeopardize firing schedule at AFMTC and hamper JUPITER development.

30 Hq, USAF, conference to plan development of AF concept for employment of JUPITER resulted in scheduling a meeting of ABMA on 8 January 1958 to coordinate preparation of AF operations plan.

1958

JANUARY

2 — In response to an inquiry from the Chief, R&D, DA, ABMA stated it could assure a third JUPITER C (JUNO I) firing to place a National Advisory Committee on Aeronautics (NACA) 12-foot inflatable sphere into a high altitude (500-mile perigee) orbit by mid-1958.

16 — The 864th Strategic Missile Squadron (JUPITER) was activated at ABMA.

20 — JUPITER Support Management Office (JSMO) was activated at ABMA. This organization, with five ABMA members, directed field logistical support activities for the JUPITER system.

29 — Chief, R&D, DA requested information regarding the use of JUPITER C missiles in connection with the satellite program.

(Approx) — The firing date of JUPITER Missile 5 was rescheduled from 26 February to 26 March to permit installation of additional telemetry instruments on the turbopump, gas generator, and lube oil system, and to permit further evaluation of the turbopump failures of Missiles 3A and 4.

(Approx) — OPERATION GASLIGHT, a project designed to obtain photographic, spectrographic, and infrared measurements of re-entry nose cones will be conducted in conjunction with JUPITER Missile #5 Nose Cone recovery operations.

FEBRUARY

5 — Conference was held at ABMA to develop relationships and responsibilities between ABMA and AF, and to establish an AFJUPLO at ABMA.

An AF JUPITER WSPO was established during this month at Inglewood, California, and a JUPITER Liaison Office at ABMA to facilitate coordination of the JUPITER weaponization program.

MARCH

31 — The first individual JUPITER training classes for AF personnel began at OGMS, using REDSTONE equipment.

1958 (Cont'd)

APRIL

8 Conference held with AF JUPITER Support Management Office to discuss equipment for 3rd and 4th JUPITER squadrons.

14 JUPITER Project Office established at ABMA.

15 Assignment to ABMA of a top priority national space program (JUNO) necessitated rescheduling delivery of JUPITER.

JUNE

2 The 865th Strategic Missile Squadron (JUPITER) activated at ABMA.

16 ABMA planned to equip and train the 864th Strategic Missile Squadron (JUPITER) for its partial deployment overseas with not less than five missiles by 31 December 1958.

JULY

1 ABMA scheduled JUPITER missiles and ground equipment to overseas deployment of three squadrons in December 1958, August 1959, and February 1960, respectively.

During the month, the AF cancelled plans for training the 866th and 867th (JUPITER) Squadrons at Vandenberg AFB, California. All squadrons would be trained by OGMS at Redstone Arsenal, Alabama

AUGUST

28 JUPITER Missile 101 delivered to AF.

31 ABMA notified AFJUPLO that the administrative and supply personnel of the 864th Strategic Missile Squadron were ready for deployment.

(Approx) JUPITER Missiles 101-105 allocated for AF training purposes.

SEPTEMBER

1 The 866th Strategic Missile Squadron (JUPITER) activated at ABMA.

16 Guidance received from SAC in revising the configuration of the 864th Strategic Missile Squadron (JUPITER).

24 Third JUPITER Logistic symposium held at MOAMA, Brookely AFB, Alabama.

1958 (Cont'd)

OCTOBER

13 AF Inter-Command Planning conference successfully resolved detailed command responsibilities and relationships in the JUPITER program.

28 AF received its JUPITER training requirements to include training of NATO squadrons.

31 Tentative JUPITER overseas deployment sites selected and primary survey accomplished.

JUPITER Support Management Office (JSMO) Team sent to Europe during the month to discuss technical aspects of the JUPITER missile system installation with representatives of the Corps of Engineers and USAFE.

NOVEMBER

7 AF JUPITER Training Programming Conference resulted in decision to field three JUPITER squadrons to be trained in five cycles.

20 DA notified ABMA that AF had responsibility for operational emplacement of the JUPITER missile. This resulted in the elimination of GSE used exclusively for mobility from the JUPITER system.

21 ABMA and MOAMA prepared detailed plans for the transfer of logistic responsibility for JUPITER to AF.

During the month, USAF decided that only eight JUPITER missiles would be deployed with the 864th Strategic Missile Squadron; one missile for each of the six launchers, plus two maintenance float missiles.

1959

JANUARY

Environmental testing of JUPITER GSE fueling and erecting components was successfully completed at Eglin AFB, Florida.

Contractor storage sites at CCMD and FICo are in the process of being terminated. JUPITER assets to be transferred to Brookley AFB (MOAMA), the Weapon system storage site, prior to 31 March 1959.

FEBRUARY

9 DA approved a USAFE plan for deployment of the JUPITER weapon system to being 190 days after signing intergovernmental agreements.

MARCH

2 Conference at Headquarters USAF resulted in preparation of JUPITER training schedule.

APRIL

13 S/AF issued implementing instructions to USAF echelons for deployment of two JUPITER squadrons to Italy.

MAY

20 Detachment 5 Liaison Office, ATC, activated at Redstone Arsenal, Alabama, to perform JUPITER administrative mission for NATO students.

NATO Liaison officer and first increment of Italian (JUPITER) students arrived during the latter part of the month at ATC, Lackland AFB, Texas, for missile indoctrination and language training.

JULY

1 USAF postponed the (JUPITER) 1 April 1959 "M" date until the USAFE-IAF Technical Agreement was signed.

During the month, Sandia Corporation concluded that clarification of the warhead environment in the JUPITER could be made on the basis of tests already completed, plus three additional successful tests at 300, 800, and 1,500 NM ranges.

1959 (Cont'd)

SEPTEMBER

1 The 864th Tactical Training Squadron (formerly 864th Strategic Missile Squadron-JUPITER) completed formal training at Redstone Arsenal, Alabama.

5 Deployment of personnel to Italy for installation of JUPITER weapon system began.

9 Initial complement of IAF personnel began JUPITER training at OGMS, Redstone Arsenal, Alabama

25 Matching and mating of JUPITER Missile 206 with its GSE completed.

31 JUPITER Initial Operational Capability (IOC) Missile 221 delivered to USAF.

OCTOBER

11 First surface shipment of JUPITER IAF equipment by MOAMA deported aboard USS May-Lykes.

22 ABMA representatives conducted meetings in Rome, Italy, resolved security problems plaguing JUPITER deployment.

Delivery of JUPITER IOC Missiles 120, 121, and 113 during October 1959 marked the end of ABMA's in-house production of these missiles for the AF.

ABMA completed matching and mating of JUPITER Missiles 207 and 208 with GSE.

NOVEMBER

4 CCMD assigned responsibility for matching and mating of GSE for JUPITER missile (M210).

9 Contract with CCMD for fabrication of 15 JUPITER IRBM targets became effective this date.

15 The 864th Tactical Training Squadron completed its JUPITER IWST.

DECEMBER

9 The first IAF students began JUPITER IWST at Redstone Arsenal, Alabama.

1959 (Cont'd)

DECEMBER

12	The second JUPITER training missile scheduled for deployment to NATO I (Italy) departed Redstone Arsenal, Alabama, by air.
20-23	Two ships departed MOAMA with fourth increments of JUPITER equipment for NATO II.
29	Pentadome erected at JUPITER site in Italy for AF weapons supply.
31	Two hundred sixty-nine USAF Technical Assistance personnel and 365 dependents were on site in Italy with the JUPITER system emplacement.

1960

JANUARY

5 Final R&D production JUPITER Missile 30 shipped to AMR.

19 First three Italian launch crews graduated from JUPITER IWST at OGMS.

20 Representatives from ABMA Detachment C, MOAMA, JEFO, and CCMD attended JUPITER modification conference at Gioia del Colle, Italy.

25 U. S. Mediterranean Division Engineer at Leghorn, Italy, convened a pre-designed conference on NATO II (Turkey) JUPITER site construction.

27 ABMA shipped the first three tactical JUPITER missiles (201-203) to NATO I.

FEBRUARY

8 Cigli, Turkey, near port city of Izmir, selected as site for deplcyment of third JUPITER squadron.

10 USAF confirmed projected slippage in BOD's of JUPITER launch positions in NATO I.

12 ABMA received informal request to continue JUPITER training.

MARCH

28 Preliminary design review of JUPITER deployment site in Turkey (NATO II) conducted in Los Angeles, California.

29 The 7230th Tactical Training Group began on-site training of IAF (JUPITER) personnel.

APRIL

5 Technical review of JUPITER communications program for NATO I held in Rome, Italy.

28 Interservice Implementation Agreement, JUPITER Missile Program, USA-USAF, Dated 27 October 1959, revised to include training of AF personnel in JUPITER administrative and technical areas.

MAY

10 First JUPITER IAF individual training cycle completed at OGMS. Second cycle began on the 18th.

1960 (Cont'd)

JUNE

13 Signing of amendment to USAF-US Army Interservice General Agreement permitted transfer of JUPITER procurement functions from Army to AF.

30 Simulated flight test of JUPITER missiles on Launch Position 1 (NATO I) successfully completed and position scheduled for transfer to AF on 5 July 1960.

In May and June, ABMA personnel moved JUPITER Missiles 201, 202, and 203 and associated GSE to Italian Launch Postion I and II sites.

Chrysler Corporation contract to provide JUPITER (IRBM) missiles for NIKE ZEUS targets terminated at cost of $1.75 M

JULY

1 Configuration control of the JUPITER missile system transferred to MOAMA per Interservice Implementation Agreement dated 27 October 1958.

11 Overseas JUPITER Launch Position Number 1 was turned over to IAF; operational on 15 July 1960.

26 JUPITER Training Reprogramming Conference held at RSA.

AUGUST

12 ABMA representatives attended JUPITER Modification Review Board Conference at MOAMA.

SEPTEMBER

14 JUPITER Training Site Number 1 turned over to IAF.

28 Installation and Checkout (I&C)Team occupied JUPITER Launch Position Number 3 (Italy).

30 Approximately 50% of all GSE for JUPITER Launch Position Number 4 (Italy) on site.

OCTOBER

3 JUPITER Launch Position Number 2 turned over to IAF.

1960 (Cont'd)

DECEMBER

28 ABMA representatives attended JUPITER Weapon System Safety Meeting at AFSWC.

31 Eleven JUPITER missiles and nine sets of match-and-mate GSE delivered during the period.

Engineering Services for the JUPITER were transferred to the AF.

Twelve JUPITER missiles shipped overseas during the period. (One missile damaged enroute was returned).

1961

JUNE

Except for minor actions, the Army's role in deploying the JUPITER weapon system to Italy was completed during June 1961.

DECEMBER

31 Except for technical assistance, Army responsibility for support of the JUPITER program ended.

Appendix 2

SEMIANNUAL PERSONNEL STRENGTH
CY 1956—1959

30 JUNE 1956

	Authorized	Assigned
Military	535	513
Civilian	3,237	2,636
Totals	3,772	3,149

31 DECEMBER 1956

	Authorized	Assigned
Military	592	624
Civilian	4,149	3,488
Totals	4,741	4,112

30 JUNE 1957

	Authorized	Assigned
Military	608	635
Civilian	4,206	4,100
Totals	4,814	4,735

31 DECEMBER 1957

	Authorized	Assigned
Military	625	629
Civilian	4,828	4,248
Totals	5,453	4,877

30 JUNE 1958

	Authorized	Assigned
Military	378	365
Civilian	5,015	4,817
Totals	5,393	5,182

SEMIANNUAL PERSONNEL STRENGTH (Cont)

CY 1956—1959

26 DECEMBER 1958

	Authorized	Assigned
Military	380	403
Civilian	5,452	5,336
Totals	5,832	5,739

30 JUNE 1959

	Authorized	Assigned
Military	382	398
Civilian	5,407	5,346
Totals	5,789	5,744

31 DECEMBER 1959

	Authorized	Assigned
Military	381	357
Civilian	5,343	5,321
Totals	5,724	5,678

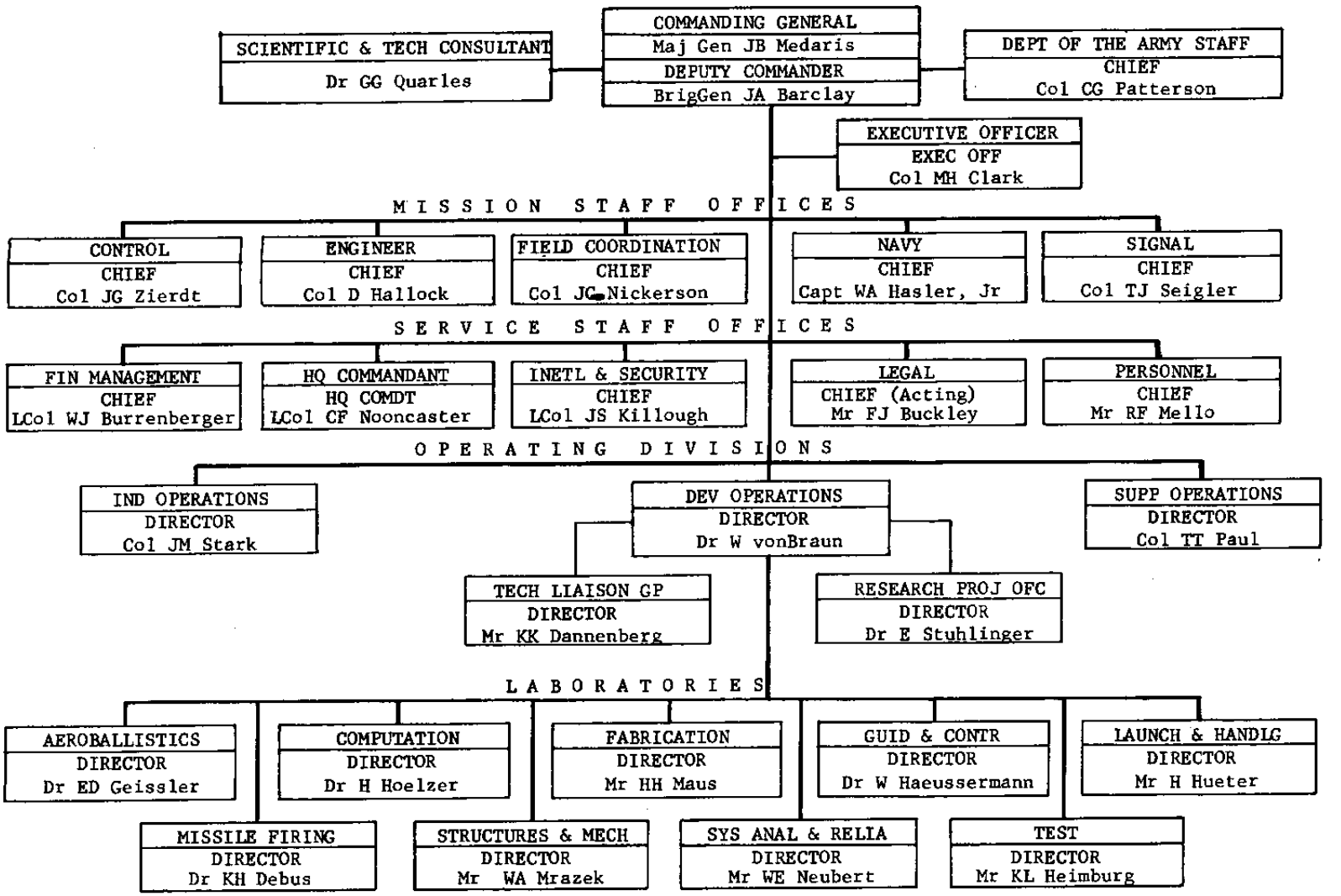
$25 MILLION FY 1957 MCA PROGRAM

PROJECT NR	PROJECT TITLE	AMOUNT
A803-803.110	Addition to Structural Fabrication Building	$ 860,000
A803-803.120	Structures and Mechanics Laboratory	5,526,000
A803-803.130	Extension to Guidance & Control Laboratory and Shop	4,623,744
A803-803.140	Computations Laboratory	1,414,000
A803-803.150	Addition to Engineering Building at Test Stand Area	595,500
A803-803.160	Guided Missile Test Shop	1,029,000
A803-803.170	Missile Assembly-Inspection Hangar	2,401,000
	JPL Facilities	1,500,000
	Extension of Utilities (RSA) to Support ABMA Facilities	500,000
	Surface Treatment Facility	1,150,000
	Signal Pictorial Services Building	485,000
	Additions to Test Stands for Power Plant Development	1,000,000
	Modification of Building 405-A	180,000
	Sub-Total	$21,264,244
	Contingiencies	3,735,756
	Total	$25,000,000

ARMY BALLISTIC MISSILE AGENCY

Huntsville, Alabama

15 Sept 56



JUPITER MISSILE FACT SHEET - 1959

		Maximum Range	Minimum Range
1.	TRAJECTORY:		
	Range (Nautical Miles)	1500	300
	Altitude (Statute Miles)	390	85
2.	CPE (Meters)	1500	1500
3.	PAYLOAD	1600 #	1600 #
4.	DIMENSIONS:		
	Length	60'	60'
	Diameter	105"	105"
5.	THRUST (Sea Level)	150,000 #	150,000 #
6.	WEIGHTS:		
	Dry	10,715 #	10,715 #
	Nose Cone (Body)	3,000 #	3,000 #
	LOX	68,760 #	68,760 #
	Fuel (RF-1)	30,415 #	30,415 #
	Lift Off	108,804 #	108,804 #
7.	TIME: (Seconds)		
	Total	1,016.9	486.9
	Maximum Dynamic Pressure (Ascent)	70	70
	Cut-off	157.8	123.7
	Separation (Thrust Unit)-Vernier Start	± 161.8	± 127.7
	Vernier Cut-off (Av.)	173.8	139.7
	Separation (Nose Cone)	339.3	305.2
	Zenith	552	262
	Re-entry (100 kilometers assumed)	950	351
	Maximum Dynamic Pressure (Descent)	980	428
	Impact	1016.9	486.9
8.	SPEED: (Mach)		
	Cut-off	13.04	6.33
	Re-entry	15.45	6.25
	Impact	0.49	0.49
9.	ACCELERATION, MAX.	13.69g	5.29g
10.	DECELARATION, MAX.	44.0g	12.0g
11.	WARHEADS	Nuclear	Nuclear
12.	FUZING	Proximity & Impact	
13.	GUIDANCE SYSTEM	Inertial	Inertial

[redacted]

JUPITER MISSILE FACT SHEET - 1959 (Cont)

E N G I N E S

Model	Description	Rated Thrust (lbs.)*	Thrust Tolerance (± lbs.)	Specific Impulse Min.	Specific Impulse Nom.	Burning Time Nominal (Seconds)
1st	Used on #1A and #1B	135,000	4,050	240	244	167
2nd	Used on #1 - #3A; Turbopump discharge duct 3.50"; flexible line 3.32" (ID)	139,000	4,170	241.3	244.9	163
3rd	Used on #4; discharge ducts and flexible line 4.26"	139,000	4,050	241.3	244.9	163
4th	Used on #5	150,000	4,500	245	247.5	152

* - AT sea level, using LOX and RF-1 fuel.

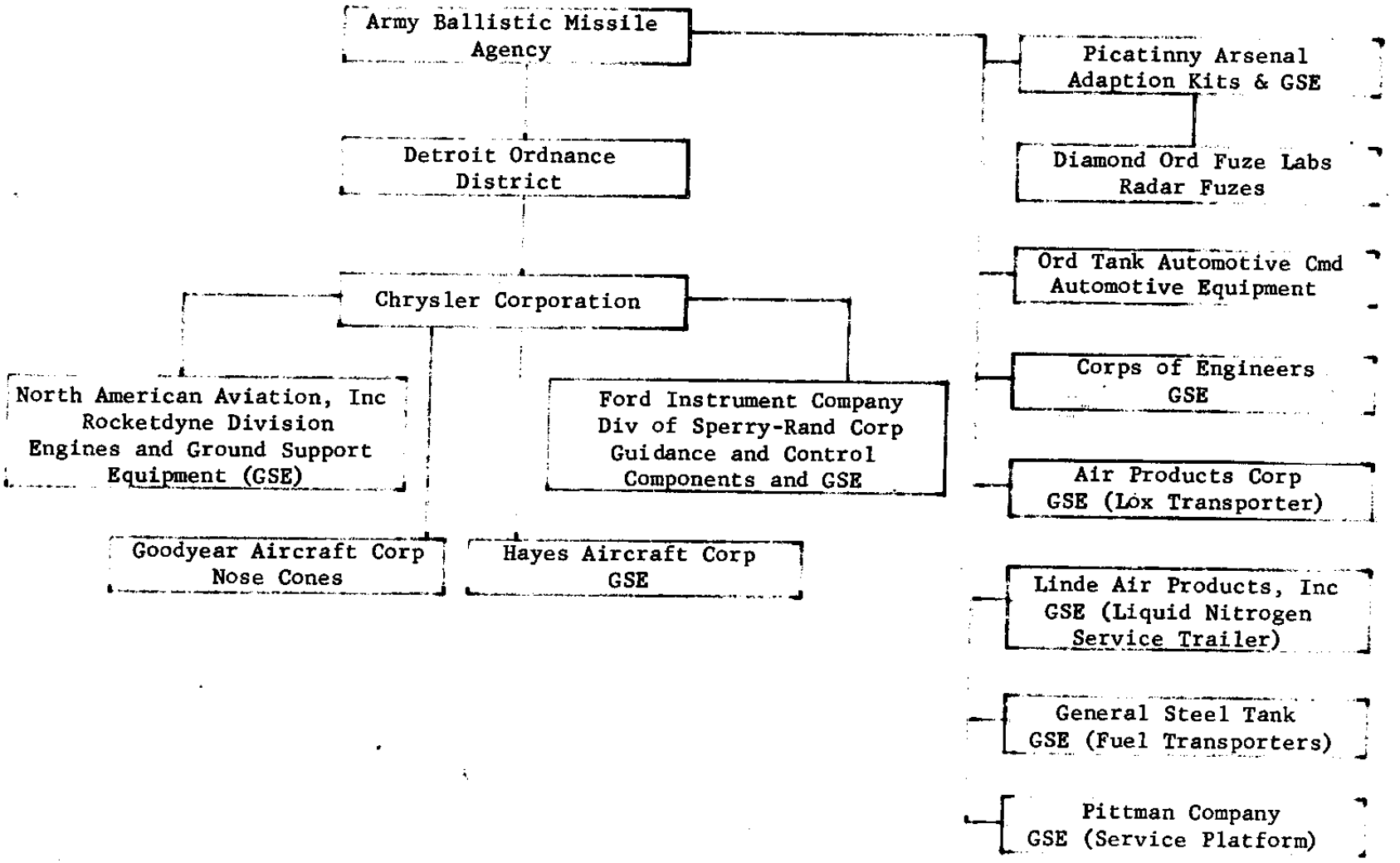
F U E L S

	LOX (99.5%)	RF-1*
MOLECULAR WEIGHT	32.0	165-180
FREEZING POINT (^{o}F)	-361.8^{o}	Av. -76^{o}F
BOILING POINT (^{o}F)	-297.4^{o}	410^{o}-572^{o}
DENSITY (68^{o}F) (gr/cc)	1.142**	0.801-0.815
COLOR	Light Blue	Colorless
ODOR	None	Typical Petroleum
TOXICITY:		
Inhalation	None	Mild
Contact	None	Mild
CORROSIVENESS	Non-corrosive	Very Mild
EXPLOSIVE LIMIT IN AIR	Non-explosive	
HANDLING HAZARD	High	Low
COMMERCIAL AVAILABILITY	Plentiful	Plentiful

*RF-1 is a kerosene-type fuel consisting primarily of aliphatic hydrocarbons.
**Density computed at boiling point (-297.4^{o}F)

CONTRACTORS STRUCTURE
JUPITER MISSILE SYSTEM

Prime Contractor - Chrysler Corporation



[redacted]

JUPITER A FIRINGS

22 Sep 55 — JUPITER A Missile RS-11 was launched at 0051 hours EST from AMR after a three-hour hold. The flight was unsuccessful. The LOX container pressure and the combustion chamber decreased 50 seconds after liftoff. The temperature of Fin Number 1 went out of measuring range 72 seconds after liftoff. The servo battery current dropped to zero and the stabilized platform lost its reference. The range safety officer gave the emergency cutoff signal at 79 seconds. Impact occurred approximately 21,000 yards from the launch pad. The RS-11 was the first flight with the complete guidance system.

5 Dec 55 — JUPITER A Missile RS-12 was launched from AMR at 1946 hours EST. The flight was successful. The actual range was 144.79 NM; .31 NM over; and 200 meters right of the intended impact point. The primary test objective was to test the complete guidance system. This was the first successful flight with the inertial guidance system.

14 Mar 56 — JUPITER A Missile RS-18 was launched at 1936 hours EST from AMR. The flight was successful. The scheduled launching date of this missile was 13 March. Three holds were called because of LOX difficulties, telemetry difficulties, and replacement of a gate valve. The actual range was 133.58 NM; 10.3 NM under; and 5.66 NM right of the intended impact point. Separation occurred before the missile gained its correct velocity. Improper assumption of propellant flow for the trajectory calculation was primarily responsible for the incorrect cutoff. The primary test objectives were to test the complete guidance and control system to establish the performance qualities of the complete missile system.

15 May 56 — JUPITER A Missile RS-19 was launched at 2321 hours EST from AMR. The flight was successful. The actual range was 169.4 NM; 13 NM over the intended impact point. Cutoff was given by the alcohol depletion switch that sensed alcohol injector pressure dropoff. Takeoff occurred 0.156 seconds after firing. The missile followed the correct trajectory with no obvious deviations. Missile cutoff occurred later than predicted and caused the missile to impact approximately 6.5 NM long. During descent the warhead turned left, causing impact to be several miles to the left of the aiming azimuth line. The primary test objectives were to test the angle-of-attack meter hardware (JUPITER control).

[redacted]

19 Jul 56 JUPITER A Missile CC-13 was launched at 0345 hours EST from AMR. The flight was successful. The actual range was 142.457 NM; .780 NM over the intended impact point. This was the first Chrysler fabricated and assembled missile.

8 Aug 56 JUPITER A Missile RS-20 was launched at 0325 hours EST from AMR. The flight was successful. The actual range was 139 72 NM; 0.3 NM over the intended impact point. The primary test objectives were to test the accuracy of the guidance system and to acquire data for the establishment of design criteria for the JUPITER. This was the first time that the combustion chamber pressure was controlled.

18 Oct 56 JUPITER A Missile CC-14 was launched at 0405 hours EST from AMR after a series of short holds. The flight was successful. The actual range was 137.870 NM; 72 meters over; and 338 meters right of the intended impact point. The primary objectives were to test the accuracy of the guidance system and to test angle-of-attack meters for the JUPITER.

30 Oct 56 JUPITER A Missile RS-25 was launched at 2104 hours EST from AMR. The flight was not successful. The behavior of the missile appeared normal for the first 13 seconds, an early roll disturbance having been smoothly eliminated. Starting at 13 seconds after range zero, the gyro yaw signal indicated increasing yaw for a few seconds and the tracking devices at the same time showed increased displacement to the left of the standard trajectory. The malfunction apparently occurred between the yaw gyro potentiometer output and the outputs of the yaw amplifier of the mixing computer. The primary test objective was to test power plant performance.

13 Nov 56 JUPITER A Missile RS-28 was launched at 2105 hours EST from AMR. The flight was successful. Actual range was 152.4 NM; 9.51 NM over; and 1.5 kilometers left of the intended impact point. The missile carried the LEV-3 rather than the ST-80 guidance system and used fuel depletion cutoff. The primary test objective was to test the Sandia payload.

29 Nov 56 JUPITER A Missile CC-15 was launched at 0823 hours EST from AMR. The flight was successful. Actual range was 138.969 NM; .137 NM over; and 122 meters left of the intended impact point, a radial miss distance of 260 meters. The primary test objectives were to test the accuracy of the complete guidance system and to test JUPITER control components.

18 Dec 56 (S) JUPITER A Missile RS-22 was launched from AMR at 2230 hours EST. The flight was successful. Actual range was 401.6 NM; 84.9 NM over the intended impact point. The missile used Hydyne fuel. The primary test objective was to test the control of an unstable missile configuration by using an angle-of-attack meter (boom type) in the ascending phase (JUPITER control).

18 Jan 57 (S) JUPITER A Missile CC-16 was launched at 2037 hours EST from AMR. The flight was successful. Actual range was 61.6 NM; 400 meters left; and 0.21 NM over the intended impact point. The primary objective was to test the accurracy of the guidance system when the missile is fired in a short range trajectory at an extreme attitude to range ratio. The missile closely followed its predicted trajectory for a successful flight which terminated 70 meters beyond and 360 meters to the left of the expected impact point at 61.553 NM range. The short range trajectory was programmed with an extreme altitude-to-range ratio so the guidance system would be subjected to the most difficult short range expected in future tactical application.

14 Mar 57 (S) JUPITER A Missile RS-32, the first missile shipped directly from the Chrysler Factory to the test site to be flight tested, was launched at 0312 hours EST from AMR. The flight was successful. Actual range was 138.178 NM; 2.2 NM under; and 1250 meters left of the intended impact point. The missile functioned properly until 182 seconds when an unexplainable pitch deviation caused a slow tilting of the missile top section. The cutoff function at 120 seconds and the separation function at 13[redacted] seconds, after flight zero time, were both satisfactory.

27 Mar 57 (S) JUPITER A Missile CC-30 was launched at 2022 hours EST from AMR. The flight was successful from the standpoint of missions accomplished, with cutoff time 112 seconds and separation time 126 seconds after range zero time. Impact point was 220 meters short and 320 meters to the right, a radial miss distance of 390 meters. The primary objective was to test the accuracy of the guidance system when the missile was fired in a short range trajectory at an extreme altitude to range ratio.

26 Jun 57 (S) JUPITER A Missile CC-31 was launched at 0609 hours EST from AMR to test performance of the inertial guidance system, angle-of-attack meters, separation of explosive screws, and impact and radar fuzing systems. Range instrumentation difficulties and deteriorating weather delayed the firing from the initially scheduled time—0230 hours EST. The flight was successful. Actual range was

[redacted]

135.425 NM; 0.42 NM over; and 389 meters left of the intended impact point.

12 Jul 57 (S) JUPITER A Missile CC-35 was launched at 0130 hours EST from AMR. The primary test objective was to test the accuracy of the guidance system. The flight was successful. Actual range was 130.125 NM; 0.15 NM over; and 285 meters left of the intended impact point. All missions were successfully accomplished. The missile followed the predicted trajectory very closely. Survey of the impact crater indicated a miss distance of 50 meters over and 284 meters to the left of the predicted impact point, giving a radial miss distance of 389.5 meters.

25 Jul 57 (S) JUPITER A Missile CC-37 was launched at 2317 hours EST from AMR. The flight was successful. Actual range was 126.227 NM; 147 meters under; and 182 meters left of the intended impact point. The primary test objective was to flight test warhead and fuze functioning as a system. A survey of the warhead impact point indicated a miss distance of 147 meters short, 182 meters to the left of the predicted impact point, or a radial miss distance of 234 meters.

10 Sep 57 (S) JUPITER A Missile CC-38 was launched at 2141 hours EST from AMR. The flight was unsuccessful. The missile impacted 14 77 NM from the launch pad. Mechanical failure of the guidance tilt program caused the missile to assume a very steep trajectory which resulted in a short range flight.

2 Oct 57 (S) JUPITER A Missile CC-39 was launched at 1429 hours EST from AMR. The flight was successful. The impact point was 445 meters long and 452 meters to the right of the predicted impact point, giving a radial miss distance of 634 meters. This was the first flight test of the XAA A-6 engine with a sea level thrust of 78,000 pounds.

30 Oct 57 (S) JUPITER A Missile CC-41 was launched at 2352 hours EST from AMR. The flight was unsuccessful. Actual range was 48 NM, whereas the predicted range was 130.588 NM. At 68 seconds, a disturbance occurred in the lateral accelerometer and computer systems. Erroneous guidance instructions were transmitted to the control system, causing a sharp yaw at 70 seconds. Cutoff was initiated at 98.1 seconds. One of the objectives was to indoctrinate troops for participation in the tactical portion of the countdown.

[redacted]

10 Dec 57 JUPITER A Missile CC-42 was successfully fired at 1936 hours EST from AMR. The missile followed the trajectory very closely and impacted on target. All missions were successfully accomplished. The predicted impact range was 141.895 NM. The miss distance has been certified as 153 meters radial, 94 meters over, and 121 meters to the left of the predicted impact point. The primary objective of the test was to flight test Hardtack adaption kit components as passengers.

14 Jan 58 JUPITER A Missile CC-45 was successfully fired at 2024 hours EST from AMR. The flight was successful in that all missions were accomplished. The missile followed its predicted trajectory closely. Impact was 370 meters over and 86 meters to the right of the predicted impact point, a radial miss distance of 380 meters. This was the fifth complete flight test of warhead and fuze system.

11 Feb 58 JUPITER A Missile CC-46 was successfully fired at 1954 houre EST from AMR. The flight was successful in that all missions were accomplished, with the exception of the Hardtack adaption kit mission. Impact was 258 meters over and 172 meters to the left of the predicted impact point, a radial miss distance of 310 meters. The primary objectives of the test were to test the warhead and fuze system and the guidance system.

27 Feb 58 JUPITER A Missile CC-43 was successfully fired at 1459 hours EST from the AMR. The flight was successful in that all missions were accomplished. Impact was 461 meters over and 64 meters to the left of the predicted impact point, a radial miss distance of 466 meters.

11 Jun 58 JUPITER A Missile CC-48 was successfully fired at 2059 hours EST from AMR. The flight was a success in that all missions were accomplished with the exception of failure of the thrust governor. This failure was caused by human error before firing which caused excess velocity, thereby exceeding the predicted impact point by 8.36 NM. Programmed range to impact was 137.31 NM. All other missions were satisfactorily completed.

[redacted]

Appendix 8

JUPITER C FIRINGS

20 Sep 56 — JUPITER C Missile RS-27, the first three-stage re-entry missile, was fired at 0145 hours EST from AMR. This missile attained an estimated range of 3,335 ST miles, an latitude of 682 ST miles, and reached MACH 18 velocity. The primary objective of the firing was the propulsion and separation test of a multi-stage vehicle. The missile was a four-stage configuration with the last stage inactive. The first stage was an elongated REDSTONE missile, the second and third stages were made up of 11 and 3-six inch scaled SERGEANT rockets, respectively. The payload consisted of approximately 20 pounds of instrumentation attached to the inactive fourth stage. The flight was successful and the sequence of operations occurred as programmed. This vehicle could have obtained sufficient velocity to place it in orbit, if the last stage had been activated.

15 May 57 — JUPITER C Missile RS-34, the second three-stage re-entry missile, was launched at 0255 hours EST from AMR to test the thermal behavior of a scaled-down version of the JUPITER nose cone during re-entry. The separated nose cone, which weighed 314 pounds, should have reached a nominal range of 1,112 NM. The missile began to pitch up at 134 seconds, and impact was 420 NM short of the intended impact point. The composite missile consisted of three stages. The first stage was an elongated REDSTONE thrust using alcohol and liquid oxygen as propellant. The second and third stages were made up of clusters of 11 and 3 scaled-down SERGEANT solid propellant rockets, respectively. The nose cone was not recovered; however, instrument contact with the nose cone through re-entry indicated that the ablative-type heat protection for warheads was successful.

8 Aug 57 — JUPITER C Missile RS-40, fired from AMR at 0159 hours EST, impacted at the predicted range. This success proved conclusively that the planned ablative-type heat protection for JUPITER warheads was satisfactory. The missile was a three-stage configuration—the first stage an elongated REDSTONE missile, the second and third stages an 11 and 3-six inch scaled SERGEANT rockets, respectively. The one-third scale JUPITER nose cone was attached to the final stage with scheme for separation provided. The nose cone traveled to a 1,168 NM range, reached a velocity of 4,004 M/Sec, and experienced a total heat input at stagnation point at 95% of that for the full scale nose cone at 1,500 NM. Naval Units recovered the scaled nose cone according to plan.

[redacted]

[redacted]

Appendix 9

JUPITER MISSILES - R&D FIRINGS

1 Mar 57 [redacted] JUPITER Missile AM-1A, the first JUPITER flight, was fired at 1651 hours EST from AMR. The missile achieved a 48,000 foot altitude. Flight terminated at 74 seconds because of missile breakup. Failure was attributed to overheating in the tail section. The trajectory to this point was as predicted.

26 Apr 57 [redacted] JUPITER Missile AM-1B fired from AMR at 1512 hours EST to test the design version of the airframe and rocket engine. The flight terminated at 93 seconds because of propellant slosh. The missile achieved an altitude of 60,000 feet. The flight was partially successful.

31 May 57 [redacted] JUPITER Missile AM-1 was fired from AMR at 1308 hours EST to test the range capability and performance of rocket engine and control system. Although the missile was 253 NM short of its estimated 1,400 NM impact point, this was the first successful flight of the JUPITER. All phases of the test were successful during this first firing of the IRBM in the western world

28 Aug 57 [redacted] JUPITER Missile AM-2, the fourth JUPITER, was fired from AMR at 1602 hours EST over IRBM range and was the second successful flight of the series. The range error was 27.5 NM with a 36.5 NM lateral error. Range was predicted for 146 NM. LOX was cut off at 170 seconds. All flight missions were fulfilled satisfactorily. Separation occurred 5 seconds after burnout, as programmed. This was the first test of separation of body from thrust unit.

22 Oct 57 [redacted] JUPITER Missile AM-3, the fifth JUPITER, was fired from AMR at 2007 hours EST. This was the first flight with a heat protected nose cone. The ST-90 inertial guidance stabilized platform was operated with partially closed circuits. Cutoff was effected by the guidance system at 170.37 seconds. Since fuel was not depleted, flight time was 9.5 seconds longer than had been predicted for an approximate 1,100 NM range. The range error was 10.2 NM with a 3.4 NM lateral error. The nose cone survived reentry and impacted in the general vicinity of the predicted impact point. Again, a successful flight.

26 Nov 57 [redacted] JUPITER Missile AM-3A was fired from AMR at 2110 hours EST. Mainstage, lift-off, and powered flight were normal. The missile passed through the critical dynamic pressure period and followed the prescribed trajectory until 101 seconds of flight when the engine thrust was terminated.

[redacted]

[redacted]

From an analysis covering the period before thrust termination, mechanical failure of the turbopump stopped the flow of propellants to the combustion chamber causing a complete loss of thrust. Telemetry signals ceased at 232 seconds. The missile was at an altitude of 65,000 feet when an explosion was observed from the Test Center above the horizon. The long range mission of this flight was not accomplished; however, other primary and secondary missions were considered successful.

18 Dec 57 (A) JUPITER Missile AM-4 was fired from AMR at 1[redacted]7 hours EST. The mainstage, lift-off, and powered flight were normal. The missile followed the prescribed trajectory. Thrust ended abruptly at 116.87 seconds of flight which resulted in a short-range impact. Failure was again attributed to turbopump malfunction. The long-range mission was not accomplished; however, other primary and secondary missions were successfully accomplished. The abrupt shutdown of the power plant resulted in a range of approximately 149 NM and an altitude of approximately 50 NM.

18 May 58 (B) JUPITER Missile AM-5, carrying America's first tactical type re-entry nose cone, was fired from AMR at 0005 hours EST. This was also the first flight test for first and second stage separation. Impact was 28.3 NM [redacted]nder and 15.6 NM to the right at a range of about 1,275 NM after approximately 960 seconds of flight. In less than five hours, the nose cone was recovered—the world's first recovery of an IRBM nose cone.

17 Jul 58 (B) JUPITER Missile AM-6B was fired from AMR at 0404 hours EST to a precalculated range of 1,241.341 NM. The nose cone impacted 1 NM short and 1.5 NM to the r[redacted]ght of the predicted impact point. This was the first f[redacted]ight test of the complete inertial guidance system. The nose cone recovery mission was successful. This was also the second successful flight test of a full-scale tactical type nose cone, as well as a successful flight test of the JUPITER lightweight, high-explosive warhead.

27 Aug 58 (B) JUPITER Missile AM-7 was fired from AMR at 1815 hours EST. The countdown was normal. Operations were interrupted by one hold—a 15 minute delay for minor adjustments. Ignition, mainstage, and lift-off were normal. The missile followed the pre-selected trajectory closely [redacted]uring power flight, though cutoff was effected by fuel de[redacted]letion rather than by pre-set guidance cutoff. The nose cone impacted 39 NM short and 15.7 to the left of the precalculated range of 1,246 NM. JUPITER 7 was the first flight test of the warhead and fuze system. This also marked the second flight test of the JUPITER all-inertial

[redacted]

guidance system, the fourth flight test of the NAA S-3D engine operating at 150,000 pounds thrust, and the first flight test of the solid propellant spin rocket and vernier motor.

9 Oct 58 — JUPITER Missile AM-9 was fired from AMR at 2249 hours EST. The missile was destroyed after 49 seconds of erratic flight caused by fire in the tail section. The fire was believed to have started by a pin-hole leak near the thrust transducer which burned through the fuel and LOX transducer lines. This was the first JUPITER missile to use swiveled turbine exhaust for roll control, also first use of solid vernier control.

13 Dec 58 — JUPITER Missile AM-13 was fired from AMR at 0353 hours EST. The missile's nose cone impacted in the pre-selected target area at a range of approximately 1,302 NM. The significant mission of the missile was the flight of a South American Squirrel monkey up to and down from outer space. The mission was considered highly successful, though the nose cone capsule containing the live passenger was not recovered. The flight is considered one of the outstanding achievements of the space research. The impact was 5.2 NM over and 0.75 NM to the right of impact point. The overshoot was caused by inter-action which occurred at separation between the booster and aft sections. A temporary cable connecting the two bodies had not been removed prior to launch.

21 Jan 59 — JUPITER Missile CM-21, the first Chrysler production qualification missile, was fired from AMR at 1910 hours EST. The nose cone impacted in the pre-selected target area at a range of 1,302 NM. Miss distance was 3 NM over and 1 NM to the left of the target. The overshoot was caused by failure of the vernier engine to cut off—high resistance of the squib firing circuit. Primary missions were successfully accomplished.

27 Feb 59 — JUPITER Missile CM-22 was fired from AMR at 1850 hours EST. The primary mission of impacting the nose cone in a pre-calculated target (MILS Network) was successfully accomplished. The nose cone impacted in the 1,302 NM target area, 2.8 NM over, with no lateral deviations. Again, the vernier engine ran to cutoff rather than the commanded 14 seconds—a near perfect flight. For the first time, missile roll was controlled by a turbine exhaust nozzle designed to eliminate problems experienced in previous flights.

[redacted]

[redacted]

3 Apr 59 (S) JUPITER Missile CM-22A was fired from AMR at 1934 hours EST. The primary mission of impacting a nose cone in a pre-calculated target area (MILS Network) was successfully accomplished with an impact of 0.8 NM under and 5.0 NM to the left of the 1,302 NM range. The lateral miss was believed to have been caused by a drifting gyro.

6 May 59 (S) JUPITER Missile AM-12 was fired from AMR at 2047 hours EST. All primary missions were essentially successful, although the impact was 69 NM short and 4.9 NM to the right of the 1,302 NM predicted impact point. This undershoot was due to thrust controller deviation which commanded the exceedingly high thrust level during the main power flight phase. Cutoff occurred at 144 seconds of flight.

14 May 59 (S) JUPITER Missile AM-17 was fired from AMR at 0052 hours EST to test impact accuracy. This shot may be considered as having hit the target. The impact was .26 NM over and 0.4 NM to the left of the predicted point of impact. Accuracy of the MILS Network was approximated at ± 0.25 NM. All primary and secondary missions were accomplished except for photographic recording of the second separation. This could not be accomplished because of the firing date.

28 May 59 (S) JUPITER Missile AM-18 was fired from AMR at 0235 hours EST. The flight was successful with impact ranging from 0.1 to 0.4 NM from the target. The missile traveled a 1,302 NM range. The significant mission of the missile was to test the effects of cosmic radiation, increased gravity, and weightlessness on live passengers and bio-medical experiments of material housed in the nose cone. On board were an American-born Rhesus Monkey, Able; a Squirrel Monkey, Baker; and the bio-medical experiments—yeast, corn, mustard seeds, fruit-fly larvae, human blood, mold spore, and fish eggs. Able and Baker were recovered unharmed within one and one-half hours after liftoff. This milestone marked the first recovery of living creatures from a flight through near space. The bio-medical experiments were for NASA analysis.

9 Jul 59 (S) JUPITER Missile AM-15 was fired from AMR at 2001 hours EST to test missile accuracy. All primary and secondary missions were successfully accomplished and impact was well within 1 NM of the pre-selected point, approximately 1,302 NM downrange—a miss distance of only 0.48 NM short and 0.09 NM to the right.

26 Aug 59 (S) JUPITER Missile AM-19, a short range (300 NM) IRBM, was fired from AMR at 2030 hours EST. The nose cone impacted 0.03 NM short and 0.22 NM to the right of the intended

[redacted]

target. This was the first JUPITER missile to be programmed for a short range flight. All primary and secondary missions were accomplished.

15 Sep 59 — JUPITER Missile AM-23, scheduled for launch at 0430 hours EST, was fired from AMR at 1645 hours EST. The flight was erratic at liftoff and the missile destroyed itself after 13 seconds, just before command destruct. Failure of a silver soldered connection joint to the pressure sphere caused destruction of the missile. The nose cone housed several biological specimens.

30 Sep 59 — JUPITER Missile AM-24 was fired from AMR at 2028 hours EST. The primary mission of impacting the nose cone in a pre-calculated target area was successfully accomplished. The missile covered a pre-calculated range of 1,299.4 NM, with the nose cone impacting within 1.25 NM of the predicted point. In addition to the usual ST-90 Stabilizer Platform, the missile carried a second system for relative accuracy and for drift investigations. It also housed a telemetry system. A significant mission was to determine environmental flight conditions.

21 Oct 59 — JUPITER Missile AM-31, the first full range tactical prototype, was fired from AMR at 2220 hours EST. All missions assigned to the flight was successfully accomplished. The missile covered a prescribed range of 1,600.448 NM, with the nose cone impacting 0.9 NM short and 0.6 NM to the right. This was the fourth Chrysler-assembled missile to be flight tested.

4 Nov 59 — JUPITER Missile CM-33 was fired from AMR at 1938 hours EST to a pre-selected range of 1,299.4 NM. The nose cone impacted 0.56 NM short and 0.09 NM right of the impact point. The test successfully accomplished all intended missions. This was the first highly successful, Chrysler-assembled JUPITER fired in the test program and was the first fired without static firing.

18 Nov 59 — JUPITER Missile AM-25 was successfully fired from AMR at 2031 hours EST to a pre-calculated range of 664.8 NM. Nose cone impacted 0.9 NM over and 1.0 NM left of the target. This was the first medium range flight for a tactical prototype.

9 Dec 59 — JUPITER Missile AM-32 was fired from AMR at 1908 hours EST. The original countdown of 480 minutes was shortened to 240 minutes. The flight was successful in all phases. The nose cone impacted 0.3 NM over and 2.0 NM right of the 2,299.4 NM range.

[redacted]

16 Dec 59 JUPITER Missile AM-26 was fired from AMR at 1903 hours EST to a prescribed distance of 300 NM. The flight was successful in all phases. Impact was 0.1 NM to the right of the 300 NM range.

25 Jan 60 JUPITER Missile AM-28 was fired from AMR at 1948 hours EST to a prescribed range of 1,299.4 NM. The nose cone impacted 0.04 NM over and 3.27 NM to the left. All missions were successfully accomplished despite elevated temperatures in the tail section. The primary mission of this flight was to test the two-way deflector launch table and to analyze elevated temperatures in the tail section.

4 Feb 60 JUPITER Missile 30, the 28th R&D firing, was fired from AMR at 1919 hours EST to a pre-calculated range of 1,299.4 NM. The flight successfully accomplished all primary and secondary missions. The nose cone impacted 0.65 NM short and 0.52 NM right of the intended target.

[redacted]

JUPITER LIVE SYSTEM TEST

20 Oct 60 (C) JUPITER Missile (LST) 217, the first to be fired under simulated tactical conditions using GSE prescribed for the JUPITER deployed to NATO I, was fired from AMR at 1102 hours EST. The missile successfully accomplished all primary and secondary missions. The nose cone impacted 1.1 NM over and 0.2 NM right of the pre-determined target 962.5 NM downrange.

JUPITER COMBAT TRAINING LAUNCH

22 Apr 61 (C) JUPITER Missile (CTL) 209, the first in a series of 12 CTL firings, was launched from AMR to a prescribed range of 1514 NM. The nose cone impacted .79 NM over and 2.19 NM right of the intended target. All missions were accomplished. The missile followed the intended flight path and performed within the accuracy requirements of the JUPITER system. IAF troops conducted the firing after LOD of MFSC completed the preliminary checkout. The primary mission of the test was to evaluate the capabilities of launch crews under operational alert conditions.

4 Aug 61 (C) JUPITER Missile (CTL) CM-218, the second to be fired under the operational control of NATO troops in the CTL program, was fired from AMR at 1919 hours and 04 seconds EST to a range of 1,514 NM. The missile was originally scheduled for firing on 3 August but was postponed because of the fuel probe in the fuel start tank and the microswitch on the fuel pumping lever arm which controls the fuel flow rate. All missions assigned to the missile and to the NATO training launch crew were successfully accomplished.

6 Dec 61 (C) JUPITER Missile (CTL) CM-115, the third NATO operational control CTL, was fired from AMR at 1737 hours and 24 seconds EST to a prescribed range of 1,516 NM. The missile was well constrained to the intended flight path and within accuracy requirements of the JUPITER system. The missile impacted in the target area and all missions assinged to this test were successfully accomplished.

18 Apr 62 (C) JUPITER Missile (CTL) CM-114 was fired from AMR at 1317 hours and 54.1 seconds EST to a predicted impact point of 1,514 NM from the firing site. All functions of the flight were normal up to 153 seconds, at which time fuel depletion was reached and normal guidance cutoff was not achieved. The missile impacted approximately 230 miles short of the intended target. All missions assigned to the NATO training launch crew were accomplished.

STATUS OF JUPITER U. S. AIR FORCE MIPR'S A/O 22 JUNE 1962

MIPR NO.	AMOUNT	ISSUED	UNISSUED	AVAILABLE FOR WITHDRAWAL	BILLED	UNBILLED
FISCAL YEAR 1958						
01-601-8-1410-55 Am 1	$ 85,753,000.00	$ 85,753,000.00	$ 0.00	$ 0.00	$ 85,753,000.00	$ 0.00
01-601-8-1410-56	86,947,000.00	86,947,000.00	0.00	0.00	86,947,000.00	0.00
01-601-8-1410-57	30,000,000.00	30,000,000.00	0.00	0.00	30,000,000.00	0.00
Sub-Total FY 58	$202,700,000.00	$202,700,000.00	$ 0.00	$ 0.00	$202,700,000.00	$ 0.00
FISCAL YEAR 1959						
01-601-9-1410-1 Orig	$ 26,000,000.00	$ 26,000,000.00	$ 0.00	$ 0.00	$ 26,000,000.00	$ 0.00
01-601-9-1410-111 Am 4	138,012,581.00	138,012,581.00	0.00	0.00	138,012,581.00	0.00
01-601-9-1410-112 Am 6	54,123,523.00	54,123,523.00	0.00	0.00	54,123,523.00	0.00
01-601-9-1410-211 Am 1	6,968,000.00	6,968,000.00	0.00	0.00	6,968,000.00	0.00
01-601-9-1410-315 Am 3	1,252,455.00	1,252,455.00	0.00	0.00	1,252,455.00	0.00
01-601-9-1410-316 Am 2	950,623.00	950,623.00	0.00	0.00	950,623.00	0.00
01-601-9-1410-322 Am 2	605,000.00	605,000.00	0.00	0.00	605,000.00	0.00
01-601-9-1410-448 Am 5	3,251,091.00	3,251,091.00	0.00	0.00	3,251,091.00	0.00
01-601-9-1410-457 Am 1	721,843.00	721,843.00	0.00	0.00	721,843.00	0.00
01-601-9-1410-463 Am 1	237,964.00	237,964.00	0.00	0.00	237,964.00	0.00
01-601-9-TS-182 Am 1	95,087.00	95,087.00	0.00	0.00	95,087.00	0.00
01-601-9-1414-323 Am 2	664,962.00	664,962.00	0.00	0.00	664,962.00	0.00
Sub-Total FY 59	$232,883,129.00	$232,883,129.00	$ 0.00	$ 0.00	$232,883,129.00	$ 0.00
FISCAL YEAR 1960						
01-601-0-1410-79 Am 4	$ 1,521,000.00	$ 1,521,000.00	$ 0.00	$ 0.00	$ 1,521,000.00	$ 0.00
01-601-0-1410-80 Am 2	0.00	0.00	0.00	0.00	0.00	0.00
01-601-0-1410-81 Am 4	5,142,259.00	5,142,259.00	0.00	0.00	2,877,719.30	2,264,539.70
01-601-0-1410-82 Am 7	76,857,767.00	76,609,374.00	248,393.00	248,393.00	68,557,424.98	8,300,342.02
01-601-0-1410-93 Am 4	984,923.00	984,923.00	0.00	0.00	984,923.00	0.00
01-601-0-1410-174 Orig	37,400.00	37,400.00	0.00	0.00	37,400.00	0.00
01-601-0-1410-178 Am 4	447,057.00	447,057.00	0.00	0.00	447,057.00	0.00
01-601-0-1410-250 Am 2	0.00	0.00	0.00	0.00	0.00	0.00
01-601-0-1410-264 Am 1	0.00	0.00	0.00	0.00	0.00	0.00
01-601-0-1410-265 Am 3	12,325,937.00	12,325,937.00	0.00	0.00	10,533,307.23	1,792,629.77
Map Jup 60-1 Am 1	1,805,240.00	1,805,240.00	0.00	0.00	1,805,240.00	0.00
33-600-0-None 107 Am 1	45,256.00	45,256.00	0.00	0.00	45,256.00	0.00
33-600-0-None 107 Orig	82,792.00	82,792.00	0.00	0.00	82,792.00	0.00
Sub-Total FY 60	$ 99,249,631.00	$ 99,001,238.00	$248,393.00	$ 248,393.00	$ 86,892,119.51	$12,357,511.49

STATUS OF JUPITER U. S. AIR FORCE MIPR'S A/O 22 JUNE 1962 (Cont)

MIPR NO.	AMOUNT	ISSUED	UNISSUED	AVAILABLE FOR WITHDRAWAL	BILLED	UNBILLED
FISCAL YEAR 1961						
Map-Jup 61-1 Am 1	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00
01-601-1-1410-513 Am 3	161,000.00	161,000.00	0.00	0.00	51,075.00	109,925.00
01-601-1-1410-514 Am 3	0.00	0.00	0.00	0.00	0.00	0.00
01-601-1-1410-515 Am 4	4,873,835.00	4,873,835.00	0.00	0.00	4,190,291.70	683,543.30
01-601-1-1410-601 Am 2	439,000.00	408,433.89	30,566.11	30,566.11	408,433.89	30,566.11
01-601-1-1410-661 Am 1	3,668,237.00	3,668,237.00	0.00	0.00	3,120,719.44	547,517.56
Sub-Total FY 61	$ 9,142,072.00	$ 9,111,505.89	$ 30,566.11	$ 30,566.11	$ 7,770,520.03	$ 1,371,551.97
FISCAL YEAR 1962						
01-601-2-Eng-710, Am 2	$ 610,500.00	$ 610,500.00	$ 0.00	$ 0.00	$ 331,023.80	$ 279,476.20
01-601-2-1410-674 Am 1	0.00	0.00	0.00	0.00	0.00	0.00
Sub-Total FY 62	$ 610,500.00	$ 610,500.00	$ 0.00	$ 0.00	$ 331,023.80	$ 279,476.20
GRAND TOTAL	$544,585,332.00	$544,306,372.89	$278,959.11	$278,959.11	$530,576,792.34	$14,008,539.66

JUPITER WEAPON SYSTEM TRAINING COURSES

(U) The following list of courses outlines the individual special training in support of the JUPITER weapon system program:

Missile Systems Analyst/Technician, SM-78 (CN ASA31470P-1 & 2): Train selected AF personnel to supervise and/or perform the checkout, alignment, and presetting of the guidance and control systems; analyze and isolate malfunctions in airborne systems and ground support equipment at launch emplacement or receiving, inspection, and maintenance areas. Training will include instruction or removal and replacement of guidance and control system components and checkout and alignment of the propulsion system.

Missile Guidance System Analyst, SM-78 (CN ASA31450P-1 & 2): Transition train AF personnel to supervise and perform checkout, alignment, and presetting of the guidance and control system. Analyze and isolate malfunctions in airborne and ground equipment and remove and replace malfunctioning units.

Guidance System Mechanic, SM-78 (CN ASA31170P-1 & 2): Transition train selected AF personnel to inspect, maintain, bench check, repair, adjust and align guidance and control system components.

Missile Test Equipment Technician Guidance and Control, SM-78 (CN ASA31570P-2 & 4): Transition train AF personnel to service and maintain ground support equipment associated with guidance and control systems, including checkout and test equipment in the various trailer and/or used in the receipt, inspection, and maintenance area. Maintain, check, and service other items of special test equipment used in guidance and control systems, and maintain standard items of test equipment.

Guided Missile Maintenance Officer, SM-78 (CN OSA3124B-1 & 2): Transition train selected AF personnel in the maintenance procedures, principles of operation, and malfunction analysis of the SM-78 missile systems and ground support systems and equipment. Training includes logistics, operational, and maintenance concepts of the SM-78 weapon system.

Hydraulic Repairman/Technician, SM-78 (CN ASA42172-1 & 2): Transition train selected AF personnel in the inspection, checkout, troubleshooting, maintenance, repair, and servicing of the hydraulic systems on an SM-78 missile and ground support equipment.

Missile Technician (Airframe), SM-78 (CN ASA43370-1 & 2): Transition train selected AF personnel to perform visual inspections of an SM-78 missile and related ground support equipment at launch emplacement; initiate and/or maintain maintenance forms and records; perform manual emergency procedures; assist in the removal of missile system

and ground support equipment components; supervise missile transportation and handling operations; assist in recycle maintenance; install explosive bolts, primer cord, and spin rockets; and assist in mating of nose cone to aft section and thrust unit.

Guided Missile Operations Officer, SM-78 (CN OSA1824-1): Transition train AF personnel to manage and coordinate the launch emplacement required to launch the SM-78 missile, including operational and maintenance concepts related to launch operations and countdown procedures.

Ground Aircraft & Missile Support Equipment Repairman, SM-78 (CN ASA4215-1 & 2): Transition train selected AF personnel to perform operation, inspection, and service of the 100 KW and 30 KW generator sets used in support of the SM-78 missile system and to understand general missile and ground support equipment electrical system operation, peak load generator requirements, and electrical power cabling and distribution.

Electrical Power Production Repairman, SM-78 (CN ASA56751-1 ç 2): Train selected AF personnel to operate, maintain, repair, and adjust electrical power generation and distribution system components.

Liquid Fuel Supply Specialist, Unconventional Fuels, SM-78 (CN ASA64350B-1 & 2): Train selected AF personnel in the procedures and safety precautions required for:

1. Transferring fuel to the launch site.
2. Filling the launch site fuel trailer.
3. Transferring liquid oxygen to the launch site.
4. Transferring liquid oxygen from the 9-ton trailer into the 19-ton trailer.
5. Transferring LN_2 to the launch site.
6. Transferring LN_2 from the transporter into the LN_2 trailer.
7. Operating the fuel filtering and dewatering equipment.
8. Functioning and operating the vacuum trailer.

Liquid Fuel Systems Maintenance Specialist, SM-78 (CN ASA56850-1 & 2): Train selected AF personnel in the operation, servicing, maintenance, trouble analysis, and repair of the liquid fuel transfer and related systems. Training will cover the detail and specific functions of the total liquid fuel transfer loops from liquid oxygen and fuel storage trailer to their point of entry. Removal, repair, calibration, and replacement of propellant system components will be covered.

Liquid Fuel System Electrical Analyst, SM-78 (CN ASA42350-1 & 2): Train selected AF personnel in the operation, servicing, and maintenance, trouble analysis, and repair of the liquid fuel transfer and related electrical system. Training will cover the detail and specific functions of the total liquid fuel transfer loops from liquid oxygen and fuel storage trailer to their point of entry. Removal, repair, calibration, and replacement of liquid fuel electrical system components will be covered.

Missile Test Equipment Technician (Propulsion), SM-78 (CN ASA31570P-1 & 2): Train selected AF personnel to perform maintenance; calibration; troubleshooting; and repair of electrical, pneumatic, and related checkout test equipment for the propulsion system by using electrical mechanical test equipment.

Missile Engine Mechanic, SM-78 (CN ASA43351-1 & 2): Train selected AF personnel in the operation, checkout, trouble diagnosis, and repair of the missile propulsion system and components. Detailed and specific instruction will be given on the simulated operation; inspection; trouble analysis; and maintenance of the propulsion system, propulsion components, propellant feed systems, and related high-pressure gas systems. Instruction will include operation of the leak tester, propulsion components tester; rocket engine electrical; and pneumatic test stand, universal test stand, fuel disconnect tester, pneumatic flow tester, and interpretation of propulsion system operation data flow and simulated engine operation. Detailed instruction on propulsion system component removal, repair, maintenance requirements, installation, and engine build-up will be included. Familiarization on the propulsion loop, fueling system, and launching data will also be included, using fluid flow in system in the final phases of individual training.

Liquid Oxygen Generation Plant Operation and Maintenance, 25-Ton/D (CN ADS56250-1 & 2): Train key maintenance and instructor personnel in the operation and maintenance of the Gas Generating Plant used as part of the SM-78 weapon system. Scope of training includes detailed instruction in the erection, assembly, operation, check-out, troubleshooting, and repair of the oxygen-nitrogen generator. Familiarization with diesel engine operation and the scheduling of generator POL supplies is also covered.

Nose Cone/Warhead Specialist, SM-78 (CN ATS46350A-1): Train selected AF personnel in receipting for, inspecting, testing, assembling, and monitoring of the JUPITER nose cone and warhead.

Integrated Weapon System Training, SM-78 (CN ASA31000-2): Qualify selected graduates of the JUPITER weapon system individual training courses as operational teams capable of maintaining and launching the JUPITER missile within the specified time limitations.

Ballistic Missile Inventory Management Procedures and Log Bal Network Operations (IRBM) (CN ADS64570-1 & 2): Train selected AF personnel in supply procedures used in the maintenance of supply records, inventory, stock levels, and inputs. Personnel will be trained in supply procedures peculiar to the operational ballistic missile supply organization, including processing of supply documents and reporting and verifying all transactions affecting inventory control. Personnel will also be trained to operate Log Bal Net communications equipment—key punch, data transceiver, teletypewriter, verifier, and signal unit. Training in the operation of the Log Bal Network will include simulated transmission and receipt of data and maintenance of records essential to the inventory control.

JUPITER AND JUPITER C SPACE MISSIONS

31 Jan 58 (U) JUPITER C Missile RS-29, launched from AMR at 2247 hours EST, successfully placed EXPLORER I—the first U. S. satellite—into earth orbit. It carried a payload weighing 30.8 pounds. All four stages performed satisfactorily.

5 Mar 58 (U) JUPITER C Missile RS-26 was launched from AMR at 1328 hours EST. The mission, to place a scientific payload (EXPLORER II) weighing 18.83 pounds into orbit, was not successful. Ignition failure of the last stage caused the vehicle to return to earth prior to orbit.

26 Mar 58 (U) JUPITER C Missile RS-24, a standby replacement for JUPITER C 26, was launched from AMR at 1238 hours EST. The 31-pound satellite (EXPLORER III) carried aloft an 18.53-pound scientific payload. It had the same type carrier vehicle as EXPLORER I. Its instrumentation, however, included a miniature tape recorder not carried on the first satellite. This recorder made it possible to collect data on radiation, micro-meteorite impact, and temperatures throughout the entire orbit and, in turn, relay this information back to earth by signal as the satellite passed over ground stations.

26 Jul 58 (U) JUPITER C Missile 44, the fourth missile of satellite configuration, was successfully placed into orbit from AMR at 1000 hours EST. It was the third successful attempt to place a satellite in orbit. The configuration of this missile was the same as the previous satellite carriers. The satellite (EXPLORER IV) weighed 37.54 pounds, and its payload weighed 24.97 pounds. The primary purpose of this satellite was to measure high energy radiation.

24 Aug 58 (U) JUPITER C Missile 47, with an assigned mission to eject EXPLORER V into orbit, was fired at 0117 from AMR. The satellite weighed 37.1 pounds and carried a 25.76 pound payload. The powered flight phase was normal for a satellite carrier. However, in the spatial flight phase, the booster collided with the top section about 12 seconds after separation, and the altitude reference was fired in the wrong direction. The satellite failed to go into orbit.

22 Oct 58 (U) JUPITER Missile C-49 (EXPLORER VI) was fired from AMR at 2221 hours EST. The missile failed to orbit a 35.5 pound payload containing a NACA high visibility balloon to provide a high altitude atmospheric density data and to serve as a radar target. Rotational spin vibration of the cluster caused the payload to break off at 112 seconds.

6 Dec 58 (U) The first lunar attempt was a modified JUPITER Missile 11 (JUNO II) fired from AMR at 0044 hours EST. The missile failed to attain escape velocity after cutoff occurred approximately 3.7 seconds too soon. It traveled 66,654 miles toward the moon and was a successful test of the four-stage JUNO II vehicle in the main power phase.

3 Mar 59 (U) From AMR at 0011 hours EST, ABMA launched JUNO II Vehicle 14-PIONEER IV, the second Army missile to carry a NASA lunar probe experiment. The missile lofted the payload on a trajectory past the moon and into orbit around the sun—the first U. S. solar satellite. Radio contact with the vehicle continued to a record distance of 406,620 miles from the earth.

16 Jul 59 (U) The firing of JUNO II Vehicle 16 from AMR at 1237 hours EST failed five seconds after launch. A malfunction developed in the electrical network at liftoff and disorder caused the vehicle's gimballed engine to be thrown into a full deflection, which, in turn, caused the vehicle to turn over.

14 Aug 59 (U) JUNO II Vehicle AM-19B was launched from AMR at 1931 hours EST. All stages fired but the primary mission of placing a 25.5 pound payload carrying a 12-foot diameter NACA-developed inflatable sphere was not successful. The purpose of this payload was to establish the density characteristics of the sphere's orbital behavior and to obtain information relative to the flight-path phenomena observed in other satellites. This failure was due to disturbances causing the cluster to fire in an incorrect direction.

13 Oct 59 (U) JUNO II Vehicle AM-19A, damaged by explosion of JUPITER Missile 23 on 16 September 1959, successfully placed a 91.5 pound satellite (EXPLORER VII) in orbit. The vehicle rose from AMR at 1031 hours EST. The vehicle continues to circle the earth sending back radiation and weather information.

23 Mar 60 (U) JUNO II Vehicle AM-19C was fired from AMR at 0835 hours EST. The first stage was normal, but the satellite was not placed in orbit.

3 Nov 60 (U) JUNO II Vehicle AM-19D was fired from AMR. The primary mission of placing into orbit the 90-pound Ionosphere Direct Measurement Satellite (S-30), EXPLORER VIII, was a success. The missile and booster were successes.

24 Feb 61 (U) JUNO II Vehicle AM-19F was fired from AMR. The primary mission of placing the Ionsphere Satellite (S-45) into orbit was not accomplished. The payload and fourth stage which were secured to the third stage cluster by shear pins prematurely separated from the vehicle 4.5 seconds after shroud separation.

27 Apr 61 (U) JUNO II Vehicle AM-19E was fired from AMR. The primary mission was to use Gamma Ray Telescope (S-15) in placing EXPLORER XI into orbit. The vehicle tumbled end-over-end 10 times a minute.

24 May 61 (U) JUNO II Vehicle AM-19G, the 10th and last to be fired, was launched from AMR. The vehicle, carrying an Ionosphere beacon set as payload, was not a success.

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