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HISTORY OF THE FIELD ARMY BALLISTIC MISSILE DEFENSE SYSTEM PROJECT 1959-1962

U S ARMY MISSILE COMMAND
REDSTONE ARSENAL, ALABAMA

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HISTORY

OF THE

FIELD ARMY BALLISTIC MISSILE DEFENSE SYSTEM PROJECT,

1959 — 1962

S E C U R I T Y

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FIELD ARMY BALLISTIC MISSILE DEFENSE SYSTEM

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1959 — 1962

John W. Bullard

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2 December 1963

Historical Monograph
Project Number: AMC 4 M

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(U) PREFACE (U)

This monograph presents the history of the Field Army Ballistic Missile Defense System (FABMDS) Project from its commencement in 1959 through the rejection of the proposed program in 1962. It is one of the monographs in the Missile Command Series, and the second historical study of the Army's attempts to develop an antimissile missile defense system. The Headquarters, United States Army Materiel Command directed preparation of the monograph in a letter to the Commanding General, United States Army Missile Command, subject: "Army Historical Program for FY 1964," dated 21 January 1963.

No attempt has been made, in this history, to provide the reader with a background of the development of the modern guided missile and the resultant need of an antimissile missile defense system. Should the reader desire further information in this area, he is encouraged to read "History of the Plato Antimissile Missile System, 1952 - 1960," (United States Army Rocket and Guided Missile Agency), June 1961.

The FABMDS story began as the Ordnance Corps was in the process of closing out the Plato antimissile missile project. The FABMDS represented the efforts of the Ordnance Corps to take a new approach in providing a field army with an antimissile missile defense system. The story progresses through development of the system requirements, performance and evaluation of the feasibility studies, formulation of a technical development plan, and rejection of the proposed component development plan by the Secretary of the Army.

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Unless otherwise noted, all documents cited as sources are located in the files of the Army Air Defense System, 1970's (AADS-70's) Office, Future Missile Systems Division, Directorate of Research and Development, United States Army Missile Command.

2 December 1963 John W. Bullard

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CHAPTER I

ORIGIN OF THE FABMDS PROGRAM (U)

(U) Early in 1959, reliable intelligence reports indicated that the Soviet Union possessed a significant short- and long-range ballistic missile and rocket capability which could be employed against a field army. There was no reason to doubt that this capability would become increasingly extensive in the course of the next decade. Thus, in 1959, technological developments that had been conjectured in 1946 had become a reality.[1] The need for a field army ballistic missile defense system (FABMDS) was made more urgent by the fact that on 6 February 1959 the Ordnance Corps' first effort to develop an antimissile missile defense system for a field army, embodied in the Plato project, was ordered terminated by the Chief of Ordnance, acting on direction from the Department of the Army Staff.[2] In consequence, a field army in 1959 was in no better position defensively than it was in May 1946 when the War Department Equipment Board had first recognized the need for an antimissile defense system.[3]

Aware of the seriousness of the situation, the Chief of Research and Development offered the Ordnance Corps a new program in this field. He suggested that the Ordnance Corps conduct a study of a possible antimissile potential in the proposed Second Generation HAWK system. He also recommended that a separate study be made to determine

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[1] For an analysis of these post-World War II developments, see Mary T. Cagle and Ruth Jarrell, "History of the Plato Antimissile Missile System, 1952 - 1960," ARGMA, 23 Jun 61, pp. 24 - 34.

[2] Ibid., p. 101.

[3] Ibid., pp. 24 - 28.

[redacted]

the requirements of a FABMDS. The Chief of Research and Development proposed a FABMDS which would be designed to counter the anticipated ballistic missile threat during the years 1965 - 75.[4]

([redacted]) The HAWK, being developed by the Raytheon Company, had been designed as an antiaircraft weapons system. In its report of 15 December 1958 (Raytheon Report BR-724), the Raytheon Company included a description of an antimissile potential in the Second Generation HAWK. The Company conceived a Second Generation HAWK able to counter both the aircraft threat and the ballistic missile threat up to the intermediate range ballistic missile (IRBM) without weakening the system's capabilities in either role. A fully mobile Second Generation HAWK system thus could provide a field army with defense from the ballistic and air-supported missile threat.[5]

([redacted]) Notifying the Army Ordnance Missile Command of the proposals made by the Chief of Research and Development, the Office of the Chief of Ordnance asked the Command to furnish information on which to base a reply. The Chief of Ordnance, in an interim reply, informed the Chief of Research and Development that the Second Generation HAWK was being studied to determine the merits of any inherent antimissile capability in the system.

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[4]DF, CRD to CofOrd, 13 Apr 59, sub: Anti-Ballistic Missile Defense System for the Field Army, Study Effort, filed in Initial FABMDS In House Study (CY60).

[5](1) Working papers, AOMC to OCO, 14 Apr 60, sub: Presentation on ARGMA Evaluation of the New Raytheon Concept for FA-AM System, Second Generation HAWK—FABMDS (CY60). (2) DF, CRD to CofOrd, 13 Apr 59, sub: Anti-Ballistic Missile Defense System for the Field Army, Study Effort, filed in Initial FABMDS In House Study (CY60).

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(U) Cautioning that any findings emanating from the study on the Second Generation HAWK would have to be carefully evaluated before directing any action, the Chief of Ordnance reminded the Chief of Research and Development that first emphasis in a Second Generation HAWK program should be placed on critical component development in order to establish technical feasibility of the proposed system. Thus, approval for production of the system could be obtained from the Department of Defense Special Assistant for Guided Missiles. Once this action had been secured, the Ordnance Corps would be in a better position to evaluate and to design the capabilities of the Second Generation HAWK to counter the anticipated ballistic missile threat during the decade, 1965 - 75.

(U) As for the proposed FABMDS study, the Chief of Ordnance wanted to have at least six industrial firms study the problems and make proposals for an air defense system. The Chief of Research and Development had proposed that the two studies be performed with Fiscal Year 1959 funds, but the Chief of Ordnance considered the shortage of such funds and the lack of time in which to deobligate funds as impediments which would prevent the use of Fiscal Year 1959 funds to support the studies. Therefore, the Chief of Ordnance proposed that funds for a FABMDS study be included in the Fiscal Year 1960 budget. He estimated that $750,000 would be required for the feasibility studies. He did point out that Fiscal Year 1959 funds could be used for the Army "in house" efforts on the studies and preliminary work on the letting of contracts.[6] The

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[6] Ltr, CofOrd to CRD, 11 May 59, sub: Anti-Ballistic Missile Defense System for the Field Army, Study Effort, Initial FABMDS In House Study (CY60).

[redacted]

Chief of Ordnance also recommended that ". . . the development of an antimissile defense system for the Field Army not be initiated unless adequate funding by the Army is assured on a long term basis. The Army should not expose itself to another funding fiasco such as was experienced in the Plato project with attendent [sic] embarrassment with industry."[7]

(6) Meanwhile, the Army Ordnance Missile Command had referred the Chief of Research and Development's proposals to the Army Rocket and Guided Missile Agency for reply. Instructions to the Commander of the Agency stipulated that the Command did not want the results of the study of the antimissile missile capability of the Second Generation HAWK to compromise the antiaircraft capability of the system. The Command also insisted that in preparing estimates of the cost of the proposed FABMDS study, it was ". . . imperative to point out that feasibility studies should only be undertaken if a strong assurance is given that funds can be made available to adequately support an orderly development program in ensuing years."[8]

(U) The proposal of the Chief of Research and Development for a FABMDS study did not receive an enthusiastic reception in the Research and Development Division of the Army Rocket and Guided Missile Agency. In his proposed answer, drafted on 12 May 1959, the Chief of the Antimissile Missile Office said:

(U) Study of the possible capabilities of Second Generation HAWK seems a common sense approach, and it is recommended that this be done. The beginning of a completely new study on a Field Army Ballistic Missile

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[7] Ibid.

[8] Ltr, CofS, AOMC, to Cdr, ARGMA, 18 May 59, sub: Same.

Defense System seems, however, to be wasteful, and unnecessary. The PLATO Program, which was directed at this threat, was cancelled for lack of funds rather than for any known technical deficiency. It would seem then, that our proper course of action would be redirection of the PLATO Program toward the more advanced threat to be expected in the 1965 - 1975 time frame. This could be accomplished, we feel, with very low level funding in FY 1960 applied toward study of necessary changes to the system to meet the more advanced threat. Since PLATO was several years down the road of development at the time of cancellation, this course of action should be most economical to us from the standpoint of time, funding, and utilization of existing development hardware.[9]

[redacted] Regardless of lingering sentiment in the Research and Development Division of the Army Rocket and Guided Missile Agency for reactivation of the defunct Plato program, the Army Ordnance Missile Command recommended to the Chief of Ordnance that a new study be made of the requirements of a field army for a ballistic missile defense system which would provide adequate protection from hostile missiles. The Command considered that both the active and passive defensive measures available to a field army were completely inadequate to provide a defense which would enable it to continue operations if subjected to a missile attack.[10]

[redacted] A new study was also desirable inasmuch as the factors influencing development of an antimissile defense system had changed since the Plato program had been originated in 1952. These factors included ". . . changes in deployment of tactical units and logistical elements, in tactical doctrine of hostile forces, in operating characteristics of hostile missiles, in capability of the technology for

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[9] DF, Chf, AMM Ofc, R&DD, ARGMA, to Chf, R&DD, ARGMA, 12 May 59, sub: Suggested Answer to OCO Teletype of 8 May 1959, Initial FABMDS In House Study (CY60).

[10] TT ORDXR-R-24, CG, AOMC, to CofOrd, 11 Jun 59, Initial FABMDS In House Study (CY60).

defense particularly in quickened response times, fire coordination, kill mechanisms, and other significant respects."[11] An up-to-date study, in the Command's viewpoint, would provide the Army with a more realistic recognition of a field army's needs.

(U) The Army Ordnance Missile Command recommended that recognition of the current needs of a field army be obtained through re-evaluation of the ballistic missile and rocket threat and determination of the profitable targets within a field army as well as the extent of its present air defense systems. By these approaches, the Command sought to define the current threat to a field army, and, by predicting the threat through 1975, to isolate its needs for air defense.

(U) Such an approach, the Command held, would provide guidelines for developing a balanced family of defense systems which would allow for growth potential. Thus, the systems would not be threatened with early obsolescence. The Command also believed that developing a balanced family of defensive systems would provide more coordination in their use against the entire threat and result in greater performance and economy. The Command cautioned against beginning a development program on the FABMDS unless there was assurance that the funds in the ensuing years would insure its orderly continuance.

[redacted] The Army Ordnance Missile Command offered to conduct and coordinate the study to establish new military characteristics for the antimissile missile defense needs of a field army. It asked that the Assistant Chief of Staff for Intelligence, the Continental Army Command, the Ballistic Research Laboratories, the Diamond Ordnance Fuze Laboratories,

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[11] Ibid.

the Picatinny Arsenal, and others participate in the program. It estimated that the cost of the study would be approximately $325,000.[12]

Establishment of the FABMDS Program

[redacted] On 17 September 1959, the Chief of Ordnance notified the Army Ordnance Missile Command that the Office of the Chief of Research and Development had recommended that the FABMDS be included in the Fiscal Year 1960 budget, obtaining the funds for such a program by reducing the budgeted allotment for the Second Generation HAWK research and development program. That Office had also directed that industrial firms be invited to make feasibility studies of the FABMDS, from which the Department of the Army was to choose the two most promising. These two and an updated version of the study by the Raytheon Company were to be developed through the refinement of system design at a total cost of $1,750,000. At that point, the best system was to be selected for development, and plans envisioned that the latter would begin in late Fiscal Year 1960 or early Fiscal Year 1961. The status of the Second Generation HAWK program in Fiscal Year 1960 was necessarily clouded with uncertainty -- especially as to whether the reduced budgeted funds would be used to continue the critical component development program.[13]

Army Ordnance Missile Command Proposals

[redacted] When the Command learned of the actions of the Office of the Chief of Research and Development in scheduling the FABMDS program in the Fiscal Year 1960 budget and directing that the feasibility studies

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[12] Ibid.

[13] TT DE OCO 005, CofOrd to CG, AOMC, 17 Sep 59, Initial FABMDS In House Study (CY60).

be begun, concern developed within the Command. The Department of the Army appeared to be beginning another antimissile missile program without a realistic concept of the threat.

[redacted] The Command warned the Chief of Ordnance, on 16 November 1959, that such an approach was fallacious. From the Command's viewpoint, the feasibility studies should be begun only when ". . . specifics of the threat to be countered and operational characteristics of the material required have been approved by the DA."[14] The Command also pointed out that deciding which FABMDS proposal to develop should be made only when the results of the Second Generation HAWK critical component development program became available and full consideration had been given to all other existing Army programs which could contribute to the defense of a field army. This would present a truer appraisal of the FABMDS requirements. Therefore, the Command advocated determining objectives of the FABMDS before asking industry to make proposals. The Command informed the Chief of Ordnance that it had undertaken a project to determine these objectives, and that the results of this project should be available for his review by 1 March 1960.[15]

[redacted] Reporting on the status of the critical component development program of the Second Generation HAWK, the Army Ordnance Missile Command informed the Chief of Ordnance that in Fiscal Year 1960 the program would require $5,885,000 after January 1960 to complete the basic design and/or development. The total funding of the program under contract as of November 1959 was $4,984,000. An immediate termination

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[14] TT ORDXR-R-40, CG, AOMC, to CofOrd, 16 Nov 59, Initial FABMDS In House Study (CY60).

[15] Ibid.

of the project would cost $3,227,000. In light of this, the Command recommended that the program be terminated immediately and the savings reserved for the FABMDS program.[16]

Program Guidance Issued

(C) Nine days later, the Army Ordnance Missile Command received guidance instructions, as approved by the Secretary of the Army, on the re-oriented Second Generation HAWK program and the FABMDS program. The Second Generation HAWK program was to contribute to a FABMDS through its capability of defending against an all-altitude, air-supported threat. Under these instructions, the Second Generation HAWK critical components development program, originally funded at $10,611,000 in Fiscal Year 1960 was reduced to $3.3 million, the program to cease upon exhaustion of the allotted funds. The $7,311,000 obtained by the reduction was to be used for the FABMDS.[17]

(C) The guidance instructions further directed that two new feasibility studies were to be initiated at a cost of $750,000 each, while the Raytheon Company's concept of an antimissile missile capability for the Second Generation HAWK was to be updated at a cost of $250,000. This part of the program, totaling $1,750,000, would be supported with Fiscal Year 1960 funds as had been proposed in September by the Office of the Chief of Research and Development. These studies were to consider the design of a FABMDS that would provide an antimissile missile capability against missiles with ranges up to 1,100 nautical miles as

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16 Ibid.

17 TT DE OCO 011, CofOrd to CG, AOMC, 25 Nov 59, Second Generation HAWK--FABMDS (CY60).

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well as against the air-supported threat. "Emphasis will be placed upon simplicity, maximum mobility, and flexibility," the instructions directed.[18] These guidance instructions provided further that development of the system, selected on the basis of technical evaluation of these studies, would be funded with the remainder of the Fiscal Year 1960 funds, that is, $5,561,000. The necessary funds for continuation of the development phase in the following fiscal year were to be programmed under the line item Field Army Ballistic Missile Defense System.

[redacted] When the FABMDS development phase was initiated, the program was to be funded so as to provide the field armies with the system at the earliest possible date. Although it appeared that the Ordnance Corps was being assured of an adequate and orderly funding program to insure systematic development of the FABMDS, higher authority made the reservation that the funding program was subject to annual review in line with the funds which were to be available to the Department of the Army for research and development purposes.[19]

Program Initiation Directed

[redacted] The Chief of Research and Development directed the Chief of Ordnance to invite interested industries to make proposals for the FABMDS feasibility studies at the earliest possible date but to negotiate no contract without further advice from his Office.[20] In response to queries raised by the Chief of Research and Development

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18 Ibid.

19 Ibid.

20 Ibid.

as to the time factors involved, the Army Ordnance Missile Command reported that the evaluation of industry proposals could be completed within 3 months after interested industries were asked to submit them. The two feasibility study contracts could be awarded one month after approval of the selected contractors by the Chief of Research and Development. Completion and evaluation of the two feasibility studies and the updated Raytheon study could be accomplished within 10 months after the contracts were let.

The Command Reiterates Its Position

Reiterating its position, the Army Ordnance Missile Command referred to the policy of immediately inviting proposals from industry as being illogical. The Command restated its position that the invitations to industry should not be released until the Command had completed its study to determine the objectives of a FABMDS. By giving the contractors the Qualitative Materiel Requirements, dated 9 November 1959,[21] and the results of the Command's FABMDS study when it became available about 1 March 1960, the contractors would have common

[21] The qualitative materiel requirements (QMR) evolved from a study process. The Continental Army Command, in its continuing study of how the Army should fight in the future, set the tactical objectives of weapon systems. The Ordnance Corps, in its continuing study of ordnance materials and production techniques, responded with technical forecasts of feasibility and determined whether all or part of any of the tactical objective could be met. From this cross fertilization, the Continental Army Command produced a qualitative materiel requirement which reduced to words the Army's future need for a piece of materiel that was within the future technical capabilities of American industry. Final approval of the QMR was made by a Materiel Requirements Review Committee appointed by the Chief of Staff, U. S. Army.

requirements for their approach, and the Command would be in a better position to evaluate their feasibility studies. Considering that completion and evaluation of the feasibility studies would require approximately 10 months, and allowing no more than 30 days for the Office of the Chief of Research and Development to approve the contractors, the Command estimated that the results of the feasibility studies should be available for review by higher authority on 1 February 1961.

[redacted] The Command held firm to the position that it had taken on the Second Generation HAWK on 16 November 1959.[22] It considered that the only part of the critical components development program of the Second Generation HAWK which might contribute to the development of a FABMDS was the continuous wave illuminator. Approximately $2 million would be required for the completion of the design and demonstration of a breadboard model. Doubting that the Second Generation HAWK would meet the requirements of a FABMDS, the Command believed that the Army would realize more in achieving a successful FABMDS by using the $3.3 million Fiscal Year 1960 Second Generation HAWK funds to conduct studies in areas that were critical in the development of a FABMDS. These areas were: (1) determining the target characteristics, (2) establishing warhead effectiveness, (3) improving radar detection and discrimination techniques, and (4) investigating the applicability of new seeker techniques for terminal guidance in a FABMDS. The Command also believed that the study being conducted to determine the objectives

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[22] TT ORDXR-R-40, CG, AOMC, to CofOrd, 16 Nov 59, Initial FABMDS In House Study (CY60).

of a FABMDS might result in definition of other critical areas requiring research. It emphasized the need for a supporting research program in these areas. Such a program, the Command pointed out, might require funds from the $5,561,000 Fiscal Year 1960 funds being held in reserve for the FABMDS program by the Bureau of the Budget.[23]

Termination of the Critical Component Program

[redacted]) The Office of the Chief of Research and Development approved the Command's recommendations on the critical component program of the Second Generation HAWK by directing termination of the program by 1 January 1960. All work was to cease with the exception of that being done on the elevated platform and essential associated equipment. This work was to be directed toward extending over-the-horizon radar detection for air defense weapons systems and fire coordination. The existing level of work was to be maintained on that part of the program and funds in the amount of $940,000 were authorized. The Office of the Chief of Research and Development requested the Chief of Ordnance to inform it of the amount of funds which were de-obligated as a result of this action.[24]

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[23] TT ORDXR-REB-29, CG, AOMC, to CofOrd, 21 Dec 59, Second Generation HAWK--FABMDS (CY60).

[24] TT OCO 001, CofOrd to CG, AOMC, 31 Dec 59, Hist Div files.

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CHAPTER II

([redacted]) DEPARTMENT OF THE ARMY STAFF REVIEW OF THE FABMDS PROGRAM (U)

(U) Reporting on the status of the FABMDS program to the Chief of Research and Development on 9 March 1960, the Chief of Ordnance indicated his intention to contract for two feasibility studies, but he pointed out that the technical requirements to be given to the contractors would be based on incomplete and unapproved military characteristics. Moreover, he entertained some doubts about the manner of selecting the industrial firms to undertake the two feasibility studies. At that time, there were some 40 companies to be considered as possible contractors, and the Chief of Ordnance feared that the Department of the Army might be subjected to both embarrassment and censure of its procurement practices if only certain firms were asked to participate in the FABMDS program.

([redacted]) If the Chief of Ordnance was not yet prepared to contract for the feasibility studies, he reported that he was ready to present to the Department of the Army Staff by 14 April 1960 an evaluation of the Raytheon Company's proposal on modifying the Second Generation HAWK for a FABMDS.[1] He requested the Army Ordnance Missile Command to prepare such an evaluation and, in accordance with direction from the Office of the Chief of Research and Development, to conduct a feasibility study for a FABMDS, commencing as quickly as possible.

(U) As the Army Rocket and Guided Missile Agency had been most directly involved in the FABMDS transactions, it prepared the report of

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[1] DF, CofOrd to CRD, 9 Mar 60, sub: Evaluation of the Raytheon Co Proposal for FABMDS, Second Generation HAWK—FABMDS (CY60).

the evaluation of the Raytheon proposal for presentation to the Department of the Army Staff. The Agency made its presentation to the Chief of Ordnance on 12 April 1960. After receiving his approval, it then presented its findings and the Ordnance Corps' recommended FABMDS program to the Chief of Research and Development on 14 April and the Vice Chief of Staff on 20 April 1960.[2]

(U) Following instructions from the Army Ordnance Missile Command, the Agency included data from a 3-month, "in-house," definitive study, which it had made in determining the objectives for a FABMDS and in establishing the technical requirements.[3] This study had also provided information which the Agency used in formulating its recommended FABMDS program. The Agency justified including this data in its report on the premise that, while its primary responsibility had been to evaluate the Raytheon proposal, an evaluation did require a comparison. Therefore, the proper comparison for Raytheon's proposal could best be made using the tentative technical requirements from the definitive study as the determinants. On the basis of this logic, the Agency divided the presentation into four parts: First, it presented data from the definitive study; second, it detailed the tentative technical requirements; third, it presented its evaluation of the proposed Second Generation HAWK; and fourth, it presented the Ordnance Corps' recommended FABMDS program.

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[2]DF, CofS, R&DD, ARGMA, to CG, AOMC, 30 Mar 60, sub: Fact Sheet—FABMDS, Hist Div files.

[3]Essentially, the technical requirements are a more detailed, technical restatement of the qualitative materiel requirements prepared by the developing agency as guidelines for direction of the research and development effort.

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The FABMDS Definitive Study

(S) Having chosen, as the purpose of its "in-house" study, to define a field army environment during the 1960's, the Army Rocket and Guided Missile Agency had realized that no complete definition of the potential air-delivered threat had ever been made. The magnitude of defining the threat was such that the Agency had called upon other Army technical and support agencies for help.[4]

(S) Recognizing that there would be complex problems in predicting the air-delivered threat to a field army during the decade of the 1960's, the study group had chosen to make only estimates of the extent of the threat for the 1960 - 65 period, which it had based on current intelligence and an evaluation of the state-of-the-art. The group had attempted to predict the extent of the threat in the 1965 - 70 period by forecasting the state-of-the-art for that time frame. However, experience with rapid technological advances, during the past one and one-half decades, had made the group cautious in making any dogmatic statements as to the state-of-the-art and doctrine in the use of these weapons systems during the study period. They had chosen to base their predictions on an evaluation of the trends in the developing state-of-the-art. The results of the "in-house" study had reflected the technical aspects of the threat with no attempt being made to define the operational aspects.[5]

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[4]For more detailed information, see "Field Army Ballistic Missile Defense Study," AOMC, 11 Mar 60.

[5](1) Presentation, AOMC to OCO, 12 Apr 60, Second Generation HAWK—FABMDS (CY60). (2) DF, CofS, R&DD, ARGMA, to CG, AOMC, 30 Mar 60, sub: Fact Sheet—FABMDS, Hist Div files.

The Study Approach

[redacted]) In undertaking this study, the group had attempted to (1) define the threat, (2) identify the friendly targets within a field army complex, (3) determine the antimissile missile capability of existing air defense systems, (4) determine requirements for mobility, countermeasures, and kill mechanisms, (5) evaluate the state-of-the-art, (6) determine the system requirements, and (7) prepare technical requirements.[6]

Supporting Data

[redacted]) Supporting data that had been used in the study included the qualitative materiel requirements (distributed in the fall of 1959 by the Continental Army Command); reports on the Second Generation HAWK; documents of the Plato antimissile missile program; and the MOMAR I (Modern Mobile Army) Report. The Second Generation HAWK reports were statements of the work which the Raytheon Company had been performing to enhance the antimissile missile capabilities of the HAWK. The Plato program documents described the work which the Army had performed in an attempt to develop the Plato antimissile missile. The MOMAR I Report outlined the projected plans and policies of a field army during the years 1965 - 70.[7]

Conclusions and Recommendations

[redacted]) The study group had concluded that no attempt should be made to develop a single, mobile air defense system for a field army as

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[6]Presentation, AOMC to OCO, 12 Apr 60, Second Generation HAWK—FABMDS (CY60).

[7]Ibid.

there were systems, either being developed or proposed, that would have provided an adequate defense against the aircraft and satellite threats. Thus, the ballistic missile threat was the remaining area for which no defense capability existed, and therefore, the study group had recommended that a FABMDS be developed to counter the ballistic missile threat.

([redacted]) Continuing with recommendations, the group had concluded that further studies should be performed, concurrently with the FABMDS feasibility studies, to determine the potential of the FABMDS against the shorter-range ballistic missiles. While the group had held that the main effort of the FABMDS program should be directed toward developing a system to counter the IRBM threat, it had also recommended that studies be made of the FABMDS potential against the longer-range ballistic missiles and against all air-supported targets.

([redacted]) Problems in the development of an antimissile missile system with "over-the-horizon" interception capability had been considered to be so difficult of solution, that the study group had thought that this capability should not be considered as one of the principal criteria in determining whether to develop the FABMDS. Instead, it had recommended that this problem be made the subject of a separate study.[8]

Technical Requirements

([redacted]) On the basis of the "in-house" study that the Army Rocket and Guided Missile Agency had conducted, the study group had developed the

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[8] "Field Army Ballistic Missile Defense Study," AOMC, 11 Mar 60, Sec V, pp. 27 - 29.

technical requirements for a FABMDS. It had assumed that a field army would require a defense system to counter an air-delivered threat during the years 1965 to 1975. That threat, it had anticipated, could consist of ballistic missiles having ranges from 70 to 2,000 kilometers, velocities from 3,000 to 12,500 feet per second, and radar cross sections from .01 to .001 square meters. Air-supported missiles and aircraft would also have contributed to the threat. A defense system would therefore have required (1) a kill probability of .96 using no more than two missiles for any one engagement, (2) a simultaneous engagement capability of a minimum of four targets, (3) defense of an area of 100 to 10,000 square miles, (4) weapon availability of 24 hours a day, (5) full mobility (self-propelled vehicle capable of 75 miles per day on improved roads), (6) air transportability, (7) an emplacement time of 30 minutes and a march order time of 15 minutes (maximum for each), and (8) a 360° field of fire.[9]

Evaluation of the Raytheon Proposal

(U) In preparing the presentation to be made to the Department of the Army Staff, the Army Rocket and Guided Missile Agency evaluated the Raytheon Company's proposal on the basis of information received in the Raytheon report BR-724 and in eight memoranda from the Company, dated 28 and 29 March 1960. A team of Raytheon representatives explained the contents of the memoranda to Agency personnel, in detail, on

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[9] (1) Presentation, AOMC to OCO, 12 Apr 60, Second Generation HAWK—FABMDS (CY60). (2) Working Papers, 20 Oct 60, sub: FABMDS Briefing, Presentation Background Information.

30 March 1960. The Agency compared the data in the report and memoranda with the technical requirements developed in its "in-house" study.

(S) Limitations in the amount of technical information available prevented the Agency from providing the Department of the Army Staff with a decisive analysis of all aspects of the Raytheon proposal. However, the Agency did emphasize the most obvious areas in which the Second Generation HAWK failed to meet the technical requirements for a FABMDS. The Agency pointed out that in decoy discrimination the proposal of the Raytheon Company had assumed that the nose cone was always the fastest object. This was not always so. The kill probability had been calculated to be as low as 0.45. There had been no determination made as to whether more than one defensive missile could be used in any one engagement. The computer relationship to the second ballistic missile acquisition radar had not been adequately covered. The defended area had not been adequately defined as it varied with target warhead weight and velocity, with system reaction time, and with impact point. The hyper-velocity fragmentation warhead had not been proven against a nuclear warhead. The system weight exceeded the load limit of the M-113[10] vehicle. Coverage of the launching and handling equipment was inadequate so that no reasonable analysis could be made. The system lacked full mobility, and it appeared unlikely that the proposed system would be capable of fording streams. Chemical, radiological,

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[10] The M-113 vehicle is a full-tracked armored personnel carrier developed by the Ordnance Tank-Automotive Command.

and bacteriological protection for the operating personnel had not been covered. Manning requirements had not been included. It appeared that the system's effectiveness could be seriously downgraded by the expected jamming[11] environment.[12]

The Recommended Program

[redacted] While the Raytheon proposal had failed to meet the requirements, the presentation pointed out that no other proposal had met the requirements either. The Army Ordnance Missile Command proposed the performance of a technical feasibility and evaluation study program to be used in conjunction with operational and tactical studies in the areas of nuclear and limited war that were either under way or being planned by the Operations Research Office, the Stanford Research Institute, and the Assistant Chief of Staff for Intelligence. The Command held that the Ordnance Corps should be as certain as possible of all the factors involved in providing the air defense needs of a field army before recommending development of a FABMDS.

[redacted] The Command recommended a three-part program: (1) modification of existing air defense systems, (2) supporting research programs, and (3) contractor feasibility studies. To meet the first part of this program, it recommended modification of the existing HAWK, Hercules, and Mauler systems to provide protection for a field army against the shorter-range missiles during the interim until a FABMDS

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[11] Jamming results from the intentional transmission of radio frequency energy in such a way as to interfere with the reception of signals by another station.

[12] Presentation, AOMC to OCO, 12 Apr 60, Second Generation HAWK--FABMDS (CY60).

could be developed and deployed. The Command proposed a supporting research program in order to seek solutions in areas of major technological problems in the development of an effective FABMDS. The feasibility study program, which the Command recommended, would require approximately 15 months and $1,750,000. A solicitation of industry for FABMDS proposals and the evaluation of these proposals would require 4 months. Of these proposals, the five best were to be chosen for 9-month feasibility studies. The five contractors were to be given contracts in the amount of $250,000 each to conduct the feasibility studies. One of the contractors would be the Raytheon Company. Upon completion of the studies, the Command proposed to make a 2-month evaluation study in order to be in a position to decide whether to recommend development of the FABMDS.

(U) In recommending that five feasibility study contractors be chosen rather than two as originally proposed by the Chief of Research and Development, the Army Ordnance Missile Command was cognizant of the fact that some 47 industrial firms had been working for over a year on the antimissile problem. As these firms were participating in the Qualitative Development Requirements Information program at the Army Rocket and Guided Missile Agency, the Command feared that Army development of any one of these firm's proposals, at that time, would discourage these firms from further participation. The Command also considered it more advantageous to the Army to review each of these

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contractors' proposals before beginning development of any one FABMDS proposal. The resultant choice, it reasoned, would insure the Army the best defense system possible.[13]

(U) The Office of the Chief of Ordnance approved on 22 April 1960 the FABMDS program recommended by the Army Ordnance Missile Command.[14]

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[13] Ibid.

[14] "FABMDS Project Management Master Plan," 1 Aug 62.

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CHAPTER III

(U) PROGRAM MANAGEMENT (U)

The Managers

(U) As system manager of the FABMDS program, the Army Ordnance Missile Command redelegated part of its responsibilities to the Army Rocket and Guided Missile Agency, which became the commodity manager of the program. As commodity manager, the Agency had several responsibilities. These included (1) determining the system technical requirements, (2) establishing and supervising the program schedules, (3) determining the budgetary requirements, (4) assigning the specific roles of all participating military agencies, (5) providing for government-furnished equipment and other support, (6) resolving technical and non-technical problems as they arose, (7) supervising the development effort by constant over-all and specific supervision to insure that decisions were rendered that would best meet the technical requirements, and (8) defining problem areas requiring further research and insuring that such research was properly placed for execution. All of the Agency's actions, in its role as commodity manager, were subject to review by the Command as system manager.[1]

(U) While the Army Ordnance Missile Command and the Army Rocket and Guided Missile Agency had been awaiting formal approval of their recommended FABMDS program, they had devised a management system for the impending program. The management plan which resulted assured Army-wide participation in the FABMDS program.

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[1]Working papers, sub: Roles of Army Technical Agencies in the FABMDS R&D Program, FABMDS Support Plan (CY60).

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Ordnance Participants

(U) The Chief of Ordnance had long endorsed a policy of arsenal utilization and support in planning new programs. In view of the impending FABMDS program, he reiterated his views, on 6 April 1960, to Major General August Schomburg, then Commanding General, Army Ordnance Missile Command.[2] In furthering this policy, General Schomburg directed all elements of the Command, when planning new programs, to invite other Ordnance Installations to participate in the planning functions, as they would be helping to plan their future roles in the program. As plans developed, they were to be submitted to the Command Headquarters for review and approval before feasibility studies were begun. General Schomburg specifically mentioned that he expected the Commander, Army Rocket and Guided Missile Agency to submit such plans on the FABMDS for approval.[3]

(U) In connection with participation in the FABMDS program by other Ordnance Corps commands and activities, the Army Rocket and Guided Missile Agency conducted meetings at Redstone Arsenal on 6 and 12 May 1960. Representatives from the Ordnance Tank-Automotive Command, the Ordnance Special Weapons and Ammunition Command, the Ordnance Weapons Command, the Aberdeen Proving Ground, the Diamond Ordnance Fuze Laboratories, and the Frankford Arsenal attended. They discussed the projected FABMDS program, the technical requirements, the military characteristics, and the procurement packages furnished the Ordnance Districts for potential bidders.

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[2] Ltr, CofOrd to CG, AOMC, 6 Apr 60, FABMDS Support Plan (CY60).

[3] Ltr, CG, AOMC, to Cdr, ARGMA, 26 Apr 60, sub: Use of Other Ord Commodity Commands, Arsenals, Installations and Activities, filed in FABMDS Support Plan (CY60).

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(U) Representatives of the Frankford Arsenal, the Ordnance Special Weapons and Ammunition Command, the Ordnance Weapons Command, and the Diamond Ordnance Fuze Laboratories recommended that the Ordnance Corps undertake an "In-Ordnance" feasibility study on the FABMDS. After discussing the proposal, however, the group concluded that, while the Ordnance Corps probably possessed greater knowledge than industry of the problems involved in developing a FABMDS, the undertaking of such an extensive study would seriously hamper other Ordnance Corps programs. Moreover, representatives of the Army Rocket and Guided Missile Agency seriously doubted that higher authority would approve an Ordnance Corps feasibility study. At any rate, each organization agreed to send representatives to Redstone Arsenal to participate in evaluating the proposals and feasibility studies to be submitted by the contractors.[4]

Other Technical Services

(U) In providing for Army-wide participation in the FABMDS program, the Agency had also sent copies of the technical requirements to other Technical Services, that is, the Quartermaster Corps, the Signal Corps, the Transportation Corps, and the Corps of Engineers. All were asked to submit comments and suggestions concerning their possible participation in the program.

Support Plan

(U) The Agency submitted the tentative support plan to the commanders of the Ordnance commands and agencies and to the Technical Services at a meeting at Redstone Arsenal on 17 August 1960. The Agency asked each of the participants to review the assigned supporting roles, the approximate

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[4]DF, MFR, R&DD, ARGMA, 26 May 60, sub: Use of Other Ord Agencies in the FABMDS Program, FABMDS Support Plan (CY60).

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funds required, and also asked that each comment on the plan.

(U) Following the presentation of the tentative plan for Army-wide participation in the FABMDS program, six of the participating organizations responded with written comments. Generally, the comments were favorable. However, there was some dissatisfaction with the assigned roles and the methods of funding. As a result, the Command directed the Army Rocket and Guided Missile Agency to meet with representatives of the various participants to resolve any differences.

(U) The Agency prepared a revised plan for Army technical agency participation and, after obtaining General Schomburg's approval, presented it to representatives of the participating organizations on 5 December 1960. The revised support plan listed phases of the FABMDS program,[5] the roles of the participants, definition of these roles, and elements of a FABMDS and program phases in which technical support was desired.[6]

Roles and Responsibilities of Participants

(U) The other military agencies participating in the FABMDS program were to perform one (or more) of four roles. They would act as either a consultant or evaluator, a technical monitor, a technical supervisor, or as a component or sub-system developer.

(U) As a consultant or evaluator, the agency occupying this position had to have a technical capability that was needed to form a technical decision on a specific problem facing the commodity manager. Assuming that agency to be the source of the best technical knowledge

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[5]See Chart 1, p. 28.

[6]See Chart 5, p. 62.

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Chart 1

PHASES OF THE FABMDS PROGRAM

I.	Development of System Technical Requirements (Revision I)	Nov 59—Mar 60
II.	Review and Approval of Recommended Program	May 60
III.	Proposals for Feasibility Studies	3 May—5 Jul 60
IV.	Formulation of Research and Analysis Projects	Feb 60—Aug 61
V.	Review and Approval of Evaluation and Selection of Feasibility Study Contractors	10 Aug—22 Aug 60
VI.	Preparation of Feasibility Study Contracts	22 Aug—30 Sep 60
VII.	Conduct of Feasibility Studies	10 Oct 60—10 Jul 61
VIII.	Conduct of Research and Analysis Projects	Begin Oct 60
IX.	Refinement of System Technical Requirements	Aug 60—Aug 61
X.	Evaluation of Feasibility Studies	10 Jul—31 Aug 61
XI.	Review and Approval of Evaluation Results	1 Sep—15 Oct 61
XII.	Review and Approval of Selection of Development Contractor if Development Contract is Possible	1 Sep—15 Oct 61
XIII.	Preparation of Development Contract if Appropriate	1 Oct—1 Nov 61
XIV.	System Development	1 Nov 61—196?

Source: FABMDS Support Plan (CY60).

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in the Army on that subject, the consultant would advise either the commodity manager or act for the commodity manager to advise the contractors. In the consultant role, the agency would most frequently be used only when specific problems coming within the cognizance of that agency would be raised.

(U) That agency acting as a technical monitor would observe and appraise the work of a contractor in a specific component area where the agency had a mission or demonstrated capability in the particular field. In this role, the agency would exercise no directive authority upon the contractor. It would report its findings to the commodity manager. These findings would be used by the Army Rocket and Guided Missile Agency in formulating project management decisions.

(U) An agency performing as a technical supervisor would exercise technical directive authority upon the contractor in a designated area when its staff possessed the best technical capability and fund of knowledge pertaining to a designated component, sub-system, or study area. Technical decisions or directives in the designated area would be within the authority of the technical supervisor except that when these decisions would affect other elements of the system, it would be referred to the commodity manager. The exact delineation of authority and responsibility would be defined in advance (where possible).

(U) In those instances where an Army technical agency possessed the best resources (personnel, equipment, or facilities) for conducting the development of a component or sub-system of the FABMDS, that agency would be requested to develop that item as government-furnished equipment

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for the prime contractor. The commodity manager would establish the over-all requirements (including technical, scheduling, and budgetary) for the developing agency. The developing agency could choose to develop the item "in-house," partially "in-house" and the remainder by commercial contract, or to sub-contract development to the prime contractor. While this role is described in terms of development of an item, it was also extended to include research and study projects.[17]

Special Instructions for Supporting Agencies

(U) When representatives of the participating organizations met at Redstone Arsenal on 5 December 1960 to discuss the revised plan for Army technical agency participation, the Chief of the Air Defense Systems Section, Research and Development Directorate, Army Rocket and Guided Missile Agency cautioned them on their actions during the feasibility studies. He reminded them that the Army was only interested in obtaining the best possible weapon system from the contractors. To allow the contractors complete freedom during the feasibility studies, the agencies had to refrain from directing the use of specific techniques, components, sub-systems, or technical approaches. He emphatically stated that the support agencies were merely consultants and not directors. While the Army was not requiring the contractors to follow Government advice, they were being asked to document their reasons for choosing not to do so. These reasons were to be considered during the evaluation of the feasibility studies.

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[17] Ibid.

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(U) The agencies had to guard against revealing one contractor's approach to another contractor. Proprietary information had to be kept inviolable. Compromise of proprietary information could lead to legal complications. Impartial and equitable treatment had to be given all contractors. Each agency was to give the same advice to all contractors, if possible. Such actions, it was hoped, would encourage the contractors to invest their own money in seeking solutions to the difficult problems in obtaining a FABMDS.

(U) The Chief also pointed out that as the representatives present would more than likely also be on committees to evaluate the results of the feasibility studies, they were expected to be circumspect in all their actions. Failure to do so could prove embarrassing to the individual, the agency, the Department of the Army, and the Government.

(U) In connection with the roles assigned to the supporting agencies, the instructions reminded the representatives that almost every missile system fielded by the Army had been deployed with at least one or more serious deficiencies. These deficiencies had resulted from oversights during the planning and development of the system or from a lagging state-of-the-art. Within the FABMDS program, there were certain responsibilities that were solely the Government's. Among these were providing the prime power, warheads, vehicles, threat definition, and signal items. The supporting agencies were to devote all their efforts to meeting the requirements in these areas within the time limits of the program phases. The Army Rocket and Guided

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Missile Agency expected each supporting agency to define the problems (within their assigned roles) and to solve the problems, or to inform the Agency if they appeared to be insoluble.[18]

FABMDS Project Office Established

(U) Approximately a year later, this program management system was modified as a result of organizational changes. On 11 December 1961, the Army Rocket and Guided Missile Agency was discontinued, its functions being absorbed by Headquarters, Army Ordnance Missile Command. Management of the FABMDS project then became the responsibility of the FABMDS Project Office under the Deputy Commanding General for Guided Missiles. In March 1962, the name "Project Manager" replaced that of "Project Office." Subsequently, under Army reorganization, the Army Ordnance Missile Command was phased into the Army Missile Command under the Army Materiel Command in August 1962, and the FABMDS Project Manager reported directly to the Commanding General, Army Materiel Command but remained attached to the Army Missile Command for administrative support.[19]

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[18] Presentation, Chf, ADSS, R&DD, ARGMA, to Supporting Agency Representatives, 5 Dec 60, sub: FABMDS Support Plan, Presentation Bkgd Info.

[19] The Project Manager from December 1961 to August 1962 was Lt Col William W. Cobb, and from August to November 1962, Col Robert W. Lutz. For details see "History of Headquarters U. S. Army Ordnance Missile Command, 1 July - 31 December 1961" and "History of Headquarters Army Ordnance Missile Command, 1 January - 30 June 1962."

CHAPTER IV

[redacted] FEASIBILITY STUDY PROPOSALS (U)

(U) Within a week after the Office of the Chief of Ordnance approved the FABMDS program recommended by the Army Ordnance Missile Command, the Army Rocket and Guided Missile Agency published the technical requirements (TR 159) on 28 April 1960. These became the basis for solicitation of feasibility study proposals.

Solicitation of Study Proposals

([redacted]) The Agency asked the Ordnance Districts to submit names of industrial firms who were to be considered as prospective bidders. It asked the Districts to consider carefully each prospective contractor who possessed as minimum criteria: (1) air defense or ballistic missile defense experience, (2) familiarity with field army operations and problems, (3) operational and system analysis capabilities, and (4) available resources to originate the study effort by 1 September 1960.[1]

([redacted]) The Agency planned to send Request for Proposal packages to the Districts to be forwarded to the approved, prospective contractors. The proposals were to be submitted to the Agency by 27 June 1960, and the feasibility study contracts were to be signed by 30 September 1960.[2]

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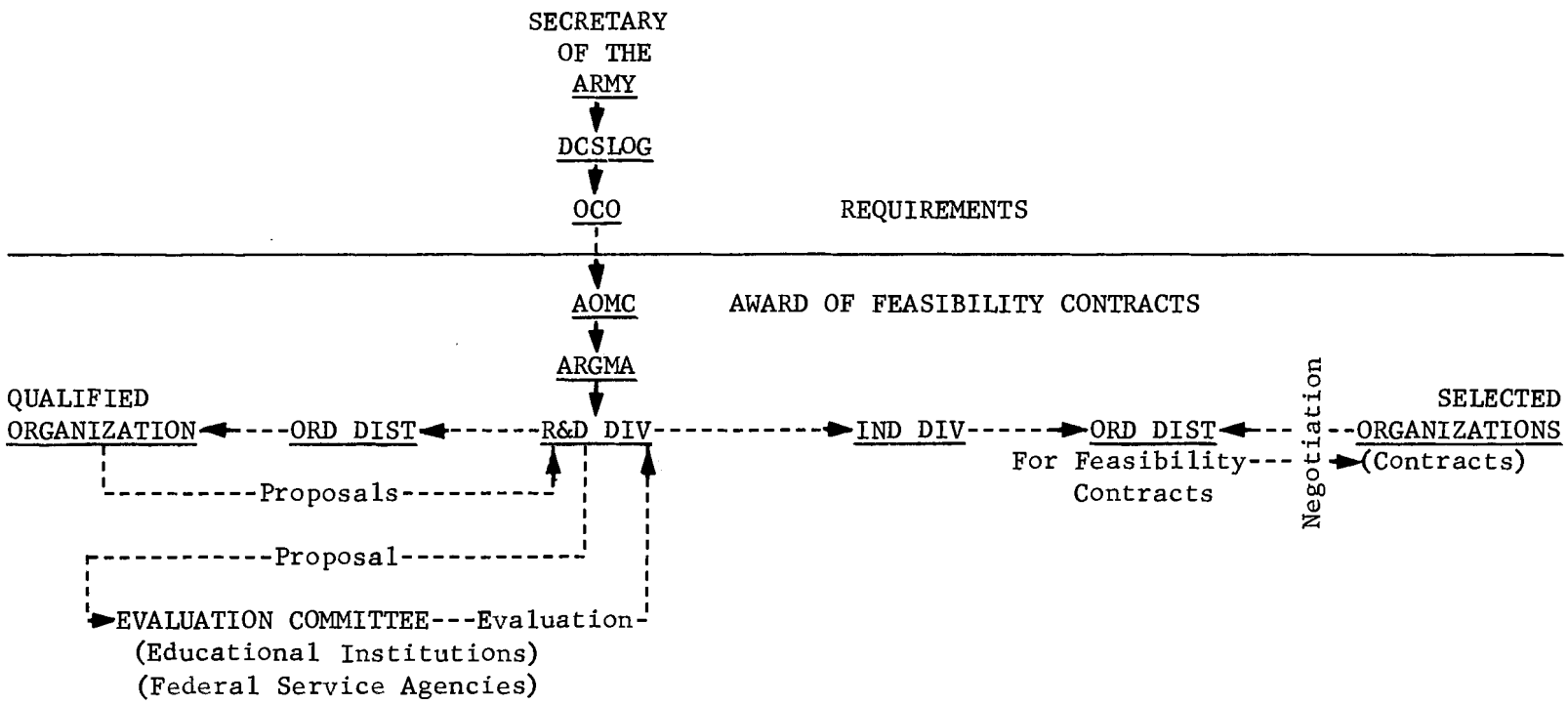
[1] TT ORDXR-IZP-137-60, Cdr, ARGMA, to CO, BHOD, et al., 28 Apr 60, FABMDS General (1), Direct Support (Guided) Div, DP&P, MICOM (Hereafter cited as AMSMI-ILA).

[2] Ibid.

Chart 2

SELECTION OF CONTRACTORS FOR FEASIBILITY STUDY CONTRACTS



Source: FABMDS General (1). AMSMI-ILA.

[redacted] The Ordnance Districts forwarded the request for proposal packages to approximately 100 prospective contractors on 10 May 1960.[3] The packages contained copies of the Technical Requirements 159, dated 28 April 1960, and additional information concerning kill mechanisms, fuzing, countermeasures, transportability and mobility.[4]

Efforts to Insure Impartiality

(U) The Office of the General Counsel of the Army Ordnance Missile Command was concerned about the procedures to be followed in awarding feasibility study contracts. He reasoned that the directed methods of awarding these contracts had placed the Army in an untenable position.

> (U) In view of the situation surrounding this procurement of feasibility studies for this system, i. e., that higher authority has included the name of a designated contractor /Raytheon/ as one of those contractors to receive a feasibility study contract; as well as the widespread interest expressed by very large corporations in this system, which by reason of its complexities and exceedingly hard technical problems, will probably be one of the largest dollar volume procurements short of NIKE ZEUS, it would be essential to . . . prevent possible allegations of unfairness which may be made by unsuccessful proposers. . . . because of the fact that today larger numbers of aircraft manufacturers and other contractors are "hungry" as a result of cut backs in aircraft programs and missile programs . . . .[5]

(U) The General Counsel suggested that the Command take two steps to strengthen its position of impartiality. First, the Command should

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[3] DF, Chf, R&DD, ARGMA, to All Elements of R&DD, ARGMA, 12 May 60, sub: FABMDS Feasibility Studies, FABMDS General (1), AMSMI-ILA.

[4] DF, Chf, R&DD, ARGMA, to Chf, Ind Div, ARGMA, 28 Apr 60, sub: Solicitation of Industry for Feasibility Studies of a FABMDS, FABMDS General (1), AMSMI-ILA.

[5] Daily Journal Entry, F. J. Buckley, Jr., General Counsel, Ofc, Gen Counsel, AOMC, 2 May 60, sub: FABMDS Procurement, FABMDS General (1), AMSMI-ILA.

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hold a briefing session to inform prospective proposers on the desired system and parameters. As the contractors would undoubtedly ask questions at such a session, the General Counsel suggested making a transcript of all meetings so that copies of the transcript could be sent to all prospective proposers. This would insure all receiving the same information. Secondly, the General Counsel proposed that one individual, within the Army Rocket and Guided Missile Agency, be designated as the Command's sole contact for prospective contractors. This individual would receive all communications from the prospective contractors. He would be instructed to record all conversations and visits from prospective proposers. All information that he gave in these instances, would be recorded so that copies could be sent to all prospective proposers, when appropriate.[6]

(U) The General Counsel reasoned that the Command by adhering to these suggested procedures would shield itself from any possibility of being charged with having shown favoritism toward any contractor. The Command could answer any such charges by stating that information furnished one contractor was given each in turn. Also, by having one person as sole contact for the contractors, the Command could exercise better control of communications between the contractors and the Command. This would be a safeguard against any unauthorized disclosures of information concerning the program.

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[6] Ibid.

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(U) The Chief of the Research and Development Division of the Army Rocket and Guided Missile Agency attempted to establish control of the situation within his division by issuing instructions to all his personnel who were connected with the FABMDS program. He informed them that the Ordnance Districts were instructing the industrial firms to address all technical questions to the Agency and all non-technical questions to the districts. Also, all contractor personnel visiting the Agency were to come by appointment only. The Chief of the Research and Development Division appointed a group of six men to handle all contacts with industry and other Government installations. All personnel were directed to refer all communications to these men. The Chief asked that written records be made of all calls and visits, and that any information provided one firm be made available to all firms, when appropriate.[7]

(U) On 6 June 1960, the Command instructed the Agency to take further steps to establish better safeguards in the conduct of the program. As requested by the Command, the Agency was to conduct a contractors' briefing conference for all prospective proposers, and the Agency Commander was to designate a FABMDS coordination team. The coordination team was to consist of a chief and two assistants, and alternates for each member also. The chief and one assistant would come from the Industrial Division of the Agency, while the remaining assistant would

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[7] DF, Chf, R&DD, ARGMA, to All Elements of R&DD, ARGMA, 12 May 60, sub: FABMDS Feasibility Studies, FABMDS General (1), AMSMI-ILA.

represent the Research and Development Division. The latter was to answer all technical questions, and the assistant drawn from the Industrial Division was to answer all business and procurement questions.

(U) As conceived by the Command, the coordination team would be the sole point of contact for industry. The Agency Commander was to instruct all personnel to refer all communications to this team. The team would be delegated authority to act informally, and thus speedily, in forwarding answers to all questioners. The team was to make the same information available to all prospective proposers, and the Agency Commander would prohibit members of the team from delegating their authority to any other individuals. In procurement problem areas, the team had to submit regular status reports to the Command.[8]

(U) Following discussions between the Deputy Commanding General, Army Ordnance Missile Command and the Commander, Army Rocket and Guided Missile Agency on 8 June 1960, the Agency decided to conduct a briefing conference for contractors on 17 June 1960. However, the Agency decided that it would not make any explanations as to the concept of a FABMDS at the conference. Reasoning that the proposers should have "free rein" in the conception of such a system, the Agency did not wish to restrict their thinking. One of the reasons that the Agency had hesitated in calling a contractors' conference was fear that it would result in delaying the proposals' due date past 5 July 1960. The Agency informed

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[8] Ltr, DCG, AOMC, to Cdr, ARGMA, 6 Jun 60, sub: FABMDS Feasibility Study Procedures Requirements, FABMDS General (1), AMSMI-ILA.

the Command that should it be found necessary, at the conclusion of the conference, to allow the proposers more time for their work, it would so recommend to the Command.[9]

Contractor Briefing Conference

[redacted] After the Request for Quotation was submitted to the industrial firms, the coordination team began receiving numerous questions concerning clarification of the technical requirements. The Agency attempted to answer some of the questions by revising the Technical Requirements 159. Revision 1 to the Technical Requirements, dated 24 May 1960, was sent to the districts on 26 May 1960 for transmission to the prospective proposers.[10]

(U) The Agency held the contractors' briefing conference on 17 June 1960. There were 79 representatives present from industry and 45 personnel from Ordnance commands and installations, the Continental Army Command, and four of the Technical Services. The conference consisted primarily of question and answer sessions. However, the Agency did take the opportunity to review the background of the program, to discuss the program funding, the projected program schedule, the technical requirements, and the methods by which the feasibility study proposals would be evaluated.[11]

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[9] 1st Ind (on basic ltr cited footnote 8), Chf, FSB, R&DD, ARGMA, to CG, AOMC, 10 Jun 60, sub: Same.

[10] DF, Chf, R&D Staff, R&DD, to Chf, Ind Div, ARGMA, 25 May 60, sub: Request for Quotation Nr. ORDXR-IZP-1-60 (TR 159) for Procurement of Feasibility Study of a FABMDS, FABMDS General (1), AMSMI-ILA.

[11] Working papers, sub: Contractors Briefing Conference, 17 June 1960, Proposed Agenda, filed in FABMDS (1), AMSMI-ILA.

Evaluation of the Study Proposals

([redacted]) The Army Rocket and Guided Missile Agency received 17 proposals from 43 companies on 5 and 6 July 1960. Of the proposals, five were presented by individual firms, and 12 by "teams" of two or more firms.[12]

(U) The evaluation committees had been organized before the receipt of the proposals. Personnel of the committees represented all pertinent areas within the Department of the Army--Ordnance Corps groups, other Technical Services, and the Continental Army Command.

(U) To direct the evaluation effort, the Agency had established a uniform evaluation policy. This policy directed that each proposal was to be evaluated on the basis of (1) technical assessment of the proposal, (2) air defense or ballistic missile defense experience of the proposer, (3) contractor familiarity with field army operations and related problems, and (4) the operational and system analysis capabilities of the proposer. The evaluation committees were charged with the responsibility of rating the individual contractors on a relative basis in accordance with their capability for performing the required studies as reflected in the material presented in their proposals.[13]

(U) Evaluation of the proposals began on 6 July 1960 and was completed on 6 August 1960.

([redacted]) The Agency assigned each committee and subcommittee a

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[12] See Chart 4, p. 47.

[13] Working papers, sub: FABMDS Evaluation Policy, FABMDS--Study Proposal Evaluation (CY60).

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[redacted]

Chart 3

[redacted]) FIRMS SUBMITTING FEASIBILITY STUDY PROPOSALS (U)

1. Armour Research Foundation

2. Convair
   Burroughs Great Valley Laboratory
   Westinghouse Air Arm Division

3. Douglas Aircraft Company, Inc.

4. General Electric Company
   Chrysler Corporation

5. Hamilton-Standard Division
   United Aircraft Corporation
   Ramo-Wooldridge
   Texas Instruments, Inc.

6. Hoffman Electronics Corporation
   Advanced Technology Corporation

7. Hughes Aircraft Corporation
   North American Aviation, Inc.
   Aerojet General Nucleonics
   R. G. LeTourneau, Inc.

8. International Telephone & Telegraph Corp.
   Chance-Vought, Aeronautics Division

9. McDonnell Aircraft Corporation

10. North American Aviation, Inc.

11. Loral Electronics Corporation
    Barnes Engineering Company
    Smyth Research Associates
    Litton Industries, Inc.
    Temco Aircraft Corporation
    ACF Industries, Inc.*
    Arthur D. Little, Inc.

12. The Martin Company
    The W. L. Maxson Company

13. Radio Corporation of America
    Cornell Aeronautical Laboratory, Inc.

14. Raytheon Company
    International Business Machines Corp.
    Dunlap & Associate, Inc.
    Avco Corporation
    Northrop Corporation

15. Republic Aviation Corporation
    ACF Industries, Inc.*
    Emerson Electric Mfg., Co.

16. Sperry Rand Corporation

17. Sylvania Electric Products, Inc.
    Aeronutronic, a Division of the
    Ford Motor Co.

Source: Presentation Background Information file.

*American Car & Foundry

[redacted]

particular area within which they were to evaluate the contractors' efforts. These included such broad areas as (1) problem appreciation (threat analysis and knowledge of field army operational philosophy), (2) detection, tracking, and communication techniques, (3) missile performance and lethality concepts and approaches, (4) ground support equipment and mobility concepts and approaches, (5) system synthesis, feasibility, and over-all study effectiveness, and (6) contractor capability and experience.[14]

([redacted]) Each subcommittee member scored the proposals on individual score sheets. These in turn were averaged for the over-all subcommittee score for each contractor. As each appraisal area had a different effect and order of relative importance on the over-all proposal, predetermined weighting factors for each area had been devised. The subcommittee scores were weighted and multiplied to determine the committee scores. These, in turn, were weighted and multiplied to produce an over-all evaluation score for each proposal.

([redacted]) In addition to the numerical scores, each subcommittee wrote a narrative summary sheet, commenting on each proposal as to advantages, disadvantages, unique features, etc. Each committee then evaluated the contractors' efforts on meeting the technical requirements.[15]

([redacted]) The final evaluation of the 17 proposals resulted in four major

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[14] Working papers, sub: Scoring Considerations, FABMDS--Study Proposal Evaluation (CY60).

[15] (1) Working papers, Presentation to CG, AOMC, 17 Aug 60, FABMDS Presentations. (2) Working papers, sub: Scoring Considerations, FABMDS--Study Proposal Evaluation (CY60).

groupings. Group I (Convair; the General Electric Company; the Martin Company; the Hughes Aircraft Corporation; Sylvania Electric Products, Incorporated; and the Raytheon Company) was considered to have presented distinguished proposals. Group II (Hamilton-Standard Division; North American Aviation, Incorporated; and the McDonnell Aircraft Corporation) had presented conditionally acceptable proposals, as only minor modifications in one or two areas would have produced an effective approach. Group III (the International Telephone & Telegraph Corporation and the Sperry Rand Corporation) were considered unacceptable, as major modifications were required in functional and synthesis areas. Group IV (the Radio Corporation of America; Douglas Aircraft Company, Incorporated; the Armour Research Foundation; the Loral Electronics Corporation; the Hoffman Electronics Corporation; and the Republic Aviation Corporation) were considered completely unacceptable, as many major modifications would have been required for an acceptable system.

After compilation of the evaluation scores, the proposals were subjected to further study to determine whether or not the top grouping proposed similar techniques. Proposals of the lower groups were checked to determine whether or not they contained proposals that merited further consideration. This review revealed that all six of the leading proposers covered the principal techniques of interest. Generally, areas not covered were

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either of specialized interest or they could be included in the supporting research program.[16]

Evaluation Results Presented to Department of Army Staff

(U) Representatives of the Army Rocket and Guided Missile Agency and the Army Ordnance Missile Command presented the results of the evaluation of the study proposals to the Department of the Army Staff on 19 August 1960. The results were accepted with few questions. The Army Ordnance Missile Command recommended that 9-month feasibility study contracts be awarded to the top six proposers (Convair; the General Electric Company; the Martin Company; Hughes Aircraft Corporation; Sylvania Electric Products, Incorporated; and the Raytheon Company). The Agency and the Command also recommended that the $2 million supporting research program, which had been proposed earlier, be approved. As there were areas of study in which Government agencies possessed useful knowledge, the Command also recommended that these agencies furnish additional guidance to the contractors performing the feasibility studies. The Command hoped that this would insure advancement of the state-of-the-art during the feasibility studies.[17]

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[16] Working papers, Presentation to CG, AOMC, 17 Aug 60, FABMDS Presentations.

[17] (1) "Field Army Ballistic Missile Defense System," Aug 60, ARGMA/AOMC, Vol I, pp. 5 - 11. (2) Working papers, Presentation to CG, AOMC, 17 Aug 60, FABMDS Presentations. (3) Travel Report, signed Thomas V. Kennemer, 22 Aug 60, sub: To attend presentation to Chief of Ordnance of the results of evaluation of proposals for Feasibility Studies for FABMDS, FABMDS General (2), AMSMI-ILA.

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CHAPTER V

(U) FEASIBILITY STUDIES PERFORMED (U)

(U) After the Department of the Army Staff had approved the FABMDS program as it had been presented on 19 August 1960 (thus authorizing the Ordnance Corps to proceed with the feasibility study phase) the Chief of Ordnance directed the Army Ordnance Missile Command to award feasibility study contracts to the top six proposers. He pointed out to the Command that the authorized funding represented $1,350,000 from Fiscal Year 1960 and $400,000 from Fiscal Year 1961 budgets.[1]

Contracts Awarded

(U) On 19 September 1960, the Army Ordnance Missile Command instructed the Army Rocket and Guided Missile Agency to award the feasibility study contracts as recommended in the evaluation presentation on 19 August 1960.[2] The Agency forwarded the procurement packages to the Ordnance Districts on 23 September 1960. As instructed by the Agency, the Districts awarded the contracts, simultaneously, on 10 October 1960.[3] Each was a $250,000, cost-plus-fixed-fee contract requiring that the feasibility study be completed within 9 months (by 10 July 1961).[4]

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[1](1) TT DE-OCO-010, CofOrd to CG, AOMC, 6 Sep 60. (2) TT DE-OCO-003, OCO to CG, AOMC, 6 Sep 60. Both in FABMDS General (2) AMSMI-ILA.

[2]Ltr, CofS, AOMC, to Cdr, ARGMA, 19 Sep 60, sub: FABMDS Feasibility Study Contracts, FABMDS General (2) AMSMI-ILA.

[3]TT ORDXR-IMP-40, Cdr, ARGMA, to CO, BHOD, et al., 5 Oct 60, FABMDS General (2) AMSMI-ILA.

[4]DF, Dir, R&DO, to Dir, Ind Opns, 9 Jan 61, sub: Review of Contracts ORD 5336, Ord 5335, ORD 3360, ORD 3160, ORD 929, and ORD 3161, FABMDS General (3) AMSMI-ILA.

Unsuccessful Proposers Informed

[redacted] The Office of the Chief of Ordnance, being aware of the Department of the Army's sensitive position, requested that the Army Ordnance Missile Command make no public announcements about the feasibility study contracts until negotiations had been completed and the contracts had been awarded. In accordance with this request, the Army Ordnance Missile Command established the policy that unsuccessful proposers would be notified simultaneously with the awarding of the contracts. The Command also requested that industrial firms negotiating for the feasibility study contracts make no public announcements about them without first checking with the Command.[5]

([redacted]) The Army Rocket and Guided Missile Agency prepared letters for each of the unsuccessful proposers.[6] These letters were, in turn, forwarded to the various Ordnance Districts to be delivered to the unsuccessful companies. The Army Rocket and Guided Missile Agency made no attempt to give lengthy explanations to each company as to the reason that a particular proposal had not been selected. Rather, the Agency chose to make more general statements that the successful contractors had proposed better concepts in certain areas. The entire purpose in thus handling the announcement of the awarding of the contracts was to prevent charges of unfairness being made against the Department of the Army's procurement practices.[7]

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[5]TT ORDXM-L-9-4, CG, AOMC (signed Maj Gen J. A. Barclay, DCG), to CofOrd, 16 Sep 60, FABMDS General (2) AMSMI-ILA.

[6]DF, Chf, Combat Rqmts Br, R&P Div, R&DO, to Chf, Ind Opns, sub: Technical Comments on Unsuccessful FABMDS Offerers, FABMDS General (2) AMSMI-ILA.

[7]Cmt 2, DF, Chf, Combat Rqmts Br, R&DO, to Ind Opns, 22 Sep 60, FABMDS General (2) AMSMI-ILA.

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Revision of the Technical Requirements

(●) At the presentation to the Department of the Army Staff on 19 August 1960, a discussion occurred concerning proposed changes to the qualitative materiel requirements and their possible effect on the study proposals. These proposed changes resulted from the FABMDS war gaming efforts which had been conducted by the Deputy Chief of Staff for Operations. The Ordnance Corps representatives took the position that the proposed changes would not alter the results of the evaluation of the study proposals.[8]

(●) Originally, the FABMDS requirements had called for an anti-missile defense system possessing full mobility, short reaction time, rapid rate of fire, capability of simultaneous multiple engagements against both ballistic and air-supported targets, and over-the-horizon detection and engagement ability, as well as the ability to defend itself against enemy ground fire. Obviously, meeting all of these requirements was practically impossible in a "fully mobile system." Therefore, the proposed changes to the qualitative materiel requirements called for a system which would primarily defend a field army from guided and ballistic missile attack. Secondarily, it would defend against attack by air-supported targets. The tertiary role of the FABMDS was to support ground fire against enemy missile launching sites. Essentially, main emphasis in development of the FABMDS was

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[8] DF, Act Chf, Tgt Msl Sys Div, Ind Opns, to Chf, ADSS, Combat Rqmts Br, R&P Div, R&DO, 7 Sep 60, sub: Statements to be furnished by R&D to Industrial in Regard to Revision 2 of TR 159, FABMDS General (2) AMSMI-ILA.

to be directed toward achieving success in the antimissile field.[9]

(U) Since approval of the revision of the qualitative materiel requirements had not been obtained, the Office of the Chief of Research and Development instructed the Chief of Ordnance to proceed with awarding the feasibility study contracts on the basis of the original technical requirements. The contracts contained a provision for changing these when the Department of the Army Staff approved the new requirements.[10]

(U) The Department of the Army Staff approved the recommended changes, and the Army Rocket and Guided Missile Agency issued Technical Requirements 159, revision 2, dated 14 December 1960, to the contractors.[11]

Official Threat Presented Contractors

(U) The threat information on which the original technical requirements had been based was considered to be unofficial information as the Department of the Army Staff had never officially approved it. When the FABMDS study began in late 1959, the Army Ordnance Missile Command had requested from the Assistant Chief of Staff for Intelligence official information on the expected threat to the field army in the 1960's. However, the Assistant Chief of Staff for Intelligence was conducting a study at the time to determine the extent of the threat, and the requested information was unavailable.

(U) Finally, in a briefing at Redstone Arsenal on 19 April 1961,

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[9] Working papers, 16 May 61, sub: FABMDS Presentation to Lt Gen J. C. Munn, USMC, FABMDS Presentation & Briefings.

[10] DF, OCRD to CofOrd, 26 Sep 60, sub: FABMDS, FABMDS General (2) AMSMI-ILA.

[11] DF, Chf, Combat Rqmts Br, R&P Div, R&DO, to Dir, Ind Opns, 10 Feb 61, sub: TR's for FABMDS, FABMDS General (3) AMSMI-ILA.

the Army Ordnance Missile Command and the Assistant Chief of Staff for Intelligence furnished the contractors with official intelligence information on the threat. The Army Rocket and Guided Missile Agency received copies of the official threat document on 5 May 1961 and immediately forwarded it to the contractors. This was barely 2 months before the feasibility studies were scheduled to be completed.[12]

Evaluation Procedure Outlined

([redacted]) During the preparation of the feasibility studies, the Army Rocket and Guided Missile Agency devised a procedure to be followed in evaluating the results of the studies. According to the plan established, the final reports, due on 10 July 1961, were to be subjected to an exhaustive evaluation process. An organization of committees, who would use computers, where possible, in their work, would review the proposed concepts in relation to the qualitative materiel requirements, the technical requirements, the threat, the state-of-the-art, and the experience of the contractors.

([redacted]) Ideally, the Agency's evaluation plan would determine the technical feasibility of the proposed systems. At the same time, the tactical application of the proposed systems was to be considered as a means of preventing the introduction of a "laboratory weapon system" into a field army.

([redacted]) Personnel composing the evaluation committees represented

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[12] Documents presented in the briefing of 19 April 1961 and later furnished the contractors were: (1) "The Field Army," (2) "Estimate of Soviet Divisional Organization and Operational Concepts in the 1965 - 70 Time Period," (3) "Materiel Development Outlook," (4) "1965 - 1975 Field Army Organization and Operational Concepts," (5) "Use and Control of Army Aircraft in the Field Army," (6) "Communications and Electronics Organization for the 1965 - 1975 Field Army," and (7) "Air Defense of the Field Army," Briefings & Presentations #2.

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the Continental Army Command, the Strategy and Tactics Group of the Office of the Deputy Chief of Staff for Operations, the Army Rocket and Guided Missile Agency, and the Army Ordnance Missile Command as well as other Ordnance Corps installations and commands.

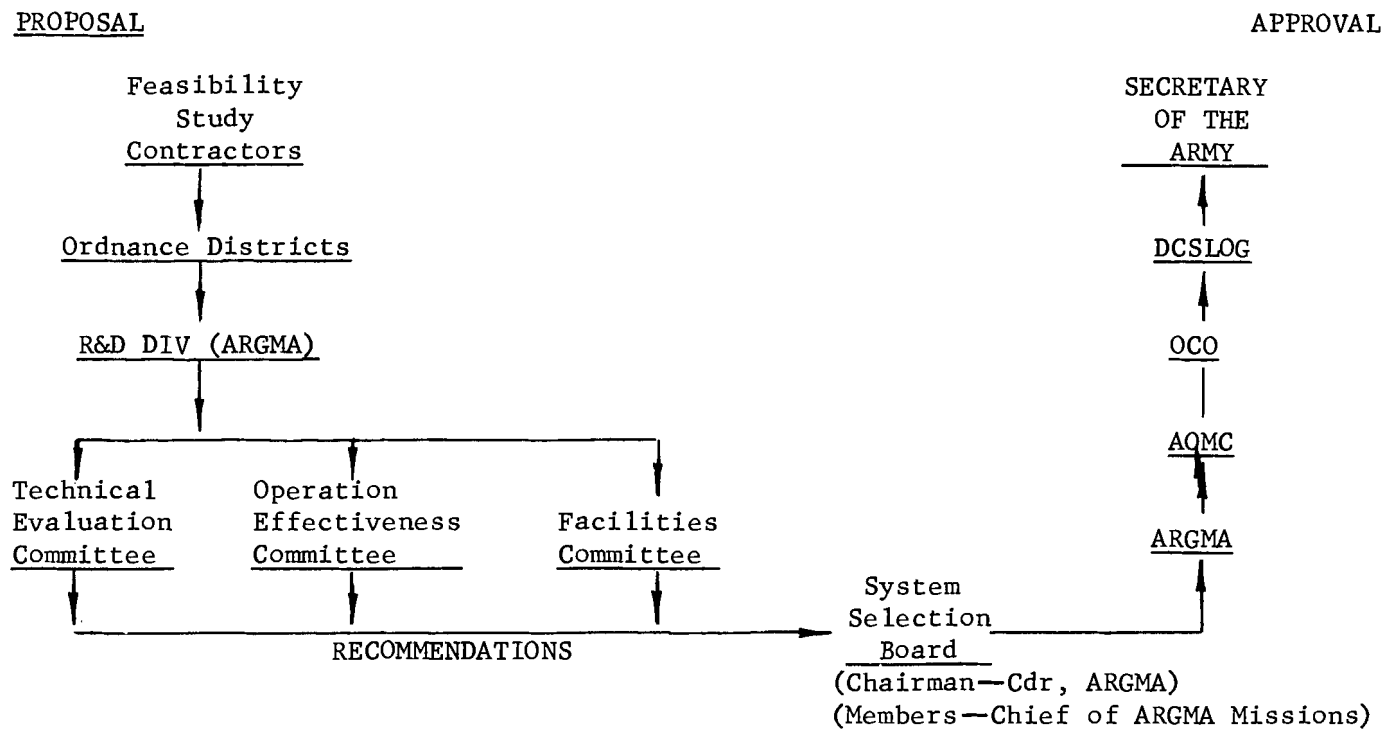
([redacted]) The organization of the committees performing the evaluation was arranged to insure that each area of consideration was investigated. An over-all committee, the General Systems Analysis and Synthesis Board, which was composed of the chairmen and vice-chairmen of the three major committees, had the responsibility of ranking the proposed concepts and then recommending to the Commander of the Army Rocket and Guided Missile Agency the most promising concept. The three major committees were the Program Committee, the Technical Committee, and the Tactics, Logistics and Human Factors Committee.

([redacted]) The Program Committee considered the proposed concepts in relation to cost and time requirements of development. It had two subcommittees, the Costs and Schedules Subcommittee and the Management and Facilities Subcommittee, for investigations in their respective areas. The subcommittees were further sub-divided into working groups for more detailed study of specific areas.

([redacted]) The Technical Committee was charged with determining the technical feasibility of the proposals. It was sub-divided into five subcommittees and these, in turn, were sub-divided into working groups for investigations at the component level. The five subcommittees

Chart 4

PHASE II: WEAPON SYSTEMS SELECTION OF PRIME CONTRACTOR



Source: FABMDS General (1). AMSMI-ILA.

investigated the general areas of sensors, data and communications, missile, ground support and mobility, and performance analysis.

([redacted]) Unlike the other major committees, the Tactics, Logistics and Human Factors Committee had no subcommittees. It merely divided into working groups for evaluating those areas implied in its name.[13]

([redacted]) Ranking the proposals on a basis of one to six, each committee sought to determine the relative merits of each proposal. The committees directed their efforts toward determining: (1) whether one of more of the proposed systems was feasible, (2) whether a combination of the proposals was desirable, and (3) whether none of the proposals (or a combination of them) could be considered feasible. The ratings of the individual committees were reviewed and analyzed by the General System Analysis and Synthesis Board, which in turn ranked the proposals on a basis of one to six. The Board also considered a composite concept of using major components of two or more of the proposed concepts. The Board then made its recommendation to the Commander of the Army Rocket and Guided Missile Agency.[14]

Presentation of Evaluation Results

(U) Having begun their evaluation of the feasibility studies on 11 July 1961, the evaluation committees concluded their work on 29 September 1961. The General Systems Analysis and Synthesis Board presented the results, and its recommendation, to the Commander, Army

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[13] Working papers, Presentation to Cdr, ARGMA, FABMDS Presentations and Briefings.

[14] Ibid.

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Rocket and Guided Missile Agency on 13 October 1961. Following his approval, the Agency presented the results to the Army Ordnance Missile Command on 16 October, the Chief of Ordnance on 17 October, the Office of the Chief of Research and Development on 18 October, and to the Commanding General of the Continental Army Command on 19 October 1961.

[redacted] The evaluation results revealed that all of the proposed systems were technically feasible. Interestingly, the proposals split into two groups: "light" vs. "heavy" systems. As proposed by Convair, the Raytheon Company, and the Martin Company, the "light" systems, weighing less than 500 tons per unit, emphasized mobility at the expense of defensive capability against the entire spectrum of the missile threat. They would provide defense against the shorter-range missiles for a smaller area. The "heavy" systems, proposed by the General Electric Company, the Hughes Aircraft Company, and Sylvania Electric Products, Incorporated, sacrificed mobility in order to attain maximum defense capability against the longer range missiles and would provide defense in a larger area for a field army.

[redacted] The over-all conclusions of the evaluation revealed that the General Electric Company's proposal best met the requirements of the qualitative materiel requirements. The evaluation results revealed that if the relative immobility of the General Electric Company's proposed system proved to be unacceptable to the potential user, then the requirements would have to be changed.[15]

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[15] Working papers, Presentation to CG, AOMC, et al., 16 Oct 61, Briefings and Presentations (DA-OCO).

[redacted] Based on the evaluation results, the question facing the Army was whether the user could tolerate the relative immobility of the "heavy" system, or did the user desire to sacrifice the greater defensive capability of the "heavy" system in order to gain the mobility of the "light" system?[16]

[redacted] The Army Ordnance Missile Command chose the "heavy" system. Recommending development of the General Electric Company's concept, it proposed a schedule of development. The schedule consisted of three major phases: (1) Experimental Model Design, Development and Testing Phase; (2) Research and Development Prototype Model Design, Development and Testing Phase; and, (3) Pre-production and Production Phase. The time for development and production of the first hardware was estimated to be 70 months after initiation of full-scale development.[17]

(U) The presentation of the evaluation results concluded with a "pat on the back" for the Army Rocket and Guided Missile Agency. The FABMDS study and evaluation represented the most thorough and comprehensive study which the Agency had ever performed on any proposed missile system. Consequently, the Army Ordnance Missile Command considered it was on firm ground in recommending the development of the General Electric Company's proposal.[18]

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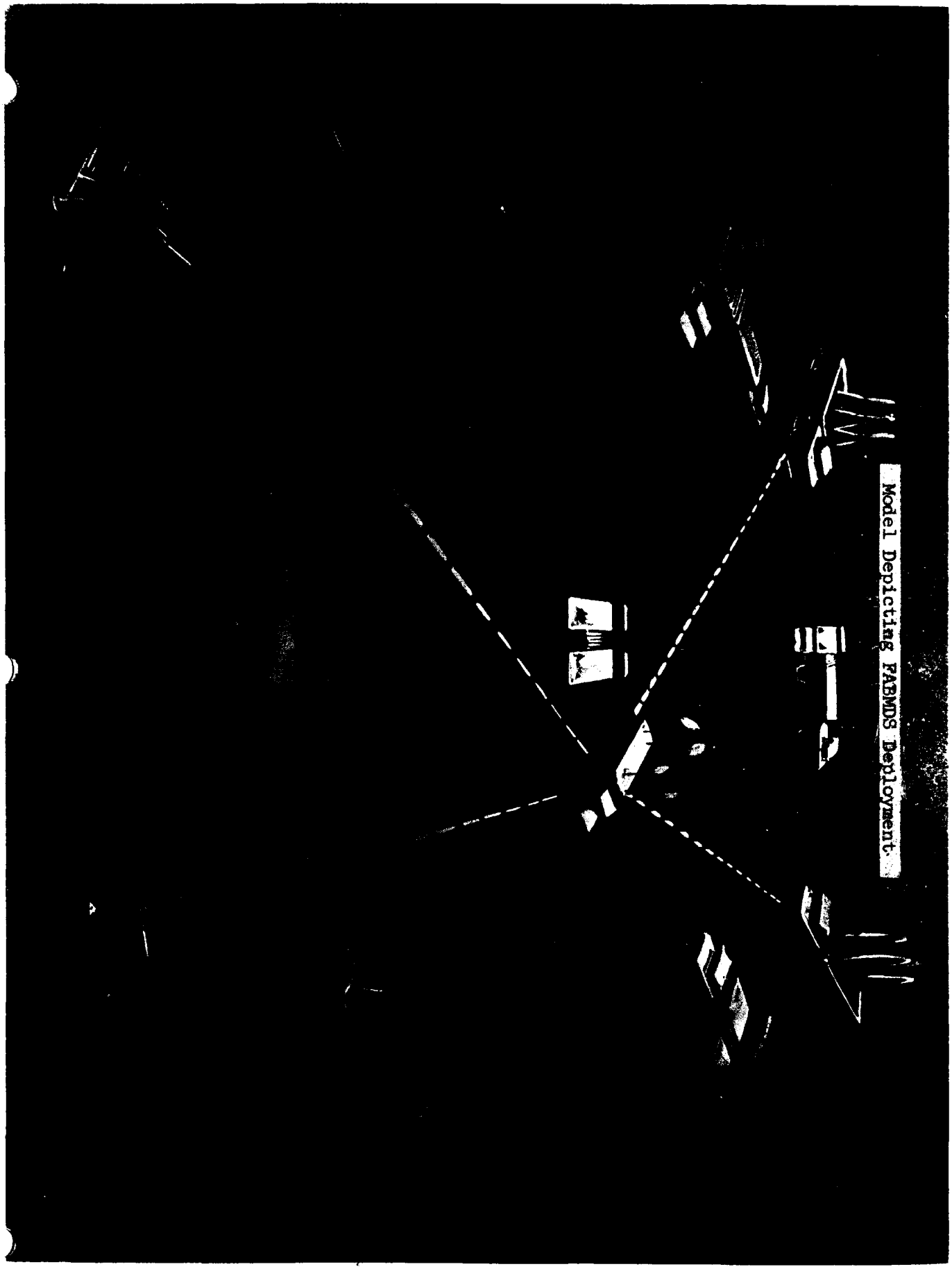
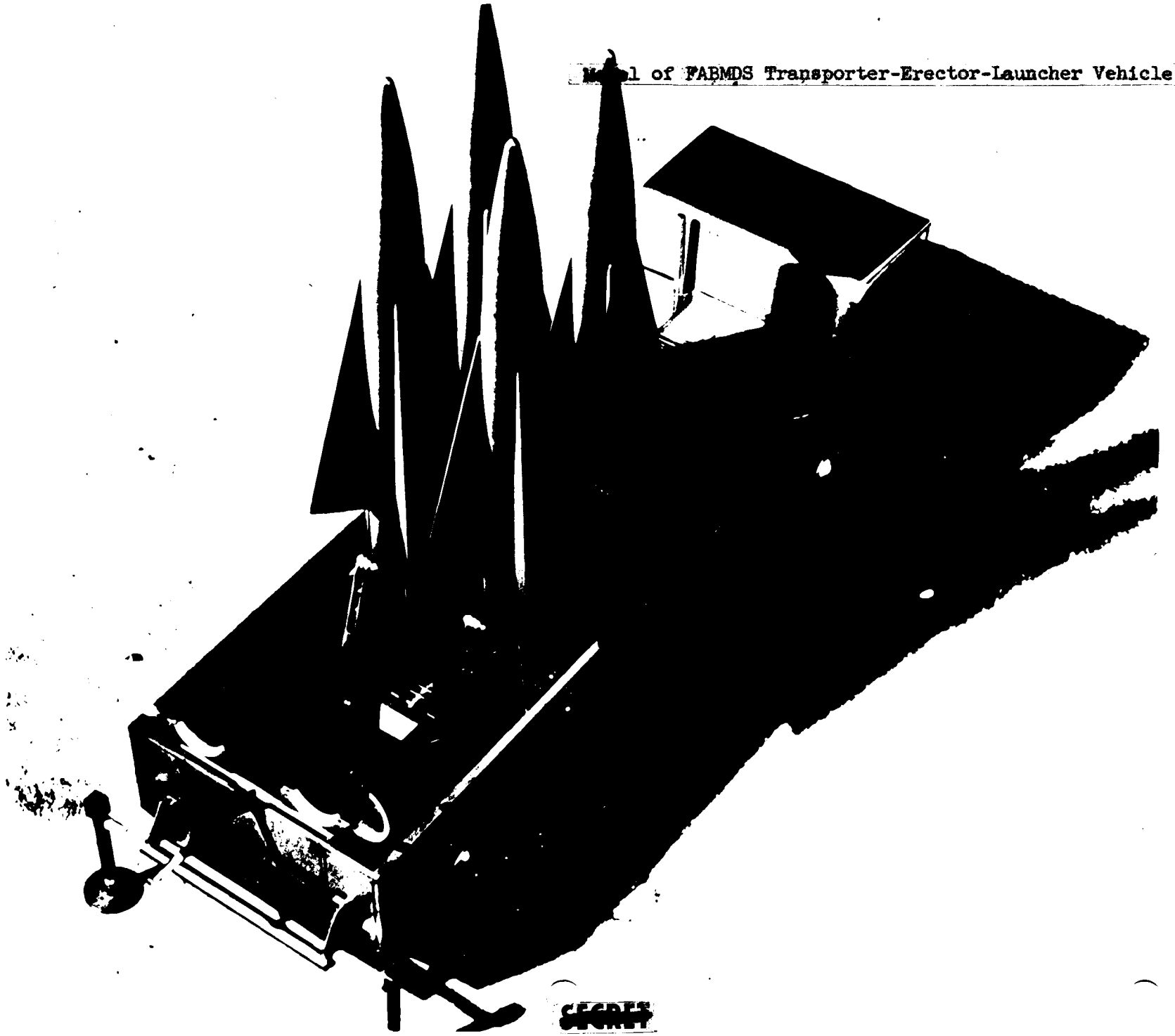
[16] Working papers, Presentation to CG, CONARC, 19 Oct 61, sub: FABMDS Presentation (Tactical Evaluation), FABMDS Presentations and Briefings.

[17] Working papers, Presentation to CG, AOMC, et al., 16 Oct 61, Briefings and Presentations (DA-OCO).

[18] Ibid.


Model Depicting FABMDS Deployment



Model of FABMDS Transporter-Erector-Launcher Vehicle

SECRET

[redacted]

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

C 115724 . 22 May 63

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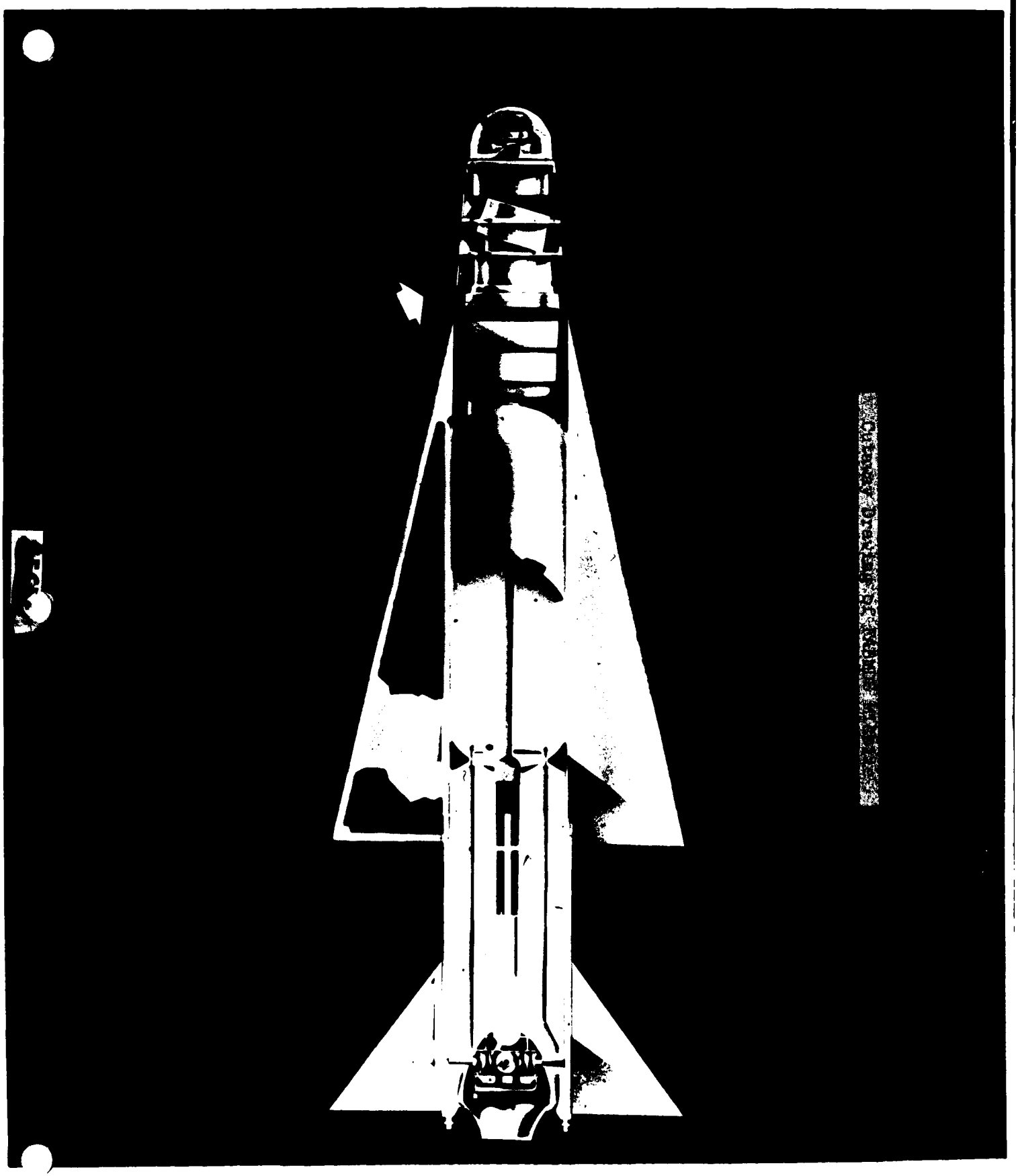

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CHAPTER VI

(C) SUPPORTING RESEARCH PROGRAM PROBLEMS (U)

Supporting Research Plan

(C) From the outset of the FABMDS program, the Army Ordnance Missile Command had recognized the need for a supporting research program to supplement and facilitate FABMDS development.[1] As a step in this direction, at the May 1960 meetings for representatives of Ordnance activities,[2] the Army Rocket and Guided Missile Agency requested the participants to list problem areas in which they desired to conduct a supporting research program. The response covered such broad areas as mobility and transportation, nuclear and non-nuclear warheads, detection and discrimination, countermeasures and counter-countermeasures, and the critical problem of over-the-horizon radar detection. The Agency used these suggestions to formulate a tentative supporting research plan.[3] The projected cost of the Ordnance Corps' supporting research program was $2.1 million maximum funding and somewhat over $870,000 if drastic funding cuts reduced the program to a minimum.[4]

Supporting Research Program Funding

(U) Funding the supporting research program was a problem the Ordnance Corps never solved. The Chief of Ordnance requested $2 million to support the research program, and as he anticipated having to justify

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[1]See pp. 12 - 13 and 21 - 22.

[2]See p. 25.

[3](1) Working papers, sub: Roles of Army Technical Agencies in the FABMDS R&D Program, FABMDS Support Plan (CY60). (2) See Chart 5, p. 62.

[4]DF, MFR, R&DD, ARGMA, 26 May 60, sub: Use of Other Ord Agencies in the FABMDS Program, FABMDS Support Plan (CY60).

[redacted]

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Date: 16 November 1960

MEANS*	GOVERNMENT AGENCIES										CONTRACTUAL COST
	BRL	COE	DOFL	FA	OTAC	PA	SC	TC	WSMR	ARGMA	
				Thousands of Dollars							
O			60								
O									150		
C											308
O			52								
O				162							
C											123
O			87								
C											103
O				52							
C											43
O						92.5					
O	30										
O			30								
C											180
O			5								
T							90				
C											95
T							65.5				
C											77
T		18									
T								13			
O					13						
C											51
A										100	
	30	18	234	214	13	92.5	155.5	13	150	100	980
	1.5%	.9%	10.7%	10.7%	.65%	4.62%	7.78%	.65%	7.5%	5%	49%

[redacted]

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the request to the Chief of Research and Development, he suggested that the Army Ordnance Missile Command be prepared to give a briefing and to answer detailed questioning on the proposed supporting research program at the Department of the Army Staff level.[5]

(U) The Command and the Army Rocket and Guided Missile Agency considered the supporting research program to be a well-rounded one, as it emphasized the FABMDS requirements and defined problem areas where supporting research would aid the contractors during the feasibility study. The Command also considered the program to be in line with work being done on the Nike Zeus antimissile missile program, research programs sponsored by the Advanced Research Projects Agency, and with research programs being conducted by the Army Rocket and Guided Missile Agency.

(U) Providing the Chief of Ordnance with background information to justify the request for $2 million for the program, the Command outlined the projected program and the anticipated costs.[6] The Command grouped the program into three priorities. Priorities one and

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[5] TT DE OCO 009, CofOrd to CG, AOMC, 7 Jul 60, FABMDS Support Plan (CY60).

[6] (U) The recommended research programs and the estimated funds required in priority one included (1) development of mathematical model for technical parametric studies and system effectiveness, $200,000; (2) tactical missile measurement program, $400,000; (3) mobility and prime electrical power, $75,000; (4) non-nuclear warhead research, $200,000; and (5) large mobile power source, $150,000. Those in priority two included (1) field army acquisition antenna, $150,000; (2) airborne power: gas generants, $80,000 and thermionic energy converter, $75,000; (3) aerodynamic research projects, $105,000; (4) navigation and position mechanism, $100,000; (5) guidance techniques, $200,000; (6) versatile radar, $200,000; and (7) infrared techniques, $65,000--Ltr, CG, AOMC, to CofOrd, 4 Aug 60, sub: Support Research program for FABMDS, FABMDS Support Plan (CY60).

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two were considered the basic categories which would cost $2 million. Priority three was an objective program which would require $1,750,000 additional funds in excess of the $2 million originally requested.[7] The Command requested that the $2 million be made available immediately to support the programs in priorities one and two and that steps be taken to obtain the additional funds to support the programs in priority three.[8]

(U) By 23 September 1960 when the feasibility study contracts were ready to be awarded, no action had been taken to furnish the supporting research funds. General Schomburg sent a teletype to General Hinrichs expressing his concern about the delay. He informed General Hinrichs that he understood the Research and Development Division of the Office of the Chief of Ordnance had failed to support his recommendations to the Department of the Army Staff. General Schomburg was of the opinion that, unless the funds, or a portion of them, were made available immediately, the contract negotiations for the feasibility studies (scheduled to begin 27 September 1960) should be suspended indefinitely.[9]

(U) General Hinrichs assured General Schomburg that the Office of the Chief of Ordnance appreciated the soundness of the program. He stated that after the Research and Development Division, Office of the Chief of Ordnance, had reviewed the program closely to determine whether work in

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[7] (~~S~~) The recommended research programs and the estimated funds required in priority three included (1) infrared techniques, $500,000; (2) auxiliary power unit propellant development, $150,000; (3) ballistic missile jamming experimental program, $300,000; (4) investigation of impact flash phenomena, $100,000; (5) power amplifiers above 1,000 megacycles, $200,000; (6) prime power research, $500,000--Ibid.

[8] Ibid.

[9] TT ORDXM-R-68, CG, AOMC, to CofOrd, 23 Sep 60, FABMDS Support Plan (CY60).

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progress could satisfy some of the needs, it had sent the Army Ordnance Missile Command's recommendations to the Office of the Chief of Research and Development with a request for the $2 million. General Hinrichs reminded General Schomburg that the Ordnance Corps had been hard hit, financially, by reprogramming and there was no program within the Ordnance Corps which could be reprogrammed to provide the Command with the requested $2 million.[10]

Interim Funding for Supporting Research Program Planned

([redacted]) After receiving authority from the Chief of Ordnance to award the feasibility study contracts, the Army Ordnance Missile Command notified the Army Rocket and Guided Missile Agency to proceed with the supporting research program, using $250,000 as interim funding. The Command informed the Agency that ". . . the $2,000,000 Supporting Research Program has not yet been approved by Department of the Army Staff. In the absence of these funds, it is desired that the $250,000 of the $1,750,000 remaining after award of feasibility study contracts, be utilized for those essential items which must start without delay."[11]

([redacted]) The Agency's current plan was to award six feasibility studies in the amount of $250,000 each for a total of $1.5 million. Using the remaining $250,000 for program management and interim funding for essential parts of the supporting research program, the Agency intended to begin the supporting research programs in the areas of warheads, fuzes, prime power supplies, vehicular transport, and system effectiveness, pending receipt of the $2 million.

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[10] TT OCO 010, CofOrd to CG, AOMC, 13 Oct 60, FABMDS Support Plan (CY60).

[11] Ltr, CG, AOMC (signed Col Thomas W. Cooke, CofS), to Cdr, ARGMA, 19 Sep 60, sub: FABMDS Feasibility Study Contracts, Government Support Agencies Correspondence (CY60).

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(C) The Army Rocket and Guided Missile Agency proposed to use the $250,000 as interim supporting research funds by giving $75,000 to the Frankford Arsenal to be applied toward developing the effectiveness model, $45,000 to the Systems Analysis Laboratory to be applied toward target definition, and $35,000 to the Picatinny Arsenal to be used for warhead research. It proposed to distribute an additional $25,000 among the participating organizations for travel funds and to reserve for itself $70,000 for program overhead.[12]

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[12] DF, Chf, Combat Rqmts Br, R&P Div, R&DO, to Chf, R&P Div, R&DO, ARGMA, 30 Dec 60, sub: FABMDS Program Activities, FABMDS (CY60).

CHAPTER VII

[redacted] A YEAR OF PLANS, REVISIONS, AND A DECISION (U)

([redacted]) On 25 October 1961, the Chief of Ordnance requested the Commanding General of the Army Ordnance Missile Command to make the evaluation results known to the feasibility study contractors. In particular, the Chief of Ordnance wanted the General Electric Company to know that although their concept had been the most acceptable, there was no certainty that they would receive a development contract from the Army.[1]

(U) Two days later, the Commander of the Army Rocket and Guided Missile Agency sent letters to each of the contractors informing them of the evaluation results, indicating the uncertainty of development of the FABMDS, and advising them that no further contractor work on the FABMDS was planned.[2]

Total Feasibility Study

(U) During the briefing on the evaluation results given to the Department of the Army Staff on 25 October 1961, the Deputy Chief of Staff for Operations announced that Army Regulation 11-25, dated September 1961, required the performance of a total feasibility study on the FABMDS. He pointed out that the results of the total feasibility

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[1] TT OCO-003, CofOrd to CG, AOMC, 25 Oct 61, Evaluation Results Notification (FABMDS).

[2] Ltr, Chf, P&P Mgmt Br, Ind Opns, ARGMA, to CO, PHOD, sub: Notification of FABMDS Study Evaluation Results, Contract ORD--3360, Evaluation Results Notification (FABMDS).

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study would aid the Department of the Army Staff in reaching a decision on whether or not to proceed with development of the FABMDS.[3]

(U) The Chief of Ordnance requested that the Commanding General of the Army Ordnance Missile Command send a representative of the Army Rocket and Guided Missile Agency to participate in the work of the Department of the Army Staff committee which would conduct the total feasibility study. This representative was to act as liaison between the committee and the Agency in order to expedite the flow of information. The committee required information from the Agency on a description of each of the proposed systems, the evaluation results of each system, and the conclusions reached with respect to each system.[4]

Technical Development Plan

(U) In providing a FABMDS technical development plan as requested by the total feasibility study committee,[5] the Army Rocket and Guided Missile Agency considered that the proposal of the General Electric Company most nearly met the synthesized FABMDS concept resulting from the evaluation of the feasibility studies, as this system could provide a field army with a defense against ballistic missiles of the 90 - 1,500 kilometer range. Consequently, it based its technical development plan on developing the proposed General Electric Company FABMDS.

(S) The FABMDS technical development plan was intended to be

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[3]DF, DCSOPS to CRD, et al., 25 Oct 61, sub: Total Feasibility Study—FABMDS, Briefings.

[4](1) TT ORD 15211, CofOrd to CG, AOMC, 26 Oct 61. (2) DF, CG, AOMC, to Cdr, ARGMA, sub: FABMDS Presentation, both in Briefings.

[5]Ltr, Chf, Adv Tech & Comp Br, R&DD, ARGMA, to CofOrd, sub: FABMDS Technical Development Plan, November Reading File (CY61).

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conducted in two phases—the experimental model phase and the research and development prototype model phase. The experimental model phase was to conclude with a system demonstration sometime between the 44th and 47th month of the development program. Design of a technical model was to begin the research and development prototype model phase. It was to come to an end upon completion of the service tests.

(U) The groundwork for the industrial phase was to be provided by the research, development, testing and engineering program, which was primarily concerned with study, design, analysis and testing. Scheduled landmarks in this program included the following: (1) firing tests to begin at White Sands Missile Range with the 18th month, (2) the experimental system to be delivered to White Sands Missile Range for contractor firing tests in the 36th month, (3) system demonstration to be carried on from the 44th through the 47th month, (4) first prototype missile to be delivered in the 46th month, (5) delivery of a prototype system for engineer service testing to be made in the 51st month, (6) engineer service testing to be performed from the 52nd through the 69th month, and (7) type classification to be accomplished in the 73rd month.

(U) Most of the development work was to be performed by one or more contractors under the supervision of the Army Rocket and Guided Missile Agency. Government agencies were to participate in the program by developing warheads, fuzing, vehicles, ground power, air conditioning, and heating items.

(U) Almost as an afterthought to the technical development plan, the Agency noted that the Marine Corps had expressed an interest in the FABMDS and had provided a consultant to the FABMDS evaluation team.[6]

Limited Component Development Plan

([redacted]) In November 1961, the Chief of Research and Development requested the Chief of Ordnance to prepare a request for a $7 million limited component development plan on the basis that funds would be available by 1 January 1962. The Command prepared the request and the Office of the Chief of Research and Development forwarded the plan through channels to the Director of Defense Research and Engineering, Office of the Secretary of Defense with a request for emergency Fiscal Year 1962 funds to implement it.[7]

([redacted]) Dr. Harold Brown, then Director of Defense Research and Engineering,disapproved the funding for the limited component development program in a succinct memorandum to the Secretary of the Army. He stated:

([redacted]) I appreciate the threat to the Field Army posed by the many and varied Soviet weapons and understand and share the Army's concern and desire to create defense against them. However, I believe that FABMDS as presently conceived, and within the present art, fails to provide assured defense in the face of a number of probable enemy tactics. Its complexity is unsuitable for the Field Army's traditional mode of operation, and while a high level of defense assurance could justify the cost, the promise at this time does not.

([redacted]) The Army staff study indicates that the Army has been evaluating contractor feasibility studies. The final results of these

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[6]"Technical Development Plan" (RCS CSCRD-21), FABMDS Project DA 516-04-015, ARGMA, 6 Nov 61, pp. 4 - 5.

[7](1) See Chart 6, p. 71. (2) TT OCO-004, CofOrd to CG, AOMC, 3 Nov 61, OCO (Correspondence & Teletypes).

Chart 6

PROJECTED FUNDING FOR FISCAL YEAR 1962, FABMDS

APPROPRIATION	INITIAL PROGRAM	OBLIGATIONS ACTUAL	OBLIGATIONS PLANNED
RDT&E	$7,000,000	-0-	$7,000,000
MCA	-0-	-0-	-0-
TOTAL	$7,000,000*	-0-	$7,000,000

*No guidance was received for Fiscal Year 1962; however, in compliance with direction from higher authority, a $7 million limited component development plan was prepared to commence in January 1962. This plan was as follows:

EFFORT	RDT&E
I. System Analysis and Engineering	$2,000,000
II. Component Development	
a. Propulsion	$2,000,000
b. Seeker	500,000
c. Radar	2,000,000
d. Warhead	200,000
e. Technical Support and Technical Supervision at ARGMA	300,000
TOTAL	$7,000,000

Source: Tech Dev Plan (RCS CSCRD-21), FABMDS, Proj DA 516-04-015, ARGMA, 6 Nov 61.

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evaluations have not been presented to OSD nor has the Army presented for OSD approval a development plan based on a specific technical approach to the problem. When the Army is prepared to present a specific development and funding program, we will be pleased to review it.

(6) Meanwhile, the effort toward achieving a FABMDS should be limited to design studies and exploratory development in critical technical areas until it can be shown that the state-of-the-art permits development of a system which has a reasonable assurance on a cost-effectiveness basis of accomplishing the desired objectives within the appropriate time frame.[8]

Director of Defense Research and Engineering Committee

(6) On 7 February 1962, the Department of the Army gave a briefing on the FABMDS to a committee from the Office of the Director of Defense Research and Engineering. The chairman of the committee was Mr. Burton Brown, Assistant Director for Air Defense, who had been directed by Dr. Harold Brown to undertake a study on antimissile defense. During the presentation, representatives from the Offices of the Deputy Chief of Staff for Operations and the Chief of Research and Development discussed Army efforts to develop an antimissile defense for a field army. They discussed the Plato program, the FABMDS contractor feasibility studies and evaluation, and the Ordnance-recommended FABMDS program. They also discussed the total feasibility study on the FABMDS. They cited the tentative cost of a 48-battery, 7-year deployment of the FABMDS as being approximately $2 billion, which included $750 million in research, development, test, and evaluation funds[9] and $800 million in procurement of equipment and missiles, Army funds. The presentation revealed that future plans for development revolved around continued supporting research

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[8] Memo, DDR&E to SA, 30 Nov 61, sub: FABMDS, OCO (Correspondence & Teletypes).

[9] See Chart 7, p. 73.

[redacted]

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Chart 7

(U) PLANNED DISTRIBUTION OF RDT&E FUNDS FOR DEVELOPMENT OF FABMDS (U)

ITEM	DESCRIPTION	PLANNED OBLIGATIONS
Contractor	System Development	$530,000,000
OSWAC	Non-nuclear Warhead Development Nuclear Warhead AK Development	18,000,000 27,000,000
OTAC	Vehicle Development, Prototype Vehicles and Technical Support	6,000,000
WSMR	Contractor Support and Engineer/Service Tests	16,000,000
Signal Corps	Technical Support and GFE	4,000,000
Corps of Engineers	Development and Procurement of Ground Power Equipment; Heating, Ventilating, and Air Conditioning Equipment	21,000,000
Ordnance District	Transportation Costs	4,000,000
Aberdeen Proving Ground (HEL, BRL)	Technical Support and Studies	1,200,000
DOFL	Technical Support	2,200,000
Frankford Arsenal	Technical Support	1,200,000
OWC	Technical Support	2,200,000
Chemical Corps	Chemical, Biological, and Radiological Protection	400,000
ARGMA	Technical Supervision and Tecynical Support	35,000,000
Targets	Procurement and Servicing	20,000,000
MTE	Procurement of Multipurpose	3,000,000
Testing Outside	Testing of System Against Ballistic Missile Targets Which Cannot be Fired at WSMR	60,000,000
TOTAL		$750,000,000

Source: "(GE) FABMDS Technical Development Plan," 6 Nov 61.

[redacted]

Chart 8

(C) ESTIMATED FUNDS NECESSARY TO COMPLETE DEVELOPMENT OF FABMDS (U)
(In thousands of dollars)

APPRO-PRIATION	FY 63	FY 64	FY 65	FY 66	FY 67	FY 68	FY 69	TOTAL
RDT&E	75,000	160,000	218,000	174,000	79,000	33,000	11,000	750,000
MCA	1,500	6,000	30,000	12,000				49,000

Source: Tech Dev Plan (RCS CSCRD-21), FABMDS, Proj DA 516-04-015, ARGMA, 6 Nov 61.

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in the fields of infrared, hybrid motor design, warhead kill mechanism, and phased array radar.

(U) While the Defense Department committee did not make any decision on the Army's program, nor on the requirements for the FABMDS, it did question the Army representatives as to the possibility of using the HAWK or Nike Hercules as interim defense systems for a field army. It also attempted to ascertain the extent of the Army's confidence in being able to overcome, within the time frame required, the technical problems in developing the FABMDS.[10]

Materiel Requirements Review Committee

(U) When the Materiel Requirements Review Committee of the Department of the Army met on 3 April 1962 to consider the results of the total feasibility study, the committee considered changing the qualitative materiel requirements for the FABMDS. The proposed changes to the qualitative materiel requirements would have expanded the coverage so that the original requirements, which had been removed in November 1960, would have been reinstated. Briefly, the changes were: (1) mandatory capability against air-supported targets, (2) capability against all missiles within the 30 - 2,000 kilometer range, (3) ground fire support required, (4) a system to link FABMDS batteries for fire coordination and distribution required, (5) Phase II air transportability required, and (6) the stipulation that the FABMDS was to

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[10] (1) TT OCO-005, CofOrd to CG, AOMC, 2 Feb 62. (2) MFR, Lt Col Rudolph A. Axelson, OCO, 8 Feb 62, sub: FABMDS Presentation to ODDRE, both in OCO (Correspondence and Teletypes).

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replace or augment the Hercules, HAWK, and Sergeant and to replace the Hercules in the continental United States.[11]

([redacted]) At a meeting of the committee on 27 April 1962, representatives of the offices of the Chief of Research and Development and the Chief of Ordnance presented a briefing on what effect the proposed revision of the qualitative materiel requirements would have on the Ordnance-recommended FABMDS program. In their technical presentation, they showed that the proposal of the General Electric Company would satisfy the new requirements. They also stated that adoption of a new set of qualitative materiel requirements would necessitate a revision of the technical development plan. This revision would require approximately 130 days and an additional $100,000 for the necessary work by the contractor.[12]

([redacted]) The committee approved, with some revisions, the total feasibility study and the new qualitative materiel requirements. The long-range planning laid out by the Materiel Requirements Review Committee foresaw a field army employing the FABMDS system in conjunction with the Mauler air defense system. The FABMDS would replace the Hercules and the HAWK. Recommending the start of developmental work in Fiscal Year 1964, the committee approved the Ordnance Corps' request for $75 million for Fiscal Year 1964. The first year's work would be devoted, predominantly, to component development work.

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[11] Journal Entry, Lt Col Wm. W. Cobb, FABMDS PM, AOMC, 16 Apr 62, sub: Proposed Revised QMR for FABMDS, FABMDS QMR's.

[12] (1) Ltr, Col Robert R. Lutz, Act Chf, GMS Br, OCO, to CG, AOMC, 4 Apr 62, sub: FABMDS. (2) Working papers, Presentation to Cdr, ARGMA, 9 Apr 62, sub: New Proposed QMR for FABMDS, both in FABMDS QMR's.

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(S) At the request of the committee, the Army Ordnance Missile Command began to devise a new technical development plan which would be based on the revised qualitative materiel requirements and would emphasize component development in Fiscal Year 1964.[13]

(S) Personnel from the Office of the Chief of Ordnance and the Office of the Chief of Research and Development presented a briefing on the total feasibility study and the recommendations of the Materiel Requirements Review Committee to Dr. Finn J. Larsen, Assistant Secretary of the Army for Research and Development, and to Mr. Paul R. Ignatius, Assistant Secretary of the Army for Installations and Logistics, on 1 May 1962. Both Dr. Larsen and Mr. Ignatius appeared to be skeptical of the need for a FABMDS.[14] They believed the proposed FABMDS ". . . contained areas of high risk and would not provide protection against the total missile threat spectrum and therefore was not acceptable. It was implied that they were not convinced that there is a requirement for FABMDS in light of our strong retaliatory means."[15]

Further Efforts at Justifying the FABMDS

(S) The Department of the Army General Staff deleted the FABMDS program from the Fiscal Year 1964 budget and intended to request the Office of the Secretary of Defense to provide the requested FABMDS

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[13] Journal Entry, Lt Col Wm. W. Cobb, FABMDS PM, AOMC, 30 Apr 62, sub: MRRC Meeting on FABMDS, 27 Apr 62, Journal Entries.

[14] Journal Entry, Lt Col Wm. W. Cobb, FABMDS PM, AOMC, 3 May 62, sub: Latest FABMDS Developments as of 3 May 62, Journal Entries.

[15] TT DA 914163, CofOrd to CG, AOMC, 16 May 62, OCO (Correspondence and Teletypes).

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funds as a separate item. In order to accomplish this, the Ordnance Corps had to obtain the approval of the Assistant Secretaries of the Army on the FABMDS program.[16]

(S) In an attempt to obtain further evidence of the need for the FABMDS and thereby allay the skepticism of Dr. Larsen and Mr. Ignatius, the Department of the Army Staff asked the Stanford Research Institute to perform a short operations study, "Ballistic Missile and Air Defense for the Army in the Field."[17] The Office of the Chief of Ordnance also authorized the Army Ordnance Missile Command to contract with the General Electric Company, for no more than $25,000, to update their FABMDS proposal in view of the revised qualitative materiel requirements as this would better enable the Ordnance Corps to answer any technical questions.[18]

(U) The Army Ordnance Missile Command revised the technical development plan in accordance with the revised qualitative materiel requirements. Issuing a new technical requirement, No. 354, dated 21 May 1962, the Army Ordnance Missile Command and the New York Ordnance District began contract negotiations with the General Electric Company. The contract, signed on 6 June 1962, was a cost-plus-fixed-fee contract in the amount of $24,831 requiring a 3-month study by the Company.[19]

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[16] Ibid.

[17] (1) Journal Entry, Lt Col Wm. W. Cobb, FABMDS PM, AOMC, 3 May 62, sub: Latest FABMDS Developments as of 3 May 62. (2) Draft copy of study scope, sub: "Ballistic Missile and Air Defense for the Army in the Field," both in Journal Entries. (3) TT DA 914163, CofOrd to CG, AOMC, 16 May 62, OCO (Correspondence & Teletypes).

[18] TT DA 914163, Same.

[19] Contract DA-30-069-ORD-3653, 6 Jun 62, General Electric (62).

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(U) On 12 July 1962, Dr. Larsen once again reviewed the FABMDS program and the Materiel Requirements Review Committee's report and recommendations. Dr. Larsen requested that another meeting be held on 18 July for the purpose of presenting more information concerning the critical technical areas of the system. Following that meeting, Dr. Larsen decided that ". . . in view of the 'discrimination problems' and 'cost-effectiveness' considerations he could not recommend full system development. He would, however, approve of limited component development and continued investigation of possible solutions to the discrimination problem."[20] The Office of the Chief of Research and Development presented Dr. Larsen with a proposed Fiscal Year 1964 component development program, which he found to be generally acceptable.[21]

([redacted]) On 31 July 1962, the FABMDS Project Officer in the Office of the Deputy Chief of Staff for Operations presented a memorandum to the Materiel Requirements Review Committee proposing that the Chief of Staff, Department of the Army, approve the forwarding of the FABMDS total system development and production plan to the Director of Defense Research and Engineering. The Office of the Chief of Research and Development countered this proposal by presenting an alternate component development plan in line with the Director of Defense Research and Engineering's memorandum of 30 November 1961. The Materiel

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[20] Trip report, Charles A. Cockrell, Chf, FMSD, R&DD, AOMC, 20 Jul 62, July Reading File.

[21] Ibid.

Requirements Review Committee approved the proposal of the Office of the Chief of Research and Development.[22]

Cancellation of the FABMDS Project

[redacted] On 10 September 1962, the FABMDS Project Manager presented a "Request for Program Change" to the Office of the Chief of Research and Development for forwarding through channels to the Secretary of the Army. The program change request proposed a $150 million component development program for the FABMDS.

[redacted] The Secretary of the Army disapproved this request on 2 October 1962 and directed the cancellation of the FABMDS project. Subsequently, the Vice Chief of Staff directed the Chief of Research and Development to change the name of FABMDS, to submit the threat definition to the Army Scientific Advisory Panel, and to submit a request for a $10 million supporting research program in those areas which the Army Scientific Advisory Panel determined to be the highest risk areas.[23]

[redacted] On 30 October 1962, the Army Missile Command[24] received notification that the FABMDS project had been renamed the AADS-70's.[25] As of 8 November 1962, all work and expenditures on the FABMDS project ceased.[26]

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[22] Trip report, Charles A. Cockrell, FMSD, R&DD, AOMC, 2 Aug 62, August Reading File.

[23] Memo, FABMDS PM, AMC, to CG, AMC, 30 Oct 62, sub: Redline Report—FABMDS, AMC Weekly & Redline Reports.

[24] The Army Ordnance Missile Command was redesignated the Army Missile Command, effective 1 Aug 62, by Army Missile Command GO 5, dated 30 Jul 62.

[25] (1) AADS-70's—Army Air Defense System, 1970's. (2) TT, CG, AMC, to CG, MICOM, 30 Oct 62, AMC Correspondence.

[26] TT 11-1036, CG, AMC, to CG, MICOM, et al., 8 Nov 62, AMC Correspondence.

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CHAPTER VIII

(S) AFTERMATH OF THE FABMDS PROJECT (U)

(U) No one, definite reason can be given as the basis for the Secretary of the Army's decision ordering termination of the FABMDS project. Rather, termination of the FABMDS project appears to have resulted from a combination of shortcomings in the proposed system and contradictions in the requirements for the FABMDS.

(S) On 1 May 1962, Dr. Larsen and Mr. Ignatius pointed out that the proposed FABMDS had several major weaknesses. Perhaps the most serious of these weaknesses was the problem of discrimination. The probable inability of the phased array radar in discriminating adequately between decoys and targets could have made the FABMDS an ineffective defensive weapon system. In relation to this discrimination problem, they also questioned the wisdom of attempting to secure research and development funds for the FABMDS in view of the fact that the Nike Zeus program, which was having similar discrimination problems, was unable to obtain production funds.

(S) Another area of concern was the minimum intercept altitude required for the nuclear warhead to be employed in the FABMDS. Detonation at too low an altitude might very well have obliterated the field army unit which the FABMDS was being used to defend. Yet, the intercept altitude required for safe detonation would also have permitted the penetration of the field army's defensive perimeter by low-flying, hostile aircraft and guided missiles. Thus, the FABMDS

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would not have been capable of countering the air-delivered threat *in toto*.

(U) Cost-effectiveness of the FABMDS was also of major concern. From Dr. Larsen's and Mr. Ignatius' questions, it appeared that the Ordnance Corps could not determine adequately what elements of a field army would be defended by a FABMDS. Nor, was the Ordnance Corps able to determine what the relative cost of this defense would be.

(U) By requesting information on the cost of increasing the number of retaliatory weapons systems available, the two Assistant Secretaries of the Army reflected the thinking of the "massive retaliation" policy.[1]

(U) Perhaps the most damaging criticism of the proposed FABMDS resulted from its size (upwards of 500 tons) and complexity. These two elements, alone, constituted a revolutionary concept in the traditional mode of field army weaponry.

(U) With the rejection of the proposed FABMDS program, there was no great change in the problem of air defense for a field army. The threat was as great as ever and, with each advancement in the state-of-the-art in guided missile development, it would become even greater. The use of conventional air defense weapons systems in conjunction with mobility and deployment remained as the best defensive tactics available. However, the Army Missile Command was continuing its efforts in developing more effective air defense weapons systems for a field army, and the Nike Hercules and the Mauler appeared to have the most promise. While

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[1] TT DA 914163, CofOrd to CG, AOMC, 16 May 62, OCO (Correspondence and Teletypes).

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the effectiveness of the Hercules was impaired by its immobility, an increased antitactical ballistic missile capability could materially aid in defending some elements of a field army. Development of the Mauler, designed for use against low-flying aircraft, would contribute added support to the antiaircraft defense of all elements of a field army. But, the Army Materiel Command, as weapons systems developer for the Army, was still faced with the requirement of developing a single, fully mobile, air defense system capable of countering the entire air-delivered threat to a field army.

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(U) BIBLIOGRAPHICAL NOTE (U)

AADS-70's Office, Future Missile System Division
Research & Development Directorate, Army Missile Command

(U) FABMDS Files, 1959 - 62. 10 ft. These voluminous files constitute the main collection of FABMDS documents extant. As a source of ready reference, for the historian, they are marred by lack of systematic arrangement, unnecessary duplication of many documents, and complete absence of some of the more important documents. They contain correspondence records, memoranda, briefings, charts, illustrations, etc. covering the FABMDS project in nearly all phases. The extent of classified information (in combination with real concern over the sensitivity of the FABMDS' feasibility study procurement) precludes easy access to the files in their entirety. The files containing the briefings and presentations are extremely helpful in that they frequently state the more technical aspects of an antimissile defense program in language for the layman. These files contain duplicates of most of the documents cited as being located in the Historical Office, Army Materiel Command (letter of 22 March 1963 to the Commanding General, Army Missile Command from the Chief, Historical Office, Army Materiel Command).

Direct Support (Guided) Division,
Directorate of Procurement & Production, Army Missile Command

(U) FABMDS Files, 1959 - 62. 1 ft. The information contained in these files relates primarily to the procurement and performance of the FABMDS feasibility study contracts. They are arranged, generally, in chronological order. The four files labelled "FABMDS General" proved to be

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of greatest value since they supplied many of the "missing" documents of the files in the AADS-70's Office.

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(U) GLOSSARY (U)

-A-

AADS-70's--Army Air Defense System, 1970's
Act--Acting
ADSS--Air Defense Systems Section
Adv--Advanced
AMC--Army Materiel Command
AMM--Antimissile Missile
AMSMI-ILA--Direct Support (Guided) Division, Directorate of Procurement and Production, Army Missile Command
AOMC--Army Ordnance Missile Command
ARGMA--Army Rocket and Guided Missile Agency

-B-

BHOD--Birmingham Ordnance District
Bkgd--Background
Br--Branch
BRL--Ballistic Research Laboratories

-C-

Cdr--Commander
Chf--Chief
CG--Commanding General
CO--Commanding Officer
COE--Corps of Engineers
CofOrd--Chief of Ordnance
CofS--Chief of Staff
CONARC--Continental Army Command
CRD--Chief of Research and Development
CY--Calendar Year

-D-

DA--Department of the Army
DCG--Deputy Commanding General
DCSLOG--Deputy Chief of Staff for Logistics
DCSOPS--Deputy Chief of Staff for Operations
DDRE--Director of Defense, Research and Engineering
Dev--Development

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DF--Disposition Form
Dir--Director
Dist--District
Div--Division
DOFL--Diamond Ordnance Fuze Laboratories
DP&P--Directorate of Procurement and Production
DR&D--Directorate of Research and Development

-F-

FA--Frankford Arsenal
FA-AM--Field Army-antimissile
FABMDS--Field Army Ballistic Missile Defense System
FMSD--Future Missile Systems Division
FY--Fiscal Year

-G-

GE--General Electric Company
GMS--Guided Missile Section

-H-

HAWK--Homing-All-the-Way Killer
HEL--Human Engineering Laboratories
Hist--Historical

-I-

Ind--Industrial
IR--Infrared
IRBM--Intermediate Range Ballistic Missile

-L-

Ltr--Letter

-M-

MCA--Military Construction, Army
Memo--Memorandum
MFR--Memorandum for Record
Mgmt--Management
MICOM--Army Missile Command
MOMAR--Modern Mobile Army

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MRRC--Materiel Requirements Review Committee
Msl--Missile
MTE--Multisystem Test Equipment

-N-

No.--Number
Nr.--Number

-O-

OCO--Office, Chief of Ordnance
OCRD--Office, Chief of Research and Development
ODDRE--Office, Director of Defense, Research and Engineering
Ofc--Office
Opns--Operations
Ord--Ordnance
OSD--Office, Secretary of Defense
OSWAC--Ordnance Special Weapons and Ammunition Command
OTAC--Ordnance Tank-Automotive Command
OWC--Ordnance Weapons Command

-P-

PA--Picatinny Arsenal
PHOD--Philadelphia Ordnance District
PM--Project Manager
Proj--Project

-Q-

QMR--Qualitative Materiel Requirements

-R-

R&D--Research and Development
R&DD--Research and Development Division
R&DO--Research and Development Operations
R&E--Research and Engineering
R&P--Requirements and Plans Division
RDT&E--Research, Development, Test & Evaluation
RF--Radio Frequency
Res--Research
Rqmts--Requirements

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-S-

SA--Secretary of the Army
SC--Signal Corps
Sec--Section
Sub--Subject
Sys--System

-T-

TC--Transportation Corps
Tech--Technical
Tgt--Target
TR--Technical Requirements
TT--Teletype

-U-

USMC--United States Marine Corps

-W-

WSMR--White Sands Missile Range

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