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THE QUEST FOR AN ADVANCED MANNED STRATEGIC BOMBER

USAF PLANS AND POLICIES

1961-1966

by

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USAF Historical Division Liaison Office

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FOREWORD

The Quest for an Advanced Manned Strategic Bomber: USAF Plans and Policies 1961-1966, is an account of the USAF effort to find a replacement for the B-52 and, though with lesser urgency, the B-58. Although three successive Chiefs of Staff, Generals Thomas D. White, Curtis E. LeMay and John P. McConnell, have given top priority to this effort, the Air Force has not yet obtained permission to develop an advanced manned bomber. Instead, it has received approval for a bomber version of the F-111 to replace the older model B-52's.

This study examines the principal manned bomber programs in progress between 1961 and 1966. One section, therefore, is devoted to each of three undertakings: the B-70, a supersonic, high-altitude bomber that was completed as an experimental type; the advanced manned strategic aircraft, judged technologically less ambitious than the B-70 but better able to penetrate enemy defenses; and the FB-111, which the Air Force considers an interim bomber, adequate to replace the B-52C through B-52F. The last section also treats the planned phase out of the older B-52's and the B-58's and recounts Secretary of Defense Robert S. McNamara's views on the role of the manned bomber.

Those interested in the B-70 program will find information on its origin, as well as on the high hopes once entertained for this type of aircraft, in The Search for New USAF Weapons, 1958-1959 (S-RD), by Arthur K. Marmor of the Air Force Historical Division Liaison Office.

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I. THE B-70 PROGRAM

(e) After 1935, according to an official Air Force history of World War II, the Army airman "was, above all else, an advocate of the big bomber, and around the potentialities of that type of plane he built his most cherished hopes."¹ Three decades later, the world scene had changed drastically and the coming of intercontinental missiles and nuclear weapons had revolutionized warfare, but many USAF leaders still insisted on the vital importance of the manned bomber, although now as part of a bomber-missile "mix." In January 1965, on the eve of his retirement as Air Force Chief of Staff, Gen. Curtis E. LeMay was asked how serious a gamble the nation was taking if it did not develop a new bomber, and he replied:²

. . . if we don't have a war, it won't matter. If we do, and we don't have a new bomber, we are apt to lose. For a considerable future, we need a manned system. There are certain things a manned system can do better; other things an unmanned system can do better. The next war will be different than the last, and the side with the most flexibility will have the advantage. The side that has the mixed force and can react with missiles and bombers is apt to beat the side that has only missiles. So we must have a manned system for the foreseeable future to exercise judgment and to react to surprises.

(e) The new bomber upon which the Air Force originally set its hopes for the 1960's was the B-70.* After more than three years of study, it signed contracts early in 1958 for development of this aircraft. North

*The Air Force also hoped that its nuclear-powered aircraft program would eventually culminate in a military useful bomber, but the Kennedy administration terminated the program in March 1961. For a detailed history of this program, see Robert D. Little, Nuclear Propulsion for Manned Aircraft: The End of the Program, 1959-1961 (AFCHO, 1963).

American Aviation, winner of the design competition, undertook to develop, as a replacement for the B-52, a high-altitude bomber capable of flying three times the speed of sound. The craft was to be powered by six General Electric jet engines buried side by side in a wide-mouthed nacelle located parallel to the fuselage and beneath the bomber's delta wing. Plans also called for twin rudders, one on either side of the row of engine exhausts, folding wingtips to insure stability at all speeds, and a longitudinal control surface on each side of the fuselage just to the rear of the crew compartment.³

(S) The B-70 program was barely under way when the Air Force proposed accelerating development, but it was slowed instead. Development of high-energy fuel suitable for the B-70 was cancelled in the summer of 1959, as was the F-108 interceptor program which had financed the development of escape capsules and other equipment that could be adapted to the B-70. Finally, on 1 December 1959 the Department of Defense (DOD) drastically curtailed the bomber program, cancelling contracts for essential military subsystems. All that remained was a commitment to manufacture two prototype B-70's that were mere shells of the complex weapon system sought by the Air Force.⁴

(U) Thomas S. Gates, Secretary of Defense during the last two years of the administration of President Dwight D. Eisenhower, told Congress in January 1960 that technical as well as tactical considerations had persuaded him to cut back the B-70 program. The technical problems stemmed from the "use of metals and components . . . still in the research stage," but the tactical objections focused on the basic question of the need for a manned

bomber in the missile age. The program, Secretary Gates explained, was geared to produce in 1965 a manned system "designed for massive retaliation as part of our strategic deterrent." But Minuteman, Titan, and Atlas--three highly regarded missiles--would be fully operational at about the same time, and he questioned whether the B-70's, at a cost of \$5.5 billion, could do more than add "diversification" to the retaliatory force. Since the Eisenhower administration was not convinced that the B-70 "would really be as effective . . . as missile systems are anticipated to be," it had elected to build two demonstration aircraft rather than plunge ahead with system development.⁵

(U) During the Presidential campaign of 1960, which saw considerable debate over American military policy, the B-70 unexpectedly assumed new importance. A week before election day, Secretary Gates released some \$155 million appropriated by Congress but previously withheld by the executive branch, bringing to \$265 million the amount that could be spent on the B-70 during fiscal year 1961. In releasing this money, the administration changed the program objective from the fabrication of prototype aircraft to demonstration of a full-fledged B-70 weapon system.⁶

(U) This decision, according to the Wall Street Journal, had obvious political implications, for it served to counter Democratic charges that the Eisenhower administration--and by association the Republican candidate, Vice President Richard M. Nixon--had placed balancing the federal budget before providing an adequate national defense. Besides helping refute Democratic arguments, the decision heralded additional employment for aircraft workers in California, where the vote promised to be close.⁷

(U) Campaigning at the time in California, Senator John F. Kennedy, the Democratic candidate, took note of the Republican administration's

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sudden change of heart, inquiring of a San Diego audience "why they did it this week." The senator then hailed efforts by members of his own party who had increased the amount appropriated for the B-70 beyond what President Eisenhower had asked. "I wholeheartedly endorse the B-70 manned aircraft," Mr. Kennedy declared.⁸

A New Setback

(U) Prospects for the B-70 seemed excellent as 1961 began. Senator Kennedy, who had declared in favor of the B-70 during his unsuccessful bid for California's electoral votes, defeated Vice President Nixon in the November election. In his last budget which was subject to change by the incoming administration, President Eisenhower accepted a \$2.7 billion B-70 program that would produce as many as a dozen experimental craft and, if the system demonstrated its worth, permit the deployment of an operational force in 1968. To begin this greatly expanded undertaking, he specifically requested \$358 million for fiscal year 1962.⁹

(U) Eugene M. Zuckert, President Kennedy's choice as Secretary of the Air Force, recommended that the new administration retain the \$358 million in its budget request. Shortly after his appointment as Chief of Staff, USAF in July 1961, General Curtis E. LeMay presented arguments in support of this recommendation before a Senate subcommittee. He paid tribute to the B-70's flexibility, which he broadly defined as the ability to locate and attack targets not precisely identified, to report the results of attacks by other weapons, to attack from any direction, to carry out shows of force impossible with missiles, and to respond to recall after being launched. General LeMay declared that the worst stumbling blocks to development were

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past. "All the inventing has been done," he said. "There are no major technical problems facing us in the B-70 program." ¹⁰

(U) Despite President Kennedy's earlier endorsement, his administration exercised caution in pursuing B-70 development. Instead of the \$358 million sought by the Air Force, Secretary of Defense Robert S. McNamara asked Congress for only \$220 million. President Kennedy and his advisers desired to limit expenditures to \$1.3 billion which would restrict development to only the airframe, engines, and bomb-navigation system and cancel work on other components vital to an integrated weapon system. The program would be reduced to about what it was before the 1960 election campaign. ¹¹

(U) The reasons for this cautious approach were similar to those given by Secretary Gates during the 1959 cutback. The Kennedy administration objected to beginning development of an integrated B-70 weapon system in 1961 because it either might not be needed or prove to be only a marginal weapon. The new bomber, Secretary McNamara argued, could not become operational until well after 1965. At that time a large number of reliable intercontinental missiles would already have been deployed. Housed in underground launchers, these new weapons would be far less vulnerable to surprise attack than B-70's based at airfields. Soviet progress in anti-aircraft missiles, moreover, would make it increasingly difficult for the B-70 to penetrate at the altitudes for which it had been designed. To operate at lower altitudes, where Russian missiles would be less effective, it would have to fly at subsonic speed. Nor was the B-70 designed to carry missiles that would enable it to remain outside the range of defensive weapons and still destroy the targets these weapons protected. Secretary McNamara

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therefore opposed an expanded B-70 effort but he assured Congress that the administration's program would preserve the option to develop and deploy an integrated weapon system by the end of 1969, should this be necessary for national security.¹²

(S) Although the administration desired only \$220 million, Congress appropriated \$400 million. Secretary McNamara, as his predecessor had done in similar circumstances, released only the amount he had requested. Congressional opinion therefore had no direct effect on the fiscal 1962 program.¹³

(U) Facing a \$1.3 billion ceiling, the Air Force set about determining just what could be done for that amount. On 20 April 1961 Secretary Zuckert advised Secretary McNamara that three aircraft could be completed. The first experimental craft would be followed in nine months by the second; the third, completed nine months after the second, would contain a prototype bombing-navigation system. Target date for the first B-70 flight was December 1962.¹⁴

From B-70 to RS-70

(S) This financial limitation, together with the administration's lack of enthusiasm for the B-70, compelled a reassessment of the whole subject of manned bombers. At Secretary McNamara's request of 2 June 1961, the Air Force scrutinized possible alternatives to the B-70, among them the B-58, an improved version of the B-58, a long-endurance aircraft designed to launch missiles, and a nuclear-powered aircraft.¹⁵

(S) More important, the Air Force revised the B-70 concept to meet the objections raised by two successive Secretaries of Defense. During the summer and fall of 1961, it shifted emphasis from bombardment to

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reconnaissance-strike. The B-70 sired the RS-70, a proposed aircraft intended to provide (1) timely, accurate, and selective reconnaissance; (2) positive control, in that after taking to the air it would be subject to recall or diversion to an alternate target; (3) flexibility in the direction and, since it carried missiles as well as bombs, in the manner of attack; and finally the ability to destroy all sorts of targets, including missile sites.¹⁶

(*) In order to begin development of the RS-70, on 12 January 1962 the Air Force requested the immediate release of \$80 million of the impounded fiscal year 1962 funds for development and procurement of sensors and other components and for modification of the third prototype B-70 to accommodate this equipment. The Air Force estimated that it would need at least \$320 million to continue development through fiscal year 1963.¹⁷

(*) The RS-70 proposal met a prompt rebuff. On 19 January Secretary McNamara said that a great deal more study was required to determine whether a reconnaissance-strike system was worth the high cost of development and production. He limited the B-70 program in fiscal year 1963 to \$171 million, to be drawn from the balance of the \$400 million appropriated the previous year.¹⁸ Shortly after this announcement, the Director of Defense Research and Engineering (DDR&E), Dr. Harold Brown, informed the Air Force that its request for RS-70 funds had been denied. He observed that "development of a reconnaissance-strike system for manned strategic aircraft is considered desirable" but questioned whether "the present state of the art is sufficient to support system development at this time."¹⁹ In March Dr. Brown obtained Secretary McNamara's approval for the Air Force to submit a

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development plan for the sort of radars required by a reconnaissance-strike system. One such radar, a prototype side-looking set, could be tested in the third B-70 or in another suitable aircraft. No such plan was submitted, however, because of an unexpected renewal of interest in the RS-70.²⁰

The Rejection of the RS-70

On 8 March 1962, after hearing USAF and OSD views on the RS-70, Representative Carl Vinson, Chairman of the House Armed Services Committee, challenged both Secretary McNamara's opinion of the RS-70 weapon system and the tactic, employed by Secretaries Gates and McNamara, of impounding money appropriated by Congress for the B-70 program. "I for one," said Representative Vinson, "do not believe that all the experts are in the Department of Defense," and he warned that his committee was "going to use my knowledge and not act as a rubber stamp to programs furnished ready-made by the Department of Defense." The committee thereupon produced a report that directed Secretary McNamara to spend \$491 million on RS-70 development during fiscal year 1963. This amount was the minimum that the Air Force believed necessary and took into account delays caused by Secretary McNamara's earlier rejection of the less ambitious proposal. "If this language constitutes a test as to whether Congress has the power to so mandate," said Mr. Vinson referring to the directive to Mr. McNamara, "let this test be made, and let this important weapon system be the field of trial."²¹

(S) Wary of a clash with Representative Vinson, President Kennedy succeeded in working out a compromise that avoided debate on the constitutional authority of Congress to compel the executive branch to spend appropriated funds. In return for Secretary McNamara's promise to begin

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at once a new study of the RS-70 proposal, Representative Vinson agreed to withdraw his constitutional challenge. Instead of directing the Secretary of Defense to spend at least \$491 million, the House appropriation bill merely authorized him to do so. A Senate-House conference then reduced the amount to \$362.6 million, which Congress finally appropriated.²²

(c) As this compromise was being reached, an ad hoc committee of the Scientific Advisory Board submitted its views on the proposed RS-70. Gen. James H. Doolittle, Retired, committee chairman, told General LeMay that, although the members favored the development effort, a minority felt that technical obstacles would prevent the system from performing as the Air Force desired. General LeMay accepted the recommendation to go ahead and pointed out that some persons had entertained misgivings about every successful development program.²³

(d) Secretary McNamara directed Dr. Joseph Charyk, Under Secretary of the Air Force, to undertake the promised study. Dr. Charyk supervised the preparation of documents that, to the Air Force, justified both the technical feasibility and strategic value of the RS-70. Secretary Zuckert therefore proposed a program intended to produce an operational wing in 1968.²⁴

(e) The Joint Chiefs of Staff, after a lengthy review of the program change proposal that embodied the basic RS-70 request, agreed on 28 September 1962 to a memorandum for the Secretary of Defense that recommended granting the Air Force sufficient funds to "demonstrate the feasibility of the aircraft and associated subsystems in a timely manner." On the following day, the Chairman, Gen. Lyman L. Lemnitzer, whose term ended on

30 September, signed the memorandum. As this recommendation was being dispatched, the JCS received from the Secretary of Defense a memorandum, dated 28 September, that indicated a tentative decision against the RS-70.²⁵

() On 1 October Secretary McNamara conferred with the JCS, now headed by Gen. Maxwell D. Taylor, and suggested that they reconsider their earlier endorsement of the RS-70 and, if their position remained the same, provide more detailed reasons for their views. On 2 November, after the Cuban missile crisis, the JCS recommended construction of at least five experimental craft to determine the feasibility of the RS-70. When General Taylor forwarded this recommendation on 6 November he expressed personal agreement with Secretary McNamara that the program should not be undertaken but did recommend "directing maximum effort toward the development of an advanced reconnaissance aircraft . . . of high reliability and great range."²⁶

() Later in November the administration added \$50 million to the B-70 program for the development of sensors suitable for a reconnaissance-strike system. Secretary Zuckert interpreted this action as reaffirmation of Secretary McNamara's opposition to the RS-70 proposal and a decision to restrict development to work on sensors beginning with the completion of the third B-70.²⁷

() This interpretation was justified. The Secretary of Defense did not retreat from the position he had set forth to the JCS and which General Taylor had supported. Instead of the \$491 million sought for fiscal year 1963 or the \$362.6 million actually appropriated, the Air Force would be allowed to spend about \$207 million on the three experimental B-70's rather than on the proposed RS-70.²⁸

B-70 Technical Problems

(U) While the RS-70 proposal was being studied and finally rejected, the B-70 was encountering severe technical problems that caused the date for the first flight, set for December 1962, to recede well into 1963. These difficulties involved the air induction control system, secondary power generating subsystem, corrosion of honeycomb metal panels, a mismatch of wing stub and wing, and leaks in the fuel tanks.²⁹

(U) Developing a fully automatic system for regulating the flow of air to the jet engines proved too much for the original subcontractor, and North American had to take over the work. To avoid losing more time, North American installed in the first B-70 a type of manual air induction control system that had originally been planned as backup for the automatic device. While this was being done, work went ahead on an automatic version for the second and third aircraft.³⁰

(U) The secondary power generating subsystem, which provided current to the pumps that maintained hydraulic pressure, also proved unsatisfactory. Excessive vibration caused failures in the generator gear boxes, and the hydraulic pumps frequently broke down. Additional braces steadied the gear boxes, but the pumps had to be rebuilt using metals able to withstand the intense heat of supersonic operations as well as the extreme pressure generated within the hydraulic lines.³¹

(U) A nickel plating solution, used to seal gas tanks, leaked into the honeycomb panels that formed both the outer wall of the tanks and the skin of the aircraft. These panels were steel sandwiches which were formed by using intense heat to fuse into an integral unit a sheet of stainless

steel honeycomb placed between two thin sheets of stainless steel. When corrosion appeared, the affected area had to be cleaned, examined for structural damage, and replaced if necessary.³²

(●) North American had anticipated that wing and wing stub would not match exactly but was confident that the error could be held to within one-tenth of an inch and compensated for quite easily. When the time came to join the two sections, however, the mismatch turned out to be as much as three-quarters of an inch. As a result, the company had to use jacks to get the parts into closer juxtaposition, insert an H-beam between wing stub and wing, and smooth and strengthen the joint by adding panels and internal braces.³³

(U) The most difficult problem was finding a suitable sealant for the fuel tanks. As General LeMay described the task for a House subcommittee:³⁴

We have not been able to manufacture these things to keep them from having little pinholes in the welds. Some of the pinholes . . . would hold fuel all right, but this airplane is going to operate at Mach 3 which means the structure will heat up to 500° or 600°. This means the fuel is going to get hot. Having hot fuel, the fumes above it, if it mixes with air you have an explosive mixture.

In order to reduce the hazard of the explosive mixture, you do not allow air in the tanks. Nitrogen is added under ten pounds pressure . . . [and] is much harder to hold than fuel

(U) To solve the problem, North American engineers tried grinding the welds and brazing the seam. This failed, and because none of the available sealants could withstand temperatures of 500° or above, new synthetics had to be developed for the job. This, more than any other technical difficulty, delayed the first flight until 1964.³⁵

The Program Continued

(U) Correcting the various technical failings disrupted schedules and cost money. In February 1963 John L. Atwood, president of North American Aviation, after pointing out that "no action of the Air Force during the past 22 months has impaired completion of the XB-70 airplane," admitted that his firm was "unable to program the completion of the three airplanes within the funds allocated." He suggested that Secretary Zuckert obtain the release of an additional \$25 million so that North American could begin fabricating the second and third aircraft. In this way the firm could avoid falling farther behind schedule and incurring greater deficits trying to catch up. Additional amounts, however, would have to be released during fiscal year 1964 if the three-plane program was to be completed.³⁶

(U) At the recommendation of the Air Force, Secretary McNamara elected to keep the three-aircraft program alive but at the expense of sensor development, which had been approved only three months earlier. Of the \$50 million earmarked for the development of sensors, he reassigned \$35.8 million to sustain the B-70 effort and stated that disposition of the remainder would await a decision on the fiscal 1964 program. During fiscal year 1963, the B-70 program thus exceeded by \$35.8 million the \$171 million that he had released originally. The total of \$206.8 million fell far short, however, of the \$362.6 million appropriated for that year by Congress.³⁷

(U) For fiscal year 1964 the Air Force requested \$156 million to continue work on three prototype aircraft, and Secretary McNamara accepted this estimate. He told Congress that he intended to provide this amount by releasing \$81 million originally appropriated for fiscal year 1963 but