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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

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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

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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

(●) 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

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deferred for later use, adding \$61 million of fiscal year 1963 funds that had been kept in reserve for emergencies, and turning over the \$14.2 million remaining from the original sensor fund of \$50 million. For fiscal year 1965 the Secretary of Defense anticipated a \$92 million program, \$55 million to come from the cancelled Dyna-Soar and the remainder from the fiscal year 1963 appropriation. The expenditure of another \$25 million during fiscal year 1966 would complete the program. Predicted B-70 development costs were now \$1.5 billion, \$200 million above the original ceiling imposed by the Kennedy administration in 1961.³⁸

(U) Despite the difficulties in assembling the first B-70 and the rising costs of development, General LeMay continued to advocate reviving the defunct RS-70 proposal. In April 1963 he told a Senate subcommittee that "the RS-70 is the one we should go full blast on now to replace the B-52." If not the RS-70, he continued, "some other system has to be brought forward," such as one of those currently under study by the Air Force. These possibilities included "a long-range, missile launching airplane, an airplane designed specifically for low altitude penetration, and . . . one using the advanced state of the art for a high altitude airplane."³⁹

(U) The Air Force was primarily concerned at this time, however, with keeping the B-70 program within the \$1.5 billion limitation than with breathing new life into the RS-70 proposal. To keep work going on the three prototypes, it decided upon a cost-plus-incentive-fee contract for the remainder of the program that would reward North American for saving money. In May 1963 the company signed the agreement and it went into effect in July. The new contract established a target cost of \$576.7 million. The

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company would receive, besides a basic fee, 20 percent of the first three percent trimmed from this amount and 10 percent of all savings in excess of three percent. This scale was adopted because savings beyond three percent seemed all but impossible. Similarly, the basic fee would be reduced if North American exceeded the target amount.⁴⁰

A Final Cutback

(●) Despite the close watch kept on the program, B-70 costs continued to rise during 1963, largely because of the time-consuming task of finding an adequate sealant for the fuel tanks. A study team appointed by the B-70 program director, Brig. Gen. Fred J. Ascani, recommended continuing the three-plane effort which, it claimed, could be finished well within the current limitation of \$1.5 billion.⁴¹

(●) But Secretary Zuckert held that since the development of a B-70 weapon system was out of the question, the program could best serve the nation by demonstrating the feasibility of Mach 3 flight, thus proving the technical innovations incorporated in the plane's design and construction. Seconded by the Chief of Staff, on 20 February the Secretary maintained that the program would make a greater contribution if the third aircraft were abandoned and some of the \$60 million required for its completion were reserved "to accommodate those contingencies that are bound to arise." In this way, two B-70's could be subjected to a "significant number of flight test hours" without exceeding the limit of \$1.5 billion. In March 1964 Secretary McNamara approved ending work on the third plane.⁴²

(●) The B-70 program, as a result of this cutback, called for the fabrication of two aircraft followed by a total of 180 hours of flight

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testing with the final test flight before 30 November 1965. Both aircraft were built: the first flew in September 1964; the second in July of the following year. The goal of completing 180 hours of flight testing by the end of November 1965 proved unattainable, however, and on that date the Air Force was planning to finish in March or April 1966.⁴³

(●) As the B-70 program neared its conclusion, the Air Force, with concurrence in November 1965, negotiated an agreement with National Aeronautics and Space Administration (NASA), whereby the latter agency would share in the costs of flight testing beyond the current terminal date of April 1966. NASA would receive information applicable to its supersonic transport program while the Air Force would obtain general data on supersonic flight. The Air Force and NASA would each pay half the cost of a flight test program of 162 hours that was scheduled over 18 months and involved the use of both B-70's. The estimated cost to the Air Force was \$27.2 million, which would raise the total program cost to \$1.489 billion, just under the \$1.5 billion ceiling.⁴⁴

What Went Wrong

(●) The XB-70 was now wholly an experimental aircraft. Built of steel and titanium and powered by six YJ-93 General Electric engines, it was designed to have an operating range of 4,000 nautical miles, a ceiling of 77,000 feet, and a maximum speed of 1,720 knots above 65,000 feet. Its primary purpose was to "demonstrate airworthiness in a sustained Mach 3 test environment."⁴⁵

(U) Whatever its contributions to future supersonic aircraft, military or commercial, the B-70 program failed to provide a replacement for the B-52.

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Secretary Zuckert held that technological risks had played a major part in the failure of the RS-70 and B-70. "I think what was attempted here," he told a House subcommittee in the spring of 1964, "was a combination of changes, of advances in the art . . . and when you put these together, you do not get just the sum of the uncertainties, you get the product of the uncertainties." ⁴⁶

(U) After his retirement in September 1965, Mr. Zuckert wrote that the "dialogue" concerning the B-70 disclosed a need for "better homework by the Air Staff before we came in with a position." It had to present information more precisely than was customary and examine the consequences of possible courses of action more closely. He absolved the Air Staff, however, from guilt in the death of the B-70, attributing it to a "question of . . . vulnerability" that "could not be satisfactorily answered." Because of the capabilities of Russian antiaircraft missiles, he doubted that the B-70 could ever have filled a genuine requirement for a manned bomber to replace the B-52's. ⁴⁷

(U) Gen. Thomas S. Power, Commander in Chief of the Strategic Air Command (CINCSAC), was thoroughly familiar with the troubles that had plagued the program. "What really 'killed' this airplane, in my opinion," he wrote, "was the fact that it was designed for flight at very high altitudes which was very desirable at the time it was conceived. But this became a serious deficiency when the Soviets developed their extensive system of high altitude antiaircraft missiles." ⁴⁸

(U) Secretary McNamara, testifying before a House subcommittee, took the position that failure was the inevitable result of pressing existing

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technology to the limit in an effort to produce something for which there was no real need. "I think, with hindsight," he said, "we can say very clearly that the requirement is still not proven. The technology is still to be fully proven out." He added that, to the best of his knowledge, "there isn't a single senior civilian or military official in the Department of Defense who, today, would recommend the B-70" ⁴⁹

(U) This statement was made after the departure of General LeMay, who retained an abiding enthusiasm for the RS-70. He placed the blame for failure on the erratic fashion in which the Department of Defense--presumably under Mr. Gates as well as Mr. McNamara--had supported the development effort. The program, General LeMay contended, had suffered from a succession of go-aheads, reappraisals, reversals, and budgetary ceilings that made the B-70 a "dead end program" without possibility of expansion. Thus, "when . . . you run into a technical problem . . . you go out to industry all over the country to try to get someone to help you solve it," but because of the limited funds available, "no one is interested and you don't get the proper talent." This lack of interest, he maintained, was the fault of the Department of Defense and was the reason that technical problems had dragged on for so many months before being solved. ⁵⁰

(U) The kind of crash development program desired by General LeMay had, in fact, been ruled out shortly after work began. As early as 1959, the Department of Defense had doubted that the B-70, already beset by technical problems, was a necessary addition to the strategic force. Political considerations during the 1960 Presidential campaign caused both parties to show an interest in the bomber, but once the ballots were counted, the new

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administration, like the old, began doubting its operational value. Nor did these doubts diminish when the Air Force proposed taking a B-70 airframe, with which the manufacturer was having serious difficulties, loading it with electronic sensors that the Secretary of Defense considered experimental, and calling the result an RS-70.

(U) The ultimate cause of the failure was the disbelief, shared by two administrations, that the B-70 could do a useful job. The Air Force could find no argument to refute objections based on the probable effectiveness of Soviet antiaircraft missiles against high flying bombers. If a new manned strategic aircraft was to be developed, the administration would have to be convinced that the plane could penetrate Soviet defenses and perform some essential mission better than it could be done by ballistic missiles.

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II. THE ADVANCED MANNED STRATEGIC AIRCRAFT

(6) By 1963 the RS-70 proposal was dead and the B-70 had become exclusively a research vehicle. Neither would replace the B-52, the last of which came off the assembly line the year before. The Air Force now undertook various studies to devise a manned bomber that would weather the sort of criticism that had been directed against the B-70 and its reconnaissance-strike variant. At the end of June, a Manned Aircraft Studies Steering Group (MASSG), headed by the office of Deputy Chief of Staff, Research and Development, was examining three likely possibilities: a low-altitude manned penetrator, a long-endurance aircraft, and a supersonic reconnaissance craft. MASSG eventually agreed that the low-altitude manned penetrator was most promising. In the meantime, Project Forecast, a major Air Force effort to calculate its future needs, also recommended development of an advanced manned system. The recommendations of the two groups served as the basis for an advanced manned strategic aircraft (AMSA) concept.¹

(7) The planners sought high performance at every altitude while emphasizing operations at extremely low altitudes to frustrate radar-directed anti-aircraft missiles. The new AMSA craft was expected to attain bursts of speed up to Mach 2.5 at high altitudes, Mach 1.2 when 200 feet above flat terrain, and about Mach .9 at low altitudes over rolling terrain. This versatility would stem from its variable wing and its radar. The wing would rotate into almost a delta shape for supersonic flight or extend at nearly right angles to the fuselage for takeoffs and subsonic operations. The radar would guide the plane over natural obstacles. AMSA was to possess an unrefueled

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range of 5,000 miles, of which 2,000 was to be flown at Mach .85 at sea level, be able to take off from a 6,000-foot runway, and carry both bombs and missiles.²

(●) The missile envisioned for the proposed aircraft was the short-range attack missile (SRAM). The Air Force had begun preliminary work on it in January 1963, following cancellation of the Skybolt air-launched ballistic missile. Preliminary studies indicated that SRAM would enhance the striking power of the B-52 and also be adaptable to the F-111 tactical fighter. Project Forecast concluded that this missile was the weapon best suited to a manned penetrator. When the AMSA concept emerged, SRAM was among the weapons the plane would carry.³

(U) Gen. Bernard A. Schriever, Commander of Air Force Systems Command (AFSC) and director of Project Forecast also urged a far more ambitious AMSA which would permit hypersonic flight by incorporating untested advances in aerodynamics, propulsion, and metallurgy. Its engines would be hydrogen fueled, its wings would retract rather than fold, and it would carry "hitting missiles" that would be launched from the bomb-bay. The Air Force, however, continued to advocate a less revolutionary design based on characteristics derived from MASSG and Forecast.⁴

The Request for a New Manned Bomber

(U) Before MASSG had reached a conclusion whether to recommend developing a manned penetrator, a long-endurance type capable of launching missiles, or a supersonic reconnaissance plane, the Air Force on 3 July 1963 made a routine request for the inclusion of \$25 million in the fiscal year 1965 budget in order to begin development of whichever weapon system might be selected. For this amount, the Air Force could undertake project definition,

that is, produce data on probable costs, time needed for development, and technical risks. If the results were satisfactory, it would be in a position to contract for further work.⁵

(S) On 3 September the Office of the Secretary of Defense (OSD) announced a tentative decision to make \$15 million available for project definition of a "penetrating strategic aircraft capable of operating from ZI bases." The plane would "complement the ballistic missile force in a post attack environment."⁶

(S) Influenced by these instructions, MASSG set aside the reconnaissance and long-endurance aircraft projects to concentrate on an advanced manned penetrator capable of supersonic speeds at high or low altitude. Studies showed that such an aircraft would be preferable to improved versions of the B-47, B-52, and B-58. It would also be preferable to both bomber designs of the F-111A, one with the original shape and the other with an elongated fuselage to provide more room for fuel and electronic equipment.⁷

(S) Late in October, the Deputy Chiefs of Staff, Plans and Operations, Programs and Requirements, and Research and Development--Lt. Gens. William H. Blanchard, David A. Burchinal, and James Ferguson, respectively--conferred with General Schriever at Forecast's West Coast headquarters. They compared MASSG's penetrator with the advanced precision strike system recommended by Forecast and discovered that the proposals were easily reconciled. The Air Force thus established the characteristics desired for its advanced manned bomber.⁸

(S) In the meantime, Secretary McNamara had changed his mind about beginning project definition for the advanced strategic aircraft. The

tentative fiscal year 1965 budget for research and development provided only \$5 million for the undertaking, too little to finance more than preliminary studies.⁹

(S) The Air Force tried to persuade Secretary McNamara to restore enough money to permit beginning the definition phase as quickly as possible. General LeMay was especially eager because he doubted that the B-52's and B-58's would last into the mid-1970's as Secretary McNamara maintained. The Chief of Staff advocated an immediate authorization to reprogram \$5 million of fiscal year 1964 funds in order to begin immediately on project definition. To continue development through fiscal year 1965, he urged the appropriation of \$78 million for engines, avionics, and the airframe itself. Secretary Zuckert supported General LeMay and on 4 November 1963 made essentially the same recommendation to the Secretary of Defense.¹⁰

(S) In his reply on 19 November, Secretary McNamara stated that Minute-man was more likely to survive enemy attack than was a manned bomber. He made it clear that he would not commit the Department of Defense to so expensive a program unless he received more valid justification for developing a manned system and a clearer picture of what the proposed aircraft was supposed to do.¹¹

The LeMay Proposal

(S) Despite this initial setback, General LeMay listed the proposed manned strategic aircraft as the Air Force's most important project. During a JCS meeting in late December 1963 at the Texas ranch of President Lyndon B. Johnson, the Chief of Staff advocated pushing ahead with the penetrator, which he called the improved manned strategic aircraft.¹²

(S) In describing the aircraft, General LeMay stressed its capability for foiling enemy radar and anti-aircraft missiles by hugging the earth's surface, its flexibility in comparison with ballistic missiles, its supersonic speed, and its capacity to strike with either bombs or SRAM's. The plane, he noted, would be large enough to accommodate sizeable fuel tanks as well as elaborate radar, infrared, and photographic gear. During his conversation with the President, General LeMay indicated he would again ask for authority to reprogram \$5 million in fiscal year 1964 funds in order to begin project definition. He would also seek a fiscal year 1965 budget of about \$50 million, mainly for the development of engines and avionics.¹³

(S) Following this meeting the JCS reviewed General LeMay's proposal and on 20 January 1964 recommended proceeding with both project definition and "design work . . . on long-lead-time items." But the Chairman, General Taylor, stated that he wanted further information on what the aircraft was expected to do, how many would be produced, and why the service chiefs favored a commitment beyond project definition. He supported beginning project definition but wanted to have the results of this phase before proceeding with the development of engines or other components. The data provided by the service chiefs in answer to these questions did not cause General Taylor to change his mind. In March the JCS, less the Chairman, recommended that Secretary McNamara endorse the LeMay proposal.¹⁴

(S) The Air Force, meanwhile, had drawn up a financial request for \$52 million in fiscal year 1965: \$15 million for project definition; \$26 million for advanced development of engines; and \$11 million for advanced development of an avionics system. Over the objections of Secretary McNamara,

Congress accepted this estimate in full and appropriated the requested funds. On 21 August 1964 President Johnson signed the appropriation bill.¹⁵

The Program Begins

(8) Although the Air Force had persuaded Congress to appropriate enough money for project definition, it remained to be seen whether the executive branch would release the funds or impound them, as it frequently had done with the B-70. Throughout the discussion of the USAF request for AMSA funds, Secretary McNamara had been reluctant to go ahead with the definition phase. In his opinion the Air Force had not yet produced a preliminary study that justified embarking on so expensive an undertaking. Nor did he accept the USAF argument that work had to start at once because the fleet of B-52's and B-58's would wear out in the early 1970's.¹⁶

(8) On 29 August Secretary Zuckert submitted a program change proposal that set forth the fiscal year 1965 AMSA effort and outlined what was considered necessary for the following fiscal year. He called for OSD to approve the beginning of project definition, release for that purpose \$15 million from the fiscal year 1965 appropriation, and provide \$77 million in fiscal year 1966 to continue development if the definition phase proved successful. He requested release of \$26 million for work on a propulsion system and assurance that \$30 million would be available the following year. Besides the release of \$11 million to begin avionics development, he desired \$14 million in the 1966 budget request to continue this development.¹⁷

(8) Secretary McNamara's reaction showed that he remained skeptical toward AMSA. On 21 October 1964 DDR&E approved release of \$3 million for analysis and definition of a propulsion system and \$2 million for similar

work on an avionics system. Late the following month, however, the Secretary of Defense limited the fiscal year 1965 effort to \$28 million, including the \$5 million already released. Of the year's total, \$5 million was earmarked for what he called "weapon system studies," \$7 million for avionics, and \$16 million for engines. The Secretary deferred the \$24 million balance of the \$52 million appropriation until fiscal year 1966, and indicated he would ask Congress for an additional \$15 million for that year to bring its total to \$39 million. His request for fiscal year 1967 was tentatively set at \$11 million. The Air Force acquiesced, with the understanding that project definition could be started if the weapon system studies justified such an undertaking.¹⁸

(●) Once established, the program inched forward, with limited work done in engine development, avionics, and weapon system studies. In February 1965 DDR&E released the remaining \$13 million of propulsion funds, but avionics development was slower in getting started. Work statements covering the \$2 million released in October 1964 were not approved until the following May, and not until June was the remaining \$5 million released to the Air Force. The \$5 million set aside for weapon system studies became available in May 1965, when DDR&E approved the approach proposed by the Air Force.¹⁹

(●) In the meantime, development had started on SRAM, tentatively planned for use with the F-111A and B-52 as well as with AMSA. Some confusion arose in February 1965 when DDR&E reversed his earlier decision to incorporate a radar homing device in the missile, but the delay proved slight, and the following month Secretary McNamara approved a development program. Following completion of the project definition phase, he would decide whether to let contracts for full-scale development.²⁰

Progress Remains Slow

(U) In planning for fiscal year 1966, Secretary McNamara concentrated his attention on avionics and propulsion, and postponed a decision on AMSA as a weapon system. His program for fiscal year 1966 remained what he had outlined in the fall of 1964: \$39 million, of which \$3 million was for continuation of system studies; \$12 million for avionics; and \$24 million for propulsion. Avionics and propulsion development could produce systems applicable to several tactical or strategic aircraft whereas system studies had but one purpose--to fix AMSA characteristics and specifications. Explaining his emphasis on electronics and engines rather than the integrated system, the Secretary said that he was primarily interested in retaining the option to build AMSA rather than in rushing the plane into service. He favored missiles over bombers for assured destruction but recognized that some unforeseen change might restore the manned bomber to strategic prominence and wanted "to retain the option to maintain indefinitely bomber units in our strategic offensive forces."²¹

(S) As far as the Air Force was concerned, AMSA was essential. Gen. John P. McConnell, who succeeded General LeMay as Chief of Staff on 1 February 1965, shared the view of his predecessor that AMSA enjoyed first priority within the service. Nevertheless, reductions in the previous year's program and Secretary McNamara's skepticism as to the value of AMSA were indications of further trouble to come.²²

(U) Although Congress once again seemed willing to appropriate more money for AMSA than Secretary McNamara requested, this placed the Air Force in an awkward position, for the added funds might prove to be more than it could spend to good advantage. General McConnell pointed out that the Air

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Force had sought \$52 million in fiscal year 1965 and \$121 million in fiscal year 1966, but Secretary McNamara had cut the first sum by almost one-half and had waited until late in the year before releasing the last of this reduced amount. As a result, the Chief of Staff stated that "we could not spend all of the \$121 million if it is given to us in the 1966 budget." General Ferguson, Deputy Chief of Staff, Research and Development, added that, because of the previous year's cutbacks and delays, the \$39 million--only \$15 million of it new obligating authority--in the President's budget would suffice.²³

(U) The OSD program would not permit beginning project definition during fiscal year 1966. General McConnell was willing to accept a year's delay in order to develop an engine that would improve the craft's performance. Sufficient funds, he said, were included in the budget to support propulsion development through fiscal year 1966. The Chief of Staff warned, however, that a decision on project definition could not be delayed beyond July 1966 if AMSA was to be available in time to replace the most modern of the B-52's.²⁴

(U) Despite USAF willingness to accept OSD funding plans, the Senate Armed Services Committee advocated an authorization of \$82 million for fiscal year 1966. Deputy Secretary of Defense Cyrus R. Vance advised both the Senate and House Armed Services Committees that an additional \$7 million might prove useful but \$82 million was too much for the program to absorb. A conference committee accepted the OSD recommendation and added only \$7 million to the \$15 million requested. This sum, plus the \$24 million carried over from the previous year, made \$46 million available for further studies of the overall system and continued development of its engines and avionics.²⁵

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(S) The entire \$46 million was released to the Air Force by the end of January 1966. First to be made available was the \$10 million allotted for aircraft system studies. Both the \$24 million for advanced development of engines and the \$12 million for avionics remained temporarily in reserve. In December, however, DDR&E honored the USAF request for \$7 million in avionics funds, and it released the remainder in January 1966. Also in January, DDR&E made available the \$24 million for propulsion.²⁶

(S) In the meantime, Secretary Zuckert had been trying to persuade OSD to expand the fiscal year 1967 program in order to permit contract definition, that part of the acquisition cycle that followed concept formulation.* In May he requested the addition of \$11.8 million--\$8.5 million for the aircraft and \$2.3 million for propulsion--to the \$11 million effort outlined by the Secretary of Defense. The JCS, though they did not endorse the view of the Air Force Chief of Staff that full-scale development ought to begin, also recommended adding this money. But Secretary McNamara did not approve the request, taking the position that contract definition amounted to a commitment to production. He remained unwilling to burden himself with a program about which he had serious doubts.²⁷

The Task Ahead

(S) Secretary Zuckert's successor, Dr. Harold Brown, formerly DDR&E, took office on 1 October 1965. Although the new secretary considered that funds for contract definition were inappropriate without a "decision to

*At this time Secretary McNamara's new terms for the acquisition cycle were concept formulation, contract definition, and production. Since the Air Force, and segments of OSD as well, continued to substitute project definition for concept formulation and engineering development for contract definition, descriptions of AMSA and other programs were somewhat confused.

proceed with full-scale development," on 10 October he recommended an increase in AMSA funds for the coming fiscal year. Secretary Brown believed that "additional funds can most profitably be used for engine development" since this could be applicable to other aircraft as well as AMSA, and he recommended that "some \$10.0 million be added . . . for this purpose." Secretary McNamara did not accept this proposal, which would have increased the fiscal year 1967 program to \$21 million.²⁸

Secretary Brown next reviewed the way in which the Air Force had tried to justify AMSA, and he concluded that the job had not been done well.²⁹ No one in OSD would support acquisition of a weapon system costing perhaps \$1.5 billion to develop and \$10 billion over the first decade of its operational life unless he was absolutely convinced that "all other weapon systems have been measured against it in terms of versatility and cost, as well as capability, and found wanting." A reasoned exposition of this sort would have to be made quickly, Secretary Brown continued, if OSD was to reach a favorable decision in time to permit development of a successor to the newest of the B-52's.³⁰

As civilian head of the Department of the Air Force, Dr. Brown, like his predecessor, became an advocate of a manned strategic aircraft, though not necessarily of AMSA. He told the Chief of Staff that, while the "advent of long range ballistic missiles has clearly changed--and reduced--the role of the strategic bomber in thermonuclear war," he nevertheless believed that "the strategic bomber is needed as part of a balanced missile/bomber force for the foreseeable future."³¹ What sort of bomber would fulfill this need he was not yet sure. Later, in the spring of 1966, he suggested

that two distinct types might be necessary, one for nuclear and the other for conventional war.³²

Secretary McNamara saw no urgent need for AMSA. He noted the JCS recommendation for increasing the fiscal year 1967 program but insisted that the service chiefs, save for the USAF Chief of Staff, shared his view that "commitment to full-scale development of the advanced manned strategic aircraft" should not be made at this time. Instead of doubling the amount requested, as Secretary Zuckert and the JCS had recommended, or adding the \$10 million sought by Secretary Brown, Mr. McNamara asked Congress for no more than the \$11 million in his original program.³³

(U) Adopting a course of action that he judged "more sensible" than spending large sums on AMSA, the Secretary of Defense approved procurement of a bomber version of the F-111A tactical fighter. The Air Force had requested this craft, dubbed the FB-111, as a replacement for the B-52C's through B-52F's, the older models in the Stratofortress series. But it saw AMSA, not the FB-111, as the eventual replacement for the newer B-52G's and B-52H's and the modified fighter as an interim solution to the problem of finding a new manned strategic aircraft.³⁴

(U) Secretary McNamara insisted that the FB-111 was as full-fledged a strategic system as the B-52 or the proposed AMSA. Although the converted tactical fighter would rely to a greater extent than AMSA on aerial tankers, he maintained that the FB-111 could fly far enough and carry enough weapons to threaten "a very large share of an aggressor's urban/industrial complex." The Secretary appeared to believe that modification of a plane already in production would provide an adequate manned bomber without spending the far larger sums required for AMSA.³⁵

(U) Therefore the task of convincing Secretary McNamara that AMSA was a necessary addition to the strategic force promised to be even far more difficult. During House hearings held in the spring of 1966 the Secretary observed that the design for the advanced strategic aircraft had not yet been decided upon and again raised the possibility of a long-endurance aircraft, possibly a version of the mammoth C-5 transport that was under development, armed with long-range missiles. The Secretary showed no enthusiasm for AMSA and very little interest in the manned bomber, which he considered supplementary to the ballistic missile.³⁶

(U) As in earlier years, the Air Force found support for AMSA within Congress. A subcommittee of the House Armed Services Committee, headed by Representative F. Edward Hebert, recommended adding \$11.8 million--the amount that Secretary Zuckert had requested to permit contract definition--to the \$11 million fiscal year 1967 program. The subcommittee also admonished the Department of Defense to pursue AMSA development with "interest and vigor."³⁷ The parent committee accepted this recommendation and voted to incorporate the additional funds in the House version of the annual authorization bill.³⁸

(U) This subcommittee also released testimony by General McConnell indicating that the JCS had unanimously recommended full-scale development of AMSA, something that Secretary McNamara had previously denied. The Secretary then pointed out that the JCS had made this recommendation in connection with the joint strategic objectives plan being prepared for fiscal year 1968, not the fiscal year 1967 budget, in order to preserve the option of developing AMSA with an initial operational capability in fiscal year 1974. He declared that they erroneously believed that they had to choose at the time between all-out development and no further development, and they had chosen

the former in order to have a design available in case a manned bomber should be needed. The Secretary maintained, however, that a decision to pursue development could wait until September 1966 without jeopardizing this target date, or even later if a postponement was acceptable. He stated that the erroneous belief of the JCS was attributable to a poorly written OSD directive.³⁹

(U) After this explanation Representative Hebert told the press that the Secretary had shown not only a "willingness to admit he was wrong" but also "an open mind on the manned bomber." Mr. Hebert expressed confidence that Secretary McNamara would permit work on AMSA to proceed and that Congress would approve for fiscal year 1967 the \$22.8 million program recommended by the Air Force, the JCS, and his own subcommittee.⁴⁰

(U) Mr. McNamara's explanation was not a commitment to develop AMSA. His final decision would probably accompany presentation of the fiscal year 1968 budget request. Proponents of AMSA had roughly until the fall of 1966 to persuade Secretary Brown that this particular design suited USAF needs and Secretary McNamara that AMSA was the best replacement for the B-52 and eventually for the FB-111.

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III. THE FB-111

(U) The sluggish course of the AMSA program, together with a possibility that the older B-52's would give way to structural strain earlier than expected, started the Air Force looking for an interim manned bomber. As early as the spring of 1963, DDR&E showed an interest in the F-111A for this role, but the Air Force debated for almost a year before recommending its use to fill the gap that otherwise would occur between phase out of the older B-52's and procurement of AMSA.

(S) The F-111 (TFX--Tactical Fighter Experimental: the name used during the design competition) was an attempt to meet the tactical fighter requirements of both the Air Force and the Navy with a single aircraft. In June 1961 Secretary McNamara directed the Air Force to proceed with an air superiority fighter for both the Air Force and the Navy. He hoped to save over \$1 billion by standardizing on one plane. More than a year later the Secretary decided that the USAF version, the F-111A, would have an air-to-ground mission as well. The Navy F-111B would be used as a long-range fleet air superiority weapon.¹

(S) The most advanced feature of the F-111A was the variable geometry wing, which could be held forward for takeoff and landing at low speeds and swept back for high speeds in flight. This aeronautical development, plus improved engines, made possible the development of a fighter that could operate effectively at high or low speeds from carriers as well as from shorter and cruder runways. This two-engine, two-pilot plane would have a

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combat operating radius of 800 nautical miles, a combat ceiling of 62,600 feet, a maximum speed of 1,434 knots, and be able to dash 165 nautical miles to a target at a speed of Mach 1.2. The F-111A made its first flight on 21 December 1964 and first moved its wings in flight on 6 January 1965.²

Getting Off the Ground

(U) Among the first to consider using the F-111A as a strategic bomber was Dr. Brown, then DDR&E. In May 1963 he suggested to a House subcommittee that, with aerial refueling, the plane could provide "a limited bombing capability particularly because the airplane can go in fast and low, which would make it relatively invulnerable to surface to air missiles." He was careful to point out that "SAC people and General LeMay would not consider this a genuine strategic bombing capability, and I am not offering it as a full-scale replacement for any of our present strategic bombers."³ In 1963 General Power, CINCSAC, requested an interim bomber that could serve until some advanced aircraft joined SAC's bomber force. At this time he favored resuming B-58 production, which had ended late in 1962, and procuring 250 of these supersonic bombers. This suggestion led to USAF consideration, along with the B-58 and several other craft, of two possible bombers based on the F-111A design. One of these retained the size and shape of the F-111A; the other had an elongated fuselage to accommodate additional fuel tanks as well as electronic equipment not normally found in a fighter. According to the Manned Aircraft Studies Steering Group,* which used data provided by General Dynamics, neither modification of the F-111A--nor, for that matter, an improved B-58--was as well suited to strategic operations as a low-altitude penetrator especially designed for the purpose.⁴

*See p 20.

(U) Meanwhile, General Dynamics was at work on a strategic version of the F-111A. In November 1963 the corporation offered for USAF consideration two models that were basically those studied by MASSG. Either could carry 10,495 pounds of ordnance but one had two sections totaling 101 inches inserted in the fuselage to increase fuel capacity and thus extend range.⁵

(U) After examining the proposal, Dr. Alexander H. Flax, Assistant Secretary of the Air Force (Research and Development) concluded that, although the technical assumptions seemed reasonable if somewhat optimistic, "the nature of the effort to convert the F-111A to a . . . SAC airplane is underplayed and the estimates of costs are undoubtedly too low." He recommended, however, a series of wind tunnel tests, which the Air Force undertook, funding it separately from F-111A development.⁶

(U) Opinion varied widely on the likely value of an F-111A bomber. General LeMay, while still Chief of Staff, felt that the plane would prove inadequate for strategic missions. In the spring of 1964 he told a Senate subcommittee that its main trouble was "that it is a small airplane and will not carry the things you need to penetrate modern defenses and still have enough range" ⁷

(U) Dr. Brown, as DDR&E, was more hopeful. On the strength of studies then in progress, he felt that the plane could be modified to carry out satisfactorily those strategic tasks that did not require an enormous payload. "If you are talking about a low-level reconnaissance job," he explained, "or a mop up job, you may be able to do it with a lengthened TFX." He conceded that a tactical fighter "was not perhaps of intercontinental range," but he held that a lengthened F-111A could nevertheless be used as a strategic bomber "since with one refueling it gets in the intercontinental class." ⁸

As time passed, the Air Force tended to accept Dr. Brown's view. Early in 1964, Maj. Gen. Jack Catton, Air Staff Director of Operational Requirements, urged General Power to direct a study of the F-111A as a strategic aircraft. In time, SAC planners concluded that a modified fighter would be superior to the B-58. General Power, concerned because the AMSA program was moving so slowly, came to advocate F-111's for SAC in order to keep a trained organization intact as a nucleus of a bomber force that could be expanded as necessary to meet any future emergency.⁹ He sought General LeMay's approval for procurement of a modified F-111A as an interim strategic bomber. The Chief of Staff rejected the recommendation, probably because of his concern lest an F-111 bomber program divert interest from AMSA--an undertaking he considered vital.¹⁰

(U) Although the Air Force did not request development of a bomber version of the F-111A, it continued--along with OSD and General Dynamics--to examine the feasibility of such a step. Roger Lewis, president of General Dynamics, tried unsuccessfully to interest the Air Force in taking an F-111A that was currently being assembled, stretching the fuselage, adding a fuel tank that would increase capacity by 69 percent, and strengthening the landing gear to support the added weight. He claimed that this modified F-111A would fly 2,000 miles without refueling at a sustained speed of Mach .9 at sea level.¹¹

The Office of Secretary of Defense finished its study early in January 1965 but made no recommendation whether to build the plane. The study merely offered additional data on the comparative costs and performance of the F-111A, B-58, and B-52 and on the cost and effectiveness of a force of 200 F-111A bombers.¹²

(b) In the meantime, an ad hoc group, headed by General Catton and made up of representatives of the Air Staff and SAC, had investigated whether a modified F-111A could replace the B-52. The group concluded that the F-111A could provide the basis for a plane that could take the place of the B-52C's through B-52F's. The aircraft that they recommended would have a stretched fuselage to accommodate additional fuel tanks, more complex avionics, and a crew of three or four.¹³

(c) In March 1965 General Schriever, AFSC Commander, called for caution in charting the course of F-111A modification. He warned that "it is highly unlikely that we can obtain authority to pursue both a B-111 development and an AMSA development at the same time," although the Air Force could probably buy an F-111A with minimum modification without endangering AMSA. He concluded that, despite the peril to AMSA, "we might do best" to seek a "full growth version . . . of the B-111 which would incorporate the AMSA engine technology and avionics" and would serve as a "valid aircraft for the strategic fleet" from 1972 until the development of a "manned hypersonic vehicle in the 80's." What General Schriever feared was that the Air Force might try to "go for a B-111 with an IOC [Initial Operational Capability] of 1970" and saddle itself with "the worst possible compromise," an aircraft that was "neither . . . a tactical fighter nor a satisfactory bomber."¹⁴

(d) But the procurement of a minimum modification version also had attractive advantages. According to the judgment of the command that would be using it, the F-111A "could perform the SAC mission in its present configuration." With minimum modifications, this would "provide the earliest available aircraft system." Some alterations, however, were "strongly desired," such as an improved bombing-navigation system, a "quick reaction

launch capability," and a homing beacon to help the bomber and its tanker rendezvous for refueling.¹⁵

(U) Time and money also were key considerations in deciding which version of the F-111A would best serve SAC's requirement for an interim bomber. AFSC revealed that an enlarged model with three or four crewmen would require costly and time-consuming revisions in the basic design. Stretching the fuselage would set in motion a chain reaction of modifications that would include, among other things, a new crew escape module, a new engine and fuel system, and extensive changes to the "glove" into which the variable wing rotated.¹⁶

(S) These factors influenced the deliberations of an Air Staff strategic study group, upon which both AFSC and SAC were represented. This group recommended that the Air Force replace the B-52C's through B-52F's with a minimum modification F-111A, and General McConnell, now Chief of Staff, approved the preparation of plans to this effect. The deputy chiefs of staff involved in this planning counseled against making a formal request to replace the older B-52's with F-111A's until B-52 life expectancy had been reassessed. For the time being, no formal request was made.¹⁷

(S) The results of this reassessment of B-52 structural soundness were far from heartening. The Air Force Logistics Command (AFLC) advised SAC that studies, based on data provided by the manufacturer of the B-52, indicated that life expectancy of the C through F models could be as much as three-and-one-half years shorter than previously believed. This disclosure gave added urgency to the acquisition of an interim bomber, for the cost of shoring up the structural members of these older planes appeared prohibitive.

The Designated Systems Management Group (DSMG) of the Air Force recommended an emergency program costing \$117 million for major modification of the wing and fuselage of these older B-52's.

Secretary McNamara subsequently placed the cost of keeping the entire current bomber fleet--all types of B-52's and the B-58's--in the operational inventory through 1975 at approximately \$17 billion.¹⁸

The FB-111 Program

(U) The FB-111 program began taking shape in April 1965 when General McConnell informally suggested to Secretary McNamara the replacement of 345 B-52C's through B-52F's with 210 FB-111's. Subsequently, the Chief of Staff testified before a House subcommittee that the proposal to substitute FB-111's at a two-for-three ratio was his own, not Secretary McNamara's, and had resulted from consultations with the Air Staff. He had never considered substituting FB-111's on a one-for-one basis, even though General John D. Ryan, General Power's successor as CINCSAC, had desired a far larger number of FB-111's than the 345 B-52's he was giving up.¹⁹

(U) General McConnell explained that the program was "based on cost to start with." He apparently based the size of the proposed force on his belief that OSD would insist that the cost of FB-111 development and procurement be offset as far as possible by money made available because of the retirement of the aged B-52's. The Chief of Staff estimated that \$510 million could in this fashion be applied to the FB-111 effort. Aside from cost, other factors were

the greater flexibility of the FB-111, its ability to carry 50 750-pound bombs and its "higher performance characteristics," as well as a need to "get some people out of the B-52 force, to put them into the rest of the forces that were being expanded." These men could, for example, serve in the Tactical Air Command (TAC) or in the Military Airlift Command (MAC).²⁰

(c) The Air Force formally presented its FB-111 program on 2 June 1965. The objective according to Secretary Zuckert, was to devise "a satisfactory hedge against catastrophic structural failure of the B-52." For this purpose the Air Force had selected a minimum modification version of the F-111A, "principally because of its early availability." The first of the 210 new bombers would become operational during fiscal 1959. Secretary Zuckert acknowledged that the Air Force preferred the "increased capability" of an enlarged aircraft but not at the higher cost in time and money. The Assistant Secretary of the Air Force (Research and Development) estimated that each stretched model would cost at least \$5.4 million, some 15 percent more than one with minimum modifications.²¹

(c) The Air Force proposed to obtain FB-111's by increasing the number of aircraft produced each month and at the same time reducing the number destined for TAC. Instead of 18 tactical aircraft per month, General Dynamics would turn out 21 aircraft of which 9 would be bombers. TAC would surrender 3 wings so that SAC could receive a total of 263, including spares and other aircraft.²²

(S) The FB-111 program also had to mesh with plans for retiring the B-52. The Air Force selected fiscal year 1969 for introducing the first of the new bombers into the operational inventory. It planned to begin phasing out the older planes in fiscal year 1968 by eliminating 3 of the 23 squadrons that year, and to finish the job in fiscal year 1971 by scrapping the last 4 squadrons. In contrast, Secretary McNamara favored beginning the phase out in fiscal year 1966, a course of action that the Air Force opposed.²³

(S) The Secretary of Defense soon inclined somewhat toward the USAF view. He devised a timetable that delayed the beginning of the phase out until fiscal year 19⁶7, when eight squadrons would be discarded. The Air Force counseled against retiring any B-52's during that period because of the fighting in Vietnam, but the Secretary of Defense persisted in his plan. In November 1965, however, he decided for technical reasons to delay the FB-111 program by some six months. The Air Force as a result recommended postponing the maximum impact of the B-52 phase out, and the Secretary agreed to adjust the schedule.²⁴

(U) While the program of B-52 retirements was being worked out, Secretary McNamara decided to retire the entire B-58 force of 80 bombers by the end of fiscal year 1971. The Air Force had not recommended this reduction, but General McConnell indicated he was not particularly troubled by it. He maintained, and the JCS agreed, that time enough remained before the planned retirement date to review the decision and either accept it or argue against it.²⁵

() As a result of these exchanges of views among his office, the Air Force, and the JCS, Secretary McNamara in December 1965 decided upon the following program:²⁶

Weapon	Unit Equipment End of Fiscal Year					
	1966	1967	1968	1969	1970	1971
B-52G-H	255	(Unchanged through 1973-1974.)				
B-52C-F	345	300	255	180	75	0
B-58.....	80	78	76	74	72	0
FB-111.....	15	105	210	(Planned maximum.)		
KC-135.....	620	(Unchanged through 1973-1974.)				
Hound Dog.....	540	540	520	520	520	350
SRAM & B-52 (None planned.)						
SRAM & FB-111.....	150	450	(Planned maximum of 525 at end of fiscal year 1972.)			

Compared with the most recent USAF proposal, this program reflected a reduction in the number of SRAM's--the Air Force had wanted 900 for the newer B-52's and a maximum of 988 for the FB-111--and a sizeable cutback in the number of FB-111's from the 60 recommended by the Air Force for fiscal year 1969 and the 150 sought for the following year.

() While the Air Force was estimating detailed program costs, it asked on 28 September 1965 for the release of \$25.2 million of fiscal year 1966 funds for FB-111 research, development, test, and engineering (RDT&E). Of this amount, \$11.5 million would be used for items--airframe engineering, tooling, and others--that required long lead time. Dr. John S. Foster, Jr.,

who became DDR&E on 1 October, replied that the year's emergency funds could provide \$8.7 million for what was "most urgently needed within the \$11.5 million requested." He said that the Air Force would have to reprogram from its own resources to locate the remaining \$16.5 million of its estimated RDT&E needs for the fiscal year. The Air Force then submitted to Dr. Foster an analysis of where the money would come from, and he approved it late in November.²⁷

(U) The proposed system package for fiscal year 1967, submitted by the Air Force late in October 1965, called for the expenditure of \$44.6 million for FB-111 development and \$39.7 million for SRAM, or a total of \$84.36 million. Dr. Foster wanted to cut the FB-111 request to \$21.6 million so that the aircraft and missile would become operational at nearer the same time. Still another delay was unacceptable to the Air Force. Secretary Brown argued that the squadron or so of FB-111's that would enter service before SRAM could serve a useful purpose without the attack missile. Moreover, when SRAM did appear, the planes would require only a minor modification, the installation of a computer, to accommodate the weapon. Secretary Brown therefore recommended keeping the program on schedule. Secretary McNamara accepted the USAF argument and increased Dr. Foster's sum to \$71.7 million, \$40.9 million for the FB-111 and the rest for SRAM. The total request by Mr. McNamara for FB-111 development and procurement during fiscal year 1967 was \$202 million, excluding SRAM RDT&E.²⁸

Early Problems

(U) Scarcely had the FB-111 program started when the first problems appeared. Some were purely technical and centered upon substitution of more

advanced avionics equipment for that specified originally. Others stemmed from conflicting USAF and OSD views concerning the capabilities of the new craft.

(S) The principal technical question that had to be resolved was, whether it was worthwhile to retard the rate of FB-111 production in order to incorporate the versatile and highly automated Mark II avionics system. The system was equally suited to aerial warfare, close air support, or interdiction. It featured such capabilities as all-weather navigation, automatic terrain following, automatic visual or all-weather weapons delivery, and electronic countermeasures. OSD favored delay; the Air Force opposed it.²⁹

(S) In November 1965 Dr. Foster maintained that the delay, which would be about six months, was worthwhile since it would result in a more effective weapon system at slight technological risk. The Air Force, however, opposed any delay unless the scheduled retirement of the B-52 fleet was adjusted to compensate for it. Secretary McNamara accepted the USAF objection, slowed the pace of B-52 retirements, and approved a reduction of from 33 to 10 in the number of FB-111's to be procured during fiscal year 1967. The schedule continued, however, to call for the attainment of an initial operational capability--one FB-111 squadron--during fiscal year 1959.³⁰

(S) CINCSAC's objection to delay could not be satisfied so easily, for it involved the basic purpose of the program. On 16 January 1966 General Ryan challenged the recent decision by pointing out that holding up production to accommodate improved avionics was out of harmony with the intent underlying the program, which was to provide an interim bomber as quickly

and with as little modification as possible. He recommended going ahead on schedule; when Mark II was ready, it could be incorporated in aircraft that were being assembled and retrofitted in those already in service.³¹

(U) The Secretary of Defense did not rescind his decision to delay the program. In December he had charged the Air Force "to coordinate and direct the FB-111A, Mark II, and SRAM programs so that the FB-111A will be produced with a modified Mark II avionics system . . . , the maximum commonality [will exist] between the Mark II for the F-111A and the Mark II for the FB-111A, [and] the SRAM program [will] be compatible with the new FB-111A avionics system." In February 1966 the Air Force contracted for definition and cost identification of a single avionics package, Mark II, for both the tactical and strategic versions of the F-111A.³²

(U) Another possible modification under discussion during the spring of 1966 was the use of an engine-afterburner combination being developed by the Navy for possible use in an improved F-111B. This power plant could provide improved takeoff characteristics, faster acceleration to Mach 2, and other features of benefit to a strategic bomber. It was not as far along in its tests, however, as the engine that powered the F-111A and was slated to power the bomber version. At this time, a change seemed unlikely.³³

(U) Far more serious than these technical questions was the conflict between Secretary McNamara and the Air Force concerning the capabilities of the FB-111. In outlining the plane's characteristics, Secretary McNamara said that the "range of the FB-111A, on a typical nuclear mission," would exceed that of the B-58, SAC's only operational supersonic bomber, as well

as that of the early model B-52's. "I believe from this comparison alone," he concluded, "that the FB-111 is not a stop-gap aircraft but is, indeed, a truly effective strategic bomber." ³⁴

(U) The USAF position on the FB-111 contradicted this view. General McConnell acknowledged that the plane "could serve usefully in the Strategic Air Command for a period of time to replace the C through F series B-52's." But he declared that the plane was too "range limited" and therefore too dependent on oversea bases. And it was unable to carry enough ordnance to "do the job we have in mind for the Advanced Manned Strategic Aircraft," which would be a "total replacement" for the entire B-52 fleet. Secretary Brown stated in February 1966 that the FB-111, although superior in speed and avionics to the older B-52's, was "too small to replace the G's and H's." To General Ferguson, Air Staff chief of research and development, the FB-111 was a "stopgap airplane" that could "do some of . . . the manned strategic aircraft job." ³⁵

(U) Secretary McNamara also differed with USAF leaders over the value of manned bombers and the number of them that should be assigned to the nation's strategic retaliatory force. On 14 February 1966 he told a House subcommittee that, according to OSD calculations, bombers had a poorer cost-effectiveness ratio than intercontinental missiles when employed for the assured destruction of priority targets. This statistical judgment, the Secretary maintained, would hold true unless missile reliability skidded to half what DOD analysts expected it to be. Should Soviet bomber defenses improve, he estimated that missile reliability would have to decline to 30 percent of the assigned figure before manned aircraft could contribute enough to the strategic force to justify using them against targets formerly covered

by missiles. Since estimates of missile reliability seemed unlikely to go so far astray, he did not consider manned bombers as good a form of strategic insurance as additional missiles would be.³⁶

(U) Secretary McNamara therefore intended to retain only a few hundred bombers, enough to supplement the intercontinental ballistic missiles. In this supplementary role, he noted, bombers "can force the enemy to provide defense against aircraft as well as missiles," an undertaking "particularly costly in the case of terminal defenses." Since missile defenses were unable to cope with aircraft and anti-aircraft weapons were useless against ballistic missiles, Mr. McNamara believed that the United States, by postponing until the moment of the retaliatory strike the decision whether to destroy a particular target with bombs or missile warheads, could force the enemy "to 'waste' a large part of his resources" on defenses that he could not use.³⁷

(U) The Air Force, in contrast, looked upon manned aircraft as an integral and important part of the retaliatory force. As the Chief of Staff stated in the spring of 1966, "balanced mix of ballistic missiles and bombers" was necessary to "maintain high confidence in our nuclear deterrent posture and provide a source of long range, all weather capabilities useful at any level of conflict to support our national military objectives." Whether this view could be reconciled with those held by Mr. McNamara remained to be seen.³⁸

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GLOSSARY

Acft	Aircraft
AFCHO	Air Force Historical Division Liaison Office
AFLC	Air Force Logistics Command
AFSC	Air Force Systems Command
AMSA	Advanced Manned Strategic Aircraft
Analys	Analysis
ARDC	Air Research and Development Command
ASD	Aeronautical Systems Division
Asst	Assistant
Atch	Attachment
Br	Branch
CINCSAC	Commander in Chief, Strategic Air Command
CJCS	Chairman, Joint Chiefs of Staff
Comdr	Commander
Compt	Comptroller
Cong	Congress
CSAF	Chief of Staff, U.S. Air Force
CSAFM	Chief of Staff, U.S. Air Force, memorandum
DCS	Deputy Chief of Staff
DDR&E	Director of Defense Research and Engineering
Dep	Deputy
Dev	Development
Dir	Director
Div	Division
DOD	Department of Defense
DSMG	Designated Systems Management Group
Exec	Executive
FY	Fiscal Year
Gen	General
Hist	History
Incl	Inclosure
IOC	Initial Operational Capability
JCS	Joint Chiefs of Staff

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GLOSSARY (Cont'd)

Ltr	Letter
MAC	Military Airlift Command
MASSG	Manned Aircraft Studies Steering Group
Memo	Memorandum
Mgt	Management
Msg	Message
n.d.	No Date
No	Number
Ofc	Office
Op	Operation, Operational
OSAF	Office of Secretary of the Air Force
OSD	Office of Secretary of Defense
PCP	Program Change Proposal
Pt	Part
R&D	Research and Development
RDT&E	Research, Development, Test, and Evaluation
Rprt	Report
Rqmts	Requirements
SA	Secretary of the Army
SAC	Strategic Air Command
SAF	Secretary of the Air Force
SECDEF	Secretary of Defense
SECNAV	Secretary of the Navy
Secy	Secretary
SRAM	Short Range Attack Missile
Strat	Strategic
Subj	Subject
TAC	Tactical Air Command
Telecon	Telephone conversation
VCS	Vice Chief of Staff
Vol	Volume

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