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Air Defense in the Nuclear Age:
The Post-War Development of American and Soviet
Strategic Defensive Systems

A thesis presented

by

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I N T R O D U C T I O N

In a speech at Ottawa on November 14, 1953, President Eisenhower stated:

You of Canada and we of the United States can and will devise ways to protect our North America from any surprise attack by air....Our security plans must now take into account Soviet ability to employ atomic attack on North America....

This was the first (and only) official public announcement of the U. S. decision to undertake continental defense on a major scale -- a decision reached after almost seven years of domestic debate regarding the "hows" and "what fors" of defense in the nuclear age. During the next five years, more than \$12 billion was spent on this program. Indeed, by January 1958, the Air Force Chief of Staff could complain that "the active air defense is a can of worms..., there are so many different kinds of weapon systems."¹ None of them, however, was the least bit effective against the incipient ICBM threat which had made an abrupt appearance in late 1957. Nevertheless, U. S. bomber defense programs continued well into the ballistic-missile age, with cumulative 1946-66 expenditures reaching approximately \$40 billion.

¹Testimony of General Thomas D. White, Hearings, U. S. Senate, Subcommittee of the Committee on Armed Services, Inquiry into Satellite and Missile Programs, (Part II), 85th Cong., 2nd Sess., January 1958, p. 1539.

Part I of this study will examine the evolution of the U. S. active air defense posture between 1946-66. Active defense shall be defined as those military programs designed to destroy attacking aircraft and missiles after being launched from their bases, plus the associated warning, command, control, and communications equipments and organizations. And the specific examination of this evolution in Section C of Chapters 1-3 will consider, in turn, the roles and missions aspect (i.e. the organization and definition of air defense responsibilities among the services); the research, development, and procurement of the systems themselves; and finally, the deployment of the systems and the operational capability of the overall posture. Accordingly, only minimal attention will be paid therein to other "damage-limiting" programs such as: counterforce offense to destroy pre-launched enemy forces; passive defense measures to reduce the vulnerability of population or property to the effects of delivered weapons; national intelligence programs; and theater force defense.

As background for this discussion, Section A of Chapters 1-3 shall be a review of the "signals" of strategic offensive capability and intent received from the Soviet Union, e.g., authoritative statements, studied disclosures of new weapons, redeployment of forces, and other less self-conscious indicators of quantitative and qualitative improvements in Soviet

strategic weapons systems. Section B will then discuss how these signals were perceived in the U. S. and the apparent effect of these perceptions on the developing defensive posture.

The principal questions which Part I seeks to answer are (1) to what degree is the evolution of U. S. air defense explained as a series of actions/reactions in a strategic "dialogue" with the USSR, (2) were there other U. S. factors, biases, and influences which operated to muffle or amplify significantly the reception of these Soviet signals and distort their feedback upon the defensive systems development, (3) to what extent can the evolving U. S. air defense posture be explained as a series of purely domestic bureaucratic decisions which bore no perceptible relation to the changing Soviet threat, and (4) what were the values of air defense perceived to be within the context of America's overall strategic deterrence policy. Part II will consist of a similar undertaking -- but in somewhat less detail -- for the evolution of air defense in the Soviet Union between 1946-60.

PART I
AIR DEFENSE IN THE
UNITED STATES : 1946 - 66

CHAPTER 1

AIR DEFENSE IN THE TRUMAN ERA:

1946-52

Section A. Stalinist Signals of Strategic Offensive Capability and Intent

The post-World War II Stalinist regime in its published military doctrine limited its air forces to the traditional role of supporting ground forces, and belittled the effectiveness of nuclear weapons. Stalin emphasized that any future capitalist-socialist war would bring victory to the USSR by virtue of her non-air-atomic "permanently operating factors" which included the stability of Russia's home front, the morale of her armed forces, the ability of her commanders, and the quantity and quality of her army divisions. Further, the USSR military press would often exhort that the Soviets would not be led to initiate war simply because they could achieve surprise, for it was not in itself considered decisive. In addition to such traditional defensive doctrine, Stalin's "peace movement" was launched in the early post-war years overtly to propagandize Russia's defensive intentions to Western European nations and the "Third World".

These declarations were also matched by demonstrations of Soviet emphasis on the development of defensive weapons systems. The USSR displayed new Mig-15 jet fighter aircraft

on Aviation Day 1947, and many more soon appeared over the Moscow and East German skies. The unexpectedly large numbers of Migs which the Soviets put into combat in Korea reinforced the image of USSR air power as being predominately defensive-oriented.

If such signals manifested no military threat to the continental U. S., there were other indications of an incipient Soviet offensive air-atomic capability which, in the context of the evolving Cold War, appeared more ominous to American security. On May Day 1948, there was a fly-by of several long-range Tu-4 bombers developed presumably from the U. S. B-29 which had been impounded following a forced landing in the Soviet Far East toward the end of World War II. Further, hastily taken photographs of the 1951 Red Army Day fly-past revealed a plane bigger than the Tu-4, with an aerodynamic structure that could lead to the conclusion that it was an intercontinental B-36 type, with turboprops for speedy attack at low as well as at high altitudes. With these aircraft, the USSR apparently began regular reconnaissance flights of U. S. air borders during the Summer of 1952. The missions came from Soviet Kamchatkan and Arctic bases, and reconnoitered Alaska, Northern Canada, and Greenland.¹

¹Reported by Joseph and Stuart Alsop, New York Herald Tribune, March 17, 1953, p. 1.

Of course, the principal demonstration of Stalin's efforts to develop a strategic offensive air capability occurred in September 1949, with the first recorded Soviet atomic explosion, several years ahead of most Western predictions.²

Nor was offensive naval power being neglected. Intensive Soviet firing trials of improved V-2 type rockets from submarines in the Baltic were reported in 1950 and 1952.³

From the background of such disclosures of offensive capability, it becomes relevant to examine the Soviet doctrinal pronouncements regarding the contemplated use of such air power in any future war. Russian military writing seems to reveal little belief in the efficacy of mass

²Soviet interest in a nuclear capability was revealed implicitly by Andrei Gromyko in a speech on May 19, 1947, which strongly hinted that the U. S.' atomic monopoly was on the verge of collapse; and by Foreign Minister Molotov who boasted on November 6, 1947 that the "secret of the atom bomb...has long ago ceased to exist." Further, Arnold Kramish in his Atomic Energy in the Soviet Union (Stanford, 1959) has shown that there was sufficient information published in Soviet journals prior to 1943 to indicate (had it been evaluated thoroughly by the West) that the USSR was abreast of the West in nuclear physics up to 1941 and only slightly behind when they resumed work in 1943. See, especially, Chapter 2.

³Air Chief Marshal Sir Philip Joubert, "Long Range Air Attack," in Asher Lee (ed.), The Soviet Air and Rocket Forces (New York, 1959), p. 109; and Asher Lee, "Trends in Aerial Defense," World Politics, VII (1955), p. 246.

destruction as a method of warfare. Moreover, the Communist concept of war has always been keyed to the class struggle. The proletariat of an enemy state represents, hence, an ally of the USSR (cf. the mutinies in post-World War I Germany); and, in this sense, the bombing of industrial areas and cities would represent a negative strategy -- one which might rob the USSR of the assistance of a subversive Fifth Column within an enemy country. The Soviets believe, additionally, that the defeat of the enemy requires the annihilation of his armed forces. Thus, "the long standing Soviet view [since 1946]...clearly places primary emphasis on counterforce strikes against Western nuclear delivery systems."⁴

In summary, the Stalinist signals of strategic offensive capability and intent were ambiguous on face value. The dictator's post-war defensive systems production and "peace movement" overtures, coupled with a military doctrine built upon the fundamental strength of the Red Army, could be contrasted markedly with his concerted effort after 1949 to develop a strategic offensive force capable of intercontinental attack. It is how these signals were perceived in the United States that we shall next consider.

⁴Raymond L. Garthoff, Introduction to Military Strategy: Soviet Doctrine and Concepts, edited by Marshal V. D. Sokolovsky (New York, 1963), p. xv. See, also, Garthoff's "Air Power and Soviet Strategy," Air University Quarterly Review, IX (Winter 1957-58), pp. 91-94.

Section B. Domestic Perceptions of the Soviet Threat

During the 1946-52 period, the USSR's strategic air-atomic capability was perceived in the U. S. to be not sufficient enough to require the development of a continental air defense system. The general public had no clearly structured system of thinking about even the rudiments of atomic energy. The Truman Administration assumed that American security depended principally upon restoring the balance of power in Europe and balancing the budget at home. The scientific community in the main urged the politically unrealistic dispersal of cities and industries as "the most important if not the only answer to the threat of atomic aggression".⁵ And the military, albeit torn by inter-service disputes, could agree that "no plans for defense should be made in derogation of the striking offensive air arm in being."⁶ Each of these domestic factors deserves amplification. In combination they acted to move the U. S. toward an underestimation of the potential Soviet offensive threat to North America,

⁵Eugene Rabinowitz, "The Only Real Defense," Bulletin of the Atomic Scientists (BAS), VII (September 1951), p. 242.

⁶Survival in the Air Age, the Report of the President's Air Policy Commission (The Finletter Report), reprinted in Air Force, XXXI (March 1948), p. 17

and away from a significant consideration of active air defensive requirements.

1. The American Public

To be sure, it is natural to expect that in the early post-World War II years, the American people -- geographically protected from intercontinental attack and psychologically conditioned by a lack of tragic experience which seemed to outweigh any Pearl Harbor traumas --- should clamor for demobilization and the return to peace as the "normal" pattern of relations among states. Further, so long as any potential enemy had only TNT bombs, America's World War II experience could readily be used to diminish the perceived seriousness of the air threat. During the war, the U. S. dropped thousands upon thousands of TNT bombs and only slowly weakened the enemy's will and capacity to continue the conflict. Besides, the shuttle-bombing of the sort that was done from bases in Britain against targets in France and Germany was much easier to conduct than intercontinental bombing such as would have to be carried out against the United States.

But, in addition, the public was quite uninformed and unimpressed by the potential loss of the U. S. atomic monopoly. What little public discussion there was of the issue prior to 1949 overemphasized the technical difficulties of making a nuclear weapon by suggesting that a balanced

industrial system was required; and underestimated the Soviets' capacity to make progress in specific areas of research by concentrating their resources and ignoring such things as consumer goods.

Even after the unexpected Soviet explosion in September 1949, popular perceptions of the seriousness of the air-atomic threat shifted only slightly. Americans continued to rely on their quantitatively superior nuclear stockpile, and were buoyed by such statements as that made by General Omar Bradley, Chairman of the Joint Chiefs of Staff: "For an industrially backward country the problem of making an atomic bomb is not so difficult as the problem of turning it out in quantity and delivering it."⁷ On the political plane, moreover, the U. S. took "refuge in a mythological world peopled by traitors, conspirators and counterrevolutionary liberators."⁸ If the Soviets had the bomb, they got it only by stealing American secrets. Stop

⁷"This Way Lies Peace," Saturday Evening Post, October 15, 1949, p. 170.

⁸Henry Morgenthau, "The Political and Military Strategy of the U. S.," Bulletin of the Atomic Scientists, X (October 1954), p. 323. Cf. Walter Marseille, "Negotiation from Strength," BAS, XI (January 1955), p. 15: "The Communist threat is perceived not so much as an external danger but as a sacrilegious attempt upon the inner sanctums of American life. Therefore, it appears so unnatural and so immoral that it must be doomed to remain unsuccessful except in case of our own moral failure." See, also,

the security leaks and the USSR would quickly fall behind in the arms race.

This general attitude of the public with regard to the air-atomic threat after 1949 can be attributed to a variety of factors: suppression of fear, feelings of impotence (what can I do about it?), and, most importantly, to the ambiguity of the atomic energy stimulus. Lay critics emphasized the inhumanity of the bomb and held out the hope of UN reconciliation of basic Cold War differences or Soviet acceptance of the Baruch Plan. Some traditionalist Western strategists (echoing Stalin) emphasized the bomb's ineffectiveness as a decisive weapon.⁹ Some journalists stimulated a "no place to hide" mentality, while the "one-or-two-bombs-and-it's-all-over" school of military analysts seemed to dominate the editorial pages of many American newspapers.¹⁰ And the generals, admirals,

E. Donovan and S. B. Withey, "Some Attitudinal Consequences of Atomic Energy," Annals of the American Academy of Arts and Sciences, CCXL (November 1953), pp. 108-117.

⁹ Especially influential was P.M.S. Blackett's, Fear, War and the Bomb (New York, 1949), pp. 1-9, 39-72. It was even estimated that against certain types of resistant targets of concrete, the A-bomb might be less effective than a series of armor-piercing bombs. See Asher Lee, Air Power (London, 1955), p. 20 ff.

¹⁰ An observation made by Carl Kaysen, "Military Importance of the Atomic Bomb," Bulletin of the Atomic Scientists, V (December 1948), p. 343.

and scientists debated about possible attrition rates by air defense to the degree that some systems to reduce potential destruction which were then technically and economically feasible tended to become lost within the cacophony.¹¹

The range of public debate on strategic air-atomic issues at this time can be manifest by the following appraisals made by two eminent scientists which appeared simultaneously in the U. S.:

There is no defense against the atomic bomb. There can be no effective interception of the bombing aircraft despite radar screen, guided missiles and supersonic fighters;¹²

.

Great bombers are essentially fragile instruments, relatively lumbering in their flight and incapable of surviving modern defensive action. Penetration of hostile skies has become an appalling task for any bomber fleet.¹³

Finally, it will be recalled that, in January 1953, ex-President Truman publicly announced, "I am not convinced Russia has the atomic bomb....I am not convinced the Russians have achieved the know-how to put the complicated

¹¹This point will be returned to in Section C below.

¹²Louis T. Ridenour, One World or None (New York, 1949), p. 222.

¹³Vannevar Bush, Modern Arms and Free Men (New York, 1949), p. 489.

mechanism together to make an A-bomb work."¹⁴ Small wonder that similar doubts and confusions persisted in the minds of lesser informed Americans, and that any public clamor for air defense systems was absent.

2. The Truman Administration

It seems clear that the executive branch contributed directly to the retarding of a significant public understanding of air defense requirements by maintaining a remarkable degree of silence about official U. S. and USSR atomic capabilities. An explanation for this is not difficult to find. With regard to U. S. air-atomic power, "uncontradicted testimony [before Congress' Joint Committee on Atomic Energy] show[ed] that in 1947...our weapons position verged upon the tragic. The U. S. then possessed so few bombs, according to Mr. Lilienthal [Chairman of the AEC], that we might have tempted fate if public statements even mentioned the importance of numbers in building an atomic deterrent to aggression."¹⁵

¹⁴New York Times, January 28, 1953, p. 1.

¹⁵U. S. Congress, Investigation into the U. S. Atomic Energy Commission, Report of the Joint Committee on Atomic Energy, Senate Report 1169, 81st Cong., 1st Sess., October 13, 1949, p. 13. President Truman has written: "In no document in my office, in the AEC, or anywhere in government, could anyone find the exact figure of the number of bombs in the stockpile, or the number of bombs to be produced, or the amount of material scheduled for production...."

In the case of the Soviets' atomic energy program, it would appear that before September 1949 the Administration had been emphatically told that there was nothing of consequence about which to speak to the public. For example, General Leslie R. Groves, who supervised the wartime Manhattan District Project, had reportedly advised the government that the Soviets would need fifteen or twenty years to build an atomic bomb. Within the intelligence community: "The Navy figured 1965. The Army guessed 1960. The Air Force, in what was considered a biased and 'alarmist' estimate had put the date at 1952."¹⁶ Further, it is revealing to note that between September 23, 1949, and October 22, 1951, two of the three White House announcements regarding USSR nuclear tests described the occurrences as "atomic explosions" which led to public speculation that perhaps the events were unintentional and counterproductive.¹⁷

Indeed, as late as 1953, it was declared by Bernard Brodie that "the secrecy which continues to beset the

The figure in question would be recorded on separate and detached pieces of paper safeguarded in a special way and of which only a bare minimum of copies existed." Years of Trial and Hope 1946-52, Vol. II (New York, 1956), p. 345.

¹⁶J. R. Shepley and C. Blair, Jr., The Hydrogen Bomb: The Men, The Menace, The Mechanism (New York, 1954), p. 13.

¹⁷See New York Times, January 28, 1953, p. 14.

entire subject of atomic weapons and their military uses is so pervasive that anyone who discusses the subject publicly must regard it not merely as a factor which must control his own writing but as a substantive issue of the first importance to his argument."¹⁸

An interesting counterpoint to this silence on the Administration's part was the good deal of public discussion by its members -- in and out of uniform -- who advocated preventive war against Russia.¹⁹ Such proposals could only dampen further any impetus for an on-going air defense program, as the granting of the initial move to the enemy was a foundation premise for its requirements.

The Truman Administration, of course, rejected preventive general war, as well as isolationism and appeasement as policy alternatives, and opted for containment as the political core of its diplomatic efforts. This doctrine had as its operative assumptions -- at least until 1950 -- that Moscow was likely to be reasonably cautious in the use of Soviet military force in pursuit of its expansionary

¹⁸"Nuclear Weapons: Strategic or Tactical?," Foreign Affairs, XXXII (January 1954), p. 219.

¹⁹For a description of such proposals during 1945-54, see Alfred Vagts, Defense and Diplomacy: The Soldier and the Conduct of Foreign Relations (New York, 1956), pp. 329-334; and Coral Bell, Negotiation from Strength: A Study in the Politics of Power (London, 1962), pp. 32-34.

objectives; and that "situations of strength" could be built in Europe and elsewhere (via economic, military and technical assistance, and alliances and commitments) to contain Soviet probings until such time as the regime would "mellow" or collapse. When joined with the deterrent power of the U. S.' offensive air-atomic force, collective defense would inhibit if not completely prevent the danger that war would result through the miscalculation of aggressors. In 1950, Communist armed force in Korea caused a vigorous re-orientation in U. S. policies. There developed from this the heightened perception of the nature of the international system as bipolar. Alliances became adjusted to the requirements of a Strategic Air Command (SAC) forward base system, and conventional ground forces expansion was urged to meet a threat which would build to a "crisis" by 1954. What is important to note for our purposes is that -- since the above policy was premised on an appraisal of the Soviet threat as being synonomous with the Red Army menace to U. S. interests in Western Europe -- continental air defense programs accordingly received low priority within the Administration.²⁰

²⁰One can speculate, in this connection, that, in so far as a conventional defense could allow the U. S. to shield Europe without necessitating the bombing of Soviet cities and industries, there may have been the thought within

Related to these policy matters, of course, were the Congressional pressures to reduce taxes and the balanced budget desires of the Administration. This situation resulted in a \$15 billion defense budget ceiling prior to 1950, and greatly hindered the allocation of funds to air defense research and development. To support such financial considerations, many high level government officials asserted that the Soviets were seeking to entice the U. S. into bankruptcy by means of large defense outlays. Indeed, "the more truculent the Russians became, the more cause there was to look to the state of the economy rather than to the state of the defense budget....To maintain military forces larger than those possible for \$15 billion would serve Russian purposes not American."²¹

the Administration that this could induce the USSR to refrain from an air-atomic attack on U. S. cities -- and hence diminish the perceived urgency of an air defense buildup. (I am indebted to Assistant Professor George H. Quester for this observation.)

²¹Warren R. Schilling, "The Politics of National Defense: Fiscal 1950," in Schilling, Paul Y. Hammond, and Glen H. Snyder, Strategy, Politics, and Defense Budgets (New York, 1960), pp. 104-105. "This powerful rationalization for low American budgets (usually linked to alleged statements of Lenin) runs through the thought of both the Truman and Eisenhower Administrations, virtually dominating the latter down to 1957. There is no scrap of serious evidence that it ever represented Communist policy." Walt W. Rostow, The United States in the World Arena (New York, 1960), p. 226n.

Yet, by the end of President Truman's last year in office, the government's perceptions of the Soviet air-atomic threat had altered to the extent that a National Security Council recommendation then for greatly expanded air defense expenditures would receive the concurrence of the outgoing Administration. Behind this judgement in December 1952, however, lay six years of uneasy dialogue within and between the U. S. scientific and military communities regarding the feasibility of air defense in the nuclear age.

3. The Scientific Community

American scientists were, themselves, jolted by the unexpectedness of the first Soviet atomic explosion. Dr. Vannevar Bush, for example, had predicted in 1946 that it would take the Russians twenty years to perform this feat if they relied entirely on their own resources.²² Others had pointed out that "bacteria now are the poor nation's weapon against the atom bomb....[T]hey are quite as deadly;...enough bacteria can be hatched in a single beer barrel to wipe out the population of the U. S."²³ The

²²Shepley and Blair, The Hydrogen Bomb, p. 13.

²³Statement of F. J. Libby, Hearings, Senate, Subcommittee of the Committee on Appropriations, Supplemental National Defense Appropriations Bill for 1948, 80th Cong., 2nd Sess., April 1948, p. 146.

result was a dearth of serious scientific thought regarding the technical problems of active air defense.

These problems seemingly received little attention even after 1949. American scientists, for the most part, began then to urge defense through pre-attack dispersal of cities and industries as offering the only promise of post-attack survival.²⁴ Involved in this focus upon dramatic, unrealistic, population-protection measures was the scientists' basic moral revulsion against mass destruction, compounded perhaps by Manhattan Project and Hiroshima guilt-feelings. There was also the more pragmatic appreciation that, by mid-1950, about 80 percent of the U. S. aircraft industry was concentrated in Seattle, Los Angeles, and Long Island, and the atomic stockpile was concentrated even more geographically. In addition, there was throughout this period the scientific judgement that uranium was extremely scarce (especially in Russia) and that, consequently, atomic bombs were too precious to be used on anything but the most important population or

²⁴See BAS, V (October 1949), p. 273 ff.; and ibid., VII (September 1951), passim. It should be noted that this notion persisted into May 1954. See ibid., X (May 1954), p. 168ff.

industrial complexes.²⁵ Most fundamentally, however, was the distressing fact that until around 1952 there just seemed to be no technological break-throughs on the horizon which would enable the defense to "catch-up" with the offense; and, hence, dispersal programs instead of active defensive systems received the support of the scientists.

Finally, it appears that a concerted scientific effort to respond to the incipient Soviet bomber threat by active air defense research was further hindered before 1952 by the overshadowing issues within the scientific community of a fervent opposition to the hydrogen bomb concept (and the U.S. decision to build one), and the scientists' attempts to divert nuclear materials from the SAC stockpile by innovations in tactical nuclear weapons for European ground defense. Thus, the emerging issue of Soviet inter-continental offense versus American air defense was obscured by the domestic debates over how the U. S. military offense should best be structured in order to meet or forestall Soviet perimeter thrusts.²⁶

²⁵For example, an article by the New York Times science writer, William L. Laurence, on October 7, 1951, headlined: "Soviet Atomic Capability Far Smaller Than Ours; Russia Lacks Rich Uranium Sources and an Adequate Industrial Plant." The article purported to show that Russia could not hope to achieve any significant production of atomic bombs.

²⁶In addition, it should be noted that the scientists'

4. The Military

Even before the USSR displayed its new Tu-4 bomber in 1948, there seemed to be general theoretical agreement within the military that a Soviet attack would come in the form of a blitzkrieg upon Europe and North America simultaneously; for it was felt that no future aggressor would repeat Germany's twice-made mistake of conquering proximate enemies first while leaving America for last.²⁷ Enthusiasts of airpower, however, felt confident that a full-scale atomic counter-offensive against the heart of the enemy's warmaking potential would secure victory fairly quickly

urgings against the development of thermonuclear weapons may have buttressed Air Force arguments for more SAC bombers. That is, the scientists did not reckon apparently that one airplane with one H-bomb could do what scores of bombers with atomic bombs were being programmed to do. Further, there was seemingly no significant early appreciation that H-bomb warheads might be required if relatively inaccurate missiles instead of SAC bombers were relied on for delivery. (Thus, it is perhaps understandable why "Air Force officers, including the Chief of Staff, seemed unimpressed with [General Elwood P.] Quesada's serious concern over the scientific opposition to the thermonuclear bomb." Shepley and Blair, The Hydrogen Bomb, p. 137.) By indirectly buttressing the Air Force's budget-battles for bombers, the scientists made air defense appropriations even more difficult to justify.

²⁷ See Vincent Davis, Post War Defense Policy and the U. S. Navy, 1943-1946 (Chapel Hill, 1966), p. 223. Doubtlessly, the U. S.' rapid post-war demobilization goes far to explain such an argument.

without requiring a costly war of attrition between surface forces or, presumably, widespread continental air defenses.²⁸

For their part, U. S. Army spokesmen argued that "the V-2 bombs in World War II never stopped:..until the Infantry seized the sites on the ground... even though [we] had undisputed control of the air for months...." They would therefore submit that "the only way you can keep [a potential enemy] from attacking the U. S. with certainty is to hold the bases in Greenland and Alaska...in Newfoundland, in Iceland, in the Azores."²⁹ Accordingly, any requirement for Army anti-aircraft artillery battalions within the continental U. S. was not perceived to be a pressing one.

Also, as suggested above (General Bradley's statement on p. 10), the Soviet demonstration of an earlier-than-expected nuclear capability in 1949 really did little to alter the basic predispositions of the services toward the question of active air defense. There was now, to be

²⁸ See, e.g., the statement of General Carl Spaatz, Commander of Army Air Forces, Hearings, U. S. House of Representatives, Subcommittee of Committee on Appropriations, Military Establishment Appropriations Bill for 1948, 80th Cong., 1st Sess., March 1947, pp. 401, 601-602.

²⁹ Testimony of Kenneth C. Royall, Secretary of the Army, Hearings, Senate, Subc. of Comm. on Approps., Supplemental National Defense Appropriations Bill for 1948, 80th Cong., 2nd Sess., April 1948, pp. 95, 97.

sure, the recognition that the Soviets might consider one-way Tu-4 attacks (capable of reaching any point in the U. S.) to be feasible.³⁰ Moreover, it was thought that "since Russia's present bombers [were] good for only one mission, the Air Generals would dispatch them at the outset to as many different targets as possible while the element of surprise still gave them maximum probability of success."³¹ But appropriation requests for continental air defense programs remained insignificant.

Thus, the services continued to follow the 1948 Finletter Report recommendations. They placed primary reliance on strategic offensive development, in order to meet the "crisis year" of 1954 (always, so it seems, several years in the future). During the 1950-51 rearmament, therefore,

the Air Force...was being built up to a strength which had no relationship to the burdens directly imposed upon it by the Korean War. Although 99 percent of the Air Force effort in the Korean War was devoted to tactical uses, the major procurement expenditures for expansion were going for an increase in strategic air power -- for relatively long-range air-atomic capabilities --

³⁰ E.g., Secretary of the Air Force Stuart Symington's remarks, Hearings, House, Subc. of Comm. on Approps., Department of Defense Appropriations for 1951, 81st Cong., 2nd Sess., February 1950, p. 1233.

³¹ Ned Root, "Strike One City," Air Force, XXXIII (March 1950), p. 17. Italics added.

rather than for ground support [and air defense] fighters.³²

The Korean experience itself was ambiguous in its effects on the perceived requirement for an air defense build-up. At this time the Soviets were being credited with an operational bomber force of about 450 Tu-4's (but fewer than 100 atomic bombs).³³ In Korean combat against the comparable U. S. bomber (the B-29), Mig fighters were effective to the degree that daylight raids over North Korea had to be stopped. Hence, proponents of U. S. fighter-interceptor systems could point to an increased rationale for their development. Yet, it seems apparent that the Air Force perceived instead that the B-29 failures would accelerate the development of higher performance long-range bombers in the USSR (and thus negate any U. S. air defense advances), especially in view of the Tu-4's lack of the radar bombsights and long-range navigational gear so necessary for night and all-weather

³²Paul Y. Hammond, "NSC-68: Prologue to Rearmament," in Schilling, Hammond, and Snyder, Strategy, Politics..., p. 356. (Italics added.) In October 1949, Admiral Arthur Radford had asserted, in testimony undenied by the Air Force, that "less than six percent of Air Force R&D funds [was] earmarked for tactical and fighter types." Hearings, House of Representatives, Committee on Armed Services, The National Defense Program-Unification and Strategy, 81st Cong., 1st Sess., October 1949, p. 52. (Italics added.)

³³General Hoyt S. Vandenberg, USAF, "The Truth About Our Air Power," Saturday Evening Post, February 17, 1951, pp. 20, 102.

operations. Hence, publications sympathetic to the Air Force made the first public revelations in early 1951 of the Soviets' development of a true, intercontinental B-36-type bomber and of a new twin-jet medium bomber in October 1952.³⁴ It was also an Air Force-related magazine that produced in mid-1952 one of the earliest published warnings that Soviet hydrogen bombs were in the offing.³⁵

But, in order not to magnify such a potential air-atomic threat to the degree that an air defense "ground-swell" would ensue (and, perhaps, because of insufficient "firm" intelligence), the Air Force never officially recognized the development of new Soviet heavy bombers during this period. Just what it was that flew over Moscow at the 1951 Air Show, therefore, was reported in March 1953 as being a "major intelligence puzzle."³⁶

³⁴William S. Friedman, "How Strong is Russia's A-Bomb Fleet?," Air Force, XXXIV (February 1951), pp. 25-27. This disclosure of a B-36-type bomber, expected to be in production "at least by 1954", was made in advance of the Soviets' Red Army Day flyby and was reportedly based on "confidential independent European sources". (p. 27). The first report of USSR twin-jet medium bomber development was made in Aviation Age, XIX (October 1952), p. 33.

³⁵Air Force, XXXV (June 1952), p. 22.

³⁶Joseph and Stuart Alsop, New York Herald Tribune, March 17, 1953, p. 16. In this connection, Air Force-related publications again acted seemingly to curb any momentum which was being generated for air defense by injecting occasional cautionary notes regarding the progress of U. S. defensive programs. For example, immediately after reporting on the

In short, throughout 1952, the American military policy makers' consensus seemed to be that Soviet heavy bomber development was lagging so far behind the West's that it could be assumed that the Russians were clinging to their traditional use of air power as a defensive and tactical tool (after all, they had reportedly built upwards to 20,000 combat and support aircraft), and that they were too backward to build complex jet bombers. Also, there had been no evidence of a Soviet atom bomb test since October 1951. By early 1953 it was thus posited that "in all probability they have settled upon a type of weapon less versatile and efficient than the Americans' but generally satisfactory by Soviet standards."³⁷

Despite such an appraisal of Soviet intentions and capabilities, one can question why the USAF was so reluctant to place a higher priority on air defense systems development during this period. That is, why did the Air Force respond to the initial Soviet intercontinental threat by a

U. S.' new F-89 interceptor just coming off the production line, Air Force speculated that "perhaps the enemy doesn't follow our high-speed, high altitude pattern. Suppose he decides to play his aerial invasion rather slow and low and very maneuverable -- which would generally raise hell with our interceptor concept." "All Weather Defense -- How Close Are We?", Air Force, XXXIV (May 1951), p. 35.

³⁷"Defense and Strategy," Fortune, XLII (June 1953), p. 94.

flight into more offensive technology? For the air defense of the United States had been assigned to the Air Force as a primary mission by the Key West Agreement of 1948. Moreover, the interdependence of air defense weapons and SAC's offensive power is evident throughout the Air Force's doctrinal pronouncements. The actual running of an air war, the effective use of air space, the proper deployment of air cover for forward SAC bases, the economics of developing and procuring fighter and bomber aircraft, the technical problems -- all these demand close interrelating of the two air power systems.

Yet, in the context of defense budget ceilings and interservice frictions, the military's strategic doctrines had to follow the battle for new weapons and functions rather than to be the source from which they were derived. The Air Force battled for bombers. To support its requests, the Air Force based its strategic doctrine on the conclusion that nuclear air power could achieve victory in war before the enemy could do unacceptable damage to the U. S. Such a conclusion, of itself, predisposed this service to place a low priority on defensive systems planning and procurement.

There were, however, additional factors which caused the Air Force to prefer an increasingly large number of bombers rather than a major re-direction of limited available

funds toward the protection of the existing force or the active air defense of continental complexes. The offensive-mindedness "Spirit of Douhet" was pervasive within SAC.³⁸

In support of its arguments, the Air Force would often assert that "the bleak and blunt evidence of the last war proved conclusively that no bombing attack mounted in sufficient strength by the Americans, British, or Germans ever was turned back by the most strenuous defensive action."³⁹ There was, moreover, the very real concern that SAC might be called upon to carry out U. S. treaty commitments to Allies which would require a large nuclear retaliatory capability.⁴⁰

The most basic explanation of this Air Force position, however, was the fact that throughout the 1946-1952 period (and beyond) the USAF rejected the technical and military feasibility of continental U. S. air defense in the nuclear age, per se. General Vandenberg (Chief of Staff during much of this period), both in his Congressional testimony and published articles, emphasized that air defense -- even with

³⁸Douhet had written in 1921: "All influences which have conditioned and characterized warfare from the beginning are powerless to affect offensive aerial action."

³⁹Vandenberg, Saturday Evening Post, February 17, 1951, p. 20.

⁴⁰See Bernard Brodie, Strategy in the Missile Age (Princeton, 1959), p. 270ff.

all the improvements he could foresee --- could never obtain more than a 30 percent attrition rate under the most favorable daylight circumstances and much lower if the enemy chose to exploit U. S. defensive weaknesses or develop new offensive countermeasures.⁴¹

And still other arguments were used by Air Force spokesmen during these years to diminish the perceived requirement for active defense systems development. In 1947, the SAC Commander, General George C. Kenney, argued publicly that a small B-36 force could act as an effective

⁴¹The "30 percent-maximum-kill" argument was voiced by Vandenberg, for example, at the Hearings, House of Representatives, Committee on Armed Services, National Defense Program -- Unification and Strategy, 81st Cong., 1st Sess., October 1949, p. 511; in the New York Times January 18, 1951, p. 4. ("even if you had radar installations every ten miles and the ground literally covered with interceptors..."); and at the Hearings, House of Representatives, Subcommittee of Committee on Appropriations, Department of the Air Force Appropriations 1954, 83rd Cong., 1st Sess., March 1953, p. 28. His successors carried on the same argument: General Nathan Twining, at the Hearings, House of Representatives, Subcommittee of Committee on Appropriations, Department of the Air Force Appropriations 1955, 83rd Cong., 2nd Sess., February 1954, p. 70; and General Curtis Le May at the Hearings, Senate, Subcommittee of Committee on Armed Services, Study of Air Power, 84th Cong., 2nd Sess., April 1956, p. 218. (Hereinafter referred to as Airpower Hearings). It is worth quoting Walter Millis here: "The fact that the Air Force clung through years to the conclusion that '70 percent of the attacking forces would get through' seems to reflect the inapplicability of statistical analyses to this issue, rather than the accuracy of the result." Arms and Men (New York, 1956), p. 351.

airborne radar net at less expense than a ground-based system.⁴² In 1949, Air Force Secretary Symington agreed that "the basic requirement of an adequate national air defense is an adequate production capacity of the country."⁴³ In 1950, Major Alexander P. deSeversky suggested that the U. S. already possessed an enormous defensive advantage over the Soviet Union due to its dense electronic network of telegraph, telephone and electric wires and conduits, and elaborate radio and television systems.⁴⁴ In 1951-53, General Vandenberg supplemented his "30 percent-kill-rate" argument by submitting that the "millions of highly trained men required to maintain elaborate defensive systems would impose an intolerable drain on our manpower pool"; that, more than interceptor planes, "we'll need the help of divine Providence to shoot down hostile planes with atomic bombs before they unload";⁴⁵ and that, in any event, as

⁴²Cited in H. A. Long, "The B-36 is a Tanker," The Freeman, March 26, 1951, an article reprinted in the Hearings, Senate, Subc. of Comm. on Approps., Department of Defense Appropriations for 1954, 83rd Cong., 1st Sess., May-July 1953, pp. 1578-1582.

⁴³Testimony at Hearings, House, Subc. of Comm. on Approps., National Military Establishment Appropriations Bill for 1950 (Part I), 81st Cong., 1st Sess., January 1949, p. 237.

⁴⁴Air Power: Key to Survival (New York, 1950), p. 177.

⁴⁵Saturday Evening Post, February 17, 1951, pp. 101,102.

General Spaatz had said, if one's air forces suffered casualties of only 4 percent on any raid, morale would probably deteriorate to such an extent that it would be doubtful that the air war could continue.⁴⁶

As a corollary to this negative attitude of the USAF toward continental air defense, the governing SAC assumption that any Soviet nuclear delivery force could be located and destroyed on the ground manifest, among other things, a low regard for the Soviets' defense against bombers. From this there arose an insensitivity to improvements in the USSR air defense posture which would logically have called for increased U. S. fighter cover capability, bomber electronic countermeasures development, or even efforts at incorporating any relevant Soviet advances into the U. S. air defense program.⁴⁷

⁴⁶ Hearings, House, Subc. of Comm. on Approps., Department of Air Force Appropriations for 1954, 84th Cong., 1st Sess., March 1953, p. 28.

⁴⁷ Despite the World War II experience with the crude German air defense which caused the abandonment of unescorted daylight bombing missions, the Air Force in its post-war planning rejected the priority development of modern long-range fighter escorts because "we have new tactics, techniques, altitudes, and speeds for our bombers." (General Vandenberg at the 1949 Unification and Strategy Hearings, pp. 464-465.) Cf. General LeMay at the 1956 Air Power Hearings: "In the past it has been so easy for bombers to penetrate a defensive system with losses you can stand that nothing much has been done in the way of research on penetration systems...." (p. 145.) It appears that a governing Air Force perception until the Korean War was that

Interestingly enough, at this same time that the Air Force was minimizing the attrition capability of a continental U. S. air defense system, lengthy negotiations were being conducted with the Canadian government regarding that country's possible large-scale production of USAF F-86 fighters. Indeed, in early 1950 the Canadian Defense Minister was treated to a U. S. air show during which the F-86 "really performed." Shortly thereafter, Canada agreed to produce 100 F-86's from components totalling \$11 million.⁴⁸

It seems interesting to observe, furthermore, that, whereas the USAF thought little of its ability to degrade a Soviet manned bomber attack, SAC -- and the other services -- appeared overimpressed by USSR offensive air deficiencies.

a bomber with MACH .85 speed would be "invulnerable" due to the "protection" of the sonic barrier and irrespective of Soviet fighter capabilities. That is, the best any interceptor could hope for was one pass at the bomber. Then the distance between the fighter and the bomber would be so great and the fighter's maneuvering in and out of the sonic barrier so difficult that the bomber could go on its way. See, for example, Air Force, XXXIII (June 1950), pp. 43, 45, which discusses the good performance of the B-36 against the Navy's "Banshee" fighter during extensive tests performed by the Joint Weapons System Evaluation Board in 1949-50. (Note the irony here, also: It was at the insistence of the Navy during the "B-36 vs. Super-carrier" dispute that these tests, which reinforced the "Big Bomber" generals' perceptions, were held.)

⁴⁸Testimony of Defense Minister Claxton, Debates of the House of Commons (Dominion of Canada) Official Report, (Hereinafter referred to as HANSARD), Session 1950, Vol. IV, June 8, 1950, pp. 3377, 3383.

The fact that the Soviets had only quite limited experience with strategic bombing in World War II would frequently be recalled. Even then, their operations were poorly planned and comparatively ineffective, and many times less than 30 percent of the aircraft on a mission reached their target.⁴⁹ Military journals would emphasize the Soviets' lack of radar instruments for blind flying, their poor standards of long-range navigation and their apparent lack of interest in air-refueling. Air Force General "Hap" Arnold stated in 1949 that "the one thing the Russians don't understand is strategic bombing."⁵⁰ And as late as 1955 it was submitted that "the Soviet pilots have neither the technique nor 'the know-how' of strategic bombing, which is extremely complicated and efficiency in which only comes with long experience in war."⁵¹

⁴⁹ See Robert A. Kilmarx, A History of Soviet Air Power (New York, 1962), p. 193.

⁵⁰ Hearings, House of Representatives, Committee on Armed Services, Investigation of the B-36 Bomber Program, 81st, 1st, October 1949, p. 381.

⁵¹ Major R. Hargreaves, USMC, "Age of Unease," U. S. Naval Institute Proceedings, LXXXI (April 1955), p. 368. "When Soviet airmen joined in the bombing of the Tirpitz, of the fifteen aircraft employed -- each of which carried a two thousand pound bomb -- eleven failed even to find the fjord where the vessel lay, while of the four that did discover it, not one scored a hit; and this in favorable flying weather." Ibid., p. 368n. In 1964, General Le May

Thus, the above perceptions within the Air Force acted to direct that service away from the high-priority development of an air defense program for U. S. industrial and population complexes. Further, even in 1952 when the SAC base system was recognized as a possible target for Soviet bombers,⁵² it was not considered sufficiently vulnerable to require special protective measures and could be assumed to remain essentially intact for a massive retaliative strike.⁵³

was still opining that, since the USSR had no real wartime training in strategic bombing, they could not be "hot-shots" in the air; and that the Soviets would catch-up with the USAF only when all the World War II-experienced SAC officers retire! See Hearings, Senate, Subc. of Comm. on Approps. and the Committee on Armed Services, Department of Defense Appropriations for 1965, (Part I), 88th, 2nd, February 1964, p. 725.

⁵²One of the earliest arguments that "Stalin's forces would be guilty of the greatest conceivable blunder if they pulverized a dozen of our cities and left our strategic bombing forces unscratched..." was made by Ned Root, "Strike One City," Air Force, XXXIII (March 1950), p. 19ff. (Although the thrust of the article was that the U. S. should not, therefore, waste money on city-defense -- not the assertion that SAC should be protected.)

⁵³See, for example, E. S. Quade, "The Selection and Use of Strategic Air Bases: A Case History," in Quade (ed.), Analyses for Military Decisions (Chicago, 1964), pp. 25-26. Indeed, many of the Air Force's formal systems analyses and Staff papers in the early 1950's "used to leave the enemy offense out of account altogether. While differential air attrition had been looked at, differential ground attrition for a long time was not allowed to figure at all." Albert Wohlstetter, "Analyses and Design of Conflict Systems," in Quade (ed.), p. 130. See, also, Brodie, Strategy in the Missile Age, pp. 166, 245.

As late as 1951, moreover, even the question of where the strategic striking force should be based in the continental U. S. was not considered a very important issue. Consequently, the U. S. continental base system "just grew." It was not planned in any way to complicate the enemy's problems of navigation, the number of targets, attack coordination, etc.⁵⁴ In addition, Air Force policy between 1949-55 was to locate the bulk of SAC's B-47 aircraft on about thirty North American bases, and, when extreme tension or surprise attack occurred, transport the planes overseas to about seventy bases, to operate from there with a minimum of active air defense protection and a maximum of time exposed to enemy air (or ground) attack.⁵⁵ In short, whereas during this period the USAF relied for its continental defense on the ability of its air-atomic offense to deter or, if need be, blunt a Soviet attack, the policy assumed such favorable operating conditions and

⁵⁴ See Air Power Hearings, p. 156. Further, it is striking that the Air Force, until 1953, "cooperated" with the Soviets' strategic planners by asking CONUS air base builders to concentrate the elements on a base and so reduce to a minimum the cost of utilities, such as roads, water, and drainage pipes. See B. L. R. Smith, "Strategic Expertise and National Security Policy: A Case Study," Public Policy (Harvard University Graduate School of Public Administration), XII (1964), p. 74.

⁵⁵ Ibid., p. 85n.

"one-way" nuclear attacks that the Soviets consistently branded the policy as "bankrupt."⁵⁶

It should be pointed out, also, that there was no particular effort made by either the U. S. Army or Navy during this period to alter these basic perceptions and policies of the USAF regarding air defense, although they each had a secondary air defense mission. The Army was concerned primarily to buildup its infantry and armored units for European ground defense. As an army anti-aircraft artilleryman lamented in 1955, "Anything not concerned with field armies falls outside the concern of most of the Army."⁵⁷ The Navy, for its part, clamored for a role in "pinpoint" strategic bombing of military targets and emphasized the capability of a large attack carrier force to divert a good portion of the Soviets' air offense from on-land targets.⁵⁸ That Naval thinking on air defense questions

⁵⁶See Raymond L. Garthoff, The Soviet Image of Future War (Washington, 1959), p. 82, and his Soviet Strategy in the Nuclear Age (New York, 1958), p. 136; and Ralph E. Lapp, "Eight Years Later," BAS, IX (September 1953), p. 285.

⁵⁷Colonel Bernard Thielen, USA, "Guardian of Our Air Frontier," Army Combat Forces Journal, V (April 1955), p. 14.

⁵⁸Such "offensive-mindedness" was criticized ironically by the USAF. It urged that the Navy should concentrate on anti-submarine warfare since most major U. S. cities lie within 100 miles of the coastline and the "Russian sub fleet might easily prove to be the counterpart of the U. S. strategic bombing effort." Air Force, XXXII (December 1949), p. 19.

was, in the main, superficial is evidenced by the fact that during the acrimonious "B-36 versus Super-Carrier" dispute of 1949, the Navy never raised the question of the vulnerability of aircraft on the ground to a surprise air-atomic attack.⁵⁹ Additionally, it was only in late 1952 that the Navy placed its first radar picket ship on twenty-four hour duty for coastal defense.⁶⁰

Some tangible efforts were made, however, in the direction of shielding the North American continent's industrial and population complexes, despite the overpowering glitter of SAC's offensive sword, and the other domestic influences discussed above which acted to delay a full appreciation of the air-atomic threat between 1946-52. Let us then next examine these efforts. In so doing, we shall have occasion to observe the extent to which other purely domestic factors operated to restrain the development of an air defense system -- apart from the Soviet threat which was perceived only dimly. We shall consider, in turn, the organizational evolution of air defense roles and missions within the military; the research on and the development

⁵⁹An observation made by Quade, "The Selection and Use...", in Quade (ed.), Analyses..., p. 99.

⁶⁰"Air Defense of North America," Air Force, XL (August 1957), p. 258.

and procurement of active defensive systems; and, finally, the actual deployment and operation of these systems.

Section C. The Development of an Incipient Air Defense Capability

1. Roles and Missions

Dating back years before World War II, the Army had had the mission and equipment for anti-aircraft defense. Whether it was for forces in the field, vital installations, or population complexes, Army weapons had served to provide the main element of defense against air attack. The Army Air Force had had an equally important and complementary task in this area. Its manned aircraft would be used to intercept enemy attacks before they reached the targets specifically defended by Army anti-aircraft artillery (AAA). To the end of World War II, this distinction in mission was comparatively clear and, for the most part, went unchallenged by the services.

However, in 1946, when the Army Air Force (AAF) established the Air Defense Command (ADC) to provide a commander to coordinate the air defense battle, a dispute arose almost immediately over which agency, the AAF or the Army Ground Forces (AGF), should have the air defense mission.⁶¹ The dispute was grounded in the concept developed

⁶¹This paragraph draws upon Colonel V. C. Wegenhoft, USAF, "Defense in Depth," Air University Quarterly Review, XII (Summer 1961), pp. 44-45.

during the war that an Air Force commander should have operational control of a wide area including the AAA deployed therein. The AAF took the position that the increased speed of modern bombers, the pending development of guided missiles, and the possibility of surprise attack on the continent made it essential to have such a coordinated defense-in-depth under one commander. The AGF challenged this concept and proposed a return to the pre-war distinction between "anti-aircraft defense" (local defense) and "defense by air" (area defense). This dispute would continue with varying degrees of intensity throughout the post-war period.

The Unification Act of 1947 gave the newly formed USAF the mission of providing the means for the coordination of air defense among all services. Service roles in air defense were not spelled out, however, until the Key West Agreement of March 1948. The USAF was given primary responsibility for continental air defense and the Army and Navy were both given a collateral role of providing defense forces to supplement those of the Air Force.

Little is known about whether there was a dispute at Key West over these assignments. It seems likely, however, that any such Army-Air Force contention was greatly overshadowed by the more widely publicized service disagreements

over roles and missions for strategic bombing and reconnaissance, amphibious operations, submarine warfare, and protection of shipping. Moreover, as the unclassified portion of the Key West Agreement made no mention at all of guided missiles responsibilities, an important source of Army-Air Force friction was, perhaps, temporarily bypassed. It also appears as though the Army (and its Coast Artillery Corps) was satisfied by an aspect of the Agreement which it interpreted to distinguish between operational control of AAA units based in the continental U. S. (vested in the Air Force) and those in overseas theaters of operation where, according to the Army, "command as well as control of AAA units assigned to field armies, corps and divisions would remain with those armies, corps and divisions...."⁶² Finally, the assignment of air defense to the Air Force was further softened by a requirement in the Agreement that all doctrines affecting AAA in joint operations were to be arrived at jointly.

By February 1949, therefore, General G. P. Saville, the USAF's ADC commander testified: "We have been working

⁶²Colonel Donald J. Bailey, Coast Artillery Corps, "Our Anti-Aircraft Artillery Has A Bright Future," Anti-aircraft Journal, LXXXIII [sic] (March-April 1950), p. 11. This distinction was important to the Army, which felt it likely that operations in the U. S. would be only transitory in preparation for a troop movement overseas.

in the closest possible coordination with the Army and the Navy. There is no evidence of any kind of any interservice question that I am aware of. It has been technical problems not responsibility problems."⁶³

Yet the soldiers seemed to recognize the dangers of a unilateral ADC, and several bitter fights ensued in 1949-50 regarding the possible impact on air defense of technical advances in electronics and surface-to-air missiles (SAMS) -- advances which forebode an increased blurring of the distinction between area and point defense concepts. It was not until August 1950 that the Vandenberg-Collins Agreement provided an arrangement satisfactory to the Army for the participation of AAA in air defense. The exact degree of operational control over anti-aircraft defenses was very carefully spelled-out. The Agreement, in effect, "limited the authority of the Air Force to that of prescribing when AAA weapons could or could not fire."⁶⁴ This degree of control seemed to allow the Army Anti-Aircraft

⁶³Hearings, House, Subc. of Comm. on Armed Services, To Authorize the Secretary of the Air Force to Establish Land-Based Air Warning and Control Installations for the National Security, 81st, 1st, H.R. 2546, February 1949, p. 339.

⁶⁴Colonel James F. Howell, USA, "Continental Air Defense Command," Anti-Aircraft Journal, LXXXVII [sic] (September-October 1954), p. 15.

Commander sufficient freedom of action to exploit the maximum capabilities of his weapons, and the service relationship was reaffirmed in the Chidlaw-Lewis Agreement of 1952.⁶⁵

With regard to U. S. Navy participation in continental defense, an informal agreement between the Navy and air defense officials was worked out in mid-1950. Under this arrangement, available Navy fighter aircraft in the continental U. S. would come under the air defense commander's control in case of an emergency, in return for USAF assistance in submarine searches when requested.⁶⁶

Against the background of the above interservice agreements and disagreements, the formal command organization of the Air Force's air defense units was passing through several stages. As stated previously, the Air Defense Command (ADC) had been formed in 1946 to coordinate the air defense battle and to man and control the air warning system. The ADC was to work closely in an emergency with the Alaskan Air Command which had been established in December 1945. The primary functions of the ADC in peacetime,

⁶⁵Jonathan Carmen ("pseud."), "The Air Defense Muddle," Army, VII (February 1957), p. 43.

⁶⁶Harold H. Martin, "Could We Beat Back an Air Attack on the U. S.?", Saturday Evening Post, November 4, 1950, p. 150.

however, consisted of the training and administration of the National Guard and Air Force Reserve forces which formed the principal combat components of the ADC.

In December 1948, the ADC and Tactical Air Command (TAC) combined their organizations under the Continental Air Command (CONAC), whose commander thus had the responsibility for both air defense and tactical air programs. In July 1950, CONAC was finally able to deal with a single commander who controlled all Army air defense components when the Army Anti-Aircraft Command (ARAACOM) was formed. And, in January 1951, ADC was taken out from under CONAC's wing and re-established as a separate command, but with primarily operational responsibilities. Thus, for the first time, air defense became the sole responsibility of a major USAF command and its commander relieved of a welter of minor administrative duties. Yet, it was not until the establishment of CONAD, in September 1954, that all U. S. air defense forces were organized on the principle of unity of command rather than that of voluntary cooperation.

One other aspect of the command organization for air defense needs to be mentioned: that of the USAF -- National Guard Bureau relationship during this period. The Air National Guard (ANG), since the end of World War II, had been planned as the principal source of America's air defense

combat capability; and, in 1949, ANG forces constituted two-thirds of those available for defense of the continent in an emergency -- the main portion of the Regular Air Force being deployed to exterior bases almost at once after M-Day, in support of U. S. international commitments.⁶⁷

Yet the USAF was quite unhappy with its command structure vis-à-vis these forces. (And, considering that the ANG received all its aircraft directly from the Air Force, the ramifications from such inharmoniousness could be significant.) As Secretary of the Air Force Symington complained:

In the final days of the [1947] unification, when everybody was compromising in order to get any bill, the National Guard interests wedged into the act the fact that the National Guard Bureau would continue to handle the Air National Guard along with the [Army] National Guard, and this meant that the Air Force... would in the usual case be under Army officers with respect to its Air guard.⁶⁸

⁶⁷ USAF Statement, Hearings, House, Subc. of Comm. on Approps., National Military Establishment Appropriations Bill for 1950 (Part II), 81st, 1st, March 1949, p. 42. As General G. P. Saville, USAF, the ADC commander stated: "The whole philosophy is to use [the reserve components] to the maximum and not maintain and pay for day-after-day an enormous thing in being any larger than it has to be." Hearings, House, Subc. of Comm. on Approps., To Authorize the Secretary of the Air Force to Establish..., 81st, 1st, February 1949, p. 344.

⁶⁸ Hearings, House, Committee on Armed Services, To Authorize the Composition of the Army of the U. S. and the Air Force of the U. S., 81st, 1st, H.R. 1437, January 1949, p. 274.

The issue of the federalization of the ANG for ready-availability during emergencies was also a disturbing one to the Air Force.⁶⁹ It concurred with the Gray Board recommendations to President Truman in 1947 that "the federal government in its relationship to the National Guard must operate through a patchwork of expediencies with the several states, a patchwork that could be abrogated at will by the states." In 1948, Lieutenant General Elwood Quesada, First USAF Special Assistant for Reserves, made a widely quoted statement that the ANG would never be effective until brought under federal command; and his sentiments were echoed publicly in 1949 by Lieutenant General Ennis Whitehead, Commander of CONAC. Although by the mid-1950's these USAF-ANG issues had dropped into the background, there is no doubt that the questions they raised between 1947-52 exemplified another instance where domestic political factors intervened in the strict military calculation of the proper structuring of air defense roles and missions.

2. Systems Research, Development, and Procurement

It has already been shown how various domestic perceptions of the Soviet threat in the U. S. between 1946-52

⁶⁹The following discussion is taken from Brigadier General Royal Hatch, USAF, "Militia: Old Cloak, New Buttons," Air Force, XL (February 1957), pp. 65-66.

resulted in the molding of the American weapons buildup around offensive systems. In a fundamental sense, however, the relative dearth of air defense programs at this time can also be explained by defects in the organization of the U. S. national military research and development (R&D) effort, which hampered innovative research. And it surely seems obvious that proponents of air defense required some sort of qualitative technological breakthrough to bring the perceived offense versus defense scales more into balance, especially when the World War II experience with existing defensive systems (unlike the experience with bombers) could not be called upon to justify their quantitative deployment.

An important aspect of this problem centers on the operation between 1947-52 of the Defense Department's Research and Development Board (RDB). When the RDB was established in 1947 a percentage of the funds appropriated for military research and development was allocated to the Board so that it might initiate projects on its own. In the ensuing years, so a Congressional committee reported, "the extent of expenditures declined because of the failure of some chairmen of the R&D Board to exercise its authority in this direction."⁷⁰ An ex-Chairman of the

⁷⁰Organization and Administration of the Military Research and Development Programs, Twenty-Fourth Intermediate

Board, Dr. L. V. Berkner, chose to explain the situation thusly: "The Board devoted itself primarily to the perfection of existing weapons and relatively little to the advocacy of radical new military measures which science was capable of producing....The basic failure was due to defective organizations."⁷¹

The RDB was made up of functional groups of civilian scientists and military officers which, by the end of 1952, had increased to more than 100 active committees, panels, and working groups.⁷² The fundamental problem was that the civilian scientists could spend less than ten or fifteen days a year with the Board and, hence, could give advice only on their particular area of full-time expertise. As a result, "the committees had to be organized according to such subject fields as aeronautics and atomic energy rather than by 'operational categories' dealing with warfare

Report of the Committee on Government Operations, Subcommittee on Military Operations, 83rd, 2nd, H.R. 2618, August 1954 (hereinafter cited as the Riehlman Subcommittee Report), pp. 9-10.

⁷¹Memorandum from Berkner to the Honorable R. Walter Riehlman, dated June 29, 1954 and reprinted in Hearings, House, Military Operations Subcommittee of Committee on Government Operations, Organization and Administration of the Military R&D Programs, 83rd, 2nd, June 1954, p. 633.

⁷²Research and Development (Office of the Secretary of Defense), Thirty-Second Report by Committee on Government Operations, 85th, 2nd, H.R. 2552, August 1958, p. 63.

problems, for example, ...air combat, etc."⁷³

Within the Air Force, itself, research and development responsibilities were essentially combined until April 1950 with the supply and logistics functions under the Air Material Command (AMC). Consequently, apart from whatever other predispositions may have existed within the USAF toward offensive systems, the AMC's philosophy of procurement tended to dominate that service's "in-house" research into possible defensive innovations. For, as Dr. James R. Killian, Jr. observed:

There is a quite proper attitude and procedure in procurement that tries to account for every single piece of equipment down to the last nut and bolt and screwdriver. When you start doing that with research you may cripple it with red tape. There are also [inflexible] contracting procedures in procurement that have been proven repeatedly not to be applicable to research and to hold it back when you try to make it applicable.⁷⁴

Even after the R&D function was separated organizationally from the AMC by the establishment of the Air

⁷³ Ibid., pp. 64-65. (Italics added.) For a more detailed discussion of the RDB's operations see Don K. Price, Government and Science: Their Dynamic Relation in American Democracy (New York, 1954), pp. 144-152.

⁷⁴ Hearings, House, Military Operations Subcommittee of the Committee on Government Operations, Organization and Administration of the Military Research and Development Programs, 83rd, 2nd, June 1954, p. 435.

Research and Development Command (ARDC) in 1950, the Air Force's research programs were still fettered by their prior subordination to supply and logistics. Hence, a Congressional report in 1954 stated that "the ARDC procurement activities continue to function under established Air Force procurement regulations, and consequently remain under the influence of production-procurement policies."⁷⁵

The exact significance of these bureaucratic factors upon the rate of technological advance in air defense "hardware" can, of course, be only surmised. Further, any discussion of the Air Force's approach to air defense R&D must take into account the studies done at that service's behest by Project RAND and the Lincoln Laboratory of M.I.T. In May 1948, the Air Force contracted with the RAND Corporation for an extensive program of research on air defense problems which bore fruit in 1952 in a study which shall be discussed below. More important during the 1951-52 period was the work carried on at the Lincoln Laboratory of M.I.T. The establishment of Project Lincoln was initiated by General Vandenberg in December 1950 in response to the Soviets' atomic explosion, and to a report by the USAF's Scientific Advisory Board which stated that post-war advances

⁷⁵Riehlman Subcommittee Report, p. 20

in high-speed computers had made possible the centralized control of the air battle over a vast area.⁷⁶ (Of course, Vandenberg was also responding to the directives in NSC-68 of early 1950 which included greater attention to continental defense problems.) Work was begun in early 1951 on two projects which eventually culminated in the Semi-Automatic Ground Environment (SAGE) system and the Distant Early Warning (DEW) line -- critical components of the mature U. S. bomber defense posture. And Air Force sympathizers proclaimed that, by May 1953, "every cent Project Lincoln [had] asked for [had] been granted by the Air Force. This [included] a four month period in which M.I.T. progressively raised its estimates from \$4 million to \$8 million to \$13 million to \$18 million, as the full Lincoln program rapidly evolved."⁷⁷

Indeed, according to Air Force magazine, the USAF in November 1949 wanted to respond to the Soviets' atomic explosion by a "Manhattan District" approach to air defense,

⁷⁶ Statements of two of the Directors of Lincoln Laboratory: Dr. A. G. Hill (Hearings, House, Military Operations Subcommittee of the Committee on Government Operations, Organization and Administration of the Military R&D Programs, 83rd, 2nd, June 1954, p. 392.), and Dr. C. F. J. Overhage (Hearings, House, Subcommittee of Committee on Government Operations, Systems Development and Management (Part 3), 87th, 2nd, August 1962, p. 1036ff.)

⁷⁷ "The Truth About Our Air Defense," Air Force, XXXVI (May 1953), p. 29.

but was turned down by higher authority.⁷⁸ The evidence for the Air Force's turning then to M.I.T. to create a centralized laboratory for new research also suggests a perception of some urgency in solving the air defense problem. The RAND Corporation was not chosen for the additional work because "the kind of research RAND was willing and able to provide on the air defense question would not meet the requirements and the time schedule that the Air Force had envisaged in originally assigning the task to RAND...."⁷⁹ Moreover, it appears that the Air Force did not choose to utilize its extant Cambridge Research Center (AFCRC) in order to avoid the time consuming task of adding personnel to AFCRC through cumbersome civil-service regulations, and the delays attendant to the equally cumbersome military chain of command in which AFCRC was enmeshed.⁸⁰

Yet, these Air Force efforts must be seen again within the context of the more vocal and diffused "Big Bomber" arguments which dominated that service's perceptions at this time. The well publicized disputes, to be discussed below,

⁷⁸ Ibid., p. 28.

⁷⁹ Bruce L. R. Smith, The RAND Corporation: Case Study of a Non-Profit Advisory Corporation (Cambridge, Mass., 1966), p. 89.

⁸⁰ See pp. 392-393 of the testimony of Dr. A. G. Hill cited in footnote 76 on p. 51 above.

between the Project Lincoln air defense-minded scientists and the USAF during 1952-53 highlight this point.

In any event, by mid-1950, a survey of the research on and development of fighter aircraft, defensive missiles, and surveillance radar revealed that

there are no interceptor planes in any of the Air Force's operational units which are equipped adequately with both radar searching systems and fire control instruments. The first batch of 'modified' all purpose planes changed about to meet the new requirements in half measure are now coming off the assembly lines, but production contracts for new planes built from the ground-up as true interceptors in the modern sense of the word have not yet been let.

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There is not one [missile-guidance device] of sufficient operational efficiencies to make it possible to go into production on a single missile type.

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Studies to overcome radar's inherent line of sight limitations by incorporating novel methods of utilization of existing equipment were stepped-up only when the Radar Network Installation Program was expedited in 1949.⁸¹

⁸¹"Locate, Recognize and Hit Targets," Air Force, XXXIII (June 1950), pp. 31, 52. There was also the recognized possibility that piloted "air-rammers" could have been developed comparatively inexpensively, as an interim

Indeed, it was not until the 1953-56 period that true all-weather interceptors, air-to-air and ground-to-air missiles, and low-altitude gap-filler radars were deployed in operational numbers within the U. S. air defense system.

As a final note on air defense research at the time of the incipient Soviet air-atomic threat, it should be mentioned that the Air Force was not alone in its lack of timely innovative systems. For the Army reported in early 1949 that "no equipment has been devised which is satisfactory against jet-propelled aircraft. Three hundred and fifty m.p.h. seems to be the point at which we cease being fully effective."⁸²

The continental air defense systems which were developed and procured for deployment between 1946 and 1952, therefore, were essentially improved versions of World War II equipments. And it scarcely needs emphasizing that the actual number of these aircraft, radars, and anti-aircraft artillery which reached operational status (and

measure, to increase the defensive attrition rate and still give the pilot a fair chance of survival. See R. W. Marlowe, "The Tactics of Suicide," Flying, XLIII (August 1948), p. 20.

⁸²Testimony of Major General K. F. Cramer, USA, Hearings, House, Subc. of Comm. on Approps., National Military Establishment Appropriations Bill for 1950, 81st, 1st, March 1949, p. 766.

could be maintained) was strictly limited by the Defense Department's fixed budgetary ceilings and "balanced forces" philosophy of apportionment among the services. President Truman's decision in December 1948 to cut back the USAF aircraft program from seventy groups to forty-eight groups thus entailed a reduction from twenty-five to twenty in the regular forces fighter-group goal, and the concomitant planned modernization of only eleven of the twenty-seven Air National Guard groups.⁸³

Further, although it had been under active investigation since 1947, a plan for the first permanent network of eighty-five aircraft control and warning (AC&W) radar stations in the continental U. S. and Alaska did not receive any appropriated funds until the Soviet atomic explosion caused Congress to authorize the Air Force in late 1949 to divert from other approved projects \$50 million with which to launch the project in earnest.⁸⁴

⁸³Ibid., Part 2, pp. 130, 40. Seventeen of the twenty USAF fighter groups were to be day-only (seventy-five aircraft per group) and three were to be all-weather (thirty-six aircraft per group). Ibid., p. 130.

⁸⁴Testimony of General Muir S. Fairchild, USAF, Hearings, House, Subc. of Comm. on Apps., Department of Defense Appropriations for 1951, 81st, 2nd, February 1950, p. 1220. With reference to the proposed AC&W net, General G. P. Saville, USAF, ADC Commander, testified in February 1949: "What we are doing is in balance with what we are doing in other armed forces projects. And that was one of the concerns of the JCS: To see that these

While the Korean conflict caused the USAF's authorized strength to jump successively to 58, 95, and 143 wings, the major procurement expenditures went for strategic offensive power, with very little modernization and expansion of the ADC's 17 operational wings. Also, throughout 1952, the proposed "stretch-out" and "whittling-down" of USAF programs by the Administration and Congress, respectively, threatened to delay seriously the completion of the radar net; delay further the conversion from VHF to UHF in ground equipment to handle the new interceptors equipped with UHF; and prevent the provision of sufficient navigational aids to permit attainment of an all-weather operating capability.⁸⁵

things were all in balance." (Hearings, House, Subc. of Comm. on Armed Services, To Authorize the Secretary of the Air Force to Establish..., 81st, 1st, February 1949, p. 337). It should be mentioned, however, that in late January 1949, "in an effort to get on with this program rapidly," the Air Force diverted as much funds from its past appropriations as was legally possible to begin construction of the AC&W control centers. (Ibid., p. 335.) Simultaneously, the Congress authorized \$85.5 million for construction of the full radar net but adjourned before the funds could be appropriated. It hardly needs adding that in the building of the AC&W control centers, "materials and construction methods [were to be] utilized which [would] result in the lowest total costs...." (Ibid., p. 347.) The question of "hardening" such centers to any degree apparently never arose.

⁸⁵Hearings, Senate, Subc. of Comm. on Approps., Department of Defense Appropriations for 1953, 82nd, 2nd, June 1952, pp. 782, 784-785, 788-790. A decision in 1952 for the extensive build-up of air defense systems was also obviously hampered by the election year uncertainties regarding what policies a new administration might adopt.

These examples of the restrictions upon air defense occasioned by domestic economic considerations could indeed be expanded. Suffice it to say, such budgetary ceilings exacerbated the fundamental problems which proponents of air defense development otherwise faced within a military environment whose traditions and doctrinal assumptions favored offensive systems. It remains to discuss the specific deployment and operation of the defensive systems that were procured. That is...just what was the U. S.' evolving active air defense capability between 1946-52?

3. Systems Deployment and Operation

After the Battle of Midway in mid-1942, when the threat of Japanese invasion of the U. S. was broken, the skeleton air defenses which had been established during the war were progressively de-emphasized. In 1946 and 1947, under the pressures of demobilization, continental defenses were practically non-existent.

Interestingly enough, it was Arctic area requirements that received much of what little attention was being paid at this time to a possible air-atomic threat. General Carl Spaatz, sporting a polar-projection map, was fond of pointing out to Congress that, whereas "in the past, wars tended to move on parallels of latitude..., with the advent of the new weapons...warfare will follow more nearly meridians of

longitude, and come over the Arctic frontier; this changes our whole defensive picture...."⁸⁶ The U. S.-Canadian Permanent Joint Board on Defense reported in 1946 that "for many years the Soviet Union has been assiduous in collecting data and conducting air and sea operations in the polar area, on a scale that dwarfed the efforts of any other country"; and emphasized improving the ability of U. S. defense forces to operate under Arctic conditions.⁸⁷ The first training operations conducted by ADC forces, therefore, were mobility and cold weather maneuvers in 1948. Later, in response to the Soviets' initial atomic explosion, General Omar Bradley opined, "If you are going to increase anything, the first increase ought to be the ground forces and air forces in Alaska...."⁸⁸ An extensive exercise ("Sweetbriar") conducted in early 1950 demonstrated the extent of feasibility of air operations in the Alaskan area and provided the basis for plans for an air defense

⁸⁶ Hearings, House, Subc. of Comm. on Approps., Military Establishment Appropriations Bill for 1948, 80th, 1st, March 1947, p. 602. See also Spaatz's statement at the Hearings, House, Military Establishment Appropriations Bill for 1947, 79th, 2nd, May 1946, p. 40lff.

⁸⁷ Melvin Conant, The Long Polar Watch: Canada and the Defense of North America (New York, 1962), pp. 30, 33.

⁸⁸ Hearings, Senate, Subc. of Comm. on Approps., Department of Defense Appropriations for 1951, 81st, 2nd, March 1950, p. 72.

build-up in the Arctic. For, by April 1950, the entire Alaskan area defense capability was vested in thirteen modified "all-weather" F-82 prop interceptors and seventy-five day-only F-80 fighter aircraft -- both types obsolescent by any standard.⁸⁹

It was not until after the Czechoslovakia coup of February 1948 that any perceptible efforts were made in the direction of air defense within the continental U. S. Before that time only one active radar station had been established in the U. S., while four radar sites deployed in Alaska operated for just a few hours each day.⁹⁰ The ADC before 1948 was equipped with aircraft left-over from SAC and TAC allotments and could not train all of its own pilots, let alone the Air Guard pilots who were supposedly manning "surplus" planes from the regular Air Force in an air defense role. In the ANG, indeed, practically all flight training had been stopped in 1947, other than for a series of schools, due to lack of funds.⁹¹ The

⁸⁹See Charles Corddry, "Air: Key to the Arctic," Air Force, XXXIII (April 1950), p. 25.

⁹⁰Lieutenant General Robert M. Lee, USAF, "The Role of Aerospace Defense," Air University Quarterly Review, XIII (Summer 1962), p. 9.

⁹¹Testimony of General Walsh, USA, Hearings, Senate, Subc. of Comm. on Approps., Military Establishment Appropriations Bill for 1948, 80th, 1st, June 1947, p. 128.

Army's situation was no better. By the Spring of 1948 there were only two Regular Army AAA battalions formed in the U. S., and only 54 percent of the Army National Guard AAA units had even been organized.⁹²

In late March 1948, therefore, General Spaatz ordered the ADC to take some World War II radars out of mothballs and deploy them around the Seattle-Hanford complex, in the industrial northeast, and in Albuquerque. The ANG, in April 1948, had just begun to emphasize the importance of aircraft control and warning groups and had hurriedly organized thirteen such groups (twenty percent of the required total).⁹³

The Soviets' Tu-4 flyby in May gave added impetus to the Congressional authorization in February 1949 for the construction of the seventy-five station permanent radar network in the continental U. S. (plus ten sites in Alaska). The Air Force expedited the project with \$50 million diverted from other USAF projects after the Soviets' explosion in September 1949.

As this radar system was not scheduled for operation until 1952, however, a mobile forty-four station "Lashup"

⁹²Testimony of General Omar Bradley, USA, Hearings, House, Subc. of Comm. on Approps., National Military Establishment Appropriations Bill for 1949 (Part III), 80th, 2nd, May 1948, p. 1223; and Major General K. F. Cramer, USA, ibid., April 1948, p. 415.

⁹³Ibid., (Major General Cramer), p. 414.

early-warning net was rushed to completion by mid-1950 to provide interim protection to the northeast, northwest, and California areas. The Air Force, in further response to the Soviet atomic demonstration, gave priority to manning and equipping fighter and radar squadrons and to extending the operating hours of the system.⁹⁴

These hectic and perhaps illogical efforts in 1948-49 to acquire immediately some kind of defense represented in retrospect the only post-war period during which air defense seemed to take priority over other U. S. national security concerns. By 1950, however, air defense doctrine was still conceived largely in World War II terms: partial, domestic-based early-warning coverage to alert both fighter aircraft and point defense anti-aircraft artillery protecting major industrial and population complexes. The air battle would be conducted visually within America's borders by day-only fighters, along tactics to be selected by those on the scene. "Speed of reaction to a raid warning, range of flight and the air battle tactics were basically similar to those that had governed the epic Battle of Britain ten years earlier."⁹⁵

⁹⁴ Lieutenant General Lee, Air University Quarterly Review, XIII, p. 9; and "Air Defense of North America," Air Force, XL (August 1957), p. 252.

⁹⁵ Conant, The Long Polar Watch, p. 34.

Furthermore, at the time the Korean conflict broke out in mid-1950, the deployment of U. S. air defense systems continued to reveal other glaring weaknesses. The radar net still was not operational twenty-four hours daily due to a lack of trained personnel; and the stations tended to be located -- not at the best technical sites -- but on government property that could be gotten land-free, with a resultant degradation of their intercept-control capability from attendant ground-clutter problems. Moreover, there were no Navy picket ships on station to extend radar coverage by compensating for the line-of-sight limitations of the ground based equipment.

Most of the U. S.' AAA was still in mothballs. An agreement between the services and the Munitions Board as to the disposition of the antiaircraft battalions had not been completed, and only a few of the highest priority installations were being guarded by AA guns. Additionally, as it was less expensive to concentrate by battalions than to disperse by batteries around the target perimeter, the deployment of these few AA guns was far from optimal.⁹⁶

The only all-weather interceptors the U. S. had in any numbers were old World War II piston F-82 aircraft and not all of the day-only F-86's had radar-pointing for their

⁹⁶See Martin, Saturday Evening Post, November 4, 1950, p. 146.

guns. Only a handful of the ANG fighter units were even equipped with jet aircraft. Most of the Regular fighters were deployed by groups at permanent airbases (rather than by squadrons at smaller fields throughout the area under their protection), which would seem to extend the time involved in getting all the aircraft airborne during an emergency, due to runway limitations, etc.

With regard to the location of the ANG fighter units, strict strategic considerations again had to be often subordinated. Original allocations were made on the basis of one fighter squadron to each state, and the remaining units were allocated on the basis of population. As Major General K. F. Cramer, Chief of the National Guard Bureau, described the process:

The specific locations are determined in the first instance through the availability of the population necessary to man and maintain the units. Then there is some thought given to the availability of facilities on which these units can be based. Thereafter the exact location is a matter in which the governors and the USAF...must be in agreement...In the event the State that we offer [the ANG unit] to from a strategic standpoint is not able to accept it because probably it has already another unit or two there, then we offer it to the next best from a strategic standpoint.⁹⁷

⁹⁷Hearings, House, Comm. on Armed Services, To Authorize the Composition of the Army..., 81st, 1st, H.R. 1437, January 1949, pp. 229, 189.

The Korean War sped up the acquisition of SAC rights to overseas bases and the extension of direct SAC control to exterior areas vital to its operation. Yet there was no attendant increase in SAC's forward air defense protection. In the continental U. S., the effects of the Korean experience on America's air defense posture were ambivalent.

The Air Force in the Fall of 1950 received a supplemental appropriation to complete the radar net in the U. S. during fiscal year 1951; and reservists recalled to active duty enabled the first full time operation of the extant warning and control system. In mid-1951 an agreement was reached with Canada to proceed at once with the construction of the Pine Tree warning and tracking line along their common border. The Ground Observer Corps (GOC), which had been established in 1950, recruited more vigorously for civilian spotters to help plug some holes in the non-existent low-altitude radar capability. Between January 1951 and April 1953, the number of GOC members increased from 50,000 to 200,000, yet this latter figure still represented only 40 percent of the USAF goal for the GOC.⁹⁸ On July 14, 1952, the GOC initiated a 24-hour-a-day surveillance program ("Operation Skywatch"), yet their "ground observers' guide"

⁹⁸"Air Defense of the U. S.," Life, January 22, 1951, p. 83; Air Force, XXXVI (April 1953), p. 38.

at this time had neither a picture nor a description of the only real air-atomic threat, the Soviets' Tu-4.⁹⁹

During 1951, the development of the Army's radar-controlled, fully automatic 75-millimeter, "Skysweeper" AAA and its surface-to-air guided missiles was drastically speeded-up by the fact that 87 percent of U. S. air losses in Korea were due to enemy ground fire. The new equipment was to be used to defend U. S. cities.¹⁰⁰ In the interim, between June 1950 and June 1952, the Army increased the number of its active AAA battalions in the U. S. from 48 to 110.¹⁰¹

It was with regard to continental fighter defenses, however, that the international events of 1951-52 caused the most significant changes. By January 1952, the Air Force's fighter-interceptors had been widely dispersed on a

⁹⁹New York Times, July 3, 1952, p. 3.

¹⁰⁰Hanson Baldwin, New York Times, July 21, 1952, p. 4.

¹⁰¹Antiaircraft Journal, LXXXXV [sic], (July-August 1956), p. 45. "Although in selecting these AAA sites primary emphasis must be placed upon the tactical requirements for the protection of population centers and other vital locations, consideration is also given to the public so as not to disrupt civilian communities by removing valuable agricultural or industrial properties from useful pursuits." Secretary of the Army Robert F. Stevens, Hearings, House, Subc. of Comm. on Approps., Department of the Army Appropriations for 1955, 83rd, 2nd, February 1954, p. 3.

one-squadron-per-base deployment.¹⁰² The principal rationale here was the increased capability to get the planes airborne on limited notice by relieving the jams that the former wing-per-base deployment would probably cause. And there is some evidence that an important factor in this decision, made shortly after the Soviets' 1951 May Day flyby, was the "entirely new type of plane" that could attack the U. S. at greatly increased speeds.¹⁰³ To complement the above dispersal, the Air Force also requested funds to install at the new fighter bases high speed refueling and alert readiness facilities. Hence, by early 1953, a leading USAF spokesman could state: "I would think that you could have every [fighter]

¹⁰² Secretary of the Air Force Thomas K. Finletter's statement, Hearings, House, Subc. of Comm. on Approps., Department of the Air Force Appropriations for 1953, 82nd, 2nd, January 1952, p. 8. Finletter added: "The medium bombers are on a two-wings per base deployment. The heavy bombers are on a one-and-two-wings per base deployment. This is not the way we would prefer to have them, but in order to cut down annual charges this calculated risk of somewhat crowded deployment has been accepted." It would be Finletter, writing in mid-1954, who would make one of the first authoritative public pleas for a "new military strategy" grounded in a well-dispersed and well-defended SAC base system, both in CONUS and abroad. Power and Policy: U. S. Foreign Policy and Military Power in the Hydrogen Age (New York, 1954), especially pp. 19ff; 29ff.

¹⁰³ Secretary Finletter's phrase, Hearings, House, Subc. of Comm. on Approps., Military Public Works Appropriations for 1952, 82nd, 1st, September 1951, p. 16.

airplane in the air in three hours throughout the U. S."¹⁰⁴

Significantly enough, while the Air Force was thus increasing the number of fighters it could put into the air in a compressed time-frame, the RAND Corporation was carrying out tests which demonstrated that "beyond a certain number of [aircraft] tracks, which...is about twelve, that they are trying to follow, all the [ground-control-intercept] personnel just goes crazy."¹⁰⁵

How were these new ADC fighter bases selected? In July 1951, Colonel H. R. Maddox testified that "the limitations imposed by the location of the aircraft control and warning sites [were] very specific insofar as the selection of associated airfields [was] concerned"; and that "consideration was given from strategic requirements to what aviationman John Doe is going to do in his off-duty hours, while at the same time considering the public interest,

¹⁰⁴General Ricks, USAF, Hearings, House, Subc. of Comm. on Approps., Department of the Air Force Appropriations for 1954, 83rd, 1st, March 1953, p. 221. As an interesting counterpoint to the USAF dispersal policy were the concurrent plans of the ANG to deploy all its newly received first-line aircraft within a complete wing (broken into the one squadron-per-base pattern) rather than scatter the modern aircraft throughout CONUS. See General Pilcher's testimony, Hearings, House, Subc. of Comm. on Approps., Supplemental Appropriations Bill, 1954 (Part 2), 83rd, 1st, June 1953, p. 34.

¹⁰⁵Dr. W. G. Whitman, Chairman of the RDB, testimony, Hearings, House, Subc. of Comm. on Approps., Department of Defense Appropriations for 1954, 83rd, 1st, February 1953, p. 154.

civil aviation requirements, and the post-emergency use of facilities constructed with public funds."¹⁰⁶ Ten months later, Maddox testified that the controlling factor in base selection was the ability of Russia to fly bombers into a particular area and the likelihood of their attempting to do so in wartime; and secondly, the need to establish a "defense-in-depth" posture.¹⁰⁷

The question of how the ADC base locations were determined was soon a rather academic one. For, in 1951-52, it became necessary "to strip all [F-86] Sabres from the air defense of the U. S. to put 125 Sabres in Korea to battle some 500 Mig's."¹⁰⁸ Indeed, according to Secretary Finletter, "at one time during the Korean War we denuded our air defenses almost entirely."¹⁰⁹ The unexpectedly heavy Communist

¹⁰⁶Hearings, House, Committee on Armed Services, Military and Naval Construction, 82nd, 1st, H.R. 4525, July 1951, pp. 1368, 1375.

¹⁰⁷Hearings, House, Committee on Armed Services, Military and Naval Construction, 82nd, 2nd, H.R. 7674, May 1952, p. 4244. By May 1952, Maddox had been raised to Brigadier General rank, with (one would suppose) an attendant elevation of perspective to these more weighty, strategic concerns. Which perspective represents the more valid description of the ADC's base selection process shall be left to the reader to decide.

¹⁰⁸Senator Stuart Symington's speech to the Senate, June 25, 1953, reprinted in Department of Defense Press Releases, 242-53, p. 22.

¹⁰⁹Power and Policy, p. 22.

fighter opposition in Korea was not the only reason for such action. In addition to moving ADC planes to the Far East, there was a substantial deployment to NATO which, according to General Matthew Ridgeway, was then shorter on combat aircraft than on anything else.¹¹⁰ Furthermore, the twenty-two ANG fighter wings which were recalled to active service beginning in late 1950 could not compensate for this loss of continental defenses as most of these planes were similarly deployed overseas, where they were to remain in an active status even after the Korean Armistice.

For those fighter planes which did remain in the continental United States during Korea, President Truman in November 1950 gave an unprecedented authorization for the actual interception of unidentified aircraft. This move came in conjunction with a Civil Aeronautics Association requirement that all planes making approaches to the U. S. from seaward file flight plans and navigate over certain check points. But as such a requirement was not made for aircraft entering the U. S. from Canada,¹¹¹ the majority of the ADC's

¹¹⁰ Reported by Roswell L. Gilpatric, "Retreat in Air Power," Reporter, June 23, 1953, p. 10. Canada, also, met its UN and NATO commitments during the Korean War at the expense of its home defenses. The RCAF sent all of its fighters out of the country except the one squadron of CF-100's which was then in the process of being organized. See HANSARD, Session 1952-53, Vol. IV, April 14, 1953, p. 3819.

¹¹¹ This was reportedly due to the problems of working out

pilots -- located in the industrial northeast and northwest, and lacking any electronic Identification Friend/Foe (IFF) equipment -- were required to "scramble" on all suspicious aircraft from the north, and probably sometimes wished that they, too, were battling Migs in Korea.

Indeed, one of the most enduring effects of the Korean conflict on continental air defense was the wealth of combat experience which accrued to U. S. fighter pilots and technicians. Also, the very favorable ratio of air combat kills for U. S. aircraft against the Migs was generally attributed to the superior quality of American airmanship and did much to increase the esteem of defensive air power within the U.S. Air Force community.

With the approach of 1953, as we have seen, domestic United States perceptions of the Soviet air-atomic threat were dimmed by the traditional image of a defensively-oriented Russian military machine. Also, the growing ring of U. S. overseas bases seemed secure (militarily and politically) for the B-47's, and the potential vulnerability of the intercontinental B-36's to the new Soviet all-weather interceptor (Yak-25) was not a disturbing issue. Moreover, the U. S.' own new all-weather interceptor (F-94C) was coming off the production line. Finally, there were published indications

an agreement with the Canadian government. See Martin, Saturday Evening Post, November 4, 1950, p. 148.

of the contemplated use of nuclear weapons for air defense systems which, some American authorities on air defense then felt, might enable the U. S. to attrite 95 percent of an air attack under any conditions.¹¹²

Yet, at this same time, there were other very disquieting signposts being raised. First, with regard to the reported Russian reconnaissance flights of the Alaskan, Northern Canadian and Greenland borders during the Summer of 1952, none of the missions was intercepted and almost none was radar-sighted. They left only their vapor-trail behind them as identification.¹¹³ Secondly, tests run by the U. S.' own aircraft on its air defenses were beginning to reveal severe defects in the system, especially in the degree of vulnerability to electronic countermeasures.¹¹⁴ Third, reports were increasing from responsible commentators which emphasized that the potential Soviet submarine threat to North America could no longer be ignored.¹¹⁵ Fourth,

¹¹²"A-Bombs for Air Defense," Air Force, XXXV (July 1952), p. 22.

¹¹³Joseph and Stuart Alsop, New York Herald Tribune, March 17, 1953, p. 1.

¹¹⁴"Air Defense of North America," Air Force, XL, pp. 258-259.

¹¹⁵E.g., F. Uhlig, Jr., "The Threat of the Soviet Navy," Foreign Affairs, XXX (April 1952), p. 22.

progress in the development of the U. S.' own hydrogen bomb produced a few published warnings that Soviet H-bombs were in the offing.¹¹⁶

In partial reaction to these disturbing signs, U. S. physical scientists began to join forces with civilian military analysts in 1952 to urge that the U. S.' active air defense effort be greatly expanded. No doubt the scientists were also affected by the demonstration of the efficacy of air defense which the Korean Migs manifest against B-29 daylight raids. There was additionally, perhaps, the fear within a major portion of the scientific community that the timely diversion of military resources to air defense systems was the one remaining way to avoid the dreaded development of a significant U. S. (and USSR?) offensive hydrogen bomb capability.

There were yet other, more technical reasons for the scientists' vocal support of active air defense at this time. The RAND Corporation, which had been researching and gaming the continental air defense problem as one of its major projects for the Air Force for several years, began briefing this service (informally in 1952 and formally in 1953) on its findings regarding the "Selection and Use of Strategic Air Bases". Among its more alarming preliminary results were

¹¹⁶E.g., Air Force, XXXV (June 1952), p. 22.

that "a large number of U. S. bases were too close to the perimeter of our projected 1956 radar net to have even marginally adequate warning against air attack"; and that "a single, high altitude, mass Russian strike against U. S. targets, including SAC, with 1956 defenses could result in attrition of 75 to 85 percent of the medium-bomber force, [whereas] with adequate warning to permit evacuation of aircraft this could be reduced to an attrition level of less than 20 percent."¹¹⁷

In addition, as we have seen, Project Lincoln (also operating under Air Force auspices) had been studying the problems of aircraft detection and interception since early 1951. This research, plus new solutions to the problems of air defense which began to emerge as byproducts of the Project East River civil defense study in early 1952, led to the organization of the Project Lincoln Summer Study on air defense in mid-1952.¹¹⁸ In the late Summer of 1952 this offshoot group of Lincoln and non-Lincoln scientists reported to the Air Force on the striking inadequacy of the extant air defenses. They further submitted that new and

¹¹⁷Quade, "The Selection and Use...", in Quade (ed.), Analyses..., pp. 43-44.

¹¹⁸See the memorandum from Lloyd V. Berkner to Honorable R. Walter Riehlman dtd. June 29, 1954, and reprinted in Hearings... Organization and Administration of the Military R&D Programs... p. 634.

potential technological breakthroughs promised to increase the air defense kill-rate to as much as 70 percent. This significant advance in expected enemy attrition was to be achieved through a distant early warning (DEW) line far out on the Arctic rim, and behind this, an in-depth system of automatic communications, supersonic fighters, and improved air-to-air homing missiles -- all of which would push the air battle well beyond U. S. borders...at a cost of between \$10-20 billion.

Over the ardent objections of the Air Force, the Truman Administration received this Summer Study report in the Fall of 1952.¹¹⁹ Upon its foundations, NSC-141 was prepared for the incoming Eisenhower Administration and "recommended an increase of some \$7 billion to \$9 billion in defense expenditures...mainly for air defense...."¹²⁰

Shortly thereafter, the Alsops broke the story of the Lincoln Laboratory work and thus provided the first public recognition of the extreme vulnerability of the United

¹¹⁹This ploy was soon to be described widely as the "end run" around the Air Force and was accomplished by the National Security Resources Board which had received a copy of the report in September 1952. The Air Force vs. Summer Study Group positions on this issue will be discussed in Chapter 2 below.

¹²⁰Glen H. Snyder, "The 'New Look' of 1953," in Schilling, Hammond, and Snyder, Strategy, Politics..., p. 407.

States to a growing Soviet air-atomic capability.¹²¹

¹²¹The first indications of Project Lincoln's findings appeared in the New York Herald Tribune, October 22, 1952, p. 25; but it was in this newspaper's March 16, 1953 issue (p. 1) that the prospects of the U. S.' lying "virtually defenseless against devastating attack" by the end of 1954 were detailed.

CHAPTER 2

AIR DEFENSE IN THE EISENHOWER ERA:

1953-56

Section A. Post-Stalinist Signals of Strategic Offensive Capability and Intent

Following Stalin's death in March 1953, the Soviet internal scene was dominated by the political succession struggle. Propaganda for foreign consumption during this process continued to blare the "peace" line associated with the former dictator, while the validity of his strategic doctrine was undergoing a critical reassessment at home. Throughout 1954, two perspectives on "the nature of the historical epoch" vied for ascendancy. Malenkov argued that the offensive power of nuclear weapons meant that a general war could cause the "destruction of world civilization"; and, hence, the Soviet Union must mould its policies within a "mutual deterrence" environment. Such a perspective called for the increased allocation of resources to domestic consumer goods production and a levelling-off of military systems expenditures.

Khrushchev, on the other hand, argued that a future general war would mean the destruction of capitalism only. He urged increased defense expenditures to improve the Soviets' strategic capacity to wage war, beyond Malenkov's "minimum deterrent" posture. The broad coalition of military and political leaders who sided with Khrushchev's traditional

line abetted his victory over Malenkov in February 1955. And, with Malenkov removed from power, the Supreme Soviet (legislature) reportedly "increased the military budget by twelve percent...."¹

While this political maneuvering was occurring, published Soviet military writing began to evince a spirit of objectivity which the fetters of Stalinist military "science" had precluded. Thus, the fact that all societies might be affected by the same laws of warfare became a point of discussion; and, early in 1954, the USSR's official military organ (Red Star) abruptly terminated its contemptuous allusions to nuclear weapons and began a serious assessment of their capabilities.

As an outgrowth of this assessment came a new look into the importance of the (non-permanently operating) "surprise" factor in an atomic attack. In September 1953, the Soviets' "agonizing reappraisal" began cautiously with the publication of the idea that "surprise can bring great advantages to the aggressor and enormous losses to the victim of an attack." By March 1955, the military innovators seemed to have triumphed when the authoritative assertion was made that the importance of the initiative in nuclear war dictated

¹Arnold L. Horelick and Myron Rush, Strategic Power and Soviet Foreign Policy (Chicago, 1965), p. 27.

that the USSR must now be prepared for "pre-emptive actions against the cunning of aggressors."²

The long-range weapons systems needed to implement any such pre-emptive war doctrine underwent great improvement between 1953-56. The principal demonstration of the Soviets' progress with strategic offensive weapons was, of course, their explosion of a hydrogen device in August 1953. This event was followed up within the next nine months by a rash of other indicators of an increasing USSR nuclear threat.

The first Soviet government allusion to its new inter-continental weapons systems appeared in an Isvestia article in December 1953, as a response to Eisenhower's recent "atoms-for-peace" address to the UN.³ Several months later U. S. Aviation Week magazine published photographs of two new Soviet heavy bombers already in service in northern Russia across the polar ice cap from North America.⁴ On March 26, 1954, Red Star provided the first hint of the force of the Russian thermonuclear explosion the preceding August when it likened the blast to the explosion caused by the million-ton meteorite that fell in Siberia in 1908.⁵ On

²See Garthoff, The Soviet Image of Future War, pp. 62, 65.

³Garthoff, Soviet Strategy in the Nuclear Age, p. 186.

⁴Cited in New York Times, February 16, 1954, p. 5.

⁵Cited in BAS, X (May 1954), pp. 167, 170.

April 28th, the Soviets chose to announce that since 1948 they had been conducting a major program of Arctic research covering conditions under and over the polar ice cap.⁶ Simultaneously, it was reported in the U. S. that Western diplomats were disturbed by a large unexplained residual (nearly one billion dollars) in the Soviet budget which was possibly being used to "pay for a long-range bomber fleet."⁷ Then came May Day in the Soviet Union.

It was at this celebration's fly-by that the Russians displayed a solitary, twin turbo-jet medium bomber (Western designated Badger...comparable to the B-47), and a solitary, four turbo-jet heavy bomber (designated Bison...comparable to the B-52). Several months later, at the July Air Show, sixty Badgers flew over Moscow in an impressive formation-flight.

In the 1955 May and July air demonstrations, both Badgers and Bisons flew by in several squadron-level numbers. Also, it was at this time that the Soviets' new, multi-turbo prop heavy bomber (designated Bear) made its first appearance, in formation flight with the Bisons. And it was during 1955

⁶New York Times, May 3, 1954, p. 24. In this connection, the USSR was "no doubt encouraged by the successful flights across the Polar route made by Scandinavian Air Services in 1954." Lee, Air Power, p. 25.

⁷Harry Schwartz, New York Times, May 3, 1954, p. 13.

that the Soviet Union became the first power to detonate a hydrogen bomb from an aircraft.

There were yet other demonstrations of the increasing attention the Soviets were paying to strategic bomber matters. In August 1953, it was reported that a vast program was underway to provide Soviet long-range bomber air bases with underground hangars and facilities.⁸ Additionally, before the end of 1954, the deployment of the Soviet bomber fleet had been altered to the point where "about sixty percent of the total Soviet air forces [were] stationed on the Arctic Ocean, the Bering Strait, and the Northern Pacific, ready for transpolar flights."⁹ There were, furthermore, indicators that the Soviets were stepping-up their programs to improve the quality of their bomber airmanship.

Efforts were made to increase proficiency in navigation and bombing, both visually and by instruments. The captured Norden bombsight was replaced by a crude electronic model. Cross-country flights of progressively greater range were ordered. Large-formation flights were instituted, as well as over-water flights. The techniques of in-flight refueling were explored. Day-in and day-out, Soviet pilots made simulated bombing runs on U. S. cities across the wastes of Siberia.¹⁰

⁸Anthony Vandyk, "Bomber Output Gets Top Russian Priority," American Aviation, August 3, 1953, p. 13.

⁹Soviet Long-Range Bomber Bases Near the North Pole, translated from German by Ewald W. Schnitzer, Project Rand T-40, December 28, 1954, p. 1.

¹⁰Shepley and Blair, The Hydrogen Bomb, p. 199.

Now, clearly, the reliability of some of these Western reports of "signals" from the USSR must be scrutinized; and the import of the "signals" themselves analysed within the full context of official Soviet disclosures and statements. Hence, it is important to note that

in the entire period from the Spring of 1954... until the advent of Sputnik [in October 1957]...., the bomber played a subordinate role in Soviet strategic claims. What was emphasized was Soviet possession of nuclear means of mass destruction; the means of delivering them were generally left out of account or referred to allusively. Military aviation was discussed... but the progress they claimed was usually in such areas as speed and altitude of flight rather than range. Explicit mention of 'bombers' was infrequent....The Soviet leaders were then clearly banking on priority in the development of a technologically new type of strategic weapon to provide the basis for future claims.¹¹

That strategic weapon was, of course, the surface-to-surface ballistic missile. As stated previously, there were authoritative reports that before 1953 the USSR began carrying out firing trials of large rockets from submarines training in the Eastern Baltic. There was some evidence, moreover, that around 1953 the Soviets made a fundamental decision to fix on the design of the IRBM/ICBM rocket and particularly on the engine thrust requirements. Indeed, it was reported that Russian successes in the IRBM/MRBM field in 1953-54 led

¹¹Horelick and Rush, Strategic Power..., pp. 28-29.

to the establishment in 1955 of the NATO radar-tracking system in Turkey to monitor Soviet missile firings.¹² Other Western commentators suggested that it was likely that "the most promising MRBM and ICBM programs were placed on a crash basis in 1955. The strongest evidence for this is the reallocation of scientific and technical manpower in 1955...Between July 1955 and December 1956 total employment in Soviet research and development institutions increased by a startling twenty-three percent."¹³

And, after all, there were a number of excellent a priori considerations which argued for a Soviet concentration on offensive missiles, even before the shift occurred in the U. S.: Czarist Russia's early experimentation with rockets; the Soviet view that missiles are (merely) extensions of artillery; their lack of extensive bomber experience during World War II; their harvest of German missile scientists at Peenemunde; their non-involvement with writing down a large existing investment in bombers; their lack of overseas bomber bases; the influence of

¹²Bell, Negotiation from Strength, p. 160.

¹³Lincoln P. Bloomfield, W. C. Clemens, Jr., and Franklyn Griffiths, Khrushchev and the Arms Race: Soviet Interests in Arms Control and Disarmament 1954-64 (Cambridge, Mass., 1966), pp. 69, 42. The authors cited, for their statistics, the work of Alexander Korol, Soviet Research and Development: Its Organization, Personnel, and Funds (Cambridge, Mass., 1957).

Malenkov who was believed to have been the political overseer of the Soviet missile program since 1947;¹⁴ and finally, their race to get strategic advantage in view of the comparative dominance of America's SAC, the incentives offered by the U. S. failure to concentrate on a unified ballistic missile program between 1950-55, and an apparent perception that Soviet security "is adequately protected if the Soviet armed forces have the finest weapons that anybody knows how to build...."¹⁵ If it was, therefore, not illogical to expect the USSR to "skip" the long-range bomber stage of offensive systems evolution and "break-through" to missiles, it became of critical importance to U. S. defense policy to assess and respond as intelligently as possible to the full gamut of Soviet strategic disclosures.

Juxtaposed to the evidence of a growing Soviet strategic offensive capability, however, were the variegated "Spirit of Geneva"-type signals which characterized the Soviet government's foreign policy in 1955-56: The Austrian Peace Treaty of May 14, 1955, and the withdrawal of Soviet troops from that country; the simultaneous withdrawal of Russian

¹⁴See Rostow, The United States in the World Arena, p. 290.

¹⁵Freeman J. Dyson, "Defense Against Ballistic Missiles," BAS, XX (June 1964), p. 18.

forces from Porkkala-Udd (Finland) and Port-Arthur (China); the May 1955 disarmament negotiations "concessions"; the establishment of formal Moscow-Bonn relations in September 1955; Soviet rapprochement with Tito; the "peaceful co-existence" doctrinal update to include the non-inevitability of general war tenet; the step-up in Soviet foreign economic assistance programs; the April 1956 dissolution of the Cominform; a markedly defensive-oriented 1956 May Day military demonstration; etc.

Finally, even though "the priority given missiles over bombers in Soviet strategic claims in the period from 1955 to 1957 is striking",¹⁶ there was General Nathan Twining's report from his Moscow visit in June 1956 to consider: "The Soviet Air Force is engaged in the development of a surprisingly wide variety of aircraft...[but]...nothing was revealed to us in the important area of guided missiles."¹⁷

¹⁶Horelick and Rush, Strategic Power..., p. 29.

¹⁷"Report from Moscow," Air Force, XXXIX (August 1956), p. 65.

Section B. Domestic Perceptions of the Soviet Threat

With the death of Stalin in March 1953, "the initial assumption that the Soviet regime was about to collapse or, alternatively, that it would now [under Malenkov] devote all its energies to the welfare of its people encouraged a natural desire to limit military expenditures" within the United States.¹⁸ The quick fall from grace of Lavrenti Beria, reputedly the mastermind of the atom bomb project in the USSR, led to further speculation that indeed the Russians' nuclear program had "bogged down."¹⁹ But these impressions were starkly dispelled in August when the Soviet hydrogen bomb explosion "broke the back of resistance to air defense within the Administration."²⁰ As General Maxwell Taylor later wrote with regard to this event in Russia, from the Joint Chiefs of Staff perspective:

Although the Soviets were known to have exploded an atomic device in 1949, up to this time we had belittled the achievement on the ground that it was a mere explosion, not an operational weapon. Now...for the first time there was a discussion of the effect of the eventual loss of the U. S.

¹⁸ Phillip E. Mosely, The Kremlin and World Politics (New York, 1960), p. 434.

¹⁹ "Defense and Strategy," Fortune, XLVII (June 1953), p. 94.

²⁰ Steven R. Rivkin, "The Decision-Making Process for National Defense Policy," (Unpublished Honors Thesis, Harvard College, 1958), p. 143.

atomic monopoly and of the possibility of an era of mutual deterrence.²¹

Prior to a decision in late 1953 to launch a major air defense effort, however, there had occurred in the U. S. another year of delay and debate, with very little tangible improvement in the country's ability to cope with a nuclear attack. At the heart of the debate lay the intelligence argument about Russian strategic strength.

The Alsops publicized widely in early 1953 their intelligence information which depicted an air-atomic threat of more than 700 Tu-4's capable of carrying nuclear-laden fighter aircraft under their wings. The fighters would be released from the Tu-4 at the American coastline for a low-level flight to the target.²²

Within the military community, the various intelligence estimates placed the Soviet bomber capability at between 400-1000 Tu-4's. This fleet would be sufficient to inflict serious damage to the country, given an expanded Soviet stockpile of atomic bombs. In mid-1953, moreover, official Air Force documents acknowledged the development of the Soviets' long-range turbo-prop second generation aircraft and estimated that they "would begin to produce

²¹The Uncertain Trumpet (New York, 1959), p. 25.

²²See New York Herald Tribune, March 16, 1953, p. 17.

modern heavy bombers as replacements for the Tu-4 at a very low rate in 1954."²³ And, after Malenkov's August announcement of the hydrogen bomb explosion, "there was little disposition in the Air Force...to doubt that the Soviet Union had a substantial nuclear capability."²⁴

The perceptions of the Eisenhower Administration, however, were of a different hue. Secretary of Defense Charles Wilson, before a Senate Appropriations Subcommittee in May 1953, chose to interpret the Soviets' overall air posture in these terms: "American people should be reassured by the Soviet concentration on fighter production as a sign that the Russians intend to build an air force of principally defensive capability." This statement was later described as apparently representing the base of much of the U. S.'

²³See Hearings, House, Subc. of Comm. on Approps., Department of Defense Appropriations for 1958 (Part 1), 85th, 1st, March 1957, p. 1122. This aircraft presumably was that of the May Day 1951 fly-by in Moscow which had been the "major intelligence puzzle" of the succeeding two years. Cf. the following account of how the puzzle was solved: "It has now been learned that the Tu-4 airframe has been 'stretched' and modified for turboprop power but that the changes are such that most of the jigs and tools used to build the original aircraft can serve for the production of the new model. ...This significant news...notably explains why Russia is still building at the rate of some sixty a month what was thought to be an obsolescent four-engine bomber," the Tu-4. Anthony Vandyk, "Turboprops Power Long-Range Red Bombers," American Aviation, August 31, 1953, p. 27.

²⁴Smith, The RAND Corporation, p. 225.

military planning in the ensuing two years; and was defended by Wilson in early 1956 at the Airpower Hearings.²⁵

Clearly, this Administration view of the Soviet strategic threat must be seen in relation to the major policy dilemma which faced Eisenhower upon taking office in January 1953: to resolve the requirements for increased air defense expenditures manifested by the Lincoln Summer Study Group Report and NSC-141, with the new President's promises of domestic "security through solvency" (balanced budget, reduced taxes, etc.) and of "liberation" (a toughness abroad which seemed to require no diminishing of U. S. offensive power in resource competition with CONAC's demands).

Resolution of this dilemma was delayed by a number of bureaucratic and technical reasons which will be discussed

²⁵ New York Times, May 20, 1953, p. 1; and June 17, 1955, p. 22; Air Power Hearings, p. 1757ff. It was remarked of Secretary Wilson that "when the information has allowed him the choice [he] has consistently put the minimum interpretation on Soviet air capabilities. He is fond of remarking that 'the Russians aren't all 40 feet tall.'" And his Deputy Secretary, Roger Kyes, would often scornfully describe service-produced intelligence as 'sales promotion stuff'. (Charles J. V. Murphy, "The New Air Situation," Fortune, LII [September 1955], p. 221.) Wilson was no more impressed with the Russian submarine threat to CONUS. See the views he expressed at a press conference on October 19, 1953: "Q. Isn't it just as feasible for them to attack with...atomic guided missiles launched from submarines off our coast? There never seems to have been any discussion of that...." Ans. "Jules Verne was an amateur now compared to the things people are writing about on this subject -- wonderful dream weapons." Department of Defense Minutes of Press Conferences for 1953, p. 18.

later. Indeed, the Cold War policies which were finally arrived at by the Administration at the end of 1953 are all too familiar to detail here. The "long-haul", the "new-look" and "massive retaliation" became practically household words whose implications were themselves debated widely and vigorously for years. Nevertheless, a brief mention of them is warranted.

The "long-haul" view of the Soviet threat (which replaced the former "crisis year" approach) symbolized the desire for stability in U. S. foreign and defense policy and minimized the significance of the traditional bases for the determination of military requirements: enemy capabilities and U. S. commitments. The threat thus envisaged would continue essentially at the current level and would not counter-balance U. S. strategic superiority until at least the end of the decade.²⁶ The "new look" meant basically that U. S. military policy-makers would now be authorized to lay plans wherein nuclear weapons (including tactical nuclears, atomic cannon, and the soon-to-be-developed nuclear air defense weapons) would be released for operational use under a wide variety of contingencies. Firepower, hence, would substitute

²⁶See Snyder, "The 'New Look' of 1953," in Schilling, Hammond, and Snyder, Strategy, Politics..., pp. 474-475; and Samuel P. Huntington, The Common Defense: Strategic Programs in National Politics (New York, 1961), p. 89ff.

for manpower. Finally, the "massive retaliation" doctrine was interpreted variously, but a determined effort to improve U. S. air defense would appear to be a requirement of the doctrine if it were to be a credible deterrent and if the U. S. wished to minimize the risks of having its intentions (to retaliate massively) probed.

How did the USSR bomber fly-by "signals" in mid-1954 affect these perceptions of the Soviet threat? The display of the twin-turbojet Badger, while impressive in formation flight, was not strategically startling. The U. S. had known that the Soviets were concentrating their nuclear delivery system efforts upon a jet light-bomber and this medium range bomber. Even the Badger was considered a primary threat only to Europe since, unrefuelled, it could not strike most continental U. S. targets and return home. And U. S. officials were confident (although puzzled) that the Soviets were quite laggard in their in-flight refueling development to extend the Badger's range.²⁷ However, the solitary, four-turbo-jet, heavy Bison bomber which was displayed on May Day was

²⁷ See Hanson Baldwin, New York Times, October 11, 1953, p. 33 and March 4, 1955, p. 10. "Not until 1955...did an article appear in the Soviet press describing aerial refueling as an essential component of an intercontinental bombing system, and not until 1957 did the Soviet Union demonstrate a bomber refueling capability in practice." Herbert S. Dinnerstein, War and The Soviet Union: Nuclear Weapons and the Revolution in Soviet Military and Political Thinking (New York, 1959), p. 230.

unheralded, unexpected, and frightening with its sleek, intercontinental-range power.

The general reaction in the U. S. to this potentially significant increase in the Soviets' offensive capability was to debate on precisely the word "potentially." Was the Bison a single prototype or did it represent the deliberate disclosure of a major USSR investment in strategic air-atomic weapons systems? Was its display intended simply to reassure Soviet allies and the domestic population during a politically unsettled period in the USSR? Or was it meant to intimidate the U. S. and its trans-Atlantic allies who controlled SAC's most important overseas bases? Or, was it none of these reasons? Could the display basically represent a self-interested Soviet attempt to correct what was perceived to be a Western underestimation of the state of USSR military security? How did the Bison shape up against the American B-52 (which was only in the production stage); and should the USAF begin laying plans for a new bomber? There were those who, remembering the unexpectedly large numbers of fighters which the Soviets put into combat in Korea, were predisposed to exaggerate the display.²⁸ There

²⁸General Twining reportedly characterized this Moscow disclosure as "a more important milestone than the knowledge of the first Soviet atomic bomb explosion." C. J. V. Murphy, "The New Air Situation," Fortune, LII (September 1955), p. 87.

were others -- like Secretary Wilson -- who suspected a Twentieth Century version of Potemkin Village, designed to scare the U. S. into reckless expenditures. There were even those who wondered how all this affected America's air defense program, just beginning to get "off the ground."

These questions were confounded by the long-range ballistic missile factor which was being introduced into U. S. appraisals of the air threat at this time. The U. S. long range missile program had been essentially dropped around 1949 because of the requirements of accuracy, guidance systems problems, and excessive warhead weights. But the hydrogen device test, plus other significant technological progress in 1952, changed the picture, and research was reopened vigorously within all services in 1953. Despite published reports that "the more the scientists examine the technical problems involved in intercontinental missile development, the more distant the era of push-button war becomes in their minds,"²⁹ there were indications of real Soviet progress in this field. Hence, Soviet successes with MRBM's in 1953-54 led to the setting-up of the NATO radar-tracking system in Turkey to monitor their missile firings.

²⁹Ralph E. Lapp and Stuart Alsop, "We Can Smash the Red A-Bombers," Saturday Evening Post, March 21, 1953, p. 86. See also Rear Admiral D. V. Gallery, USN, "Don't Get Hysterical About Guided Missiles," Saturday Evening Post, June 13, 1953, pp. 151-155.

There seemed to be some concern with Soviet long-range missile development outside of the Administration, also. For example, with regard to the 1952 Lincoln Summer Study Group, it was later testified that "the purpose of the Summer Study was simply this. We knew that the Russian threat to the continent might grow in a variety of ways...including ballistic missiles...and we wanted to see whether the kind of air defense planning that was going on...within Lincoln was appropriate to the growing threat."³⁰

As far as can be determined, there was only one major action taken by the U. S. in 1954 more or less in response to the above Soviet bomber and missile signals. On May 14, 1954, the Air Force gave the "highest possible priority" to the rapid development of an ICBM capability. This required the USAF to augment its strictly limited R&D funds to the extent that work on the advanced, long-range, all-weather interceptor to support the investment in the DEW line had to be immediately stopped, and that work on the DEW line and the SAGE system was delayed in 1955.³¹

³⁰ Dr. Zacharias' testimony, In The Matter of J. Robert Oppenheimer, Hearings before the Personnel Security Board, U. S. Atomic Energy Commission, April 1954, p. 923ff.

³¹ Testimony of Trevor Gardner (Assistant Secretary of the Air Force for R&D) and Donald Quarles (Secretary of the Air Force) at the Air Power Hearings, April 1956, p. 1108ff, and p. 1600 respectively.

Such a decision regarding ICBM development could, of course, have represented "not a response forced by desperation but rather by an objective appraisal of the operational feasibilities."³² Further, one could already detect in 1954 an incipient disenchantment with bomber defense programs (criticized as being almost "still-born") which would rise to a crescendo in the U. S. after Sputnik. For example, Senator Symington spoke out thusly before the Senate on July 21, 1954:

Within a few years it will be possible to deliver atomic and hydrogen weapons by long-range intercontinental ballistic missiles....The elaborate and expensive systems of radar defense we are being urged to build would be utterly useless against...a missile barrage [and]...no workable method of intercepting or deflecting them has been devised, even in theory.³³

Nevertheless, what is important for our present purposes is to underscore the fact that U. S. perceptions of the Soviet threat in 1954 still resulted in a response made at the expense of certain approved bomber defense programs.

This is not to suggest that the Air Force, itself,

³²C. J. V. Murphy, "Defense: The Revolution Gets Revolutionary," Fortune, LIII (May 1956), p. 248. See, also, General N. F. Twining, USAF (Ret.), Neither Liberty Nor Safety: A Hard Look At U. S. Military Policy and Strategy (New York, 1966), p. 302ff.

³³Congressional Record, 100, 11159.

continued to view nuclear bombs only as "one-way" weapons --- to be used exclusively by SAC. Nor did it appear to consider the present bomber threat to have been eclipsed by the uncertain future ICBM threat. Indeed, 1954 was a year of relative desperation within the Air Force. It was clearly recognized that the Soviets' atomic stockpile was continually growing, and, augmented by its H-bomb program, had been magnified a thousand fold in potential destructive power. The Air Force had also received in mid-year the completed RAND study of its SAC basing system which formally concluded that

a growing Russian defense has forced us to the use of high-performance, short-radius bombers. At the same time, an increasing Russian offensive power will compel us to keep as much as we can of the vulnerable part of our strategic complex a long distance from the enemy's bombers. In such a world, a system for basing our bombers at home within the cover of our radar network and extending range to target by means of dispersed overseas re-fueling stations appears to be important for a large part of our strategic task.³⁴

Furthermore, in 1954-55 there were published reports that "the great interest recently shown by the Red Air Force in developing bases on Sakhalin Island (8 have been built there) seems to have been a sudden awareness of the utility of the jet stream." This jet-stream "presents almost a

³⁴Albert J. Wohlstetter, et al., Selection and Use of Strategic Air Bases (RAND R-266), April 1954, pp. 371-372.

tailor-made course for the enemy if he wanted to employ it to attack the U. S. through the soft underbelly."³⁵ As a result of all these developments in 1954 (even though air defense progress was rather substantial that year), hope was given up, for the most part, of preventing enormous damage to the continent should surprise attack come. Hence, by January 1955, the "important question" the new CONAD command was trying to answer was "not how high a percentage of enemy planes can be shot down but how much destruction compressed in a brief period the country can stand and still keep going."³⁶

It was also at about this time that the USAF "picked-up" (if only tentatively) the long-standing Soviet signals of a counterforce strategic targeting doctrine. As the Chief of Staff, General Twining, stated in February 1955: "It is my theory that our SAC force would be the number one target for the Russians to attack."³⁷ Yet, as will be shown later, this perception did not immediately lead to the concerted

³⁵American Aviation, October 11, 1954, p. 29; and E. M. Miller, "Red Stars on the Jet Stream," Air Force, XXXVIII (July 1955), p. 38.

³⁶BAS, XI (January 1955), p. 38.

³⁷Hearings, House, Subc. of Comm. on Approps., Department of the Air Force Appropriations for 1956, 84th, 1st, February 1955, p. 35. (Italics added.)

deployment of active air defense protection for SAC complexes. This relative inattention to the security of the U. S. second-strike strategic force is all the more striking in view of the concurrent Soviet doctrinal outpourings which revealed an increased appreciation of the importance of "surprise" and "pre-emption."

Now, admittedly, such new Russian military thought could be (and was) disparately interpreted. On the one hand, the increased appreciation of these factors in warfare was seen as truly representing an attempted readjustment of the Soviet military posture to its new long-range attack possibilities, and a warning to the West that the USSR would indeed "strike a pre-emptive blow against the cunning of aggressors" if it had to. But the doctrine was also interpreted to imply simply an overconfidence in the Soviet ability to receive warning of attack, and a lack of confidence in the adequacy of its offensive force to effect retaliation.³⁸ However interpreted, it is revealing that as late as 1958 the principal effect of any Soviet "First-Blow" doctrine on U. S. strategy could still be reported to be the increased importance of SAC's overseas bases as a complicating factor

³⁸For the former view, see Harry Schwartz, New York Times, June 20, 1955, p. 1; for the latter, H. S. Dinnerstein, "Soviet Military Posture as a Reflection of Strategy," in Eugene M. Emme (ed.), The Impact of Air Power: National Security and World Politics (Princeton, 1959), pp. 559-560.

to a pre-emptive attack -- not the increased importance of active protection for SAC's continental bases.³⁹

There seems little doubt that such considerations of active air defense requirements were essentially muffled in 1955-56 by the "bomber gap" debate which then dominated U. S. national security discussions. And it was the Moscow air shows of May and July 1955 which triggered the debate.

Both Badgers and Bisons flew-by in several squadron-level numbers. Especially distressing to Western observers, also, was the first appearance of a multi-turbo-prop heavy Bear bomber. Since it flew in formation with the Bison and revealed good tanker characteristics, the "appalling" hypothesis was developed that the Bear would refuel the Bison and thus give the Soviets a continuous two-way intercontinental mission capability.⁴⁰ Furthermore, the appearance of radar bulges on the Badgers' fuselage was an "alarming development" which upped U. S. estimates of Soviet electronic sophistication.⁴¹

There was very little delay in response to this signal from the USSR. With regard to the Bison, General Twining

³⁹See "Why Soviets Plan a 'First Blow'", U. S. News and World Report, February 7, 1958, p. 65ff.

⁴⁰Murphy, Fortune, LII (September 1955), p. 218.

⁴¹Testimony of Trevor Gardner, Air Power Hearings, p. 1136.

said he had now seen "enough that we have to accept the fact that they're in production."⁴² There was, in addition, a sharp upward revision of American estimates of Soviet bomber production capacities, as a result of a test problem submitted to a group of U. S. aircraft manufacturers after the Moscow displays. The test seemed to furnish proof that a four year Bison design-to-production cycle was within the Soviet capability, whereas the B-52 cycle had consumed eight years.⁴³ By mid-May the Senate was preparing an inquiry on U. S. air power and the Air Force was ordering an increase in B-52 production from twelve to seventeen a month.

The proponents of increased U. S. air-atomic counterforce as the principal response to the USSR threat repeated relentlessly throughout 1955-56 that the Soviets either had overtaken the U. S., or could overtake the U. S., in all categories of warplanes except that of the medium jet bomber;⁴⁴ that with present plans and production schedules, "in 1959 they will have approximately twice the number of heavy bombers that the USAF will have"; and that America had thus lost

⁴²New York Times, May 20, 1955, p. 7.

⁴³See Murphy, Fortune, LII (September 1955), pp. 87; 222-223.

⁴⁴See, e.g., statement of General Twining, Hearings, House, Subc. of Comm. on Approps., Department of Defense Appropriations for 1957, 84th, 2nd, February 1956, p. 759.

"command of the air" by continued underestimating of Soviet airpower.⁴⁵

It has been suggested that the appearance of the Soviets' "pre-emptive" war doctrine in 1955 provided a rationalized basis for the apparent USAF shift to a counterforce strategy at this time.⁴⁶ For it could be argued that Soviet advocates of pre-emption required a substantial buildup of their heavy bomber fleet (not simply the capability to do so) if it were to be a credible strategy -- and, hence, the U. S. needed to spawn now a large second-strike force of its own.

Additionally, it should be noted that a significant factor in the USAF's pleas for more offense at this time involved its requirement for more tanker aircraft to serve B-47's which, due to the advanced Soviet bombers and decreased warning time, could no longer be expected to be flown overseas to operate during war.⁴⁷

⁴⁵Testimony of General John P. McDonnell, USAF, Air Power Hearings, p. 174. Cf. the "rebuttal" to this latter point that "because of our fascination with mass bombing, insufficient attention has...hindered progress in intelligence and reconnaissance on Soviet military targets." Colonel Richard S. Leghorn, USAFR, "No Need to Bomb Cities to Win War," U. S. News and World Report, January 28, 1955, p. 87.

⁴⁶See, e.g., George E. Lowe, The Age of Deterrence (Boston, 1964), p. 100ff.

⁴⁷Testimony of General McDonnell, Air Power Hearings, p. 176.

And, moreover, to the commentators who pointed to the contribution made by U. S. naval aircraft to America's overall air-atomic strength, General Twining replied:

If I was assured when we wanted to attack Russia on a strategic mission that the naval carriers were assigned to General LeMay, ...fine. But, that is not the case and I don't know where these carriers are going to be...so the SAC has to be just as big, just as strong and just as ready, regardless of this Navy contribution.⁴⁸

These arguments for an increased strategic offense, however, were based fundamentally upon quantitative comparisons of USAF versus Soviet aircraft, and tended to obscure some important considerations. First, the Air Force's own B-52 program was lagging -- not simply because of some malicious distortion of the U. S.' Soviet intelligence -- but because of an electrical system component failure which forced SAC to reject approximately 40 percent of the aircraft produced up to May 1956.⁴⁹ Secondly, the overwhelming attention paid to the manned heavy bomber threat delayed general U. S. appreciation of the rapidly growing Soviet naval threat -- both submarines and aircraft⁵⁰ -- and missile threat, to

⁴⁸Air Power Hearings, p. 1840.

⁴⁹P. Peeters, Massive Retaliation: The Policy and Its Critics (Chicago, 1959), pp. 135-136.

⁵⁰E.g., Senator Symington at the Air Power Hearings: "I only learned in these hearings that the Soviets had three to four thousand naval airplanes." (p. 1372.)

which an overall air defense posture must adjust. For our immediate purposes, the most interesting aspect of the "bomber-gap" debate in 1955-56 was its almost total disregard for the effects of comparative air defense postures on the overall air power situation (in both the pre-attack and post-attack environments), and its minimal attention to the present or future deficiencies in CONAD.

Why was this? Probably the simplest explanation for the disregard of the air defense factor in the air power equation is that the vocal debaters just did not think air defense mattered. The Soviets had displayed forty-eight new, supersonic day fighters and fifty new, advanced all-weather interceptors at their July 1955 air show to augment their already considerable deployment of defensive systems. But General Twining in early 1956 could still dismiss this capability with a perfunctory, "SAC continues to have the ability to get through."⁵¹ Furthermore, even when USAF sympathizers manifested a respect for Soviet defenses their arguments quickly lapsed into a reinforcement of the center-stage battle for more SAC planes: "With the Soviet advance in fighters, the SAC might have to go back to large defensive

⁵¹Hearings, House, Subc. of Comm. on Approps., Department of Defense Appropriations for 1957, 84th, 2nd, February 1956, p. 761.

formations."⁵² For the U. S. defense posture, the CONAD commander, at the Air Power Hearings, testified that "we now have a good system to fight the Tu-4" but that operational U. S. fighters had neither the speed nor altitude to intercept the Bison (pp. 252, 244). And, after all, the Bison was the principal villain of the "bomber-gap"; so how could CONAD really matter in the airpower calculation?

One other consideration which affected the role of air defense in the 1955-56 "bomber-gap" debate bears mentioning briefly at this point: The bitter USAF-USA rivalry over ground-to-air missiles which was then bubbling beneath the surface. The Army at this time was convinced (albeit not very vocally) that its operational Nike-Ajax missile had a good capability against the Bison. The Air Force, however, was conducting staff studies to demonstrate the unsuitability of the Nike for continental defense and the greater potential of the Talos missile which it hoped to develop in a similar role. It seems likely, therefore, that the Air Force was reluctant to engage in a frank and open discussion of the CONAD posture (even if they felt it did matter) for fear of generating Army comment on Nike, and until the Air Staff

⁵² Brigadier General Thomas R. Phillips, USA (Ret.), "The Growing Power of the Soviet Air Force," Reporter, June 30, 1955, p. 18.

had marshalled all its arguments for the Talos.⁵³

Now the Air Power Hearings in the Spring of 1956 proved to be an important forum for illuminating some principal U. S. air defense deficiencies, and occasioned a re-examination of the future evolution of the system. Yet it is significant that the \$900 million in additional defense funds that were appropriated during the Hearings were intended primarily for more B-52's, KC-135 tanker aircraft, and ICBM/IRBM research. It is equally revealing to note also that after all the months of testimony on Airpower, the Senate report of the Hearings essentially dismissed the question of "air defense power" with the single, hackneyed statement: "The best defense against air attack is a strong offense."⁵⁴

⁵³ Hence, the Nike-Talos dispute did not break fully into the open until May 1956. (See Anthony Leviero, New York Times, May 21, 1956, p. 1; and May 29, 1956, p. 12.) A further complication here was the fact that the services were also engaged in other, more fundamental rivalries at this time. The Army was against the massive retaliation doctrine, while the Air Force and Navy debated the vulnerability of the Forrestal-Class carrier and its role in strategic bombing. These rivalries were described as "more acute and far-reaching" than any since 1949 (A. Leviero, New York Times, May 19, 1956, p. 1); and, once again, air defense problems took a back seat at the services' major staff levels. Finally, Secretary Wilson's extraordinary press conference in May wherein all the service Chiefs disavowed the nasty, staff studies; plus Wilson's later threat ("Let's see who sticks his head up next. I think it might be a little dangerous"), must have had the effect of dampening further the frank discussion of air defense missile power throughout the remainder of the year.

⁵⁴ Airpower, Rept. of Subc. of Comm. on Armed Services, S. Doc. 29, 85th, 1st, January 25, 1957. p. 6.

Throughout 1955 and 1956, a counterpoint ran uneasily beneath the Air Force's vociferous pleas for more strategic aircraft. The theme was a dual one: there was no bomber gap today, but there may be a ballistic-missile gap tomorrow. From either end, it augured poorly for any air defense effort on other than an "orderly basis with phased increases in forces and facilities."⁵⁵

A budget-minded Administration proffered the first half of the theme. In mid-May 1955, Eisenhower professed publicly real doubts that the USSR had a lead in airpower; Secretary Wilson, in April 1956, was "sure that the Russians showed us purposely all [the Bisons] they had"; and in between time there were continued calls to adjust the economy and the military for the "long-haul."⁵⁶

To be precise, the Administration never explicitly denied that the USSR might possibly be ahead in heavy bomber capability and potential. Its public argument was that the gap evaporates when USN and Allied offensive airpower contributions are counted.⁵⁷ Of course, the government privately

⁵⁵Admiral Arthur W. Radford's phrase to describe the modus operandi of the major air defense buildup embodied in NSC-162 in the Fall of 1953. (Speech delivered before the National Press Club, December 14, 1953. Reprinted in Vital Speeches, XX [January 1954], p. 172.) See pp. 128-138 below.

⁵⁶New York Times, May 19, 1955, p. 1; Air Power Hearings, p. 1761.

⁵⁷See, e.g., Secretary Wilson's testimony, Air Power

may have had real confidence in 1954-56 -- based on its intelligence products -- that the Soviets were not intending to build a bomber fleet nearly so large as SAC's alone. There is some evidence that this is the opinion they were receiving from the JCS.⁵⁸ Moreover, the well-publicized USAF intelligence estimates of Soviet Bison bomber production capability were apparently known within the Administration to be upwardly biased.⁵⁹

The Administration, however, did not bring the "bomber-gap" to the public by revealing to it in any detail the actual degree of U. S. vulnerability to Soviet bomber attack (the oft called-for "Operation Candor"). In short, the government did not talk extensively about USSR strategic capabilities.

Hearings; p. 1685ff. Note that the Administration, also, did not publicly interject the air defense factor into the airpower equation.

⁵⁸ See the testimony of Admiral Radford, Hearings, Senate, Subc. of Comm. on Government Operations, Organizing for National Security (Vol. 1, Part V), 86th, 2nd, June 1960, p. 682.

⁵⁹ "...the earlier estimates given to the Committee [on Armed Services] by the Air Force sources deliberately took the highest of the estimates for Soviet production of Bison bombers, rather than the average; that is, the 'policy' officials eliminated certain phrases with which the professional intelligence specialists had qualified their appraisals...." (Timothy W. Stanley, "Congressional Investigations and National Security: A Study of Legislative-Executive Relations in the Area of Foreign and Military Policies, 1947-1957," [Unpublished Ph.D. thesis, Harvard University, December 1958], p. 479.)

From one perspective, it can be said that the U. S. chose thereby not to let the Soviets know whether they were getting away with a bluff of their offensive strength. For there is an old military doctrine that "security is a delaying action", which implies that it is only knowledge of the very new developments (e.g., Soviet hydrogen bombs, Bison bombers) which are worth trying to keep secret. From another point of view, it appears that the Eisenhower Administration was deeply motivated by the desire to avoid a general American public obsession with nuclear war destructiveness. As one commentator expressed this notion:

Eisenhower has conducted his foreign policy on the theory that the only way of avoiding another world war, aside from simply remaining strong, is for the U. S. to set an example of self-control calculated to lower the world's fever...He believes that unless the war talk stops, unless the U. S. sets an example of national calmness, the world may be set blindly on the path of war.⁶⁰

And, of course, there were also the Conservative Republican domestic economic pressures and the international "Spirit-of-Geneva" considerations which must have affected the government's strategic perspective.

Whatever the complex of economic, military, and psychopolitical factors involved in the Administration's perceptions

⁶⁰C. J. V. Murphy, "The White House Since Sputnik," Fortune, LVII (January 1958), p. 232.

of the Soviet threat, the Basic National Security Policy (BNSP) paper which was developed in January 1955 gave recognition for the first time to the possibility of a Soviet-American relationship of mutual deterrence; and by 1956 the government had apparently accepted the concept of a "sufficient deterrent."⁶¹

It has been suggested that "quite possibly it was the increasing effectiveness of continental defense rather than the continued predominance of strategic airpower which the Administration saw as the principal counterbalance to the future strength of the Soviet strategic air force."⁶² However, the Administration appeared to see less clearly that the burgeoning Soviet long-range missile program could possibly soon render these defenses essentially useless. Perhaps the bureaucratization and interservice competition which characterized the United States' long-range missile R&D efforts at this time, of itself, precluded a more objective appraisal of the USSR ICBM/IRBM program.⁶³ Too, it seems

⁶¹Taylor, The Uncertain Trumpet, p. 26; Huntington, The Common Defense, p. 100ff.

⁶²Huntington, p. 78.

⁶³The U. S. missile program was described by Senator Symington as having "the most complicated organizational structure [he] ever heard of before, either in business or in government...." Air Power Hearings, p. 655.

that most of the warnings of such a potential Soviet threat in 1955-56 were content to urge a step-up in the U. S. ICBM/IRBM program in response -- and made little reference to the missiles' effects upon the evolving American air defense posture.⁶⁴ It was not until July 1956, henceforth, that negotiations commenced with Canada for "joint collaboration in the study of methods and procedures" for dealing with a defense against the ICBM.⁶⁵

In any event, Eisenhower in February 1956 "cautioned against inflating the importance of these ocean-spanning monsters which cannot be controlled after the beginning of their flight and would have to be used in large numbers."⁶⁶ And the Administration here again chose not to be candid with the American public regarding Soviet offensive missile advances. It was left to a U. S. technical publication to break the story in late 1957 of how the government had been using extremely powerful long-range radar and other equipment

⁶⁴For example, one of the most widely cited warnings was made by Senator Henry Jackson in a speech on the Senate floor February 1, 1956 (Cong. Rec. 102, 1763ff.), in which he exhorted the country to give "wartime urgency" to U. S. offensive missile programs, but made nary a mention of anti-bomber (or anti-missile) defenses.

⁶⁵Testimony of Prime Minister Diefenbacker, HANSARD, Session 1957-58, Vol. II, November 13, 1957, p. 1060.

⁶⁶Quoted in BAS, XII (April 1956), p. 137.

based in Turkey to monitor Russian missile firings since the Summer of 1955.⁶⁷

Finally, it should be noted that -- while the Soviets' IRBM/MRBM test center had been located by U-2 aircraft in mid-1956 -- it was not until the early Summer of 1957 that their Tyura Tam ICBM range was found.⁶⁸ For an Administration otherwise predisposed toward stable, long-range air defense programming, therefore, this intelligence "mystery" could act to muffle any impetus for systems reorientation to meet the new ballistic missile threat. It required, indeed, the trauma of a Sputnik to do this.

Let us then turn at this point to an examination of the development of the U. S. air defense posture during the early Eisenhower years.

⁶⁷"How the U. S. Taps Soviet Missile Secrets," Aviation Week and Space Technology, October 21, 1957, pp. 26-27.

⁶⁸According to C. J. V. Murphy, "Khrushchev's Paper Bear," Fortune, LXX (December 1964), p. 227.

Section C. The Build-up of the U. S. Air Defense Posture

1. Roles and Missions

Through a series of voluntary interservice agreements, the three service components of the U. S. air defense forces were -- until September 1954 -- assigned to the USAF's Air Defense Command for wartime operations. During peacetime they remained under the control of their particular service chief. Whatever recognition there may have been of the deficiencies of such an arrangement, the services just could not agree on an improved command organization. However, with the Administration's decision in late 1953 to build-up considerably its continental defenses, pressures to reconcile such interservice differences grew.

As a result, on September 1, 1954, the Continental Air Defense Command (CONAD) was established as a joint command directly under the JCS, with the USAF serving as the executive agency. General Benjamin Chidlaw, the Air Force's ADC commander, received a "second-hat" as CINC-CONAD. Navy and Army officers were assigned to his staff and reported directly to him instead of to their own service chiefs. Such an organizational change was obviously designed to give the air defense commander maximum access to defensive weapons in a maximum number of places, to provide essential unification of authority and segregation of responsibilities, and, consequently, to achieve quicker, undelayed striking power.

The establishment of CONAD did not, however, resolve all of the organizational problems within the air defense community. General Chidlaw still did not have command over the administrative, logistical, supply, training, and personnel aspects of his component service organizations. There was still no single commander for all of the Navy's air defense forces. The Army's Antiaircraft Command (ARAACOM) was still suffering the "in-house" problems that resulted from its subordinated standing within that service. As one colonel described it: "The anti-aircraft defense has a tortured command structure, hard to describe and harder to live with, which has little discernible correspondence with any element of the Air Force, and no clearly stated relationship with the rest of the U.S. Army."⁶⁹ But the principal organizational problems involved the Army-Air Force frictions which the creation of CONAD had, indeed, exacerbated.

An Army spokesman later wrote that the Army had been "forced to accept" the CONAD arrangement in 1954. He went on to detail the problems generated through 1956 by the increased authority of its commander, and suggested that "a great deal of the fault for the muddle has been the Army's

⁶⁹ Colonel Bernard Thielen, USA, "Guardian of Our Air Frontier," Army Combat Forces Journal, V (April 1955), p. 16. Apropos to this problem, it is revealing to note that it was not until January 1955 that the "Anti-Aircraft Association" was enabled to merge with the "Association of the U. S. Army," the USA's journalistic medium.

past failure to recognize where all this was leading."⁷⁰ The primary complaints included the filling of all key staff positions with Air Force officers, the pressures upon ARAACOM to abolish AAA operations centers, the denial of equipment to them, and CINC-CONAD's attempts to throw out the Army's Missile Master (the new Nike ground control system scheduled for initial operational capability in 1957) and replace it with the Air Force's SAGE control system (initial test segments of which had been placed in operation in April 1956.)⁷¹

From the Army perspective, its tensions with the Air Force were explained basically by the successful deployment of the Army's Nike-Ajax missile system (operational since 1953) and the concomitant failure of the Air Force's Bomarc missile to develop as rapidly (the first Bomarc would not be deployed until September 1959). As the Army put it, "The fighter aircraft was no longer the most effective air defense weapon."⁷² Furthermore, the advances in surface-to-air missilery complicated the basic distinction between point

⁷⁰Jonathan Carmen ("pseud."), "The Air Defense Muddle," Army, VII (February 1957), p. 44. Carmen was supposedly a Washington writer with ten years of active Army service.

⁷¹Ibid., passim.

⁷²Ibid., p. 43.

defense and area defense missions under which the services had been implicitly operating since 1948. As the Army progressed with developmental work on SAMs with ranges greater than the Nike-Ajax's, it threatened the Air Force's area-defense programs.

All of these issues came to a head at the close of the 1955-56 "bomber gap" debate, and Defense Department directives ensued which attempted their resolution. In June 1956, plans to integrate the SAGE and Missile Master systems were ordered. At the same time, however, CINC-CONAD was given authority to centralize the control of air defense forces, including the assignment of individual antiaircraft batteries to designated targets.⁷³ In September 1956, CONAD and ADC split into two commands at a single headquarters, with ADC a component command on a level with ARAACOM; and an increase in the number of Army and Navy officers on the joint staffs became required.⁷⁴

Finally, on November 26, 1956, Secretary Wilson issued a policy memorandum which articulated for the first time the difference between the services' air defense missions. The Army was explicitly assigned the "point defense" mission which

⁷³ See Wegenhoft, Air University Quarterly Review, XII (Spring 1961), p. 46.

⁷⁴ The Army still complained in February 1957, however, that the Air Force continued to fill all key positions. See Carmen, Army, VII (February 1957), p. 45.

was defined as involving a system wholly dependent upon the radars and the missiles located at the defended point (AAA-Nike [Talos]-Missile Master). The Air Force was given the "area defense" mission defined as that which involves a system wholly dependent upon an integrated net of radars (fighters-Bomarc-SAGE).⁷⁵ According to his later Congressional testimony, Wilson also included a 100 mile horizontal range limitation in his definition of point defense. He justified this limitation by stating: "There is a great feeling on the part of the Air Force with its manned bombers and interceptors that the Army may shoot our own planes down."⁷⁶

As will be seen later, these directives did not completely eliminate the interservice organizational/roles and missions problems which had been haunting U. S. air defense for years. It seems likely, moreover, that these problems within the U. S. military served to divert attention from the even more awesome problems of the command and control of

⁷⁵The memorandum was directed to the members of the Armed Forces Policy Council and was entitled "Clarification of Roles and Missions to Improve the Effectiveness of Operation of the Department of Defense." The text appears in the New York Times, November 27, 1956, p. 22. In point of fact, it was the Air Force's attempts to develop a point defense missile (the land-based Talos) and the ensuing Congressional pressure on DOD to choose between the Talos and Nike that precipitated this memo. See pp. 135-138 below.

⁷⁶Hearings, House, Subc. of Comm. on Approps., Department of Defense Appropriations for 1958 (Part 1), 85th, 1st, January 1957, pp. 8-9; 293-294. The quotation appears on p. 294.

all the air defense forces of the North American continent. As late as June 1955, the Royal Canadian Air Force had to suggest that the problem of a unified command for all of the continent's air defense forces must be confronted.⁷⁷ General Partridge, CINC-CONAD, at the 1956 Air Power Hearings spotlighted this organizational deficiency;⁷⁸ and, almost simultaneously, the JCS and Canadian chiefs met on May 14, 1956, and referred the question of an integrated air defense system to a joint study group.⁷⁹ It was not until the latter part of 1957, however, that the North American Air Defense Command (NORAD) was finally established.⁸⁰

Finally, a few words about USAF-National Guard relationships during this period. The splendid performance

⁷⁷ See Conant, The Long Polar Watch, p. 44.

⁷⁸ "Canada runs its own defenses; Northeast Air Command runs its own defenses; Alaska does; and so on." (p. 242.)

⁷⁹ Testimony of Defense Minister G. W. Pearkes, HANSARD, Session 1957-8, Volume II, p. 1928.

⁸⁰ This delay in the establishment of NORAD was also due to domestic Canadian politics. The Liberal Party -- in power from 1935-1957 -- had been intent since 1948 on keeping Canada closely allied to NATO and was opposed to any excessive dependence on the U. S. within a formal air defense organization. When Diefenbacker's Conservative government was established in June 1957, a NORAD agreement was greatly facilitated. In this connection, the RCAF had apparently been a consistently vocal proponent of a NORAD-type organization ever since the early post-war years. See Leslie Roberts, There Shall Be Wings: A History of the Royal Canadian Air Force (Toronto, 1959), p. 276.

of the ANG pilots during the Korean conflict, plus the creation in 1953 of an Air Force Division within the National Guard Bureau, did much to soften the earlier apprehensions and antagonisms. Moreover, the issue of the ready-availability of the state-controlled ANG units had died by 1957. For, at that time, "the governors of every state and territory [had] approved procedures whereby a button pushed to alert the nation's defenses [would] also alert the fighter squadrons of the...ANG."⁸¹

2. Systems Research, Development, and Procurement

The resolution of Eisenhower's dilemma of the NSC-141-recommended air defense expenditures versus his campaign promises of "security with solvency" and "liberation" was hampered by various bureaucratic and technical factors. These factors had coalesced during 1953 to preclude a decision for the extensive development and procurement of air defense systems until late in that year.

First of all, Eisenhower had been "nettled" in January 1953 to find that the NSC-141 recommendations had not been carefully priced, nor screened and coordinated by the JCS.⁸² Additionally, the Lincoln Summer Study Group's report had been

⁸¹Hatch, Air Force, XL (February 1957), p. 66.

⁸²C. J. V. Murphy, "The Eisenhower Shift (Part II)," Fortune, LIII (March 1956), p. 230.

essentially ignored within the Administration in early 1953 due to the secrecy which surrounded the projects, the budgetary prohibitions, and even because of its distinctly academic and theoretical flavor.⁸³

There was also the growing rift in 1953 between the Air Force and some of the Lincoln scientists which hampered a more timely, vigorous appraisal of the Summer Study Group's recommendations -- a rift which had grown since 1949 as it moved from a debate on the H-bomb, to tactical nuclear weapons, and now to air defense. The Gray Board's Oppenheimer Hearings in 1954 revealed in some detail how the USAF's chief scientist had reportedly attempted to "sabotage" Project Lincoln from the start, and how the "Big Bomber" Generals propagandized Lincoln's findings as a "Maginot Line" philosophy.⁸⁴ Dr. Lloyd V. Berkner, also, stated later that "many efforts were made [within the armed forces] to suppress the findings of the Lincoln Summer Study and little effort was made to demonstrate how the ideas might work out."⁸⁵

This rift was exacerbated, so it seems, by the U. S. journalistic emphasis on the more dramatic aspects of the

⁸³H. Baldwin, New York Times, June 26, 1953, p. 6.

⁸⁴In The Matter of J. Robert Oppenheimer, . . ., pp. 754-768; 926ff.

⁸⁵Memorandum to R. Walter Riehlman cited in footnote 71 on p. 48 above.

Summer Study proposals. For example, a widely cited scenario appeared in the Saturday Evening Post in March 1953 which described in the following terms the sequence of events to assure "85-95 percent destruction" if the Summer Study's "\$20 billion plan" were put into operation:

The very-early-warning net immediately reveals the first approach of the Soviet attacking force. By instant and automatic communication links, the whole American ADC is alerted, while every major target city in the U. S. is warned of the danger. By pre-arranged plan, the whole defensive force is then brought to bear on the invaders. The enemy bombers are tracked by radar throughout the thousands of miles from the Northern warning net to the targets. Hour after hour, the invading aircraft are repeatedly attacked by radar-equipped all-weather fighters, firing air-to-air missiles which twist and turn after the invading bombers; by pilotless aircraft which can be made, if necessary, to ram the intruders; and by guided, target-seeking missiles of intermediate range. Those intruding aircraft which survive this fatal gauntlet are then attacked on the approaches to the cities themselves, by missiles like the deadly Nike, whose crews have been alerted to their task hours before. And the planes which do get through, hit cities whose people have received ample warning to take cover or even to leave the danger area.⁸⁶

There was also a published account that the Summer Study Group expected that "swarms of interceptor aircraft, nestling in fleets of huge transports on perpetual patrol, would

⁸⁶Lapp and Alsop, Saturday Evening Post, March 21, 1953, p. 86.

presumably engage the oncoming bombers."⁸⁷ As such reports could obviously gull the public into believing that the technical resources for a near perfect air defense were imminent, the Air Force's quite uncertain support of the Summer Study was reinforced.

Indeed, throughout 1953, Air Force magazine tried to bring the valid, technical air defense issues into perspective by dismissing the publicized USAF-scientists' dispute as mostly nonsense. They submitted that "all have the same end in view. The difference is primarily a matter of what should be done first." Further, they asserted that

the only Summer Study Group recommendation turned down by the Air Force was a recommendation for a multi-billion dollar crash program to implement a deep early-warning system....The Air Force turned it down on the advice of other civilian scientists, and not for any neurotic reasons of its own. These scientists felt that the new equipment involved should be tested before being bought in large quantities.⁸⁸

While this debate was occurring, the Administration received in May 1953 another report of the air defense situation by the Kelly Committee which had an essentially compromise nature. The report seemed to support the predominate

⁸⁷"Defense and Strategy," Fortune, XLVIII (July 1953), p. 40.

⁸⁸"The Truth About Our Air Defense," Air Force magazine Staff Study, XXXVI (May 1953), pp. 34, 29. (Note the interesting parallel here with the Navy's argument in 1949 that the B-36 was an unproven weapon and should not be procured heavily until after sufficient tests and evaluation.)

military view that the continued development of the U. S.' strategic offensive capability must have top priority. It also dismissed the practicality of some of the more dramatic Summer Study proposals. On the other hand, the report underlined the seriousness of the rising Soviet threat and emphasized particularly the importance of an improved and extended radar early warning system.⁸⁹

On top of all this, the Administration was anxious to have the air defense problem studied by some of its "own people". The Bull Committee was thus formed, headed by Lieutenant General Harold Bull, an old friend of Eisenhower's and his wartime chief of plans. The committee was a mixed civilian-military group whose report covered a wide variety of issues, including means to counteract A-bombs brought into the country by suitcase-carrying saboteurs.⁹⁰

During most of 1953, therefore, the Administration amassed air defense study reports, but still apparently hoped that extensive additional systems expenditures could somehow be avoided.⁹¹ Such temporizing, if you will, was

⁸⁹For a discussion of this report, see BAS, IX (July 1953), p. 229; and "Defense and Strategy," Fortune, XLVIII (July 1953), p. 40.

⁹⁰See Robert M. Loebelson, "How Much Air Defense for the Nation?," American Aviation, November 9, 1953, p. 16.

⁹¹See Stuart Alsop, New York Herald Tribune, November 22, 1953, Section 2, p. 5. Cf. Alexander P. de Seversky's account of why he had, at one point during 1953, been chosen

furthered by the lack of real pressure for a decision from either Congress or the U. S.' "attentive elite." Congress seemed to regard such a decision as being of an executive nature; and, furthermore, it had not been privy to much of the Soviet intelligence necessary to pursue its jurisdiction. Indeed, the first significant Congressional interest in problems of air defense occurred only after the Soviets' August H-bomb explosion when, on October 4, 1953, Representative W. Sterling Cole called for an immediate increase of \$10 billion in air defense and civil defense spending.⁹²

The "attentive elite" during 1953 seemed divided on the question of whether to launch a major air defense effort and their arguments tended to cancel each other's out. Doubtlessly, the fact that the USSR air-atomic threat was so obscurely defined at this time (e.g., Secretary Wilson's versus the Alsops' perceptions) largely explains this situation. The principal general arguments in favor of an expanded air defense system were that it would: provide a disincentive to

to be an Assistant to Secretary of the Air Force Harold Talbott: "[Talbott] had sold the Administration the idea that, because of the confidence the American people reposed in me, I could discredit the project [Lincoln] as being utterly impractical. In preventing this [\$21 billion] unwarranted expense I would be performing a great service to the country and for the President." America: Too Young To Die (New York, 1961), p. 68.

⁹²As noted by Huntington, The Common Defense, pp. 337-338.

a USSR attack; reduce the opportunities for Soviet nuclear blackmail, with a concomitant reduction in the anxiety-level of U. S. daily life; improve America's alliance relationships;⁹³ be of great relevance to possible future arms control environments;⁹⁴ and protect SAC for counterattack.⁹⁵

Opponents of a major continental defense build-up generally cited the expense involved; the prior obstacle posed by the lack of a Department of Defense organization to synchronize its development;⁹⁶ the attendant technical problems; the extant protection from the American forward base structure;⁹⁷ the ensuing Maginot Line psychology at

⁹³"...the very fact of early warning requires the intimate collaboration of our allies, north, east and West"; and the leadership position of the U. S. would be "strengthened by the world knowledge that we are prepared to repel as well as to invade." James R. Killian and A. G. Hill, "For a Continental Defense," Atlantic Monthly, CXCII (November 1953), p. 365.

⁹⁴"...in which steps of evasion will be either far too vast to conceal or far too small to have, in view of the existing measures of defense, a decisive strategic effect." J. R. Oppenheimer, "Atomic Weapons and American Policy," Foreign Affairs, XXXI (July 1953), pp. 534-535.

⁹⁵"Almost without exception, advocates of air defense took the view that it ranked second in American military priorities to the maintenance of the striking capability of SAC." Rostow, The United States in the World Arena, p. 313.

⁹⁶The Kelly Report specifically pointed to this hindrance to an air defense effort. See BAS, IX (July 1953), p. 229.

⁹⁷"[Our] overseas bases...protect the continental U. S. far more surely than a radar station on Montauk Point, or

home and Fortress America image abroad; the Soviet offensive countermeasure potentialities (which included sabotage and the Trojan Horse method, as well as electronic counter-measures, chaff, decoys, etc.); and even the argument that the Soviets would have no reason to develop a more complex weapon if the West permitted them to do the job more simply with the Tu-4.⁹⁸

Included within this general public debate was the specific and vital question of the technical feasibility and tactical importance of a Distant Early Warning (DEW) line along the Arctic rim. Everyone agreed that warning of attack was of paramount importance. There was also general agreement that the question of "how much time do we need" was not the principal issue because of the imponderables which precluded a specific answer: time of day of the attack, the season, the weather, the enemy's route and speed of attack, the varying warning times required by different military

an interceptor base in New Jersey...A part, perhaps the whole, of the enemy's first onslaught would have to be directed against the overseas bases." H. Baldwin, "What Kind of Defense in the Atomic Age?," New York Times Magazine, May 17, 1953, p. 39. See, also, General Omar N. Bradley, "A Soldier's Farewell," Saturday Evening Post, August 22, 1953, p. 58.

⁹⁸Cited in L. V. Berkner, "Science and Military Power," BAS, IX (December 1953), p. 363.

forces for retaliation and by different cities for effective civil defense, etc. The area of disagreement lay in the answers to the question of "how much time can we get."

The Summer Study Group had submitted that the present theoretical warning time of about one hour could be increased to about six hours by means of the DEW line and they had recommended its immediate construction. For they were also convinced that two scientific breakthroughs in 1952 had made the DEW line operation feasible: automatic alarm circuits that enabled radar to give an audible alarm when a target was picked up (thus reducing the otherwise burdensome manpower requirements); and VHF ionospheric and UHF tropospheric scatter propagation techniques which, for the first time, promised to provide reliable long-range communications virtually immune to all known atmospheric phenomena.⁹⁹ Such an increase in warning time could permit the partial evacuation of cities -- a consideration still close to the hearts of the liberal scientists. Also, DEW line advocates reminded the Air Force that while the present amount of expected warning time could possibly permit SAC to rise up and disperse from its bases, four to six hours'

⁹⁹ See Charles Corddry, "Burglar Alarm," Air Force, XXXIX (June 1956), p. 77ff; H. LeFay, "Dew Line: Sentry of the Far North," National Geographic Magazine, CXIV (July 1958), p. 129ff; and C. J. V. Murphy, "The Polar Watch," Fortune, LVI (December 1957), pp. 245-246.

warning from DEW would enable SAC to "bombup" and launch its counterstrikes by the time the enemy force crossed the U. S. borders.¹⁰⁰

The Air Force was the most vocal opponent of such a concerted effort to build defenses "from-the-outside-in" and argued that the U. S. must instead improve systematically and carefully "from-the-inside-out." The USAF submitted that the radar necessary for a DEW line was not far enough advanced to permit construction on a crash basis. Another serious Air Force objection was that the DEW line made no provision for tracking an enemy strike down through Canada and into the U. S. defense perimeter. And, as General Bradley suggested, an unreliable warning system might be worse than none at all, should Soviet high-flying "spoofers" play "hide and seek and go home" in the Canadian wilderness while U. S. interceptors and populations weary of the game and drop their guard.¹⁰¹ A much less publicized Air Force objection was that the DEW line

would not be practical because interceptors [then could] fly only up to two hours before they require[d] refueling. Thus, the USAF held, we might as well get the radar line set

¹⁰⁰ See C. J. V. Murphy, "The U. S. as a Bombing Target," Fortune, XLVII (November 1953), p. 22. It will be recalled that the USAF was at this time also being painfully reminded of SAC's wasting second-strike assets by the RAND study cited on pp. 72-73 above.

¹⁰¹ See "A Soldier's Farewell (Part II)," Saturday Evening Post, August 29, 1953, p. 48.

up at a point where the enemy bombers could be picked-up and shot down, i.e. about 600 miles north of U. S. boundaries, and then gradually extend both the early warning line and the interception line further north.¹⁰²

Hence, the Air Force was content at this time to increase the country's early-warning capability to about two hours, by hooking the existent continental U. S. radar system more closely into the Canadian's McGill Line along the fifty-fifth parallel -- initial construction of which began in late 1953. They also made plans with the Navy to establish an interim "flying DEW line" in the form of radar-equipped Lockheed Constellation aircraft on the continent's seaward flanks.

All of these debates sketched out above which acted to impede a decision for the extensive build-up of continental defenses were cast into a new light after August 1953. The Administration's resistance to additional air defense spending melted quickly in the heat of the Soviets' H-bomb explosion. NSC-162 was prepared in the Fall and included major defensive programming. In February 1954, it was estimated that almost ten percent of the Defense Department's expenditures for military functions in fiscal year

¹⁰²Lobelson, American Aviation, November 9, 1953, p. 16. Aside from the light such an argument shed on the lagging USAF fighter modernization program, this Air Force case apparently ignored the fact that the Royal Canadian Air Force felt strongly that its operational CF-100 interceptor had sufficient range

1955 would be for continental defense.¹⁰³

Yet, it is important to stress that, even now, systems development and procurement were "to continue on an orderly basis with phased increases in forces and facilities."¹⁰⁴ This approach was in consonance with the Administration's "long-haul" view of the Soviet threat; a view which materialized during 1953 and continued throughout the Eisenhower years. Such a perspective portended other ramifications for military R&D efforts. As one commentator suggested: "Under the concept of the ['long-haul'], a decision whether to continue buying an old model, to buy a new model not yet thoroughly proven, or to wait until the new model had been completely tested was more likely [than the former 'crisis-year'

and performance to work effectively with a DEW line. See HANSARD, Session 1953-4, Vol. 1, November 26, 1953, pp. 362-363.

¹⁰³ Department of Defense Statement, Hearings, House, Subc. of Comm. on Approps., Department of Defense Appropriations for 1955, 83rd, 2nd, February 1954, p. 86.

¹⁰⁴ Admiral Radford's speech cited in footnote 55, p. 105 above. Cf. the following exchange: "Q. Could you develop the continental defense system any faster than you are now doing if more money were appropriated for that purpose? Admiral Radford. No, sir." (Hearings, House, Subc. of Comm. on Approps., Department of Defense Appropriations for 1955, 83rd, 2nd, February 1954, p. 115.) Radford's answer was accepted by Congress as a simple fact without calling upon any outside expertise to check the Admiral's allegation. Hence, even in 1954, Congressional pressures to speed-up the air defense build-up were essentially absent. (On this point, see Edward L. Katzenbach, Jr., "How Congress Strains at Gnats,

method] to be resolved in favor of the latter alternative."¹⁰⁵ With these observations in mind, let us next examine, in turn, the actual development and procurement of aircraft control and warning (AC&W) radar, fighter aircraft, and surface-to-air missiles between 1953-56.

Construction of the complete DEW line system began, on an expedited basis, only after January 1955.¹⁰⁶ Prior to that time the DEW concept and its wholly new equipment underwent extensive testing on segments of the proposed line. Initial testing of some of the equipment in the Fall of 1952 had led to a contract with Western Electric in January 1953 to operate a test warning system in Northeast Alaska and Western Canada. In February 1953, agreement had been reached with Canada for the installation of the stations, and by November the sites were completed for testing. By the Summer of 1954, the experimental radars and forward-scatter techniques were showing better-than-expected results. And it was at this time that the Air Force "swung behind the early

Then Swallows Military Budgets," Reporter, July 20, 1954, pp. 31-35.)

¹⁰⁵Snyder, "The 'New Look' of 1953," in Schilling, Hammond, and Snyder, Strategy, Politics..., p. 406.

¹⁰⁶The following discussion draws upon: Richard Morenus, Dew Line: The Miracle of America's First Line of Defense (New York, 1957), p. 31ff.; Hearings, House, Military Construction Appropriations for 1956, 84th, 1st, June 1954, pp. 5-6; and C. J. V. Murphy, "The Polar Watch," Fortune, LVI (December 1957), p. 250ff.

warning idea."¹⁰⁷

The timing of the USAF support for the complete DEW project is explained in part by the test-successes. Some commentators, however, have based the decision on less technical factors. As it was later written:

When the Air Force finally decided to invest in the DEW line, it was persuaded to do so by a fairly simple proposition. This was to foreclose, in Soviet strategic planning, the prospect of a cheap ride into the American air. [Assistant Secretary of the Air Force Trevor Gardner]...bulled the DEW line through. [He] had been set afire by the arguments of scientists and a group of Air Force officers who had decided that the strategy of the technological power game demanded something more subtle than the threat of SAC's offensive strength alone. "The game," Gardner recalls, "was to force the other guy to go higher, faster, and load himself down with electronic countermeasure gear."¹⁰⁸

(Here, perhaps, one can detect the influence of the Soviets' 1954 May Day bomber fly-by). In any event, during the Summer of 1954, the JCS requested immediate authorization for construction funds for the complete DEW line. The sense of urgency which they imparted to Congress was later described as being due to their desire to begin work before the cold weather season set in the Arctic; and to some unanticipated deficiencies in the Pine-Tree line which was just coming into operation.¹⁰⁹ Following a U. S.-Canadian decision on the

¹⁰⁷ Ibid. (Murphy), p. 250.

¹⁰⁸ Ibid., p. 120.

¹⁰⁹ Hearings, House, Subc. of Comm. on Armed Services, Establishment and Development of Certain Military Installations, 85th, 2nd, H.R. 9738, January 1958, p. 3817.

exact location of the DEW line, a contract was let with Western Electric in November 1954 to proceed with the installation of all the facilities.

The Soviets' 1955 May Day fly-by may have affected somewhat the Administration's "orderly" programming of this project. It was reported in the Fall of 1955 that there was "gathering pressure upon Mr. Wilson to hasten the completion of the DEW line, particularly in light of the Bison development."¹¹⁰ When completed in the Summer of 1957, the DEW line was labelled "perhaps...the most costly construction task ever accomplished in so short a time."¹¹¹

While the DEW line was being developed to increase the aircraft early-warning time, the USAF approved in January 1954, a four year program to install more than 300 small, automatic "gap-filler" radar sites in the continental U. S. to provide a reliable low-altitude detection capability. As important as the achievement of such a capability would

¹¹⁰ Murphy, Fortune, LII (September 1955), p. 230. Actually, however, the real pressure may have been that which was on Western Electric: "...the prime contractor, in an all-out effort to meet the beneficial occupancy date, has progressed much more rapidly than was thought physically possible." (Testimony of General Washbourne, USAF, Hearings, House, Subc. of Comm. on Armed Services, Military Public Works, 84th, 2nd, H. R. 8625, March 1956, p. 6567.) That is, the expediting of the project may have resulted more from these commercial profit concerns than from the Soviet displays.

¹¹¹ Conant, The Long Polar Watch, p. 40.

seem to be, the Air Force was unable to predict completion of the sites' construction before 1958. One colonel explained the problem thusly to a Congressional committee: "Siting teams go out and locate, physically locate the locations on the ground...[and] we can't get the equipment, we don't have the survey teams to physically locate them in the field." This prompted Senator Henry Jackson to observe: "By the time we finish the last radar site the Russians will have the intercontinental ballistic missile....There ought to be some way to step this up, except this is all mixed up with the Bureau of the Budget."¹¹²

The final element in the aircraft control and warning aspect of air defense R&D during this period was the developmental work on the SAGE system. This project was designed to apply high speed digital computers for the ground-control of air defense operations. In February 1954, an NSC directive called for the attainment of the SAGE capability as rapidly as possible.¹¹³ The CONAD commander testified at the 1956 Air Power Hearings that the introduction of SAGE would increase the capability of the U. S. air defense system "by a factor of something like 5 to 10." (page 254). Yet, in April 1957, an Air Force progress report

¹¹² Hearings, Senate, Military Public Works Construction, 84th, 1st, S. 1765, May 1955, pp. 503-504.

¹¹³ USAF statement, Hearings, House, Subc. of Comm. on Approps., Supplemental Defense Appropriations for 1958, 85th,

stated that "the SAGE program has not yet reached the point where we have scheduled operational tests against SAGE as such. We continue to make tests against the radar."¹¹⁴ Apart from the obvious technical complexities involved here, a "long-haul" view of the Soviet threat again seemed to encourage such thorough pre-deployment explorations.

What was the situation with regard to fighter aircraft development and procurement? When the Air Force was authorized in October 1951 to expand from 95 to 143 wings, the 17 operational air defense wings were planned to be modernized and expanded to 29. The first major defense decision made by President Eisenhower was a May 1953 cut-back of this USAF expansion to an "interim" 120 wing program, to be in place by January 1957. The previously planned air defense wing expansion, however, was not to be affected by this cut-back. Furthermore, the December 1953 "new look", which called for a USAF buildup to 137 wings, recognized the requirement for even more fighter aircraft by including 5 more ADC wings within the 17 wing increase.¹¹⁵ There was also the decision that the modernization of the ANG's 27 wings must be expedited.

2nd, January 1958, p. 186.

¹¹⁴Testimony of General Pachynski, Hearings, House, Subc. of Comm. on Approps., Department of the Air Force Appropriations for 1958, 85th, 1st, April 1957, p. 290.

¹¹⁵The remainder of the 17-wing increase included 13 TAC wings and 2 SAC wings (3 troop carrier wings were

Hence, while the proportion of planned Regular air defense wings within the total USAF goal had not regained its pre-Korean level (25 of 70; 20 of 48), Eisenhower's "new look" appeared to see a steady, unimpaired expansion of interceptor strength, within a SAC-stabilized force structure.

Actual aircraft procurement expenditures after 1953 reflected, however, a different pattern. With the Soviet bomber and long-range missile developments of 1954-55, increased U. S. bomber and offensive missile requirements interjected to delay the achievement of the "new look's" air defense goals. Work on the new long-range all-weather F-102 interceptor was "dawdling in the design stage" for almost two years before the Air Force -- in response to the May 1955 Moscow fly-bys -- announced in August 1955 that it was drastically speeding up the F-102 development cycle.¹¹⁶ The U. S. supersonic day-interceptor program also experienced production delays. While F-101 and F-104 program acceleration was recommended by General Twining in June 1955, by January

deleted). Under the 143, 120, and 137-wing programs between October 1951 and December 1953, SAC's programmed goals were 57, 52, and 54 wings respectively. On all these force levels see American Aviation, November 9, 1953, pp. 15-16; statement of SECAF Talbott, Hearings, House, Department of Air Force Appropriations 1955, 83rd, 2nd, February 1954, p. 2; and Statement of General L. B. Washbourne, USAF, Hearings, Senate, Subc. of Comm. on Armed Forces, Military and Naval Construction Authorization, 83rd, 2nd, June 1954, p. 132.

¹¹⁶ Murphy, Fortune, LII (September 1955), pp. 230, 87.

1956 output of these aircraft had reportedly slowed down in the face of more pressing R&D requirements.¹¹⁷ The situation was summed-up thusly by Trevor Gardner in February 1956:

With our existing fighters...we are embarked upon, because of the funds limitation, a very cautious program of procuring these aircraft. In general we are applying the fly-before-you-buy philosophy. There again this is partly for lack of funds which are flowing into the ballistic-missile program.¹¹⁸

Let us consider finally the development of surface-to-air missile systems between 1953-56. The Army's high-altitude-capable, fifty mile range Nike-Ajax missile had become operational in 1953, while R&D work proceeded on a longer-range, higher-altitude nuclear-armed Nike-Hercules. The Air Force in early 1951 had let a contract for the development of the high-altitude-capable, 200 mile Bomarc which that service felt would be available for tactical use in the same time-frame as the Nike. Many problems plagued the Bomarc program, however, and around 1955, the Air Force turned to a land-based version of the Navy's Talos missile as a logical R&D stepping-stone to the Bomarc. (It should be noted here that -- whereas the Air Force began installing low-altitude gap-filler radars in 1954 -- it was not until late 1957 that

¹¹⁷Twining testimony, Hearings, House, Subc. of Comm. on Approps., Department of Defense Appropriations 1956, 84th, 1st, June 1955, p. 33; Joseph and Stuart Alsop, New York Herald Tribune, January 4, 1956.

¹¹⁸Testimony, Hearings, House, Subc. of Comm. on Approps., Department of Defense Appropriations 1957 ("General Statements"), 84th, 2nd, February 1956, p. 877.

the Soviets' "on-the-deck" threat was perceived to be serious enough to cause the initiation of the low-altitude Bomarc B program in February 1958.)¹¹⁹ As the Talos and Nike development progressed, questions arose concerning their comparability and possible duplication. The Defense Department was content to conduct extensive studies on this point in early 1956 which "clearly showed that at this time neither system [had] a predominate advantage."¹²⁰

While these studies were in progress, the fiscal 1957 military construction authorization bill was before Congress and it contained requests for funds for both Talos and Nike site construction. When Congress objected to the duplication, the Army stated that the Talos did not have any characteristics of an interceptor and therefore should not be an Air Force responsibility. The Air Force responded by stating it had been "told by the JCS that the Air Force would be responsible for developing, procuring, and employing guided missiles beyond the range of 50 miles [and] Talos is that missile...."¹²¹ It was later reported that in November

¹¹⁹ Testimony of Colonel Dietrich, USAF, Hearings, House, Department of Defense Appropriations 1961 (Part 7), 86th, 2nd, March 1960, p. 201.

¹²⁰ Hearings, House, Department of Defense Appropriations 1958 (Part 2), 85th, 1st, February 1957, pp. 1340-1341.

¹²¹ Testimony of General Taylor and General Twining respectively, Hearings, Senate, Subc. of Comm. on Approps.,

1954 the Secretary of Defense had indeed approved the responsibility for all three services to produce SAMs, with the Army limited to local defense missiles not to exceed a fifty mile range and with the Air Force to defend wider areas.¹²² Nevertheless, the Senate Armed Services Committee denied the authorization for the Talos site construction and called upon the Defense Secretary to decide between them.¹²³

Secretary Wilson's November 26, 1956 memorandum ensued and the land-based Talos was given to the Army. The Air Force then concentrated its SAM R&D efforts on its lagging Bomarc program. The Army soon sought funds for further work on Talos but was informed by the Defense Department that any such funds would have to be taken from Nike appropriations. The JCS subsequently recommended that, due to budgetary limitations, the land-based Talos not be developed. And the

Department of Defense Appropriations 1957, 84th, 2nd, May-June 1956, pp. 86 and 1265.

¹²²Organization and Management of Missile Programs, Eleventh Report by Committee on Government Operations, House, 86th, 1st, H.R. 1121, September 2, 1959, p. 14. It thus becomes unclear how the Army's Nike-Hercules work could have been justified under such an agreement.

¹²³See Authorizing Construction for Military Departments, S.Rept. 2364, 84th, 2nd, June 26, 1956, pp.10-11; and Congressional Record, 102, pp.12167-77, 12959, 14634, 14884. For a discussion of the involvement of the Armed Services Committees in air defense construction projects during the 1950's --an involvement which grew out of 1951 legislation that required the military departments to "come into agreement" with the committees on the great majority of their proposed

Army quickly discontinued the program. "Though both the Air Force and the Army had made broad claims for the capability of the land-based Talos missile, and more than \$25 million had been spent on its development, the entire project was canceled...."¹²⁴

Hence, as was seen in the case of AC&W radar programs and fighter aircraft, the pace and nature of the Eisenhower Administration's development of continental surface-to-air missile systems in 1953-56 was largely determined by a complex of domestic bureaucratic and economic factors operating within a framework of a "long-haul" view of the Soviet threat.

3. Systems Deployment and Operation

The United States continental air defense capability was not materially improved during 1953 while the Administration was weighing the conflicting perspectives on systems feasibility and desirability. The only advance was that culminated in April when the seventy-five radar stations of the Permanent System became fully operational in the continental U. S.¹²⁵

real estate transactions -- see Raymond H. Dawson, "Congressional Innovation and Intervention in Defense Policy: Legislative Authorization of Weapons Systems," American Political Science Review, LVI (March 1962), pp. 42-57.

¹²⁴Organization and Management of Missile Programs, Eleventh Report by Committee on Government Operations, House, H.R. 1121, 86th, 1st, September 2, 1959, pp. 120-121. (Hereinafter cited as the Dawson Subcommittee Report.)

¹²⁵Even this advance occurred more than a year later than

During this year, it was generally accepted that the defensive forces could achieve about fifteen percent attrition in a daylight attack, and less than one percent if the enemy came under the cover of night or poor visibility conditions.¹²⁶

Efforts to improve this capability were more substantial in 1954. Even then, however, much of the air defense expenditures went for systems which would become operational only in later years. Apart from such R&D efforts discussed previously, continental U. S. "inshore and offshore barriers" were established in 1954 -- superconstellation aircraft patrols, conversion of USN destroyer escorts to radar picket ships, and "Texas-Tower" construction. In addition to these long-range programs, by April 1954 the number of active Ground Observer Corps observation posts had been increased by some 1500 beyond the 2700 posts that had been operational in April 1953.¹²⁷ More sophisticated test-alert exercises were run against the system throughout the year. Also, Nike batteries began to be phased-in in increasing numbers and Army National

planned due to strikes and radar equipment shortages. Air Force, XL (August 1957), p. 253.

¹²⁶ See, e.g., Alsops, New York Herald Tribune, July 22, 1953, p. 17.

¹²⁷ Testimony of General Asensio, USAF, Hearings, Senate, Subc. of Comm. on Approps., Department of Defense Appropriations 1955, 83rd, 2nd, May 1954, pp. 314-315.

Guard units, for the first time, began to man some of the AAA sites which remained active.

While the fighter aircraft modernization and expansion program went forward (albeit somewhat haltingly), there seemed to be a growing appreciation for a more strategically located air defense base structure. To the USAF, this meant the requirement for a solid line of new airfields across the northern continental U. S. periphery.¹²⁸ And in 1955, Congress approved the construction of six interceptor bases just below the Canadian border, so that the enemy could be encountered as far away from important American complexes as possible. In the meanwhile, housing shortages at or near operational USAF bases precluded the ADC from keeping more than four (of twenty-five) aircraft on alert at each fighter base, with the remainder of the squadron's crew-members forced to live as much as thirty miles from their station.¹²⁹ It was for reasons such as this that the Air Force began in 1953 to place increasing reliance on the Air National Guard to maximize the U. S. air defense readiness capability.¹³⁰

¹²⁸ See testimony of Colonel Moore, Hearings, House, Committee on Armed Services, Military and Naval Construction, 83rd, 2nd, H.R. 8726, April 1954, pp. 4165-4166.

¹²⁹ Testimony of General Twining, Hearings, House, Subc. of Comm. on Approps., Department of the Air Force Appropriations 1956, 84th, 1st, February 1955, p. 16.

¹³⁰ The following facts have been taken from Air Force, XXXVII (May 1954), p. 53; XXXVIII (February 1955), p. 59;

Selected ANG squadrons took on an actual air defense assignment for the first time, in 1953, when they were "scrambled" on an ADC alert and controlled by active ground-control-intercept units. Early in 1954, the ANG received its first jet all-weather interceptors when six F-94's were made available to them by the Air Force. On August 15, 1954, seventeen ANG units began to provide ADC with crews and two aircraft each on a daily, five minute runway alert from dawn to dusk. Between August 1954 and August 1955, these ANG aircraft were "scrambled" 7,400 times, made 16,000 intercepts and flew some 18,000 hours under ADC control. Additionally, on February 12, 1955, certain ANG units received their first major classified briefing on air defense operations. Finally, during July 1955, seventeen ANG wings were redesignated from "fighter-bomber" to "fighter-interceptor" wings and relieved of their tactical support mission. Hence, the majority of ANG pilots could now concentrate their training on air combat-type flights.¹³¹

and XXXVIII (September 1955), pp. 166, 169; and Air Reservist, May 1954, p. 11.

¹³¹Prior to this move, only six ANG wings were trained simply as fighter-interceptors and "assigned" immediately to ADC upon recall. The seventeen fighter-bomber wings had been "earmarked" for air defense assignments for "as long as they would be needed," after which they would turn to tactical air support tasks for National Guard ground forces. See Major General E. T. Ricks, "We Can Help The Pros Plug Our Defense Gaps," Air Force, XXXVI (September 1953), p. 60

By the beginning of 1956, fourteen different sources were feeding into CONAD information about these and the other 30,000 scheduled flights (plus a great many more unscheduled) per day in North America -- the heavy-surveillance radars; the heavy height-finder radars; the small gap-filler radars; the civil aircraft flight plans relayed from CAA flight service centers; the military aircraft flight plans relayed from the Military Flight Service; the Pine-Tree line (to be completed in mid-1956); the Mid-Canada line (to be completed in early 1957); the DEW line (to be completed in the Summer of 1957); the radars in southern Alaska; Navy picket ships off the east and west coasts of the continent; Navy Constellation airborne early warning aircraft; Texas Towers; the Ground Observers Corps; and the Air Weather Service. Yet, until the SAGE system was deployed initially in 1958, all this information had to be correlated by the "eyeballin' and grease-pencilin'" method.

This operational handicap and other air defense deficiencies in fighter and radar high-altitude capability were brought before the 1956 Air Power Hearings by General Earl E. Partridge, CINC-CONAD. It was at these Hearings, also, that Partridge gave recognition to an apparent policy decision that "our primary mission in the ADC is to defend the bases from which the Strategic Air Command is going to operate." (page 264.) Prior to such a decision, the deployment

of U. S. air defense systems in the early Eisenhower years continued the pre-1953 pattern of major industrial and population center protection.

Hence, Secretary Wilson testified in February 1954 that "above all things we must protect the industrial complex of the North American continent. No one can finally win a world war unless they destroy our will to fight and our industrial potential here in this country."¹³² As for the vulnerability of SAC during 1953, the Air Force -- in order to effect economies in base structure and aircraft availability due to manpower decreases -- had to double-up units on its bases, thereby increasing the overall military vulnerability of the force.¹³³ During the ensuing few years, Regular and ANG fighter squadron deployments were made with no special attention to the question of enhancing SAC's second-strike capability.¹³⁴ Insofar as strategic considerations entered into the ADC base selection process, the geographical requirements for proximity to AC&W radar sites, and for defense-in-depth in the northern areas tended to preclude extensive protection of SAC bases,

¹³²Hearings, House, Department of Defense Appropriations 1955, 83rd, 2nd, February 1954, p. 67.

¹³³Testimony of General Vandenberg, Hearings, House, Department of Air Force Appropriations 1954, 83rd, 1st, p. 9.

¹³⁴See, e.g., the testimony of General L. G. Washbourne and Colonel W. G. Moore, Hearings, Senate, Subc. of Comm. on Armed Services, Military and Naval Construction Authorization, 83rd, 2nd, S. 3260, June 1954, pp. 133, 142, 146.

most of which were located in the southern half of the country. And, ANG units continued to be located by the Governors near heavily populated areas.

Nor was the Army exactly eager to deploy its Nike or AAA batteries around SAC installations. By mid-1956, to be sure, a few strategic air bases were being guarded by these Army systems.¹³⁵ But the vast majority of the Nike and AAA weapons were protecting principal American cities and industrial complexes.

Now the USAF had been aware, at least since 1953, of the growing vulnerability of its SAC to a Soviet surprise attack. The RAND Base Selection Study cited previously had been distributed throughout the Air Force in March 1953 and extensive briefings on its results continued until November. While the study highlighted foremostly the vulnerability of overseas SAC bases, its recommendations for a domestic based retaliatory force would certainly seem to generate attention toward the necessary defensive requirements at home. Thus, in the wake of the Soviets' H-bomb explosion in August, the USAF Chief of Staff directed in November that the vulnerability of airbase facilities should be recognized in all Air Staff

¹³⁵ See Hearings, Senate, Subc. of Comm. on Approps., Department of Defense Appropriations 1957, 84th, 2nd, June 1956, p. 1261.

planning and action.¹³⁶ Also, early in 1954, Secretary of the Air Force James H. Douglass stated, "It is of extraordinary importance that [our] capability to strike back be defended by our air defense system, with perhaps as great attention to protecting that capability as to protecting our important industrial capacities, as well."¹³⁷ And former Air Force Secretary Finletter published at this time a book which called for a "new military strategy" based on a well-defended and well-dispersed SAC system both in the continental U. S. and abroad.¹³⁸ In February 1955, General Twining "theorized" that SAC would be the number one target of a Soviet strike; and one year later he announced that "our plan...is to disperse our heavy bomber units one squadron, or one third of a wing to a base. We also plan to cut down the medium jet B-47's to one wing per base."¹³⁹

Despite such USAF directives and assertions, as we have seen, SAC remained essentially unprotected and undispersed for a second-strike throughout this period. In 1953-54, USAF resistance to a re-direction of its basing

¹³⁶ Smith, The RAND Corporation, p. 234.

¹³⁷ Hearings, House, Comm. on Armed Services, Military and Naval Construction, 83rd, 2nd, May 1954, p. 4162.

¹³⁸ Power and Policy, especially pp. 19ff; 29ff.

¹³⁹ Hearings, House, Department of Defense Appropriations 1957, 84th, 2nd, February 1956, p. 764.

and air defense policies could be explained primarily by such factors as: antipathy toward RAND's civilian "expertise"; the inertia of established programs; fears of undermining morale; fears of embarrassment before Congress; and the "big bomber" versus "small bomber" in-house quarrel which threatened to eclipse other strategic concerns.¹⁴⁰ During 1955-56, quantitative, "command of the air" arguments which dominated the "bomber gap" debate acted to overshadow public concern with SAC vulnerability on the ground in the U. S.

Furthermore, the 1955-56 Nike-Talos dispute tended to force the USAF to push the question of missile protection for SAC into the future; and to demonstrate that perhaps the Air Force remained unconvinced of the seriousness of SAC's ground-attrition weaknesses, even apart from the factors listed above which retarded remedial action. Let us expand this point. It has been reported that the land-based Talos was originally envisaged by the USAF as a weapon to be used against sea-approach attacks by enemy aircraft.¹⁴¹ When it requested Talos construction funds in mid-1956, however, the Air Force announced that the Talos would be tested in a point-defense deployment at four SAC bases. The following

¹⁴⁰These points were cited by Smith, The RAND Corporation, p. 222ff.

¹⁴¹A. Leviero, New York Times, May 29, 1956, p. 12.

colloquoy ensued:

Senator John Stennis. You are not asking for any operational Nike I or Nike B for your SAC bases pending the development of Talos a little further?

General Twining. That is right.

Stennis. You don't consider it an emergency to put them in? You are willing to wait until Talos is a little further along?

Twining. Yes: that is true. We couldn't defend all the SAC bases and everything with the Nike available if we wanted....

Stennis. I believe that if this thing was very urgent, the Air Force would be asking for their part of Nike rather than let them all go to the cities.¹⁴²

Placing Talos in the same role as Nike could be seen, henceforth, as part of the interservice grabbing for new power and roles as new weapons were developed. Their projected deployment around SAC bases could reflect this rivalry as much as a fundamental concern for an enhanced second-strike capability.

In any event, the Senators could see no reason for defending overlapping areas with rival SAMs. Their denial of Talos construction authorization, Secretary Wilson's giving of Talos to the Army, and that service's subsequent termination of the project, resulted in a further delay in

¹⁴²Hearings, Senate, Subc. of Comm. on Approps., Department of Defense Appropriations 1957, 84th, 2nd, June 1956, p. 1272.

achieving adequate active air defense protection for home-based SAC forces.

If the USAF was thus not a vocal proponent of active protection for SAC between 1953-56, what factors influenced the Administration's preference for defensive systems deployment around industries and cities -- in the face of Soviet signals of a counterforce targeting strategy? First, it seems likely that the Administration was simply unaware of the degree of vulnerability of its second-strike SAC forces. The RAND Base Selection study had been distributed only within the Air Force. Moreover, under the government's budgetary policies, the services were loathe to publicize any degradations of their offensive capabilities to the advantage of a sister service. When not clamoring for more and better aircraft, the Air Force would assert that its lack of sufficient trained personnel and enough bases represented its highest priority needs; thus, diverting attention from the deficiencies of the existing force. As Morton H. Halperin later wrote: "The straitjacket which has confined the military chiefs, preventing them from admitting extensive weakness even while pressing for more funds, has surely been an important restraint on the flow of information to the White House and Congress."¹⁴³ Secondly,

¹⁴³"The Gaither Committee and the Policy Process," World Politics, XIII (April 1961), p. 372n.

the new Administration's shift of emphasis in 1953 from establishing mobilization reserves to the building of an industrial mobilization base, for extended production during wartime, tended to generate an air defense requirement for the protection of this production base.¹⁴⁴ Thirdly, Eisenhower's previously mentioned desires to minimize U. S. obsessions with nuclear destruction would be furthered by offering the public the "palliative" of population defense. And there were several reasons why active air defenses may have been preferable to passive programs. The Soviet advances toward a hydrogen-bomb capability made bomb shelters appear even less feasible than before. Moreover, the degree of local involvement which would be necessitated by a Federally-directed national shelter program would tend to project much more governmental concern with general war than would active systems; and, hence, would be self-defeating in

¹⁴⁴Moreover, active air defense of the U. S.' industrial mobilization capability became even more desirable and feasible due to the type of production base which Secretary Wilson developed between 1953-56. Given the choice of establishing (1) a broad, well-dispersed base for critical items, minimizing the volume of orders to each production source, or (2) a smaller base, with a larger volume of business given to each company, Wilson opted for the latter. He recalled the slow start of production during the Korean War and believed that a more dependable base would ensue by limiting production to fewer plants. See Charles H. Donnelly, U. S. Defense Policies Since World War II, Library of Congress, Legislative Reference Service, H. Doc. 100, 85th, 1st, November 1956, pp. 54-55.

this respect. Finally, a further inhibition on such passive defense programs may have been the Administration's desire not to add another dimension to the East-West arms race.

The strategic arms race did escalate in October 1957, however, when the Soviets' launching of Sputnik caused the acceleration of ballistic missile and anti-ballistic missile programs. Let us then consider next the USSR offensive signals between 1957-60, the perceptions of these signals in the United States, and the effects of such perceptions on the Eisenhower Administration's evolving bomber defense posture.

CHAPTER 3

AIR DEFENSE IN THE EISENHOWER ERA:

1957-60

Section A. Khrushchevian Signals of Strategic Offensive Capability and Intent

The USSR announced the first successful test of a multi-stage, intercontinental ballistic rocket on August 26, 1957. In confirmation of this claim, Sputnik I was launched on October 4th and Sputnik II went up on November 3rd. During the next four years, "Khrushchev and other Soviet leaders gave every indication in their public statements that they were indeed in a hurry to capitalize on their initial advantage and that they were bent on acquiring a large force of first-generation ICBM's."¹

Such declaratory policy regarding ICBM's went through several stages in the 1957-60 period.² Between August 1957 and October 1958, Khrushchev introduced the concept of "country-busting" into Soviet discussions of general nuclear warfare but said nothing directly about the production of ICBM's. The first production claim was made just before

¹Horelick and Rush, Strategic Power..., p. 36.

²The following discussion has been drawn from ibid., pp. 49-60.

Khrushchev precipitated a Berlin crisis on November 10, 1958. And, in the United States, the "missile gap" controversy broke open in December. Until January 1960, however, the USSR was not inclined to claim a significant operational ICBM capability. Moreover, their production claims were low-keyed for the last half of 1959, possibly due to the "Spirit of Camp David" detente which characterized the international diplomacy of that period. It was in Khrushchev's major policy speech to the Supreme Soviet on January 14, 1960, that the first authoritative claim was made of a considerable operational ICBM force that "could literally wipe from the face of the earth the country or countries that attacked us."

Between 1957-60, "Khrushchev's magnification of the Soviet ICBM capability contrasted with his belittlement of the Soviet bomber capability."³ In the Fall of 1957, Khrushchev declared that fighter and bomber aircraft could now be "put into museums." This line was emphasized again in his January 1960 Supreme Soviet speech: "Almost the whole of the airforce is being replaced by rocket equipment. We have now cut down sharply, and it seems will continue to cut down and even discontinue the manufacture of bombers

³Ibid., p. 66.

and other obsolete machinery."⁴

Nevertheless, the Soviets' action-policy regarding their strategic bomber force during this period demonstrated continued interest in their operational manned aircraft systems. Upwards to forty new jet bomber bases were reported to have been constructed in the Arctic regions of the USSR between 1955-60.⁵ A new air-to-surface missile, with a thermonuclear warhead capable of being released outside the range of point-defense systems became operational within the Soviet Air Force during 1958.⁶ Bomber crew training standards continued to improve in all phases of operation.⁷ A significant advance here was the first Soviet demonstration of an actual in-flight refueling capability, when a Bison bomber connected with a Bison tanker by the intricate "probe-and-drogue" method during rehearsals for the 1957 July Air Show in Moscow.⁸ By 1960, the Soviet long-range air-atomic force was virtually an all-jet force, with the Tu-4 almost eliminated from first-line bomber duties and the Bear used for in-flight refueling and maritime reconnaissance. At that

⁴New York Times, January 15, 1960, p. 2.

⁵Asher Lee, The Soviet Air Force (London, 1961), p. 137.

⁶Described in Aviation Week, May 12, 1958, p. 26.

⁷See Lee (ed.), The Soviet Air and Rocket Forces, p. 19.

⁸See American Aviation, June 17, 1957, p. 18.

time, also, the Badgers and Bisons began being refitted with longer fuselage noses housing new radar bomb sights.⁹ The USSR did not, however, display any new, more advanced long-range bombers during this period.

Finally, a few words regarding strategic doctrinal signals. Beginning in late 1957, the possibility of a Soviet pre-emptive strike faded out of their published military writing. The concept did not reappear in an authoritative statement until Marshal Malinovsky's address to the 22nd Party Congress in 1961.¹⁰ Throughout most of the 1957-60 period, furthermore, the USSR continued to assert the importance of a counterforce targeting strategy.

⁹Lee, The Soviet Air Force, pp. 137-138.

¹⁰See Raymond L. Garthoff, Introduction to Military Strategy: Soviet Doctrine and Concepts, Marshal V. D. Sokolovsky (ed.), (New York, 1963), p. xix.

Section B. Domestic Perceptions of the Soviet Threat

The impact of Sputnik was indeed substantial within the United States. General Partridge, CINC-NORAD, summarized its potential effect on his air defense posture by lamenting: "If the aggressor's weapon is the ICBM, the continent stands almost as naked today as it did in 1946, for I have no radar to detect missiles and no defense against them."¹¹ The government's response to Sputnik was quick.

In January 1958, the Department of Defense requested \$1,270 million in supplemental appropriations which were intended to: accelerate the Atlas, Thor, Jupiter, and Polaris offensive missile programs (\$683 million); speed-up the operational date of the Ballistic Missile Early-Warning System by two years (\$329 million); create an Advanced Research Projects Agency for anti-ballistic missile research (\$10 million); accelerate the dispersal of the SAC base system and permit the more timely construction of adequate ground alert facilities at these bases (\$219 million); and enable the construction of five additional SAGE centers (\$29 million).¹²

This response did not, however, forestall the blossoming

¹¹Quoted by Hanson Baldwin, New York Times, January 22, 1958, p. 12.

¹²Statement of SECDEF Neil McElroy, Hearings, House, Subc. of Comm. on Approps., Supplemental Defense Appropriations 1958, 85th, 2nd, January, 1958, p. 6ff.; and statement of SECAF James Douglass, Hearings, House, Committee on Armed

of a "missile gap" debate which preoccupied public discussions of U. S. security between 1958-61. As with the earlier "bomber gap" myopia, such a preoccupation tended to preclude active national consideration of the full gamut of the country's strategic vulnerabilities. Hence, Senator Henry Jackson observed in January 1958: "While there have been some meagre attempts to detect Russian submarines, I know of no means by which we hope to detect the missiles fired from these submarines, and yet there is this enormous threat that everyone seems to bypass."¹³

In any event, it was not until early 1960 that the U. S. government rejected the possibility that the USSR had been engaged in a "crash" program to deploy a large first-generation ICBM force.¹⁴ (Interestingly, such an appraisal followed on the heels of the first major USSR claim of a significant

Services, Establish and Develop Certain Military Installations, 85th, 2nd, H.R. 9739, January 1958, p. 3802ff. The SAGE appropriations were not directly related to Sputnik. The funds were requested to bring the construction of the centers in line with computer production, and were supposed to have been included in the regular 1958 budget, but the request was submitted to Congress too late to get authorization. See Douglass' testimony, Hearings, Senate, Subc. of Comm. on Approps., Supplemental Defense Appropriations Bill 1958, 85th, 2nd, January 1958, p. 99.

¹³ Hearings, Senate, Subcommittee of Committee on Armed Services, Fiscal Year 1958 Supplemental Military Construction Authorization (Air Force), 85th, 2nd, H.R. 9739, January 1958, p. 21.

¹⁴ According to the testimony of SECDEF Thomas S. Gates,

operational missile capability.) Projections of this USSR capability had, however, been apparently pared down in the U. S. intelligence estimates since early 1959. For example, Air Force Chief of Staff General Thomas White justified in February 1959 his not initiating a SAC airborne alert capability (contrary to widespread public opinion that one-third of the force was always in the air) on the basis of the lack of any operational Soviet ICBM's at that time, and the expectation that no significant deployment would be made "within the next year or two." Hence, he testified further, the USAF was "working rapidly toward" a fifteen minute ground alert capability for one-third of the SAC force, in conjunction with the two to six hours warning being provided then by the DEW line.¹⁵ Indeed, by February 1960, JCS had not even replied to COM-SAC General Thomas Power's urgent request of March 1959 for such an airborne alert capability; the request being held "until [JCS] went through the normal budget cycle...."¹⁶ And, in March 1960, General White testi-

Jr., Hearings, Senate, Subcommittee of Committee on Armed Services, in conjunction with Committee on Aeronautical and Space Sciences, Missiles, Space, and Other Major Defense Matters, 86th, 2nd, February 1960, p. 442.

¹⁵Hearings, House, Subc. of Comm. on Approps., Department of Defense Appropriations 1960 (Part 1), 86th, 1st, February 1959, pp. 862, 866.

¹⁶Pages 355-357 of the Hearings cited in footnote 14 above.

fied that the manned bomber would remain the dominate threat for another three or four years.¹⁷

Such perspectives on relative Soviet bomber and missile strengths should naturally have been of the utmost importance to the evolving US air defense posture. While ICBM's would seem to negate completely the population and industrial defenses systems which had been deployed through 1956, the useful life of these CONAD programs would of course be extended with the collapse of the "missile gap." Additionally, the maintenance or expansion of a modernized bomber force would provide the Soviets with weapons systems whose greater accuracies than those of ICBM's made them the logical choice for counterforce strikes against SAC. Hence, the post-1956 bomber threat was important to any re-direction of America's air defense deployment pattern toward reducing the vulnerability of SAC to surprise attack -- a vulnerability which represented the major danger facing the country, according to the Gaither Committee Report to the Administration in the Fall of 1957.¹⁸

¹⁷Hearings, House, Subc. of Comm. on Approps., Department of Defense Appropriations 1961 (Part 7), 86th, 2nd, March 1960, p. 174.

¹⁸There were also published accounts which "leaked" the Report's dire warnings to the public. On this Report, see Halperin, World Politics, XIII (April 1961), passim.

What then were the U. S. estimates of the Soviet long-range air-atomic threat between 1957-60? It was revealed in February 1957 that as early as the preceding August the "bomber gap" had begun to dissolve within the USAF. During that Summer (which was also the period of the first U-2 overflights), the Air Force felt that the Soviets had produced a quite fewer number of Bisons and Bears than expected, and that they probably could not build-up to the previously predicted 1957-58 levels.¹⁹ Its Soviet production-capacity estimates for the post-1958 period, however, were not reduced.²⁰

By November 1957, U. S. national intelligence estimates had reduced the August 1956 Soviet heavy-bomber strength figures by over one-third; and by December 1958, the August 1956 estimates had been reduced by 75 percent.²¹ Furthermore, in January 1959, it was felt that the USSR now had

¹⁹Testimony of General Twining, Hearings, House, Subc. of Comm. on Approps., Department of Defense Appropriations 1958 (Part 1), 85th, 1st, February 1957, pp. 911, 1063, 1108-1109, Cf. Allen Dulles' remark about the Soviets' July 1955 fly-by: "Later it was surmised that the same squadron [of heavy bombers] had been flying around in circles, reappearing every few minutes." Craft of Intelligence (New York, 1963), p. 149.

²⁰Twining testimony (p. 1063) cited in footnote 19 above. This latter forecast may have been related to the USAF desire to forestall criticism of its expenditures on the SAGE system which was expected to be operational in 1959-60.

²¹According to Senator Symington, "Where the Missile Gap Went," Reporter, February 15, 1962, p. 22.

only one-half the estimated capability for bomber production of that which was presented in early 1957.²²

During 1959 there was a good deal of Congressional concern about "excessive" air defense expenditures in the face of such a declining heavy bomber threat, which was then being estimated at between only 100-125 operational aircraft. An extensive study of the entire air defense program was completed by the Department of Defense in the Summer of 1959 and various cut-backs were proposed. In January 1960, national intelligence estimates again reduced the strength of the Soviets' operational heavy bomber force. This decrease -- reinforced by Khrushchev's expressed intentions in his Supreme Soviet speech regarding future bomber production -- occasioned a further re-evaluation of the air defense system by the Air Force in February-March 1960, with subsequent additional program cut-backs and re-directions.

The principal explanations offered in the U. S. for the apparent lack of a Soviet heavy-bomber build-up are pertinent to note at this point. (The a prioristic arguments for the Soviets' early post-war concentration of their military R&D efforts on ICBMs/IRBMs at the expense of bomber development

²²Testimony of General Twining, Chairman of JCS, Hearings, House, Subc. of Comm. on Approps., Department of Defense Appropriations 1960 (Part 1), 86th, 1st, January 1959, p. 185.

have already been mentioned in Chapter 2.) First, there seemed to be some feeling within the Air Force that USSR disappointment with the performance characteristics of the Bison was a major contributing factor.²³ Secondly, it was known as early as 1958 that the USSR was developing a superior follow-up medium bomber, which undoubtedly diverted budgetary allocations from the Bison/Bear apart from the obvious resource-competition from Soviet missile programs.²⁴ Thirdly, General Thomas Power, SAC commander, testified in 1960 that, in his opinion, the principal reason why Khrushchev "definitely decided to place his chips on missiles" was that the risks of pilot-aborted missions were eliminated with missiles where "no one leaves Russia."²⁵ Finally, other non-military commentators emphasized the constraints on bomber production posed by the post-1957 secular decline of the Soviet economy and Khrushchev's

²³Such Bison performance deficiencies were strongly implied by General Twining in his February 1957 testimony (pp. 1022-1023, 1030-1031 and 1124) during the Hearings cited in footnote 19 on p. 159 above.

²⁴See the January 1959 testimony of General Twining (pp. 18-19) during the Hearings cited in footnote 22 on page 160 above. Cf. Asher Lee's suggestion in 1958 that "the chief indication that the three existing Soviet long range bomber air armies are not likely to be expanded for the next year or so is the present emphasis on long-range jet transport planes." ("The Future of Soviet Air Power," in Lee [ed.], The Soviet Air and Rocket Forces, p. 292.)

²⁵Hearings, House, Department of Defense Appropriations for 1961 (Part 7), 86th, 2nd, March 1960, p. 113.

increasing attention to the expansion of the USSR consumer goods sector.

It is also important to note the arguments which were not being put forward. That is, no authoritative U. S. spokesman openly suggested that the Soviets might possibly have been also deterred from deploying a large bomber-fleet between 1956-60 due to the air defense systems that the U. S. developed during this same period. And these systems had supposedly been designed in part to discourage Soviet saturation-raid tactics. With reference to the Genie nuclear air-to-air missile in operational use since January 1957, General Partridge stated: "Formation-flying in the face of an atomic-warhead-equipped air defense force is just out of the question, so the enemy must come in one airplane at a time."²⁶ The Army's Nike-Hercules nuclear surface-to-air missile, operational since June 1958, was also credited with the ability to destroy many bombers in a close-formation raid and hence induce the USSR to separate widely its attacking force.²⁷ While the Air Force's Bomarc A missile was not

²⁶"For Sneak Attack: Two Hour Warning", interview with General Partridge, U. S. News and World Report, September 6, 1957, p. 77.

²⁷See e.g., Hearings, Senate, Subc. of Comm. on Approps., Department of Defense Appropriations 1960, 86th, 1st, May 1959, p. 304.

equipped with a nuclear warhead, William M. Holaday, Special Assistant to the Secretary of Defense for Guided Missiles, asserted for it, too, in mid-1959 (as it was becoming operational), that "one of its greatest advantages is against a mass raid against us....We can launch 30 missiles at one time, all right together....If this is a concentrated raid I am confident the Bomarc would tear it to pieces...."²⁸ The SAGE system's ability to handle far more enemy attacks than could manual control methods also made saturation tactics much more difficult. And, even if half of the SAGE centers should be disabled, the rest of the system was designed to take over and absorb practically all of the hostile raids in the adjoining knocked-out area. Hence, from this perspective, the USAF built twice as many SAGE centers as were really needed, in order to preclude saturation bombing.²⁹

Now, of course, formation flying and saturation bombing are not perforce the tactics of a large bomber fleet. The Soviets could have recognized these capabilities of U. S. air defense systems and still produced many Bisons and Bears for multiple, low-altitude, ECM-equipped attacks in a single

²⁸Hearings, House, Committee on Science and Astronautics, National Defense Plan Briefing, 86th, 1st, June 1959, p. 304.

²⁹See Hearings, House, Subc. of Comm. on Approps., Department of Defense Appropriations 1962 (Part 2), 87th, 1st, March 1961, p. 964.

or "buddy" aircraft profile. Indeed, given the traditional Russian "long-war" view of nuclear hostilities and their rejection of the decisiveness of an atomic blitzkrieg, such a policy would seem entirely logical. In other words, the above U. S. air defense "signals" were speaking more to the Soviets' wartime bomber tactics than to their pre-war bomber production. Yet, the fact that dispersed formation tactics are much more difficult technically to execute than a mass raid evolution would seem to imply that Soviet calculations of the desirability of extensive bomber expenditures should have at least considered these effects of the U. S. air defense posture as much as, say, the political reliability of their attack pilots. In any event, it is revealing that U. S. discussions of the absence of a Soviet bomber-fleet in 1957-60 demonstrated the same real subordination of the air defense factor in the U. S.-USSR strategic dialogue as was evident in 1955-56 when the U. S. was discussing the presence of a Russian air-atomic armada.

Section C. The Development of a Mature Air Defense System

1. Roles and Missions

The North American Air Defense Command (NORAD) was established in August 1957 under the operational control of General E. E. Partridge, who continued as CINC-CONAD. By early 1959, air defense forces in the U. S.; Canada, Alaska, and Greenland were operating under the same procedures and operational practices. Yet, between 1957-60, problems of roles and missions still plagued the air defense organization within the continental U. S. General Partridge's responsibilities continued to be limited to the broad planning statement of air defense systems requirements and the establishment of the tactics and techniques that were to be followed in the wartime operation of these systems. The administration, logistics, supply, training, and personnel aspects of his forces remained the responsibility of the component service commands. As such, CINC-CONAD had no direct budgetary function in systems procurement. In General Partridge's words in March 1959:

I submit to the JCS plans for the future and requirements for forces.... [After the JCS decides on a program for all services], the various portions of the program are then suballocated to the three services in the U. S., and the three services then budget for the necessary funds, procure the real estate, do the construction work, and so on.... When they are

ready they are turned over to me to use.... [This is] an involved and time consuming process.³⁰

And it was also a process whose "laissez-faire" aspects were supposed to have been eliminated by the Department of Defense Reorganization Bill of August 1958. There are indeed strong indications that air defense organization was the most important single headache that the White House hoped to cure by this legislation.³¹ The Act established CONAD as a strengthened unified command reporting directly to the Joint Chiefs of Staff and the Secretary of Defense, rather than through the Air Force as executive agency. The Act was also intended to increase the administrative control of the Secretary within the Defense Department, partly to overcome the previous apparent reluctance at the Secretary level to eliminate or redirect duplicative weapons systems -- particularly those associated with air defense missiles.

A unified CONAD, furthermore, would give the decisions of its commander more of the authority of the Defense Secre-

³⁰ Testimony, Hearings, Senate, Subcommittee of Committee on Armed Services, Military Construction Authorization Fiscal Year 1960, 86th, 1st, S. 1086, March 1959, pp. 32, 42.

³¹ See, e. g., the testimony of SECDEF McElroy and SECAF Douglass, Hearings, House, Committee on Armed Services, Investigation of National Defense Missiles, 85th, 2nd, H. R. #67, January 1958, pp. 4068 and 4724 respectively; and Hearings, Senate, Committee on Armed Services, Department of Defense Reorganization Act of 1958, 85th, 2nd, H. R. 12541, June 1958, pp. 85, 406ff, 416ff.

tary and the JCS and, hopefully, eliminate the type of doctrinal dispute which erupted between the Army and Air Force during 1958. The dispute centered on the Army Air Defense Command's alleged general war policy of "shooting everything down and sorting out (the friendlies and the hostiles) on the ground." As one Army colonel stated in January 1958: "As between the risk to friendly aircraft and the certainty of destruction of unidentified, the entire priority must be given the latter, even though the probability of the former may approach 100 percent because of the weapon selected." He went on then to argue that each anti-aircraft battery should be considered an autonomous unit with exclusive jurisdiction over the use of the airspace within range of its weapons, since it was the unit which could engage the enemy most rapidly.³² The Air Force asserted that this "terrifying" doctrine which "disowned identification as any part of the Army air defense mission" was, moreover, being taught at the Army Air Defense School contrary to the intent of CONAD.³³ The implications of these problems of meshing effectively various air defense weapons led the Air Force to establish in 1958 the Air Defense Systems Integration Division, with the MITRE Corporation

³²Colonel W. M. Vann, "Antiaircraft Defense", Military Review, XXXVII (January 1958), p. 63.

³³Claude Witze, "The Mix-Up in Air Defense", Air Force, XLI (September 1958), pp. 40-41.

as its management consultant.

This dispute did indeed die down after the creation of a unified CONAD in August 1958. In October, it was asserted by Army magazine that "Army air defense units attack only those targets which [CINC-CONAD] wants attacked, and no others."³⁴ And, in March 1959, when Air Force Chief of Staff, General White, was asked, "Do you have any concern about the Nike shooting down SAC planes because of lack of proper means of identification?"; he replied, "No, I do not.... We have that very well ironed out."³⁵

Yet, the Reorganization Act was by no means the panacea for air defense organizational problems as they were viewed from the CONAD perspective. General Partridge's early retirement in May 1959 was attributed to his feelings that CINC-CONAD's powers were still not commensurate with his authority, especially in the JCS determination of the ratio of Nike-Hercules/Bomarc procurement.³⁶ His successor, General L. S. Kuter, continued to suffer from an uncertain relationship with the Navy. An example of this was the

³⁴Volume IX, (October 1958), p. 62.

³⁵Hearings, Senate, Subcommittee of Committee on Armed Services, Major Defense Matters with Emphasis on the Fiscal Year 1960 Military Budget and the Berlin Situation, 86th, 1st, March-June 1959, p. 104.

³⁶See James Reston, New York Times, May 3, 1959, p. 27.

Navy's withdrawal and decommissioning of nine radar picket ships from the seaward extensions of the DEW line in November 1959. This move was made unilaterally over the objections of CINC-CONAD who asserted that the WV-2 aircraft which would remain flying airborne early warning patrols would not have so good a detection capability as would the ships. And the USN justification of the withdrawal was hardly designed to pacify General Kuter: "The ships having the least effect on the fighting capability of the Navy were selected to be decommissioned."³⁷

Nor were CONAD's relations with the Air Force made any smoother by the elimination of the latter's executive agency capacity in air defense matters and the raising of CONAD to the same organizational level as SAC. As 1960 wore on, there appeared to be signs of increasing USAF-CONAD friction occasioned by the persistent attempts of CONAD to use its newly authorized direct line to JCS to plead for the closest possible attention to the requirements of air defense.³⁸

³⁷CNO memorandum OP-03:jec of 8 March 1960 (Subj: "Withdrawal of radar picket ships....") submitted to the House Armed Services Committee and reprinted on pp. 455-456 of the Hearings cited in footnote 14 on p. 157 above.

³⁸See, e. g., Hearings, House, Subc. of Comm. on Approps., Department of Defense Appropriations 1961 ("...Reappraisal of Air Defense Programs"), 86th, 2nd, March 1960, pp. 26-27.

2. Systems Research, Development, and Procurement

With the incipient collapse of the "bomber gap" and the orbiting of Sputnik, fears began to be generated within the United States that its air defense posture would be obsolescent before it was completed, and pressures grew for a re-direction of the systems programming policies. In the face of such a domestic reaction to the changing Soviet threat, Administration and military spokesmen proffered reasons in 1957-58 for continued bomber defense appropriations. Secretary of the Air Force Quarles rejected the obsolescence fears by arguing that, without bomber defenses, manned aircraft would be the preferred way for the Soviets to do their strategic bombing even if they had an ICBM or submarine-launched missile capability.³⁹ General LeMay objected to Congressional concern about future missile attacks when the American population could "be killed a lot easier by a bomber today....", and asserted that the country had not done enough yet to meet this present threat.⁴⁰ General Partridge highlighted the magnitude of this job which

³⁹Hearings, House, Subc. of Comm. on Approps., Department of Defense Appropriations 1958 (Part 1), 85th, 1st, February 1957, p. 1089.

⁴⁰Hearings, Senate, Committee on Appropriations, Supplemental Defense Appropriations Bill 1958, 85th, 2nd, H. R. 10146, January 1958, p. 113.

remained in building an adequate bomber defense system. He estimated that 1950-65 costs would cumulate to about \$61 billion; and stated that "unfortunately only a small portion of this has been spent already, and the big expenditures lie ahead of us."⁴¹ General James M. Gavin, the Army's Chief of R&D, offered real dividends from such expenditures: "We are after 100 percent effectiveness in defense. And with the nuclear Hercules, and the Talos...and the [low-altitude SAM] HAWK systems, in a mixed complex, very little, if anything, is going to get through...."⁴² These missiles, along with the Bomarc, would be controlled by the vastly more advanced SAGE/Missile Master system which was expected to be fully operational in the 1959-60 period when the Soviet bomber-production capability was expected to be significantly greater than the 1957-58 estimates.

Other specific bomber defense expenditures were justified as involving mandatory improvements upon existing programs in order to save the investment in them. Thus, the eastward and westward extensions of the DEW line were necessary to preclude the out-flanking of this early-warning net.

⁴¹U. S. News and World Report interview, September 6, 1957, pp. 81-82.

⁴²Hearings, Senate, Subc. of Comm. on Approps, Department of Defense Appropriations 1958, 85th, 1st, June 1957, p. 893.

Also, the "White Alice" radio communication system in Alaska was vital to overcome the magnetic storms, which had reportedly caused the DEW line radar stations there to be out of touch with CONAD headquarters about 70 percent of the time in 1957-58.⁴³ The air surveillance system within the U. S. would be rendered essentially useless unless a "frequency diversity radar" program were initiated to cope with the smaller radar reflecting areas, higher operating altitudes, and increased electronic countermeasures capability of the newer Soviet bombers and their expected air-to-surface missiles.⁴⁴ Funds for the expedited construction of five SAGE centers were needed, moreover, to bring the lagging building construction in line with the computer production -- a situation which had forced the accumulation of the hardware in costly air-conditioned storage.⁴⁵ In addition, one-half of the entire fiscal year 1958 ADC construction program involved necessary expenditures for storage and improved check-out

⁴³Hearings, House, Subc. of Comm. on Approps., Department of Air Force Appropriations 1958, 85th, 1st, April 1957, p. 622; and Hanson Baldwin, "Communique from Our Alaskan Outpost," New York Times Magazine, March 15, 1959, p. 101.

⁴⁴Hearings, House, Subc. of Comm. on Approps., Department of Defense Appropriations 1959 (Department of Air Force), 85th, 2nd, March 1958, p. 383.

⁴⁵See footnote 12 on p. 156 above, and the testimony of General LeMay on pp. 125-126 of the Senate Hearings cited therein.

facilities for the previously approved air-to-air and surface-to-air missiles.⁴⁶

Furthermore, when the Eisenhower Administration proposed in the fiscal year 1958 budget to reduce the USAF force structure from 137 wings to 128 wings (in order to create an offensive missile force), no ADC wings were cut-out, and the interceptor-force modernization program was to go forward as planned.⁴⁷

Finally, of course, the belated recognition of the vulnerability of SAC to a surprise air-atomic attack would seem to have given real impetus to new air defense expenditures, apart from the SAC dispersal and ground-alert facilities programs launched in 1957. That is, there would appear to be an increased need for air defense programs which would ensure that SAC had maximum warning time to get airborne, active defense protection on its bases, fighter-interceptor support on its outbound flights, and assurances that its planes would not be shot down enroute home.

Funds were indeed appropriated and obligated for each of the specific bomber defense programs mentioned above which were requested in fiscal year 1958. The Administra-

⁴⁶Hearings, House, Committee on Armed Services, Military and Naval Construction, 85th, 1st, H. R. 7130 and H. R. 8240, May 1957, p. 1991.

⁴⁷Testimony of SECAF Douglass, ibid., pp. 1965, 1968.

tion's fiscal 1959 construction requests, however, were received much more critically by Congress. By that time, as we have seen, national intelligence estimates had further reduced the Soviets' operational heavy-bomber strength. Moreover, the budget estimates for continental defense in fiscal 1959 had increased substantially to some \$4.6 billion (eleven percent of the Department of Defense total) which was more than ever before planned.⁴⁸ This prompted the Senate Armed Services Committee to state in its construction authorization report of July 1958 that "the effort and resources the country is putting into continental defense systems is tremendous and a little bit frightening." The report went on to complain that

in classified briefings, overlays shown of existing and planned defensive systems indicate the eventual deployment of at least four systems superimposed upon each other and blanketing the entire continent. While each system has its own special characteristics, these overlays clearly indicate areas of overlap where one system might well perform the function of its neighbor.... (T)he committee's experience is that such programs have a habit of being approved by default through the medium of piecemeal submission on an annual basis without regard to the accumulation of long-range contingent liabilities. (In fact, the committee suspects that in some instances where the JCS cannot agree on duplicating systems, it slightly reduces each in scope

⁴⁸Page 293 of the Senate Hearings cited in footnote 35 on p. 168 above.

and proceeds to develop both.)⁴⁹

The focal point of this Congressional criticism was the potential duplication of surface-to-air missile programs embodied in the Air Force's Bomarc and the Army's Nike-Hercules. It appeared to the non-technical person that both of these systems would do the same thing at different ranges --- destroy high altitude enemy aircraft. Their differences became even less clear as the Nike was improved so that its range might extend beyond 100 miles and shade it, hence, into the "area defense" category. Such rapidly-changing weapons improvements tended also to make Secretary Wilson's 1956 memorandum appear unrealistic in its attempt to distinguish SAM systems' roles and missions by the nature of their radar guidance information. Furthermore, as General Partridge had stated in the Fall of 1957, "It is meaningless, almost, to talk about point defense or local defense....When it is a city you want to defend, you put these NIKE batteries all the way out here like this,

⁴⁹Military Construction Authorization Fiscal Year 1959, Committee on Armed Services, Senate, 85th, 2nd, S. Rept. 1982 on H. R. 13015, July 28, 1958, pp. 20, 22-23. Cf. the observation that the services' "experience under General Eisenhower has taught them that he expects one rule to be followed. It is that if a service really wants a new weapon system and can make a convincing case for it, that service can have its weapon, but only if something else is dropped from its catalogue." C.J.V. Murphy, "Defense: The Converging Decisions", Fortune, LVIII (October 1958), p. 120.

and you are covering maybe 125 miles across the area".⁵⁰

After a detailed review of these two systems, the Military Construction Subcommittee of the Senate Armed Services Committee was content to make a 20 percent reduction in the total funding requested for them; and they authorized the Secretary of Defense to construct such Army and Air Force missile sites as he deemed essential to U. S. security.⁵¹ With the procurement funds available, the Army began to replace its Nike-Ajax missiles with the Hercules during 1958 and laid plans for the introduction by mid-1959 of its Hawk low-altitude, point-defense SAM. The Air Force continued to experience difficulties with its Bomarc A test program which was in its seventh year.⁵² For its contribution to the low-altitude SAM field, the Air Force initiated in February 1958 the Bomarc B program on an ac-

⁵⁰U. S. News and World Report interview; September 6, 1957, p. 83.

⁵¹Page 26 of Senate Report 1982 cited in footnote 49 on p. 175 above. This action was substantially concurred in by the House Armed Services Committee.

⁵²Along with the technical problems, this program suffered from an intense quarrel between the Air Force's Air Research and Development Center and its Air Defense Command regarding who was in charge; plus the red-tape from the four different command channels involved in the program's management which did not meet at a single point short of the Chief of Staff. See Colonel Q. J. Goss, "Early Combat Capability With New Weapons", Air University Quarterly Review, XIII (Summer 1962), pp. 32, 38.

celerated schedule. The Bomarc B, furthermore, was to have a 400 mile range, in recognition of the Soviets' advances in ASM's capable of being released several hundred miles from the target.⁵³

The Department of Defense fiscal year 1960 budget estimates for continental defense programs continued at a \$4.3 billion level, a full ten percent of the Department's total.⁵⁴ Included therein were authorization requests for the initial construction of fifty additional Hercules sites and thirty Bomarc batteries. However, the offensive "missile gap" debate in 1959 generated even more American public pressures for a step-up in the ICBM, Polaris, and anti-ballistic missile programs and increased fear that the U. S. bomber defense programs were obsolescent; while the collapse of the "bomber gap" made such major additional air defense expenditures appear more unwarranted. Such pressures were compounded by the "finite deterrence" versus "counterforce" strategic doctrinal controversy which reached a peak in the U. S. early in 1959. The Navy and Army, among others, asserted that the U. S. had developed an air-atomic "overkill" capability and should redirect its resources toward achieving a small, in-

⁵³See p. 201 of the House Hearings cited in footnote 119 on p. 136 above.

⁵⁴Page 293 of the Senate Hearings cited in footnote 35 on p. 168 above.

vulnerable nuclear deterrent force and a modernized, mobile ground force. The Air Force was compelled to deny the "over-kill" argument and stepped-up its pleas for additional B-52 wings and increased numbers of B-58's to replace the aging B-47's. This controversy placed the Air Force in the uncomfortable position of admitting that the U. S. was spending too much money on air defense (hence, redirect toward SAC), while arguing for continued authorizations for its Bomarc/SAGE. And as a reflection of the Air Force's position on these issues, consider the practically unprecedented justification for air defense expenditures which General White, Chief of Staff, gave at this time: "You may be sure that the Russians are spending...just about the same proportion of their military budget on the same kind of defense as we are, and that they are going out as fast as they can with a SAGE system that is copied or at least similar to ours."⁵⁵

Moreover, the Defense Department, under Congressional pressures to reduce air defense funding, shifted markedly from its 1954-56 arguments and became in early 1959 the leading forecaster of an improved Soviet air-atomic force -- supersonic bombers equipped with advanced ASM's -- and a principal proponent of the requirement to push the air battle (via Bomarc) away from the presently defended point complexes.

⁵⁵Ibid., p. 136.

To bolster their arguments for the Bomarc, the Defense Department and the Air Force highlighted the report of an ad hoc technical panel (the Furnas Committee) convened by DOD in December 1958 to determine whether the low-altitude-capable, extended-range Bomarc B could become an active part of NORAD by 1961. The report confirmed the feasibility of the program and recommended that initial deployment be expedited.⁵⁶ (The Air Force then shifted the emphasis of its Bomarc project by proposing to build only five "A" sites with the remainder to be manned with the "B" model missiles.⁵⁷) The Defense Department also justified the Bomarc program on the basis of a February 1959 decision by Canada to cancel its CF-105 interceptor development and buy Bomarcs instead.⁵⁸

⁵⁶Hearings, Senate, Subc. of Comm. on Approps., Department of Defense Appropriations 1960, 86th, 1st, May 1959, p.208.

⁵⁷Testimony of General White, ibid., p. 708.

⁵⁸There are indications that the Air Force "pressured" the Canadian government into this decision (despite the grave uncertainties of the Canadians regarding Bomarc) by its December 1958 determination not to procure the CF-105 for its own forces (after over a year of encouragement that such action was likely), and its magnification of the USSR's long-range ASM threat. Hence, one of the reasons for DOD's support of Bomarc might have been the Administration's concern over the political implications in Canada if the program were "cancelled" by Congress. See HANSARD, Session 1959, Vol. II, March 2, 1959, pp. 1499ff. and 1514; Melvin Conant, "Canada's Role in Western Defense", Foreign Affairs, XL (April 1962), p. 437; and Hearings, House, Subc. of Comm. on Approps., Department of Defense Appropriations 1961 (Part 7), 86th, 2nd, March 1960, p. 254.

Finally, the Air Force pointed out that Bomarc's reaction-time permitted the launching of a battery's thirty "A" missiles or twenty-five "B" missiles within two minutes or thirty seconds respectively; while only one-quarter of a Hercules battery's eighty-four missiles could be launched in fifteen minutes, with all of them requiring three hours.⁵⁹

The Army responded to these arguments by stressing that -- whereas the Bomarc had been tested for some eight years at a cost of over \$2 billion without achieving an operational capability -- Hercules missiles were already sited at sixty-two locations with trained crews. Furthermore, they asserted that the Hercules had been successful in tests against supersonic targets while the Bomarc had yet to shoot one down.⁶⁰ The Army also reiterated how the deployment of Nikes demonstrated that system's area defense capability by providing a "continuous protective blanket" covering vital continental complexes for many square miles.⁶¹

These questions regarding the proper mix of U. S. surface-

⁵⁹New York Times, May 24, 1959, p. 7. These unfavorable Nike reaction times were based on a TOP SECRET test which the Air Force made public, according to the Dawson Subcommittee Report, p. 123.

⁶⁰New York Times, May 24, 1959, p. 7.

⁶¹See, e.g., the testimony of Secretary of the Army W. H. Bruckner, Hearings, Senate, Department of Defense Appropriations 1960, May 1959, p. 74.

to-air missile programs (as well as the larger question of offensive versus defensive systems expenditures) came to a head during the Congressional Hearings on the fiscal year 1960 budget. Secretary of Defense McElroy testified frankly that this was an area where his Department had not done very well in arriving at a decision. Indeed this was for McElroy "the most difficult matter" which confronted him; and he eventually confessed: "As far as I am concerned, it would not bother me if you held our feet to the fire and forced us in connection with this budget."⁶² The Armed Services Committees reacted quickly to the offer.

The Senate Armed Services Committee in May 1959 deleted over \$17 million of the \$22.4 million in Army requests for initial construction on the fifty Nike-Hercules sites. It asserted that the Nike was "virtually obsolete" since it could be outflanked by Russian bombers, and that greater emphasis should be placed on area defense systems.⁶³ Almost simultaneously, the House Armed Services Committee reported its bill which severely reduced the Air Force's Bomarc authorization requests. This Committee was more impressed with the fact that Nike was already operational and somewhat less

⁶²Ibid., pp. 31, 33. See also p. 331ff.

⁶³Military Construction Authorization Fiscal Year 1960, Senate Report 296, 86th, 1st, May 29, 1959, pp. 13-14; New York Times, May 25, 1959, p. 17.

costly than the Bomarc system.⁶⁴

The sharp difference between these May 1959 bills brought the SAM controversy more into the open and increased the interservice acrimony which surrounded the debate. Within a month, the Department of Defense was presenting to Congress an air defense "master plan" which attempted to clarify and integrate in one document all of the defensive systems requirements. Significantly, the plan called for the retention of each system, although most were reduced in scope.⁶⁵ The Nike-Hercules program was reduced by \$469 million over the life of the program, which represented a 30 percent decrease in the number of contemplated batteries. Bomarc requirements were reduced from thirty to eighteen batteries, effecting a program-life savings of \$750 million. SAGE centers construction was reduced by \$49 million. Prime radar sites were also reduced by \$274 million, with an increase of \$94 million for gap-filler radars. The Nike-Zeus anti-ballistic missile program received a proposed increase of \$137 million. Finally, none of the approximately \$1.3

⁶⁴Dawson Subcommittee Report, p. 123.

⁶⁵The following is taken from the testimony of M. H. Stans, Director of the Bureau of the Budget, on pp. 294, 306-307 of the Senate Hearings cited in footnote 35 on p.168 above; and Hanson Baldwin, New York Times, June 21, 1959, Part IV, p. 7. The systems deployment concepts in the "master plan" will be discussed in subsection 3 below.

billion thus saved was proposed to be added to offensive systems so far as the "master plan" was concerned.

The military construction bills which were subsequently passed accepted this "master plan" in the sense that they gave full authorization for its fiscal 1960 requests. In addition, air defense funding in the Administration's fiscal 1961 budget was prepared on the basis of this plan. But, as another Congressional committee was to report in September 1959, with reference to the formulation of the plan:

Since the JCS...could not come into agreement, they had to defer to [SECDEF's] non-military advisors. The decisions were military only to the extent that the Joint Chiefs had to re-arrange their assessment of the air defense requirements; the decisions were fiscal in part, political in part, and in some respects they were based upon considerations of precedent in the allocation of resources among the separate services.⁶⁶

The "master plan" did not direct itself to fighter-interceptor requirements and accepted the USAF plans for these systems. The Defense Department, however, did direct the Air Force to decide whether its new MACH-3 aircraft was to be the B-70 bomber or the F-108 interceptor; but not both. Despite an investment of \$150 million, the Air Force chose to cancel the F-108 program in September 1959 -- a decision based upon, according to General White, "What would worry the

⁶⁶Dawson Subcommittee Report, p. 152.

Russians most...."⁶⁷ Other important changes to fighter systems development programs arose from a further re-evaluation of future air defense requirements which the Air Force conducted unilaterally in January and February 1960.⁶⁸

At this time, intelligence estimates had made still another reduction in the Soviets' operational heavy bomber strength and Khrushchev had strongly implied that few, if any, future bombers would be produced. While the Administration had begun to reject the "missile gap", there seemed little doubt that the ICBM would become the predominant threat in the 1963-65 period. The Air Force's air defense study in early 1960 determined that, as then presently contemplated, U. S. bomber defense programs would achieve full operational capability just about that same time. Further analysis disclosed that many new features would have to be added to the bomber defense programs if

⁶⁷Page 126 of the Senate Hearings cited in footnote 14 on page 157 above.

⁶⁸The below discussion of this Air Force study draws upon testimony of Major General H. M. Estes, Jr., Assistant Chief of Staff, USAF, Hearings, House, Subc. of Comm. on Government Operations, Organization and Management of Missile Programs (Part 2), 86th, 2nd, May 1960, pp. 46-49, 66; and the March 24, 1960 report of the study, entitled "Revisions in 1960 and 1961 Air Force Programs: Reappraisal of Air Defense Programs," Appendix to Hearings, House, Subc. of Comm. on Approps., Department of Defense Appropriations 1961, 86th, 2nd, passim.

they were to be retained and were to survive an ICBM attack; e.g., more hardening of SAGE combat centers, hardening and dispersal of Bomarc, and "positive provisions" for fighter-interceptor survival. Such features were obviously expensive and to implement them would delay still further the achievement of the system's full operational capability.

The USAF thus decided in March 1960 to go beyond the Department of Defense's "master plan" and reduce further its bomber defense programs by concentrating on those systems improvements which could be completed most quickly; and to redirect the other released funds toward an acceleration of Air Force ICBM and anti-ICBM programs. Therefore, the construction of eight super (hardened) SAGE combat centers was cancelled, and the SAGE's other twenty-five center-program was re-arranged to effect completion in calendar 1962 rather than 1964. The number of planned Bomarc B batteries was further decreased from eighteen to ten, with a more timely completion date of mid-1961.⁶⁹ The Air Force's existing supersonic fighter force was to receive more immediate modernization, increased all-weather capabilities,

⁶⁹The repeated test-failures of the Bomarc missiles doubtlessly contributed to this decision, also. Ironically, the first successful Bomarc B interception of a supersonic target (after seven failures) occurred only three weeks after the Air Force decision to cut-back the program. See Air Force, XLIII (September 1960), p. 264.

and more extensive nuclear arming. Finally, a new fire-control system and an advanced air-to-air missile for interceptors was to continue under development "as an insurance policy against the possibility of an increased bomber threat in the future."⁷⁰

3. Systems Deployment and Operation

During 1957-58, the U. S. bomber defense capability was markedly improved as major systems came into initial operational use. The main DEW line was turned over to the Air Force in August 1957. The line's westward extension was on limited operational status in late 1958 and work on the eastward extension began during the 1958 construction season. The thirty-four "White Alice" tropospheric scatter radio stations in Alaska were all transmitting by March 1958, and, during that year, communications from the DEW radar chain to Anchorage and Fairbanks were effective about 99.4 percent of the time.⁷¹ Progress with the low-altitude gap-filler radar program enabled the Ground Observer Corps to be put on a ready reserve status in January 1958 and to be completely eliminated in January 1959. Also, in 1958 the

⁷⁰General Estes' testimony on p. 48 of the House Hearings cited in footnote 68 on p. 184 above.

⁷¹See H. Baldwin, New York Times Magazine, March 15, 1959, p. 101.

U. S. went from subsonic to supersonic aircraft in the majority of its interceptor force. Moreover, many of the fighter squadrons had been equipped with conventional air-to-air missiles (AAM's) and an increasing percentage of them were capable of employing the nuclear Genie AAM. The sixty Nike-Ajax battalions which had been deployed between 1953-58 began to be replaced in June 1958 by the nuclear Hercules missile. The first of the new ground control radar units for these Army missiles -- the Missile Master -- was installed in January 1957. And the first SAGE control center was opened at MacGuire Air Force Base in June 1958.

That these systems were welcomed additions to the air defense community is unquestioned. General Partridge described the Genie AAM as being "as important to the air defense business as radar was in World War II."⁷² NORAD experts proclaimed that "one modern interceptor armed with nuclear weapons [could] now-in effect-do the job formerly done by about sixteen of the old conventionally armed F-86's."⁷³ The ability of SAGE to handle about 100 times the amount of information that had been handled on a manual basis was described by one Air Force general as "the answer today to

⁷²Interview in USNWP, September 6, 1957, p. 77.

⁷³Cited by H. Baldwin, New York Times, January 22, 1958, p. 12.

the air defense problem."⁷⁴

Such exuberance must be placed, however, in a fuller perspective. First of all, despite the widespread deployment of air defense systems within the continental U. S. by 1959 (and the projected plans for additional overlapping coverage), the entire Dominion of Canada had no surface-to-air missiles and only nine squadrons of subsonic, CF-100 fighters deployed upon its territory to handle initially the Soviet first-strike bombers -- with the newer CF-105 not expected to be operational until 1962.⁷⁵ Besides, even these limited forces were greatly reduced in their potential effectiveness by the political obstacles in both the U. S. and Canada which had precluded their being equipped with nuclear weapons.

Secondly, NORAD air defense officials were still quite mindful of the inherent tactical advantages that accrued to the offense -- advantages which were complemented by the continued advances in the Soviets' air-atomic capabilities. Referring to the expected NORAD attrition-rates, General Partridge analogized: "It's like shooting down all the birds in a flock of ducks. If the conditions are good,

⁷⁴Testimony of General Friedman, Hearings, House, Department of Defense Appropriations 1959 ("Department of Air Force"), 85th, 2nd, March 1958, p. 656.

⁷⁵HANSARD, Session 1957-8, Vol. II, December 5, 1957, pp. 1898, 1929.

we would get most of them. If they're bad, or the ducks are exceptionally adept, we might miss a good many."⁷⁶

This question of NORAD's attrition capability was answered more specifically by an Air Force colonel who cautioned in February 1958: "I would not like to leave the impression in anybody's mind that it would be more than 50 percent."⁷⁷

In this connection, Herman Kahn made an interesting observation on "the general feeling of hopelessness held by even the protagonists of air defense" at this time. He pointed to a motto of NORAD which affirmed: "We believe that the defense of North America is so vital, not only to the people of the U. S. and Canada but to the whole Free World, that we must build the best air defense that seems possible, because it might work -- not fail to build it because it might not." Kahn then suggested that "a military organization that is worried about its morale would be extremely loathe to raise the question 'might work' unless it felt that this view would improve morale; that is, unless it felt that the 'might work' position represented a more optimistic point of view than that held by the audience."⁷⁸

⁷⁶USNWP interview, p. 76.

⁷⁷Hearings, House, Department of Defense Appropriations 1959 ("Overall Policy Statements"), p. 144.

⁷⁸On Thermonuclear War (Princeton, 1960), p. 101.
Italics Kahn's.

During 1959-60, the deployment of the newer radar, missile, and fighter-interceptor programs increased -- while pressures grew to reduce the perceived excesses of overlapping coverage of America's bomber defenses. The western extension of the DEW line (from the Aleutians to Midway Island) was completed during 1960. The radar improvement program ("frequency diversity") became initially operational in 1959. Its radars were credited with being better by a factor of two in range and three to four in altitude than the previous radars, against a Bison-type target; and, furthermore, they would prevent any substantial degradation of the radar coverage against Soviet ASM's.⁷⁹ During 1959, SAGE coverage of the northeast United States was completed, as well as a substantial portion of the north central region. The north central and northwestern areas were covered with a SAGE capability during 1960. By June 1960 the last 90 and 120 millimeter AAA unit in NORAD had been phased-out, and a substantial number of the Army's surface-to-air missile battalions had been converted to the Nike-Hercules. The Hawk low-altitude point defense missile became operational in mid-1959. The modernization program

⁷⁹Testimony of Colonel Woods, USAF, Hearings, House, Subc. of Comm. on Approps., Military Construction Appropriations 1960, 86th, 1st, May 1959, p. 454.

for the over 1,500 U. S. fighter interceptors was expedited in 1960 to approach a 100 percent all-weather, missile-armed force. Further, the number of U. S.-based fighters on a five and fifteen minute alert status was increased by almost 20 percent during 1960.⁸⁰ By mid-1959, three ANG squadrons were being equipped with Sidewinder AAM's and, as of July 1960, nineteen ANG squadrons were standing a five minute runway alert, six of them on a twenty-four hour daily basis.⁸¹

To what extent were these improvements in U. S. air defense systems directed toward reducing the vulnerability of SAC to a surprise bomber attack between 1957-60? As mentioned above, this vulnerability had been painfully detailed to the Administration by the Gaither Report of late 1957. It seems evident, however, that both the Administration's biases and the domestic inter-service problems which continued throughout this period acted to impede the specific and widespread deployment of active defense systems in protection of SAC's second-strike capability.

⁸⁰Testimony of General Agee, USAF, Hearings, House, Subc. of Comm. on Approps., Department of Defense Appropriations for 1962 (Part 2), 87th, 1st, March 1961, pp. 805, 958. However, the sharply reduced fiscal 1961 defense budget necessitated the dropping of eight squadrons of older fighter-interceptors from the USAF inventory. See Air Force, XLIII (September 1960), p. 262.

⁸¹Air Force, XLII (August 1959), p. 105; and XLIII (July 1960), p. 114.

Throughout the 1957-60 period, various Congressional committees would object to the continued high-priority efforts of the Administration to "palliate" the public through the active defense protection of their industries and cities. For example, a Senate report in mid-1958 expressed concern about "the heavy deployment of missiles requiring stockpiles of nuclear warheads immediately adjacent to heavy centers of population", and objected to "the attendant publicity implying that the deployment of these weapons at such locations constitutes no hazard and provides complete security from attack."⁸² In March 1959, Senator Jackson referred to this situation and stated: "I would hope that the Joint Chiefs would really look at this on a cold-blooded basis and stop all this nonsense of soft-soaping the people and saying that we have a defense because they have installations around a city."⁸³

Additionally, the acrimonious Hercules-Bomarc interservice controversy, which replaced the earlier Ajax-Talos dispute, created further obstacles in 1957-58 to the redirection of the Army's surface-to-air missile deployment toward SAC bases. For legitimate budgetary reasons, more-

⁸²Pages 20-21 of S. Report 1982 cited in footnote 49 on p. 175 above.

⁸³Page 127 of the Senate Hearings cited in footnote 35 on p. 168 above.

over, the Army was concerned to utilize its Hercules initially on existent Ajax city-ringing sites, as replacements for these older missiles. By early 1959, however, the fifty additional Hercules sites which the Defense Department requested were reportedly scheduled to protect about twenty-five SAC bases. But, when the "master plan" reduced the program by 30 percent, only about sixteen SAC bases could be provided with point-defense missiles⁸⁴ -- and only after a lengthy construction period had transpired.

Of course, the Air Force could have recognized the need to protect its strategic aircraft and still have rejected the need for point defense systems, even if they had been made available to SAC after 1956. Indeed, the many efforts which the USAF made to distinguish its area defense or "defense-in-depth" philosophy from the Army's point-defense or "building-block" preferences are instructive here.⁸⁵ Long-range interceptors and Bomarc deployed all along the northern periphery of the continental US (and on newly constructed USAF bases!) were,

⁸⁴Hanson Baldwin, New York Times, May 28, 1959, p. 13; and June 21, 1959, Part IV, p. 7.

⁸⁵As late as March 1960 -- two and one half years after CINC-NORAD had described such distinctions as virtually "meaningless" -- General White still took pains to detail the differences in these concepts. (Hearings, Senate, Department of Defense Appropriations 1961, 86th, 2nd, pp. 1391-1392.)

henceforth, more vital to SAC than obsolescing Nikes. Yet even the interceptors and Bomarcs appeared to command a lower priority in this regard than did the continental radar warning net. As General LeMay emphasized at the 1956 Air Power Hearings:

Alert time is more important than anything else. It does not matter whether you shoot down zero percent or 30 percent of the bombers coming in. That is not so important. But alert time is. That is the factor that will give us the ability to save more of our force. (page 204)

It seems plausible, therefore, that the Air Force viewed its SAC base dispersal program, coupled with its attempts to achieve a fifteen minute ground alert capability for one-third of SAC, as a sufficient response to the RAND Base Selection Study, Gaither Committee Report, etc. But even these programs (initiated in 1956-57) had not been completed by 1960.

One must conclude again that, at bottom, the Air Force remained skeptical that an air-atomic attack could significantly cripple SAC -- no matter what defensive measures were taken; bomber gap or no bomber gap. For example, General White could still submit in March 1959: "I do not think [our SAC bases] are very vulnerable at this time to a low-level bombing attack, because it is going to be very difficult for the Russians to make a low-level attack with the equipment they have, make the

range."⁸⁶

If active air defense systems played a subordinate role in reducing the vulnerability of SAC to a Soviet counterforce bomber strike, the question of the vulnerability of the air defense system itself to a Soviet ICBM/SLBM strike was also subordinated. Despite the vociferous "missile gap" discussions in the U. S., it appears that not until about 1960 was serious attention given (by the USAF) to the question of the capability of American bomber defenses to survive a missile attack. And it was not until 1962 that programs to increase this capability were effected. Before that time, there were no plans for the quick dispersal to additional pre-equipped bases of Regular and ANG fighter-interceptor squadrons in a post-attack environment. The Bomarc program (unlike the U. S.' ICBM program) was a "soft" one and was to be concentrated on fewer than a dozen bases. None of the SAGE's twenty-one control centers was hardened, seven were co-located with SAC forces, and

⁸⁶Page 103 of the Senate Hearings cited in footnote 35 on p. 168 above. And recall again that General LeMay was still asserting in 1964 that since the USSR had no real wartime bombing experience, their pilots remained deficient; and they would catch-up with U. S. strategic bombing expertise only when all the World War II-experienced SAC officers retired. Hearings, Senate, Subc. of Comm. on Approps., and Committee on Armed Services, Department of Defense Appropriations 1965 (Part 1), 88th, 2nd, March 1964, p. 725.

two were in close proximity to large cities. Furthermore, the NORAD headquarters in Colorado was located above ground in the end of an old hospital.⁸⁷

Part of the explanation for this situation was simply the lack of a sense of urgency to redirect programs which came only when the potential ICBM threat materialized into a significant operational threat after 1960. There was also, of course, the Administration's ceilings on defense expenditures. As General LeMay later reported: "When we built the SAGE system, we were pressed for funds as always, and instead of putting them out in isolated places we put them on bases that we already had."⁸⁸ Furthermore, it seems likely that the interservice SAM dispute which dominated air defense polemics during this period (i.e., each service asserting that its missiles could kill more bombers) obscured both the issues of system survivability and system obsolescence in the face of a growing ICBM/SLBM threat.

⁸⁷On these points see p. 100ff. of the Senate Hearings cited in footnote 35 on p.168 above.

⁸⁸Hearings, Senate, Subc. of Comm. on Approps., and Committee on Armed Services, Department of Defense Appropriations 1966 (Part 1), 89th, 1st, February 1965, p. 730.

CHAPTER 4

AIR DEFENSE IN THE BALLISTIC MISSILE AGE:

1961-66

After the ICBM "missile gap" collapsed publicly in the U. S. in late 1961, manned bombers and missile-launching submarines again became prominent in Soviet strategic claims. The Russians at this same time began to emphasize their development of 50-100 megaton super-bombs.¹ To support their bomber claims, the Soviets displayed at the July 1961 air show their new supersonic, medium jet bomber, the Blinder, in a ten plane fly-by. Additionally, they displayed a new stand-off cruise missile with an estimated range of about twice that of their older ASM's. Such missiles would give the USSR the capability for a bomber-launched attack outside the effective zone of present U. S. air defense weapons.

These qualitative improvements in the Soviets' air-atomic force were not, however, matched by quantitative increases in their inter-continental-range bomber strength after 1960. In early 1965, the USSR was credited with the capability of striking the continental U. S. with only "approximately 100 bombers on two-way missions, plus perhaps another 150 medium bombers on two-way missions over Alaska, portions of Canada

¹On these Soviet claims see Horelick and Rush, Strategic Power..., Chapter 8.

and a very small segment of northwest U. S."² By that time, the USSR had built-up its operational long-range offensive missile force to about 150 ICBM's, plus a handful of SLBM's.

Henceforth, there remained a definite bomber threat after 1960, and, accordingly, the need to remain defended against it. The U. S.' principal bomber defense concern between 1961-66, however, was to reduce the vulnerability of the extant system to a prior, surprise ICBM/SLBM attack; while simultaneously reducing NORAD's operating costs to a level more commensurate with the changing overall threat. The foremost effort toward increasing the air defense system's survivability was directed at the aircraft surveillance, warning, and control program. For, as we have seen, the SAGE direction center system was "soft" and was concentrated on or proximate to probable Soviet missile targets.

It had been determined in 1960 that to attempt to "harden" SAGE would be too expensive in view of the declining bomber threat, and furthermore, a Super-SAGE would not have sufficient hardness against expected ICBM nuclear yields. President Kennedy's changes to the Eisenhower

²SECDEF Robert MacNamara, interview in U. S. News & World Report, April 12, 1965, pp. 54-55.

fiscal 1962 budget thus included \$23 million to establish an interim, manual, back-up ground-control-intercept capability (BUIC) at twenty-seven prime radar sites estimated to have a high survival potential.³ Work was also begun that year on a more effective back-up system of thirty-four semi-automatic BUIC-II stations co-located with the prime radars. In addition, all the U. S. prime radars began to be linked together with a new communications system designed to operate even if SAGE were destroyed. This system entailed fallout protection and shielding measures, as well as emergency power facilities, to enable the crews to function in the post-missile attack environment. By October 1962, this manual back-up phase had been completed. In November, the Office of the Secretary of Defense directed a phasedown of six of the twenty-one SAGE direction centers and seventeen of its associated heavy radars. This phasedown was completed by mid-1964; and in 1965 the BUIC-II program was re-oriented by programming its hardware into nineteen BUIC-III control sites rather than thirty-four BUIC-II sites. These enlarged BUIC-III stations were also planned to be integrated with twelve SAGE direction centers, with each integrated sector internettted with ten to fifteen radars.

³Hearings, House, Subc. of Comm. on Approps., Department of Defense Appropriations 1962 (Part 3), 87th, 1st, April 1961, p. 575.

Thus, any of the SAGE's or BUIC-III's could handle the entire sector even if the others were destroyed. The twelve sectors would feed into four combat centers which in turn fed into the projected underground NORAD Combat Operation Center. This entire conversion program was expected to be completed by mid-1970.⁴

The dispersed BUIC programs cost approximately \$132 million to construct, whereas the total investment in SAGE by early 1965 was approximately \$2 billion. Moreover, the BUIC was considerably less expensive to operate. Its capacity, of course, was significantly less than that of the SAGE and yet more commensurate with the actual bomber threat.⁵

The second principal effort made after 1961 to enable the U. S. air defense to survive a missile attack as well as

⁴On the evolution of this program, see the statement of SECDEF MacNamara, Hearings, Senate, Subc. of Comm. on Approps., and Committee on Armed Services, Military Procurement Authorizations for Fiscal Year 1967, 89th, 2nd, February 1966, p. 71; and Hearings, Senate, Subc. of Comm. on Approps., Department of Defense Appropriations 1964, 88th, 1st, April 1963, pp. 48-49; and the statement of General Friedman, USAF, Hearings, House, Subc. of Comm. on Approps., Department of Defense Appropriations 1965 (Part 2), 88th, 2nd, January 1964, p. 421.

⁵Testimony of General Crow, USAF, and General Gerrity, USAF, Hearings, House, Subc. of Comm. on Approps., Department of Defense Appropriations 1966 (Part 4), 89th, 1st, March 1965, pp. 407 and 394 respectively; and testimony of General Lavelle, USAF, ibid. (Part 2), February 1965, p. 424.

fight bombers pertained to its interceptor force. By the end of 1963, one third of the interceptor force was being maintained on alert at all times. Also during this year, 25 percent of the fighter aircraft had been dispersed to additional existing bases, and support facilities thereon were constructed in 1963-64.⁶ This program had "permitted ADC to disperse approximately 173 interceptors to 17 dispersal bases within three hours at the beginning of the [1962] Cuban crisis."⁷ The Air Force was less happy, however, with the steady decrease in its active fighter inventory since 1959 and the attendant increase in its reliance on some 500 ANG interceptor aircraft. Moreover, the USAF was unable to convince the Defense Department throughout this period of the need to procure a new "follow-on" manned interceptor to counter the Soviet advances in ASM's. Secretary MacNamara apparently made such procurement

⁶Statement of SECDEF MacNamara, Hearings, Senate, Department of Defense Appropriations 1965 (Part 1), February 1964, p. 99.

⁷Testimony of General LeMay, Hearings, House, Subc. of Comm. on Approps., Department of Defense Appropriations 1964 (Part 2), 88th, 1st, February 1963, p. 434. The Cuban crisis also led to the reinforcement of the skimpy radar, fighter, and SAM defenses which had been previously deployed in the southeastern U. S. Such a reinforcement had also been recommended by a House Committee Report of September 17, 1962 which included among its arguments the IFR capability of Soviet bombers that the U. S. "must now concede." (Report of Special Subcommittee on Defense of Southeastern U. S., Committee on Armed Services, House, 87th, 2nd.)

dependent upon the Soviets' deployment of a new, heavy bomber (the Blinder had only a one-way intercontinental range capability); and was otherwise content to study the "cost-effectiveness" aspects of the alternative new interceptor configurations.⁸ The Administration did initiate in early 1964, nonetheless, the F-12 aircraft test program which continued with three planes beyond 1966. This new interceptor was to have a MACH-3 speed and a long range capability at both high and low-altitudes.

With regard to surface-to-air missiles, no attempt was made by the Defense Department after 1960 to harden or disperse the sites. Both Bomarc and Hercules control capability was, however, placed in the BUIC program. In 1963, Secretary MacNamara had justified the retention of the almost 400 Bomarc missiles by pointing out that they cost only \$20 million a year to operate and that their concentration on eight soft bases would probably induce the Soviets to target missiles against them. The phase-out of Bomarc A missiles began nevertheless in 1964 with the 188 "B" missiles redistributed then among six bases.⁹

⁸ See e.g., MacNamara's testimony, Hearings, Senate, Department of Defense Appropriations 1964 (Part 1), 88th, 1st, February 1963, pp. 102-103.

⁹ Hearings, House, Subc. of Comm. on Approps., Department of Defense Appropriations 1964 (Part 1), 88th, 1st, February 1963, pp. 512-513; also, Hearings, Senate, Department of Defense Appropriations 1965 (Part 1), February 1964, p. 103.

Also, the Nike-Ajax force was completely phased-out by mid-1965; and in early 1966 it was decided to remove the twenty-two Hercules batteries which had been deployed to defend soft SAC bomber bases in the U. S. and Greenland. In announcing this decision to remove the Hercules, MacNamara reasoned that since the affected SAC bases would be "high priority targets for early enemy missile attack, it no longer [made] sense to maintain their relatively costly anti-bomber defenses."¹⁰ At this same time, MacNamara proposed the continued development of the SAM-D program as a possible replacement for the Hawk and Hercules in the 1970's.¹¹

Finally, the U. S. responded to the Soviets' offensive

¹⁰ Statement during Hearings, Senate, Military Procurement Authorizations Fiscal Year 1967, February 1966, p. 73. Such reasoning appears inconsistent, however, with MacNamara's arguments for the retention of U. S. manned bombers earlier in this same statement:

"They can force the enemy to provide defense against aircraft in addition to defense against missiles. This is particularly costly in the case of terminal defenses. The defender must make his allocation of forces in ignorance of the attacker's strategy, and must provide in advance for defenses against both types of attack at each of his targets. The attacker, however, can postpone his decision until the time of the attack, then strike some targets with missiles alone and others with bombers alone, thereby forcing the defender, in effect, to 'waste' a large part of his resources." (pp. 55-56. Italics added.)

¹¹ Ibid., p. 74.

missile threat by preparing to make a transition to a new type of air defense which would be much less dependent on a complex, ground-based command and control environment. Accordingly, in 1966, MacNamara proposed to undertake the contract definition phase for development prototypes of a highly survivable airborne warning and control system (AWACS) aircraft and its complementary overland radar.

It has cost the U. S. on the order of \$2 billion a year to support the above bomber defense programs between 1961-66. These expenditures assume special significance in the context of the other specific anti-ballistic missile (ABM) programs which were (and were not) being pursued in America at this same time. While this is not the place for an extended discussion of ABM questions, it seems appropriate to juxtapose briefly the U. S.' "whither ABM?" debate of the early 1960's with the "whither air defense?" issues of the early 1950's.

Now, considerable funds had been expended in the United States since 1958 on various programs to provide warning of a ballistic missile attack. Three Ballistic Missile Early Warning Sites (BMEWS) had become operational by 1963 to give NORAD a fifteen minute warning capability. A missile defense alarm satellite system (MIDAS) had also been developed to increase this warning time to thirty minutes. In addition, some of the U. S.' coastal radars

were modified between 1964-66 to give them a limited capability to detect a short-range SLBM a few minutes prior to impact.

Further, the Defense Department's Advanced Projects Research Agency had, since 1958, been extensively studying the full range of missile phenomenology with special emphasis on the ABM problem. And the "problem" centers on the question of whether to deploy the Army's Nike Zeus/Nike-X anti-missile missile system which has been under active development since November 1956.

The principal U.S. arguments for the deployment of an ABM system seem to be that it would (1) save lives, (2) protect against accidental missile firings, (3) discourage nuclear proliferation, and (4) discourage Chinese Communist ICBM development. It can be noted that (2), (3), and (4) are justifications that were not particularly relevant to the 1950-53 air defense debate. Moreover, even the argument that defensive systems would reduce the number of deaths was not the primary focus for the earlier air defense proponents. To be sure, Hiroshima and Nagasaki were still vivid events at that time, and the hydrogen bomb's capacities had opened the age of threatenable national destruction. Yet, it seems that the air defense proponents (i.e. liberal scientists, scholars) were most concerned to demonstrate the "wrong-headedness" of their

domestic detractors who maintained "it couldn't be done" or who urged more nuclear offense instead. In other words, everyone knew then (as now) that a deployed defense in itself could reduce deaths. Against a very limited threat, however, a cogent argument for defense had to move on and address itself to domestic questions of timing, feasibility, cost, etc. When the threat became significant, the saving of lives became equated with the saving of the nation as an entity -- and technical questions and cost-effectiveness considerations became subordinated in the perspective of those who supported an ABM.

One further justification for extensive ABM expenditures -- which has been quite vocal in the U. S. after 1963 -- is the reported initial deployment of such a system in the USSR. Again, no significant similar arguments can be found for air defense programs in the early 1950's, despite the more overwhelming evidence then of superior Soviet bomber defenses. In short, it seems that a basic difference between the arguments for air defense in 1950-53 and for ABM defense in 1960-63 is explained by the intervening development of a perceived East-West strategic "balance of terror" whose very "delicacy" calls for greater attention now to the international systemic implications of major national security decisions.

Hence, the principal arguments against the deployment

of an ABM system have been that it (1) might induce a Soviet preventive strike or, failing that, would (2) lead to a renewed "arms race" via a quantitative acceleration of the USSR ICBM program, (3) costs more to deploy than it would to negate it via qualitative improvements in Soviet bomber or ICBM penetration aids, (4) is really not needed anyway due to the thaw in the Cold War. Arguments against bomber defense development in the early 1950's, on the other hand, tended to emphasize the domestic destabilization which would ensue: the budgetary diversions from preferred offensive systems; the sharp break with U. S. traditions and service doctrines; the difficult reconciliation of the demands of the disparate activities to be protected; the resultant "Maginot Line" psychology; etc. When the detractors of air defense voiced the possible undesirable Soviet or allied reactions to a defensive build-up, their positions seemed far less realistic.

Now, to be sure, even the current ABM detractors' arguments about undesirable Soviet responses to the deployment of an American anti-missile system seem rather strained. Jeremy J. Stone observed in late 1965, for example, that no Soviet spokesman "has made any attempt to deter our procurement of an anti-missile system by suggesting that the Soviet Union would give high priority to neutralizing its effects

[by more offense]".¹² That is, there remain unmistakable domestic factors which also account for the U. S. resistance to major ABM expenditures.

The \$20 billion price-tag estimate for the fully deployed system has been, of itself, even more of an impediment than the similar price-tag put on an air defense program by the Lincoln Summer Study Group in 1952-53. In addition, the questions of technical feasibility (missile reaction speed, traffic handling capacity, decoy-discrimination capability, etc.) have haunted anti-missile as well as anti-bomber defense programs. Also, until the very recent development of an "exoatmospheric" area defense capability for an ABM, the political question of "whom to defend" and the burdensome economic requirement for a complementary national fallout shelter program were important obstacles to the system's deployment. Furthermore, the vocal supporters of ABM have tended to be concentrated only within segments of the military and Congress who, by themselves, have been unable to "break the back of resistance" to ABM within the Administration. The liberal

¹²Stone goes on to suggest that "this interesting lapse probably reflects Soviet interest in their own ballistic missile defense; it is psychologically and politically difficult to urge or warn your adversary to refrain from action you are yourself advocating and planning." ("Containing the Arms Race," BAS, XXI [September 1965], p. 18.)

scientists -- unlike their 1952-53 counterparts -- have been essentially opposed to ABM, perhaps because of their perception that the "balance of terror" is, after all, a balance. And the USAF (which had stopped all its ABM research in January 1958) has remained even more skeptical of the attrition capability of an anti-missile missile than they had been with regard to the kill-rate of air defenses.¹³ Indeed, ABM R&D work has been, in a sense, even more ignoble in Defense Department/Air Force eyes than the previous air defense efforts, in that a principal justification for its existence has been that it has advanced U. S. understanding of its ICBM penetration aids problems.¹⁴

Finally, let us consider again the question of the U.S.' \$2 billion per year bomber defense expenditures between 1961-66. Secretary MacNamara has submitted that

the requirement for air defense is more a function of the number of targets to be

¹³For example, General LeMay described the Air Force's pre-1958 research thusly: "The best scientific brains that we in the Air Force had been able to get hold of did not know how to do an effective job of shooting down the missile. They saw ways that could be explored, but even the most optimistic said that they might get 10 percent of the missiles." (Hearings, Senate, Committee on Appropriations, Supplemental Defense Appropriations Bill 1958, 85th, 2nd, January 1958, p. 114.) Such USAF statements were retained throughout the 1960's.

¹⁴See, e.g., Hearings, Senate, Committee on Foreign Relations, Nuclear Test Ban Treaty, 88th, 1st, August 1963, pp. 780ff., 859ff.

defended than of the number of attacking bombers. Since the enemy would not know in advance which targets our bombers would attack, he would have to defend all of the targets....That is one of the major arguments, if not the major argument for our heavy manned bombers.¹⁵

And General Thomas S. Power has written that "it is entirely conceivable that bombers someday may have to serve as penetration aids for our missiles by attacking an aggressor's missile defense system."¹⁶ By reversing the national roles in these arguments, it is interesting to ponder whether the ultimate significance of air defense in the ballistic missile age might have been its contribution to the retardation of widespread ABM systems deployment in both the U. S. and USSR, with the attendant unpredictable ramifications upon the international strategic balance.

¹⁵Hearings, Senate, Department of Defense Appropriations, 1966 (Part 1), 89th, 1st, February 1965, p. 49; and Hearings, House, Department of Defense Appropriations 1966 (Part 3), p. 139.

¹⁶Design for Survival (New York, 1964), p. 170.

PART II

AIR DEFENSE IN THE
SOVIET UNION: 1946 - 60

CHAPTER 5

AIR DEFENSE IN THE STALINIST ERA:

1946-52

Section A. U. S. Signals of Strategic Offensive Capability and Intent

Between 1945-47, United States demobilization policies had cut its long-range operational bomber force to a fraction of its wartime strength. Despite this action, there is a growing body of scholarly Western opinion which holds that President Truman was ready to begin the Cold War as early as mid-1945. As one U. S. commentator has recently written: "It is now evident that, far from following his predecessor's policy of conciliation, shortly after taking office Truman launched a powerful foreign policy initiative aimed at reducing or eliminating Soviet influence in Europe... [and that] the atomic bomb...determined much of Truman's shift to a tough policy...."¹

¹Gar Alperovitz, Atomic Diplomacy: Hiroshima and Potsdam (New York, 1965), p. 13. For an essentially concurring perspective, see Dana F. Fleming, The Cold War and Its Origins (Vol. 1) (London, 1961), pp. 268-270 and 332; and for the related perspective which argues that America's "'Open Door' imperialistic bombast" in 1945-47 precluded a rapprochement with Stalin, see William A. Williams, The Tragedy of American Diplomacy (New York, 1962), passim. See, also, Martin F. Herz, The Beginnings of the Cold War (Indianapolis, 1966), passim.

Moreover, various U. S. military leaders began in 1945 to argue publicly that air-atomic forces should be the primary component of the American defense establishment. For example, General James Doolittle urged: "We must have striking power -- and striking power in mass and at long range. It must be a power that knows no barriers of land or water. It must be air power."² And in mid-1946, the requirement for a U. S. doctrine of "massive retaliation" via strategic air power was proclaimed when General Spaatz asserted that American strength should lie in "our ability to strike back quickly with a counter-offensive, to neutralize the hostile attack at its source...by striking at the vitals of the aggressor."³ The authoritative Finletter Commission reinforced these sentiments, in its 1948 published report, by submitting that America's national security posture should place principal reliance on strategic aviation capable of destroying the enemy's industrial base.

While U. S. strategic doctrinal pronouncements continued to underline heavily the air-atomic delivery potential of

²Hearings, Senate, Committee on Military Affairs, Department of Armed Forces; Department of Military Security (Unification), 79th, 1st, S. 84 and S. 1482, October 1945, p. 291.

³Hearings, House, Subc. of Comm. on Approps., Military Establishment Appropriations Bill 1947, 79th, 2nd, May 1946, p. 402.

American bombers within the context of a "containment" policy, previews of such "Armageddons" with the USSR began to appear frequently in U. S. mass media after 1947. As one article reported in mid-1948:

The U. S. planes would go out from England in very small groups -- perhaps in twos and threes. Flying at more than 35,000 feet they would seek to slip into Russia unnoticed....Russian radar is extremely bad....Their targets: first, Moscow -- Moscow, above all. Then the other cities of European Russia -- Kiev, Leningrad, Kharkov, Odessa.⁴

During this 1946-52 period, U. S. "air power rattling" was complemented by a barrage of public talk from government voices (in and out of uniform) which proposed its early use in a preventive war.⁵

In late 1949, the U. S.' Unification and Strategy Congressional Hearings ("B-36 versus Supercarrier") provided more strategic offensive signals. At its most basic level, the issue that developed during these Hearings was to determine which military service

⁴Newsweek magazine, May 17, 1948, pp. 30-31. The article was reportedly based on a speech by General G. C. Kenney, COM-SAC. See, also, General Spaatz, "If We Should Have to Fight Again," Life, July 5, 1948, pp. 35-44; and J. and S. Alsop, "If War Comes," Saturday Evening Post, September 11, 1948, pp. 15-17, 178-183.

⁵For a discussion of such proposals see Vagts, Defense and Diplomacy, pp. 329-334; and Bell, Negotiation from Strength, pp. 32-34.

could carry out best a strategy which equated threats to our national security interests with the necessity of inflicting maximum devastation on the heart of the Soviet Union. [Thus]...although the Navy could have drawn from its traditional strategic doctrines of sea power to suggest an alternative strategy of peripheral warfare, emphasizing its flexibility, selectivity and restraint...[it] chose to argue instead that the Navy could handle the massive air strikes at the heart of Russia better than could the Air Force.⁶

Whether the attack would take the form of the Navy's "pin-point" low-altitude bombing of military targets, the Air Force's high-altitude mass area strikes on industrial complexes, or -- which was more likely -- both, the U. S. strategy which was gropingly being formulated clearly had implications for the Soviet air defense posture.

To assess just how capable this posture could be against varying U. S. offensive deployments was another fundamental aspect of these 1949 Hearings. The Navy, for its part, termed the B-36 bomber a "billion dollar blunder" because USN fighters and, therefore, presumably, the Soviet defense could outmaneuver it in its "lumbering" flight. Admiral Radford and his group argued at length that the Air Force was not justified in neglecting fighter protection by concentrating on obtaining an intercontinental bombing capability, and urged a redirection of U. S. resources toward

⁶Hammond, "NSC-68...", in Schilling, Hammond, and Snyder, Strategy, Politics..., pp. 281-282.

small, fast bombers and high performance fighters which would operate from a network of forward land bases and supercarriers.⁷ In this way, the argument ran, the enemy's air defensive capability could be degraded by swift, low-level attacks from many directions. Further, by implication, such a strategy would require the enemy's air defense to counter U. S. forward-based fighter air cover capabilities, whereas an alternative posture of essentially home-based forces would permit the Soviet defense to be geared more primarily to bomber aircraft characteristics.

Now, during these Hearings, there was general U. S. agreement on the importance of an overseas bomber base structure. For a variety of reasons, however, the Air Force desired to develop an intercontinental attack capability. A principal factor was its concern about forward base denial. If adequate overseas bases were available, the B-36 would indeed operate from them and thus increase appreciably the "lumbering" aircraft's altitude and speed performance to compound further the Soviet defense problem. If "forced" to operate from the continental U. S., the bomber's range capabilities (plus those of aerial refueled

⁷Hearings, House, Committee on Armed Services, National Defense Program -- Unification and Strategy, (Hereinafter referred to as Unification and Strategy Hearings), 81st, 1st, October 1949, pp. 46, 139, 181, and 510.

medium bombers) would still complicate the enemy's air defense as it would require him to "look around a global circumference for any approaching attacks."⁸

These Hearings, of course, revealed clearly the U. S.' lack of an integrated strategic doctrine and the obstacles to such integration posed by the current inter-service debates and defense budgetary ceilings. Nevertheless, to the Soviets, the Hearings must have reinforced the signals that the U. S. was relying exclusively on air-atomic power for its security and was seeking to build a force of both medium and heavy bombers and modern fighters which would be deployed for numerous "close-in" strikes, against a full spectrum of targets, by a choice of tactics, and along a wide variety of axes. Another disturbing aspect of the U. S. signals during this time must have been their utterly confident forecast of the success of bomber missions no matter what final form the "blitzkreig" strategy took. And then, of course, there was the January 1950 announcement by President Truman that the U. S. would proceed to develop the hydrogen bomb.

⁸General Bradley's testimony, Unification and Strategy Hearings, p. 525. See also SECAF Symington's testimony, p. 431ff. General Vandenberg's testimony on pp. 455 and 510-511, comes close to submitting that the B-36 threat would cause the USSR to exhaust its resources in preparing a defense, and provides an interesting parallel to the then fashionable U. S. perception of Soviet motivations, i.e. U. S. bankruptcy via large defense outlays.

Against the background of the above polemics and statements were the actual development and deployment of the U. S.' strategic offensive capability. While the buildup of SAC did not begin in earnest until 1949, the U. S. demonstrated its interest and expertise in air-atomic matters early in the post-war period. In September 1946, three B-29's flew non-stop from Japan to Chicago to prove the feasibility of long-range strategic bombing. Two months later the U. S. dispatched six B-29's on a diplomatic mission to the American zone of Germany. The Soviets' natural inclination to focus their initial air defense efforts in Central and Eastern Europe were doubtlessly fortified by this move which, also, probably created Soviet speculation that the U. S. would seek to fill the power vacuum in Europe with permanent American bomber bases -- speculation which was soon to be confirmed.

During the 1948 Berlin crisis, the U. S. sent two B-29 groups to England -- within unrefueled striking range of Moscow -- and in August 1948 SAC was operating from four bases in Great Britain.⁹ Concurrently, the U. S.' Berlin

⁹It is revealing that The Forrestal Diaries (edited by W. Millis, New York, 1951, p. 457), in outlining the considerations which affected the decision to send B-29's to England, mentions the effects on the American public, the USAF, and Great Britain -- but says nothing about what such a move would, could, or should do to the USSR.

Airlift was demonstrating clearly the powerful efficiency of the USAF which could just as easily carry nuclear bombs as foodstuffs. Then, during February and March 1949, a U. S. B-50 made the first non-stop flight around the world with four successfully executed in-flight refuelings from KC-29 tankers. Several months later a B-47 set a speed record by flying non-stop across the U. S. in three hours and forty-six minutes.¹⁰

The principal USAF expenditures during the 1950-51 U. S. rearmament went for strategic aircraft systems. In addition, the Korean War had caused the U. S. to speed up the acquisition of rights to an overseas base system moulded to the capabilities of the B-47. By 1953, SAC could be seen operating from airfields in Greenland, Britain, Morocco, Spain, and throughout the Far East.

As a further consequence of the Korean War, the U. S. Congress, beginning in 1951, had authorized the building of a series of large aircraft carriers. The Soviets had therefore to consider the prospects of an even more complex air defense task which would have to confront the variety of attack tactics and penetration routes open to

¹⁰R. G. Hubler, SAC: The Strategic Air Command (New York, 1958), p. 97.

naval strikes launched within the expansive Mediterranean and Pacific Ocean areas.

Furthermore, the U. S. demonstrated the increases in its nuclear stockpile when atomic bombs

were fired off helter-skelter during 1951. More than 18 atomic blasts were officially acknowledged (from 1945 to 1951 only eight, including the two that were dropped on Japan, were fired). There was suddenly enough fissionable material in the nation's locker for such devices as atomic-powered submarines for which the Navy let a contract in September 1951.¹¹

Then, too, the USSR could but wonder when U. S. offensive air forces would become equipped with thermonuclear weapons, since the first hydrogen device had been exploded by America on November 7, 1952.

It might be mentioned, finally, that -- if the Soviets' defensive tasks were complicated by the widely deployed U. S. offensive forces -- Soviet defensive systems deployment decisions were not made any easier by inconsistent U. S. targeting doctrine "signals." That is, it seems practically impossible to discern which Soviet targets were planned to be retaliated against first by SAC aircraft during this period. At a press conference in August 1951, General Vandenberg announced that an Air Force re-assessment of its job now required that "the emphasis,

¹¹Shepley and Blair, The Hydrogen Bomb, p. 132.

in point of time, must go first to destroy the enemy's ability to smash us and then to wreck his warmaking potential."¹² Yet, in 1954, former Secretary of the Air Force Finletter wrote that "the old counter-industry concept for the strategic air should be given up."¹³ And, later still, an Air Force colonel stated, with reference to the Air Force targeting doctrine in 1950-53:

We switched [from Delta-Destruction of will and ability to wage war; Bravo-Blunting of offensive forces; Romeo-Retardation or interdiction, in that order of priority] to Romeo, Delta, Bravo when the infancy of NATO demanded, at General Eisenhower's insistence, that the solidarity of the newly born NATO community required predominant emphasis -- even by strategic offense forces -- upon the retardation task, [i.e. destruction of short-range enemy air strength in order to isolate the battlefield] in light of the fact that the strategic force alone possessed a nuclear capability....It was necessary to demonstrate to our new allies that this capability was directly committed to their support.¹⁴

Finally, there were even hints in the U. S. of a quasi-"flexible response" targeting philosophy in 1953. U. S. News and World Report reported then that: "Ready in the Pentagon...is a whole series of atomic-attack plans, each with a different combination of targets to fit a

¹²Cited in Air Force, XXXIV (October 1951), p. 45.

¹³Power and Policy, pp. 54-55.

¹⁴Colonel R. E. Kirtley, USAF, "National Military Planning Requirements," Center for International Affairs Seminar Paper, Harvard University, January 1960, p. 69.

different war situation. Counterattack... might avoid the Ukraine entirely, if that area showed signs of rebelling against Communist war planners."¹⁵ If considered at all valid by the Kremlin, such "signals" could inject further uncertainty into Soviet systems deployment calculations and could call for greater attention to the requirements of defensive mobility and rapid reaction-times.

¹⁵October 23, 1953, p. 22.

Section B. Domestic Perceptions of the U. S. Threat

Air-atomic defense was a pressing concern of the USSR in 1946. It has even been suggested that "the first project faced by Soviet air-power planners after World War II was to establish a modern air defense system...."¹⁶ It is important to note, however, that there were some Soviet domestic considerations at that time which would seem to have argued against a rapid air defense build-up. Marxist-Leninist-Stalinist dogma and Russian history had converged to cause a continued public deprecation of the general strategic importance of the enemy's air offensive force and the specific role of surprise attack. Marxism, of course, emphasized the fundamental importance of the socio-economic structure in charting a nation's historical path. Lenin, for his part, did not show much interest in reassessing this doctrine on the basis of the introduction of military air power during his lifetime. Furthermore, the basic Marxist perspective was reinforced by Stalin's doctrine of the "permanently operating factors" which he formulated in 1942. Accordingly, any war in which the USSR was involved would be victorious due to the stability of Russia's home-front, the morale of her armed forces, the ability of her commanders, and the quantity and quality

¹⁶ Robert A. Kilmarx, A History of Soviet Air Power (New York, 1962), p. 222.

of her army divisions. This doctrine remained intact publicly throughout Stalin's lifetime. As such, no amount of "blitzkrieg" atomic offensive power could alone enable a Western aggressor to triumph in wartime. Indeed, insofar as the U. S.' atomic stockpile was actually a primary deterrent to Soviet aggression in the early post-war years, the aspect that probably gave Moscow pause was its possible ultimate effects in a prolonged war of attrition which would enable the small American production of bombs and bombers to be accelerated.

Similarly, the early warning of surprise attack was not a basic theoretical concern to the Soviets since the unexpectedness of the aggressor's blow could in no wise prove decisive. To be sure, the USSR had undergone the traumas of Germany's "surprise" attack in 1941. Yet, as in Czarist times, Russia had achieved a long, slow, and bloody salvation. It can be argued, furthermore, that the "surprise" in 1941 involved more the unexpected superiority of German forces rather than the timing of the attack. And, while with regard to the available information on the quantity and quality of American forces, the Russians may suffer from (in Voltaire's phrase) an "embarrassment of riches", there seems little doubt that the Soviets felt confident in their U. S. "order of battle" intelligence.

In addition, the Soviet leadership during World War II had lost the control and use for a time of approximately 40 percent of their people, many of their greatest cities and much of their richest natural resource area. As a result, Russian ideas of an acceptable (survivable) level of damage may have been different from Western ones.

More tangible and formidable considerations were those of geography. The Kremlin faced in 1946 the weighty task of defending the largest national land mass in the world, with air approaches along a boundary of about 20,000 miles. These borders could, of course, be viewed with equal cogency as being essentially impregnable to air-attack. Such a view seems especially applicable to the USSR whose appreciation of the techniques of long-range air navigation was unsophisticated to say the least. There were, henceforth, the ice-filled waters and tundra of the Arctic North with its dearth of air-navigational check-points and frequent magnetic storms; the frozen wastes of the Siberian East; the world's most rugged mountain ranges and arid deserts of the South; and the quickly developed, unbroken tier of satellite states to the West. Closely associated with these geographical factors was the aura of impregnability which could have been generated by the nature of the Soviets' closed society. Thus, their forces' locations were "hidden"; their natural

and man-made barriers to low-level overland air navigation were unknown to the foreigner; adequate maps were unavailable to the enemy for effective high altitude bombing; etc. From the above standpoints, a major allocation of scarce resources by the Soviet government toward fighter aircraft and radar defense programs would appear unwarranted -- especially in the context of the leadership's apparent need to recover first from the ravages of war and to reestablish tight political control over the country.

Furthermore, Soviet published military doctrine throughout the Stalinist era limited its air forces to the traditional role of supporting ground troops; and the organization of air power in the USSR Defense Ministry seemed to prevent the Soviet Air Force from achieving political parity with the Soviet Army and Navy.¹⁷ Thus, any attempts by the military elite to refashion publicly its forces in consideration of the new requirements of air-atomic defense would face bureaucratic obstacles, even apart from the pervasive stagnation of Soviet thought which otherwise characterized the Stalinist period.

Related to this, of course, was the fact that there were no effective pressures for air defense brought to bear upon the totalitarian regime by any "anxious" domestic

¹⁷See Lee, The Soviet Air Force, pp. 246, 258.

population. Indeed, through Stalin's mass media controls, "the Soviet public had to wait for nearly 10 years to find out precisely what the atom bomb was."¹⁸ In fact, such lack of atomic "candor" on Stalin's part could in itself be considered a defensive-ploy of sorts. "By feigning a near indifference to the sorrow that atomic weapons can cause, one can perhaps deny other nations the clues needed to press their advantage in crises."¹⁹

It can be noted finally that "there [had been] little need to develop a large, modern air-defense fighter [and radar warning and ground control] force in rear areas during World War II as...the Luftwaffe was unable to embark on a systematic strategic air offensive against the USSR";²⁰ and "Japanese preoccupation with the campaigns in the Pacific and South East Asia virtually eliminated any threat of long-

¹⁸ Henry A. Kissinger, Nuclear Weapons and Foreign Policy (Garden City, N. Y., 1957), p. 84. Moreover, Stalin had "decreed" that, in any event, the long-range genetic dangers from nuclear fallout would present no problem for the Soviet people since the "Lysenko Theorem" had enabled the genetic endowment of the species to be changed by external treatment, including proper nutrition!

¹⁹ George H. Quester, "On the Identification of Real and Pretended Communist Military Doctrine," Journal of Conflict Resolution, X (June 1966), p. 173.

²⁰ Kilmarx, A History of Soviet Air Power, p. 197. None of Germany's four-engined heavy bombers built prior to World War II went into large-scale production.

range air attack on the USSR."²¹ Thus, the few conventional air defense programs and techniques which the Soviets developed prior to 1945 went largely untested and, as such, could provide no wartime operating record as an impetus to their continued development in peacetime.

However, all of these domestic considerations to support, if you will, air defense non-action were subordinated to a single factor in the Stalinist international perspective: his implacable conviction that the fundamental "contradictions" between capitalism and socialism would inevitably erupt into general war at the initiative of the West. For this principal reason the USSR had to improve its international power position through territorial expansion, and prepare a defense of the Motherland against such an opponent who was nuclear armed and effectively beyond the reach of the USSR's ground-air combined support team. Henceforth, the Soviet people must be prepared for an eventual retreat into the great spaces of the interior, wearing down the enemy as they go. Total mobilization via the "permanently operating factors" would be effected and the enemy would be defeated by a massive ground counter-offensive which would overrun Europe. The role of the air defense system was to be an essential one: to operate

²¹Lee, The Soviet Air Force, p. 109.

more or less independently to help bring order out of chaos during each phase of the drawn-out encounter of attrition, by reducing the effects of localized bomber raids on Soviet industrial and population complexes, and exacting as high a toll as possible of the enemy bomber forces.²² The harassment of U. S. B-29 overseas bases by Tu-4's would also contribute to limiting the damage to the USSR. Such a strategic doctrine was held in 1946 and was maintained intact -- at least publicly -- throughout the Stalinist era.

The importance of this ideological framework to Stalin's decision in 1946 to launch a full-scale air defense effort seems unquestionable. But there also appear to be some other, more pragmatic considerations which bore upon this decision. First, Stalin and his top officers had been very much impressed by the damage caused by British and American heavy bombers to German and Japanese cities and industries, which clearly argued for greater attention to strategic air defense problems.

Secondly, it was a well-known fact of World War II bombing offensives that -- while they were generally effective -- the attacker's losses did rise rapidly (much faster than lineally) with the depth of enemy territory

²²See, e.g., Herbert S. Dinnerstein, The Soviet Military Posture as a Reflection of Soviet Strategy, Project RAND Research Memorandum RM 2102, March 24, 1958, p. 5.

into which they penetrated. Hence, considerable importance could be attached to the potential effectiveness of the military "defense-in-depth" concept for which the Soviets' great land spaces were quite well suited. Also, the relevance of a "defense-in-depth" program was enhanced by the Russians' concerted shift of their western-located heavy industries to the more secure regions of the Volga and the Urals -- a move which would greatly increase an aggressor's required penetration distances. This dispersal program had been begun by the Soviets in the mid-1930's, was accelerated during the war, and became one of the country's major enterprises during the immediate post-war period. There was, moreover, the seemingly evident importance of a build-up in anti-aircraft artillery strength for widespread, deep deployment within the USSR to protect retreating ground forces preparatory to a counter-offensive. And as artillery had been traditionally the Russians' military forte, the Soviets were naturally predisposed to exaggerate the potential efficacy of such a defensive technique.

Thirdly, Stalin's perceptions of the feasibility of an air defense effort were greatly affected by the large technical legacy in defensive military equipment and scientific skill which the USSR acquired from Germany beginning in 1945.

In all the main fields of strategic air defense weapons the Soviet air debt to Germany...was most marked. The first generation of jet fighter planes such as the [Mig-15], the early-warning radar equipment, the radar guidance of fighter planes both from the ground and in the air, the prototypes of most of the first ground-to-air and air-to-air guided weapons, these are what the USSR owes in whole or in part to German scientific and technical engineering genius.²³

Fourthly, it could be argued that an element in the initial Stalinist perspective on air-atomic defense was the demobilization of the West in 1945-47. This policy, from a pragmatic standpoint, appeared to reduce the defensive problem for the USSR to more manageable proportions. Or, in Marxist-Leninist terms, since "tottering capitalism" was propped up only by military spending, demobilization forebode severe economic crises in the West and could hasten the onset of its conflict with the socialist states.

In 1946, therefore, all of these factors had coalesced into a decision to prepare defenses against the inevitable attack. There seems little doubt that the verve with which the Stalinist regime approached the implementation of this decision between 1946-52 resulted in some measure from the previously discussed U. S. strategic "signals." For example, The Forrestal Diaries make note of Soviet fears in mid-1948 generated by the U. S.' "overexcitable statements" proposing

²³Lee, "Strategic Air Defense," in Lee (ed.), The Soviet Air and Rocket Forces, p. 124.

preventive war;²⁴ and Andrei Vishinsky made a particularly vituperative U.N. speech in September 1948 denouncing U. S. mass media articles which "reproduce detailed plans of attack."²⁵ Such public utterances in the U. S. assume special importance when one considers how difficult it is to convince a Russian that U. S. individuals often express views which are at variance with their government's policies.

Related to the effects of the overt U. S. preventive war talk was the possible effect on the Soviet military efforts of the U. S.' "Baruch Plan" for the control of atomic energy proposed early in the post-war period. As suggested by one respected British commentator, the most unfortunate aftermath of this abortive plan was

the credence it gave to the practicality of waging preventive war against a great power. For this is just what is meant by the infliction of "instant and condign punishment" [of any transgressors of the control arrangements] by atomic bombs. [The Soviets] reacted in a perfectly predictable way by energetically starting their own atomic energy programme and making sure that their effective frontiers were pushed as far as possible away from their cities and essential industrial areas to get greater depth of terrain for air defense.²⁶

Additionally, the persistent voices in the U. S.

²⁴W. Millis (ed.), p. 24.

²⁵Vital Speeches, November 1, 1948, pp. 38-41.

²⁶P. M. S. Blackett, Atomic Weapons and East-West Relations (Cambridge, 1956), pp. 91-92.

which urged the expansion of the Korean War effort and even the use of atomic weapons against Communist China may well have forced upon the Soviet leadership a heightened reassessment of how exposed their own country remained to an air-atomic attack. In this connection, it is known that the USSR's State Planning Commission Chairman, Saburov, told the 19th Party Congress in October 1952 that the "dispersal of Soviet industry, making it less vulnerable to air attack, would be a key feature of the nation's latest Five Year Plan."²⁷

Let us speculate, finally, upon the possible effect on Soviet air defense developments of the U. S.' "the bomber will always get through" signals. That these signals had been received clearly in the USSR is evident. The Soviets' Major General Khlopov wrote, in June 1950, that "the bankruptcy of the [American] plan for future war...consists in the fact that they almost all proceed from the extremely favorable conditions in which the enemy [the USSR] will be so weak in the air that it will be possible in the first phase of the war to complete, with impunity, flights to targets selected by Americans."²⁸

²⁷ New York Times, October 9, 1952, p. 9.

²⁸ Quoted in Garthoff, Soviet Strategy in the Nuclear Age, p. 136.

This operative USAF assumption made SAC less sensitive to Soviet air defense developments which would logically have called for improved U. S. countermeasures -- and, thus, from this point of view, gave the effectiveness of Soviet air defense systems a more "on-going" character in the USSR. Additionally, the low USAF regard for Soviet air defenses furthered SAC's rejection of one-way bombing missions. This meant that the USAF was not reluctant to plan flights whose withdrawing aircraft retraversed threatening USSR flak areas and fighter base territory. Such U. S. tactics would seem to give added importance to deployed air defenses, especially in the context of a war of attrition. Moreover, the USAF emphasis on multiple bomber missions launched from overseas bases meant also that it would pay the USSR to plan its defenses to cope with departing bombers as well as just the invading force. It remains then to discuss specifically the development of the Stalinist air defense posture.

Section C. The Development of the Stalinist Air Defense Posture

During 1946, the first improved radar early warning units were set up along the Baltic coasts and over the frontiers of Central and Western Europe.²⁹ In 1947, Soviet production of its first jet fighter, the Mig-15, was speeded up in order to build a nucleus of trained jet pilots while the captured German research data was being evaluated. Mig-15's were seen that year in increasingly large numbers over Moscow and East German skies. The initial post-war emphasis on this fighter program may have been due in part to the fact that 68 percent of all German aircraft shot down by the Soviets in 1944 were accounted for by fighters.³⁰ It also seems likely that the Soviets viewed this aircraft as representing the quickest counter to the high-altitude B-36. It is evident in this regard that the Mig-15 was designed primarily as a high-altitude interceptor. Its phenomenal rate of climb (by early post-war standards), excellent performance from 30,000 to 50,000 feet, and heavy armament all point in this direction.

²⁹ Lee, "Strategic Air Defense," in Lee (ed.), The Soviet Air and Rocket Forces, p. 121.

³⁰ Noted in Kilmarx, A History of Soviet Air Power, p. 198.

In 1948, the Soviets made their first attempts at producing jet all-weather fighters. This model --- the SU-15 --- never progressed beyond the experimental stage, however. Also during that year the USSR received a supply of British turbo-jet engines (the Rolls-Royce Nene) which saved the country about two years' research in its fighter aircraft development programs.³¹

The secrecy which shrouded these Stalinist military developments is, perhaps, exemplified by the following divergent U. S. perceptions of Soviet air defense capabilities during 1948. According to General Kenney, Commander of SAC, in May 1948:

Russian radar is extremely bad and the country's radar defenses are spotty. It would be relatively easy for American pilots to get across the border undetected. But in view of the excellence of the Russian fighters and fighter pilots they would face hot and heavy going once they were detected.³²

The Alsop brothers, on the other hand, reported in September 1948 that

now and in the foreseeable future, radar interception of attacking aircraft need be expected only at the border and in the immediate vicinity of important targets....The Russian fighters of the last war did not even provide oxygen for the pilot, and it will be a long time before the

³¹W. Green, "The Development of Jet Fighters and Fighter Bombers," in Lee (ed.), The Soviet Air..., p. 137.

³²Newsweek, May 17, 1948, p. 30.

Soviets can teach their raw manpower the more complex branches of the fighter art....³³

By 1949 the USSR had broadened the scope of its air defense effort and was far along in the development of surface-to-air missile systems to defend Moscow.³⁴ During that year, also, the Soviet artillery arm was considerably strengthened and improved by the deployment of hundreds of radar-controlled heavy anti-aircraft guns of up to 120 millimeter calibre; and the USSR simultaneously expedited the work of developing a continent-wide early warning system. At the outbreak of the Korean War in mid-1950 the Soviet air defense force consisted of over 1,500 operational jet fighters, and "the radar stations had expanded to the Far Eastern Maritime Provinces, including the vital Magadan Region opposite Alaska, as well as to the coastal areas of the Black Sea from the Crimea down to Batum."³⁵

Indeed, the Soviet-built Mig fighters which were put into action in Korea were in much greater numbers and performed with much higher sophistication than had been anticipated in the West. Further, the "Soviet radar [gave] the Chinese and North Koreans adequate and consistent

³³ Saturday Evening Post, September 11, 1948, p. 180.

³⁴ Kilmarx, A History of..., p. 235.

³⁵ Lee, The Soviet Air Force, pp. 118, 114-115.

early warning of the approach of UN bomber and fighter planes, both by day and night, over a period of three years...."³⁶ Soviet radar-armed anti-aircraft ground artillery performed quite admirably also, and accounted for approximately 87 percent of the U. S. air losses in Korean action.³⁷

The value of the Korean War to the Soviets as an air defense testing and training ground appears obvious. Another pertinent benefit which accrued from this encounter -- fought mainly over Communist-controlled territory -- was the opportunity it gave to acquire and exploit Western military hardware. For "there was little USAF equipment committed in Korea that was not compromised....This gave the Russians a rich harvest of modern electronic equipment, including airborne radar and advanced gun sights."³⁸

The airborne radar acquisitions were particularly important as a supplement to what the Germans had contributed some six years before. Apparently the lack of enough understanding of this equipment had retarded the Soviets' development of guided air-to-air missiles for their interceptors. (Perhaps, too, the Russian military tradition

³⁶ Lee, "Strategic Air Defence," in Lee (ed.), The Soviet Air..., p. 122.

³⁷ H. Baldwin, New York Times, July 21, 1952, p. 4.

³⁸ Kilmarx, A History of..., p. 240.

had caused them to place exaggerated faith in the lethality of an interceptor's aerial cannon.) There were, also, reports that the Soviets were concentrating on a piloted rocket-fighter program at this time, rather than air-to-air missiles.³⁹

A more important effect of the essential lack of modern airborne radar, however, had been to delay a significant Soviet all-weather fighter capability. Thus, "there was no sign that this [radar] equipment had been used on any scale in the Korean War when it would have been invaluable on night fighter operations against United Nations B-29 bombers...."⁴⁰

The information regarding the effects of the Korean War on the capabilities of the USSR-based air defense system is quite inconclusive. For example, it is difficult to determine whether the Mig-15's which were sent to Korea "stripped" vital home defenses or whether they were considered "surplus" by the USSR. There is some evidence, however, that Mig-15 production stopped in 1952, at which

³⁹ See John T. Dodson, "Russia's Rocket Fighter," Flying, XLVI (January 1950), pp. 12-14; and American Aviation, November 10, 1952, p. 2. This latter report stated that one of the reasons for the apparent Soviet preference for piloted rocket fighters over guided missiles was the "traditional Russian belief in hand-to-hand fighting (coupled with an inherent distrust of robots)."

⁴⁰ Lee, The Soviet Air Force, p. 116. This point will be returned to in Chapter 6 below.

time the improved Mig-17 was put on the assembly line.⁴¹ It was during 1952, moreover, that initial production of the all-weather Yak-25 interceptor began in Russia. This would lend credence to the position that the Korean Migs were perhaps "surplus" to the Soviets' needs.

As to the quality of the Soviet-based radar warning and control network during Korea, the available information is again ambiguous. The Alsops wrote in mid-1953: "The first interception of an American reconnaissance aircraft on the Soviet air borders occurred off Siberia, as long ago as 1949. Since then, interceptions have been frequent; and...some American planes actually have been shot down." But several months later, Hanson Baldwin reported that "U. S. planes have flown frequently near Soviet frontiers apparently without detection."⁴²

In any event, Stalin died in March 1953; his son, Vassily, was ushered-out as the Commander of the key Moscow Air Defense District; and a new era for Soviet air defense was generally ushered-in.

⁴¹See, e.g., Phillips, Reporter, June 30, 1955, p. 18.

⁴²Saturday Evening Post, June 27, 1953, p. 66; and New York Times, October 11, 1953, p. 33.

CHAPTER 6

AIR DEFENSE IN THE POST-STALINIST ERA:

1953-60

Section A. U. S. Signals of Strategic Offensive Capability and Intent

Tests in the United States with a droppable hydrogen bomb during 1953 signalled the imminent introduction of these weapons into America's operational strategic inventory. The USAF at this time also pointed-out that such weapons should not alter USSR defense problems in the sense that they would reduce the U. S. requirement for many manned bombers. As General Vandenberg emphasized, the U. S. may still have to dispatch thirty conventional bombers along on the thermonuclear mission so that the interlocking fire-power of the whole formation could protect all the planes.¹ Furthermore, if the Soviets were beginning to see results in their diplomatic and propagandistic efforts to increase the political vulnerability of SAC's overseas bases, the U. S. military stressed that the B-36 had been considerably improved; and that, for the B-47, "air refueling [had] become a commonplace..."², as hedges against such a contingency.

¹See New York Times, June 6, 1953, p. 7.

²H. Baldwin, New York Times, October 30, 1953, p. 24.

Such statements were reinforced by the Administration's signals in 1953-54. Whereas Eisenhower had chosen not to be candid to the American people regarding the Soviets' growing nuclear offensive threat, the government continually sought to make it clear to the USSR that the U. S. intended to remain well-ahead in the air-atomic power race and would indeed use that power if necessary. Thus, in his address before the UN on December 8, 1953, Eisenhower's "decision to present only the facts he knew 'incontrovertably' led to a one-sided recital of strength that could be interpreted as sabre-rattling...."³ Also, at this time, Bernard Brodie suggested that the U. S.' eagerness to demonstrate its power (which exceeded the restraints against waste) could be manifest by the official public knowledge that America had already exploded more than forty nuclear devices.⁴

In January 1954, the Administration publicly adopted the "New Look" in military planning. This policy gave the Defense Department more money and an explicit fiat to do what the country had been doing essentially since 1947: place principal reliance for U. S. national security on

³Bulletin of the Atomic Scientists, X (February 1954), p. 45.

⁴"Nuclear Weapons: Strategic or Tactical?," Foreign Affairs, XXXII (January 1954), p. 220.

air-atomic power -- now tactically as well as strategically conceived. Furthermore, Secretary Dulles' "massive retaliation" speech that month represented an attempt to integrate America's superior nuclear capability into a strategic doctrine which would deter the broad spectrum of possible Soviet expansionist moves.

During 1953-56, the Air Force was being built-up to an authorized strength that had been greatly increased during the Korean War. The "bomber gap" controversy expedited this build-up that included the extensive introduction of the new B-52 intercontinental bomber to replace the B-36's. There were also frequent demonstrations of SAC's sophisticated aerial refueling capabilities which, by 1956, enabled the B-47 to reach two-thirds of all key targets in the Soviet bloc from North American bases and the B-52, similarly refueled, to reach any place on earth.⁵ At the height of the Suez and Hungarian crises in 1956, "more than 1000 B-47's were on non-stop combat training missions averaging 8000 miles each as they ranged the North American and Arctic skies."⁶ Simultaneously, the USAF unveiled its Low-Altitude Bombing System (LABS) techniques

⁵See Melvin Conant, "Canada's Role in Western Defense," Foreign Affairs, XL (April 1962), p. 432.

⁶New York Times, December 19, 1956, p. 23.

which would enable "on-the-deck" attacks without the plane's getting caught in the bomb blast.⁷ And, in February 1957, the Air Force announced that such increased offensive capabilities in its strategic force permitted the elimination of the handful of SAC strategic fighter wings that had been previously retained to assist the older B-36 missions.⁸

These signals of the U. S.' attention to the development of an improved air-atomic deterrent force continued after Sputnik. Indeed, "the main American response [to a possible 'missile gap'] was directed at refuting the Soviet contention that ICBM's had rendered the manned bomber obsolete."⁹ In late 1957, therefore, the Air Force announced that it was arming its bombers with the 75-mile supersonic Rascal air-to-surface missile which would permit nuclear attacks beyond the surrounding air defense zones. There were also frequent disclosures after 1957 of Air Force progress with its 200-mile, supersonic, jam-proof Hound Dog ASM which became operational in late 1959.

⁷See New York Times, October 12, 1956, p. 31.

⁸Testimony of General Twining, Hearings, House, Department of Defense Appropriations 1958, 85th, 1st, February 1957, p. 918.

⁹Horelick and Rush, Strategic Power..., p. 46.

The USAF bomber force itself underwent considerable qualitative improvement between 1958-60. The range of the B-52 was increased by 15 percent when its "H" model was equipped with a new turbofan engine in late 1959. With these engines, the B-52 could attack many USSR targets from the U. S. without aerial refueling.¹⁰ Moreover, the new B-58 was coming into the USAF operational inventory in limited numbers at this same time. This aircraft had a supersonic-dash low-altitude capability which would give it the unique ability to outrun USSR fighters. Also, the B-58 frame had been designed with an exceptionally small radar-reflective area so as to confound further the Soviet defenses.¹¹ To complement the B-52 (which could approach the USSR from any direction) and the B-58 (supersonic, low-altitude), the USAF also planned -- beginning in late 1959 -- to produce a MACH 3, extremely high-altitude B-70 bomber. To counter this aircraft, the USSR would reportedly have to produce a whole new family of defensive systems whose metals and fabrication processes could meet the

¹⁰Testimony of Dr. Herbert York, DDR&E, Hearings, House, Department of Defense Appropriations 1961, (Part 6), 86th, 2nd, February 1960, pp. 9-10.

¹¹See Hearings, House, Department of Defense Appropriations 1962 (Part 6), 87th, 1st, April 1961, pp. 334-336.

strains of a 2,000 mile per hour cruising speed.¹² In addition, it was reported in early 1960 that one of the major programs in all of the U. S.' aircraft weapons systems -- B-52, B-58, B-70 -- had been the development and the supply of electronic countermeasures for these bombers.¹³

Of course, a principal American national security endeavor between 1957-60 was to increase the second-strike capability of these SAC bombers through the dispersal of their U. S. base structure and the attainment of a fifteen minute ground alert capability for a full one-third of the force. Also, note should be taken of the decision in the mid-1950's to introduce short-range atomic weapons into the NATO environment. This decision led quickly to the equipping of several hundred fighter-bombers with a nuclear capability at scores of European bases for the purpose of interdicting Soviet airfields and communications facilities. There was, further, the manned bomber threat from U. S. naval aircraft carriers which increased after 1957 to the point where, in 1962, the Soviets'

¹²Air Force, XLIII (March 1960), p. 27. According to this article, such a Soviet endeavor would be "backbreaking" and would "almost certainly stagger [Khrushchev] in his program to provide more consumer goods for his public" (p. 27). Cf. General Vandenberg's justification of the B-36 in 1949! (footnote 8 on p. 216 above.)

¹³Dr. York's testimony on p. 79 of the Hearings cited in footnote 10 on p. 244 above.

Marshal V. D. Sokolovskii wrote: "One of the most important tasks of our navy, from the first minutes of the war will be to destroy enemy carrier attack forces."¹⁴

The strategic doctrinal signals as to how these U. S. forces would be utilized in wartime were grounded fundamentally in the 1954 "massive retaliation" policy which remained essentially unchanged until 1961. There were, however, during this period, renewed outbursts of preventive war proposals. For example, Arthur Krock publicly inferred in December 1957 that the Gaither Committee Report to the Administration had recommended a "first-strike" strategy.¹⁵ And during 1959-60, the "missile gap" fears in the U. S. engendered much open advocacy of preventive or pre-emptive warfare.¹⁶

Additionally, specific U. S. forces' targeting strategies underwent an evolution during this period. The USAF seemed to shift around 1955 to a predominant counterforce philosophy.¹⁷ This shift was given an impetus in the

¹⁴Soviet Military Strategy, trans. Dinnerstein, Gouré, and Wolfe, p. 420.

¹⁵New York Times, December 20, 1957, p. 26.

¹⁶See Lowe, The Age of Deterrence, pp. 188-193, 202-204, for documentation.

¹⁷See T. F. Walkowicz, "Counterforce Strategy," Air Force, XXXVIII (February 1955), p. 26ff.; and Leghorn, "No Need to Bomb Cities to Win Wars," USNWP, January 28, 1955.

ensuing years by the advent of the ICBM/SLBM which -- being essentially invulnerable to population-defense systems -- generated much American talk of a U. S. "overkill" capability by proponents (e.g., the Navy and Army) of the policy of a "finite deterrent" force targeted against only major Soviet cities and industries (contra USN targeting concepts in 1949). The Air Force was led, henceforth, to solidify its arguments for a strategic counterforce capability based upon an increased number of modern long range bombers.

All of the above signals would appear to argue for no diminishment of the USSR's air defense effort in the early post-Stalinist era. What about the indicators of U. S. long-range ballistic missile development? On balance (at least until 1958), the signals clearly were not designed to cause a significant redirection of Soviet resources toward anti-ballistic missile expenditures.

It was well known that the U. S. long-range missile program had been essentially dropped in 1949 because of the requirements of accuracy, guidance system problems, and excessive weights. With the U. S.' thermonuclear explosion and other important technological progress that changed this picture, research was re-opened vigorously within all services in 1953. Yet between 1953-57 the U. S. continued to stress the development of a greater manned

bomber force and consistently downgraded the potential effectiveness of any first-generation (U. S. and USSR) long-range ballistic missile.¹⁸ Then, too, the U. S. ICBM/IRBM/MRBM programs in the mid-1950's were characterized by a high degree of bureaucratization and interservice competition which tended to foster -- within the prevailing strategic concept of a "floating D-Day" -- a procrastination in missile production through the "testing-to-death" phenomenon.¹⁹ The Eisenhower Administration, indeed, seemed reluctant to assign a substantial strategic role to long-range offensive missiles. Regarding the ICBM, Eisenhower, in February 1956, "cautioned against inflating the importance of these ocean-spanning monsters...";²⁰ and referring to the IRBMs/MRBMs, Secretary of the Air Force Quarles submitted that their deployment in Europe by the USSR "would not materially affect the balance of power between the two blocs" and, hence, would not of itself require a similar deployment by the U. S.²¹ Perhaps the only significant U. S. signal before 1958 which could have led directly to a step-up in Soviet ABM research was the

¹⁸See, e.g., General LeMay's testimony at the 1956 Air Power Hearings, p. 107.

¹⁹Ibid., pp. 624ff., 655, 1112, 1140-1141.

²⁰Quoted in BAS, XII (April 1956), p. 137.

²¹Air Power Hearings testimony, pp. 1603, 1003.

authorization in 1956 for the USN to begin development of the Polaris missile for submarine delivery.

Sputnik, of course, caused a significant acceleration of U. S. long-range missile development. The first official disclosure of a target date for the Atlas' initial operational capability came when Air Force Secretary Douglass said in December 1957 that one would be ready for combat "within two years."²² This first-generation Atlas missile, as well as the Thor, Jupiter, and Polaris programs, were greatly expedited in January 1958. In February, the USAF was directed to accelerate the Titan development and to proceed with the R&D on the second-generation Minuteman solid propellant ICBM. By September 1959, a SAC combat crew had successfully fired its first operational Atlas; and Eisenhower, in his January 1960 State of the Union Address, stated that the Atlas had proven equally successful in its last fifteen test launches, with an accuracy of less than two miles. By January 1960, also, Titan had an impressive five out of seven test-launch successes, Thor was deployed in Great Britain, and Jupiter was being deployed in Italy. On July 20, 1960, two successful firings occurred of a Polaris missile from an underwater launching site; and on January 1, 1961, two Polaris-equipped submarines were on-station.

²²New York Times, December 18, 1957, p. 1.

Section B. Domestic Perceptions of the U. S. Threat

There is a real question whether the minimum requirements of credibility had been fulfilled by America's "massive retaliation" doctrine. Certainly the human costs and risks involved were enormous in view of the Soviets' burgeoning offensive nuclear programs. Furthermore, the doctrine did not appear to set so easily with the U. S. Administration's attempts to balance the budget, reduce taxes, and build an industrial mobilization base for producing equipment over an extended wartime period. There was also the critical state of Allied and domestic American opinion that ensued from the doctrine's pronouncement, which must have raised some Soviet doubts about U. S. resolve to retaliate (initiate?) massively.²³ On the other hand, it can be argued that the very ambiguity of the doctrine's implications behooved the Soviets to ensure that their air defense preparations were adequate to meet the

²³It was even said of the doctrine that it "required the tacit assumption on the part of our allies, our enemies and our own people that we didn't mean a word of it". BAS, XVIII (March 1962), p. 18. On criticisms of the doctrine's credibility see William W. Kaufmann, "The Requirements of Deterrence," in Kaufmann (ed.), Military Policy and National Security (Princeton, 1956), p. 24ff.; J. D. Singer, Deterrence, Arms Control, and Disarmament (Columbus, 1962), pp. 58-61; and P. Peeters, Massive Retaliation: The Policy and Its Critics (Chicago, 1959), passim. For a discussion of the "signals" which were sent during 1954 in an attempt to "solidify" the doctrine, see Lowe, The Age of Deterrence, Chapter 3.

gamut of attack possibilities -- from a tactical barrage of atomic weapons in an initially limited European encounter to an all-out surprise attack in a general nuclear war. Thus, Khrushchev later reflected that the doctrine was "barefaced atomic blackmail, but it had to be reckoned with at the time...."²⁴

Tightly meshed with these 1953-54 signals from the U. S. was the strategic doctrinal re-evaluation which characterized Soviet published military thought in the early post-Stalinist era. At the center of this re-evaluation was the recognition of the destructive power of nuclear weapons. With such a recognition it became "legitimate to argue that capitalism might be deterred from making war, irrespective of its chances for victory...[i.e.] the constant preoccupation with impending disaster was no longer justifiable."²⁵ Indeed this was precisely the position of Georgi Malenkov in the USSR's political succession struggle. His argument in its broader "mutual deterrence" form implied a reduced military budget and a concomitant slow-down in air defense programs.

Khrushchev, however, opted for the position that nuclear war, albeit vastly destructive, could still be

²⁴ Pravda, August 12, 1961. Cited in Horelick and Rush, Strategic Power..., p. 30.

²⁵ Dinnerstein, War and The Soviet Union, p. 13.

"won" by the USSR. The broad coalition of Party and military leaders which sided with him facilitated his ascension to political primacy in early 1955. With Malenkov's removal from power, the Supreme Soviet apparently "increased the military budget by twelve percent...",²⁶ and presumably air defense programs would be increased and refined.

Moreover, with a newly invigorated appreciation of the characteristics of nuclear weapons came a re-evaluation of the importance of the "surprise" factor in an atomic attack. By early 1955 such an "agonizing reappraisal" of how wars are won had been presumably concluded with the assertion that the importance of the initiative required that the USSR must be ready for "pre-emptive actions against the cunning of aggressors."²⁷

The doctrine of pre-emptive warfare which appeared thusly in the USSR may have been simply a reflection of Soviet confidence in its intelligence network and its appreciation of the requirements of a democracy preparatory to engaging in hostilities.²⁸ Further, if the Soviets

²⁶Horelick and Rush, Strategic Power..., p. 27.

²⁷See Garthoff, The Soviet Image of Future War, pp. 62, 65.

²⁸Thus it is interesting to note that the Soviet civil defense system, as it developed after 1954, is "clearly based on the assumption that Soviet leaders will receive considerable advance warning of danger." Leon Gouré, Civil Defense in the Soviet Union (Berkeley, 1962), p. 145.

were not convinced that they would receive unequivocal warning of an air-atomic attack, "pre-emption" in the bomber era would still be credible and practical, in that "fail-safe" missions could be launched upon receipt of even ambiguous warnings.

However, the Soviets' pre-emptive warfare writings in the mid-1950's may have been grounded most fundamentally in the rising expectation of a surprise U. S. air-atomic attack; and, hence, may have represented a doctrine of desperation designed to protect their emergent, extremely limited long-range bomber force. To be sure -- the "Spirit of Geneva" notwithstanding -- there were various U. S. signals in 1953-56 which could have elicited such fears. There was, for example, the extensive buildup of SAC's overseas base structure.

Soviet commentators have always construed the development of U. S. air bases around the periphery of the USSR as an indication that the U. S. and NATO in general count heavily on surprise attack. These bases, the Soviets maintain, can be quickly neutralized in war by Soviet strategic retaliation and many of them rapidly overrun by Soviet ground troops. They consequently reason that these bases could be of only limited use in the prolonged type of war which they (the Soviets) envisage. Therefore they contend that these bases are designed with only one purpose in mind -- a surprise attack on the USSR.²⁹

²⁹ Cyril E. Black and Frederick J. Yeager, "The USSR and NATO," in NATO and American Security, Klaus Knorr (ed.),

Also, the USAF shift in 1955 to a predominant counterforce targeting strategy would logically seem to have given the USSR a rising expectation of surprise attack. In addition, the American U-2 flights (of which the USSR had knowledge in mid-1956) could definitely have implied a U. S. need for sufficient information regarding the Soviet air power "order of battle" to make possible a successful surprise attack on those forces.

It is in this context that the Soviets' extensive disarmament concessions of May 1955 regarding inspection and control can be understood. To secure observers at U. S. overseas bases would be to secure more early warning of attack. And it could thus also be reported that during 1955 President Eisenhower and his principal advisors had formed the impression at Geneva that "the Kremlin's failure to brandish the bargaining power that goes with air supremacy [was] a convincing sign that the Russians themselves [did] not believe the U. S. [had] lost the capacity for decisive retaliation."³⁰

One further consideration with regard to this doctrine of pre-emption needs to be discussed. It seems plausible

(Princeton, 1959), p. 43. Note, also, that the existence of these bases would greatly complicate the timing problems of a pre-emptive attack -- which further indicates the "desperation" motives in the doctrine's genesis.

³⁰Murphy, Fortune, LII (September 1955), pp. 86-87.

that the doctrine also may have grown out of a belated Soviet awareness that only if the weight and effectiveness of the opponent's blow could be reduced by a pre-emptive attack would the active air defense system such as the USSR had been developing appear justifiable. That is to say, the Soviet air defense program prior to 1954 -- although actively developed -- had been oriented to a "strategic defense" perspective and had been conceived essentially in World War II terms: point defenses concentrated around individual industrial and population complexes; single-engined, day-only fighters and AAA organized locally to deal with the full brunt of an enemy first strike and to destroy empty departing bombers as well as attacking planes, etc.

The post-Stalinist doctrinal revisions, however, gave an impetus to a broadened appreciation of the strategic and technical requirements for defense against nuclear bombing. Air defense could no longer be viewed as "guaranteeing" order out of chaos in a long war of attrition. Its operation during the (brief) initial phase became the paramount consideration; and even here its tasks should be reduced to manageable proportions through the pre-emptive actions of the Soviet offense. Thus, the rapid completion of extended radar early-warning nets, all-weather fighter and missile development, and a highly integrated national defensive organization came to

be perceived as increasingly urgent tasks between 1954-56.

There was another potential inadequacy, however, which seemed to be pursued with much less urgency by the Soviets through mid-1956: the defensive systems protection of their strategic offensive capability itself. For, whereas "in 1957 the Soviet military press expected an air attack upon the Soviet Union to concentrate mainly on airfields and air installations",³¹ the USSR's published statements revealed only minimal appreciation of measures such as base hardening, aircraft dispersal, camouflage, increased readiness, etc., to improve the force's chances of surviving a surprise attack.

Now, with any amount of confidence in a pre-emptive strategy -- plus the inherent "pre-U-2" protection afforded Soviet strategic forces by the nature of their closed society -- one could argue that further such defensive measures would be of only marginal tactical significance. Yet, in addition, it seems noteworthy that the Soviets did not even evince a keen awareness of the need to reduce the vulnerability of the USSR economic war potential. As R. L. Garthoff has written, "Soviet discussions of the conversion and mobilization of the economy for war and the role of the 'military economy' which were published

³¹Dinnerstein, War and The Soviet Union, p. 242.

in the period through 1955 failed to raise the problem of vulnerability -- and hence even the question of the full availability -- of the economy in time of war."³²

To be sure, Soviet doctrine held that the offense could overpower the defense in nuclear war. The Russians quite realized that a very few nuclear bombs could wipe out even the most carefully hidden airfield or the largest metropolitan complex. Thus, the USSR press warned in 1955 that "not a single enemy plane must be allowed to get through the active defenses"; and that "the slightest mistake of an anti-aircraft unit in conditions of atomic warfare can lead to very serious consequences."³³ Yet, one is left with the definite impression that the Soviet perspective on air defense as it evolved through mid-1956 was, at bottom, an optimistic one. The USSR might not succeed in fully blunting the enemy's strategic offensive capability at its bases -- but the Motherland's active defense forces would indeed be at "hair-trigger" readiness to deal effectively with the attacks from residual U. S. air-atomic forces.

Pre-emption faded out of open Soviet military writing in 1957. Presumably the USSR did not need the doctrine to

³²The Soviet Image of Future War, pp. 49-50.

³³Cited in Dinnerstein, War and the Soviet Union, pp. 238, 241.

"protect" its emergent missile force as it did with regard to its bombers. Besides, of course, the doctrine's practicality diminished with the diminished warning times associated with ICBM strikes. What seems more important, however, was the apparent post-1956 acceptance by the Soviet leadership of Malenkov's "mutual deterrence" philosophy. This was reflected in their limited deployment of long-range offensive nuclear systems; their "peaceful-coexistence" doctrinal innovations; their increased attention to "Third World" matters and Soviet domestic welfare concerns; etc. The constellation of factors which caused the "nature of the historical epoch" to be thus defined in the USSR needs no detailing here. Suffice it to say, the continued quantitative and qualitative improvement of the U.S.' bombers and air defense forces throughout this period, and the swift achievement of a superior ICBM capability after 1957 confronted the Soviets with an offensive "arms race" which was probably not worth attempting to "win". Major military efforts were henceforth directed toward the modernization of the air defense system, under the continued impetus of the post-Stalinist strategic doctrinal musings and the distressing American U-2 flights between 1956-60.

Section C. The Development of the Post-Stalinist Air
Defense Posture

The Soviet radar warning and "defense-in-depth" posture was strengthened in early 1954 by the integration of the European satellite air forces into an efficient organizational structure -- a move which culminated in the Warsaw Pact in mid-1955. By 1956, the Soviet early warning radar system could be termed "reasonably comprehensive", and included "fairly reliable radar for ground-control intercept...."³⁴

To operate within this radar network were the SAM-I surface-to-air missiles which became operational during 1953. These missiles were deployed extensively in the ensuing years around such key centers as Moscow, Leningrad, and the atomic weapons development complex at Ulan-Ude. Some of the batteries were reported to have "an infra-red detection system as well as a radar-tracking target system linked by computer to missile tracking radar."³⁵

The new Mig-17 fighter was also operational by 1953, and several thousand augmented the Mig-15 force within the next few years. By 1955, moreover, the Soviet Fighter

³⁴Lee, The Soviet Air Force, p. 120; Kilmarx, A History of Soviet Air Power, p. 266.

³⁵Asher Lee and Richard Stockwell, "Soviet Missiles," in Lee (ed.), The Soviet Air and..., p. 153; Kilmarx, A History of..., p. 266.

Air Army had "absorbed most of the elite fighter pilots and fighter planes the bulk of which had been previously allocated to the tactical air forces...."³⁶ Then, at the May 1955 Air Show, the USSR displayed forty-eight new Mig-19 day, supersonic fighters. More significant was the display at this same time of fifty Yak-25 all-weather, subsonic fighters, which indicated that the USSR was finally deploying an all-weather interceptor in operational numbers. To be sure, the USSR had by 1955 deployed upwards to 20,000 subsonic, day-only fighters -- not including the planes and equipment sent to the other Bloc nations. But these aircraft were essentially obsolescent in coping with the U. S.' improved B-36 high-altitude night-flyer and the speedier B-47 all-weather bomber which were both operational in large numbers by 1953.

Several reasons could be advanced as to why the Soviets were so tardy in equipping their defense forces to meet this all-weather threat. In all likelihood, the basic causes for the delay could be found in the sundry bureaucratic, fiscal, and technical problems which surrounded the USSR all-weather fighter program. Particularly

³⁶ Lee, "Prologue," in Lee (ed.), The Soviet Air..., p. 9. For an informed discussion of Soviet fighter capabilities and air defense tactics at this time, see M. Gladych, "How The New Red Fighters Stack-up," Air Force, XXXVIII (March 1955), p. 25ff.

important, of course, was the failure mentioned above to develop technically effective airborne radar interception equipment. Involved here, also, may have been some unforeseen production bottlenecks in the early 1950's; for it was reported that "between 65 and 70 percent of the ...radar instruments used by the Red Air Force [were] being built in the Soviet zone of Germany."³⁷

Doubtlessly, a further contributing factor was the lack of "the sense of urgency that a fuller appreciation of the role and power of nuclear weapons later produced."³⁸ On the other hand, a "Machiavellian" approach might suggest that the USSR -- impressed by the bombing accuracy degradations of Allied nighttime missions in World War II and conscious of the fact that "flash blindness" problems for bomber pilots are significantly greater at night -- initially wanted to encourage the U. S. to divert its resources toward developing an all-weather, high-altitude bomber capability. And a pragmatically calculating Russian might well have determined that there was some reason to think that Soviet all-weather fighters would be of only marginal tactical importance in any war which the Soviets were "forced" to

³⁷ Aviation Age, June 1953, p. 11. Indeed, June 1953 was the month of the portentous East German proletariat uprisings.

³⁸ Dinnerstein, War and The Soviet Union, p. 238.

initiate. That is, as U. S. analysts discovered in the early 1950's:

The task of destroying Russian strategic targets in a summer operation was found to be much more difficult and several times more costly...than in winter. A large proportion of the target system is then in daylight adequate for the operation of [Soviet] day fighters. Moreover, the time of outbreak may very well be decided by the enemy and he has a comparative advantage in choosing the summer. Strategic targets in the U. S. are in much more southerly latitudes, making Russian night attacks feasible in summer as well as in winter.³⁹

In any event, the large number of new fighters which appeared in 1955 clearly highlighted the Soviet talent for short lead-times in aircraft production once the various pre-production obstacles had been overcome. Moreover, one year later, at the 1956 Air Show, the Soviets revealed four advanced, supersonic fighter prototypes each with either a full or limited all-weather capability.

Of all the air defensive efforts which were undertaken by the Soviets between 1954-56, however, "perhaps the most significant development was organisational."⁴⁰

³⁹Quade, "The Selection and Use of Strategic Air Bases...", in Quade (ed.), Analyses for Military Decisions, p. 34n. In summertime, also, the USSR's post-attack agricultural problems and fallout protective measures would be less difficult than in winter.

⁴⁰Lee, The Soviet Air Force, p. 120.

In 1955, for the first time, the Soviet Air Defense Force came to occupy an independent position of rough equality with the ground, naval, and offensive air forces, and embraced in one national command all the components of the active air defense system. The facilities and equipment of the USSR tactical and naval air forces were also more closely integrated into the over-all air defense of the homeland.⁴¹

Thus, by 1956, it could be written that "certainly... the Soviet air force had all the major elements of a first-class strategic air defense organization."⁴² Furthermore, General LeMay could then state that due to the increased sophistication of Russian air defenses, the U. S. would need to assign missions to attack the defenses directly and to step-up markedly the development of air defense penetration systems for SAC aircraft.⁴³

Yet, despite the significant advances that had been made, and the more than 500,000 personnel engaged in the effort, there remained glaring inadequacies in the Soviets' air defense system in 1956. The 20,000 mile early-warning

⁴¹See R. L. Garthoff, "Soviet Air Power: Organization and Staff Work," in Lee (ed.), The Soviet Air and..., p. 178; and Kilmarx, A History of..., p. 265ff.

⁴²Lee, The Soviet Air Force, p. 120.

⁴³Air Power Hearings testimony, p. 145.

fence around the Soviet periphery was far from complete according to an article in a Soviet military journal published in 1957.⁴⁴ There were apparently no indications that the Soviets were as far along with either a SAGE-type ground control system or a nuclear AAM as was the U. S. by that time.⁴⁵ The system had practically no capability against low-flying bombers and still did not function well at night and in poor-visibility conditions. And, of course, there were the air defense dilemmas which the long-range ballistic missile promised soon to usher in.

Then on July 1, 1956, an American U-2 reconnaissance aircraft flew a mission over the USSR as far as Kiev, some 250 miles from the frontiers of the East European Communist states. Soviet radar was able to detect and track this and succeeding such flights -- but their weapons could not reach the U-2's extremely high altitude. Khrushchev later stated that from such actions, "We drew the conclusion: to improve rockets, to improve fighters."⁴⁶ The considerable expansion of the Soviets' long-range

⁴⁴Cited in Lee, "Strategic Air Defense," in Lee (ed.), The Soviet Air and..., p. 126.

⁴⁵See, e.g., the USNWP interview with General Partridge, September 6, 1957, p. 85; and Hanson Baldwin, New York Times, February 1, 1958, p. 44.

⁴⁶Quoted by Hanson Baldwin, New York Times, May 11, 1960, p. 4.

bomber base structure in the latter 1950's suggests that dispersal came to be seen as a high priority defensive measure, also.

Accordingly, developmental work on a more capable high-altitude SAM-I surface-to-air missile and an advanced SAM-II was expedited. Also between 1957-60, the supersonic Mig-19 was gradually replaced by the MACH-2 Mig-21 which was generally fitted with new infra-red homer AAM's.⁴⁷ In addition, the Soviet all-weather interceptor force began to receive a supersonic successor to the Yak-25 which was equipped with liquid-fueled auxiliary rockets to provide a "zoom" capability for high-altitude intercepts. Even more advanced fighter prototypes underwent extensive flight testing during this period. As these modern aircraft became operational, the East European satellite air forces were augmented with Mig-19's and Yak-25's to improve the Bloc's "defense-in-depth" capability.

These efforts which the USSR had made to improve its high-altitude air defenses led to a shift in SAC training tactics in the U. S. In late 1959, the SAC and the FAA established seven special air routes within the U. S. for

⁴⁷ There are indications that the introduction of these AAM's was accelerated after the 1958 Formosa Straits air battles in which U. S. Sidewinder missiles were used with much effectiveness. See Air Force, XLII (October 1959), p. 15.

low-altitude training missions by B-47 and B-52 aircraft.⁴⁸

And a quite significant dividend from these Soviet efforts came in early May 1960 at Sverdlovsk when a U-2 mission was "shot down" for the first time.⁴⁹ For the remainder of the year,

the most far-reaching Soviet claims...stressed the effectiveness of Soviet air defenses. In his initial treatment of the U-2 affair, Khrushchev restricted himself to boasts that Soviet air defenses could now prevent high-altitude reconnaissance aircraft of the U-2 type from overflying the Soviet Union with impunity.... Soon...Khrushchev extended his claim to cover not only U-2's but SAC bombers as well.⁵⁰

Of course, the publicity attendant to the U-2 affair threw some international light upon Soviet defensive weaknesses in the latter 1950's. Moreover, President Eisenhower's open justification of the flights as being essential to U. S. security was undoubtedly disconcerting and perhaps frightening in its implications regarding a possible U. S. counterforce attack. Naturally, however, Khrushchev

⁴⁸Air Force, XLII (December 1959), p. 24.

⁴⁹There still seems to be no firm consensus on the exact circumstances of the downing of this U-2. See, for example, David Wise and Thomas B. Ross, The U-2 Affair (New York, 1962), pp. 258-259, which cautiously accepts the conclusion (attributed to the CIA) that Powers' aircraft was disabled at 68,000 feet by a near-miss Soviet SAM.

⁵⁰Horelick and Rush, Strategic Power..., p. 74. See ibid., pp. 74-75 and 80-81 for references to various of Khrushchev's statements at this time which asserted that, e.g., "not a single bomber could get through to its target."

did not need to reveal the incident if he were really concerned about such an aftermath.

The U-2 affair thus revealed the strides which the USSR had taken between 1956-60 to improve its "hair-trigger" readiness to deal with an aggressor's air-atomic attack. It seems plausible that such air defense programs went forward, also, without too much Soviet concern regarding their obsolescence or re-direction in the face of the prospective long-range ballistic missile threat. Indeed there are no indications that any USSR anti-ballistic missile programs went beyond the research stage during this period. The "first prominent allusion to the Soviet ABM development [did not occur until] ...September 1961, when Khrushchev told a Western journalist that at the same time that Soviet scientists and engineers began work to develop intercontinental missiles, another group had been asked to work on means for countering such missiles."⁵¹ Certainly the competing resource demands of other military and non-military programs, to say nothing of the technical problems involved, dictated in large measure the pace of the Soviet ABM project. And, while it would be quite difficult to assess the impact on this Soviet effort of U. S. signals

⁵¹W. F. Hahn and A. J. Cottrell, Ballistic Missile Defense and Soviet Strategy, Institute for Defense Analyses Research Paper P-140, October 1963, p. 15.

of ICBM/IRBM capability and intent during this period, the signals clearly were not designed, on balance, either to increase the pace of the Soviets' ABM development or decrease their bomber defense expenditures.

Finally, a few words about Soviet air defense systems deployment between 1953-60. The post-Stalinist military doctrinal re-evaluations had caused a shift away from the older "strategic defense" concept of wartime operations. Thus, rapid-reaction times, integrated organizational structures, and other capabilities for attriting the enemy's attack at the very onset of the conflict were stressed. Yet, in deploying its weapons, the USSR retained the "cold-blooded" Stalinist concept of an "island" system of heavy defense around the most important Soviet complexes -- principally population and industrial centers. Other areas were only lightly guarded, if at all.⁵² As an indicator of the USSR's intensive deployment of systems in protection of vital areas, consider the following CIA report of the air defense network which the Soviets had established on the small island of Cuba by late 1962:

There are 24 operational SAM sites, each with

⁵²See, e.g., the USNWP interview with General Partridge, September 6, 1957, p. 60; Hanson Baldwin, New York Times, May 11, 1960, p. 4; and Marshal V. D. Sokolovskii (ed.), Soviet Military Strategy, trans. Dinnerstein, Goure, and Wolfe, p. 418.

6 launchers. There is probably a total of about 500 SAM missiles in the system....To supplement S-A-missiles, the Soviets brought in additional MIG fighters, reaching a total of about 100, including 42 MIG-21 aircraft.... About 200 modern Soviet radars were installed to tie the system together.⁵³

In this connection, it seems interesting to observe that such a Soviet pattern of concentrated air defense deployment made good sense in view of the lack until 1961 of an integrated strategic target plan in the United States -- a situation which made it extremely likely that the effect of American air-atomic mission planning by the disparate U. S. striking forces would be the programmed overkill of high-priority USSR complexes and an insufficient weight of effort directed toward other targets.

⁵³ Statement of John McCone, Director, CIA, Hearings, House, Subc. of Comm. on Approps., Department of Defense Appropriations 1964, 88th, 1st, February 1963, p. 52.

C O N C L U S I O N
THE U. S.-USSR AIR DEFENSE DIALOGUE
IN THE NUCLEAR AGE

The fundamental premise of a U. S.-USSR strategic dialogue is that each power views the "arms race" as a two-sided adaptive system rather than as a pair of unilateral programs. As such, each power seeks to calculate rationally the opponent's military offensive capability and intent, and develop a defense whose dimensions reflect such a perceived threat and take the opponent's expected response to this move into account -- while simultaneously communicating to the other side the likely consequences of his alternative responses. Such a strategic dialogue, it would seem, was not in the foreground of Soviet-American relations between 1946-60. It is questionable whether a conscious dialogue of this type was even possible, given the basic U. S.-USSR nuclear power asymmetries which characterized this period. In any event, it is clear that the "signals" of strategic offensive capability and intent which were sent (whether consciously or not) by both sides were either muffled or amplified out of proportion by domestic bureaucratic and ideological factors with the result that, indeed, a pair of unilateral air defense programs evolved. Hence, in the broadest sense, the U. S. reacted to the Soviets' post-war offensive signals by a

flight into more offensive programs, the USSR reacted initially to the American signals by deploying more-or-less anachronistic defensive programs, and neither power reacted by developing a secure second-strike capability, which became a principal strategic task during the late 1950's. Let us look more closely at each of these conclusions.

It seems apparent that U. S. policy-makers -- during most of the post-war period -- were content to estimate the Soviets' domestic arms preparations and made little overt attempt to influence them. To be sure, the U. S. did signal generally its intent to remain ahead quantitatively in the offensive nuclear air power race. But such a "full-fury" perspective would appear to have reinforced the Communists' "inevitable war" ideology, foreclosed any Soviet examination of a wide range of strategic alternatives, and led that country to a significant early emphasis on air defense programs and a concerted attempt to develop a nuclear air-atomic deterrent capability. Thus, up to 1950, the U. S. seemed to ask simply, "When will the Soviets get the atom bomb and what will be the rate of growth of our own stockpile and delivery force?" Between 1950-52, the official position regarding the U. S.' offensive military establishment appeared to be to multiply its weapons systems as much as possible in relation to as

many contingencies as possible in order to meet an "immediate" threat. From 1953-60, the quest for foreign and defense policy stability manifest itself in the attempted development of a U. S. military posture based on unilaterally perceived "long-haul" air-atomic requirements, with less regard supposedly paid to temporary changes in the international system than that which was said to characterize former U. S. military policy planning.

On the other hand, however, the American reaction to the USSR's offensive signals revealed an exaggerated sensitivity to Soviet aggressive intentions, coupled with an apparent continued misreading of their offensive capabilities. The signals from the USSR had, of course, been ambiguous on face-value and were clouded further by the aura of secrecy which pervaded Communist Russia, especially during the Stalinist period. Nevertheless, until around 1953 the threat of a Red Army offensive in Western Europe was magnified in the U. S., while the Soviets' growing long-range air-atomic potential was underestimated. Then, in a curious reversal of these perceptions, the U. S. military tended to react to the Soviets' post-1953 signals by an overestimation of the USSR's intercontinental bomber and missile force -- without seeming to examine why the Soviets would want to attack the U. S. in the first place.¹

¹"Curiously enough, this [latter] question, which seems

The fundamental cause of such a "misreading" of Soviet signals in the U. S. lay in the extremely complex interplay of the domestic political process and foreign and defense policy considerations within the executive and legislative branches of the government. This interplay manifest itself in the major role that political choices played in the allocation of resources for national security and the economic bases of these choices. The result was the stress throughout most of the 1946-60 period on the buildup of the Strategic Air Command as the principal deterrent to Soviet aggression; and the basing of its requirements for quantitative superiority vis-à-vis the USSR's strategic offense on the assumption that a new war would begin by a Soviet surprise air-atomic attack -- an assumption which "was explicitly rejected by Soviet theory and indeed ridiculed by it."² However, it is important to note that the pressures for a buildup of U. S. long-range offensive power lay generally outside of the executive branch. For "not once did either [the Truman or Eisenhower] Administration attempt to seize upon a Soviet technological advance as a means of

so basic, is often ignored in our pre-occupation with technology and military capabilities." G. H. Snyder, Deterrence and Defense: Toward a Theory of National Security (Princeton, 1961), p. 57.

²Kissinger, Nuclear Weapons and Foreign Policy, p. 90.

[The text on this page is extremely faint and illegible. It appears to be a multi-paragraph document with several lines of text per paragraph. A small black speck is visible near the center of the page.]

intensifying or expanding the American military effort."³ Indeed, the Eisenhower Administration's budget restraints and "long-haul" view of the Communist threat seem motivated in part by a desire not to escalate the U. S.-USSR arms race.

The effect of all this on America's air defense was to retard significantly its development prior to 1954; and to mould its development after 1954 less as a function of the perceived bomber/missile threat than as a reflection of the requirement for stability in the executive's defensive programming. As a partial consequence of this latter point, throughout most of the 1950's the problem of protecting SAC's second-strike capability against a bomber attack and of re-orienting the entire CONAD posture to the incipient ICBM threat were largely subordinate defensive concerns; while air defense, itself, remained subordinate in the overall matrix of U. S. military priorities.

Of course, there were the attendant technical feasibility considerations which set real limits upon the development of U. S. air defense programs, especially prior to 1953. There was, also, the variety of historical and psychological factors which predisposed the American public and its military services to seek an improved offense as the best means of

³Huntington, The Common Defense, p. 186.

defense. And it must be underlined that the U. S.' development of an extended overseas SAC base system and a variety of sophisticated bomber aircraft and tactics represented a substantial complication of the Soviets' already formidable air defense problems; and would appear to have forced a diffusion of their wartime offensive air-atomic effort away from continental U. S. targets -- hence, further dimming the perceived requirement for widespread defensive systems in the United States.

The U. S. military disposition to react to Soviet signals by more offense tended, however, to obscure a more objective appreciation of the full spectrum of strategic roles that air defense could play in the nuclear age. At bottom, U. S. justifications for air defense assumed its obvious wartime damage-limiting values, and moved on to argue the technical feasibility of increasing its attrition rate capability in the face of persistent domestic beliefs that "70 percent of the aggressor's strike will always get through." Such arguments diverted attention from the fact that "because [the enemy] can penetrate anywhere does not mean that he can penetrate everywhere."⁴ There was seemingly little appreciation, therefore, that the mere existence of an air defense system could force the enemy offense to assign

⁴Thornton Read, "Strategy for Active Defense," American Economic Review (Proceedings), May 1961, p. 470.

so much of its striking power to destroy some targets (or even to suppress the defensive system itself) that it could not attack all of them. That is, the targets saved by air defense would not necessarily be those at which defenses were located. Further, the air defense system could force the enemy to reduce the payload of his bombers and increase the technical complexity of their missions, by requiring the aircraft to carry additional fuel for evasive tactics and low-altitude approaches, electronic penetration aids, decoys, etc.

From this perspective, it would appear that U. S. interests might have been better served by some signals which upgraded the expected wartime capability of its extant defenses, rather than engaging primarily in a domestic dialogue over possible technical improvements to an attrition-rate proclaimed to be deficient.⁵ In addition, this focusing of American attention on the system's overall attrition capability made it more likely that its components would be deployed in depth to attempt the defense of the entire continental U. S. territory, instead of being concentrated in

⁵Canada seems to have done a "better job" here. Its House of Commons debates and mass media would frequently present a quite optimistic image of its air defense capability. See, e.g., HANSARD, Session 1952-53, Vol. I, November 30, 1953, p. 454; Session 1953-54, Vol. V, May 21, 1954, p. 4952ff.; Session 1959, Vol. III, May 13, 1959, p. 3613; Session 1960, Vol. III, March 28, 1960, pp. 2511-2512.

fewer areas (at less expense) to force a corresponding Soviet concentration of attack.

Moreover, there are other values which accrue to an air defense system that were apparently considered even less in open U. S. polemics. During peacetime -- besides simply threatening the warning of attack -- an air defense system can act to enforce control of continental airspace as a basic component of national sovereignty. It can increase the risks of foreign reconnaissance overflights. Also, air defense, as indicated above, complicates an enemy's general war planning and increases his military uncertainties. A mature bomber defense system, furthermore, might tend to reduce an enemy's political policy choices by making "nuclear blackmail" a less credible alternative. During the initial wartime phase -- besides blunting the first strike -- air defense could verify whether the strike was inadvertent, provide information regarding the initial damage, and allow deliberate response by protected command/control centers. During the middle phase of the war, air defense could assist the reorganization of that part of the strategic force which has survived, as well as direct the returning bombers, those aircraft in the maintenance pipeline and training commands, interceptors on naval carriers in continental U. S. ports, etc. During the termination phase of the war, the military effects of air defense may

prove to be even greater than they were earlier, due to the combat experience of the system and its operating against a residual offense which could be, perhaps, less competent than the first-strike force and which must navigate over a very uncertain post-attack terrain. The defensive system could also contribute to drafting and verifying the termination agreement, provide status information to guide negotiations (by permitting or denying reconnaissance), and signal deception or violation of the agreement.⁶

Now it is possible that these values of air defense may have been more sharply in the perceptions of U. S. policy-makers than has otherwise been suggested. For example, it could be argued that the widespread deployment of active defensive systems during the second Eisenhower Administration reflected -- not simply a bureaucratic inability to choose between "rival" military programs -- but a definite executive desire to develop overlapping area coverage due to a view of general war as an extended, "long-haul" operation in which some of the above listed values of air defense would become important.⁷

⁶For a more extended discussion of some of these air defense values, see Roger Levien, An Appreciation of the Value of Continental Defense (RAND Memorandum RM-3987-PR), March 1964; and Kahn, On Thermonuclear War, pp. 102-109.

⁷There is some evidence that Eisenhower retained throughout his Presidency the soldier's "war of attrition"

There seemed to be, however, no overt attempt made between 1953-60 to communicate any such appreciation of the values of air defense to the USSR. Nor was there any authoritative American expression of the possible deterrent role which its defensive systems might have played in the Soviets' decision not to procure a large intercontinental bomber force during the latter 1950's. In short, U. S. air defense was at no time in the post-war period a significant component of the international military dialogue of strategic deterrence.

The actual development of America's mature bomber defense posture, moreover, can be seen most fundamentally as the product of --- in Huntington's phrase --- the "executive

view of nuclear conflict. For example: his preferences for a "balanced" military force structure; his industrial mobilization base policy; his national stockpile inventory which emphasized unprocessed raw materials located in unprotected storage; and his civil defense policy that -- until May 1958 -- had at its core the "mass evacuation" concept, which also seems to imply a non-conclusive first phase. Indeed, Eisenhower had written the following in a letter to Secretary Wilson of January 5, 1955:

"The initial phase of a general nuclear war would consist of exchanges of staggering blows at the homelands of the antagonists. The great test for the U. S. would be to survive this terrible period, knocking out in the meantime the enemy's capacity to inflict further damage on America. Once this point had been reached, the country could then proceed in the customary way of building up the resources needed to go on and win the war."

Cited in Robert J. Donovan, Eisenhower: The Inside Story (New York, 1956), p. 328.

legislation" of strategic programs. Decisions regarding air defense structural requirements have been the result of controversy, bargaining, and compromise among various government agencies and officials whose different interests and perspectives compelled recourse to the involved process of legislation. The U. S. Air Force's relationships with the Bureau of the Budget, the Secretary of Defense, the Army, and the National Guard Bureau, for example, are henceforth more important to an understanding of the evolution of American air defense organizations, systems R&D and deployment, and defensive doctrine between 1946-60 than are the patterns in the Soviet-American strategic balance.

Basic to this point is the fact that the U. S. demonstrated until the latter 1950's a conspicuous unreadiness even to minimize the advantages to the USSR of a first-strike by actively protecting SAC's nuclear retaliatory force (including the associated command and control elements), despite the high targeting priority which the Soviets had appeared to assign to SAC bases, and the persistent urgings of the American attentive public. One can only conclude that here again domestic bureaucratic factors acted to muffle such signals and caused U. S. military policy-makers to perceive air-atomic power as a "one-way" weapon.

All of this is not to suggest, of course, that international systemic factors had no influence upon the evolution

of the American air defense posture. From the Czechoslovakian coup of 1948, through the Korean War, the initial Soviet hydrogen bomb explosion, and the 1954-55 May Day bomber fly-bys, to Sputnik, U. S. policy-makers -- as we have seen -- have responded in part by alterations in their air defense programming. What is important to reiterate, however, is that in every case, with the possible exception of the 1948-49 tensions in Europe and the initial Soviet atomic bomb explosion, the international disturbances have caused the U. S. to perceive other military needs to be more important than an acceleration of defensive systems expenditures. Indeed, the U. S. response has often been at the expense of approved bomber defense programs. Whether it be the Far East and European defense problems in the early 1950's, the strategic airpower problems of the mid-1950's or the post-Sputnik problems of the late 1950's, the U. S. Air Force has been primarily concerned to buildup its SAC and TAC components; and -- under the pressures of budgetary ceilings -- has consistently devoted less attention to its Air Defense Command organization whose forces have always comprised over 80 percent of the total American air defense effort.

In this regard, it is interesting to speculate whether the absence of a Korean War in 1950-53 might have profoundly altered the future course of U. S. bomber defense systems.

During the preceding two years, the attempt to develop a continental air defense capability to meet the onset of the Cold War was in the foreground of U. S. national security efforts. The impetus which was being generated for these defensive programs was abruptly halted, however, by the Communist aggression in June 1950. Beyond the immediate needs of the Korean conflict (which, indeed, caused a substantial deployment of continental fighter-interceptor forces overseas), America then adjusted its strategic efforts to the improvement of the NATO alliance structure to deter any military encounters in Europe. The defense of U. S. interests in this area through strengthened offensive air-atomic forces, along with an increase in conventional ground forces, became a paramount U. S. security concern. SAC's forward-base system underwent a rapid expansion. American scientists concentrated on innovations in tactical nuclear weapons for European defense. Preventive war urgings appeared with increasing frequency within the U. S. mass media. All of these phenomena acted to divert attention from programs to defend North America against the incipient Soviet intercontinental bomber threat.

Moreover, insofar as the lack of a Korean conflict could have facilitated the re-election of a Democratic Administration in 1952, continuation of the prevailing "crisis year" approach to military programming would also

seem to have furthered the buildup of continental defense systems in 1953-54. With the "year of maximum danger" (wherein the USSR would have an effective intercontinental air-atomic capability) having been established as 1954 by the Truman Administration, procurement expenditures for defensive systems might well have been greater in the early 1950's than they were to be under the Eisenhower "long-haul" perspective which pushed this danger point toward the end of the decade and emphasized stability in military programming. Indeed, the expansion of the U. S. air defense effort which was to be embodied in Eisenhower's "new-look" did not result in any tangible increase in the operational capability of the system to attrite an atomic attack until after 1954. And as it was, this defensive buildup occurred somewhat paradoxically with the simultaneous demonstrations in the Soviet Union of a developing long-range thermonuclear delivery capability that reduced considerably the tactical significance of CONAD's improving overall attrition-rates.

Whether any such hypothetical momentum for continental defenses in 1950-53 could have induced concomitant technological breakthroughs in defensive systems, and otherwise surmounted the various domestic phenomenological and budgetary obstacles to air defense expenditures is of course unanswerable. It is conceivable, however, that

with an earlier buildup of reasonably effective continental defenses (especially in the area of radar warning systems), America might have been somewhat less disposed to emphasize the development and maintenance of a quantitatively superior strategic air-atomic force, based on the assumption that any new war would be a general one, begun by a Soviet surprise intercontinental attack. The deterrent effect of these U. S. defenses against a very limited Soviet A-bomb force could not only make a surprise attack appear less likely, but, if war came, the early warning and attrition capabilities of the defenses could theoretically enable effective U. S. retaliation with a less massive atomic (or thermo-nuclear-equipped) offensive Air Force.

Consequently, American military planners might then have responded to the Soviets' 1953 hydrogen bomb explosion and the 1954-55 May Day bomber fly-bys in a more balanced fashion. These USSR signals might then have indicated to the Joint Chiefs of Staff, for example, that the SAC deterrent was a wasting one (within a newly perceived environment of imminent U. S.-USSR strategic parity), and pointed to the requirement for much stronger limited war conventional forces as a primary component of the American national security posture. (The absence of a Korean War would also seem to have removed an obstacle to the buildup of U. S. conventional forces in the mid-1950's, in that the

scope and methods of Korea had become condemned in America as intolerably wasteful and had led accordingly to the "massive retaliation" doctrine.) And with strategic air-power seen less as the single solution to the complex problems of international relations, the Air Force's Air Defense Command responsibilities could, perhaps, have been discharged with less ambivalence in the succeeding years.

But -- rightly or wrongly -- the actual development of America's continental defenses went forward basically within a policy framework which emphasized the primacy of offensive air-atomic power in a strategy of general war deterrence. While the U. S. Administration took pains to minimize the psychological impact of major international system disturbances on its domestic society, the U. S. national security policy responses to these disturbances were generally aimed at improving, not the country's military ability to defend against attack, but rather at increasing America's ability to inflict nuclear destruction.

As we have seen, however, such a brandishing of the "invincible" SAC sword did not cause the Soviet Union to fret itself into an air defense paralysis. In a certain sense, the full gamut of the Soviet response to U. S. strategic signals was defensive or "defense-by-bluff." For it is evident that the Soviets' strategic resources before 1950 were allocated primarily for air defense programs,

while relying on the image of a Red Army "colossus" behind the Elbe River to deter the West. Also, it has been argued that "defense-by-bluff" was involved in the post-Stalinist May Day signals which "led us to believe that they were building a sizeable long-range bomber force, whereas in fact they were investing most of their national product for their long-range forces in long-range ballistic missiles."⁸ Such a "bluff", from the Soviet view, would cause the U. S. to embark upon an expensive bomber program in response, while the USSR's projected air defense programs were perceived to be adequate to meet such a buildup.

Yet, at its most fundamental level, the Soviet-American arms race was not viewed in the USSR as a "two-sided adaptive system." The Stalinist air defense posture was developed primarily from the ideological dictates of an inevitable war of attrition in which offensive airpower would play an important but by no means decisive role. As such, the organization and deployment of air defense to meet a series of bomber raids in the rear prior to a Soviet counter-offensive seemed rather anachronistic in the nuclear age. But the USSR apparently saw little point in directly adapting Soviet programs to U. S. strategic-technical signals, and, indeed, "from 1946 until 1954 non-Soviet military thought was

⁸James M. Gavin, War and Peace in the Space Age (New York, 1958), p. 241.

considered below discussion, save for occasional propagandistic ideological diatribes."⁹ Moreover, from the pure Stalinist perspective, there would be little reason to think that Soviet signals could have a long-run influence on American military policy which was, after all, determined by the necessities of the capitalist system.

The post-Stalinist revisions in the Soviets' perspective on air defense brought their program more in line with the nature of the U. S. offensive threat, by emphasizing extended early-warning, all-weather capabilities, integrated organization, and blunting, pre-emptive attacks. Yet there remained in the Soviet view the disdain for the U. S. signals which stated that its atomic bombs could be dropped "where, how, and when they were wanted", since Soviet bomber bases until the late 1950's seemed to be accorded no special defensive protection.

Thus, both the U. S. and USSR were slow to appreciate the advantages to strategic deterrence of a secure second-strike air-atomic capability which could have acted to reduce the reciprocal fears of surprise attack between these two powers. Further, it seems clear that active defenses to reduce specifically the vulnerability of nuclear retaliatory forces would (1) have been less expensive to deploy

⁹Garthoff, Soviet Strategy in the Nuclear Age, p. 70.

than were the population and industry defense systems in that less geographical coverage would be required, (2) have had a higher tolerance of failure insofar as they were supplemented by other defensive measures such as dispersal and hardening, (3) have been less susceptible to obsolescence than were population defenses due to the greater accuracies required to hit the defended bases, and (4) have tended to draw enemy attacks away from cities and other major industrial complexes. Perhaps it is this lesson from the development of air defenses in the nuclear age which should be in the foreground of the anti-ballistic missile debate of the 1960's.

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