NOTICE TO ALL PARTICIPANTS IN BETA I & II

Any resemblance between these hypothetical events and the real world is not coincidental. In preparing the scenarios from which BETA I & II will be initiated, a number of real life considerations have been introduced. They have, however, been intermixed with some highly imaginative and speculative material intended to provoke thought and to stimulate politico-military discussion. BETA is neither a war-game nor a technological analysis. The aim is to explore a wide range of plausible, (if not necessarily probable), contingency situations in order to derive broad insights into current and potential problems. Participants are reminded that play is limited to the TOP SECRET NO FOREIGN level and discussion of RESTRICTED DATA is not authorized.

~~CONFIDENTIAL~~

WORKING PAPER

6-b

BETA I AND II-67

ISSUES, PROBLEMS, AND QUESTIONS

The following material is intended to provoke thought and to stimulate discussion. It does not represent the views of the Joint Chiefs of Staff, the Joint War Games Agency, or of any other Government agency.

BETA I AND II-67

ISSUES

The United States should deploy an ABM system.

YES	NO
The Soviet Union has already deployed an ABM system in the defense of metropolitan Moscow. In addition, it is presently deploying the TALLIN missile system across the Soviet Union, which may or may not have an ABM capability. To the extent these systems are effective in the intercept of offensive missiles, however, the US strategic deterrent is proportionately degraded.	The USSR has a pathological fear of an attack on her territory. The ABM capabilities being installed around Moscow and the TALLINN system do not provide the Soviets a significant degree of protection against a massive ICBM attack. MINUTEMAN III and POSEIDON missiles, carrying multiple re-entry vehicles and equipped with modern penetration aids, will be capable of inflicting unacceptable damage to the Soviet Union.
It is believed by some experts that the Soviet conducted extensive exo-atmospheric tests involving ABM warheads and that they may have acquired knowledge regarding X-rays and other phenomena which have been denied to the United States by the Nuclear Tests Ban Treaty. As a result, many authorities hold that Soviet defenses could, at the present time, drastically reduce the destructive capabilities of the current US family of ICBMs.	It is possible, through underground testing and extrapolation of past test data, to determine the efficacy of various anti-missile phenomena such as X-rays. There is no assurance, however, that Soviet ABM capabilities could reduce US offensive capabilities to any significant degree. For this reason, great effort is being applied to the improvement of US penetration capabilities.

YES	NO
While the cost of an ABM system appears excessive when compared to costs of improved offensive systems, the mere existence of Soviet ABMs has forced the United States into a costly program of warhead hardening, penetration devices, and increased emphasis on other improvements in its offensive systems. Since the Soviets have not had to contend with a US ABM system, they have not felt it necessary to initiate these costly and complex programs. They have been able to adhere to a simple, extremely large, high-payload missile while the United States has been forced into payload reductions to accommodate hardening and penaids.	It is widely held that about four times as much security can be purchased by investment in offensive missile improvements as could be secured by a like expenditure for an anti-ballistic missile system. In addition, a program aimed at further refinement of US offensive capabilities, rather than at the establishment of an ABM system, would make more effective use of US brainpower and technological resources. It would also add credibility to the US deterrent posture. Such a program is well within current US state-of-the-art, while the feasibility of developing an effective ABM defense remains doubtful.
Even if the best possible US ABM system was incapable of intercepting all incoming offensive missiles, it is possible that ABMs could provide important protection to vital industrial centers. Further, it is conceivable that the segment of the productive base which was preserved could provide a critical difference in the residual viability of the nation. Looking at the problem in this way, rather than considering that casualties might be reduced from 120 million to 60 million people, ABM installation appears no less important.	The prospects for preserving a major portion of the industrial base, in the face of an all-out thermonuclear exchange between the United States and the Soviet Union, are remote regardless of relative ABM capabilities. It is doubtful that more than a small percentage of Soviet ICBMs could be intercepted and destroyed. Those remaining would wreak massive destruction on the United States.

YES	NO
Unless an intensive US ABM program is initiated, it is likely that major technological breakthroughs in this field will accrue to the side which has made the decision to go ahead with ABMs. This, in turn, would enable them to outdistance US technology, reducing the probabilities of the United States ever regaining parity. The Soviets may already be decisively ahead.	As long as an active research and development program is underway in the ABM field, there is every prospect for keeping abreast of technological developments and perhaps achieving even greater progress than an opponent who has moved into active production and deployment. There are decided advantages to deferring actual production, as long as possible, in order to assure full utilization of the most recent technological innovations. The Soviet ABM system may already be obsolete.
United States strategy is predicated upon nuclear deterrence. In a confrontation with Red China or some nation other than the Soviet Union, which had even a limited ICBM capability, the US nuclear deterrent would be more credible if reinforced by an ABM system. US tactical nuclear weapons will be a far less credible deterrent against Red China's numerical military superiority when that country has the capability of holding one or more American cities as nuclear hostages.	In all probability, a defense against even the limited ICBM capability of Red China would prevent Peking from attempting to hold an American city hostage. Considering the cost, however, and the low probability that China would risk certain destruction by a nuclear confrontation with the United States, deployment of the ABM as a defense against China would be a poor national investment.
US allies overseas, who depend on the umbrella of US offensive weapons, would find a more credible assurance if the United States had a limited ABM capability. This is	In the event the United States deployed an ABM system for its own protection, countries such as France, Japan and West Germany could interpret this move as a

YES	NO
particularly true on the part of nations subject to threats by Red Chinese nuclear weapons. A credible US ABM system should serve to strengthen allied confidence in the United States nuclear umbrella.	return, by the US, to a "Fortress America" philosophy. This could lead to a shift away from reliance on US protection and is likely to induce non-nuclear nations to initiate nuclear programs.
Deployment of ABM systems by both the US and USSR might constitute a major deterrent to the proliferation of offensive nuclear missile systems by other nations. The significance of the British, French, and Red Chinese nuclear capabilities would be degraded in proportion to deployment of ABM systems by the super powers.	Existence of an ABM will, to some extent, degrade the capabilities of a nuclear opponent; however, there are other means of delivering nuclear weapons, some extremely primitive, against which even the most advanced ABM offers little or no defense. Such offensive weapons are now within the capabilities of smaller countries. It is doubtful, therefore, that proliferation can long be restrained.
Regardless of its quality, the Soviet ABM system is a powerful bargaining counter. If nothing else, the prospect for expanding it constitutes a "blue chip" which may be exchanged, in an arms control agreement, to improve the Soviet strategic position. Indeed it already appears to have had such an effect.	While it is true that the Soviet ABM system may have value as a bargaining counter, it would appear that they could have taken a more economical approach if that were a sole purpose. For far less than it has cost to deploy the current defensive system, they could have made major increases in their offensive delivery capabilities, which would have constituted an even better bargaining counter.
The psychological is as ten times to the physical. The continued existence of the Soviet	One of the hazards of over-reliance on any ABM system is the false sense of security

YES	NO
ABM system without a compensating defense for the United States may lead to a dangerously adverse degree of general US apprehension. Consider for a moment, the impact of a grapefruit-sized Sputnik in 1957 on American public opinion or the dropping of 15 tons of bombs by the Tokyo Raiders in 1942. In this light, it is difficult to estimate the psychological importance of Soviet missile defenses.	and overconfidence which its existence may generate. Willingness to take risks, even nuclear risks, might be far greater in a world in which ABM systems are popularly believed to provide security. The search for psychological comfort through installation of a US ABM defense could, therefore, result in the discovery of something more dangerous -- a propensity to gamble.

PROBLEMS

1. How to overcome the imbalance created by the Soviet deployment of a limited ABM system.

2. How to counter Soviet ABM deployment without triggering an expensive arms race.

3. How to avoid being victimized by "nuclear blackmail" without an ABM system as protection.

4. How to maintain US security against the possibility of an adventurous single ICBM attack from a third country.

5. How to convince the Soviet Union that an agreement to discontinue deployment or expansion of its ABM system is in its own best interests.

6. How to avoid being trapped in an arms control arrangement with the Soviet Union which may be detrimental to the best interests of the United States.

7. How to determine the form of guarantees to be required by the United States as protection against possible Soviet cheating.

8. How to establish appropriate procedures for policing an arms control agreement between the Soviet Union and the United States.

9. How to reassure the US public and allies that the US deterrent posture is not impaired by the development of new Soviet and CHICOM strategic capabilities.

10. How to reassure US allies that American nuclear guarantees are not invalidated by changing Soviet and CHICOM capabilities.

11. How to assure the Soviets and others that planned changes in US strategic forces do not reflect changes in US objectives but are only necessary measures to maintain deterrence.

12. How to reassure NATO allies that US forces are designed and planned to offer them protection on an equal priority with the United States.

13. How to reassure the world that the United States is interested only in peace but is determined to maintain an adequate strategic posture in the face of the continued Soviet and CHICOM threat.

14. How to provide adequate safeguards for the advancement of US technological capabilities, in the areas under restriction, during the periods of arms control.

QUESTIONS

1. Does the state-of-the-art in US technology provide an ABM system which is really capable of protecting US offensive capability and/or major target complexes?

2. If the United States decides against ABM deployment, can it stand up against the possibility of "nuclear blackmail"?

3. How would requirements for additional space launching facilities be accomodated without violating agreements?

4. What is the latest date on which the United States could accept a freeze on further production or deployment of strategic offensive/defensive weapon systems?

5. Are US unilateral intelligence means capable of detecting and identifying significant additions to Soviet strategic forces?

6. Will increased Soviet capabilities result in a more daring or belligerent national policy or actions?

7. How significant are Communist China's nuclear weapons and missile development programs?

8. What effect would future US ABM deployments have upon allies? e.g., FRG, Canada, UK, Nationalist China, Korea, the Philippines, and Japan?

SNK's notes from MOVE I, Apr 25. DECLASSIFIED

6-C

1. US will support German rearming politically - but not militarily.
2. U.S. will take advantage of low MT to resume testing for ABM
3. Will unite East Ger behind USSR.

4. NATO will oppose + not. German nuclear arming.

+

Objections:
Will use this ① to overcome reverses; and ② unite Communist World; and ③ Will seek to prevent German nuclear capabilities
④ Will seek to improve image with neutrals; &
⑤ Will seek to headoff US resumption - if testing.

Option I - Tough Line - Seek a confrontation to back down & humiliate US.
Option II - Conciliatory - conclude confrontation mistake - use it can
Option III - Mixed:
a) Hard Line - with Conciliatory Screen
b) Conciliatory Line - with Hard Screen.

Under Option I

1. Increase nuclear readiness
2. Berlin Blockade.
3. Message to NATO allies to disassociate from Crisis
4. Inform neutrals as in (3)
5. Communists to close lines
6. Offer renew Chinese Treaty.
7. Initiate discussions with France

Under Option II

1. Mobilize maximum pressure in West against entire —
2. Offer Strategic offense - Defense Freeze; E-W Troop withdrawal; Demolish Berlin Walls; and Unify Germany

Under Option III(b)

1. Invite resumption of neg on Freeze
2. LNTB still in effect 100 MT only a warning —
3. In absence of progress on arms control will have to deploy more weapons to East Europe + deploy others

Plus many others.

Recommendation

Option III (a)

First. 1. Mil preparatory measures under I but no challenge.

Then 2. Psychwar campaign - 100MT paratroop exercises - Crisis by violation of FRG of Brussels Treaty. Inviting NATO to dissociate themselves.

Then 3. Blockade of Berlin: - Call on Senate of Berlin to dissociate from FRG weapons program + of men from FRG. If they refuse, blockade all civilian traffic (not US military) + offer to supply needs from GDR.

Then 4. Another peace offensive - ~~if~~ tense in FRG breakdown.

Then 5. Selective bombing of selective German nuclear facilities with iron bombs.

[Control - No European country would face war on this issue & US would not face a nuclear war.]

Assessment of US position

1. US moved siege on 100 MT test as a pretext to resume testing
2. This moved helps US more than USSR.
3. US might seek accommodation with China
4. US say NATO not FRG
5. US might call for conf on unification of Germany

Softies

1. Preparation for testing
2. Tie number arms to level of tension & call for a Conference

WHITE HOUSE

URGENT URGENT URGENT

MUST BE DELIVERED TO:

Mr. S.M. KEENY

PRIOR TO 1200, 19 APR 67

EOB 286

~~SECRET-NOFORN~~

7a

BETA I & II – 67

FACT BOOK

PREPARED BY

JOINT WAR GAMES AGENCY
JOINT CHIEFS OF STAFF
WASHINGTON, D.C. 20301

APRIL 1967

~~SECRET-NOFORN~~

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~~SECRET - NOFORN~~

BETA I & II - 67

25 April - 16 May 1967

FACT BOOK

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BETA I & II - 67

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GENERAL INFORMATION

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GENERAL INFORMATION

POLITICO-MILITARY GAMES

1. General.

a. The Joint War Games Agency, Organization of the Joint Chiefs of Staff has three major divisions (See Attachment #1). Two of these divisions are concerned with problems of limited and general war; the third, the Cold War Division, is responsible for the preparation and conduct of inter-agency, politico-military games.

b. An annual program of games, as well as each individual game, is developed with assistance from interested agencies and departments. Responsible officials are contacted, by Cold War Division project officers, for ideas and suggestions in conducting research. Scenarios are then developed by interviewing knowledgeable people and identifying major issues and problems. An appropriate game organization is developed in preparing for the exercise. Efforts are made to obtain participants with detailed and expert knowledge of the subject to be examined.

c. JWGA's politico-military games are generally conducted on an interagency basis with participants from the principal organizations involved in national security planning. The emphasis in most games is on current or potential problems associated with international affairs.

d. Some games are conducted with high-level officials participating on "senior-level" teams, which review and discuss proposals developed by "action-level" teams. The exact format of each game varies according to the special requirements that may be posed but, in general, these are "desk" or "manual" type games in which teams, representing designated nations, meet and discuss a situation which has been portrayed in a game scenario. Each team develops: an estimate of the situation, objectives, strategies and specific actions (including contingency actions) to be taken in political, psychological, economic, technological or military areas, as well as an array of contingencies. These are included in the team's "move message". While the teams are deliberating, the game clock is stopped; time only "moves" after teams have

submitted their decisions (move messages) to the Control Group and it moves only to the extent determined by Control.

e. The Control Group, representing other nations, nature and fate, examines each team's "move message" and determines the positions of other countries and influences. Control may advance time a week, month, or perhaps years for the next move and will prepare a scenario projection outlining the new situation which requires the opposing teams to make new decisions. This process is repeated two or three times.

f. Joint War Games Agency Staff Officers serve as Game Staff Representatives (GSR) on each team. In addition to serving as a team member, the GSR provides administrative assistance to players. During deliberations, team requests for additional information are submitted through the GSR who determines whether or not a written message is required. Written messages are held to a minimum on administrative matters; however, queries of substance on which Control is required to make a ruling are reduced to writing.

g. Generally, these games are followed by a review and discussion which sometimes use video-tape presentations to summarize the action. Such meetings provide opportunities for many of the highest officials, from the agencies concerned, to exchange opinions, comment on hypothetical game events and discuss related "real life" questions.

h. Final game reports, disseminated in film briefings and in written form, serve as the basis for follow-on studies and actions. They are also useful for the analysis of contingency plans and often help in pointing up intelligence and other program requirements for various agencies, departments and miltary commands.

2. Gaming Philosophy.

a. The intent of politico-military games is to alert, inform, educate, and to stimulate new ideas and concepts. Games have maximum impact on those who participate -- the action-level players and seniors who review and finalize team decisions. The information and education process begins when the participants begin thinking about their impending role as a "Red" or "Blue" leader. Their review of material pertinent to the game

within their own agency, both factual and conceptual, is reinforced by reading the material which JWGA assembles. Generally, this includes information related to salient issues, problems and questions.

b. This process is continued in team meetings, during game play, as new facts and opinions are exchanged and controversial matters are explored. There is a degree of personal involvement in a politico-military game which transcends some of the more formal methods of consultation. The removal of restraints through the use of a hypothetical scenario projection out in time, the view provided from the "enemy" side of the conflict, and the element of competition in a "game," all tend to heighten the degree of interest and participation, especially in the crisis type of game.

c. These games are guided "brain-storming" sessions which begin uncovering ideas when the first research for the game is begun. The process continues through the game into the final review with the top officials in government, and it is still going on months afterward while film or video-tapes summarizing the game and written reports commenting on it are circulating throughout the government.

d. Politico-military games are never intended to be predictive -- at least in the aggregate sense. For example, some games will involve overt aggression; this is not intended to suggest that such aggression is likely to occur under the conditions depicted or, if it did occur, that the particular strategies employed by the enemy of the other "countries" involved are most probable or likely. The games must have a broad context in which to be played -- in effect a set of initial assumptions which may range in probability from highly unlikely to virtually certain. The events which occur during the game result from the inter-action of team and control players who may hold disparate views on much of the material involved.

e. The Control Group blends opposing team actions together under considerable pressure of time and is generally torn between an honest interest in evaluating the impact of opposing strategies -- acting as sort of a referee to assess the probable outcome of various confrontations in a predictive or probabilistic manner -- and posing additional problems to challenge one or more of the teams. Quite often Control puts

greater pressure on Blue, reflecting an interest in forcing the US to a "maximum effort." It is difficult, therefore, to assume that the outcome of one of these games reflects Control's unbiased and straight-forward projection of how things would have come out if actions similar to those taken by the playing teams were to be taken in real life. Actually, the Control Group in these games introduces material into the game not only for third countries, nature and other influences, but for the teams themselves. Sometimes this is done to get two conservative teams off "dead-center" and, at other times, simply to examine some thought-provoking idea. The main purpose of these games is to surface ideas, contingencies, wind-fall opportunities, hidden problems, and sometimes to examine controversial subjects relating to programs, objectives, weapons systems, etc.

3. Specific Functions of the Directorate, Control and Game Staff.

a. The Game Directorate is responsible for sparking and guiding discussions of the Control Group during its plenary meetings between the playing team deliberations. The Directorate solicits inputs from those members of Control who are particularly charged with suggesting the course of opposition strategy and the moves of various "third" countries and influences. It seeks consensus regarding the outcome of policies, programs and strategies adopted by "governments" represented by the playing teams, and supervises deliberations of the entire Control Group with a view to airing and examining major differences of opinion. Projections by Control should be based on serious and considered group opinion on the outcome of team moves in each game.

b. The Game Directorate is also responsible for leading discussion at post-game critiques with the object of further illuminating areas of major interest. Issues, problems and questions cited in the advance material provided to participants, represent typical subject matter for discussion at the review.

c. Control decides how far to "move the calendar ahead" for the next period of team deliberations and prepares appropriate scenario(s) describing intervening events. Ordinarily, information is withheld from each team in a logical manner based on probable intelligence capabilities and to that

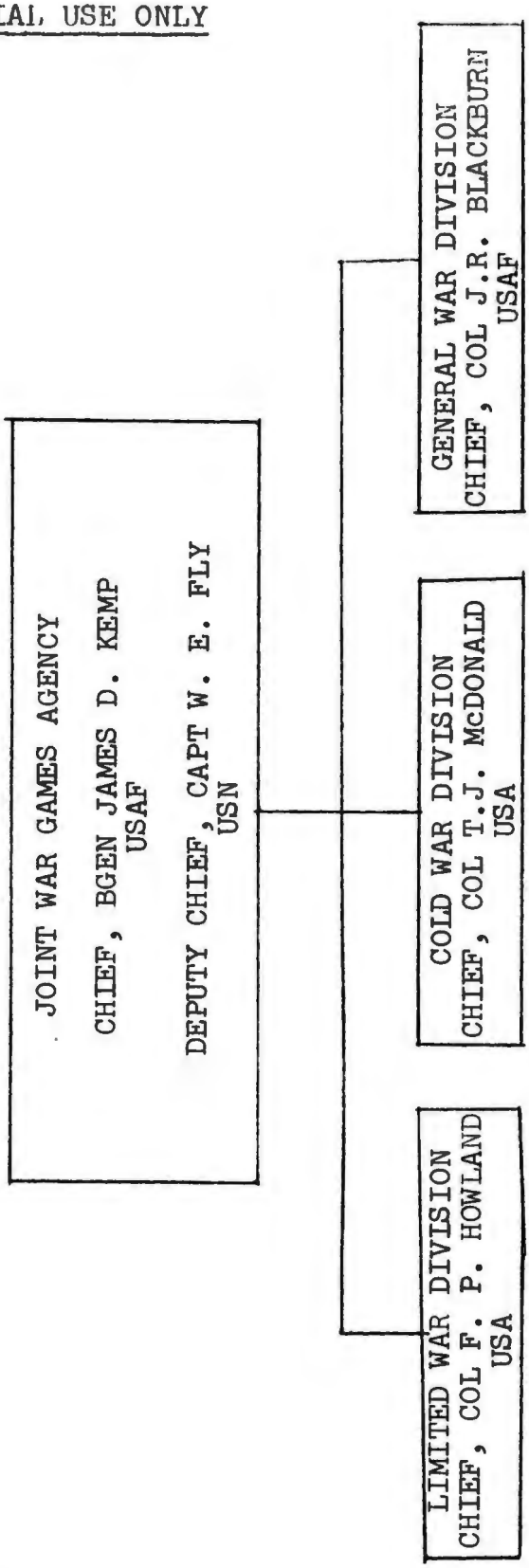
extent, at least, various team scenario projections will differ.

d. The Control Group constitutes a valuable sounding board in this process and each member is encouraged to state his views as forcefully as he wishes. The Directorate will try to achieve consensus on major matters.

e. While teams deliberate, a skeleton Control Group will be available to respond to specific queries regarding scenario matters. The "clock is stopped" during these periods and communication between teams will be minimal.

f. The Game Staff consists of members of JWGA's Cold War Division, as well as other individuals designated by cooperating agencies. They are full-fledged members of the teams or Control Directorate who have special responsibilities for briefing the teams on administrative and procedural matters, serving as liaison officers between teams and Control, ruling on technical points or obtaining Control guidance, and advising the Team Captain on such matters as format for team meetings, drafting and finalization of move messages. They are also responsible for introducing comments when appropriate to enhance the value of team deliberations. If it becomes apparent that a major logical option or probable contingency is not receiving adequate consideration in deliberations, the Game Staff Representative (GSR) is encouraged to raise the subject. Written messages should be held to a minimum on administrative matters; however, queries of substance on which Control will be required to make a ruling, will be reduced to writing. Appropriately colored message forms, arranged in packs of four copies, are available in game rooms for use in preparing messages. Typewriters are also available in each game room, however, legible hand-written messages are acceptable. Drafters should retain one copy of each message; the other three copies are passed to the Control Group through the Game Staff Representative.

g. GSRs will assist in preparations for Control meetings and participate in Control meetings to clarify team move messages and to assure that Control is fully responsive to team messages. They are also responsible for maintaining a day-to-day summary of team deliberations for purposes of post-game analysis and inclusion in the final written and videotape reports.



Attachment #1

7-f

BETA I AND II-67

GAME STRUCTURE, ORGANIZATION, CONCEPT AND SCHEDULE

1. (U) BETA I and II will be conducted in the Joint War Games Agency, Organization of the Joint Chiefs of Staff, game rooms (BC-942A) during the period 20 April through 11 May 1967 with a critique conference in Room 5C-1042 on 16 May 1967 (See Attachment #1).

2. (S) BETA I and II-67 will be conducted as two concurrent, senior-level games. In each game, one team will represent the United States (Blue), while a second team will represent the Soviet Union (Red). A single Control Group will represent all other nations, fate, nature, and other influencing factors. (See Attachment #2).

3. (U) The following organizations have been invited to participate in BETA I and II-67:

a. The White House Staff.

b. The Department of State.

c. The Department of the Treasury.

d. The Arms Control and Disarmament Agency.

e. The Central Intelligence Agency.

f. The National Security Agency.

g. The United States Information Agency.

h. The Department of Defense:

(1) The Assistant Secretary of Defense for International Security Affairs.

(2) The Assistant Secretary of Defense for Systems Analysis.

(3) The Director, Defense Research and Engineering.

(4) Organization of the Joint Chiefs of Staff.

(5) United States Army.

(6) United States Navy.

(7) United States Air Force

(8) United States Marine Corps

(9) Defense Intelligence Agency

(10) CINCLANT

(11) CINCNORAD

(12) CINCSAC

4. (C) Criteria for nomination of players and Control personnel are direct knowledge, experience and current responsibility for strategic offensive and defensive systems. Balance will be sought among political, military, economic (including logistics) and psychological experience in team organization. However, it is not intended that individual players should attempt to represent their agencies or to limit their comments to a particular area of expertise. Each player is expected to serve as a generalist while providing advice in those areas where he has special knowledge.

5. (U) The success of the game depends largely on the ability of playing teams to devise plausible and thought-provoking strategies and actions which advance interests of the government or group represented. Control is responsible for introducing logical, third country inputs and other influences and for making an honest evaluation of actions initiated by the various teams.

6. (U) The starting point for BETA I and II-67 will be set in a mid-range time frame. A scenario, setting the stage for game play, will be issued to participants prior to the game. Background information, contained in this Fact Book, is designed to supplement the initial game scenario. In addition, reference material, appropriate maps and other data will be available in game rooms.

7. (U) BETA I and II-67 are scheduled to begin with a briefing for the teams at 1000 and 1400 hours on Thursday, 20 April and for the Control element at 1000 hours on Monday, 24 April, in Room BC-942A, the Pentagon.

8. (SNF) At 0930 hours, Tuesday, 25 April, 2 and 9 May 1967, players on the United States and Soviet teams will meet in the Pentagon facilities of the Joint War Games Agency, Room BC-942A. Each team will discuss its initial scenario. Seniors will meet with their teams at 1400 hours on each of these dates to be briefed on team estimates, objectives, strategies, tactics, and options. Seniors will give guidance and make decisions on the proposals offered by their teams and depart at 1530 hours. These discussions, briefings, and decisions, will lead to preparation of a team "move message". Game staff Representatives will provide specific guidance for move message format. Messages will be prepared on appropriately colored forms available in the game rooms. Players will remain until released by team captains.

9. (U) A "skeleton" Control Group, consisting of Game Staff Representatives and selected Control members, will meet on 25 April, 2 and 9 May to handle scenario questions generated by playing teams. Plenary meetings of the Control Group will be held at 0930 hours on 27 April, 4 and 11 May.

10. (U) A critique for action-level players will be conducted at 1030 hours, 16 May 1967, in Conference Room 5C-1042. A senior critique of the game will be held in Room 5C-1042, at 1400 hours, 16 May 1967. Senior critique participation will include all game participants.

11. (U) An unclassified game schedule, in calendar form, is included at Attachment #1 for the convenience of game participants.

BETA I AND II-67

GAME SCHEDULE

APRIL 1967

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
17	18	19	20 Pre-Game Briefings 1000 - Red 1400 - Blue	21
24 Pre-Game Briefing 1000 - Control	25 Move I 0930-1730 action level 1400-1530 seniors *	26	27 0930-1600 Control Meeting	28

MAY 1967

1	2 Move II 0930-1730 action level 1400-1530 seniors *	3	4 0930-1600 Control Meeting	5
8	9 Move III 0930-1730 action level 1400-1530 seniors *	10	11 0930-1600 Final Control Meeting	12
15	16 Critiques 1030-1200 action players 1400-1530 * action & seniors	17	18	19

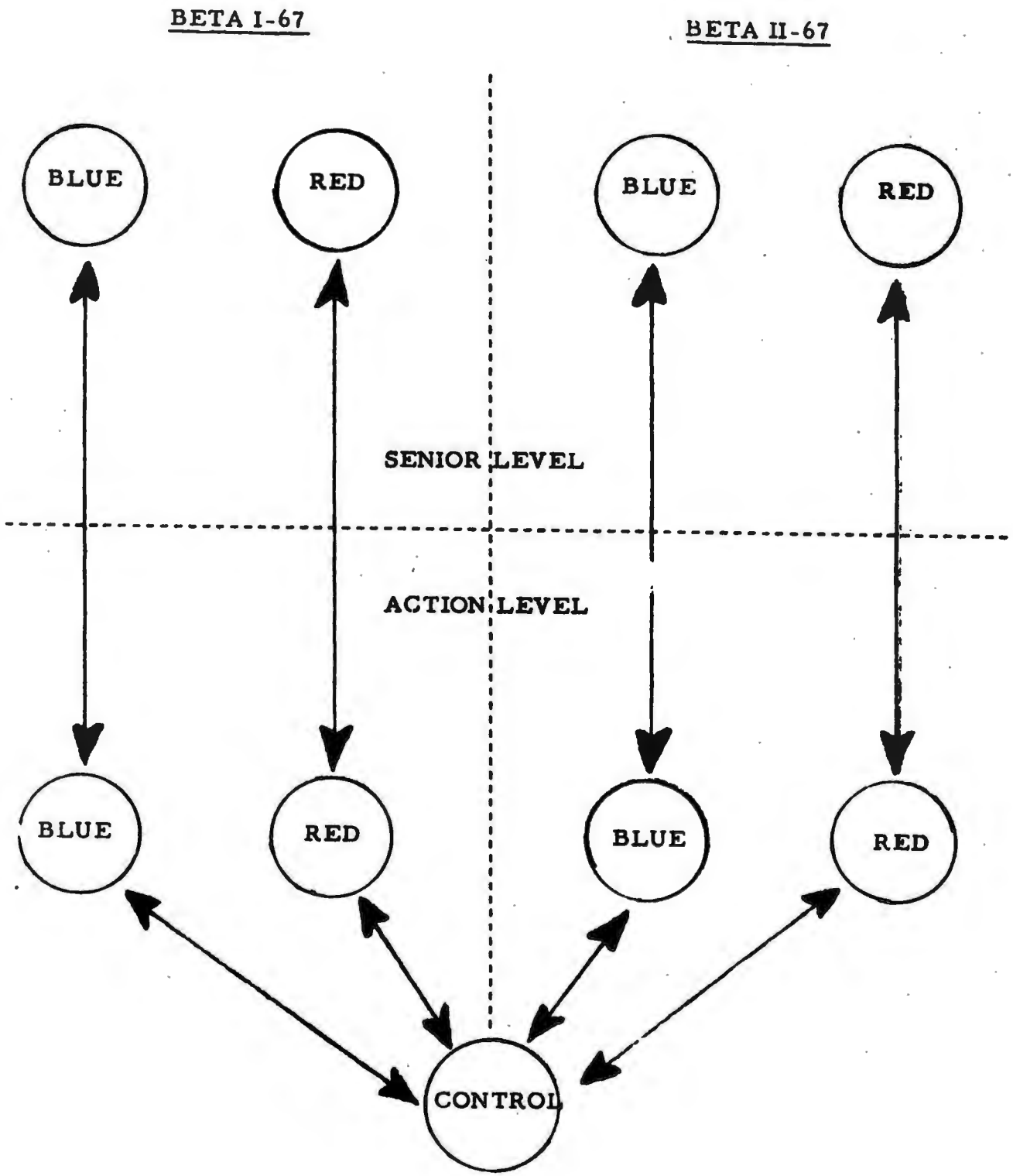
*Guides will be available at River Entrance to escort seniors to their destination.

Attachment #1

7-9

BETA I and II-67

GAME STRUCTURE



BETA I AND II-67

ADMINISTRATIVE INSTRUCTIONS

1. Transportation/Parking

a. There is a minimum of parking space available at the Pentagon. Participants from agencies outside the Pentagon are encouraged to use government or commercial transportation. Passes for use on Department of Defense buses may be obtained for civilian game participants.

b. For those who must drive, "Visitor Parking" areas are located in South Parking, Lanes 12, 13, and 7A (three hour limit, and around the border of South Parking (five hour limit after 8 AM). (See Attachment #1) This area is limited and at least 30 minutes should be allowed to obtain a space. Parking limits in Visitor Parking in Lanes 12 and 13 can be extended only by advising a JWGA representative of the parking lane number, license number, make, model, color and year of your car.

c. Temporary parking passes may be obtained by advising the Cold War Division of requirements prior to game play. Spaces in temporary pass areas are not specifically assigned, and more passes are issued than available spaces; therefore, early arrival is necessary to assure a parking space.

2. Directions to Game Location

Game rooms are located in BC-942A, the Pentagon, and can be reached by the following routes:

a. From Concourse to BC-942A: Descend Stairway 93D (located along left side of the bank) to the basement and follow directional signs marked "Joint War Games Agency".

b. From River Entrance to BC-942A: Descend escalator and follow directional signs marked "Joint War Games Agency".

c. Guides will be available to escort seniors from River Entrance, The Pentagon, to Game Rooms.

3. Security

a. Politico-military games are played, for the most part, at the SECRET-NOFORN level. Material discussed in game

rooms may be TOP SECRET and all participants must be cleared for TOP SECRET information. Confirmation of clearances in writing is requested of all agencies prior to the game.

b. The title of the games BETA I and II-67, is unclassified when mentioned without subject reference. Discussion on the subject or scope of the games is classified SECRET - NOFORN.

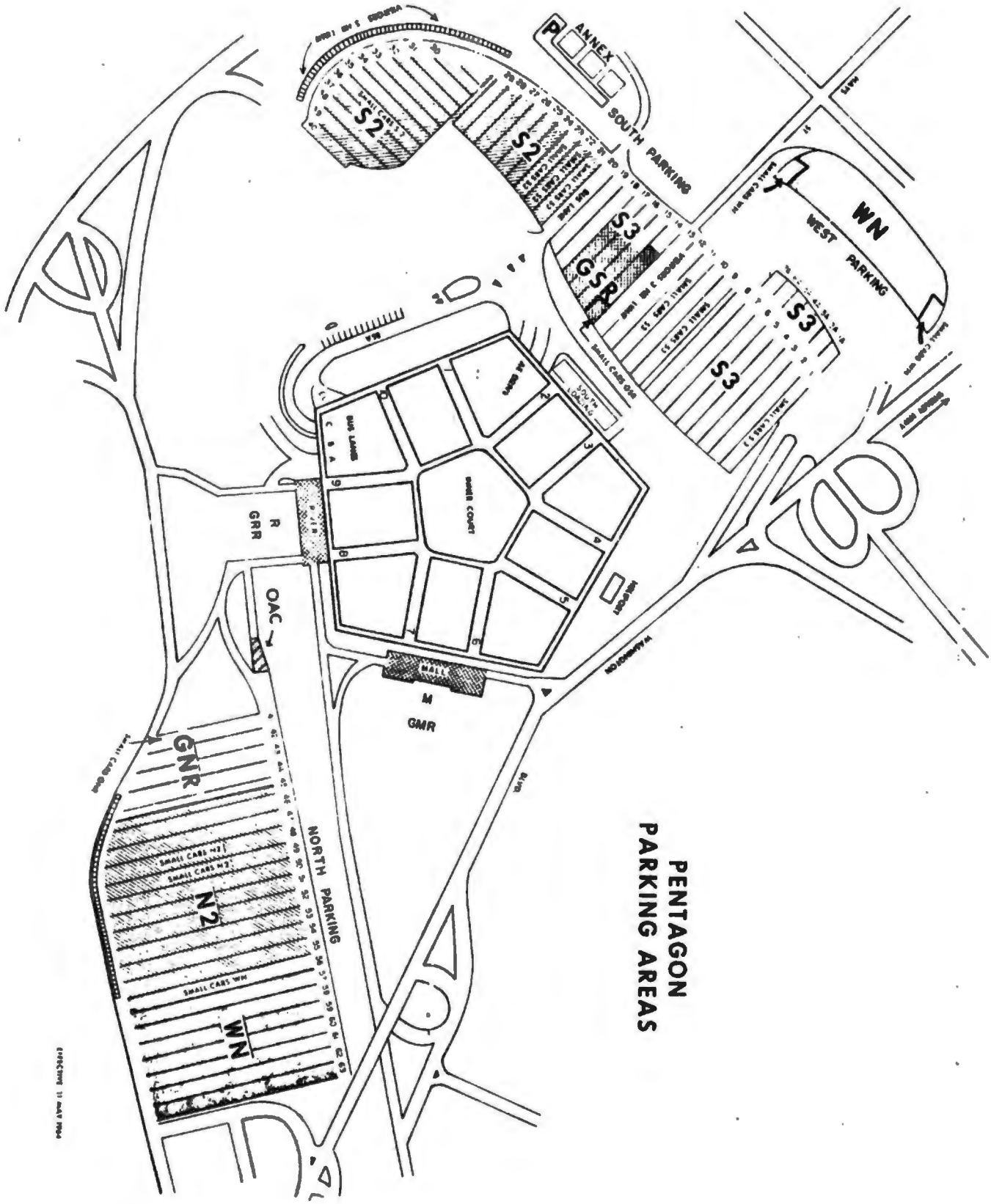
c. Game deliberations and team plans should not be discussed outside the game rooms until the games are over. A security leak between teams could influence the course of a game and reduce the value of the outcome.

4. Administration

a. During the conduct of the game and the critique, participants may be reached by telephone at Code 11, Extension 79860 or 57683 (from civilian phones, call OX 7-9860 or OX 5-7683).

b. A final report will be prepared for distribution to interested agencies and game players.

c. Preparations for the game are directed by Colonel Thomas J. McDonald, USA, Chief, Cold War Division. In the event of questions, comments, or need for further assistance, call Code 11, Extension 79860 or 57683 (from civilian phones call OX 7-9860 or OX 5-7683.)


P
ANNEX
SOUTH PARKING
S2
S3
WN
WEST PARKING
R
GRR
OAC
INNER COURT
M
GMR
GNR
N2
WN
NORTH PARKING
PENTAGON
PARKING AREAS

Attention—Drivers of Automobiles
The Pentagon Parking Areas

INSTRUCTIONS

Parking in Pentagon parking areas is a privilege and not a right of the individual. All instructions and regulations are promulgated to protect, insofar as possible, the parking privilege granted to permit holders and others. As a privilege it may be withdrawn if abused by failure to comply with instructions and regulations.

Permits may be issued to Pentagon and Annexes 1, 2, 3 occupants for specific automobiles and are not transferable, unless utilized by an authorized car pool. The permit is Government property and as such must be returned to the parking control officer upon cancellation, invalidation, resignation of the original permit holder, or transfer of the permit holder, from the Pentagon or Annexes 1, 2, 3. A parking permit is valid only when the control card and permit reflect the individual's current vehicle state license number and license numbers of all car pool members. Lost or stolen permits must be reported immediately to the parking control officer. A permit holder may apply for a new permit in such cases.

Permit and Corresponding Parking Restrictions

Permits	Sections
B-1	Lanes *1, 2, 3, 4, 5, 6, 7, 8, *9, 10, *11, 14, 15, 16, 17, 18, 19, 20, 21, 22, 50, 60, 70 *Small Car Lane
B-2	Lanes *31, *32, *33, 34, 35, 36, 37, 38, 39, 30, 31, 30, 33, 34, 35, *36, 37, 38, 39, 40 *Small Car Lane
B-3	Lanes 45(no carpool), 46, 47, *48, *49, 50, 51, 52, 53, 54, 55, *56(no carpool) *Small Car Lane
C&R	Lanes *41, 42, 43, 44, 45(no carpool) *Small Car Lane
M-B	West Parking Area (center)(Small car as marked) and North Parking Area Lanes *56(no carpool thru 6) *Small Car Lane
No Permit Required	Visitors sections Lanes 12, 13 South Parking Area - 3 Hour Limit; North Porter Road - 5 Hour Limit Enforced hours stated on signs.

By Direction of Police Certain spaces on the Mall and River Terraces set aside for official, diplomatic, and Congressional automobiles, and certain other visitors in a VIP category not to exceed 2 hours

Between 4:30 and 5:30 p.m., no right turn will be permitted from Lanes 50 through 60.

Parking spaces at the Pentagon are limited and, therefore, it is impossible to provide parking space for all those who desire to park. Newly assigned and temporary duty personnel, those who do not have permits and visitors who plan to remain longer than 2 to 3 hours, are encouraged to use commercial transportation.

In order that parking spaces may be provided for as many individuals as possible, it is suggested that all efforts be made to form car pools. Permits are not transferable in car pools unless authenticated and recorded. See your parking control officer.

Authority: Memorandum for the Secretary of the Army from the Office of the Secretary of Defense, 28 October 1948, subject: "Parking Control".

REGULATIONS

GENERAL SERVICES ADMINISTRATION

Pentagon Area Traffic and Parking Regulations

Vehicle Parking

The following regulations apply to the parking and operation of vehicles in the Pentagon area:

1. No person shall operate or park a motor vehicle in the parking areas of or on the roads adjacent to the Pentagon contrary to these regulations or to the directions of police officers on duty or to the directions of posted signs.

2. The provisions of subparagraphs a. to d. of this paragraph are applicable from 7:30 a.m. to 6:00 p.m., Monday through Saturday, and 7:30 a.m. to 1:30 p.m., Sundays and Holidays except at the Mall and River Entrances where these provisions will apply 24 hours daily, Monday through Sunday. Directions by police officers on duty will apply at all times.

   a. A valid parking permit is required for parking in all sections of the Pentagon parking areas, except as indicated in subparagraphs c. and d. of this paragraph and must be conspicuously displayed inside front windshield of the vehicle behind the rear view mirror. (For the purposes of the regulations in this part a valid parking permit is a permit issued by a department parking control officer to park a specific vehicle identified by license tag number in a designated parking section of the Pentagon parking area. The permit is not transferable except in the case of a properly registered car pool. The permit is automatically invalidated upon the resignation of the permit holder or cancellation by a parking control officer, change in license tag number, damage or mutilation of the permit, or loss or pilferage of the permit.)
   b. Parking in any section other than that which corresponds to the permit assignment is prohibited, with the following exception: A person with an authorized parking assignment in any section other than those designated "V-N" may park in a V-N section when space is not available in his assigned section. In such a case, the circumstances shall be reported to the department parking control officer. A person with an authorized parking assignment to a V-N section may not park in any other section.
   c. Motorcycles, motor bicycles, motor scooters, and all similar type motor vehicles shall be parked in Lane 19 only. No parking permit is required.
   d. No parking permit is required for parking in sections identified by posted signs as reserved for visitors,* or reserved for the exclusive use of Congressional, diplomatic, or official representatives. A special "Press Permit" is required for parking in sections reserved for press representatives. Parking in sections reserved for visitors shall not exceed the time limits indicated by posted signs at these locations, except by special permission of the police officer on duty.
3. Vehicles shall be parked well inside the marked parking spaces. Parking in areas other than designated parking spaces and parking in parking lanes at tow walls or in such a manner as to block or partially block such lanes is prohibited.
4. No vehicle may be parked in excess of 18 hours in one location, unless prior permission for such extended parking has been obtained from the Captain, U. S. Special Police, Pentagon Building.
5. No vehicle shall be parked or operated in bus lanes, except as follows:
   a. Authorized transit buses in Lanes A and B.
   b. Authorized official shuttle buses in Lane C.
   c. Taxis in Lane C.
   d. Commercial and official vehicles authorized to make delivery to concessionaires and the post office while loading and unloading at specially designated platforms in Lane C.
6. No vehicle shall be parked on interior roads except as follows:
   a. Commercial vehicles, either official or private, while unloading and loading authorized supplies.
   b. Official cars transporting prisoners under guard.
   c. Other specially authorized vehicles.
7. In any case charging a violation of these rules and regulations governing the parking of a vehicle, proof that the particular vehicle involved in such stated offense was parked in violation of such rules, together with proof that the party charged with the offense was the registered owner of such vehicle at the time of such parking, shall constitute, in evidence, a prima-facie presumption that such registered owner of such vehicle was the person who parked or placed such vehicle at the point where, and for the time during which, such violation occurred.

Pedestrian Traffic

Pedestrians shall not walk in roadways in and immediately outside the bus terminals, on the curb alongside stairways in bus lanes, or in other areas where such action is prohibited by posted signs.

Penalties

Whoever shall be found guilty of violating these regulations shall be fined not more than $50.00 or imprisoned for not more than thirty days, or both.

Authority

These regulations are promulgated, pursuant to Public Law No. 566, 80th Congress, approved June 1, 1948 (40 U.S.C. 318) and the Federal Property and Administrative Services Act of 1949 (63 Stat. 377) as amended, as a supplement to the "Rules and Regulations Governing Public Buildings and Grounds", approved by the Administrator of General Services, August 23, 1956, 44 CFR 101-1.13 (21 F. R. 6408).

Dated: September 11, 1958

*Only nonoccupants of the Pentagon and Pentagon Annexes are recognized as bona fide visitors, except that newly assigned personnel shall be regarded as visitors on their first day of duty.

D-27060

ISSUES, PROBLEMS, AND QUESTIONS

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BETA I & II-67

ISSUES, PROBLEMS AND QUESTIONS

The "Issues, Problems and Questions" Section of the BETA I & II-67 Fact Book will be issued to all game participants under separate cover.

CRISIS CHRONOLOGY

1

5/23/67

TO: Ed Roberts (thru Harry Beach)

Would you be good enough to file this "BETA War Games" folder in "SMKeeny, NSC Staff Member" files. Thanks ever so much.

Jean Barker

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CRISIS CHRONOLOGY

The material contained in this section is drawn from open source material except where noted. It does not represent policy statements or intelligence estimates of the United States.

CRISIS CHRONOLOGY

1944 Germans develop "robot planes" called V-1 and V-2. Launch site on Cherbourg Peninsula overrun by allies V-1 and V-2s fall on London. Widespread rumors indicate Germans developing V-3 with secret warhead believed to be an atomic bomb.

1945 United States drops atomic bombs on Hiroshima and Nagasaki. Bishop Oxnam and John Foster Dulles ask suspension of atomic bomb use. Soviet press urges atomic knowledge pooling and hints at international race to better US bomb. Major General Leslie Groves states that there is no defense against the bomb.

1946 Tidal wave of world opinion calls for control of mass destruction weapons. Moscow radio claims US Bikini tests are contributing to arms race. UN attempts to establish arms control, frustrated by arguments over control procedures, etc. US War Department establishes AAF 1st Experimental Guided Missiles Group to develop robot bombs and guided missiles. Major General Hasbrouch reports US Army experts see effective intercontinental missile ten to fifteen years away. Top-rank German scientists revealed to be working on various projects in both the United States and the USSR.

1947 Gromyko hints at development of weapons by USSR to offset US atomic monopoly. Mutual distrust, accusations, and counteraccusations continue to frustrate arms control negotiations in the UN. The United States and Great Britain demand international inspection system as prerequisite for general disarmament. Attempts made to consider atomic and conventional weapons separately. Secretary of State reports US will not repeat unilateral disarmament of 1921. US missile test program largely based on captured German rockets.

1948 East-West polemic reaches new noise level in United Nations although UN Conventional Armament Committee achieves some meaningful discussion but virtually no agreement. Committee adapts report holding disarmament impossible now. Berlin blockade by USSR overcome by massive airlift. US conducts Eniwetok test series.

Paris Figaro reports unsuccessful bomb test by USSR in Ural Mountains. Secretary Forrestal tells US Congress that Soviets know how to make bomb, but lack industrial capacity. Soviets continue to hint that they have the bomb.

1949 The USSR explodes its first atomic bomb. United States accused of contributing to Soviet development by lax security, such as the Coplon affair . World confident that US will maintain atomic primacy, but political and psychological impact of Soviet bomb not overlooked. United States reports blast detector with world-wide range. US missile program scores successes with WAC Corporal and Aerobee rockets. USSR said to be making similar progress aided by German scientists. USAF continues to equip strategic fleet with B-36 intercontinental bombers. XB-47 Stratojet sets coast-to-coast speed mark at 3 hours 46 minutes.

1950 Efforts toward disarmament and banning the bomb continue while military analysts turn out plethora of comparative studies of East-West military postures. Dr. Albert Einstein calls US-USSR arms race "hysterical" and sees it barring peace. Both sides accuse each other of duplicity and cynicism. The war in Korea provides world's first air battle between jet aircraft. Experts doubt man can survive at supersonic speeds. President Truman orders AEC to manufacture a hydrogen bomb, re-kindling open dispute and threat of "scientists' revolt." Reports indicate USSR following similar program. Possible effects of radioactivity concerns the entire world.

1951 Western "Big Three" blame high force levels in USSR Bloc for world tension. France charges USSR has five-million man force. Secretary Acheson assures USSR that Korean cease-fire is only specific political condition for implementing disarmament plan. Electric Boat Company builds hull for atomic-powered submarine. Nevada test series lay groundwork for tactical weapons. Deliveries begin on all-jet B-47 while USAF receives prototype XB-52. USSR equips selected units with twin-jet bombers.

1952 UN Assembly, 42-5, approves Western Big Three proposal; creates Disarmament Commission. USSR Minister Vishinsky scores it and offers counterproposal. US Army reveals 280mm gun capable of firing atomic rounds. USSR downs US B-29 off Kuriles. Charges B-29 violated frontier near Yuri, Kuriles. USSR aircraft inventories reported 5,000 greater than that of the United States. US Navy uses guided missiles against North Korea, first such operation in actual war. President Truman lays Nautilus' keel. General Electric to build nuclear power plant.

1953 President Eisenhower offers 5-point disarmament plan that could follow proof of USSR peaceful intent. Vishinsky revives USSR proposal for unconditional ban on weapons of mass destruction. USSR claims to have H-bomb. President Eisenhower obliquely confirms the story and reveals that the US has several H-bombs in megaton range. End to Korean War negotiated. Keel for Sea Wolf laid. Third nuclear submarine planned. US announces first Nike battery will be installed at Fort Meade to protect Capital, Baltimore, and military and industrial targets.

1954 Sir Patrick Dixon (GB) formally proposes creation of subcommittee of US, Great Britain, France, Canada, and USSR to study disarmament. Vishinsky proposes: Communist China, India, and Czechoslovakia membership. President Eisenhower announces US military formula based on more atomic power, less manpower. John Foster Dulles coins phrase, "massive retaliation." Japanese fishing boat crewmen burned by radioactive dust from US H-bomb in megaton range detonated at Eniwetok. Nautilus commissioned. New Tupolev 4-jet intercontinental bomber revealed at May Day flyover, Moscow. Gradual replacement of B-29s and B-50s by B-47s continues. US and German scientists say USSR may lead US in rocket and missile development. West Germany integrated in Western European defense through expansion of Brussels Treaty and NATO. USSR says West German rearmament would prevent accord on German reunification.

1955 President Eisenhower appoints Harold Stassen his special assistant on disarmament problems. Eisenhower proposes "open skies" program. Bulganin rejects proposal but lauds Eisenhower sincerity. Holds both countries so large that anything can be hidden. Pope urges end of nuclear tests. Hammarskjold opens Geneva Conference on Peaceful Uses of Atomic Energy. Senate leaders demand review of US strength in aircraft vis-a-vis the Soviets. Hansen Baldwin sees US accelerating ICBM missile development as result of USSR development of ballistics type with 600-800 mile range. US announces plans to orbit earth satellite during International Geophysical Year. Critics see little value in plan.

1956 Khrushchev holds USSR ready to end H-bomb tests and cut arms budget pending general disarmament accord. Stassen proposes US and USSR designate 20,000 - 30,000 square-mile area where measures could be tried out as confidence-building step. Stevenson says, if elected President, his "first order of business" will be to seek accord to end H-bomb tests; says he would go anywhere and consult with anyone to break deadlock and find new start for peace search. John Foster Dulles holds events in Eastern Europe do not justify cutting forces or armaments, as Soviets brutally put down revolt in Budapest. Soviets start new nuclear test series with high-altitude burst over Central Asia. US tests at Eniwetok include small, efficient, and "clean" H-bomb. USSR reported to be out-producing US in aircraft. B-52 output increased to push re-equipping of SAC. Convair XB-58 makes its first flight. Jupiter missile launched from Patrick AFB reaches 650-mile altitude and travels 3,300 miles at 15,000 mph, over twice height and speed of any previous man-made object.

1957 The Space Age is born as Soviets orbit first man-made object, a 184-pound satellite called "Sputnik." Recrimination mounts in US over lag in space. Grave concern mounts world-wide over political and military impact of Soviet feat. US rushes Vanguard project. Powers shot down over USSR while on U-2 sortie. Incident breaks up Summit Meeting as Khrushchev walks out. Yearlong efforts to achieve nuclear test moratorium frustrated by virtual impasse on conditions. USSR

and US continue nuclear test programs as Great Britain becomes world's third H-bomb power with "weapon" exploded at high altitude over Christmas Island.

1958 Gromyko announces USSR decision to halt nuclear tests unilaterally, asks US and Great Britain to follow suit; says USSR will resume tests if lead is ignored. Eisenhower calls USSR tests halt a "gimmick" for propaganda purposes, dismisses move as a fraud since it does not provide for inspection. Both USSR and US agree to technical talks in Geneva on tests ban. Eisenhower says US will halt nuclear tests on year-by-year basis if USSR will not resume tests. US successful in launching its first earth satellite, "Explorer." USAF announces it will launch a prototype reconnaissance satellite. USSR orbits 3,000-pound vehicle. Growing concern in US over "missile gap" causes Eisenhower to push ICBM program. "Atlas" accomplishes first full-range (6,325-mile) flight by US ICBM.

1959 Talks on nuclear test ban continue in Geneva, focus on issues of detection and veto. Both USSR and US continue to honor voluntary suspension of tests. US names seven military pilots to be trained as "Mercury" astronauts. USSR successfully orbits and de-orbits dogs; also hits moon with rocket. George Washington is commissioned, first ballistic missile-firing craft. General Maxwell D. Taylor and Admiral Arleigh Burke express concern over US reliance on retaliatory weapons. Fear of Soviet superiority in ICBM widespread as first Atlas becomes operational.

1960 France becomes fourth nuclear power with explosion of H-bomb in Sahara. Geneva talks continue in atmosphere of uneasy de facto nuclear test moratorium. Presidential candidates Kennedy and Nixon pledge to continue voluntary test suspension if elected. Space feats of Soviets, coupled with US failures, continue to convince most of the world of Soviet superiority in space. USS Enterprise, first atomic-powered carrier and largest ship ever built, launched. USS Triton completes first submerged voyage around the world. US intelligence estimates see USSR with at least 150 ICBMs operational in 1961, for at least three-to-one superiority. Khrushchev warns missiles come off assembly line "like sausages."

1961 President Kennedy delays resumption of talks at Geneva to study issue further. Kennedy and Khrushchev meet in Vienna. Conference ends in controversy over USSR demand for veto over tests ban control. USSR resumes nuclear testing in the atmosphere with weapons in the 60-megaton range. USSR wins race to achieve manned space flight by putting Cosmonaut Yuri Gagarin into orbit and bringing him safely back to earth. US launches 3,500 pound experimental missile-detection satellite (MIDAS) into nearly circular 1,850-mile-high polar orbit. US suffers great loss of prestige in wake of failure at Bay of Pigs. Soviets successfully intercept ICBM warhead over Aral Sea using nuclear tipped warhead. US successfully fires first Minuteman and silo-positioned Titan while latest intelligence estimates show US leads USSR in combat-ready ICBMs and has averted predicted 1962 missile gap.

1962 US resumes nuclear testing in the atmosphere while talks at Geneva grind on, blocked primarily by disagreement over the modalities of detection. Soviets continue to test huge weapons over Novaya Zemlya. US and USSR in major confrontation over positioning of Soviet offensive missiles revealed by US aerial reconnaissance of Cuba. US-imposed blockade of ships bound for Cuba produces peace formula. Khrushchev pledges USSR to stop work on bases, dismantle weapons and take them home under UN supervision, while Kennedy agrees to lift blockade and not to invade Cuba. Khrushchev claims USSR anti-missile missile can "hit fly in outer space." Kennedy says US has anti-missile missiles equal to USSR's, but holds neither has adequate defenses against massive nuclear attack. Kwajalein-based missile intercepts nose cone of Atlas ICBM fired from California. Defense Department officials still doubt system can cope with mass attack. USSR lead in booster evident as Soviets launch 1,970-pound Mars probe from satellite in parking orbit around earth.

1963 Harriman, Gromyko, and Hailsham initial US-USSR-British treaty to ban nuclear tests in atmosphere, space, and under water. DeGaulle rejects French adherence to tests ban treaty; urges curbs on nuclear delivery systems instead. Treaty ratified by US after serious, dissenting voices heard. Goldwater concerned

over possibility USSR could encourage or participate in Chinese tests without detection. Mansfield calls treaty "flicker of light where there has been no light." Dr. Edward Teller holds treaty will impede US anti-missile missile development. US begins to make strides in space race as Mercury program progresses well. Soviet anti-missile missile displayed in Moscow parade. Western experts skeptical as weapon appears designed for intercept in the atmosphere.

1964 Communist China tests air dropped nuclear weapon. US offers to burn 480 B-47s if USSR will burn 480 TU-16s. U Thant proposes five nuclear powers, including China, meet in 1965 to discuss total test ban and ways to prevent nuclear weapons' spread. Gemini series begins. President Johnson reports US has operationally-ready anti-satellite system. "Ranger" transmits 4,320 pictures of the moon. US commits combat troops in Southeast Asia.

1965 UN Disarmament Committee, 89-0, approves resolution urging assembly to call world disarmament conference that would include Communist China. US and USSR discuss nonproliferation accord. White House Citizens' Committee under Dean Wiesner and R. L. Gilpatric urges 3-year moratorium by US and USSR on production and deployment of anti-missile systems to avoid new missiles arms race. Red China rejects role in world disarmament conference proposed by UN. Gemini program achieves major successes as US apparently overtakes USSR in race to the moon. Soviets introduce new anti-missile missile in Moscow parade. System being deployed around Moscow. US delays decision to build anti-missile missile system while continuing research and development.

Jan 1966 Secretary McNamara (according to the published section of his testimony before the House Armed Services Committee investigating the planned retirement of two-thirds of the strategic bomber force) says that US missile forces would be more than enough to inflict "an unacceptable degree of destruction on both the Soviet Union and Communist China simultaneously." McNamara outlines Pentagon studies of an antimissile defense system and says system would be too expensive for the good it would do against threat of Soviet

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Union. He says he favors a "light" system to cope with the Chinese threat in the next decade. Disarmament conference reconvenes in Geneva.

Feb 1966 — Soviets successfully land "Luna 9" vehicle on the moon. Premier Kosygin (in policy message to the 17-nation disarmament conference in Geneva) repeats offer that the Soviet Union would not be the first to use nuclear weapons, providing the other nuclear power would make the same commitment. Powerful underground nuclear explosion Semipalatinsk (Soviet Central Asia) detected by Sweden. Soviet press for nonproliferation treaty.

Apr 1966 — US Navy recovers intact a US hydrogen bomb from the Mediterranean which had been lost off the coast of Spain when two US aircraft collided during a refueling operation.

Aug 1966 — At Geneva, the US asks the Soviet Union to agree to a freeze in existing levels and kinds of nuclear weapons carriers. The USSR charges US is blocking passage of nonproliferation treaty. The conference recesses and is expected to meet again in early 1967. Lunar Orbiter I, launched August 10, moves into orbit; it is the first US satellite to orbit the moon.

Nov 1966 — Soviets conduct long-range missile tests into the Pacific. Secretary McNamara declares, at a news conference, that the Soviet Union has developed and is deploying an antiballistic missile defense system. *(US intelligence community agrees that ABM system being deployed around Moscow is effective and should be operational by winter of 1967-68. Experts disagree on role of TALLINN system being deployed in other parts of the USSR). He reports that he has recommended to President Johnson that the US produce and deploy the submarine-launched Poseidon missile. Soviet military leaders publicly disagree as to the effectiveness of their own ABM system.

Dec 1966 — At a news conference, Secretary Rusk expresses the hope that the US and USSR will not deploy anti-missile defense systems.

*Material within parenthesis drawn from sources classified SECRET - NOFORN.

Jan 1967 — At a White House ceremony, sixty-two nations sign the first international treaty governing the exploration of space. The new US Ambassador to the Soviet Union, Llewellyn E. Thompson, arrives in Moscow. Thompson reported to have mission of negotiating on ABM ban. Three astronauts of Apollo I mission are killed in a flash fire in the cockpit of the space ship.

Feb 1967 — US Defense budget includes contingency fund of $377 million earmarked for initial deployment of ABMs in the event negotiations with the Russians to bar such weapons fail. Geneva convention reconvenes.

Mar 1967 — Disagreement on ABM deployment decision between Secretary McNamara and the Joint Chiefs of Staff featured by several US journals.

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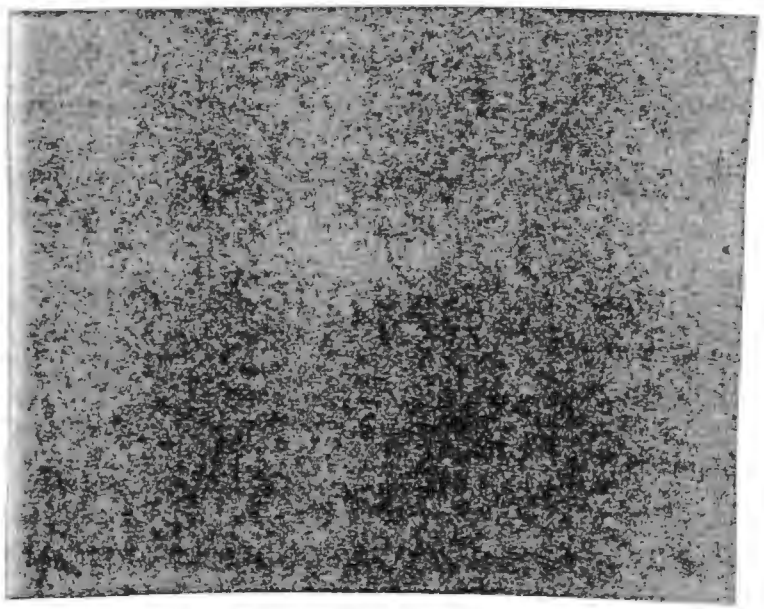
COMMUNIST STRATEGIC CAPABILITIES

This section contains performance and deployment data on the Communist strategic arsenal. The first portion consists of four articles covering recent trends and developments in Soviet anti-ballistic missiles, strategic rockets and long-range aviation. The second portion contains handbook information on the major strategic weapons systems of the Communist World.

Most of the information presented has been compiled from publications of the Defense Intelligence Agency.

SOVIET ABM's

POSSIBLE DEPLOYMENT CAPABILITIES



PAGES D-3,4,5,6,7,8,9,10,11,12 and 13 entirely sanitized.

Changing Times

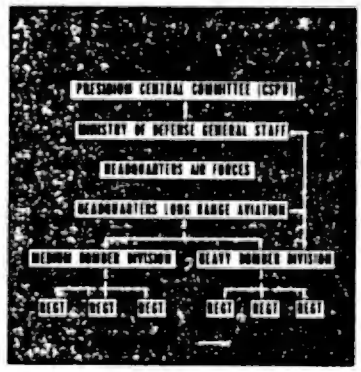
SOVIET LONG RANGE AVIATION COMPLEMENTS MISSILE FORCE

This organization will be important in Soviet mixed-force plans until at least mid-1970's; medium bomber, Badger, still is the backbone; although only the heavies could accomplish a return-flight attack against the United States, a one-way assault using the mediums is not an impossibility

Long Range Aviation (LRA)—the Soviet air element roughly comparable to the United States Strategic Air Command—for many years enjoyed the "prestige" of being the sole strategic threat against the Western World. This position has been changing gradually over the last 10 years as Soviet dependence on LRA has been successively reduced: First in 1956 with deployment of the SS-3 (MRBM)—at that time under LRA control; again in 1960 with establishment of the Strategic Rocket Troops (SRT) and the limited deployment of the SS-6 (ICBM); and yet again in 1961-62 with deployment of the SS-7 (ICBM). As a result, the manned bomber has relinquished its primary attack role to the missile force. LRA remains, however, well trained and strategically deployed and with an effective command and control system. Further, it is expected to remain, at least through the mid-1970's, a formidable, though gradually diminishing, threat to the West.

LRA part of mixed force

The Soviet high command apparently adheres to the mixed-force concept as a basis for military policy and programs. This policy has been brought out by numerous statements of high-placed military and political leaders. As recently as 19 December 1965 the head of the air forces, Chief Marshal of Aviation K. A. Vershinin, stated that there is still room for piloted aircraft and that the missile-carrying bomber can hit any ground or naval target. But the LRA bomber now is regarded as complementing operations of the SRT, since it has certain advantages over ballistic missiles: It can carry and deliver a greater payload with greater accuracy, and it is capable of flexibility and diversification in attack. Because of these advantages Soviet planning probably calls for employment of the strategic bomber in attacks following an initial missile strike, or in supplementing a retaliatory blow if the USSR is attacked first. In general, LRA bombers are probably programed for armed reconnaissance, attacks against selected hard targets, and bomb-damage assessment.



Three commands

[redacted] About 75 percent of the force is deployed in the western USSR under the First and Second LRAA, with respective headquarters at Smolensk and Vinnitsa. The remainder of the force is under the command of the Third LRAA, with headquarters at Blagoveshchensk. The greatest part of the Third is in the Far East, but the organization has Badger units at Belaya, in the Lake Baykal region, and [redacted]

[redacted]

Aircraft used

The first aircraft adopted for use in modern methods of LRA strategic bombing was Bull (Tu-4) prop medium bomber, copied from a B-29 acquired in 1944. Bull was assigned to LRA operational units in 1949 and by mid-1954 had peaked at a strength of 1,150. It has been phased out of LRA. Badger (Tu-16) jet medium bomber was added to LRA in 1954, and Bison (M-4) jet heavy bomber and Bear (Tu-95) turboprop heavy bomber were added in 1955. Blinder supersonic-dash jet medium bomber, probably designed as a follow-on to Badger, was added in 1962.

BADGER continues to be the workhorse. [redacted] There are four variants of the aircraft, but only one, Badger A (bomber), is assigned to LRA.

BISON—Three variants of Bison (A, B, and C) were developed before production ended in mid-1961. [redacted]

BEAR—Five variants of Bear have been developed, three strike and two nonstrike. The three strike variants—Bear A (bomber) and the B and C (ASM AS-3, Kangaroo, carriers)—and one of the nonstrike variants—Bear E (photographic reconnaissance)—are assigned to LRA. The other nonstrike variant—Bear D (elint reconnaissance)—has been identified only in Soviet naval aviation. [redacted]

BLINDER is a swept-wing medium bomber capable of supersonic performances. Two versions have been produced. Blinder A is basically a bomber, but some are assigned reconnaissance roles; Blinder B carries one Kitchen ASM. [redacted]

BADGER A, top, is one of four variants of Badger; Badger A (bomber) is the only one assigned to Long Range Aviation. Bull, bottom, was the first aircraft adopted for strategic bombing; 690 Badgers are still in use, but Bull is phased out. [S]

[redacted]

Heavies best for attack

[redacted] range capabilities of LRA bombers indicate that an aircraft attack against the United States would be limited almost exclusively to heavy bombers. [redacted] and consist mostly of Bear A (bomber) and Bear B/C (ASM carriers). Some Bisons would be used principally as tankers, to refuel the Bears.

LRA crews are evaluated fully capable of performing their assigned missions, but even with aerial refueling and Arctic staging, LRA capability for conducting two-way intercontinental missions is not without limitations. The Bear, the best aircraft for the purpose, is obsolescent by US standards. Nevertheless, that aircraft operating from home base is within operational radius of most strategic targets within the United States, and staging from Arctic bases

BEAR, with AS-3 ASM; Bear production probably is continuing but at a reduced rate. (S)

or refueling and carrying ASM's (AS-3, Kangaroo, 350-nautical mile range) could reach any US target.

The capability of Soviet medium bombers for two-way intercontinental missions is markedly limited. With both Arctic staging and refueling the Badger could reach only the northwestern tip of the United States and return.

[redacted]

Moreover, while one-way medium bomber strikes against the United States cannot be ruled out, Badger and Blinder probably would be employed principally for two-way missions against Eurasian targets, with a small number of aircraft used for strikes against Alaska, Greenland, Iceland, and Canada.

BLINDER B carrying delta-wing ASM; about 90 Blinder A are assigned to LRA. (S)

Command and control

[redacted]

Control at highest level

[redacted]

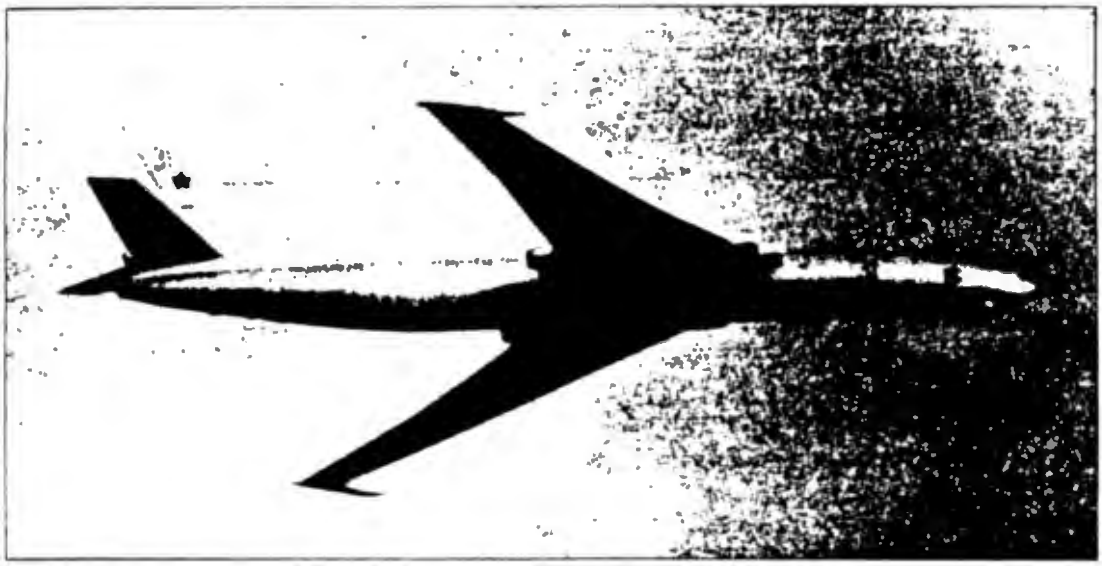
[redacted] Transmittal of high-priority communications, including alert orders, from the Ministry of Defense through LRA Headquarters and LRA operational commands probably involves such media as secure telephone, radio or radio printer/scrambler, and landlines. Communications links and alert procedures probably are tested frequently for an acceptable state of readiness and adequacy. An executive order probably could be relayed from the Ministry of Defense through successive headquarters of LRA and [redacted] LRA would be aware of it in sufficient time to take appropriate countermeasures. In addition, LRA units probably are advanced to a state of training wherein, with current manning, one-third of the available force could be established and maintained on alert, and with a slight increase in personnel, one-half could be brought to comparable status.

[redacted]

[redacted]

R&D cloudy

There is no evidence that an improved heavy bomber is planned or in production; nor is one expected through the mid-1970's. Blinder B, with its ASM (AS-4, Kitchen) is



BISON would be used principally as tanker, to refuel Bears. Bison strength reached peak of about 120 in mid-1961 and since that time has dropped gradually to 100. Further reduction to 65-85 by mid-1970 estimated. [S]

air army to operational units [redacted] Transmission time would be reduced for units under direct operational control of LRA Headquarters.

Not on alert status

[redacted]

storage facilities at most strike-unit bases. If operational units received preliminary warning and maintained aircraft on ground alert, the aircraft probably could start their takeoff within 5 to 10 minutes following receipt of the execution order.

[redacted]

expected to become operational at an early date, but, considering the limited capabilities of this aircraft, a further improved medium bomber in the early 1970's is a possibility.

[redacted]

[END]

STRATEGIC MISSILES

SOVIET STRATEGIC ROCKET TROOPS

(AS OF 1 OCTOBER 1966 AMENDMENT)

Missile System	Operational Launchers
ICBM (SS-6)	4
ICBM (SS-7)	197
ICBM (SS-8)	23
ICBM (SS-9)	33
ICBM (SS-11)	82
Total ICBM	339
IRBM	103
MRBM	608
Grand Total	1,050

[redacted]

SOVIET ICBM AND MRBM/IRBM GENERAL DEPLOYMENT

1 October 1966

PREPARED BY DEFENSE INTELLIGENCE AGENCY (DIAAP-1)

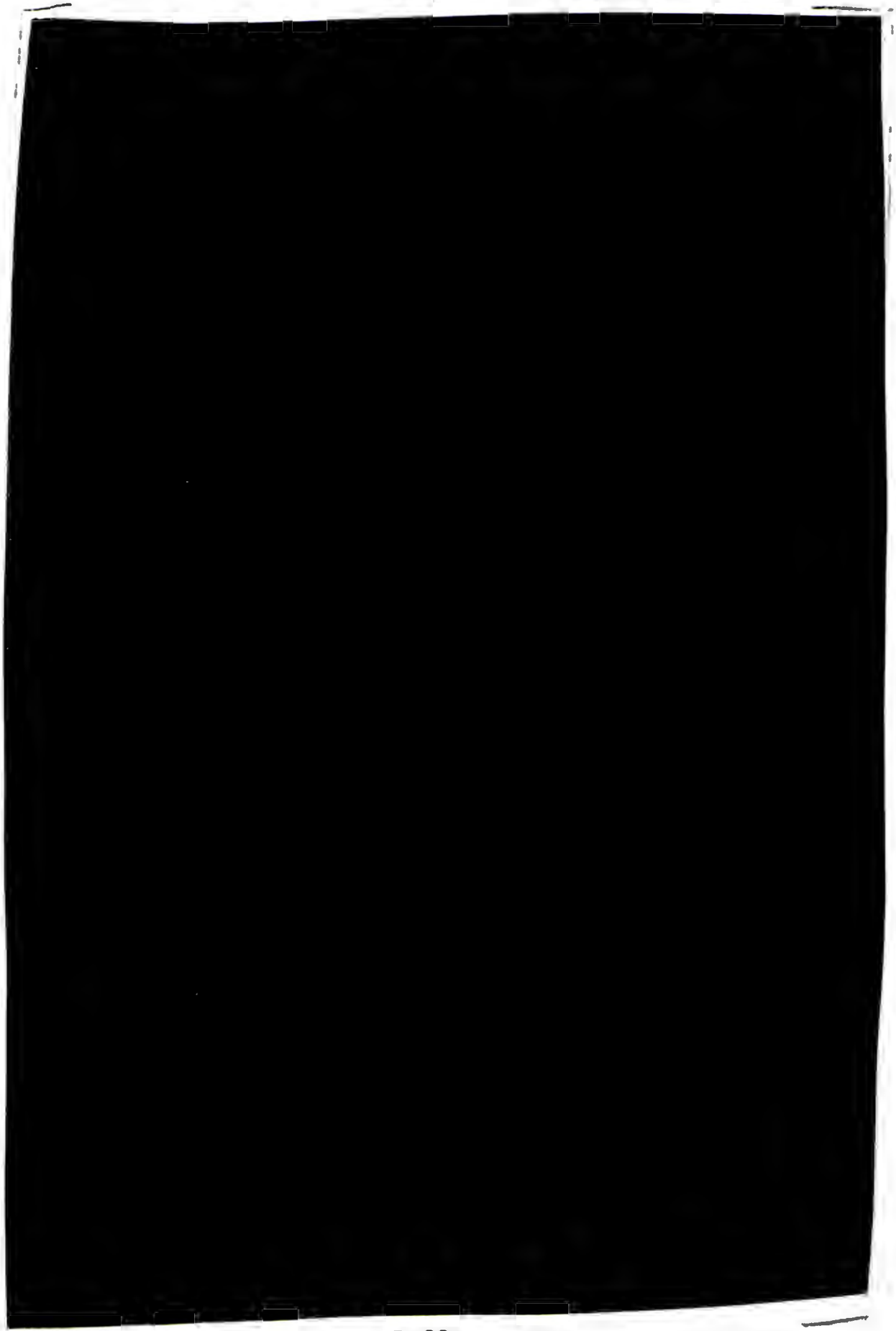
COMMUNIST SURFACE-TO-AIR MISSILE SITES/COMPLEXES (OTHER THAN CUBA)

(AS OF 1 OCTOBER 1966)

	SA-1 1/	SA-2 2/	SA-3 3/
Warsaw Pact Countries (Active)			
USSR			
Located in USSR	56	1,017 4/	113
Located in East Germany	-	31	-
Located in Poland	-	3	-
Located in Hungary	-	2	-
Total USSR	56	1,053	113
Bulgaria	-	19	-
Czechoslovakia	-	25	-
East Germany	-	23	-
Hungary	-	14	-
Poland	-	28	-
Rumania	-	18	-
Other European Communist Countries			
Albania	-	2	-
Yugoslavia	-	5	-
Asian Communist Countries			
Communist China	-	20 5/	-
North Korea	-	5	-
North Vietnam	-	132 6/	-
Mongolia	-	1	-

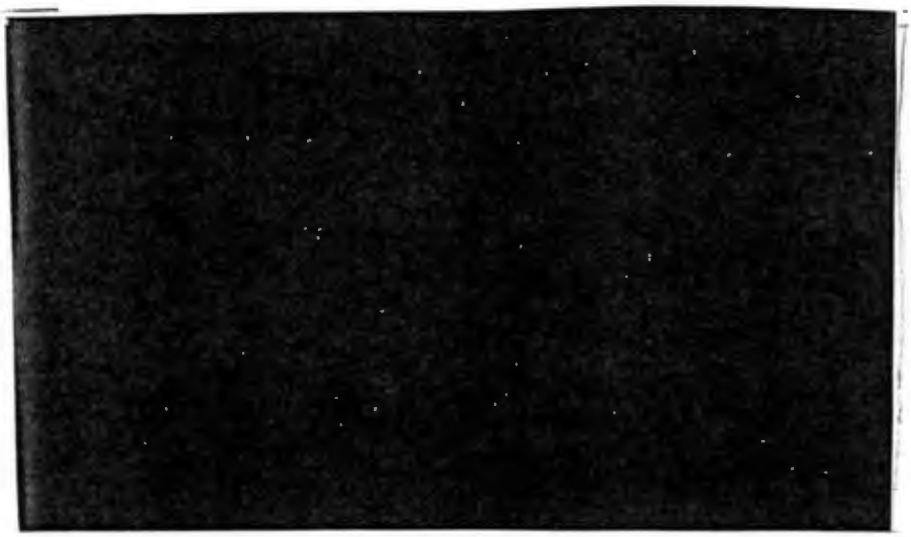
[redacted]

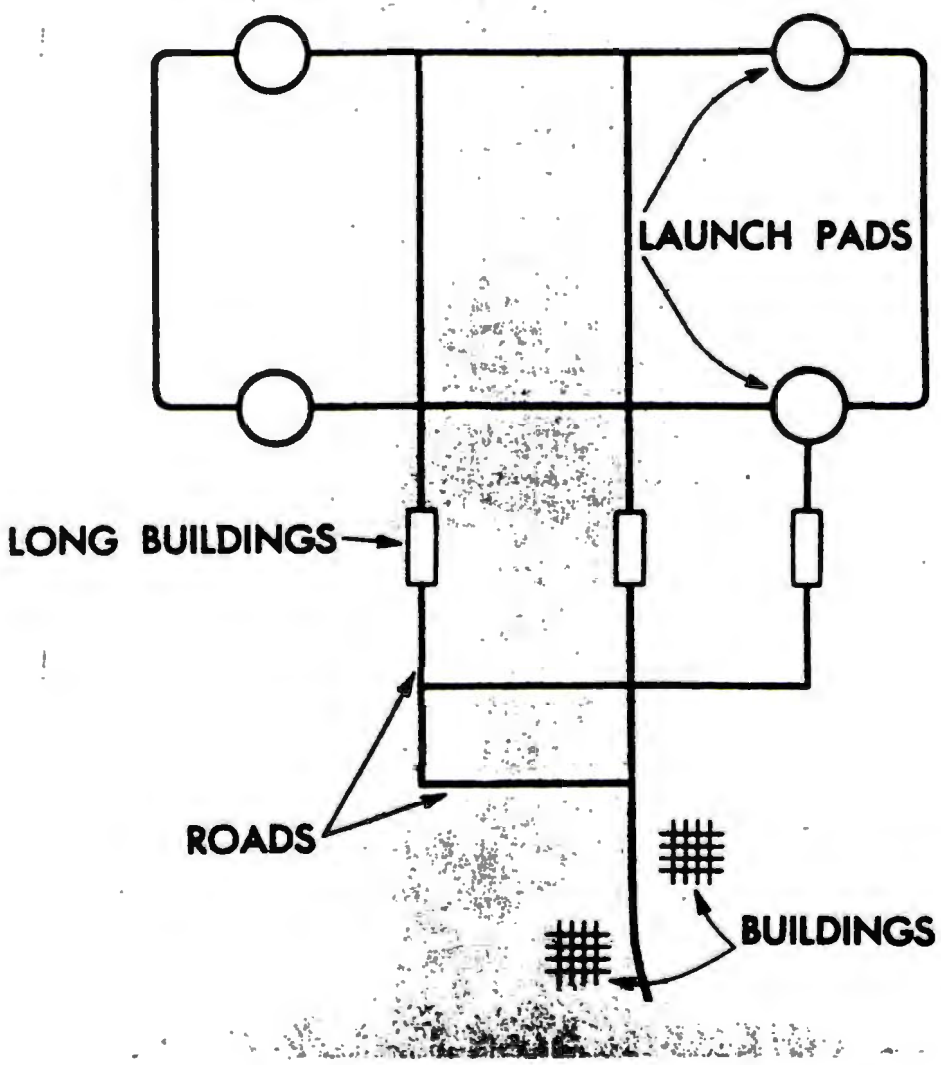
[redacted]



[redacted]

MISSILE READINESS CONDITIONS





Line Drawing of SS-4 Site at Stryy

SS-4 (SANDAL) MISSILE SYSTEM

The SS-4, medium range ballistic missile (MRBM), is a product of the native Soviet design group and is based on the SS-1 (SCUD) design concept. It was publicly displayed for the first time in the Moscow Parade of November 1960, several years after its initial deployment. The SS-4 was used in conjunction with atomic testing during 1961 and 1962. Deployment of the system to Cuba and subsequent withdrawal provided unique data on Soviet equipment and techniques in preparing the SANDAL for operational employment. The missile is deployed at both soft (see line drawing) and hard sites.

CHARACTERISTICS AND PERFORMANCE

IOC - Late 1958

TYPE - Single-stage, ballistic

MAXIMUM OPERATIONAL RANGE - 1,020 nm 1/

GUIDANCE - Inertial

[redacted]

PROPELLANTS - Storable liquid

[redacted]

WARHEAD WEIGHT - 2,200 lb

[redacted]

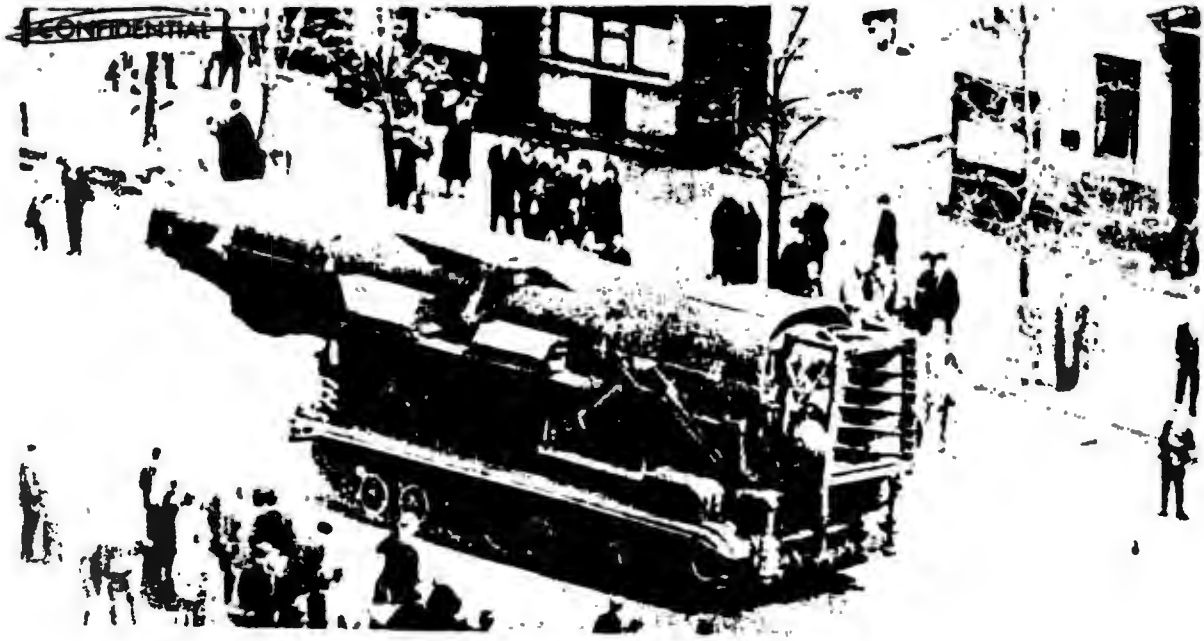
[redacted]

EMPLOYMENT - Strategic

1/ Nonrotating earth.

2/ Probably slightly higher for hard sites.

3/ Normal readiness condition.



SS-X-1 (SCAMP) MISSILE SYSTEM

SCAMP was publicly displayed in the Moscow Parade of May 1965. The ballistic missile is probably a two-stage, solid propellant design which is housed in an environmental control pod. The pod is mounted on a tracked chassis, similar to previous Soviet designs, which probably serves as a transporter-erector-launcher. The mobile system should move well on roads at up to 20 miles per hour, but will have limited cross-country mobility. There is no evidence of flight testing of an associated missile.

CHARACTERISTICS AND PERFORMANCE 1/

IOC - 1967-68 2/

TYPE - Probably two-stage, tandem

RANGE - 1,500-nm class

GUIDANCE - Inertial

[redacted]

PROPELLANT - Probably solid

[redacted]

[redacted]

EMPLOYMENT - Strategic

1/ Characteristics based in part on Soviet claims. Data are tenuous.

2/ If intensive flight testing begins in immediate future.

SS-X-2 (SCROOGE) MISSILE SYSTEM

SCROOGE was first displayed in the Moscow Parade of November 1965. The missile is probably a two- or three-stage, solid propellant design capable of IRBM ranges and housed in an environmental control canister.

The canister is mounted on a tracked chassis, similar to the SCAMP, which probably serves as a transporter-erector-launcher. The weapon system is not operational.

CHARACTERISTICS AND PERFORMANCE 1/

IOC - 1967-68

TYPE - Probably three-stage, tandem

RANGE - 3,000-nm class

GUIDANCE - Inertial

[redacted]

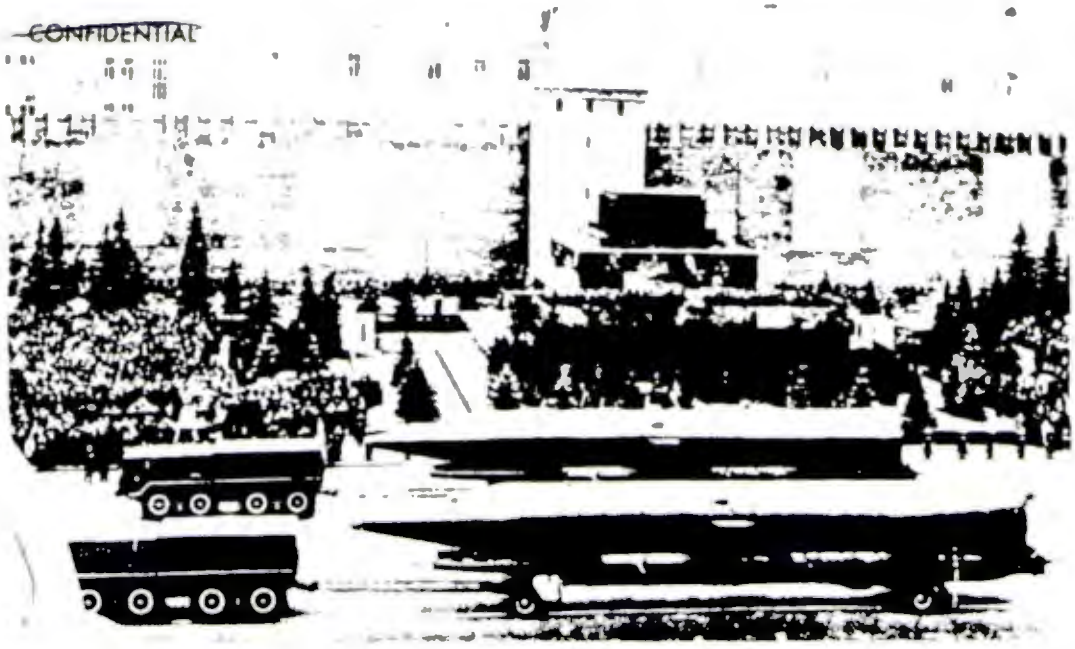
PROPELLANT - Probably solid

[redacted]

[redacted]

EMPLOYMENT - Strategic

1/ Characteristics based in part on Soviet claims. Data are tenuous.



SS-5 (SKEAN) MISSILE SYSTEM

The SS-5, intermediate range ballistic missile (IRBM), is a product of the native Soviet design group that developed the SS-1 (SCUD) and SS-4 (SANDAL). It was flight tested at the Kapustin Yar Missile Test Range and became operational in late 1961. The system was scheduled for and undergoing deployment in Cuba in 1962. Limited data were obtained due to the forced withdrawal prior to completion of the sites or introduction of the missile itself. The SS-5 was publicly displayed for the first time in the Moscow Parade of November 1964. It is deployed at both soft and hard sites.

CHARACTERISTICS AND PERFORMANCE

IOC - Late 1961

TYPE - Single-stage, ballistic

MAXIMUM OPERATIONAL RANGE - 2,200 nm 1/

GUIDANCE - Inertial

[redacted]

PROPELLANTS - Storable liquid

[redacted]

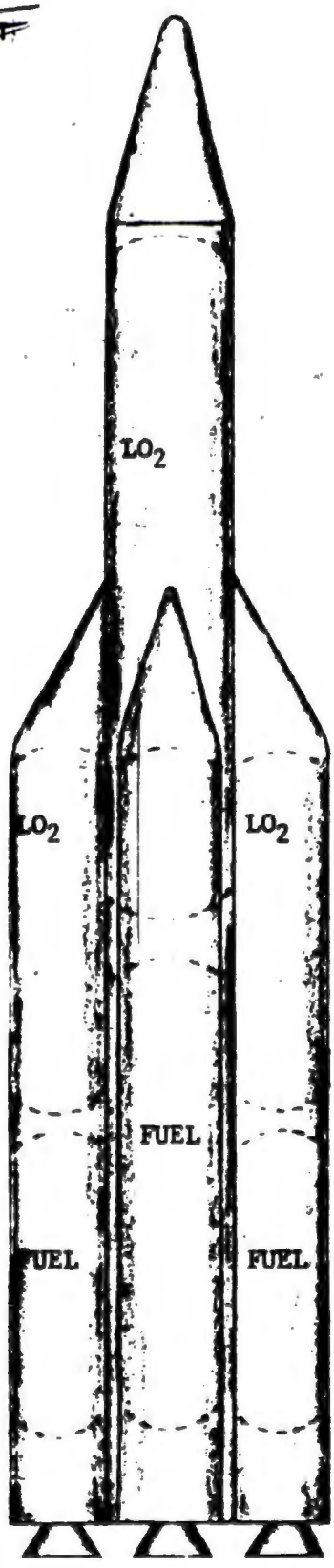
[redacted]

EMPLOYMENT - Strategic

1/ Nonrotating earth. This missile has been fired to 2,500 nautical miles.

2/ Probably slightly higher for hard sites.

3/ Normal readiness condition.



LENGTH: 100 (± 10) FEET
FIRST STAGE DIAM: APPROX: 16 FEET
SUSTAINER DIAM: APPROX: 8 FEET

SS-6 ICBM

SS-6 MISSILE SYSTEM

The SS-6, a product of the German-oriented design group, has served a dual role as the primary Soviet space booster and as their first intercontinental ballistic missile (ICBM). It is a one and one-half stage, parallel configuration and was flight tested at the Tyura Tam Missile Test Range. The SS-6 is the only current man-rated Soviet space booster. There has been limited, soft site deployment of the SS-6 as an ICBM.

CHARACTERISTICS AND PERFORMANCE

IOC - 1960

TYPE - Parallel-staging, ballistic

MAXIMUM OPERATIONAL RANGE - 6,000 nm 1/

GUIDANCE - Radio inertial

[redacted]

PROPELLANTS - Nonstorable liquid

[redacted]

EMPLOYMENT - Strategic; space booster 3/

1/ Nonrotating earth.

2/ Normal readiness condition.

3/ See Section 7, Space Systems, for SS-6 role as space booster.

SECRET

LENGTH: 100 (± 5) FEET
FIRST STAGE DIAMETER: 10 FEET
SECOND STAGE DIAMETER: 8 FEET

SS-7 ICBM

SS-7 (SADDLER) MISSILE SYSTEM

The SS-7, a second generation intercontinental ballistic missile (ICBM), is a product of the native Soviet design group that developed the SS-1 (SCUD), SS-4 (SANDAL), and SS-5 (SKEAN). It was flight tested at the Tyura Tam Missile Test Range and became operational in 1962. Several re-entry vehicle variants have been introduced in continued research and development flight testing. The system is probably extensively deployed at both soft and hard sites within the Soviet Union.

CHARACTERISTICS AND PERFORMANCE

IOC - Early 1962 (soft)
- Early 1963 (hard)

TYPE - Two-stage, tandem, ballistic

MAXIMUM OPERATIONAL RANGE - 6,000 nm 1/

GUIDANCE - Inertial

[redacted]

PROPELLANTS - Storable liquid

[redacted]

[redacted]

EMPLOYMENT - Strategic

1/ Nonrotating earth.

2/ Probably slightly higher for hard sites.

3/ Normal readiness condition.

SS-8 (SASIN) MISSILE SYSTEM

The SS-8, a second generation intercontinental ballistic missile (ICBM), is a product of the German-oriented design team that developed the SS-2 (SIBLING), SS-3 (SHYSTER), and the SS-6. It was flight tested at the Tyura Tam Missile Test Range and, after some difficulties in the test program, became operational in 1963.

The system is probably deployed in limited numbers at both soft and hard sites within the Soviet Union.

CHARACTERISTICS AND PERFORMANCE

IOC - Mid-1963 (soft)
- Mid-1964 (hard)

TYPE - Two-stage, tandem, ballistic

MAXIMUM OPERATIONAL RANGE - 6,000 nm 1/

GUIDANCE - Radio inertial

[redacted]

PROPELLANTS - Nonstorable liquid

[redacted]

[redacted]

EMPLOYMENT - Strategic

1/ Nonrotating earth.

2/ Probably slightly higher for hard sites.

3/ Normal readiness condition.

SS-9 MISSILE SYSTEM

The SS-9, a third generation intercontinental ballistic missile (ICBM), is a product of the native Soviet design group that developed the SS-7. It was flight tested at the Tyura Tam Missile Test Range and became operational during 1965. The system appears to be intended for use as a major weapon system and will probably be deployed at dispersed hard sites.

CHARACTERISTICS AND PERFORMANCE

IOC - Two-stage, tandem, ballistic

MAXIMUM OPERATIONAL RANGE - 6,500 nm 1/

GUIDANCE - Radio inertial 2/

[redacted]

PROPELLANTS - Storable liquid

[redacted]

[redacted]

EMPLOYMENT - Strategic

1/ Nonrotating earth.

2/ Missile may have an alternative all inertial guidance mode.

3/ Normal readiness condition.

SS-11 MISSILE SYSTEM

The S-11 was flight tested at the Tyura Tam Missile Test Range and became operational during 1966. The system appears to be intended for wide-scale deployment, probably at dispersed hard sites.

CHARACTERISTICS AND PERFORMANCE

IOC - 1966

TYPE - Two-stage, tandem, ballistic

MAXIMUM OPERATIONAL RANGE - 5,500 nm 1/

GUIDANCE - Radio inertial and/or inertial

[redacted]

PROPELLANT - Storable liquid

[redacted]

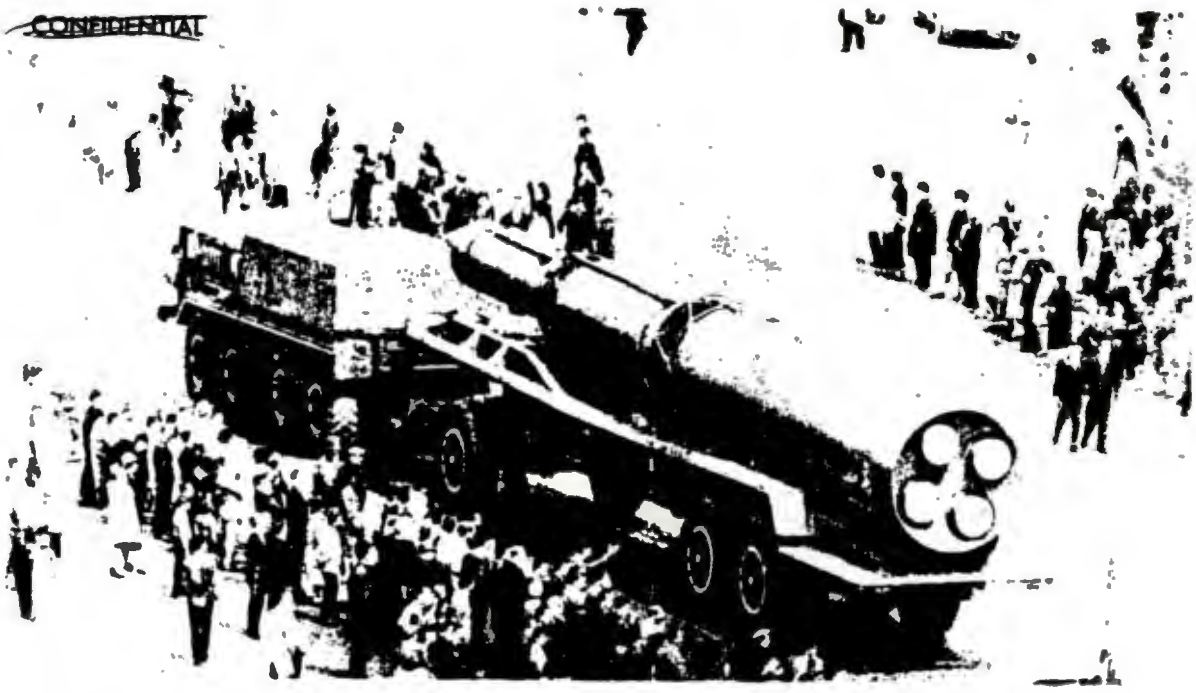
[redacted]

EMPLOYMENT - Strategic

1/ Nonrotating earth

2/ Normal readiness condition.

CONFIDENTIAL



SS-X-3 (SAVAGE) MISSILE SYSTEM

SAVAGE was first displayed in the Moscow Parade of May 1965. It is a "Minuteman-type" three-stage design, probably employing modified double-base solid propellants, capable of ICBM ranges. There is no known flight test activity equating to a solid propellant ICBM.

CHARACTERISTICS AND PERFORMANCE

IOC - 1967-68

TYPE - Three-stage, tandem

MAXIMUM OPERATIONAL RANGE - 5,500 nm 1/

GUIDANCE - Inertial

[redacted]

PROPELLANT - Solid

[redacted]

[redacted]

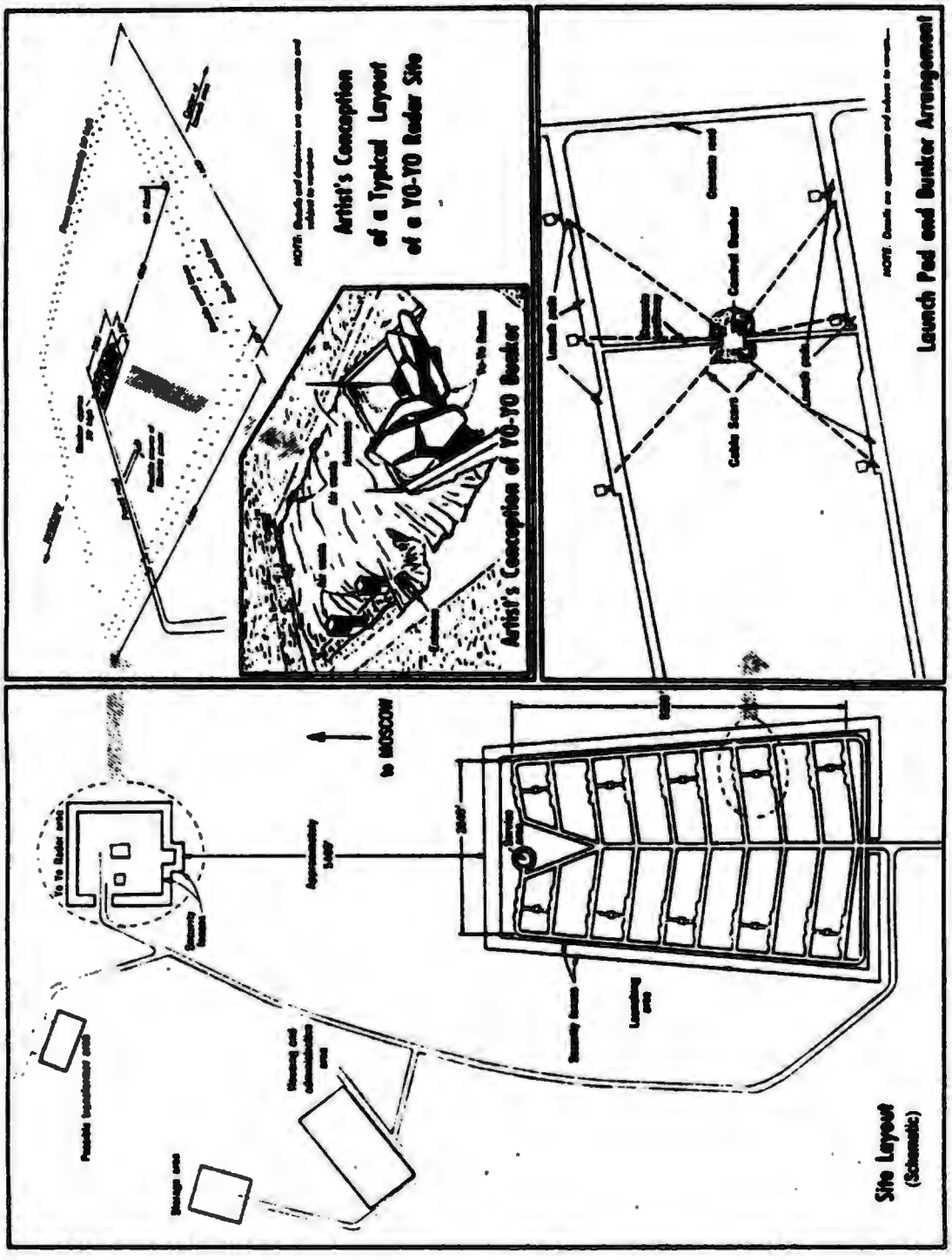
EMPLOYMENT - Strategic

1/ Nonrotating earth.

2/ Normal readiness condition.

AIR DEFENSE SYSTEMS

TYPICAL SA-1 SITE



PAGES D-40,41,42,43,44,45,46 and 47 entirely sanitized.

There is no page D-48 in this set.

Pages D-49 and D-50 entirely sanitized.

AIR DEFENSE AND LONG-RANGE AVIATION

PAGES D-52, 53,54,55,56,57,58,59,60,61,62,63,64,65,66 and 67

entirely sanitized.

BALLISTIC MISSILE SUBMARINES

FBM SUBS

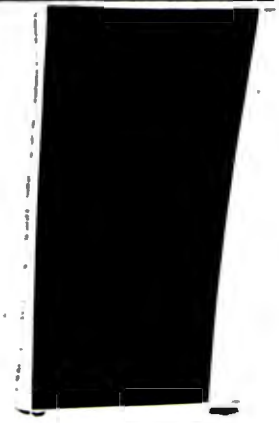
SUBMARINE RANGE CATEGORIES

For convenience, Soviet submarines are arbitrarily categorized according to their estimated range capabilities. Range categories based on absolute maximum surface ranges at most economical fuel consumptions are as follows:

Type	Range
Long Range (LR)	Greater than 10,000 nm
Medium Range (MR)	5,000 to 10,000 nm
Short Range (SR)	Less than 5,000 nm

TABLE OF CATEGORIES

Range Category	Class	Absolute Maximum Surface Range (nm)
Long Range	Nuclear	
	"J"	
	"G"	
	"F"	
	"Z"	
Medium Range	"R"	
	"W"	
Short Range	"Q"	
	"M"	



SUBMARINE PATROL DURATION AND RADIUS

Patrol duration has been examined in detail and is defined as the normal length of time that a submarine can remain at sea without replenishment under combat conditions. It is estimated on the basis of personnel endurance, general habitability, and the consumption of food, spare parts, and other consumables, including fuel.

Patrol radius was computed using an over-all speed of advance (SOA) of 12 knots for nuclear submarines and 6 knots for diesel-electric submarines and has been determined from an extensive evaluation of all available information. None of the submarines listed would be limited by a lack of fuel.

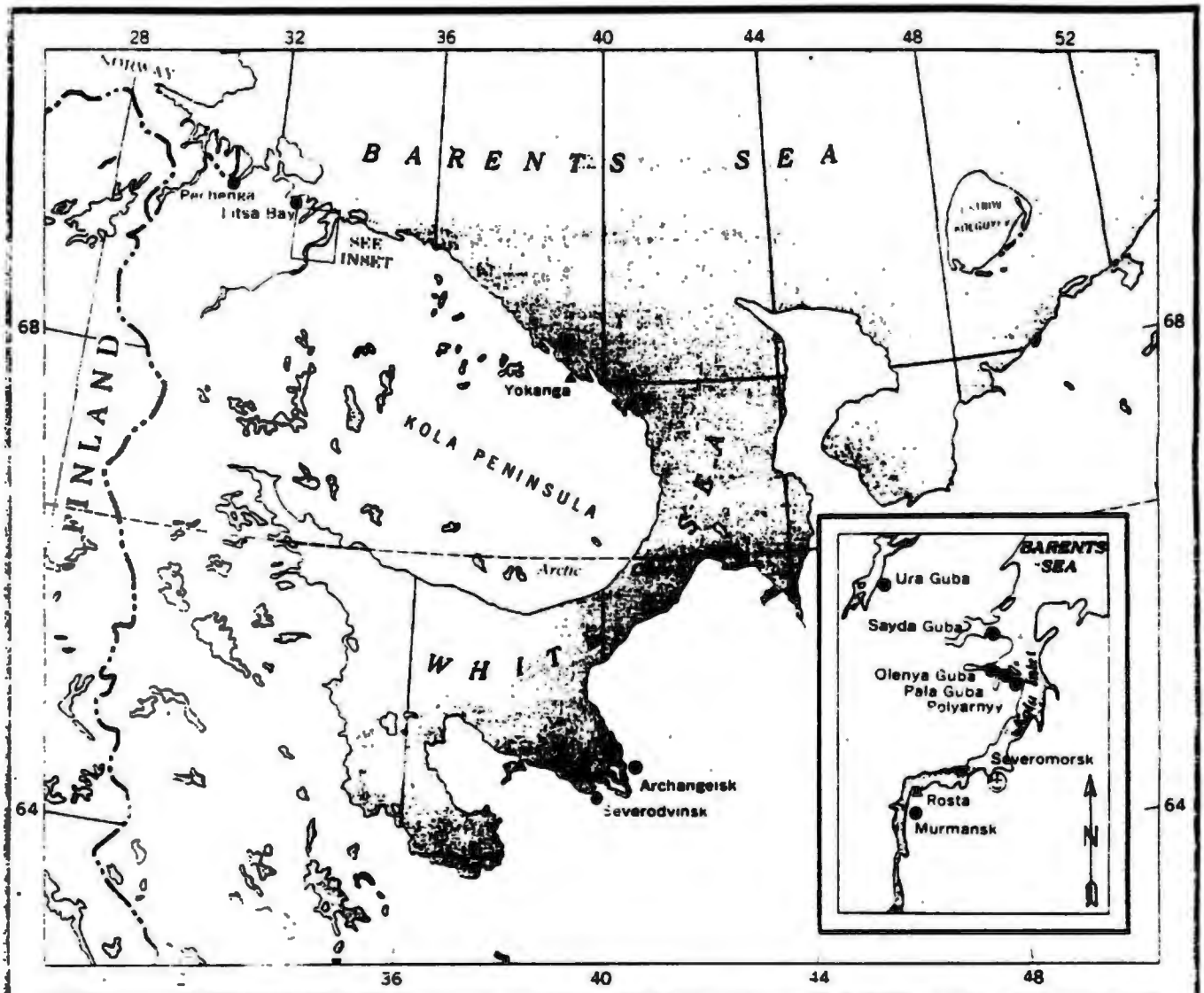
SOVIET NAVAL FORCES

STRENGTH AND DISPOSITION

Type Ship	Northern Fleet	Baltic Fleet	Black Sea Fleet	Pacific Fleet	Totals
SUBMARINES					
Nuclear					
Ballistic Missile ("H-I") 1/	4	-	-	1	5
Ballistic Missile ("H-II") 1/	5	-	-	-	5
Cruise Missile ("E-I")	-	-	-	5	5
Cruise Missile ("E-II")	11	-	-	7	18
Torpedo Attack ("N")	15	-	-	2	17
Diesel					
Ballistic Missile ("G-I", "G-II", & "Z-Conversion")	25	-	-	10	35
Cruise Missile ("W-Conversion" & "J")	14	4	3	4	25
Long Range Attack ("Z" & "F")	47	8	-	20	75
Medium Range Attack ("W" & "R")	58	49	29	46	182
Short Range Attack ("Q")	-	12	3	-	15
Short Range Attack ("M-V")(OSS)	-	-	2	5	7
Totals	179	73	37	100	389
SURFACE SHIPS					
Missile Cruisers (CLG)	-	-	1	-	1
Light Cruisers (Gun)(CL)	3	3	4	4	14
Missile Destroyers & Frigates (DDG, DDGS, DLG, DLGM)	4	5	10	6	25
Destroyers (Gun)(DD)	19	15	18	26	78
Escorts (DE, PCE)	28	27	19 2/	22	96
Cruisers (OCA)	-	1	1	1	3

1/ An "H" Class unit probably transferred from the Northern to the Pacific Fleet in March 1966. Whether it was an "H-I" or an "H-II" Class unit is not known at this time; transfer is not reflected in the fleet totals.

2/ Includes one "Kola" Class DE in the Caspian Sea.



SOVIET NORTHERN FLEET

1 October 1966

- Fleet Headquarters
- Surface Ship Bases
- Submarine Base
- Suomarine and Surface Ship Base

NORTHERN FLEET ORDER OF BATTLE

SUBMARINES

Nuclear Powered Ballistic Missile (SSBN)	9
Nuclear Powered Cruise Missile (SSGN)	11
Ballistic Missile (SSB)	25
Nuclear Powered Attack (SSN)	15
Cruise Missile (SSG)	14
Long Range (Snorkel) (SS)	47
Medium Range (Snorkel) (SS, SSR)	58

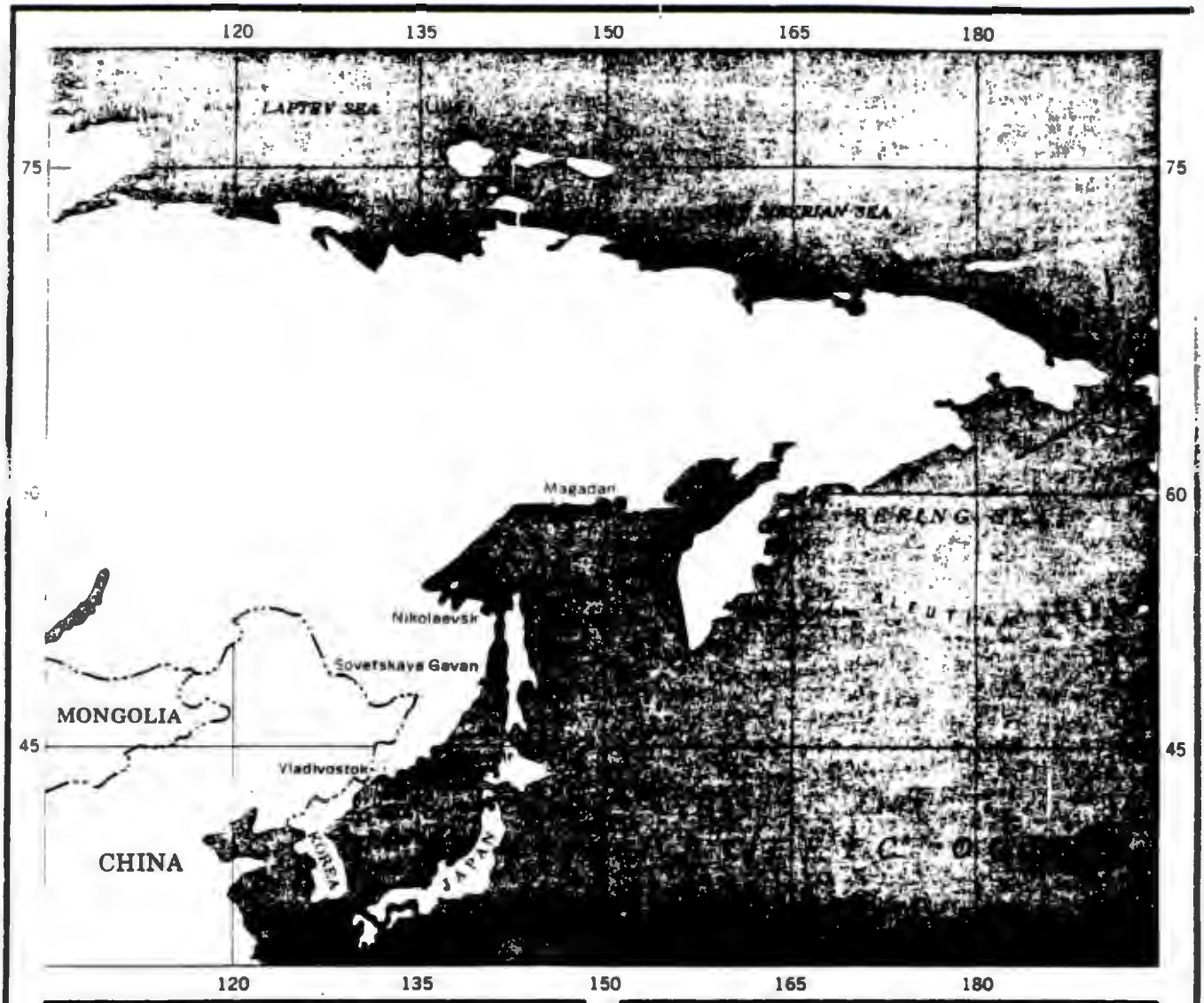
PRINCIPAL SURFACE SHIPS

Light Cruisers (CL)	3
Destroyer Types (DLGM, DDGS, DD)	23
Escorts (DE, PCE)	28

NAVAL COMBAT AIR ORDER OF BATTLE

Bombers (MED)	102
Recon (MED & LT JET, PROP & TURBOPROP)	55
Helicopter (ASW)	52

(PREPARED BY DEFENSE INTELLIGENCE AGENCY (DIAAP-1)



SOVIET PACIFIC FLEET

1 October 1966

- Fleet Headquarters
- ● Surface Ship Bases
- ● Submarine Base
- • Submarine and Surface Ship Base

PACIFIC FLEET ORDER OF BATTLE

SUBMARINES

Nuclear Powered Ballistic Missile (SSBN)	1
Ballistic Missile (SSB)	10
Nuclear Powered Cruise Missile (SSGN)	12
Cruise Missile (SSG)	4
Nuclear Powered Attack (SSN)	2
Long Range (Snorkel) (SS)	20
Medium Range (Snorkel)(SS, SSR)	46
Old Short Range (OSS)	5

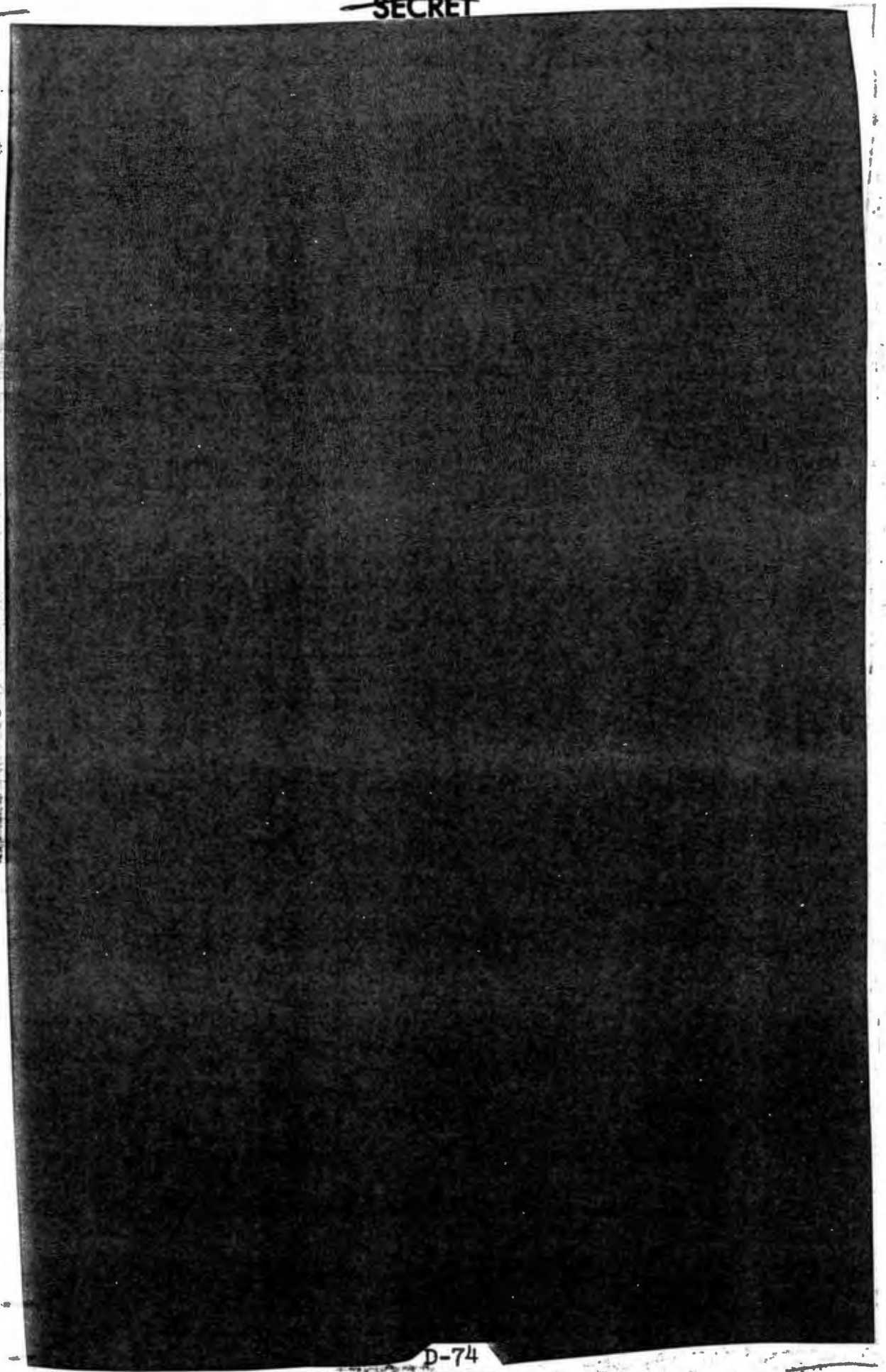
PRINCIPAL SURFACE SHIPS

Old Heavy Cruiser (OCA)	1
Light Cruisers (CL)	4
Destroyer Types (DLGM, DDGS, DD)	32
Escorts (DE, PCE)	22

NAVAL COMBAT AIR ORDER OF BATTLE

Bombers (MED)	109
Recon (MED & LT JET, PROP & TURBOPROP)	61
Helicopter (ASW)	50

PREPARED BY DEFENSE INTELLIGENCE AGENCY (DIAAP-1)



CHINESE COMMUNIST NAVAL FORCES

STRENGTH AND DISPOSITION

Type Ship	North Sea Fleet	East Sea Fleet	South Sea Fleet	Totals
Principal Combatant				
Old Destroyer (ODD)	4	-	-	4
Destroyer Escort (DE)	-	5	1	6
Ballistic Missile Submarine (SSB) 1/	1	-	-	1
Submarine (SS)	19	10	-	29
Old Submarine (OSS)	1	3	-	4
Patrol				
Old Patrol Escort (OPF)	3	12	1	16
Submarine Chaser (PC) 2/	8	10	8	26
Large Guided Missile Patrol Boat (PTFG)	1	1	2	4
Fast Patrol Boat (PTF)	33	29	24	86
Small Guided Missile Patrol Boast (PTG)	2	-	-	2
Motor Torpedo Boat (PT)	63	73	45	181
Hydrofoil Motor Torpedo Boat (PTH)	-	4	-	4
Motor Gunboat (PGM)	17	40	30	87
Old Motor Gunboat (OPGM)	-	-	3	3
Mine Warfare				
Fleet Minesweeper (MSF)	6	8	4	18
Minesweeper (Small Steel Hulled)(MSM)	10	25	-	35
Old Coastal Minesweeper (MSCO)	-	-	4	4
Auxiliary Minesweeper (MSA)	9	11	-	20
Amphibious 3/				
Tank Landing Ship (LST)	8	9	3	20(8)
Medium Landing Ship (LSM)	1	8	4	13(11)
Large Infantry Landing Ship (LSIL)	3	11	2	16
Utility Landing Craft (LCU)	-	6	4	10
Landing Craft Mechanized (LCM)	50	99	50	199
Auxiliaries (various types)	23	29	20	72
Service Craft (various types)	101	105	143	349

1/ Estimated to be operational as a conventional attack submarine.

2/ This includes two 135-foot unidentified PC in the South Sea Fleet.

3/ Numbers in parentheses are additional units in merchant service.

PAGES D-76,77,78,79,80,81,82,83,84,85,86,87,88,89,90,
91,92,93, and 94 entirely sanitized.

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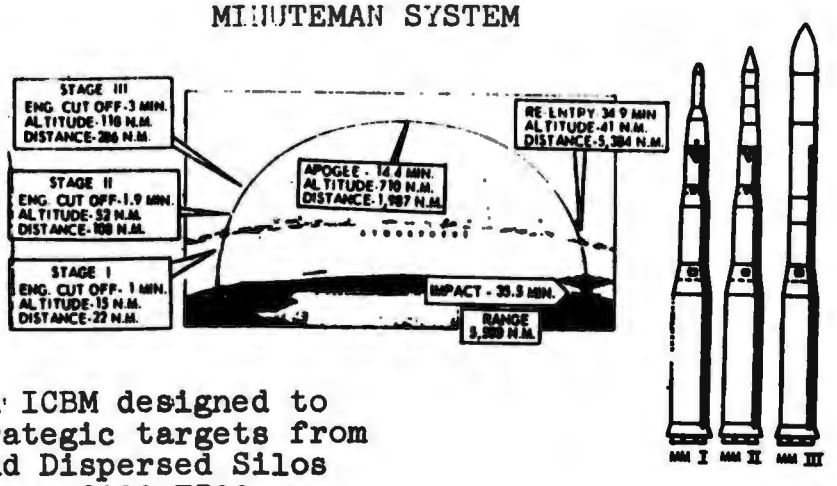
7-P

U.S. CAPABILITIES

MINUTEMAN SYSTEM

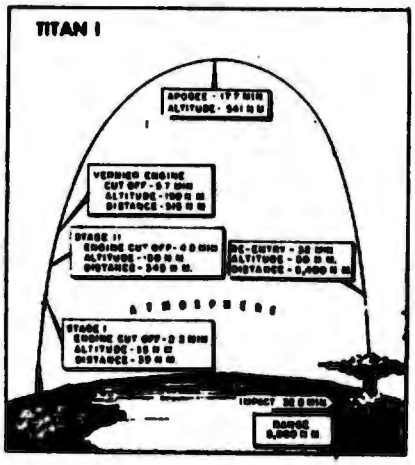


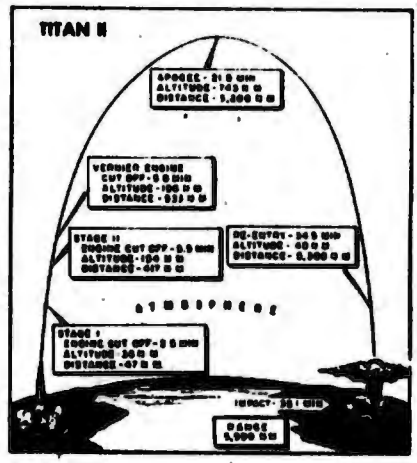
MISSION: An ICBM designed to destroy strategic targets from Hardened and Dispersed Silos of ranges from 2000-7500 nm.

CHARACTERISTICS

Missile System						
Popular Name	MM I			MM II		
Model Desig.	LGM-30A			LGM-30F		
No. Stages	3			3		
Tot Wt - Launch (lbs)	67,713			73,289		
Re-Entry Veh Wt (lbs) a/	820			- 1/		
Tot Length (ft)	53.7			55.8		
Maximum Diameter (in)	74.25 h/			65.7		
CEP (ft)	4800 b/			2370 c/		
Air Frame-by Stage	(1)	(2)	(3)	(1)	(2)	(3)
Tot Wt (000 lbs)	50.8/	12.4/	4.5	51.2/	16.0/	4.4
Length (ft) g/	24.8/	13.2/	7.15	24.2/	14.1/	7.12
Diameter (in)	67.9/	44.6/	37.8	65.7/	52.0/	37.5
Propulsion-by State						
Max Thrust (000 lbs)	217.3/	50.9/	20.5	221.4/	69.9/	20.5
Spec Imp (secs)	260.8/	269.4/	269.5	266.3/	282.2/	269.5
Burn Time (secs)	59.74/	60.83/	55.89d/	61.4/	66.1/	54.9e/
Guidance & Control - by Stage						
Control Type f/	NCU /	NCU /	NCU	NCU /	LITVC/	NCU
Guidance Type	N-10			NS-17		
Accuracy (ft)	4000 b/			1600 c/		
No. of Targets	1			8		

TITAN SYSTEM



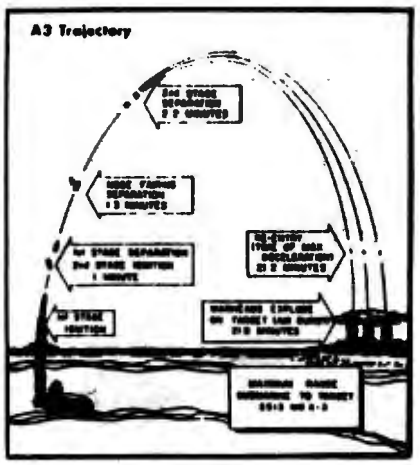


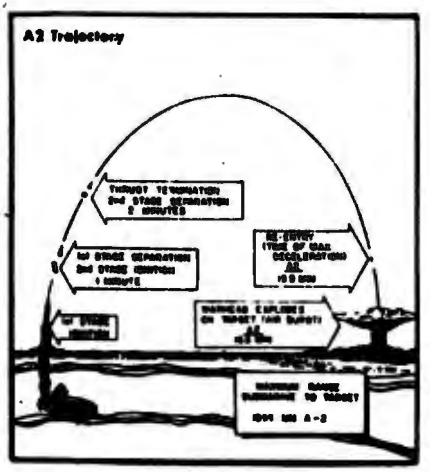
MISSION: An ICBM designed to destroy strategic targets at a range of 5500 NM. TITAN I in Hardened Silos, lifted to launch; TITAN II to be launched in silo.

CHARACTERISTICS

TITAN MODELS	HGM-25A (I)	LGM-25C (II)
MISSILE:		
1st Sqdn Opn'l	Apr 62	June 63
Gross Weight(lbs)	226,000	331,000
Stages	2(Liquid)	2(Liquid)
Fuel	Cryogenic	Hypergolic
Specific Impulse (Seconds)		
1st Stage at Sea Level	244.5	257.5
2nd Stage at Altitude	307	310
Range (nm)	3000-5500	3000-6115
Guidance	Radio Inertial	All Inertial
Length (ft)	97	103
Diam(ft)(By Stage)	(1st St)(2nd St) 10 8	10
Design Estimates:		
Opn'l Accuracy, CEP Goal(nm)	0.78	1.00
Reaction Time(Min) (Time to Launch All Sqdn Missiles)	15 (30 Min.)	1 (1 Min.)
Reliability(%) (Design Objective)	.90	.90

FBM WEAPON SYSTEM





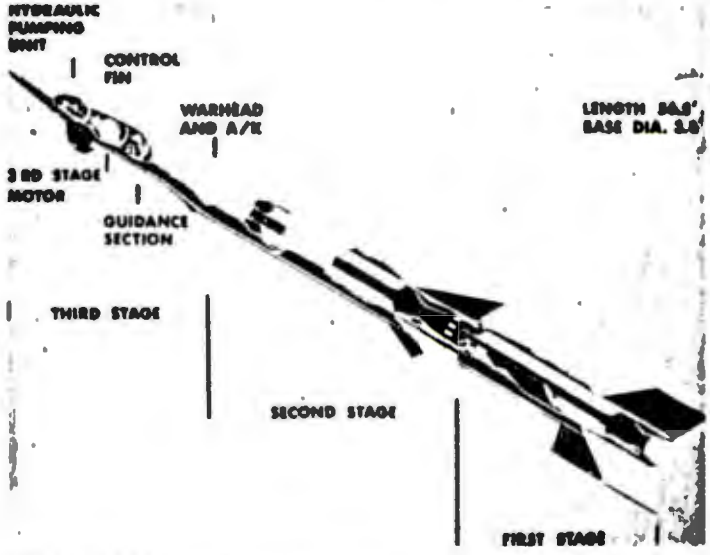
MISSION: The Fleet Ballistic Missile System is a submarine launched ballistic missile with a high yield warhead for use against strategic, urban/industrial and/or counter force targets.

CHARACTERISTICS

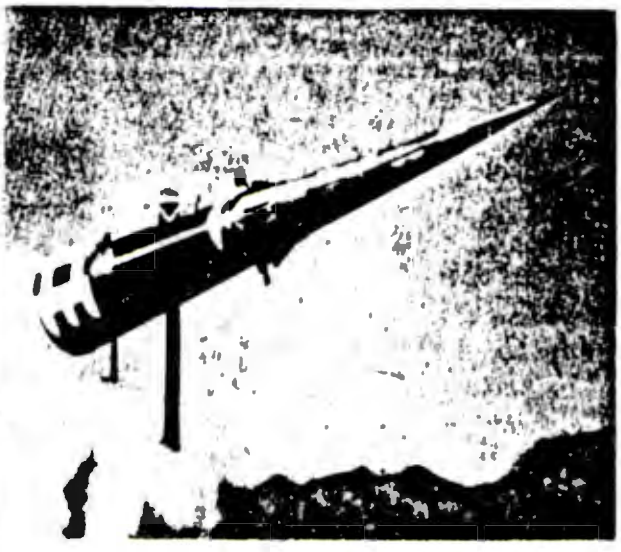
Missile:	POLARIS		POSEIDON
Mission Model	A-2 a/	A-3 a/	C-3 b/
Op'l Avail(CY)	1962	1964	1970
Length (ft)	31.0	32.4	34.13
Diameter (in)	54.0	54.0	74.0
Gross Wt (lbs)	32,255	35,695	65,500
Guidance - Inertial	MK-1	MK-2	MK-3
Stages (Solid)	2	2	2
Specific Impulse (sec) 1st/2nd Stage c/	233/245	246/257	251/258
90% Repeatable Range, Avg w/o Penaids (NM)	1,555	2,513	1,800 d/
with Penaids (NM)	1,455	2,192	1,800 e/
Penaids	PXI f/	PX2 g/	h/
System CEP(NM): Demonstrated (Comp) i/	1.2@1500j/ .8@1500k/	1.0 1/	.25
System Reliability i/m/ Demon(Comp)	.67 n/ .94 o/	.96(DASO) .64(OT)	.86

NIKE X

ANTI-MISSILE MISSILE SYSTEM



SPARTAN (ZEUS, DM 15X-2)



SPRINT

MISSION:

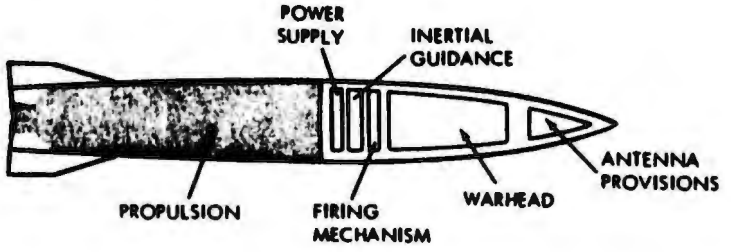
To develop a ground-to-air guided missile system capable of defending the United States against the ballistic missile threat forecast for the post-1969 period.

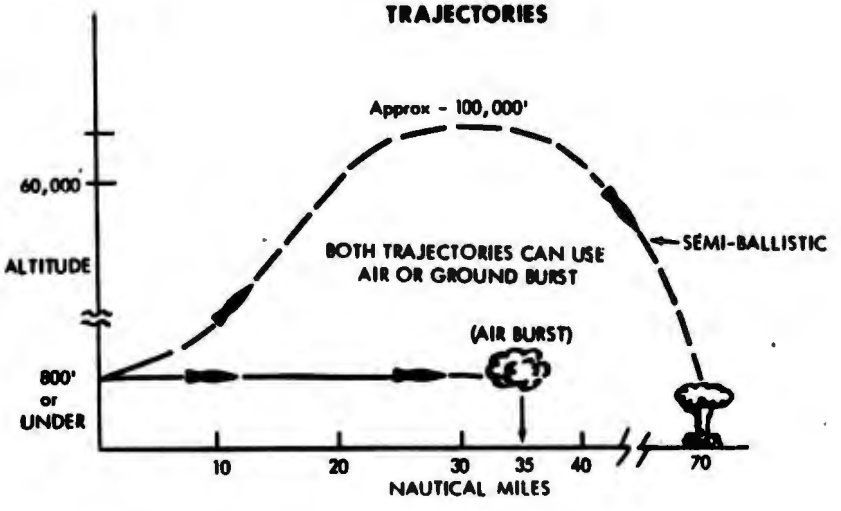
To explore the growth potential of the NIKE X System and its capability to perform other missions, and to develop these capabilities to the extent which may be authorized. This includes at least the following:

a. Defense of hardened targets.
b. Intercept of Satellites.

MISSILE CHARACTERISTICS	SPARTAN	SPRINT
Overall Length (feet)	56.5	26.86
Gross Weight (lbs)	35,890	7,380
Power Stages	3	2
Velocity, Maximum (ft per sec)	9,036	10,560
Guidance	Command	Command
Maximum Diameter (inches)	44	53
Maximum Altitude	282 NM	100,000 ft
Maximum Acceleration	19 g	159 g
Nominal Intercept Range	300 NM	18-23 NM
Warhead Weight (lbs)	2,900	175
Maximum Thrust (lbs)	500,000	800,000
Burn time, First Stage (sec)	4.9	1.3
Burn time, Second Stage (sec)	19.6	2.5
Burn time, Third Stage (sec)	13.7	
Type Propellant	Solid	Solid

SHORT RANGE ATTACK MISSILE (SRAM) AGM-69A SYSTEM



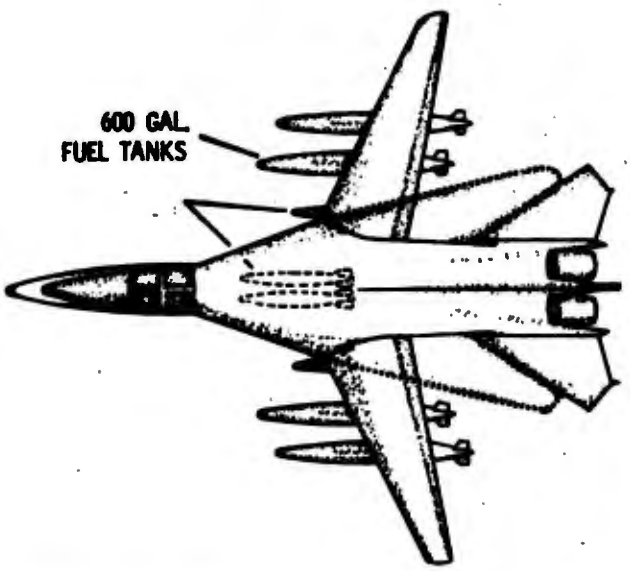


MISSION:
Provide USAF Strategic and Tactical Air Forces with an air-to-surface missile to:
(a) Improve survivability of aircraft penetrating at low altitudes through the use of stand-off defense suppression tactics.
(b) Destroy soft and medium hard primary targets.
(c) Force enemy into a considerable defense expenditure by having to defend against a new diverse threat.

CHARACTERISTICS

Weight	2,200 lbs.
Length	168"
Diameter	17.5"
Controls	Aerodynamic
Guidance	Inertial, with provision for Anti-radiation homer
CEP	Less than 2,000 ft.
Propulsion	Solid
Carrier	FB-111 2 internal; up to 6 total with external carriage
	B-52 G/H 8 internal; up to 20 with external carriage

FB-111A SYSTEM
(Fighter Bomber)



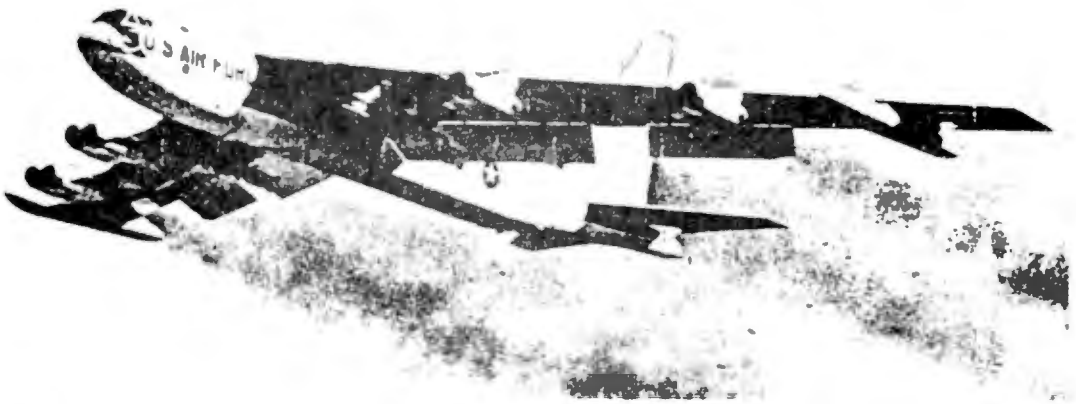
MISSION AND DESCRIPTION

The FB-111A will provide the USAF strategic forces with the earliest effective aircraft system to replace ageing B-52 C-F aircraft. It is a medium range strategic bombardment system capable of operating over enemy territory from CONUS bases. It will be a high speed, low altitude penetration and attack aircraft capable of long range refueled missions. It will carry nuclear bombs and Short Range Attack Missiles (SRAM) or conventional weapons. It is a two engine, two place, side by side seating arrangement aircraft. Significant features include a variable sweep wing, short take-off and landing capability, forward looking and terrain following radars and inertial navigation capability.

CHARACTERISTICS

Weight - Take-off (Maximum)	122,900 lbs
Take-off (Basic Nuclear Mission)	107,560
Empty	45,143 lbs
Fuel Capacity - Internal (5,070 gal approx)	32,948 lbs
External (4/600 gal tanks)	15,600 lbs
Length - Fuselage	73.5'
Wing 70' extended;	31.4' folded
Max. Speed, at altitude	2.5 Mach
Take-off Distance, (Basic Nuclear Mission) Over 50' obstacle	6,350'
Combat Range (Hi-lo-lo-hi) 4 MK-43's; 1460 N.M. lo alt; .85 Mach; 1 tanker	6200 N.M.
Ceiling-Combat	57,500'
Engines	2/TF - 30-P-12
Crew	2

B-52/AGM-28 (HEAVY BOMBER)



MISSION:

B-52 - A long range, intercontinental, day or night, all weather, strategic, heavy bomber for delivery of nuclear or conventional weapons at high subsonic speeds, at either high or low altitudes for destruction of surface objectives. In addition to its primary bomb load, it can carry two air-launched AGM-28 (Hound Dog) guided missiles and/or four ADM-20 (Quail) decoys. It can be refueled by the KC-135A.

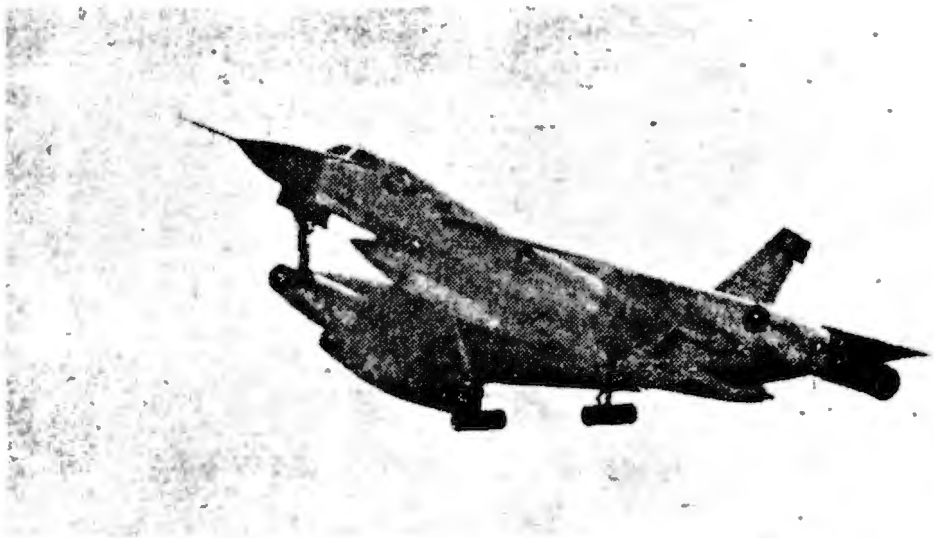
AGM-28 - An air-breathing, air launched, air-to-surface guided missile designed to enhance the firepower, flexibility, penatrability and effectiveness of the B-52. It delivers a nuclear warhead against enemy strategic targets.

AGM-28	A	B
Launch Weight (lbs)	9,716	10,147
Length/Span (ft)	42.5/12.2	42.5/12.2
Speed (kn)	2.01M	2.01M
Range (nm) (Hi-Hi)	633	683
Engine	J-52-P3	J-52-P3
CEP @ 600 nm (ft)	6,500'(SOR)	6,500'(SOR)

CHARACTERISTICS

	B-52F	B-52G	B-52H
T/O Weight(lbs)	450,000	488,000	488,00
Length/Wing Span(ft)	156.5/185.0	157.5/185.0	156/185
T/O Ground Run(ft)	7,000	8,150	7,420
Engines(8)	J-57-P-43WB	J-57-P-43WB	TF-33-P3
Combat Speed (Kn-hi/lo) a/	476/375	476/375	476/375
Range(NM)-Unfueled	6,940/	8,000/	9,474/
Refueled	9,300	10,360	11,810
Ceiling(ft)	46,600	45,600	46,300
Crew	6	6	6
Max Fuel Cap.(gals)	41,550	48,030	48,030

B-58A (HUSTLER)

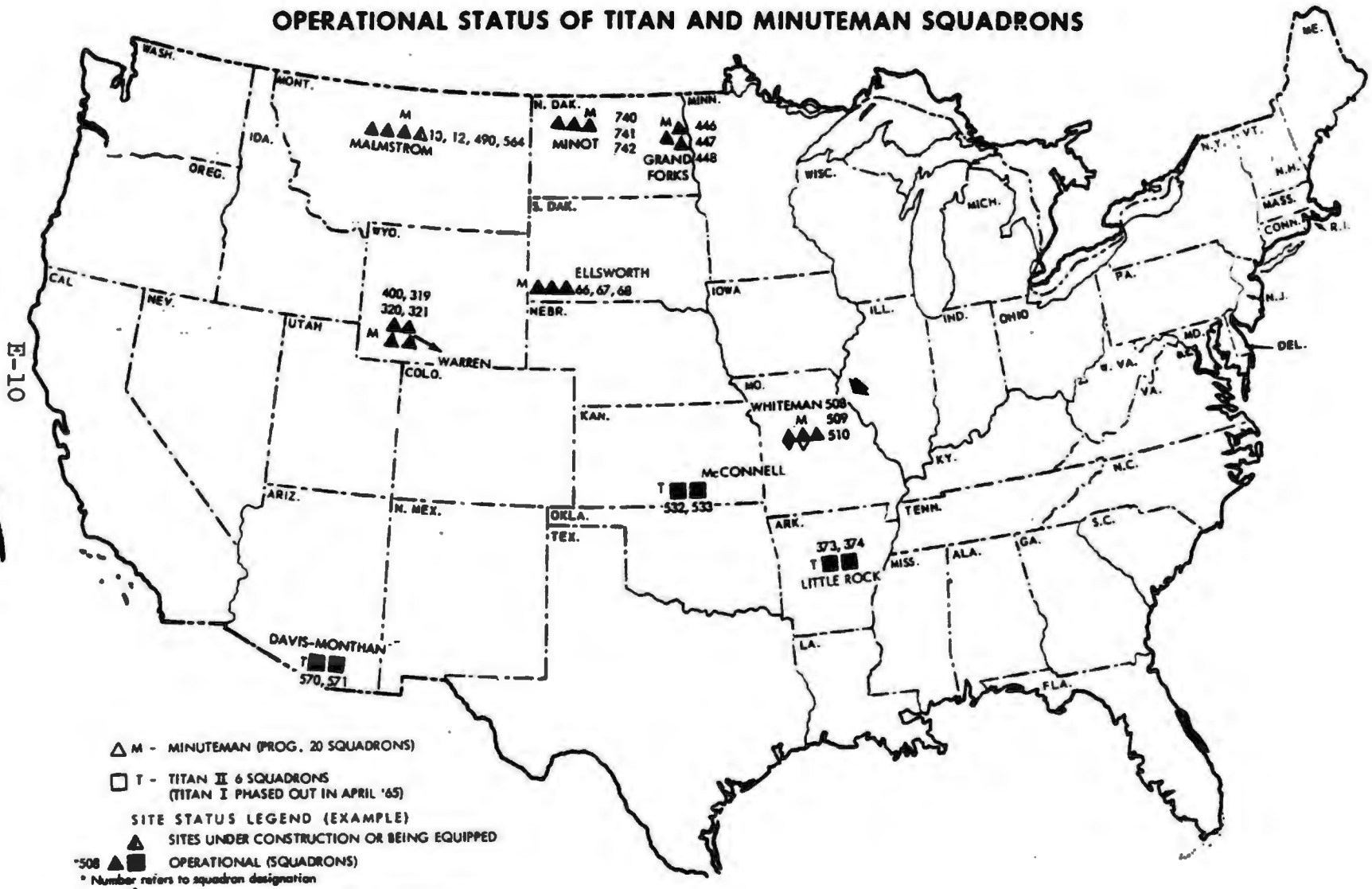


MISSION: A long-range, intercontinental, day or night, all weather bomber for delivery of nuclear weapons at supersonic speed for destruction of surface objects.

CHARACTERISTICS

Name/designation	Hustler (B-58A)
Length	97 ft
Wing span	57 ft
Gross take-off weight	163,000 lbs
Maximum speed	1,145 kts
Cruise speed	535 kts
Ceiling (combat)	63,000 ft
Combat Radius	
a. With refueling	4,950 nm
b. Without refueling	1,850 nm
Ordnance Load	
a. Maximum	19,845 lbs
b. Normal	11,380 lbs
Crew	3

OPERATIONAL STATUS OF TITAN AND MINUTEMAN SQUADRONS



DATA AS OF 1 MARCH 1967

SECRET

SECRET

SECRET

SAC HEAVY BOMBER INSTALLATIONS

INCLUDING
AGM-28 and KC-135A

Note: All locations have one sqd except as noted.

SECRET

DATA AS OF 1 MARCH 1967

SECRET

POLARIS OPERATIONAL SITUATION CHART

OPERATIONAL: DEPLOYED AND READY-FOR-SEA STATUS WITH 16 MISSILES

598 CLASS — SSBN

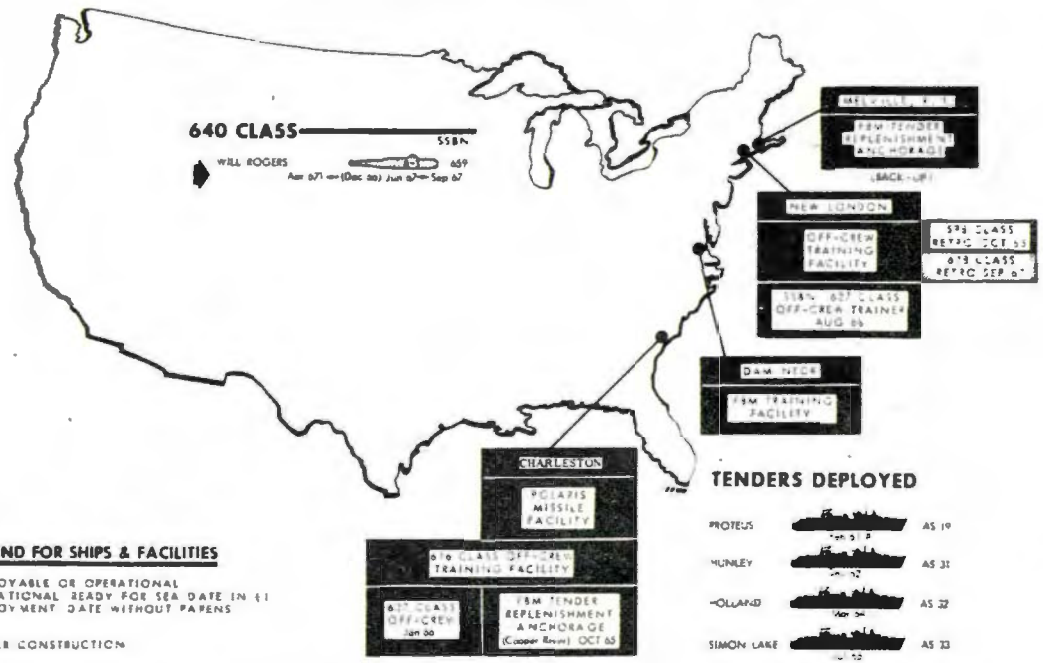
- GEORGE WASHINGTON — 598 (Deployed) — Nov 60 (A-1) Jun 66 (A-3)
- PATRICK HENRY — 599 (Deployed) — Dec 60 (A-1) Dec 66 (A-3)
- THEODORE ROOSEVELT — 600 (Ready-for-Sea) — Jul 61
- ROBERT E. LEE — 601 (Deployed) — May 61 (A-1) Dec 66 (A-3)
- ABRAHAM LINCOLN — 602 (Overhaul) — Aug 61

608 CLASS

- ETHAN ALLEN — 608 (Overhaul) — Apr 62 with A-1, Redeployed Jun 62 with A-2
- SAM HOUSTON — 609 (Overhaul) — Oct 62
- THOMAS A. EDISON — 610 (Overhaul) — Nov 62
- JOHN MARSHALL — 611 (Overhaul) — Dec 62
- THOMAS JEFFERSON — 618 (Deployed) — Oct 63

616 CLASS

- LAFAYETTE — 616 (Deployed) — Jan 64
- ALEXANDER HAMILTON — 617 (Deployed) — Mar 64
- ANDREW JACKSON — 619 (Deployed) — Apr 64
- JAMES MONROE — 622 (Deployed) — Jun 64
- NATHAN HALE — 623 (Deployed) — May 64
- WOODROW WILSON — 624 (Deployed) — Jul 64
- HENRY CLAY — 625 (Deployed) — Aug 64
- DANIEL WEBSTER — 626 (Deployed) — Sep 64
- JOHN ADAMS — 620 (Deployed) — Nov 64



LEGEND FOR SHIPS & FACILITIES

- DEPLOYABLE OR OPERATIONAL OPERATIONAL READY FOR SEA DATE IN (-) DEPLOYMENT DATE WITHOUT PARENS
- UNDER CONSTRUCTION

P Pacific Deployment (indicated after deployment date)

NEW OR SIGNIFICANTLY REVISED INPUT SINCE LAST REPORT, TO FACILITATE READING

TENDERS DEPLOYED

- PROTEUS — AS 19
- HUNLEY — AS 31
- HOLLAND — AS 32
- SIMON LAKE — AS 33
- CANOPUS — AS 34

SECRET

OPERATIONAL: DEPLOYED AND READY-FOR-SEA STATUS WITH 16 MISSILES Cont'd

627 CLASS

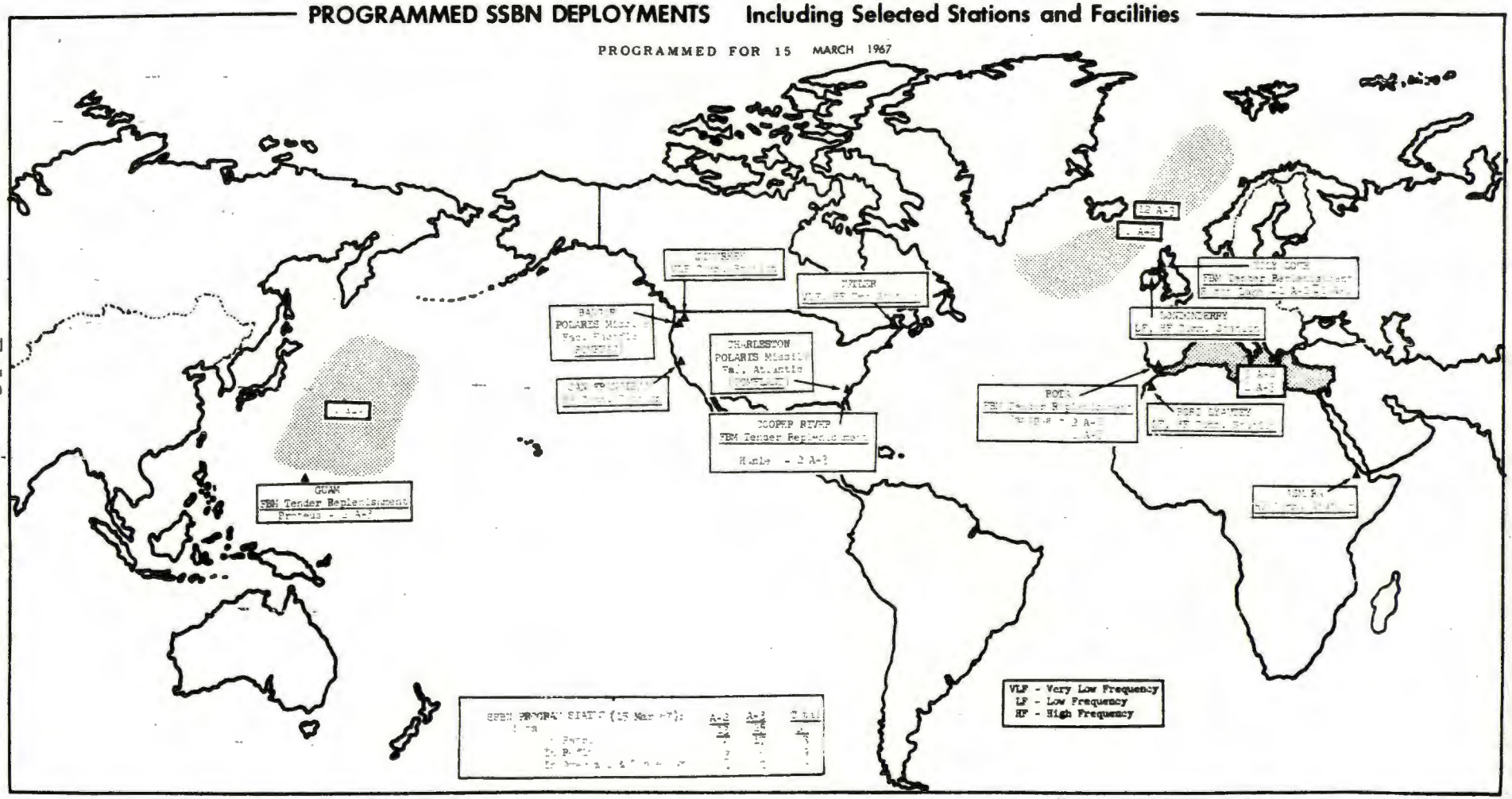
- TECUMSEH — 628 Deployed
- DANIEL BOONE — 629 Deployed
- JAMES MADISON — 627 Deployed
- ULYSSES S. GRANT — 631 Deployed
- CASIMIR PULASKI — 632 Deployed
- JOHN C. CALHOUN — 630 Deployed
- VON STEUBEN — 632 Deployed
- STONEWALL JACKSON — 634 Deployed
- SAM RAYBURN — 635 Deployed
- NATHANAEL GREENE — 636 Deployed

640 CLASS

- SIMON BOLIVAR — 64 Deployed — Apr 66
- BENJAMIN FRANKLIN — 640 Deployed — Mar 66 P
- KAMEHAMEHA — 642 Deployed — Aug 66 P
- GEORGE BANCROFT — 643 Deployed — Jul 66
- LEWIS AND CLARK — 644 (Deployed) — Jul 66
- AMES PCLA — 645 Deployed — Oct 66
- GEORGE C. MARSHALL — 654 Deployed — Oct 66
- GEORGE WASHINGTON CARVER — 656 Deployed — Dec 66
- HENRY L. STIMSON — 655 Deployed — Aug 66 Dec 66 Feb 67
- FRANCIS SCOTT KEY — 657 Ready-for-Sea — Dec 66 Feb 67 Jun 67
- MARIANO G. VALLEJO — 658 Ready-for-Sea — Dec 66 Apr 67 Aug 67

PROGRAMMED SSBN DEPLOYMENTS Including Selected Stations and Facilities

PROGRAMMED FOR 15 MARCH 1967



DATA AS OF 1 MARCH 1967

SIGNIFICANT
DOCUMENTS

7-8
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7-R

TREATY

BANNING NUCLEAR WEAPON TESTS

IN THE ATMOSPHERE, IN OUTER SPACE, AND UNDER WATER

The Governments of the United States of America, the United Kingdom of Great Britain and Northern Ireland, and the Union of Soviet Socialist Republics, hereinafter referred to as the "Original Parties",

Proclaiming as their principal aim the speediest possible achievement of an agreement on general and complete disarmament under strict international control in accordance with the objectives of the United Nations which would put an end to the armaments race and eliminate the incentive to the production and testing of all kinds of weapons, including nuclear weapons,

Seeking to achieve the discontinuance of all test explosions of nuclear weapons for all time, determined to continue negotiations to this end, and desiring to put an end to the contamination of man's environment by radioactive substances,

Have agreed as follows:

Article I

1. Each of the Parties to this Treaty undertakes to prohibit, to prevent, and not to carry out any nuclear weapon test explosion, or any other nuclear explosion, at any place under its jurisdiction or control:

a. in the atmosphere; beyond its limits, including outer space; or under water, including territorial waters or high seas; or

b. in any other environment if such explosion causes radioactive debris to be present outside the territorial limits of the State under whose jurisdiction or control such explosion is conducted. It is understood in this connection that the provisions of this subparagraph are without prejudice to the conclusion of a treaty resulting in the permanent banning of all nuclear test explosions, including all such explosions underground, the conclusion of which, as the Parties have stated in the Preamble to this Treaty, they seek to achieve.

2. Each of the Parties to this Treaty undertakes furthermore to refrain from causing, encouraging, or in any way participating in, the carrying out of any nuclear weapon test explosion, or any other nuclear explosion, anywhere which would take place in any of the environments described, or have the effect referred to, in paragraph 1 of this Article.

Article II

1. Any Party may propose amendments to this Treaty. The text of any proposed amendment shall be submitted to the Depositary Governments which shall circulate it to all Parties to this Treaty. Thereafter, if requested to do so by one-third or more of the Parties, the Depositary Governments shall convene a conference, to which they shall invite all the Parties, to consider such amendment.

2. Any amendment to this Treaty must be approved by a majority of the votes of all the Parties to this Treaty, including the votes of all of the Original Parties. The amendment shall enter into force for all Parties upon the deposit of instruments of ratification by a majority of all the Parties, including the instruments of ratification of all of the Original Parties.

Article III

1. This Treaty shall be open to all States for signature. Any State which does not sign this Treaty before its entry into force in accordance with paragraph 3 of this Article may accede to it at any time.

2. This Treaty shall be subject to ratification by signatory States. Instruments of ratification and instruments of accession shall be deposited with the Governments of the Original Parties--the United States of America, the United Kingdom of Great Britain and Northern Ireland, and the Union of Soviet Socialist Republics--which are hereby designated the Depositary Governments.

3. This Treaty shall enter into force after its ratification by all the Original Parties and the deposit of their instruments of ratification.

4. For States whose instruments of ratification or accession are deposited subsequent to the entry into force of this Treaty, it shall enter into force on the date of the deposit of their instruments of ratification or accession.

5. The Depositary Governments shall promptly inform all signatory and acceding States of the date of each signature, the date of deposit of each instrument of ratification of and accession to this Treaty, the date of its entry into force, and the date of receipt of any requests for conferences or other notices.

6. This Treaty shall be registered by the Depositary Governments pursuant to Article 102 of the Charter of the United Nations.

Article IV

This Treaty shall be of unlimited duration. Each Party shall in exercising its national sovereignty have the right to withdraw from the Treaty if it decides that extraordinary events, related to the subject matter of this Treaty, have jeopardized the supreme interests of its country. It shall give notice of such withdrawal to all other Parties to the Treaty three months in advance.

Article V

This Treaty, of which the English and Russian texts are equally authentic, shall be deposited in the archives of the Depositary Governments. Duly certified copies of this Treaty shall be transmitted by the Depositary Governments to the Governments of the signatory and acceding States.

IN WITNESS WHEREOF the undersigned, duly authorized, have signed this Treaty.

DONE in triplicate at the city of Moscow, the fifth day of August, one thousand nine hundred and sixty-three.

RESOLUTION ADOPTED BY THE GENERAL ASSEMBLY

[On the report of the First Committee (A/5571]7
1884 (XVII). Question of general and complete disarmament

The General Assembly,

Recalling its resolution 1721 A (XVI) of 20 December 1961, in which it expressed the belief that the exploration and use of outer space should be only for the betterment of mankind,

Determined to take steps to prevent the spread of the arms race to outer space,

1. Welcomes the expressions by the Union of Soviet Socialist Republics and the United States of America of their intention not to station in outer space any objects carrying nuclear weapons or other kinds of weapons of mass destruction;

2. Solemnly calls upon all States:

a. To refrain from placing in orbit around the earth any objects carrying nuclear weapons or any other kinds of weapons of mass destruction, installing such weapons on celestial bodies, or stationing such weapons in outer space in any other manner;

b. To refrain from causing, encouraging or in any way participating in the conduct of the foregoing activities.

1244th Plenary Meeting
17 October 1963.

TREATY ON PRINCIPLES GOVERNING THE ACTIVITIES OF STATES IN THE EXPLORATION AND USE OF OUTER SPACE, INCLUDING THE MOON AND OTHER CELESTIAL BODIES

The States Parties to this Treaty,

Inspired by the great prospects opening up before mankind as a result of man's entry into outer space,

Recognizing the common interest of all mankind in the progress of the exploration and use of outer space for peaceful purposes,

Believing that the exploration and use of outer space should be carried on for the benefit of all peoples irrespective of the degree of their economic or scientific development,

Desiring to contribute to broad international cooperation in the scientific as well as the legal aspects of the exploration and use of outer space for peaceful purposes,

Believing that such cooperation will contribute to the development of mutual understanding and to the strengthening of friendly relations between States and peoples,

Recalling resolution 1962 (XVIII), entitled "Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space," which was adopted unanimously by the United Nations General Assembly on 13 December 1963,

Recalling resolution 1884 (XVIII), calling upon States to refrain from placing in orbit around the earth any objects carrying nuclear weapons or any other kinds of weapons of mass destruction or from installing such weapons on celestial bodies, which was adopted unanimously by the United Nations General Assembly on 17 October 1963,

Taking account of United Nations General Assembly resolution 110 (II) of 3 November 1947, which condemned propaganda designed or likely to provoke or encourage any threat to the peace, breach of the peace or act of aggression, and considering that the aforementioned resolution is applicable to outer space,

Convinced that a Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, will further the Purposes and Principles of the Charter of the United Nations,

Have agreed on the following:

Article I

The exploration and use of outer space, including the moon and other celestial bodies, shall be carried out for the benefit and in the interests of all countries, irrespective of their degree of economic or scientific development, and shall be the province of all mankind.

Outer space, including the moon and other celestial bodies, shall be free for exploration and use by all States without discrimination of any kind, on a basis of equality and in accordance with international law, and there shall be free access to all areas of celestial bodies.

There shall be freedom of scientific investigation in outer space, including the moon and other celestial bodies, and States shall facilitate and encourage international cooperation in such investigation.

Article II

Outer space, including the moon and other celestial bodies, is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means.

Article III

States Parties to the Treaty shall carry on activities in the exploration and use of outer space, including the moon and other celestial bodies, in accordance with international law, including the Charter of the United Nations, in the interest of maintaining international peace and security and promoting international cooperation and understanding.

Article IV

States Parties to the Treaty undertake not to place in orbit around the earth any objects carrying nuclear weapons or any other kinds of weapons of mass destruction, install such weapons on celestial bodies, or station such weapons in other space in any other manner.

The moon and other celestial bodies shall be used by all States Parties to the Treaty exclusively for peaceful purposes. The establishment of military bases, installations and fortifications, the testing of any type of weapons and the conduct of military manoeuvres on celestial bodies shall be forbidden. The use of military personnel for scientific research or for any other peaceful purposes shall not be prohibited. The use of any equipment or facility necessary for peaceful exploration of the moon and other celestial bodies shall also not be prohibited.

Article V

States Parties to the Treaty shall regard astronauts as envoys of mankind in outer space and shall render to them all possible assistance in the event of accident, distress, or emergency landing on the territory of another State Party or on the high seas. When astronauts make such a landing, they shall be safely and promptly returned to the State of registry of their space vehicle.

In carrying on activities in outer space and on celestial bodies, the astronauts of one State Party shall render all possible assistance to the astronauts of other State Parties.

States Parties to the Treaty shall immediately inform the other States Parties to the Treaty or the Secretary-General of the United Nations of any phenomena they discover in outer space, including the moon and other celestial bodies, which could constitute a danger to the life or health of astronauts.

Article VI

States Parties to the Treaty shall bear international responsibility for national activities in outer space, including the moon and other celestial bodies, whether such activities are carried on by governmental agencies or by non-governmental entities, and for assuring that national activities are carried out in conformity with the provisions set forth in the present Treaty. The activities of non-governmental entities in outer space, including the moon and other celestial bodies shall require authorization and continuing supervision by the State concerned. When activities are carried on in outer space, including the moon and other celestial bodies, by an international organization, responsibility for compliance with this Treaty shall be borne both by the international organization and by the States Parties to the Treaty participating in such organization.

Article VII

Each State Party to the Treaty that launches or procures the launching of an object into outer space, including the moon and other celestial bodies, and each State Party from whose territory or facility an object is launched, is internationally liable for damage to another State Party to the Treaty or to its natural or juridical persons by such object or its component parts on the Earth, in air space or in outer space, including the moon and other celestial bodies.

Article VIII

A State Party to the Treaty on whose registry an object launched into outer space is carried shall retain jurisdiction and control over such object, and over any personnel thereof, while in outer space or on a celestial body. Ownership of objects launched into outer space, including objects landed or constructed on a celestial body, and of their component parts, is not affected by their presence in outer space or on a celestial body or by their return to the Earth. Such objects or component parts found beyond the limits of the State Party to the Treaty on whose registry they are carried shall be returned to that State, which shall, upon request, furnish identifying data prior to their return.

Article IX

In the exploration and use of outer space, including the moon and other celestial bodies, States Parties to the Treaty shall be guided by the principle of cooperation and mutual assistance and shall conduct all their activities in outer space, including the moon and other celestial bodies, with due regard to the corresponding interests of all other States Parties to the Treaty. States Parties to the Treaty shall pursue studies of outer space, including the moon and other celestial bodies, and conduct exploration of them so as to avoid their harmful contamination and also adverse changes in the environment of the Earth resulting from the introduction of extraterrestrial matter and, where necessary, shall adopt appropriate measures for this purpose. If a State Party to the Treaty has reason to believe that an activity or experiment planned by it or its nationals in outer space, including the moon and other celestial bodies, would cause potentially harmful interference with activities of other States Parties in the peaceful exploration and use of outer space, including the moon and other celestial bodies, it shall undertake appropriate international consultations before proceeding with any such activity or experiment. A State Party to the Treaty which has reason to believe that

an activity or experiment planned by another State Party in outer space, including the moon and other celestial bodies, would cause potentially harmful interference with activities in the peaceful exploration and use of outer space, including the moon and other celestial bodies, may request consultation concerning the activity or experiment.

Article X

In order to promote international cooperation in the exploration and use of outer space, including the moon and other celestial bodies, in conformity with the purposes of this Treaty, the States Parties to the Treaty shall consider on a basis of equality any requests by other States Parties to the Treaty to be afforded an opportunity to observe the flights of space objects launched by those States.

The nature of such an opportunity for observation and the conditions under which it could be afforded shall be determined by agreement between the States concerned.

Article XI

In order to promote international cooperation in the peaceful exploration and use of outer space, States Parties to the Treaty conducting activities in outer space, including the moon and other celestial bodies, agree to inform the Secretary-General of the United Nations as well as the public and the international scientific community, to the greatest extent feasible and practicable, of the nature, conduct, locations and results of such activities. On receiving the said information, the Secretary-General of the United Nations should be prepared to disseminate it immediately and effectively.

Article XII

All stations, installations, equipment and space vehicles on the moon and other celestial bodies shall be open to representatives of other States Parties to the Treaty on a basis of reciprocity. Such representatives shall give reasonable advance notice of a projected visit, in order that appropriate consultations may be held and that maximum precautions may be taken to assure safety and to avoid interference with normal operations in the facility to be visited.

Article XIII

The provisions of this Treaty shall apply to the activities of States Parties to the Treaty in the exploration and use of outer space, including the moon and other celestial bodies, whether such activities are carried on by a single State Party to the Treaty or jointly with other States, including cases where they are carried on within the framework of international inter-governmental organizations.

Any practical questions arising in connection with activities carried on by international inter-governmental organizations in the exploration and use of outer space, including the moon and other celestial bodies, shall be resolved by the States Parties to the Treaty either with the appropriate international organization or with one or more States members of that international organization, which are Parties to this Treaty.

Article XIV

1. This Treaty shall be open to all States for signature. Any State which does not sign this Treaty before its entry into force in accordance with paragraph 3 of this article may accede to it at any time.

2. This Treaty shall be subject to ratification by signatory States. Instruments of ratification and instruments of accession shall be deposited with the Governments of the Union of Soviet Socialist Republics, the United Kingdom of Great Britain and Northern Ireland and the United States of America, which are hereby designated the Depositary Governments.

3. This Treaty shall enter into force upon the deposit of instruments of ratification by five Governments including the Governments designated as Depositary Governments under this Treaty.

4. For States whose instruments of ratification or accession are deposited subsequent to the entry into force of this Treaty, it shall enter into force on the date of the deposit of their instruments of ratification or accession.

5. The Depositary Governments shall promptly inform all signatory and acceding States of the date of each signature, the date of deposit of each instrument of ratification of and accession to this Treaty, the date of its entry into force and other notices.

6. This Treaty shall be registered by the Depositary Governments pursuant to Article 102 of the Charter of the United Nations.

Article XV

Any State Party to the Treaty may propose amendments to this Treaty. Amendments shall enter into force for each State Party to the Treaty accepting the amendments upon their acceptance by a majority of the States Parties to the Treaty and thereafter for each remaining State Party to the Treaty on the date of acceptance by it.

Article XVI

Any State Party to the Treaty may give notice of its withdrawal from the Treaty one year after its entry into force by written notification to the Depositary Governments. Such withdrawal shall take effect one year from the date of receipt of this notification.

Article XVII

This Treaty, of which the Chinese, English, French, Russian and Spanish texts are equally authentic, shall be deposited in the archives of the Depositary Governments. Duly certified copies of this Treaty shall be transmitted by the Depositary Governments to the Governments of the signatory and acceding States.

IN WITNESS WHEREOF the undersigned, duly authorized, have signed this Treaty.

DONE at the cities of London, Moscow and Washington, the 19th day of January one thousand nine hundred and sixty-seven.

DRAFT TREATY

TO PREVENT THE SPREAD

OF NUCLEAR WEAPONS

THE PARTIES TO THIS TREATY,

Desiring to promote international peace and security,

Desiring in particular to refrain from taking steps which will extend and intensify the arms race,

Believing that the further spread of nuclear weapons will jeopardize these ends,

Recalling that Resolution 1665 (XVI) of the General Assembly of the United Nations urges all States to cooperate for these purposes,

Desiring to achieve effective agreements to halt the nuclear arms race, and to reduce armaments, including particularly nuclear arsenals,

Reaffirming their determination to achieve agreement on general and complete disarmament under effective international control,

Have agreed as follows:

Article I

Each of the nuclear-weapon States party to this treaty undertakes:

1. Not to transfer nuclear weapons into the national control of any non-nuclear weapon State, or into the control of any association of non-nuclear-weapon States.

2. Not to provide to any non-nuclear-weapon State or association of such States --

(a) assistance in the manufacture of nuclear weapons, in preparations for such manufacture, or in the testing of nuclear weapons; or

(b) encouragement or inducement to manufacture or otherwise acquire its own nuclear weapons.

3. Not to take any other action which would cause an increase in the total number of States and associations of States having control of nuclear weapons.

4. Not to take any of the actions prohibited in the preceding paragraphs of this Article directly, or indirectly through third States or associations of States, or through units of the armed forces or military personnel of any State, even if such units or personnel are under the command of a military alliance.

Article II

Each of the non-nuclear-weapon States party to this Treaty undertakes:

1. Not to manufacture nuclear weapons, and not to seek or to receive the transfer of nuclear weapons into its national control or into the control of any association of non-nuclear-weapon States of which it is a member.

2. Not to seek or receive, and not to provide whether alone or in any association of non-nuclear-weapon States:

(a) assistance in the manufacture of nuclear weapons, in preparations for such manufacture, or in the testing of nuclear weapons; or

(b) encouragement or inducement to manufacture or otherwise acquire its own nuclear weapons.

3. Not to take any other action which would cause an increase in the total number of States and associations of States having control of nuclear weapons.

4. Not to take any of the actions prohibited in the preceding paragraphs of this Article directly, or indirectly through third States or associations of States, or through units of its armed forces or its military personnel, even if such units or personnel are under the command of a military alliance.

Article III

Each of the States Party to this Treaty undertakes to cooperate in facilitating the application of International Atomic Energy Agency or equivalent international safeguards on all peaceful nuclear activities.

Article IV

In this Treaty

(A) "Nuclear State" means a State possessing independent power to use nuclear weapons as of . . . . . .

(B) "Non-nuclear State" means any State which is not a nuclear State.

Article V

1. This Treaty shall be open to all States for signature. Any State which does not sign this Treaty before its entry into force in accordance with paragraph 3 of this article may accede to it at any time.

2. This Treaty shall be subject to ratification by signatory States. Instruments of ratification and instruments of accession shall be deposited with the Governments of the United Kingdom of Great Britain and Northern Ireland, the Union of Soviet Socialist Republics, and the United States of America, which are hereby designated the Depositary Governments.

3. This Treaty shall enter into force on the deposit of instruments of ratification by . . . . . Governments, including those of the United Kingdom of Great Britain and Northern Ireland, the Union of Soviet Socialist Republics, and the United States of America.

4. For States whose instruments of ratification or accession are deposited subsequent to the entry into force of this Treaty, it shall enter into force on the date of the deposit of their instruments of ratification or accession.

5. The Depositary Governments shall promptly inform all signatory and acceding States of the date of each signature, the date of deposit of each instrument of ratification of and accession to this Treaty, and the date of its entry into force.

6. This Treaty shall be registered by the Depositary Governments pursuant to Article 102 of the Charter of the United Nations.

Article VI

1. This Treaty shall remain in force indefinitely subject to the right of any Party to the Treaty to withdraw from the Treaty if it decides that extraordinary events related to the subject matter of the Treaty have jeopardized the supreme interests of its Country. It shall give notice of such withdrawal to all other signatory and acceding States and to the United Nations Security Council three months in advance. Such notice shall include a statement of the extraordinary events it regards as having jeopardized its supreme interests.

2. ..... years after the entry into force of this Treaty, a conference of Parties may be held at a date and place to be fixed by agreement of two-thirds of the Parties in order to review the operation of the Treaty.

Article VII

This Treaty, of which the Chinese, English, French, Russian, and Spanish texts are equally authentic, shall be deposited in the archives of the Depositary Governments. Duly certified copies of this Treaty shall be transmitted by the Depositary Governments to the Governments of the signatory and acceding States.

In witness whereof the undersigned, duly authorized, having signed this Treaty.

Done in triplicate at the city of ....., the ..... day of ....., one thousand nine hundred and sixty five.

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ARTICLES FROM THE PRESS

The articles contained in this section are drawn from open source material. They do not represent policy statements or intelligence estimates of the U.S.

CONTENTS

THE ANTI-BALLISTIC MISSILE DEBATE

By J. I. Coffey

ONE of the great problems in arms control is that advances in technology, and their application to military programs, tend to invalidate or render meaningless even the soundest arms-control proposals. Twice in the last decade this has occurred, once when the diffusion of nuclear technology and the production of large numbers of nuclear weapons rendered futile any hope of complete nuclear disarmament, and again when the advent of intercontinental missiles made necessary a rethinking of all the proposals for limiting or abolishing strategic strike forces. It may well be that we are about to witness a similar overtaking of current arms-control proposals because of the possibility of deploying highly effective ballistic missile defenses.

Although work on anti-ballistic missiles has been under way for some years, the prospects for their being really effective have in the past seemed relatively small. As Secretary of Defense McNamara and others have indicated, this was due largely to the development of sophisticated penetration aids (chaff, decoys, nose cones whose wakes were not easily identifiable by radar, etc.), so that incoming warheads could not be readily distinguished at the optimum altitudes for engagement by anti-ballistic missiles. Under these circumstances, the cost/effectiveness of such missiles was relatively low, in that an enemy could penetrate missile defenses with comparative ease. Alternatively, he could simply bypass local defenses by striking at undefended targets or by exploding large-yield weapons up-wind from defended ones. To cope with this latter threat, and with the possibility of fallout—or even blast damage—from defending missiles detonated at low altitudes, ballistic missile defenses had to be complemented by shelters capable of protecting against fallout and resistant to blast pressure. All in all, it is understandable that the United States did not deploy anti-ballistic missiles during the early sixties.

However, in the past year or so, a number of developments have called that decision into question. The first of these was the discovery that long-range interceptors could destroy incoming warheads beyond the atmosphere, before they dropped to altitudes at which current types of penetration aids would be effective in confusing the missile defense radars. Moreover, the extended

range of these interceptors meant that fewer anti-missile missiles could protect a larger area, thereby reducing both the number of batteries which would have to be deployed and the cost of a defensive system. Even when combined with terminal defenses around targets of particular importance, new types of ballistic missile defenses appear to be more flexible and less costly than those which were under consideration a year or two ago.

A second relevant development was the detonation by the Chinese of a series of nuclear devices, several of which, according to the U.S. Atomic Energy Commission, "included thermonuclear material," and one of which was mated with a short-range missile. Even though a Chinese intercontinental ballistic missile force may, as Mr. McNamara testified, be seven or eight years off, the prospect of such a force gives rise to understandable concern. A system of anti-ballistic missiles which intercepted targets beyond the earth's atmosphere ("exo-atmosphere") could certainly reduce damage from attacks by small nuclear powers such as China, as well as degrade second strikes or uncoördinated attacks by larger powers and guard against accidental launchings.

The third development has been an apparent step-up of Soviet activity in anti-ballistic missiles. Although the U.S.S.R. has for some years been working on anti-missile missiles, and has even televised films of missile interceptions, evidence of the actual installation of missile defenses has been both scant and contradictory; thus, while President Johnson, in his State of the Union Message, referred only to the emplacement near Moscow of "a limited anti-missile defense," other sources have spoken of Soviet A.B.M. sites athwart the natural access routes of incoming U.S. missiles, and have described the Soviet program as a nationwide net. Even limited Soviet ballistic missile defenses could, as General Maxwell D. Taylor stated some years ago, have a significant political and psychological impact, while more extensive ones might to some degree erode American strategic superiority.

Anyone concerned with the security of the United States must, therefore, pay close attention to the potentialities of ballistic missile defenses for limiting damage from a nuclear strike, or, in a larger sense, for helping to deter such a strike. However, it is not enough to consider the case in so narrow a context, since national security embraces concerns other than that of damage limitation and may prescribe means of achieving that security other than large and costly expenditures for defensive systems. Thus, those

deciding whether, how and when to deploy ballistic missile defenses must consider their broad effects, taking into account possible Soviet reactions, the impact on friends and allies of such a decision, and the political and sociological implications of such a move for the United States. They must also consider other means of advancing our interests and security, the impact on the arms race, the implications for agreement on further arms-control measures, the possible effect on past agreements such as the nuclear test-ban treaty, and the options open to the United States if it deems these factors important.

II

As previously indicated, technological improvements in ballistic missile defenses make feasible the deployment of a system which could markedly reduce the damage from an attack of a given magnitude. This has led to suggestions for at least the partial or "light" deployment of anti-ballistic missiles as a defense against lesser nuclear powers—and specifically against Communist China. It is argued not only that anti-missile missiles could reduce damage from a Chinese Communist attack, but also that they would render such an attack less likely, thereby enhancing the credibility of the American deterrent and giving the United States greater freedom of action in containing or opposing Chinese Communist expansionism in South and Southeast Asia. It is also maintained that the deployment of ballistic missile defenses may advantageously influence Chinese plans for weapons procurement, and specifically that it may induce the Chinese not to build intercontinental ballistic missiles. A look at both these possibilities is in order.

Broadly speaking, the Chinese Communists have two choices: to attempt to develop a regional deterrent based on light or medium bombers, medium-range or intermediate-range ballistic missiles and submarine-launched missiles; or to aim at a global deterrent, composed of long-range bombers, intercontinental ballistic missiles and more advanced submarine-launched missiles. Whether they will, in the long run, follow one or both of these routes is less important than the fact that the current constraints on their resources almost force them into a minimal program; indeed, Secretary McNamara's postulated Chinese I.C.B.M. threat is almost a decade off.

Considering these constraints, the possible uses of Chinese

nuclear power, and the political advantages of deploying a visible deterrent as soon as possible, it may well be that the Chinese will forgo for the time being the deployment of intercontinental ballistic missiles—whether or not the United States installs anti-ballistic missiles. However, this would not preclude the Chinese from developing a capability to launch small-scale attacks against the United States, which they could do either with conventional delivery vehicles such as small ship-borne or submarine-carried seaplanes, or with more exotic vehicles such as submarines equipped to fire nuclear-tipped torpedoes against port installations and coastal cities. In fact, it is possible that the Chinese may find it advantageous to build submarine-launched missiles rather than intercontinental ballistic missiles. In the first place, they now have submarines, they have fired short-range missiles, and they would find it fairly simple to adapt these, or to build rather crude forms of sea-based missiles. In the second place, a missile submarine force would give them both a regional and an intercontinental capability, at least to the extent of small-scale attacks upon coastal cities. Furthermore, such a force would be less vulnerable to preëmptive attack than either bombers or the kinds of first-generation "soft" I.R.B.M.s and I.C.B.M.s that are likely to be within Chinese capabilities.

Moreover, while fear of Chinese retaliation against the United States may inhibit our freedom of action vis-à-vis Communist China, there are other inhibiting factors, ranging from the possibility of Soviet intervention to concern over the political and psychological consequences of drastic measures—factors which certainly operated prior to the time the Chinese developed nuclear weapons. To these must be added the deterrent effect of a regional Chinese capability, which could enable the Chinese to strike at American bases in East Asia or even to threaten the cities of our Asian allies. While such a regional deterrent may not in itself have the impact of an intercontinental one—especially since it may not suffice to "trigger" a Soviet strategic strike against the United States—it will certainly strengthen the present barriers to U.S. military intervention in Asia.

Entirely aside from the question of whether ballistic missile defenses are necessary to deter Chinese nuclear strikes against the United States, it is also questionable whether they will have the desired impact on the Chinese development of particular weapons systems; they may simply induce the Chinese to empha-

size weapons programs with which ballistic missile defenses (and particularly exo-atmospheric defenses) cannot readily cope, weapons such as submarine-launched cruise-type missiles. In any case, as China's technology and industrial capacity grows, so also will the sophistication of its weapons. To counter this, we will probably find it necessary to extend, to deepen and perhaps to improve our anti-ballistic missile system and to build up our air defenses and antisubmarine warfare forces. Thus, whatever the initial form of an A.B.M. system designed for use against Communist China, it will ultimately become either largely ineffective or little different from that required to defend against Soviet forces. In the long run, therefore, ballistic missile defenses capable of coping with a Chinese attack are likely to increase markedly our capability to limit damage by Soviet strategic forces—a point which the U.S.S.R. is not likely to miss.

This raises immediately the question whether ballistic missile defenses are really needed against the Chinese Communists, who do not now possess, nor are likely to possess in the next decade, a strategic strike force sufficient to constitute a serious threat to the United States. For the Chinese to attack, or to threaten to attack, American cities in the face of our strategic superiority would be the rashest of acts on the part of a people who have been noted for their caution and conservatism in the use of military power.[1] Indeed, it is rather astonishing that the United States, which seems satisfied that its deterrent is effective against the Soviet Union, should be so concerned about its ineffectiveness against a power whose resources are miniscule, whose opportunities for significant gains through limited war are considerably less than those of the Soviet Union, and which, moreover, has shown no signs of undertaking such adventures.

III

Whatever the American decision with respect to deploying anti-ballistic missiles against Communist China, it is obvious that this may not be controlling; even should the United States refrain from building ballistic missile defenses, the U.S.S.R. might do so. In view of the tests they have conducted, the boasts they have made of the capabilities of their anti-missile missiles, and their

[1] Mr. McNamara has estimated that the best the Chinese could do, by 1975, would be to inflict six to twelve million fatalities on the United States; conversely, a small fraction of the U.S. delivery vehicles surviving a *Soviet* first strike could, if directed against China, kill fifty million Chinese and destroy half of Chinese Communist industry.

thinking concerning the role of defenses as a stabilizing influence, it is entirely possible that the Soviets may extend to other areas the missile defenses now surrounding Moscow—if indeed they have not already done so. In this case, much will depend upon how we react.

One option, of course, would be to do nothing, on the grounds that the strength, the diversity and the sophistication of our strategic strike forces now in being or currently programmed would enable them to overcome Soviet defenses, should the necessity ever arise. Although this may suffice militarily, especially against small-scale missile defenses around a few Soviet cities, it has severe drawbacks in other respects; as an unidentified official of the Johnson Administration is reported to have said, the President "could be crucified politically . . . for sitting on his hands while the Russians provide a defense for their people."[2] And if the Soviets extended their ballistic missile defenses to the extent that they significantly eroded American strategic delivery capabilities, the pressures to respond with some sort of arms buildup would be almost irresistible.

This could take the form of strengthening strategic strike forces, with the primary aim of insuring, as President Johnson said in his State of the Union Message, "that no nation can ever find it rational to launch a nuclear attack or to use its nuclear power as a credible threat against us or our allies." A second aim might be to retain the ability to limit damage through counterforce attacks against Soviet missile sites, air bases and other strategic targets. In seeking to achieve these aims, the United States would have, broadly speaking, four choices: to penetrate, to overwhelm, to bypass or to evade Soviet ballistic missile defenses. While any of these options could probably maintain our capacity for "assured destruction," they would obviously have quite different implications for damage-limitation, for possible Soviet reactions and, consequently, for the size and the cost of American strategic strike forces.

It is significant that Mr. McNamara, in response to the apparent acceleration of the Soviet A.B.M. program, has chosen to upgrade American strategic strike forces rather than to expand them. Both the Minuteman III, which replaces an earlier version, and the Poseidon submarine-launched missile, which is a successor to Polaris, can carry numerous penetration aids and/or mul-

[2] *The New York Times*, December 27, 1966, p. 9.

tiple warheads, which, in Mr. McNamara's judgment, would "increase greatly the overall effectiveness of our Assured Destruction force . . . even if the Moscow-type A.B.M. defense were deployed at other cities as well. . . ." Although the introduction of multiple warheads theoretically increases the number of targets at which the United States could strike, these warheads may seem less threatening to the U.S.S.R. than would comparable increases in the size of our missile forces. And in this instance, as in many others, appearance may be as important as reality.

Had Mr. McNamara's proposal been, instead, to saturate segments of the Soviet defenses through timed salvos of missiles, or to exhaust them through the sheer number of missiles launched, this would probably require not only multiple warheads but also larger missile forces. The same would be true if the objective were to bypass their defenses by striking at more lightly defended targets or launching missiles along paths which would avoid the heaviest concentrations of defensive installations. The consequent expansion of American missile forces, which are already three times as big as those of the U.S.S.R., could appear to enhance the U.S. counterforce capability and thus threaten the Soviets' own capacity for deterrence. Their logical response would be to expand their Strategic Rocket Forces, and perhaps to place greater reliance on mobile missiles, thus touching off a further round of increases by the United States, and so on.

Interestingly enough, Mr. McNamara has apparently ruled out the option of evading Soviet ballistic missile defenses, which would have meant relying more heavily on weapons systems, such as bombers and cruise-type missiles, that could not be degraded by Soviet A.B.M.s; in fact, he indicated that "a new highly survivable I.C.B.M. would have a far higher priority than a new manned bomber." Since bombers have little or no intrinsic first-strike counterforce capability, they might pose less of a threat to the Soviet deterrent than would an expansion of missile forces, and might provoke other—or milder—Soviet reactions. For the same reason, however, they might make less of a contribution to damage-limitation than would more or better missiles. In sum, the decision to penetrate any future Soviet A.B.M. system, rather than to overwhelm, evade or bypass it, seems to reflect careful consideration of possible Soviet reactions, as well as of our defense needs.

There is, of course, an alternative to strengthening offensive

forces, and that is to build defensive ones—a step recommended by the Joint Chiefs of Staff and endorsed by some influential members of Congress. Here also there are a number of options, ranging from the installation of anti-missile missiles around I.C.B.M. sites to the full-scale deployment of both area and local ballistic missile defenses designed to protect American cities.

As Mr. McNamara testified, the first option is only one possible way of preserving our "assured destruction" capability in the face of unexpected increases in the size and the effectiveness of Soviet missile and missile-defense forces, and must be compared with other ways of preserving that capability; moreover, it would not reduce damage from a Soviet attack on American cities. A "light" A.B.M. deployment around cities, whatever its political advantages and its utility vis-à-vis Communist China, would be largely ineffective against the U.S.S.R. and, like pregnancy, hard to stop short of full term. And extensive ballistic missile defenses, while they could significantly reduce damage from an attack by those Soviet forces now in being or presumably programmed, could not reduce fatalities below several tens of millions—even if we struck first against the U.S.S.R. Should the Soviets choose to augment or upgrade their strategic strike forces, the net result could be, as Secretary of State Rusk pointed out, to reëstablish something approximating the present levels of mutual destruction at a much higher cost to both sides.

In the light of this gloomy prospect, the Administration is seriously trying to persuade the Soviets to limit their ballistic missile defenses—an effort upon which the U.S. Ambassador to Moscow, Mr. Llewellyn Thompson, is reportedly engaged. If he succeeds, then neither the improvements in strategic strike forces which the Department of Defense has programmed nor the partial deployment of anti-missile missiles around I.C.B.M. sites for which it has budgeted may be required—and many of the options previously discussed will seem irrelevant. However, it is doubtful whether even our able and influential Ambassador can persuade the Soviet leaders to accept a freeze on weapons, which would condemn the U.S.S.R. to continuing strategic inferiority. And any short-term moratorium on A.B.M.s will be really significant only if it is the prelude to a broader program of arms limitation, for otherwise the differing strategic concepts and conflicting strategic objectives of the two countries may impel either or both to procure ballistic missile defenses. Thus, one

crucial question is the willingness of the United States to propose (and the Soviet Union to accept) new and far-reaching curbs on strategic armaments, now or in the near future.

IV

The content of any new proposals will depend in part on the importance attached to arms control in general and ballistic missile defenses in particular. From the preceding discussion it would seem that the introduction of anti-ballistic missiles—regardless of who introduces them and for what reasons—is likely to have a significant impact on the current negotiations for arms control. For instance, ballistic missile defenses, by injecting a new factor into strategic calculations and by triggering various responses such as those previously described, would necessitate a complete reorientation of our proposal for a freeze on strategic forces. And, since bombers may take on new importance as a hedge against ballistic missile defenses, the deployment of A.B.M.s would make bomber disarmament, whether total or proportionate, less acceptable and less likely.

In addition, the deployment of ballistic missile defenses could stultify progress toward a nonproliferation agreement. For one thing, the Europeans might view Soviet ballistic missile defenses as further degrading the effectiveness of our deterrent, and hence increasing the likelihood of Soviet pressures against NATO Europe. While a subsequent American deployment might somewhat strengthen belief in the credibility of the deterrent, it might also lead to greater European concern over the likelihood and the imminence of war, and thus to renewed efforts to buttress deterrence through the development of their own ballistic missile defenses or through control over nuclear strike forces. And should both sides deploy anti-ballistic missiles, the Europeans may again be concerned lest Europe become a battleground for the nuclear giants. While all conceivable reactions cannot be discussed here, it seems likely that the deployment of ballistic missile defenses by one or both sides will strengthen the desire of some Europeans to develop national or regional nuclear deterrents and increase their reluctance to sign a nonproliferation agreement.

In the longer run, the impact of ballistic missile defenses on the prospects for arms control may be even greater. At the very least, the requirement for hundreds or thousands of nuclear-tipped anti-missile missiles would militate against further cut-

backs in the production of fissionable materials. Furthermore, the desire for greater information concerning warhead effects would make it difficult for either the United States or the Soviet Union to give up the underground testing of nuclear weapons, which, according to some reports, is related to the development of missile defense systems. And at some stage in the expenditure of billions of dollars, one side or the other might feel compelled to try out the operational effectiveness of its long-range anti-missile missiles against incoming warheads. Even if these tests took place outside the atmosphere, so that there would be no fallout, they would constitute a clear breach of the present nuclear test ban, as would, of course, operational tests of nuclear-armed terminal defense missiles such as the U.S. Sprint or Hibex. Thus, in time, the procurement of ballistic missile defenses might lead to the abrogation or nullification of the nuclear test ban, as well as the inhibition of further progress toward arms control.

One reason for this is the probable effect on the negotiations themselves. As shown by the Soviet reaction to our intervention in Viet Nam, it is hard to reach agreement on arms control during periods of increased tension, such as would probably follow stepped-up expenditures for defensive and offensive strategic weapons. Moreover, increases in strategic armaments would certainly alienate those powers which are already seeking cutbacks in weapons stockpiles and strategic delivery vehicles as the price of their own adherence to any nonproliferation agreement.

At the very least, therefore, the deployment of anti-ballistic missiles would in all probability lead to a hiatus in arms-control negotiations, while both sides tried out their new weapons, decided on countermeasures to the other's deployment, and reestablished an effective and acceptable strategic balance. It could mean the loss of any chance for an early agreement on a comprehensive test ban and on the nonproliferation of nuclear weapons, leading to decisions by countries such as Italy or India to proceed with their own nuclear weapons programs. And it could lead to a new arms race with the U.S.S.R., in which, as Mr. McNamara put it, "all we would accomplish would be to increase greatly both their defense expenditures and ours without any gain in real security to either side."

In considering how the United States might attempt to hedge against these potential consequences, while still assuring its own security and protecting its own interests, a number of possibilities

come to mind. The first and foremost, of course, is to seek at least a moratorium on anti-ballistic missiles—as we are doing—perhaps at the price of some change in the present levels of strategic strike forces. Failing this, we might seek agreement with the Soviets on measures to limit the numbers or types of ballistic missile defenses, or both, so that neither side would feel threatened by an open-ended deployment of such defensive weapons. Alternatively, the United States might try to set limits on the numbers or types of offensive weapons which might be added to the arsenals of both sides in response to the deployment of anti-ballistic missiles, in order to dampen the impact on the arms race of incremental increases in strategic strike forces. Indeed, we might find it desirable to suggest revisions in our present freeze proposal which would allow the limited introduction of anti-missile missiles, providing corresponding numbers of I.C.B.M.s or I.R.B.M.s were destroyed.

To avoid interminable wrangling over technical details, and to allow for necessary adjustments in postures, such agreements might be tacit rather than formal, could be limited to a fixed number of years, or subject to cancellation for cause upon notice. The important problem is not the design of new measures, but recognition that reduction in armaments may promote the national security as well as—or better than—their augmentation.

It is obvious that judgments as to the desirability of building ballistic missile defenses will differ according to one's opinion as to the likelihood of war, one's desire to employ strategic forces as coercive instruments, one's theories on crisis behavior, and one's views as to how the communists are likely to conduct themselves in the next decade. But whatever views one may have on the utility of A.B.M.s, one must also acknowledge their disadvantages. For any deployment, the price, in coin and in new instabilities, will be high. Chief among the costs is likely to be an erosion of the already slim possibility of reaching agreement on further arms-control measures which could promote a more secure world. Without denying the importance of military power in attaining this goal, it is still possible to question the relative allocation of resources to the increase of that power, and particularly the addition of increments which promise so little and risk so much. On these grounds the whole issue of constructing ballistic missile defenses needs to be carefully thought through, by both the United States and the Soviet Union.

WHO'S ANTI THE ANTI-MISSILES?

Anti-missiles figure nowhere in Britain's defence plans and have not done for years, though in theory this is one of the few countries small enough to be ringed with effective missile defences

British work on anti-missiles was stopped in the early 1960s for precisely the same reason that Mr McNamara and his advisers in Washington are refusing now, against strenuous military pressure, to go ahead with theirs. The thing doesn't really work. It is difficult for the anti-anti-missilers to spell this out without giving away too much about their own missile warheads, the decoys in them and the multiple warheads that split up and head for different targets and generally make the task of sending up enough missiles to intercept the flaming bunch a technical impossibility. But without a technical breakthrough that is not yet in sight, no anti-missile system has any hope of being effective, not even one designed to protect a few selected targets.

A defence that can offer only to intercept nuclear warheads by exploding its own nuclear warheads, fall-out, blast and all, directly over threatened cities is no defence at all, and this is the best that American technology, with its two-tier system of long-range and short-range anti-missiles, can offer at the moment. It may not always be so hopeless, which is why the latest American defence budget still provides for $800 million to be spent on anti-missile research and development, including a substantial sum in reserve should the decision be taken to go into production. But it is now.

A huge weight of military opinion is being thrown against this research spending, but this is nothing new. The mistake of most British commentators is to think that Whitehall has a monopoly of Blimps. The Pentagon can boast as good, if not better; eminent military men who have supported a whole succession of bad weapons including the 2,000 mph B70 bomber (which let them down by leaking fuel like an old sock); the Skybolt air-launched ballistic missile; that standing aerodynamic joke, the B36 bomber (which they actually got into service); and now the anti-missile. In some respects, it is the duty of military planners to argue in support of all options, however slim. It is the business of the politicians and their advisers to weed out the non-starters.

The Russian announcement of anti-missile installations around selected cities has many Americans worrying whether Soviet scientists have hit on a missile development that the United States has not thought of. It need not necessarily be so. Russian air force generals may, for a start, carry more weight inside their government than American air force generals do, but, even if they don't, the Russian move makes cold war sense. One of the aims of the cold war is to place economic strain on the other side. If, for a relatively modest investment in not-very-good anti-missile installations, the Soviet Union can bluff the American administration into putting its own anti-missiles into production at an estimated cost of $40 billion, it will have achieved a very considerable cold war victory indeed. So far, the United States has refused to be bluffed; but with an election coming next year, and the military men doing their level best to whip up public opinion with last weekend's list of the 50 cities that would be their first choice for anti-missile protection (the psychological appeal of anti-missiles is strong), President Johnson's nerve might yet break, even if Mr. McNamara's doesn't.

..... THE ECONOMIST, 18 February 1967

SIX-NATION SETUP TO BUILD EARLY WARNING SYSTEM

LONDON, March 21 (AP). A six-nation corporation to build an early warning system stretching from the Arctic Circle to the Eastern Mediterranean was announced in London today.

It was set up to build NATO's $280 million "Nadge" (NATO Air Defense Ground Environment), a warning system extending from Norway to Turkey. It will be completed by 1971.

The consortium is called "Nadgeco" and is made up of: Hughes Aircraft Company, United States, N.V. Hollandse Signaalapparaten, Netherlands; Marconi Company, Britain; Selenia SPA, Italy; AEG-Telefunken, West Germany; and Thomson Houston-Hotchkiss Brandt, France.

Nadge is the largest military electronics project to be undertaken in Europe, experts said.

It will build equipment to provide fighter aircraft and ground-to-air missiles with an advanced ground control system which will detect, identify, track and destroy enemy bombers.

..... WASHINGTON POST, 22 March 1967

A STRATEGY FOR ARMS CONTROL

Is it possible to be serious about disarmament in the reality of today's world? When I was asked to chair a White House Panel on Arms Control and Disarmament in the summer of 1965, my first inclination was to say no. In the midst of an undeclared but escalating war, with defense spending at an all-time, "peacetime" high, this hardly appeared to be a time when progress toward disarmament was possible. Two decades after Hiroshima, we have moved steadily away from the conviction that disarmament is the necessary rational solution to international security to the point where we now seem completely resigned to maintaining our national security on the brink of a precarious balance of terror.

Yet, although there is certainly good reason to question the effectiveness of those of us who have worked on disarmament endeavors in the past, I accepted the chairmanship of the panel, and I am extremely glad I did. Our efforts regenerated my earlier conviction that it is quite possible, even at this late date, to devise an arms control program that would in no way detract from our national security. In fact, it would almost certainly enhance it. The panel's recommendations for a series of simple, modest, straightforward, safe disarmament steps, coupled to modest international security arrangements, were contained in our report to the President and made public by him. A few of them are actually going forward in a halting way. This in spite of the fact that the reaction of government officials to those proposals was extremely negative.

Before discussing these recommendations, I would like to speculate, first, on why there is so little understanding and support for disarmament, and then to suggest that our knowledge of the ways in which societies develop can show us how to institute and manage a disarmament program.

The Panel on Arms Control and Disarmament for the White House Conference on the International Cooperation Year chose to recommend a series of individual steps, not because it rejected the goal of comprehensive world disarmament but, on the contrary, because it believed that this collection of limited measures, taken together, would constitute a major step toward that goal. Although the panel was criticized by some for not recommending immediate comprehensive disarmament, it is significant that there has been no stampede to negotiate even the limited steps we proposed - or any other arms control measures. While some people, including the Soviet delegate to the Geneva Disarmament Conference, blamed the lack of disarmament activity on the Vietnam war, I do not think the degree of genuine commitment to disarmament has changed very much, nor that it was ever adequate to the need.

The fact is that very few of the world's leaders or its ordinary citizens regard disarmament as a realizable goal and therefore worth the effort, the loss of national freedom and initiative, and the hazards of the unexplored route that must be followed to achieve it. Our panel believed that if we could show, through specific - even if modest - successes, that disarmament is a practical, attainable goal, we might reawaken an interest in it.

But demonstrating that the goal is practical is only half the problem. We must also understand that it is essential. Almost all statesmen would agree to the ultimate necessity of curbing arms escalation, but they also seem to hope that existing arrangements will suffice for now and, with a little luck, for as long as they have responsibility. In many sections of our own country, where it is a political liability to oppose maximum military force, whether it is needed or not, few politicians have been willing to champion arms control measures.

Why is there so little interest in disarmament? One reason, it seems to me, is a blind, misplaced faith that we can ensure our security indefinitely through unilateral technical developments and vast military forces - in other words, through a continued arms race.

Even on the infrequent occasion when we seriously do consider an arms control proposal, we scrutinize it from a peculiar point of view. The normal procedure is to evaluate any proposal in the light of the most dangerous possible eventuality, no matter how improbable that may be, and to give

absolutely no weight to the consequences of failing to halt the arms race. I often had the desperate feeling, while listening to strategy discussions, that the obsession to deter a single, unlikely, mad adventurer, which seemed to dominate our defense planning, would eventually result in a world in which sane men are helpless to avoid the ultimate catastrophe.

Another reason why most people are not particularly interested in disarmament is the result of an almost universal failure to appreciate how much worse the international situation can become, and within how short a time.

If we try to picture what the world will look like in ten or fifteen years, if we cannot arrest the arms race or halt the spread of nuclear weapons, these are some of the possibilities we must foresee:

In ten or fifteen years, China will have substantial numbers of advanced nuclear weapons, many intermediate-range ballistic missiles, a few submarine-borne missiles, and the beginning of an intercontinental missile force. China recently exploded nuclear device No. 5 to remind us of her determination to become a major nuclear power. Russia and China will probably have conventional and nuclear weapons and large numbers of soldiers stationed on their mutual borders. As a result of the Chinese developments, India and Japan will have begun to develop nuclear weapons and strategic delivery systems. Still reacting to China, India will have increased its conventional army, and Pakistan will have responded in kind. Pakistan will also try to obtain nuclear weapons, possibly from China.

In Europe, as German pressures for reunification and for nuclear weapons continue to grow, the United States will finally have been forced to share some control over its nuclear weapons stationed in Germany. Conceivably, the Germans will have grown so discontented that they will have begun developing their own nuclear weapons in the already established Carlsruhe Research Center.

The minimum Russian response to this would probably be to increase its own nuclear force and to increase its occupation forces in East Germany. Fear of a German nuclear force might cause Russia to take much more drastic action. The same fear might also have persuaded Sweden to begin

developing a nuclear capability and France and England to increase their military establishments.

Russian-American enmity over European developments will have made their cooperation elsewhere impossible, and they will continue to feed the conventional arms race in the Middle and Far East. If the Israelis feel overly threatened by the growing Arab conventional arms stocks, they may begin to develop nuclear arms.

The mere number of possible interactions could make the world of 1976 exceedingly unstable. Even a small war in one of the critical areas will have the potential for rapid escalation. This, then, is the prospect we should keep in mind when we debate the desirability of collective disarmament measures.

The question still remains, given the reality of our present international situation, whether it is possible to make concrete progress in disarmament. Here I think it would help us to try to understand the ways in which societies change and develop, particularly in our own time when man's technical ability to control his environment is proceeding at an almost unmanageable speed.

The biological evolution that produced modern man and the social evolution out of which modern civilization was developed are both basically the result of a trial-and-error process. The difference is that in the social evolution man himself is able to direct the evolutionary process toward his own goals. Although the scientific revolution has vastly increased our ability to affect the physical world, the fact remains that while man's intervention can increase the range of evolutionary possibilities, man cannot change the fundamental experimental nature of the evolutionary process. It still remains subject to all the hazards of evolution, including that of producing social dinosaurs unfit to survive, or, more likely, of producing an environment unfit for man.

Our studies of information and computer technology have taught us that trial and error are inherent in any learning effort. These studies have also taught us the properties that are essential to a good learning system. If we view society as a giant learning machine - every society is trying

to learn to satisfy better the needs and aspirations of its members; some work better than others - and if we agree that trial and error are involved in all learning, we can specify the properties a social system must have to function effectively.

Bearing in mind our specific concern with the institution and management of a disarmament effort, let us examine the characteristics of a good learning system that apply here. The "machine" should be able to carry out experiments rapidly, which, in general, means that many experiments will take place simultaneously. Communication channels within the system should be capable of accurate and rapid transmission, so that information about difficulties can be transmitted quickly. Its error-detection system must be sensitive enough to detect malfunction early in order that quick adjustments can be made if things do not go as expected. Lastly, the individual experiments or steps that are selected should be such that each involves a small risk, in case it proves unworkable.

This model should help us to adopt a reasonable attitude toward the difficulties we are bound to encounter along the way. As long as we have a basically deterministic view of progress, wherein every individual action must prove to be either all right or all wrong - an attitude all too prevalent in both East and West - then it will be extremely hard for us to accept some partial successes, and some complete failures, and to make adjustments in partially completed plans on the basis of experience and new information.

In the world today, with so many great political differences and even greater levels of human and social development, any attempt to implement, in one step, a detailed, comprehensive world disarmament plan is hopeless. There are just too many uncertainties and too many choices.

While it is not possible in one step to make the transition to the world organization that would be needed for total disarmament, it is perfectly feasible to begin a step-by-step program of arms limitation experiments to learn how to create the world we would like. We can agree on the need for a disarmed world functioning under international law; describe our objectives - that is, how this world would look in the end - and then agree to carry out experiments, a few steps at a time, to move toward our goal.

Because the Arms Control and Disarmament Panel believed that the best way to make progress was to start, we recommended a series of measures that we believed to be negotiable separately, that require no inspection and which, when taken together, would represent a major step toward a safer, more manageable world. Many of our recommendations are being considered seriously, and there is at least a glimmer of hope that some agreements will be forthcoming. Unfortunately,most of the arrangements require concessions by both sides in the arms race, and no group seems to be prepared today to accept some short-run inhibitions to achieve long-run objectives. The reason that the just concluded agreement to ban weapons from space was possible was that this very worthwhile step did not interfere with any current military project of the signatory powers. These were among our recommendations:

The United Nations. Without confidence in the peacekeeping machinery, nations will continue to arm. The panel recommended the creation of a U.N. Peace Force composed of a standby force committed by member nations and a U.N. elite force of 2,000 men; a strengthened Peace Observation Corps available directly to the Secretary General; regional and worldwide nonaggression pacts, and the development of a legal foundation strong enough to support the peacekeeping activities.

To be effective, the United Nations must have adequate financial support, which member nations, including the United States, have not been willing to provide. As a temporary expedient, we suggested that the nuclear powers pledge an agreed fraction, such as one-half of 1 per cent, of their military expenditures to appropriate U.N. agencies for peacekeeping and economic assistance.

This issue was one of the most important to be considered during the recently ended session of the United Nations. Clearly some nations, including the Soviet Union and France, still believe that achieving an effective U.N. capability for peacekeeping with majority control and without a veto is not compatible with their national interests.

Nuclear Weapons. The panel's recommendations included a nonproliferation pact; pledges by the nuclear powers not to attack or threaten to attack a non-nuclear nation; defense guarantees for the non-nuclear nations; a U.S., British, Soviet treaty to cease production of nuclear materials; and the creation of nuclear-free zones in Latin America, Africa, and the Near East.

Of all the disarmament steps, the nonproliferation agreement is the single most important, and the one that cannot wait. Five nations already have their fingers on the nuclear trigger. Sixteen more countries are waiting to decide whether to join the nuclear club. Twelve of these countries are capable of producing weapons within three years. Three of them - Sweden, Israel, and India - could do so within months.

The principal stumbling block to a nonproliferation treaty is the question of whether the United States, through NATO, will share its ownership and control of nuclear weapons with West Germany. Under the terms of its admission to NATO, West Germany is enjoined from manufacturing nuclear weapons but not from acquiring them. Although a nonproliferation treaty is clearly in the interest of both Russia and the United States, the Soviet Union has made it clear that it will not sign such a treaty until the question of German participation in the control of nuclear weapons is settled. It was on this issue, primarily, that discussions at the Geneva Disarmament Conference this past year broke down.

Recent developments in Germany and within NATO itself have clarified somewhat the German nuclear weapons access problems, and the recent conversations between Soviet and American representatives have produced some hopeful pronouncements. Some observers believe that a nonproliferation agreement is in sight and will be signed this spring. I hope they are correct. Everyone realizes that time is running out on this possibility for arms limitations and so this is one of the few opportunities that the statesmen of the world have approached with a sense of urgency. I believe that some type of security guarantees for the non-nuclear nations will be required to make a nonproliferation treaty acceptable to the small group of nations that have a clear nuclear potential and security needs which might make nuclear weapons appear useful.

European Security. The issue of nuclear sharing for Germany is obviously related to the larger question of European security, where the present fluid situation makes some real progress possible. To reduce the tensions in Europe and to move toward settlement of the outstanding East-West differences, the committee recommended:

(1) That the United States and its allies seek a nonaggression pact between NATO and the Warsaw Pact Organization. Even though this would do no more than recognize

explicitly what has already been recognized tacitly - that the situation in Central Europe can only be changed by mutual consent, not force - our proposal was initially greeted with a great deal of reserve. The new German leaders obviously understand this point even if our State Department policy makers do not.

(2) That the United States seek to ensure that measures to improve Western security do not result in creation of new nuclear forces. Instead, there should be greater involvement of our Western European allies in the planning of U.S. strategic forces, as well as in other military planning and arms control problems.

(3) That the United States explore, along with arms control and related security measures, steps which would help lead to German reunification. In this connection, the possibilities for balanced reductions in U.S. and Soviet troops in Central Europe should be examined.

The great common interest of the United States and the Soviet Union is in a settled political situation in Europe. Germany remains the great issue of the confrontation, and the one most likely to become the occasion of conflicts from which neither nation can retreat. Since any such conflict would probably begin with the devastation of Germany, it is as much in the German interest as in the Soviet and American to resolve the European political situation.

The key question, of course, is whether this common interest is strong enough to overcome the conflicts of interest on all sides. Given the German and American desire for reunification of Germany, it is inconsistent, in the light of Russia's concern over its security, for the United States to insist on close military integration of West Germany within NATO, including German control of a NATO multilateral nuclear force. On the other side, continued Soviet support of East German independence is in conflict with the Soviet desire to legitimize the post-war settlement of Germany, since it is now impossible for Russia to expect West Germany and her allies to accept the division of Germany as permanent.

The debate seems to have become polarized around the question of which comes first, European settlement or detente. Our recommendations proposed moving toward a detente in an

evolutionary way. If we are not prepared to chance the consequences of a nonaggression agreement or any troop reductions, how can we reasonably expect the Soviet Union to agree to major changes in political alignment?

The new leadership in West Germany appears to be bent on a meaningful search for agreements leading to detente and, hopefully, reunification.

The total weapons race. Another major problem in arms control involves the containment of the existing arms race. In the strategic nuclear weapons area, primarily between the United States and Russia, we proposed limiting the strategic delivery capabilities on both sides. This would be done through a freeze on the number of delivery vehicles, followed by a cut amounting, as a start, to one-third of each party's medium and long range vehicles, and a moratorium on the deployment of anti-ballistic missiles defense systems.

We gave high priority to containing the competition in weapons procurement between the United States and Russia. Unless checked, this competition will otherwise lead to the periodic expensive procurement, deployment, and redeployment of entirely new weapons systems. The fact is that for the past decade we have been involved in a continuously escalating arms race, the ironic consequence of which is to increase continually the potential for destruction, should a nuclear war occur.

We urged the Soviet Union and the United States to agree to a three-year moratorium on new deployment of anti-ballistic missile systems, since any new antimissile deployment by one would most certainly result in the other nation's augmenting its offensive capability. The final result would be to increase once again the potential for destruction.

Recently Secretary of State Dean Rusk spoke of initiating private talks with the Russians to see if an agreement to restrict antimissile systems could be arranged. In my view, this should be coupled with a limitation on strategic delivery systems in order to really arrest the arms race.

The arms race among underdeveloped nations. To curb the conventional arms race among these nations, we recommended:

(1) That the United States seek to have controls established over the traffic in arms by major-power agreement to refrain from introduction of sophisticated weapons; by regional non-acquisition agreements; by U. S.-supervised agreements about sale and acquisition, and by the establishment of a U.N. monitoring system to record the traffic in arms.

(2) That the United States join with other major powers to provide adequate security for the less developed nations. In addition, that the United States support the establishment of U.N. peacekeeping procedures to the same end.

Thus, we concluded as we began, with the United Nations. Since our panel believed that universal membership is essential to an effective United Nations, we focused on the importance of involving the Peoples' Republic of China in the U.N. although the United States is apparently not yet willing to halt its opposition to membership for China, it is heartening to see the emergence, in the past half year, of a more thoughtful body of opinion in this country on the China question.

My hope, in presenting this quick survey of the Disarmament Panel's report, is to show that there are many possible ways of making real progress toward a disarmed and secure world. Some are simple and easy to negotiate; all they require is a little motivation. Others are more difficult and would require a great deal of thought and effort. But no one of these proposals, either singly or collectively, would pose a security problem for the United States or for the other nations of the world. On the contrary, the real threat - one of total destruction - lies in continuing the present national military arsenals.

by Jerome B. Wiesner
..... SATURDAY REVIEW, 4 March 1967

THE MYTH OF TECHNOLOGICAL STALEMATE

The modern technologies affecting strategic war are in a violent state of flux.

More true breakthroughs, more destabilizing changes, can be expected in the next decade than have occurred in the twenty-five years since World War II.

The idea that offensive weapons are all-powerful in the nuclear age with the defense helpless against them, may prove to be one of the shortest-lived "axioms" upon which a national military strategy was ever based.

Such views of course, are completely contrary to the official US position on strategic war. Secretary of Defense Robert S. McNamara recently said, "Even if the Soviets ... were to assign their entire available missile force to attacks on our strategic forces, more than one-half ... would still survive and remain effective." He also holds that no conceivable type of missile defense would be able to stop our surviving force of missiles and prevent them from bringing an unacceptable retaliation against the Russians.

There is room to seriously question these conclusions.

A great deal of technical evidence indicates that the pendulum is swinging away from an all-powerful offense. Possibly the Administration does not believe it is time to start discussing this swing. But soon the US public must be told that the multibillion-dollar long-range rocket systems it has just purchased, those based undersea as well as underground, are not the weapons to end all weapons. They could become obsolescent more quickly than any major system of the past. They may have a much shorter time in the sun than the high-altitude bomber.

The most destabilizing of all developments - a sound, "nearly perfect," operational defense against ballistic missiles - appears to be in the technical cards within the next ten years or less. Both the US and the USSR could devise such a defense.

The idea that the whole strategic war picture can change rapidly in the next few years and that a viable defense can be erected against long-range rockets rests on four critical developments. These are:

Very large nuclear weapons, above sixty megatons, could form the basis of a "screening-type" of missile defense, a protecting shield of high-energy particles over a target nation. Such a shield would be much more economical and more effective than the Nike-X type of "dueling" terminal defense, in which each incoming warhead must be met by a defending warhead in a "bullet vs. bullet" engagement.

Extremely accurate ICBMs, which can hit within 600 feet of a target at intercontinental ranges. The unexpectedly rapid development of this "hard-target" capability during the past five years has disrupted original US plans for long-term protection of its Minuteman retaliatory force in underground silos. The concept of mobile ICBMs, mounted on trains or cross-country vehicles, has been resurrected only recently.

Astounding reconnaissance systems development. Astounding is the quietest adjective that can be applied to the results now being achieved with "multi-spectral" reconnaissance systems and to the progress that is surely coming in the next five to ten years. Most important is the prospect that a satellite will be able to "see" submarines submerged several hundred feet in the ocean. Rapid, nearly real-time, methods of transmitting large volumes of this data to surface vessels and aircraft open the way to effective antisubmarine defenses. Similar satellite reconnaissance techniques will allow mobile ground-based offensive missiles, as well as aircraft, to be tracked continuously. The security of mobility, even Polaris-type under-the-sea mobility, as a protection for offensive systems is rapidly declining.

Major cost reductions for rocket vehicles and many types of space systems have opened two broad avenues for change in the strategic balance. First is the possibility of many nations acquiring small intercontinental nuclear attack forces. Second is the prospect that the more advanced nations will be able to consider more sophisticated offensive systems as well as defensive systems which will intercept ICBMs in their boost and midcourse flight phases.

Technology is pushing these four critical developments rapidly and unavoidably upon us. Any engineer, any scientist, any planner working on the over-all strategic war problem now deals with this technology regularly.

Unclassified sources reveal the general extent of this

technical advance today and the rapid progress that can be expected in the near future. However, classification keeps most of the story buried with only about ten percent of the iceberg showing. The following paragraphs come from a study of that ten percent.

Large Nuclear Weapons

The original US calculations on the affects of very large nuclear weapons, in the 100-megaton class and above, have been grossly in error. It now appears that, when exploded in space, these weapons will generate more than 1,000 times the number of high-energy particles originally predicted. Estimating the energy of these particles and their number (flux) by extrapolating from the data the US has gathered on tests of twenty-megaton-class weapons has not been possible. The very large weapons represent a new phenomenon.

Original warning of the new phenomenon came from the Russian sixty-megaton test at high altitude above the Arctic circle in 1961. It is by far the largest nuclear weapon exploded to date.

The US has followed up and investigated this phenomenon to a limited extent through underground tests. Small weapons have been rigged, in long tunnels about a mile underground, to produce directional explosions, which simulate the effects of the larger weapons through a small arc. Air is pumped out of these instrumentation-lined tunnels, and it is possible to gather some data on nuclear effects in a near space environment. Collecting meaningful data from such tests and developing a valid theory for predicting the effects of very large nuclear weapons in space have become top-priority tasks of the Atomic Energy Commission.

Some basic new possibilities in ballistic missile defense are raised by the fact that these very large weapons give off more than 1,000 times more high-energy particles than expected. A "screening" defense system now appears possible. Explosion of a few very large weapons at the proper altitude and latitude could trap dense quantities of the particles in the earth's magnetic field at relatively low altitudes below the Van Allen belts of natural radiation. The umbrella of trapped radiation could be strong enough to disable ICBM warheads by violently and suddenly changing the characteristics

of their electronic guidance and fuzing elements or by reacting adversely with their basic nuclear material.

In a defense system the very large weapons would have a dual advantage. Exploding in the midst of a barrage of warheads and decoys they would do great immediate damage. The full force of the weapons would be felt in one massive pulse of energy, and their kill radius with this pulse would be much wider than that of the relatively small weapons, well below ten megatons, that are contemplated by the US for use in the Nike-X system.

A second or so after the blast, if it were triggered at the right point, a portion of these particles would bounce back into the area of the attacking missiles to start forming the screen. They would be trapped along the earth's lines of magnetic force traveling between points near the North and South magnetic poles. Travel time between the poles has been found to be about one second. In about a half-hour the particles would spread out to encircle the globe. It is believed in some quarters that the belt created by very large weapons in the 100-megaton range and higher would be powerful enough to turn the most heavily shielded ICBM warhead into a dud. The decay rate would be rather rapid, but the belt could remain lethal to the warheads for many minutes, possibly an hour. So a few weapons, with a warning system to report when ICBMs were fired, have the potential of stopping barrages.

Serious thought about "screening" defense dates back a number of years. They have great potential advantages over Nike-Zeus and Nike-X type "dueling" systems because they don't require elaborate radar facilities for tracking large numbers of in-coming warheads, they need not sort out warheads from decoys, and they can handle a large "saturation barrage."

The first tests to determine if a radiation umbrella could be formed were made by the US in 1958 with three small Argus shots, each in the kiloton yield range. It proved possible to form three umbrellas, but they were far too weak to damage a missile warhead. Extrapolation of the Argus data apparently misled most US researchers to the conclusion that it would be impossible to build a weapon large enough to create an effective belt.

A NASA report indicates that seven artificial radiation belts have been created around the earth - four by the US

and three by the Russians. The three Soviet tests mentioned by NASA came in the fall of 1962 - shortly after the US 1.4-megaton explosion code-named Starfish. The following year the test-ban treaty was signed, and all experimental work has since been carried on underground.

The NASA report does not contain information on a large number of high-altitude shots that did not form a long-lasting radiation belt because they were not exploded at the proper altitude and latitude. It dealt only with the belts that had a measurable intensity for months or years.

The two principal US high-altitude shots of this "non-belt" type, Teak and Orange, were made in 1958 and were both in the "megaton range." Teak, the biggest, formed a fireball eighteen miles in diameter that glowed brightly for about five minutes. Serious disruptions of high-frequency radio communications and some types of radar transmission lasted for more than one hour.

Soviet high-altitude tests reportedly have been much more numerous. One of them was the sixty-megaton blast made in the fall of 1961, early in the surprise test program that broke the voluntary test moratorium.

A total of seventy-one shots, around one a week, were made in this Soviet test series that ran for nearly eighteen months, mostly in the Arctic. Many high-yield weapons were exploded at various altitudes and latitudes. On the strength of these tests, many US experts believe the Russians know considerably more than this nation about high-altitude effects of large weapons.

"Hard-Target" Accuracy

For several years two basic bodies of information on strategic war have been passing about in the United States. That reaching the general public is generated by the government and very often is at odds with the information circulating in the technical community.

No better example exists than the double information on ICBM accuracy. In his Posture Statement in January 1963 before the House Armed Services Committee, Mr. McNamara discussed the 1964-1968 defense program and the general outlook for that period. He said, "An attacker would have to

use several of his missiles in order to be reasonably confident that he had knocked out one Minuteman (in a silo)."

This translates roughly into a technical estimate that the Soviet missiles for the period discussed would have an accuracy CEP (circular error probable) of about one mile, meaning that half of the missiles fired at a given target would strike within one mile of it. Hardened structures, such as Minuteman silos, can withstand one-megaton surface bursts at distances of about 2,000 to about 2,500 feet, according to DOD publications. Several factors influence this estimate, including type of terrain and shock-absorbing mechanism in the silo, but it is in the ball park.

At the time that Mr. McNamara was making this estimate it was commonly accepted in the US technical community that guidance accuracies were improving rapidly, and that in this five-year period a hard-target capability with a CEP of 1 mile, or about 600 feet, would be achieved. This common technical opinion was reflected in the November 1962 issue of Astronautics in an article by H. H. Koelle, former director of future projects at NASA's Marshall Space Flight Center. Mr. Koelle said, "For many years guidance accuracy was a limiting performance factor, which led to requirements for high-yield warheads. But through extension of presently available technology of sensors and terminal control, we can now see the achievement of a hard-target capability before 1970." (Emphasis supplied)

Mr. Koelle then made the obvious comment that strategic missile systems would have to be moved out of the silos and made mobile once the hard-target capability was a reality.

Today all signs indicate that the information in the technical community was correct and the public information from DOD was about one order of magnitude in error. Last month Gen. John P. McConnell, Air Force Chief of Staff, talked to a congressional committee about the need for advanced ICBMs which would be mobile, able to move constantly about the US in trains, trucks, or some new type of cross-country vehicle. The Washington Star reported that General McConnell indicated that Mr. McNamara "already has given tentative approval."

On this particular point the Air Force record for being in tune with technology is better than Mr. McNamara's. Very early in the program, the USAF planned to put a significant

percentage of the Minuteman force on trains. By 1961 considerable work had been done in designing and testing proper rail equipment, etc. More than $100 million was spent on this project before Mr. McNamara canceled it in 1962, giving several reasons why the mobile missiles were more costly and less cost/effective than the silo types.

This doesn't mean the 950 or so Minutemen in silos today are useless and are not a potent retaliatory force. It simply means that Mr. McNamara's five-year estimates in 1962 were quite inaccurate and that his 1962 cost/effectiveness standards do not hold up now. The difficult problem of counting the relative worth of ICBM forces apparently has turned out to be different than he expected. With a hard-target capability the Soviets can get one Minuteman for about each warhead expended, instead of "for several missiles" as Mr. McNamara estimated.

This brings up the question of comparing missiles to war heads. The terms are not synonymous, as is well known today. However, in 1962 they were often used loosely and interchangeably. Earl H. Voss, writing in the Washington Star at the end of 1962, optimistically reported that, "The United States is credited with more than a 3-1 advantage in nuclear missiles over the Soviet Union.... Competent observers said this estimate of United States power is behind recent statements by President Kennedy and Secretary of State Rusk that the world has come to a "turning point" in history... (which was brought about by) smaller, cheaper, advanced nuclear weapons scattered in hardened sites and almost invulnerable to attack." Mr. Voss went on to say that "an attacking power would have to use four rockets, given reasonable accuracy, to knock out each silo." On this basis, Voss's sources said the Russians would have to outdistance this country "4-1 in missile production" before attempting a "first attack."

Since then, starting in about 1964, there have been numerous newspaper stories about multiple warheads being developed, with Minuteman and Polaris carrying about three apiece. If the Russians also can handle multiple warheads, their bigger missiles could be a great advantage. For instance, they have shown missiles in Red Square with bigger payloads than the Titan II, which can carry more than five times the load of a Minuteman. So, by rough estimating, one might conclude that the large Soviet ICBMs might carry more than fifteen warheads

or more than five times that of the Minuteman.

Regardless of the capability one attributes to the Soviet missiles, hard-target accuracy and development of multiple warheads have changed the picture completely from 1962. It would seem highly foolish today to attribute overwhelming warhead superiority to the United States; or to say that the Soviets would have to outproduce us 4 to 1 in missiles to overcome our lead and make a first strike on the Minuteman force feasible.

Multispectral Reconnaissance

Today's technology has no more important message for laymen than the one from the reconnaissance business. This message is, "Man really is just learning to 'see', but we are rapidly gaining full sight along the entire electromagnetic spectrum." The lifting of our "blindness" is going to be a traumatic affair. Enough is known already to establish that.

It is abundantly clear that man and his new and improved reconnaissance devices can "see" much more from a satellite than was predicted even five years ago. For example, submarines can be observed at depths of several hundred feet in the ocean. There is reason to expect, in the next five years or so, other revolutionary developments of great military importance, such as the observation of men under heavy foliage, possibly using improved versions of older equipment such as long-wavelength radar.

It is now possible to begin design of a satellite which can deliver the following information using only on-board equipment: the pressure, temperature, and humidity at various altitudes in the atmosphere; the temperature and salinity of water at various depths in the ocean to more than 200 feet; the dimensions and speed of ocean currents to depths of more than 200 feet; tracking the movement of fish in schools as small as thirty feet in diameter at depths of more than 200 feet; survey of water supply, including the location of underground rivers; inventory of forests, including the types, heights and health of trees; structural information on the earth's surface, including the types of rocks, their attitude, and drainage pattern; water content, texture, plasticity, and bearing capacity of some types of soil; sources of sand and gravel; survey of crops under cultivation,

including types and state of health; sources and types of pollution in rivers and coastal waters; and identification of some types of ore deposits. This list could go on and on.

Most of the information is made available by comparing several pictures of a given spot on earth which were made at the same time but in various portions of the electromagnetic spectrum; hence the term "multispectral" reconnaissance.

Conventional photography in the visible light region continues to be the backbone of aerial reconnaissance as it has for fifty years. The resolution (ability to show small objects from high altitude) of conventional photographs is higher by far than those obtained from radar, infrared, or other types of sensors. Steady improvements in resolution have been made since World War I, and the experts say there seems to be no end in sight. Today, judging from reports in technical journals, satellite photographs taken on a clear day should show objects on the ground smaller than a garbage-can top.

Multiband color photography is just about the hottest development in conventional systems today. Three or four color photographs, each sensitive to light at a particular, narrow band of visible or near-infrared frequencies, will show a great deal about land and water when compared.

Additional data comes from instruments collectively capable of scanning nearly the entire electromagnetic spectrum, from radio waves, through radar and microwaves, the complete infrared spectrum, up to ultraviolet and X-rays. Steady improvements are being made in both passive instruments, which observe natural radiation at a partciular frequency, and in active equipment such as radar which emits radiation at a given frequency (coherent radiation) and picks up a reflection from the object being observed. With this lineup of devices, quite detailed reconnaissance can be carried on continuously regardless of atmospheric weather conditions.

To be useful, however, data from all these instruments must be recorded at the same instant, and reduced to a format that can be studied by either humans or machines. Immense quantities of data must be handled rapidly to do the complete job. A few years ago it was considered impossible. Today, however, the experts are arguing about which of several possible methods would be best.

A key development has been the extension of the region of coherent radiation to frequencies far higher than those of radar. This ability to radiate energy at the shorter wavelengths, e.g., the visible-light laser, vastly increases the resolution of radar-like reconnaissance devices and allows communication equipment data-handling capacity to be increased to the infinite for all practical purposes.

Future development of these multispectral sensors will have two main branches. One branch will be pure science. It concerns the development of improved sensors in all parts of the spectrum, and development of means for generating coherent radiation at shorter and shorter wavelengths, beyond the laser. Eventually, one can expect that gamma-ray lasers will be possible, and they will be the true death ray. Nothing could stand against them. Natural gamma rays from space now are detected in mines more than a mile deep. A coherent stream of radiation with this sort of energy could destroy anything it was focused upon.

Excitement in the scientific community has seldom topped that being shown in the new sensors and the new forms of coherent radiation. This is because the sensors are important "eyes" for science just as for reconnaissance. They are vital in learning more about plasmas, high-temperature reactions of all types, the structure of the atom, and a host of other phenomena. There is little likelihood of stemming this scientific development even if it was desired. Too many good minds are at work and the costs of meaningful experimentation are not high.

The second major course of development concerns the actual multispectral reconnaissance systems. Here the big need is to calibrate the entire system - to get the various sensors to work together. The basic capabilities of the various sensors have been established. But simultaneous measurements must be made over various types of known terrain before the full implications of the sensor outputs can be interpreted.

Some calibration data already exists, and this forms the basis of predictions being made. It also has been established that complete calibration and shakedown of the system is likely to take many months and possibly years of work in a manned satellite. Equipment adjustments and test modifications couldn't be handled automatically.

The Department of Defense has allowed the Air Force to request $431 million in FY 1968 to accelerate the Manned Orbiting Laboratory (MOL), after keeping the project moving at a slow pace for three years. First flight of a MOL complete with crew is scheduled for 1969. In view of the reconnaissance potential of manned satellites with multispectral equipment, this could hardly be called a high-priority program.

NASA expects to have its first small manned station in orbit in 1968. This station will be more than twice as big as the MOL, and as soon as its habitability is established, testing with elements of a multispectral system is to begin.

Declining Costs - Increasing Opportunities

It may not be immediately apparent from the size of US expenditures, but the costs of rocket vehicles and space systems are falling rapidly. US research is mainly responsible for the new low-cost opportunities, but other nations may be in a better position to capitalize on some of it because they started late.

The commonly held idea that large, long-range rockets must be extremely complicated and very expensive already has been outmoded. The best example is the Japanese space program, which has developed a four-stage solid-fueled rocket capable of putting a 300-pound payload in a 300-mile orbit. This rocket, the Mu, is officially known as a satellite launcher, which is one way of saying that it also is an intercontinental rocket with a payload of about 400 pounds.

The startling point is that the Japanese claim to have spent only $25 million in more than five years of work on a series of ever-larger solid-rocket motors, some of which have been stacked together to form the Mu. In contrast, the United States spent hundreds of millions before we had a rocket that could put 300 poonds in orbit.

Solid-propellant rockets have proven to be less expensive and more reliable than predicted five years ago by anyone except their manufacturers. Many US experts today contend it would be the highest form of arrogance not to concede that at least a dozen nations, Red China included, could produce intercontinental solid-fueled rockets. The production rate might be slow, the propellant formulation conservative, and the motors might only have eighty-five

percent or so of the Minuteman's efficiency, but these foreign vehicles easily could be larger than Minuteman with substantially bigger payloads.

The rapidly declining cost of "minimal" delivery systems upsets the predictions of many experts who held that at least a dozen nations had the capability to make atomic bombs but could not afford the greater cost of building intercontinental rocket delivery systems. For example, a 1958 report prepared for the American Academy of Arts and Sciences by nuclear scientists William C. Davidson, Christoph Hohenemser, and Marvin I. Kalkstein, concluded that eleven nations, including Red China, had the wherewithal to make up to twenty nuclear weapons in a five-year program costing $150 million. Mr. Hohenemser, about five years later in 1963, expressed the belief that some of these twelve nations would begin "a primitive nuclear weapon program at present or in the near future." He felt that these weapons would be a menace to other secondary powers but not to the United States or Russia because long-range delivery systems cost billions, as "is well illustrated by US expenditures." Japanese expenditures in capitalizing on previous US technical experince are perhaps a more valid index.

Declining costs and improving performance for all space systems may bring reconsideration of many offensive and defensive concepts, previously discarded by the US as too expensive. One such concept is the Bambi (ballistic missile boost intercept) which involves many hundreds of satellites spaced out in low earth orbit so that several of them always are over enemy ICBM sites. In case of attack, the Bambi satellites would launch small rockets against the rising ICBMs. During this vulnerable takeoff period, lasting several minutes, the ICBMs would be traveling relatively slowly on a trajectory that is quite predictable. The rocket and warhead would be locked together to form a large target and the rocket exhaust plume would be the strongest sort of homing beacon.

Several years ago many believed that a successful defense would require action against ICBMs in their boost and midcourse flight phases as well as the terminal. Dropping costs may revive such thinking. Satellite technology now offers the long-life components, small computers, infrared sensors, and power systems needed for Bambi, all at a new low price.

Launch costs also will be reduced to about one-fifth the current price in the near future as Saturn V becomes operational. The Saturn V could put over 100 Bambis, each weighing a ton or so, into orbit at once. Total Bambi system costs should be reduced by a factor of at least ten compared to estimates of eight to ten years ago.

Today, a cursory look at even the rudiments of the military-technological revolution inevitably leads to two conspicuous conclusions. First, the revolution which began with World War II - fission weapons, rocket engines, and electronic developments - is far from dead or dormant. The opportunity for, indeed the probability of, major technical change still is rising sharply.

Second, the layman must feel cut off from technical reality. So much is withheld. The ostensible reason is national security, but one must wonder if the basic kind of information needed to put a layman in the ball park of reality would really give secrets away to the Russians.

Little light is being shed on the full reaches of technical reality. Instead of systematic discussions of possible technical alternatives, scientists and government officials are presenting the public with strong doses of their personal philosophies, moral and political beliefs, and their stands on global strategy, all under the guise of technical objectivity.

No shade of thinking seems to lack the prestige of support by at least one prominent scientist. This runs the gamut from complete disarmament now, to crashing ahead on a host of major new offensive and defensive systems. In effect, the scientists are saying, "We have seen reality, and we advise you to take this particular course." They don't explain the reasons behind their advice or why their conclusions and those of equally eminent scientists may lie 180 degrees apart.

Administration policy is presented with similar finality. Mr. McNamara says flatly that no antimissile system would be worth the price of installation. He reiterates that our military strategy is based on a secure missile force that could absorb any conceivable enemy action and then penetrate any conceivable defense in a retaliatory attack. The Administration holds that a stalemate situation exists because no

US defense could prevent this nation from being destroyed by the Soviets. It is not anticipated that any technological advance or series of advances could break the stalemate.

On this basis the US is attempting to reach two major agreements with the Soviet Union. One would stop the installation of any type of missile defense system by either country. The other, a "nonproliferation" pact, would stop either power from aiding another nation in the acquisition of nuclear arms.

Enough is known of the military/technological revolution to question each fundamental tenet of this US policy. The basic questions, which not only must be asked but also answered, would seem to include the following:

Aren't US missile forces, both land and sea based, less secure today than they were three years ago? Won't they be far less secure five years from now than they are today.

Isn't it reasonable to assume that any missile defense system installed by either the US or Russia today could be improved substantially in the next five to ten years?

Is there reason to believe that the day of a meaningful nonproliferation treaty is past? Can't Red China, and possibly other nations, be expected to have substantial strategic arsenals of twenty-five to fifty nuclear weapons plus intercontinental delivery systems within five years? If this is so, isn't the two-nation stalemate theory outdated for good, and doesn't the erection of the soundest possible missile defense become exceedingly attractive?

The Congress, as it debates ballistic missile defenses, has an obligation to get detailed answers to these questions. If the answer to any, or all, is yes, it seems properly prudent for the United States to exploit its technological prowess to the maximum, at the same time that it is attempting to negotiate a more peaceful world.

by J. S. Butz, Jr.
Air Force Magazine, March 1967

DETERRENCE BY ANTI-MISSILES: Examining the Proposition That World Peace Can Be Maintained Only by Extreme Escalation

ONE of the basic facts about nuclear weapons is that few people really believe or can imagine that they will ever be used. As a result, any discussion of nuclear plans and possibilities assumes a certain air of unreal horror. And yet, short of a drastic change in the international situation or in human nature, the leaders responsible for a nation's security cannot rule out the possibility of a nuclear war. Hence, one of the most painful and long-deferred decisions facing Washington is whether or not the U.S. should install an anti-missile defense system. The U.S. and Russia are close to agreeing on a treaty curbing the spread of nuclear weapons to non-nuclear powers. Yet despite that hopeful turn, warned President Johnson last week, the two nations have reached a "watershed" in arms competition and are risking further "futile escalation" in the area of missile defense.

According to intelligence reports, Soviet Russia is even now beginning to deploy a defense system designed to protect its major cities against attack by intercontinental ballistic missiles. American military men want the U.S. to counter by installing a vast anti-ballistic missile (ABM) system of its own. The Administration hopes to avoid this and is attempting to persuade the Russians to enter an agreement under which neither the U.S. nor the Soviets would deploy ABMs; to that end, U.S. Ambassador Llewellyn Thompson is now holding talks with Soviet Premier Alexei Kosygin. In London two weeks ago, Kosygin made a press-conference statement that seemed to discourage an ABM ban. A system that deters attack, said the Premier, is not a factor in the arms race. "On the contrary, it is a factor that reduces the possibility of the destruction of people."

On the face of it, this sounded eminently reasonable. Yet Kosygin must know that the implications of either a Russian or American ABM buildup cannot so easily be brushed aside.

Whether nuclear weapons are offensive or defensive depends largely on the point of view. The U.S., which has concentrated on offensive weapons, has always insisted that it maintains a defensive stance and would never make the first attack. But it has promised that any sneak attack it might suffer, no matter how damaging, would trigger an automatic response so terrible as to be intolerable to any enemy.

The threat is convincing—but only so long as a potential enemy accepts its basic premise. What if he decides that his scientists and engineers have built a practically perfect defense so that he will not be wiped out by a retaliatory attack? This would obviously disturb the "balance of terror" that has preserved an uneasy nuclear peace for the past two decades. Some American military men argue that any "defensive" Russian ABM system may actually be a sign of belligerence, a signal that its builders are preparing to make the first strike, while getting ready to ride out the U.S. response. Besides, the cold logic of deterrence works only when the opponent is capable of understanding it. What if the uneasy ruler of a new nuclear power were to make an irrational decision that he had more to gain than to lose from an attack on the U.S., whatever the risk of retaliation?

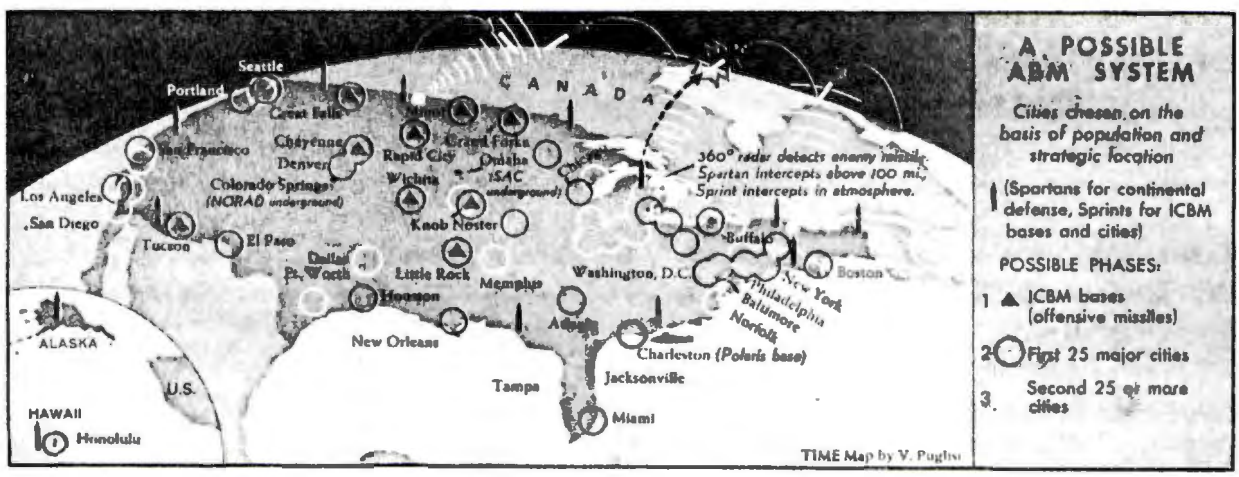
If the Joint Chiefs have their way, the answer to all such questions will be the installation of a U.S. Nike-X ABM system, beginning with the building of a "thin" continental defense consisting of long-range, Spartan missiles capable of intercepting and destroying incoming ICBMs above the atmosphere. As a backstop, fast, short-range Sprint missiles, designed to intercept any missiles that penetrated the Spartan screen, would be set out to protect U.S. Minuteman missile bases. This first phase of ABM deployment, which would afford protection against accidental firings of Soviet missiles or a surprise attack by China, has a price tag of about $5 billion. For another $5 billion, the military men would place Sprints around 25 key U.S. cities, providing protection against a moderate-strength Soviet attack. The third phase of the plan, at a price of $10 billion, would extend Sprint coverage to another 25 U.S. cities and increase the number of missiles protecting each city to cope with a massive attack. Total predicted cost, including fallout shelters: $22 billion.

How It Works

Defense Secretary Robert McNamara, for one, believes that political pressures would boost the bill. "The unprotected, or relatively unprotected areas of the U.S.," he says, "would claim that their tax dollars were being diverted to protect New York and Washington while they were left naked." McNamara guesses that an ABM system would cost about $40 billion over a ten-year period.

That seems a small enough price to pay for protection against a nuclear attack that might otherwise kill more than 120 million Americans. The question is whether any system, no matter how costly, can really buy protection—and how much. The answer lies in the workings of the ABM system.

All ABMs are meant to be nuclear-tipped; the idea is that they will create nuclear explosions that, in one way or another, will damage or destroy incoming missiles. If these explosions occur in the atmosphere, as with Sprint, they can destroy the incoming missiles by heat and blast effect. (Fallout



from these explosions will endanger the defended territory, hence the need for shelters.) If the explosions occur above the atmosphere, as with Spartan, the enemy missiles will not be hurt by blast, since there is no air to carry shock waves, but will be damaged in other ways, especially by the X rays and neutrons released in the explosion. Above the atmosphere, they are not impeded by air molecules, so they can cause damage at greater distances.

Within about two miles from an exploding one-megaton ABM, for example, the heat shield of an intercontinental missile will be severely "burned" by X rays. If the shield is damaged badly enough, the friction generated when the ICBM warhead enters the atmosphere will cause it to burn up long before it reaches its target. The burst of neutrons produced by the explosion of an ABM warhead can have an even more immediate effect on an ICBM warhead as far away as 1½ miles. By penetrating the uranium trigger of the warhead, the neutrons can cause it to fission prematurely, generating enough heat to deform the trigger and disarm the missile. An electromagnetic pulse of radio frequency waves produced by the exploding ABM can also induce damaging surges of electric current in the circuits of the ICBM, preventing its warhead from exploding.

It sounds formidable; yet even the Pentagon admits that the costliest contemplated ABM system cannot buy complete security. Why not? Because scientists have already learned a great deal about how to penetrate an ABM system.

With a double heat shield on an ICBM warhead, for example, the outer shield can be made to take the brunt of X-ray damage, leaving the inner shield to protect the warhead as it descends through the atmosphere. A neutron-blocking layer of paraffin or liquid hydrogen can prevent the uranium trigger from fissioning prematurely. Installation of more rugged electrical components and addition of bypass circuits reduce the possibility of damage from the surge of current caused by an electromagnetic pulse.

The attacking nation can choose from a whole catalogue of ingenious "penetration aids" to baffle enemy defense (*see diagram above*). Dummy missiles may be employed or missiles releasing decoys that defending radar has difficulty differentiating from authentic warheads. A single missile can suddenly eject multiple warheads that separate widely enough so that even a well-aimed ABM will destroy only one of them. An advance high-altitude nuclear explosion can temporarily blind a city's radar defenses or attackers can simply saturate a city with more ICBMs than there are defending missiles.

In view of such penetration methods, if the Soviets were to strike with all of their offensive missiles, enough could penetrate a Nike-X system to kill 30 million Americans. And if the Soviet Union should increase the number and quality of its missiles, U.S. casualties could rise as high as 90 million.

If an ABM system thus cannot really assure adequate protection, why should the Russians bother to deploy one? One possible answer is that their definition of "adequate" may be flexible. Conceivably, Russian strategists may argue that even if an ABM system could not keep out all U.S. missiles, it could keep out enough to give the nation a fighting chance to survive and rebuild. The other and more unsettling possibility is that Russian scientists are on to a better defense system than the U.S. so far contemplates. U.S. military planners remain haunted by the frightening possibility that the Russians have actually developed a technique that will come up to Khrushchev's boast that a Russian rocket could "hit a fly" in outer space. Rumors have circulated in Washington about Russian "X-ray defense" and "zap" effects of nuclear explosions far bigger than those involved in the Nike-X system—explosions that would effectively clear the skies of most, if not all, U.S. ICBMs, no matter how many were launched.

Less worried U.S. scientists doubt that the Russians have any such super defense weapon. It would be too large and heavy for quick launching or easy, accurate control. Many military planners, moreover, believe that Moscow may only be bluffing with its ABM plans. By constructing a token number of missile sites, say the doubters, the Russians are perhaps hoping to make the U.S. overreact and thereby further strain its economy. There is also some suspicion in Washington that the Russians may use the threat of an ABM installation only to pressure the U.S. into agreeing to an overall limitation of missile capacity. Finally, it is also conceivable, some U.S. experts believe, that the Soviet ABM deployment is not intended to defend against a massive U.S. attack at all, but is a guard against the less formidable missile threat that China might pose as early as the 1970s.

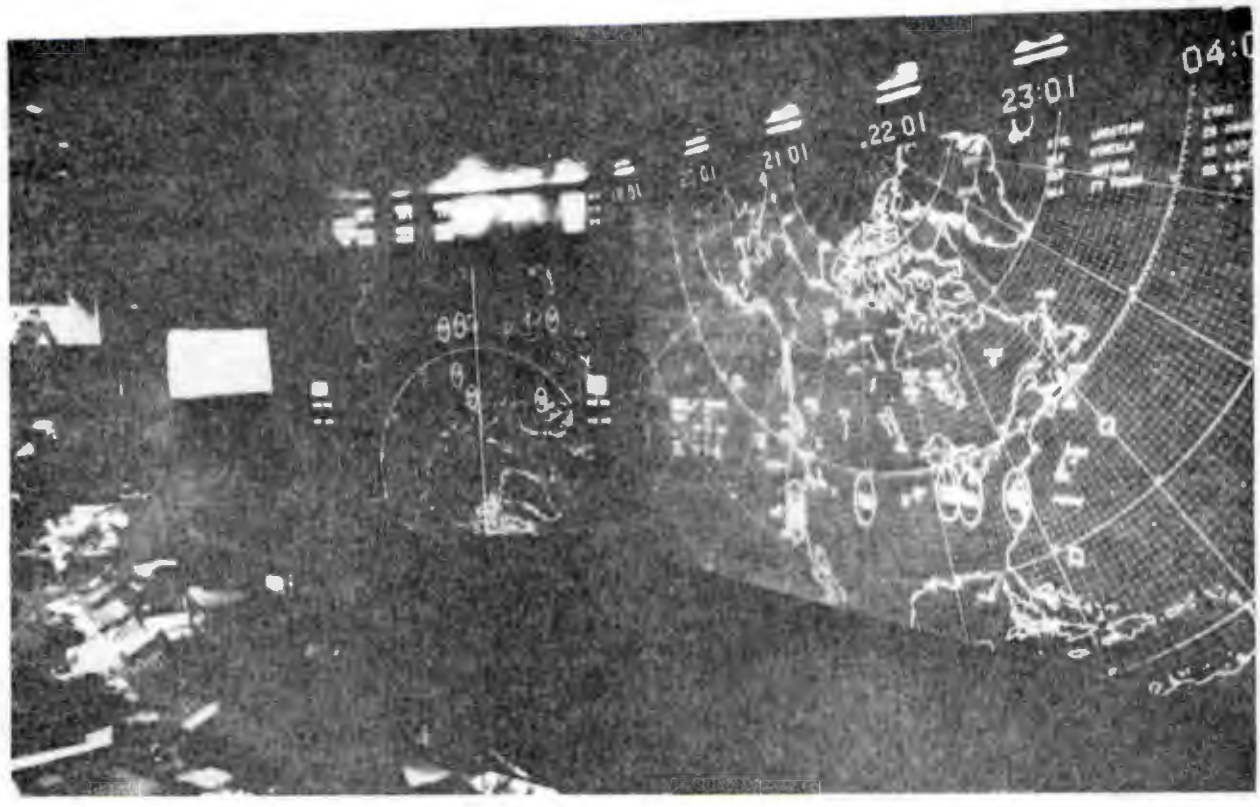
Secretary McNamara adamantly opposes deployment of the Nike-X system and insists that the defensive advantage remains with a credible offensive deterrent. That U.S. deterrent now consists of 1,004 Minuteman and Titan ICBMs and 640 submarine-based Polaris missiles, as against Russia's reported 340 ICBMs and 130 submarine missiles. "It is our ability to destroy an attacker as a viable 20th century nation that provides the deterrent," says McNamara, "not our ability to partially limit damage to ourselves."

Where It May Lead

Yet some strategists worry that the U.S. has become too complacent behind its nuclear-missile superiority. Says Herman Kahn, a mathematician turned defense analyst: "For the past 20 years, the Soviets have lived in an environment in which they were clearly strategically inferior. It would be a mistake to let that change." Most military men agree that if the Russians are really determined to deploy a major ABM system, the U.S. will have to follow suit—although many would be satisfied merely to prepare a "mobilization base" allowing relatively quick development of an ABM system if it later became necessary.

Both sides stand to lose severely from full deployment now. Any new missile race, as President Johnson put it, "would impose on our peoples and on all mankind an additional waste of resources with no gain in security to either side." It would surely damage both the U.S. and Russian economies, though hurting Russia's far more, at a time when Moscow's rulers seem determined to give their people capitalist-style consumer pleasures.

Economics aside, should one nation deploy an effective ABM system before the other, the possibilities of a disastrous nuclear exchange would increase. The nation with missile defenses would be tempted to strike while it had the advantage; the defenseless power, anticipating an attack, might be panicked into striking first. On the other hand, if both nations installed full ABM systems concurrently, the balance of terror would remain the same. But in that case, despite the expenditure of untold billions, nothing will have been gained.



Situation room at NORAD headquarters: With fifteen minutes' warning from BMEWS, no time for human decisions

A Matter of Missiles and Megadeaths

Senator: You are saying that the Nike X system—even as envisaged in the 1970s—can be offset without too much trouble?

McNamara: In all probability, all we would accomplish would be to increase greatly both their defense expenditures and ours without any gain in real security to either side.

Wheeler: We believe that we should go ahead now and start to deploy ... One nation will probably survive best in a nuclear exchange, and the 30, 40 or 50 million American lives that could be saved are, therefore, meaningful in every sense.

—Testimony before the Senate Armed Services Committee, released last week

The issue that divides Secretary of Defense Robert S. McNamara and Gen. Earle Wheeler, the chairman of the Joint Chiefs of Staff, goes directly to the heart of security and sanity in the nuclear age. Both men are charged with the responsibility of thinking about the unthinkable: the possibility of an ultimate nuclear war. And each is sure that his way is the surest way to indemnify the future of civilization itself.

In simplest terms, the issue is this: the Russians are deploying at least a limited anti-ballistic missile (ABM) system. Should the U.S. spend some $30 billion over the next decade to deploy its own ABM, the still-experimental Nike X? Or should the U.S., as McNamara urges, try to control the arms race by limiting its response to the Soviet deployment? And what should be the Russian response to the American response? For in a mirror-image of the Pentagon debate, Soviet brass hats and cost-conscious bureaucrats also disagree about the merits of the ABM, the burdens of an arms race and the levels of "acceptable" megadeaths.

At first glance, logic would seem to be on the side of the military. As surely as the spear inspired the shield, each successive offensive weapon has created a need for a defensive one. But the era of ocean-spanning missiles and warheads with the explosive power of 10 million tons of TNT is a far more complex period than any military strategist has ever known before. There are no longer mere weapons, there are weapons systems. And the cost of these systems is so great and their destructive power so vast that even the announcement of their development can shake the precarious balance of nuclear terror and set off a series of moves and countermoves. The moves themselves are no longer straightforward. They are subtle, shaded by economic, psychological, political and technical nuances. The old checkerboard of strategy has run out of squares.

Secrecy, for example, is no longer absolutely advantageous in the new strategy: the U.S. cannot hide the precise locations of its Minuteman ICBM sites, nor does it try. It wants the Soviet Union to understand fully the size of its arsenal and its ability to strike a retaliatory blow. Even superiority has disadvantages: the double Nobel Prize winner Linus Pauling once suggested facetiously that the U.S. should give Polaris missile-carrying submarines to the Russians to improve their deterrent forces and thereby ensure a more stable balance of power in the world. Now, there are suggestions that what the Russians really need is more McNamara-style systems analysis to show them the danger of deploying an ABM defense.

Freeze or Spiral? Yet there are signs that the Russians for their part have recognized the new nuclear logic. Replying to an offer by President Johnson, Soviet Premier Aleksei Kosygin agreed last month "to discuss means of limiting the arms race in offensive and defensive nuclear missiles." And in Moscow last week, U.S. Ambassador Llewellyn E. Thompson was waiting only for the official signal to begin "negotiations to negotiate." If the talks get that far, the U.S. will have an opportunity not only to press for a brake on ABM deployment but also to exhume a three-year-old American proposal to "freeze" strengths in all nuclear weapons. Both sides seem aware, as President Johnson emphasized recently, "that the United States and the Soviet Union have reached a watershed in the dispiriting history of our arms com-

petition. Decisions may be made on both sides which will trigger another upward spiral."

The revelation that the two nuclear superpowers are at least within talking range is heartening. Each week that passes moves the Soviet ABM system further along and increases the pressures on the U.S. And if past strategic decisions are any guide, the U.S. and the Soviet Union will need every opportunity they can get to explore the consequences of their actions.

Twice before in the last decade, the two nuclear superpowers faced similar watersheds—and escalated the arms race.

The first escalation came in the late 1950s with the development of ICBM's. The U.S. hit the panic button first in 1957, the year of the Sputnik and the beginning of the fanciful "missile gap" of Soviet superiority. Within two months of Sputnik I's launching, the U.S. ordered two intermediate-range ballistic missiles —the Jupiter and Thor—into production. Development of the Polaris was accelerated; so were the Atlas and Titan ICBM's. And when the new ICBM silos went underground across the U.S. in the early 1960s, it was Khrushchev's turn to respond—he broke the three-year-old nuclear test moratorium by detonating a 57-megaton "terror" bomb. The result for both sides was less security rather than more: when the total nuclear arsenals were added up, the strategists found that the age of overkill had arrived. There was more megatonnage than there were suitable targets to destroy.

Power Play: The second escalation was Khrushchev's Cuban missile adventure in 1962. It was, in effect, an attempt to close the real missile gap created by the U.S. buildup. The terror of that confrontation had a mixed effect. On the positive side, it produced the first major de-escalation of the new era. Premier Khrushchev and President Kennedy resolved to step back from the brink and began to build a narrow community of interest based on their mutual power—and vulnerability. The atmospheric test ban of 1963 was one result of this détente. But many military and scientific voices in the U.S. warned that the ban would hobble U.S. technology—that an unexpected breakthrough by the Soviets could shift the global power balance radically. In recent years, some advocates had fixed upon the ABM as just such a breakthrough. Indeed, only last week, the defense-minded Air Force Association proclaimed at its convention in San Francisco that the Nike X version of the ABM hadn't broken through far enough. The 2,000 delegates urged that the U.S. explore an "electronic shield defense" based on high-altitude H-bomb explosions and called for a "re-examination of national strategy in the light of current and projected technology."

To date, that technology has provided the U.S. with a verified 3-to-1 lead in offensive delivery vehicles. The U.S. arsenal now includes 950 1-megaton Minuteman ICBM's deployed across the nation in underground silos "hard" enough to withstand a megaton hit a half-mile away; 54 10-megaton Titan II's; 656 Polaris missiles assigned to 41 nuclear submarines, at least 30 of which are on patrol at all times, and 680 B-52 and B-58 bombers. These capabilities are constantly being modernized. For example, the Defense Department plans to phase out the early Minuteman and replace it with Minuteman III, a highly sophisticated missile equipped with a new third-stage engine to carry a payload of multiple warheads. The Polaris submarine fleet will soon be refitted with the Navy's new Poseidon missile, which can scatter mini-warheads at multiple targets. And the Air Force is developing an advanced multiple-warhead ICBM to be fired from pads hauled by trains and trucks.

The last official count of Soviet ICBM's was 340. There are also some 130 600-mile Serb missiles deployed on submarines, and about 155 subsonic bombers. Scrag, the Soviet opposite of Minuteman III, is still on the drawing boards. "I know how many missiles the enemy has tonight," President Johnson said last week in a Tennessee speech. And with untimely bluntness, he identified the source of his information: U.S. reconnaissance satellites.

Actually, both the U.S. and the U.S.S.R. have been seeking for the chimera of an impregnable defense for twenty years. Since 1953, Nike Ajax and Hercules anti-aircraft missiles have guarded U.S. cities. The Nike Zeus grew out of this program. By 1963 the Zeus had successfully intercepted ten out of fourteen Atlas and Titan ICBM's launched from Vandenberg Air Force Base in California toward Kwajalein atoll in the Central Pacific. But the system had one glaring defect: its rotating dish radar, sweeping the sky every second or so, was simply inadequate to cope with the hundreds of warheads and decoy devices a massive attack would entail. Moreover, Zeus was too slow to match the lighter, faster, second-generation ICBM's. The system was scrapped.

Enter, Galosh: The Russians seemed to achieve initial success. In 1961 they staged an intercept of an ICBM by a nuclear warhead high over Lake Aral. In less than a year, Nikita Khrushchev was bragging that the Soviet anti-missile could "hit a fly in outer space." It was one of Khrushchev's more memorable hyperboles. As intelligence analysts later reconstructed it, the Soviets did deploy in the early 1960s what they hoped

Offense vs. defense: ABM intercepting ICBM in U.S. test over Pacific

would be a shield of anti-missile missiles. These weapons were in the Nike-Hercules class—effective against guided, air-breathing missiles but not against ballistic warheads raining from the skies at speeds of 5 miles a second.

The Russians displayed their latest ABM on a trailer in Red Square in 1964. Mounted in a green pod, it looked like a cigar in a metal container. NATO unceremoniously designated it the "Galosh."

Little is known of Galosh in the West—at least publicly. It has a four-nozzle booster, probably uses solid fuel for a quick start and attacks its target beyond the edge of the atmosphere. It is reportedly emplaced in the Moscow area, but may also provide regional protection for a much broader industrial belt across Central European Russia. There has been some speculation that the missile is presently deployed along the "ICBM lanes"—the short, over-the-pole route between the U.S. and the U.S.S.R.; if so, this would make Soviet targets vulnerable from the south, where Polaris subs prowl the Mediterranean. Another defensive system has been pinpointed near Tallin, Estonia. But U.S. officials don't agree about this deployment. Security at Tallin is so tight that foreign visitors are prohibited from visiting the city by air.

Thick or Thin? One explanation for the Soviet ABM deployment may be the Russian military man's inherent bias for defense. After centuries of invasion, he has developed an almost paranoid fear. The ABM may be therapeutic. Still, there is considerable debate over the system's effectiveness. "If enemy missiles fly," Gen. Pavel Kurochkin said recently, "they will not arrive in Moscow." In a public display of disagreement rare for the Soviet Union, Kurochkin was later challenged by Deputy Minister of Defense Vasili Chuikov, who declared: "There are no means yet that would guarantee the complete security of our cities and most important objectives from the blows of the enemy's weapons of mass destruction."

By some accounts, Soviet strategists are fully aware that no ABM system can stop every enemy warhead in a full-scale attack. This would seem to explain the general feeling in the West that the Soviets have no intention of deploying a "thick" area defense. In fact, the present "thin" system appears directed more at stopping a crude Chinese attack than a clever American one.

Costly: The U.S. Nike X is a better ABM system—on paper. Already, the U.S. has spent more on research and development of the system than it spent on the Manhattan Project to develop the atom bomb. A $100 million contract awarded to Western Electric last week brought the grand total to $2.8 billion.

Essentially, the Nike X system consists of missiles, radar and computers that tell the radar and the missiles what to do. The big missile in the system is the 54-foot-long Spartan, an improved—though still untested—version of the Zeus. Like the Soviet Galosh, it is designed to intercept a salvo of incoming ICBM's above the atmosphere and shower them with radiation from its own nuclear warhead.

Blast would have no effect in outer space, for there is no atmosphere to carry the shock waves. Spartan's killing power, therefore, would come from X-rays and neutrons released by the nuclear blast. X-ray energy hitting a wire in an ICBM, for instance, would convert to heat and melt the wire. And a number of X-rays penetrating a warhead heat-shield conceivably could weaken it to such an extent that it might not be able to withstand the stresses of re-entry.

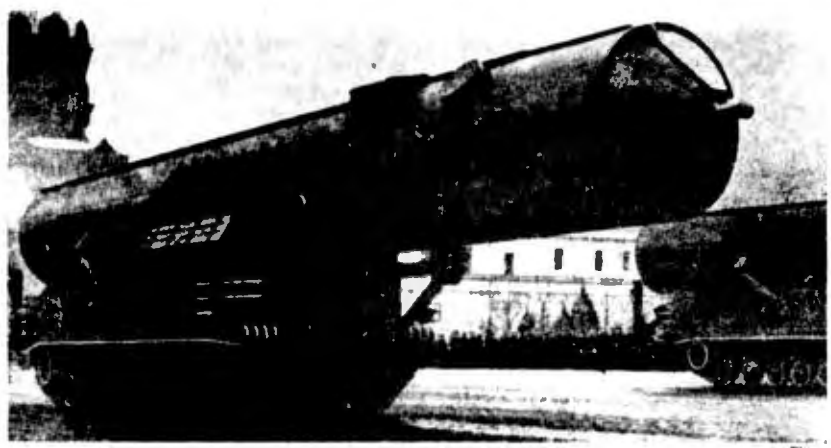
What the Spartan misses, the nuclear-tipped Sprint is designed to catch. Smaller and speedier, Sprint can reach an altitude of some 30 miles in about fifteen seconds. And that's about all the time it would have once an ICBM had penetrated the outer shield of Spartans.

Both missiles, however, would be no more than toys without their elaborate radar. The Ballistic Missile Early Warning System (BMEWS) screen near the Arctic Circle has been operational since 1963; it can give the NORAD command at Colorado Springs, Colo., fifteen minutes warning of an impending attack. BMEWS's huge stationary radars, in fact, can spot enemy ICBM's while they are still on their way up. Behind BMEWS, the Nike X system would use TACMAR (Tactical Multi-function Array Radar) for long-range search and missile tracking, PAR (Perimeter Acquisition Radar) for picking out targets even farther away and finally MSR (Missile Site Radar) to provide control for Sprint and Spartan during the actual engagement of warheads. In prototype systems at White Sands, N.M., and Kwajalein atoll, these ears employ phase-array radar: the dish is fixed, rather than rotating, yet it can scan hundreds of individual objects with astonishing accuracy—and at a rate computed in milliseconds. Unlike conventional radar, a phased-array dish sends out short, pulsed bursts of high-frequency waves in every direction at once. Anything in the path of the beam bounces a signal to the radar array.

All of this happens much too fast for men to monitor. Nike X requires computers to communicate with itself, with other machines, with people. It must be programed. In an actual attack, the time for human decisions would be past.

'Penaids': Despite the ABM's functional precision, it has serious weaknesses. It can be fooled by the offense. It carries with it the unpopular burden of civil defense. And it is expensive.

Just as the ICBM led to the ABM, so too has the ABM brought forth a whole new flock of hardware to penetrate an enemy's defense. Now, offensive missiles are being designed to carry not only warheads, but decoys to confuse the other side's radar and make him waste his ABM's against blips on a screen.



Russian ICBM in Red Square: Deterrents must be seen to be believed

Decoys, or "penaids" as they are called in the Pentagon, can take many forms: chaff, inflatable balloons, even an ICBM's booster, which could be detonated after engine cut-off so that the pieces would follow the warhead in a radar-frustrating cloud of metal.

To confound an ABM system even further, the attacker might resort to the "pindown" or blackout technique by setting off a series of nuclear blasts in space. This is similar to the Air Force Association's proposal for a nuclear shield, but instead of killing ICBM's, it would foil the ABM's electronics long enough for the attacker to sneak through a salvo of ground-zero bursts.

The ways to get around the ABM, in fact, would appear to be almost limitless for the attacker. The offense in nuclear

war always has the jump on the defense. ABM systems, suggests Harvard chemist and U.S. disarmament consultant Paul Doty, could be circumvented by an offshore, underwater nuclear burst that would inundate tidewater cities such as Boston or New York. "A weapon of 1 megaton," he says, "could set up waves of 40, 50 or 60 feet depending on the depth of the burst." Presumably, the bomb would be planted first by a submarine. And Donald Brennan, chief nuclear strategist at the Hudson Institute, foresees the possible return of the bomber. Manned bombers, of course, were consigned to the museums some years ago by missile strategists; but a robot bomber could play a role in the brief spasm of World War III. "It could come in under the ABM radar," says Brennan, "and anti-aircraft defenses would be useless."

30 Megadeaths: Another weakness in the system is civil defense. Though fallout shelters are clearly called for, people don't like them and to a certain extent don't believe in them.

The negative attitude is understandable. In the same posture statement in which he announced that 82 million man-spaces would be available in stocked shelters by July 1, 1967, Secretary McNamara also predicted that 30 million Americans would die in an all-out nuclear exchange with Russia, even assuming that the U.S. had deployed Nike X and a shelter system in defense of 50 key cities. And if the Soviets should react to that deployment by increasing their second-strike offensive capability, he added, then the U.S. would suffer 120 million dead—the same toll that would be suffered if the U.S. deployed no ABM system whatsoever and the Soviets maintained their present offensive force. "Either way," says Doty, "it would mean the end of the nation. If there were one-third casualties, then another third would die by the end of two months."

No Place to Hide: It might be argued that these calculations—based as they are on computer studies that embrace a host of variables including the vagaries of weather—are at best only guesstimates. But both the ABM advocates and its detractors agree on the figures—give or take a few megadeaths. And in any case, the public seems to accept fatalistically the casualty figures. As a consequence, many cities just aren't taking civil defense very seriously. New York City, for example, has reduced its CD budget by one half to $1 million annually. And Timothy Cooney, the program's director, speaks of shelters as the Achilles' heel of the Nike X system: "I maintain that if civil defense is keyed to the ABM then the ABM may well never make it." His advice to New York's 7.8 million residents, should the sirens ever blow: "Stay indoors and listen to transistor radios."

The final drawback of the ABM is its

FIGHTING A NUCLEAR WAR OF THE WORDS

Nuclear weapons have changed all the rules of strategic war—and unleashed a fallout of acronyms, neologisms, euphemisms and technical jargon. Words like deterrent, credibility, overkill and doomsday machine became familiar, and were even kidded in such movies as "Dr. Strangelove." Now development of anti-ballistic missiles has produced a second generation of Strangelovisms. Among them:

All-Out Strategic Exchange: A euphemism for World War III with nuclear weapons. Estimated immediate casualties: 120 million killed in the U.S., 120-plus megadeaths in the U.S.S.R.

Assured Destruction Force: A striking force of nuclear missiles numerous and secure enough to survive a first strike (or a so-called pre-emptive attack) by the enemy and devastate him in return. ADF differs from a credible deterrent, which does not have to be effective as long as the enemy believes that it will be effective.

Blackout: A nuclear explosion that blinds ABM radar with radiation so that the radar cannot track incoming warheads or guide its own missiles to intercept them.

Damage Limitation: The strategy of blunting an enemy's attack with an ABM system, fallout shelters and hardened missile sites. The goal is to assure survival of the Assured Destruction Force as well as of people.

ICM: An acronym for Improved Capability Missile—a highly advanced missile concept that has not reached the hardware stage, such as a warhead that can maneuver in the atmosphere to avoid ABM's and zero in on its target.

MIRV: Poseidon, the advanced version of the Navy's Polaris, and Minuteman III are MIRV's or Multiple Individually targeted Re-entry Vehicles—missiles that release two or more warheads as well as Penaids toward separate targets.

Penaid: Short for penetration aids, like chaff (metallic strips which confuse radar by sending back random reflections), decoy warheads, multiple warheads or blackout, which help attacking missiles penetrate enemy defenses.

Preferential Defense: Another euphemism. It signifies protecting some areas, such as large manufacturing centers or military installations, but not others, like rural locales, with an ABM system.

Rippled Attack: To frustrate an enemy ABM system the attacker can "ripple" his missiles, sending them in salvos to trick the enemy into expending his defensive missiles on the first few waves so that he has nothing left to block the final blow.

Spartan and **Sprint:** The two missiles in the Nike X system. Spartan is a new version of the Nike anti-aircraft rockets deployed around U.S. cities. It is designed to intercept enemy warheads above the atmosphere. The warheads that get through encounter Sprint, a conical missile with an acceleration of 100 G's. Spartan and Sprint are launched by computers fed tracking information by TACMAR and MSR.

TACMAR and **MSR:** Two kinds of radar in a Nike site, the Tactical Multi-function Array Radar and Missile Site Radar. TACMAR scans the sky for incoming enemy missiles and feeds the information to the Nike computers for analysis. MSR guides Spartan and Sprint missiles to their points of interception.

WALOPT (Weapons Allocation and desired ground-zero Optimizer): A computer program that calculates the megatonnage needed to destroy each target, in order to assure the most efficient use of warheads and bombs. World War III, it seems, may be fought by two supercomputers.

After Strangelove, strangerwords

GLOSSARY

7-a

7-V

GLOSSARY

BADGER	Soviet all-jet medium bomber (TU-16)
BEAR	Soviet heavy turboprop bomber (TU-95)
BISON	Soviet heavy all-jet bomber (M-4)
BLINDER	Soviet supersonic medium bomber (Sov model number unknown)
BMD	Ballistic missile defense
COMINT	Communications intelligence
COSMOS	Soviet reconnaissance satellite
DOG HOUSE	Soviet early warning radar
ECM	Electronic countermeasures
ELINT	Electronic intelligence
FARMER	Soviet interceptor (MIG-19)
FB-111	US strategic bomber
FIDDLER	Soviet long-range interceptor (Sov model number unknown)
FISHPOT	Soviet supersonic interceptor (SU-9)
FLASHLIGHT	Soviet interceptor (YAK-25)
FOBS	Fractional orbit bombardment system
FRESCO	Soviet interceptor (MIG-17)
GALOSH	ABM associated with Moscow BMD
HEN HOUSE	Soviet early warning radar
HOUND DOG	Standoff attack missile used by US strategic bombers

HSD	Hardsite defense
HUSTLER	US strategic bomber (B-58)
ICBM	Intercontinental ballistic missile
IOC	Initial operational capability
KT	Kiloton
LRAA	Long Range Air Army (USSR)
MAR	Multifunction array radar
MINUTEMAN	US ICBM
MIRV	Multiple independent reentry vehicles
MSR	Missile site radar
MT	Megaton
MTR	Missile track radar
POLARIS	US submarine launched ballistic missile
POSEIDON	US submarine launched ballistic missile
PVO	Air defense forces (USSR)
RV	Reentry vehicle
SLBM	Sea-launched ballistic missile
SLCM	Sea-launched cruise missile
SNDV	Strategic nuclear delivery vehicle
SPARTAN	US missile used for exo-atmospheric intercept of RVs (formerly NIKE Zeus)
SPRINT	US missile used for terminal intercept of RVs
SRAM	Supersonic rocket attack missile

SSB	Conventional powered ballistic missile submarine
SSBN	Nuclear powered ballistic missile submarine
SSGN	Nuclear powered cruise missile submarine
STRATOFORTRESS	US strategic bomber (B-52)
TALLINN	Soviet air defense missile system
TALL KING	Soviet early warning radar
TITAN	US ICBM
TRIAD	Radar associated with Moscow BMD

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