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HR 70-14

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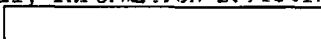
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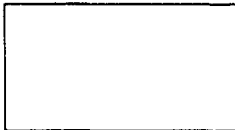
30 APR 1961

MEMORANDUM FOR: Director of Central Intelligence

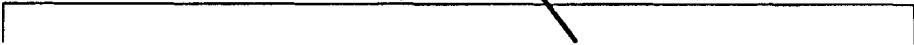
SUBJECT: Preliminary Comments on an Article from the
Official Soviet Journal, Information Bulletin
of the Missile Troops 

1. This article presents a generally accurate, straightforward description of US-UK strategic missile and bomber forces as of the date of publication, mid-1961. It is our impression that most if not all of the information could have been compiled from unclassified U.S. sources.

2. The article is apparently intended to disseminate general information on Western strategic attack weapons and force levels to officers of the Soviet long-range missile forces for orientation purposes. However, it makes no effort to evaluate Western capabilities, nor does it provide information on comparable Soviet systems and capabilities, the effect of U.S. programs on Soviet planning, or the Soviet view of the strategic balance of power. For the most part the informed Soviet officers to whom the article is addressed are left to draw their own conclusions.



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3. At a few points, the article states unfavorable comments about US capabilities. For example, it refers to the "manifest backwardness" of US missile development compared to the USSR and to the "inadequate" strategic missile forces of the US and UK, but does not indicate the basis for these judgments. The occasional allusions to antimissile and "antinuclear" defenses are ambiguous and provide no evidence of the status of the Soviet ABM program.

4. In describing the manning and operation of Western ICBM and IRBM units, the author attributes the requirement for "comparatively few" personnel to the high degree of automation and mechanization of these systems and also, in the case of the Thor units, to the Western intention of firing "only" a single missile from each launcher. Several previous documentary reports have indicated relatively high manning requirements for Soviet missile systems, as well as a Soviet intent to use existing launchers for repeated firings.

5. The reference, on page 26, to US development of a "U-3" reconnaissance aircraft probably derives from US press materials, such as an article by Hanson Baldwin in the New York Times of Sunday, 29 May 1960 entitled, "U-2 Case Perils Project for Higher Flying Plane".

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RAY S. OLIVE
Deputy Director (Intelligence)

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Case Perils Project For Higher-Flying Plane

By HANSON W. BALDWIN

The failure of a new reconnaissance aircraft capable of cruising at an altitude of more than 100,000 feet has been jeopardized by the U-2 incident, in the opinion of Washington experts. The loss is a fatal blow to the Soviet Union. The U-2 plane, a Lockheed U-2, has led to indefinite suspension of intelligence gathering "overflights" which had been going on without major incident for four years. The U-2 plane, capable of an altitude of about 70,000 feet, has not penetrated beyond Communist frontiers since May 1. President Eisenhower has publicly promised that these photographic flights will not be resumed during his Administration.

Soviet Aims Accomplished

Senator John F. Kennedy, a leading candidate for the Democratic nomination for President, has said he will not approve their resumption if he becomes President.

During repeated flights in the last four years the U-2's have photographed Moscow, Peiping, Soviet nuclear explosion, Soviet missile-launching sites, airfields and some of the areas supposedly most heavily defended in the Soviet Union, China and the satellite countries.

Washington experts feel that Premier Khrushchev's exploitation of the U-2 incident prior to and during his visit to Paris has thus accomplished one of its objectives—the halting of an air intelligence operation that had provided the United States with information of tremendous value that could be acquired in no other way.

However, the public "con-

U-2 Furor Imperils U. S. Project For 100,000-Foot-Ceiling Plane

Continued From Page 1, Oct. 8

of the U-2's planned successor in doubt.

The Lockheed U-2, which had been flying over the Soviet Union at high altitudes for four years, faced increasing risks as time went on. Anticipated advances in the capabilities of Soviet air defense weapons would make the U-2 vulnerable even at 70,000 feet.

Therefore a successor to the U-2, described by some writers as the U-3, had been designed and was being built. It was expected to cruise at altitudes higher than 100,000 feet. The future of this plane, and in fact of the entire air reconnaissance program, is now in doubt.

From the military intelligence point of view the halting of the "overflights" is viewed as of incalculable importance, all the more so since it will be at least two or three years before reconnaissance satellites are available to replace piloted planes.

The U-2 program of reconnaissance was the most important secret source of information about the Soviet Union available to the Central Intelligence Agency. The data it provided was of importance with that collected by the National Security Agency, a separate intelligence-gathering organization, which intercepts, analyzes and, if possible, decodes Soviet communications.

The U-2's were flying over Moscow within two years after they were ordered from the Lockheed Aircraft Corporation, a record of engineering design and production skill that demonstrated what ample funds, full support and elimination of red tape could mean.

U-3 Defied Interceptors

The Communists had detected by radar sound, but by no means been able to stop them. U-2 pilots had seen Soviet interceptors rise to attack them, but the

or fall off thousands of feet below them. Some of the interception attempts were photographed.

Washington authorities are doubting the advisability of releasing for publication some of the photographs taken over the Soviet Union. Their clarity, detail and accuracy are said to be so striking that the photographs might serve as powerful arguments for President Eisenhower's "open skies" plan for safeguarding against surprise attack.

They would also serve another purpose. Revelation of the successful and long-continued U-2 flights over the Soviet Union has increased American military technical and scientific standing in some countries that at the same time were distressed about Washington's handling of the U-2 incident.

Soviet Power in Question

In these countries, according to Washington reports, the impression is growing that the vacated power of the Soviet Army has been tried and found wanting. Release of the photographs, it is believed, would provide proof of United States ingenuity and power and might compensate somewhat in psychological gains for the halting of the flights.

On the other hand, those who are arguing against publication contend that release of the photographs would compound the internal effect of the U-2 incident already evident in the Soviet Union, since it would strike another blow at the prestige of both Premier Khrushchev and the Soviet Army.

In striking a balance sheet of U-2 gains and losses, Washington experts, though disturbed at the Government's handling of the case after May 1, are beginning to think that in the long view of history the President's frankness in assuming personal responsibility for the flights may pay dividends. They add, too, that Allied unity has been strengthened.

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WASHINGTON 25, D. C.

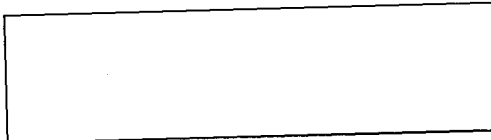
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MEMORANDUM FOR: The Director of Central Intelligence

SUBJECT : STRATEGIC MISSILE BULLETIN: "Strategic Means of Attack of the USA and Great Britain, Their Employment in Combat, and Some Prospects for Their Development"

1. Enclosed is a verbatim translation of an article which appeared in a Soviet Ministry of Defense publication called Information Bulletin of the Missile Troops (Informatsionny Byulleten Raketnykh Voysk). This publication is classified TOP SECRET by the Soviets and was first issued in 1961. It is intended for generals and officers of the Missile Troops.

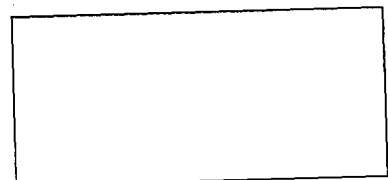
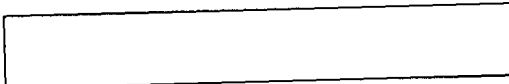
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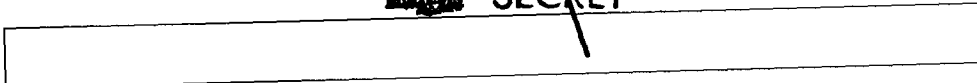
Richard Helms

Richard Helms
Deputy Director (Plans)

Enclosure



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Original: The Director of Central Intelligence

cc: Military Representative of the President

Special Assistant to the President for
National Security Affairs

The Director of Intelligence and Research,
Department of State

The Director, Defense Intelligence Agency

The Director for Intelligence,
The Joint Staff

The Assistant Chief of Staff for Intelligence
Department of the Army

The Director of Naval Intelligence
Department of the Navy

The Assistant Chief of Staff, Intelligence
U.S. Air Force

The Director, National Security Agency

Director, Division of Intelligence
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National Indications Center

Chairman, Guided Missiles and Astronautics
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The Deputy Director of Central Intelligence

Deputy Director for Intelligence

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30 April 1962

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COUNTRY : USSR

SUBJECT : STRATEGIC MISSILE BULLETIN: "Strategic Means of Attack of the USA and Great Britain, Their Employment in Combat, and Some Prospects for Their Development"

DATE OF INFO: July 1961

APPRAISAL OF CONTENT : Documentary

SOURCE : Reliable source (B).

Following is a verbatim translation of an article titled "Strategic Means of Attack of the USA and Great Britain, Their Employment in Combat, and Some Prospects for Their Development", which appeared in the 1961 First Issue of a TOP SECRET Soviet publication titled Information Bulletin of the Missile Troops (Informatsionnyy Byulleten Raketnykh Voysk). The 1961 First Issue was sent to press on 16 July 1961.

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Strategic Means of Attack of the USA and Great Britain,
Their Employment in Combat,
and Some Prospects for Their Development

The main force of aggression at present is American imperialism, which, having established an enormous apparatus for war, is taking every measure to prevent its reduction. The imperialists reject all the constructive proposals of the Soviet Union and of the other peace-loving countries which we directed toward disarmament. Under the banner of defense against "the Communist threat", American imperialism, in conjunction with the imperialists of Britain, France and West Germany, has drawn many countries into military blocs - NATO, CENTO, SEATO and others, and has created a network of military bases directed, primarily, against the socialist countries.

The threatening stocks of nuclear weapons are growing. The American militarists are preparing to begin destructive atomic testing once again, and they continue to organize military provocations, which are fraught with the threat of serious international conflicts. The aggressive actions of the USA against Laos and Cuba are striking examples of such provocations.

The American command is nurturing plans for a surprise attack on the countries of the Socialist Camp, intending to use the enormous striking force and range of operations of modern strategic means of attack for its aggressive aims. Plans to use the element of surprise to win a future war are strenuously debated in the pages of the foreign press.

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The Strategic Air Command of the USAF

The Strategic Air Command (strategicheskoye aviatsionnoye komandovaniye -- SAC) is a basic unification of the strategic aviation of the USA and is intended mainly to carry out independent strategic tasks by attacks on the most important administrative-political and military-industrial centers and military installations in the enemy's interior zone.

In the armament of strategic aviation units in the USA, there are heavy and medium bombers, "Atlas" inter-continental ballistic missiles (ICBM) and "Snark" cruise missiles, "Thor" and "Jupiter" intermediate range ballistic missiles (IRBM) and reconnaissance and tanker aircraft.

The basic heavy bomber is the B-52, variously modified, and the medium bomber is the B-47. The "Thor" and "Jupiter" IRBM's are mainly intended for issue to the armies of the Allies in NATO. (The "Thor" has been adopted for British units, and the "Jupiter" for Italian units.)

The SAC of the USA unites the 2nd, 8th, 15th and 16th Air Armies, which are dissimilar in their composition and organization.

For the more efficient control of strategic aviation and guided missile units, air divisions (aviatsionnaya diviziya) (the number in an army fluctuates between 8 and 10) and two divisions of guided missiles (the 1st and 13th Guided Missile Divisions) have been created. In addition, there are independent air divisions directly subordinate to SAC, and independent aviation wings and squadrons of guided missiles, incorporated directly in the air armies.

Of the four above-mentioned air armies of SAC, USAF, three armies (the 2nd, 8th and 15th) and the divisions of guided missiles are located in the continental portion of the USA, and only the 16th Air Army and three independent

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divisions (the 3rd, 4310th and the 7th) are located respectively, in Spain, on the island of Guam, in North Africa and in Britain; in these large units only control echelons (upravleniye) have been created, which have no subordinate units and which are intended to direct the combat training of strategic aviation squadrons arriving in these areas from the USA, and also to prepare operational bases in the event of deployment of the military air forces.

In the complement of SAC, USAF, there are ten squadrons of ICBM's (seven "Atlas" squadrons and three "Titan") and one squadron of "Snark" cruise missiles. Of these only three "Atlas" squadrons (the 576th at Vandenberg Air Base, the 564th and the 565th at Warren Air Base) and a squadron of "Snark" cruise missiles (the 556th at Presque Isle Air Base) are in a state of readiness, i.e., are armed with combat missiles and with launching installations (ustanovka) for launching them.

The remaining "Atlas" and "Titan" missile squadrons have only staffs and a full complement of personnel, which is undergoing training in the preparation and use of ICBM's. It is planned to bring these squadrons to combat readiness by the second half of 1961. In January 1961, also, at Hill Air Base, the staff of the 4062nd wing of "Minuteman" missiles was formed. According to the plans of SAC the units of the 2nd and 8th Air Armies of SAC, USAF should be mainly ready for operations on the western and northern air axes. The 15th Air Army is designated for operations from the eastern and northern air axes.

In order to increase the combat readiness, mobility, and combat capability of the strategic aviation, and also for greater security in its basing, the command of the USAF has recently undertaken a series of measures. One of these is the breaking up of the B-52 heavy bomber wings, each of which, instead of three squadrons each of fifteen B-52's and one squadron of 20 tanker aircraft, will have one combat squadron composed of 15 B-52 aircraft and one squadron of tanker aircraft composed of ten KC-135 aircraft. Each wing will be based at a separate air base. In addition, it is planned to increase the total number of B-52 bombers in the middle of 1961.

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Thus, because of the combat and numerical composition of the guided missile units of SAC, USAF, and also considering the state of combat readiness of these units, the command of USAF continues to consider as its basic means of air attack piloted nuclear weapon delivery aircraft, a portion of which can be equipped with guided missiles of the "air-to-surface" class.

Besides the USA, only Great Britain at present has means for strategic attack.

The Bomber Command of the RAF of Great Britain unites all the means for attack and strategic reconnaissance located on the territory of Great Britain, including IRBM's, strategic (medium) bombers, tactical bombers and strategic reconnaissance aircraft.

In the complement of Great Britain's Bomber Command, there are 13 squadrons of strategic bombers and 4 squadrons of "Thor" missiles disposed on 20 launching platforms (60 launching installations).

The Organization of Units and Subunits of Inter-Continental Ballistic Missiles and Medium Range Missiles

A wing of "Atlas" ICBM's consists of the staff, two or three combat squadrons, support squadrons (combat support) and service squadrons.

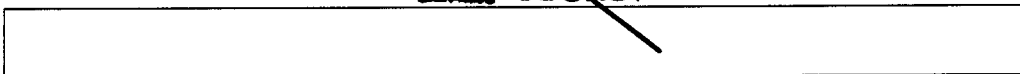
A combat squadron consists of three detachments, each of which has three combat crews. Each detachment services three launching installations (a squadron's unit of fire is 10 missiles).

Precise data on the numerical strength of the personnel of an "Atlas" missile combat squadron is not yet available, but from an analysis of the data published in the foreign press, one can surmise that there are more than 700 men in a combat squadron.



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The organization of a wing of "Titan" ICBM's and its combat and numerical complement are similar to the organization and combat and numerical complement of an "Atlas" wing.

Only in Great Britain are there "Thor" missile squadrons. These squadrons are not included in wings or divisions, but are immediately subordinate to Bomber Command of the British Air Force and in an operational respect, to SAC, USAF.

A "Thor" missile squadron consists of the staff, five combat detachments, and a service detachment. Each combat detachment consists of five combat crews. The squadron has 15 launching installations, serviced by 25 combat crews.

The number of combat crews exceeds the number of launching installations, which ensures 24 hour combat duty. The complement of a "Thor" missile squadron is more than 770 men.

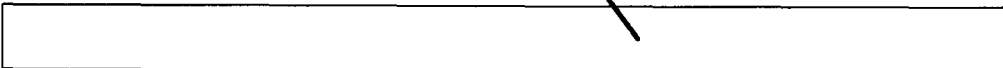
The organization of "Jupiter" ballistic missile squadrons is similar to that of "Thor" missile squadrons. The complement of a "Jupiter" missile squadron is about 8 percent greater than that of a "Thor" missile squadron because there is less automation in the work of preparing and launching the missile.

The presence of comparatively few service personnel in the combat subunits of ICBM and IREM units is explained by the wide automation and mechanization of the work involved in preparing the missile for launching, and in the "Thor" missile squadrons stationed in Britain, even more so, since the British command plans only a one-time use for each launching installation. This latter point considerably reduces the requirement for personnel dealing with the transport of missiles, warheads, and fuel to the base, and also with the preparation of the missiles at the technical site (tekhnicheskaya pozitsiya), as this work can be done in advance by a small number of specialists.



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The Strategic Missiles and Cruise Missiles of the
USA and Great Britain,
Their Employment in Combat and the Prospects for Their Development

At present, pilotless weapons of strategic designation have been developed only in the USA. Britain conducted work on a missile of its own design which was named "Blue Streak". The development of this missile was stopped at the beginning of 1960. In Britain, up to the present time, four squadrons have been formed, which have as their armament American "Thor" ballistic missiles. In France, they are only studying the possibility and advisability of building their own strategic missiles or the possibility of receiving American licenses.

The following pilotless means of strategic attack have been adopted by the USAF:

- the "Atlas" ICBM;
- the "Snark" intercontinental cruise missile;
- the "Jupiter" and "Thor" IRBM's.

In 1960, in accordance with a plan which had been drawn up earlier, the arsenal of pilotless means of attack of the USA was strengthened with "Polaris", Type A1 missiles, which are intended for use from atomic submarines for the purpose of destroying strategically important coastal and rear area objectives, at ranges of up to 2,000 kilometers. Three atomic submarines, the "George Washington", the "Patrick Henry" and "Robert E. Lee", are already carrying on combat watch (vakhta) in the North Atlantic and the "Theodore Roosevelt", according to the plans of the US command should be commissioned into the US Navy in 1961. The US Naval Command intends to arm certain aircraft carriers, 18 heavy and 6 light cruisers, and a series of merchant vessels of the Liberty and Victory classes with "Polaris" missiles. However, the question of arming these ships and vessels has not been finally decided.

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The possibility of using "Polaris" missiles from stationary and mobile land equipment (ustroystvo) is also being studied.

In 1961 it is also proposed to finish the tests of the "Titan" and "Minuteman" ICBM's. According to the plans of the NATO command, by the middle of 1962, three "Jupiter" missile squadrons should be formed and brought to a state of combat readiness in the composition of the unified armed forces of the bloc. Of these, it is planned to station two squadrons with a unit of fire of 30 missiles in Italy and to hand them over to the Italian Air Force and it is proposed to have one squadron with a unit of fire of 15 missiles on Turkish territory, as part of the Air Force of that country.

By locating squadrons of "Jupiter" IRBM's in the European zone, the command of NATO [two words missing] the following operational-tactical requirements:

-the squadrons must be in a state of constant combat readiness, able to launch their missiles 15 minutes after the moment when the combat order is issued;

-each squadron must be prepared, already in peacetime, to deliver a strike against 15 primary and 15 alternate targets (objectives) (one primary and one alternate target for each missile);

-the amount of the average probable deviation at a range of 2,800 km should not exceed 3.6 km (the desired deviation is 1.5 km);

-shifting fire from the primary target to the alternate target should not take more than 15 minutes; the time required for the preparation of data and for the rearming of the missile for two new (primary and alternate) targets should not exceed 2 hours;

-the reliability of operation of the missiles in any meteorological or climatic conditions must be brought up to 95 percent; the possibility of changing the type of burst of the warhead (from a ground to an air burst and

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vice versa) during the missile's flight to the target, must be ensured;

-a second launch from the same launching mounts, in accordance with earlier calculated data, should take place not more than 3 hours after the first launch.

The NATO command plans to use the "Thor" and "Jupiter" IRBM's from stationary, as well as from temporary firing positions. Much attention has recently been given, therefore, to increasing their mobility and combat readiness. However, for the combat use of the "Jupiter" ballistic missiles (and the "Thor's" in Great Britain) permission must be obtained from the American command, which directly controls missile warheads with nuclear charges. Because of this dual subordination every squadron will have direct communication with the senior staff of the national air force and with the staff of SAC, USAF.

At present, of the three missile bases which are projected, construction has been completed at only the base at Gioia 7 (Italy); at the other two bases construction is due to be completed by the end of 1961.

In the USA, work is being carried out to ensure the invulnerability of the "Atlas" ICBM. Thus, the firm "General Electric" is working on the creation of a guided nose cone for the "Atlas" missile, which could change the missile's direction of flight, deviating from a normal ballistic trajectory. The use of such a nose cone will considerably complicate antimissile defense. The "Atlas" missile is also equipped with an explosive charge which is intended to explode the main stage of the missile after the separation of the nose cone, which makes the radar detection and the identification of the nose cone among the mass of fragments difficult.

At present, a modification of the "Titan" missile ("Titan II") is being evolved, which is intended to use stable fuel components, allowing preliminary fueling and the lengthy storage of the fueled missile in a silo (shakhta).

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The "Titan II" missile will be equipped with an inertial guidance system only, and it will have a more powerful warhead (approximately 10 megatons), and a greater range (up to 17,000 km). Unlike the "Titan I", which is launched from ground level (after it has been lifted from its silo), the "Titan II" missile is designed to be launched directly from its silo. The first flight tests of the "Titan II" are scheduled for the end of 1961.

Successful firings of combat versions of the "Titan" missile over a distance of 9,800 km were made at Cape Canaveral on 29 September and 24 October 1960. The first combat squadron of "Titan" missiles is due to be formed at Lowry Air Base by June 1961.

Since 1958 the solid fuel "Minuteman" ICBM has been under development in the USA; the missile will be launched from underground (stationary) and railroad (mobile) launching installations. The latter possibility is particularly attractive to the American command and to the generals of NATO.

It is envisaged that mobile launching installations for "Minuteman" missiles will be placed on railroad flatcars. A railroad complement has three to five flatcars with missiles, a command post car, one or two cars with electric power plants, a car with communications apparatus, and several cars for the service personnel. The installation of a missile on the launch pad (stol) is carried out with hydraulic apparatus.

The USAF is planning to build 125 railroad flatcars for the launching of "Minuteman" missiles from mobile installations.

American military specialists see a number of advantages in this missile over those equipped with liquid-fuel missile engines (zhidkostnyy raketnyy dvigatel -- ZhrD):

-simpler construction, and, consequently lower cost of production, great reliability, and simplicity of operation;

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-the weight of the warhead is almost five times less than that of the "Atlas" and "Titan" missiles.

The propulsion system of the "Minuteman" missile consists of three solid fuel rocket engines. Experiments with solid missile fuel, conducted in the USA, have shown that it will be possible to store the "Minuteman" missile in underground silos in a state of immediate combat readiness for up to three years.

The "Minuteman" is a three-stage missile. Originally, it was planned to use it as a one, two, or three-stage missile, depending on the range required. However, according to the latest information from the press, the "Minuteman" will always be used as a three-stage missile with an intercontinental range.

It is planned to launch the first "Minuteman" missiles only from previously selected positions after the preliminary selection of a target and the calculation of a flight control program.

In the future, according to the plans of the American command, the "Minuteman" missile should replace all the existing types of US ballistic missile.

The "Snark" intercontinental cruise missile, while inferior to the ICBM's in its tactical and technical characteristics, is still available and, in the immediate future, it will remain part of the arsenal of the USAF's means of air attack.

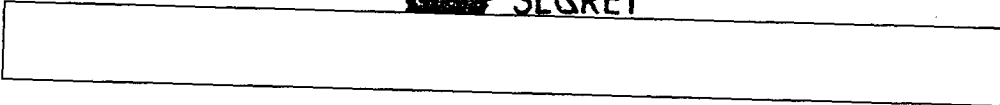
The Characteristics of Missile Bases and Launching Platforms for ICBM's and IRBM's

Missile bases for ICBM's and IRBM's are a complex of stationary structures and equipment, which are intended, as a rule, to provide for the launching of missiles by the forces and means of one squadron.



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The main elements of a base are:

-the launching platforms;

-the supply center which is an airfield providing for the delivery (by air transport) of missiles, equipment, fuel /approximately 3 lines missing/

...and also cover for the personnel of the supply center, in the area of the supply center, are located the staff of the squadron and the command post of the base;

-routes for transporting missiles by vehicular transport from the supply center to the launching platforms.

A missile base for the launching of "Atlas" missiles consists of nine surface or partially underground launching platforms dispersed over a territory of approximately 120 x 60 (80) kilometers and at a distance of 15 to 45 kilometers from one another and 25 to 80 kilometers from the supply center. On each launching platform there is one launching installation. Some bases have three launching platforms with three launching installations on each.

At most of the missile bases, launching platforms of the partially underground type are being built to launch the "Atlas" missile. All the elements of such a launch platform are set in the ground and covered with a layer of earth, and the platform itself, measuring 500 x 300 meters, is revetted.

On the launching installation, the missile is in a horizontal position in a stationary hangar, which is covered with a movable reinforced concrete slab (plita). During the preparation of the missile for launching, the slab is moved to one side and the missile is raised to a vertical position on the launch pad.

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The reinforced concrete hangar is capable of withstanding the pressure of a shock wave of 1.2 kilograms per square centimeter. According to instructions, 15 minutes are allotted for the launching of the missile from the hangar, of which 2 minutes are used to erect the missile in a vertical position; the remainder of the time is used to fill the missile with fuel components and for other operations.

At the beginning of May 1960, at the Vandenberg Range, an experimental launching of an "Atlas" from its hangar was conducted. Twenty-two minutes were needed to raise the missile to the vertical position and to fill it with fuel.

In the future, at some bases, it is proposed that launching platforms of the underground type will be built.

In this case the launching mount will be in a silo of a depth of about 53 meters, with a diameter of 16 meters. The control point is in a silo about 9 meters deep and 12.2 meters in diameter. The underground "Atlas" silos are calculated to withstand a shock wave with a pressure of the order of 7 kilograms per square centimeter. For a launch, the launching installation, with the fueled missile vertically set upon it, is raised to the surface by an elevator.

A missile base for launching "Titan" missiles consists of three underground launching platforms at a distance of 15 to 60 kilometers apart and between 15 and 70 kilometers from the supply center.

The launching platform of a "Titan" rocket occupies an area of approximately 500 x 300 meters, on which three launching installations are mounted. Thus, in all at a "Titan" missile base [three words missing] of one squadron of "Titan" missiles [three or four words missing] structures (perhaps 12 launching installations). [Two words missing] pad has its own control center [several words missing]. The launching installations are located in silos

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at a depth of [two words missing] and have a diameter of 12.2 meters; from above the silo is covered with steel plates (folding doors). To launch the missile, the launching pad is raised to the surface. The automatic filling of the "Titan" missile's fuel tanks will take place under ground. It is envisaged that the preparation of a "Titan" missile for launching from its underground launching installation will take less than 15 minutes.

A missile base for launching "Minuteman" missiles should occupy an area of approximately 50 x 40 km. On each launching platform (the number of them at each base is not yet established) there are two underground launching installations. The launching installation is in a silo 25 meters deep with a diameter of 8 meters, the missile is launched directly from the silo without raising the launch pad to the surface.

The base for launching "Snark" cruise missiles has an average dimension of 10 x 4 kilometers. The "Snark" cruise missile is launched from a mobile launching installation at an angle of 15° from the horizontal. The mobile launching installation provides for the launching of the "Snark" cruise missile from any level area of limited dimensions within an hour of the delivery of the missile. All the rest of the equipment and the launch and control apparatus are mounted on vehicles and trailers; the mobility of the ground equipment allows considerable dispersal of "Snark" missile subunits with two missiles on a launching platform. At the Presque Isle "Snark" cruise missile base there are 20 launching installations.

The missile base for launching the "Thor" missile occupies a territory of 700 to 1,000 square kilometers, which ensures the dispersal of launching platforms over the terrain at intervals of 10 to 40 kilometers.

The launching platform of the missile base is a complex of stationary structures and equipment with three launching installations, serviced by the forces of one combat detachment of the squadrons. The launching platforms

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are situated on small airfields which were used during World War II, most of which have dirt runways.

The launching platform occupies an area of an average dimension of 1,200 x 600 meters.

The basic elements of the launching platform are:

- three launching installations, laid out at a distance of 250-400 meters from each other; premises for assembly, for technical servicing and for checking the missile;
- a command post;
- an underground depot for missiles;
- a storage place for fuel components for the missiles;
- shelter for personnel and equipment;
- concrete roads in the platform area for the transport of missiles.

The launching installation for the "Thor" missile consists of a launch pad and of a complex of mobile and fixed equipment for the launching of one missile.

The fixed equipment of the launching installation is mounted in a reinforced concrete structure and partially buried. The launch pad, fuel pipes and other equipment are located in concrete trenches about 2 meters in depth. Up to the time of launching, the missile is stored horizontally on the erector carriage (lafet-podyemnik) mounted on the launch pad in a mobile hangar, which is moved aside on rails before the missile is raised to the vertical position.

Every three "Thor" launching mounts are serviced by a trailer, in which is a launch control officer and the main launch control board for the three missiles. This trailer is located 300 to 400 meters away from the launching installations.

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According to information in the foreign press, preparation for the launching of a prechecked "Thor", mounted with a nose cone, takes 15 to 20 minutes.

Presumably a base for launching the "Jupiter" IRBM has the same characteristics as the base for launching "Thor" missiles.

The main attention in the development of the combat equipment of the USAF, and of the armed forces as a whole, is devoted to speeding up the issue to the troops of strategic nuclear/missile weapons; to broadening research and development in the field of antimissile defense; and to making use of cosmic space for military purposes. At the same time, although to a considerably lesser degree than earlier, the further development and production of the "air-to-surface" class of nuclear missile continues.

Tasks receiving the highest national priorities are those of perfecting the "Atlas" and "Titan" ballistic missiles and of building the "Minuteman" missile.

According to the armed forces' five-year construction plan (1959-1964), it is proposed to have 41 ICBM squadrons in USAF, of which 13 squadrons will have "Atlas" missiles, 14 will have "Titan" missiles and 14 will have "Minuteman" missiles. According to the table of organization and equipment, these squadrons will have, respectively, 130-145 "Atlas", 126-140 "Titan" and up to 750-800 "Minuteman" missiles.

By the end of the 1951 fiscal year, the command of the US Armed Forces plans to have not less than three additional squadrons of ICBM's at full combat readiness, in addition to the three "Atlas" squadrons which exist at present.

It is intended that the full combat readiness of all strategic missile units will be achieved, in accordance with the above-mentioned plans, by 1965.

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The Americans are paying particular attention to the development of the "Minuteman" missile, which has great advantages over other missiles.

However, the USAF command considers that the "Atlas" and "Titan" missiles will retain their importance for some time to come and will be used for attacks against the very largest targets, well equipped in the anti-nuclear respect.

In the future, it is intended to use strategic cruise missiles mainly to combat radio-technical devices.

The American command is developing plans for building ICBM's of small dimensions by 1965-67. For this purpose, the USAF Research and Development Command has begun preliminary talks with commercial firms.

These missiles, according to the preliminary plans, should weigh about 9 tons, have a range of 4,000 to 13,000 kilometers, with an average radius of deviation from the target of 400 meters and a warhead weighing 90 to 270 kilograms.

It is planned that this missile will be launched from the platform of the auto trailer on which the missile is transported. The weight of the auto trailer with the missile should not exceed 18-20 tons.

At the beginning of September 1960, 18 American firms presented preliminary projects for a small-dimension ICBM to the Missile Command of the USAF; this missile received the designation "Midgetman". After examination of the projects, six of them are supposed to have been selected for further development.

The Douglas firm is working on modifications of a large version of the "Thor" missile for launching from three words missing and is also developing the "Thoric" -- a two-stage intercontinental variant of the "Thor" missile.

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The "Thoric" will be similar to the two-stage experimental "Thor-Able" rocket, whose range is 8,000 kilometers.

Development of a new type of air-to-surface missile which will be used from strategic bombers is also taking place in the United States. One such missile is the "Skybolt" airborne (aviatsionnyy) ballistic missile.

Capability studies are also being made into the launching of a modified "Minuteman" ICBM from the projected B-70 bomber. The modification to the missile envisages that the first stage will be reduced in size.

The US Navy at present has missile weapons of all classes. However, the chief concern of the command of the USN continues to be devoted to the mastery of the "Polaris" ballistic missile.

In the USA the following versions of "Polaris" missiles are being developed:

-type A-2 with a range of 2,800 kilometers; planned to be adopted as armament by the end of 1961;

-type B with a range of 2,800 kilometers and a more powerful warhead than the "Polaris" A-2; planned to be adopted as armament by the middle of 1963;

-type C with a range of 3,700 kilometers; planned to be introduced as armament in 1964.

The "Polaris" ballistic missile has two stages. Solid fuel rocket engines are used as motive forces in the first and second stages. "Polaris" type A-1 missiles are armed with a nuclear explosive with a trotyl equivalent of 600,000 tons, but it is proposed to arm later models (A-2, B, C), with a nuclear explosive yield of up to 3 megatons. The guidance system of the "Polaris" is inertial, ensuring an accuracy of fire of up to 1.8 kilometers from land launchers and of up to 5.5 kilometers when used from submarines (accuracy of fire is stated in average probable deviations, which will not be exceeded by 50 percent of the missiles).

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For accurate determination of the position of submarines during "Polaris" missile firings a navigation system which guarantees accuracy of movement of the submarine to a predetermined area, with an accuracy of not more than 0.9 kilometers for 10 hours of travel, is used.

Speeding up work on these versions of the "Polaris" missile is considered a first-priority task.

The American military command also devotes a great deal of attention to the development of cosmic military means, considering these as one of the basic elements of the strategic striking forces of the future. This work is directed, first of all, toward the building of satellites intended for the reconnaissance of missile launching bases, large industrial centers and other targets of a similar nature, and also for the detection of missiles in the air.

At present two such satellites, the "Midas" and the "Samos", are known.

For the launching of such military satellites an experimental wing was formed within the structure of USAF at the end of 1959 with a T/O&E of 400, which will be brought up to 3,000 in the future.

The Strategic Bombers of the USA and Great Britain,
Their Employment in Combat and Some Prospects for
Their Development

The B-47 and B-52 strategic bombers, which comprise the main body of strategic means for air attack available to the USAF, have insignificant speeds (960-1,050 kilometers per hour) and operating altitudes (14-15 kilometers).

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To increase the combat capabilities of these aircraft, the following measures have been taken:

-some of the B-52 and B-47 bombers have been equipped with aiming systems for low-altitude bombing and with navigation devices for carrying out flights at these altitudes;

-in the units the number of KC-135 tanker aircraft has been increased (to 360 aircraft), with the result that the proportion of these aircraft to B-52 bombers rose to about 2:3.

In addition, the range of the B-52 has been increased to 17,000-18,000 kilometers, chiefly by increasing the fuel supply, improving the system of refueling in flight, and installing more economical turbo-fan (turboventilyatornyy) engines.

At present, Great Britain has three types of medium range V-class strategic bombers ("Valiant", "Victor" and "Vulcan").

These bombers are inferior in combat capabilities to USAF planes of the same type, and the British command, therefore, has the task of increasing the combat capabilities of these bombers by equipping them with air-to-surface class missiles, and by increasing their speed, range, and operating altitudes.

In the next three years, Great Britain plans to increase the number of strategic bombers by five squadrons (40 aircraft).

The strategic bombers are armed with guided air-to-surface missiles, intended both for delivering strikes against targets and for radio countermeasures. At present, US strategic aviation has two types of guided missiles - the "Rascal" (with which one wing of B-47's is armed) and the "Hound Dog".

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The "Hound Dog" missile was accepted as armament at the beginning of 1960 (approximately 400 missiles were ordered), and a series of launchings from B-52C bombers took place. Two "Hound Dog" missiles can be hung on each aircraft (under the wing on pylons).

The maximum range of these missiles is 800 kilometers.

Combined use of the "Hound Dog" missile is possible -- one missile will carry a nuclear warhead, and the other the apparatus for radio countermeasures.

The development of a new type of air-to-surface missile, which has received the name "Skybolt", is going on in the USA. It is proposed to use these missiles from the B-52G and B-52H strategic bombers, and perhaps from the B-58 and B-70.

The range of these missiles is 1,600-1,800 kilometers (according to other information 2,500-2,800 kilometers). The acquisition of "Skybolt" missiles as armament is planned for 1962-1964.

Initially, the basic armament of the British strategic bombers will be the British air-to-surface missile, "Blue Streak" (range 160 kilometers), and by 1962-64 they will have an American airborne ballistic missile, the "Skybolt".

Taking into account the existing network of airfields, the means of control, and also the aviation and missile groupings which have been set up, the American command is examining and studying the two most likely variants for carrying out a surprise strike against targets in the Soviet Union and the countries of the Peoples' Democracies.

The first variant is intended for use by the USA, if it succeeds in advance, under the guise of different exercises and maneuvers, in creating a powerful grouping of aviation and missiles in Europe, the Near, Middle and Far East and on the territory of the USA itself. The Americans consider that, with this variant, the possibility of making maximum use of all strategic aviation crews will

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exist, and in the process, the less fully-trained crews will operate from overseas territories, while the more fully-trained crews will deliver strikes from the American continent.

The weak aspect of this variant is considered to be the loss of the element of surprise, since it will hardly be possible to conceal from the enemy the massing of large amounts of strategic bomber aircraft in the theaters of military action, whatever measures may be taken for operational concealment.

The second variant provides for the delivery of the first attacks by strategic aviation from the airfields at which they are based in peacetime without preliminary regrouping.

According to this variant almost all the heavy bombers and a large part of the medium bombers will operate from airfields on the American continent, while missiles are being launched from fixed missile bases in the USA and in overseas theaters of military operations.

After the strike has been delivered, the greater part of the surviving B-52 aircraft, will apparently return to air bases on the American continent, while a large number of the B-47 bombers will land at airfields in different theaters of military operations.

The second variant, from the point of view of the American command, ensures the achievement of strategic surprise. The weak side of this variant is the impossibility of using all available strategic bombers for the first strike.

In accordance with such plans for the use of strategic means of attack, the command of the Anglo-American bloc, during different exercises and maneuvers, is systematically working on the initial period of a war, using primarily offensive means of strategic attack: nuclear weapons, strategic aviation, an aircraft-carrier fleet, missile-carrying submarines, and strategic guided missiles.

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In order to use the striking power of strategic aviation more effectively, the command of the USAF is undertaking the following measures.

The Conduct of 24-Hour Duty by SAC in the European and Pacific Ocean Zones, in Alaska and in the Continental portions of the USA under the designation of "Retaliatory Action", is conducted in accordance with a carefully worked out program. This program provides for the all-round training of crews in operations during alerts and in methods of delivering strikes on enemy targets during the initial period of a war.

With the aim of ensuring security against possible attacks by the enemy, the American command bases the aircraft carrying out 24-hour duty in small subunits (of six to eight aircraft) on separate airfields. This basing also ensures that the aircraft take-off during an alert in the shortest time, estimated at 15 minutes. During an alert the crews do not know whether it is a training or a combat alert, until an agreed signal to cut short the alert at one of its stages is transmitted.

In accordance with the program of 24-hour duty mentioned above, 80 to 120 aircraft are always based at air bases in the European Zone, 15 in Alaska and 25 in the Pacific Zone. Counting the crews carrying on similar 24-hour duty in the continental areas of the USA, the number of duty crews reaches 300, and in periods when the international situation is aggravated, the number sometimes reaches 500 bombers, or approximately 17 to 28 percent of all American strategic bomber aircraft.

The Performance of 24-Hour Airborne Duty by Strategic B-52 Bombers

In connection with the manifest backwardness of US missile weapon development in comparison with that of the Soviet Union, and the lack of antimissile defense, the command of USAF considers that in the event of a surprise enemy attack it will be possible to save at least some

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portion of the bombers for a retaliatory strike only by organizing round-the-clock airborne duty by heavy B-52 bombers, armed with nuclear weapons, together with 24-hour duty by strategic bombers on airfields. Practical tests of the possibility of organizing 24-hour airborne duty by strategic B-52 bombers had already begun at the end of 1958. At first, unbroken airborne duty was carried out by 8-10 bombers, by 1960 their number had increased to 12-14, and by the end of 1960 it reached 24 aircraft. During airborne duty the B-52 bomber crews fly over Canadian territory up to the 70th parallel, over a closed route. The bombers sometimes stay in the air for up to 24 hours, refueling twice from KC-135 tankers. In order to increase the striking power of the bombers carrying out airborne duty, some crews from the complement of subunits on duty are detailed for duty on airfields ready to take off immediately at an alert. The number of duty crews on airfields corresponds to the number of crews on airborne duty.

According to available information all B-52 crews were to have training in airborne duty by the end of 1960.

During 1960, SAC conducted four large exercises, Full Play - February 1960; Sky Shield - September 1960; Big Play - October 1960; Full Coordination - November 1960, with the actual participation of up to 1,000 strategic bombers.

In 1960, the command of USAF, making use of the operational and strategic background of the maneuvers of the unified armed forces of NATO, Autumn '60, also held two exercises of the strategic aviation and unified command of the antiaircraft defense of the North American continent under the designations September 1 (20-23 September 1960) and Big Job (28-30 September 1961).

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This testifies to the great attention which the US command continues to devote to questions of preparing strategic aviation to carry out large operations to deliver nuclear strikes against important targets in the Soviet Union and in the countries of the Peoples' Democracies directly from the continental area of the USA.

In the course of these exercises, units of strategic bombers were in a state of military readiness, which ensured the take-off of duty bombers on the alert in 10-15 minutes and the lift-off of 50 percent of the aircraft, prepared for flight, within two hours of the issue of the order.

The distribution of bombers by echelons in the exercise Big Play, for instance, was carried out in the following manner: in the first echelon there were 37 percent of the bombers, in the second, up to 40 percent (nuclear strikes were delivered within three hours after the strike by the first echelon), and in the third echelon were 23 percent of the bombers (a strike was carried out nine hours after the strike by the second echelon).

In view of the inadequate equipping with strategic ballistic missiles of the armed forces of the USA and Britain, the basic strategic attack means of these countries at present continues to be subsonic aircraft, a portion of which can be armed with guided air-to-surface missiles.

During 1961-62 the improvement of the combat quality of strategic aviation aircraft will be continued by equipping them with guided air-to-surface missiles.

The degree to which the air forces are equipped with strategic missiles will increase. However, the number of strategic aviation aircraft in 1961-62 will, apparently, remain at the previous level, while the complement continues to be increased with heavy intercontinental B-52 bombers.

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In the USA, a heavy strategic bomber is being developed, the B-70 "Valkyrie", with a maximum speed of 3,000-3,300 kilometers per hour and a practical ceiling of 25-30 kilometers. The flight range will be 12,000-14,000 kilometers. At present, two experimental models of the aircraft are being built.

In connection with the increase in the equipping with strategic missiles of the armed forces of the USA and Britain (especially the USA), it is possible that, from approximately 1963-64, the numbers of strategic bombers will begin to be gradually reduced.

Together with this, in this period, it is possible that new piloted strategic aircraft (basically carriers for airborne ballistic missiles) may be introduced into the armament of the air forces; these will be intended for the performance of those combat tasks which cannot be accomplished effectively with missiles (the destruction of mobile targets in the theaters of military operations, the conduct of reconnaissance, etc.).

During 1964-65, it can be expected that active means of antimissile defense, and of certain military cosmic means, the development of which, together with that of intercontinental missiles, has first priority attention, will be introduced into the armament of the armed forces of the USA:

The American command considers that, despite the reduction in strategic bomber aircraft, the role of strategic reconnaissance aircraft will increase under present conditions, since these aircraft are responsible for ensuring the gathering of the information which is necessary for the destruction of enemy targets with strategic missiles and for the assessment of the results of nuclear/missile attacks.

In connection with this, a supersonic reconnaissance aircraft, the U-3, with an operational flight ceiling of 33 kilometers, is being developed in the USA.

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It is also planned to use a version of the B-70 bomber as a reconnaissance aircraft.

Some Questions of the Control
of Strategic Means of Attack

The command of the armed forces of the USA envisages the centralized control of the use in combat of strategic means of attack from the command post of SAC, USAF, at Offutt Air Base.

At the SAC command post there is a computation section, equipped with a computing machine, which stores information on the status of the strategic means of attack, of crews, and of bases, and information on the plans for the combat use of forces, subordinated to SAC.

The use of strategic means of attack is planned by a committee of the Chiefs of Staff of the USA and Great Britain, as, at present, these are the only countries which have at their disposal the means which have been mentioned.

In the USA, under the unified Joint Chiefs of Staff, a section has been established to designate strategic targets. The commander of SAC, USAF, General Power, has been appointed chief of this section. The personnel of this section will number 40 to 50 officers of the Army, Navy, and Air Force.

The section designating strategic targets compiles lists of targets, which are to be destroyed by missiles and strategic bombers, and presents them for final confirmation by the Joint Chiefs of Staff. Then these lists are sent out to the staffs of the different armed forces.

In the past year, the further perfection and enlargement of the system of strategic communications of USAF, of the Navy and of the ground forces has continued. The strategic systems of communications established at

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present are provided by the centralized directorates of the respective armed forces both on the continent of the USA, and in overseas theaters of military operations. With the aim of increasing the reliability and operation of the controlling elements and also in connection with the possible putting out of action of ground control points, SAC took the decision to create a reserve airborne command post. Three jet KC-135 tanker aircraft were converted as an airborne command post, and a special group of 25 was prepared for each aircraft, headed by a responsible general of the SAC staff.

If the main command post were to be knocked out, the airborne command post is empowered to take up immediate contact with the Joint Chiefs of Staff, and to carry out the control of all means of strategic attack from the air and on the ground.

From August 1960, SAC, USAF, began practical work on the control of units and large units of strategic aviation directly from an airborne command point.

From an analysis of the structure and prospective development of the armed forces of the main capitalist countries and, in the first place, of the armed forces of the USA, it is apparent that the main task continues to be seen as that of the further equipping of the USAF and other armed forces with nuclear/missile weapons, primarily of the strategic category.

In spite of considerable exertions and huge financial appropriations, in practice, up to the present, the US has for armament only the intercontinental "Atlas" missile (only a few missiles being in a state of combat readiness), "Thor" medium-range missiles (60 missiles) and the "Polaris" (48 missiles on three submarines), and the "Snark" cruise missile (20 missiles).

In order to increase its missile arsenal, the USA is speeding up the construction of missile bases and is conducting intensive missile testing. Thus, while in 1959,

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twenty-four "Atlas" missile launchings were conducted, in 1960 approximately 73 such launchings were made. "Titan" missiles were launched 9 times in 1959 and approximately 23 times in 1960. By a sharp increase in the intensity of launchings, the American command is aiming first of all at the quickest introduction as armament of improved modifications of these missiles, and at increasing their dependability and combat readiness.

The work being conducted in the USA and in Great Britain on the construction of air and cosmic means of attack is confirmation of the aggressive intentions of the ruling circles of these countries.

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