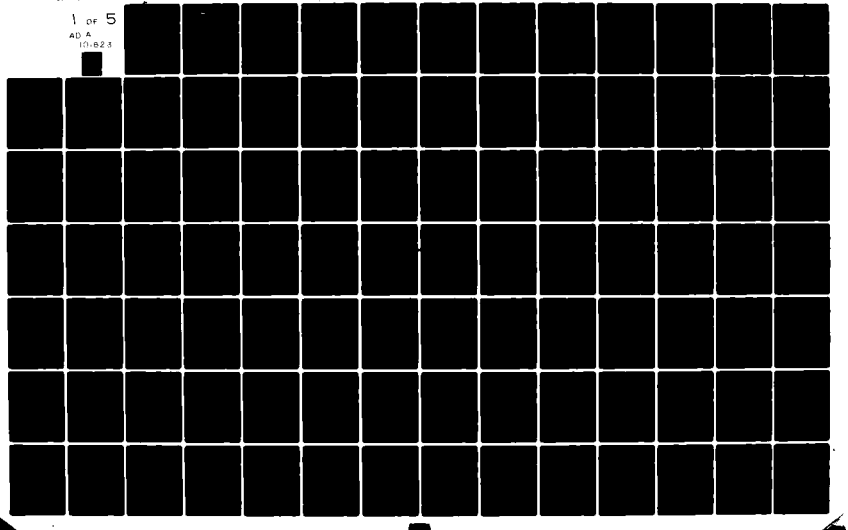
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U.S. ARMS CONTROL AND DISARMAMENT AGENCY

PREPARED BY

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Answers to these and related questions have been derived from qualitative and quantitative content analyses of Soviet open-source national security publications. The commentaries sampled in the analyses - spanning the years 1960 to 1980 - represent the views of naval, military, and party/government leaders and spokesmen.

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SOVIET PERCEPTIONS OF U.S. ANTISUBMARINE WARFARE CAPABILITIES

VOLUME III: APPENDICES

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TABLE OF CONTENTS

VOLUME III

APPENDIX		PAGE
A.	SOVIET OPEN-SOURCE DATA USED FOR QUALITATIVE ANALYSIS FOR THE PERIOD 1960-1966	A-1
B.	SOVIET OPEN-SOURCE DATA USED FOR QUALITATIVE ANALYSIS FOR THE PERIOD 1966-1971	B-1
C.	SOVIET OPEN-SOURCE DATA USED FOR QUALITATIVE ANALYSIS FOR THE PERIOD 1971-1976	C-1
D.	SOVIET OPEN-SOURCE DATA USED FOR QUALITATIVE ANALYSIS FOR THE PERIOD 1976-1980	D-1
E.	SPECIFIC U.S. PROGRAMS MENTIONED IN QUANTITATIVE SAMPLE	E-1
F.	QUANTITATIVE DATA SUMMARY	
	PERIOD 1: 1961-1965	F-1
	PERIOD 2: 1966-1970	F-2
	PERIOD 3: 1971-1975	F-3
	PERIOD 4: 1976-1979	F-4
G.	BIBLIOGRAPHY	G-1
H.	CHRONOLOGY	H-1

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APPENDIX A

SOVIET OPEN-SOURCE DATA USED FOR QUALITATIVE ANALYSIS FOR THE PERIOD 1960-1966

THE 1960-1966 SOVIET OPEN-SOURCE DATA USED IN CHAPTER I

		PAGE
1 (a) -	Is anti-SSBN ASW seen by the Soviets as within the technological state-of-the-art given the great lead of submarine warfare?	A-2
1 (b) -	Is the U.S. Navy seen as assigned a priority mission for anti-SSBN ASW?	A-8
2 (a) -	General Soviet Appraisals of U.S. ASW	A-13
2 (b) -	U.S. Budget Allocations to ASW	A-15
2 (c) -	U.S. ASW Force Levels and Forward Deployment Readiness	A-16
2 (d) -	Mission-completion Capabilities of Soviet SSBNs	A-19
3 (a) -	SOSUS (plus any Compatible Mobile/Portable Subsystems)	A-23
3 (b) -	Shore-based VP Airplanes (plus Satellites)	A-31
3 (c) -	SSNs (plus SUBROC)	A-34
3 (d) -	CVSs (plus Aircraft)	A-38
3 (e) -	DLs, DDs, and DEs (plus ASROC and DASH/LAMPS)	A-40
3 (f) -	Mines	A-42
FOOTNOTES TO CHAPTER I		A-43

1960-1966, 1 (a) - IS ANTI-SSBN ASW SEEN BY THE SOVIETS AS WITHIN THE TECHNOLOGICAL STATE-OF-THE-ART GIVEN THE GREAT LEAD OF SUBMARINE WARFARE?

1960 - "Submarines have incomparably greater covertness and lesser vulnerability than surface ships under the conditions of thermonuclear war."8/

- "The appearance of nuclear-powered submarines has introduced a mass of unknowns into the field of antisubmarine defense."29/

- "...now submarines are being developed considerably faster than their surface-combatant brothers-in-arms. Having long enjoyed superiority in covertness and cruising range and endurance, nuclear-powered submarines are in the same class with the fastest surface ships as concerns speed (and in the future may surpass them). Therefore, it is becoming increasingly difficult for surface ships to combat submarines."24/

1961 - The Soviet Defense Minister, Marshal Malinovskiy, quoted Khrushchev in his accountability report to the XXIInd Party Congress to the effect that the Soviet reaction to the U.S. Polaris SSBN crash construction program would not take shape as mainly building greater ASW forces but in building an off-setting counter force of Soviet strategic submarines.[31] This suggests that the Party and military leadership were hedging against the likelihood that the ASW state-of-the-art might continue indefinitely to be disadvantaged by the high military characteristics of nuclear-powered submarines. By the same token, it seems not unlikely that the Party and military leaders had decided that U.S. ASW capabilities, SOSUS included, were not an unacceptably great threat to the Soviet SSBN force -- for the construction of which the USSR began in earnest at that time to expand their capacity for series construction.

1962 - "The measures in the field of antisubmarine defense carried out in recent years in the navies of the capitalist states, especially in the U.S. Navy, testify to the fact that foreign specialists consider antisubmarine defense to be one of the most important types of operations at sea. At the same time they acknowledge that

existing forces, means, and methods for combat with submarines, particularly with nuclear-powered missile submarines, are insufficiently effective. The development of submarines, in their opinion, has considerably outstripped the development of the forces and means for combat with them...Already the development of modern submarines has sharply reduced the capabilities of existing forces and means of antisubmarine defense and has led to the present necessity of modernizing them."3/

- "...the antisubmarine zone must not embrace tremendous areas in our seas and in the oceans. Our fleets are not capable of carrying out this antisubmarine mission with...the weapons available. The task of...destroying the submarine already has become much more difficult...Due to the increase in the mobility of submarines, the space and directions from which a submarine may attack with equal probability of success has greatly increased. It is possible to detect and destroy a modern submarine...only with the aid of a tremendous number of new weapons. One of these weapons, in the opinion of foreign specialists, is the missile /-torpedo/ or depth charge...The most difficult problem is considered that of finding improved means of increasing the detection range of submerged submarines."22/

- "It is apparent...that antisubmarine weapons in the capitalist countries are undergoing a qualitative leap forward in comparison to World War II. However, as foreign specialists have noted more than once, antisubmarine weapons development abroad up to the present time is still lagging far behind the requirements established as a result of the much greater leap forward in the development of submarines."22/

1963 - "In the evaluation of American military specialists, the combat forces and means of antisubmarine defense to be found in the armament of the U.S. Navy in recent years, and that are effective in some measure against diesel-powered submarines, have been proven to be of little effectiveness in combat with nuclear-powered submarines...Many military commentators abroad are observing that the appearance of the nuclear-powered submarines...has forced naval

specialists to reevaluate existing technical means for submarine search and detection... Submarines with nuclear-power plants have shown up the inadequacies of the technical means for submarine search and detection which has led to the development of new antisubmarine weapons and sensors."4/

- "...the search for submarines in the expanses of the oceans with the aid of sonobuoys, aviation, and surface combatant ships is extraordinarily difficult to conduct and of slight effectiveness due to the relatively short range of sonar. Moreover, the probability of effecting the detection and destruction of submarines is not great either because the speed of nuclear-powered submarines is greater than the speed of antisubmarine combatant ships. Furthermore, the speed at which submarines can operate noiselessly is increasing steadily but the speed at which surface antisubmarine ships can operate is limited by the interference with the sonar caused by high speeds.

  "Modern submarines can remain submerged and operate for months in the open sea and in regions which are ice-bound by a cover of ice... The strong points of nuclear-powered submarines are easy to appreciate: they can proceed covertly in a submerged state to an assigned region in the oceans and sneak up unnoted and launch their missiles ..."30/

- "It is believed in the U.S. that missile submarines are largely invulnerable and that, due to their great submerged endurance and covertness, they can launch a nuclear strike by surprise. "12/

1964 - "The problem of creating new antisubmarine means has been accorded a special position as a result of the rapid development of submarines inasmuch as the arsenal of antisubmarine means available are not very effective in actual use.

  "In evaluating the capabilities of contemporary antisubmarine forces, several foreign military specialists recognize that they are only slightly better than during World War II. The reason for this, in their view, is the considerable lag in the development sensors for submarine detection..."7/

- "The Americans accord great importance to the utilization of nuclear-powered submarines in antisubmarine defense, believing that they have many advantages over other antisubmarine forces. A nuclear-powered antisubmarine submarine can operate covertly right up to the moment of /launching its torpedo/ strike, even in regions where there are considerable antisubmarine forces of the enemy. They are capable of operating in any region of the World Ocean successfully, including under the Arctic ice."13/

1965 - "It is known that the combat capabilities of submarines have grown considerably in recent years ...Similarly, new and more effective antisubmarine means have been developed as well. However, the development of the latter has been taking place at a somewhat slower pace and, in the evaluation of foreign specialists, has fallen behind the development of submarines."6/

"A formidable new enemy of submarines has appeared -- antisubmarine submarines...As before, antisubmarine aviation presents a serious threat to missile submarines which the latter can only counter by covertness...Substantial improvements have taken place in the development of the forces and means of antisubmarine defense as well in the case of surface ships...Antisubmarine aviation is being improved and antisubmarine shipboard helicopters and submarines have appeared. The means for the detection of submarines are being developed -- towed and dunking sonars, sonobuoys, and stationary means of hydroacoustic surveillance -- and their detection ranges have increased.

"New means for the destruction of submarines have been developed -- antisubmarine torpedoes and missiles which have a nuclear charge as their warhead...This has increased the radius and reliability of the destruction of submarines."20/

- "It is completely obvious that...the size of the regions at sea to be searched for submarines is vast, the speed of the missile submarines is great, and the ranges of antisubmarine weapons and sensors are comparatively short...

"The reason for the difficulty of the problem of combating such a striking force as nuclear-powered missile submarines is the indisputable difficulty of their detection and timely destruction...It is precisely nuclear-powered missile submarines which wil act alone in the most various parts of the World Ocean. Naturally, to detect a submarine under such conditions is a most difficult matter." 21/

- "Among the most important combat characteristics of modern submarines are the capabilities for remaining submerged for prolonged periods and for inflicting missile strikes on targets from the depths without surfacing. At first blush these qualities ensure submarines complete invulnerability and give them the characteristics of an absolute' weapon. But, as it always has happened in the history of military affairs, following the appearance of a new weapon, new means appear for countering them...Among these means, as foreign specialists hold, belong nuclear weapons. Antisubmarine missiles, torpedoes, and depth charge carrying nuclear charges are becoming a formidable adversary for nuclear-powered submarines. As is known, the basic advantage of a nuclear weapon over a conventional one consists of the enormous destructive power of the explosion, permitting the destruction of a target even when the explosion has taken place at a great distance from it. This quality takes on a special meaning when a nuclear weapon is used against a mobile, covert, and relatively small target like a nuclear-powered submarine.

  "The mobility of a submarine, its capability to quickly change course, speed, and submergence depth has made extraordinarily more difficult the application of conventional types of antisubmarine weapons -- torpedoes and depth charges armed with conventional explosives. In the time it takes for their delivery, a submarine has had time to move away to a considerable distance to escape destruction...

  "The employment of conventional antisubmarine weapons against nuclear-powered submarines is limited...not only by their great covertness. These submarines do not have to appear on the surface and thereby unmask themselves. And

detecting a submarine underwater and determining its precise coordinates...is a most difficult matter, and, *in fact, not always* a possible one."32/

1966 - "Today the basis of a navy has become the submarine force -- nuclear-powered submarine missile platforms armed with ballistic and homing missiles and torpedoes. The combat capabilities of the nuclear-powered submarine missile platforms are incomparable. In comparison with other naval forces, they have such advantages as covertness ...virtual invulnerability..."33/

1960-1966, 1 (b) - IS THE U.S. NAVY SEEN AS ASSIGNED A PRIORITY MISSION FOR ANTI-SSBN ASW?

1960 - "In the U.S. at the present time, the construction of nuclear-powered missile submarines and submarines with torpedo armament is being extensively developed. They are assigned to offensive combat missions."8/

- The various classes of ASW surface combatant ships of the U.S. Navy, such as frigates, destroyers, and cruisers, are noted to "have been assigned basically" to the "antisubmarine and anti-air defense of combatant surface ships and convoys while crossing the seas".24/

- The "new concept" of ASW hunter-killer groups was said to have been developed by the U.S. in order to "deprive submarines of the initiative", a remark indicative of depriving attack submarines of free choice in deciding what approach would be best for attacking a convoy or carrier task force rather than having anything to do with anti-SSBN ASW.29/

1962 - "In wartime, the antisubmarine search-strike groups /of the U.S./ are planned for use to provide anti-submarine protection to formations of naval forces and convoys and for establishing barriers on the deployment routes of the enemy and on the far approaches to the coastline of the U.S."3/

1963 - "...American military leaders are striving to get moving in the area of combat with modern submarines...The U.S. is devoting particular attention to insuring the protection of its sea and oceanic shipping for troops, weapons, and military equipment."

"Two more aircraft-carrier, hunter-killer groups /in addition to ALPHA, BRAVO, and CHARLIE/ have been established in the ASW Forces of the Atlantic Fleet. Their basic assignment is to insure the antisubmarine defense of the CVA task forces of the Atlantic Fleet."4/

- "Nuclear-powered multipurpose torpedo submarines ...did not take shape in their modern form immediately /after WW II/...A general trend toward the maximum curtailing of the number of

submarines, which was brought about by economic and military reasons, played an important role. A more effective type of nuclear-powered submarine had been developed by 1960-1961 which is capable of effectively carrying out various missions...

"Even now there are still two points of view on the question of the construction of antisubmarine submarines. The proponents of the first view, which is subscribed to by the U.S. naval command, consider it inadvisable to build submarines specially designed just for combat with submarines ...The exponents of the other /Soviet naval!?/ point of view, without denying the possibility of employing multipurpose submarines in antisubmarine defense hold that only task-specific submarines can successfully carry out antisubmarine defense missions. They assert that the requirements for combat with modern submarines demand that antisubmarine weapons of all types be improved and that nuclear-powered antisubmarine submarines be provided with the latest equipment for search and detection of submarines. Multipurpose submarines, in their view, cannot meet these requirements. Data from the foreign press indicate that the first point of view has been approved in the ruling circles of the U.S. Navy...

"The American naval command is planning to build multipurpose nuclear-powered submarines and nuclear-powered missile submarines in a ratio of about two to one. This ratio was fixed, according to information in the American press, by the requirement for protecting each nuclear-powered missile submarine with two nuclear-powered torpedo submarines."12/

1964 - "The American military leadership is striving to rearm its navy in a short time with modern offensive weapons. Along with the uninterrupted modernization of its strike aircraft carriers, the Pentagon is placing basic reliance on the Polaris submarine system...the Americans... /also/ are striving to develop effective antisubmarine forces and means."5/

- "The reorganization of the U.S. Navy's ASW forces in the late '50s was attributed to a U.S. decision to create standing peacetime ASW forces

to be ready for immediate "counteraction in the event of the territory of the U.S. coming under fire from missile submarines."13/

- "Task Force Seventy-Two, consisting of destroyers, and shore-based and sea-based aviation, is assigned the primary task of patroling, mainly in the Straits of Formosa, and /is also assigned/ to the search for submarines."18/

- "Task Force Seventy-Two (Patrol Forces) is assigned mainly for combat with submarines. It includes a division of destroyers and several air squadrons of shore-based patrol airplanes and seaplanes. The main unit of the force is based in the region of Taiwan..."19/

- The U.S. was said to be according considerable attention to the construction of "multipurpose submarines with torpedo and missile-torpedo /SUBROC/ weapons for combat with submarines (above all, with missile submarines)".36/

1965 - "In the view of the U.S. military leadership, this /U.S. Atlantic/ Fleet is assigned primarily for delivering strikes with nuclear-missile and conventional types of weapons on enemy objectives employing nuclear-powered missile submarines and aircraft carrier strike forces, for securing the stability of oceanic and sea communications, and for the conduct of amphibious operations."22/

- "Combatant escort ships, together with strike aircraft carriers, constitute the basis of American naval forces...In addition to the crash development of nuclear-powered missile submarines and the construction of strike aircraft carriers, the amphibious forces...have received further development..."

- "/In the United States/ only one sub-class of combatant surface ship is being given further development -- strike aircraft carriers."

  "Simultaneously with the development of ships constituting the basis of the striking power of the /U.S./ naval forces in the form of nuclear-powered missile submarines and strike aircraft carriers, and also amphibious forces, further development was given also to ships intended for

their defense during operations at sea. The nucleus of this group of ships became submarines armed with powerful antisubmarine weapons and surface combatants for which guided-missile weapons became the basic armament..."

"In the 1949-1950 period, nineteen /U.S./ submarines built in the war years were designated for supporting the operations of surface ships...

"At that time /prior to 1961/ when the surface ship force expanded rapidly, construction of the submarine force in the U.S. received considerably less attention. This was explained by the fact that the U.S. naval command had no definite views on the employment of submarines in combat operations at sea.

"...in the postwar years a substantial part of the destroyers of World War II construction were modernized. However, in the process of these partial modernizations it was not possible to give these ships all of the characteristics required for escort ships. It was necessary to build ships of special design with more powerful anti-air and antisubmarine capabilities which would be able more successfully to carry out the task of defending aircraft carriers while operating at sea...

"Frigates and destroyers, along with such escort ships as cruisers, must insure the defense of strike aircraft carriers...

"...the 'backbone' of the American Navy -- the strike aircraft carriers -- have 'absorbed' ever greater numbers of escort ships.

"With the completion of all of the planned new escort ships for aircraft carriers, the naval forces of the U.S. will have at sea only fifty-eight new ships; that is only a little more than two ships for each aircraft carrier. That, unquestionably, is insufficient and it will be necessary to enlist the services of a considerable number of warships of other classes, primarily destroyers.

"However, this defense /of CVAs by screening DLs and DDs/, in the view of the American /naval/

command, cannot be counted on to provide a fully reliable defense. It is essential to develop a considerable defense-in-depth not only for air defense but also for antisubmarine defense. This can be achieved only by means of a special antisubmarine group out ahead /of the carrier task force/. This special group, in the view of the American command, must be formed around a ship carrying antisubmarmine airplanes and helicopters. Only an antisubmarine aircraft carrier fits the bill. Accordingly, beginning in 1953 the American Navy began to refit a part of the strike carriers of the Essex Class as antisubmarine aircraft carriers ...The aircraft-carrier search-strike /hunter-killer/ group is formed around an antisubmarine aircraft carrier which is screened by six to eight destroyers. This group moves out far ahead on the course of the /strike/ aircraft carrier and /thereby/ increases the depth of the antisubmarine defense."16/

1965 - "In...Exercise Teamwork /in 1964/, the /U.S. aircraft carrier/ strike force overcame the barrier of about fifteen submarines deployed between Iceland and the Faeroes and entered the Norwegian Sea...During this movement of the aircraft-carrier strike force and its subsequent maneuvers, the antisubmarine hunter-killer group and shore-based aviation carried out a constant search for submarines."35/

1960-1966, 2 (a) - GENERAL SOVIET APPRAISALS OF U.S. ASW

1960 - "Antisubmarine defense is receiving exceptional attention in the postwar years. Thus, in the U.S....1/

1961 - "Capitalist countries are making great efforts in the area of improving the forces and means of antisubmarine defense. For example in the U.S.A 2/

- "Despite the availability of a large number of various...means for search for submarines, their effectiveness...is insufficient. In a report giving appraisals of weapons under the jurisdiction of the U.S. Secretary of Defense, it is observed that the state of the forces and means of combat with modern, nuclear-powered submarines and the plans for their further development are unsatisfactory. In support of this conclusion, an example was presented of an exercise during which a nuclear-powered submarine passed three times under an antisubmarine group and was not detected by it. As a result, the necessity was stressed of giving greater attention to improving the means for submarine detection."2/

1962 - "In the general plans for the development of the naval forces of the capitalist countries the modernization of the forces and means of antisubmarine defense are being accorded ever greater attention. In the U.S., for example,... This /preceding prefatory description/ far from complete enumeration of the measures which have been taken by the leadership of the naval forces of the U.S. and NATO indicates that enormous attention is being given to the matter of antisubmarine defense."3/

1963 - "In recent years the development and buildup of the forces and means for combat with modern submarines is being given great attention in the general system of the...military measures of the U.S."4/

1964 - "Understanding perfectly well that any aggressive actions at sea inevitably will call forth retaliatory strikes, including from submarines, the American cock sparrows and their followers are striving to develop effective antisubmarine forces and means"5/ (emphasis supplied).

1965 - "...in recent years enormous attention is being given in several foreign countries to the problems of developing the means of combat with submarines ...On the basis of the material presented, it may be concluded that the improvement of antisubmarine weaponry abroad, especially in the U.S., is considered an important problem and great efforts are being made for its solution." 6/

1960-1966, 2 (b) - U.S. BUDGET ALLOCATIONS TO ASW

1960 - "...about sixty percent of the naval budget in the U.S. is being spent for development of the forces and means for antisubmarine defense."1/

1961 - "...in the U.S., appropriations for work in the field of antisubmarine defense constitute about half of all appropriations for the Navy as a whole."2/

1962 - "In the American Navy...appropriations for work in the area of antisubmarine defense is growing from one year to the next. Thus, while in the 1959/60 fiscal year 1.3 billion dollars were allocated to this work, in 1960/61 this allocation amounted to 1.4 billion dollars, and in 1961/62 grew to 1.8 billion dollars."3/

1964 - "...ever larger sums are being allocated by the U.S. from year to year for the improvement of ASW means. Thus, in the 1962/63 fiscal year 2.83 billion dollars were allocated for this purpose and in 1963/64 this allocation increased to 3.73 billion dollars."7/

1965 - "...the report of Secretary of Defense MacNamara on the military budget for 1965/69 states... 'one-third of the appropriations for the Navy are devoted to the development and production of antisubmarine forces and equipment'."8/

1960-1966, 2 (c) - U.S. ASW FORCE LEVELS AND FORWARD DEPLOYMENT/READINESS

1962 - "The command of the U.S. Navy established in 1958 a special force -- antisubmarine aircraft-carrier search-strike /hunter-killer/ group ALPHA in which were included an aircraft carrier, several destroyers, airplanes, helicopters, and submarines. This group was charged with working out new /tactical/ methods of combat with submarines, and also with evaluating the combat effectiveness of ASW weapons systems coming into the inventory. Later in the American Navy two more such groups -- BRAVO and CHARLIE -- were established." 3/

1963 - "In 1958 in the U.S. Atlantic Fleet a new aircraft carrier search-strike group /APUG/ was established, Task Force 81, with the main task of raising the combat readiness of the ASW forces of the Atlantic Fleet. At the end of the year, APUG BRAVO and APUG CHARLIE were established. Although both of these groups were formed on the same principles as ALPHA, they differed from it in composition and assignment. APUG BRAVO directed its efforts to working out and modernizing the tactics for an aircraft-carrier search-strike group and mainly the methods for search, tracking, and destruction of submarines. APUG CHARLIE was assigned to work out tactics for convoy escort.

"In addition to the forces named /ALPHA, BRAVO, and CHARLIE/, two more aircraft carrier search-strike groups were set up in the ASW Forces of the Atlantic Fleet. Their basic assignment is to insure the ASW defense of the task forces of the Atlantic Fleet. One of these APUG operates periodically with the U.S. Sixth Fleet in the Mediterranean.

"At the end of 1961, the American naval command announced that it proposed a second such group /for forward deployment/, consisting of the ASW carrier Essex and six destroyers for deploying for constant combat patrolling in the region between Iceland and the British Isles. For basing the groups, it is intended to make use of one of the naval bases on Iceland.

"The establishment of ASW search-strike groups in the Pacific began only in the second half of 1959. Overall it was intended to form three aircraft-carrier and one ship search-strike groups. It was planned to operate one APUG and the ship search-strike group off the U.S. West Coast, the second APUG in the Hawaiian area, and the third in the Far East.

"It was reported in the American press that the composition of the APUGs in the Pacific, like those in the Atlantic, would include a large ASW aircraft carrier, destroyers, and patrol airplanes of land-based aviation. Additionally, it was anticipated that submarines would be widely utilized for antisubmarine defense.

"Thus, it is completely obvious that the basic ASW forces of the U.S. Atlantic and Pacific Fleets are aircraft-carrier search-strike groups."4/

1964 - "The Americans are also undertaking measures for the establishment of a reserve of ASW forces which is /to be/ in a high state of readiness, the so-called 'special reserve'. The decision on this was made in 1958. According to the plan, the 'special reserve', in contrast with the regular naval reserve, must be in twenty-four hour readiness for carrying out combat actions. In the complement of the 'special reserve' are included ...fifty-one destroyers and escort ships, forty-one antisubmarine air wings, and twenty-thousand personnel. It is planned to base the ships and squadrons of the 'special reserve' on the East and West coasts of the U.S.... the ships and airplanes of the 'special reserve' can be rather quickly reassigned to the operational fleet, whenever the /international/ situation becomes tense. At such times, about 8,300 reservists can be called up to man thirteen additional destroyers, twenty-seven escort ships, and eighteen antisubmarine squadrons of the 'reserve'."13/

"Task Force Seventy /of the U.S. Seventh Fleet in the Western Pacific/ included several /task/ groups: a search-strike /hunter-killer/ aircraft-carrier group, a /shore-based/ air group, a mine-warfare group, and a submarine group. The basic mission of the force is combat with submarines."18/

1964 - "...the Antisubmarine Force (headquarters at Pearl Harbor), which was created in 1960 with the task of combating enemy submarines in the theater and providing protection for shipping, is one of the basic constantly-operating /in peacetime/ forces in the Pacific Fleet. In these forces are included about one hundred surface ships, /four Essex Class/ ASW aircraft carriers, forty submarines, about five hundred airplanes and various shore units. The personnel number one hundred thousand men."19/

1965 - The ASW Forces of the Second Fleet are assigned to antisubmarine work in the theater, the conduct of long-range reconnaissance, control of shipping, and to mine warfare. These forces include: antisubmarine aircraft carriers, destroyers and escort ships, and also sixteen patrol aircraft squadrons. In addition, other forces are included in them periodically.

"For daily /peacetime/ activity there are /in the Atlantic Fleet/ three aircraft-carrier search-strike groups: (ALPHA, BRAVO, and CHARLIE) in each of which are an antisubmarine aircraft carrier, up to ten destroyers and one or more submarines, and search-strike group DELTA of /shore-based/ patrol aviation. Usually, /in peacetime/ not less than one antisubmarine aircraft-carrier search-strike group is constantly at sea on combat alert and patrol. Round-the-clock flights also are carried out by shore-based aviation which works under great strain in conducting daily /peacetime/ antisubmarine surveillance in the theaters. (The average flight time reaches seven hundred hours per crew.)

"Additionally for submarine search and for the early detection of air targets, the so-called 'barrier forces' have been deployed since 1956 to Newfoundland and the Azores. Regular flights are carried out by radar-picket airplanes and intermittent ones by antisubmarine airplanes.17/

1960-1966, 2 (d) - MISSION-COMPLETION CAPABILITIES OF SOVIET SSBNs

1961 - "Nikita Sergeyevich Khrushchev reminded the zealous admirals of the West that modern military technology makes it possible to bring vital centers under fire...by means of ballistic missiles fired from submarines. I /Marshal Malinovskiy/ remark on this occasion /of his accountability report to the XXIInd Congress on his stewardship as Defense Minister/ that our missile-armed submarines have learned to operate well under the ice cover of the Arctic and to assume with precision positions for launching missiles -- which is very important for hitting objectives on land..."31/

1962 - "In order to combat submarines successfully it is necessary to have the capability to solve two problems: that of detecting a submarine at an early time and that of directing a weapon accurately at it. For a long time these tasks were solved according to the principle used in both world wars: 'Catch the fox at the henhouse' -- in other words, to track down and destroy a submarine near its victim. However, with the advent of nuclear-powered submarines, this principle has become inapplicable. A missile-carrying submarine which has as its target an industrial center or grouping of ships does not need to be located in proximity to its target. As a consequence of this, the antisubmarine zone now must embrace tremendous areas in our seas and in the oceans...The most difficult problem is considered to be that of finding improved means for increasing the range of detecting submarines in a submerged state."22/

1963 - "The view is held abroad that in certain circumstances the effectiveness of antisubmarine barriers...has decreased...Now it is far from mandatory for missile submarines to penetrate such barriers to deliver strikes on operational and strategic objectives. It is presumed that for the delivery of such strikes it will not even be necessary to enter the zone protected by the forces and means of a submarine barrier."4/

- "Modern submarines can remain submerged and operate for months in the open sea and in regions which are ice-bound by a cover of ice...

The strong points of nuclear-powered submarines are easy to appreciate: they can proceed covertly in a submerged state to an assigned region in the oceans and sneak up unnoted and launch their missiles..."30/

- "It is believed in the U.S. that missile submarines are largely invulnerable and that, due to their great submerged endurance and covertness, they can launch a nuclear strike by surprise."12/

1964 - "The Americans accord great importance to the utilization of nuclear-powered submarines in antisubmarine defense, believing that they have many advantages over other antisubmarine forces. A nuclear-powered antisubmarine submarine can operate covertly right up to the moment of /launching its missile/ strike, even in regions where there are substantial antisubmarine forces of the enemy. They are capable of operating in any region of the World Ocean successfully, including under the Arctic ice."13/

1965 - "A reason for the difficulty of the problem of combating such a striking force as nuclear-powered missile submarines is the indisputable difficulty of their detection and timely destruction...It is precisely nuclear-powered missile submarines which will act alone in the most various parts of the World Ocean. Naturally, to detect a submarine under such conditions is a most difficult matter."21/

- "Among the most important combat characteristics of modern submarines are the capabilities for remaining submerged for prolonged periods and for inflicting missile strikes on targets from the depths without surfacing. At first blush these qualities ensure submarines complete invulnerability and give them the characteristics of an 'absolute' weapon. But, as it always has happened in the history of military affairs, following the appearance of a new weapon, new means appear for countering them...Among these means, as foreign specialists hold, belong nuclear weapons. Antisubmarine missiles, torpedoes, and depth charges carrying nuclear charges, are becoming a formidable adversary for nuclear-powered submarines. As is known, the basic advantage of a nuclear weapon over a

conventional one consists of the enormous destructive power of the explosion, permitting the destruction of a target even when the explosion has taken place at a great distance from it. This quality takes on a special meaning when a nuclear weapon is used against a mobile, covert, and relatively small target like a nuclear-powered submarine.

"The mobility of a submarine, its capability to quickly change course, speed, and submergence depth has made extraordinarily more difficult the application of conventional types of anti-submarine weapons -- torpedoes and depth charges armed with conventional explosives. In the time it takes for their delivery, a submarine has had time to move away to a considerable distance and escape destruction...

"The employment of conventional antisubmarine weapons against nuclear-powered submarines is limited...not only by their great mobility but also by their great covertness. These submarines do not have to appear on the surface and thereby unmask themselves. And detecting a submarine underwater and determining its precise coordinates...is a most difficult matter and, in fact, not always a possible one."32/

- "Today the basis of a navy has become the submarine force -- nuclear-powered submarine missile platforms armed with ballistic and homing missiles and torpedoes. The combat capabilities of the nuclear-powered submarine missile platforms are incomparable. In comparison with other naval forces, they have such advantages as covertness...virtual invulnerability...".33/

- "Due to their high mobility, great covertness, and unlimited cruising range and endurance, nuclear-powered submarines have spread the threat of the delivery of strikes all over the World Ocean. In this regard, the concentration of forces of antisubmarine defense in one region or another not only does not make the operation of nuclear-powered submarines more difficult, it simplifies to a considerable degree the execution of their combat missions. Upon encountering organized opposition in one region, nuclear-powered submarines can quit them rapidly

and concentrate their efforts in another region where the antisubmarine defense of the enemy is less developed."34/

1960-1966, 3 (a) - SOSUS (Plus Any Compatible Mobile/ Portable Subsystems)

1961 - "Specialists working in the field of hydro-acoustics believe that a deep study and understanding of oceanographic characterisitics would help more than the development of new methods and equipment for solving the problems of combat with submarines. This opinion is shared by several representatives of the U.S. Navy who believe that it is unwarranted for the immediate future to count on radical changes in the methods of search or to count on the appearance of new detection equipment and that they should therefore concentrate efforts on the perfection of available acoustic and magnetic gear and more thoroughly study temperature characteristics, the nature of currents, the character of the bottom, and also investigate the influence of these factors on the propagation of sound waves." 2/

1962 - In the first edition of the now-classic book Military Strategy prepared by a group of Army officers on the General Staff of the Armed Forces and edited by the long-term head of the General Staff, Marshal Sokolovskiy, a four-page section on "Preparation of Theaters of Military Action for War" did mention the more obvious infrastructure for the oceanic TVDs such as ports and naval bases including U.S. preparation of oceanic TVDs. Nevertheless, not a word was included about SOSUS although some mention would have been called for considering the potential importance of SOSUS by 1962 against the "main striking force" of the Soviet Navy -- their nuclear-powered submarines: SSBNs, SSGNs and SSNs. Similarly, a five-page section further on in the book that discussed "Military Activity in Naval Theaters in a Future War" contained a statement that logically should have included some mention of SOSUS in the description of U.S. ASW forces that followed it in expansion of the statement: "Our fleets have gone out onto the wide expanses of the oceans of the world. /In any future war/ they will be opposed by a strong and experienced enemy. The American-British command is paying great attention to preparations for combat with our forces, especially with our submarines". The omission of any mention of SOSUS was made all the more obvious by

inclusion of a passage stating a Soviet military requirement for long-range detection of submarines (whether by a stationary system like SOSUS or by some compatible mobile or transportable system) which obviously had been written with a knowledge of SOSUS in mind: "Warfare against submarines can be conducted successfully by antisubmarine submarines with missile and torpedo armaments, by airplanes, by antisubmarine surface ships on underwater wings with missile armament /e.g., ASROC type "missile-torpedoes"/, and also by destroyers, fast surface craft, and helicopters. For success in this combat it is necessary to have a reliable system of surveillance that insures the timely detection of the submarines of the enemy (especially of his missile submarines), that accurately determines the coordinates of his position, and that can vector to them our active means of combat".25/

- "The advantage will go to that side which is first to detect a submarine...For several years ...the U.S. has been building a stationary system of long-range submarine detection. Its basis is formed of underwater buoys equipped with hydroacoustic equipment. This equipment 'listens' continuously for sounds produced by submarines. The buoys are placed at a specified distance from each other and are connected with radio-transmitting equipment. Data on the location of a detected submarine are transmitted by radio to the information center where this information is processed on computers and then transmitted to the ASW headquarters.22/

- "In foreign navies it is considered that one of the most difficult problems in combat with submarines under modern conditions is that of the search for, and detection and identification of, underwater targets. Therefore, it is not accidental that the development of new and modernization of means of detection already in the armaments of capitalist countries, and in the U.S. in the first place, is being given special attention. It is typical that in the U.S. about one half of the one hundred developmental projects are concerned with hydroacoustic means. In the U.S. the modernization of hydroacoustic means occupies more than three hundred various firms and organizations. According to information in the foreign press, new forms of hydroacoustic gear are being worked out in the U.S.

and in other capitalist countries. New, deep-water towed sonar, frequency-modulation sonar, and the AMFAR underwater detection system for detection of submarines at extra long range, hydrophones with 360 degree coverage for submarines, etc., are being developed...

- "The passive hydroacoustic system CAESAR has been developed in the U.S. already. This system is comprised of a net of sound detection hydrophones on the continental shelf of the Atlantic and Pacific coasts of the U.S. which transmit their signals to shore stations. Hydrophones work in the low-frequency range and insure the detection of submarines up to a distance of one hundred miles.

  "Yet, even such a range, in the opinion of foreign specialists, is insufficient for the detection of modern submarines, in particular of missile submarines at significantly great distances. Consequently, in the U.S. intensive work is being conducted on a system named ARTEMIS for development of a new oceanic system for detection of underwater targets. According to press information, this system is comprised of a large number of stationary hydrophones mounted on heavy foundations on the ocean floor and dispersed at specified intervals. The individual components of the system already have been developed and are being tested. The Americans plan to encircle the North Atlantic with this very sophisticated system of submarine detection, integrating into it the CAESAR system, the hydrographic ships of NATO and ships of the missile ranges, which will permit the monitoring of wide oceanic regions." 3/

1963 - "Nuclear-power plants have enabled submarines to remain submerged for a protracted time, to attain high underwater speeds, and to dive to considerable depths. The aggregate of these factors has seriously complicated combat with modern submarines and above all their detection. The problem of prompt and reliable detection of underwater combatant warships has acquired such acuteness that, according to the admission of official American military circles, it has been raised to the rank of the number one problem of the U.S. naval forces. American military specialists consider that without successful

resolution of this most important problem the accomplishments in other areas of antisubmarine defense, and in ASW weapons development in particular, lose their meaning for the most part inasmuch as a submarine must first be located before it can be destroyed. In their opinion, the detection of submarines at long range is the key to the resolution of the entire problem of ASW."

"Captain First Rank Kvitnitskiy, the author of the book quoted from above, added directly to the foregoing passage the remark: "It is not coincidental that the American Navy, in developing the technological means for the detection of submarines at great distances, annually expends on them twenty-five percent of the total amount allocated to ASW". Kvitnitskiy further observed that the related problems of identification and classification of underwater contracts were of "particular importance".4/

- "Until recently it had been intended that the Project CAESAR system would be based /entirely/ on passive sonar detection due to which its range would be increased and the secrecy of its operation would be insured. Subsequently these views have undergone change. The advent of nuclear-powered submarines capable of cruising at great depths has necessitated developing /active/ deep-water hydroacoustic buoys (as distinguished from radio-acoustic ones /sonobuoys/) with a long service life. For this project ARTEMIS and ATLANTIC have made their appearance.

"The first of these projects /ARTEMIS/ pursues the aim of studying the possibilities for detecting submarines at great distances with the aid of deep-water hydroacoustic buoys operating in an active mode and anchored along the Atlantic continental shelf.

"In the other project /ATLANTIC/ it was proposed to utilize these buoys tied in with two trans-Atlantic telephone cables extending between Europe and the American continent.

"Relative to project ARTEMIS, the American press reports that it is intended to develop a special system of detection of underwater targets which

would constitute the equivalent of the North American radar system for detection of air targets.

"This sophisticated system is intended to encircle the North Atlantic Ocean. It is planned to include in the system the hydrophones of Project CAESAR, the hydrographic ships of NATO, and missile-range ships, which will permit the monitoring of wide oceanic regions. It is particularly asserted in the media that development of these projects is basically completed and that the actual testing in practice of the capabilities of the new systems is being conducted at present...

"For the protection of sea and ocean shipping, it is considered necessary to carry out antisubmarine measures to hinder the breakout of the submarines of the opponent from their bases onto the shipping lanes. Therefore, serious attention is being paid abroad to the blocking of the most probable routes of movements of submarines.

"Military officials of the U.S. note that in such a way not only is it possible to hinder the exit to sea of submarines from their bases and facilitate the destruction of submarines already operating on the sea lines of communication, but also to prolong their return to base. It is planned to block the bases of submarines and the basic regions of their deployment by means of establishing strong antisubmarine barriers.

"According to data in the American press, it is planned in wartime to establish three basic antisubmarine barriers. The first is planned for setting up in the Dardanelles and the second in the Baltic /Danish/ Straits. The third -- the basic barrier -- would pass through the northern part of the Atlantic and have a length of 2,500 miles. It would stretch from the southern part of Greenland to the northern part of Scotland, including Iceland and the Faeroes and the Orkney Islands. It is planned to place hydroacoustic buoys in this system at intervals of fifty miles apart...The probable creation also of antisubmarine barriers in the narrow entrances to the Sea of Japan and the Sea of Okhotsk has been suggested."12/

- In a 1963 book by two naval-engineering officers on Hydroacoustics in Military Affairs -- in which some mention of SOSUS could scarcely be avoided -- the CAESAR subsystem, which lies at the heart of the whole SOSUS system, was portrayed as nothing more in concept and developmental potential than intended for "protection of the shore on the far approaches to naval bases". Moreover, ARTEMIS, conceived as becoming (if ever built) the main active subsystem of SOSUS, was presented as designed only for detecting submarines "approaching" U.S. coasts.28/

- The second edition of Military Strategy, which appeared fifteen months after the first and seemed otherwise to have been thoroughly revised, still contained no mention or allusion to SOSUS as a threat to Soviet submarines, including their SSBNs. Rather, the passages in both sections of the book on which the analysis of the first edition above was based remained unchanged. Moreover, a new sentence was inserted in the second edition immediately preceding the quote given from the first edition above that ostensibly referred to the Soviet "antisubmarine defense system" but was couched in such general terms as to be equally applicable to U.S. ASW. The sentence in question read: "The former coastal system of antisubmarine defense would be ineffective now against missile submarines".[26] Accordingly, this statement could reasonably be construed to be an esoteric assertion (to quiet Admiral Gorshkov's incessant pleadings for more ASW ships and aircraft) that the Army felt that the SOSUS system of the early '60s posed no real danger to Soviet SSBNs.

1964 - The first edition of Combat Course of the Soviet Navy, which appeared in early 1964, is the only official history of the Soviet Navy extant, the latest (3rd) edition of which appeared in 1974. Although one would not particularly expect the Soviets to dwell on the vulnerability of their purportedly invulnerable sea-based strategic deterrent in a popular account of the Soviet Navy, the book generally attempts to give the reader a realistic account of "the strong naval opponent" constituted by the U.S. and NATO navies. In several passages in which at least some esoteric allusion to the threat constituted by SOSUS could have been worked in without damage to the

USSR's deterrent image and to the edification of the informed reader, the opportunity was not taken. For example, the following passage is a case in point: "At the contemporary stage our Navy has become primarily a submarine navy, the basis of which is comprised of nuclear-powered submarines armed with missiles and torpedoes with nuclear warheads. Submarines today are capable of successfully conducting combat against the aircraft carriers and surface missile ships of an opponent, and of destroying his missile submarines and ground military targets. Possessing unlimited cruising radius, high submerged speed, great endurance and diving depths, they can operate at great distances from their bases, remain submerged for protracted periods, and accurately destroy any target with its missiles fired from underwater...The new submarines, aircraft, and surface ships with their powerful weapons have radically altered previous conceptions of the missions of a navy and the conditions and methods for carrying them out under various circumstances. The Soviet Navy is an oceanic navy, one capable of carrying on combat with an enemy at great distances from our bases, of destroying his surface ships and submarines in the ocean, and of delivering strikes on any target on the territory of an enemy. For the fullest utilization of the striking power of our Navy, new tactics and strategies for carrying out the various missions of warfare at sea have been worked out and tested in combat exercises. Fleet exercises and long ocean cruises by our submarines...have verified the correctness of our new tactics..."27/

- "Abroad, and particularly in the U.S., the problem of the fast and reliable detection of submarines has become the main one in the development of antisubmarine means."7/

1965 - "...modern technical means insure not only the command and control of forces but also the /successful/ employment of weapons. They create the capability to selectively destroy the enemy at the maximum distance and independent of conditions of visibility (night, fog). However, in this matter there still remain difficulties or limitations, for example in the field of the detection of... submarines while submerged... Only the detection of submarines remains an admitted difficulty."21/

- "The equipment for earth satellites is being modernized, enabling them to determine the position of various small targets. There are in orbit at present a series of American earth satellites capable of registering the launch of missiles.

  "Moreover, as certain specialists propose, it is possible, with the help of special equipment for observing the water surface, to detect submarines. The Americans, for example, are trying to achieve this aim in 1965 using for the purpose the Gemini space craft with a crew of two men." 21/

- In November 1965, only a few months before the XXIIIrd Party Congress (which marks the end of the first period under study in Chapter I), a book appeared with the title The Postwar Doctrine and Development of the Navies of the Imperialist States that gave such otherwise full treatment to the threat constituted by U.S. naval forces that one had every reason to expect a full discussion of SOSUS. However, no such discussion is to be found in the book despite its containing a very detailed fourteen page description of all of the U.S. naval forces with which the Soviet Navy would have to attempt to contend in any future war. Although painstaking coverage was given to enumerating the ASW weaponry of the U.S. Navy, no reference, overt or esoteric, was made to the capabilities of SOSUS at that time to thwart the mission effectiveness of Soviet SSBNs by detecting them and vectoring ASW forces against them before they could reach missile launch station and start launching their strategic missiles against the U.S. 16/

1966 - "...modern submarines have such important advantages as the capability to operate for long periods under a great blanket of water...which protects them from the means of detection...a nuclear-powered submarine...can detect a surface ship before the latter can detect the submarine ...Nuclear-powered submarines, due to their high mobility and high covertness...have spread the threat of the delivery of /strategic/ strikes over the whole World Ocean." 34/

1960-1966, 3 (b) - SHORE-BASED VP AIRPLANES

1961 - "In January 1961, the command of the air wing of the shore-based aviation of the U.S. Atlantic Fleet...were transferred from the ranks of the Naval Air Force to the operational jurisdiction of the command of the Antisubmarine Forces /Atlantic Fleet/ and antisubmarine operations in the region of the East Coast of the U.S. and the Caribbean were assigned to shore-based aviation."13/

- "In September 1961 the antisubmarine group DELTA was formed, comprising Patrol Squadron 24 and a detachment of Patrol Squadron 45. The group is operationally subordinate to the command of the Antisubmarine Forces /Atlantic Fleet/ and carries out the task of improving the tactics for shore-based ASW aviation."13/

1963 - "Recently the foreign press has reported the development of the Jezebel sonobuoy with a passive acoustic system with a long detection range..."

"For the search for submarines in a submerged condition there is also being used a magnetic /anomaly/ measuring device that is carried in the armament of airplanes and helicopters."

"In the foreign pres it is reported that a gas analyzer, ASR-2, is carried aboard...the Lockheed P2V Neptune.

"Together with the devices named, in the U.S. there has been developed a device named Julie which works on the principle of registering the acoustic waves from a submarine caused by the explosion of a small bomb dropped by the aircraft."4/

1964 - "...a modern ASW organization must be based on the various heterogenous forces and means. However, under present conditions, antisubmarine aviation is considered to be the most effective /single/ type. Therefore, in a number of capitalist countries, great attention is devoted to its development and significant means are allocated to it...

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"In the U.S. Navy...shore-based aviation consists mainly of...P-2 airplanes (presently being replaced by P-3A airplanes)..."5/

"In the U.S. Navy, in accordance with this new sequence /of first determining the weapons and sensor suits to be carried by an aircraft and only then designing the aircraft/, the development of a new antisubmarine airplane under the A-NEW project is being conducted. In the 1962/63 fiscal year four million dollars were appropriated for this and in 1963/64 eight million."13/

- "...The Antisubmarine Forces /of the U.S. Pacific Fleet/ include: Task Group 70.4, an aircraft search-strike group and units of shore-based ASW aviation. Usually an antisubmarine aircraft carrier, six to eight destroyers, and one or more submarines are included in such groups."19/

- "The shore-based aviation /of the U.S. Pacific Fleet/ is composed of patrol airplanes, radar picket, and weather reconnaissance aircraft. These ASW airplanes are organized in six air wings with two or three air squadrons in each; Air Wing One of the Seventh Fleet is based at Naha (on the island of Okinawa), Air Wing Two at Barbers Point (in the Hawaiian Islands), Air Wing Four at Whidby Island (in the region of Seattle), Air Wing Six at Iwakuni (Japan), Air Wing Ten at Moffet Field (California), and Air Wing Fourteen at North Island (in the region of San Diego). In December 1963, a joint headquarters was formed at Moffet Field for patrol aviation to work out common tactical methods for ASW."19/

1965 - "The Lockheed P-3A ORION is assigned to reconnaissance of coastal waters, for patrolling at sea (including on /ASW/ barriers...), and also for the search and destruction of submarines detected by other means /primarily by SOSUS and related systems/. Reconnaissance and patrolling are usually conducted at low altitudes /especially to permit use of the magnetic anomaly detection gear (MAD)/ ...The airplane can be modified for minelaying, as an air command post, and also for the transport of fifty soldiers with full equipment, or cargo weighing eighteen hundred kg."4/

- "In the arsenal of this aviation /of the U.S. Atlantic Fleet/ are mainly airplanes of the ORION /P-3/ and NEPTUNE /P-2/ types, but the latter are being steadily replaced by the former.

- "...Patrol (antisubmarine) aviation /of the Atlantic (Second) Fleet/ constitutes the main part of shore-based aviation and, besides being tasked with the search and destruction of submarines, are also charged with minelaying, search and rescue ...reconnaissance, protection of naval forces and convoys, ice and weather reconnaissance, and the movement of various cargo. This aviation is mainly airplanes of the ORION and NEPTUNE types..."17/

- "Antisubmarine aviation is being developed... /Existing/ means for the detection of submarines are being improved -- towed and dipping sonar, sonobuoys, and stationary means of hydroacoustic surveillance -- and their detection ranges are being increased."20/

1960-1966, 3 (c) - SSNs (Plus SUBROC)

1960 - "As the result of the construction of an insignificant number of new submarines and the transfer of obsolescent ones to the navies of other countries, in the U.S. Navy at the end of 1960 were.../only/ twenty new diesel-powered submarines.../and/ nine /nuclear-powered/ torpedo-attack submarines..."16/

- The U.S. was alleged to be prosecuting a project "ANSOUND" that would provide a much longer-range detection system for submarines.8/

- The "missile-torpedo" SUBROC was reported under development by the U.S. for submerged-launch from submarines.1/

1962 - "In the U.S. at the present time, the construction of missile-armed submarines is extensive as is also that of nuclear-powered submarines with torpedo weapons. Budget allocations for the construction of the submarine forces of the U.S. are growing constantly."9/

- "In the U.S. the problem has been assigned to develop a prototype submarine with speeds of forty to sixty knots and more."10/

- The construction of three nuclear-powered submarines "designated primarily for antisubmarine defense" were reported to be included in the more-than-half of the U.S. naval budget for FY 1960/61 allocated for antisubmarine-defense aims (also included were three frigates, two destroyers, and two destroyer escorts.)3/

1963 - "Simultaneously with this /the construction of one Polaris SSBN per month/, the construction of nuclear-powered antisubmarine submarines is being conducted in stepped-up fashion. While earlier three such submarines were laid down yearly, in 1962 eight were laid down."11/

- "The U.S. Navy was said to be working on the development of "a more effective multipurpose torpedo submarine", specifically by improvements to the "experimental" nuclear-powered submarines Nautilus and Seawolf and to submarines of the Skate and Skipjack classes.12/

- "...the multi-purpose submarine Thresher, which was the first of a series of seventeen submarines, was developed precisely to carry out these missions /1) ASW; 2) Anti-surface ship; 3) ASW escort for surface ships and SSBNs; 4) Minelaying, and 5) Reconnaissance/...The submarines of the Thresher Class are the basic class of multipurpose submarine for the present ...For combat with submarines, the Thresher Class submarine is to be equipped with anti-submarine torpedoes and the SUBROC missile-torpedo...

  "it would be incorrect to say that the accident with the Thresher had brought about a principal change in the U.S. shipbuilding program or resulted in a curtailment of the construction of multipurpose submarines. The American command accords great importance to this submarine class and is planning the mass construction of these ships with the aim of bringing their number by 1970 up to seventy units according to one set of data and up to one hundred units per another set of data. The shipbuilding program of 1962/63 alone plans for the construction of eight multi-purpose torpedo submarines and the program for 1963/64 for six of these submarines."

  "As of mid-1963, there were /in the U S. Navy/ sixteen multipurpose nuclear-powered submarines, two of the Thresher Class, four non-series (Nautilus, Seawolf, Triton, and Tullibee), four of the Skate Class and six of the Skipjack Class.

- "It is significant that submarine construction priority in the U.S. is being accorded to multi-purpose torpedo submarines even in comparison with the construction of nuclear-powered missile submarines...nineteen nuclear-powered /multi-purpose torpedo/ submarines are in various stages of construction or planning. Of these, seven have /already/ been launched."12/

1964 - "At the present time in the U.S., only nuclear-powered submarines are being built and individual diesel submarines are being modernized under the FRAM-II program...All of the nuclear-powered antisubmarine submarines being built are of the Thresher class of twenty-five units..."

"Although the Americans widely proclaim the high qualities of their own antisubmarine submarines, they do not possess high qualities. The loss of the Thresher is proof of this..."

"At the present time in the U.S., scientific research and development work is being conducted, directed mainly at the development of more effective nuclear-powered submarines with torpedo and missile weapons. In this connection, the most important tasks are considered to be the lowering of the noisiness of the machinery, increasing the submergence depth of the submarines, and increasing the range of detection of the hydroacoustic gear. The small experimental submarine Dolphin is viewed by the Americans as the first step in this direction."13/

- "In 1958 the Goodyear Company began the planning of the SUBROC antisubmarine projectile which was a combination of a missile and a torpedo. However, this variant was not adopted since it did not meet modern requirements.

"...the development of a second variant of the SUBROC missile has been carried out at a forced pace. In it a nuclear depth charge was used instead of a torpedo. In 1963, the first experimental model appeared and underwent trials in the Pacific which apparently gave good results ...After the completion of all testing in 1964, production of the first run of two hundred missiles is planned. An allocation for this of one hundred fifty million dollars has been projected.

"The U.S. Naval Command plans to arm twenty-five nuclear-powered multipurpose submarines of the Thresher Class and its modifications...with the SUBROC missile."14/

1965 - "The direction taken in the construction of submarines has changed somewhat in the U.S. While before the greater part of appropriations for nuclear-powered submarine construction was allocated to nuclear-powered missile submarines, now the greater part of the means are going for the construction of multipurpose submarines which combine the qualities...for combat with /both/ surface ships and with submarines...In the U.S. naval construction program for 1964/65,

the building is provided for of six multipurpose nuclear-powered submarines...the number of them under construction or on order has reached thirty...

"As of the end of 1964, there were twenty-one submarines of this category /multipurpose SSNs/ in the order of battle of the U.S. Navy and the total number of /ASW/ submarines /i.e., counting those with diesel propulsion/ is fifty-one."15/

- "In the course of 1962-64 eight submarines entered service (counting the sunken Thresher) ...In the armaments of submarines of this type are a guided missile projectile SUBROC, four 533 mm torpedo tubes for antisubmarine torpedoes...

"In 1962/63 the U.S. Government awarded a contract for the construction of eleven nuclear-powered torpedo submarines of the new, large series of the Sturgeon Class. These submarines will have more modern sonar gear and fire-control equipment for torpedo firing. They will be three hundred ten tons heavier and 4.5 meters longer than the Thresher Class.

"In the program for the 1963/64 fiscal year, appropriations have been made for the construction of six more of the Sturgeon Class submarine. And, finally, in the program for 1964/65, it is planned to build an additional six...

"At the start of 1965...the Americans had 29 nuclear-powered torpedo submarines under construction or planned for construction."16/

1960-1966, 3 (d) - CVSs (Plus Aircraft)

1961 - "At the beginning of 1961 the U.S. Navy had in its composition eleven antisubmarine aircraft carriers of the Essex Class."16/

1964 - "The armament of the /eleven ASW aircraft carriers of the class/ Essex, included the ASW airplanes of the S-2D Tracker type, helicopters of the SH-3A type, and the long-range radar surveillance airplanes of the E-1B Tracer type. The airplanes and helicopters are together in Air Group Sixty, whose shore base is at Quonset Point. The air group included Squadrons 34 and 39 (total of 22 Tracker airplanes) and the Sixth Detachment of Squadron Twelve of Tracer airplanes (four planes).

- "For the prolonging of the period of service of these /antisubmarine/ aircraft carriers, the Americans have begun to carry out their modernization under the FRAM-II program...All /eleven of the Essex Class/ anti-submarine aircraft carriers are undergoing such modernization.

"Although at the present time the Americans are not building new antisubmarine aircraft carriers, a resumption of their construction is not excluded. Notably, the commander of the ASW Forces of the U.S. Pacific Fleet, Vice Admiral Thach, recently announced that one of the new-project antisubmarine aircraft carriers (possibly nuclear-powered) will enter the Navy within ten years."13/

"On each of them /the three ASW hunter-killer aircraft carriers of the U.S. Pacific Fleet/ is based an ASW air group numbering 45-48 airplanes and helicopters; two squadrons with 20 to 24 ASW airplanes, a squadron with 14 ASW helicopters ...In all the shipborne aviation of the Pacific Fleet has...90 ASW airplanes and 60 helicopters..."19/

1965 - "...for combat with submarines the /Atlantic (Second) Fleet/ Air Force has five antisubmarine aircraft carriers and shorebased aviation at its disposal...There is also one ASW training aircraft carrier, the Lexington, which can be employed for combat, if necessary.

"The aircraft of these /antisubmarine/ aircraft carriers are organized into air groups; two air squadrons of ASW airplanes (10 to 12 in each) and a squadron of ASW helicopters (14 in each). In total, an air group includes about 40 airplanes and helicopters. In addition, since 1963 they began to attach a detachment of four all-weather fighters to these aircraft carriers for the strengthening of antisubmarine defense..."17/

1960-1966, 3 (e) - DLs, DDs, and DEs (Plus ASROC and DASH/ LAMPS)

1960 - "In our days the development of antisubmarine means is continuing uninterruptedly....Antisubmarine ships now are developing completely differently from formerly. As a rule they are fast and capable of cruising in the open seas and oceans in any weather...Having considerable range and cruising endurance, modern antisubmarine ships are capable of carrying out combat missions in any distant regions...not a single...submarine can pass undetected if surveillance /i.e., by surface ASW ships/ is vigilantly conducted..."24/

- "The conclusion has been reached by navies abroad that the various classes of antisubmarine ships (frigates, corvettes, subchasers, and others) have become obsolete and must be replaced."24/

- ASROC was reported under development in the U.S. and to be an antisubmarine "missile-torpedo" for launching by surface ships against submarines (or other surface ships).1/

- By 1961, the U.S. Navy was said to include eight frigates, 290 destroyers, 33 destroyer escorts.16/

1962 - "It is known that more than half of the 1.4 billion dollars appropriated for ASW in FY 1961/62, 0.8 billion, was allocated to the construction of new and the refit of old antisubmarine ships. Approved were three frigates, two destroyers, two destroyer escorts and three nuclear-powered submarines that are primarily intended for antisubmarine defense. For refit are 14 destroyers, one submarine and other ships."3/

1964 - "In the construction of ships of the frigate class, the Americans have taken a course for the combining of weapons -- they are developing ships with missile weapons for carrying out of both the antisubmarine and anti-air missions.

"In 1959/61, the construction of 10 frigates with surface-to-air missiles of the Coontz Class with a full displacement of 5,600 tons was

completed. These ships are armed with...one antisubmarine missile weapon of the ASROC system..."

"Immediately after this was begun the construction of another series -- ten frigates...of the Leahy Class, an improved version of the Coontz Class. Completion of construction is expected in February 1964.

"In the construction of antisubmarine frigates, destroyers, and escort ships, the following trends are clearly observable: first, the construction of multipurpose ships capable of carrying out both antisubmarine and air-defense missions, and second, arming these ships with long-range antisubmarine missile weapons, the ASROC and DASH systems...

"The ASROC system recently began entering the arsenal but the number of ships equipped wtih them is still not great...an improved version is being developed...

"At the present time, development of an improved version of the /ASROC/ system is being conducted.

"The program for arming ships with the DASH system was adopted in 1958. It was planned to equip 240 ships with such helicopters in the course of seven years...

"For the fulfilling of the program of arming ships with the DASH system, the American command allocates the following means: in FY 1960/61 - forty-three million; 1961/62 - fifty-two million; and 1962/63 - ninety-three million dollars.

"Although many ships have undergone the alterations necesary to permit them to take the DASH radio-guided ASW helicopter, their arrival has been postponed many times due to various troubles ...The U.S. Navy command hopes that these shortcomings will be overcome and that the helicopters will be deployed to the ships in 1964."13/

1960-1966, 3 (f) - MINES

1964 - "The Mine Forces /of the U.S. Pacific Fleet/ (headquarters at Long Beach) unite all ships which are assigned to the laying and sweeping of mines. At present all minelayers are in reserve and the mine forces include one flotilla and several individual divisions of minesweepers..."19/

1965 - "The Lockheed P-3A ORION...can be modified for minelaying...".5/

FOOTNOTES TO CHAPTER ONE
(see note at end*)

1. Candidate of Military Science, Engineer-Captain 2nd Rank A. L. Prostakov, Antisubmarine Defense of Merchant Ships, 1960, pp. 138, 162.

2. Engineer-Lieutenant Colonel A. G. Sholom, "The Direction of Development of Submarine Detection Means Abroad", Naval Digest, March 1961, p. 74.

3. Engineer-Captain 1st Rank V. V. Belyayev and Captain First Rank V. N. Berezovskiy, Preface to Antisubmarine Defense in Modern War; A Collection of Translated Articles, Rear Admiral A. I. Rodionov (Ed.), 1962, pp. 7, 8, 11 and 12.

4. Captain 1st Rank A. Kvitnitskiy, Antisubmarine Warfare, 1963, p. 4, 9, 10, 14, 15, 20 and 21.

5. Engineer-Captain 1st Rank E. I. Sukhotskiy, "Antisubmarine Aviation of the Capitalist Countries", Naval Digest, November 1964, pp. 77, 84.

6. Captain 2nd Rank I. Ya, Pereverzev, "Modern Shipboard Antisubmarine Weapons", Naval Digest, June 1965, pp. 78 and 83.

7. Engineer-Captain 1st Rank I. I. Tynyankin, "The State and Directions of Development of Ship and Aviation Hydroacoustic Means", Naval Digest, June 1964, p. 82.

8. V. N. Gerasimov and V. F. Droblenkov, Submarines of the Imperialist States, 1960, pp. 8 and 217-218.

9. Admiral S. G. Gorshkov, "Resolutions of the XXIInd Congress of the CPSU and the Tasks of the Sailors", Naval Digest, January 1962, p. 3.

10. V. N. Gerasimov and V. F. Droblenkov, Submarines of the Imperialist States, 2nd Revision Edition 1962, p. 275.

11. Fleet Admiral S. Gorshkov, "Short-sighted Strategy", Izvestiya, 19 May 1963.

12. Captain 1st Rank A. Kvitnitskiy, "The Rise and Development of the Nuclear-powered Submarine Fleet of the U.S.", Military-Historical Journal, November 1963, pp. 45, 46 and 49.

13. Captain 3rd Rank V. F. Kostrov, "Basic Directions in the Development of the Antisubmarine Forces of the U.S.", Naval Digest, February 1964, p. 87.

14. Engineering Major-General P. Ya. Zalesskiy and Engineering Lieutenant-Colonel V. A. Konovalov, "The Antisubmarine Missile SUBROC", Naval Digest, May 1964, pp. 85 and 87.

15. Engineering Captains 3rd Rank G. Svyatov and V. Chernyshev, "The Course to a Multipurpose Submarine", Red Star, 12 February 1965.

16. Candidate of Military Science, Instructor, I. N. Potapov, The Postwar Doctrine and Development of the Navies of the Imperialist States, 1965, pp. 79-80, 89.

17. Captain 1st Rank E. S. Marinin and LCOL N. K. Nikolayev, "The U.S. Atlantic Fleet", Naval Digest, November 1965, p. 82.

18. L. Yeremeyev, "The Seventh Fleet of the United States", International Life (Russian edition), July 1964, pp. 148-150.

19. Captain 1st Rank E. S. Marinin, "The Pacific Fleet of the U.S.", Naval Digest, September 1964, pp. 79-82.

20. Rear Admiral, Instructor, B. F. Petrov, "The Content and Character of Contemporary Combat Activity at Sea", Naval Digest, January 1965, pp. 8, 11, 12 and 13.

21. Candidate of Naval Science, Captain 1st Rank P. V. Nikolayev, "The Problem of Struggle With Nuclear-Powered Missile Submarines", Naval Digest, February 1965, p. 22.

22. Engineering Captain 2nd Rank V. Mikhaylin, "Physics and Antisubmarine Defense", Red Star, 10 March 1962.

23. Captain 1st Rank L. B. Karlov, "Positional Hydroacoustic Means of Submarine Detection", Naval Digest, December 1965, pp. 76-79.

24. E. Ya. Shchekotov, Hunters for Submarines, 1960, pp. 107, 109, 117.

25. Military Strategy, 1st edition, Marshal V. D. Sokolovskiy (Ed.), 1962, pp. 105-109, 230, 353-357.

26. Military Strategy, 2nd edition, Marshal V. D. Sokolovskiy (Ed.), 1963, pp. 121-124, 396-401.

27. Combat Course of the Soviet Navy, 1st edition, Rear Admiral N. A. Piterskiy (Ed.), 1964, pp. 598 and 606.

28. L. V. Karlov and E. N. Shoshkov, Hydroacoustics in Military Affairs, 1963, pp. 118-119.

29. Admiral L. A. Vladimirskiy, Preface to Sea Power Today, translated from the German, 1960, p. 21.

30. G. M. Trusov, Submarines in the Russian and Soviet Navy, 2nd revision edition, 1963, p. 417.

31. Marshal Rodion Malinovskiy, Accountability Report to the XXIInd Party Congress, Pravda, 25 October 1961.

32. Candidate of Military Science, Engineering Captain 1st Rank V. Abchuk, "Nuclear Weapons Against Submarines", Red Star, 21 January 1965.

33. History of Military Art, Professor, Colonel A. A. Strokov (Ed.), 1966, pp. 606-609.

34. Vice Admiral V. D. Yakovlev, The Soviet Navy, 1st edition, DOSAAF Press, signed to press 8 January 1966, p. 47.

35. Captains First Rank V. N. Nikolayev and E. S. Yefimov, "Some Information on the Basic Exercises of the Naval Forces of the U.S. and NATO in 1964", Naval Digest, July 1965, p. 80.

36. Admiral A. T. Chabanenko, "Our Sea Shield", Literary Russia, 24 July 1964.

* Unless otherwise noted, the publisher of the books cited was the Soviet Ministry of Defense.

APPENDIX B

SOVIET OPEN-SOURCE DATA USED FOR QUALITATIVE ANALYSIS FOR THE PERIOD 1966-1971

THE 1966-1971 SOVIET OPEN-SOURCE DATA USED IN CHAPTER II

		Page
1 (a) -	Is anti-SSBN ASW seen by the Soviets as within the technological state-of-the-art given the great lead of submarine warfare?	B-2
1 (b) -	Is the U.S. Navy seen as assigned a priority mission for anti-SSBN ASW?	B-11
2 (a) -	General Soviet Appraisals of U.S. ASW.	B-22
2 (b) -	U.S. Budget Allocations to ASW.	B-26
2 (c) -	U.S. ASW Force Levels and Forward Deployment/Readiness	B-27
2 (d) -	Mission-completion Capabilities of Soviet SSBNs.	B-32
3 (a) -	SOSUS (plus any Compatable Mobile/ Portable Sub-systems)	B-35
3 (b) -	Shore-based VP Airplanes (plus Satellites)	B-46
3 (c) -	SSNs (plus (SUBROC)	B-49
3 (d) -	CVSs (plus Aircraft)	B-57
3 (e) -	DLs, DDs and DEs (plus ASROC and DASH/ LAMPS)	B-61
3 (f) -	Mines	B-66
FOOTNOTES TO CHAPTER II		B-67

1966-1971, 1 (a) - IS ANTI-SSBN ASW SEEN BY THE SOVIETS AS WITHIN THE TECHNOLOGICAL STATE-OF-THE-ART GIVEN THE GREAT LEAD OF SUBMARINE WARFARE?

1966 - "Nuclear-powered submarines are capable of successfully carrying out combat missions in a fight with the surface and submarine forces of the navy of any enemy and also of destroying from enormous distances the vital objectives in his territory."3/

- "Nuclear-powered submarines are very formidable weapons. They are virtually invulnerable and very mobile....They are capable of successfully carrying out their strategic assignments in the oceans despite the opposition of the surface and submarines forces of the enemy...and /thereby/ destroying vitally important objectives on land."5/

- "In the U.S., as before, scientific-research and experimental-construction work is being carried out to find fundamentally new means for the detection of submarines."8/

- "Soviet nuclear-powered submarines are capable of carrying out any mission in any region of the World Ocean. Those who specially love to rattle the saber should remember that we also have reliable means of combat with the submarines of an enemy."9/

- "...in the opinion of foreign specialists, all of the means available at the present time on shipborne antisubmarine airplanes are little effective for the initial detection of nuclear-powered submarines."11/

1967 - "The combat capabilities of modern submarines have raised the requirements for the organization and conduct of antisubmarine warfare considerably....In contemporary conditions, the specialists of many countries assert, large numbers of forces and means are required to conduct a war with submarines.

"...The technical capabilities of existing hydrophones and sonobuoys do not provide the necessary range of detection of underwater targets and they do not work reliably under all conditions."12/

- "The difficulty of combating submarines in our day is explained above all by the great speed of nuclear-powered submarines in a submerged state (30-35 knots) -- which are higher then the search speeds of the modern antisubmarine ships at which the effective employment of hydro-acoustic means of detection of submarines is still possible (20-25 knots).

  "In the opinion of foreign naval specialists, the most effective way of combating submarines is by inflicting powerful strikes (primarily nuclear ones) on the points of basing and of the construction and repair of submarines."13/

- "In the major foreign navies, antisubmarine missiles are considered to be one of the most effective and promising means of warfare with the fast modern submarines..../However/ the further increase in the effective range of the various types of antisubmarine weapons, especially of antisubmarine missiles, is limited by the limited capabilities of submarine detection gear. Therefore, it not a coincidence that increasing submarine detection ranges has been announced to be the top priority problem of the U.S. Navy."13/

- "Despite the enormous efforts being made for the development of antisubmarine weapons, including torpedoes, the latter, in the opinion of American specialists, do not satisfy the requirements placed on them. With the aim of speeding up work on the creation of new models of fast, long-range, and quiet antisubmarine torpedoes, a special program has been set up in the U.S. for...a small torpedo with a weight of less than 230 kg...and a large torpedo with a weight of up to 1800 kg...with jet propulsion and...speeds of 20-30 knots."13/

- "The great diving depth of modern submarines (350-400 meters) and submerged cruising range (about 100,000 miles and more) ensure the covertness of their actions and the capability for conducting combat operations in the course of a prolonged period far from their bases."13/

- "Another valuable characteristic of nuclear-powered submarines is their great covertness of operation....Moreover, nuclear-powered

submarines, possessing high speed, good maneuvering qualities, and the capability for operating at great depths, can penetrate antisubmarine barriers successfully."14/

- "The antisubmarine aircraft carriers /of the U.S./, which were converted from obsolete strike carriers, are primarily assigned for operations against diesel-powered submarines. It is considered that their light shipborne aircraft with their limited flight time and their helicopters correspond to this role. In combat with nuclear-powered submarines /however/, especially those armed with ship-to-ship missiles, this correlation /of forces between CVS and submarine capabilities/ is reversed -- the /surface/ ships themselves have been turned into targets. In view of these considerations, it is obvious that no increase in the number of these ships is planned for the future."15/

- "Submarines possess the greatest self-reliance, so additional forces do not have to be provided for their protection."16/

- "Comparatively recently there has been developed...antisubmarine ships of a new class /i.e., the Moskva Class "antisubmarine cruiser"/. They have good sea-keeping qualities and great cruising range and speed. They are equipped with homing torpedoes and depth charges. Their mission is to conduct search for the fast-moving nuclear-powered submarines at great distances from their bases."17/

- "The aviation of the /Soviet/ Navy is armed with missiles and antisubmarine aviation. It can fight the...missile submarines of an enemy successfully."18/

- "/Nuclear-powered/ submarines can be combatted successfully by antisubmarine submarines with missiles and torpedoes, by aircraft, and by surface ships with hydrofoils and armed with nuclear weapons and also by destroyers, fast torpedo boats, and helicopters. Nuclear submarines with Polaris missiles can be destroyed at their bases by strikes by the Strategic Missile Forces and Long-range Aviation, while crossing the seas, and in combat patrol areas by the operations of antisubmarine submarines, Long-

range Aviation, and by other antisubmarine forces and means."19/

- "One of the biggest problems of nuclear war is, as is known, the struggle against missile submarines. The most difficult task in this struggle is the search of the broad expanses of the seas and oceans for missile carrying submarines. This is made even more difficult by the fact that the capabilities of modern means of detection do not always permit one to discriminate nuclear-powered submarines from conventionally-powered ones or missile submarines from torpedo submarines. Therefore, the operations of the antisubmarine forces involve a struggle against all submarines."21/

- "Antisubmarine surface ships...are not capable now of carrying out a search for high-speed submarines which take advantage of the great depths /of submergence of modern submarines/... judging by the statements of the naval specialists of a number of countries, it is doubtful that surface ships will be able in the coming years to increase substantially their capabilities for effective search for enemy submarines operating at great depths."21/

- "The water thicknesses of several hundred meters serve as an effective obstacle to the detection by surface ship search of the physical fields created around submarines. If, in addition, they /U.S./NATO scientists/ succeed, as a result of the latest achievements in science and technology, in considerably decreasing the intensity of the various physical fields of submarines, then their detection by the search means of surface ships will become even more difficult."21/

1968 - "In the reports of the U.S. Secretary of Defense on the military budget from 1965 to 1969, it is shown that the efforts from the development of antisubmarine means are growing from year to year. This reflects the extreme difficulty of the antisubmarine mission....

"According to the experience in combat training of the antisubmarine forces of the navies of capitalist powers, the detection, tracking, and destruction of submarines by means of surface

ships, airplanes, and helicopters, given the radically increased combat capabilities of the submarines, present great difficulties."30/

- "Such joint actions have become necessary due to the fact that modern submarines, in comparison with the other antisubmarine forces, possess the greatest detection range for underwater targets. Foreign specialists are attempting to exploit this most important advantage of submarines in joint antisubmarine measures....The foreign press acknowledges that, despite the recognized advantages of close cooperation by the heterogeneous forces of antisubmarine warfare, the tactics of foreign navies for joint operations of submarines with other antisubmarine forces, those of the U.S. Navy in particular, have not been worked out adequately. Many unsolved problems are hampering this, above all the problem of communication with submerged submarines."30/

- "The experience of two world wars have shown that submarines are a formidable weapon in the struggle on the sea and oceanic lines of communications and that their role among the other branches of the naval forces is growing steadily. At the same time, they have proven to be a fairly effective means of conducting combat operations against submarines themselves.... Nuclear-powered submarines with torpedoes and missiles obviously will become the main antisubmarine force in the long-term.30/

- "The foreign press acknowledges that antisubmarine airplanes at the present time do not possess sufficiently effective means of search and detection of submerged submarines. For the time being, these means can only maintain a contact or regain a lost contact on a submarine which has been detected earlier by other means...".30/

- "The future of antisubmarine airplanes depends ...on the development of equipment capable of detecting submarines at great ranges."30/

- "In conclusion, it should be noted that, despite the great attention given to it by the American command, the problems of search, detection, and identification of submarine targets, without solution of which other achievements in the

field of antisubmarine defense lose meaning, still are considered to be especially difficult."33/

- "A competition to enable submarines to operate at ever increasing depths has been going on. Great submergence depths enhances the tactical-technical characteristics of submarines: their covertness of operation, maneuverability, blast resistance, and their capability for avoiding antisubmarine weapons. Now at a time when nuclear-powered submarines possess the highest combat importance, the competition to achieve the greater submergence depth is not abating but excerbating."34/

- "It is precisely the application of nuclear propulsion to submarines that has given them such qualities as speed, endurance, and covertness, that they are superior to even the most modern surface combatant ships...".35/

1969 - "The advent of nuclear-powered submarines unquestionably decreased the capabilities of aviation in combat with /these/ real undersea boats which are capable of cruising at great speeds and great depths.37/

- "This problem of combat with submarines is far from being solved in that the partial loss of covertness by a submarine during their employment of their /strategic missile/ weapons from a shallow depth is compensated for by the considerable range of the missiles, which permits the selection of a missile-launching position in remote sea and oceanic regions. /To counter this/, great efforts would be required by the forces of antisubmarine aviation."37/

- "In present conditions, antisubmarine aviation is virtually incapable of detecting submarines...at depths exceeding 70 meters."37/

- "The high mobility of /nuclear-powered/ submarine forces, their enormous radius of action, their capability to carry out missions with a small number of submarines, their low vulnerability and great endurance, and also the long-range and destructiveness of modern weapons warrant the assertion that there is no place on earth beyond the range of naval weapons."38/

- "Warfare against nuclear-powered submarines in general and with missile submarines in particular is the most difficult and labor-intensive mission. This is the result of their high submerged maneuvering and combat capabilities. If account is taken of the colossal expanses and depths of oceanic theaters of military action and also of the /comparatively small/ capabilities of contemporary antisubmarine forces and means, then the difficulties inherent in this warfare become fully understandable."38/

- "In conclusion, we note that, by the general admission of American specialists, they are far from a solution to the antisubmarine defense problem. It is considered the most difficult problem with which the U.S. Naval Command is confronted at present."40/

1970 - "Nuclear-power plants make the search for submarines extraordinarily complicated....It is not by coincidence that the American naval specialist Kurso /phonetic spelling/ notes with special concern that the number one problem of antisubmarine warfare is that of the detection of a submarine which is in a submerged condition...

"The World Ocean, which includes in itself the Pacific, Indian, Atlantic, and Arctic Oceans, has a surface of more than 360 million square kilometers, that is, more than 70% of the area of the Earth, contains more than one billion square kilometers of water, and has a maximum depth of 11 kilometers. All of this creates favorable conditions for the covert operations of submarines and presents serious impediments for employment of detection means. The American specialists believe that finding a submarine submerged in such oceanic jungles is more difficult than finding a needle in a haystack....

"At present, foreign specialists believe, there exists an obvious disparity between the considerably increased combat capabilities of nuclear-powered submarines and the lag in the development of the means of struggle with them....

"The search and detection of /nuclear-powered missile/ submarines is considered especially

difficult since they can be positioned submerged in practically any point in the expanses of the World Ocean that is within the range of their ballistic missiles."45/

"Since up to now no principle has been found on the basis of which could be developed a universal means for providing fast and reliable detection of nuclear-powered submarines which are located at any point in the World Ocean, the efforts of foreign specialists consequently have been directed toward the working out and development of means for the search and detection of submarines each of which works on a physical principle of limited application...

- "Investigations on the research and development of non-acoustic means of detection of submarines are included in the so-called project ANSOUND. It consists of a series of special investigations, including the study of 'windows in the ocean' for electromagnetic waves, the study of the laws of the movement of ionized particles in the water medium, the determining of the potential for the guiding of torpedoes to a submarine by its wake, the investigation of magnetic and gravitational anomalies brought about by the presence of masses of metal in the water medium, and others. Important significance is attached to the utilization of the 'window in the ocean' which permits infrared beams and electromagnetic waves to disseminate in water to great distances and depths."45/

- "The capabilities of submarines for the detection of surface ships and submarines at sea have increased considerably. According to press information, the nuclear-powered American submarines of the Permit Class are capable of patrolling a 60-mile stretch of an antisubmarine barrier and fully insuring the detection of a target traversing that stretch."46/

- "Nuclear-powered plants insures to the submarine, besides great speed, also great covertness of operation...missile submarines can approach near to their objectives covertly."47/

- "Such warships /Soviet missile submarines/, while remaining in submerged condition thousands of kilometers from their targets and being virtually invulnerable, can deliver devastating nuclear-missile strikes on enemy objectives."49/

- "...Nuclear-powered missile submarines are considered to most fully satisfy the requirement for invulnerability, possessing covertness of operation and staying power in the missile-launch regions."50/

- "It is generally appreciated that success in antisubmarine warfare depends first of all on solving the problem of their detection, identification, and unbroken protracted tracking. Accordingly, in the NATO countries, wide study is being made of the various physical fields which unmask a submarine, such as heat, electromagnetic, hydrodynamic turbulence, radioactivity, and others. The development and improvement of the means of detection based on the exploitation of these fields would permit, in the opinion of foreign specialists, a substantial increase in the capabilities of antisubmarine forces and reduce to a minimum the primary advantage of submarines -- their covertness."52/

- "Nuclear-powered submarines have a submerged speed up to 30 knots and the capability to cruise submerged for two months without surfacing. This affords them great covertness...".53/

1966-1971, 1 (b) - IS THE U.S NAVY SEEN AS ASSIGNED A PRIORITY MISSION FOR ANTI-SSBN ASW?

1966 - "In antisubmarine combat, the U.S. Naval Command distinguishes three basic types of combat actions: the inflicting of nuclear strikes on naval bases, shipbuilding and repair yards of enemy submarines, the establishment of antisubmarine barriers in the straits and narrows on the routes of transit of submarines from basing points to the regions of combat action, and the search and destruction of submarines on the sea lines of communications in the open oceans and ~~in the regions of potential location of missile-launching positions. In this regard, it is~~ considered that the first two types of action do not exclude the possibility of the breakthrough /of straits and narrows/ into the ocean by a considerable number of enemy submarines.... For the carrying out of these missions /i.e., including anti-SSBN ASW/ the extensive employment of aircraft carrier hunter-killer groups is planned."11/

1967 - "Aircraft-carrier hunter-killer groups are assigned for insuring the antisubmarine defense of strike-carrier forces and convoys."13/

- "For combat with enemy submarines on the antisubmarine barriers and at the exits from their bases, extensive employment of antisubmarine submarines of the Thresher Class is planned."13/

- "The command of the armed forces of the...NATO Bloc assigns the...following basic missions: the inflicting of massive nuclear strikes on the most important coastal and deep objectives of the enemy, including on his industrial and administrative centers and naval bases, by means of the missile weapons of the submarine forces and by carrier-based and shore-based aviation; the insuring of the protection of their own sea and oceanic lines of communication; the defense of the shore from the strikes by missile submarines of the enemy; and cooperation with the Ground Forces....

"Great attention is being paid...to the employment of mobile naval forces for strengthening... the antisubmarine barriers. Accordingly, the use is planned of frigates, destroyers, and

escort ships armed with guided missiles. In addition, it is planned to employ shore-based antisubmarine airplanes (of the NEPTUNE, ORION, and other types). In special circumstances, it is planned to employ aircraft-carrier strike groups or aircraft-carrier hunter-killer groups.

"The American-British Command is also giving great attention to combatting enemy submarines in the open ocean. Special antisubmarine defense forces are being established for this purpose and a system is being developed for the antisubmarine defense at sea of naval forces and convoys. The basis of these forces consists of aircraft-carrier hunter-killer groups...along with torpedo-attack submarines and shore-based airplanes. These forces are assigned for insuring the antisubmarine defense of aircraft-carrier strike forces and large convoys and also for mobile antisubmarine barriers, both on the routes of deployment of submarines to their combat patrol stations and on the approaches to the U.S. coasts."13/

- "Very serious attention is being paid by foreign navies to the construction of screening ships (frigates, destroyers, and /destroyer-/ escorts) for protecting naval strike forces -- nuclear-powered missile submarines and aircraft carrier strike forces -- and also for the protection of antisubmarine and amphibious forces and for the protection of the sea lines of communications.

  "In connection with the appearance of new types of weapons, with the changing conditions for the conduct of naval operations, and with the arming of cruisers with anti-air guided missiles, the scope of the missions assigned to these ships changed....Under the new conditions, cruisers were explicitly reassigned as screening ships with the main mission of providing antisubmarine defense of various formations of ships and, above all, of the aircraft carrier strike forces and strike groups. In the views of foreign specialists, cruisers could be assigned to the protection of major convoys, to amphibious landing operations, and to counter-amphibious operations. Cruisers, as a rule, have rather powerful antisubmarine armaments which are intended mainly for self-protection.

"Helicopter cruisers are multipurpose ships that are assigned a role in antisubmarine and amphibious landing operations.

"Frigates, under contemporary conditions, protect the combat operations of naval strike forces, primarily of aircraft carriers, submarines, and of antisubmarine and amphibious forces. In the views of Western specialists, frigates can be used for the anti-air and antisubmarine defense of ship formations, most importantly aircraft carrier task forces and antisubmarine aircraft-carrier hunter-killer groups, and also fast convoys. Moreover, frigates can protect the deployment of their own submarines, take part in operations for the search and destruction of submarines in the regions of their deployment and likely combat stations, and be added to amphibious groups to provide fire to support for landings.

"Destrovers at present are assigned in the major navies to the protection of the combat operations of the aircraft-carrier and amphibious forces and also to the anti-air and antisubmarine defense of convoys.

"At the present time, /destroyer-/ escorts are assigned mainly to providing antisubmarine defense for warships and merchant ships....It is considered that they can /also/ be employed for...aircraft-carrier antisubmarine hunter-killer groups...and for protection of amphibious operations."13/

1968 - "According to the views of the navies of the U.S. and Great Britain, naval forces are assigned to carry out the following basic missions:
- participation in the nuclear offensive of a general nuclear war by employing the nuclear-powered missile submarines and aviation of the navies for the delivery of nuclear strikes on the most important objectives on the territory of the enemy;
- destruction of the /naval/ opponent at sea and at base;
- insuring the transport of troops to the theaters of military action and the putting ashore of amphibious landings and cooperation with the Ground Forces ashore;

- defense of the oceanic and sea lines of communication; and
- defense of the coasts, of the territory of the country, and key islands against seaborne strikes.

"According to the views of the naval commands of the U.S. and Great Britain, antisubmarine warfare in a future war will be a complex of operations and /routine daily/ combat activities directed at the destruction of the submarines of an opponent in the regions of their bases, on the deployment routes from their basing regions to the areas of combat patrolling. In this connection, very special attention is paid to nuclear-missile strikes on submarine bases right at the outset of the war in order to prevent the submarines from deploying to their combat patrol areas ...

"The Antisubmarine Forces of the /U.S./ Atlantic Fleet are the highest operational organization of the U.S. Navy in the zone of the Atlantic Ocean. The basic combat missions of the Antisubmarine Forces are combat with submarines in the Atlantic and defense of the oceanic and sea lines of communication. In the composition of the Antisubmarine Forces are several antisubmarine task forces including aircraft-carrier antisubmarine task forces, antisubmarine submarine forces, and shore-based antisubmarine aviation. The antisubmarine task forces conduct antisubmarine warfare on the approaches to the U.S. East Coast and on the antisubmarine barriers in the central and northern parts of the Atlantic."24/

- "Aircraft-carrier antisubmarine /task/ groups... normally are assigned for the antisubmarine defense of carrier strike forces, for the antisubmarine screening of amphibious-landing forces and of other forces during sea transit, and also for the antisubmarine screening of convoys and for the search and destruction of submarines in assigned maritime regions."24/

- "Annually the U.S. Navy conducts a large number of antisubmarine exercises. Multi-purpose and missile submarines are employed extensively in these exercises. The missile submarines are designated as 'the enemy'."27/

- "Surface ships...according to the views of the American command, are the basic force of the U.S. Navy for the antisubmarine defense of the sea lines of communication and for the antisubmarine defense of fast strikes forces."30/

- "Until the mid-'50s, the U.S. and /other/ NATO navies were charged with completely preventing the egress of enemy submarines into the oceans by destroying them in their bases and at the outset of their deployment. Such a requirement was realized in subsequent years to be infeasible of accomplishment. Without completely giving up the destruction of submarines at their bases, the military leadership of NATO /now/ holds that /the more feasible tactic is/ to strongly oppose submarines along the route of their transit to combat patrol areas... Such opposition should be provided, in the first place, by submarines stationed in direct proximity to the enemy's coasts... Therefore, the militarist circles of the West plan to use part of their submarines in a future "big" war close to the bases of enemy submarines where other antisubmarine forces (surface ships and aviation) could be detected and attacked by the enemy."30/

- "In the foreign press it has been reported that the growing combat capabilities of nuclear-powered submarines for the carrying out of antisubmarine missions permit them to be employed not only by the positional method but also ... for the antisubmarine defense of mobile forces of large warships and merchant ships. However, along with this, the foreign press observes that, although this idea is intrinsically attractive, the contemporary level of the development of communications equipment...are such that the employment of nuclear-powered submarines in this way at this time is of low possibility.

  "One of the possible alternatives for the combat employment of nuclear-powered submarines is held to be that for the preliminary surveillance of the regions of deployment of attack carrier forces with the aim of forestalling possible attacks by the submarines of an opponent.

  "One should not fail to note that some of the authoritative individuals in the West do not

share the view of the proponents of excessive praise of submarines who assert that submarines are the most effective type of force for anti-submarine warfare and justify this by asserting that during an armed engagement the submarines are operating in one and the same medium and that /consequently/ the chances of success are equal /for the two sides/.

"Thus, for example, the command of the Canadian Navy has come out against the use of submarines for the purpose of antisubmarine combat barring dire necessity because it is considered an unwarranted expenditure of forces. It believes that...the losses of its own submarines would be equal to the number of enemy submarines destroyed. Based on the experience of NATO antisubmarine exercises... the command of the Canadian Navy came to the conclusion that the antisubmarine forces should consist of surface ships, long-range patrol airplanes, fast jet airplanes, and helicopters.

"However, such views on the composition of antisubmarine forces are not dominant and do not reflect the point of view of the political leadership and naval command of the main capitalist states; the contemporary trend to the construction of multipurpose submarines by the main capitalist states and the direction of combat training attest to the fact that these submarines are assigned mainly to antisubmarine warfare....Thus, in the foreign press it is reported that the submarines (including nuclear-powered) of the U.S. First Fleet in the Pacific spend seventy percent of their time underway on antisubmarine tasks. Moreover, they participate yearly in four fleet exercises and in nine amphibious exercises in which they are also engaged to some degree on antisubmarine tasks."30/

- "...the military leaders of the U.S. consider the Navy as the basis of their striking power, one of the most important means for a nuclear-missile offensive against the socialist countries.

"They openly assert that the basic assignment of the navies of the U.S. and NATO is comprised of the delivery of nuclear strikes from the sea on the most important objectives in the territory of the socialist countries.

"A special interdepartmental 'Poseidon Commission' of the U.S., charged with defining the roles and missions of the U.S Navy at the contemporary stage, noted in their conclusions that now 'the former missions and role of the Fleets is becoming to a marked degree obsolescent. The mission for protection of oceanic communications is yielding to the mission of projecting sea power against objectives on land'."35/

1969 - "Under contemporary conditions, antisubmarine aviation is incapable in practice of detecting a submarine...at a depth exceeding seventy meters. Sonobuoys facilitate the conduct of /ASW/ search by airplanes. However, in matter of fact this equipment is of help only in localizing a contact. Yet, the effectiveness of antisubmarine airplanes increases if they know, even if only roughly, the location of the submarines of an opponent."37/

- "...in the Atlantic, in the region between Greenland, Iceland, England, and the coast of Norway, shore-based /U.S./ airplanes patrol systematically, even in peacetime."40/

- "In the Atlantic in time of war, the U.S. Naval Command plans to conduct mainly active /tactically offensive/ antisubmarine operations in the waters of the opponent and active and defensive operations on sea and oceanic lines of communication and the regions adjoining them to insure the stability of maritime communications. The /total/ disruption or substantial weakening of the strikes by missile submarines on the territory of the U.S is considered to be the main mission of the antisubmarine forces. Convinced that the insuring of antisubmarine defense cannot be fully effective by inflicting strikes on submarines in port and at the exits from their bases, the Americans have begun to establish antisubmarine zones, which are saturated with /ASW/ forces and means, on the probable routes of movement /of Soviet SSBNs/ and off their own coasts as well."40/

- "...American nuclear-powered submarines are assigned the following missions for the initial period of a nuclear war:
  - strike at the territory of the USSR with POLARIS missiles;

- blockade the /necessary/ straits and narrows so as not to permit the Soviet Navy to break out into the Atlantic and Pacific...".41/

- "The antisubmarine aircraft carriers entered the composition of the screening forces....The antisubmarine aircraft carriers have become an integral part of the screening forces of the strike carriers."58/

- "Destroyers (of the Gearing Class, of the Allen M. Summer Class, and others), SAM destroyers (of the Charles Adams Class), frigates, and SAM frigates entered the composition of the screening forces /for CVAs, convoys, and amphibious landing forces/."58/

- ...the Americans have uninterruptedly strengthened their antisubmarine defense in the postwar period. They have constructed numerous antisubmarine ships for the defense of aircraft carrier strike forces, and also antisubmarine forces for the defense of their territory from possible strikes by the missile submarines of the Soviet Navy...

  "The basic direction of the development of naval art in the capitalist countries in the postwar period has been:
  - the working out and modernizing of the methods for employment of missile submarines assigned to the destruction of ground objectives and also the methods for warfare against missile submarines;
  - the development of systems of combat with submarines, first of all measures for the /total/ disruption or weakening of nuclear strikes of an opponent from underwater on objectives located on their territory...".58/

1970 - "Lockheed P-3A ORION. This shore-based patrol airplane is assigned to carry out the following basic missions:

1. Patrolling of the coastal zones of the ocean for detecting the approach of amphibious-landing forces, formations of surface ships, and submarines.

2. Patrolling in oceanic regions distant from the base (airfield) during the escorting of

naval strike forces and merchant ships, and also during the conduct of general searches for submarines.

3. Minelaying and patrolling on an antisubmarine barrier or other line of surveillance (blockade, screen) for the detection, identification and attack of penetrating submarines, surface combatants or the merchant ships of an opponent."45/

- "At the present time, the mobile forces of the U.S. that are assigned for operations on the antisubmarine barriers in the Atlantic are comprised of three task forces: the 81st, 82nd and the 83rd. Task Force 81 must conduct antisubmarine warfare mainly on the near approaches to the Atlantic coast of the U.S. Since 1958, the aircraft-carrier hunter-killer groups ALPHA, BRAVO, and CHARLIE have been included in this task force.

  "Task Force 80 covers the distinct approaches to the Atlantic coast of the U.S. from the submarines of the enemy.

  "Task Force 82 comprises the barrier forces assigned for combat with the submarines of the enemy on the main antisubmarine barriers of the Atlantic Ocean: Greenland, Iceland, Faeroe Islands, Shetland Islands, southern end of Norway...".45/

  - "Judging from the material in the foreign press, the naval commands of the countries of the imperialist camp plan to employ submarines, nuclear-powered ones primarily, for carrying out the following basic missions:
    - the delivery of nuclear-missile strikes on important objectives in the territory of the opponent and on his warships and bases;
    - the destruction at sea by means of missiles and torpedoes of /the opponent's/ submarines, surface combatant ships, and merchant ships.

  "In their views on the employment of naval forces, the U.S. and Great Britain proceed /from the assumption/ that the main opposition to them at sea will come from Soviet submarines and naval missile aviation. So, they are giving

great attention to the development of antisubmarine forces and means.

"In the view of their specialists, it is essential to conduct antisubmarine warfare not only for the defense of ground objectives but also for insuring the successful operation of their attack aircraft carriers and amphibious forces, and of /oceanic/ transits of convoys.... according to the views of U.S. specialists, the most important mission of torpedo submarines is considered to be combat with the missile submarines of an opponent. The basic conflict will develop, in their views, on the approaches to bases, in the regions of combat patrolling, and on the so-called antisubmarine barriers established on the probable routes of transit of submarines, and in navigational narrows."47/

- "The shore-based patrol airplanes /of the U.S. Navy/ are assigned for the search and destruction of submarines at sea and in the approaches to the /American/ coast."53/

- "Antisubmarine aircraft-carrier search-strike groups are normally assigned for the antisubmarine defense of aircraft carrier strike forces, for the antisubmarine screening of amphibious detachments and other combatant-ship forces, for the screening of troop transports during sea transits, and also for the antisubmarine screening of convoys, and for the search and destruction of submarines in assigned regions."53/

1966-1971,2 (a) - GENERAL SOVIET APPRAISALS OF U.S. ASW

1966 - "In recent years special attention is being given to the problem of antisubmarine combat, /the U.S./ regarding it as one of the very important links of the offensive American strategy....A comparison of the shipbuilding programs for recent years attests to the fact that even greater attention in the U.S. is being paid to increasing the number of antisubmarine ships (both submarines and surface ships).... Along with increasing the scale of construction of antisubmarine submarines, the /U.S./ command is striving to increase considerably in a short time the number of surface antisubmarine ships ....Such is some information on the measures of the American command for the development of antisubmarine forces and means. The data given speaks of the large scale and comprehensiveness of these measures but it would be a mistake to overestimate the actual state of the means of antisubmarine combat in the U.S. Navy. It is highly symptomatic that, in recent times, the American press, along with its clearly biased evaluation of the capabilities and combat effectiveness of their antisubmarine system, has been forced to acknowledge the difficulties and serious shortcoming in its development.

"Despite the considerable outlay of material means and effort, the U.S. Navy does not have effective antisubmarine defense means at its disposal."8/

- "...the American military leadership considers combat with modern submarines at the present time as a problem of top priority importance, the resolving of which demands considerable material expenditures, huge efforts, and the careful organization of the naval forces included in this effort."11/

1968 - "In the navies of the U.S., Great Britain and the other NATO countries great attention has been paid in recent years to the development of the forces and means for combat with the submarines of an opponent. Antisubmarine ships and aircraft are being built and research and development work is being intensively conducted. Special, large operating formations of antisubmarine forces have been established by the

U.S. naval forces in the Atlantic and Pacific theaters...The American command considers combat with submarines in a future war to be the most important part of combat at sea."24/

- "In their military-strategic plans, the commands of the U.S. and NATO attach the most importance to a build-up of the forces and means for combat with modern submarines and the organization of the antisubmarine struggle as a whole.

  "For the U.S. Navy, in the opinion of foreign specialists, finding reliable methods for the destruction of submarines is problem number one and antisubmarine defense is viewed as one of the most important directions of the activities of the U.S. Navy for the immediate future.

  "In this connection, a number of large-scale measures are being carried out by the U.S. Navy. These measures include: the improvement of the organization of the antisubmarine struggle; the equipping of sea and oceanic theaters for antisubmarine warfare; the seeking out of improved means for the search, classification, and identification of submarines; the development of new antisubmarine weapons; the conduct of work for the modernization of existing, and the development of new, antisubmarine weapons platforms; acceleration of the combat training of the ASW forces, the seeking out of new tactical methods for the employment of antisubmarine forces and means; and others.30/

- "In the overall organization of antisubmarine warfare, the naval leadership of the U.S. accords the most importance to...the centralization...of all activities for antisubmarine defense. To this end, two important new central organs have been created in the U.S. Navy...To the Directorate for Antisubmarine Warfare Programs are assigned the tasks of studying the submarine forces of the enemy and the development of methods for the combat employment of the antisubmarine forces and means. The Directorate for Antisubmarine Systems Development is charged with antisubmarine weapons development and also with the basic research and development work for new means for antisubmarine warfare."30/

- Improvement of the antisubmarine forces and means of the U.S. Navy is taking the following lines:

  - Reequipping shore-based patrol aviation with ORION airplanes having better flight characteristics and improved systems for the detection and destruction of submarines relative to earlier modifications of this aircraft;
  - Equipping shipboard antisubmarine aviation with new airplanes of the VSX type, the development of which is already proceeding;
  - Construction of new nuclear-powered antisubmarine weapons systems and low-frequency sonar...;
  - Establishing stationary hydrophone systems in inshore and in forward oceanic regions for the detection of submarines;
  - Improving acoustic and non-acoustic sensors for aviation and for stationary means to increase the effective detection range...; and
  - Development of special radar stations for detecting submarine periscopes."33/

- "Such are some of the basic directions in the development of the antisubmarine capabilities of foreign ships. The striving to employ the latest advances of scientific-technological progress shows what huge efforts the imperialists make for the maintenance and development of antisubmarine forces and means."32/

- "Extremely great attention is being paid in the U.S. to the development of antisubmarine forces and means and to the working out of methods for their employment."33/

1969 - "The American command is paying great attention to developing the forces and means for combat with submarines...".37/

- "In the West, they fully appreciate how devastating the answering strike in reply /to SSBN strikes/ will be so they are adopting energetic measures to counter the submarine threat."39/

- "The U.S. naval command considers the resolution of the problem of the struggle with submarines to be one of the main conditions for gaining command of the sea. The /U.S./ naval forces

would not be able, in the view of the majority of specialists, to carry out the offensive missions which they are assigned without having resolved this problem. It is precisely this that explains the special attention which is being paid to the development of the organization and employment of the antisubmarine forces."40/

1970 - "Great attention has been given to the development of the forces and means of antisubmarine struggle in the overall system of aggressive military measures of the imperialist states, in particular to the crash development of antisubmarine aviation...

- "The leadership of the Armed Forces of the U.S. views the struggle with the submarines of an opponent as a national problem and one of the most important strategic missions of the U.S. Navy in a future war against the USSR....

"The practice by the navies of the U.S., Great Britain, Canada and the combined forces of NATO of conducting numerous ASW exercises confirms that the organization and direction of the cooperation of heterogeneous forces for antisubmarine warfare constitute the basic content and goal of all exercises...".45/

- "In the U.S., a special program of oceanographic and hydrographic research of the World Ocean has been worked out and is being carried out in the present decade (1961-1970) under the name of 'Tenock". The main goal of the program is to seek out ways to resolve the problem of the development of equipments for the effective search and detection of nuclear-powered submarines. The basic questions subject to investigation under this program are: the dissemination in sea water of light, sound and radio waves....The 'Tenock" program provides for the installation of powerful automatic anchored and drifting buoys, the widening of the scale of the utilization of aviation and artificial Earth satellites for the investigation of communications between the atmosphere and the sea and, finally, the utilization of submarines capable of breaking through the Artic ice."45/

- "It is considered in the capitalist countries that the first priority for destruction as sea in a nuclear-missile war would become nuclear-powered missile submarines, the platforms for the main striking power of modern navies. It is precisely for this reason that great attention is being given at this time by all the navies of the world to the construction of antisubmarine forces.52/

1966-1971, 2 (b) - U.S. BUDGET ALLOCATIONS TO ASW

1966 - "The /U.S./ allocations for antisubmarine forces and means...grow from year to year. Thus, while they amounted to 1.253 billion dollars in fiscal year 1960/1961, by 1965/1966 they had increased to 3.5 billion."8/

1967 - "About 50% of all allocations for the U.S. Navy has been earmarked in recent years for ships with antisubmarine defense as their primary role. It is reported, too, that by 1970, about 50% of the U.S. Navy will consist of antisubmarine forces."13/

1968 - "...of the allocations earmarked for the /U.S./ Navy, one-third are devoted to the development and construction of antisubmarine forces and means."30/

1969 - "In recent years, it should be noted, about three billion dollars are spent yearly, just in the budget of the /U.S./ Navy, for antisubmarine forces and means."36/

1966-1971, 2 (c) - U.S. ASW FORCE LEVELS AND FORWARD DEPLOYMENT/READINESS

1966 - "...the American naval command considers antisubmarine submarines to be the most effective antisubmarine forces. According to data in the American press, by September 1966, the U.S. Navy had 22 nuclear-powered antisubmarine submarines (four non-series, six of the Skipjack Class, four of the Skate Class, and eight of the Thresher Class)."8/

1967 - "In contemporary conditions, assert the specialists of many countries, a large complement of antisubmarine forces and means are required for antisubmarine warfare. A part of these can /i.e., should/ be deployed ahead of time in the regions of potential operation of enemy submarines in order to carry out their timely detection, tracking, and destruction at the outset of a war."12/

- "For operations against nuclear-powered submarines, one cannot count on success employing only a single type of force, such as just antisubmarine submarines, or just aviation, or just surface ships. In the opinion of the specialists of many countries, it is essential now to employ all of the antisubmarine forces and means in close cooperation...".12/

1968 - "There are eight antisubmarine aircraft carriers in the complement of the U.S. Navy....On each such ship there are based...20 antisubmarine airplanes and 16 antisubmarine helicopters...". 24/

- "The admirals of the U.S. and /other/ NATO navies believe that antisubmarine warfare must be conducted with those forces which the commands would have at their disposal at the beginning of a war. Accordingly, great attention is being paid by the U.S. while still at peace to the development of special antisubmarine forces."30/

- "The Antisubmarine Forces formed in the Atlantic and Pacific Fleets of the U.S. are equivalent to operational fleets."30/

- "An important role in the overall system for opposing enemy submarines on the antisubmarine barriers is assigned to the antisubmarine aircraft-carrier hunter-killer group (APUG), which is a well-developed form of organization for heterogeneous antisubmarine forces... According to reports in the foreign press, an APUG usually has one antisubmarine aircraft carrier and up to nine destroyers and escort ships in its composition. At the present time, torpedo submarines, including nuclear-powered ones, have begun to be included in the aircraft-carrier hunter-killer groups of the U.S. Navy....Group ALPHA, in particular, is intensively engaged in developing the forms and methods for tactical cooperation of the heterogeneous antisubmarine forces with submarines. The main goal of these efforts is to exploit the advantages of submarines...to increase the overall effectiveness of the whole antisubmarine aircraft-carrier hunter-killer group."30/

- "The basic antisubmarine barriers have been established already organizationally speaking and are in operation with a limited composition of antisubmarine forces. These, however, can be built up quickly in accordance with the situation....The forces of the antisubmarine zones (barriers) include a substantial number of submarines in addition to the surface-ship forces (frigates, destroyers, and destroyer escorts), the shore-based patrol airplanes (of the ORION, NEPTUNE, and other types, and the special aircraft-carrier hunter-killer groups ....According to the views of foreign specialists, antisubmarine operations are characteristically a war of attrition the outcome of which is determined by the sum total of a whole series of limited-scale combat encounters in which the role of antisubmarine barriers will be quite significant."30/

- "In mid-'68...the U.S. had 39 multipurpose submarines...which are mainly assigned for antisubmarine warfare."34/

1969 - "Already in the ranks of the U.S. Navy are 36 nuclear-powered torpedo submarines: five nonseries, four of the Skate Class, five of the Scorpion Class (the Thresher and Scorpion perished), 13 of the Permit Class, and nine of the

Sturgeon Class. The non-series submarines and the Skate Class are considered obsolescent and can carry out only limited missions. The imminent transfer of Triton to the reserves has been announced."36/

- "The antisubmarine warfare forces of these /U.S. Atlantic and Pacific/ fleets include...four aircraft-carrier hunter-killer groups (with each comprised of one antisubmarine aircraft carrier with airplanes and helicopters of antisubmarine defense and six-eight destroyers) and 15 squadrons of shore-based patrol airplanes. The basis of the submarine antisubmarine forces consists at the moment of diesel-powered torpedo submarines (about 80 units) but more than 30 nuclear-powered submarines are included /already/."40/

- "In the Atlantic, even in peacetime, /NATO/ airplanes patrol systematically in the region between Greenland, Iceland, England, and the coast of Norway....In the Pacific, comparable patrolling by the shore-based air of the antisubmarine defense is established in the region from Kamchatka to the Philippine Islands."40/

1970 - "At the end of the 1965/66 fiscal year there were nine antisubmarine aircraft carriers in the ranks of the U.S. Navy. In 1966 their number was reduced to eight (four each in the Atlantic and Pacific Oceans). This number of antisubmarine aircraft carriers was cut back in the 1968/69 fiscal year as well."45/

- "In ordinary conditions, the air group of an antisubmarine aircraft carrier includes...two squadrons of deck-based antisubmarine Grumman S-2D TRACKER airplanes with ten per squadron; one squadron of 14-16 Sikorsky SH-3A or SH-3D SEA KING antisubmarine helicopters; and a detachment of four radar picket airplanes of the E-1B TRACER type."45/

"For insuring the combat readiness of the antisubmarine airplanes of shore-based aviation in the Atlantic, airfields have been developed and are already being used in Norway...Iceland... Scotland...Newfoundland, Azores, and Spain. In the press it has been reported that Norwegian, American and British antisubmarine airplanes are stationed continuously at these bases...During

exercises of the combined naval forces of NATO and in periods of international crises, the number of American antisubmarine airplanes at the airfields of Iceland and Norway usually increase..."45/

- "The basic force of shore-based patrol (antisubmarine) aviation is the wing. In the ranks of the wing are included several patrol squadrons, each having 10-12 patrol airplanes.

  "Lockheed P-3A 'ORION' and Lockheed P-2 'NEPTUNE' airplanes are included in the arsenals of the 27 patrol (antisubmarine) squadrons...".45/

- "In the order-of-battle of the U.S. Navy there are already now /in early 1970/...44 nuclear-powered torpedo submarines of multipurpose designation."47/

- "There are now...five antisubmarine aircraft carriers...in the U.S. Navy."51/

- "Aboard each antisubmarine aircraft carrier are based an antisubmarine air group numbering about 50 airplanes and helicopters, including 20 antisubmarine airplanes, 16 antisubmarine helicopters...".53/

- The Armed Forces of Capitalist States, a reference book edited by Major-General P.I. Sergeyev that appeared on 27 October 1970, listed the following forces which presumably would have ASW as one of their primary assignments:

  4 - Antisubmarine aircraft carriers
  46 - nuclear-powered torpedo submarines
  No frigates (not counting 28 SAM frigates)
  140 - Destroyers (not counting 28 SAM DDs)
  42 - Destroyer escorts (not counting 6 SAM DEs).53/

- The Officers' Handbook, which was compiled by Reserve Major-General S.N. Kozlov and appeared on 27 November 1970, listed nine CVSs, five in the Atlantic Fleet and four in the Pacific, with only one of the nine forward deployed (to the 7th Fleet in the Western Pacific).55/

1971 - The Handbook of Foreign Navies listed nine CVSs in the order-of-battle of the U.S. Navy in early 1971. Four of the nine were reported to have undergone FRAM-II modernization.57/

1966-1971, 2 (d) - MISSION-COMPLETION CAPABILITIES OF SOVIET SSBNs

1967 - "Nuclear-powered submarines, which possess high cruising speed, good maneuvering qualities, and the capability of operating at great depths, can successfully penetrate antisubmarine screens. "14/

- /Nuclear-powered Soviet/ submarines are capable of remaining in any area of the World Ocean for an extended time and of delivering powerful strikes on land objectives while submerged....

  "The striking power and cruising range and endurance /of nuclear-powered submarines/ have increased, their speed has grown...which enables them to remain for prolonged periods in those regions of the oceans where it is required to protect the state interests of the Soviet Union...".18/

- "The most important characteristics which a submarine must have are great endurance, high speed, the capability to fire missiles while submerged, a reasonably large supply of missiles and torpedoes, a high capability for self-concealment and particularly great depth and rapidity of submergence, and the capability to remain submerged for extended periods of time. These characteristics enable the /Soviet/ Submarine Force to make nuclear-missile strikes against shore objectives...".19/

1968 - "Great attention is being paid at present to working out joint operations of submarines and antisubmarine aviation for opposing the submarine forces of the 'enemy'. In particular, the /1967/ summer exercise of the combined navies of NATO, QUICK PURSUIT, which was conducted in the region between Norway and Iceland to the north of the Faeroe Islands, was dedicated to this end. Submarines and patrol airplanes of the navies of the U.S., Great Britain, France, Canada, Norway, and The Netherlands participated in the exercise. The organization of cooperation /between VP and SSNs/ was the most important stage of Exercise QUICK PURSUIT ...In the course of such /antisubmarine/ exercises, submarines equipped with the AN/BQQ-2 sonar gear reportedly detected the submarine

'enemy' with sufficient reliability throughout a 60-mile search zone of the antisubmarine barrier."30/

- "A particularly valuable quality of nuclear-powered submarines is their great mobility -- which enables them to rapidly carry out covert transits to the combat patrol areas and remain in these areas for the great part of their time at sea....Taking advantage of their high qualities, nuclear-powered submarines can penetrate successfully into regions defended strongly by an enemy, can successfully force straits and narrows, and penetrate enemy antisubmarine barriers."35/

1969 - "Submarines possess the greatest self-reliance, so additional forces do not have to be provided for their protection."42/

1970 - "In the opinion of foreign specialists, the... qualities of nuclear-powered submarines have radically increased their capabilities for operating covertly and substantially facilitate their escaping detection and destruction by aviation means."45/

- "Many military specialists consider that even under conditions of strong antisubmarine defense, the reconnaissance activities of submarines along the shore /of the opponent/ would be sufficiently effective. They consider it expedient to use antisubmarine submarines first of all for reconnaissance of an opponent's submarine bases, that is, in the regions dangerous for operations by surface ships and aviation."46/

- "...missile submarines are difficult to detect while in the ocean.../they/ can approach near to their objective covertly."47/

- "Nuclear-powered Soviet submarines have frequently been in the central part of the Artic Basin. But even earlier our diesel submarines made under-ice cruises. During the Great Patriotic War, they approached close to the combatant ships of the enemy while under the ice cover and sank them."47/

- "Our cruiser submarines are capable of carrying out long cruises of many months' duration and in submerged condition without /ever/ surfacing. While remaining in submerged condition thousands of kilometers from their targets and being virtually invulnerable, such warships can deliver devastating nuclear-missile strikes on enemy objectives."49/

- "...nuclear-powered missile submarines are considered to most fully satisfy the requirement for invulnerability, possessing covertness of operation and staying power in the missile launch regions."50/

1966-1971, 3 (a) - SOSUS (PLUS ANY COMPATIBLE MOBILE/ PORTABLE SUBSYSTEMS

1966 - "In the U.S. a potential deep-water system for the long-range surveillance /of submarines/ is being developed. The overall program is code name TRIDENT and has three main parts: ARTEMIS, CAESAR, and COLOSSUS. TRIDENT provides for the development of a system /capable of/ insuring the underwater surveillance of large regions and detection of fast nuclear-powered submarines. In these systems, the Americans plan to employ new passive means for detection of the fast-moving submarines and active means for the low-noise, deep-running submarines.

"The scope of experimental work which has the aim of developing effective means for search, detection, and identification of submarines is being broadened...

"In the opinion of naval specialists, the problem of the detection and identification of submarines remains a serious one...and they are forced to acknowledge that right now, in spite of the significant outlays of material means and efforts, the U.S. Navy does not have at its disposal effective antisubmarine defense means."8/

- "American specialists believe that by 1975 the U.S. Navy will have non-acoustic means of detection, classification, and fixing the position of submarines. Until that time, hydrophones will remain the basic means. It is this fact that explains the heightened interest in hydroacoustic technology on the part of the U.S. Navy Command."8/

1967 - "The weapons possessed by modern antisubmarine forces permit the reliable destruction of submarines at great depths. However, the...capabilities of existing hydrophones and sonobuoys do not provide the necessary range of detection of underwater targets....Consequently, military specialists abroad are turning increasingly to non-acoustic means of search."12/

- "As to practical measures for the timely /i.e., peacetime/ preparation of antisubmarine barriers, the Anglo-American command is paying

primary attention to strengthening the barrier in the North Atlantic. For equipping this barrier, which is 2,500 miles in length and 50 to 100 miles in depth, it is planned to use minefields, automatic hydrophones which signal the appearance of a submarine, and other stationary means. It is proposed to place the automatic hydrophones at 50-mile intervals and also to use the FISH-2 active, deepwater buoys (CAESAR and ARTEMIS).

"The American command, in trying to take into serious account the capabilities of nuclear-powered missile submarines for retaliatory strikes with nuclear missiles, is currently developing a major system of offshore antisubmarine defense of the U.S. continent in a depth of up to 600 miles...".13/

- "Prior to the advent of nuclear-powered submarines in the Soviet Navy, the U.S. Navy was assigned the mission of completely preventing our submarines from reaching the oceans by destroying them in their bases and at the outset of their deployments. In recent years, such a mission has been acknowledged to be unrealistic. While not fully giving up the mission of destroying our submarines at their bases and while sortieing from them, the Americans have begun to develop deeply echeloned antisubmarine barriers on the probable routes of our submarines....Considerable antisubmarine forces and means have been developed by the Americans; they include systems of hydrophones which constitute the basis of the /U.S./ antisubmarine defense zone...".15/

- "The former /Soviet/ coastal system of antisubmarine defense now would be ineffective against missile submarines. For successful combat against them, it is essential to have a reliable system of surveillance which insures the timely detection of enemy submarines, especially the missile submarines, and which insures the exact determination of the coordinates of their position and the vectoring against them of the active means of combat."19/

1968 - "For combat with submarines, major operational antisubmarine forces have been established in the Atlantic and Pacific theaters by the U.S.

Navy. Working out the tasks for combat with submarines predominates in the combat training of the naval forces of the NATO countries."24/

"One should not fail to note that some of the authoritative individuals in the West do not share the view of the proponents of excessive praise of submarines who assert that submarines are the most effective type of force for antisubmarine warfare and who justify this by asserting that during an armed engagement the submarines are operating in one and the same medium and /consequently/ the chances /of the opposing sides/ are equal.

"Thus, for example, the command of the Canadian Navy has come out against the use of submarines for the purpose of antisubmarine combat barring dire necessity because it is considered an unwarranted expenditure of forces. It believes that...the losses of its own submarines would be equal to the number of enemy submarines destroyed. Based on the experience of NATO antisubmarine exercises...the command of the Canadian Navy came to the conclusion that the antisubmarine forces should consist only of surface ships, long-range patrol airplanes, fast jet airplanes, and helicopters. The U.S. Navy is carrying out a number of large-scale measures intended to increase the effectiveness of the development and employment of antisubmarine forces and means. The measures include...the infrastructuring of sea and oceanic theaters for antisubmarine defense /for/...improved means for the search, classification, and identification of submarines."30/

- "The existence of reliable, widely-deployed system of warning of the appearance of submarines in a given theater is considered /by the U.S. Navy/ to be the most important factor determining the success of the struggle with submarines. The U.S. program for the development of stationary, long-range detection systems which will insure the detection of submarines in vast regions has been given the code name TRIDENT. Thus, the modernization of the antisubmarine forces and means are proceeding along the following lines:...the development of stationary hydroacoustic systems for the long-range detection of submarines in offshore regions and

in forward oceanic regions....In conclusion, it should be noted that, in spite of the great attention accorded /to ASW/ by the American /naval/ command, the problem of antisubmarine defense remains unresolved at this time. The problem of search, detection and identification of submarine targets, without the resolution of which other achievements in antisubmarine defense lose meaning, are still considered especially difficult."33/

- "...modern submarines have such advantages as the capability to operate for prolonged periods under a great blanket of water which protects them from the means of detection and from the powerful modern means of destruction...a nuclear-powered submarine, being equipped with modern sonar...and being submerged, can detect a surface ship before the latter can detect the submarine....Nuclear-powered submarines, due to their high mobility, excellent covertness, and unlimited cruising range, have spread the threat of the delivery of strategic strikes over the whole World Ocean."35/

1969 - "In evaluating the combat capability of modern submarines, the Americans acknowledge the real likelihood of their breaking out into the oceans, including into the oceanic approaches to the /American/ continent. Consequently, they accord an important place in the overall system of antisubmarine measures to the organization of coastal zones of antisubmarine defense. These zones are equipped with stationary means of long-range detection of submarines...".40/

1970 - "In the opinion of U.S. specialists, the most important mission for torpedo submarines, primarily nuclear-powered ones, is combat with the nuclear-powered missile submarines of an opponent. The main struggle will develop, in their opinion, on the approaches to bases, in the regions of combat patrolling, and on what are called the antisubmarine barriers that are established on the probable routes of transit of submarines and in navigational narrows. Aviation, surface ships and, if possible, emplaced mines and hydrophones, will have to be employed."47/

- "Numerous articles in the foreign press attest to the fact that the U.S. Naval Command is

paying great attention to the development of existing, and to the development of new, positional means for the detection of submarines... The development of hydrophones in the past decade has served as a substantial stimulus to the development of /such/ positional means. Thus, it is known that work is being carried out on the TRIDENT program in the U.S. in recent years, including on the subsystems CAESAR, COLOSSUS, ARTEMIS and others. Great sums are being invested in this program: 20 million dollars in 1965, 22 million in 1967, and about the same amount is planned for 1970.

"American specialists who have worked out the so-called concept of 'balanced antisubmarine forces' assign a significant role in them to the positional means of detection of submarines. At the same time, they acknowledge the shortcomings inherent in these means: the capability only to detect but not to destroy the enemy, the low accuracy of fixing positions of submarines, the limited effectiveness of the application of antisubmarine weapons /due to lack of real-time data?/, and the immobile nature of the device which precludes changing its location when conditions change.

"From information in the foreign press, one may conclude that modern positional means are employed for: the detection of submarines during their penetration of the very extended antisubmarine barriers, the surveillance of submarines in the continuous zones extending out for considerable distances from the /U.S./ coasts, and detection of the submarine enemy... in close to their shores, on the approaches to bases, etc."44/

- "The Officers' Handbook, which was published in the "Officers' Library" series for use by officers of all of the Soviet Armed Forces, described the U.S. Navy at considerable length, including a comment on its hydroacoustic gear, but gave its readers no inkling of the existence of the SOSUS system."55/

- "...the command of the navies of the U.S.A. and England and of NATO on the whole are striving for the creation of well-balanced antisubmarine forces, which should include: a global system

of stationary means of detection and identification of submarines, antisubmarine aviation, antisubmarine surface ships and antisubmarine submarines....

- "...in order to fight confidently against nuclear-powered missile submarines operating at various depths, means are needed which are capable of round-the-clock monitoring of the depths of many regions of the world ocean amounting to millions of cubic kilometers and of surveilling all regions from which submarines can inflict their missile strikes....

"An antisubmarine barrier, according to the views of American naval specialists, is a system of stationary systems and mobile means of detection and classification of submarine targets, and also of groups of mobile forces which are at the necessary level of combat readiness, capable of establishing and maintaining contact with an identified submarine and, if necessary, of destroying it within the limits of the defended zone....The development of antisubmarine barriers is planned by the naval command of the U.S.A., and at the present time are conducting their expedited installation in all of the exits from the Arctic Ocean, the Barents and other polar seas through the narrows into the Atlantic and Pacific Oceans. Special attention is being given to the development of antisubmarine barriers on the exits into the northern part of the Atlantic Ocean, through which lie the basic routes between the U.S. and its NATO allies. Most important, in the opinion of the Americans, is the Central-European theater of military action....

"The Eastern Barrier -- lies between northern Norway and the Spitzbergen Archipelago. On this antisubmarine barrier, the U.S. Naval Command expects to oppose submarines by mobile forces: shore-based antisubmarine airplanes and antisubmarine submarines. It is considered that the installation of positional means for the destruction of submarines on this barrier would be complicated due to the difficult hydrometerological conditions. /However, it appears that the possibility of employing stationary means of detection of submarines on the Eastern Barrier/ is not excluded....

"The main or, as it is often called in the press, the Western Antisubmarine Barrier -- is established along the lines of Greenland - Iceland - Faeroes and Shetland Islands - southwestern coast of Norway. Precisely on this barrier it is proposed to develop the strongest opposition to the exiting of Soviet submarines into the Atlantic. The American specialists believe that the great depths in the region of this barrier, which vary from 200 up to 1,000 meters, and also the high-tide and low-tide currents, which reach 7 knots at the full and new moons, exclude the possibility for extensive application of all the systems of antisubmarine positional means of detection and make more difficult the establishment of uninterrupted minefields....

"The Coastal Antisubmarine Zone -- It is planned to protect the distant approaches to the American continent from the side of the Atlantic Ocean from submarines with constantly patrolling antisubmarine airplanes and escort ships carrying helicopters, on a line from the island of Newfoundland to the Straits of Gibraltar.

"This matter of organizing the struggle with the missile-carrying submarines of the enemy directly on the close approaches to the Atlantic coast of the U.S. is of special concern to the American military command. According to reports in the foreign press, a coastal 'antisubmarine zone' with a depth of up to 600 miles is being established here...

"In evaluating the prospective capabilities of nuclear-powered missile-carrying submarines, naval specialists of the U.S. are convinced that the 600-mile depth of the antisubmarine zone along the east and west coasts of the U.S.A. is obviously inadequate.

"In order to make the combat operations of the missile submarines of the enemy more difficult, the U.S. Naval Command is increasing the depth of the coastal antisubmarine barriers by developing special systems of long-range detection and classification of submarine targets.

"As has been reported in the foreign press, since 1959 the American Naval Command....has

turned to the development of a special system of hydroacoustic and computer equipment known under the name of Project ARTEMIS. It is planned that the ARTEMIS subsystem will be used in conjunction with the /already/ operational CAESAR subsystem, with the hydrometeorological vessels of NATO and with ships located on the antisubmarine barriers.

"American specialists in antisubmarine warfare are convinced that with the final entry into the ranks of the ARTEMIS system, a fully modern system will have been developed for the detection of submarines, for tracking them, and for vectoring of antisubmarine aviation and other mobile antisubmarine forces to them, and for the coordination of their actions on the antisubmarine barriers in the entire North Atlantic...

"Antisubmarine struggle in the Straits Zone -- The U.S. and its NATO allies accord an important place to the organization of antisubmarine barriers in the zones of the Baltic and Black Sea Straits for opposing the breakthrough of enemy submarines from the Black into the Mediterranean Sea, and from the Baltic into the North Sea and then into the zone of the English Channel and on into the Atlantic.

"The potential for the installation in the Straits of Denmark and in the narrows between Iceland and the Faeroe Islands of systems of long-range submarine detection is being studied by the American and English naval commands, which in their opinion, would increase the capabilities for the employment of antisubmarine aviation.

"The equipping of the Baltic and Black Sea Straits for antisubmarine warfare and the maintaining there of an operational regime which would preclude the passage of submarines is being laid by the American command on the naval forces of the NATO countries which are close to the zones: Great Britain, the Federal Republic of Germany, Denmark, Norway, The Netherlands, Turkey and Greece. Along with the employment of positional antisubmarine means and antisubmarine ships, it is proposed to use here antisubmarine aviation, and above all, helicopters.

"Antisubmarine struggle in the Pacific theater of military action -- In recent years, the Pentagon is giving ever more attention to the development of antisubmarine barriers and zones in the Pacific theater. The efforts of the U.S. Naval Command in the Pacific Ocean are directed above all toward the development of effective stationary systems of long-range detection, classification of submarine targets and the tracking of them. This, in the opinion of American specialists in antisubmarine warfare, would significantly heighten the possibilities of employing shore-based antisubmarine aviation.

"As is known from reports in the foreign press, the U.S. Navy plans to develop in the Pacific Ocean a system of long-range detection of submarines similar to the 'Norad' system of anti-air defense. The purpose of the system of long-range detection is to provide a real-time presentation of the situation in the Pacific by integrating the collection and processing of all incoming information on the location and movements of enemy submarines.

"According to reports in the American press, the surveillance of submarines within the confines of the Pacific theater is organized in three basic zones: in the forward zone of antisubmarine struggle, in the zone between the Hawaiian and Aleutian Islands and in the zone of antisubmarine struggle off the Pacific Coast.

"The U.S. Naval Command is giving a maximum of attention to the development of an antisubmarine barrier between the Hawaiian and Aleutian Islands. It is precisely on this barrier, with a depth of 350-500 miles, perpendicular to an axis of search from the island of Oahu, to Midway Island and on the Dutch Harbor, according to the views of the Americans, where it is necessary to mount effective opposition to enemy submarines. Specialists of the U.S. Navy believe that this barrier should permit increasing the depth of /the antisubmarine defense of/ the approaches to the Pacific Coast of North America by 1,500 miles. Antisubmarine airplanes already are patrolling here, operating from the island airfields and ships of the antisubmarine forces of the Hawaiian naval district.

"For antisubmarine warfare on the approaches to the Pacific Coast of the U.S.A., it is planned to develop a deeply echeloned antisubmarine barrier with a depth of up to 600 miles. The means of the system of long-range detection envisaged by Project ARTEMIS will be employed for the detection and identification of submarines...

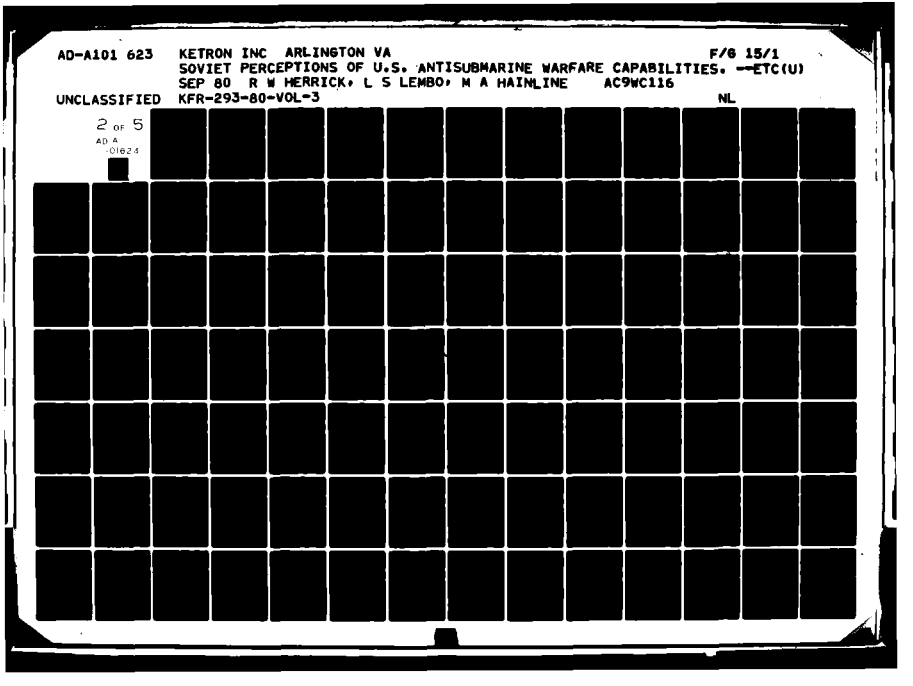
"Arctic Region -- According to numerous statements of American military specialists, the Arctic, in a future war, is viewed by the Pentagon as one of the important theaters of military actions.

"The leadership of the U.S. Navy views the Arctic, along with the seas adjacent to it, as one of the regions where the operations of the American Navy against Soviet submarines would be conducted for the prevention of their exit into the Atlantic and Pacific Oceans through the passage between Northern Norway and the Canadian archipelago....

"A number of measures for the operational infrastructuring of the region have already been carried out, including some for antisubmarine warfare. The U.S. has developed a considerable number of airfields in the northern regions of Canada....

"In the leading naval circles of the U.S. and NATO it is considered that /sometime/ in the 1970s new airborne instruments and combat means for the search and detection of submerged submarines, when employed in cooperation with new stationary means of submarine barriers, will provide considerable range of detection, a high level of reliability for the identification of submarine targets, and sufficient accuracy for the determination of their location and movements."45/

"The capabilities of antisubmarine aviation in cooperation with stationary means of detection installed close to the shore or in straits or narrows are increasing even more. With their help /i.e., of stationary means/ airplanes can reach the area of detection more quickly than other forces and start to track the submarine."50/


AD-A101 623 KETRON INC ARLINGTON VA F/G 15/1
SOVIET PERCEPTIONS OF U.S. ANTISUBMARINE WARFARE CAPABILITIES. --ETC(U)
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- "Specialists believe that the maximum increase in the effectiveness of antisubmarine aviation is directly dependent on the possibilities for increasing the effective range of the existing means of detection and the development of new ones capable of detecting submarines at great distances and at submergence depths right up to the greatest ones. The extensive use of such stationary means of surveillance of the underwater situation as hydrophone grids and heavy buoys with hydroacoustic and other detection means installed on them will largely decide the fate of antisubmarine warfare. Stationary means can detect submarines at distances of over 100 miles...These detection means, being the source of the initial contacts on submarines, facilitate the vectoring to them of antisubmarine ships and aircraft....

  "/Antisubmarine warfare/ has come to be viewed as a basic component of war at sea as a whole. It is believed that victory in it will be gained by he who continuously knows the location of the submarines of the enemy side and has at his disposal adequate means for their destruction."52/

1971 - The Handbook on Foreign Navies, although primarily a Soviet Janes Fighting Ships for the non-Communist world, provided a sufficiently lengthy and comprehensive description of "the forces and means" of the U.S. Navy in the preface that the lack of any mention of SOSUS could only have been deliberate. This was particularly the case in one passage which stated that the U.S. was 'conducting work on a broad scale for the modernization of existing, and the development of new, means for the detection and destruction of submarines'."57/

1966-1971, 3 (b) - SHORE-BASED VP AIRPLANES (PLUS SATELLITES)

1966 - "The main shore-based airplane of antisubmarine aviation /in the U.S./ is the P-3A ORION."8/

- "A great deal of attention is being given in the U.S. to the development of new aviation non-acoustic means. Included are equipments which register radioactive wakes of nuclear-powered submarines, infrared radiations, biological and technological waste thrown off to the surface, changes of the character of the waves caused by a submarine, and others...".11/

1968 - "Among antisubmarine patrol aircraft, the American P-3A ORION holds the greatest interest..." .24/

- "...the improvement of the antisubmarine forces and means of the U.S. Navy is taking the following directions....the reequipping of shore-based patrol aviation with ORION airplanes which have better flight characteristics and improved systems for submarine detection and destruction as compared to other airplanes of this kind /including/ acoustic and non-acoustic means of detection of submarines...".33/

1969 - "The Americans are placing particular hope on the use of laser instruments for this goal /of antisubmarine aviation/ -- but the work remains in the experimental stage up to this time. Although...the beam of a laser can penetrate into the /water/ depths up to 200 meters, many American specialists express doubt as to the suitability of the use of such an instrument for the purpose of submarine search since it insures only pinpoint surveillance and scarcely can rival even the magnetic detectors with a surveillance-belt width of 200 meters.

"On the whole, according to views existing abroad, the prospects for improved antisubmarine aviation...are continuing to improve noticeably.

"In the development of antisubmarine aviation abroad, the striving for the development of multipurpose airplanes which would be capable of carrying out both the search and destruction of submarines has been clearly evident in recent years."37/

- "In the U.S. recently intensive research has been carried out aimed at developing aviation equipment...for detecting submarines at great depths....The American command is not limiting itself to the development of just aviation equipment for antisubmarine warfare. Extensive work is /also/ being conducted for development of space systems for antis 27/

1970 - "The military circles of the imperialist states -- and of the U.S. primarily -- are entertaining great hopes for antisubmarine aviation equipped under the A-NEW program. However, in the opinion of foreign specialists, the A-NEW system will not be able to fundamentally solve the critical problem of the initial search for modern submarines...since all the sub-systems involved have limited search capabilities..." .45/

"The prototype of the A-NEW equipment has already been developed and has undergone a series of laboratory tests. The results of the experiments with the prototype by a composite automated system for the collection and evaluation of information received from the detection gear on an antisubmarine airplane were considered to be satisfactory, although there were shortcomings in the design...".45/

- "The Lockheed P-3A ORION and the Lockheed NEPTUNE airplanes are included in.../U.S. Navy/ patrol squadrons. In the future, it is planned, these airplanes will be replaced by Lockheed P-3C ORION airplanes."45/

- "In foreign navies, the question of the utilization of artificial Earth satellites for the goal of antisubmarine warfare is being studied persistently. Foreign specialists believe that from satellites and from manned space stations, with the aid of special equipment, it is possible to directly surveil the surface of the oceans for the detection of submarines in a submerged state. In the U.S. a special Project 287 has been adopted under which a manned space laboratory is being developed that is intended specifically for...antisubmarine warfare.

"Foreign specialists see the widest utilization of satellites for antisubmarine warfare in their

application for the picking up and relaying of information from a global system of powerful sonobuoys, which can be deployed in a particular pattern in the ocean in the zones of the probable appearance of the submarines of an enemy...

"As the latest reports of the foreign press attest, scientific-research and experimental work is being carried out at a forced pace on the integrated utilization of aviation and outer-space means in the interests of antisubmarine warfare. Study has already begun of the potential for the utilization of artificial Earth satellites for relaying information on the underwater situation taken from sonobuoys placed by aviation or ships in the regions of the most probable appearance of the submarines of the enemy."45/

- VP aircraft were not even mentioned in an article on U.S. naval development: "The development of antisubmarine and patrol-escort forces is constantly at the center of the attention of the American command. Torpedo submarines, anti-submarine aircraft carriers, frigates, destroyers and escort ships are their basis."51/

- "Specialists believe that a further increase in the effectiveness of antisubmarine aviation is wholly dependent on the possibilities for increasing the detection ranges of existing detection equipment and developing new ones capable of detecting submarines at long range and at diving depths right up to the maximum."52/

1966-1971, 3 (c) - SSNs (PLUS SUBROC)

1966 - "The Americans consider it a requirement to have 64 series-construction nuclear-powered torpedo submarines....In the 1966/67 fiscal year, the construction of five torpedo submarines is planned and, in the coming years, six. However, the possibility of increasing the construction program for /these torpedo attack/ submarines is not excluded. It is /also/ intended to modernize the nuclear-powered /torpedo-attack/ submarines of earlier construction."1/

- "/In/ the program for 1965/66...it is planned to construct six nuclear-powered antisubmarine submarines....The largest number of submarines (four units) were commissioned in 1964. From 1965, the rate of construction of this type decreased somewhat in connection with the increase in construction time. After the loss of Thresher the Americans decided to introduce several structural changes on the other submarines under construction in order to improve their survivability."8/

1967 - "Nuclear-powered multipurpose submarines are considered /by the U.S./ as one of the most important components of the antisubmarine forces. Their numbers, after a two-year period of pause caused by the Thresher catastrophe, have started again to grow rapidly."15/

- "The rate of construction in the U.S. of multipurpose nuclear-powered submarines armed with torpedoes and antisubmarine missiles with nuclear charges has slowed down...While five or six such submarines were laid down in the recent past, this figure was cut back for the first time in the last fiscal year to three submarines. It has been reported that it will remain at the same level for the coming fiscal year also. However, this slowing of the rate of construction is...temporary...explained by an increase in aircraft-carrier construction..."20/

1968 - "...in carrying out the policy of the arms race, the U.S. imperialists have been constructing warships and auxiliary ships on a considerable scale. Just for the shipbuilding program for 1966/68, there is planned the construction of 34 and refit of 21 combatant and auxiliary ships...

including three multipurpose nuclear-powered submarines...".23/

- "The American command considers nuclear-powered torpedo submarines to be the most important antisubmarine means and, consequently, pays great attention to the construction of this type. It is planned to have over 60 nuclear-powered torpedo submarines in the U.S. Navy by 1970."24/

- U.S. submarine designers were reported to be striving for the following improvements in SSNs: "decreasing submarine noise, increasing the depth of submergence, developing new material for stronger hulls, developing new torpedoes and guided-missile weapons, and modernizing sonar and navigation equipment."26/

- "At the present time, in the opinion of foreign specialists, submarines themselves, and nuclear-powered ones in the first place, are one of the most promising means of antisubmarine warfare. This is based on the facts that submarines, in comparison with surface ships, possess unlimited cruising range, independent of the roughness of the sea and weather conditions for operating sonar gear, and are capable of carrying out combat in enemy waters where the operation of other antisubmarine forces is excluded. Submarines also have the capability to attack enemy submarines covertly, exploiting their ability to cruise quietly and employ /passive/ sound-listening gear...Preference is given to nuclear-powered submarines /over diesel-powered ones/. Great diving depth, the newest sonar search gear, and modern antisubmarine weapons enable these ships to combat enemy submarines effectively. Nuclear-powered submarines with torpedo and missile weapons obviously will become the main antisubmarine forces in the long haul. Consequently, their development is being accorded great attention, especially in the U.S.".30/

- "American naval specialists hold that under contemporary conditions nuclear-powered submarines are one of the effective means for the search and destruction of enemy submarines. They have great advantages over antisubmarine surface ships and aviation in operations against fast submarines operating at great depths."33/

- "...the improvement of the antisubmarine forces and means of the U.S. Navy is proceeding along the following lines...the construction of new nuclear-powered antisubmarine submarines that are equipped with new sonar and weapons of long range. Great significance is accorded to reducing the noise level of /these/ submarines."33/

- "In accordance with the warship construction program adopted in the U.S., there are 29 multipurpose submarines under construction or planned for construction...From 1960 up to the present, the period is typified by the series construction of multipurpose nuclear-powered submarines of the Skipjack class. The /subsequent/ Thresher and Sturgeon classes are distinguished from Skipjack by having greater submergence depth, a new sonar system, and better habitability.

  "The loss in 1963 of the newest nuclear-powered submarine Thresher -- lead ship of the series -- revealed substantial shortcomings in the design and construction of U.S. submarines....However, these /corrective/ measures failed to insure adequate reliability for American nuclear-powered submarines inasmuch as another one... the Scorpion, this time of the Skipjack Class... perished during an Atlantic crossing in March 1968."34/

  "It is noted that the construction rate of /U.S./ multipurpose submarines has been slowed...While five to six were being built recently, in the fiscal year 1968, funds were appropriated only for three such ships. However, it is considered that this reduction...is only temporary. This is explained primarily by the increase in expenditures for aircraft carriers, landing ships...needed by the Pentagon for the war in Vietnam.

  "The start of the development is reported on a project for a multipurpose submarine for 'tomorrow' which will have greater submergence depth and speed but, primarily, will have a reduced noise level...It is entirely probable that it will reach a maximum tonnage of 5,000... submerged speed of 45-55 km/hr...and submergence depth of 500 to 600 meters...

"The extensive /U.S./ construction of missile and multipurpose nuclear-powered submarines... forces our country to take all necessary measures for the further strengthening of the defense capabilities of the Soviet Navy.

"It is difficult to say at the present time just when the problem of developing attack submarines with depths up to 5,000 meters will be solved. Right now the U.S. considers that the attack submarines of the next decade with...steel hulls...will be able to submerge to depths of 1,200 meters."34/

1969 - "Up to the present time the construction of 69 nuclear-powered submarines (the Thresher and Scorpion perished), of which 36 are already operational, have been financed by the long-range programs which have been adopted: five non-series, four of the Skate Class, five of the Scorpion Class, 13 of the Permit Class, and nine of the Sturgeon Class...

"It should be noted that...the construction of nuclear-powered torpedo submarines has not kept pace with the intended schedule and that so far their delivery is proceeding with a considerable lag. This is explained primarily by the imperfection of their construction and equipment. It became necessary to introduce substantial changes in the design of the submarines in the course of their construction to increase their reliability, maneuverability, and seaworthiness.

"According to press information, in the U.S. the possibilities for developing nuclear-powered submarines with higher submerged cruising speed, greater diving depths, and less noise are being intensively studied.

"In accordance with the plan adopted for the construction of nuclear-powered torpedo submarines, they are limited to 60 units (not counting five non-series and four of the Skate Class). But this decision of the Defense Department was given a hostile reception by militaristic, reactionary circles in the U.S., including by the admirals, who...consider it necessary to increase the number of such submarines from 100 to 110....It may be surmised that the 'hawks' will gain the upper hand this

time as usual and that the program for the construction of nuclear-powered torpedo submarines will be increased."36/

- "In the U.S., according to press information, intensive studies are being made of the prospects for the development of nuclear-powered submarines with higher submerged cruising speeds, greater diving depths, and less noise."36/

- "The Americans consider antisubmarine submarines, in particular the nuclear-powered ones, to be the most effective force for the search and destruction of submarines inasmuch as they have considerable advantages over surface ships and aviation in operations against fast submarines operating at great depths."40/

- "Antisubmarine submarines usually patrol in the forward regions on the probable routes of transit of enemy submarines. It is believed that in the regions of combat operations the enemy will be forced to proceed at high speed and that this will inevitably affect his covertness adversely (due to the high level of self-generated noise). As a consequence, the Americans have reached the conclusion that not only nuclear-powered but diesel submarines too can be used for antisubmarine warfare."40/

1970 - "On American shipbuilding ways, 29 multipurpose submarines are under construction."47/

- "It is planned to construct a total of 70 of these /multipurpose/ submarines of this type (in addition to the non-series units). Over 55 of these will be of the Sturgeon Class /that is, 22 more/. It should be noted that the /U.S./ naval command is achieving the realization of the plan for the construction of 100-110 units....

"At the present time, the Americans are conducting extensive research on the preparations for construction of submarines of a new generation. With this goal in mind...the experimental deep-diving diesel submarine Dolphin has been developed....In the near future it is intended to build a nuclear-powered torpedo submarine of a fundamentally new type (the CONFORM Project). All of this confirms the intentions of the Americans to prepare a new program for

construction of more modern submarines. However, according to the estimates of specialists, the serial construction and commissioning in the /U.S./ Navy of these new-generation nuclear-powered torpedo submarines cannot be expected before the mid-'70s.

"Simultaneously, development has been undertaken of more modern means for the detection and destruction of submarines -- in particular, the possibilities /are being investigated/ of developing a new /submarine-launchable/ antisubmarine missile system STAM (Submarine Tactical Air Missile) which, according to the plan, should be superior to the existing SUBROC system.

"According to information in the foreign press, the /U.S./ shipbuilding program for 1970/71 provides for the construction of three nuclear-powered submarines of the new generation of the SSN-688 /Los Angeles/ Class...51/

- "Among the nuclear-powered torpedo submarines in the active /U.S./ fleet are five non-series, nine of the small-series Skate and Skipjack Classes and the remainder, which have been built in the past decade and are sufficiently modern, include 13 of the Permit Class and 22 of the superior Sturgeon Class....The submarines of the Permit and Sturgeon Classes are armed with SUBROC missile systems and antisubmarine torpedoes."51/

- "The leading place in combat against the submarine threat is shifting steadily from surface ships and aviation to antisubmarine submarines. This process may be observed even in the matter of the multipurpose submarines of the U.S. The American command, in particular, believes that multipurpose nuclear-powered submarines correspond in the highest degree to the tasks for antisubmarine warfare at sea."52/

- "In the development of new multipurpose submarines /in the U.S./ and the modernization of those already in commission, the main attention is being paid to the lowering of their noise level, and to increasing their cruising speed and diving depth. Such a trend is not coincidental. It is known that the noise of submarines has a considerable effect on the range of

their detection by antisubmarine forces and means and also on the effective range of their own sonar gear -- and, consequently, on the covertness and success of their operations. For example, the American multipurpose submarine of the Permit Class, which entered operation in 1965-66, has almost twice as great a diving depth and one-and-a-half times less noise than the previously built Skipjack Class. In the process of their maximum development, the overall resolution is forseen of the construction and technological problems directed at lowering the noise level of the ships to that of the sea, at increasing the diving depth initially to 600-900 meters and then to 1,200, and at an increase in speed of from two to three times."52/

- "The number of SSNs under construction in the U.S. was shown in Table II of the book The Armed Forces of the Capitalist States, which was released for publication on 22 October 1970, as 23.

  "The American command is carrying out intensive construction of nuclear-powered /multipurpose, torpedo-attack/ submarines, having the ultimate aim of replacing with them all of the conventional submarines in the order-of-battle of the fleets /i.e., the 69 diesel boats shown in Table II/. In recent times, the American command has been paying great attention to the construction of fast and noiseless boats."53/

- "Nuclear-powered submarines /of the U.S./ have been provided with the most modern armaments: sonar and torpedoes of various types. The latest classes of nuclear-powered submarines have received the antisubmarine weapons system SUBROC, which is considered to be the most modern kind of antisubmarine weapon. SUBROC is comprised of a missile-torpedo (or a missile-depth charge)."53/

- "There are several classes of nuclear-powered /U.S./ torpedo submarines, including:

  19 - Sturgeon,
  13 - Permit,
  5 - Skipjack,
  4 - Skate, and several /six/ non-series boats (one in reserve).53/

- "...with the aid of the underwater MORAY device...the U.S. is developing the individual components...of a deep-diving small antisubmarine submarine. It is considered that such submarines could lie on the bottom of the ocean along the probable routes of enemy submarines and also close to his bases and on the antisubmarine barriers....Although the design and construction of the prototype would require a large expenditure, the cost of each submarine in serial construction would not be more than one-fourth the cost of a nuclear-powered torpedo submarine of the Sturgeon Class...".54/

1971 - The Handbook of Foreign Navies, which appeared only two weeks before the XXIVth Congress convened on 30 March 1971, listed the only SSN construction program in the U.S. as that of the Sturgeon Class. Of the 20 of that program remaining to be built, 17 were indicated to be currently under construction with the remaining three yet to be laid down.57/

- The Handbook of Foreign Navies listed the following SSNs with SUBROC:

  1 - Narwhal Class
  20 - Sturgeon Class, and
  13 - Permit Class.57/

1966-1971, 3 (d) - CVSs (PLUS AIRCRAFT)

1966 - "The combat capabilities of aircraft carriers /of the U.S. Navy/ are to be increased by means of equipping them with the new SH-3A/D SEA KING helicopters...and by replacing the S-2 TRACKER with the more modern S-2E TRACKER."1/

- "Great attention is being given to the development of a relatively new subclass of these ships -- antisubmarine aircraft carriers. It is known the opinion exists in U.S. naval circles that it is necessary to construct nuclear-powered antisubmarine aircraft carriers according to a new design. Up to this time, this sub-class has consisted mainly of obsolete aircraft carriers reequipped for carrying out antisubmarine missions.

  "The complement of aircraft carrier antisubmarine aviation consists mainly of the S-2D TRACKER airplane. However, in the opinion of specialists, regardless of improvements, it does not satisfy contemporary requirements. In this connection, they are working out at the present time a new shipborne antisubmarine airplane, the VSX, which has two turboprop engines.

  "The use of airplanes capable of vertical takeoffs and landings for combat with submarines is being examined in the U.S. ..."8/

- "In the opinion of American specialists, the experience of combat training showed that the employment of these /antisubmarine aircraft-carrier hunter-killer/ groups, which consist of heterogeneous antisubmarine forces, can be adequately effective."11/

1967 - "Antisubmarine helicopters, in the estimation of foreign commands, are on a par at present with submarines as one of the most effective types of antisubmarine weapons. This evaluation is based mainly on the high search speed of helicopters, which approaches 20-25 knots and more as compared to 18 to 20 knots for surface ships, but also by their covertness of search and by their invulnerability to the weapons carried by submarines. At the same time, it is believed that there are also inherent shortcomings in antisubmarine helicopters. It is enough to recall the

difficulty of using them in difficult hydrometeorological conditions, the limited flight time, and the comparatively short periods between overhauls."13/

1968 - "The construction of antisubmarine aircraft carriers is not being conducted and none is forseen for the near future. Furthermore, there is talk of the number of antisubmarine aircraft carriers being steadily decreased in the future in correspondence with the growth in the numbers of more effective antisubmarine forces and means, nuclear-powered antisubmarine submarines in particular."24/

- "The basic gear for search by antisubmarine helicopters are the sonar and the magnetic detector. A dipping sonar, like the variable-depth sonar, penetrates below the surface layer but the helicopter itself is a rather noisy and vibrating working platform. The detection range of a dipping sonar is still insufficient at present. However, a number of tasks are being carried out by the helicopter at present and it may prove in the future to be quite an effective antisubmarine means."30/

- "...the improvement of antisubmarine forces and means by the U.S. Navy is taking the following directions...the arming of shipborne antisubmarine aviation with new airplanes of the VSX type, the development of which is already going on."33/

1970 - "...the S-2F (S-2D) TRACKER airplane...modifications of it are the only type of antisubmarine airplane of the aircraft carrier aviation of the U.S. Navy...their production continued until 1965...".45/

- "In 1968 the Lockheed Company was given a contract for developing a new shipborne antisubmarine airplane, the VSX, which would have a range of about 1,600 km. and a flight endurance of up to 10 hours. It is planned to install in the airplane the compact A-NEW gear and a modern system for the detection, tracking, and destruction of submarines.

"Since 1967, /U.S./ aircraft carriers have begun to receive a squadron each of these /SH-3A-D/ helicopters."46/

- "In the system for antisubmarine warfare, increasing importance is being accorded to manned helicopters, and especially for the /initial/ detection of submarines. Aircraft carriers, surface ships of other classes, and shore bases are equipped with them. The American SEA KING helicopters SH-3A to SH-3D are the most numerous and widely deployed. Sonar and radar are installed in them for submarine detection and they carry sonobuoys and depth charges. This helicopter, with a maximum flight duration of about four hours, can conduct a search for not over 2 1/2 hours. Since 1967 /strike/ aircraft carriers have been receiving one squadron apiece. American specialists consider the complexity of their use to be one of the serious shortcomings of the SEA KING since control is exercised from the /shipboard or land/ basing point--which deprives the crew of the capability to act independently in accordance with the situation." 46/

- "The latest modification of the TRACKER airplane--the S-2E -- can carry out a reasonably wide range of missions for the detection, tracking, and destruction of submarines. These /ASW carrier/ airplanes are equipped with systems for surveillance and reconnaissance but they do not have the requisite means for the analysis, processing, and transmission of the data to the strike forces."46/

- "The construction of new /antisubmarine/ aircraft carriers is not planned but the Americans plan to provide replacements from those /CVAs/ being taken out of the complement of the carrier strike forces. Ultimately, the number of antisubmarine aircraft carriers is planned to be still further curtailed...to be compensated for by the development of surface ships with powerful antisubmarine weapons and more effective shore-based antisubmarine airplanes. It is believed that the combat capabilities of antisubmarine aircraft carriers also can be substantially increased by being equipped with new shipborne antisubmarine airplanes. In particular, work is being done on the development

of the S-3A airplane which is planned to replace the S-2 TRACKER which is now in the order-of-battle of antisubmarine aircraft carriers."51/

- In the book Armed Forces of the Capitalist States, which was released for publication in October 1970, Table II listed the number of CVSs under construction in the U.S. as zero."53/

1966-1971, 3 (e) - DLs, DDs, and DEs (Plus ASROC AND DASH/LAMPS)

1966 - "...foreign specialists consider destroyers and frigates as the 'main battery' of the antisubmarine aircraft-carrier hunter-killer group. The employment of helicopters for target designation considerably enhances the combat capabilities of these antisubmarine defense surface ships."11/

1967 - "It is noteworthy that for the past two years no construction of frigates has been provided for in the shipbuilding programs of the U.S. The American command explains this on the one hand by the need for accelerating the construction of other naval forces, in particular those for amphibious landings and antisubmarine use, and on the other hand by the presence in the order-of-battle of an allegedly sufficient number of anti-air guided-missile ships. For the goal of strengthening antisubmarine defense, it is not necessary to build such large and expensive ships."13/

- "One of the basic assignments of destroyers is the antisubmarine defense of combatant ships and merchant ships at sea. Destroyers are being armed for this with the newest models of antisubmarine weapons, including the antisubmarine missile ASROC...the DASH system, the Mark 37, 14, and 46 torpedoes...".13/

1968 - "...in the shipbuilding program for fiscal year 1967/68, there is planned the construction of 34 and the refitting of 21 combatant and auxiliary ships...including...two guided-missile destroyers, ten large /destroyer/ escort ships..."23/

- "Recently, the surface antisubmarine ships /of the U.S. Navy/ have been equipped with the low-frequency AN/SQS-26 sonar...".30/

- "Surface ships possess great load capacity which, considering the trend of increasing weight and size of antisubmarine weaponry, is of no small importance. In recent times, U.S. antisubmarine surface ships are being equipped with the AN/SQS-26 sonar which, in individual cases in which the convergence zones can be used, is capable of detecting submarines at ranges of 30-45 miles...The zone of the direct

detection of a submarine target is...8-14 miles. However, between the zone of convergence and the zone of direct detection lies a rather wide zone of acoustic shadow within which the ship cannot track the detected submarine target and so lacks the capability to employ either the ASROC antisubmarine missiles or the pilotless helicopter of the DASH system.

"In the opinion of foreign specialists, among the basic shortcomings of surface ships is their vulnerability to attack by submarines since they have too little covertness of operation and, in comparison with submarines, do not have an advantage in the range of detection. Bad weather, which makes the detection and tracking of modern submarines more difficult, has a negative effect on the effectiveness of the operations of antisubmarine ships...In spite of the fact that surface antisubmarine ships no longer play the /leading/ role in antisubmarine warfare that they played in the Second World War, they are /still/ considered to be a sufficiently effective means of combat with enemy submarines when their capabilities in cooperation with airplanes, helicopters, and submarines are taken into account."30/

- "The attempt was made abroad to equip a surface ship with a nuclear-powered plant for antisubmarine tasks...The Bainbridge was scarcely effective...its maximum speed is 55 km/hr and that, it was emphasized in the press, is clearly insufficient for combat with nuclear-powered submarines. Moreover, this frigate was not armed with antisubmarine helicopters. Apparently to make up for this shortcoming, the American naval leadership decided to supply the second /nuclear-powered/ frigate, the Truxton, with three radio-guided antisubmarine helicopters.

"The further development of the antisubmarine characteristics of the surface ship, as foreign specialists emphasize, is dependent on greatly increasing its cruising speed. Great hopes in this plan are being pinned on the employment of the principles of motion when the entire ship, or part of it, is lifted into the air in order to reduce the resistance of the water medium. There is talk about ships on underwater wings,

on air cushions, or of the so-called ekranoplanes. Foreign specialists believe that, in the near future, the development of antisubmarine ships on underwater wings with a displacement of about 5,000 tons will be fully practicable. In size they will be equivalent to destroyers. It is expected that their cruising speed will increase from two to three times over that of conventional destroyers."32/

- "...the development of the antisubmarine forces and means of the U.S. Navy is going along the following lines:...the construction of modern antisubmarine surface ships that are armed with long-range antisubmarine weapons systems and low-frequency sonars. In this connection, a trend toward integrating all of a ship's weapons and equipment into a sophisticated combat system /A-NEW, presumably/ is planned."33/

1969 - "The series production is planned /in the U.S./ of large antisubmarine ships of the DX Class. It is intended to install the newest submarine weapons and sensors, and electronics and automation...According to information in the press, in the course of ten years it is planned to build more than 100 /of these/ ships at an overall cost of over three billion dollars."36/

- "Right now /January 1969/ about 160 /U.S./ combatant ships are armed with the ASROC antisubmarine missile system and more than 100 outfitted with the DASH antisubmarine system."36/

- "The Americans consider that destroyers are most effective in tracking and attacking submarines because they are able to maintain contact with a target for an extended period that can repeatedly move out to the attack. In recent years, the combat capabilities of these ships have been increased substantially due to their employment of the long-range antisubmarine weapons systems ASROC and DASH which are capable of attacking submarines at great ranges."40/

1970 - "According to the plans of the U.S. Navy, it has been planned to arm 279 ships with the DASH system, for which, by the program of the introduction of the DASH weapons system, it is proposed to build 900 radio-guided antisubmarine helicopters, with the idea of having two operational and one in reserve on each ship...".45/

- "In World War II, surface ships carried out extensive searches on the antisubmarine barriers located on the main routes of enemy submarine movements. This method has not lost its meaning even under contemporary conditions. However, due to the difficulty of combat against nuclear-powered missile submarines, antisubmarine ships, for example in the exercises of foreign navies, conduct searches in the open zones of theaters in addition to operations on the barriers, in particular in the regions of the most likely location of missile submarines....The main shortcomings of surface ships are their lack of covertness, their shorter ranges of detection than submarines, /both of/ which result in their vulnerability to submarine attack. Moreover, a great influence on the effectiveness of the operations of surface ships is exerted by the weather conditions which /can/ make search and tracking of submarine targets more difficult. However, modern surface ships, as a rule, carry helicopters or airplanes and have at their disposal everything necessary for the command and control of heterogeneous antisubmarine forces and means. Therefore, definite success is expected from them in antisubmarine warfare."52/

- "Despite the successful development of antisubmarine submarines, the leading role in antisubmarine warfare /still/ is assigned to surface ships in the majority of countries....Antisubmarine surface ships are grouped in an organized manner into hunter-killer groups which can search great expanses of the oceans and seas in a short time and detect and destroy the submarines /therein/".52/

- The book Armed Forces of the Capitalist Countries, which was released for publication in October 1970, showed in Table II that no conventionally-powered frigates or destroyers, with or without surface-to-air (SAM) missiles, were under construction in the U.S. and only two nuclear-powered SAM frigates.53/

- "There are several classes of them /U.S. "destroyers"/, including:

  18 - Forrest Sherman,
  8 - Carpenter,
  30 - Frank Knox,

45 - Gearing,
53 - Allen M. Sumner, and
110 - Fletcher.53/

1971 - "The possibility of deploying helicopters on practically all ships permits them to be employed with particular effectiveness for antisubmarine warfare. They are capable of conducting the full cycle of this warfare: search, detection, tracking, and destruction of submarines. A helicopter can carry out a search beyond the limits of the range of a ship's sonar, hover in one place, detect an enemy submarine with the aid of a dipping sonar, and quickly attack it or track it no matter how rapidly it takes evasive action....a helicopter is capable of appearing suddenly over a submarine, which has no means of combat with an air target, and of destroying it. Manned and pilotless helicopters have been developed....However, the radio-controlled helicopter does not have its own means of detection...Therefore, a preference is shown for piloted helicopters."56/

- The Handbook of Foreign Navies, which appeared in March 1971 showed five destroyers of the Spruance Class under construction. The first of an unnamed SAM DDG was listed as under construction with 50 more said to follow.57/

- The Handbook of Foreign Navies, which was released for publication on 19 March 1971, showed that of 240 operational destroyers in the U.S. Navy all were of World War II construction except for 14 that had been built in the late '50s. Fifty-six of these were shown to have received DASH, 78 others to have been fitted with ASROC, and six destroyers to have received both. This added up to 140 of the 240 that had received at least one postwar ASW system.57/

1966-1971, 3 (f) - MINES

1968 - "Offensive minelaying, in the opinion of the military leadership of the navies of the main capitalist states, had important significance. The development in the West of a number of improved prototype mines designed for submarine laying attests to this. Torpedo submarines, which are able to carry 30 mines, are best-suited for the covert laying of mine barriers, in the opinion of foreign specialists....In view of the great covertness of submarine operations, it is acknowledged to be feasible to lay mine barriers across the exits from enemy submarine bases and in the navigational narrows through which pass the deployment routes of enemy submarines."30/

1970 - "In the postwar years considerable attention has been paid abroad to the development of mines. Antisubmarine mines, as is known, are immobile or mobile....Among the aviation mines in the armaments of the NATO countries are the bottom mines MK-52 and MK-55 and the anchored mine MK-56....The further development of antisubmarine mines is proceeding along the lines of increasing the reliability of individual components, of simplifying construction, and of lessening the cost of their production. Special attention is being given to mines suitable for dropping from aircraft flying at great speeds. In particular, the MK-52 and MK-55 mines are being modernized."45/

- "The nuclear-powered submarines of the U.S. are being armed at the present time with bottom and anchored mines."47/

FOOTNOTES FOR CHAPTER II

1. Captain Second Rank O. V. Shokarev, "A Budget for War", Naval Digest, June 1966, pp. 83-86.

2. Admiral A. Chabanenko, "Ready for Cruising or Battle", Water Transport, 30 July 1966.

3. Fleet Admiral S. G. Gorshkov, "Always on Combat Watch", Pravda, 31 July 1966.

4. Admiral V. Grishanov, "Under the Combat Pennants of the Homeland", Izvestiya, 31 July 1966.

5. Fleet Admiral N. D. Sergeyev, interview with Ogonyek correspondent, Radio Moscow, 0630 GMT, 31 July 1966.

6. Fleet Admiral N. D. Sergeyev, "On Combat Watch", Light of the East, 31 July 1966.

7. (Naval) Aviation Colonel General I. Borzov, "Wings of the Soviet Navy",. Labor, 31 July 1966.

8. Captain First Rank A. A. Kvitnitskiy, "Direction of the Development of the Forces and Means of Antisubmarine Defense by the U.S. Navy", Naval Digest, November 1966, pp. 81-86.

9. Captain Second Rank V. G. Redanskiy, "Nuclear-powered Submarines and U.S. Policy", Naval Digest, November 1966, pp. 93-96.

10. Editorial, "The Combat Capability of the Submarine", Red Star, 15 November 1966.

11. Captain Second Rank Yu. L. Korshunov, "Operations of Aircraft-carrier Hunter-killer Groups Against Submarines", Naval Digest, December 1966, pp. 76-78.

12. Colonel I. I. Reshetov, "The Search and Destruction of Submarines by the Heterogeneous Forces of a Navy:, Naval Digest, February 1967, pp. 40-42.

13. Captain First Rank N. I. Belavin, Missile Ships, 1967, pp. 3, 42, 108, 118, 143, 149, 163, 194, 198, 211-212, 238-9, 257, 262-265, and 269.

14. Combat Course of the Soviet Navy, 2nd edition, Admiral N.A. Piterskiy (Ed.), 1967, pp. 546-548 and 550.

15. Captain First Rank K. T. Titov, "Some Criteria of the Development of the U.S. Navy", Naval Digest, June 1967, p. 83.

16. V. I. Lenin and the Soviet Armed Forces, 1st edition, Colonel General A. S. Zheltov (Ed.), 1967, p. 269.

17. Engineer-Admiral P. G. Kotov, "The Navy, Born of October", Labor, 30 July 1967.

18. 50 Years of the Armed Forces of the USSR, Marshal M. V. Zakharov (Ed.), 1968 (signed to press 6 November 1967), pp. 513 and 514.

19. Military Strategy, 3rd edition, Marshal V. D. Sokolovskiy (Ed.), 1968 (signed to press 30 November 1967), pp. 308 and 366.

20. Engineer-Captain First Rank V. Gerasimov, "Submarines in 1967, A Survey", Red Star, 7 December 1967.

21. Admiral A. Chabanenko, "Combating Nuclear-powered Missile Submarines, Military Thought, December 1967, p. 45.

22. Fleet Admiral S. Gorshkov, "The Navy of the Socialist State", Military Thought, January 1968, pp. 18-29.

23. Captain First Rank E. S. Marinin, "The Shipbuilding Industry of the U.S.", Naval Digest, January 1968, pp. 73-78.

24. Organization and Armaments of the Armies and Navies of the Capitalist States, 2nd edition, Major-General P. I. Sergeyev (Ed.), 1968, pp. 516-518, 522-524, 529-532, 534, 536-539, 542-515.

25. Fleet Admiral S. G. Gorshkov, "In the Open Seas and Oceans", Pravda, 14 February 1968.

26. "The Navy of the USSR; Materials for Reports and Discussions", Communist of the Armed Forces No. 13, June 1968, p. 32.

27. Admiral A. T. Chabanenko, preface to Russian translation of Undersea Victory by Captain W. J. Holmes, U.S. Navy, 1968, pp. 17 and 18.

28. Fleet Admiral Gorshkov, Radio Moscow address for Navy Day, 1430 GMT, 27 July 1968.

29. Fleet Admiral Gorshkov, "Maritime Perimeters of Defense", Pravda, 28 July 1968.

30. N. I. Suzdalev, Submarines Against Submarines, 1968 pp. 3, 5, 127, 129, 132-133, 135-140, 142-150, 152-153, 155-160.

31. "The Navy of the USSR: Materials for Reports and Discussions" (on Navy Day), Communist of the Armed Forces No. 13, July 1968, p. 32.

32. Captain First Rank V. Abchuk, "The Target is in the Depths of the Ocean", Red Star, 3 October 1968.

33. Captain Second Rank F. V. Fedorov, "Development of Antisubmarine Forces and Means in the U.S. Navy", Naval Digest, November 1968, pp. 80-86.

34. Candidate of Technical Science, Engineer-Captain Second Rank G. I. Svvatov, Nuclear-powered Submarines, 1968, pp. 19-23 and 93.

35. Vice Admiral V. D. Yakovlev, The Soviet Navy, 2nd edition, DOSAAF Press, 1968, p. 52-53, 55-57, 60-63 and 67.

36. Captain Second Rank O. V. Shokarev, "In the Intoxication of Military Hysteria: Several Plans for the Development of the U.S. Navy", Naval Digest, January 1969, pp. 92-99.

37. Captain First Rank A. A. Kvitnitskiy, "Aviation Against Submarines", Naval Digest, April 1969, pp. 93-99.

38. Vice Admiral V. I. Surabekov, Retired, "The Basic Aspects of Contemporary Armed Struggle at Sea", Naval Digest, June 1969, pp. 29 and 30.

39. Admiral A. T. Chabanenko, "Following the Traditions of Our Fathers", Literary Russia No. 30, 25 July 1969.

40. Captain Second Rank R. K. Vasil'yev, "Some Views on the Organization and Employment of the Antisubmarine Forces of the U.S. Navy", Naval Digest, September 1969, pp. 93-98.

41. Candidate of Naval Sciences, Instructor, Captain First Rank Yu. I. Bol'shakov, "Fantasy and Actuality in Distant Submarine Cruises", Naval Digest, September, 1969, p. 108.

42. V. I. Lenin and the Soviet Armed Forces, 2nd edition, Colonel-General A. S. Zheltov (Ed.), 1969, p. 237.

43. Doctor of Naval Sciences, Rear Admiral K. A. Stalbo, "The Development of Naval Science", Naval Digest, December 1969, p. 34.

44. Engineer-Captain First Rank A. L. Prostakov, "Positional Means for the Detection of Submarines by the U.S. Navy", Naval Digest, January 1970, pp. 95-98.

45. I. M. Sotnikov and N. A. Brusentsev, Aviation Against Submarines, 1970, pp. 5-7, 13-16, 21, 27, 32, 71, 74-75, 78-81, 112-111-115, 133-135, 144-153, 155-156, 197-198.

46. Captain First Rank I. K. Firsov, "Forces and Means of Surveillance in Foreign Navies", Naval Digest, March 1970, pp. 85-93.

47. Rear Admiral A. I. Rodionov, The Strike Force of the Navy, 1st edition, 1970, pp. 3, 16, 20, 23, 29, 33, 34, 37 and 41.

48. V. Goltsev, "Okean", Izvestiya, 19 April 1970.

49. "Oceanic Shield of the Homeland: Materials for Reports and Discussions", Communist of the Armed Forces No. 12, June 1970, p. 32.

50. Colonel A. P. Anokhin, "Aviation in Combat with the Strike Forces of a Navy", Naval Digest, June 1970, pp. 33-36.

51. Captain First Rank V. N. Shevtsov, "The Contemporary State and Direction of Development of the U.S. Navy", Naval Digest, September 1970, pp. 80-87.

52. Captain First Rank V. G. Yefremenko, "The Development and Modernization of Antisubmarine Forces and Their Tactics", Naval Digest, October 1970, pp. 16-23.

53. Colonels P. E. Maslennikov, I. I. Moskvin, I. P. Kanayev and Captain First Rank D. K. Romanov, The Armed Forces of the Capitalist States, Major-General P. I. Sergeyev (Ed.), 1970, pp. 258, 261-265, 270-273.

54. Engineer-Captain Third Rank V. D. Yevseyev, "The Development of Underwater Apparati in the U.S.", Naval Digest, November 1970, pp. 85-92.

55. Officers' Handbook, Major-General S. N. Kozlov (Compiler), 1970, pp. 245-248 and 309.

56. Colonel M. Belov, "Helicopters Aboard Ship and Ashore", Red Star, 13 January 1971.

57. Handbook of Foreign Navies, V. A. Kovalenko and M. N. Ostroumov (Compilers), signed to press 19 March 1971, pp. 12-14, 265-271, 278, and 285-299.

58. History of Naval Art; Textbook for the Higher Naval Schools, 1969, pp. 535, 537, 540, 541, 562 and 569.

APPENDIX C

SOVIET OPEN-SOURCE DATA USED FOR QUALITATIVE ANALYSIS FOR THE PERIOD 1971-1976

AC9WC116-III

THE 1971-1976 SOVIET OPEN-SOURCE DATA USED IN CHAPTER III*

	Page
1 (a) - Is anti-SSBN ASW seen by the Soviets as within the technological state-of the-art given the great lead of submarine warfare?	C-2
1 (b) - Is the U.S. Navy seen as assigned a priority mission for anti-SSBN ASW?	C-10
2 (a) - General Soviet Appraisals of U.S. ASW	C-16
2 (b) - U.S. Budget Allocations to ASW	C-20
2 (c) - U.S. ASW Force Levels and Forward Deployment/Readiness	C-21
2 (d) - Mission-completion Capabilities of Soviet SSBNs	C-26
3 (a) - SOSUS (plus any Compatible Mobile/Portable Subsystems)	C-34
3 (b) - Shore-based VP Airlines (plus Satellites)	C-44
3 (c) - SSNs (plus SUBROC)	C-48
3 (d) - CVSs/CVs/SCSs (plus Aircraft)	C-59
3 (e) - DLs, DDs, and DEs (plus ASROC and DASH/LAMPS)	C-70
3 (f) - Mines	C-83
FOOTNOTES TO CHAPTER III	C-90

*Parenthetical source references to "FNC" are to the monthly "Foreign Naval Chronicle" in Naval Digest and are followed by the number of the month and year of the issue referenced.

1971-1976, 1 (a) -IS ANTI-SSBN ASW SEEN BY THE SOVIETS AS WITHIN THE ASW TECHNOLOGICAL STATE-OF-THE-ART GIVEN THE GREAT LEAD OF SUBMARINE WARFARE?

1972 - "...the nuclear-powered submarine...incorporates the latest achievements of scientific-technological progress...combining great striking power, high mobility and endurance, and covertness. For the latter, the environment in which the submarine operates is exploited. This medium is difficult to 'illuminate' with available means of detection."14/

- "The exceptional combat characteristics of nuclear-powered submarines, their great destructive power, and the relative invulnerability of ballistic missiles carrying nuclear warheads bring up the antisubmarine defense problem anew. This defense has acquired new importance...The opinion is heard that the contemporary surface ship is hard put to compete with a nuclear-powered submarine in speed and range of operation, and invulnerability to weather conditions and inefficiency of sonar gear. There is no need to mention secrecy of operation since a surface ship shows up at sea as on the palm of one's hand while a submarine remains hidden by a layer of water hundreds of meters thick. The critical problem of antisubmarine defense is the detection and classification of targets...Despite the rather great reliability of submarines being detected by shore hydrophone stations, it is considered aboard that low-noise missile submarines can launch their missiles from positions beyond the effective detection range of /such stationary/ detection systems."16/

- "What is it that attracts specialists to the nuclear-powered submarine as an antisubmarine defense weapon? A submarine remains hidden right up until the moment of attack. It is able to cruise in any part of the /World/ Ocean, including under the Arctic ice. Of all the antisubmarine forces, only the submarine finds itself in the same environment and under the same conditions as an enemy submarine. It's speed and endurance enable it to pursue a target or to remain in a position for a long time. The submarine, as an enemy of something like itself, has many advantages....attack submarines can easily overtake

missile submarines, which are slower.... Submarines make little noise...The sonar gear in modern antisubmarine submarines permits them to detect other submarines at great ranges. The effective range of one foreign sonar system is 55 km under favorable circumstances....In order to maintain their covertness of operation, submarines make most use of the passive mode for sound-ranging."16/

- "The antisubmarine airplane S-2 TRACKER has been in the armaments of aircraft carriers since 1954. The airplane has proven itself through use. However, its effectiveness has dropped with each passing year as a consequence of the improvements made in the characteristics of submarines."21/

- "The problem of antisubmarine warfare, in the estimation of American specialists, has been complicated extraordinarily by the advent of nuclear-powered submarines which are capable of operating with high effectiveness in the open regions of the oceanic theaters against naval forces and merchant ships on important shore objectives. Antisubmarine warfare requires enormous efforts by the heterogeneous forces of a navy and is a mix of offensive and defensive special measures and combat operations. American naval specialists include the delivery of nuclear strikes on the main base concentrations of submarines with the aim of barring their exit to the ocean and to the approaches to the U.S. coast and the conduct of active search and destruction of submarines during their transit of the ocean and in the areas of their combat /SLBM-launch/ operations."21/

- "The existing means of search for submarines in the arsenals of antisubmarine aviation /of the NATO states/ are believed not to have been improved /adequately/ and to be intended on the whole for the detection of submarines which are cruising at shallow depths, at periscope depth, or snorkeling. Means for the detection and destruction of nuclear-powered submarines are still of slight effectiveness."21/

- "Submarines equipped with missiles and long-range torpedoes along with supersonic missile aviation and missile ships are capable of destroying the

enemy in any region of the World Ocean. Submarine, surface, and air antisubmarine forces are able to detect and reliably destroy submarine targets in any hydrometeorological conditions."23/

- "The basis of our Navy is comprised of modern combatant ships...first of all, of nuclear-powered submarines with powerful missiles and homing torpedoes. The Navy has the most modern surface missile ships, surface antisubmarine ships...and powerful missile and antisubmarine aviation..."24/

- "The basis of the Navy is comprised of nuclear-powered missile and torpedo submarines, modern missile and antisubmarine surface ships, naval aviation, and naval infantry."25/

- "Our nuclear-powered submarines comprise the main strike force of the Navy. Armed with missiles with underwater launch and homing torpedoes, they are capable of successfully carrying out operational-strategic missions of destroying strike-carrier and missile-carrying units /i.e., SSBNs/ of an opponent, of inflicting strikes on important shore objectives. The striking power of naval aviation, which is armed with missiles and antisubmarine weapons, has grown immeasurably. Surface ships have received maximum development as well. Missile cruisers, antisubmarine and escort ships, and destroyers armed with powerful missile and antisubmarine weapons and new electronic systems are capable of carrying out difficult missions of warfare at sea."26/

- "The capabilities of antisubmarine aviation, equipped with modern instruments for the search and destruction of a submarine opponent, have increased immeasurably."27/

- "As a result of the change in the nature of submarine employment brought about by the advent of ballistic-missile submarines and their /constant/ patrolling in the ocean, the former importance of concentrating aviation on the destruction of submarines at their bases has been substantially decreased."31/

1973 - "The equipping of submarines with nuclear power installations and arming with ballistic missiles

of long-range with underwater start has transformed these ships into the main strike force of the modern navy, and has made them capable of carrying out a wide range of offensive missions of an operational and strategic character. Such a sharp widening and strengthening of the combat and technical potentials of submarines has complicated extraordinarily the struggle with them by antisubmarine forces.

"The search for submarines has been especially complicated in connection with their being equipped with nuclear power plants, which permits the turning of a submarine from a 'submersible', as it was before this, into a genuinely underwater ship, capable of operating underwater for an unlimited time. The detection of a submarine has been hampered substantially in connection with the sharply increased underwater cruising speed.

"Modern submarines have received the potential to move out for the attack and conduct fire with torpedoes and ballistic missiles from sharply increased distances and from a comparatively great depth. This also seriously complicates the detection and destruction of submarines by surface ships and aviation.

"The complicating of the struggle with nuclear-powered missile submarines, and consequently with that part of the missile potential which is deployed on them, is brought about, in the opinion of foreign naval specialists, by the high covertness of submarines, and consequently the growing difficulty of their search and detection. In this plan, the following have important significance: the presence of vast sea and ocean expanses, within the bounds of which can be placed firing positions for nuclear-powered missile submarines; the mobility of submarines carrying missile weapons; the good defensibility of submarines which are in a submerged state."36/

- "Military specialists in the West recognize that nuclear-powered submarines, with their capability for carrying out extended cruises at high speeds and great depths, have confronted antisubmarine defense forces with a problem of unprecendented difficulty. The fear has been expressed that the most reliable hunter of the nuclear-powered

submarine -- the surface ship -- will prove to be insufficiently fast to successfully track and attack it. Under these circumstances, great hopes are being placed particularly on antisubmarine ships on an air cushion in light of purportedly highly reassuring results of their test trials."36/

- "In comparing and evaluating the heterogeneous forces of antisubmarine defense, it is...emphasized that the combat characteristics of multipurpose nuclear-powered submarines are growing significantly faster."36/

- "...up to this time an effective means for the long-range detection of submarines has not been found... the continuous surveillance of a submarine of a potential enemy is a virtually impossible task."36/

- "Foreign military specialists consider the development of the technical means to provide reliable detection of submarines at significantly long ranges to be the most urgent problem. According to the opinion existing in NATO military circles, without the successful resolution of this problem, all the achievements in the field of antisubmarine weapons and their platforms lose their value. Moreover, it is believed that, to the extent that this problem is not solved, the submarine will continue to be the 'master' of the sea."36/

- "Already in 1917...British submarines sank 21 German submarines. Such a high effectiveness of submarine antisubmarine operations becomes especially striking when one takes into account that the countries of the Entente enlisted the services of more than 5,000 ships and 2,500 airplanes, and laid about 137,000 mines just for this purpose of antisubmarine defense. The basic methods for employing submarines against submarines were patrolling near the coast of the enemy, 'ambushes' on the routes of transit of his submarines, and cruising /i.e. , "free search/ in the areas of his combat operations. Patrolling close to enemy /submarine/ bases proved to be the most successful method."39/

- "The increase in their /submarines'/ diving depth and cruising speed in the postwar period played

an important role in the growth of this /anti-submarine/ role of submarines. The French Admiral P. Barjot states: 'The radical increase in the speed of submarines can reach the point where the majority of surface ships equipped with sonar will become ineffective'. The American naval specialist J. Mariott asserts that at speeds over 25 knots and in stormy weather the sonar of surface ships becomes virtually useless. Moreover, he and other bourgeois theorists believe that surface ships cannot detect and track submarines moving at a depth of 500 meters and more and, consequently, submarines will be practically invulnerable."39/

- "The submerged speed of nuclear-powered submarines right now is essentially equal to the speed of antisubmarine surface ships and, in the opinion of foreign experts, will exceed it by 20-30 knots in the not-too-distant future (not including ships with dynamic means of support). Even a speed of 60 knots is not considered extreme for submarines."39/

1974 - "Antisubmarine airplanes and helicopters which have modern means of combat with the submarines of an opponent in their armament are included in the order-of-battle of the /Soviet/ Navy. Antisubmarine aviation can employ its weapons /either/ independently or in cooperation with the submarines and surface ships, and successfully search for enemy submarines at sea, including nuclear-powered ones, and track and destroy them...."50/

1975 - "In the struggle against missile submarines, submarines of operational-tactical designation /i.e., torpedo-attack submarines/ hold the leading place. They now represent the greatest threat both for strategic submarines and for surface combatants and merchant ships as well....Modern submarines possess great submergence capabilities, are becoming ever quieter and faster than their predecessors; they already move under water faster than the surface ships which are hunting them. In the opinion of foreign specialists, submarines will be able to develop a speed up to 40 knots in the near future and exceed the limits of the capabilities of surface ships that track them. In addition, the speed of a surface ship,

which at one time afforded it an excellent capability for defense against a torpedo attack, now has been transformed into a liability: the higher its speed, the further away that it can be detected by a submarine.. which gives the submarine important data on the location and situation of the target and for the fire control of its weapons. In this way, a submarine, exploiting its own important properties such as covertness in antisubmarine warfare, right away gains very important tactical advantages: freedom of choice of options for maneuver and attack.

"Foreign specialists are the real way for combating the submarine threat in tactics for the joint employment of heterogeneous forces (submarines, surface ships, and aviation). It is believed that composite groups of heterogeneous surveillance are capable of most effectively carrying out this task and in this way effectively protecting one's own mission-submarine platforms but also task forces of combatant ships and large convoys."81/

- "Passive and active hydroacoustic means are classified into mobile and stationary ones. Mobile ones are installed in airplanes and helicopters, surface ships, and submarines. Since their range of detection is relatively short, stationary means play the main role in resolving the problems of long-range detection and initial classification. Only with their help are the navies of the U.S. and NATO expecting to establish /in wartime or international crisis/ submarine detection barriers and zones over great distances of the sea and ocean theaters of military action.... The rapid development of the CAESAR net of acoustic detectors enabled the American command in a relatively short time to develop a system of continuous surveillance of the underwater situation in the Atlantic and Pacific Oceans - SOSUS (Sound Surveillance Underwater System)....After detection of a target by means of SOSUS, mobile forces, most often airplanes of shore-based patrol aviation, are vectored to the region of the contact for its localization and final classification. Contact surveillance (tracking) is maintained on the submarine.82/

- "Warfare against submarines has become of national importance and one of the main missions of

navies since they have been provided with nuclear propulsion and nuclear missiles. The threat which modern submarines constitute (especially those with nuclear missiles) has created a need for the development of a /whole/ complex of special antisubmarine forces: surface ships of various types (from small antisubmarine craft up to antisubmarine aircraft carriers), submarines, antisubmarines, airplanes and helicopters....In this connection, systems of surveillance of submerged submarines have been developed aboard which monitor tens of millions of square kilometers of sea (ocean) area. In the system for antisubmarine warfare nuclear-missile weapons and outer-space means have been introduced. The importance and difficulty of the tasks of antisubmarine warfare have required impressing into use not only the forces and means of navies but also other branches of the armed forces as well. The character of antisubmarine exercises and maneuvers of the navies of foreign states attests to the fact that the resolution of the problem of antisubmarine warfare holds one of the top places in their scheme of things for combat training."84/

- "Can submarines, despite the constant modernization of antisubmarine means, accomplish strategic aims in a war at sea? A great deal of research has affirmed the high effectiveness of submarines when properly employed and provided with combat support."85/

1971-1976, 1 (b) -IS THE U.S. NAVY SEEN AS ASSIGNED A PRIORITY MISSION FOR ANTI-SSBN ASW?

1971 - "The successes of other countries in submarine construction have considerably increased the threat to the U.S., the Pentagon leaders believe. Consequently, antisubmarine warfare is now considered to be one of the top priorities for the U.S. Navy. In the view of the U.S. Naval Command, this warfare requires active operations of antisubmarine forces in regions adjacent to the bases of a probable opponent's submarines, on their transit routes to the areas of combat operations, and in the areas of combat operations themselves. /Such active operations of the U.S. Naval Command/ are also required to provide escort protection for naval and merchant ship forces."1/

- "Aircraft-carrier antisubmarine forces are assigned to combat with submarines in particular regions of the oceans and also to the conduct of the antisubmarine defense of aircraft-carrier task forces, amphibious landing forces, and of convoys during their transits."1/

- "Their /U.S. SSNs'/ basic missions are considered to be combat with submarines and the protection of their own missile submarines."11/

1972 - "There are torpedo submarines in the navies of a number of capitalist countries (and /more/ are building) which are assigned primarily to the search and destruction of the nuclear-powered missile and torpedo submarines of the enemy and also for the support of their own forces."14/

- "Antisubmarine warfare is viewed by the U.S. Naval Command as one of its main problems, the resolving of which is considered to be an important prerequisire for gaining command of the seas."21/

- "Proceeding from the enormous territorial scale and vast forces and means devoted to the protection of maritime communications and antisubmarine warfare, Vice Admiral T. Caldwell, former Deputy Chief of Naval Operations for ASW, raised the question of the need for gaining total control over the ocean expanses on the surface, underwater, and in the air. Admiral E. Zumwalt,

himself, agrees with this, considering the danger to maritime communications of the U.S. to be 'the most serious threat'. The joint use of such /multipurpose/ aircraft carriers with air-capable ships, attack submarines and antisubmarine airplanes permits the creation of mobile defense zones for ensuring the freedom of maritime communications."29/

1973 - "According to the views which have formed in the U.S., the nature and scope of the measures and efforts in preparation for antisubmarine warfare have long since passed beyond the limits of what might reasonably be understood as antisubmarine defense and at present constitute not defensive but mainly offensive operations."36/

- "While according great significance to the destruction of missile submarines directly in their bases, at the same time this possibility is not exaggerated in the military circles of the West. Rather, great attention is being given to developing an effective opposition to the combat deployment of submarines."36/

- "According to American experts, the range of these /Trident/ missiles, which is twice that of Poseidon, will make it possible to position ships carrying them in almost any area of the World Ocean. These /areas/ obviously will be separate zones adjoining the shoreline of the United States itself. In the opinion of American specialists, this will also make it possible to concentrate here the main antisubmarine defense forces, which will assume a new role -- the screening of the strategic /submarine/ missile force."38/

- "The pronouncements of American specialists on the possible roles of the general-purpose forces are also of considerable interest. They are defined in general terms as insuring 'control of the sea'. The 'control-of-the-sea' concept presupports the development of the general-purpose forces to 'protect the maritime shipping communications of the United States and its allies, to protect the interests of the United States in possible crisis, and to maintain an American 'overseas presence'."38/

- "The NATO naval forces hold regular maneuvers off the European coasts under various code names. In September of last year, 300 ships, 700 aircraft and about 64,000 men took part in regular maneuvers in the North Atlantic (with the codename STRONG EXPRESS). The maneuvers were led by U.S. Admiral Charles Duncan, British Admiral Edward Ashmore, and General A. Goodpaster, Supreme Allied Commander of NATO Forces in Europe. The maneuver's operations zone embraced the entire North Atlantic ocean area and the adjacent land regions. During the maneuvers, joint /NATO/ exercises were carried out for attack submarines, control of the sealines of communications, offensive operations by attack aircraft carriers groups, and landings on the Norwegian coast."38/

- "One of the main missions for torpedo submarines (especially nuclear-powered ones) became antisubmarine warfare in accordance with the principle "Sink all submarines!" regardless of whether it was a missile submarine or a torpedo one (/since/ classifying them by their noise was practically impossible)."39/

- "At the present time, two basic types of nuclear-powered submarines have been developed: missile and torpedo (multipurpose); the basic role of the latter is the destruction of the former."39/

- "Submarines of the Los Angeles Class are assigned in particular for the antisubmarine defense of aircraft carriers groups."48/

1974 - "It is considered that antisubmarine warfare... must be conducted by use of active, offensive operations. And for its realization is foreseen the continuous tracking of each submarine during its transit from its base and quick destruction at the outset of a war. The greater part of this mission is being worked out in the northeastern part of the Atlantic and near the eastern shore of the North American continent."49/

- "Task Force 70 /of the U.S. 7th Fleet in the Western Pacific/ is a composite one. Depending on the situation and the missions assigned, it includes several task groups of various forces of the fleet: an aircraft-carrier hunter-killer group (APUG), ship and aviation hunter-killer

groups, and also groups of minesweepers, submarines, etc..."

"Task Force 72 consists of patrol forces in the Taiwan Straits area. It includes a division of destroyers and a squadron of P-3 ORION airplanes of shore-based patrol aviation. Its main assignment is surveillance...and antisubmarine search."55/

1975 - "Their /U.S. SSNs'/ basic role is combat with the submarine and surface forces of the enemy."64/

- "In 1972-'73 the U.S. Navy tested the suitability of the HARRIER for the future SCS light, aircapable ships with the aim of providing air and antisubmarine defense for these ships and for convoys."66/

- "Delivery to the Navy of 105 SH-2 SEA SPRAY helicopters for use in the LAMPS ship system will be made in 1975....These helicopters are intended for providing antisubmarine and air defense ships." (FNC 6/75)

- "Antisubmarine aircraft carriers, in the opinion of foreign specialists, are intended for carrying out the following missions:

  -antisubmarine defense of combatant-ship forces, primarily of aircraft-carrier task forces and operational amphibious-landing forces in transit of the sea;
  -defense of territory of the U.S. from submarines armed with ballistic missiles;
  -antisubmarine defense of the sea and oceanic lines of communications; and
  -command and control of the combat operations as the flagship of the forces and means of antisubmarine hunter-killer groups."71/

- "...multipurpose aircraft carriers of the /U.S./ Navy will be able to carry out missions of antisubmarine warfare, mainly with the aim of self-defense."78/

- "Nuclear-powered submarines with ballistic missiles, having been recognized as the main strike force of a modern navy, have also attracted attention to themselves as the basic target for the

operations of all the other forces of a navy. Warfare against these missiles platforms, the effort to destroy them before they can employ their weapons, has become one of the top priorities of navies.../However/, as the foreign press notes, the solutions to the basic problems of this matter 'are to be found /only/ at the sources of the economic and political life of the country'."81/

Foreign specialists see the real way of combating the submarine threat in tactics for the joint employment of heterogeneous forces (submarines, surface ships, aviation). It is believed that composite groups of heterogeneous forces in combination with stationary systems of hydroacoustic surveillance are capable of most effectively carrying out this task and in this way effectively protecting not only one's own missile-submarine platforms but also task forces of combatant ships and large convoys."81/

- "The character of the antisubmarine exercises and maneuvers of foreign navies attests to the fact that the resolution of the problems of antisubmarine warfare holds one of the top places in their scheme of things for combat training. In it are included offensive operations for the destruction of submarines in the shipyards, at their bases, in transits at sea, in their combat patrol areas and combat /missile-launch/ positions, antisubmarine defense of the strike forces of the navy /i.e., both CVAs and SSBNs/,antisubmarine defense of convoys, /troop/ transports /i.e., merchant ships sailed individually without escort screens/, and for the antisubmarine defense of important regions and objectives in the open sea (ocean) and offshore."84/

- "Up until the Second World War, destroyers were assigned for the delivery of torpedo and gunfire attacks on surface targets. With the advent of the new means of war at sea, the character of the missions carried out by destroyers changed as well. Antisubmarine and anti-air defense of aircraft carrier forces, convoys, amphibious forces, and also fire support during amphibious landings or from seaward directions to support the ground forces, the conducting of blockade operations, reconnaissance, and tracking are /all/ assigned to them now."87/

- Alleges that one of the missions of U.S. aircraft carrier task forces was "to cover the regions of patrolling of the strategic missile submarines of the U.S."92/

1971-1976, 2 (a) - GENERAL SOVIET APPRAISALS OF U.S. ASW

1971 - "Enormous attention is being accorded by all of the capitalist naval powers to the development and improvement of the forces and means for warfare against submarines."....The direction of the development of the modern navies of the capitalist countries attests to an effort to develop such forces and means as would be capable of conducting warfare against submarines in any region of the World Ocean."12/

1972 - "Vigorous search for the most effective methods and means for antisubmarine warfare has characterized the development of the navies of the U.S. and other capitalist countries in recent years. Special antisubmarine surface ships, airplanes, and helicopters are being built. In this plan, great attention is being accorded to the development and improvement of antisubmarine aircraft carriers and helicopter carriers, which are the basic types of ships of aircraft-carrier hunter-killer groups of antisubmarine defense..."21/

- "Judging from the statements of the leading figures of the /U.S./ Navy and the Pentagon, such operations as protection of maritime communications and antisubmarine warfare now constitute a complicated system into which are drawn reconnaissance and combat aviation, both carrier-based and shore-based, special helicopters, antisubmarine submarines (that is, attack submarines armed with torpedoes), surface ships specially adapted for antisubmarine warfare and possessing special weapons and electronic equipment, antisubmarine aircraft carriers and a widely-deployed system of search and identification of submarine targets carried out by air, surface, underwater, and ocean-bottom means."29/

1973 - "In the evaluation of the military specialists of the U.S.A., the combat means which were until recently in the arsenal of the U.S Navy, and were to some extent effective against diesel submarines, have proven to be little effective for the struggle with nuclear-powered submarines. One of the most prominent leaders of American antisubmarine defense noted that, in spite of the serious development of antisubmarine forces and

means, the underway covertness of modern nuclear-powered submarines gives them the advantage over forces and means of antisubmarine defense.

"As is believed in the West, the lag in the development of forces and means of antisubmarine defense along with the perfection of the submarines themselves has served as a self-apparent stimulus for efforts directed toward the liquidation of this gap.

"The continuous widening of the scale of experimental-design work and the rapid growth of allocations earmarked for the maintenance and development of antisubmarine forces and means is a most important feature of the measures being conducted in recent years in the U.S.A. for preparation for the struggle with submarines. However, even these measures have not as yet given tangible results. In the foreign press it has been noted that much still needs to be done before a sufficiently effective system of antisubmarine weaponry will have been developed."36/

- "In the overall system of military preparations, one of the paramount places in aggressive foreign circles is accorded to strengthening of the naval forces including the preparation for antisubmarine warfare which is one of the links of imperialist strategy..../However/ they in the West do not over-estimate the effectiveness of their system of warfare with submarines and recognize it to be undeveloped to a large extent and incapable of fully preventing modern nuclear-powered submarines from carrying out their missions assigned them."36/

- "In assessing programs for...naval ship construction in the United States, it is also appropriate to discuss the main trends in the development of the U.S. Navy toward the end of the '70s and at the start of the '80s. The first thing that is apparent is the effort to give the U.S. Navy qualitative supremacy over the Soviet Navy. This is evident both in the efforts to improve the tactical and technical characteristics of the existing types and classes of ships....Four nuclear-powered attack aircraft carriers will be added to the general-purpose forces. It is planned to employ the non-nuclear aircraft carriers as multipurpose ships for helicopters as well as

for airplanes. Several nuclear-powered frigates will be commissioned for the purpose of screening the attack aircraft carriers. The fleet of destroyers will be largely renewed. The majority of large surface-to-surface and surface-to-air missiles and also with new aircraft, including VTOL aircraft. All of this will substantially increase the capabilities of individual /types/ of naval forces to carry out many missions independently.

"It is also planned to modernize the fleet of ships of the antisubmarine defense forces. New nuclear submarines with improved performance characteristics will supplement the ships of the antisubmarine forces. By the start of the '80s, the ships of four new types will be commissioned: a patrol frigate...an escort aircraft carrier for helicopters and VTOL aircraft (called a 'sea-control ship'), an air-cushion ship with a speed of 80-100 km/hr., and also a small hydrofoil ship armed with ship-to-ship missiles and designed to operate fairly close to the shore."38

- "An important, integral part of the process of the construction of U.S. naval forces is the development of the forces for 'antisubmarine warfare'. These are comprised of a very large number of various ships and aircraft, and also by stationary systems for the monitoring of the underwater situation."47/

1975 - "An independent direction in the development of the submarine forces of the U.S. is the building of nuclear-powered attack submarines or, as they are called, multipurpose ones, which are armed with torpedos and missile-torpedos. These ships are primarily assigned to the antisubmarine warfare....it is obvious that the main assignment of the modern navies of the Western powers is action against the territory of an opponent. At the same time, the naval forces of the U.S. and NATO also possess great capabilities for naval warfare, in the first place against submarines.

"The development of antisubmarines forces is being accomplished mainly as the result of a buildup in the numbers of nuclear-powered and diesel torpedo submarines, by refitting of the surface ship component of the antisubmarine forces, by acquisition of new antisubmarine aircraft

and helicopters, and by development of positional systems of long-range hydroacoustic surveillance. /A footnote added: "In the U.S. alone by the end of the '70s, it is planned to have about 90 nuclear-powered multipurpose submarines"/. "The U.S. already has begun large-series construction of the nuclear-powered multipurpose submarine of the Los Angeles Class (It is planned to build about 40 of this class) and the large antisubmarine ship of the Spruance Class (It is said that about 30 ships of this class will be built), the construction of 46 destroyer escorts of the Knox Class is being completed, the equipping has begun of antisubmarine ships with new, piloted, antisubmarine helicopters, which will significantly increase the capabilities for reconnaissance and for antisubmarine defense beyond the limits of operation of ships' radar and sonar. All of the frigates, destroyers, and destroyer escorts that are being built in the U.S. and NATO will have in their armaments antisubmarine missile systems and piloted helicopters. The tempo of R&D and operational development of new types of antisubmarine ships is being increased.85/

1971-1976, 2 (b) - U. S. BUDGET ALLOCATIONS TO ASW

1972 - "In the FY 1971/72 budget of the U.S. Navy, 2.9 billion dollars was allocated for the development of antisubmarine forces and means. In the FY 1972/73 budget, 3.5 billion dollars is being requested for this same purpose." (FNC 9/72)

1973 - "...the overall /U.S./ increase in the production of antisubmarine means...increased from 2.3 billion dollars in 1971 (which in itself was unprecedentedly high) to 3.5 in fiscal year 1972/73."36/

- "According to the estimates of foreign specialists, the expenditures of the U.S. Navy in the development of antisubmarine forces and means from 1971 through 1975 will increase from 2.5 billion dollars to 4.5."41/

1975 - "In the 1975 fiscal year,3.27 billion dollars were appropriated for carrying out the antisubmarine programs."82/

1971-1976, 2 (c) - U. S. ASW FORCE LEVELS AND FORWARD DEPLOYMENT/READINESS

1971 - "/The U.S. Navy's/ shore-based patrol aviation numbers...about 300 airplanes /largely/ P-3C ORIONs..."1/

- "By the start of 1970, 47 such /nuclear-powered torpedo-attack submarines/ had been built..."1/

- "The U.S. Navy was reported to have 50 such /nuclear-powered torpedo/ submarines in commission as of 1 June 1971..."2/

- "The antisubmarine aircraft carrier SHANGRI-LA has been placed in reserve. As a result, the number of /antisubmarine/ aircraft carriers has been cut back to three..." (FNC 7/71)

- "Among the ships of the /U.S. naval/ reserve are one nuclear-powered torpedo submarine...nine /antisubmarine/ aircraft carriers of the Essex Class, 244 destroyers and escort ships.... (FNC 10/71)

1972 - "There are at present 63 destroyer-escorts in the U.S. Navy and another 124 are maintained in the reserve."19/

- In the operational order-of-battle of the /U.S./ Navy at the beginning of 1972 there were 412 ships of the basic types, including...three antisubmarines aircraft carriers...214 destroyers and destroyer escorts...54 nuclear-powered torpedo submarines, 42 diesel-powered /torpedo attack/ submarines." (FNC 5/72)

- "It is planned to maintain in the order-of-battle of the /U.S./ Navy /for FY 1973/74/ 11 attack, three multipurpose, and two antisubmarine aircraft carriers, 242 cruisers, destroyers and destroyer escorts...60 nuclear-powered and 27 diesel-powered torpedo submarines..." (FNC 7/72)

- To be placed in reserve from July 1972 through June 1973 are 84 ships, including an antisubmarine aircraft carrier, two-guided missile frigates, 21 destroyers...". (FNC 7/72)

- "Out of the 740 ships in the order of battle of the U.S. Navy, 346 or about 47 percent have

antisubmarine warfare as either their main or secondary role."29/

1973 - "The U.S. Navy is now divided according to function into strategic forces...and general-purpose forces. During 1973...the latter will include 16 aircraft carriers (including the nuclear-powered Enterprise), 242 screening ships, 60 multipurpose nuclear-powered submarines and 27 diesel ones, and 66 amphibious ships. In sum, the Navy will have 594 warships and 58 reserve ships."38/

- "The antisubmarine forces of the imperialist opponent number about 300 torpedo submarines at the beginning of the '70s, including 50 nuclear-powered submarines (61 of the diesel-powered and 46 of the nuclear-powered torpedo submarines are American).39/

- Reports that 37 of the projected 46 Knox Class DEs completed.40/

- Reports that shore-based aviation of the U.S. Navy at a level of 24 squadrons of P-3 ORION airplanes that is to remain level "for the next several years. 40/

- "By the beginning of March 1973, 31 (of 37) nuclear-powered torpedo submarines of the Sturgeon Class had been completed." (FNC 5/73)

- "Pacific Fleet destroyer squadrons 1,3,11,19 and 29 have been deactivated. Eleven squadrons remain of which six are based /home-ported/ at San Diego, three at Long Beach, and two at Pearl Harbor.... ships and forces of the Navy assigned /i.e., forward deployed/ to foreign bases.... Yokosuka /Japan/, Destroyer Squadron 15 /comprised of one DLG, one DDG, and four DD/." (FNC 7/73)

- "The numbers of the ship complement of the U.S. Navy on 1 July 1973: 58 nuclear-powered torpedo submarines plus one in reserve; zero antisubmarine aircraft carriers in commission, with five in reserve; one multipurpose air-capable ship with none in reserve; 2 DLGN, 2 DLG, and 28 DDG with none in reserve; and 94 destroyers with 52 in reserve." (FNC 10/73)

1974 - "At the beginnning of 1974, the regular Navy numbered 649 ships and vessels, including 116 submarines, 14 aircraft carriers...30 frigates, 61 destroyers....In the reserve fleet there numbered 292 ships, including 10 submarines, 5 aircraft carriers,...61 destroyers....Under construction are 27 submarines, 3 aircraft carriers, 5 frigates, 23 destroyers....

"In 1974 it is planned to commission (upon completion of construction): 6 nuclear-powered torpedo submarines, a nuclear-powered aircraft carrier, a nuclear-powered guided-missile frigate, a destroyer...in 1975 - 5 nuclear-powered torpedo submarines, a nuclear-powered guided-missile frigate, 4 destroyers...in 1976, 5 nuclear-powered torpedo submarines, the nuclear-powered aircraft carrier D. Eisenhower, a nuclear-powered guided-missile frigate, 5 destroyers...in 1977 - 2 nuclear-powered torpedo submarines, a nuclear-powered guided-missile frigate, 3 destroyers.... (FNC 8/74)

- "Destroyer Squadron 9 will be /forward/ based at Guam from the spring of 1975. It is composed of /a DLG, 2 DDs, and 3 DEs/." (FNC 9/74)

- "The Number of the Ships and Aircraft of the Regular /U.S./ Navy:

Class of ship, aircraft	According to the situation 30.6.74	Planned for as of 30.6.75
Nuclear-powered torpedo submarines.....	61	67
Aircraft carriers.	14	15
Guided-missile frigates.....	29	32
Guided-missile destroyers.....	29	29
Destroyers.....	32	35
All ships, including auxiliaries...	157	148

Deck-based antisubmarine airplanes..	138	184
Airplanes of shore-based patrol aviation.....	437	429
Helicopters.....	1,286	1,276
All aircraft..... (FNC 10/74)	6,475	6,283

- "The 24 squadrons of the /ORION/ P-3B and P-3C airplanes are deployed to the following air bases: Sigonella (Italy), Rota (Spain), Lajes (Azores), Keflavik (Iceland), Kinley (Bermuda), Adak (Aleutians), Iwakuni (Japan), Naha (Okinawa), and Agana (Guam). In the reserves there are 12 squadrons of P-2 and P-3A airplanes."63/

- "As of 30 June 1975, the U.S. Navy is planned to total 67 /nuclear-powered/ torpedo submarines... 15 aircraft carriers...32 guided-missile conventional frigates, 29 guided-missile destroyers, 35 destroyers...". (FNC 12/74)

1975 - Class of ship	U.S.
Nuclear-powered torpedo submarines.....	64* 87
Diesel-powered torpedo submarines.....	15 6
Guided-missiles destroyers.....	39 62
Destroyers....	67 19
Guided-missile frigates.....	6 14
Frigates /and DEs/	63 60

*In the numerator - data as of 1.VII.1975; in the denominator - the proposed composition as of 1980.

Airplanes and shore-based aviation.....	250
Helicopters.....	about 200

(FNC 10/75)

- "As of June 1, 1976 the number of ships in commission in the U.S Navy will be cut back from 502 to 490 units. The number of aircraft carriers will be lowered from 15 to 13. (Two will be placed in reserve.) There will be four more nuclear-powered torpedo submarines.../and four/ destroyers will be commissioned." (FNC 10/75)

- "As of April 1975, orders /for the U.S. Navy/ had been placed for the construction of 75 combatant ships and auxiliaries, including...24 nuclear-powered aircraft carriers,...29 destroyers of the Spruance Class." (FNC 12/75)

1971-1976, 2 (d) - MISSION-COMPLETION CAPABILITIES OF SOVIET SSBNs

1971 - "The main force of our Navy -- the nuclear-powered submarines -- are capable of destroying from great distances both targets at sea and important objectives on the seacoast and in the rear of an enemy." 3/

- "...Our strategic missile forces...together with our nuclear-powered missile submarines of the Navy are the main means for the deterrence of an aggressive and a reliable shield covering the world system of socialism....now nuclear-powered submarines, which are armed with missiles and long-range homing torpedoes, along with missile-armed naval aircraft form the basis of our Navy's combat power. There has been a substantial increase in the combat capabilities of our various surface ships that are equipped with modern weapons for destroying targets on the surface, submerged, and in the air." 4/

- "Such /nuclear-powered/ submarines are capable of striking enemy strategic targets at a range of 1,000 kilometers and of hitting enemy /surface/ ships and submarines with cruise missiles and torpedoes." 6/

- "Our submarines, surface ships, and aviation are equipped with combat means capable of destroying various underwater, surface, and air targets in any region of the World Ocean." 7/

- "A special role in contemporary combat operations belongs to submarines, the most developed and powerful ships. Armed with ballistic missiles and enormous flight ranges and an accurate system of guidance, they can inflict powerful strikes on military objectives on the shore of the enemy from any point in the World Ocean. The submerged missile-launch capability affords covertness and surprise in delivering their weapons. Our present-day nuclear-powered submarines constitute the main striking force of our Navy. Their numbers and quality fully correspond to the requirements for successfully carrying out the missions for defense of the state interests of the Homeland on the sea and oceanic expanses. In constituting a formidable force of inexorable retaliation to aggressors if they should ever dare to

unleash a war, our submarine fleet fulfills a most important function of peace under contemporary conditions."8/

- "Nuclear-powered submarines armed with missiles with underwater launch and homing torpedoes have become the most powerful ships in our Navy. A nuclear-powered submarine cruiser is capable of launching missiles with nuclear warheads from a submerged position thousands of miles away from the target while itself remaining virtually invulnerable."9/

- "Nuclear-powered submarines with ballistic missiles carrying nuclear warheads are capable of inflicting strikes on the strategic objectives of an opponent from thousands of miles away and of destroying the surface ships and submarines of an opponent with cruise missiles and torpedoes."10/

- "Equipping submarines with nuclear-powered weapons...gave them the capability to act against objectives...in the depth of an enemy's territory...nuclear-powered submarines...constitute a very difficult target for antisubmarine forces."11/

1972 - "...the strategic forces of navies /i.e., SSBNs/ ...are not capable of realizing their capabilities in full measure without the appropriate support of other forces. And in the event of a conventional start of a war /between the superpowers/, they /Soviet SSBNs/ will, in general, be held in reserve."14/

- "Arming submarines with long-range missiles enables them to operate...at a considerable distance from the shore of a probable enemy, reliably protected by surface ships and aviation. These submarines can launch their missiles both while transiting and when leaving their bases and even from points along the shores of the American /read "Eurasian" in this obvious surrogate use of the U.S. Navy's SSBNs for the USSRs/ continent. Arranging launch areas close to one's own shores appreciably simplifies the organization of the war and cuts down on the expenditures of fuel and time spent on ocean transit."15/

- "Despite the rather great reliability of submarines being detected by shore hydrophone

stations, it is considered abroad that low-noise missile submarines can launch their missiles from positions beyond the effective detection range of /such stationary/ detection systems."16/

- "The Navy has developed into a formidable force. The main strike force of our Navy is comprised of nuclear-powered submarines armed with long-range missiles and homing torpedoes...Soviet naval personnel have repeatedly demonstrated on long cruises their readiness to carry out the most difficult missions."32/

1973 - "...nuclear weapons have enabled the submarine forces of the /Soviet/ Navy to become part of the Strategic Nuclear Forces of the Country. The ballistic missiles of submarines insure the capability for destroying from different directions the strategic targets of an enemy located in the depths of his territory."32/

"Thus, as a result of its arming with strategic nuclear weapons, the /SSBN force of the/ Navy objectively acquires the capability not only of sharing in the destruction of the military-economic potential of an aggressor but also becomes one of the most important factors for the deterrence of a nuclear attack. In this connection, missile submarines, due to their greater survivability in comparison to land-based missiles, are an even more reliable means of deterrence."33/

- "Underrating the necessity for support of the operations of submarines by aviation and surface ships in the two previous world wars cost the German command dearly....We require not only submarines but various kinds of surface ships.33/

- "The /Soviet/ Navy is a formidable force. Its main striking arm, nuclear-powered missiles submarines armed with ballistic missiles, combines great striking power, mobility, and virtual invulnerability."34/

- "Today's nuclear-powered submarines, armed with ballistic missiles with underwater start, are capable of carrying out a wide range of offensive missions of an operational and strategic character, and can inflict strikes on objectives of the enemy from any point of the World Ocean.

"The high combat stability of these ships, achieved by their covertness underway, their surprise application of weapons, great speed of underwater cruising, and the capability of remaining in the ocean at combat readiness for a prolonged time has made nuclear-powered submarines a very 'difficult' objective for antisubmarine forces."36/

- "Over the 25 postwar years, the diving depth of submarines has more than doubled and the significance of this factor for increasing the covertness of submarines is difficult to overestimate."36/

- "In the tactics of /U.S./ amtisubmarine forces, the destruction of submarines during the combat-deployment stage is given significant attention, especially because, up to this time, no effective means for the long-range detection of submarines has been found. They can, as before, reliably conceal themselves in the depths of the seas and oceans and remain in constant readiness for launching their missiles. As foreign naval specialists acknowledge, under contemporary conditions the continuous surveillance of a submarine is a virtually impossible task. Just for this reason there exist /U.S./ plans for the employment of antisubmarine submarines in the regions close to the bases of the opponent's missile submarines, on their transit routes to the regions of combat patrolling, and in the most likely combat patrol areas."36/

- "The militarist circles of the imperialist countries see in the powerful submarines of the USSR, which are armed with modern nuclear-missile weapons and are prepared for successful operations /even/ under conditions of a /highly/ developed antisubmarine defense, one of the serious obstacles in the path of the realization of their aggressive plans. In these plans, they do not overestimate in the West the effectiveness of their system of warfare with submarines and recognize it to be, to a large extent, undeveloped and incapable of fully stopping modern nuclear-powered submarines from carrying out their assigned missions."36/

- "We have received qualitatively new ships which have extensive capabilities for antisubmarine

warfare. The uniting of the tactical-technical advantages of the helicopter with the ship, the embodiment of which is the antisubmarine cruisers of the Leningrad Class, has proven to be successful. Antisubmarine airplanes, carrying modern sensors and weapons on board, are an important means of antisubmarine warfare."45/

1974 - "Nuclear-powered submarines, which possess high cruising speed, good maneuvering qualities, and the capability of operating at great depths, can penetrate antisubmarine curtains successfully."50

- "The antisubmarine forces of the /Soviet/ Navy include antisubmarine cruisers, large and small antisubmarine /surface/ ships, submarines, airplanes, and helicopters. They are capable of carrying out search and destruction of enemy submarines not only in their own coastal zones but also in distant regions of the open seas and oceans. The cruising speed and seaworthiness of antisubmarine ships has increased and the weaponry and electronic gear have been improved. The joint employment of antisubmarine ships, antisubmarine airplanes and helicopters is effective in warfare against submarines, including nuclear-powered ones."50/

- "At the present time, the main means capable of carrying out the basic missions of the Navy are nuclear-powered submarines, which are armed with various missiles and homing torpedoes....They can deliver strikes from great distances both on targets at sea and on objectives on land situated on the coast or in the rear."51/

- "...a nuclear-powered missile submarine is capable of delivering an accurate and powerful strike on strategically important targets at very long range. Naturally, the success of such an attack will depend largely on whether the missile platform can remain undetected until the moment its weapons are used, and, more precisely, whether the ship's commanding officer and the whole crew can maintain secrecy for an extended period under the difficult situation of antisubmarine warfare."56/

- "Nuclear-powered submarines are...armed with long-range ballistic missiles....In the event of necessity, nuclear-powered submarine can cover a

great distance covertly and take up a favorable position for the delivery of a strike on an aggressor."59/

- "Modern submarines...provide the /Soviet/ Navy with the capability...to reliably destroy important ground objectives in the depths of enemy territory."60/

- Argues that the development of /Soviet/ SSBNs into a reliable weapons system requires that they be given greater "defense-in-depth" by other naval forces including a more extended range of reconnaissance.62/

1975 - "At the present time, nuclear-powered submarines armed with various missiles and homing torpedoes are the main means capable of carrying out the basic missions of the Navy. They can deliver strikes from great distances on targets at sea and on land, on the coast and in the rear of an enemy."67/

- "Atomic energy and nuclear weapons combined with various types of missiles and electronic gear have given the /Soviet/ Navy new characteristics and advanced it to the ranks of the strategic forces capable of exerting a decisive influence not just on the course and outcome of major operations in large theaters of military action but also on the /course and outcome of the/ war as a whole. Possessing ocean-going, nuclear-powered submarines and modern surface ships, including ones with aviation weaponry, the Navy has become capable of operating worldwide, projecting its power not only over the ocean but also to land areas on distant continents."68/

- "It /the Soviet Navy/ has nuclear-powered submarines armed with...ballistic missiles and homing torpedoes, naval missile and antisubmarine aviation...surface ships of various types -- missile cruisers, antisubmarine ships...".72/

- "Nuclear-powered submarines armed with long-range missiles, naval missile and antisubmarine aircraft, various types of missile and antisubmarine surface ships...now constitute the basis of the /Soviet/ Navy's combat might."73/

- "Nuclear-powered submarines...have now become the main striking power of the /Soviet/ Navy and... are armed with long-range ballistic missiles and homing torpedoes....No less formidable are the supersonic naval missile aircraft that...are capable of delivering...strikes against naval forces and enemy bases and coastal targets... Antisubmarine aircraft have on board excellent equipment for the rapid detection of enemy submarines and the weapons to destroy them."74/

- "The nuclear-powered submarine armed with long-range ballistic missiles...and homing torpedoes is the pride of Soviet shipbuilding...Supersonic naval missile aircraft...are capable of delivering...strikes against naval forces, bases, and shore targets of the enemy....Aircraft of the antisubmarine force possess great technical capabilities for the rapid detection and destruction of the enemy's submarines. All types of surface ships have also undergone considerable changes..: missile cruisers, antisubmarine ships..."75

- It's /the Soviet's Navy's/ basis consists of nuclear-powered submarines, naval missile and antisubmarine aviation, and various types of missile and antisubmarine surface ships...".76/

- "New missile, antisubmarine...and other surface ships and submarines, which have great endurance, unlimited seaworthiness, great striking power, and combat stability, are capable of carrying out a wide range of missions successfully in a war at sea."77/

- "Submarines of operational-tactical designation /that is, torpedo-attack submarines/ are increasingly... being employed for the protection of the combat patroling of strategic submarines. In the opinion of foreign specialists, this basically strengthens /these/ units and significantly decreases the degree of threat to them by submarines."81/

- "Can submarines, despite the constant modernization of ASW means, accomplish strategic aims in a war at sea? A great deal of research has affirmed the high effectiveness of submarines when properly employed and provided with combat support."85/

- "Thus, in nuclear-powered submarines are concentrated all of the basic indices which characterize the power of a navy: great striking power, high mobility and stealth, the capability of conducting combat operations on a global scale for destruction of important ground objectives, and the submarines and surface ships of an enemy."85/

- "Now the /Soviet/ Navy is capable of carrying out strategic missions not only for the destruction of important ground objectives of an enemy but also for the destruction of nuclear-powered submarines at sea."85/

- In an obvious surrogate for the Soviet Navy's Delta Class SSBN, it was asserted that the longer range of Trident missiles would "enable submarines located in their bases or in the coastal regions...to deliver strikes in the...continent."88/

1976 - "At present, the main means capable of carrying out the basic missions of the /Soviet/ Navy are nuclear-powered submarines armed with various missiles and homing torpedoes. The Navy also has at its disposal missile, antisubmarine,...and other surface ships...Naval missile aviation is an important means for the destruction /of the naval forces/ of an opponent."91

1971-1976, 3 (a) - SOSUS (PLUS ANY COMPATIBLE MOBILE/ PORTABLE SUB-SYSTEMS)

1971 - "The development and modernization of passive hydroacoustic systems for the detection of submarines and the classification of contacts with underwater targets is continuing in the U.S.

"In addition to modernizing the mobile systems for search for submarines, the U.S. Navy Command has been according great attention in recent times to the modernization and the development of new positional means of detection intended for two tasks:

/1) / Detection of submarines whenever they penetrate the very long ASW barriers;

and

/2) / The surveillance of submarines at considerable distances from one's own coasts.

It is the requirements for carrying out these tasks that have determined the main directions of the development of positional hydroacoustic means.

"In the U.S., work has been carried on for the past decade for developing a system for the detection of submarines on the far approaches to the American coast -- Project TRIDENT and also the passive systems CAESAR for the Atlantic coast of the U.S. and COLOSSUS for the Pacific. The acoustic antenna for these are erected within the limits of the continental shelf.

"Deep-water manned hydrophones are being developed in the U.S. at present. Their crews will be comprised of ten men who will be able to work water for a month. The installation of such stations at depths up to 2,000 meters will permit the forward stationing of the acoustic antennae out to 200 miles from the shore.

"Significant means have been expended for these systems of Project TRIDENT: 20 million dollars in 1965, 22 million in 1967, and about the same amount was spent in 1970."7/

- "The solution of the antisubmarine warfare problem under present conditions is closely connected to the development of means for the reliable detection and destruction of low-noise

targets that are moving at high speeds an at great depths. Consequently, equipment for the detection of submarines is being developed by navies abroad in not just the acoustic field but in other physical fields as well."12/

1972 - "Foreign experts accord an important role in antisubmarine warfare to fixed or positioned antisubmarine installations. Their purpose is to detect a submarine on the far approaches to a coast. A fixed hydroacoustical system consists of a network of sound-ranging stations and low-frequency hydrophones that are mounted within the limits of the continential shelf below the disturbances in the upper layer....Such systems permit the detection of submarines hundreds of kilometers from shore. In May 1968, the American CAESAR system was used to determine the approximate location of the loss of the nuclear-powered submarine SCORPION (830 km southwest of the Azores)....

"Independently-operating hydroacoustical stations which work like sonobuoys are positioned on antisubmarine barriers. They transmit detection data by radio to a shore post, airplane or ship. The signals from such buoys can also be received by earth satellite.

"Despite the rather great reliability of submarine detection by shore hydrophone stations, it is considered abroad that low-noise missile submarines can launch their missiles from positions beyond the effective range of detection systems. Therefore, new ways for long-range detection of submarines are being sought -- for example, installing nuclear-powered hydrophones at great depths thousands of meters from shore."16/

- The book Aircraft Carriers and Helicopter Carriers, despite rather extensive discussion of antisubmarine zones and barriers established by the U.S. and of the "forces and means" employed in those zones and on those barriers, never hinted at the existence of any stationary "means" for ASW in the American "arsenal".21/

- "An evaluation of the strategic measures taken by the U.S. for the preparation of potential theaters of military action in the ocean could not be

complete without a look at the problems connected with the development of a global system of surveillance, detection, and identification of submarine targets. The best-known of the systems of submarine detection, that on the far approaches to the Atlantic coast /of the U.S./ is...the positional CAESAR system of passive hydroacoustics. It is installed on the continental shelf at a depth of about 200 meters. As a supplement to it, the COLOSSUS system was added in 1964. The SEA SPIDER hydrophone system is being installed along the Pacific coast and near the Hawaiian Islands. All of these systems, as well as a number of others (BARRIER, BRONCO) are integral parts of the overall SOSUS detection system and are based on the passive principle of hydroacoustics. The ARTEMIS system, which employs extremely powerful low-frequency sonar is intended for long-range detection of submarines and should become the active component of SOSUS.

"All of these systems of hydrophones and sonar, according to the Western press, are intended primarily for the establishment of antisubmarine barriers with the aim of interdicting the potential routes of exit of the submarines of a putative opponent into the open ocean. Among them are named barriers between Greenland and Scotland, between Japan and Alaska, and at the Azore Islands. In addition, hydrophones of the CAESAR system can be installed along the shores of 'friendly nations'. Therefore, there is every reason to assume that the United States is developing a global net for the detection and identification of submarine targets and a system of antisubmarine barriers which occupies the entire vast expanse of the World Ocean and consequently has important strategic significance...".29/

1973 - "Stationary (positional) hydroacoustic means have received special development in the U.S. Their basic function is the long-range detection of nuclear-powered missile submarines and the vectoring of patrolling antisubmarine forces to the target for its direct tracking (or destruction). Work is being carried out on several programs. One of these -- CAESAR -- provides for the development of a net of passive hydrophone-detectors within the confines of the continental shelf and on underwater heights....In another program -- ARTEMIS -- the possibilities of

developing stationary means of detection employing very powerful....low-frequency sonar transmitters has been under investigation."35/

- "It is planned to equip the antisubmarine barriers and zones (mainly in the Atlantic) with the MSS, SAS, and COLOSSUS systems. In the MSS detection system, sonobuoys will be used which are dropped from ships or airplanes and which automatically anchor themselves. It is considered that it /the MSS System/ can be deployed rapidly in any operational direction. The experimental model is scheduled for delivery in February 1972.

- "However, foreign specialists note that the stationary means presently available do not meet the expanding requirements for reliable monitoring of the underwater environment for the timely detection, and, most importantly, the classification of the new low-noise submarines. So, research in the field of developing other means of detection is being continued. Along with existing means, they must constitute a constantly-operating system of submarine surveillance."35/

- "...up to this time, no effective means for the long-range detection of submarines has been found...the continuous surveillance of a submarine of a potential enemy is a virtually impossible task."36/

- "The antisubmarine forces of the /U.S./ Atlantic Fleet integrate the submarines, surface ships of various types, aircraft carrier-based and shore-based antisubmarine aviation, and also the system of stationary means of long-range antisubmarine surveillance which operates in the /Atlantic/ theater...As the Western press has noted, antisubmarine barriers have been established on the probable routes of transit of /Soviet/ submarines, and the East coast of the U.S. is covered by stationary hydroacoustic systems."37/

- "No mention was made of SOSUS in a Naval Digest article titled "Perspectives for the Development of the U.S. Navy in the '70s" which discussed virtually every important aspect of current U.S. naval development except what the U.S. was doing for anti-SSBN ASW including steps for the improvement of the SOSUS system. The alleged "blue-waters" strategy" of the U.S. was mentioned

as were purported U.S. R&D efforts to evolve an effective "global strategy". Also discussed were all the various types of forces and weapons being built for ASW, including the development of "multipurpose" aircraft carriers and submarines. The absence of any discussion of such an important aspect of U.S. naval strategy suggested that SOSUS was deemed either too unimportant or too sensitive to discuss.40/

"U.S. Navy expenditures for development of antisubmarine forces and means from 1971 through 1975, in the estimates of foreign specialists, will increase from 2.5 billion dollars to 4.5; the greater part of this sum is going for the development of means of submarine detection. The ultimate aim of all this work is the development of a global system of submarine surveillance throughout the World Ocean.

"At present, all hydroacoustic means of surveillance of submarines are part of the SOSUS system. It includes shipboard, airborne, and stationary means of search....Stationary /positional/ means of submarine detection are the basis of the entire SOSUS system. The most developed at present is the CAESAR net of stationary /hydrophone/ detectors, which became operational initially along the U.S. Atlantic coast; in 1969-'70, along the Pacific coast....In 1972, the Americans started expanding the zones of operation of CAESAR into the Caribbean and Gulf of Mexico. For deployment into the regions of the Atlantic located beyond the zones of operation of CAESAR, the SAS System is being developed. It will include a net of...hydrophones on botton-installed tripods...The SAS System will be unique for the width of its acoustic range, its high sensitivity, and high date-transmission speed. Its cost, apparently, will exceed one billion dollars. In addition, it is planned to equip the antisubmarine barriers with the MSS and COLOSSUS systems." MSS was described as based on anchored sonobuoys that would operate for 90 hours. Simultaneous (i.e. real-time) transmission of submarine position data to the ASW forces by a special information system OSIS was stressed.41/

1974 - "...exceptional importance is ascribed to these SOSUS sub-systems by the American command."53/

- Widening the coastal zone of submarine detection presents great difficulties....It is considered that the effectiveness of the detection barriers can be increased by extensive employment of automatic aviation equipment /sonobuoys/. One of the feasible options would be to employ the MSS system /of more durable sonobuoys/."53/

- In 1971 the Canadian Navy started work in the region of Lincoln Bay for establishing a barrier across the entrance from the North Arctic Ocean into the Baffin sea /sic-bay/.53/

- "It is planned /in the U.S. Navy/ to develop an integrated system for the collection, processing, and display of such /submarine positional/ data from all sources, including from positional and stationary means. In the opinion of foreign specialists, development of such a system will make possible the more effective conduct of antisubmarine warfare."53/

- "The view is being expressed that the collection of data from positional means by satellite permits development of a 'global' system of submarine detection and tracking."53/

- "A special role is accorded to the matter of the correct classification of the hydroacoustic contacts gained. For this reason, the question is being studied intensively abroad employing computers for classification."53/

- "It is expected that a well-equipped and automated shore command center /for the SOSUS system/ would make it possible to increase the effectiveness of the mobile forces supporting the system and the distant (ASW) barriers for submarine detection by two times and more."53/

- "...the stationary and positional systems for submarine detection are considered abroad as a most important, integral part of the overall system for antisubmarine warfare."53/

1975 - "A positional system for the...detection of submarines has been installed along the /East/ coast of the U.S. The system's hydrophones are positioned on the continental shelf...in the sector from Florida... to Nova Scotia. Due to the exploitation of underwater sound channels, an

extended range of detection is obtained." (FNC 2/75)

- "Warfare with (SSBN) missile platforms...has become one of the top-priority missions of navies.....

  "Among the many qualities characteristic of submarines, the covertness of their operations remains highly important.

  "The hunt for...solutions to the timely detection of submarines has led to the appearance of various systems of underwater surveillance in those regions where the use of strategic submarines is most likely. The U.S. Navy, for example, already has turned to the development of a global net for the detection and identification of submarines, having in view the development of a hydroacoustical field...for the detection of any submarine which enters the limits of the field. Such a system, in the estimation of specialists, would permit not only the detection of missile submarines but also the determination of their location, that is, would provide full information on each enemy submarine to allow 'the inflicting on it of a strike without warning and within a few minutes'. All of this is a manifestation of one of the leading trends in the development of naval tactics -- that for submarines of improving their covertness and for antisubmarine forces of depriving submarines of that advantage."81/

- "At the end of the May 1968 the American nuclear-powered submarine Scorpion was lost while transiting from the Mediterranean to the United States. The moment of the breaking of the solid hull had been fixed by several hydrophones. Thus, it was possible to establish the location of the sunken submarine -- 450 miles southwest of the Azores. With this data, the search forces easily found the ...Scorpion at the end of September. In this manner, the effectiveness of the new submarine detection system was confirmed."82/

- "In 1972, the Budget and Finance Committee approved a plan for improving the existing barriers or zones on the far approaches to the /U.S. East/ coast and to straits and also for the establishment of new ones. To this end, substantial means are being expended.

For example, out of 327 million dollars allocated for carrying out ASW measures in FY 1975, almost 25 percent (80 million dollars) were spent on the development of a global system of long-range hydroacoustic surveillance."82/

- "The American Naval Command accords importance to the concept that the data gathered by all of the sources of hydroacoustic underwater surveillance (SOSUS), after processing at shore centers, be transmitted /in real time/ to the antisubmarine forces. One of the measures directed at solving this task is the development of a specialized information system, OSIS, with shore stations for the processing and forwarding of data to ships and airplanes located at sea and in the air. As SOSUS is perfected and its zones of operation are expanded over the World Ocean, the Pentagon plans to establish a single operating system of hydroacoustic underwater surveillance under the global command of the U.S. Armed Forces...".82/

- "From everything related above, it is clear that the main assignment of the modern navies of the Western powers is for action against the territory of an enemy. At the same time, the naval forces of the U.S. and NATO also possess great capabilities for naval warfare and, in the first place, for antisubmarine warfare.

  "The development of the antisubmarine forces is being effected mainly by way of an increased buildup in the number of nuclear-powered and diesel-powered torpedo submarines, by the refitting of the surface ASW combatant force, by receiving new ASW airplanes and helicopters, and by the installation of positional systems of long-range hydroacoustic surveillance."

  "The matter of search for submarines is considerably more difficult /than in WW II/, especially for nuclear-powered ones having high speed and great submergence depths. And, although the search for them is based on the use of many physical fields...their detection poses no small difficulties....

  "Means for the illumination of the underwater environment...have acquired a most important significance under contemporary conditions. Among them, a special place has been occupied by

hydroacoustic stations and systems which are devoted to the detection of submarines and surface ships, the search for mines, protection of shipping, and to rescue work. Hydroacoustic means are being developed intensively in all navies and already have become an inseparable part of the armament of submarines, surface combatants, helicopters, airplanes, and of stationary systems.

"The extensive application of hydroacoustics has exerted a substantial influence on the development of the Navy and on /Soviet/ naval art. The potentials of hydroacoustics are far from exhausted. Work for increasing its effectiveness will continue, especially for antisubmarine warfare. Consequently, more effective methods for warfare against the forces of the enemy of a navy will continue to be developed."85/

1976 - "A continuously operating system of antisubmarine surveillance has been developed in the Pacific by the Americans for the obtaining of data on the location of diesel and nuclear-powered submarines in the theater of military action. The SOSUS system of stationary means of long-range hydroacoustic detection constitutes its basis.

"The hydrophone-detectors, as the foreign press reports, are installed in the region of the continental shelf along the coast of the North American continent and also in the underwater heights alongside the Aleutian chain and those of the Hawaiian Islands and the Kirile-Kamchatka Trench. To the north of the Hawaiian Islands, the SEA SPIDER deepwater hydroacoustic system operates (at a depth of 4,900 meters). At present, research is being conducted aimed at installing hydroacoustic means of detection in the approaches to Taiwan, Okinawa, Korea, and the Philippine Islands. In the Hawaiian Islands a joint intelligence center for the SOSUS system is being established....Antisubmarine surveillance is organized in such a manner that data on the underwater situation is provided by all forces at sea and in the air -- by surface ships and submarines in transit, in combat training areas, when conducting reconnaissance, ships and aircraft along trade and flight routes, and by airplanes of shore-based patrol aviation along the routes of their daily patrol flights. With the

aid of space satellites, surveillance of the departure of submarines from their bases or those which are surfaced or cruising at shallow depths is reported. Radio surveillance means can provide interception and direction-finding of /submarine/ radio transmissions. Special attention is given by the U.S. Navy to the antisubmarine activities of shore-based patrol aviation. In noting such positive qualities as maneuvering speed and being equipped with various means of detection and destruction of submarines, the American command believes that shore-based airplanes, in combination with stationary means of surveillance, are highly effective in the overall system of 'antisubmarine warfare'. All information on the submarine situation is collected in the processing center (San Francisco) and after technical analysis, it is plotted on a map. Notification is given to the forces on each detected target. The ultimate goal of all of these efforts is achievement of the continuous tracking of a detected nuclear-powered submarine. Antisubmarine submarines and airplanes of shore-based aviation, or special surface ships /e.g., ASW crusiers/ can be employed for the tracking."90/

1971-1976, 3 (b) - SHORE BASED VP AIRPLANES (PLUS SATELLITES)

1971 - "The /U.S./ Navy is planning to reequip 226 shore-based patrol airplanes of the P-3A and P-3B ORION types, equipping then with an improved system of passive sonobuoys -- DIFAR...". (FNC 5/71)

- "Shore-based patrol aviation, which numbers in its composition about 300 airplanes, is considered as before to be an important means for antisubmarine warfare. The P-3C ORION, which became operational in the Navy in the early '60s, must be considered as the main type. In the near future it should replace the obsolescent airplanes of the NEPTUNE and MARLIN types completely."1/

- "In the antisubmarine forces of NATO are an estimated 650 shore-based patrol airplanes of antisubmarine defense, the majority of which are all-weather ones and with adequately high speed and endurance."12/

- "/After asserting that the U.S. accords a paramount role in ASW to submarines, the article continued:/ A special place in the military plans of the imperialist countries is assigned to antisubmarine aviation which, in the opinion of foreign specialists, is capable of significantly facilitating the carrying out of the mission for warfare against submarines and of substantially lessening the overall effort of the forces. In this regard, development is being conducted for a considerable increase in the radius of operation and flight speed of airplanes, the automation of the search processes and destruction of submarines."12/

1972 - "Independently-operating hydroacoustical stations which work like sonobuoys are positioned on antisubmarine barriers. They transmit detection data by radio to a shore post, airplane, or ship. The signals from such buoys can also be received by earth satellite."16/

- "Sonobuoys enable /antisubmarine/ aviation to survey vast water regions. The one-time nature of their use is the basis of their shortcomings. Moreover, the possibility of using

sonobuoys depends on the sea state. Nonetheless, the simplicity of construction, low weight and small size, and the low cost of sonobuoys make feasible their mass application. Sonobuoys are the basic means of search being employed by anti-submarine airplanes."31/

1973 - "Despite the development and entry into use in the /U.S./ Navy of new shipborne antisubmarine airplanes, foreign specialists consider that the development of shipborne antisubmarine aviation is being conducted less intensively than that of shore-based air. This is explained by the growing effectiveness of shore-based airplanes of antisubmarine defense and by the equipping of attack aircraft carriers, destroyers, and other classes of ships with antisubmarine helicopters. It is expected that in the near future the point of defense of ships antisubmarine-wise will be carried out more by antisubmarine helicopters along with shore-based air. In the long run, this /point ASW defense/ will be carried out also by airplanes with vertical takeoff and landing."36/

- "Among a number of new means of antisubmarine warfare, /in the U.S./, there is the directional aviation sonobuoy DIFAR. As the foreign press notes, DIFAR will increase the antisubmarine detection capabilities of antisubmarine airplanes considerably."36/

- "In 1972, 24 squadrons of shore-based patrol P-3 ORION airplanes were in the order-of-battle of the antisubmarine forces. In the course of the next few years, their numbers are expected to be kept unchanged. The P-3C airplanes with improved aviation electronics are coming into the order-of-battle."40/

- "In the /U.S. Navy/ budget for FY 1972/73, funds were allocated for the purchase of...24 shore-based P-3C ORION patrol airplanes." (FNC 6/73)

- "On January 1, 1973, U.S. Naval Aviation numbered 6,815 airplanes, including...450 shore based patrol airplanes." (FNC 6/73)

- "Modern naval aviation can carry out such missions as the search and destruction of submarines..."42/

- "Antisubmarine airplanes and shipborne helicopters have proven themselves to be an effective means of fighting submarines no matter at what depth they may be located."44/

- "Naval missile and antisubmarine aviation has become an important force in our Navy. It is a formidable weapon assigned to combat the surface ships and submarines of an opponent."44/

1974 - "The capabilities of antisubmarine aviation, which is equipped with modern instruments for the search and destruction of a submarine opponent, have grown immeasurably."57/

- "There are also modern antisubmarine airplanes and helicopters in /Soviet/ Naval Aviation which are capable of locating and destroying a submarine opponent in the ocean's expanses."58/

- "Antisubmarine airplanes and helicopters, which are equipped with effective sensors and weapons for search and destruction of a submarine opponent, also have important significance."60/

- "The P-3C airplane possesses sufficiently high flight characteristics and is assigned for carrying out a vast complex of antisubmarine tasks... The P-3C is equipped with the...A-NEW system... which substantially enhances its combat capabilities in the search and attack of submarine targets. The ORION is literally stuffed with sensors,..systems for the collection, processing, and display of information... The system reportedly can handle the processing of three times as much volume of signals from sonobuoys as the earlier modification...

  "Without denying the many merits of the ORION, specialists note, however, its great weight, lack of economy, and high cost (7 million dollars) and, therefore, are recommending to the command that other alternatives be sought...

  "Along with the unarguable merits of shore-based patrol airplanes of foreign navies, substantial shortcomings are present in them as well. In the opinion of foreign specialists: they are completely helpless in an encounter with fighter aircraft and require reliable air cover. It is not always possible to provide this since the

radius of operation of fighter aviation is not great. A heavy and relatively slow machine, it is a superb target for missiles of the ship-air class, including as well those launched from submarines (for example, the British SLAM anti-air missile system)."63/

1975 - "After detection of a target is made by means of SOSUS, mobile forces, most often airplanes of shore-based patrol aviation, are vectored to the contact area for the localization and final classification of the target. Continuous surveillance (tracking) /usually by the VP airplanes/ is maintained on the submarine."82/

1976 - "Special attention is accorded by the U.S. Navy to the antisubmarine operations of shore-based patrol aviation...the American command believes that shore-based airplanes, in combination with the stationary means of surveillance, are highly effective in the overall system of 'antisubmarine warfare'.... Notification is given to the /U.S. ASW/ forces on each detected submarine target. The ultimate goal is the achievement of continuous tracking of the nuclear-powered submarines. Antisubmarine submarines and airplanes of shore-based aviation, or special surface ships may be employed for the tracking."90/

1971-1976, 3 (c) - SSNs (plus SUBROC)

1971 - "In January /1971/ a long-term contract was signed for the construction of 12 nuclear-powered torpedo submarines of the SSN 688 Class." (FNC 4/71)

- "The command of the U.S. Navy gives preference to nuclear-powered torpedo submarines among the heterogeneous forces and means provided to the Navy for antisubmarine warfare. That is why, in recent years, the construction of nuclear-powered torpedo submarines has been stepped-up along with the intensive construction of nuclear-powered missile submarines.

  "In the opinion of the Pentagon as stated by its chief, MacNamara, at the beginning of 1966: 'A study of the problems of antisubmarine warfare indicates the requirement for about 64 first-class nuclear-powered torpedo submarines'.

  "Taking into account that 23 nuclear-powered /torpedo/ submarines had been built but that four of them...could not be considered to be first-class antisubmarine submarines, it was necessary to build an additional 45 submarines. This very number was planned for construction in subsequent years. By the beginning of 1970, 47 such ships had been built and 21 more were in various stages of construction.

  "After completion of the financing of the construction of these nuclear-powered torpedo submarines of a new design with an overall cost of three billion dollars....As a result of the completion of this program, the overall number of nuclear-powered torpedo submarines in the U.S. Navy will reach 100 boats."1/

- "The military-political leadership of NATO accords exceptionally great significance to the development of nuclear-powered torpedo submarines. In addition to the traditional missions /of torpedo-attack submarines/ for the destruction of surface naval combatants and merchant ships and for the conduct of covert reconnaissance, nuclear-powered submarines armed with torpedos with either conventional or nuclear warheads are considered by the strategists of the

Pentagon to be most effective in warfare with the submarines of an opponent.

"The U.S. Navy had 50 torpedo submarines on 1 June 1971 /emphasis in the Russian original/. An additional 26 units are on order in various stages of construction.

"The most developed and representative /of the U.S. SSN's/ are the submarines of the Sturgeon Class. They were designed on the basis of the submarines of the Permit Class but having improved antisubmarine weapons, the modern sonar AN/BQQ-2, and relatively better seagoing characteristics...

"The U.S. Naval Command plans to have 105-110 nuclear-powered torpedo attack submarines in the Navy. As the nuclear-powered ones are built, the diesel-powered ones will be correspondingly mothballed."2/

- "The laying down of the last two nuclear-powered torpedo submarines of the 37 of the Sturgeon Class...is planned for June and October 1971." (FNC 6/71)

- "Five nuclear-powered torpedo submarines in the SSN 688 /Los Angeles Class...are included in the shipbuilding program for 1971/72 fiscal year." (FNC 6/71)

- "The development of torpedo weapons is taking the direction of standardization and a sharp reduction in the number of modifications. Priority is being given to antisubmarine torpedoes....One should note that the expansion in the number of weapons platforms that carry torpedoes. This is being accomplished by means of the antisubmarine missile-torpedo being married to the antisubmarine airplane and especially to the antisubmarine helicopter."5/

- "A paramount role /in ASW/ is assigned /by all of the capitalist naval powers/ to antisubmarine submarines. Their optimum development is being sought primarily by increasing their submergence depth, cruising speed, noise reduction, and to the improvement of sonar gear and special weapons."12/

- "The 50th nuclear-powered /torpedo/ submarine entered the /U.S. Navy's/ order-of-battle with the delivery of SSN 647...of the Sturgeon Class." (FNC 10/71)

1972 - "In the 1970/71 fiscal year, 87 warships were built, including two nuclear-powered, torpedo submarines..." (FNC 1/72)

- "Despite the merits of surface ships and aircraft as platforms for antisubmarine weapons, naval experts are more inclined to think the most powerful opponent of a nuclear-powered submarine is /another/ nuclear-powered submarine, a special antisubmarine submarine or, as the Americans call it, an attack submarine. Incidentally, the lost submarine Thresher was such a submarine."16/

- "The antisubmarine guided-missile weapons of submarines are represented by a single antisubmarine missile, that of the SUBROC type. Its main use is for combat against nuclear-powered submarines. The missile was developed from 1956 to 1964 and in 1965 entered into the armaments of American nuclear-powered submarines....The missile's range is 40-48 km and its flight speed is Mach 1. Target designation during firing comes from the sonar complex AN/BQQ-2 and often based only on the direction of the noise of the moving target. It is probable therefore that the missile is fitted with a nuclear charge (depth charge) to increase its effectiveness....The lack of a conventional warhead /i.e., the presumed inefficiency of SUBROC without a nuclear warhead/ is considered to be a serious deficiency of the SUBROC system."16/

1973 - "According to the situation on September 1, 1972, the number of /U.S. Navy/ ships of the main types was summarized by the following data: nuclear-powered torpedo submarines, 55 operational, 1 in reserve, and 20 under construction." (FNC 1/73)

- "An order has been placed for the construction of 12 nuclear-powered torpedo submarines of the SSN 688 Class with a delivery period from 1975 through 1977. The lead submarine of this series was laid down...on January 8, 1972 and the second...on August 12 of the same year." (FNC 1/73)

- "In modern conditions, the struggle with submarines, especially with missile-carriers, has become one of the most important missions of submarines. The defenders of such a point of view argue their view by saying that the combat qualities of submarines have grown sharply. This has seriously hampered their search and detection, tracking and destruction by surface ships and aviation....The most effective of the anti-submarine forces are those which operate in the same medium as the forces against which they are assigned. This rationale has served as one of the reasons for the development of a special class of torpedo submarines in a number of foreign navies. In recent years, the scale of construction of such submarines has been widening.

"Thus, the military leadership of the U.S.A. plans to bring...their overall numbers up to 100-110 torpedo submarines. By the middle of 1972 in the ranks of the U.S. Navy there numbered 57 nuclear-powered torpedo submarines.

"At the present time, the most modern American nuclear-powered torpedo submarine is considered to be the submarines of the Sturgeon Class. Out of the series of 40 units, about 30 have already been entered into the ranks, and the remainder are either under construction or on order.

"...The American specialists believe that the further development of antisubmarine submarines will go along the path of the improvements of the basic tactical-technical elements, and above all along the line of the increasing of the working diving depth and underwater cruising speed, the lowering of noisiness, the improvement of the characteristics of the hydroacoustic equipment and armaments, the increasing of the level of automation, the reliability of technical means and the improvement of the conditions of their servicing and repair.

"According to the views existing in the U.S.A., the first torpedo submarine, which will to a greater extent answer these requirements, will be the lead (series of thirty units) nuclear-powered SSN-688 Los Angeles. In January 1971 the U.S. Navy concluded contracts for the construction of the first 12 submarines of this class. Entry into the ranks of the lead submarine is planned

for the end of 1974. In the U.S. they believe that the nuclear-powered submarines of the SSN-688 class will be able to be used in torpedo, mine-laying, reconnaissance and rescue variations. However, the main assignment of these submarines will be warfare against the submarines of the enemy.

"American propaganda, expressing the interests of the militarist circles and placing emphasis on the loss by the U.S. of the leading place in submarine construction, is calling for a stepped-up pace of construction of torpedo submarines of the new type. In this connection, already right now, it is recognized as necessary to allocate /sufficient/ means yearly for the construction of at least three or four fast submarines of the SSN-688 class.

"At present, the importance is stressed of development of experimental submarines, designated for the testing of new concepts in the combat application of nuclear-powered torpedo submarines. It is not by chance that, along with the development of the design of the lead SSN-688 submarine, there was conducted in the U.S. over the last three years the intensive designing of a principally new experimental ship, not intended for series construction. Talk is going on now about the 'super low-noise' nuclear-powered submarine SSN-685 Glenard P. Lipscomb.

"Talk is going on about the nuclear-powered torpedo submarines of the 'Conform' design, which would be the furthest development of the nuclear-powered torpedo submarines of the interim class SSN-688 and which would begin to be built after the completion of the construction of the 30 submarines of the SSN-688 class."36/

- "It is accepted that under the new conditions, the speed of conventional torpedoes already does not satisfy the requirements for warfare against modern submarines. An identified solution to this problem is the employment of special missiles whose initial and final portions of the path to the target occur underwater and the intermediate part along an air trajectory. The antisubmarine missile SUBROC, which was added to the armament of U.S. torpedo submarines in 1965, is being /widely/ discussed. This missile is

employed with a nuclear charge. It is assigned to warfare against the fast and highly maneuverable nuclear-powered submarines /operating/ in a submerged state.... It's main merit consists of that fact that it possesses a greater range and higher speed of approach to a target than do conventional torpedoes.... It is emphasized abroad that these missiles can be employed for the delivery of strikes from submarines in the course of amphibious landing operations, for the destruction of sea and land targets, and also for carrying out a number of other combat missions. A serious shortcoming of SUBROC is considered to be the fact that its launch can be conducted only from a relatively shallow depth...and that launch produces a rather considerable noise which unmasks the submarine. Among the negative qualities of SUBROC is the absence of a charge with conventional explosives."36/

- "As a part of the development of a torpedo submarine of the CONFORM design in the U.S., work has been undertaken for the development of a new antisubmarine missile system which...should be superior to the existing SUBROC system /i.e., but still have a nuclear charge/.

  "Also being developed in the U.S. is an antisubmarine missile AUM (Advanced Underwater Missile) for arming multipurpose nuclear-powered submarines. It is planned to...provide this W-30b missile with a conventional warhead...to be a non-nuclear modification of the SUBROC missile."36/

- "Despite the existence of missiles, antisubmarine torpedoes remain the basic weapon of nuclear-powered torpedo submarines. The significance of this tactical weapon of submarines has grown markedly with the radically curtailed possibilities for submarines to remain surfaced and with their substantially increased diving depths. These characteristics of modern nuclear-powered submarines have made the destruction of submarines with other weapons considerably more difficult."36/

- "As the naval specialists of the U.S. have observed, the first evaluation tests of this /Mark 48 antisubmarine/ torpedo has demonstrated...that it can...provide U.S. submarines with a capabil-

ity to more effectively combat the newest, fast, deep-running submarines. Its advantages over the many /other/ types of American torpedoes, and over the Mark 37 in particular, have been demonstrated. As a result of these tests, the American command...will replace the 16 kinds of torpedoes in the U.S. Navy with the Mark 48."36/

- "The Americans have 46 nuclear-powered torpedo submarines....The Americans are undertaking at present the series construction of new multipurpose submarines of the SSN-688 Class.

  "The lowering of their noise, the increasing of the speed submerged cruising, and increasing the submergence depth are the basic directions of submarine development. Practical results have been achieved in all three directions. Thus, the American nuclear-powered submarine Permit built in 1966 has a noise level one and one-half times less than that of the Skipjack -- a submarine of the same class but built in 1961. The submerged speed of nuclear-powered submarines right now is essentially equal to the speed of antisubmarine surface ships and, in the opinion of foreign experts, will exceed it by 20-30 knots in the not-too-distance future (not including ships with dynamic means of support). Even a speed of 60 knots is not considered extreme for submarines...great attention is /also/ being given abroad to increasing the submergence depth of submarines."39/

- "Out of 37 nuclear-powered torpedo submarines of the Sturgeon Class, 31 had been completed by the beginning of March 1973 and the rest should be ready by July 1974." (FNC 4/73)

- "According to the shipbuilding program for FY 1973/74, the command of the /U.S./ Navy is expected to receive funds for the construction of 19 ships /including/ five nuclear-powered torpedo submarines of the Los Angeles Class." (FNC 6/73)

- "It is planned /in the U.S./ to build 46 nuclear-powered torpedo submarines over the next ten years." (FNC 8/73)

- "Among the newest American antisubmarine torpedoes is the Mark 48. Its development began in 1964 but still it is far from completion despite

the fact that the American command has expended hundreds of millions of dollars on it....According to statements of the U.S. naval specialists,...despite the existence of shortcomings, it can still enable U.S. submarines to more effectively combat the newest fast, deep-running submarines. Its superiority over the many /other/ types of American torpedoes has been demonstrated, in particular over the Mark 37 antisubmarine torpedo. In view of the results of its testing, the American command has found it to be expedient to replace the majority of the 16 types of torpedoes in the inventory of the navy with the Mark 48....It has a speed and depth of operation several times greater than those presently in the armament of the U.S. Navy. This also applies to its range which is 25 miles for the Mark 48, Mod 0 torpedo."46/

- "In connection with the development of the torpedo submarine under Project CONFORM, work has been undertaken in the U.S. for the development of a new antisubmarine missile system which should have superior characteristics to the existing SUBROC system."46/

- "Four nuclear-powered torpedo submarines were built from April 1972 through April 1973." (FNC 11/73)

- "It is planned by 1981 to bring the number of U.S./ nuclear-powered torpedo submarines up to 88."48/

1974 - "Five nuclear-powered /torpedo/ submarines will be commissioned /in the U.S. Navy/ during FY 1973/74, after which there will be 64 of them." (FNC 2/74)

- "The General Dynamics Corp. has been awarded a contract (500 million dollars) for the construction of seven nuclear-powered /torpedo/ submarines of the SSN-688 /Los Angeles/ Class...". (FNC 4/74)

- "According to the outline of the budget of the U.S. Defense Department for FY 1974/75...by [illegible] there will be in the complement of the [illegible] nuclear-powered torpedo submarines...".

- "The nuclear-powered torpedo submarine SSN-688 Los Angeles has been launched....It is the lead ship in a series of 23....Eventually, it is planned to bring the number of this class up to 43." (FNC 9/74)

  "The U.S. Navy Command maintains that there should be 90 nuclear-powered torpedo submarines in the Navy's complement. As of mid-'74 there were 61 in commission and orders had been awarded for the construction of 27 more." (FNC 12/74)

1975 - "At the present time the U.S. Navy has in commission and under construction 88 multipurpose submarines.... The U.S. has been planning to have 60 nuclear-powered multipurpose torpedo submarines of the first line by the mid-'70s and to build another 40 boats by 1980."64/

- "U.S. -- In long-term programs, there are planned for construction...26 nuclear-powered torpedo submarines of the Los Angeles Class (nine are being built already and it is intended to complete 23 by 1980)....In addition, in various stages of construction are...two nuclear-powered torpedo submarines of the Sturgeon Class...".65/

- "By the start of the '70s, antisubmarine torpedoes were determined by the U.S. Navy to no longer meet contemporary requirements; energetic measures were undertaken for the development of new ones. In 1971...in competitive sea trials the Mark 48, Mod 1 torpedo was selected and series production started in 1972....It is planned that 500 per year will be purchased until 1979. Despite this series production, R&D for improving the Mark 48 is continuing. Substantial improvements have been incorporated in the Mark 48 which reduces it self-noise which has reduced the interference with the low-frequency homing system."74/

- "For the 1975/76 fiscal year, the /U.S./ Naval Command is requesting allocations for the construction of...two nuclear-powered torpedo submarines...". (FNC 10/75)

- "The submarines of the Permit and Sturgeon classes now constitute the basis of the antisubmarine forces of the U.S. Navy. The loss of the submarine Thresher led the Americans to review the

construction plans for submarines of this type. The number of this series of submarines /originally of the Thresher Class/ being built has been cut back from 25 to 13 (with the first ship /and the entire class re-/named the Permit). Series production was /also/ continued on the basis of another design -- the Sturgeon Class (37 units) with increased reserves of buoyancy....

"Increasing the /submerged/ cruising speed of submarines is viewed by American naval specialists as one of the important directions for their improvement for antisubmarine warfare. Evidence of this is provided by the construction in the U.S. of a new series of nuclear-powered submarines of the SSN-688 Los Angeles Class. The 32-40 knot speed of these submarines is provided by a single-reactor nuclear-power plant...and is characterized by a decreased noise level."89/

- "Work on the development of weapons and equipment /in the U.S./ is being carried out...in particular for the replacement of the AN/BQQ-2 sonar, which provides detection and classification of submarine targets at distances of up to 30 miles; the AN/BQQ-5 is being developed which has better capabilities, especially for target classification....The capability for submarine detection has been increased considerably /too/ by the introduction of antisubmarine submarines of the DIMUS system, a passive hydroacoustic system capable of conducting search by narrow directional beams which illuminates even the third (convergence) zone and has a range of up to 160 km. In addition, the effectiveness of this device in the classification of the contact has been improved by spectrum analysis which permits identification of the acoustic 'fingerprint' of the detected submarine."89/

- "For installation on submarines of the Los Angeles Class, and possibly for refit of the older sonar of submarines of the Permit and Sturgeon classes, the DNA system, structured as an integral part of the hull, has been developed. In it are used the latest achievements in data processing and fire control, including for the SUBROC antisubmarine missile system.

"The towed-antenna sonar, which includes hydroacoustic countermeasures, is the latest step in

the development of means of detection installed on antisubmarine submarines...and increases the capability for detecting nuclear-powered submarines which are trailing in the shadowed section astern."89/

- "Significant efforts are being made /by the U.S./ for the improvement of weapons and guidance systems. In addition to the SUBROC antisubmarine missile system, nuclear-powered submarines have been armed with the remote-controlled Mark 48 torpedo."89/

- "Notification is given to the /U.S. ASW/ forces on each detected submarine target. The final aim of all these efforts is the organization of continuous tracking of the detected nuclear-powered submarine. Antisubmarine submarines and airplanes of shore-based aviation or special surface ships can be employed for the tracking."90/

1971-1976, 3 (d) - CVSs/CVs/SCSc (plus Aircraft)

1971 - "Of the several sub-classes of aircraft carriers available at the end of the /Second World/ War, only one -- the attack carrier -- was further developed in the postwar period."1/

- "The advisability of the continued maintenance of hunter-killer antisubmarine forces formed around the nucleus of antisubmarine carriers is being studied by the U.S. Navy in recent years. Military specialists believe that these hunter-killer groups can be replaced completely by modern airplanes of /shore-based/ patrol aviation, which possess a greater flight range, and by nuclear-powered antisubmarine submarines. At the same time, they assume that the antisubmarine aircraft carrier remains the only antisubmarine ship which is capable of carrying antisubmarine aviation onboard for conducting the antisubmarine defense of naval (and merchant) ships during sea transits. As a result of these considerations, the U.S. Government decided that as of 1970 five antisubmarine aircraft carriers would be retained in an operational status in the Navy. (The remaining ones would be placed in reserve.) The five operational antisubmarine aircraft carriers are to be provided with improved ship-based antisubmarine airplanes. The twin-engine S-3A (VSX) airplane, which will have the A-NEW system and will start being delivered to the Navy in the mid-'70s, should be just such an airplane. These airplanes, which will have a flight range of more than 2,000 km, together with the helicopters of the SEA KING type, will constitute the nucleus of antisubmarine aircraft-carrier aviation."1/

- "This summer, antisubmarine aircraft will be based on the attack carrier SARATOGA in addition to the attack and fighter aircraft. This is according to a plan for the employment of attack carriers in the capacity of multipurpose aircraft carriers." (FNC 6/71)

- "It is interesting that at the beginning of the 1950s for the struggle with submarines in distant regions, mobile aircraft-carrier hunter-killer groups (APUG), which included heavy aircraft carriers, were organized in the navies of the U.S. and the U.K. Later, they were shifted to the sub-class of antisubmarine /aircraft carrier-

CVS/. In the '60s, these ships underwent modernization and at the present time are the basic antisubmarine force of the U.S. and NATO. However, with the development of shore-based patrol aviation and the increase of their radius of action, and in proportion to the entry into the ranks of nuclear-powered torpedo submarines, the role of antisubmarine aircraft carriers is constantly decreasing, and their numbers are decreasing commensurately. In the nearest perspective, ships of this sub-class apparently will cease to exist, surrendering their place to multipurpose aircraft carriers and helicopter carriers...".12/

- "In the near future, it is planned /in the U.S./ to start serial construction of multipurpose helicopter carriers of the DH Class, which will have a displacement of 12,000 tons. They are intended to provide for the antisubmarine and antiair defense of formations of combatant ships, amphibious-landing detachments, and of convoys...and also for warfare against surface ships and submarines on the oceanic lines of communications. The typical composition of the air group of this carrier will include six vertical takeoff and landing airplanes of the HARRIER type, six heavy antisubmarine multipurpose or amphibious-landing helicopters (depending on the missions) and a detachment of helicopter minesweepers." (FNC 12/71)

1972 - "A great deal of attention is being devoted to antisubmarine aircraft carriers. The Americans are even planning to build a nuclear-powered aircraft carrier. Several tens of airplanes or helicopters will be based on each aircraft carrier."16/

- "It is obvious from information in the foreign press that the high cost of strike aircraft carriers is compelling the United States to curtail their construction somewhat....The possibilities of the development of more inexpensive so-called air-capable ships is being studied intensively. They would initially have to supplement the strike carriers and perhaps ultimately even replace them. It is anticipated that these ships will have the dimensions of modern cruisers and a flight deck along the whole length of their hull. Their armament should consist of airplanes

with vertical takeoff and landing of the HARRIER type, and also antisubmarine helicopters and helicopter-minesweepers. The standard air group is expected to consist of six /VTOL/ airplanes and a like number of helicopters....The first ship of this type, the cost of which is estimated to be less than 100 million dollars, should enter the order-of-battle at the end of the '70s."20/

- "The antisubmarine aircraft carriers of the U.S. are of the Essex Class....The further modernization of these aircraft carriers is not planned in connection with the long period of service of these ships and the run-down condition of the hulls and machinery. As the antisubmarine forces of the U.S. are developed, the role of these ships /of the Essex Class/ will drop....The construction of antisubmarine aircraft carriers is not expected in the near future as a result of the /priority/ development of other classes and types of antisubmarine ships....In a report to Congress, former Defense Secretary MacNamara has stated that practice had shown that the aircraft-carrier hunter-killer group is too expensive a system in relation to its effectiveness in comparison with the other antisubmarine forces. As the /U.S./ Navy receives new antisubmarine ships, such as nuclear-powered submarines, destroyer escorts, and ORION patrol airplanes, the importance of antisubmarine aircraft carriers will decrease even more. The continued arming of attack aircraft carriers with antisubmarine airplanes and SEA KING helicopters attests to the gradual turning away of the U.S. Navy from antisubmarine aircraft carriers. Aircraft carriers are becoming more universal, capable of carrying out the missions of delivering strikes and of air and antisubmarine defense. The obsolescent antisubmarine aircraft carriers are being removed from the order-of-battle of the /U.S./ Navy."21/

- "As a result of the successful conclusion of the trial employment of the carrier Saratoga as a multipurpose one, the /U.S. Naval/ Command considers it desirable to build the fourth nuclear-powered aircraft carrier, CVAN-70, as a multipurpose one." Each CV is to have up to 10 S-3A VIKING airplanes and 8 SEA KING helicopters. The plan for the 1980s calls for 12 CVs, including 4 multipurpose CVNs. (FNC 1/72)

- "For replacement of the expensive but little-effective and also physicaly aged aircraft carriers have come helicopter-carrying ships -- crusiers and frigates. Principally new air-capable ships of the DH Class /U.S./ and TDS (England) are being planned....On the DH, the prototype which apparently is the American helicopter carrier Guam, it is planned to deploy a composite air group consisting of six heavy antisubmarine helicopters and six airplanes with vertical takeoff and landing. The latter are assigned to antisubmarine defense of the ships and for the delivery of strikes on targets at sea."28/

- "A new /U.S./ concept of naval air power has evolved as a result of the criticism of the high cost, vulnerability, and other negative qualities of the big strike aircraft carriers. It is based on the maximum introduction on the ships of the Navy of deck-borne aviation: airplanes (mainly with vertical or short takeoff and landing) and helicopters. It is proposed that they would be based on ships of all classes of large enough size to permit them to carry deck-borne airplanes or helicopters. Such ships would be essentially small aircraft carriers of simple construction with a displacement of 10,000 to 12,000 tons, with a flat deck running the length of the ship, with an 'island' superstructure, without an angled deck, without launching catapults and other equipment characteristic of modern aircraft carriers. With the means spent on the outfitting of one nuclear-powered aircraft carrier, about seven and even more such air-capable ships could be built....As for the role of such ships, Admiral E. Zumwalt said: 'The main mission of air-capable ships would be the securing of control over communications and not the projection of sea power in the coastal zone.' Consistent with this, he proposed to designate them not 'air-capable ships' but as ships assigned for gaining control of the sea ('sea control ship'). Basically, such ships would be small aircraft carriers of the type that were used in the Second World War

  "Along with this, Zumwalt considers it feasible to deploy antisubmarine aviation on strike aircraft carriers as well, thereby converting them into multipurpose aircraft carriers."29/

1973 - "The antisubmarine helicopter in most widespread use in the U.S. is the SH-3A SEA KING , which has been in the armament of the U.S. since 1961. At the present moment, in the opinion of specialists, this helicopter already does not meet requirements. It is complicated to use and has insufficient cruising speed. At the end of 1966, an order was placed for production of helicopters of the latest modification, the SH-3D SEA KING which, American specialists consider, is superior to the SH-3A type in its flight and technical characteristics."36/

- "The construction of antisubmarine aircraft carriers, it should be emphasized, has not been conducted in the capitalist countries now for a number of years. This is a clear reflection of the fact that no unity of views on the role and place of these ships in the antisubmarine warfare system has been reached by foreign naval specialists up to the present. Diametrically opposed views continue to be espoused in the West, both on the question of which would be the most effective type of antisubmarine aircraft carriers and whether these ships are needed at all...the circumstances that antisubmarine aircraft carrier are highly vulnerable targets and themselves require the protection of ships and aviation is an important factor. /However,/ the main consideration is that an aircraft-carrier hunter-killer group, the nucleus of which is an antisubmarine aircraft carrier, is too expensive a system in terms of its effectiveness."36/

- "Great attention is being paid in the U.S. to finding substitutes for antisubmarine aircraft carriers....It is held that the importance of antisubmarine aircraft carriers will decrease even more to the degree of entry into service of modern antisubmarine ships and airplanes (nuclear-powered torpedo submarines, the latest /destroyer-/ escort ships, the latest types of shore-based and shipborne antisubmarine airplanes).

  "Great hopes in this regard are placed on attack aircraft carriers. It is considered in the U.S. that the strengthening of the antisubmarine capabilities of attack carriers will compensate to a great extent for the absence of antisubmarine aircraft carriers. It is planned...to modernize

the attack carriers in order to create improved conditions for the basing on them of antisubmarine airplanes and helicopters. There is a discussion about the gradual changeover of attack carriers into multipurpose ones so that they will be capable of delivering strikes on shore targets, of insuring air superiority, and /also/ be capable of antisubmarine warfare.

"Considerable interest in plans for developing such /air-capable/ ships is being exhibited in the U.S. where it is planned in the near future to begin the series construction of multipurpose helicopter carriers of the DH Class with a displacement of 12,000 tons...they are intended for the antisubmarine and air defense of surface-ship forces, amphibious-landing detachments, and of convoys...and also for combat with surface ships and submarines on oceanic communications.

"Naval specialists believe that these multipurpose ships, which have significantly smaller dimensions and displacement than antisubmarine aircraft carriers of the Essex Class, would be capable of highly effective conduct of the missions of the antisubmarine and air defense of fast-moving surface-ship forces and convoys."36/

- "The antisubmarine aircraft carrier operates in the composition of an aircraft-carrier hunter-killer group (APUG). On the aircraft carrier is usually based an antisubmarine air group comprised of two squadrons of TRACKER antisubmarine airplanes (20 altogether), the latest modification being the S-2E) and a squadron of piloted antisubmarine SEA KING helicopters (14-16, the latest modification being the SH-3D).36/

- "/In the U.S./ there is being designed an air-capable ship for 'control of sea communiations' -- a light aircraft carrier with a displacement of about 17,000 tons -- a platform for helicopters and also for airplanes with vertical and short take-off and landing for the conduct of limited antisubmarine and anti-air tasks. In the coming decade, it is planned to order 8-12 of such ships."40/

- "The start of the delivery of the new shipborne antisubmarine airplane S-3A VIKING is planned for

February 1974 (as of now, 55 have been ordered).40/

"A contract for the construction of the first light, multipurpose aircraft carrier of the SCS /sea-control ship/ Class is to be awarded in December 1973. The ship is to be laid down in June 1974 and delivered to the Navy in May 1977. The cost of construction is about 100 million dollars. The first series of eight of these ships is planned to be built by 1980." (FNC 5/73)

- "In the /U.S. Naval/ budget for FY 1972/73, funds were allocated for the purchase of ...33 ship-borne S-3A VIKING antisubmarine airplanes." (FNC 6/73)

- "On January 1, 1973, U.S. Naval Aviation numbered 6,815 airplanes, including...180 /aircraft-carrier/ antisubmarine airplanes...". (FNC 6/73)

- "According to the shipbuilding program for FY 1973/74, the U.S. Navy command is expecting to receive funding for construction of 19 ships /including/ a ship of the SCS /sea-control ship/ (a light, multipurpose aircraft carrier)." (FNC 6/73)

"Five antisubmarine aircraft carriers...have been decommissioned...". (FNC 11/73)

- "By the end of FY 1973/74, three aircraft carriers /CVAs/ will have been modernized and redesignated as multipurpose aircraft carriers /CVs/." (FNC 8/73)

- "Under the long-term /1972-82/ shipbuilding program, the U.S. is planning to build light multipurpose air-capable ships." (FNC 11/73)

- "The /U.S./ naval leadership is requesting allocations for the construction of the first air-capable ship of 14,100-tons displacement. Ships of this type are intended for the defense of maritime communications, for the point defense of convoys and groups of combatant ships....In the event of approval by Congress...the first ship of a first series of eight could be commissioned in fiscal year 1977."48/

1974 - "In FY 1973/74 it is planned to cut back the number of ships /in the U.S. Navy/ by 66 (from 584 to 518)/ To be placed in reserve are...the antisubmarine aircraft carriers Intrepid and Ticonderoga...". (FNC 2/74)

- "The attack aircraft carriers Kitty Hawk, Independence, and Saratoga have been reclassified as multipurpose. They have been assigned the hull numbers CV-63, CV-60, and CV-62 respectively." (FNC 2/74)

- "On February 20, 1974, the official announcement was made on the introduction into the armament of /U.S./ Naval Aviation of the new S-3A VIKING airplane which is assigned for warfare against quiet, fast submarines and small missile ships. In comparison with the TRACKER antisubmarine airplane, the capabilities of the means of detection of submarine targets has increased three times, the payload of torpedos and sonobuoys has doubled, and the overall effectiveness of the airplane reportedly has increased ten times." (FNC 7/74)

- "The composition of the /U.S./ Navy in the past decade invariably has included two sub-classes of aircraft carriers: attack and antisubmarine. However, the U.S. military leadership has come to the conclusion that the development of a large number of big ships of this class is not within the power of even the powerful economy of their country (for example, the fourth nuclear-powered attack CVAN 70 comes to almost 1 billion dollars). Therefore, in the ranks of the regular navy it is proposed to have not more than 12 attack and multipurpose aircraft carriers. The subclass of antisubmarine carriers, represented earlier by the obsolete ships of the Essex Class, are generally ending their existence. Their construction in the future is not planned.

  "For expanding the capabilities of the Navy for gaining command of the sea, the U.S. Navy is moving toward the construction of ships of a new class -- multipurpose air-capable ships SCS (Sea Control Ship).

  "The overall state of the conception of the utilization of these ships has been formulated by the U.S. Naval chief of staff. On them, in the opin-

ion of specialists, should be based an air group of mixed composition, including airplanes with vertical (shortened) take-off and landing, and also helicoptrs. Multipurpose air-capable ships would operate in those situations, when because of unavailability or inadvisability, heavy aircraft carriers should not be enlisted for the carrying out of combat missions. It is proposed to maintain them constantly in those regions where main oceanic communications transit."61/

1975 - "U.S. -- In long-term programs there are planned for construction...four multipurpose air-capable ships (two could be in service with the naval forces by 1980)."65/

- "In the complement of the reserve fleet of the U.S. Navy are 201 combatants and auxiliaries, including...four antisubmarine aircraft carriers..." (FNC 1/75)

- In 1972/73 the U.S. Navy tested the suitability of the HARRIER for the future SCS light, air-capable ships with the aim of providing anti-air and antisubmarine defense for these ships and for convoys. The testing showed that its capabilities for the destruction of already detected submarines (its 'response time') is significantly better than that of antisubmarine helicopters. It is equipped with sonobuoys for localizing a target and can carry torpedoes and other antisubmarine weapons."66/

- "It is planned to equip /with the SEASPRAY helicopter for LAMPS/...the light multipurpose aircraft carriers of the SCS Class." (FNC 6/75)

- "The basic strike force in antisubmarine warfare has become antisubmarine aviation. The further development of which, in turn, has brought about the appearance of a special sub-class of ships -- antisubmarine aircraft carriers....

- "Antisubmarine aircraft carriers carry out the missions assigned them within the framework of aircraft-carrier hunter-killer groups, each of which includes an aircraft carrier, six to ten destroyers and destroyer escorts....At the start of 1974, there were in the U.S. ten antisubmarine aircraft carriers of the Essex Class, /all of/ which were in reserve.

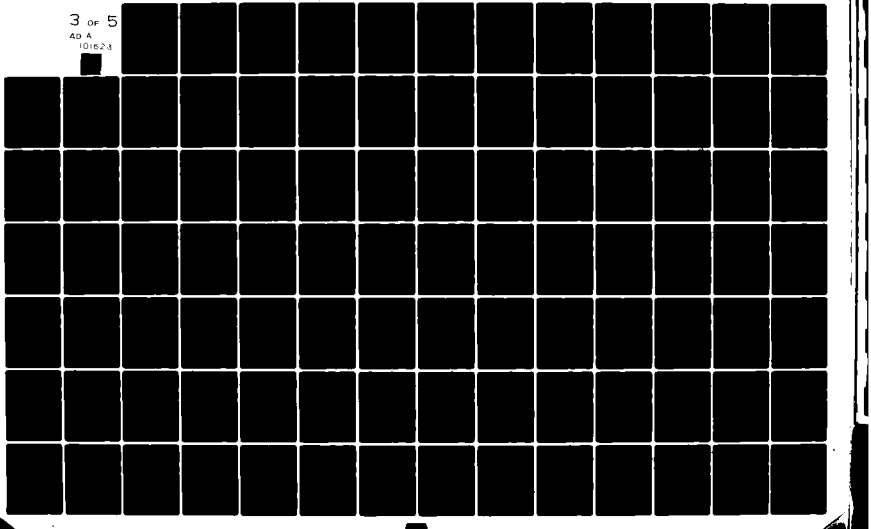
- "The removal from operation of the antisubmarine aircraft carriers does not indicate a downgrading of the role of shipborne antisubmarine aviation. This is shown, in the first place, by the order placed by the U. S. Navy for development and production of a large series of a new shipborne antisubmarine airplane, the S-3A VIKING and, in the second place, the new conception which foresaw the employment of /attack/ aircraft carriers in a multipurpose mode. Moreover, a series of investigations conducted in recent years in the U.S. has shown that antisubmarine aircraft carriers can be the most effective, if not the only, means of antisubmarine warfare in certain conditions (including operations beyond the range of shore-based air, loss of bases, need for continuous ASW patrolling, etc). This is due to their high mobility, maneuverability, and availability on board of combat-ready antisubmarine aviation....The placing into reserve of the antisubmarine aircraft carriers in the U.S. is viewed abroad as a consequence of the financial difficulties being experienced by the country and not as the result of a change in the views of military specialists on the prospects for...the employment of antisubmarine aircraft carriers..."71/

- "TRACKER airplanes /operating from CVSs/...were highly effective against diesel submarines /but/ with the provision of nuclear-powered plants to submarines, a 'devaluation' of the antisubmarine aircraft carrier took place....The Essex Class antisubmarine aircraft carriers, despite their relatively large displacement, could not handle the newest antisubmarine VIKING airplane that had been designed especially for combat against nuclear-powered submarines."78/

- "In the naval leadership of the U.S....the idea is gaining currency of the construction of...inexpensive ships for carrying antisubmarine helicopters and airplanes....In the U.S. a final decision still has not been adopted as to which type of air-capable ship to give preference. The project for the SCS ship did not find support in the government. Right now other projects are being worked out....Trends have been set abroad for the construction of heavy, multipurpose aircraft carriers (only the U.S. is building them with antisubmarine VIKING airplanes and [illegible],

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air-capable ships, platforms for antisubmarine helicopters and also airplanes with vertical take-off and landing."78/

- "In the overall system of military preparations by the capitalist countries, /shipborne/ antisubmarine helicopters occupy a special place. Their main assignment is antisubmarine warfare beyond the limits of the range of action of torpedo and missile weapons of ships.

  "The development of helicopters is proceeding in two directions: improvement of heavy aircraft for ships carrying primarily airborne weapon systems (multipurpose aircraft carriers, air-capable ships, antisubmarine cruisers) and the development of medium and light piloted helicopters for destroyer escorts. As the standard heavy helicopter, the countries of NATO...have adopted the American SEA KING of two modifications -- the SH-3A and the SH-3D (in the inventory since 1961 and 1966 respectively). Production of the SH-3H modification began in 1971. It has improved antisubmarine warfare capabilities...a new towed sonar...".79/

1976 - "A preliminary design for an aircraft carrier on an air cushion is being developed by Lockheed Missiles and Space Corporation. This SES-CV is intended for antisubmarine warfare. It is expected that the development of such a ship will bring about great changes in the tactics of the U.S. Navy and will raise the capabilities of shipborne aviation." (FNC 1/76)

- "The Eighth Composite Air Group, which will include Antisubmarine Helicopter Squadron 15 (SH-3H SEA KINGs), will be based aboard the nuclear-powered aircraft carrier Nimitz." (FNC 2/76)

1971-1976, 3 (e) - DLs, DDs, and DEs (PLUS ASROC AND DASH/LAMPS)

1971 - "/The DX (DXG)/DXGN destroyer construction/ program provides for the construction in the course of the next ten years of more than 200 ships of new classes for the replacement of 300 destroyers, frigates and escort ships, which were built during the Second World War and have been in the ranks for 25 or more years. The cost of the program is estimated at three billion dollars and is considered in the U.S. to be the largest of the postwar programs for construction of surface ships.

"The problem of the raising of the speed of ships, in the opinion of specialists of the U.S. Navy, has become one of the most important problems of post-war shipbuilding. As is known, the growth of the speed of ships with conventional hulls is accompanied by a sharp increase in the resistance of the water. Therefore, for the achieving of high cruising speeds, it is not enough to merely increase the power of the engine; it is necessary to utilize a different principle of movement. One of these promising principles of movement of ships should be considered to be the principle of movement of underwater wings. They are attempting to utilize this principle in the development of small antisubmarine ships. The leading place in the development of ships on underwater wings among the capitalist states belongs to the U.S.....".1/

- "The testing of the piloted shipboard antisubmarine helicopters of the LAMPS system is going forward successfully. An order has been placed for the first batch - 26 UH-2D SEA SPRITE helicopters. Ten of these will be provided to nuclear-powered frigates...and the remaining ones are earmarked for destroyers....Altogether it is planned to acquire 379 such helicopters." (FNC 5/71)

- "Seven destroyers of the Spruance Class are provided for in the shipbuilding program for FY 1971/1972." (FNC 6/71)

- "The DD 963 Spruance destroyers under construction will have...an ASROC antisubmarine guided

missile weapon /and/ a landing pad for an SH-3D SEA KING antisubmarine helicopter..." (FNC 8/71)

- "The development of surface antisubmarine ships abroad is pointed at equipping them with new means for the detection and destruction of submarines and at increasing their cruising speed and range. In particular, serious attention is being given to developing ships on air cushions and underwater wings."12/

- "The increase in the range of detection of submarines, their great submergence depths and maneuverability has brought about the development abroad of new means of destruction such as nuclear depth charges, homing and wire-guided torpedoes, missile-torpedoes /e.g., ASROC/, new models of mines, etc." 12/

- "In accordance with the LAMPS program, the decision has been made to reequip 115 SEA SPRITE helicopters which are already in the /U. S./ Navy's order-of-battle for use aboard ship in place of the radio-controlled...antisubmarine helicopters of the DASH system." (FNC 12/71)

- "Shipborne antisubmarine helicopters have won an enduring place in a relatively short time and are being accorded ever greater importance in the system of antisubmarine forces. Foreign specialists observe that as long as submarines are lacking in air defense weapons, helicopters, which have a significant superiority in speed and maneuverability over a nuclear-powered submarine and even more over diesel-powered ones, will remain a highly effective means of combat with them.

- "The advantages of antisubmarine helicopters are their low dependence on weather and sea conditions and the capability to search a significant area of the water medium in a short time with the aid of dipping sonar and sonobuoys. The shortcomings of antisubmarine helicopters are their low combat stability with respect to antiaircraft weapons, their comparatively short radius of action...".13/

- "The special LAMPS program (Light Airborne Multipurpose System) was adopted for the /U.S./ Navy in 1969. Its goal is to provide ships of frigate, destroyer, and destroyer-escort classes

with a reliable helicopter that is capable of carrying out the tasks for the search and destruction of submarines, reconnaissance, ferrying missiles, and conducting electronic countermeasures."13/

1972 - "By March /1972/, the first 20 SH-2D SEA SPRITE helicopters, reequipped for use as antisubmarine helicopters under the LAMPS program, will become operational on screening ships." (FNC 1/72)

- "Foreign military experts are of the opinion that surface ships are the traditional platforms for antisubmarine weapons...although their importance has decreased somewhat. A surface ship is hard put to combat a nuclear-powered submarine.... Nevertheless, naval experts still consider that the surface ship is suitable for antisubmarine defense. Their characteristics were greatly improved after the /Second World/ War. Their speed and range were greatly increased and their propulsion plants, detection equipment, and weapons were all greatly developed. The speed of surface ships could be increased even more but, because of the cavitation noise inherent in high speeds, sonar gear would be of low effectiveness. However, it is considered that a high-speed ship moving on underwater wings or an air cushion holds promise for antisubmarine defense. The speed of ships traveling on hydrofoils reaches 100 km/hr....Antisubmarine ships are grouped into hunter-killer groups which can feel out a large maritime area in a brief period. Search effectiveness is improved if the /antisubmarine/ ships act in conjunction with antisubmarine aviation. In such a case, a ship can then maintain direct sonar contact with a submarine detected by aviation. It employs its weapons by getting a target designation from an airplane or helicopter....Low-frequency sonar installed on the newest foreign ships permit detection of submarines at ranges of 30-45 miles under favorable conditions.../but/ without being able to employ bottom reflection, the effective range of sonar is three to 14 miles....Antisubmarine missile-torpedos with an effective range of 25 km are used on the naval combatant ships of some countries. TNT or a nuclear charge with the equivalent of 10-20 kilotons of TNT is used in the warhead of these missiles. The missile-torpedo is fired in the direction of the submarine

and then on command from the ship the torpedo drops by parachute until it reaches the water where it starts to home on the submarine. If the warhead of the missile is a depth charge, there is no need to reduce speed as it approaches the water. The bomb submerges and explodes at the set depth....A torpedo is being developed which is guided by wires. According to the press, it will be 'faster-running and less noisy and operate in very deep water'. The maximum depth of submergence of the torpedo is 1,800 meters.... Antisubmarine ships of various classes and types are being improved continuously. Destroyers, destroyer escorts, frigates and special subchasers have been further developed."16/

- "Frigates /DLs/ are multipurpose escort ships of large displacement, according to the American classification. Their basic role is insuring the air and antisubmarine defense of attack aircraft carriers and functioning as flagships for the screening forces of aircraft carrier strike forces or of separate hunter-killer groups....The Americans intend to continue construction of nuclear-powered frigates with the aim of forming aircraft carrier task forces which include only ships with nuclear propulsion...the military specialists of the U.S. and NATO have come to the conclusion that it is necessary to have escort ships with improved missile and antisubmarine systems, and also with universal guns of medium caliber. U.S. Navy frigates have light, piloted helicopters. The basic weapons for the destruction of submarines carried by frigates are antisubmarine guided-missile systems /i.e., ASROC/ and antisubmarine torpedoes, including wire-guided ones.

  "The construction of guided-missile frigates is very expensive. The cost of an American guided-missile frigate with a conventional power plant has already reached 70-80 million dollars and with nuclear propulsion, 180-220 million. Many foreign specialists believe that it is more advantageous, according to the criterion of 'cost-effectiveness', to build multipurpose escort ships of smaller displacement: destroyers and destroyer escorts."17/

- "It is planned to build 30 units of the Raymond A. Spruance Class. Allocations for 13 of them

have been made already...their antisubmarine armament is being improved. To the ASROC and 324 mm torpedo tubes are being added light piloted helicopters of the LAMPS system."18/

- "Destroyer-escorts are essentially antisubmarine ships and have very limited capabilities for the conduct of other combat tasks. They are intended mainly for the defense of amphibious-landing ships and merchant ships while in transit at sea. Destroyer escorts either operate individually or with hunter-killer groups....The /U. S. destroyer-escort/ ships of new design have helicopter pads and hangars which, however, have remained empty. Having removed the radio-controlled and little-effective helicopters of the DASH system...the Americans could not promptly reequip these ships with...LAMPS....In the meantime, the latest ships of the Knox Class are being armed with multipurpose helicopters, the SH-2D SEA SPRITE. The series of escort ships of the Knox Class is the largest. Right now there are 32 ships /of the Knox Class/ in the order-of-battle and it is planned to build another 14 units by 1974. They have strong antisubmarine weapons and the best sonar system in the U.S. Navy, the AN/SQS-26 CX and the towed sonar AN/SQA-13....A general shortcoming of even the newest /U.S./ escort ships is the large displacement which entailed...high cost and low combat stability relative to the forces and means of air attack. The Americans consider one of the solutions to the problem the production of less-expensive ships with a displacement of not more than 3,500 tons with gas-turbine power plants -- which would increase the cruising speed up to 30 knots."19/

- "Operational experience /of the U.S. Navy/ showed that the /DASH drone/ helicopters did not meet modern requirements and are being replaced to a substantial degree by light piloted machines.... Out of 750 DASH helicopters built by the Gyrodyne Corporation, 362 were destroyed due to construction faults and guidance-system failures. Therefore, it has been removed from the inventory. In April 1970, the U.S. Naval Command approved the specifications of the design of a light, multipurpose piloted helicopter of the LAMPS system. It is planned to reequip all SEA SPRITE helicopters into LAMPS system helicopters and in

1971/72 produce the first 20 machines...the choice of a specific type of light helicopter for the LAMPS system has not been decided finally. Only after the experimental testing to develop the optimal model of electronic equipment and armament will the helicopter type be chosen... which is planned for the mid-'70s."28/

- "Admiral Zumwalt believes that 'the helicopter is as much an essential part of the ship to which it belongs as any other part of the system of weapons and sensors'. According to the latest data, it is planned to deploy antisubmarine helicopters on 76 ships of the destroyer class."29/

- In the U.S., great hopes are being placed on the new DD-963 gas-turbine destroyers of the Spruance Class. /Also/ new classes of ships are being developed such as fast, large-tonnage ships on underwater wings and on air cushions."29/

- "By 1974 the U.S. had developed a seagoing antisubmarine ship on underwater wings (KPK) High Point which demonstrated a speed of 45 knots in waves....The following year, an even faster experimental KPK, the Dennison began testing. In 1969 the experimental small antisubmarine ship Plainville...was delivered to the Navy....However, the work for the development of a full-fledged antisubmarine KPK remains in the experimental stage. The hydrofoils of these ships are very vulnerable; any floating object is dangerous to them. Moreover, the first trials of a KPK of a specially-designed towed sonar showed unsatisfactory results. Vibration of the towing cable at high speeds, strong interference, and other technical problems posed many new and difficult problems for the designers.

  "The employment of ships and craft on air cushions (KVP) against submarines is considered a long-term matter. Work on their development is being conducted in the U.S., U.K., and France.... Such ships have the capability for extended search for submarines /only/ in the displacement mode. /Only/ during an attack would the KVP move out on its air cushion....The shortcoming of modern KVPs is their dependence on the weather. Its 'skirt' is very sensitive to sea waves; therefore the employment of antisubmarine KVPs is

possible only near the coast, and even there in waves not higher than three to four balls."30/

1973 - "According to the situation on September 1, 1972, the number of /U.S. Navy/ ships of the main types were summarized by the following data:...destroyers, 104 in commission, 72 in reserve, and 16 under construction." (FNC 1/73)

- "It is assumed in the West that this mission /of protecting CVAs in enemy home waters/ could not be effectively provided for by the development of multipurpose patrol-escort ships which simultaneously satisfy the requirements for antisubmarine and air defense....Among the multipurpose ships of latest construction /in the U.S. Navy/ are the destroyers of the DD-963 Spruance Class, the destroyer escorts of the Knox Class, and also nuclear-powered guided-missile frigates (DLGNs) and guided-missile frigates (DLGs). It is the ships of these classes which have the most improved antisubmarine weapons and air-defense weapons."36/

- "DD-963 Spruance Class Destroyers -- Construction of these ships was started in the U.S. in 1970. It is planned to build 30 ships of this class.... It is planned to equip them with the antisubmarine guided-missile ASROC...an SH-3D SEA KING antisubmarine helicopter, and fixed and towed sonar. The cost of the lead ships, whose commissioning is planned for the end of 1974, amounts to 105 million dollars. The overall cost of the entire series of ships is 2.55 billion dollars, with completion of construction scheduled for 1978.

  "Nuclear-powered Guided-missile Frigates -- The American Naval Command, according to reports in the foreign press, intends to employ nuclear-powered surface ships, frigates in particular, for carrying out antisubmarine missions. In addition to the Bainbridge and Truxton, which are already in commission, the U.S. is building four /more/ nuclear-powered, guided-missile frigates of a new DLGN-38 Class. Completion of this series is planned for 1976. The cost of each of the ships is 222 million dollars. The first of them has been launched already...armament...two ASROC antisubmarine missiles...one piloted antisubmarine helicopter.

"DXG Class Guided Missile Frigates. It is planned under the long-range shipbuilding program to construct 28 frigates of this class by 1976. It is planned to arm the DXG frigates with...the ERA antisubmarine missile system and with piloted helicopters."36/

- "It should be noted that in the airborne segment of its path, the ASROC missile flies a ballistic curve and, since it is not guided, delivers the torpedo only to the region of the submarine determined before launch. Thus, the accuracy of ASROC missiles fired at maneuvering submarines is certainly not very good. Another shortcoming of the system is that only on large ships can the launcher be reloaded by the crew.../also/ the homing system on the torpedo reacts not only to signals from target submarines but also to those from a surface ship or even a helicopter that is searching for the submarine."40/

- "The construction of five nuclear-powered frigates with antisubmarine and anti-air weapons is continuing....The Navy is bringing to fruition the program for the construction of 30 destroyers of the Spruance Class (money has already been allocated for the building of 23 of the ships). The series construction of 46 destroyer escorts of the Knox Class is being completed (37 ships of this class are operational already)."40/

- "During the modernization of the destroyers of the F. Sherman Class. the ASROC antisubmarine guided-missile weapon will be installed on these ships...it is /also/ planned to install a helicopter pad for a piloted, multipurpose helicopter. It is planned to refit the entire series by the end of 1974." (FNC 6/73)

- "According to the shipbuilding program for FY 1973/74, the U.S. Navy Command is expecting to receive funding for...seven destroyers of the R. Spruance Class." (FNC 6/73)

- "Under the long-term /1972-82/ shipbuilding program, it is planned to launch...30 destroyers /and/ one destroyer on underwater wings and one destroyer on an air cushion." (FNC 11/73)

- "The ASROC system was developed in the U.S. between 1957 and 1961....The missile launcher

permits firing either a single missile or a spread of any number of two to eight missiles...the firing accuracy of ASROC against a maneuvering submarine is low....Foreign specialists also note that the limited speed and especially the /limited/ range of the Mark 44 torpedo insure a capability for the ASROC missile-torpedo only against submarines moving at not more than 18 knots."46/

1974 - "In the FY 1973/74, it is planned to cut back the number of ships /in the Navy/ by 66 (from 584 to 518). To be placed in reserve are...39 destroyers...". (FNC 2/74)

- "Foreign naval specialists believe that ships on an air cushion and wing-in-ground ships are highly promising for operations against an enemy's submarines."52/

- "DD-963, the lead ship of the Spruance Class, was laid down in November 1973...and is programmed for commissioning at the end of 1974. Four other ships of this class have been laid down ." (FNC 4/74)

- "According to the outline of the budget of the /U.S./ Defense Department for the 1974/75 fiscal year, funds are being requested for the construction of...seven destroyers of the Spruance Class with LAMPS helicopters...". (FNC 6/74)

- "The U.S. Naval Command is investing considerable effort in the development of a light, antisubmarine helicopter in accordance with the LAMPS program (Light Airborne Multipurpose System). Right now the designs submitted by 13 aviation firms are being considered. The development of the LAMPS system began in 1970 with the reequipping of 20 multipurpose SH-2 SEA SPRITE helicopters which were given the designation SH-2D....By the end of 1972, there were 12 of these helicopters aboard ships. At the start of 1973, a contract was awarded...for the reequipping of another 55 helicopters with an SH-2F modification. In FY 1974/75 a contract for 30 more will be let, bringing the total number up to 105.... Now work is being carried out for the development of the Mark 3 LAMPS system...with a combat radius of 130 km. According to the initial plan, 200 such helicopters will be produced.

- "That antisubmarine ships with helicopters on board are very mobile and can combat submarines effectively has been shown by.../naval/ exercises."59/

1975 - "U.S. -- In long-term programs, there are planned for construction...30 destroyers of the Spruance Class (nine are under construction; altogether 23 will be in commission by 1980)..."65/

- "In the complement of the reserve fleet of the U.S. Navy are 201 combatants and auxiliaries, including...34 destroyers..." (FNC 1/75)

- "Delivery to the U.S. Navy of 105 SH-2 SEA SPRAY helicopters for use with the LAMPS ship system will be effected in 1975. Six squadrons have been formed already (three each at Norfolk and Imperial Beach Air Stations. The helicopters are intended for providing antisubmarine and anti-air defense of ships....It is planned to equip ships of the....Belknap, Spruance classes....Altogether, more than 200 will be required." (FNC 6/75)

- "In the opinion of the U.S. Navy's Chief of Naval Operations the employment of ships on an air cushion can be used to effect a basic change in the nature of war at sea. In the antisubmarine adaptation, a ship with a displacement of 2,000 to 2,200 tons can prove more effective in warfare against nuclear-powered submarines since it will possess high combat stability as a result of its high speed and low level of underwater noise."70/

- "There are 14 DD-963 Spruance Class destroyers under construction out of the series of 30 /programmed/. Five of them have been launched and the lead ship is about the be commissioned." (FNC 7/75)

- "As the leadership of the U.S. Navy believes, the /postwar/ modernization /of 130 DDs/ increased their effectiveness and permitted the extention of their period of service by five to eight years. The program included two sub-programs; FRAM-I and FRAM-II. In the first one, the antisubmarine guided-missile ASROC system was installed, in the second, the DASH system and a towed variable-depth sonar. As the press has reported, the destroyers do not have sufficient anti-air

means...and /therefore/ are assigned /only/ to antisubmarine warfare. The FRAM program, however, enabled the Navy to delay facing up to the problem of ship renewal. A real solution to the problem, as the leaders of the U.S. Navy have stated repeatedly, is possible only by dint of accelerating the commissioning of new ships, and in large numbers....After the completion of the construction of the Charles F. Adams Class destroyer, not another destroyer was built in the U.S. for ten years....In the foreign press statements have appeared that the role of destroyers is becoming less important, of secondary importance, and that the prospects for their development are highly doubtful....

"Destroyer escort ships are specialized ships which are assigned primarily to antisubmarine warfare and have limited capabilities for carrying out other tasks. A characteristic of modern destroyer escorts is the installing on them of landing platforms and even hangars for antisubmarine helicopters. In the U.S., as a result of the removal...of the pilotless helicopter antisubmarine DASH system, helicopters are temporarily missing from many ships. However, the majority of new destroyer escorts in the future are programmed to be armed with piloted shipborne helicopters developed under the LAMPS program....

"The basis of the antisubmarine armament of the destroyer escort ships of the U.S. Navy is the antisubmarine guided-missile weapon system ASROC. Moreover...on many of them, antisubmarine helicopters are being used....The growing displacement, their equipping with systems for the stabilization of pitching in heavy seas, the equipping with steam-turbine power plants, the arming with antisubmarines guided missile weapons, and the outfitting with the AN/SQS-26 sonar have given destroyer escorts great capabilities for antisubmarine warfare /out/ on the /World/ Ocean." 71/

- "At the present time, according to American classification, multipurpose ships of large displacement are called frigates. Their basic missions are the securing of the anti-air and antisubmarine defense of attack aircraft carriers and the carrying of the functions of the screening forces

of aircraft carrier task forces or separate hunter-killer groups. Additionally, frigates can be included in amphibious landing forces and employed to provide gunfire support of amphibious forces and of ground forces operating in coastal directions."71/

- "The improvement of the ASROC system is being conducted with the aims of increasing the firing range two to three times, of replacing the Mark 44 torpedo with the more effective antisubmarine torpedo, the Mark 46, and of introducing in-flight guidance for the missile."71

- "The feasibility is being investigated of operating helicopters from ships having dynamic principles of support....The most interesting are the American...antisubmarine ship on underwater wings (KPK) of the DEH Class and a ship on an air cushion (KVP) of the DSX Class.

  "The displacement of the DEH is 1,360 tons, its cruising speed up to 50 knots, its range at 42 knots cruising speed is 3,500 miles. The KPK will be outfitted with a helicopter, a missile-gun system, and also a sonar....Test trials of the towed AN/SQS-10 and AN/SQS-13 sonars on the KPK prototype High Point showed a capability for towing the gear at up to 42 knots and at a depth of about 100 meters. In the estimation of specialists, the new ship is seaworthy enough to operate in the North Atlantic 98.5% of the year.

  "Research directed toward the development of an ocean-going ship on an air cushion is still in the early experimental stage. Nevertheless, after the completion of trials of the experimental SVP SES 100B (a speed of 92 knots was reached) an initial design of an antisubmarine KVP DSX with a displacement of 2,000 tons was undertaken."78/

- "Medium antisubmarine helicopters...are now being given the greatest development. Relatively small dimensions and weight permit them to be based on many destroyer escorts. Effective search gear and weapons for destruction of submarines make them a highly important element of antisubmarine ship systems. SH-2D and SH-2F antisubmarine helicopters, which are modified SH-2 SEA SPRAY helicopters, are being used in the American LAMPS

system....The Americans now are developing a helicopter for LAMPS Mark 3 that will be substantially superior to the SH-2F. Thirteen firms are competing with models for flight trials....A final choice is scheduled to be made by the end of 1975. The initial production run for this helicopter is only 200."79/

- "Modern submarines, which possess great diving depth, are becoming ever quieter and faster.80/

- "modern submarines...right now move submerged faster than the surface ships which are hunting them. In the near future, in the view of foreign specialists, submarines will be able to develop speeds up to 40 knots and will exceed the limits of the capabilities of surface ships to track them."81/

- "...in September 1975 the destroyer Raymond A. Spruance was delivered to the Navy - the first of 30 ships of the same class. Another five have been launched and 10 others are at various stages of construction...the cost of one ship has grown from 60 to 115 million....

  "The antisubmarine armaments of the destroyer are: two medium helicopters of the LAMPS system, the ASROC missile system, three triple-tube torpedo launchers for the Mark 46 torpedo....It is assumed that these new ships will be the least noisy surface ships of the U.S. Navy."86/

1971-1976, 3 (f) - MINES

1971 - "An order for the development of the new CAPTOR/PAROSS antisubmarine system has been awarded to the Reynolds Aluminum and Honeywell corporations. It will consist of Mark-46 homing torpedoes in containers installed on the bottom or anchored at depths of 750 meters. (This part is named CAPTOR -- capsulated torpedo) and a passive-active system of ocean surveillance (Passive-Active Reporting Ocean Surveillance System). The torpedoes will be laid from airplanes, surface ships, and submarines. The weapon is intended for antisubmarine warfare in narrows, straits, and on the approaches of naval bases -- which, in the opinion of specialists, will permit the freeing of antisubmarine submarines for the carrying out of other missions. Twenty million dollars has been allocated for the development...". (FNC 9/71)

- "The increase in the range of detection of submarines, their great submergence depths and maneuverability has brought about the development abroad of such new means of destruction as depth charges with nuclear charges, self-guiding and dual-plane wire-guided torpedoes, missile-torpedoes, new models of mines, etc.".12/

1972 - "Aviation mines are planted along antisubmarine barriers and the probable routes of submarines."16/

1973 - "An important place among antisubmarine weapons is accorded to mines /by the U.S. Navy/. Their extensive employment is planned for the blockade of an opponent's submarine bases and for the establishment of antisubmarine barriers. The /U.S./ interest in mines has grown especially due to the fact that they can be used with nuclear charges and, consequently, with the radical increase in the power of mine weapons."36/

- "In the naval aviation of the capitalist countries, antisubmarine mines have received extensive development in recent years. Their distinctive features are a sufficient discrimination, proximity of the explosion to the target, and the relatively low cost of mass production. Judging from the materials in the foreign press, the development of aviation antisubmarine mines is taking the direction of increasing their

reliability, the simplification of their construction, and of complicating their sweeping.

"In the opinion of foreign military specialists, the employment of mines would have great importance in offensive military actions since the potential exists with their help of seriously hampering the enemy's deployment and operation of his submarines."36/

- "Mines. In the opinion of foreign military specialists this weapon would be extensively employed in any likely warfare not only by submarines and aviation but also by surface ships as well....As bourgeois military specialists assert, one of the results of the advent and over-estimation of the new /nuclear/ weapons has been the premature neglect of traditional combat means, very notably the lessening of attention to the development and production of mine weapons. This is the only possible explanation for the situation which has developed in which it has eventuated that foreign navies do not have a sufficient number of minelayers at their disposal at the present time for carrying out the large-scale operations for the laying of minefields. It is apparent...that serious apprehension is being expressed in foreign military circles to the effect that...there are practically no new, improved mines appearing. It is noted that the navy is using comparatively obsolete types of mines. It should be noted that, along with the supporters of the extensive employment of mine weapons who demand that the neglect of them be corrected immediately, there are individuals who are adducing arguments against the employment of naval mines in an armed conflict at sea. Among these arguments are the comparatively low effectiveness of mines, the mutual danger of blowing up their own surface ships and submarines, and insufficiency of means for laying mines, and their slow accomplishment of desired results. At the same time, it is emphasized that often striking a mine of an opponent is interpreted as a torpedo attack by a submarine. From this it is asserted that one can cause a strain in the forces and means of antisubmarine defense by the judicious and consistent employment of mines."36/

- "Two self-transporting mines have been developed in the U.S. for antisubmarine warfare. One of

them which bears the designation of SLMM is designed for laying off submarine bases and on the expected routes of submarine transits....The other mine-development project has the name CAPTOR. It is comprised of a combination of an antisubmarine torpedo with a mine anchoring device. The torpedo is enclosed in a hermetically sealed aluminum container which can be anchored at depths up to 800 meters."46/

1974 - "It has been decided /in the U.S./ to gradually replace mines Marks 25, 36, 50, 52, 55, 36 DESTRUCTOR and 40 with QUICKSTRIKE and CAPTOR mines. The first of these is a bottom type intended for installation in coastal and internal waterways and also in ports and bases....The CAPTOR system...is a MARK 46 homing torpedo emplaced with an anchor." (FNC 6/74)

1975 - "Despite the enormous efforts expended on developing the means for antisubmarine warfare, the U.S. Navy does not have specialized antisubmarine mines. The non-contact bottom and anchored mines presently existing in the /Navy's/ arsenals can only be employed in a limited way for antisubmarine tasks.

"In the views of the U.S. Naval Command, and that of other countries of NATO, mine weapons should occupy a worthy place in the overall system of antisubmarine warfare. It is considered advisable, for example, in the threatening period just before a war or with the beginning of combat actions, to cover the northern passages into the Atlantic with antisubmarine mine fields. But for this mines are needed which are capable of destroying targets with freedom of movement in three dimensions. For the development of such a weapon, they have turned in the U.S. to working out of a specialized antisubmarine mine, under the designation of CAPTOR. (Capsulated Torpedo).

"In the press it is stated that if with the aid of antisubmarine submarines, aviation and surface ships of the navies of NATO, 60-90 days would be required for the liquidation of the threat to maritime communications in the Atlantic, CAPTOR mines, laid by B-52 strategic bombers, would permit the carrying out of the mission in a few days. It is sufficient, states the foreign press, to block the exits from bases with mines,

to cover the zones of transit of submarines into the Atlantic and Pacific oceans with mine barriers - and the 'threat' to the maritime communications which connect the U.S. with its NATO partners would be liquidated...

"...Overall expenditures in the CAPTOR mine program are estimated at 334.5 million dollars, and the cost of one mine (with torpedo) is about 135 thousand dollars. The U.S. Navy is proposing to order 4000-4500 mines...

"...In 1975-1976 it is intended to shift over to series production, and from 1977 to move toward mass production and delivery to the Navy of mines which, in the views of the U.S. Naval Command, is projected to play a special role in antisubmarine warfare.

"In the American press it is observed that the CAPTOR mines are suitable for employment in the barrier antisubmarine field in the Denmark Straits between Greenland and Iceland. Between Iceland and the British Isles they can be employed along the barriers together with stationary hydroacoustic stations of long-range detection, antisubmarine submarines, surface ships and airplanes. It is believed that, having enveloped the North Sea with an enormous arc of a mine field barrier, it would be possible to block the exit into the Atlantic for all submarines. Besides this, it is intended to blockade the narrows of the Mediterranean Sea, and also the exits into the Pacific Ocean with CAPTOR mines. It is assumed that the laying of CAPTOR mines would permit not only the closing of the exit to submarines of the enemy into the ocean, but also the establishing of mine-field barriers accross the huge water expanses which adjoin the U.S. (the Gulf of Mexico, the Gulf of Saint Lawrence, and others), which supposedly would eliminate the necessity for the organization of convoys in these regions and free significant antisubmarine forces for action in the open ocean."69/

- "In recent times in the press, much attention is being given to the design of the CAPTOR mine, which stipulates the development of a homing antisubmarine mine-torpedo with a great radius of action...

- "In recent times in the American press have begun appearing reports on the development of still another new mine - QUICKSTRIKE. It is designed to be laid by airplanes, surface ships and submarines. The mine is designed on the basis of the American standard 900-kilogram aviation bomb. According to reports in the American press, in its design will be incorporated the latest achievements in arms technology, including laser and electro-optical guidance technology...". 71/

- "About 60 million dollars are spent annually in the U.S. for the development and purchase of mine weapons and means of anti-mine defense....

  "Mine weapons, in the opinion of foreign military specialists, have undergone in recent times a no less significant (although a less noticeable) change than, say, missiles, and constitute an inseparable part of the arsenal of modern combat means of armed warfare in all maritime and oceanic theaters of military operations. Among the merits of mines are numbered: simplicity, comparative cheapness of production and employment while at the same time being highly reliable. On the one hand there are the complexity and high cost of anti-mine operations; on the other, there are the constant combat readiness over a prolonged interval of time and the absence of the necessity for servicing after emplacement; there are also the surprise, instantaneousness and effectiveness of action on the target while providing automatically for its selectivity; the potential for covert working out, testing, series production and accumulation of reserves....

  "In the opinion of foreign specialists, mine weapons can be employed in military conflicts of any scale, both with defensive as well as offensive goals. But they are especially effective in non-nuclear war, since they can be employed for the blockading of the forces of the enemy, in warfare on the /sea lines of/ communications; the protection of amphibious landings and in anti-amphibious defense, in the deployment of one's own naval forces and the maintenance of the combat stability of ground forces from the side of the sea, i.e., in short, for the carrying out of the majority of missions assigned to a navy....

They are accorded an important place as well in the concept of 'weapons of neutralization' being worked out at the present time in the U.S. Until such time in the future that corresponding laser systems or powerful electromagnetic generators are developed which destroy combat equipment (including ships and vessels), the non-contact underwater explosion remains the most available means to the end.

"These features of mines make difficult the working out of criteria for the evaluation of the effectiveness of the weapon. Many factors such as psychological influence on the enemy, the low susceptibility to obsolescence, and so forth, practically cannot be subjected to mathematical analysis. This has become, in the opinion of several specialists, one of the reasons for the underestimation in the recent past of mine weapons on the U.S. Navy.

"According to foreign data, naval mines are being developed and produced at the present time in the U.S., England, France, the FRG, Italy, Japan, the Netherlands, Sweden, Denmark, Belgium, Spain and South Africa. In this regard, the greatest attention to the development of mine weapons is being given in the U.S., where their development is being conducted under four extended programs, which can be conditionally divided into the following forms: the development of new models of mines intended for the destruction of combatant ships, merchant ships, and auxiliary ships of the enemy; the development of special antisubmarine means; the improving of the equipping of submarine saboteurs; and the development of a modular unified aviation ammunition, AMWS (Aviation Module Weapons System)....

"From the beginning of the 1960's, in the U.S. they turned to the development of the so-called 'waiting' self-guiding mine-torpedoes with a great radius of response, and from 1972 began the industrial production of the CAPTOR mine-torpedo.

"Since 1970, the new QUICKSTRIKE project is being worked out in the U.S. It has as its aim the development of a universal bottom non-contact mine (for laying by aviation, surface ships and submarines). According to reports in the American press, the new bomb-mines, the series

delivery of which is planned for the near future, should replace all the mines being prepared at the present time in the U.S.A. (aside from special-purpose mines). They would have great range and increased reliability of remote guidance by coded signal.

"In 1972, the aerodynamic characteristics, and also the stability of motion of the new mines in the air, were tested by the Naval Ordnance Laboratory of the U.S.....From 1971 through 1974, more than 4 million dollars have been spent on the development of the QUICKSTRIKE project.

"Taking into consideration the importance to the new mines of a system of remote control, which makes the mines safe for their own forces and practically impervious to sweeping, work on the development of this system has been conducted in the U.S. since 1970 under the separate RECO project.

"The realization of the QUICKSTRICK project, according to the assertions of American specialists, would permit to the maximum possible degree the utilization of the most valuable characteristic of mine weapons....83/

FOOTNOTES TO CHAPTER THREE

1. Professor I. N. Potapov. The Development of Navies in the Postwar Period, signed to press 26 May 1971, pp. 80, 122-123, 125, 127-128, 130, 141 and 142.

2. "The Nuclear-powered Torpedo Submarines of the NATO Countries: Handbook Data For Naval Officers", Naval Digest, June 1971, pp. 107-108.

3. Marshal A. A. Grechko, On Guard Over Peace and the Construction of Communism: Implementing the Decisions of the XXIVth Party Congress, signed to press 14 June 1971, p. 48.

4. Marshal A. A. Grechko, "The Navy of our Homeland", Naval Digest, July 1971, pp. 3-9.

5. Engineer-Captain Second Rank Yu. A. Nevskiy, "The Torpedo Weapons of the Capitalist Countries", Naval Digest, July 1971, pp. 101-106.

6. Fleet Admiral S. G. Gorshkov, Speech at Navy Day Meeting in Moscow, Radio Moscow, 23 July 1971.

7. Fleet Admiral S. G. Gorshkov, "Oceanic, Nuclear-powered, and Missile-Armed", Pravda, 25 July 1971.

8. Fleet Admiral V. Kasatonov, "Oceanic Guard of the Homeland", Red Star, 25 July 1971.

9. Admiral G. G. Oleynik, "Under the Flag of the Homeland", Labor, 25 July 1971.

10. Admiral V. N. Alekseyev, "Guard of the Homeland". Soviet Latvia, 23 July 1971.

11. Captain First Rank D. P. Sokha, "The Yesterday and Today of Submarines", Naval Digest, September 1971, p. 28.

12. Captain First Rank V. Yefremenko, "The Evolution of the Struggle Against Submarines", Naval Digest, November 1971, pp. 18-25.

13. "Antisubmarine Helicopters of the Navies of Capitalist Countries and Their Weapons Platforms", Naval Digest, December 1971, pp. 91-92.

14. Captain First Rank Aleshkin, "Some Trends in the Development of Naval Forces", Naval Digest, January 1972, p.25.

15. Engineer-Captain Second Rank V. Yerofeyev, "A Replacement for 'Polaris' and 'Poseidon', "Naval Digest, January 1972, p. 89.

16. Vice Admiral V. Sorokin and Captain First Rank V. Krasnov, "Antisubmarine Defense", Science and Life, January 1972, pp. 48-55.

17. Frigates of the Navies of the Capitalist Countries", Naval Digest, February 1972, pp. 97-98.

18. "Destroyers of the Navies of the Capitalist Countries", Naval Digest, March 1972, pp. 109-110.

19. "Destroyer-escorts of the Navies of the Capitalist Countries", Naval Digest, April 1972, pp. 105-106.

20. Captain First Rank A. Petrenko, "Aircraft Carriers", Technology and Armamants, May 1972, p. 47.

21. I. M. Korotkin et. al., Aircraft Carriers and Helicopter Carriers, signed to press 22 May 1972, pp. 96-97, 174-175, 179, 282-284, 286-287, 292-293 and 298-299.

22. "Antisubmarine Guided-Missile Weapons", Naval Digest, June 1972, pp. 97-98.

23. Fleet Admiral S. G. Gorshkov, "On the Seas and Oceans", Pravda, 30 July 1972.

24. Fleet Admiral V. A. Kasatonov, "On Combat Watch", Red Star, 30 July 1972.

25. Fleet Admiral S. M. Lobov, "The Oceanic Watch of Naval Personnel", Moscow Pravda, 30 July 1972.

26. Engineer Admiral P. Kotov, "Oceanic, Nuclear-powered, Missile-Armed", Rural Life, 30 July 1972.

27. Rear Admiral N. Shablikov, "Oceanic Guard of the Land of the Soviets". Soviet Lithuania, 30 July 1972.

28. Engineer Colonel A. Ivanov, "Shipborne Antisubmarine Helicopters", Naval Digest, August 1972, pp. 94-99.

29. V. Teplinskiy, "The World Ocean and the Military Strategy of the U.S.", U.S.A.: Politics, Economics, Ideology, October 1972, pp. 15-24.

30. "The Small Antisubmarine Ships and Craft of Capitalist Countries", Naval Digest, November 1972, pp. 101-102.

31. Colonel N. Semenov, "The Employment of Aviation in Combat Operations at Sea", Naval Digest, December 1972, pp. 32-36.

32. Marshal A. A. Grechko, "A Socialist, Multinational Army". Red Star, 17 December 1972.

33. Fleet Admiral S. G. Gorshkov, "Navies in War and Peace", Naval Digest, February 1973, pp. 19-21.

34. General of the Army V. Kulikov, Chief of the Armed Forces' General Staff, "The Soviet Armed Forces and Military Science". Communist No. 3, February 1973, p. 79.

35. "Hydroacoustic Means for Submarine Detection of the Navies of the Capitalist Countries", Naval Digest, February 1973, pp. 95-96.

36. Captain First Rank A. A. Kvitnitskiy, Antisubmarine Weapons and Their Platforms. DOSAAF Press, signed to press 15 February 1973, pp. 2, 4-12, 17-19, 20-21, 23-4, 38-50, 52-4, 57-63, 65-69, 75-89 and 92-4.

37. Captain First Rank E. Shcheglov, "The U.S. Atlantic Fleet", Red Star, 20 February 1973.

38. G. Svyatov and A. Kokoshin, "Sea Power in the Plans of the American Strategists", International Life (Russian edition), March 1973, pp. 77-86.

39. Captain First Rank G. Kostev, "Underwater Battle", Naval Digest, March 1973, pp. 35-40.

40. Candidate of Technical Sciences G. Svyatov, "Prospects for the Development of the U.S. Navy in the '70s", Naval Digest, March 1973, pp. 91-97.

41. "The Prospects for the Development of Hydroacoustic Means of Submarine Detection in the U.S.", Naval Digest, June 1973, pp. 97-98.

42. N. N. Ivanov, Wings Over the Sea, signed to press 29 June 1973, p. 299.

43. Fleet Admiral S. G. Gorshkov, Interview, "We Always Remember the Order of the Homeland", Soviet Soldier No. 13, July 1973.

44. Admiral N. Sergeyev, "On Guard over the Maritime Perimeters", Labor, 29 July 1973.

45. Admiral N. Amel'ko, "Place of Service -- the Ocean", Water Transport, 28 July 1973.

46. K. V. Morozov, Mine and Torpedo Weapons. DOSAAF Press, 1974, signed to press 18 October 1973, pp. 23, 61-74.

47. Doctor of Naval Sciences, Professor K. Zvyagin, "The Navies of the Great Powers in the Postwar Period", Naval Digest, November 1973, pp. 98-102 and 105.

48. "Construction of the U.S. Navy for Fiscal Year 1973/74", Naval Digest, December 1973, pp. 95-96.

49. Captain First Rank I. Vasil'yev and Captain Third Rank V. Moronov, "The Militaristic Exercises of the Combined Naval Fores of NATO", Naval Digest, February 1974, pp. 92-97.

50. Combat Course of the Soviet Navy, 3rd rev. ed., V. I. Achkasov and A. V. Basov (leaders of authors' collective). Signed to press 13 February 1974, pp. 494-496.

51. Marshal A. A. Grechko, The Armed Forces of the Soviet State, 1st edition, signed to press 9 April 1974, p. 98.

52. Captain First Rank N. Vlasov, "The Yesterday, Today, and Tomorrow of Surface Ships", Naval Digest, March 1974, pp. 22-27.

53. A. L. Prostakov, The Hydroacoustic Means of a Navy, signed to press 28 May 1974, pp. 88, 89, 91, 98-100, 102 and 103.

54. "Against Submarines", Naval Digest, June 1974, p. 98.

55. "The U.S. 7th Fleet", Naval Digest, June 1974, pp. 93-94.

56. Rear Admiral A. Mikhaylovskiy, "The Tactical Aspect of Secrecy", Red Star, 9 June 1974.

57. Engineer Vice Admiral V. Novikov, "Watch-standers on the Maritime Perimeters", Water Transport, 27 July 1974.

58. Admiral G. Bondarenko, "Always on Guard", Soviet Patriot, 28 July 1974.

59. Vice Admiral I. Rudnev, "The Continuous Watch", Pravda of the Ukraine, 28 July 1974.

60. Admiral V. Alekseyev, "Oceanic, Missile-armed", Soviet Lithuania, 28 July 1974.

61. Captain Second Rank Yu. Nefed'yev, "Multipurpose Air-Capable Ships", Naval Digest, August 1974, pp. 96-100.

62. Professor, Rear Admiral N. Pavlovich, "Basic Factors in the Development of Naval Art", Military-Historical Journal, December 1974, p. 48.

63. Colonel I. Kutsayev, "Airplanes Against Submarines", Naval Digest, December 1974, pp. 86-90.

64. Doctor of Naval Sciences, Captain First Rank N. V'yunenko, "The Development of Submarine Forces", Naval Digest, January 1975, pp. 26-37.

65. "The Numerical Ship Composition of the Navies of the Principal Capitalist States and the Prospects for Their Development", Naval Digest, January 1975, pp. 97-100.

66. "The Harrier is Flying from the Ships", Naval Digest, March 1975, pp. 102-103.

67. Marshal A. A. Grechko, The Armed Forces of the Soviet State, 2nd rev. ed., signed to press 26 March 1975, p. 105.

68. Fleet Admiral S. G. Gorshkov, "Using Wartime Experience in Present-Day Navy Work", Problems of Philosophy, May 1975, pp. 26-38.

69. "Mine Weapons Against Submarines", Naval Digest, July 1975, pp. 101-102.

70. Captain First Rank (Reserve) D. Sokha, "Air Cushion Ships", Naval Digest, July 1975, pp. 76-81.

71. A. I. Larionov and Yu. Nesvitskiy, The Surface Fleet of NATO, signed to press 2 July 1975, pp. 75-78, 104, 116-118, 129-130, 144-145, 147, 149, 290, 293 and 306.

72. Admiral N. Amel'ko, TASS Interview (in English), 0854 GMT 25 July 1975.

73. Fleet Admiral N. Smirnov, "On Guard Over the Homeland", Red Star, 27 July 1975.

74. Fleet Admiral N. Sergeyev, "Always on Guard", Labor, 27 July 1975.

75. Admiral G. A. Bondarenko, Radio Moscow (in Russian), 0830 GMT, 27 July 1975.

76. Vice Admiral Ya. Kudel'kin, "Always on Guard", Soviet Estonia, 27 July 1975.

77. Vice Admiral N. Shablikov, "On Guard Over the Maritime Perimeters", Soviet Lithuania, 27 July 1975.

78. Captain First Rank B. Komkov, "Combatant Ships -- Platforms for Antisubmarine Aviation", Naval Digest, August 1975, pp. 89-95.

79. "Shipborne Antisubmarine Helicopters of Foreign Navies", Naval Digest, August 1975, pp. 97-98.

80. Engineer Captain First Rank Yu. Nevskiy, "The Development of Antisubmarine Torpedoes in the NATO Countries", Naval Digest, September 1975, pp. 101-103.

81. Captain First Rank N. V'yunenko, "On Several Trends in the Development of Naval Tactics", Naval Digest, October 1975, pp. 21-26.

82. B. Chizhov, "SOSUS Detects the Submarine", Naval Digest, October 1975, pp. 93-97.

83. Engineer Captain First Rank A. Kondratovich and Candidate of Technical Sciences Yu. Skorokhod, "Mines -- A Universal Weapon", Naval Digest, November 1975, pp. 110-114.

84. Admiral N. N. Amel'ko, "Antisubmarine Warfare", Soviet Military Encyclopedia, Vol. 1, signed to press 5 November 1975, pp. 575-576.

85. Fleet Admiral S. G. Gorshkov, Seapower of the State, signed to press 27 November 1975, pp. 286-287, 309, 312, 336 and 340.

86. Engineer Captain First Rank N. Yur'yev, "The Spruance Class Destroyers of the U.S. Navy", Naval Digest, December 1975, pp. 87-90.

87. "Escort Ships of the Navies of the Capitalist Countries", Naval Digest, December 1975, pp. 91-92.

88. Captain First Rank K. V. Morozov, Missile Weapons at Sea, DOSAAF Press, signed to press 12 December 1975, p. 53.

89. "The Nuclear-powered Torpedo Submarines of the U.S. Navy", Naval Digest, January 1976, pp. 97-98.

90. "Organization of the Antisubmarine Forces of the U.S. Pacific Fleet", Naval Digest, January 1976, pp. 97-99.

91. Engineer Colonel-General N. Alekseyev, "Scientific-Technological Progress and the Defense Might of the Country", Red Star, 28 January 1976.

92. Professor, Doctor of Historical Sciences, Captain First Rank I. Potapov, "Evolution of the Striking Forces of the U.S. Navy in the Postwar Period", Military-Historical Journal, February 1976, p. 84.

APPENDIX D

SOVIET OPEN-SOURCE DATA USED FOR QUALITATIVE ANALYSIS FOR THE PERIOD 1976-1980

THE 1976-1980 SOVIET OPEN-SOURCE DATA USED IN CHAPTER IV*

		Page
1 (a)	- Is anti-SSBN ASW seen by the Soviets as within the technological state-of-the-art given the great lead of submarine warfare?	D-2
1 (b)	- Is the U.S. Navy seen as assigned a priority mission for anti-SSBN ASW?	D-8
2 (a)	- General Soviet Appraisals of U.S. ASW	D-18
2 (b)	- U.S. Budget Allocations to ASW	D-23
2 (c)	- U.S. ASW Force Levels and Forward Deployment/Readiness	D-25
2 (d)	- Mission-completion Capabilities of Soviet SSBNs	D-30
3 (a)	- SOSUS (plus any Compatible Mobile/Portable Subsystems)	D-44
3 (b)	- Shore-based VP Airplanes	D-59
3 (c)	- SSNs (plus SUBROC)	D-64
3 (d)	- CVSs/CVs/SCSs (plus Aircraft)	D-70
3 (e)	- DLs, DDs, and DEs (plus ASROC and LAMPS)	D-79
3 (f)	- Mines	D-88
FOOTNOTES TO CHAPTER IV		D-93

*Parenthetical source references to "FNC" are to the monthly "Foreign Naval Chronicle" in Naval Digest and are followed by the number of the month and year of the issue referenced.

1976-1980, 1 (a) - IS ANTI-SSBN ASW SEEN BY THE SOVIETS AS WITHIN THE ASW TECHNOLOGICAL STATE-OF-THE-ART GIVEN THE GREAT LEAD OF SUBMARINE WARFARE?

1976 - "The difficulty of antisubmarine warfare against the fast, highly-maneuverable modern nuclear-powered submarines has led foreign specialists to the conclusion that various types of forces are required for carrying out antisubmarine tasks. As an analysis of /U.S. and NATO/ combat training shows, success in antisubmarine operations can be won only by the joint employment of surface ships, submarines, aviation, and also of the positional means..."3/

- "The role of surface ships in the overall system of 'antisubmarine warfare' has changed commensurate with the degree of improvement in the submarine fleet, the extensive introduction in it of nuclear-power plants, missile weapons, and modern torpedoes. While remaining the main type of force for 'defense of an objective' point defense , they have gradually surrendered their former primacy to nuclear-powered submarines and aviation for all other operations."11/

- "According to the views held in the U.S., the mission of antisubmarine warfare long ago exceeded the limits of the literal concept of the antisubmarine defense of naval forces and merchant convoys. It has developed from a special kind of protection of the combat operations of the Navy into an independent operational-strategic mission that is closely related to the gaining of command of the sea. This has been effected by the radically expanding role of submarines in warfare at sea, by the widening circle of combat missions which they are capable of carrying out as a result of their having been equipped with nuclear-power plants and powerful new long range weapons...with the aim of conducting the most effective antisubmarine warfare, it is planned to bring together the heterogeneous antisubmarine forces into special task-specific forces for carrying out the main task -- the search and destruction of submarines deployed to sea or on deployment routes. As their top priority, such forces must control the zones from which strikes by missile submarines

are possible. These measures, according to the view of the American command, could lead to the latter being forced out of the zones close to the U.S. coasts to more distant regions...

"Taking into account the views of the commands of the US Navy and navies of other NATO countries in the development of ASW forces and means, foreign military specialists draw the following conclusions:

- Antisubmarine warfare will be carried out under centralized direction throughout the entire ocean (sea) theater, from their base areas to areas of combat employment;

- ASW forces and means of all arms (nuclear and diesel submarines, surface combatants, and ASW aviation) will be employed in antisubmarine warfare in close coordination with stationary hydroacoustical means;

- The basic condition for success in combating the underwater threat is organization of continous tracking, primarily of submarines with ballistic missiles, and combining the defense of the most important installations with sea control over vast geographic areas of the ocean theaters."19/

"The high mobility of nuclear-powered ballistic-missile submarines, their great endurance and diving depths, their arming with powerful offensive and defensive weapons have insured them a high combat effectiveness /even/ under the conditions of the growing effectiveness of the antisubmarine forces..."20/

- "The equipping of modern submarines with sonar gear capable of detecting submarine targets at a considerable distance, with homing torpedoes, with nuclear warheads, and with other weapons permits carrying the warfare with a submarine enemy into the depths of the sea.

"The basic struggle, in the opinion of foreign specialists, will be concentrated in the approaches to bases, in the combat patrol areas, on the so-called antisubmarine barriers established on the probable routes of transit of submarines, and in the navigational narrows.

Aviation and surface ships should operate in these areas and, if possible, mines and hydrophones should be emplaced.

"In the view of foreign specialists, antisubmarine warfare, including that with nuclear-powered missile platforms too, can be carried out by diesel-powered torpedo submarines even though they are inferior to nuclear-powered ones in their speed and submerged endurance. Nevertheless, they are relatively small, have a low noise level while cruising on their electric motors, and possess good sonar and modern means of destruction. These characteristics enable them to successfully combat both nuclear-powered as well as /other/ diesel submarines. It is considered that the most effective antisubmarine warfare can be achieved by the joint operations of submarines with aviation and surface ships. In the system of antisubmarine warfare, provision also has been made for missile-submarine strikes on the shipbuilding yards which are constructing submarines, on their bases and ship repair yards, and on their training centers for submarine personnel."20/

- "Naval specialists believe that the great diving depth in combination with the high submerged speed of modern submarines enable them, especially nuclear-powered ones, to conduct reconnaissance of the forces for defense of a region, /even/ while right in the antisubmarine defense zone of an enemy, in order to inflict on them or on shore objectives a torpedo or missile strike at the right moment, to lay mines in the coastal channels, or to put ashore a reconnaissance or sabotage group..."20/

- "According to the evaluation of American naval specialists, the antisubmarine forces and means which are now in the inventory of the U.S. Navy continue to be insufficiently effective. The increasing of underwater speeds, maneuverability, diving depths, the possession of effective defensive weapons and various means of cover and deception endows with high combat stability not only the nuclear-powered submarines but diesel-powered ones as well."20/

1977 - "The military-political leadership of the U.S. and of the other countries of NATO believe that

with the advent of nuclear-powered submarines... the antisubmarine forces are being tasked with the resolution of a highly complex and hard-to-solve problem. Nuclear-powered submarines, in comparison with their predecessors, are freer to select the region for missile launch. Thus, for example, the regions of patrol of American submarines with 'Polaris' and 'Poseidon' missiles (firing ranges 4,600 to 5,600 kms.) already embrace an enormous expanse of water of 8,242,500 square miles. The change over to the new 'Trident' nuclear-powered submarine missile system (firing range 8-12,000 km.) leads, in the opinion of the American command, to the widening of the zone to include the greater part of the World Ocean. From this stems the radical increase in the scope of the area of antisubmarine operations against the submarine platforms for strategic weapons."27/

- "The concept of 'antisubmarine warfare' includes detection, classification, localization, and destruction. The most difficult and the most important, in the opinion of foreign specialists, is the initial detection and classification of submarines, especially of the highly maneuverable nuclear-powered submarines. It is not coincidental, therefore, that the development of stationary, shipboard aviation and space means of surveillance of the underwater environment and its study are given particular attention abroad."27/

- "In contemporary conditions, the armaments, endurance, diving depth, cruising speed, and the range of submarines have grown considerably. The importance of antisubmarine warfare is growing in correspondence with the increasing capabilities of submarines and the broadening of their missions, and the role of cooperation of the heterogeneous /ASW/ forces grows /too/."28/

1978 - "The development of effective antisubmarine means largely depends on the possibility of solving difficult technological problems. The most difficult of them, it is considered, are the detection and classification of nuclear-powered submarines. The extent these problems are solved depends on the development of antisubmarine weaponry...

"The advent of fast, nuclear-powered, missile submarines possessing the capability of launching all of their supply of ballistic missiles in a short time necessitated the development of antisubmarine weapons of a new type capable of delivering a strike on a missile submarine in the briefest time and with a high probability of destroying it. Antisubmarine missiles, which are to be found in the armaments of many classes of surface combatant ships and submarines of the leading imperialist powers, constitute such weapons.

"Guided antisubmarine missiles launched from underwater are being received by foreign submarines (for example, the SUBROC missile)...Such missiles carry a warhead or torpedo to distances of 50-60 km."52/

- "In the postwar period, in connection with the development of nuclear-power plants, missile weapons and nuclear warheads, the combat capabilities of submarines increased radically. This necessitated the further increase and modernization of antisubmarine forces themselves and their armaments. At the beginning of the 1970s, in the navies of the most powerful states were developed antisubmarine forces which included multipurpose nuclear-powered submarines, antisubmarine surface combatant ships of specialized construction (frigates, escorts, destroyers, antisubmarine cruisers, and aircraft carriers), antisubmarine airplanes (shore-based and shipborne), and antisubmarine helicopters. Their armaments included new means for defeating submarines:...wire-guided torpedoes, antisubmarine missile-torpedoes and missile-bombs, mines with antennae and non-contact detonators. For the detection of submarines are employed equipment sensitive to various physical fields and to submarine wakes...and computers for plotting attacks on detected submarines."61/

1979 - "Can submarines, despite the constant modernization of antisubmarine means, achieve strategic aims in a war at sea? A great deal of research has affirmed the high effectiveness of submarines when they are properly employed and provided with combat support."70/

- "Antisubmarine warfare occupies a most important place in the theory and practice of the naval art of the main countries of NATO. Its growing role and significance were determined by the advent in the navies of the advanced naval powers of nuclear-powered multipurpose and missile submarines.

  "The commands of the U.S. Navy and of the other NATO countries found themselves faced with the problem of organizing an antisubmarine struggle which, for its importance and difficulty, scarcely has an equal. In its nature, it has far exceeded the bounds of antisubmarine defense, experience in the organization of which was gained in the two world wars. Right now it /antisubmarine defense/ can be useful only in an extremely limited way since it was based on the opposition of only diesel submarines and only during the defense of combatant ships and merchant ships from their attacks. However, even in those years, the organization of antisubmarine defense was not easy. The Commander-in-Chief of the Soviet Navy, Admiral of the Fleet of the Soviet Union S. Gorshkov, notes: 'Against the German submarines operated 5,500 specially constructed antisubmarine ships and 20,000 small craft. For every German submarine there were 25 ships and 100 airplanes of the Allies and for each German submarine at sea, there were 100 British and Americans'."72/

- "Vice Admiral F. Harlfinger, USN (Retired), a specialist in ASW matters, considers that the entire American antisubmarine defense is presently no more than 20 percent effective."72/

1976-1980, 1 (b) - IS THE U.S. NAVY SEEN AS ASSIGNED A PRIORITY MISSION FOR ANTI-SSBN ASW?

1976 - "Two classes of nuclear-powered submarines are distinctly defined: missile ones and torpedo ones; the basic assignment of the latter is the destruction of the former."1/

- "The basic type of daily activity of all of the forces of the NATO navies /in the Mediterranean/ is search for submarines. As in the Atlantic and Pacific theaters of military action, here too there functions a system of continuous antisubmarine monitoring."2/

- "The main missions which were worked out /by the navies of the U.S. and other NATO countries/ were:

  - Warfare against missile submarines in all theaters and on the antisubmarine barriers...

  - Point defense of forces of combatant ships and merchant ships."3/

- "In the conduct of offensive missions /by the U.S. and NATO navies/, the main attention is devoted to gaining and maintaining command of the sea by warfare against the submarines and strike groups of surface ships. For example, those were the tasks carried out by the strike fleet of the combined NATO navies in the culminating exercise of SEA HUNT-75 in the Atlantic."3/

- "Concerning the employment of antisubmarine forces, the NATO Command concludes that the main aim in a global nuclear war is the neutralization of the nuclear weapons delivery platforms. If they can succeed in solving this problem, they assume that gaining of the command of the sea then would be significantly easier."5/

- "According to information in the American press, by 1980 the escort ships of the U.S. Navy must be prepared to provide simultaneous protection for 12 attack aircraft carriers, the ships and craft of the amphibious forces...about 10 groups of supply ships, and five convoys. For their defense, about 250 modern escort ships are required."11/

- "The military leadership of NATO considers that attack and multipurpose aircraft carriers, due to their great size, are more vulnerable to the missiles and torpedoes of submarines than are ships of other classes. Therefore, for protecting their transit and movements in combat areas, a deeply-echeloned defense against the various forces of an enemy are being developed. Special significance is accorded to antisubmarine and anti-air defense. Each aircraft carrier is covered by a heterogeneous antisubmarine protection which includes nuclear-powered torpedo submarines (they conduct long-range hydroacoustic search), escort ships (they operate in the capacity of close-in protection) with their helicopters, and also airplanes of shipborne and shore-based antisubmarine aviation (in the zone of long-range antisubmarine defense). The operations of all of these types of forces are backed up by the stationary means of long-range hydroacoustic surveillance."11/

- "The detection of submarines, their attack and destruction, in the opinion of many foreign specialists, should be carried out along the route of transit of convoys and combatant-ship forces by composite aviation-ship hunter-killer groups that include antisubmarine airplanes (shore-based and shipborne), shipborne helicopters, nuclear-powered submarines, and fast escort ships."11/

- "In the opinion of naval specialists in the West, the operations of the navies of the U.S. and her allies must be directed toward providing antisubmarine protection to strike carrier forces and groups, to convoys, and to amphibious landing detachments, toward the defense of maritime communications, /and/ toward opposing submarines armed with ballistic missiles...

- "In the military plans of the U.S., the defense of their own territory from the missiles of submarines occupies an important place."20/

- "Foreign military theorists believe that in a future nuclear-missile war, the basic efforts would be directed to the destruction of nuclear-powered submarines and attack aircraft-carrier forces. They note this in regard to the fact that the problem of /the unavoidability of

carrying out/ warfare against all submarines has arisen with special acuteness due to the virtual impossibility of distinguishing a missile submarine while submerged from any other submarine."20/

- "In the view of the leadership of the navies of foreign countries, contemporary war requires the carrying out of various missions from ships of this class /destroyers/: the screening of aircraft-carrier forces, convoys, replenishment ships, and amphibious-landing forces, the support of ground forces, bombardment of shore-objectives, combat against submarines and surface ships, and the conduct of reconnaissance."21/

1977 - "In the opinion of the command of the navies of the NATO countries, the carrying out of the missions of antisubmarine warfare is not conceivable without the joint employment of...heterogeneous forces...In addition to employing submarines and surface ships, naval aviation and a stationary system of long-range hydroacoustic surveillance for the detection and destruction of an opponent's submarines, it is planned to utilize airplanes of strategic aviation, means of outer-space reconnaissance, and other means and forces.

"It is considered that the basic missions for warfare with the submarines of an opponent are: the defense of own territory from oceanic and sea directions, protection of the combat operations of combatant surface ships, protection of amphibious forces and replenishment ships, and the defense of the sea and oceanic communications. The concept of 'antisubmarine warfare' is viewed in NATO as a single whole with the concept of 'the gaining of command of the sea'. The working out of the missions for antisubmarine warfare by all types of operational-tactical forces...is being given priority attention. The majority of the classes of ships and types of forces of the Navy participate in their carrying out. This is effected by the efforts of the command of the North Atlantic Bloc to compensate for the deficit in the number of antisubmarine forces of each individual country..."27/

- "Two basic types of nuclear-powered submarines have been defined clearly abroad: missile and torpedo, the basic mission of the latter being the destruction of the former."27/

- "The basic assignment of the VIKING airplane is the...protection of aircraft-carrier forces against submarines armed with tactical, antiship missiles."27/

- "The views of the NATO command on the employment of antisubmarine forces may be summarized as follows: of primary importance in a global nuclear war is to neutralize the delivery systems for nuclear weapons. Only if this problem can be resolved successfully, they hold, can the tasks be carried out for the protection of sea communications and for gaining 'command of the sea'."27/

- "The NATO command regards offensive naval operations, including nuclear-missile strikes against submarine bases and shipbuilding yards by aircraft, submarines, and surface ships, as the most effective form of antisubmarine warfare. Foreign military professionals, however, do not overrate the results which strikes against submarine base areas can yield: they take the view that the major portion of the submarines will be absent from their bases, dispersed and on-station in the ocean or enroute to their stations. Accordingly, Pentagon leaders and those of other military departments within the NATO countries foresee:

  o systematic operations of hunter-killer forces on the antisubmarine barriers, in straits and narrow seaways, in probable submarine breakout areas, and along the probable routes of their deployment to their on-station areas;

  o massive or selective (offensive) minelaying by aviation and submarine mine forces at the exits from submarine bases, on barriers, and in narrow seaways;

  o the operation of nuclear-powered /torpedo/ attack submarines at positions near enemy bases;

- o the organization of regular, daily operations in the most important ocean areas directed to the search and destruction of submarines detected in the most important regions of the World Ocean; and

- o the direct antisubmarine defense of surface warship forces, amphibious-landing forces, replenishment ships, and convoys during oceanic crossings and in areas where they rendezvous or carry out their mission assignments.

"All /U.S. and other NATO naval/ forces are assigned in their daily /peacetime/ activities to search for the underwater enemy with the ultimate aim of continuously and reliably knowing the location of every strategic submarine in real time."27/

- "Special attention was accorded /by 'the navies of the capitalist countries' in 1976/ to antisubmarine warfare and the training of antisubmarine forces. The search for and destruction of missile submarines throughout all theaters and on the antisubmarine barriers were the main missions for all of the naval forces of the NATO countries."30/

- "As a result of nuclear-powered missile submarines having become the basic strike force of a navy, it was necessary to develop and modernize the means of warfare against them and, first of all, nuclear-powered torpedo submarines. Their most intensive construction was carried out in the U.S."31/

- "American specialists consider that it will be necessary to build 75 air-capable ships by 1990 for carrying out of the task of control of the sea and for supplementing the functions of strike carriers."31/

- "At the present stage of scientific-technological progress, the forces of a navy have acquired the capability to directly and immediately destroy not only the forces of an opponent's armed forces at sea and in coastal regions but also military-economic objectives in the deep rear of an enemy. The creation of strike groups of the forces of a navy for operations against

important ground objectives certainly must be considered to be one of the most important characteristics of the development of navies.

"Submarines armed with ballistic missiles, in the view of foreign specialists, are not the only force which can operate from the ocean's depths. A trend in the development of naval forces has now appeared with distinguishable clarity. It is to place reliance on forces which have increased combat stability and which concentrate in themselves great strike capabilities. To such naval forces belong not only submarines armed with ballistic missiles but also ones armed with other kinds of weapons. They have become the main means for conducting warfare at sea while combat operations for their destruction constitutes the basic content of military operations on the expanses of the World Ocean."31/

- "It is noted in the Western press that the significance of antisubmarine warfare, above all with ballistic missile-armed submarines, provides a basis for considering the combat operations of naval forces for the destruction of antisubmarine forces as operations directed at the resolution of one of the top priority missions of warfare at sea."31/

- "In the view of American specialists, aircraft carriers are becoming the basic ship for basing tactical aviation and an integral part of the forces for insuring command of the sea."31/

- "The equipping of navies with nuclear-missile weapons have increased at the present time the importance of the operations of a navy against the shore. First aircraft carrier aviation and then ballistic missiles fired from submarines determined the colossal capabilities of a navy in delivering strikes on the territory of an enemy...A modern oceanic navy, acting against shore objectives can directly influence the course and outcome of a war. Consequently the operations of a navy against the shore have acquired dominating importance for a war at sea... One of the main missions /of a navy/ has become war against the strategic naval means of an enemy with the aims of either interdicting his strikes or blunting them to the maximum."40/

1978 - "The basic tasks of the /70 programmed/ frigates /of the Oliver Hazard Perry Class/ are the defense of merchant ships and /naval/ auxiliaries and amphibious-landing ships from air, surface, and submarine attack." (FNC 5/78)

- "The combat training of the NATO navies, according to foreign press reports, is conducted actively and is aimed at practicing the following missions: delivery of nuclear strikes against ground targets, destruction of ship forces at sea, support of NATO's Joint Armed Forces in Europe, protection of ocean and sea lanes, antisubmarine defense of the East Coast of the American continent, and conduct of amphibious landing operations."49/

- "The /U.S./ doctrine /of 'strategic sufficiency'/ defines a significant role for air-capable ships in screening friendly strategic-missile submarines and in combating the enemy's missile platforms..."50/

- "The tasks for aircraft carrier forces have not undergone such profound changes in the postwar period as they did during World War II. They remain: gaining command of the sea, operations against ground targets in continental theaters, primarily in the interests of the ground forces, combating enemy submarines and surface ships, screening friendly submarine and surface forces, and participating in amphibious operations."50/

- "The United States and NATO commands give much attention to supporting ocean shipping. This mission is practiced, with the participation of aircraft carrier forces, during many exercises."50/

- "The navies of the world powers, according to the views of foreign military specialists, have come to be assigned primarily to the first priority mission for the destruction...with nuclear-missile weapons of the most important strategic objectives of an opponent and also for the carrying out of a second no less important mission -- warfare with the strike forces of the opposing navy: his submarines, air fleet and surface combatant ships -- the platforms for nuclear-missile weapons and, in the first place, the nuclear-powered missile submarines."52/

- "Destroyers...are multipurpose combatant ships which carry out various tasks..."

  "At the contemporary stage of development of destroyers in the majority of foreign countries, destroyers, in the view of the leadership of the navies of the NATO countries, are called on to carry out a wide range of tasks of antisubmarine and anti-air defense of large naval forces, aircraft carriers among them, for insuring all aspects of the defense of convoys, amphibious-landing forces...In addition, they are assigned to provide gunfire support to ground forces in coastal directions, the support of amphibious landings during debarkation, and the conduct of blockade operations."52/

- "The basic task of frigates of the U.S. Navy is the provision of anti-air and antisubmarine defense for strike aircraft carriers..."52/

- "Multipurpose submarines /of the U.S./ are intended for the following combat tasks: warfare with enemy submarines during their sortie from base, during their transits at sea and in the area of combat operations, during antisubmarine defense of combatant ship forces and convoys, during the delivery of strikes at surface combatant ships and task forces of combatants, during warfare on /the sealines of/ communications, during the conduct of reconnaissance, and during picket duty."52/

- Strike aircraft carriers, in the view of the American command, are the main strike force for gaining command of the sea. They are considered the most multipurpose, universal combatant ship, and one capable of carrying out a broad range of missions in all kinds of naval operations, whether with nuclear or conventional weapons. The basic assignment of strike carriers is the fulfillment...of the following tasks:

  o destruction of important objectives on the shore and in the rear of an enemy, among them naval bases, administrative and industrial centers, ports, airfields, and large war plants /e.g., shipyards/;

  o gaining of command of the sea by means of the destruction of the submarines and surface

combatant ships of an enemy at sea and at their bases and his aviation on their airfields and in the air;

- o anti-air and antisubmarine defense of naval forces during sea transits;
- o provision of air support to ground forces on the offensive and defensive in coastal sectors of a front;
- o covering large convoys in crossing the ocean (or sea);
- o supporting amphibious landing operations during sea crossings, during debarkation on the coast, and during operations on the shore; and
- o interdiction of the maritime communications of an enemy."52/

- "In 1977, the U.S. Navy devoted special attention /in its naval training exercises/ to the tasks for gaining command of the sea in the assigned region, for antisubmarine warfare, and for amphibious landings...According to information in the foreign press, the NATO command considers warfare against the submarines of an enemy to be the most important condition for gaining command of the sea."56/

1979 - "The United States views the main task of its general purpose naval forces to be 'sea control' in the important areas of the World Ocean. It is estimated that, in case of war in Europe, it will be necessary to deliver across the Atlantic monthly five million tons of cargo of which three million will be purely military. For this it will be necessary to form and escort across the ocean an average of five convoys per month. In each convoy there will be up to 100 ships. In case of 'conflicts in Southeast Asia' two or three transoceanic convoys of the same composition might be required. To protect the merchant ships, it is planned to assign one antisubmarine ship (frigate) and a missile ship (destroyer or cruiser) for the air defense of each 20 ships of a convoy. Moreover, the general purpose forces should be ready to cover the tanker routes from the Red Sea across the waters of the Indian Ocean and South Atlantic."67/

- "In the joint NATO naval exercise 'Northern Wedding-78' /held as the naval side of 'Autumn Forage-78', the annual NATO-Europe reinforcement exercise/ was conducted from 4 to 19 September in the regions of the Eastern Atlantic, Norwegian and North Seas, and the English Channel... The organization was worked out for the conduct of combat operations for command of the sea, for landing major amphibious forces of the NATO strike fleets, the protection of the sealines of communications, and the escort of convoys, minelaying and minesweeping, carrying out of all kinds of defense of surface naval forces during sea crossing and in battle."68/

- "The main threat to nuclear-powered missile submarines, foreign specialists believe, comes from nuclear-powered torpedo submarines, which are capable of carrying out prolonged and covert tracking of them. Therefore, antisubmarine warfare against the submarines of an enemy is being given intense attention and for the struggle against them are being enlisted nuclear-powered and diesel submarines, surface ships and antisubmarine aviation in close coordination with the passive stationary SOSUS systems of long-range hydroacoustic surveillance."82/

- "The modernization of all components of the strategic nuclear forces of the U.S., and the development and modernization of offensive armaments is included in what is known as the 'Carter Doctrine'....

  "The number of combatant ships of the U.S. Navy is slated to rise to 550 by 1990. Primarily to be increased are the numbers of aircraft carriers, destroyers, and submarines."86/

1976-1980, 2 (a) - GENERAL SOVIET APPRAISALS OF U.S. ASW

1976 - "Statements in the foreign press attest to the fact that the command of NATO considers solving the problem of warfare against the submarines of an opponent to be one of the most important conditions for gaining 'command of the sea'. This precisely explains the increased interest in the preparation of antisubmarine forces. All of the navies of the NATO countries have developed antisubmarine defense as a basic kind of support for combat operations....

"Positional hydroacoustic means /during NATO naval exercises during 1975/, as previously, were the basis for the organization of the entire antisubmarine system for warfare against missile submarines in the areas of their combat patrolling and on the antisubmarine barriers. Using data from them /SOSUS hydrophones/, mobile forces were vectored to the targets and established contact with the submarines of the opponent...The airplanes of shore-based aviation... were the most effective of the forces capable of arriving quickly in the area of the detected target.3/

- "Antisubmarine warfare, in the view of the leadership of the U.S. Navy, must combine the principles of point (objective) defense and area (regional) defense. Point defense...can be provided by carrier-based antisubmarine aviation, by antisubmarine helicopters, surface ships and submarines /all/ operating as screening forces...Area defense, in the view of foreign military specialists, is a type of offensive operations of antisubmarine forces with the aim of preventing the penetration of enemy submarines into a particular region (area) of an oceanic theater. Area defense requires the installation within the areas to be defended of stationary means of detection and the deployment therein of mobile antisubmarine forces (antisubmarine submarines and airplanes of shore-based patrol aviation). Stationary means of detection are considered to be the basis of the organization of area defense since they permit a considerable increase in the effectiveness of the operations of the mobile antisubmarine forces. The military leadership of the U.S. has

developed a system of underwater surveillance, SOSUS, in which a hydrophone system is employed that permits the long-range detection of the noise of submarines. The antisubmarine barrier on the Greenland-Iceland-Scotland perimeter established /by the U.S./, with the aim of preventing the penetration of the submarines of an opponent /Guess who!/ into the Atlantic, may serve as an example of area defense as foreign specialists perceive it. Nuclear-powered submarines, shore-based airplanes, and surface ships in combination with antisubmarine mine barriers can be included in the forces and means which are operated on such a barrier. The stationary means for submarine detection are installed there /in the GIUK Gap/ already."19/

- "The antisubmarine forces and means now in the inventory of the U.S. Navy, according to the evaluation of American naval specialists, continue to be insufficiently effective."20/

- "Means are being developed /by the U.S. Navy/ for the hydroacoustic surveillance of the ocean depths in zones beyond the limits of the... CAESAR system...Foreign specialists note that the stationary detectors available at present do not insure the reliable surveillance of the water medium and the timely detection of targets and, most importantly, they can not classify the sound contacts."20/

1977 - "The naval forces of the leading maritime powers of the West and Japan are undergoing a major buildup with priority assigned to strategic and antisubmarine forces. The navies of other capitalist countries show a marked orientation to employment as antisubmarine navies.

"By dint of great efforts, huge material expenditures, and mobilization of the entire resources of the country, the U.S. has been able to effect a qualitative restructuring of its naval forces and to modernize its ship complement and its aviation technology.

"The development of a continuously operating system of long-range underwater sound surveillance, as evidenced in foreign publications, has considerably enhanced the capabilities of /U.S. and other NATO/ naval forces for warfare against modern, nuclear-powered submarines.

"...the problem of warfare against nuclear-powered submarines carrying strategic missiles, as acknowledged by NATO's military-political leadership, is still far from a solution."27/

- "Operational coordination of...submarine surveillance means /in any warfare at sea/ would be instituted in sea and ocean theaters to include normal /mobile and portable/ means and long-range detection means, which may include antisubmarine weapons platforms. /Antisubmarine/ barriers also will be established employing the CAPTOR mine-torpedoes. The operational forces may include fixed and towed detection means as well as attack submarines with AN/BQQ-5 sonar systems, VIKING and ORION antisubmarine airplanes, and the LAMPS ship-helicopter system.

"It is considered that the position of detected submarines will be determined in a circle with a diameter of around 16 km. in areas of the World Ocean already encompassed by long-range surveillance systems, which will permit effective use of ship and aircraft forces and means of localization. It is possible to organize an exchange of information here, such as between attack submarines and antisubmarine aircraft through a radio buoy with a hydroacoustic channel /i.e., a sonobuoy/. Thus, the various forces and means, including the long-range detection system, will be patched into it during the search, detection, and tracking of a submarine...

"In the opinion of U.S. Navy specialists, organizing continuous surveillance in all parts of the World Ocean will hinder the activity of multipurpose and strategic-missile submarines of the probable enemy."42/

1978 - "The United States is continuing the buildup of its Navy. President Carter has presented to Congress a five-year program for modernizing the Navy estimated as costing about 28 billion dollars. The program provides for building about 70 large new ships and modernizing 13 existing ones. The program includes provisions for starting the construction of one aircraft carrier, a nuclear-powered cruiser, seven destroyers, 26 frigates, six Trident nuclear-powered torpedo-firing submarines, five nuclear-powered torpedo-firing submarines, submarine

chasers, landing ships, surveillance ships, etc. /Additionally/ several aircraft carriers, destroyers and other ships comprising the striking force of the U.S. Navy will be modernized and reequipped."47/

1979 - "The development of the antisubmarine forces /of the U.S. and other NATO countries/ is being accomplished mainly by means of increasing the numbers of nuclear-powered and diesel-powered torpedo submarines,1/ renovation of the ship component of the antisubmarine forces, acquisition of new antisubmarine airplanes and helicopters, equipping the airplanes and helicopters with the latest antisubmarine weapons, and the development of a positional system of long-range hydroacoustic surveillance.

"The U.S. already has undertaken the construction of a major series of multipurpose submarines of the Los Angeles Class (it is planned to build more than 40 boats of this Class), destroyers of the Spruance Class (30 ships), guided-missile frigates of the Perry Class (74 units), and has begun equipping antisubmarine ships with new antisubmarine helicopters, which considerably raises the surveillance and antisubmarine capabilities beyond the limits of the range of action of a ship's radio direction-finding and hydroacoustic gear.

"All cruisers, destroyers, and frigates building in the U.S. and /other/ NATO countries will have antisubmarine missile systems and helicopters in their armament. The tempo of R&D and operational development of new types of antisubmarine ships is being increased."70/

- "The American press contends that the United States is approaching a 'technological breakthrough' in the field of antisubmarine defense owing to a further development of acoustical and nonacoustical (infrared, laser, etc.) means of

1/ Just in the U.S. it is planned to have about 90 nuclear-powered multipurpose submarines.

detection and also to the latest developments in computer technology. These achievements are being extensively incorporated in the global system for monitoring the underwater environment that is being created by the United States."80/

1976-1980, 2 (b) - U.S. BUDGET ALLOCATIONS TO ASW

1976 - "...the U.S. Navy is devoting increasing attention to the further development and to a buildup of antisubmarine forces and means. It plans to allocate $20 billion to this end in the coming five years. Additionally, the aircraft of the Navy are to be significantly modernized and replaced."18/

1977 - "The organization of warfare with submarines ('antisubmarine warfare' in American terminology) requires the mobilization of colossal material means and production resources. It suffices to note that the United States of America annually spends about four billion dollars on the development of antisubmarine forces. And this does not count the indirect expenditures for the same purpose."27/

- "The cost of the program of measures for antisubmarine warfare for the 1975-'78 period, which includes development of the long-range detection systems, is placed at 2.3 billion dollars, which shows the great attention being given by the United States to the combating of enemy submarines."42/

1978 - "In the budget of the Department of Defense, expenditures for the means of antisubmarine warfare occupy a leading place. And allocations for the Navy on the whole, and in particular for scientific-research and experimental-design work, also exceed the corresponding budgets of the other branches of the armed forces of the U.S." (FNC 8/78)

1979 - "According to the U.S. shipbuilding program for /the coming/ five years, appropriations are earmarked as follows: over $8 billion for development of the TRIDENT system, about $8.6 billion for antisubmarine forces and facilities (five SSNs and 26 guided-missile frigates, 12 underwater ocean surveillance ships, and a cable ship to support the SOSUS stationary long-range hydroacoustic system)...The appropriations are being distributed on a roughly equal basis among strategic forces, antisubmarine forces, and means for anti-air warfare."67/

- "The U.S. Navy annually spends an average of five billion dollars on defensive and offensive programs for antisubmarine warfare."81/

1976-1980, 2 (c) - U.S. ASW FORCE LEVELS AND FORWARD DEPLOYMENT/READINESS

1976 - "Task Force 67, which is assigned for the surveillance of submarines and combat with them, constitutes the basis of the antisubmarine forces of the American Sixth Fleet which is in the Mediterranean. Permanently included in it are 13 airplanes of shore-based aviation which operate from the air bases at Rota, Signonella, and Suda."27/

- "Among the countries of the capitalist world, the U.S. now possesses the largest number of nuclear-powered submarines. As of 1 June 1975, in the complement of the submarine forces of the U.S. there were...62 nuclear-powered torpedo submarines in commission, one in reserve, and 23 under construction. Moreover, there were eight /more/ of the so-called first generation /in commission/ which were either built singly or in very small series..."20/

1977 - "Task Force 85 is composed of shore-based patrol aviation /of the U.S. Atlantic Fleet/. The bases for this aviation are dispersed so as to insure their rapid access to any point in the /Atlantic/ Ocean."27/

- "Composite Task Force 70 /of the U.S. Seventh Fleet in the Western Pacific/ is antisubmarine. Depending on the missions assigned, it includes several operational hunter-killer groups of heterogeneous forces.

"In Task Force 72 are included a division of destroyers (3-4 ships) and a squadron (nine planes) of the airplanes of shore-based patrol aviation.

"In the Western part of the Pacific Ocean, the antisubmarine forces of the U.S. Navy...utilize the bases of Yokosuka, Sasebo, Naha (Japan) and Subic Bay (The Philippines).

"The antisubmarine aviation of the /Seventh/ Fleet is dispersed throughout the entire theater..."27/

- "The U.S. Naval Forces with ASW weaponry, as of 1/7/77 (numerator) or as of 1/1/80 (denominator):

"Classes (Subclasses) of ships	U.S.
Multipurpose aircraft carriers	13
	13
Antisubmarine aircraft carriers	--
Cruiser-helicopter carriers	--
Nuclear-powered torpedo submarines	67
	82
Diesel submarines	9
	5
Guided-missile cruisers	27
	32
Guided-missile destroyers	39
	39
Destroyers	66
	44
Guided-missile frigates	6
	34
Frigates	58
	35
All together:	285
	284
Airplanes of shore-based aviation	250
Helicopters (about)	200."27/

1978 - "...the eighth ship of the Spruance Class has been homeported in Norfolk where three other ships of this class already have been based... four others are homeported in San Diego." (FNC 4/78)

- "Around two-thirds of the U.S. Navy and the navies of NATO allies is concentrated in the Atlantic. The ocean has been turned into a base for nuclear missile systems and air groupings.

"In conformity with views of the American-NATO command, it is planned to have from 60 to 80 percent of the nuclear-powered strategic submarines, nuclear-powered attack submarines, diesel submarines, aircraft carriers, guided-missile and ASW ships, coastal patrol aircraft, deck-based aircraft, and Marines in the Atlantic theater at the time a war begins. According to foreign press data, these forces can employ from 6,000 to 7,000 nuclear warheads, including several hundreds of bombs from aircraft carriers deployed in the theater at the beginning of combat operations as part of NATO's attack fleet...

"The far-flung network of naval and air bases, basing points, and airfields permits the stationing of NATO forces along the entire perimeter of the Atlantic. There are a total of 85 ship bases and basing points and 90 air bases here, which comprise around 60 percent of the entire system of fleet basing of capitalist countries in the World Ocean. In wartime this network can be significantly expanded by using commercial ports, of which there are over 1,140 on the Atlantic.

"The Atlantic Ocean occupies first place among all other parts of the World Ocean in being infrastructured with technical means of surveillance, navigation, and a system of communications. The American command devotes a considerable amount of attention to forward basing of attack and antisubmarine forces at bases and in ports of Allied countries.

"Judging from foreign press reports, combat training of NATO's Navy is conducted actively and is aimed at practicing the following missions: delivery of nuclear strikes against ground targets; destruction of ship forces at sea; support of NATO's Joint Armed Forces in Europe; protection of ocean and sea lanes; antisubmarine defense of the east coast of the American continent; and conduct of amphibious

landing operations. The direction and content of the NATO's Navy combat training thus bears a clearly evidenced offensive character..."49/

- "Aircraft carriers...are forward deployed in the main oceanic and sea theaters /in peacetime/ to establish and maintain a high readiness by powerful forces...Constituting the nucleus of the surface forces, they group around themselves various combinations of antisubmarine, attack, or amphibious landing ships. This insures a marked level of readiness to accomplish all missions...There are two carriers with their escort forces constantly located here /in the Mediterranean/...There is a similar aircraft carrier force (2-4 carriers) in the U.S. Seventh Fleet operating in the Western Pacific...The remaining carriers are part of the Second Fleet Forces in the Atlantic (3-4 carriers) and the Third Fleet in the Pacific (4-6 carriers)."50/

- "In March /1978/ the nuclear-powered submarine Los Angeles chopped to the Pacific Fleet and is attached to Submarine Squadron Six, based at Pearl Harbor. Before this, she had operated in the Atlantic and Mediterranean..." (FNC 7/78)

- "In the current fiscal year, 24 surface combatant ships and auxiliary vessels are being removed from the composition of the regular and reserve fleets (13 from the Atlantic and 11 from the Pacific). They include five destroyers...At the same time, after construction, the regular Navy will be supplemented by 13 surface ships, including 11 destroyers of the Spruance Class, a guided-missile frigate, the Oliver H. Perry..." (FNC 11/78)

- "Adak is a U.S. Navy base situated on the island of the same name, the largest in the Aleutian chain, near the Kamchatka Peninsula. Frigates are based here for patrol duty. Not far from the harbor is an air base for patrol aviation from which ORION aircraft make systematic flights to scout and search for submarines."63/

1979 - "The U.S. Naval Command has two naval bases at its disposal in the oceanic region of the Atlantic -- Bermuda...and Newfoundland. Together with the air bases of Kinley and Argentina located there /respectively/, they provide

basing for surface ships, submarines, and airplanes of shore-based aviation which are assigned the tasks of the protection of /the sealines of/ communications and antisubmarine warfare against enemy submarines in the oceanic region.../Additionally/ a forward basing point and antisubmarine air base...has been established at Keflavik, Iceland."65/

1976-1980, 2 (d) - MISSION-COMPLETION CAPABILITIES OF SOVIET SSBNs

1976 - "A lowered noise level at the optimum cruising speed, a capability to submerge to great depths, the effectiveness of their means of detection and destruction are the characteristic features of submarine-hunting submarines...The naval commands of the U.S. and U.K. intend to employ nuclear-powered torpedo submarines individually and in groups, independently and in cooperation with escort, antisubmarine airplanes, and helicopters...One of the basic (if not the main) tasks of nuclear-powered torpedo submarines, according to information in the foreign press, is the constant trailing in peacetime of nuclear-powered ballistic-missile submarines with the mission of destroying them at the outset of a nuclear war."1/

- "Shipborne aviation personnel /of the Soviet Navy/ have...mastered to perfection the tactics of search for and combat with submarines in all regions of the seas and oceans. Coordination of surface combatants with antisubmarine helicopters during search and attack of submarines has been mastered...

  "Among the ships of fundamentally new types, it is especially necessary to note the antisubmarine cruisers, foremost among which are the Moskva and Leningrad. The antisubmarine cruiser...typifies the new direction in surface ship construction. Aboard the ships of this class are concentrated many new forms of military technology which provide them with exceptionally strong combat capabilities. Possessing great maneuverability and high seaworthiness, these ships carry on board modern means of combat with submarines. Their main advantage in comparison with other ASW ships consists in that they are equipped with the necessary number of helicopters capable of locating in a short time the submarines and other enemy forces at sea."7/

- "The /Soviet/ Navy has grown into a formidable force. At present, nuclear-powered submarines armed with various missiles and homing torpedoes are its main means capable of carrying out the basic missions of the Navy. Naval missile

aviation also has been transformed into a powerful force. The Navy also possesses missile, antisubmarine, minesweeping, landing, and other surface ships...Our Navy has mastered /operating on/ the expanses of the World Ocean. At its disposal is everything necessary for the successful conduct of combat operations on the oceans and seas."8/

- "Our aircraft of antisubmarine aviation, which are equipped with modern means, can carry out search for and destruction of the submarines of an aggressor far out at sea."9/

- "The construction of the Soviet Navy always has been tied closely to the latest achievements of science and technology. Nuclear-powered submarines have been built which incorporate such qualities as stealth, mobility, practically unlimited cruising range, and colossal striking power. These mighty nuclear-powered submarines, which are invulnerable to an enemy, have assumed the leading role in our Navy."10/

- "A modern navy is one capable of inflicting strikes with strategic nuclear forces on important ground objectives of the enemy, of destroying the forces of his navy at sea..."12/

- "The Soviet Navy has acquired the capability to deliver nuclear-missile strikes from great distances on the territory of an enemy, on his navy, and on his bases."13/

- "Our balanced Navy is comprised of...completely modern nuclear-powered submarines possessing tremendous striking power and meeting the requirements of modern war to the maximum extent...naval aviation, which has now become ocean going, missile-carrying, and antisubmarine...wonderful surface ships, including missile cruisers, antisubmarine ships, destroyers, minesweepers..."14/

- "Nuclear-powered submarines armed with ballistic missiles and homing torpedoes are the pride of the /Soviet/ Navy. In the complement of the Navy are modern antisubmarine ships, missile cruisers...air-cushion ships...Naval aviation is an important, integral part of the Navy."15/

- "Today our /Soviet/ Navy incorporates ships of great endurance, unlimited seaworthiness, and high striking power and combat stability. There are missile-carrying surface ships armed with missiles of great power and exceptional accuracy. There is supersonic missile-carrying aviation designed to combat surface ships and submarines. Our nuclear-powered submarines armed with long-range...missiles and modern homing torpedoes are the pride of the Soviet people."16/

- "It is considered that, in the event of war, /Soviet/ submarines could operate against task forces of the strike carrier forces of NATO... and provide antisubmarine defense for...their own...submarines armed with ballistic missiles."19/

- "The destruction of submarines directly at their bases, in the view of foreign military specialists, although of great significance, nevertheless obviously cannot bring about a significant lowering of the submarine threat. In this connection, they turn to the experience of World War II and point out that out of the total number of submarines lost, only about eight percent were destroyed in their bases. This is why the leaders of the navies of the U.S. and NATO, as the foreign press reports, are planning to concentrate their main efforts on the destruction of submarines at sea on the deployment routes and directly in the areas of combat patrolling -- that is, over the expanses of the entire oceanic (sea) theater."19/

- "Antisubmarine warfare against submarines armed with ballistic missiles is considered in the U.S. to be a problem of extraordinary importance. This is explained by the foreign press as due to the difficulty of the detection of submarines and the difficulty of intercepting and destroying the ballistic missiles launched by them since the latter have a relatively low flight altitude and short flight time...The specialists of the U.S. hold that the short flight time of ballistic missiles launched from submarines (about 15 minutes for a flight over a distance of 2,800 km. on a normal trajectory and seven to eight minutes on a depressed trajectory) can prove to be insufficient for the institution of countermeasures...

"The American military theoreticians, while terming antisubmarine warfare against ballistic-missile submarines 'strategic ASW', consider that /only/ two options of warfare against them are possible: a preemptive surprise strike on all missile submarines (a preemptive surprise first strike) and strikes with the aim of limiting their /Soviet SSBNs'/ capabilities for inflicting damage (damage-limiting attack)...The second option calls for the destruction of the maximum-possible number of missile submarines over the course of an extended period of time. Only that particular percentage of submarines being tracked /in peacetime/ can be destroyed at the outset of a war under this second option. Thus, a most important role in the organization of antisubmarine warfare against ballistic-missile submarines, in the view of American specialists, is played by tracking them while still peacetime..."19/

"The American command is planning to organize and conduct antisubmarine warfare within the zones of responsibility of their basic operational fleets. The main efforts will be concentrated in the North Atlantic and in the Western Pacific where it is planned to deploy the most powerful groups of antisubmarine forces...

"The main mission of submarine forces in the Eastern Atlantic, foreign specialists consider, will be the establishment of continuous control over the deployment of enemy submarines. To achieve this, it is planned to employ a grouping of ASW naval forces of the European NATO countries, which may include up to eight nuclear and 90 diesel submarines, up to 160 destroyers and frigates, and around 150 coastal patrol airplanes.

"In the opinion of NATO naval specialists, it is advisable to focus the efforts of ASW forces on the ASW barriers. This can include the following narrows: Spitsbergen - Bear Island - North Cape and Greenland - Iceland - Faeroes Islands and Norway. In addition, it is planned to bring in ASW forces to search for submarines in the open areas of this zone and to insure the antisubmarine defense of aircraft carrier strike forces in the Norwegian Sea...

"The basic task of the antisubmarine forces of NATO in the Western Atlantic is considered to be antisubmarine warfare (above all with nuclear-powered missile submarines) in the approaches to the East Coast of the U.S. and the protection of trans-Atlantic communications. It is planned to assign this task to the naval ASW forces of the United States and Canada."19/

- "These characteristics /modernity, nuclear-power, submerged endurance, and virtually unlimited range/ and also the increase in submergence depth, the equipping with modern sensors, cover and deception methods available and the weapons for self-defense have raised the combat capabilities of submarines considerably and their invulnerability to antisubmarine forces."20/

- "The great cruising range submerged provided by the nuclear-power plant insures the submarine great covertness during its sojourn at sea...The great cruising range submerged in combination with high speed affords a submarine the capability to escape from surface ships which are tracking it...Foreign nuclear-powered submarines are capable of diving to a depth of up to 400-500 meters. At such depths, it is believed, a submarine is more difficult to detect and destroy with antisubmarine weapons. Moreover, it is capable...of maneuvering through the depths under a thick layer of water and of so escaping from antisubmarine ships."20/

- "It is considered that nuclear-powered missile submarines can constitute a constant threat of a nuclear-missile strike from...the regions of the Arctic while being covered by the ice against the antisubmarine forces of an enemy. While remaining in the assigned region, the missile-armed submarine can maneuver freely in the deep, which enables it /both/ to receive radio transmissions from the command and to take up the initial position at the right moment, to make the necessary calculations, and to carry out missile launchings at the assigned targets."20/

- "The nuclear-powered submarines built in the Soviet Union are formidable and reliable ships. They are capable of completing extended cruises in submerged condition, of inflicting powerful

torpedo strikes on combatant ships and merchant ships of the enemy and of destroying with missiles any objective on land and sea."20/

- "The navies of the U.S. and other countries of NATO are according ever greater attention to warfare against the submarines of an enemy, employing aviation, surface ships and, above all, nuclear-powered torpedo submarines for this purpose."20/

- "Out of the whole inventory of antisubmarine forces, foreign naval specialists especially single out nuclear-powered torpedo submarines armed with SUBROC antisubmarine missiles, homing torpedoes, or wire-guided ones. In their estimation, nuclear-powered torpedo submarines equipped with improved sonar gear are capable of carrying out covert search for enemy submarines, tracking them and effectively employing weapons for their destruction."20/

1977 - "The basis of the Navy is constituted by nuclear-powered submarines, naval missile and antisubmarine aviation, and various types of missile and antisubmarine surface ships."23/

"Modern surface ships...can conduct warfare with a surface, submarine, and air enemy. Naval aviation, which is capable of destroying submarines and surface ships and other small and highly maneuverable targets at sea, is an important component of the strike forces of the Navy."24/

- "They /the Germans/ employed their submarines /'without the necessary measures of support'/ and took no special measures during the war for combatting the /enemies'/ antisubmarine defense forces."26/

- "Exploiting the /North Atlantic/ region's natural features and a situation in which all of the countries fronting on the barrier are NATO members, the command of the NATO bloc has succeeded in the development of a completed system for the basing of ships and aircraft so as to provide a deeply-echeloned structure of mobile forces in the shortest time. The barrier is equipped with fixed underwater surveillance systems. It is planned to deploy submarines...in the Denmark Strait and at individual patrol

areas on the barrier between Iceland and Norway during periods of high tension or at the start of combat operations. According to American sources, eight positions have been designated for nuclear-powered submarines which will coordinate operations with the BGAS /underwater sound surveillance shore facilities/ and lay minefields of CAPTOR mines."27/

- "...the problem of warfare against nuclear-powered submarines carrying strategic missiles, as acknowledged by NATO's military-political leadership, is still far from solution."27/

- "The experience of the Great Patriotic War showed that in antisubmarine warfare the most serious problem was the detection of submarines while submerged. The rapid development of hydroacoustic means played a most important role in /solving/ this /problem/...the day-to-day warfare against submarines required their integration throughout the entire theater into a single system...

  "The antisubmarine forces of the Soviet Navy are capable of successfully carrying out the missions which they are assigned /i.e., including SSBN protection/. They have the requisite means for detection and destruction /of enemy submarines/ and they have at their disposal antisubmarine ships /which include ASW submarines/ and aviation which can conduct antisubmarine warfare in the distant regions of the seas and oceans."28/

- "Nuclear-powered submarines armed with long-range underwater-launched missiles and modern homing torpedoes are the pride of our Navy. Supersonic missile and antisubmarine aviation capable of successfully combating surface ships and submarines have become the Navy's highly mobile strike force. Cruise missile, antisubmarine, minesweeping, amphibious-landing and other surface ships are capable of carrying out a broad range of missions in a war at sea."29/

- "Multipurpose aircraft-carrier task groups, according to the pronouncements of foreign military specialists, now can independently control the sea expanses for antisubmarine defense at a radius of up to 40 miles from the aircraft

carrier (up to 60 miles, according to some sources) and also carry out effective detection of submarines at a range of up to 100 miles. In addition, the need is noted, as before, of pressing into service the P-3C ORION airplanes of shore-based patrol aviation for the search for submarines in the Far Zone (100-150 miles from the carrier). In the course of combat training, the view that nuclear-powered submarines are required in the screen of hunter-killer groups finally has become firmly established."30/

- "For operations on the /antisubmarine/ barriers, submarines are employed. The new nuclear-powered torpedo submarine of the Los Angeles Class, in the estimation of American specialists, is capable of reliably controlling a square area 60 miles on a side."30/

- "It is considered that modern antisubmarine submarines, which are equipped with qualitatively new sonar gear, can conduct warfare against missile submarines in any region of the World Ocean."31/

- "The leading role in the composition of the Navy is played by submarines. Of all of the classes of warships, they correspond most fully to the requirements of modern war...By far the most powerful and modern among them are the missile submarines...They are capable of remaining submerged for long periods of time and, without surfacing, of delivering strikes with ballistic missiles on objectives located on the territory of an enemy..."32/

- "The fact that the regions of patrolling /of Soviet Delta Class SSBNs, implicitly/ will exceed existing areas by 10-14 times makes ballistic-missile submarines less vulnerable to antisubmarine defense forces."33/

- "At present...the main means of carrying out the basic missions of the Navy are nuclear submarines armed with various missiles and homing torpedoes...The Navy has missile, antisubmarine, anti-mine, amphibious-landing and other surface ships. Naval missile-carrying and antisubmarine aviation have opened up new opportunities for strengthening the combat might of the Navy and increasing the mobility of its forces."34/

- "The basis of the combat might of the Navy is comprised of nuclear-powered submarines, naval missile-carrying and antisubmarine aviation, and missile and antisubmarine surface ships of various types."35/

- "In addition to submarines, our Navy also has at its disposal missile-carrying, antisubmarine, amphibious-landing, and other surface ships that are armed with modern weapons for fighting enemy warships, submarines, and aircraft. Our Navy has everything necessary for conducting combat operations on the oceans and seas either on a one-shot or protracted basis."36/

- "The modern Soviet Navy...is capable of destroying important enemy ground objectives...The main characteristics of a modern navy include...the capacity to covertly and rapidly deploy its forces and deliver annihilating strikes on ground targets...Submarines and naval aviation have become the main branches of forces of the Soviet Navy and various missiles with nuclear warheads have become the main weapons. For providing combat stability to the submarines and all around support for warfare against submarines and against antisubmarine forces of the enemy and for carrying out other specific tasks, various surface ships and airplanes are coming into the composition of our Navy. They are armed with torpedoes, missiles of various uses...and other types of naval weapons."40/

- "The Soviet Navy is capable of countering aggression from seaward directions and of carrying out major operational and strategic missions in oceanic and sea theaters of military action... The Navy constitutes a balanced system of the various branches of forces including submarines, surface ships, naval aviation, coastal missile forces, naval infantry...Submarines and the Naval Air Force, armed with missiles of various classes and designations, are the main branches of the Navy...Submarines -- one of the main branches of the forces of the Navy -- are continuously modernized."41/

1978 - "The basis of the combat might of the /Soviet/ Navy now is comprised of submarines, surface missile and antisubmarine ships, missile aviation, and shore missile batteries."43/

- "At the present time, nuclear-powered submarines armed with various missiles and homing torpedoes are the main means capable of carrying out the basic missions of the /Soviet/ Navy. They can deliver strikes at great ranges not only on targets at sea but also on the coasts and in the rear of an enemy."44/

- "Modern surface ships...can effectively combat surface, submarine, or air opponents. Naval aircraft capable of hitting submarines, surface ships...are an important component of the Navy's strike forces."45/

- "When a /Soviet/ naval formation lacks an air-capable ship, the formation may be provided cover by shore-based fighter aviation..."46/

- "Antisubmarine aviation /of the USSR/, which is equipped with various airplanes and helicopters, is capable of successfully conducting search for submarines in any region of the seas and oceans and of destroying them."48/

- "At the present time, the main means for carrying out the basic missions /of the Soviet Navy/ on the seas and oceans are nuclear-powered submarines armed with various missiles and torpedoes...Soviet nuclear-powered submarines have demonstrated their high seagoing qualities under the ice at the North Pole..."51/

- "Nuclear-powered submarines armed with long-range ballistic missiles have the capability to destroy from various directions the strategic objectives of an enemy which are located in the depths of his territory. Important factors of the combat power of ballistic-missile submarine platforms, in the opinion of foreign specialists, are the large number of missiles on each submarine and the capability to launch the entire supply of missiles in a comparatively brief period after the order to deliver a strike."52/

- "The widespread introduction of nuclear-power plants, nuclear-missile weapons, and electronics have changed the combat capabilities of our Navy radically. In its composition are nuclear-powered submarines armed with missiles and torpedoes, antisubmarine, missile, minesweeping, amphibious-landing and other surface combatants

with powerful modern weapons. Antisubmarine cruisers which carry helicopters and airplanes on them have become a new type of surface ship in our Navy."53/

- "Our Navy has at its disposal missile-carrying, antisubmarine, minesweeping, amphibious-landing and other modern surface ships. The pilots of the Naval Air Force have a perfect mastery of complicated combat equipment and make confident flights over the vast expanses of the oceans."54/

- "Despite the obvious achievements in the area of developing modern antisubmarine submarines, foreign specialists hold that managing to trail missile submarines is still very difficult... Technically, this is difficult to do but possible."57/

- "In /every Soviet Navy/ operational zone support is given for establishing a situation...which will protect the permanent and maneuvering bases of the naval forces."58/

- "For the antisubmarine defense of the system of bases of the /Soviet/ naval forces (combatant ships, merchant ships, auxiliaries located at naval bases, and at basing points and at anchorages)...there may be utilized the requisite stationary means of detection and tracking of submarines and /also/ mobile antisubmarine forces."60/

1979 - "Can submarines, despite the constant modernization of antisubmarine means, achieve strategic aims in a war at sea? A great deal of research has affirmed the high effectiveness of submarines when they are properly employed and provided with combat support...

"Thus, in nuclear-powered submarines are concentrated all of the basic indices which characterize the power of a navy, great striking power, high mobility and stealth, the capability for conducting combat actions on a global scale for destruction of important ground objectives /and/ the submarines and surface ships of an enemy...

"Missile submarines are weapon platforms for powerful, long-range strategic missiles, which

are designated for the destruction of important ground objectives of the enemy. They are a basic component of the combat might of the leading navies of the world, among them, of the Soviet Navy...

"Now the /Soviet/ Navy is capable of carrying out strategic missions not only for the destruction of important ground objectives on enemy territory but also for the destruction of nuclear-powered submarines at sea."70/

- "What are these nuclear-powered, ballistic-missile submarines like as surveillance targets? First of all, let us note that, because of the great range of ballistic missiles, the operating areas of nuclear-powered, ballistic-missile submarines are dispersed all over the vast expanses of the World Ocean. The size of these areas increases as the range of fire increases.

"Thus, favorable conditions exist for submarines to maneuver strategically and to select their operating areas so as to take advantage of the location of enemy forces, weather conditions, and the level of biological noises and other phenomena which make their detection difficult. All this demands global coverage of surveillance, the capacity to monitor vast expanses to the furthest limits of the oceanic theaters of operations and to maintain continuous surveillance of every submarine.

"Surveillance is rendered more difficult too, as noted abroad, by the covertness of operation of submarines, by their capacity to remain submerged at great depths for extended periods. Especially important is the quiet running of the ballistic-missile submarines...

"In addition to /these aforementioned/ technical procedures to insure covertness, rational use is made of the hydrological particularities of the oceans and seas as well as of their seasonal changes...

"Also contributing to the maintenance of the covertness of submarines is the standard operating procedure for use of their electronic gear...Sophisticated electronic countermeasures are used to divert search forces in false directions.

"Thus, the measures for covert operations taken by nuclear-powered, ballistic-missile submarines make them an extremely complex and difficult target for surveillance /systems/ and hamper the latters' performance."72/

- "It is essential to note that, because of the constantly increasing range of ballistic missiles, the importance of surveillance of the bases of strategic submarines, in the opinion of foreign experts, will become even greater in the future. Submarines carrying intercontinental missiles, such as Trident I and II for example, do not need to penetrate oceanic zones or antisubmarine barriers or screens. They can fire their missiles from near their own bases."72/

- "The Navy comprises...submarines with missile and torpedo armaments, supersonic missile-carrying aircraft, shipborne airplanes, modern surface ships of various types...in short... everything needed to...counter an aggressor's attack from the sea and to neutralize his strike forces."74/

- "Our Navy...right now...is fully balanced among the branches of the forces: submarines, surface ships, Naval Aviation, the coastal missile forces, and the Naval Infantry. The basis of its power is submarines with nuclear-power plants and missile weapons, aviation that is capable of conducting combat operations from airfields and from air-capable ships, surface ships including the antisubmarine cruisers Kiev, Minsk, and Moskva..."75/

- "Today's nuclear-powered submarines armed with ballistic missiles form an inseparable part of our country's strategic shield along with the Strategic Missile Forces. The combat capabilities of the submarines, surface ships, and of the aircraft and antisubmarine forces have increased."76/

- "Nuclear-powered submarines armed with ballistic missiles and homing torpedoes...are now the main means of carrying out the Navy's basic missions. The Navy also possesses missile, antisubmarine, mine-warfare, amphibious-landing and other surface ships that are armed with modern weapons for combating the surface-ship forces,

submarines, and aircraft of an enemy. The Navy has remarkable, modern ships -- the antisubmarine cruisers Kiev and Minsk...Naval missile and antisubmarine aircraft have demonstrated new capabilities...over the boundless expanses of the oceans..."77/

- "Nuclear-powered submarines with ballistic missiles are now its /the Soviet Navy's/ main strike force...Missile-carrying and antisubmarine aircraft possess great capabilities. Our surface ships...are up to the level of modern requirements."78/

- "Trident-1 has a range of 7,000 kms. while the range of Trident-2 is 12,000. American experts say that this will make it possible to bring the zones of combat patrol of these submarines closer to the coasts of the United States. This will make the task of the adversary's antisubmarine forces more difficult, thus making the U.S. submarines invulnerable."81/

- "We did not succeed in penetrating the antisubmarine barrier covertly. Combatant ships of the 'enemy' hunter-killer group detected our submarine and started to take position for delivering a decisive strike. Normally in such circumstances one should attempt to break away from 'the enemy'. However, everything considered, the antisubmariners were holding contact so reliably that it was unlikely that we would succeed. So I decided to take a tactical measure, the plan for which had long been conceived. A sudden maneuver took the antisubmariners by surprise. Taking advantage of it, we successfully carried out our assigned mission. 87/

1976-1980, 3 (a) SOSUS (PLUS ANY COMPATIBLE MOBILE/PORTABLE SUBSYSTEMS)

1976 - "The tasks of the initial detection of the missile submarine, classification of the contact, and the vectoring of a torpedo submarine to the target are assigned to the stationary means of long-range detection of the SOSUS system in the zone of its effectiveness, to airplanes of shore-based aviation, to space satellite, radio monitoring, and other means of surveillance. In this connection, the U.S. Navy Command is cognizant of the fact that the effectiveness of the system of long-range hydroacoustic detection can be lowered significantly by the employment of electronic countermeasures and that a submarine being tracked can, with their /ECM/ help, escape..."1/

- "As in the Atlantic and Pacific theaters of military action, here /in the Mediterranean/ too there functions a system of continuous antisubmarine surveillance. Stationary hydroacoustic means are its basis. They are installed, as the foreign press reports, on the approaches to the Straits of Gibraltar (the AFAR system operates from the side of the Atlantic Ocean) and by the shores of Italy and Turkey.

  "Special attention in the organization of antisubmarine surveillance is given to shore-based patrol aviation which, due to the presence of a developed net of air bases dispersed throughout the entire theater, and in combination with the stationary means, can operate very effectively."2/

- "In 1976, there will enter service the towed sonar for surface ships, the IETAS (Interim Escort Towed Array System). Eventually, it will be replaced with the more sophisticated ETAS which is being developed at present." (FNC 3/76)

- "The SURTASS (Surveillance Towed Array Sensors System), for the search for submarines in vast regions, is being developed. It is planned to equip small, quiet ships with this towed sonar for patrolling in assigned regions...The platforms for these sonar will supplement the

net of stationary means of the SOSUS system...for which one billion dollars have been appropriated in the past two-three years." (FNC 3/76)

- "The deployment of antisubmarine forces prior to the start of combat operations or under the conditions of a war which has started can be accomplished only on the basis of a system of continuous antisubmarine surveillance and systematic tracking of each nuclear-powered missile submarine that has been developed in peacetime, according to statements in foreign publications /Emphasis from the original Russian text/.

"At the cost of great efforts and the marshaling of the material resources of the country, the leadership of the Armed Forces of the U.S. and their allies, as the foreign press states, have succeeded in completing the first stage in the development of a global system of submarine surveillance...

"Under the CAESAR program, it is known, the U.S. Navy has installed a net of hydrophone detectors on the continental shelf along the East Coast... and on the underwater heights of the Atlantic. At present, CAESAR is undergoing its fifth modernization. The zone of operation of the detectors has embraced the basin of the Caribbean and the Gulf of Mexico.

"A comparable COLOSSUS system was installed off the West Coast of the U.S. in the mid-'60s. Stationary means of long-range submarine detection, according to the foreign press, have been installed along the chain of the Aleutian Islands, and the Kuriles-Kamchatka Trench. Similar systems, BARRIER and BRONCO, exist off the coasts of a number of other countries (Great Britain, Portugal, Denmark, Turkey, Italy). A deepwater Hawaiian chain of hydroacoustic surveillance named SEA SPIDER has become operational. Still another system of submarine detection, AFAR, has been developed by the U.S. Navy and NATO which permits tracking submarines in the approaches to the Straits of Gibraltar...

"By the end of the '70s, the operational centers of the /U.S. fleet/ commanders-in-chief and naval commanders in the /ASW/ zones are planned

for unification into a single computer net of the U.S. Naval Command. This will provide direct, high-speed exchange of data between the integrated computers...

"Special attention is being accorded by the U.S. Navy to the end that the information collected by...SOSUS will be disseminated to the antisubmarine forces in a timely basis. One of the measures directed toward achieving this end is the development of a specialized data system, OSIS, with shore centers for the processing and dissemination of /SOSUS/ data.

"Having obtained a fix on the sound of a target and classified it tentatively as submarine, one of the 22 SOSUS shore stations forwards the fact of the detection to a command post of the antisubmarine forces which retransmits the information. Mobile forces, most often airplanes of shore-based aviation, are vectored to the area of the contact. Continuous surveillance (tracking) is established on the detected submarine. The tracking can be covert (by employment of passive means of surveillance) or overt (by use of active means of search).

"In organizing surveillance on antisubmarine barriers, the joint use of stationary and positional means and various mobile forces is planned. Foreign specialists hold that the effectiveness of detection barriers can be increased by the use of autonomously operating /long-lasting sonobuoy/ devices emplaced by aviation or submarines."5/

- "Judging from reports in the foreign press, the P-3C ORION airplanes...cannot carry out effectively some of the important missions for antisubmarine defense which are assigned to antisubmarine aviation. In particular, it cannot carry out adequately the job of processing data from the stationary system of the CAESAR type because the collection of data from them requires such heavy gear that the ORION cannot carry it."6/

- "The Naval Research Laboratory has approved a concept for the design and production of a low-frequency directional hydrophone which is significantly superior to existing ones in its

characteristics. The new hydrophone provides a more precise determination of the direction of the source of an acoustic signal..." (FNC 8/76)

- "...great attention is being given abroad to the development of better means for the detection and destruction of submarines, to the construction of ship and aircraft suitable for employing the latest antisubmarine weapons, and to the designing of various hydroacoustic gear for surveillance of the depths of the approaches to their own coasts and in the vast regions of the seas and oceans."20/

- "...distinguishing a missile-armed submarine underwater from any other submarine is virtually impossible..."20/

- "In the U.S. stationary (positional) hydroacoustic means for the detection of nuclear-powered missile submarines and the vectoring to them of the mobile antisubmarine forces have received great development. Thus, in 1952 the Americans brought into operation a stationary net of detectors, CAESAR, off the Atlantic Coast of the U.S. and in 1969-1970 another off the Pacific Coast. In 1972, work began for the installation of such a net in the Caribbean and the Gulf of Mexico. The net consists of anchored hydrophones connected by underwater cables with shore posts where processing of the data is conducted. Means are being developed for the hydroacoustic surveillance of the ocean depths in zones beyond the limits of the operation of the CAESAR system as well. Foreign specialists note that the stationary detectors presently available do not insure the reliable surveillance of the water medium and the timely detection of targets, and, most importantly, they cannot classify the sound contacts."20/

1977 - "The deployment of antisubmarine forces before the outbreak of combat operations or in the conditions of a war's beginning, as foreign publications indicate, must proceed on the basis of a system already established and tested in peacetime for continuous antisubmarine surveillance and organized tracking of every nuclear-powered missile submarine.

- "At considerable cost and effort and the marshaling of the material resources of all the NATO countries, the policy makers of the U.S. Armed Forces and their allies have succeeded in establishing a global system of antisubmarine surveillance. At its basis is the centralized collection of information on the underwater situation from all forces and means at sea, in the air, and in space.

  "Satellites observe the dispositions of warships at their bases. Satellites can detect submarines located on the surface and at shallow depths; submarines can be detected by surface combatant ships and other ships at sea, by aircraft in flight, and also by patrolling warships and aircraft in operating and exercise areas...

  "Inasmuch as the effective range of sonar systems aboard mobile platforms is quite short, not exceeding /a few/ hundred miles, and since the exploitation of an airplane's mobility entails a considerable expenditure of sonobuoys, the main role in the resolution of the problem of long-range detection and the initial classification is laid on the stationary means of hydroacoustic surveillance of the SOSUS system -- the basis of a global system of surveillance of the underwater environment that permits the collection and technical analysis of information on all hydroacoustic contacts.

  "The basic sources of information for SOSUS (initially processed by the 22 shore stations) are the U.S. Navy's stationary systems CAESAR, COLOSSUS, SEA SPIDER, CASS (prospective), and also the NATO systems AFAR, BRONCO-BARRIER."27/

- "Positional hydroacoustic means have constituted the basis for the structuring of the entire /U.S. and NATO/ antisubmarine system."30/

- "Among such /non-acoustic/ means /of submarine detection/ there is, first of all, a laser system; it can be installed both in submarines and antisubmarine airplanes. In this connection, foreign specialists consider that a laser locator installed in an airplane insures the location of a submarine at depths up to 150 meters."31/

- "In the scientific-technical literature of the U.S., great attention is being accorded to the problem of the detection of submarines by their turbulent wakes. Representatives of American military circles hold that a system developed on this principle can not only detect a submarine but also track it by towing the sensor for the system along through the wake. They also believe that, besides the towed detection system, the development of stationary equipment for the detection of submarines by their wakes is possible..."31/

- "At the present time, the U.S. Navy is devoting a lot of attention to the development of a system for continuous surveillance of submarines in the World Ocean. Work is being carried out to include it in a global military surveillance and control system. It will consist of 35 peripheral computer centers and a joint center in the Hawaiian Islands...

  "Surveillance, including long-range surveillance, includes detection and continuous tracking of enemy submarines in peacetime. It is understood that this includes classification of the submarines to include identification as well as determination of their location with sufficient accuracy for effective final search by mobile antisubmarine forces in case such need arises (such as the start of military operations)...The fact is that, for range of detection as well as for informational content, hydroacoustic signals have no equal. This does not mean, of course, that other physical fields are not being studied or used but that for now the submarine detection methods and means connected with them are of secondary importance."42/

  "U.S. expenditures for these purposes /research of the World Ocean/ averaged $800 million per year during the 1975-'78 period."43/

  "Foreign specialists believe that towed arrays have substantial advantages in comparison with fixed hydroacoustic detectors. Above all, they can be towed at depths more favorable for submarine detection in a given area and they are less vulnerable to enemy ordnance, which in no way can be said of fixed hydroacoustic facilities.

"Success in developing towed arrays led to the development of a new sub-system of SOSUS under the name of SEA GUARD. It is intended for surveillance of quiet submarines, the appearance of which /in the Soviet Navy/ worried the U.S. Naval Command greatly. SEA GUARD is to involve special ships...in the ocean with special data processing."42/

1978 - "The development of effective antisubmarine means largely depends on the possibility of solving difficult technological problems. The most difficult of them, it is considered, are the detection and classification of nuclear-powered submarines."52/

- "From 1979 to 1983, it is planned to build /in the U.S./...12 surveillance ships of the Taigos Class...".55/

- "In the development of antisubmarine weapons, the U.S. Navy gives special significance to the means of detection and classification of targets...For low frequencies, a towed antenna array, SURTASS, is being developed, which should widen the zone of oceanic underwater surveillance and supplement the CAESAR/SOSUS stationary system of underwater surveillance...In the solving of the problems of underwater warfare, acoustic modelling, which is being carried out under the LRAPP program by many laboratories of the Navy, has taken on important significance. With the help of acoustic models, which reproduce the temperature mode, saltiness, and depth in individual regions of the ocean at various times of the year, the optimal variants for the application of one or another hydroacoustic system in the changing conditions of the surrounding medium can be determined. The LRAPP program has been going on already for 11 years..." (FNC 8/78)

- "In 1972 the U.S. Budget Committee /of ?/ approved a plan for the modernization of existing /ASW/ perimeters and zones on the far approaches to the /U.S./ coasts and straits, and also for the establishment of new ones. Considerable means are being expended for these aims. For example, in the U.S. alone, in 1976 about 25 percent (about 800 million dollars/ of the funds were allocated for carrying out of the ASW

program were expended for the development of a global system of long-range hydroacoustic surveillance.

"Research is continuing directed at widening the zones of operation of the stationary means in the Aleutian Islands, Taiwan, Okinawa, Korea, and the Philippine Islands. In the Hawaiian Islands a joint intelligence center for the SOSUS system is being established."57/

- "The development of means for the long-range detection of submarines under the SEA GUARD program is going along the route of the development of widely-apertured antenna installations, the introduction of computerized methods and means for the processing of signals, and investigation of the feasibility of active hydroacoustic detection. Also being improved are the towed hydroacoustic stations of the SURTASS type..." (FNC 12/78)

1979 - "The AFAR antisubmarine field has been developed in the region of the Azores. Its passive hydroacoustic system is dedicated to insuring the monitoring of the underwater situation in this region."65/

- "In the opinion of scientists and specialists, the deep-water hydroacoustic surveillance system (SASS) can become one of the most effective means of detection of...submarines. In the working out of the project, begun in 1973, are participating /two research facilities and four private companies/. The completion of the work on the SASS project is planned for the end of the 1982 fiscal year. By that time it is planned to have fully worked out and tested a model of the system, in the composition of which are included underwater structures, hydrophones and electronic equipment. Since SASS has potential shortcomings which limit the potential for its operational application, it is planned to continue scientific-research and experimental-design work.

"Up until 1977, research was carried out on the effectiveness of the operating hydroacoustic system of surveillance, SOSUS. Analytical and experimental work showed that the main direction for the increasing of its sensitivity lay in the

development of more effective antenna installations. Measurements carried out in the ocean served as the basis for the selection of the contracting firms for the next orders. In 1977 was begun the production of the new antenna sprays and their factory testing..." (FNC 1/79)

- "According to the U.S. shipbuilding program for /the coming/ five years, appropriations are earmarked as follows: ...12 underwater ocean surveillance ships, and a cable ship to support the SOSUS stationary long-range hydroacoustic system."67/

- "From everything related above, it is clear that the main assignment of the navies of the Western powers is for actions against the territory of an enemy. At the same time, the naval forces of the U.S. and NATO also possess great capabilities for naval warfare and, in the first place, for antisubmarine warfare.

  "The development of the antisubmarine forces is being effected mainly by way of an increased buildup in the number of nuclear-powered and diesel-powered torpedo submarines, by the refitting of the surface ASW combatant force, by receiving new ASW airplanes and helicopters, and by the installation of positional systems of long-range hydroacoustic surveillance.

  "The matter of search for submarines is considerably more difficult /than in WW II/, especially for nuclear-powered ones having high speed and great submergence depths. And, although the search for them is based on the use of many physical fields...their detection poses no small difficulties...70/

  "Means for the illumination of the underwater environment...have acquired a most important significance under contemporary conditions. Among them, a special place has been occupied by hydroacoustic stations and systems which are devoted to the detection of submarines and surface ships, the search for mines, protection of shipping, and to rescue work. Hydroacoustic means are being developed intensively in all navies and already have become an inseparable part of the armament of submarines, surface combatants, helicopters, airplanes, and of stationary systems."

"The extensive application of hydroacoustics has exerted a substantial influence on the development of the Navy and on /Soviet/ naval art. The potentials of hydroacoustics are far from exhausted. Work for increasing its effectiveness will continue, especially for antisubmarine warfare. Consequently, more effective methods for warfare against the forces of the enemy of a navy will continue to be developed."70/

- "The covertness measures taken by nuclear-powered, ballistic missile submarines make them an extremely complex and difficult target for surveillance...So, it is not surprising that there is a continuing and highly scientific effort being made in the U.S. to...establish an effective system for monitoring the submarines of the putative enemy.

  "American military experts accord very great importance to their system of submarine surveillance. It is a very important component of 'antisubmarine warfare' and has both operational and strategic significance."72/

- "Judging from reports in the foreign press, the Americans are attempting...to establish a system of submarine surveillance in the /World/ Ocean zone, employing for this purpose stationary and fixed hydroacoustic systems, aircraft, surface ships, electronics, and space reconnaissance. The main components of this system are in operation at present. The passive hydroacoustic system SOSUS has been in operation for over 20 years. According to the press, 22 SOSUS stations had been installed in the Atlantic and Pacific by mid-'73 and were monitoring vast underwater expanses. SOSUS makes it possible to detect and track the movements of submarines within the SOSUS zone of surveillance and to classify the submarine contacts. Consequently, the Americans assign SOSUS a major role among the means for supporting operations to destroy enemy submarines before they can launch their missiles. Of the four 'classic functions' of antisubmarine defense -- detection, classification, localization, and attack -- SOSUS has the capability to perform the first three. Concomitantly, unlike the other means, it does its tracking secretly and not at severely restricted ranges, which is very important in order to provide vectors to the attack forces.

"Nevertheless, as foreign experts testify, SOSUS does not satisfy the operational requirements of /the U.S./ command fully. In the first place, it does not provide surveillance coverage of all possible routes of deployment and operating areas, especially of those submarines with long-range ballistic missiles. In the second place, the present positioning of its hydrophones does not provide a continuous, solid zone of effective surveillance. The zone of observation formed by the SOSUS detection nets is, figuratively speaking, 'insular' in nature. Only within 'islands' of this zone do its surveillance data meet operational-tactical requirements for accuracy and reliability in classification and tracking. Work is underway to eliminate the weak spots by improving the system, modernizing it, installing new components, and introducing data processing equipment and methods.

"However, the view is that the problem of submarine surveillance cannot be solved by SOSUS alone. Consequently, two mutually supporting new systems are being developed by the U.S. Navy. One of these (Projects RDSS and SASS) is termed an anchored stationary system while the other (Project FDS) is an integrated towed system. Project RDSS requires anchoring passive hydroacoustic buoys of great endurance /90 days at depths of up to 5,400 meters/. Project SASS involves the installation of hydrophone antennas on specially constructed support towers on the ocean floor. Project FDS envisions the establishment of 'barrier' or 'security' lines of submarine surveillance for the purpose of interdicting passages leading into certain areas of the World Ocean."72/

- "Vice Admiral F. Harlfinger, USN (Retired), a specialist in ASW matters, believes that American antisubmarine defense overall is no more than 20 percent effective at present. This is [illegible]y plans have been worked out in the U.S. and in other countries for scientific and engineering studies to make substantial improvements in its effectiveness. Fundamental to these is a search for new approaches and new equipment [illegible] will insure detection and extended tracking [illegible] in the oceanic zone. This is often referred to in the American press

as 'the battle to make the sea transparent'. This effort is taking two directions: conventional (existing/ means are being improved -- for example, sonobuoys that can identify a submarine's type, nationality, and exact location -- and new, more effective means are being developed for surveillance of the newer submarines. For example, there was a report in the American press of a study of the feasibility of employing electromagnetic impulses in a low-frequency range for the surveillance of submarines. New magnetrometric, infrared, laser, gas-analyzer, ionizing, and other means of detection are in various stages of development. Under serious consideration are the possibilities of establishing a satellite system of submarine surveillance."72/

- "Antisubmarine warfare against the submarines of an enemy is being given intense attention /in the U.S./ and for the struggle against them are being enlisted...submarines, surface ships, and antisubmarine aviation in close coordination with the...SOSUS system of long-range hydroacoustic surveillance."82/

- "NATO's military specialists hold that antisubmarine warfare can be successful only when the problem of the continuous surveillance of...the World Ocean is solved...In the opinion of the American Navy, the existing /SOSUS/ system of surveillance of the underwater system does not fully meet contemporary requirements -- above all from the point of view of the speed of processing the collected information, for determining submarine locations precisely, and for insuring the timely employment of weapons against them. As a consequence extensive work is being carried out in the U.S....for the further development and improvement of the means and methods for the detection of submarines...

  "Work for the development and improvement of hydroacoustic means and methods of submarine detection are covered by a number of programs: SEA GUARD, LAMBDA, LRAPP, TASS, RDSS, and SASS...It is planned to employ the /SURTASS/ special hydroacoustic surveillance ships in those regions of the World Ocean where stationary means of detection are not installed or where they are not sufficiently effective.

"In the RDSS (Rapid Deployment Surveillance System) program, a positional system of hydroacoustic surveillance is being worked out. It is based on the application of anchored sonobuoys, dropped from airplanes, with a more prolonged (up to 90 days) functioning period than that of the sonobuoys which are used at the present time by shore-based patrol aviation of the U.S. Navy. These buoys would be equipped with devices for the collection of information on submarines. Transmission of it to the shore collection and processing center must be carried out by radio through an artificial earth satellite (airplane) upon request or independently.

"The American specialists believe that RDSS resolves the problem of precise determination of the location of detected submarines and ensures a capability for combat operations against them in a short time after the beginning of combat operations at sea. It is believed that it will supplement the SOSUS stationary system of long-range hydroacoustic surveillance and will find wide application on the Greenland-Iceland-UK barrier and also in other regions of the oceanic and maritime theaters of military action.

"The SASS program (Suspended Array Surveillance System/ provides for the development of a stationary system of hydroacoustic surveillance of long-range, low-noise, deep-water submarines. As the foreign press states, it would consist of a series of support towers, installed every 8-10 miles on the heights of the bottom of the ocean at depths of up to 6,000 meters...In the opinion of western military specialists, the SASS system can become one of the most effective means of detection of submarines.

"Along with the realization of the programs enumerated above, which are directed toward the improvement of the existing, and the creation of new, hydroacoustic means, extensive research in the area of the working out of non-acoustic means of detection of submarines and the methods of their utilization is being conducted by the U.S. Navy.

"Thus, within the SEA GUARD program, a high-efficiency laser which works in the visible portion of the spectrum, and designated for under-

water surveillance, has been created by the center for acoustic research at Moffet Field.

"Western specialists believe that in the future, in connection with the rapid development of technology, the significance will increase of stationary systems of detection of submarines based on the principle of the change of the earth's magnetic field in a given region during the passage of a submarine.

"The command of the American navy is devoting great attention to the development and improvement of the means and methods of collection and processing of hydroacoustic information, and to the raising of the effectiveness of its use. The existing stationary hydroacoustic systems and hydroacoustic means of surface ships, submarines and airplanes of shore-based patrol aviation serve as the sources of information.

"In the opinion of foreign specialists, the centralized processing of hydroacoustic information with the aid of computers on a close-to-real-time scale permits the heightening of the effectiveness of struggle with submarines by 50 percent.

"Judging by the statements in the foreign press, in the U.S. are being worked out various systems for the processing of data that are intended for deployment on surface ships, submarines and airplanes of shore-based patrol aviation. Thus, in 1980, an automated system of digital processing of data on the underwater situation, 'Proteus', the potentials of which raise the capabilities of existing means of processing by two times, should enter into the armaments of the Navy. It is proposed to install this system on 240 'Orion' aircraft, 12 hydroacoustic surveillance ships with towed antennae and on 100 frigates and destroyers with towed antennae.

"A device for the processing of hydroacoustic signals of a wide frequency range has been created for nuclear-powered submarines of the U.S. Navy. As the foreign press notes, it would permit the processing of signals, coming in on 80 channels, at a speed of up to 160 million signals per second, the fixing of the changes of the noises of submarines which are equal in

noise level to the surrounding medium, and give a conclusion to their detection.

"In the interests of providing automated classification of detected targets, great significance is being given to...a special method, FACT (Fast Asymptotic Coherent Transmission)...

"In the opinion of American military specialists, for the centralized processing of hydroacoustic information and its evaluation on a close-to-real time scale, the automation of the process of the collection of information by various systems and means, and also the timely forwarding of it to the patrolling antisubmarine forces, takes on exceptionally important significance...

"It is planned to distribute the results of the evaluation of the underwater situation in a theater in the form of information on the forces of the enemy through a developed system for control of the U.S. Navy in the zones. It would include shore command centers for control of the U.S. naval forces in the zones, FCC (Fleet Command Center), centers for control of antisubmarine forces, ASWCCCS (Antisubmarine Warfare Command and Control Centers System) and an automated flag command center, TFCC (Task Force Command Center), /all of these three types of centers/ integrated with a specialized information system of ocean reconnaissance and surveillance, OSIS (Ocean Surveillance Information System).

"Such, in brief, are the basic direction of work being conducted in the U.S. Navy for the development of a global system of surveillance of the underwater situation in the sea and oceanic theaters of military action."83/

1976-1980, 3 (b) - SHORE-BASED VP AIRPLANES

1976 - "Special attention in the organization of antisubmarine surveillance /by NATO ASW forces in the Mediterranean/ is given to shore-based patrol aviation which, due to the presence of a developed net of air bases dispersed throughout the entire theater and in combination with stationary means, can operate very effectively."2/

- "Aviation is especially effective when it operates in a system of zonal defense in which it is vectored to targets by positional hydroacoustic systems..shore-based aviation is employed for submarine search both separately and jointly in cooperation with other antisubmarine forces and means, including being vectored by stationary means of long-range hydroacoustic surveillance."4/

- "It should be noted that in the course of the operational and combat training of the navies of the NATO countries, they employ their shore-based and ship-based aviation very extensively. Not one exercise has been held without them. In addition to patrol flights for surveillance of a given region, airplanes fly out to the areas of detection of a target by other forces and means and they also conduct the antisubmarine defense of task forces and convoys in the Far /Antisubmarine Defense/ Zone."4/

- "Mobile forces, most often the airplanes of shore-based patrol aviation, are vectored to the area of /SOSUS/ contact. Continuous surveillance (tracking) is established on the detected submarine."5/

- "According to the conclusion of American specialists, the A-NEW system raises the effectiveness of the P-3C airplane by more than two times in comparison with the preceding P-3A/B ORION modifications. However, the cost of this airplane is about seven million dollars of which five million goes into the A-NEW system for search and targeting. In total, 100 P-3C airplanes have been ordered for the sum of 600-800 million dollars. The airplanes are to be produced over a period of five years...at two to three planes per month...

"Judging from reports in the foreign press, the P-3C ORION airplanes, into the development of which have gone hundreds of millions of dollars, cannot carry out effectively some of the important missions for antisubmarine defense which are assigned to antisubmarine aviation. In particular, it cannot carry out adequately the job of processing data from the stationary systems of the CAESAR type because the collection of data from them requires such heavy gear that the ORION cannot carry it. Consequently, in U.S. naval circles, the view has been expressed that it is necessary to develop a new patrol aircraft in place of ORION, for example, on the basis of the largest American military transport, the C-5 GALAXY airplane."6/

- "Shore-based aviation conducts antisubmarine patrol against multipurpose submarines in the coastal zone where a large number of combatant ships and merchant vessels normally transit between bases and ports, /and/ patrols in the open sea within the limits of its tactical radius searching for missile submarines in specified regions of the ocean. Also, shore-based aviation patrols on the antisubmarine barriers with the aim of collecting information on the movement of submarines obtained by sonobuoys or by stationary hydroacoustic means installed on the barrier. While on the barrier, shore-based aviation cooperates with surface ships and antisubmarine submarines....The patrolling antisubmarine airplanes cannot exchange information directly with the antisubmarine submarines but must transmit it through a shore command point -- which results in a loss of time and makes the reconnaissance data obsolete. Finally, shore-based antisubmarine aviation carries out search for submarines in zones in which other antisubmarine forces have had contact with a submarine but, for some reason, have lost it."6/

- "In the draft Navy budget for FY 1977, the purchase of 12 shore-based P-3C ORION patrol airplanes...is included." (FNC 9/76)

- "In the U.S. there is included in the complement of antisubmarine aviation /both/ shipborne airplanes and helicopters...and shore-based antisubmarine airplanes, which are more often termed 'patrol' airplanes....Airplanes in flight,

naturally, cannot lower a sonar into the water and tow it. For the detection of submarines, they use special sonobuoys which are dropped into the water. These buoys surveil the water expanse around themselves and transmit the received data by radio to the airplane ..Sonobuoys are one-time means and are not retrieved by the airplanes. The supply of buoys on board an airplane is not great.20/

- "In serial construction /in the U.S./ at the moment is the shore-based patrol airplane P-3C ORION. The Navy plans to procure 12 ORION airplanes per year up to 1985." (FNC 12/76)

1977 - "In the postwar period...the leadership of the navies of the U.S. and NATO consider...shore-based aviation to be a most important, integral part of the antisubmarine forces. In their view, a shore-based patrol airplane must discharge the tasks in minimum time of searching distant regions of the oceans while conducting routine (everyday) patrolling or escorting task forces of naval combatant ships or convoys /of merchant ships/, of carrying out mine patrols on antisubmarine barriers...and of localizing submarine contacts detected by other means (primarily by stationary ones)."27/

- "As the foreign press asserts, the search for underwater targets at great depths will be facilitated by /obtaining/ photography /of the same areas/ in /both/ infrared and the visible spectra and correlating them. Considering that it will become possible in the near future to transmit satellite photography to ground stations rapidly, the antisubmarine capabilities of satellite surveillance will increase markedly."27/

- "U.S. airplanes of shore-based patrol aviation were /in this survey of NATO naval training in 1976/ the most effective of the forces in arriving rapidly in the area of the contacts made by stationary means."30/

- "A new type of naval aviation appeared in the early 1950s, antisubmarine aviation. Shore-based airplanes of antisubmarine aviation, such as the P-3A ORION, ...can carry all types of antisubmarine weapons with an overall weight of more than 6,500 kg...."31/

- "Antisubmarine aviation, it is believed in the West, is capable of surveilling considerable expanses of the seas and oceans in a short period of carrving out the search and destruction of submarines, both independentlv and in cooperation with other antisubmarine forces.... The U.S. and its partners in NATO are placing great hopes on the further development of antisubmarine aviation, considering it to be the /or, optionally "a"/ main type of force in antisubmarine warfare against nuclear-powered submarines."39/

- "The first P-3C ORION airplane of the second modification began its acceptance trials in March /1977/." (FNC 8/77)

- "The feasibility is being studied of developing a multipurpose airplane of shore-based patrol aviation with a flight weight of 135-180 tons and a speed of flight out to the region of combat operations of mach 0.5 - 0.8. Its missions would be: providing air cover for ships at sea, conducting warfare with submarines, operating on maritime communications, and the antisubmarine and anti-air defense of convoys at greater distance /than possible with ORIONs/. (FNC 10/77)

1978 - "Production of modification two of the P-3C ORION was begun in the fall of 1977....Since 1972 the U.S. Navy has ordered 458 P-3 ORION airplanes. Another 14 will be acquired in FY 1978. It is planned to continue acquiring these machines until 1985." (FNC 9/78)

- "Operations of antisubmarine aviation based on data from positional hydroacoustic means (systems) are acquiring ever greater importance."59/

1979 - "In the U.S. Navy /as of September 1976 when this book was sent to the printer/ there is shore-based patrol aviation numbering about 450 airplanes. Half of them (24 patrol squadrons with nine airplanes each) are in the regular Navy /i.e., in commission vice in reserve/."66/

- "Since 1969, the U.S. Navy has been working on the development of an outer-space system of reconnaissance of the oceanic theaters of military action ...At the present time (however/, as has been noted in the press, there is no /effective/

...system of space reconnaissance of the U.S. Navy." (Underlining in the Russian original.) 71/

- "Lockheed is developing a new modification of the P-3C ORION airplane of shore-based patrol aviation. It will be equipped with gear for the automatic processing of information from sonobuoys and capable of rapidly discriminating between a valid signal and background noise and interference. This airplane will enter service this year. ...

  "Work has begun connected with the search for a replacement for the P-3C ORION...The following variants are being investigated: modernization of the P-3C; adaptation of civil transport airplanes; or a /wholly/ a new design....Until the development and introduction into service of the new aircraft, the Navy plans to arm the P-3C airplane...with the HARPOON anti-ship guided missile (up to six missiles) which has a flight range of 60 miles...". (FNC 10/79)

1976-1980, 3 (c) - SSNs (PLUS SUBROC)

1976 - "The main advantage of a nuclear-powered submarine is covertness of operation. It has been freed of the various noises which cannot be eliminated from a surface ship. Sonar gear, as a means for permitting the use of torpedoes, is not needed for submarines /and/ they rarely use radio communications...nuclear-powered submarines are capable of submerging to depths at which cavitation does not occur even at top speed....Reduced noise levels at optimal cruising speed, the capability of submerging to great depths, and /possession of/ effective means for the detection and destruction /of enemy submarines/ are the characteristic features of submarine-hunting submarines."1/

- "Fifty-six assembled AN/BQR-21 DIMUS...sonar are being ordered, intended for the detection and classification of low-noise nuclear-powered submarines at distances of up to 100 miles. All nuclear-powered missile submarines and part of the nuclear-powered torpedo submarines will be equipped with these sonar... In 1976, the AN/BQQ-5 sonar will enter service. All submarines of the SSN-688 Los Angeles Class under construction will be equipped with it as will too submarines of the SSN-594 Permit Class and SSN-637 Sturgeon Class (during routine overhaul)." (FCN 3/76)

- "The series production of the remote-controlled Mark 48, Mod-3 torpedo, whose production was begun in January 1975, is continuing. In contrast to the Mark 48, Mod-1, which had only one-way communication with the submarine, two-way communication has been provided for the new torpedo." (FNC 5/76)

- "As long as submarines do not have means for anti-air defense, the helicopter will remain essentially invulnerable and will employ its detection means and weapons without constraint."11/

- "As of 30 June /1976/, it was planned to have 65 nuclear-powered torpedo submarines in the composition of the U.S. Navy. The number is planned to increase by 1978 to 75." (FNC 9/75)

- "In the /U.S./ Secretary of Defense's report to the Congress, it is indicated that it is planned to build over the next five years....11 nuclear-powered torpedo submarines...". (FNC 10/76)

- "Procurement of the Mark 48 torpedo, with which it is planned to replace all other submarine torpedoes, is continuing. As of February 1976, about 800 of them had been delivered by the manufacturer and about half of all submarines had been armed with them." (FNC 11/76)

- "Shipbuilders abroad at present are seeking the optimum forms for the hull, sail, and screws (of submarines/ and noise reduction during submerged movement...".20/

- "The American solid-fuel antisubmarine missile-torpedo SUBROC has a flight range of 40-60 km. This exceeds the flight range of all other types of antisubmarine weapon."20/

- "For the development of deep-running submarines, great scientific research and experimental development is being conducted abroad. Thus, the experimental deep water submarine of the U.S., the Dolphin, has submerged to from 600 to 900 meters. This means that the time is not far off when series submarines too will be able to submerge to such depth. According to reports in the foreign press, by 1980 the U.S. will be able to build a submarine for submerging to from 1,000 to 1,200 meters. Such a depth would provide a better defense against a surface and air enemy."20/

1977 - "According to the situation at the end of 1976, a decision was adopted for financing the construction of...39 multipurpose nuclear-powered submarines of the Los Angeles Class. The construction is proceding with considerable delay beyond the planned schedule. The lead ship of this class /the Los Angeles/ was transferred to the Navy only in 1976, not in 1975 as previously reported. Over the course of the past year, it had been planned to complete the construction of the next five of these submarines."22/

- "Table 3 showed that the U.S. planned to build eight multipurpose torpedo submarines in the period 1978 through 1982: two in 1978, one in

1979, one in 1980, two in 1981 and two in 1982." 22/

- "On 16 October 1976, the 14th of the Los Angeles Class submarines was laid down." (FNC 2/77)

- "In 1969 it was reported that the U.S. Navy was investigating the feasibility of developing a new tactical missile for use against /both/ submerged and surface targets on the basis of SUBROC. Its entry into service is expected by the end of the 1970s. The Mark-46 antisubmarine torpedo will be the warhead for this new missile. This new modification of the antisubmarine missile /SUBROC/ has been given the acronym STAM." 27/

- "In January 1975 production was started on an improved, telemetry-guided torpedo, the Mark-48, Mod-3. It differs from the Mark-48, Mod-1 with its one-way link by having a two-way link." 27/

- "The 16th nuclear-powered torpedo submarine of the Los Angeles Class, the SSN-703, will be laid down...at the end of 1977. Its launching is planned for 1979 and its delivery to the Navy for 1980." (FNC 6/77)

- "The antisubmarine torpedo is virtually becoming the basic type weapon of submarines in warfare against the submarines of an opponent." 31/

- "It is reported in the foreign press that after the completion of the Los Angeles Class series of multipurpose nuclear-powered submarines, it is planned to develop a new submarine of this type that is armed with anti-ship missiles. This submarine will have a new hull, a new nuclear-propulsion plant, an increased depth of submergence, and will be faster. According to an announcement of the Chief of Naval Operations of the U.S. Navy, the first two of these submarines, which will be armed with cruise missiles, will be launched in the present decade." 31/

- "The Los Angeles (SSN-688), the lead ship of the class, was commissioned on 13 November 1976 five months behind schedule. Its weaponry - four ... torpedo tubes for firing SUBROC antisubmarine guided missiles, Mark-48 wire-guided /antisubmarine/ torpedoes... In sum, 31 of the 39 SSN-688

Class have been ordered. The current program provides for the completion of five submarines over a two-year period....The overall cost per unit with weapons and equipment is 320 million dollars....The construction rate of the submarines in this series is lagging more and more behind schedule. By mid-'76, the lag in the construction schedule was estimated to be about two years. In 1977...12 submarines were laid down; seven units are programmed for delivery to the Navy this year." (FNC 9/77)

1978 - "In FY 1977, three nuclear-powered torpedo submarines of the Los Angeles Class were commissioned." (FNC 4/78)

- "In FY 1979...four nuclear-powered submarines of the Los Angeles Class...will be commissioned." (FNC 7/78)

- A total of 36 Los Angeles Class SSNs are planned.52/

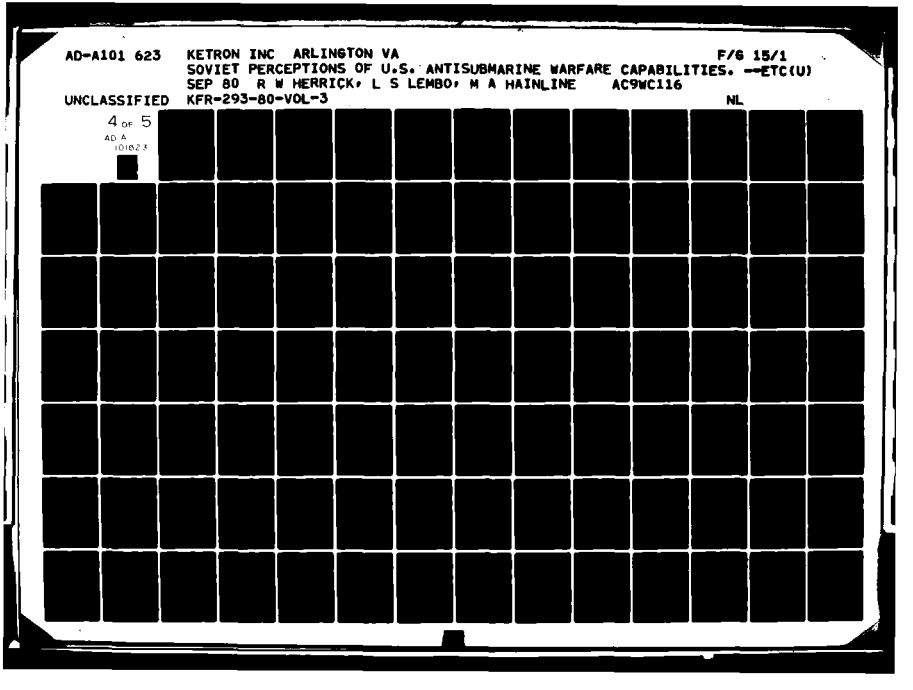
- A total of 59 SSNs are shown as in commission (as of 22 April 1977 when this reference work was sent to the printers). This included 37 Sturgeon Class (built from 1967 to 1975), 13 Permit Class (1962-1968), five Skipjack Class (1959-1961), and four Skate Class (1957-1959).52/

- "The submergence limits of series torpedo submarines abroad reach 400 meters and more (480 meters for the American submarine of the Los Angeles Class.52/

- "The new American submarines of the Los Angeles Class have a submerged speed of about 40 knots...".52/

- "The basic assignment of diesel-powered submarines, just as in the period of World War II, is considered to be operations (together with nuclear-powered submarines) on the lines of communications of an enemy with the aim of fully or partially interdicting his shipping...

"In the views of foreign specialists, diesel-electric submarines, which are equipped with modern technology and torpedo weapons, can conduct warfare against nuclear-powered and diesel-


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powered submarines of an opponent in the composition of heterogeneous antisubmarine forces on barriers, in straits zones, in narrows, and in the approaches to naval bases. The main advantages of diesel-powered submarines over nuclear-powered ones are considered to be their comparative quietness and cheaper cost of construction."52/

- "From 1979 to 1983, it is planned to construct...five nuclear-powered multipurpose submarines of the Los Angeles Class...".55/

- "In 1979, it is planned to allocate funds for the building of...one nuclear-powered torpedo submarine of the Los Angeles Class...'. (FNC 10/78)

- "Despite the obvious achievements in the area of developing modern antisubmarine submarines, foreign specialists hold that effecting the trail-of missile submarines is very difficult. Technologically, this is difficult but not impossible."57/

- "There is a projection on the U.S. Navy's complement in 1990. In commission should be...90 nuclear-powered multipurpose submarines...". (FNC 11/78)

1979 - "In 1970-1976...funds were allocated /to the U.S. Navy/ for the construction of...26 multipurpose nuclear-powered submarines...".64/

- "According to the U.S. shipbuilding program for /the coming/ five years, appropriations are earmarked as follows: ...for five SSNs...".67/

- "General purpose forces are being upgraded... Some 73 percent of multipurpose submarines (of the Los Angeles and Sturgeon classes, and the non-series submarines) have been in commission less than 15 years. They will receive antiship missiles and improved sonar gear. The appearance onboard submarines of weapons to combat an air enemy cannot be excluded."67/

- "In the /large-diameter/ antisubmarine torpedo Mark-48, Mod-3 there is installed the TELCOM command and control system which insures two-way communications with the platform."69/

- "On 22 July 1978 was launched into the water at Groton the nuclear-powered torpedo submarine SSN-698 BREMERTON (laid down on 8 May 1976).

  "The Department of the Navy has agreed to compensate the Electric Boat shipyard for losses sustained during the construction of 16 nuclear-powered submarines of this type. The shipbuilders have accused the Navy of introducing about 35 thousand changes into the design of the submarines, which was tantamount to its remaking. At the same time it is noted that the delivery of the submarines to the Navy is being delayed by a shortage of a qualified work force and low productiveness of labor." (FNC 3/79)

- "In the U.S. alone it is planned to have about 90 nuclear-powered multipurpose submarines.... The U.S....has undertaken the construction of a major series of multipurpose submarines of the Los Angeles Class (it is planned to build more than 40 boats of this Class)."70/

1976-1980, 3 (d) - CVSs/CVs/SCSs (PLUS AIRCRAFT)

1976 - "In the plans of the /U.S./ Navy, it is envisaged that the Forrestal Class aircraft carriers will be replaced with nuclear-powered multipurpose ones of the CVLNX Class of medium (60,000 tons) displacement beginning in 1984-1985. In this event, there will be no fewer than 12 large aircraft carriers in commission. Considering this number to be insufficient, the Navy Command proposes to build air-capable ships of the VSS (VSTOL Support Ship) with vertical takeoff and landing airplanes and with helicopters. Their displacement would be 17,000 to 35,000 tons. The installation of catapults and arresting gear on these ships will permit basing aboard them the antisubmarine airplanes of the S-3A VIKING type." (FNC 3/76)

- "For the 1980s the U.S. Navy is planning to have the following aircraft carrier forces: 12 large multipurpose aircraft carriers... Starting with FY 1979, it is planned to replace the /six/ ships of the Forrestal and Kitty Hawk classes with six to nine light nuclear-powered aircraft carriers of the CVLN Class with a displacement of from 45,000 to 60,000 tons. The air wing of such a ship would include 75 airplanes of the... S-3 type, antisubmarine helicopters, and others. The CVLN would be 60-70 percent as effective as a Nimitz Class aircraft carrier (the cost of which is six billion dollars together with its air wing and about ten billion with its escort ships)." (FNC 5/76)

- "Foreign specialists assume that the further development of naval aviation will take the direction of equipping it with airplanes with vertical takeoff and landing.".6/

- "Air Wing One, which is based aboard the multipurpose aircraft carrier John F. Kennedy, has the following composition: Air Antisubmarine Squadron 21 (10 S-3A VIKING airplanes), Antisubmarine Helicopter Squadron 11 (8 SH-3D SEA KING helicopters)...". (FNC 7/76)

- "There is being developed in the U.S. the design for a so-called light aircraft carrier on underwater wings of the SHAS Class for the basing of

jet airplanes with vertical or shortened takeoff and landing. The major dimensions and characteristics of the ship: displacement - 1,000 tons...cruising range on the foils - more than 2,000 miles...maximum speed - 50 knots...".17/

- "In the draft Navy budget for FY 1977...the purchase of 12 shipborne S-3A VIKING airplanes...is included." (FNC 9/76)

- "In the U.S. and U.K. in recent times, they have turned to the development of the so-called 'air-capable' ships -- platforms for airplanes with vertical takeoff and landing and for helicopters -- in place of the unwieldy antisubmarine aircraft carriers which were converted from attack aircraft carriers of old designs. Foreign specialists believe that, along with their relative inexpensiveness, there are shortcomings, too, innerent in surface ships which conduct antisubmarine warfare: the impossibility of a covert approach to a submarine (a submarine detects the noises of a surface ship earlier than the latter detects the submarine), the absence of advantages in speed for the tracking of an evading submarine especially in stormy weather, and the lowering of the effectiveness of sonar operations due to the increase of interference with the increase of speed."20/

- "A combat air squadron with VIKING airplanes has appeared for the first time, on the aircraft carrier John F. Kennedy. Up to the end of 1975, 93 such airplanes had been delivered to the Navy." (FNC 12/76)

1977 - "The last of the Essex Class, the aircraft carrier Oriskany, CV-34, was decommissioned and sent to the anchorage for ships in the reserve in Bremerton." (FNC 3/77)

- "/In World War II/ 46 German submarines were sunk by airplanes from aircraft carriers. Another 48 were sunk by joint operations of /carrier-borne/ aircraft and escort ships....As the role of submarines grew, the /surface-ship/ type of antisubmarine aircraft carrier also evolved. Antisubmarine aircraft carriers operated within the composition of an aircraft-carrier hunter-killer group in which were included six to eight escort ships or destroyers in addition to the aircraft-carrier flagship....

"However, with the introduction into the submarine forces of nuclear-powered plants, a reevaluation of antisubmarine aircraft carriers took place. The aircraft carrier proved to be a vulnerable target for the missile and torpedo weapons of a submarine enemy and required a strong screen itself. Therefore the fate of heavy aircraft carriers for antisubmarine defense was decided -- they were placed in reserve."26/

- "The Vinson, the last aircraft carrier of the Nimitz Class, will be the first specially designed ship of multipurpose assignment....One squadron of antisubmarine airplanes and helicopters is based on multipurpose aircraft carriers under everyday conditions...But, in the opinion of the American command...multipurpose aircraft carriers would be able to carry out antisubmarine warfare tasks only to a limited extent since their overall number is not great."

"In the U.S. variants of the ships of light aviation support (VSS), with a displacement of 22-23 thousand tons, are being worked out. They are constructed like helicopter carriers but are to be equipped with catapults and arresting gear for the ensuring of the take-off and landing of conventional airplanes (including the S-3A VIKING).

"Different variants of air capable ships with displacement of up to 20 thousand tons with conventional and nuclear power plants and with a speed of up to 30 knots have been worked out. In contrast to previous ones they are of smaller displacement and of simplified construction. Heavy antisubmarine helicopters and airplanes with vertical take-off and landing could be based on such ships.

"In the opinion of the American command, the joint employment of heavy multipurpose aircraft carriers and ships of light aviation support would heighten the effectiveness, operational readiness, and the combat stability of air capable ships and, mainly, would widen significantly the capability for the dispersal of shipborne aviation throughout the oceanic theaters of military actions.

"In this way, it is believed abroad, a trend has been noted toward the construction of multipurpose heavy aircraft carriers (only the U.S. is building them) with aviation of antisubmarine defense for self-defense, and lighter ones -- air-capable ships -- which would carry antisubmarine helicopters, and also airplanes with vertical take-off and landing.

"In contrast to large aircraft carriers, intended primarily for warfare with surface ships and 'actions against the shore', air-capable ships and cruisers are intended to be utilized mainly for warfare in the open sea with submarines, surface ships, and partly with the aviation of the enemy...".26/

- "Up until 1974 the basic airplane of aircraft-carrier aviation was the propeller-driven S-2 TRACKER which has been operational for about 20 years and had grown obsolescent...In 1974 it was replaced by the S-3A VIKING which, according to statements of foreign specialists, possessed optimal flight and combat qualities and was equipped with the newest means for search, detection, and destruction of modern submarines. This is the first deck-launched airplane with jet engines, insuring quick arrival in the area of a contact. Based aboard multipurpose aircraft carriers, possessing long range, they can operate beyond the limits of shore-based antisubmarine airplanes....According to the foreign press, the area that can be patrolled by the VIKING is eight times as large as by the TRACKER."27/

- "The conversion of American aircraft carriers into multipurpose ones with the introduction of S-3A VIKING antisubmarine airplanes (up to 8-10) and SH-3 SEA KING antisubmarine helicopters (up to 10) into the complement of the air wings based aboard the carriers has radically increased the antisubmarine capabilities of aircraft-carrier forces. It is considered that the VIKING is ten times more effective than /was/ the TRACKER airplane."30/

- "Intensive work is being conducted abroad in recent times to develop a principally new type of shipborne airplane with vertical takeoff and landing."31/

- "The 'oceanic strategy' /allegedly adopted by the U.S./ brought considerable changes in the subsequent development of strike aircraft carriers. This is explained by the fact that this strategy involved, along with a nuclear-powered missile-submarine system, the development of global general-purpose naval forces whose ships must not only deliver strikes with their aircraft but also conduct antisubmarine warfare. The nucleus of such forces must be comprised of multipurpose, not strike, aircraft carriers, carrying onboard not only strike aircraft but also antisubmarine aviation. For this reason, all of the U.S. strike aircraft carriers in commission in the mid-'70s are being converted to multipurpose ones with an antisubmarine air group based onboard consisting of ten airplanes of the S-3A VIKING type...Construction has been started on a fourth nuclear-powered aircraft carrier, the Carl Vinson, which was designed as multipurpose. Its commissioning is expected in 1981...".31/

- "Thus, besides four aircraft carriers with nuclear propulsion, there will remain in the complement of the U.S. Navy at the end of the '70s eight aircraft carriers of the Forrestal Class and three of the Midway Class. These 15 multipurpose aircraft carriers will be able to base 720 modern aircraft /including/ ...150 airplanes of antisubmarine aviation of the latest model."31/

- "Under conditions of the continuous increase in the complexity and expensiveness of naval technology, the cost of the construction of surface warships has increased radically. Thus, for example, the cost of the Enterprise built in 1934-'38 was 24 million dollars, the nuclear-powered Enterprise built in 1958-'61 was 425 million, the Nimitz, lead ship of the class, cost 605.8 million and the Carl Vinson, the third of the Nimitz Class, will cost one billion dollars. An alternative way out of this situation /was taken by/ the decision of the American Administration on the necessity for the series construction of an air-capable sea-control ship (SCS) of small displacement which will cost approximately 100 million dollars. American specialists hold that, for supplementing the task of the strike carriers for control of the

sea, it is required to build 75 air-capable ships by 1990. It is planned to build them in three equal series: 'A', 'B', and 'C' with a six-year construction period for each. The ships of Series A are planned for employment only for operations to insure control of the sea. The aircraft carriers of the following series /i.e., B and C/ will be employed also in combat operations in the capacity of striking ships. It is planned to build the ships of the first series by 1980...they should have a displacement of 15,000 tons...The speed will be 23 knots. Their armament...three airplanes with vertical takeoff and landing of the HARRIER type and 14 SEA KING antisubmarine helicopters...

"In the U.S. at present authorization has been given for the first eight of these ships. Construction of the lead ship began in 1975 and is programmed for commissioning in 1979. The ships of the following series are to be built after the '70s with improved designs which take into account improvements in shipborne aviation and experience gained in the construction and operation of the sea control ships of the first series."31/

- "New less-expensive combatant ships of a navy can successfully carry out the indicated tasks /for gaining and maintaining command of the sea/. Air-capable ships are the principal ships of this nature. Probably such ships will first supplement and ultimately replace strike aircraft carriers."31/

- "In the view of the command of the U.S. Navy, the VIKING has considerable advantages over the TRACKER in speed, range, and effectiveness. Its search potentials are 8-10 times greater than those of TRACKER. The duration of patrolling of the VIKING airplane is 6-8 hours."37/

- "There will take place in 1980-'85, according to the views of foreign specialists, the introduction of various modifications of the HARRIER employed as fighter-interceptor, attack plane, reconnaissance plane, and also as antisubmarine airplane."38/

1978 - "The projected CVV multipurpose aircraft carrier is to have a full-load displacement of 58,000

tons and a speed of 27 knots. Two catapults and three sets of arresting gear are to be installed on this ship which is intended for handling conventional airplanes and helicopters and VTOL airplanes." (FNC 3/78)

- "At present, all American attack aircraft carriers (except for Midway) are being refitted as multipurpose ships and the antisubmarine aircraft carriers are being inactivated as not 'cost-effective'."50/

- "...the Americans have eight antisubmarine aircraft carriers in reserve....These ships normally operate in the composition of hunter-killer groups...which include an aircraft carrier and five to eight destroyers and frigates....The sub-class of antisubmarine aircraft carrier exists only in the Navy of the U.S. In the other capitalist countries, such aircraft carriers are counted as multipurpose."52/

- "Strike aircraft carriers, in the view of the American command, are the main strike force for gaining command of the sea. They are considered the most multipurpose, universal combatant ship, and one capable of carrying out a broad range of missions in all kinds of naval operations, whether with nuclear or conventional weapons. The basic assignment of strike carriers is the fulfillment...of the following tasks:

  - o destruction of important objectives on the shore and in the rear of an enemy, among them naval bases, administrative and industrial centers, ports, airfields, and large war plants /e.g., shipyards/;

  - o gaining of command of the sea by means of the destruction of the submarines and surface combatant ships of an enemy at sea and at their bases and his aviation on their airfields and in the air;

  - o anti-air and antisubmarine defense of naval forces during sea transits;

  - o provision of air support to ground forces on the offensive and defensive in coastal sectors of a front;

- o covering large convoys in crossing the ocean (or sea);

- o supporting amphibious landing operations during sea crossings, during debarkation on the coast, and during operations on the shore; and

- o interdiction of the maritime communications of an enemy."52/

- "From 1979 to 1983, it is planned to build...one conventionally-powered attack aircraft carrier...".55/

- U.S. aircraft carriers designed from the keel up as multipurpose such as the first such CV, USS Vinson, are shown in Table 1 (p. 213) to be intended to carry ASW aircraft comprised of 20 S-3 VIKINGS and 16 SH-3 SEA KING helicopters.57/

- "The Navy has displayed great interest in the development of air-capable ships on an air cushion, on which, as a result of the utilization of the intense air currents generated while cruising, take-off and landing can be carried out with a rather small flight deck.... The tactical-technical data on three types of air-capable air-cushion ships have been worked out; the CTOL/SES-CV, carrying conventional airplanes; the VSTOL/SES-CV with vertical and shortened takeoff and landing airplanes, and the VSTOL/SES-CVN, equipped with a catapult and arresting gear...". (FNC 11/78)

- "For the extension, until the end of the current century, of the period of service of the aircraft carriers of the USS FORRESTAL class their major overhaul and modernization will be carried out. The time period for each ship - 2.5 years, cost - 496 million dollars. The beginning of the work: the USS SARATOGA - October 1980, the USS FORESTAL - January 1983, the USS INDEPENDENCE - March 1985,, and the USS RANGER - May 1987." (FNC 11/78)

- "There is a projection for the complement of the U.S. Navy in 1990. In commission should be... not less than 10 heavy aircraft carriers and an undetermined number of large combatant ships on air cushions." (FNC 11/78)

- "In the U.S., Great Britain, and in several other countries, instead of constructing specialized antisubmarine combatant ships, it is planned to utilize the strike aircraft carriers, destroyers, frigates, and other surface warships for antisubmarine warfare by arming them with the appropriate means."62/

1979 - "In 1970-1976...funds were allocated /to the U.S. Navy/ for the construction of...two nuclear-powered aircraft carriers and...310 antisubmarine airplanes /i.e., both shipborne and shore-based/."64/

- "The U.S. Navy has 13 multipurpose aircraft carriers.../each/ carrying ten VIKING antisubmarine airplanes."80/

1976-1980, 3 (e) - DLs, DDs, AND DEs (PLUS ASROC AND LAMPS)

1976 - "For increasing the combat effectiveness of escort ships, all of them are equipped with antisubmarine helicopter systems which have become the main means of warfare with a submarine opponent at intermediate distances (30-40 miles). The number of shipborne helicopters is growing. According to estimated data, by 1980 not less than 800 of the LAMPS and LINKS helicopter systems will be required."11/

- "Various concepts for the development of combatant ships on underwater wings are being studied intensively in the U.S. They are being accorded a prominent place in the plans for the renewal of the ship complement of the Navy. It is considered that the high speeds, low noise, stability in waves, and the insignificant magnetic field of the hull creates favorable conditions for the employment of weapons from such platforms and makes them less vulnerable /than displacement ships/ in combat with submarines, surface ships, and aviation....

  "Specialists consider that /escort/ ships of the /1,600-ton/ DEH Class...will be superior for antisubmarine operations than normal displacement ships of equivalent size. The development of the DEH Class ship is projected by the ten-year shipbuilding plan of the U.S. Navy. The start of construction is scheduled for 1976. ...

  "Specialists abroad are expressing the view that such ships in the complement of navies will bring substantial changes in the character of combat operations at sea, in particular in the conduct of antisubmarine operations and strikes at convoys and naval task groups. The high speeds and good maneuvering capabilities of ships on underwater wings raise their combat stability in combat with submarines and aviation."17/

- "The feasibility is being studied of replacing the ASROC antisubmarine missile system with a TARPON system in which a HARPOON missile is used as the delivery system and a Mark 46 torpedo as the weapons' part." (FNC 10/76)

- "Great significance is accorded abroad to antisubmarine surface ships: frigates, destroyers, and escort ships. Their crash construction is being conducted. The greatest number of antisubmarine surface ships is being built in the U.S. ....In the U.S. at present nuclear-powered frigates are being built; they are intended for the antisubmarine defense of nuclear-powered aircraft carriers at sea. As foreign specialists view it, the tactical-technical characteristics of these ships indicate that they are insufficiently effective for warfare against modern submarines due to their low speeds. For this reason, scientific-research work and design-experimental work has begun for the development of antisubmarine ships on underwater wings and air cushions with cruising speeds of up to 90 knots."20/

1977 - "Construction of the destroyers of the Spruance Class...is still...believed to be 'lagging' behind the planned period. During 1977 it was planned to deliver eight ships of this class, which would have decreased the lag and permitted the completion of the construction of the entire series (30 ships) in 1979 as planned.

"As follow-on to the ships of the Spruance Class, it is planned to turn to the construction of the DDG-47 Class, which is to be armed with the AEGIS missile system. In addition, it is planned to modernize the guided-missile destroyers of the Charles Adams Class (DDG-2), which were built in 1960 to 1964. This modernization would extend their service life in the complement of the Navy by 10 to 15 years.

"In the fall of 1977...the escort ship Oliver H. Perry (FFG-7) was delivered to the Navy for acceptance trials...after the necessary changes, series construction will begin in 1980. Without even waiting for the completion of the acceptance trials of the first ship, the U.S. Naval Command adopted a decision to increase the series production run from 50 to 74 units."26/

- "Simultaneously with the carrying out of the large-series construction of escort ships of the displacement type, work is being conducted in the U.S. on the development of ships for this same purpose /i.e., escort ships/ on an air

cushion. At a cost of about 160 million dollars, the U.S. Navy has concluded a contract with 'Rohr Industries' for the development of such a ship having a tonnage of 3,000. Its basic tactical-technical characteristics according to the design follows:...armament-cruise missiles, an anti-air missile system, an anti-submarine missile system, and helicopters or VTOL airplanes. According to the budget for experimental-design work, the order for the construction of a prototype is expected to be awarded in the coming year...".26/

- Table 3 showed planned U.S. construction for the five-year period from 1978 through 1982 to include 10 DDs and 58 DEs, including, in 1981 and 1982, a new FFGX Class DE each year.22/

- -"In September /1976/...was launched the guided-missile escort ship FFG-7 Oliver Hazard Perry -- the lead ship of a series of 50-56 units....its weapons /include/...two helicopters...". (FNC 2/77)

- "With the appearance of nuclear-powered submarines, the role of surface escort ships changed; however, they still remain significant, especially in the defense of an objective, /i.e., point defense/.

  "Escort ships, which include cruisers, destroyers, and escort ships (frigates), even now occupy one of the basic places in the navies of foreign countries. And not only because they are the most numerous but also due to their capability of carrying out a wide range of missions thanks to their universality....

  "Destroyers. With the appearance of new means of armed warfare at sea, the character of missions carried out by destroyers changed as well. To them are now entrusted the antisubmarine and anti-air defense of aircraft carrier forces, convoys and amphibious forces.

  "In the U.S. Navy, destroyers have always been the most numerous class of ships; however, in post-war times their number has been cut back significantly. Right now in the U.S. Navy has again begun the large-series construction of destroyers of the SPRUANCE class....

"But foreign specialists note the weak anti-air weapons and high cost of construction of a series ship (up to 100 million dollars). The increase of the complexity and the growth of the cost of construction of destroyers has led to the point that their large-series construction is being conducted only in the U.S. and partly in France. Ships of this class are becoming even less numerous, and are losing their role of the leading (in an antisubmarine context) force of the navy in the majority of countries and are gradually being replaced by escort ships (according to the American classification - frigates) which are smaller in displacement and in cost."27/

"In recent years the top cruising speed of screening ships abroad has stabilized. In the opinion of foreign specialists, the practical top end for displacement ships will not exceed 35 knots in ideal conditions. Lagging significantly behind in the speed of search for nuclear-powered submarines, surface ships are losing the capability for the conducting of successful search for them, especially in heavy seas.

"It is considered advisable to switch to the development of fast (from 50 knots and more) highly seaworthy ships of new architectural forms with dynamic principles of support. Designs are being looked at for catamarans with below-the-surface hulls, ships on automatically-guided underwater wings and ships on an air cushion.

"However, catamarans are still in the stage of theoretical working out and model testing. At the same time, significant experience has already been accumulated in the construction of experimental hydrofoil and air-cushion ships, on the basis of which foreign specialists are drawing conclusions on the potential for the development of oceanic antisubmarine hydrofoil and air-cushion ships with a speed of 50-80 knots. In the U.S. Navy right now, they are financing the development of an antisubmarine hydrofoil ship of the DEH Class.

"Research for the development of oceanic ships on an air cushion (the SES program) has still not gotten out of the stage of early experimentation. However, after the completion of the

tests of the experimental air-cushion ship SES 100B (a speed of 90 knots was achieved) began the pre-draft designing of an antisubmarine air-cushion ship with a displacement of 2200 tons, a length of 73-86 meters, a width of 32 meters, a height of 17 meters....It is planned to arm the ships with one-two helicopters. The appearance of experimental models of air-cushion and hydrofoil ships is expected already by 1980.

"In the U.S. research is also being conducted for the development of large (with a mass of up to 2000 tons) ekranoplane combatant ships having a speed of 200-250 knots.

"Helicopters occupy a special place in the overall system of developing and improving antisubmarine forces. Their main role is antisubmarine warfare beyond the range limits of the torpedoes and missile weapons of surface combatant ships....The medium-weight helicopters are receiving the greatest development now. Their relatively small size permits their operation from many screening-force warships while effective search equipment and submarine kill systems make these helicopters an important, integral part of the antisubmarine defense systems of surface combatant ships.

"The American LAMPS Mark-1 system uses the SH-2D and SH-2F antisubmarine helicopters which are modifications of the multipurpose HH-2 SEA SPARROW helicopter. The SH-2F helicopters are widely deployed...It is planned to produce about 200 helicopters of this kind."27/

- "On antisubmarine /surface/ ships /according to this survey of NATO naval exercises in 1976/ basically were laid the tasks of point defense of amphibious-landing forces, convoys, and replenishment groups. However, in the estimation of foreign specialists, the relatively low effectiveness of surface ships against nuclear-powered submarines, due to their /surface ASW ships'/ high noise, lowers their significance in the system of point defense."30/

- "The modern antisubmarine helicopter, equipped with dipping sonar and antisubmarine weapons, can conduct successfully the search for submarines and their destruction."31/

- "The fifth destroyer of the Spruance Class...was commissioned in January /1977/". (FNC 8/77)

- "It has been decided to extend by 15 years the operational life of 23 guided-missile destroyers of the Charles F. Adams Class, which have been in commission since 1960-'64. It is estimated that the modernization of each ship will cost 138.2 million dollars." (FNC 12/77)

1978 - "The sixth ship of the Spruance Class has been commissioned." (FNC 3/78)

- "In FY 1977, six Spruance Class destroyers were commissioned." (FNC 4/78)

- "In the coming year, 27 combatant and auxiliary ships will be decommissioned /by the U.S. Navy/ including.../six/ destroyers." (FNC 4/78)

- "The lead ship of the first of 70 frigates of the Oliver Hazard Perry Class guided-missile escort ship (frigate) has been delivered to the Navy." (FNC 5/78)

- "A pilotless, remote-controlled airplane with vertical takeoff and landing has been designed /in the U.S./ for employment from smaller ships." (FNC 6/78)

- "In FY 1979...eight destroyers of the Spruance Class will be commissioned." (FNC 7/78)

- "The basic task of frigates of the U.S. Navy is the provision of anti-air and antisubmarine defense for strike aircraft carriers....".52/

- "Destroyers...are multipurpose combatant ships which carry out various tasks...".

  "At the contemporary stage of development of destroyers in the majority of foreign countries, destroyers, in the view of the leadership of the navies of the NATO countries, are called on to carry out a wide range of tasks of antisubmarine and anti-air defense of large naval forces, aircraft carriers among them, for insuring all aspects of the defense of convoys, amphibious-landing forces...In addition, they are assigned to provide gunfire support to ground forces in coastal directions, the support of amphibious

landings during debarkation, and the conduct of blockade operations."52/

- The number of Spruance Class DDs to be constructed is given as 30 and the construction period as 1975-1980.52/

- "From 1979 to 1983 it is planned to build... seven guided-missile destroyers of the DDG-47 Class, 26 escort ships of Oliver H. Perry Class...".55/

- "The 11th and 12th destroyers of the Spruance Class have been commissioned." (FNC 10/78)

- "In 1979 it is planned to allocate funds for the construction of eight guided-missile destroyers of the Perry Class...". (FNC 10/78)

1979 - "In 1970-1976...funds were allocated for the construction of...30 destroyers and ten missile escort ships...".64/

- "According to the U.S. shipbuilding program for /the coming/ five years, appropriations are earmarked as follows:...26 guided-missile frigates...".67/

- "The most modern small-diameter torpedo...is the Mark-46. It is designed for the destruction of submarines maneuvering at a speed of 30 knots and a /maximum/ depth of 450 meters. It is employed as the warhead of the guided antisubmarine missile ASROC..".69/

- "The wharves of 'Ingalls Shipbuilding' have been given an order for the building of the lead guided-missile destroyers of the DDG-47 class... It's weapons:...an ASROC antisubmarine missile complex, antisubmarine torpedoes, two LAMPS helicopters with antisubmarine and anti-ship weapons. The laying down of the lead ship will be in September 1979, transfer to the Navy - at the end of 1981. Altogether over 10 years it is planned to commission 15 such ships at a cost of 14 billion dollars. All of them will be laid down in the same dock by the sectional method, bearing in mind the experience of the building of the 30 destroyers of the Spruance Class (of which 17 have been delivered to the Navy, seven have been launched and are being fitted out, and

six are in various stages of construction)...". (FNC 3/79)

- "The U.S. has undertaken the construction...of destroyers of the Spruance Class (30 ships), guided-missile frigates of the Perry Class (74 units), and has begun equipping antisubmarine ships with new antisubmarine helicopters, which considerably raises the surveillance and antisubmarine capabilities beyond the limits of the range of a ship's radio direction-finding and hydroacoustic gear.

  "All cruisers, destroyers, and frigates building in the U.S. and /other/ NATO countries will have antisubmarine missile systems and helicopters in their armament."70/

- "In recent years great attention is being given by the NATO countries...to the development of antisubmarine helicopters capable of operating from ships of relatively small displacement....

  "The SH-60B helicopters of the LAMPS Mark-3 system was developed as the result of a competition among 17 firms....The basic assignment of this new helicopter is antisubmarine warfare and over-the-horizon detection of surface ships carrying cruise missiles and transmission of data on them to their own forces. It is planned to arm the DDG-47 and DD-963 destroyers, the FFG-7 frigates, and the air cushion ships developed under the SES program with these helicopters...The LAMPS Mark -3 is substantially improved over the SH-2F which it is replacing....The weaponry of the helicopter consists of two self-guiding Mark-46 torpedoes....Test flights of the experimental model are scheduled for 1979 and delivery of the helicopters to the fleet units for 1983. The overall cost of the program is evaluated at 3.5 billion dollars and of one of the helicopters at 14.5 million dollars."79/

- "At the end of 1977, the U.S. Navy Command took the decision...to construct the shipborne antisubmarine helicopter SH-60B SEA HAWK system LAMPS Mark-3....The U.S. Navy expects to buy 204 SEA HAWK helicopters (...maximum speed 330/km/hr., two Mark-46 torpedoes). Entrance into service is expected in 1981-1982. The cost of

research and development and production will exceed 3.5 billion dollars. They will replace the light helicopter SH-2F system LAMPS, Mark-1."84/

1976-1980, 3 (f) - MINES

1976 - "Great attention has been given abroad in the postwar years to the development of mines since the aviation mine is an effective means of warfare against a surface and submarine opponent...

American naval specialists hold that, in the combat operations being planned by the countries of NATO, the employment of aviation mines will have important significance since, with their help, the basic transit points through which an enemy must deploy his forces to sea can be mined from the air in a few hours time. The employment of surface ships for the conduct of offensive mining operations would be limited. The greatest covertness in minelaying can be achieved by employing submarines. However, they cannot replenish existing minefields without running the risk of being blown up. Therefore, aviation is most often suited for the surprise and massive laying of mines....

"American specialists hold that active minelaying will play an important role, especially against submarines. The mining from the air of narrow passages or straits can turn them into mortally dangerous traps in a few hours, can block the approaches to bases, and can divert enemy submarines into areas where they can be destroyed....

"Thera are no airplanes in a single capitalist state which are specifically designed for minelaying. Other types of airplanes of naval aviation are used for this purpose...those with sufficient bomb-carrying capacity and lift capability...".6/

- "In recent years, special attention has been given /by the U.S./ to development work in the area of mine weapons. While only one model of mine weapons was being developed in 1974 and with a budgetary allocation of /only/ 1.7 million dollars, the number of models has increased to five in later years and the allocations for them have grown considerably: 5.5 million in 1975, 18.3 million in 1976, and in 1977 the draft budget provides for an allocation of 22.7 million dollars. Among the new types of mines

are the antisubmarine mine-torpedo CAPTOR...the remote-controlled bottom mine QUICKSTRIKE, which has magnetic, acoustic, and hydro-dynamic detonators, and the remote-controlled mine REKO for use in offshore minefields and on antisubmarine barriers...". (FNC 9/76)

- "It is planned /by the U.S. Navy/ to procure 480 CAPTOR mines during 1977." (FNC 11/76)

- "The unlimited cruising range of nuclear-powered submarines enables them to project a threat of mining...to the remotest waters of the earth's sphere. The reserves of mines on submarines is not substantial but the fruitfulness of their employment is great. This is explained primarily by the fact of the covertness of their laying and the difficulty of combating submarine mines... Given the contemporary state of radar technology, the covert laying of mines in the waters of an enemy by surface ships and airplanes is extremely difficult. It is substantially easier for a submarine to accomplish this. It can approach the area to be mined covertly; it can conduct reconnaissance of the routes of movement of enemy ships covertly; it can determine the channels in use and lay the mines as if 'aimed' precisely at the actual channel....

  "In taking into consideration the high effectiveness of submarine minelaying, American naval specialists are searching for ways to convert for such use obsolete (first-generation) nuclear-powered missile submarines. With very spacious tubes...they can accommodate a large number of mines and lay them in a specified position with high accuracy. For example, it has been calculated that in each launch tube of the George Washington Class 16 mines can be placed. Altogether, the submarine can carry 256 mines. This would permit it to lay a minefield of several rows with a length of more than ten miles...".20/

1977 - "The fact of the matter is that the increase in the range of action of missile weapons, foreign specialists are observing, is prompting the laying of antisubmarine mine barriers at significant distances from their own shores and over large areas. Taking this into account, in 1975

the U.S. Navy received into its inventory a qualitatively new antisubmarine homing mine-torpedo -- CAPTOR....

"...the American specialist R. Duncan...reaches the conclusion that 'sea mines are becoming one of the basic weapons that can substantially influence the course and outcome of a war'. In the opinion of other authors, the use of mine weapons in a nuclear-missile war above all would permit the conduct of effective combat with nuclear-powered missile submarines."

The article also mentioned that the U.S. had spent about 60 million dollars in 1974 on research, development, and testing of the CAPTOR mine-torpedo and that the U.S. Government intended to purchase between 4,000 and 4,500 of them. "Striving to justify such high expenditures, the newspaper The New York Times commented on this situation as follows: 'The significance of this new mine consists of the blocking of Soviet submarines in the Norwegian Sea or their destruction while attempting to return to bases for repairs. The U.S. Navy is planning the establishment of barriers on the two main routes of Soviet submarines of the Northern Fleet to the Atlantic. One minefield would be laid in the Denmark Strait between Greenland and Iceland, the other between Iceland and the British Isles...The employment of this mine is /also/ being planned for closing the submarine routes running from Vladivostok and Petropavlovsk to the Pacific Ocean...'

"Other plans also exist. For example, employment of the CAPTOR mine is planned for the laying of barriers in the huge water expanses bordering the U.S. on the East and West. In the opinion of naval specialists, the projected barriers would eliminate the necessity for forming convoys in these regions and would free significant antisubmarine forces for operations in the open oceans."25/

- "It is considered expedient.../in the U.S./ to close the northern passages into the Atlantic with antisubmarine mines whenever there is a threat of a new war or with the start of combat operations. In 1975 the serial production of the special antisubmarine mine CAPTOR was begun

by the U.S....American experts calculate that it would require only 500 CAPTOR mines (in a single line) to establish an antisubmarine barrier on the line from Greenland to the British Isles."27/

- "In a general war...mines can be employed... above all against submarines."31/

- "In order not to produce an enormous supply of mines in peacetime, the U.S. Navy began in the first half of 1972 the development of a new mine on the basis of the standard 907 kg. aviation bomb, of which there is a large supply. This is the QUICKSTRIKE mine, which has improved resistance to being swept. It will be universal in that it can be laid by surface ships, airplanes, and submarines. In the event of a military conflict in any region of the World Ocean, only the radioelectronic units i.e., the mine mechanisms rather than the mines themselves need be sent there and installed in the conventional... aviation bombs to convert them into /QUICKSTRIKE/ non-contact mines..."31/

- "In recent years, great attention is being paid in the U.S. to development of special antisubmarine mines. Two projects are involved, SLMM and CAPTOR. Their unique feature is the full automation of the control of their operation. The SLMM mine project is for the development of a mobile mine which is fired form the torpedo tube of a submarine with the aim of mining enemy submarine bases or the approaches to them. It is an improved Mark-27 mobile mine which was developed on the basis of...electric torpedoes. Mine instruments and a non-contact detonator are installed in the warhead of such a torpedo. After being launched from the torpedo tube /of a submarine/ moving at slow speed, it traverses a considerable distance and settles on the bottom, becoming a conventional, non-contact bottom mine. According to a statement by the U.S. Navy's Chief of Naval Operations, a new antisubmarine mine, CAPTOR, is being developed utilizing Mark 46 torpedoes which are fired from installations anchored underwater....According to data in the foreign press, it seems apparent that the CAPTOR mine became operational in the U.S. Navy in 1976."31/

1978 - "Under contemporary conditions in the sea theaters of military action, mines, in the opinion of foreign military specialists, can find wide employment for the blockade of enemy submarines in their bases or in coastal regions, for their destruction during transit to their patrol areas or areas of combat operations, and also for preventing the penetration of enemy warships into one's own waters, into sea regions along one's own coasts."52/

1979 - "The Mark-46 mine is used as the active part of the Mark-60 mine-torpedo CAPTOR...it was planned that the U.S. Navy would have 1,000 CAPTOR mines by the end of 1978. American specialists consider that for closing the entry for submarines into the North Atlantic between Greenland and England requires 200 mine-torpedoes, the cost of which would be $20 million (about $100,000 per mine). This amount is the cost of /only/ one nuclear-powered torpedo submarine of which not less than 20 would be required to fulfill this task."69/

1980 - "A special word is called for about the laying of minefields at the entrances to naval bases and ports -- which the Pentagon views as one of the tasks of blockade operations. Here the experience of minelaying during the Vietnam War is to be taken into account. At the time...over 11,000 tons of mines were laid. Now the Pentagon has developed new models of more powerful mines."85/

FOOTNOTES TO CHAPTER IV

1. B. Chizhov and A. Zheludev, "Antisubmarine Submarines: The Tactics for Their Operations", Naval Digest, March 1976, pp. 94-98.

2. "Organization of the Antisubmarine Forces of the Unified NATO Forces in the Mediterranean", Naval Digest, March 1976, pp. 101-102.

3. Yu Maslennikov, "In the Roadsteads of the 'Cold War' (Combat and Operational Training of the Navies of the NATO Countries in 1975)", Naval Digest, April 1976, pp. 86-92.

4. Captain First Rank Yu. Bol'shakov and V. Komkov, "Tactics of Air Search for Submarines", Naval Digest, May 1976, pp. 88-93.

5. "A System for Continuous Antisubmarine Surveillance", Naval Digest, May 1976, pp. 99-100.

6. N. A. Brusentsev, Naval Aviation, signed to press 21 May 1976, pp. 7, 9, 10, 25, 27, 37, 38, 73-76, 99, 104, 105, 132, 134, 136, 137, 142-144, 167, 168, 178, 205, 206, 208-211, 232-234, and 265.

7. Fleet Admiral N. Smirnov, "The Navy of the USSR in the Postwar Years", Military-Historical Journal, July 1976, p. 33.

8. LCOL A. Khor'kov, "The Armed Forces of the USSR in the Postwar Period", Communist of the Armed Forces No. 13, July 1976, pp. 72-73.

9. "The Oceanic Water of Sailors; Materials for Reports and Discussion for Navy Day of the USSR', Communist of the Armed Forces No. 13, July 1976, pp. 16-22.

10. "Sea Shields of the Homeland", Naval Digest, July 1976, pp. 5-6.

11. "V. Komkov and Captain First Rank Yu. Bol'shakov, "Surface Warships Against Submarines", Naval Digest, July 1976, pp. 87-92.

12. Fleet Admiral S. G. Gorshkov, "Navy", Soviet Military Encyclopedia, Vol. 2, signed to press 20 July 1976, p. 235.

13. Fleet Admiral S. G. Gorshkov, "Naval Art", Soviet Military Encyclopedia, Vol. 2, signed to press 20 July 1976, p. 234.

14. Fleet Admiral S. G. Gorshkov, Navy Day speech, Radio Moscow in Russian, 0840 GMT, 24 July 1976.

15. Fleet Admiral H. Smirnov, "Oceanic Guard of the Homeland", Red Star, 25 July 1976.

16. Admiral V. Grishanov, "The Combat Pennants of the Motherland", Izvestiya, 25 July 1976.

17. Captain First Rank (Reserve) D. Sokha, "Boats and Ships on Underwater Wings", Naval Digest, August 1976, pp. 68-73.

18. Colonel M. Ponamarev and V. Berezin, "The Pentagon's New Plans", Red Star, 29 August 1976.

19. Captain Second Rank S. Shapovalov, "The Views of the U.S. and NATO Commands on the Conduct of 'Antisubmarine Warfare'", Naval Digest, November 1976, pp. 85-91.

20. Rear Admiral A. I. Rodionov, The Strike Force of the Navy, 2nd edition, DOSAAF Press, signed to press 11 November 1976, pp. 4-5, 43, 45, 60, 71-74, 78, 80, 99-100, 103, 105, 106, 108, 110-113, 115, 120, 122, and 123.

21. Captain First Rank I. Gorin, "The Evolution of Destroyers", Naval Digest, December 1976, pp. 71-72.

22. A. A. Narusbayev, "Military Ship Construction in the Capitalist Countries for 1977", Shipbuilding, January 1977, pp. 17-23.

23. "Faithful Guard of the Gains of October", Communist of the Armed Forces No. 3, February 1977, p. 7.

24. Fleet Admiral S. G. Gorshkov, "Always on Guard", Red Star, 7 February 1977.

25. Engineer Captain First Rank (Retired) A. Geiro and Engineer Captain First Rank A. Sazonov, "Sea Mines", Red Star, 24 February 1977.

26. Vice Admiral K. Stalbo, "Creativity in Researching the Problems of Naval History", Naval Digest, March 1977, p. 22.

27. Captain First Rank B. I. Rodionov, Antisubmarine Forces and Means of Navies, signed to press 5 April 1977, pp. 4-8, 17-24, 26, 28-29, 31, 34, 37-38, 41-45, 52-54, 58, 60-62, 64, 87, 96-97, 100, 104-105, 109-113, and 131.

28. Captain First Rank A. Basov, "The Struggle with the Submarines of an Opponent", Military-Historical Journal, June 1977, pp. 40-47.

29. "Oceanic Shield of the Homeland: Materials for Reports and Discussions on Navy Day of the USSR", Communist of the Armed Forces No. 12, June 1977, p. 43.

30. Yu. Maslennikov, "On Course Against Detente (The Content and Direction of Operational and Combat Training of the Navies of the Capitalist Countries in 1976)", Naval Digest, June 1977, pp. 88-93.

31. I. N. Potapov, Scientific-Technological Progress and the Navy, signed to press 27 June 1977, pp. 61, 63-67, 85, 86, 132, 133, 135-137, 150-152.

32. Fleet Admiral N. Smirnov, "The Ocean--School of Combat Mastery", Technology and Armaments, July 1977, p. 2.

33. E. Rakitin, "Realization of the 'Trident' Program", Naval Digest, July 1977, pp. 91-94.

34. Vice Admiral V. Chernavin, TASS Interview (in English), 28 July 1977.

35. Fleet Admiral N. Smirnov, "Oceanic Watch", Red Star, 31 July 1977.

36. Admiral V. Mikhaylin, "Ocean-going, Missile-carrying", Rural Life, 31 July 1977.

37. Colonel V. .Platonov, "The Airplanes of American Aircraft Carriers", Naval Digest, August 1977, pp. 90-96.

38. Lieutenant-Colonel Yu. Savel'yev, "The 'Harrier' Airplane: Its Present and Future", Naval Digest, August 1977, pp. 96-98.

39. Aviation Major-General N. Vishenskiy, "A Book on the Strike Force of Modern Navies" (A Review of N. A. Brusentsev's Naval Aviation -- see Footnote Six above), Naval Digest, August 1977, pp. 102-104.

40. Fleet Admiral S. G. Gorshkov, The Navy, Knowledge Press, signed to press 22 September 1977, pp. 39-40, and 48-49.

41. The Soviet Armed Forces: A History of Construction, S. A. Tyushkevich (Ed.), signed to press 22 November 1977, pp. 469-470.

42. Engineer Captain Third Rank A. Lyalikov, "Developmental Trends in the U.S. Navy on the Long-range Detection of Submarines", Naval Digest, December 1977, pp. 87-91.

43. L. I. Korzun, On Guard Over Peace and Socialism, Knowledge Press, signed to press 23 January 1978, p. 57.

44. "The Navy", Technology and Armaments, February 1978, p. 22.

45. Fleet Admiral S. Gorshkov, "Always On Guard", Red Star, 7 February 1978.

46. G. A. Gromov, "The Defense and Protection of Combatant Ships", Soviet Military Encyclopedia, Vol. 5, signed to press 3 March 1978, p. 665.

47. "Carter's Naval Modernization Program Called Insufficient", TASS in English, 1448 GMT, 27 March 1978.

48. Aviation Major-General N. Vishenskiy, "Soviet Naval Aviation -- 60 Years", Naval Digest, May 1978, pp. 74-75.

49. Vice Admiral (Reserve) V. Solov'yev, "Oceanic Staging Area for Aggression", Naval Digest, June 1978, pp. 20-24.

50. Vice Admiral K. Stalbo, "Aircraft Carriers in the Postwar Period", Naval Digest, June 1978, pp. 91-100.

51. Fleet Admiral N. Smirnov, "The Continuity of Naval Tradition", Shipbuilding, July 1978, p. 1.

52. N. W. Suvorov et.al., Modern Combatant Ships, DOSAAF Press, signed to press 20 July 1978, pp. 34-35, 66-67, 77, 189-190, 192, 193, 206, 211, 221, 224, 229, and 231.

53. Fleet Admiral N. Smirnov, "On Oceanic Watch", Red Star, 30 July 1978.

54. Admiral V. Grishanov, "Oceanic Guard of the Fatherland", Izvestiya, 30 July 1978.

55. Captain First Rank Yu. Bol'shakov, "The 'New Philosophical Conception' of Secretary Brown", Naval Digest, August 1978, pp. 91-91.

56. Yu. Maslennikov, "When They Do Not Want Military Detente (Operational-Tactical and Combat Training of the Navies of the NATO Countries in 1977)", Naval Digest, October 1978, pp. 85-90 and 93.

57. Yu. Sorokin (Ed.), Deep Watch, Young Guards Press, signed to press 23 October 1978, pp. 210-215, 221-225, and 227-229.

58. "Operational Zone", Soviet Military Encyclopedia. Vol VI, signed to press 10 November 1978, p. 63.

59. N. I. Vishenskiy, "Antisubmarine Aviation", Soviet Military Encyclopedia, Vol VI, signed to press 10 November 1978, p. 595.

60. N. N. Amel'ko, "Antisubmarine Defense", Soviet Military Encyclopedia, Volume VI, signed to press 10 November 1978, p. 596.

61. V. G. Yefremenko, "Antisubmarine Forces", Soviet Military Encyclopedia, Volume VI, signed to press 10 November 1978, p. 597.

62. N. N. Amel'ko, "Antisubmarine Ships", Soviet Military Encyclopedia, Volume VI, signed to press 10 November 1978, p. 597-598.

63. "The System of Basing of the U.S. Navy", Naval Digest, December 1978, pp. 111-112.

64. N. Zhukov, "The U.S. Naval Forces: The Postwar Period", Naval Digest, January 1979, pp. 65-69.

65. "U. S. Naval Bases on Foreign Territory", Naval Digest, January 1979, pp. 71-72.

66. The Armed Forces of the Capitalist States, Major-General P. I. Sergeyev (Ed.), signed to press 29 January 1979, pp. 8-9, 252, and 254-257.

67. Rear Admiral B. Yashin and Captain First Rank B. I. Rodionov, "The Naval Forces of the U.S.: The Present and Near Future", Naval Digest, February 1979, pp. 66-71.

68. "NATO Maneuvers 'Autumn Forge-78'," Naval Digest, February 1979, pp. 72-73.

69. Engineer Captain First Rank V. Dorodnykh, "Torpedo Weapons of the Capitalist States", Naval Digest, March 1979, pp. 50-57.

70. Fleet Admiral S. G. Gorshkov, Seapower of the State, 2nd edition, sent to printer 28 April 1979, pp. 225, 274-275, 277-278, 291, 298, and 302.

71. Captain First Rank Yu. Galich and Engineer Captain First Rank N. Kocheshkov, "The Navy and the Outer-Space Program of the U.S.", Naval Digest, April 1979,. pp. 68-71.

72. I. Kuz'min, "Surveillance of Nuclear-powered Missile Submarines", Naval Digest, May 1979, pp. 66-71.

73. Captain First Rank B. Makeyev, "The Transoceanic Sealines of Communication in Contemporary Conditions", Naval Digest, July 1979, pp. 19-22.

74. Engineer Admiral P. Kotov, "Ocean-going, Missile-carrying", Red Star, 24 July 1979.

75. Fleet Admiral N. Smirnov, "Oceanic Watch, Red Star, 29 July 1979.

76. Engineer Admiral V. G. Novikov, "Guarding Peace", Light of the East, 29 July 1979.

77. Engineer Admiral P. Kotov, "The Motherland's Oceanic Guard", Socialist Industry, 29 July 1979.

78. Admiral V. Grishanov, "The Motherland's Proud Pennants", Izvestiya, 29 July 1979.

79. I. Kutsev, "New Shipboard Helicopters of the Navies of the NATO Countries", Naval Digest, August 1979, pp. 86-88.

80. "U.S.A.", Soviet Military Encyclopedia, Volume 7, signed to press 7 September 1979, p. 434.

81. G. Sturua, "The Navy in the U.S.A.'s Expansionist Policy", International Affairs, November 1979, pp. 117-119.

82. Captain First Rank V. Flegontov, "Protection for the Combat Operations of the American SSBNs", Foreign Military Review, December 1979, pp. 69-76.

83. Captain First Rank V. Irinin, "Prospects for U.S. Navy Development of Hydroacoustic Systems for Surveillance of the Underwater Situation", Foreign Military Review, December 1979, pp. 76-80.

84. Engineer Major B. Vladimirov, "Production of Military Helicopters in the U.S.", Soviet Military Review, January 1980, pp. 46-50.

85. Fleet Admiral V. A. Kasatonov, interview by Yu. Dmitriyev, Labor, 20 February 1980.

86. Colonel V. Katerinich, "NATO: Reliance on Gaining Military Superiority", Communist of the Armed Forces No. 5, March 1980, pp. 86 and 87.

87. "Proceed Without Fail", Red Star, 1 March 1980.

APPENDIX E

SPECIFIC U.S. PROGRAMS MENTIONED

IN QUANTITATIVE SAMPLE

SPECIFIC U.S. PROGRAMS MENTIONED IN QUANTITATIVE SAMPLE

PERIOD	1961-1965	1966-1970	1971-1975	1976-1979	TOTAL
SUBMARINES:					
THRESHER/PERMIT (SSN-594)	10	3		1	14
SKIPJACK (SSN-585)	5				5
SKATE (SSN-578)	2				2
SEAWOLF (SSN-575)	1				1
TRITON (SSN-586)	1				1
TULLIBEE (SSN-597)	2			1	3
NARWHAL (SSN-671)		2	1	1	4
STURGEON (SSN-637)		1	1	1	3
LOS ANGELES (SSN-688)			3	3	6
LIPCOMB (SSN-685)				1	1
TOTAL:	21	6	5	8	40
HELICOPTERS:					
SEA KING SH-3 series	3	1	8		12
SEA BAT (HSS-1/SH-31)	4				4
SEA SPRITE (UH-2A)	1		1		2
SEA LIGHT			1		1
LAMPS (SH-60B)				4	4
TOTAL:	8	1	10	4	23
LAND-BASED AIRCRAFT:					
NEPTUNE (P2)	7				7
ORION (P3)	8		16 (P3C)	1	25
A-NEW			4	2	6
TOTAL:	15		20	3	38
CARRIER-BASED AIRCRAFT:					
TRACKER (S-2)	9	8 (S2D/E)	2		19
TRACER		4	1		5
VIKING (S-3)				1	1
TOTAL:	9	12	3	1	25

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SPECIFIC U.S. PROGRAMS MENTIONED IN QUANTITATIVE SAMPLE

PERIOD	1961-1965	1966-1970	1971-1975	1976-1979	TOTAL
ASW WEAPONS:					
DASH (QH-50)	4	3	1		8
SUBROC	11	3		1	15
ASROC	5	6	2	4	17
LULU DEPTH CHARGE	2				2
HEDGEHOG DEPTH CHARGE	1				1
ALPHA DEPTH CHARGE	2				2
MK32 TORPEDO	1				1
MK37 TORPEDO	3		1		4
MK39 TORPEDO	1				1
MK43 TORPEDO	3				3
MK44 TORPEDO	3		2		5
MK46 TORPEDO	3		4	1	8
MK112	1				1
MK113	1				1
DELPHIN/DELPHIN II	1				1
MK52 AV. MINE	1	1			2
MK55 AV. MINE	1	1			2
MK57 AV. MINE	1				1
MK108 ROCKET LAUNCHER	1				1
MK45 (ASTOR) TORPEDO	2		1		3
MK56 MINE		1			1
MK48 TORPEDO			6	2	8
533mm TORPEDO			1		1
MK37C TORPEDO				1	1
MK60 (CAPTOR MINE)				1	1
TOTAL:	48	15	18	10	91
AIRCRAFT CARRIERS:					
RANDOLPH (CVS-15)	1				1
FORRESTAL (CV-59)		1			1
AMERICA (CV-66)		1			1
MIDWAY (CV-41)		1		1	2
ORISKANY (CV-34)		1			1
HANCOCK (CVS-19)			1		1
WASP (CVS-18)			1		1
INTREPID (CVS-11)			2		2
TICONDEROGA (CVS-14)			1		1
SARATOGA (CV-60)			1		1
NIMITZ (CVN-68)				1	1
DWIGHT D EISHENHOWER (CVN-69)				1	1
CARL VINSON (CVN-70)				1	1
ENTERPRISE (CVN-65)		1		2	3
ESSEX (CVS-12)			2		2
TOTAL:	1	5	8	6	20

SPECIFIC U.S. PROGRAMS MENTIONED IN QUANTITATIVE SAMPLE

PERIOD	1961-1965	1966-1970	1971-1975	1976-1979	TOTAL
SONARS/RADARS/OTHER SENSORS:					
VARIABLE DEPTH SONAR	4				4
AN/AQS 10 (Air)	3				3
AN/BQQ1 (Sub)	3				3
AN/BQQ2 (Sub)	3		2		5
AN/SQA10 (Ship)	1				1
AN/SQS4 (Ship)	1				1
AN/SQS23 (Ship)	2		1		3
AN/SQS26 (Ship)	2				2
AN/APS20 (Radar)	3				3
AN/APS59 (Radar)	2				2
AN/APS80 (Radar)	2				2
AN/APS88 (Radar)	2				2
JEZZEBEL	2	1	1	2	6
JULIE	2	1	1	2	6
ARTEMIS	1				1
ATLANTIC	1			1	2
ASH	2				2
ORBITRON (electromagnetic)	1				1
CAESAR	1		1	1	3
MSS			1		1
SAS			1		1
COLOSSUS			1		1
AN/SQA14 (Towed)			1		1
AN/SQA26 CX			1		1
DMA				1	1
SOSUS				1	1
DIFAR				1	1
CASS				1	1
DICASS				1	1
AN/BQQ5				1	1
AN/SSQ36				1	1
AN/SSQ53				1	1
TOTAL:	38	2	11	14	65
SURFACE COMBATANTS:					
WILLIS A. LEE (DL-4)	2				2
DEALEY (DE-1006)	1				1
CLAUD JONES (DE-1033)	1				1
FLETCHER (DD-445)	1	1			2
BAINBRIDGE (CGN-25)	1				1

SPECIFIC U.S. PROGRAMS MENTIONED IN QUANTITATIVE SAMPLE

PERIOD	1961-1965	1966-1970	1971-1975	1976-1979	TOTAL
SURFACE COMBATANTS (cont'd):					
GLOVER (ADGE-1)	2				2
BELKNAP (CG-26)		1		1	2
LEAHY (CG-16)		1		1	2
COONTZ (DDG-37)		1		1	2
CHARLES F. ADAMS (DDG-2)		1	1	2	4
FORREST SHERMAN (DD-931)		1		1	2
CARPENTER (DD-825)		1		1	2
KNOX (FF-1052)		1		1	2
GEARING (DD-714)		1	1	1	3
ALLEN M. SUMNER (DD-692)		1	1		2
GARCIA (FF-1040)		1			1
GUAM (LPH-9)			1		1
RAYMOND A. SPRUANCE (DD-963)			1	2	3
VIRGINIA (CGN-38)				1	1
CALIFORNIA (CGN-36)				1	1
LONG BEACH (CGN-9)				1	1
TRUXTON (CGN-35)				1	1
ALBANY (CG-10)				1	1
MITSCHER (DDG-35)				1	1
DECATUR (DDG-31)				1	1
BROOKE (FFG-1)				1	1
OLIVER HAZARD PERRY (FFG-7)				1	1
TOTAL:	8	11	5	20	44
PERIOD TOTALS:	148	52	80	66	346

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SPECIFIC U.S. PROGRAMS MENTIONED IN QUANTITATIVE SAMPLE

PERIOD	1961-1965	1966-1970	1971-1975	1976-1979	TOTAL
SURFACE COMBATANTS (cont'd):					
GLOVER (ADGE-1)	2				2
BELKNAP (CG-26)		1		1	2
LEAHY (CG-16)		1		1	2
COONTZ (DDG-37)		1		1	2
CHARLES F. ADAMS (DDG-2)		1	1	2	4
FORREST SHERMAN (DD-931)		1		1	2
CARPENTER (DD-825)		1		1	2
KNOX (FF-1052)		1		1	2
GEARING (DD-714)		1	1	1	3
ALLEN M. SUMNER (DD-692)		1	1		2
GARCIA (FF-1040)		1			1
GUAM (LPH-9)			1		1
RAYMOND A. SPRUANCE (DD-963)			1	2	3
VIRGINIA (CGN-38)				1	1
CALIFORNIA (CGN-36)				1	1
LONG BEACH (CGN-9)				1	1
TRUXTON (CGN-35)				1	1
ALBANY (CG-10)				1	1
MITSCHER (DDG-35)				1	1
DECATUR (DDG-31)				1	1
BROOKE (FFG-1)				1	1
OLIVER HAZARD PERRY (FFG-7)				1	1
TOTAL:	8	11	5	20	44
PERIOD TOTALS:	148	52	80	66	346

APPENDIX F

QUANTITATIVE DATA SUMMARY

- PERIOD 1: 1961-1965
- PERIOD 2: 1966-1970
- PERIOD 3: 1971-1975
- PERIOD 4: 1976-1979

TABLE V

QUANTITATIVE DATA SUMMARY

PERIOD 1: 1961-1965

RAW % OF CATEGORY TOTAL

RAW % PERIOD TOTAL

	Advantage Over Other Means	Effective Threat	Operational Capability	Operational Limitation	Technical Description	Improving	Mention	Other	TOTAL
AIRCRAFT (UNSPECIFIED)	1/3.45	2/6.9	9/31.03	5/17.24	—	7/24.14		5/17.24	29/6.79
LAND-BASED FIXED-WING AIRCRAFT		1/4.35	7/30.43	1/4.35	2/8.7	4/17.39	5/21.74	3/13.04	23/5.39
CARRIER-BASED FIXED-WING AIRCRAFT			1/6.67		4/26.67	2/13.33	4/26.67	4/26.67	15/3.51
HELICOPTERS	4/15.38	2/7.69	5/19.23	1/3.85	3/11.54	7/26.92	1/3.85	3/11.54	26.6.09
AIRCRAFT CARRIERS		2/16.67				3/25	3/25	4/33.33	12/2.81
SURFACE COMBATANTS	1/2.7		6/16.22	7/18.92		10/27.03	10/27.03	3/8.11	37/8.67
SUBMARINES	3/5	3/5	16/26.67	3/5		25/41.67	6/10	7/6.67	60/14.0
SONARS	1/14.29	2/28.57				2/28.57	1/14.29	1/14.29	7/1.64
Sonobuoy/Dipping Sonar		1/6.25	5/31.25		3/18.75	5/31.25	2/12.5		16/3.75
Ship carried		1/6.25	4/25	1/6.25		3/18.75	7/43.75		16/3.75
Submarine carried			5/55.56			1/11.11	3/33.33		9/2.11
Fixed		/9.09	3/27.27			4/36.36	3/27.27		11/2.58
RADARS			1/14.29		1/14.29	2/28.57	3/42.86		7/1.64
MAD			2/25	3/37.5		2/25		1/12.5	8/1.87
UNSPECIFIED SENSORS			1/12.5	4/50		2/25		1/12.5	8/1.87
Airborne			2/66.67		1/33.33				3/.70
Shipborne									
Submarine-borne									
OTHER SENSORS			2/22.22		3/33.33	4/44.44			9/2.11
TORPEDOES	1/14.29			1/42.86		2/22.57	1/14.29		7/1.64
Air-launched			3/42.86	1/14.29		3/42.86			7/1.64
Ship-launched				3/15.38		3/23.08	8/61.54		13/3.04
Submarine-launched		1/7.14	2/14.29	2/14.29	1/7.14	2/14.29	4/28.57	2/14.29	14/3.22
AEW MISSILES						1/33.33	2/66.67		3/.70
Ship-launched						2/50	2/50		4/.94
Submarine-launched	1/7.69		1/7.69	1/7.69		9/69.23		1/7.69	13/3.04
DEPTH BOMBS		2/14.29	3/21.43	3/21.43		3/21.43	2/14.29	1/7.14	14/3.28
MINES		2/14.29	6/42.86			6/42.86			14/3.28
UNMANNED HELICOPTERS	1/16.67		1/16.67		1/50	1/16.67			4/1.41
UNSPECIFIED WEAPONS			1/66.67			2/66.67			3/.70
Shipborne									
Airborne			1/100						1/.33
Submarine-borne			1/33.33	1/33.33		1/33.33			3/.70
OTHER WEAPONS						1/100			1/.23
ANTISUBMARINE C[illegible]			1/50	1/50					2/.47
MULTIPLE PLATFORM-TYPE [illegible]									
RADARS (DPS-6,B6,A/C, AIRSHIPS, ETC)			2/100						2/.47
SEARCH/KILLER/SEARCH STRIKE		1/25				1/25	1/.25	1/25	4/.94
A/C and OTHER		1/100							1/.23
CENTRAL A/C		1/5.26	3/15.79	6/31.58		8/42.11		1/5.26	19/4.45
TOTAL	13/304	23/5.39	94/2201	65/10.54	21/4.92	128/29.98	68/15.93	35/82	427/

TABLE V

QUANTITATIVE DATA SUMMARY

PERIOD 2: 1966-1970

RAW % OF CATEGORY TOTAL

RAW % PERIOD TOTAL

	Air... Ship...	Effect... Threat	Operat... Capabil...	Operational Limitation	Tech... Descr...	Improving	Limiting	Other	...
AIRCRAFT ...			1/50			1/50			2/1.42
LAND-BASED FIXED-WING AIRCRAFT		1/20	2/40	1/20		1/20			5/3.55
CARRIER-BASED FIXED-WING AIRCRAFT		1/8.33	6/50	1/8.33		2/16.67	2/16.67		12/8.51
HELICOPTERS			2/33.33			1/16.67	3/50		6/4.26
AIRCRAFT CARRIERS		1/10	3/30	1/10		1/10		4/40	10/7.09
SURFACE COMBATANTS			2/18.18			2/18.18	6/54.55	1/9.09	11/7.8
SUBMARINES	1/7.14	3/21.43	2/14.29	1/7.14		5/35.71	1/7.14	1/7.14	14/9.93
SONARS				2/100					2/1.42
Sonobuoys/Dipping Sonar			3/100						3/2.13
Ship carried									
Submarine carried						1/100			1/.71
Fixed						1/100			1/.71
...									
...									
UNSPECIFIED SENSORS						1/100			1/.71
Airborne			2/66.67			1/33.3.			3/2.13
Shipborne									
Submarine-borne									
OTHER SENSORS									
TORPEDOES						1/100			1/.71
Air-launched		1/33.33	2/66.67						3/2.13
Ship-launched								1/100	1/.71
Submarine-launched		1/50	1/50						2/1.42
ASW MISSILES						3/100			3/2.13
Ship-launched			1/16.67				5/23.33		6/4.26
Submarine-launched	1/33.33					1/33.33	1/33.33		3/2.13
DEPTH BOMBS		1/20	2/40					2/40	5/3.55
MINES	1/14.29	2/28.57	1/14.29			3/42.86			7/4.96
UNMANNED HELICOPTERS						1/25	3/75		4/2.84
UNSPECIFIED WEAPONS				1/100					1/.71
Shipborne									
Airborne									
Submarine-borne									
OTHER WEAPONS									
ANTISUBMARINE C[3]			4/100						4/284
MULTIPLE PLATFORM-TYPE OPS									
CARRIER KILLER SEARCH STRIKE GROUPS		1/25	1/25			1/25		1/25	4/2.84
SUBMARINES IN MUK			1/100						1/.71
SHIPS IN MUK			4/100						4/2.84
CARRIER BASED A C IN MUK			5/100						5/3.55
HELICOPTERS IN MUK			2/100						2/1.42
...			5/35.71	2/14.29		7/50			14/9.93
TOTAL	3/2.13	12/8.51	52/36.88	9/6.38		34/24.11	21 14.89	10/7.09	141

TABLE V

QUANTITATIVE DATA SUMMARY

PERIOD 3: 1971-1975

	RAW % OF CATEGORY TOTAL								RAW # PERIOD TOTAL
	Advantage Over Other Means	Effective Threat	Operational Capabil.	Operational Limitation	Technical Description	Improving	Maintain	Other	Type
AIRCRAFT (UNSPECIFIED)		1/33.33				1/33.33		1/33.33	3/1.85
LAND-BASED FIXED-WING AIRCRAFT		1/5.88	3/17.65	1/5.88	3/17.65	7/41.18	1/5.88	1/5.88	17/10.4
CARRIER-BASED FIXED-WING AIRCRAFT							2/33.33	4/66.67	6/3.7
HELICOPTERS	1/5	1/5	2/10		1/5	8/40	3/15	4/20	20/12.3
AIRCRAFT CARRIERS		1/8.33	1/8.33	1/8.33	1/8.33	4/33.33	2/16.67	2/16.67	12/7.41
SURFACE COMBATANTS		1/5.88	1/5.88	2/11.76	1/5.88	7/41.18	3/17.65	2/11.76	17/10.4
SUBMARINES	1/6.67	1/6.67	1/6.67	1/6.67	4/26.67	5/33.33	1/6.67	1/6.67	15/9.26
SONARS					-				
Sonobuoys/Dipping Sonar					1/50		1/50		2/1.23
Ship carried		1/25		1/25			2/50		4/2.47
Submarine carried						1/50	1/50		2/1.23
Fixed			1/16.67		2/33.33	2/33.33	1/16.67		6/3.70
RADARS									
NAD									
UNSPECIFIED SENSORS						1/100			1/.62
Airborne									
Shipborne									
Submarine-borne									
OTHER SENSORS	1/33.33		1/33.33			1/33.33			3/1.85
TORPEDOES						2/100			2/1.23
Air-launched						2/50	2/50		4/2.47
Ship-launched			1	3		4	2	1	11/6.79
Submarine-launched	1/9.09	1/9.09	1/9.09	2/15.38	2/15.38	4/30.77	1/9.09	1/9.09	13/8.02
A/S MISSILES									
Ship-launched						1/33.33	2/66.67		3/1.85
Submarine-launched									
DEPTH BOMBS							1/100		1/.62
MINES			1/50			1/50			2/1.23
UNMANNED MISSILES				1/100					1/.62
UNSPECIFIC WEAPONS				1/100					1/.62
Shipborne									
Airborne					1/100				1/.62
Submarine-borne									
OTHER WEAPONS									
ANTI-SUBMARINE C[3]									
TRIPLE PLATFORM-TYPE OPS									
CV, SHIPS, SUBS, A/C			1/100						1/.62
SEARCH STRIKE GROUP			1/100						1/.62
SHIPS WITH VTOL A/C & HELO		1/20	1/20			3/60			5/3.09
CENTRAL ASW			3/37.5			5/62.5			8/4.94
TOTAL	4/2.47	9/5.56	19/11.73	13/8.02	16/9.88	59/36.42	25/15.43	17/10.49	162/

TABLE V

QUANTITATIVE DATA SUMMARY

PERIOD 4: 1976-1979

RAW % OF CATEGORY TOTAL

	Advantage Over Other Navies	Effective Threat	Operational Capability	Operational Limitation	Technical Description	Improving	Restrict	Other	Total	RAW % PERIOD TOTAL
AIRCRAFT (UNSPECIFIED)										
LAND-BASED FIXED-WING AIRCRAFT		1/25.5	2/25			2/25	3/37.5		8/6.72	
CARRIER-BASED FIXED-WING AIRCRAFT		1/20	1/20			2/40	1/20		5/4.2	
HELICOPTERS	1/10	1/10	3/20			5/50	1/10		10/8.4	
AIRCRAFT CARRIERS						2/40	3/60		5/4.2	
SURFACE COMBATANTS				1/10	4/40	2/20	2/20	1/10	10/8.4	
SUBMARINES	2/7.14	1/3.57	7/25		2/7.14	14/50	1/3.57	1/3.57	28/23.53	
SONARS										
Sonobuoys/Dipping Sonar	2/18.18		1/9.09	2/18.18	2/18.18	3/27.27		1/9.09	11/9.24	
Ship carried						1/100			1/.84	
Submarine carried			4/50			4/50			8/6.72	
Fixed			1/33.33	1/33.33			1/33.33		3/2.52	
RADARS										
MAD										
UNSPECIFIED SENSORS										
Airborne										
Shipborne										
Submarine-borne										
OTHER SENSORS						1/100			1/.84	
TORPEDOES			1/50			1/50			2/1.68	
Air-launched					1/100				1/.84	
Ship-launched			1/50		1/50				2/1.68	
Submarine-launched			1/25		1/25	2/50			4/3.36	
ASW MISSILES										
Ship-launched					4/100				4/3.36	
Submarine-launched						1/50	1/50		2/1.68	
DEPTH BOMBS										
MINES					1/100				1/.84	
UNMANNED HELICOPTERS										
UNSPECIFIED WEAPONS										
Shipborne										
Airborne										
Submarine-borne						1/100			1/.84	
OTHER WEAPONS										
ANTISUBMARINE C³			1/50	1/50					2/1.68	
MULTIPLE PLATFORM-TYPE OPS										
S.PLANES, SURF. SHIPS, A C & HELOS			2/66.67					1/33.33	3/2.52	
SHIPS WITH HELICOPTERS						1/100			1/.84	
GENERAL ASW			1/16.67			5/83.33			6/5.04	
TOTAL	5/4.2	4/3.36	25/21.01	5/4.2	16/13.45	47/39.5	13/10.92	4/3.36	119/	

APPENDIX G

BIBLIOGRAPHY

BIBLOIOGRAPHY OF SOURCES ON SOVIET PERCEPTIONS OF U.S. ASW

1960

1) Admiral S. Gorshkov, "Nadezhnyy strazh bezopasnosti Rodiny" (Reliable Guard of the Security of the Homeland) Soviet Fleet, 23 February 1960. (R)

2) Captain First Rank E. Shchekotov, Okhotniki za podvodnymi lodkami (Hunters for Submarines), Military Press of the Ministry of Defense, signed to press 8 April 1960, 128pp. (F)

3) Admiral L. A. Vladimirskiy, Preface to Morskaya moshch' segodnya (Seapower Today), Military Press of the Ministry of Defense, signed to press 10 June 1960, pp. 5-28. (A)

4) Admiral S. Gorshkov, "Strazh morskikh rubezhey" (Guard of the Maritime Perimeters), Agitator No. 13, July 1960. (R)

5) "Nadezhnyi strazh Sovetskikh morskikh rubezhey; materialy dlya dokladov i besed o Dne voyenno-morskogo flota" (Reliable Guard of Soviet Maritime Perimeters; Materials for Reports and Discussions for Navy Day) Soviet Navy, 20 July 1960. (PP)

6) Admiral S. Gorshkov, "Vernyye syny Rodiny" (True Sons of the Homeland), Pravda, 31 July 1960. (P)

7) Admiral A. Golovko, "Flot Sovetskoy strany" (The Navy of the Soviet Land), Izvestiya, 31 July 1960. (P)

8) Admiral F. Gorulya, "Krepit' boyegotovnost', povyshat' masterstvo!" (Strengthen Combat Readiness, Raise Skills), Red Star, 31 July 1960. (M)

9) Vice Admiral V. Ivanov, "Flot velikoy Sovetskoy derzhavy" (The Navy of the Great Soviet Power), Soviet Navy, 31 July 1960. (R)

10) Commander-in-Chief Black Sea Fleet, Admiral V. Kasatonov, Vsegda na strazhe" (Always on Guard), Pravda of the Ukraine, 31 July 1960. (R)

11) Rear Admiral V. Lizarskiy, "Na strazhe mirnogo truda" (On Guard Over Peaceful Labor), Turkmenian Spark, 31 July 1960. (R)

12) V. Linetskiy, "Amerikanskiy flot i 'politika sily'"(The U.S. Navy and "the Policy of Strength"), Soviet Navy, 9 August 1960. (P)

13) Candidate of Military Science, Engineer-Captain 2nd Rank A. L. Prostakov, Protivolodochnaya oborona torgovykh sudov (Antisubmarine Defense of Merchant Ships), Military Press of the Ministry of Defense, signed to press 18 August 1960, 172pp. (F)

14) "43-ya godovshchina Velikoy Oktyabrskoy sotsialisticheskoy revolyutsii" (The 43rd Anniversary of the Great October Socialist Revolution), Communist of the Armed Forces, No. 1, October 1960, pp. 34-41. (R)

BIBLIOGRAPHY OF SOURCES ON SOVIET PERCEPTIONS OF U.S. ASW

1961

15) Corresponding Member of the Academy of Science L. A. Zenkevich and Captain 2nd Rank S. D. Osokin, "Sovetskiye issledovaniya mirovogo okeana" (Soviet Research in the World Ocean), Naval Digest, February 1961, pp. 34-44. (F)

16) Admiral S. Gorshkov, "Na strazhe Rodiny" (On Guard of the Homeland), Labor, 23 February 1961. (R)

*17) Engineer-Colonel A. G. Sholom, "Napravlennost' razvitiya aviatsionnykh sredstv obnaruzheniya podvodnykh lodok za rubezhom" (Direction of the Development of Submarine Detection Means Abroad), Naval Digest, March 1961, pp. 74-80. (F)

18) Rear Admiral V. S. Sysoyev, "Ob izmenenii soderzhaniya nekotorykh ponyatii voyennomorskogo iskusstva" (On the Changes of the Content of Several Understandings of Naval Art), Naval Digest, April 1961, pp. 22-30. (A)

19) Admiral S. Gorshkov, "Nadezhnyy strazh morskikh rubezhey SSSR" (Reliable Guard of the Maritime Perimeters of the USSR), Communist of the Armed Forces No. 13, July 1961, pp. 25-30. (R)

20) Admiral A. Golovko, "Vsegda na vakhte" (Always on Guard), Agitator No. 14, July 1961, pp. 26-27. (R)

*21) "Na strazhe morskikh rubezhey Sovetskoy Otchizny" (Materials dlya dokladov i besed o Dne VMF SSSR)" (On Guard of the Maritime Perimeters; Materials for Reports and Discussions for Navy Day of the USSR), Soviet Patriot, 19 July 1961. (PP)

22) "Voyenno-morskoi flot Sovetskoy derzhavy; materialy dlya dokladov i besed ko Dnyu voyenno-morskogo flota" (The Navy of the Soviet Power; Materials for Reports and Discussions for Navy Day) Red Star, 20 July 1961. (PP)

*23) Rear Admiral V. I. Andreyev, Bor'ba na okeanskikh kommunikatsiyakh (The Struggle on the Ocean Lines of Communications), Military Press of the Ministry of Defense, signed to press 29 July 1961, 375 pp. (AA)

* - Starred entries were included in the quantitative sample.

*24) Admiral S. Gorshkov, "Na strazhe morskikh rubezhei Sovetskoi derzhavy" (On Guard of the Maritime Perimeters of the Soviet Power), Pravda, 29 July 1961. (R)

25) Vice Admiral V. Grishanov, "Povyshat' bditel'nost'i boyevuyu gotovnost'" (Raise Vigilance and Combat Readiness), Red Star, 29 July 1961. (T)

26) Admiral A. Andreyev, "Na strazhe morskikh rubezhev" (On Guard of the Maritime Perimeters), Water Transport, 29 July 1961. (R)

27) Admiral S. Golovko, "Pod flagom Rodiny" (Under the Flag of the Homeland), Izvestiya, 30 July 1961. (R)

28) Admiral A. Chabanenko, "Na strazhe morskikh rubezhey" (On Guard of the Maritime Perimeters), Economic Gazette, 30 July 1961, p. 1. (R)

29) Vice Admiral V. N. Ivanov, "Na boyevoy vakhte" (On Combat Watch), Labor, 30 July 1961. (R)

30) Engineer Admiral N. Isachenkov, "Voyenno-morskoy flot Sovetskoy derzhavy" (The Navy of the Soviet Power), Communist of Tadzhikistan, 30 July 1961. (R)

*31) Engineer Captain First Rank V. V. Belyayev, "Nekotorive voprosy ekspluatatsii atomnykh podvodnykh lodok" (Some Questions of the Exploitation of Submarines), Naval Digest, August 1961, pp. 78-84. (A)

32) Captain First Rank F. M. Pondar' and Captain First Rank N. P. V'yunenko, "Vazhnaya tema" (An Important Theme), Naval Digest, August 1961, pp. 89-94. (Review of book by Major General M. V. Smirnov, and Colonels I.S. Baz', S. N. Kozlov and P. A. Sidorov, O sovetskoy voyennoy nauke (On Soviet Military Science), Military Press of the Ministry of Defense, 1960.) (A)

33) N.S. Khrushchev, "Otchet TsK KPSS' (Report of the Central Committee), Stenographic Record of the XXIInd Party Congress, 17 October 1961, Vol. 1, p. 55. (R)

34) Marshal R. Ya Malinovskiy, "Rech' tov. R. Ya. Malinovskogo" (to the XXIInd Party Congress), Pravda, 25 October 1961. (R)

*35) "Sovetskiye Vooruzhenniye Sily na strazhe stroitel'stva kommunizma" (The Soviet Armed Forces in the Construction of Communism), Military-Historical Journal, December 1961, pp. 3-11. (RR)

*36) "Istoricheskiye resheniya XXII s'yezda KPSS" (The Historical Resolutions of the XXII Congress of the CPSU), Naval Digest, December 1961, pp. 3-14. (PP)

37) Instructor, Candidate of Naval Science, Captain First Rank M. E. Stepanov, "Obespecheniye razvertivaniya podvodnykh lodok v khode voyennykh deystviy" (Support for the "Deployment of Submarines in the Course of Military Action), Naval Digest, December 1961, pp. 39-48. (A)

BIBLIOGRAPHY OF SOURCES ON SOVIET PERCEPTIONS OF U.S. MSU

1962

38) Rear Admiral V. Prokof'yev, "Glavnaya udarnaya sila v voyne na more" (The Main Striking Force of a War at Sea), Red Star, 13 January 1962, pp. 2-3. (A)

*39) "Na strazhe sozidatel'nogo truda stroiteley kommunizma" (On Guard of the Creative Labor of the Builders of Communism), Communist of the Armed Forces, No. 2, January 1962, pp. 38-45. (R)

40) Professor, Major-General N. M. Kiryayev and Instructor, Candidate of Historical Science Colonel M. N. Shatalin, "XXII s"ezd KPSS ob ukreplenii voruzhennykh sil i oboronosposobnosti SSSR" (The XXIInd Congress of the CPSU on the Strengthening of the Armed Forces and the Defense Capability of the USSR), Naval Digest, February 1962, pp. 9-19. (MA)

41) Marshal V. D. Sokolovskiy (Ed.) Voyennaya strategiya (Military Strategy), 1st edition, Military Press of the Ministry of Defense, signed to press 24 May 1962, 453pp. (MA)

42) Protivolodochnaya oborona v sovremennoy voyne, (Antisubmarine Defense in Modern War), Rear Admiral A. I. Rodionov (Ed.), Military Press of the Ministry of Defense, signed to press 29 May 1962, 313 pp. (A)

43) Fleet Admiral S. G. Gorshkov, "Flot Sovetskoy derzhavy" (The Navy of the Soviet Power), Soviet Warrior No. 13, June 1962, pp. 1-2. (R)

44) Deputy Chief of the main Political Directorate of the Soviet Army and Navy, Vice Admiral V. Grishanov, "Den' Voyenno-Morskogo Flota SSSR" (Navy Day of the USSR), Communist of the Armed Forces No. 13, July 1962, pp. 13-21. (PP)

*45) Fleet Admiral S. Gorshkov, "Slavnoye detishche Sovetskogo naroda" (Glorious Offspring of the Soviet People), Agitator No. 13, July 1962, pp. 30-32.

46) "Navstrechu Dnyu Voyenno-Morskogo Flota" (Greeting Navy Day), Red Star, 29 July 1962. (P)

47) Fleet Admiral Gorshkov, "Vernyye syny Rodiny" (True Sons of the Homeland), Pravda, 29 July 1962. (P)

48) Fleet Admiral S. G. Gorshkov, "Moguchiy flot moguchey derzhavy" (Mighty Navy of a Mighty Power), Soviet Russia, 29 July 1962. (R)

49) Vice Admiral V. Grishanov, "Strazh morskikh rubezhey" (Guard of the Maritime Perimeters" Izvestiya, 29 July 1962. (R)

50) Admiral F. V. Zozulya, "Vsegda na strazhe" (Always on Guard), Red Star, 29 July 1962. (R)

*51) Admiral N. Kharlomov, "Pod vympelom Sovetov" (Under the Banner of the Soviets), Labor, 29 July 1962. (R)

52) Commander-in-Chief Black Sea Fleet, Vice Admiral S. E. Chursin, "Flot velikoy derzhavy" (Navy of a Great Power), Pravda of the Ukraine, 29 July 1962. (R)

*53) Candidate of Naval Science, Instructor, Captain First Rank N. Potapov, "Doktrina i flot" (Doctrine and the Navy), Red Star, 26 September 1962. (T)

*54) Captain First Rank B. Korenev, "Vysokaya otsenka zovet k novym uspekham" (A High Rating Calls for New Successes), Communist of the Armed Forces, No. 19, October 1962, pp. 29-35. (T)

55) "Sorok pyat'let Velikoy Oktyabr'skoy sotsialisticheskoy revolyutsii" (Forty-Five Years of the Great October Socialist Revolution), Communist of the Armed Forces, No. 19 October 1962, pp. 36-43. (PP)

56) Fleet Admiral S. G. Gorshkov, "Podvodnyy flot zorko okhranyayut morskiyye rubezhey Rodiny" (The Submarine Fleet Vigilantly Guards the Maritime Perimeter of the Homeland), Red Star, 31 October 1962. (R)

57) Colonels E. F. Mikitin and N. R. Pankratov, "XXII s'yezd KPSS o zashchite sotsialisticheskogo Otechestva" (The XXII Congress of the CPSU on the Defense of the Socialist Homeland), Naval Digest, November 1962, pp. 8-16. (NA)

58) Protivolodochaya oborona v sovremennoy voyne: sbornik perevodnykh statei (Antisubmarine Defense in Modern War; A Collection of Translated Articles), Rear Admiral A. I. Bodienov (Ed.), Military Press of the Ministry of Defense, signed to press 22 May 1962, 312 pp. (P)

BIBLIOGRAPHY OF SOURCES ON SOVIET PERCEPTIONS OF U.S. [illegible]

1963

59) Admiral V. Z. Alafuzov, "K vykhodu v svet truda 'Voyennaya stragegiya' (To the Coming Out of the Work "Military Strategy"), Naval Digest, January 1963, pp. 88-96.

60) "45 let Sovetskoy Armii i Voyenno-Morskogo Flota" (45 Years of the Soviet Army and Navy), Naval Digest, February 1963, pp. 3-8. (R)

61) Major-General B. Teplinskiy, Retired, "Rakety 'Polaris' i Amerikanskaya strategiya" ("Polaris" Missiles and American Strategy), New Times No. 8, February 1963, pp. 6-9. (A)

*62) Fleet Admiral S. G. Gorshkov, "Bol'shiye zadachi Sovets-kogo flota" (Great Tasks of the Soviet Navy), Red Star, 5 February 1963. (R)

63) Fleet Admiral S. G. Gorshkov, "Sovetskim vooruzhennym silam - 45 let" (The Soviet Armed Forces - Years), Labor, 22 February 1963. (R)

64) V. A. Abchuk, "Opredeleniye vremeni otryva korabley okhraneniya dlya ataki obnaruzhennoy podvodnoy lodki" (A Determination of the Time of the Breaking Away of the Ships of the Screen for Attack on a Detected Submarine), Naval Digest, March 1963, pp. 59-61. (F)

65) Colonel I. G. Bogatov, "Izmeneniye oboznacheniya samoletov i vertoletov morskoy aviatsii SShA" (Changes in the Designations of Airplanes and Helicopters of U.S. Naval Aviation), Naval Digest, March 1963, pp. 83-85. (F)

66) Colonel P. Fedorov, "Anglo-amerikanskaya aviatsiya v bor'be s nemetskimi podvodnymi lodkami vo vtoroy mirovoy voyne" (Anglo-American Aviation in the Struggle with German Submarines in the Second World War), Military-Historical Journal, April 1963, pp. 84-91. (A)

67) Admiral V. A. Kasatonov, "30 let na strazhe sovetskogo zapolyar'ya" (30 Years on Guard of the Soviet Polar Region), Naval Digest, May 1963, pp. 3-12. (R)

*68) Captain First Rank Retired B. N. Lebedev, "Bor'ba s nemetskimi lodkami v obshirnoy blokadnoy zone severnogo i norvezhskogo morey" (The Struggle with German Submarines in the Wide Blockade Zone of the North and Norwegian Seas), Naval Digest, May 1963, pp. 28-34. (A)

*69) Captain First Rank V. P. Rogov, "Imperialisty SShA delayut stavku na 'Polaris'" (The Imperialists Place Reliance on "Polaris"), Naval Digest, May 1963, pp. 77-86. (A)

*70) Fleet Admiral S. Gorshkov, "Blizorukaya strategiya" (Short-sighted Strategy), Izvestiya, 19 May 1963. (R)

*71) A.A. Kvitnitskiy, Bor'ba s podvodnymi lodkami (The Struggle with Submarines), Military Press of the Ministry of Defense, signed to press 28 May 1963, 128pp. (A)

*72) Fleet Admiral S. Gorshkov, "Na strazhe morskikh rubezhey" (On Guard of the Maritime Perimeters), Agitator No. 11, June 1963, pp. 24-26. (R)

73) Captain First Rank N.P. V'yunenko, "Rol' nauki v razrabotke voprosov vooruzhennoy bor'by na more" (The Role of Science in the Working Out of Questions of Armed Struggle at Sea), Naval Digest, June 1963, pp. 19-26. (A)

74) Captain First Rank B.N. Ivanov, "O predmete issledo-vaniya taktiki" (On the Topic of Investigation of Tactics), Naval Digest, June 1963, pp. 27-30. (F)

75) Colonel V. G. Rog, "Vliyaniye raketno-yadernogo oruzhiya na primeneniye aviatsii na more" (The Influence of Nuclear-Missile Weapons of the Use of Aviation at Sea), Naval Digest, June 1963, pp. 31-37. (A)

76) V.P. Pavlov, "Opasnyye plany amerikanskogo imperializma (K sozdaniyu ob'yedinennykh yadernykh sil NATO)" (The Dangerous Plans of American Imperialism (for the Creation of a United NATO Nuclear Force)), Naval Digest, June 1963, pp. 30-36. (P)

77) Aviation Major-General S. Ruban and Colonel N. Antonov, "Nad okeanskimi glubinami" (Over the Ocean Depths), Red Star, 5 June 1963. (P)

*78) Fleet Admiral S. Gorshkov, "Voyenno-morskoy flot nashey Rodiny" (The Navy of Our Country), Communist of the Armed Forces No. 13, July 1963, pp. 13-25. (R)

79) Fleet Admiral S. G. Gorshkov, "Zabota partii o flote" (Concern of the Party for the Navy), Naval Digest, July 1963, pp. 9-19. (R)

30) Engineer-Colonel S. D. Kurlyandskii, "Nekotorye voprosy svyazi s podvodnymi lodkami" (A Few Questions of Communications with Submarines) Naval Digest, July 1963, pp. 80-85. (F)

31) First Deputy Commander-in-Chief of the Navy, Admiral V. A. Fokin, "Voyennye moryaki na strazhe Rodiny" (Navy Personnel on Guard of the Homeland), Water Transport, 27 July 1963. (R)

32) Commander-in-Chief Northern Fleet, Admiral V. A. Kasatonov, "Tridsat' slavnykh let" (Thirty Glorious Years), Red Star, 27 July 1963. (R)

33) Fleet Admiral S. Gorshkov, "Na strazhe mirnogo truda" (On Guard of Peaceful Labor), Pravda, 28 July 1963. (R)

34) Vice Admiral V. Grishanov, "Strazh morskikh rubezhei" (Guard of the Maritime Perimeters), Izvestiya, 28 July 1963. (R)

35) Admiral V. Fokin, "Boyevaya vakhta na moryakh i okeanakh" (Combat Watch on the Seas and Oceans), Red Star, 28 July 1963. (R)

36) Admiral A. Chabanenko, "Na boyevoy vakhte" (On Combat Watch), Soviet Patriot, 28 July 1963. (R)

37) Vice Admiral V. Ivanov, "Voyennye moryaki" (Naval Personnel), Labor, 28 July 1963. (R)

*38) Commander-in-Chief of the Black Sea Fleet, Vice Admiral S. Chursin, "Na strazhe morskikh rubezhey Otchizny" (On Guard of the Maritime Perimeters of the Fatherland), Pravda of the Ukraine, 28 July 1963. (R)

*39) Marshal V. D. Sokolovskiy (Ed.), Voyennaya strategiya (Military Strategy, 2nd edition, Military Press of the Ministry of Defense, signed to press 30 August 1963, 504 pp. (MA)

90) I. V. Kolyshkin, V glubinakh polyarnykh morey (In the Depth of the Polar Seas), Progress Press, signed to press 21 September 1963, 328pp. (PP)

91) I. A. Bykhovsiy, Atomnyye podvodnyye lodki (Nuclear-powered Submarines), Shipbuilding Industry Press, signed to press 22 September 1963, 264pp. (F)

92) Engineer-Captain 2nd Rank G. M. Trubov, Podvodnye lodki v russkom i Sovetskom flote (Submarines in the Russian and Soviet Navies), 2nd edition, Shipbuilding Industry Press, signed to press 10 October 1963, 440pp. (F)

93) Captain Second Rank V. V. Peregudov, Captain Second Rank A. I. Smirnov, "Ballisticheskaya raketa 'Polaris'" (The Ballistic Missile 'Polaris"), Naval Digest, October 1963, pp. 81-88. (A)

*94) Captain 2nd Rank V. I. Dmitriyev, Atakuyut podvodniki (The Submariners Attack), Military Press of the Ministry of Defense, 1 November 1963, 342pp. (F)

95) Engineer-Captain First Rank A. L. Prostakov, "Perspektivy uvelicheniya dal'nosti deistviya gidroakusticheskikh sredstv nablyudeniya" (Perspectives of the increasing of the range of operation of hydroacoustic means of observation), Naval Digest, November 1963, pp. 67-74. (F)

*96) Captain First Rank A. A. Kvitnitskiy, "Vozniknoveniye i razvitiye atomnogo podvodnogo flota SShA" (The Rise and Development of the U.S. Nuclear-Powered Submarine Fleet), Military-Historical Journal, November 1963, pp. 44-57. (F)

*97) Admiral V. M. Kharlamov, "Vydayushchiesya pobedy" (Notable Victories), Naval Digest, November 1963, pp. 20-25. (F)

98) A. A. Prostakov, Gidroakustika v inostrannykh flotakh (Hydroacoustics in Foreign Navies), The Shipbuilding Industry Press, signed to press 12 December, 156pp. (F)

BIBLIOGRAPHY OF SOURCES ON SOVIET PERCEPTIONS OF U.S. NAVY

1964

99) Aviatsionnaya tekhnika kapitalisticheskikh stran (Aviation Equipment of Capitalist Countries), Military Press of Ministry of Defense, 1964. (F)

100) N. A. Pitkerskiy (Ed.) Boyevoy put' Sovetskogo VoyennoMorskogo Flota (Combat Course of the Soviet Navy), 1st edition, signed to press 14 January 1964, 523pp. (F)

101) Captain Second Rank V. S. Pavlov, "O skrytnosti svyazi pri upravlenii silami flota" (On the Concealment of Communications in the Direction of Naval Forces.) Naval Digest, January 1964, pp. 19-25. (F)

102) Colonel V. P. Zhukov, "Osobennosti vedeniya vozdushnoy razvedki na morskikh teatrakh" (Particulars of the Conducting or Air Reconnaissance in the Maritime Theaters), Naval Digest, January 1964, pp. 26-30. (F)

*103) Lieutenant Colonel A. F. Prostokhanov "Perestroyeniya samoletov dlya obsledovaniya uchastka morya v kratchaysheye vremya" (The Deployment of Aircraft for the Searching of a Portion of the Sea in a Very Short Time), Naval Digest, January 1964, pp. 54-58. (F)

104) Engineer-Captain Second Rank V. P. Lakaev, "Kharakteristiki upravlyaemosti i manevrennyye vozmozhnosti podvodnykh lodok" (Characteristics of C^ and Patrolling Potential of Submarines), Naval Digest, January 1964, pp. 63-73. (F)

105) Colonel L. Sytov, "Vooruzhennyye sily SSSR v poslevoyennyy period" (The Armed Forces of the USSR in the Postwar Period), Communist of the Armed Forces, No. 3, February 1964, pp. 67-72. (R)

106) Vice Admiral V. A. Sychev, "Rakety--glavnoye oruzhiye flota" (Missiles--the Main Weapons of the Navy), Naval Digest, February 1964, pp. 13-23. (A)

107) "Teoriya Voenno-Morskogo iskusstva i sovremennyy flot" (The Theory of Naval Art and the Modern Navy), Naval Digest, February 1964, pp. 41-47. (A)

108) Captain 3rd Rank V. P. Mastov, "Osnovnyye napravleniya razvitiya protivolodochnykh sil SShA" (Basic Directions in the Development of the Antisubmarine Forces of the U.S.), Naval Digest, [illegible], pp. [illegible]. (F)

*109) Fleet Admiral S. G. Gorshkov, "Flot v bol'shom plavanii" (The Navy on a Distant Cruise), Red Star, 21 March 1964. (R)

110) Fleet Admiral S. Gorshkov, "Na strazhe mira i sozidaniya" (On Guard of Peace and Work), Economic Gazette, 22 February 1964. (R)

111) Lieutenant-General of Aviation N. A. Sbytov, "Kharakter i zakonomernosti mirovov raketno-yadernov voyny" (The Character and legal aspects of World Nuclear-Missile War), Naval Digest, March 1964, pp. 9-16. (A)

112) Lieutenant Colonel B. I. Zverev, "Leninskaya zabota o vosstanovlenii i stroitel'stve flota" (Lenin's Concern for the Restoration and Construction of the Navy), Naval Digest, April 1964, pp. 10-18.

*113) Captain First Rank M. K. Mal'kov, "Skrytnost'-vazhnevsheye uslovive uspeshnykh deystviy podvodnykh lodok" (Concealment is a Very Important Condition of Successful Actions of Submarines), Naval Digest, April 1964, pp. 27-33. (A)

114) Captain First Rank I. K. Kuz'min, "Razvedka v boevykh deystviyakh po unichtozheniyu sil flota protivnika" (Reconnaissance in Military Actions for the Destruction of Enemy Naval Forces), Naval Digest, May 1964, pp. 36-43. (F)

*115) Captain First Rank V. P. Bogov, "Pod chernym flagom (K sozdaniyu mnogotselevykh yadernykh sil NATO" (Under a Black Flag (to the Creation of Multi-Purpose Nuclear Forces of NATO)), Naval Digest, May 1964, pp. 70-74. (F)

*116) Major-General Retired P. Ya. Galeshkin and Engineer-Colonel Retired V. A. Konovalov, "Protivolodochnaya raketa 'Subroc'" (ASW Missile "Subroc"), Naval Digest, May 1964, pp. 85-87. (F)

117) N. N. Korotkin et. al., Avianostsy (Aircraft Carriers), Military Press of the Ministry of Defense, signed to press 22 June 1964, 276pp. (F)

*118 Admiral V. A. Kasatonov, "V tesnom edinstve" (In Close Unity), Naval Digest, June 1964, pp. 3-9. (R)

119) Captain Second Rank P. A. Sirotin, "Osnovy aviatsionnogo poiska protivnika v more" (The Basis of Aviation Search for the Enemy at Sea), Naval Digest, June 1964, pp. 51-57. (A)

120) Engineer-Captain First Rank (reserve) A. M. Breyev, "Primeneniye armirovannykh plastikov v podvodnom korablestroenii" (The Application of Reinforced Plastics in Submarine Ship Construction), Naval Digest, June 1964, pp. 69-71. (F)

121) Engineer-Captain First Rank I. I. Tynyanki, "Sostoyaniye i puti razvitiya korabel'nykh i aviatsionnykh gidroakusticheskikh sredstv" (The State and Directions of Development of Ship and Aviation Hydroacoustic Means) Naval Digest, June 1964, pp. 77-82. (F)

122) L. Yeremeyev, "Sed'moy flot Soyedinnenykh Shtatov" (The Seventh Fleet of the United States), Internationl Life (Russian edition), July 1964, pp. 148-150. (F)

*123) Admiral V. Grishanov, "Slava i gordost' naroda" (Glory and Pride of the People), Agitator No. 13, July 1964, pp. 15-17.

*124) "Moguchiy flot sotsialisticheskoy derzhavy" (The Mighty Navy of the Socialist Power), Naval Digest, July 1964, pp. 3-9. (R)

125) Captain First Rank Yu. P. Markov, "Bor'ba Prodolzhaetsya" (The Struggle Continues), Naval Digest, July 1964, pp. 35-40. (R)

*126) Captain First Rank V. P. Pavlov, "Voprosy ispol'zovaniya atomnykh raketnykh lodok" (Questions of the Use of Atomic Missile Submarines), Naval Digest, July 1964, pp. 72-81. (A)

*127) Rear Admiral (reserve) D. A. Tuz and Captain First Rank N. N. Ignat'ev "Boevoy put' sovetskogo flota" (The Combat Course of the Soviet Navy), Naval Digest, July 1964, pp. 83-92. (F)

128) Fleet Admiral S. Gorshkov, "Na strazhe morskikh rubezhey" (On Guard of the Maritime Perimeters), Pradva , 26 July 1964. (R)

*129) Admiral V. Grishanov, "Strazh morskikh rubezhey" (Guard of the Maritime Perimeters), Izvestiya, 26 July 1964. (R)

130) First Deputy Commander-in-Chief of the Navy, Admiral V. A. Kasatonov, "Boevaya vakhta Sovetskikh morvakov" (Combat Watch of Soviet Naval Personnel), Red Star, 26 July 1964. (R)

131) Admiral A. T. Chabanenko, "Nash morskoy shchit" (Our Sea Shield), Literary Russia, 24 July 1964. (R)

132) Vice Admiral I. Yeliseyev, "Nadezhnyy strazh Sovetskoy derzhavy" (Reliable Guard of the Soviet Power), Water Transport, 25 July 1964. (R)

133) Admiral N. Viongradov, "Na strazhe morskikh rubezhey" (On Guard of the Maritime Perimeters), Rural Life, 26 July 1964. (R)

134) Chief of the Main Staff of the Navy, Vice Admiral N. Sergeyev, "Nash sila i slava" (Our Power and Glory), Soviet Russia, 26 July 1964. (R)

135) Engineering Vice Admiral L. Karaganov, "Na strazhe morskikh rubezhey" (On Guard of the Maritime Perimeters), Labor, 26 July 1964. (R)

136) Engineer-Lieutenant-Captain I. K. Smirnov, "Zapusk raket neposredstvenno s poverkhnosti vody" (The Launching of Missile Directly from the Surface of the Water), Naval Digest, August 1964, pp. 79-82. (F)

137) Captain First Rank V. N. Berezovskii, "Ocherednoye podtverzhdeniye podgotovki inostrannykh flotov k termoyadernoy voyne" (The Recurrent Confirmation of the Preparation of Foreign Navies for Thermonuclear War), Naval Digest, August 1964, pp. 83-84. (F)

138) Aviation Major-General P. P. Nevsorov, "Primeneniye aviatsii v bor'be s podvodnymi lodkami" (Employment of Aviation in the Struggle with Submarines), Naval Digest, September 1964, pp. 27-33. (A)

139) Lieutenant-Colonel V. G. Usenko and Lieutenant-Captain S. I. Berdnikov, "Poisk podvodnykh lodok vertoletami" (Search for Submarines with Helicopters), Naval Digest, September 1964, pp. 60-64. (A)

*140) Captain First Rank E. S. Marinin, "Tikhookeanskiy flot SShA" (The Pacific Fleet of the U.S.), Naval Digest, September 1964, pp. 78-83 . (F)

141) Problemy revolyutsii v voyennom dele; sbornik statey (Problems of the Revolution in Military Affairs; A Collection of Articles), Military Press of the Ministry of Defense, signed to press 21 October 1964, 136pp. (A)

*142) Rear Admiral (retired) G. S. Ivanov, "Pobeda v Zapolyarye" (Victory in the Polar Region), Naval Digest, October 1964, pp. 16-22. (R)

*143) N. V. Kapustin, "Korabel'nyye shumy i vozmozhnyye puti ikh umen'sheniya" (Ship Noises and Possible Means of Their Reduction), Naval Digest, October 1964, pp. 65-72. (F)

*144) Engineer-Captain E. I. Sukhotskiy, "Protivolodochnaya aviatsiya kapitalisticheskikh stran" (Antisubmarine Aviation of the Capitalist Countries), Naval Digest, November 1964, pp. 77-84. (A)

145) Captain First Rank V. S. Bakov "Istoriya Otechestvennykh podvodnykh lodok" (History of the Homeland's Submarines), Naval Digest, November 1964, pp. 90-93. (A)

146) Senior Engineer-Lieutenant O. L. Ivanov, "Obespecheniye zhivucnesti podvodnykh lodok, nakhodyashchikhsya v remonte" (The Ensuring of the Survivability of Submarines while Under Repair), Naval Digest, December 1964, pp. 68-72. (F)

BIBLIOGRAPHY OF SOURCES IN SOVIET PERCEPTIONS OF U.S. ASW

1965

147) "Voyenno-morskiye oruzhiye" (Naval Weapons), Military Press of the Ministry of Defense, 1965, 304pp. (F)

148) V. Abchuk, "Atomnoye oruzhiye protiv podvodnykh lodok (Automic Weapons against Submarines), Red Star, 21 January 1965. (F)

*149) Rear Admiral B. F. Petrov, "Soderzhaniye i kharakter sovremennykh boevykh devstviy na more" (The Content and Character of Modern Combat Actions at Sea), Naval Digest, January 1965, pp. 7-15. (A)

150) Lieutenant-Colonel B. I. Zverev, "Devatel'nost' M. V. Frunze po ukrepleniyu boevoy moshchi sovetskogo Voyenno-Morskogo Flota" (The Activities of M. V. Frunze for the Strenthening of the Military Power of the Soviet Navy), Naval Digest, January 1965, 24-33. (F)

*151) Captain First Rank N. P. V'yunenko, "V strategicheskom tupike" (In a Strategic Deadend), Naval Digest, January 1965, pp. 78-83. (P)

152) Fleet Admiral S. G. Gorshkov, "Sovershenstvovat' boevuyu podgotovku flota na morskikh i okeanskikh prostorakh" (Improve Naval Combat Training on the Sea and Ocean Expanses), Communist of the Armed Forces No. 4, February 1965, pp. 13-23. (T)

153) Captain First Rank P. V. Nikolayev, "Problema borb'y s atomnymi podvodnymi lodkami raketonostsami" (The Problem of Combat with Nuclear-powered Missile Submarines), Naval Digest, February 1965, pp. 22-27. (A)

*154) Engineer-Captain First Rank V. V. Belyaev, "Sovremennyye problemy voyennogo korablestroyeniya" (Contemporary Problems of Military Shipbuilding), Naval Digest, February 1965, pp.. 79-84. (P)

155) Rear Admiral (retired) G. S. Ivanov, "O boevykh delakh severomortsev," (On the Military Affairs of the Northern Sea Sailors), Naval Digest, February 1965, pp. 88-91. (R)

156) G. Svyatov and V. Chernyshev, "Kurs na mnogotselevyye podvodnyye lodki" (The Way to a Multipurpose Submarine), Red Star, 12 February 1965. (A)

157) Rear Admiral V. S. Lisyutin, "Kniga ob avianostsakh" (Book on Aircraft Carriers), Naval Digest, March 1965, pp. 89-93. (F)

158) Marshal V. Sokolovskiy and Major-General M. Cherednichenko, "Nekotoryye voprosy Sovetskogo voyennogo stroitel'stva v poslevoyennyy period" (Some Questions of Soviet Military Construction in the Postwar Period), Military Historical Journal, March 1965, pp. 3-16. (MA)

159) Admiral V. I. Platonov, "Na strazhe zapolyar'ya" (On Guard of the Polar Region), Naval Digest, April 1965, pp. 15-25. (R)

160) Lieutenant-Colonel Yu A. Bryukanov, "Vzaimodeistviye aviatssi s podvodnymi lodkami" (Cooperation of Aviation with Submarines), Naval Digest, April 1965, pp. 41-46. (A)

161) Captain First Rank K. K. Frants, "Proshloye i budushcheye avianostev", (The Past and Future of Aircraft Carriers), Naval Digest, April 1965, pp. 46-54. (A)

162) Aviation Lieutenant-General A. M. Shuginin, "Udary S Vozdukha", (Strikes from the Air), Naval Digest, May 1965, pp. 27-35. (A)

163) Aviation Major-General B. Teplinskiy, Retired, "NATO i plany 'ogranichennoy voyny'" (NATO and the Plans for a Limited War"), New Times, No. 23, 1965, pp. 7-9. (P)

164) S. A. Gulyayev, "Rol' aviatsii v boyevykh deystviyakh na more v sovremennykh usloviyakh" (The Role of Aviation in Combat Actions at Sea in Contemporary Conditions), Naval Digest, June 1965, pp. 36-43. (A)

165) Captain Second Rank K. O. Dubravin and Captain Second Rank P. A. Sirotin, "Vremya prebyvaniya tseli v rayone poiska" (The Time of Arrival Targets in the Region of Search), Naval Digest, June 1965, pp. 62-67. (F)

166) Captain 2nd Rank I. Ya. Pereverzev, "Sovremennoye korabel'noye protivolodochnoye oruzhiye" (Modern Shipboard Antisubmarine Weapons), Naval Digest, June 1965, pp. 73-33. (F)

167) Yeremeyev, "Voyenno-morskiye sily SShA" (The Naval Forces of the U. S. A.), International Life, No. 7, July 1965, pp. 141-143. (F)

168) L. Eremeyev, "Voyenno-morskiye sily SShA" (The Naval Forces of the U.S.). Military-Historical Journal, July 1965, pp. 141-143. (F)

169) Admiral N. D. Sergeyev, "Flot velikoy derzhavy" (The Navy of a Great Power), Naval Digest, July 1965, pp. 3-9. (R)

170) Admirals A. E. Orel, S. M. Lobov, N. N. Amel'ko S. E. Chursin, "Pod flagom Sovetskoy Otchizny" (Under the Flag of the Soviet Homeland), Naval Digest, July 1965, pp. 10-17. (R)

171) Engineer-Captain Third Rank V. T. Tomashevskii, "Sinteticheskiye konstruksionnyye materialy v podvodnom korablestroenii", (Synthetic Construction Materials in Submarine Ship Construction), Naval Digest, July 1965, pp. 69-72. (F)

172) Engineer-Captain First Rank A. L. Prostakov, "Neakusticheskiye sredstva obnaruzheniya podvodnykh lodok" (Non-acoustic Means of Detection of Submarines), Naval Digest, July 1965, pp. 73-79. (F)

173) Captain First Rank V. N. Nikolayev and Captain First Rank E. S. Yefimov, "Nekotoryye svedeniya ob osnovnykh ucheniyakh voyenno-morskikh sil SShA i NATO v 1964 godu" (Some Information on the Basic Exercises of the Naval Forces of the U. S. and NATO in 1964), Naval Digest, July 1965, pp. 80-86. (F)

174) Rear Admiral (reserve) F. I. Chernyshev, "O podvigakh i slave podvodnikov") On the Deeds and Glory of the Submariners), Naval Digest, July 1965, pp. 90-96. (F)

175) "Na strazhe morskikh rubezhey; materialy dlya dokladov i besed" (On Guard of the Maritime Perimeters; Materials for Reports and Discussion), Red Star, 13 July 1965. (R)

176) Fleet Admiral V. A. Kasatonov, "Voyenno-morskoye moguchestvo Rodiny" (The Naval Might of the Homeland), Baku Worker, 22 July 1965. (R)

*177) Fleet Admiral S. Gorshkov, "Vernyye syny Rodiny" (Faithful Sons of the Homeland), Pravda, 21 July 1965. (R)

*178) Admiral V. M. Grishanov, "Na strazhe morskikh rubezhey Otchizny" (On Guard of the Maritime Perimeters of the Fatherland), Red Star, 21 July 1965. (R)

179) Chief of the Main Staff of the Navy, Admiral N. Sergeyev, "Moguchiy flot Sovetskoy derzhavy" (Mighty Navy of the Soviet Power), Soviet Kirgiziya, 25 July 1965. (R)

*180) Admiral I. S. Yumanshev, "Tikhookeanskiy Flot v boyakh za Rodinu" (The Pacific Ocean Fleet in Battle for the Homeland), Naval Digest, 1965, pp. 3-16. (A)

181) Captain First Rank Retired J. M. Sendik, "Pervaya podvodnaya lodka peresekayet Arktiku" (The First Submarine Crosses the Arctic), Naval Digest, August 1965, pp. 22-24. (F)

182) Captain A. G. Smirenskiy, "Primeneniye aviasii dlya poiska i unichtozheniya podvodnykh lodok" (Employment of Aviation for the Search and Destructin of Submarines), Naval Digest, September 1965, pp. 21-24. (A)

183) Captain First Rank K. V. Penzin, "Karl Denits fal'sifitsiruyet istoriyu" (Karl Doenitz Falsifies History), Naval Digest, September 1965, pp. 86-91. (F)

184) "Pod vsepobezhdayushchim znamenem Velikogo Oktyabrya" (Under the All-Triumphant Banner of Great October), Naval Digest, October 1965, pp. 3-9. (R)

*185) Captain First Rank I. V. Firsov, "Razvedka podvodnymi lodkami" (Reconnaissance with Submarines), Naval Digest, October 1965, pp. 16-22.

186) A. V. Kafman, "Sredizemnoye More-uzel imperialisticheskikh protivorechii" (The Mediterranean Sea is a Knot of Imperialist Contradictions), Naval Digest, October 1965, pp. 74-78.

187) Engineer-Captain Third Rank G. I. Koloskov, "Ot 'Polarisa' k 'Poseydonu'" (From "Polaris" to "Poseidon"), Naval Digest, October 1965, pp. 83-85. (F)

188) V. I. Matveyev, "Skrytnost'--osnova uspeshnykh deystviy podvodnykh lodok" (Stealth-the Basic for the Successful Action of Submarines), Naval Digest, November 1965, pp. 15-19. (A)

*189) E. S. Marinin and N. K. Nikolayev, "Atlanticheskiy flot SShA" (The Atlantic Fleet of the U.S.), Naval Digest, November 1965, pp. 32-36. (F)

190) Captain First Rank I. N. Potapov, Poslevoyennye doktriny i razvitiye flotov imperialisticheskikh gosudarstv. Military Press of the Ministry of Defense, signed to press 6 November 1965, 260 pp. (F)

*191) Rear Admiral (reserve) V. N. Romanovskiy, "Russkoytorpede-100 let" (The Russian Torpedo-100 years), Naval Digest, December 1965, pp. 32-33. (F)

192) Captain Second Rank G. P. Yarovoi, "Povyshat' kachestvo obucheniya protivolodochnykh sil" (Raise the Quality of Training of Anti-Submarine Forces), Naval Digest, December 1965, pp. 42-45. (T)

193) Captain First Rank L. B. Karlov, "Pozitsionnyye gidroakusticheskiye sredstva obnaruzheniya podvodnykh lodok" (Positional Hydroacoustic Means of Submarine Detection), Naval Digest, December 1965, pp. 76-79. (T)

BIBLIOGRAPHY OF SOURCES ON SOVIET PERCEPTIONS OF U.S. ASW

1966

194) Spravochnik po inostrannym flotam (Handbook of Foreign Navies), Military Press of the Ministry of Defense, 1966, 620pp. (F)

195) "Navstrechu velikomu yubileyu" (Meeting the Great Anniversary), Naval Digest, January 1966, pp. 16-21. (R)

196) Admmiral N. M. Kharlamov, "Tendentsii razvitiya voyennomorskikh flotov" (Trends in the Development of Navies), Naval Digest, January 1966, pp. 31-35. (A)

197) F. Gavrilov, "NATO sozdayet protivolodochnyye rubezhi (NATO is Creating Antisubmarine Perimeters), Red Star, 7 January 1966. (A)

*198) Vice Admiral V. D. Yakovlev, Sovetskiy Voyenno-Morskoy Flot (The Soviet Navy), 1st edition, DOSAAF Press, signed to press 3 January 1966, 71pp. (P)

199) "Sorok pyatoye godovshchina Sovetskikh Vooruzhennykh Sil" (The Forty-Fifth Anniversary of the Soviet Armed Forces), Communist of the Armed Forces, No. 2, January 1966, pp. 37-42. (R)

*200) Vice-Admiral I. N. Zakharov, "Tikhookeantsy vypolnyayut vzyatyye obyazatel'stva" (The Pacific Ocean Sailors are Fulfilling Their Assumed Responsibilities), Naval Digest, February 1966, pp. 11-13. (R)

201) Admiral Yu. A. Panteleyev, "Nekotoryye voprosy deystviy flota v sovremennoy voyne" (Some Questions of the Actions of Navies in Modern War), Naval Digest, February 1966, pp. 27-34. (A)

202) G. Svyatov, "Put' v glubine; ob uvelichenii glubin pogruzheniya podvodnykh lodok" (Course to the Depths; On Increasing the Depth of Submergence of Submarines), Military Knowledge, February 1966, pp. 36-37. (P)

203) Fleet Admiral S. Gorshkov, "Vakhta na more" (Watch at Sea), Soviet Russia, 1 February 1966. (R)

204) M. Petrov, "Voyenno-morskaya aviatsiya SSHA" (U.S. Naval Aviation), Aviation and Cosmonautics, March 1966, pp. 90-93. (P)

205) "Vakhta na dal'nikh meridianakh" (Watch on Distant Meridians), Red Star, 22 March 1966. (R)

206) Major-General Kh. M. Dzhelaukhov, Ekonomicheskiy potentsial v sovremennoy voyne" (Economic Potential in Modern War), Naval Digest, March 1966, pp. 14-22. (F)

207) Lieutenant-Colonel V. P. Ignatov, "Sostoyaniye i perspektivy razvitiya avianosnoy aviatsii VMS SShA" (The State and Outlook for Development of Aircraft Aviation of the U.S. Navy), Naval Digest, March 1966, pp. 78-83. (A)

208) Marshall V. Sokolovskiy and Major-General M. Cherednichenko, "O sovremennoy voyennoy strategii" (On Modern Military Strategy), Communist of the Armed Forces No. 7, April 1966, pp. 59-66. (MA)

209) V. Sychev, "Rakety--oruzhiye korabley; flot segodnya i zaftra" (Missiles--Shipboard Weapons; the Navy Today and Tomorrow), Red Star, 20 April 1966. (A)

210) Marshal R. Ya. Malinovskiy, Speech to the XXIII Congress of the CPSU, Stenograficheskiy otchet XXII s"yezda KPSS, (Stenographic Account of the XXIII Congress of the CPSU), Vol. I, April 1966. (R)

211) Fleet Admiral S. G. Gorshkov, "XXIII s"yezd KPSS i zadachi voyennykh moryakov" (The XXXIIIrd Congress of the CPSU and the Tasks for Naval Personnel), Naval Digest, May 1966, pp. 3-13. (R)

212) Captain First Rank (reserve) M. P. Gordeyev, "Lozhnyye tseli element maskirovki flota" (False Targets are an Element of the Camouflaging of the Fleet), Naval Digest, May 1966, pp. 39-42. (F)

213) Marshal R. Ya. Malinvoskiy, "Rech' tov. Malinovskogo na pervomayskom parade" (Speech of Tomrade Malinovskiy at the May 1st Parade), Pravda, 2 May 1966. (R)

214) A. Siderenko, "Dal'niy pokhod--serennoye ispytaniye; o boyevoy uchebe podvodnikov" (The Distant Cruise--A Serious Test; On the Combat Training of Submariners), Communist of the Armed Forces, No 12, June 1966, pp. 26-30. (F)

215) Captain First Rank I. P. Firsov, "Maskirovka podvodnykh lodok" (The Masking of Submarines), Naval Digest, June 1966, pp. 27-33. (F)

216) Colonel Yu. A. Bryukhanov, "Boyevyye deystviya aviatsii protiv podvodnykh lodok" (Combat Action of Aviation Against Submarines), Naval Digest, June 1966, pp. 34-37. (A)

217) Engineer-Lieutenant-Captain L. D. Zamkovskiy and Engineer-Lieutenant-Captain B. A. Dorokhov, "Novoye v razvitii sredstv svyazi VMS SShA" (What's New in the Development of Means of Communication of the U.S. Navy), Naval Digest, June 1966, pp. 79-82. (A)

218) Captain Second Rank O. V. Shokarev, "Byudzhet voyny" (A Budget for War), Naval Digest, June 1966, pp. 86-88. (P)

219) Fleet Admiral V. A. Kasatonov, "Zashchita morskikh rubezhei v nadezhnykh rukakh" (The Protection of the Maritime Perimeters in Reliable Hands), Shipbuilding, July 1966, pp. 3-6. (R)

220) "Den' Voyenno-morskogo flota SSSR: Materialy dlya dokladov i besed" (Navy Day of the USSR; Materials for Reports and Discussions), Communist of the Armed Forces No. 13, July 1966, pp. 53-57. (PP)

221) "Voyennyye doktriny stran NATO" (The Military Doctrines of the NATO Countries), Communist of the Armed Forces, No. 13, July 1966, pp. 90-91. (PP)

222) "Morskoi prazdnik Sovetskogo naroda" (Naval Holiday of the Soviet People), Naval Digest, July 1966, pp. 2-7. (R)

223) Candidate of Naval Science, Instructor, Captain First Rank N. V. Penzin, "Izmeneniye sposobov i form vooruzhennoi bor'by na more" (Changes in the Methods and Forms of Armed Struggle at Sea), Naval Digest, July 1966, pp. 33-43. (A)

224) Marshal R. Ya. Malinovskiy, "Rech' ministra oborony SSSR na priyema v Kremle v chest' vypusknikov voyennykh akademii" (Speech of the Minister of Defense at the Kremlin Reception in the Honor of Graduates of the Military Academies), Red Star, 2 July 1966. (R)

*225) Admiral A Chabanenko, "Vernye strazhi lyubimoi Otechestva; k pokhodu bovu gotovy!" (Faithful Guards of the Beloved Homeland; Ready for Sortie and Battle!), Water Transport, 30 July 1966. (R)

*226) Fleet Admiral S. G. Gorshkov, "Vsegda na strazhe" (Always on Guard), Pravda, 31 July 1966. (R)

227) Admiral V. Grishanov, "Pod boevymi flagami Rodiny",Under the Combat Pennants of the Homeland", Izvestiya, 31 July 1966. (R)

*228) Fleet Admiral V. A. Kasatonov, "Na boyevoi vakhte" (On Combat Watch), Red Star, 31 July 1966. (R)

229) Chief of the Main Staff of the Navy, Fleet Admiral N. D. Sergeyev, "Na boyevoi vakhte" (On Combat Watch), Light of the East, 31 July 1966. (R)

*230) Vice Admiral Vladimir Alekseyev, "Flot--Sila strategicheskaya" (The Navy--A Strategic Force, Communist of Tadzhikistan, 31 July 1966. (A)

231) Commander-in-Chief of Naval Aviation, Aviation Colonel-General I. Borzov, "Kryl'ya Sovetskogo flota" (Wings of the Soviet Navy), Labor, 31 July 1966. (R)

232) Aviation Lieutenant-General A. M. Shuginin, "Boyevoi put' morskoi aviatsii" (Combat Course of Naval Aviation), Naval Digest, August 1966, pp. 14-20; September 1966, pp. 10-15; and December 1966, pp. 21-27. (F)

233) Colonels, Candidates of Naval Science, Instructors N. M. Lavrent'yev and L. I. Gorodenskiy, "Upravleniye aviatsiy pri deystviyakh protiv podvodnykh lodok" (Command and Control of Aviation for Action Against Submarines), Naval Digest, August 1966, pp. 27-30. (F)

234) Engineer-Captain Third Rank A. A. Fedulov and Captain (reserve) N. F. Alekseyev, "Avtomatizirovannyye sistemy upravleniya VMS SShA" (Automated Command of the U. S. Navy), Naval Digest, August 1966, pp. 31-36. (A)

*235) Captain First Rank V. V. Blagin and Captain First Rank M. V. Patrikeitsev, "Rakety v Voyenno-Morskom Flote" (Missiles in the Navy), Naval Digest, August 1966, pp. 22-24. (A)

236) E. Mamayev, "Stavka na vnezapnost'; kak predstavlyayut na zapade deystviya flota v nach. periode voiny" (Reliance on Surprise; How the Actions of the Navy in the Initial Period of a War is Viewed in the West), Red Star, 9 August 1966. (A)

237) V. F. Drobleniov and V. M. Gerasimov, Ugroza iz glubiny (Threat from the Deep), Military Press of the Ministry of Defense, signed to press 15 September 1966. (A)

238) Captain Third Rank Yu. I. Chesnov, "Nemerknushchii Podvig" (The Unfading Exploit), Naval Digest, September 1966, pp. 16-20. (R)

239) Colonel I. E. GAVRILOV, "Ob effektivnosti poiska podvodnykh lodok" (On the Effectiveness of Search for Submarines), Naval Digest, September 1966, pp. 47-50. (A)

240) Engineer-Captain 2nd Rank Yu. A. Nesvitskiy and Engineer-Captain Lieutenant V. D. Yeliseyev, "Shumnost' Amerikanskikh atomnykh podvodnykh lodok (The Noise of American Nuclear-powered Submarines), Naval Digest, September 1966, pp. 70-83. (F)

*241) Captain Second Rank V. V. Peregudov and Captain Second Rank A. I. Smirnov, "Podgotovka sistemy bazirovaniya angliyskikh atomnykh raketnyk lodok", (The Preparation of Systems of Basing English Atomic Missile Submarines), Naval Digest, September 1966, pp. 84-86. (F)

242) Rear Admiral (reserve) D. A. Tuz and Captain First Rank N. P. Vlyunenko, "Nadvodnyye korabli stanovyatsya podlinno navodnym" (Surface (above water) Ships are Becoming Genuinely Above Water Ones), Naval Digest, October 1966, 22-25. (A)

243) Engineer-Captain A. L. Prostakov, "Puti snizheniya shumnosti podvodnykh lodok" (The Ways of Lowering the Noisiness of Submarines), Naval Digest, October 1966, pp. 63-71. (F)

244) V. Rasterugev, "Poisk, unichtozheniye podvodnykh lodok" (The Search for the Destructin of Submarines), Military Knowledge, November 1966, pp. 33-36. (F)

245) Captain First Rank A. A. Kvitnitskiy, "Napravlennost' razvitiya sil i sredstv PLO VMS SShA" (Direction of the Development of the Forces and Means for ASW by the U.S. Navy), Naval Digest, November 1966, pp. 31-36. (A)

246) Captain Second Rank V. G. Redanskiy, "Atomnyye podvodnyye lodki i politika SShA" (Atomic Submarines and U.S. Policy), Naval Digest, November 1966, pp. 93-96. (A)

*247) Candidate of Naval Science, Captain 2nd Rank Yu. L. Korshunov, "Deystviya avianosnoi poiskovo-udarnoi gruppy protiv podnodnykh lodok" (Actions of Aircraft Carrier Hunter-Killer Groups Against Submarines), Naval Digest, December 1966, pp. 76-78. (F)

*248) Engineer-Captain Second Rank L. G. Shapiro "Atomnyye nadvodnyy korabli VMS SShA" (Atomic Surface Ships of the U.S. Navy), Naval Digest, December 1966, pp. 79-83. (A)

*249) F. Sverdlov, "Boi v glubine" (Battle in the Depths), Red Star, 13 December 1966. (A)

*250) Rear Admiral A. M. Gontayev, "Stoil li izdovat' v takom vide?" (Was it Worth Being Published in Such a Form?), Naval Digest, December 1966, pp. 38-39. (Review of a book by G. Bush, "Takoi byla podvodnaya voyna" (Such was the Submarine War), Voenizdat (Military Press of the Ministry of Defense), 1965. (R)

BIBLIOGRAPHY OF SOURCES ON SOVIET PERCEPTIONS OF U.S. ASW

1967

251) "49-ya godovshchina Sovetskikh Vooruzhennykh sil" (The 49th Anniversary of the Soviet Armed Forces), Communist of the Armed Forces, No. 2, January 1967, pp. 30-37. (R)

252) K. Kasenov, "Vakhta na dal'nikh meridianakh; o boyevykh ucheniyakh podvodnikov" (The Watch on Distant Meridians; On the Combat Training of Submariners), Military knowledge, February 1967, pp. 12-13. (T)

253) "Moguchiy strazh zavoyevaniy Oktyabrya" (The Powerful Guard of the Victories of October), Naval Digest, February 1967, pp. 3-3. (R)

254) Fleet Admiral S. G. Gorshkov, "Razitiye sovetskogo voyenno-morskogo iskusstva" (The Development of Soviet Naval Art), Naval Digest, February 1967, pp. 9-21. (A)

255) Colonel I. I. Reshetov, "Poisk i unichtozheniye podvodnykh lodok raznorodnymi silami flota" (The Search and Destruction of Submarines by the Heterogeneous Forces of a Navy), Naval Digest, February 1967, pp. 40-42. (A)

256) Rear Admiral N. M. Yelagin and Captain First Rank A. B. Ryzhov, "Flotskoye spasibo za spravochnik" (Navy Thanks for the Handbook), Naval Digest, February 1967, pp. 88-90. (T)

257) A. Elkin, "Aysbergi nad nami; o krugosvetnom podvodnom plavanii gruppy Sovetskikh atomnykh podvodnykh lodok" (Icebergs Over Us; On the Globe-girdling Cruise of a Group of Soviet Nuclear-powered Submarines), Komsomol Pravda, 1 February 1967. (P)

*258) Captain First Rank B. G. Kholmanov, "Raschet verovatnosti obnaruzheniya tseli poyskovymi silami" (An Analysis of the Probability of Spotting a Target with Search Forces, Naval Digest, March 1967, pp. 58-61. (T)

*259) Captain First Rank N. T. Titov, "Poslevoyennyye doktriny i floty" (Post War Doctrines and Navies), Naval Digest, March 1967, pp. 30-33. (A)

260) Captain First Rank M. I. Belavin, Korablivakhtennost' (Ship's Duty), Military Press of the Ministry of Defense, signed to press 7 April 1967, 272 pp. (A)

261) O. Baranov, "Protivolodochniki; kommandir i sovrem. boy" (Antisubmariners; the Commander and Modern War), Red Star, 13 April 1967. (T)

262) N. A. Piterskiy (Ed.), Boyevoy put' Sovetskogo Voyenno-Morskogo Flota (Combat Course of the Soviet Navy) 2nd edition, Military Press of the Ministry of Defense, signed to press 25 May 1967, 591pp. (P)

*263) Candidate of Naval Science, Captain First Rank K. T. Titov, "Nekotoryye kriterii razvitiya VMS SShA" (Some Criteria of the Development of the U.S. Navy), Naval Digest, June 1967, pp. 31-36. (A)

264) V. Ermolayev, "Ekzamenuyet okean; flot v dal'nikh pokhodakh" (The Ocean Examines; The Navy on Distant Cruises), Red Star, 14 June 1967. (R)

265) "Moguchiy flot sovetskoy derzhavy" (The Mighty Navy of the Soviet Power), Communist of the Armed Forces, No. 13, July 1967, pp. 48-52. (R)

266) Captain First Rank N. V'yunenko, "Snabzheniye korabley v more" (The Supplying of Ships at Sea), Rear and Supply of the Soviet Armed Forces, No. 7, July 1967, pp. 91-92. (A)

267) L. I. Brezhnev, "Rech tov. Brezheva na priyeme v Kremle v chest' vypusknikov voyennykh akademii" (Speech of Comrade Brezhnev at the Kremlin Reception for the Graduates of the Military Academies), Pravda, 6 July 1967. (R)

268) Marshal A. A. Grechko, "Rech' ministr oborony SSSR na priyeme v Kremle v chest' vypusknikov voyennykh akademii" (Speech of the Minister of Defense of the U.S.S.R. at the Kremlin Reception in Honor of the Graduates of the Military Academies), 6 July 1967. (R)

269) Engineer-Rear Admiral (reserve) M. A. Rudnitskiy, "Sovetskiyye podvodnyye lodki" (Soviet Submarines), Naval Digest, July 1967, pp. 29-34. (A)

270) Vice Admiral V. A. Sychev, "Razvitiyye artilleriyskogo i raketnogo orudhiya VMF" (The Development of Artillery and Missile Weapons of the Navy), Naval Digest, July 1967, pp. 34-41. (A)

271) Captain Second Rank T. K. Belashchenko, "Elita Pentagona" (The Elite of the Pentagon), Naval Digest, July 1967, pp. 87-91. (P)

272) Chief of the Main Staff of the Navy, Admiral I. D. Sergeyev, "O tekh, kto v more" (For Those at Sea), Red Star, 29 July 1967. (R)

273) Fleet Admiral S. G. Gorshkov, "Nash mogushiy okeanskiy flot" (Our Mighty Oceanic Navy), Pravda, 30 July 1967. (R)

274) Admiral V. Grishanov, "Prisyaga Oktyabryu" (An Oath to October), Izvestiya, 30 July 1967. (R)

275) Fleet Admiral V. A. Kasatonov, "Na boyevoy vakhte" (On Combat Watch), Red Star, 30 July 1967. (R)

276) Commander-in-Chief Pacific Fleet, Admiral N. Amel'ko "Chasovyye golubykh rubezhey" (Sentinels of the Blue Perimeters), Komsomol Pravda, 30 July 1967. (R)

277) Deputy Commander-in-Chief of the Navy, Engineer Admiral P. G. Kotov, "Flot rozhdennym Oktyabreyem" (The Navy, Born of October), Labor, 30 July 1967. (R)

278) Deputy Commander-in-Chief of the Navy, Vice Admiral G. M. Yegorov, "Vsegda na boyevoy vakhte" (Always on Combat Watch), Soviet Russia, 30 July 1967. (R)

279) Vice Admiral Vladimir Alekseyev, "Voyennyy flot Strany Sovetov" (Military Fleet of the Land of The Soviets), Communist of Tadzhikistan, 30 July 1967. (R)

280) Rear Admiral A. Babushkin, "Moguchiy flot Sovetskoy derzhavy" (Mighty Navy of the Soviet Power), Soviet Patriot, 30 July 1967. (R)

281) G. Safronov, "Vperedi--okean; flot v dal'nikh pokhodakh" (Forward into the Ocean; the Navy on Distant Cruises), Red Star, 10 August 1967. (R)

282) Fleet Admiral S. G. Gorshkov, "Na strazhe zavoyevaniy velikogo Oktyabrya" (On Guard of the Great Gains of October), Naval Digest, October 1967, pp. 3-15. (R)

*283) Aviation Lieutenant-General B. L. Petrov, "Razvitiyye sposobov ispol'zovaniya i taktiki sovetskoy morskoy aviatsii" (The Development of Methods of Use and Tactics of Soviet Naval Aviation), Naval Digest, August 1967, pp. 36-42. (A)

284) Lieutenant-Colonel V. N. Plakhov, "Kurs preshniy-agressiya i revansh" (Back to the Previous Course--Aggression and Revenge), Naval Digest, August 1967, pp. 91-96. (P)

*285) Vice-Admiral B. D. Kostyugov, "Minno-torpednoye oruzhiyye za gody sovetskoy vlasti" (Mine-Torpedo Weapons During the Years of Soviet Power), Naval Digest, September 1967, pp. 34-38. (A)

*286) Admiral N. N. Amel'ko and Vice-Admiral M. N. Zakharov, "Na zashchite dal'nevostochnykh morskikh rubezhev" (In the Defense of the Far East Maritime Borders), Naval Digest, October 1967, pp. 24-30. (R)

287) Admiral S. E. Chursin and Rear-Admiral I. S. Rudnev, "Okhranyaya yuzhnyye morskiye granitsy Rodiny" (Guarding the Southern Maritime Borders of the Homeland), Naval Digest, October 1967, pp. 39-44. (R)

288) Admiral N. M. Kharlamov, "Nauchnyy progress i razvitiye voyenno-morskogo flota" (Scientific Progress and the Development of the Navy), Naval Digest, October 1967, pp. 55-59 (A)

289) Aviation Major-General V. I. Rakov, "V vozdushnykh boyakh" (In Air Battles), Naval Digest, October 1967, pp. 31-36. (A)

290) Vice-Admiral A. I. Sorokin, "Pod flagom Rodiny" (Under the Flag of the Homeland), Naval Digest, October 1967, pp. 36-38. (R)

291) 50 let vooruzhennykh sil SSSR (50 Years of the Armed Forces of the USSR), By a collective of Army authors (with Fleet Admiral Isakov listed as an advisor), Military Press of the Ministry of Defense, signed to press 6 November 1967, 383pp. (MA)

292) Marshal V. D. Sokolovskiy (Ed.), Voyennaya strategiya (Military Strategy), 3rd edition, Military Press of the Ministry of Defense, signed to press 30 November 1967, 464pp. (MA)

*293) Captain-First Rank O. V. Shul'man and Captain Second Rank B. A. Shimanyuk, "Minnoye oruzhiye v sovremennykh usloviyakh" (Mine Weapons in Modern Conditions), Naval Digest, December 1967, pp. 39-43. (A)

294) Captain First Rank A. Kvitnitskiy, "Protivolodochnaya aviatsiya VMS SShA" (Antisubmarine Aviation of the U.S. Navy), Aviation and Cosmonautics, December 1967, pp. 90-91. (F)

295) V. Gerasimov, "Podvodnyye lodki 1967 god; voyen.-tech. oborudovaniye" (Submarines in 1967; A Military-technological Survey), Red Star, 7 December 1967. (A)

296) Rear Admiral V. Cherokov, "Udarnaya moshch' flota" (The Striking Power of the Navy), Red Star, 10 December 1967. (A)

BIBLIOGRAPHY OF SOURCES ON SOVIET PERCEPTIONS OF U.S. ASW

1968

*297) Flet Admiral V. A. Kasatonov, "Voyenno-Morskoy Flot" (The Navy), Military-Historical Journal, January 1968, pp. 29-40. (F)

298) Vice-Admiral G. M. Yegorov, "K novym uspekham!" (To New Successes!), Naval Digest, January 1968, p. 3-9. (R)

299) Captain First Rank E. S. Marinin, "Sudostroitel'naya promyshlennost' SShA (The Shipbuilding Industry of the U.S.A.), Naval Digest, January 1968, pp. 73-78. (F)

300) Fleet Admiral V. Kasatonov, "Na morskikh prostorov--vakhta zorkaya" (On Maritime Expanses--A Vigilant Watch), Communist of the Armed Forces, No. 3 February 1968, pp. 75-79. (R)

301) Admiral N. D. Sergeyev, "Shchit i mech Otechestva (Shield and Sword of the Fatherland), Naval Digest, February 1968, pp. 3-8. (R)

302) Lieutenant-Colonel G. A. Arzumanov, "Nayemniki bol'shogo biznesa" (The Mercenaries of Big Business), Naval Digest, February 1968, pp. 32-38. (F)

303) Vice-Admiral V. N. Alekseyev, "Slavnyy put' sovetskogo voyenno-morskogo flota" (The Glorious Route of the Soviet Navy), Naval Digest, February 1968, p. 91-96. (R)

304) Fleet Admiral S. G. Gorshkov, "Flot na boyevoy vakhte" (The Navy on Combat Watch), Little Flame, No. 6, February 1968, pp. 6-8. (R)

305) Fleet Admiral S. Gorshkov, "Polveka na boyevoy vakhte" (A Half-Century on Combat Watch), Technology and Armaments, No. 2, February 1968, pp. 12-13. (R)

306) Fleet Admiral S. G. Gorshkov, "Flot nashey Rodiny" (The Navy of Our Homeland), Red Digest, 11 February 1968. (R)

307) Fleet Admiral S. G. Gorshkov, "V otkrytykh moryakh i okeanakh" (In the Open Seas and Oceans), Pravda, 11 February 1968. (R)

*308) Fleet Admiral S. G. Gorshkov, "Vooruzhennyye sily strany" (The Armed Forces of the Country), Labor, 23 February 1968. (R)

309) Admiral N. M. Kharlamov, "Razvitiye voyenno-morskikh flotov" (The Development of Navies), Technology-Youth, No. 2, February 1968, pp. 14-16. (A)

310) "K novym sversheniyam vo imya Rodiny" (To New Achievements in the Name of the Homeland), Naval Digest, March 1968, pp. 3-4. (R)

311) Vice-Admiral (retired I. D. Yeliseyev, "Morskiye operatsiy i vozmozhnosti protivodeystviya protivnika" (Naval Operations and Possibilities of Enemy Counteraction), Naval Digest, March 1968, pp. 21-25. (A)

312) Captain Third Rank Yu. F. Tarasyuk, "Vsplytiye podvodnykh lodok v arkticheskikh l'dakh" (The Surfacing of Submarines in Arctic Waters), Naval Digest, April 1968, pp. 62-66. (P)

313) Fleet Admiral S. G. Gorshkov, "Den'Pobedy" (Victory Day), Economic Gazette, 6 May 1968, p. 9. (R)

*314) Major-General K. S. Bochkarev, "KPSS-vdokhnovitel' i organizator pobed sovetskogo naroda i ego vooruzhennykh sil" (The CPSU is the Inspirer and Organizer of the Victories of the Soviet People and It's Armed Forces), Naval Digest, May 1968, pp. 3-11. (P)

*315) Aviation Lieutenant-General S. A. Gulyayev and Aviation Major-General P. S. Borisov, "50 let aviatsii DKBF" (50 years of Aviation of the Twice Red-Banner Baltic Fleet), Naval Digest, May 1968, pp. 61-66. (R)

316) P. Simonyan, "Voyennaya doktrina mirovogo zhendarma" (The Military Doctrine of the World Gendarme), Pravda, 16 May 1968. (P)

*317) "Na boyevoy vakhte" (On Military Watch , Naval Digest, June 1968, pp. 3-7. (R)

318) L. I. Brezhnev, "R[illegible] t[illegible] . Brezhneva na priyeme v Kremle v chest' vypusknikov voyennykh akademii" (Speech of Comrade Brezhnev at the Kremlin Reception for the Graduates of the Military Academies), Pravda, 9 July 1968. (R)

319) "Voyenno-Morskoy Flot SSSR; materialy dlya doklada i beseed" (The Navy of the USSR), Communist of the Armed Forces, No. 13, July 1968, pp. 30-31. (P)

*320) Admiral A. T. Chabanenko, preface to Pobeda pod vodoy, Military Press of the Ministry of Defense, signed to press 9 July 1963, pp. 17-18. This is a translation of a U.S. book Underwater Victory. (F)

321) Captain Second Rank Yu. N. Belyakov, "Bundesmarine v planakh revansha i agressii" (The Bundesmarine in the Plans of Revenge and Aggression), Naval Digest, July 1968, pp. 82-85. (P)

322) Fleet Admiral S. G. Gorshkov, Statement for Navy Day to A Pravda correspondent, Pravda, 28 July 1968. (R)

323) Fleet Admiral S. Gorshkov, "Morskiye rubezhey oborony" (The Maritime Perimeters of Defense), Soviet Lithuania, 28 July 1968. (R)

*324) Fleet Admiral S. Gorshkov, "Na morskikh rubezhakh" (On the Maritime Perimeters), Soviet White Russia, 28 July 1968. (R)

325) Chief of the Political Directorate of the Navy, Admiral V. Grishanov, "Na boyevoy vakhte" (On Combat Watch), Izvestiya, 28 July 1968. (R)

*326) First Deputy Commander-in-Chief of the Navy, Fleet Admiral V. Kasatonov, "Okeanskiy strazh Rodiny" (Oceanic Guard of the Homeland), Red Star, 28 July 1968. (R)

327) Chief of the Main Staff of the Navy, Admiral N. D. Sergeyev, "Morskoy shchit Strany Sovetov" (Maritime Shield of the Land of the Soviets), Komsomol Pravda, 28 July 1968. (R)

328) Deputy Commander-in-Chief of the Navy, Engineer Admiral P. Kotov, "Morskoy shchit Otchizny" (Maritime Shield of the Fatherland), Labor 28 July 1968. (R)

*329) Admiral N. M. Kharlamov, "Vernyy strazh morskikh granits" (Faithful Guard of the Maritime Borders), Moscow Pravda, 28 July 1968. (R)

330) Vice Admiral N. Kulakov, "Morskoy shchit Rodiny" (Maritime Shield of the Homeland), Leningrad Pravda 28, July 1968. (R)

331) First Deputy Chief of the Political Directorate of the Navy, Captain First Rank N. Shablikov, Soviet Patriot, 28 July 1968. (R)

332) Commander-in-Chief of the Red-Banner Northern Fleet, Admiral S. M. Lobov, "Na shirotakh vsekh okeanov" (On the Latitudes of All of the Oceans), Rural Life, 23 July 1968. (R)

*333) A. Bulatov, "Articheskaya strategiya Pentagona, "(The Arctic Strategy of the Pentagon), Red Star, 31 July 1968. (PP)

*334) V. Kulish, "Novaya voyennaya doktrina NATO" (The New Military Doctrine of NATO), World Economics and International Relations (MEMO), September 1968, pp. 27-37. (PP)

335) N. I. Suzdalev, Podvodnyye lodki protiv podvodnykh lodok (Submarines Against Submarines), Military Press of the Ministry of Defense, signed to press 19 September 1968, 164 pp. (A)

336) Admiral M. N. Zakharov, "Navstrechu slavnomu yubileyu" (Meeting the Glorious Anniversary), Naval Digest, September 1968, pp. 3-8. (R)

337) Vice-Admiral N. I. Smirnov, " Komandno-shtabnoye ucheniye 'Sever'" (The Command-Headquarters Exercise "North"), Naval Digest, September 1968, pp. 14-19. (F)

*338) Captain Second G. G. Piyanzov and Captain Third Rank E. P. Demshin, "Gidroakusticheskiye avtonomnyye mayaki VMS SShA" (Hydroacoustic Autonomous Beacons of the U.S. Navy), Naval Digest, September 1968, pp. 34-36. (F)

339) V. Abchuk, "Tsel'--v glubinakh okeana; o protivolodochnykh sredstva nadvodnogo flota" (The Target--in the Ocean Depths; On the Antisubmarine Means of the Surface Fleet), Red Star, 3 October 1968. (F)

340) Captain First Rank I. P. Chernyshev, "Vchera i segodnya boyevykh katerov"(The Yesterday and Today of Combatant Craft), Naval Digest, October 1968, pp. 23-33. (A)

341) Rear-Admiral V. L. Ustinovskiy, "Operativnaya maskirovka" (Operational Masking), Naval Digest, November 1968, pp. 33-37. (F)

342) Captain 2nd Rank R. B. Fedorov, "Razvitiye protivolodochnykh sil i sredstv v VMS SShA" (Development of Antisubmarine Forces and Means in the U.S. Navy), Naval Digest, November 1968, pp. 30-36. (A)

343) Candidate of Technical Science, Engineer-Captain 2nd Rank G. I. Svyatov, atomnyye podvodnyy lodki (Nuclear-powered Submarines), Military Press of the Ministry of Defense, signed to press 15 November 1968, 174 pp. (P)

*344) "K novym uspekham!" (To New Successes!), Naval Digest, December 1968, pp. 3-7. (R)

345) Rear-Admiral N. M. Ignat'yev, "100 letiye minno-torpednoy sluzhby" (The Centennial of the Mine-Torpedo Service), Naval Digest, December 1968, pp. 59-60. (R)

*346) Vice Admiral V. D. Yakovlev, Sovetskiy Voyenno-Morskoy Flot (The Soviet Navy), 2nd edition, DOSAAF Press, signed to press 9 December 1968, 96 pp. (P)

BIBLIOGRAPHY OF SOURCES ON SOVIET PERCEPTIONS OF U.S. [illegible]

1969

347) Captain Second Rank O. V. Shokarev, "V ugare voennoy isterii (Nekotoryye Plany razvitiya VMS SShA" (In the Intoxification of Military Hysteria (Several Plans for Development of the U.S. Navy)), Naval Digest, January 1969, pp. 92-99. (P)

348) Captain Second Rank E. K. Kosinov, Engineer-Captain Second Rank A. N. Muratov and Captain Second Rank V. A. Svintsov, "Moglo byt' luchshe" (It Could Be Better), Naval Digest, January 1969, pp. 105-108. (Review of a Book by Yu. V. Skorokhod and P. M. Khokhlov, Korabli protivominnoy oborony, Military Press of the Ministry of Defense, 1967,). (A)

*349) Fleet Admiral V. Kasatonov, "The Role of Surface Ships in Combat at Sea" (O roli nadvodnykh korabley v bor'be na more), Military Thought, No. 2 February 1969, pp. 31-40 (English Translation). (A)

350) Fleet Admiral S. G. Gorshkov, "Flot v bol' shom plavanii" (The Navy on a Long Cruise), Communist of the Armed Forces, No. 4, February 1969, pp. 27-31. (R)

*351) Colonel G. F. Tomilov, "Rol' nauchno-tekhnicheskogo progressa v ukreplenii oboronosposobnosti strany" (The Role of Scientific-Technical Progress in the Strengthening of the Defense Capabilities of the Country), Naval Digest, February 1969, pp. 13-27. (A)

352) Yu. Dmitriyev, "Vertolety nad morem; reportazh s borta bov. protivolodochnogo kreysera" (Helicopters Over the Sea; Reportage from Aboard an Antisubmarine Cruiser), Labor, 13 February 1969. (P)

*353) Lieutenant-Colonel A. M. Anikin, "Diskretnyy poisk tseli na zadannom rubezhe" (Discrete Search for a Target in an Assigned Area), Naval Digest, March 1969, pp. 46-48. (P)

354) Engineer-Colonel (reserve) A. I. Lodkin, "'Korabli-raketonostsy'" ("Missile-carrying Ships"), Naval Digest March 1969, pp. 107-110. (A)

355) Captain First Rank A. A. Kvitnitskiy, "Aviasiya protiv podvodnykh lodok" (Aviation Against Submarines), Naval Digest, April 1969, pp. 93-99. (A)

356) Vice Admiral V. I. Surabekov, Retired, "Osnovnyye cherty sovremennoy vooruzhennoy bor'by na more" (The Basic Features of Modern Armed Struggle at Sea), Naval Digest, June 1969, pp. 26-32. (A)

*357) Chief of the Main Staff of the Navy, Admiral N. D. Sergeyev, "Strazh morskikh rubezhey" (Guard of the Maritime Perimeters), Military Knowledge, No. 7, July 1969, pp. 3-5. (R)

358) "Nadezhnyy strazh morskikh rubezhey Otchizny; materialy dlya dokladov i besed o Dne Voyenno-Morskogo Flota SSSR" (Reliable Guard of the Maritime Perimeters of the Fatherland; Materials for Reports and Discussions on Navy Day of the USSR), Communist of the Armed forces, No. 13, July 1969, pp. 40-44. (R)

359) Fleet Admiral S. Gorshkov, Agitator, No. 13, July 1969, (English translation, Soviet Union FBIS, 5 August, pp. E-1 thru E-5. (R)

*360) "Okeanskiy strazh Otechestva" (The Oceanic Guard of the Homeland) Naval Digest, July 1969, pp. 3-8. (R)

*361) Vice Admiral A. I. Petelin, "Est' nad chem podumat'" (Something to Consider), Naval Digest, July 1969, pp. 107-111. Review of a book by D. Kholms (T. J. Holmes' called Pobeda pod vodoy, Undersea Victory), Military Press of the Ministry of Defense, 1968. (A)

362) Deputy Commander-in-Chief of the Navy, Engineer Admiral P. Kotov, "Morskoy shchit strany Sovetov" (Maritime Shield of the Land of the Soviets), Water Transport, 26 July 1969. (R)

363) Fleet Admiral S. G. Gorshkov "Okeanskiy strazh Otechestva" (Oceanic Guard of the Fatherland), Pravda, 27 July 1969. (R)

*364) Admiral V. Grishanov, "Okeanskiy strazh Rodiny" (Oceanic Guard of the Homeland), Izvestiya, 27 July 1969.

365) First Deputy Commander-in-Chief of the Navy, Fleet Admiral V. Kasatonov, "Nadezhnyy forpost Rodiny"(Reliable Outpost of the Homeland), Red Star, 27 July 1969. (R)

366) Admiral V. A. Amel'ko, "Na boyevoy vakhte" (On Combat Watch), Naval Life, 27 July 1969. (R)

367) Deputy Commander-in-Chief of the Navy, Vice Admiral G. M. Yegorov, "Ot polyarnykh l'dov do yuzhnykh shirot" (From Polar Ice to Southern Latitudes), Labor, 27 July 1969. (R)

368) Vice Admiral V. N. Alekseyev, "Pod vsemi shirotami" (Under All Latitudes), Soviet Latviya, 27 July 1969. (R)

*369) Vice Admiral G. Oleynik, "Na boyevoy vakhte" (On Combat Watch), Soviet Patriot, 27 July 1969. (R)

370) Engineer-Captain First Rank V. M. Shiltov, "Podvodnyye lodki SShA v budushchem desyatiletii" (U.S. Submarines in the Coming Decade), Naval Digest, August 1969, pp. 89-97. (A)

371) Admiral S. G. Zakharov and Rear Admiral K. A. Stalbo (Eds.), Istoriya Voyenno-Morskogo Iskusstva (A History of Naval Art). "A textbook for Higher Naval Schools" published by the Main Staff of the Navy by the Military Press of the Ministry of Defense, signed to press 12 August 1969, 376 pp. (A)

372) Captain 2nd Rank R. N. Vasil'yev, "Nekotoryye vzglyady na organizatsiyu i ispol'zovaniye protivolodochnykh sil VMS SShA" (Some Views on the Organization and Use of the Antisubmarine Forces of the U.S. Navy), Naval Defense, September 1969, pp. 88-93. (A)

373) Colonel (retired) S. S. Ural'skiy, "Zabota KPSS o sovetskikh vooruzhennykh silakh" (The Concern of the CPSU for the Soviet Armed Forces), Naval Digest, September 1969, pp. 100-104. (P)

374) Engineer-Captain 2nd Rank Yu. M. Zarin and Captain First Rank A. I. Gorbunov, "Organizatsiya razrabotki novogo vooruzheniya v VMS SShA" (The Organization of Working Out New Arms in the U. S. Navy), Naval Digest, October 1969, pp. 99-105. (P)

375) A. Podienov, "Flot agressii, o VMS SShA" (An Aggressive Navy; About the U.S. Navy), Technology and Armaments, November 1969, pp. 46-47. (P)

*376) Admiral N. Yegorov, "Moguchaya sila" (Mighty Power), Red Star, 13 November 1969. (R)

377) Vice Admiral G. M. Yegorov, "K novym vysotam voinskogo masterstva" (To New Heights of Military Mastery) Naval Digest, December 1969, pp. 3-8. (R)

373) Vice-Admiral (retird) I. D. Yeliseyev, "Sily flota i bazy v boyevykh deystviyakh" (The Forces of the Navy and Bases in Military Actions), Naval Digest, December 1969, pp. 22-28. (A)

379) Rear Admiral K. A. Stalbo, "Razvitiye voyenno-morskoy nauki" (The Development of Naval Science), Naval Digest, December 1969, pp. 32-37. (A)

BIBLIOGRAPHY OF SOURCES ON SOVIET PERCEPTIONS OF U.S. ASW

1970

380) Candidate of Historical Science, Instructor, Engineer-Captain A. L. Prostyakov, "Pozitsionnyye sredstva obnaruzheniya podvodnykh lodok v VMS SShA" (Positional Means for the Detection of Submarines by the U.S. Navy), Naval Digest, January 1970, pp. 95-98. (F)

381) I. M. Sotnikov and I. A. Brusentsev, Aviatsiya protiv podvodnykh lodok (Aviation Against Submarines), Military Press of the Ministry of Defense, signed to press 16 January 1970, 208 pp. (A)

(382) "Na strazhe kommunizma" (On Guard of Communism), Naval Digest, February 1970, pp. 3-6. (F)

383) V. Kulish and S. Fedorenko, "Discussions in the United States of Strategic Weapons", World Economics and International Relations, March 1970, pp. [illegible] Translation on USSR Military Affairs No. 504, JPRS 50000 of 12 July 1970. (A)

384) "Rear-Admiral (reserve) F. I. Chernyshev, "Leninskiye osnovy voyennoi politiki KPSS" (The Leninist Bases of the Military Policy of the CPSU), Naval Digest, March 1970, pp. 3-9. (F)

385) Captain First Rank I. N. Zimin, "Sily i sredstva razvedki v inostrannykh flotakh" (Forces and Means of Reconnaissance in Foreign Navies), Naval Digest, March 1970, pp. 87-93. (F)

386) "Pobedonosnoye znamya leninizma" (The Victorious Banner of Leninism), Naval Digest, April 1970, pp. 3-6. (F)

387) Admiral N. D. Sergeyev, "V. I. Lenin o prednaznachenii voyenno-morskogo flota" (V. I. Lenin on the Intended Use of the Navy), Naval Digest, April 1970, pp. 14-21. (A)

388) Colonel-General (retired) M. M. Lomov, "Leninskiye osnovy sovetskoy voyennoy strategii" (The Leninist Bases of Soviet Military Strategy), Naval Digest, April 1970, pp. 21-31. (A)

389) Yu. B. Korobley, "V. I. Lenin o putyakh ukrepleniya oborony Sovetskogo gosudarstva" (V. I. Lenin on the Ways of Strengthening the Defense of the Soviet State), Military-Historical Journal, April 1970, pp. 14-23. (A)

390) Rear Admiral A. I. Rodionov, Udarnaya sila flota (The Strike Force of the Navy), DOSAAF Press, signed to press 1 April 1970, 48 pp. (A)

391) Fleet Admiral S. G. Gorshkov, "Voyenno-morskoy flot v velikoy Otechestvennoy bovne" (The Navy in the Great Patriotic War), Naval Digest, May 1970, pp. 3-12. (A)

392) Captain First Rank (reserve) L. M. Yeremeyev and V. Z. Anufrivev, "Fal'sifikatory istorii vtorov mirovoy voyny ne unimavutsya" (The Falsifiers of the History of the Second World War are Not Quieting), Naval Digest, May 1970, pp. 110-117. (A)

393) Marshall M. V. Zakharov, "Nepobedimyye i legendarnyye" (Invincible and Legendary), Around the World, No. 5, May 1970, exact page number not known.

394) Fleet Admiral S. G. Gorshkov, "Nepobedimyye i legendarnyye" (Invincible and Legendary), Around the World, No. 5, May 1970, pp. 13-15; blanket title includes articles by Gorshkov and others, including the preceeding entry by Zakharov. (B)

395) "Moguchiy flot sovetskoy derzhavy; Materialy dlya dokladov i besed Dnu voyenno-morskogo flota" (The Mighty Navy of the Soviet Power; Materials for Reports and Discussions about Navy Day), Naval Digest, June 1970, pp. 7-17. (B)

396) "Okeanskiy 'Shtandart-novogo vremeni' Rodine" (The 'Ocean' Vanguard-A Military Report to the Homeland), Naval Digest, June 1970, pp. 12-14. (B)

397) Colonel A. P. Zakhin, "Aviatsiya v borbe s udarnymi silami flota" (Aviation in Struggle with the Strike Forces of the Navy), Naval Digest, June 1970, pp. 22-26. (B)

398) Fleet Admiral S. Gorshkov, "The Fleet on a Great Cruise" Technology and Armaments, No. 7, July 1970, pp. 1-3; JPRS English translation titled "Admiral Gorshkov Discusses Navy Day". (B)

399) Admiral G. M. Lobov, "Oceanic Guard of the Homeland" Petty Officer Sergeant, (Starshina sernhant), No. 7, July 1970, pp. 1-3. JPRS English translation titled "Expansion of Soviet Naval Power Praised". (B)

400) Vice Admiral V. Alekseyev, "Flot nashey Rodiny" (The Navy of our Homeland), Military Knowledge, No. 7, July 1970, pp. 1-3. (B)

401) Arkadii Perventsev, "Moguchiy okeanskiy!" (Powerful Oceanic!), Naval Digest, July 1970, pp. 3-7. (R)

402) Rear-Admiral N. I. Shablikov, "Boyevoy raport Rodine" (Military Report to the Homeland), Naval Digest, July 1970, pp. 8-15. (R)

*403) Captain First Rank V. S. Pirumov, Captain Third Rank A. B. Emel'yanov and Engineer-Captain Third Rank A. P. Il'in, "Rakioelektronnaya bor'ba v voyne na more" (Radioelectronic Struggle in War at Sea), Naval Digest, July 1970, p. 46-49. (F)

404) Captain First Rank N. P. Kozub, "NATO -- glavnaya voyenno-politicheskaya gruppirovka imperializma" (NATO is the Main Military-Political Group of Imperialism), Naval Digest, July 1970, pp. 100-107. (P)

405) Fleet Admiral S. Gorshkov, "Okeanskiy strazh Rodiny" (Oceanic Guard of the Homeland), Pravda, 26 July 1970. (R)

406) Fleet Admiral V. A. Kasatonov, "Vsegda v boyevoy gotovnosti" (Always in Combat Readiness), Red Star, 26 July 1970. (R)

407) Admiral G. M. Yegorov, "Okeanskaya zastava Rodiny" (Oceanic Gate of the Homeland), Rural Life, 26 July 1970. (R)

408) Admiral V. Amel'ko "Okeanskiy shchit Rodiny" (Oceanic Shield of the Homeland), Soviet Russia, 26 July 1970. (R)

409) "My -- protivolodochniki" (We Are Antisubmarine Warfare Men), Naval Digest, August 1970, pp. 32-33. (F)

410) I. A. Bukhovskiy, "V. I. Lenin o podvodnom flote" (V. I. Lenin On the Submarine Fleet), Shipbuilding, August 1970, pp. 51-52. (A)

411) V. Dygalo, "Ritm okeanskikh budney; flot v dal'nikh pokhodakh" (The Rhythm of Oceanic Routine; the Navy on Distant Cruises), Red Star, 25 September 1970. (F)

412) Captain First Rank (retired) V. A. Poleshchuk, "Podvodnyye minnyye zagraditeli KBF v Velikoy Otechestvennoy voyne" (Underwater Mine Obstacles of the Red-Banner Baltic Fleet in the Great Patriotic War, Naval Digest, September 1970, pp. 56-60. (A)

413) Captain First Rank V. N. Shevtsov, "Sovremennoye sostoyantye i napravlennost' razvitiya VMS SShA" (The Contemporary State and Direction of Development of the U.S. Navy), Naval Digest, September 1970, pp. 80-87. (A)

*414) Candidate of Historical Sciences, Instructor A. I. Babin, "F. Engel's o voyenno-morskom flote" (F. Engels on the Navy), Naval Digest, October 1970, pp. 3-9. (A)

415) Captain First Rank V. G. Yefremenko, "Razvitiye i sovershenstvovaniye protivolodochnykh sil i ikh taktiki" (The Development and Modernization of Antisubmarine Forces and Their Tactics), Naval Digest, October 1970, pp. 16-23. (A)

*416) Captain First Rank V. V. Kozyr', "Obespecheniye skrytnosti pri vsplytii na periskopnuyu glubinu" (The Insuring of Secrecy while Surfacing to Periscope Depth), Naval Digest, October 1970, pp. 34-37. (F)

417) Rear-Admiral G. V. Lazarev and Captain First Rank V. N. Kharitonov, "Pokoriteli morskikh glubin" (The Conquerors of the Sea Depths), Naval Digest, October 1970, pp. 54-58. (F)

418) Fleet Admiral V. A. Kasatonov, "Navstrechu XXIV s"yezdu KPSS" (Meeting the XXIV Congress of the CP), Naval Digest, November 1970, pp. 2-3. (R)

419) Engineer-Captain Third Rank V. D. Zevgeyev, "Razvitiye podvodnykh apparatov v SShA" (The Development of Underwater Apparat. in the U.S.A.), Naval Digest, November 1970, pp. 30-31. (A)

420) Engineer-Captain (reserve) V. I. Smirnov, "Podgotovka plavsostava podvodnykh lodok SShA i ikh nauchnoye obespecheniye" (The Crew-Ice Ballet of U.S. Submarines and Their Scientific Services), Naval Digest, December 1970, pp. 36-41. (F)

*421) Colonels P. T. Maslennikov, I. I. Moskvin, and I. P. Kanarev, and Captain First Rank D. K. Romanov, Vooruzhennyye sily kapitalisticheskikh gosudarstv (The Armed Forces of the Capitalist States) Major-General P. I. Sergeyev (Ed.), Military Press of the Ministry of Defense, signed to press 22 October 1970, 433 pp. (F)

422) A. G. Kavtaradze, "Kniga o razvitii russkogo voyenno-morskogo flota" (A Book on the Development of the Russian Navy), History of the U.S.S.R., No. 6, November-December 1970, pp. 149-151: Review of book by K. F. Shatsillo, Russkiy imperializm i razvitiye flota nakanune pervoy mirovoy voyny (1906-1914) Russian Imperialism and the Development of the Navy on the Eve of the First World War (1906-1914), "Science" Press, 1968. (F)

423) Spravochnik Ofitsera (Officers' Handbook), Officers' Library series, Military Press of the Ministry of Defense, signed to press 27 November 1970, Reserve Major-General S. N. Kozlov (Compiler), 399 pp. (MA)

BIBLIOGRAPHY OF SOURCES ON SOVIET PERCEPTIONS OF U.S. ASW

1971

*424) Doctor of Military Science, Colonel M. Belov, "Vertolety na korablyakh i na beregu" (Helicopters Aboard Ship and Ashore), Red Star, 13 January 1971. (A)

425) Captain First Rank N. P. Mirunenko, "Pentagon rvetsya v tsarstvo Neptuna" (The Pentagon is Spoiling for the Realm of Neptune), Naval Digest, January 1971, pp. 93-98. (P)

426) Colonel V. P. Zhukov, "Aviatsiya protiv podvodnykh lodok" (Aviation Against Submarines), Naval Digest, February 1971, pp. 117-118. (A)

427) Lieutenant-Colonel L. V. Ilyushin and Engineer-Major A. F. Kontivvskiy, 'Idut polety vertoletov" (Helicopter Flights are Going On), Naval Digest, February 1971, pp. 52-56. (F)

428) Aviation Colonel-General A. A. Mironenko and Aviation Major-General A. V. Khramtsov, "50 let aviatsii KChF" (50 Years of the Aviation of the Red-Banner Black-Sea Fleet), Naval Digest, February 1971, pp. 57-61. (R)

429) "The Nixon Doctrine: Declarations and Realities", U.S.A.: Economics, Politics, Ideology, No. 2, February 1971, pp. 13-43; FBIS English translation. (PP)

430) Rear Admiral M. Stalbo,"Znacheniye morey i okeanov v boyevykh deystviyakh" (The Significance of the Seas and Oceans in Combat Actions), Military Thought, No. 3, March 1971, pp. 43-50. (A)

431) "Trudovoy i voinskiy rapport Rodine" (Labor and Military Report to the Homeland), Naval Digest, March 1971, pp. 37. (R)

432) Candidate of Technical Sciences V. A. Volod'kovskiy and S. P. Grachev, "Nauchno-tekhnicheskiy progress i flot" (Scientific-Technical Progress and the Navy), Naval Digest, March 1971, pp. 68-70. (A)

433) Rear-Admiral S. I. Filonov, "Letopis' "Okeana'" ("Chronicle of Ocean"), Naval Digest, March 1971, pp. 102-105. (P)

*434) Marshal A. A. Grechko, Speech to the XXIV Congress of the CPSU, XXIV s"ezd Kommunisticheskov partii Sovetskogo Soyuza, stenograficheskiy otchet, 30 marta - 9 aprelya (XXIV Congress of the Communist Party of the Soviet Union, Stenographic Account, 30 March - 9 April), Vol. I, 1971, pp. 344-351. (R)

*435) Engineer-Rear-Admiral N. I. Beresnov, Captain First Rank S. E. Butov and Economist S. S. Starostin, "Moguchaya postup' sovetskogo naroda" (A Mighty Step of the Soviet People), Naval Digest, April 1971, pp. 3-6. (R)

436) Vice-Admiral (retired) V. I. Surabekov, "Nekotoryye voprosy ispol'zovaniya voyenno-morskogo flota v trudakh V. I. Lenina" (Several Questions of the Use of the Navy in the Works of V. I. Lenin), Naval Digest, April 1971, pp. 28-33. (A)

437) "Atomnyye raketnyye podvodnyye lodki VMS Kapitalisticheskikh stran" (Atomic Missile Submarines of the Capitalist Countries), Naval Digest, April 1971, pp. 89-90.

438) Rear-Admiral A. M. Gontayev, "Ne zabyvat' opyt voyny!" (Do Not Forget the Experience of the War!), Naval Digest, April 1971, pp. 91-96. Review of a book by S. Roskill, Flot i voyna (The Navy and War), Military Press of the Ministry of Defense, 1970. (R)

439) Captain First Rank D. A. Fomin, "XXIV s"ezd KPSS ob agressivnosti imperializma" (XXIV Congress of the CPSU on the Aggressiveness of Imperialism), Naval Digest, May 1971, pp. 6-11. (R)

440) Laureate of the State; Candidate of Technical Sciences, Instructor, Engineer-Captain First Rank (retired) A. B. Geiro, "Morskiye miny" (Sea Mines), Naval Digest, May 1971, pp. 86-91. (F)

441) "Udarnyye avianostsy VMS kapitalisticheskikh stran" (Strike Aircraft Carriers of the Navies of the Capitalist Countries), Naval Digest, May 1971, pp. 107-108. (F)

442) I., N. Potapov, Razvitiyye voyenno-morskikh flotov v poslevoyennyy period (Development of Navies in the Postwar Period), Military Press of the Ministry of Defense, signed to press 26 May 1971, 292 pp. (A)

443) "Na strazhe morskikh rubezhey; materialy dlya dokladov i besed" (On Guard Over the Maritime Perimeters; Materials for Reports and Discussions), Communist of the Armed Forces No. 12, June 1971, pp. 86-91. (RR)

*444) "Okeanskiy strazh Sovetskoy Otchizny; Materialy dlya dokladov i besed o Dne VMF" (Oceanic Guard of the Homeland; Materials for Reports and Discussions for Navy Day), Naval Digest, June 1971, pp. 16-22. (PP)

445) Captain First Rank N. P. V'yunenko, "Sovetskoye voyenno-morskoye iskusstvo nakanune Velikoy Otechestvennoy voyny" (Soviet Naval Art on the Eve of the Great Patriotic War), Naval Digest, June 1971, pp. 29-34. (A)

*446) "Atomnyye torpednyye podvodnyye lodki VMS stran NATO" (Atomic Torpedo Submarines of the Navies of the NATO Countries), Naval Digest, June 1971, pp. 107-108. (A)

*447) Vice Admiral G. Shchedrin, "Atomnyy, raketnyy, okeanskiy" (Nuclear-Powered, Missile, Oceanic), Military Knowledge, No. 7, July 1971, pp. 5-7. (A)

448) Marshal A. A. Grechko, Na strazhe mira i stroitel'stva kommunizma; resheniya XXIV s"yezda KPSS v zhizn'" (On Guard Over Peace and the Construction of Communism; the Resolutions of the XXIVth Congress of the CPSU Into Life), Military Press of the Ministry of Defense, signed to press 14 June 1971, 112 pp. (MA)

*449) V. Novikov, "Okeanskiy, dal'nego plavaniya" (Oceanic, Distant Cruise), Technology and Armaments, July 1971, pp. 2-3. (R)

450) Marshal A. A. Grechko, "Flot nashey Rodiny" (The Navy of Our Homeland), Naval Digest, July 1971, pp. 3-9. (P)

*451) Interview with Fleet Admiral N. D. Sergeyev, "God XXIV s"yezda KPSS - god otlichnoy uchoby i sluzhby" (The Year of the XXIV Congress of the CPSU is a Year of Excellent Training and Service), Naval Digest, July 1971, pp. 9-11. (P)

452) Captain First Rank B. F. Balev, "Zashchita okeanskikh kommunikatsii (Po opytu vtoroy mirovoy voyny)" (The Defense of Oceanic Communications According to the Experience of the Second World War), Naval Digest, July 1971, pp. 23-29. (A)

453) Engineer-Captain Second Rank Yu. A. Nevskiy, "Torpednoye oruzhiye kapitalisticheskikh stran" (Torpedo Weapons of Capitalist Countries), Naval Digest, July 1971, pp. 101-106. (P)

454) "Torpedy VMS kapitalisticheskikh stran" (Torpedoes of the Navies of Capitalist Countries), Naval Digest, July 1971, pp. 113-114. (F)

455) Fleet Admiral S. G. Gorshkov, "Okeanskiy, atomnyy raketnyy' (Oceanic, Nuclear-powered, Missile-equipped), Pravda, 25 July 1971. (A)

456) Fleet Admiral V. Kasatonov, Okeanskiy strakh Rodiny" (Oceanic Guard of the Homeland), Red Star, 25 July 1971. (R)

457) Captains First Rank A. N. Kramer' and S. M. Yefimov, "Novaya pyatiletka i voprosy ukrepleniya oboronosposobnosti strany" (The New Five-year Plan and the Question of the Defense of the Country), Naval Digest, August 1971, pp. 3-9. (A)

458) "Morskaya aviatsiya' Istoricheskaya spravka" (Naval Aviation; A Historical Sketch), Naval Digest, August 1971, pp. 17-20. (A)

459) Rear-Admiral K. A. Stalbo, "Zigzagi amerikanskoy 'bol' shoy strategii" (The Zigzags of the American "Grand Strategy"), Naval Digest, August 1971, pp. 33-38. (P)

460) "Letno-takticheskiye dannyye samoletov i vertoletov palubnoy aviatsii SShA, Anglii i Frantsii" (Flight-Tactical Data of Airplanes and Helicopters of the Shipborne Aviation of the U.S.A., England and France), Naval Digest, August 1971, pp. 99-100. (F)

461) A. Abbasov, "Reshitel'nost' komandira; flot v dal'nykh pokodakh" (The Decisiveness of a Commander; the Navy on Distant Cruises), Red Star, 27 August 1971. (R)

462) Captain First Rank D. P. Sokha, "Vchera i segodnya podvodnykh sil" (Yesterday and Today of Submarine Forces), Naval Digest, September 1971, pp. 20-29. (A)

*463) Captains First Rank Yu. I. Pol'shakov and I. P. Popov, "Ot 'potaynnogo'sudna k atomnomu raketonostsu" (From a "Secret" Ship to an Atomic Missile-Carrier), Naval Digest, September 1971, 106-111. (F)

464) P. Danilov and V. Fedorov, "Protivolodochnyye samolety i vertolety" (Antisubmarine Aircraft and Helicopters), Aviation and Cosmonautics, October 1971, pp. 46-47. (F)

465) Engineer-Rear Admiral K.Frants, "Razvedyvatel'noye obespecheniye deistviy udarnykh avianostsev protiv morskikh ob"ektov" (The Reconnaissance Screening of the Actions of the Strike Aircraft Carriers against Sea Objectives), Naval Digest, October 1971, pp. 18-23. (A)

466) Rear Admiral A. Gontayev, "Put' v okean; podgotovka lichnogo sostava podvodnykh lodok k dal'nim pokhodam" (Course to the Ocean; Training Submarine Crews for Distant Cruises), Naval Digest, October 1971, pp. 59-65. (T)

*467) "Dizel'nyye torpednyye podvodnyye lodki kapitalisticheskikh stran" (Diesel Torpedo Submarines of the Capitalist Countries), Naval Digest, October 1971, pp. 81-82. (F)

468) Engineer-Captain First Rank K. Lavrov and Candidate of Technical Sciences V. Vasil'chikov, "Spravochnik, kotoryy davno zhdali" (A Reference Book Which We Have Been Long Awaiting), Naval Digest, October 1971, pp. 97-100. Review of book by V. A. Kovalenko and M. N. Ostroumov, Spravochnik po inostrannym flotam (Reference Book on Foreign Navies), Military Press of the Ministry of Defense, 1971. (R)

469) Captain First Rank A. Klimov, "Tvorcheskiy poisk" (Creative Search), Naval Digest, November 1971, pp. 9-12. (F)

470) Captain First Rank V. Yefremenko, "Evolyutsiya bor'by s podvodnymi lodkami" (Evolution of the Struggle with Submarines), Naval Digest, November 1971, pp. 13-[illegible]. (A)

471) Captain First Rank A. Basov, "Deystviya protiv podvodnykh lodok v Velikoy Otechestvennoy voyne" (Actions against Submarines in the Great Patriotic War), Naval Digest, November 1971, pp. 25-29. (A)

472) Rear Admiral V. Krupnikov, "Puti povysheniya effektivnosti poiska" (Ways of Heightening the Effectiveness of Search), Naval Digest, November 1971, pp. 32-35. (F)

473) Engineer-Captain Second Rank L. Mitrofikin, "Protivolodochnyye 'Malyutki' v agressivnykh planakh amerikanskoy voyenshchiny" (Anti-Submarine "Babies" in the Aggressive Plans of the American Militarists), Naval Digest, November 1971, pp. 33-37. (P)

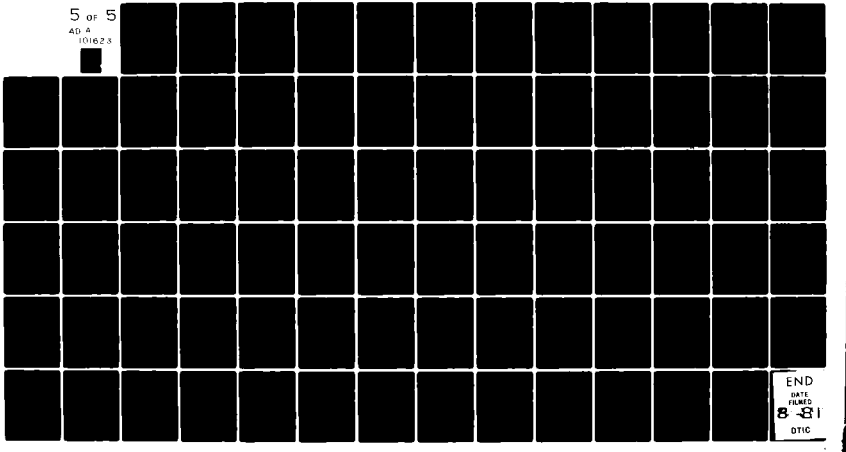
474) "Protivolodochnyye avianosty" (Anti-Submarine Aircraft Carriers), Naval Digest, November 1971, pp. 39-[illegible]. (F)

475) Engineer-Captain First Rank A. Prostakov, "Po pelengu...podvodnaya tsel'! (Obzor literatury o deyetviyakh protiv podvodnykh lodok)" (Along the Bearing... A Submarine Target! A Survey of Literature on Actions Against Submarines), Naval Digest, November 1971, pp. 107-109. (F)

476) "Protivolodochnyye vertolety VMS kapitalist-icheskikh stran i ikh nositeli" (Anti-Submarine Helicopters of the Navies of Capitalist Countries and their Carriers), Naval Digest, December 1971, pp. 91-92. (F)

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BIBLIOGRAPHY OF SOURCES ON SOVIET PERCEPTIONS OF U.S. ASW

1972

477) Rear Admiral V. Sorokin and V. Krasnov, "Protivolodochnaya oborona" (Antisubmarine Defense), Science and Life, January 1972, pp. 48-55. (A)

478) Rear Admiral V. Prokof'yev, "Khoroshiye itogi, bol' shiye zadachi" (Good Results, Great Tasks), Naval Digest, January 1972, pp. 3-7. (R)

479) Candidate of Naval Science, Captain First Rank N. Aleshkin, "Nekotoryye tendentsii razvitiya voyenno-morskikh sil" (Some Trends in the Development of Naval Forces), Naval Digest, January 1972, pp. 24-30. (A)

*480) Engineer-Captain 2nd Rank V. Verofeyev, "Na smenu 'Polarisu' i 'Poseydonu'" (The Change to "Polaris" and "Poseidon"), Naval Digest, January 1972, pp. 88-92. (A)

481) "Kreysera VMS kapitalisticheskikh stran" (Cruisers of the Navies of Capitalist Countries), Naval Digest, January 1972, p. 97-98. (P)

482) K. Leonidov, "Glavnyy geroy - sovetskiy atomnyy flot" (The Main Hero is the Soviet Atomic Fleet), Naval Digest, January 1972, pp. 105-107. (R)

*483) M. Ponomarev, "Pod flagom militaristskogo bloka; manevry i ucheniya NATO v 1971 g." (Under the Flag of the Militarist Bloc; Maneuvers and Exercises of NATO in 1971, Red Star, 9 January 1972. (PP)

484) V. Sakyan, "Nayti, atakovat', unichtozhit!" (Locate, Attack, Destroy!), Red Star, 15 January 1972. (P)

485) Rear Admiral A. I. Sorokin, My -- s atomnykh (We Are From the Nuclear-powered Submarines), 2nd edition, supplemented. DOSAAF Press, signed to press 3 February 1972. (P)

*486) "Sozdannyye velikim Leninym (Created by Great Lenin), Naval Digest, February 1972, pp. 3-6. (A)

487) Rear-Admiral (reserve) F. Chernyshev, "Na sluzhbe reaktsii" (In the Service of Reaction), Naval Digest, February 1972, pp. 13-17. (P)

483) Fleet Admiral S. Gorshkov, "Voyenno-morskiye floty v voynakh i v mirnoye vremya" (Navies in War and Peace), Naval Digest, February 1972 through February 1973 less June 1972 and January 1973. (A)

489) "Fregaty VMS kapitalisticheskikh stan" (Frigates of the Navies of Capitalist Countries), Naval Star, February 1972, pp. 97-98. (F)

490) Commander-in-Chief of the Red-Banner Pacific Fleet Admiral N. Smirnov, "Krasnoznamennyy, Tikhookeanskiy" (The Red-Banner Pacific Fleet), Naval Digest, March 1972, pp. 3-9. (R)

491) Reserve Captain First Rank G. Strelkov, "Elektronika podvodnoy voyny; sbor i otrabotka okeanogr. informatsii v VMS SShA" (The Electronics of Undersea Warfare; the Collection and Working Up of Oceanographic Information in the U.S. Navy), Naval Digest, March 1972, pp. 90-92. (F)

492) Doctor of Naval Science, Captain First Rank K. Titov, "Operativnoye oborudovaniye Tikhookeanskogo teatra voyennykh deystviy (The Operational Infrastructure of the Pacific Ocean Theater of Military Action), Naval Digest, March 1972, pp. 101-108. (F)

*493) "Eskadrennyye minonostsy VMS kapitalisticheskikh stran" (Destroyers of the Navies of Capitalist Countries), Naval Digest, March 1972, pp. 109-110. (F)

494) Rear-Admiral V. Andreyev, "Voyennaya doktrina amerikanskogo imperializma" (The Military Doctrine of Amerlcal Imperialism), Naval Digest, April 1972, pp. 97-102. (R)

495) "Storozhevyye korabli VMS kapitalisticheskikh stran" (Guard Ships of the Navies of Capitalist Countries), Naval Digest, April 1972, pp. 105-106. (F)

496) Candidate of Historical Sciences, Colonel I. Stavitskiy, "Novyy trud o voyennom nasledii V. I. Lenina" (A New Work on the Military Legacy of V. I. Lenin), Naval Digest, April 1972, pp. 107-109. Review of book by N. N. Azovtsev, V. I. Lenin i Sovetskaya voyennaya nauka. (A)

497) "Bessmertiye velikogo podviga" (The Immortality of the Great Deed), Naval Digest, May 1972, pp. 3-5. (R)

498) Captain First Rank (reserve) D. Sokh, "Podvodnyye lodki proryvayut blokadu: Stranitsy istorii" (Submarines Break the Blockade: Pages of History), Naval Digest, May 1972, pp. 59-62. (A)

499) Lieutenant-Colonel K. Kozlov, "Opornyye bazy NATO v vostochnom Sredizemnomor'e" (Support Bases of NATO in the Eastern Mediterranean Sea), Naval Digest, May 1972, pp. 86-92. (F)

500) Captain First Rank A. Petrenko, "Avianostsy" (Aircraft Carriers), Technology and Armaments, May 1972, p. 17. (A)

501) I. M. Korotkin et al, Avianostsy i vertoletonostsy (Aircraft Carriers and Helicopter Carriers), Military Press of the Ministry of Defense, signed to press 22 May 1972, 312 pp. (A)

502) A. Smukul, "Vooruzheniye podvodnykh lodok" (Armaments of Submarines), Technology and Armaments, June 1972, pp. 46-47. (A)

503) "Protivolodochnoye upravlyayemoye raketnoye oruzhiye" (Anti-Submarine Guided Missile Weapons), Naval Digest, June 1972, pp. 97-98. (F)

504) "Na boyevoy vakhte v moryakh i okeanakh; materialy dlya dokladov i besed o dne Voyenno-morskogo flota SSSR" (On Combat Watch in the Seas and Oceans; Materials for Navy Day Reports and Discussions), Communist of the Armed Forces No. 12, June 1972, pp. 30-34. (PP)

505) "Raketnyye katera VMS kapitalisticheskikh stran" (Missile Craft of the Navies of Capitalist Countries), Naval Digest, July 1972, pp. 113-114. (F)

*506) Fleet Admiral S. G. Gorshkov, "Na moryakh i okeanakh" (On the Seas and Oceans), Pravda, 30 July 1972. (R)

507) Admiral V. Grishanov, "Chasovyye okeanskikh rubezhey" (Sentinels of the Oceanic Perimeters), Izvestiya, 30 July 1972. (R)

508) Fleet Admiral V. A. Kasatonov, "Na boyevoy vakhte" (On Combat Watch), Red Star, 30 July 1972. (R)

509) Chief of the Main Staff of the Navy, Fleet Admiral N. D. Sergeyev, "V traditsiyakh flota" (In the Traditions of the Navy), Komsomol Pravda, 30 July, 1972. (R)

510) Engineer-Admiral P. Kotov, "Okeanskiy, atomnyy, raketonosnyy" (Oceanic, Nuclear-powered, Missile-carriers), Rural Life, 30 July 1972. (R)

*511) Fleet Admiral S. M. Lobov, "Okeanskaya vakhta voyennykh moryakov" (The Oceanic Watch of Naval Personnel), Moscow Pravda, 30 July 1972. (R)

512) First Deputy Chief of the Main Staff of the Navy, Admiral V. N. Alekseyev, "Okeanskaya vakhta" (Oceanic Watch), Labor, 30 July 1972. (R)

513) First Deputy Chief of the Political Directorate of the Navy, Rear Admiral N. Shablikov, "Okeanskiy strazh strany Sovetov" (Oceanic Guard of the Land of the Soviets), Soviet Lithuania, 30 July 1972. (R)

514) Admiral V. Alekseyev, "Razvitiye boyevykh katerov i priyemov ikh ispol'zovaniya" (The Development of the Combatant Craft and Methods of their Use), Naval Digest, August 1972, pp. 32-38. (A)

515) Captain 2nd Rank-Engineer M. Filyukov, "Vliyaniy sobstvennykh akusticheskikh pomekh korablya na effektivnost' poiska" (The Influence of a Ship's Own Acoustic Interference on the Effectiveness of Search), Naval Digest, August 1972, pp. 31-33. (F)

516) Captain 2nd Rank-Engineer B. Shishkin and Lieutenant-Captain-Engineer V. Peterkov,"Gidroakustiches kiyye mayaki VMS stran NATO" (Hydroacoustic Beacons of the Navies of the NATO Countries), Naval Digest, August, 1972, pp. 33-35. (F)

*517) Engineer-Colonel A. Ivanov, "Korabel'nyye protivolodochnyye vertolety" (Shipboard Antisubmarine Helicopters), Naval Digest, August 1972, pp. 94-99. (F)

518) "Torpednyye katera VMS kapitalisticheskikh stran: (Torpedo Boats of the Navies of Capitalist Countries), Naval Digest, August 1972, pp. 103-104. (F)

519) G. Svyatov, "Voyenno-morskiye sily SShA; spravka" (The Naval Forces of the U.S.; Reference Information), U.S.A., September 1972, pp. 122-127. (F)

520) Captain First Rank K. Titov, "Ob"ekty i sily razvedki na more" (Objectives and Forces of Reconnaissance at Sea), Naval Digest, September 1972, pp. 58-62. (A)

521) V. Teplinskiy, "Mirovoy okean i voyennaya strategiya SShA" (The World Ocean and the Military Strategy of the U.S.), U.S.A., October 1972, pp. 15-24. (PP)

522) Aviation Colonel-General A. A. Mironenko, "Pos krylom -- okean; o morskoy aviatsii, beseda s nach. shtaba aviatsii VMF SSSR" (Under the Wings -- the Ocean; Interview with the Chief of Staff of Naval Aviation of the USSR), Soviet Russia; 29 October 1972. (R)

523) Captain First Rank (retired) N. Gordeyev, "Protivodeystviye razvedke protivnika" (Counteraction to the Reconnaissance of the Enemy), Naval Digest, October 1972, p. 31-35. (A)

*524) M. Novikov, "Zvezda nad okeanom; o dal'nikh plavaniyakh sov. voyen. moryakov" (Stars Over the Ocean; On the Distant Cruises of Soviet Sailors), Red Star, 25 November 1972. (R)

*525) Captain 2nd Rank-Engineer I. Balin, "Minnaya opasnost'" (The Mine Danger), Naval Digest, November 1972, pp. 42-47. (A)

526) "Malyye protivolodochnyye korabli i katera kapitalisticheskikh stran: (Small Anti-Submarine Ships and Craft of Capitalist Countries), Naval Digest, November 1972, pp. 101-102. (P)

527) Marshal A. Grechko, "Sotsialisticheskaya, mnogonatsional'naya Armiya" (A Socialist, Multinational Army), Red Star, 17 December 1972. (MA)

528) Colonel N. Semenov, "Primeneniye aviatsii v boyevykh deystviyakh na more" (The Use of Aviation in Combat Actions at Sea), Naval Digest, December 1972, pp. 32-36. (A)

529) Captain First Rank-Engineer V. Gorelov, "O tekhnicheskoy ekspluatatsii sudov na vozdushnoy podushke" (On the Technical Exploitation of Air-Cushion Ships), Naval Digest, December 1972, pp. 70-74. (P)

530) Captain First Rank V. Shloma, "Kniga o poslevoyennom razvitii flotov" (Book on the Post-War Development of Navies) Naval Digest, December 1972, pp. 100-102. Review of book by I. N. Potapov, Razvitiye voyenno-morskikh flotov v poslevoyenny period (The Development of Navies in the Post-War Period), Military Press of the Ministry of Defense, 1971. (A)

BIBLIOGRAPHY OF SOURCES ON SOVIET PERCEPTIONS OF U.S. ASW

1973

531) Fleet Admiral V. A. Kasatonov, "Tverdoy postupyu k novym rubezham" (Firm Approach to New Perimeters), Communist of the Armed Forces, February 1973, pp. 62-67. (A)

532) A. A. Kvitnitskiy, Protivolodochnoye oruzhiye i ego nositeli (Antisubmarine Weapons and Their Delivery Platforms), Military Press, signed to press 15 February 1973, 96 pp. (F)

533) E. Shcheglov, "Atlanticheskiy flot SShA" (The Atlantic Fleet of the U.S.), Red Star, 20 February 1973. (F)

534) "Gidroakusticheskiye sredstva obnaruzheniya podvodnykh lodok VMS kapitalisticheskikh stran" (Hydroacoustic Means of Detection of Submarines of the Navies of Capitalist Countries), Naval Digest, February 1973, pp. 95-96. (F)

535) G. Svyatov and A. Kokoshin, "Morskaya moshch' v planakh amerikanskikh strategov" (Seapower in the Plans of the American Strategists), International Life (Russian edition), March 1973, pp. 77-86. (PP)

536) Rear-Admiral A. Gontayev, "Vnezapnost' kak kategoriya voyenno-morskogo iskusstva" (Suprise as a Category of Naval Art), Naval Digest, March 1973, pp. 30-35. (A)

537) Captain First Rank G. Kostev, "Bitva pod vodoy" (Battle Underwater), Naval Digest, March 1973, pp. 35-40. (F)

538) Candidate of Technical Science G. Svyatov, "Perspektivy razvitiya VMS SShA v 70-e gody" (Prospects for the Development of the U.S. Navy in the 1970s), Naval Digest, March 1973, pp. 91-97. (A)

539) G. Svyatov, "Stavka na 'trezubets Neptuna'; zametki o voyenmor. politike SShA" (Reliance on 'the Trident of Neptune'; Notes on the Naval Policy of the U.S.), Red Star, 23 March 1973. (P)

540) V. Arkhipenko, "Na strazhe morskikh rubezhey; o boyevykh budnyakh moryakov Tikhookean. flota" (On Guard of the Homeland; On the Combat Routine of the Sailors of the Pacific Fleet), Communist, April 1973, pp. 92-102. (R)

541) Rear-Admiral S. Filonov, "Unichtozheniye sil flota v basakh" (Destruction of the Forces of a Navy at Their Bases), Naval Digest, April 1973, p. 22-26. (F)

542) Captain 2nd Rank-Engineer Yu. Nevskiy, "Morskiye miny SShA" (Sea Mines of the U.S.A.), Naval Digest, April 1973, pp. 72-77. (F)

*543) Captain First Rank V. Shchetinin, "Minnoye oruzhiye v voyne na more" (Mine Weapons in War at Sea), Naval Digest, May 1973, pp. 23-26. (A)

544) Candidate of Technical Sciences I. Korotkin, "Pozhary na avianostsakh" (Fires on Aircraft Carriers), Naval Digest, May 1973, pp. 93-98. (F)

545) Admiral G. Yegorov, "Krasnoznamennyy Severnyy flot na vakhte" (The Red-Banner Northers Fleet on Watch), Naval Digest, June 1973, pp. 3-9. (R)

*546) "Perspektivy razvitiya gidroakusticheskikh sredstvobnaruzheniya podvodnykh lodok v SShA" (The Outlook of Development of Hydroacoustic Means of Detection of Submarines in the U.S.A.), Naval Digest, June 1973, pp. 87-93. (A)

547) Moguchiy flot nashey Rodiny; materialy dlya dokladov i besed o Dne Voyenno-morskogo flota SSSR" (The Mighty Navy of our Homeland; Materials for Reports and Discussions for Navy Day of the USSR), Communist of the Armed Forces, July 1973, pp. 39-43. (PP)

548) Admiral N. N. Amel'ko "Okeanskiy strazh Rodiny" (Oceanic Guard of the Homeland), Military Knowledge, July 1973, pp. 6-8. (R)

549) Engineer Vice Admiral V. Feminykh, "Okeanskiy strazh Otchizny" (Oceanic Guard of the Homeland), Technology and Armaments, July 1973, pp. 3-5. (R)

*550) Colonel A. Bulatov and V. Gagolyev, "Arktika v planakh NATO" (The Arctic in NATO Plans), Soviet Warrier No. 13, July 1973, pp. 46-47. (P)

551) Admiral N. Amel'ko, "Mesto sluzhby -- okean" (Place of Service -- the Ocean), Water Transport, 23 July 1973. (R)

552) Fleet Admiral S. G. Gorshkov, "Na okeanskoy vakhte" (On the Ocean Watch), Pravda, 29 July 1973. (R)

553) Admiral V. Grishanov, "Vernost' Rodine" (True to the Homeland), Izestiya, 29 July 1973. (R)

554) Fleet Admiral V. Kasatonov, "Okeanskiy strazh Otechestva" (Oceanic Guard of the Fatherland), Red Star, 29 July 1973. (R)

555) Admiral N. Sergeyev, "Na strazh morskikh rubezhey" (On Guard over the Maritime Perimeters), Labor, 29 July 1973. (R)

556) Engineer-Colonel I. Alekseyev, "Dlya udara s vozdukha; o vooruzhenii morskoy aviatsii SShA" (For Strike from the Air; On the Armament of the Naval Aviation of the U.S.), Naval Digest, August 1973, pp. 63-72. (F)

557) Rear-Admiral K. Stalbo, "Razvitiye sovetskogo voyennomorskogo iskusstva v Velikoy Otechestvennoy voyne" (The Development of Soviet Naval Art in the Great Patriotic War), Naval Digest, August 1973, pp. 16-23. (A)

*558) Colonel Yu. Khramov, "Vozdushnaya razvedka korabley v more" (Air Reconnaissance of Ships at Sea), Naval Digest, August 1973, pp. 23-25. (A)

559) Captain 2nd Rank-Engineer V. Yeliseyev, "Rezervy strategicheskikh sil" (The Reserve of the Strategic Forces), Naval Digest, August 1973, pp. 85-91. (A)

*560) Candidate of Naval Science, Captain First Rank N. Ivanenko, "Nauchno-tekhnicheskaya revolyutsiya i flot" (The Scientific-Technological Revolution and the Navy), Naval Digest, November 1973, pp. 24-28. (A)

561) Doctor of Naval Science, Professor K. Zyvagin, "Floty velikikh derzhav v poslevoyennyy period" (The Navies of the Great Powers in the Postwar Period), Naval Digest, November 1973, pp. 98-102. (A)

562) Candidate of Naval Science, Reserve Rear Admiral V. Yaskin, "O sovremennykh strategicheskikh kontseptsiyakh VMS, SShA" (On the Contemporary Strategic Conceptions of the U.S. Navy), Naval Digest, December 1973, pp. 91-94. (A)

563) "Stroitel'stvo VMS SShA v 1973/74 finansovom godu; spravochnyye dannyye ofitseru flota" (Construction of the U.S. Navy in the 1973/74 Fiscal Year; Handbook Data for Naval Officers), Naval Digest, December 1973, p. 95. (F)

BIBLIOGRAPHY OF SOURCES ON SOVIET PERCEPTIONS OF U.S. ASW

1974

564) A. Zheludev, "Atomnyye podvodnyye korabli VMF SShA" (Nuclear-powered Submarines of the U.S. Navy), Red Star, 10 January 1974. (F)

565) V. I. Achkasov and A. V. Basvo (Ed.), Boyevoy put' Sovetskogo Voyenno-Morskogo Flota (Combat Course of the Soviet Navy), 3rd edition, Military Press of the Ministry of Defense, signed to press 13 February 1974, 592 pp. (A)

566) Fleet Admiral S. G. Gorshkov, "Nadezhnyy strazh Otechestva" (Reliable Guard of the Fatherland), Soviet Patriot, 20 February 1974. (R)

567) Captain First Rank G. Kostev, "Vzaimodeystviye-vazhneyshiy printsip ispol'zovaniya sil" (Cooperation is a Very Important Principle of the Use of Forces), Naval Digest, February 1974, pp. 28-33. (A)

*568) Captain First Rank I. Vasil'ev and Captain Third Rank V. Mironov, "Militaristskiye uprazhneneniya OVMS NATO" (The Militaristic Exercises of the Combined Naval Forces of NATO), Naval Digest, February 1974, p. 92-97. (F)

569) "Rakety dlya VMS" (Missiles of the (U.S.) Navy), Naval Digest, February 1974, pp. 97-98. (F)

570) Captain First Rank N. Vlasov, "Vchera, segodnya i zavtra nadvodnykh korabley" (Yesterday, Today, and Tomorrow of Surface Ships), Naval Digest, March 1974, pp. 22-27. (A)

571) Captain First Rank-Engineer E. Shoshkov, Colonel-Engineer V. Shashurin and Captain Third Rank-Engineer V. Peterkov, "Nadezhnost' gidrolokatsionnykh stantsiy i effektivnost' poiska" (The Reliability of Hydroacoustic Stations and the Effectiveness of Search), Naval Digest, March 1974, pp. 34-36. (F)

*572) Candidate of Technical Sciences G. Svyatov, "Voyenno-tekhnicheskaya politika SShA: Nekotoryye tendentsii ee razvitiya" (The Military-Technological Policy of the U.S.A.: Some Tendencies of its Development), Naval Digest, March 1974, pp. 97-102. (A)

573) Marshal A. A. Grechko, Vooruzhennyye sily Sovetskogo gosudarstva (The Armed Forces of the Soviet State), Military Press of the Ministry of Defense, signed to press 9 April 1974, 423 pp. (A)

574) Major-General N. Pankratov and Colonel T. Vakhnov, "Leninskim Kursom" (By the Leninst Course), Naval Digest, April 1974, pp. 3-10. (NA)

575) Admiral V. Sysoyev, "Okeanskaya vakhta chernomortsev" (The Oceanic Watch of the Black Sea Sailors), Naval Digest, May 1974, pp. 3-8. (R)

576) Captain First Rank V. Artomonov and Reserve Rear-Admiral V. Yashin, "Teni NATO nad Sredizemnomor'em "(NATO's Shadow over the Mediterranean), Naval Digest, May 1974, pp. 102-108 and 111. (F)

577) "6-y Flot SShA" (The U.S. 6th Fleet), Naval Digest, May 1974, pp. 109-110. (F)

578) A. L. Prostakov, Gidroakusticheskiye sredstva flota (Hydroacoustic Means of a Navy), Military Press of the Ministry of Defense, signed to press 28 May 1974. (F)

579) "7-y flot SShA" (The U.S. 7th Fleet), Naval Digest, June 1974, pp. 93-94. (F)

580) "Protiv podvodnykh lodok" (Against Submarines), Naval Digest, June 1974, p. 98. (A)

581) Doctor of Naval Science, Rear Admiral A. Mikhaylovskiy, "Takticheskiy aspekt skrytnosti" (The Tactical Aspect of Secrecy), Red Star, 9 June 1974, p. 2. (A)

582) Aviation Colonel-General A. A. Mironenko, "Krylya flota" (Wings of the Navy), Soviet Patriot, 9 June 1974. (A)

*583) "Okeanskiy strazh strany Sovetov; materialy dlya dokladov i besed o Dne Voyenno-Morskogo Flota SSSR" (Oceanic Guard of the Land of the Soviets'Materials for Reports and Discussions for Navy Day of the USSR), Communist of the Armed Forces, No. 13, July 1974, p. 33-37. (PP)

584) Deputy Commander-in-Chief of the Navy, Admiral G. Bondarenko, "Flot na boyevoy vakhte" (The Navy on Combat Watch), Naval Digest, July 1974, pp. 3-8. (R)

585) R. Tumkovskiy, "Nastoyashcheye i budushcheye udarnykh avianostsev" (The Present and Future of Strike Aircraft Carriers), Naval Digest, July 1974, pp. 95-99. (A)

*586) Captain First Rank (retired) G. Gel'fond, "Iskusstvo pobedy" (The Art of Victory), Naval Digest, July 1974, pp. 105-109. Review of book by V. I. Achasov and N. B. Pavlovich, Sovetskiye voyenno-morskoye iskusstvo v Velikoy Otechestvennoy voyne, Military Press of the Ministry of Defense, 1973. (A)

587) "Okeanskiy, raketonosnyy" (Oceanic, Missile-carrying), Red Star, 28 July 1974. (R)

*588) Fleet Admiral S. G. Gorshkov, "Morskaya moshch' strany Sovetov" (The Seapower of the Land of the Soviets), Pravda, 28 July 1974. (R)

589) Admiral V Grishanov, "Otvazhnyye syny Rodiny" (Courageous Sons of the Homeland), Kazakhstan Pravda, 28 July 1974. (R)

590) Fleet Admiral V. Kasatonov, "Na strazhe Otechestva" (On Guard of the Fatherland), Red Star, 28 July 1974. (R)

591) Engineering Admiral P. Kotov, "Okeanskiy strazh Rodiny" (Oceanic Guard of the Homeland), Socialist Industry, 28 July 1974. (R)

592) Admiral G. Pondarenko, "Vsegda na strazhe" (Always on Guard), Soviet Patriot, 28 July 1974. (R)

*593) Deputy Chief of Staff of Naval Aviation, Aviation Major-General N. Vishenskiy, "Morskaya aviatsiya - aviatsiya okeanskaya" (Naval Aviation - Oceanic Aviation), Naval Digest, August 1974, pp. 3-6. (A)

594) Captain 2nd Rank Yu. Nefed'ev, "Mnogotselevyye aviabazovyye korabli" (Multi-Purpose Air-Capable Ships), Naval Digest, August 1974, pp. 96-100. (A)

*595) Aviation Colonel-General G. Kuznetsov and Colonel V. Pondarenko, "Boyevaya letopis' aviatsii VMF" (The Military Chronicle of Naval Aviation), Naval Digest, August 1974, pp. 104-105. (Review of book by P. N. Ivanov, Krylya nad morem. Istoriya sozdaniya, razvitiya i boyevoy deyatel'nosti aviatsii Voyenno-morskogo Flota SSSR (Wings over the Sea. The History of the Combat Activities of the Aviation of the Navy of the U.S.S.R.), Military Press of the Ministry of Defense, 1973. (A)

596) Captain First Rank K. Titov, "Knigi ob avianostsakh" (Books on Aircaft Carriers), Naval Digest, August 1974, pp. 107-109. (Review of two books: the first by I. N. Korotkin, F. F. Slepenkov and B. A. Kolyzayev, Avianostsy i vertoletonostsy (Aircraft Carriers and Helicopter Carriers), and the Second, Boyevoye ispol'zovaniye avianostsev: Tematicheskiy sbornik. Perevod s angliyskogo (Combat Uses of Aircraft Carriers. Thematic Digest. Translation from English), both books Military Press of the Ministry of Defense, 1970 and 1973, respectively.)

597) Captain First Rank-Engineer E. Buzov, "Tendentsii vazvitiya neakusticheskikh sredstv obnaruzheniya" (Tendencies of the Development of Non-Acoustic Means of Detection), Naval Digest, September 1974, pp. 85-89. (A)

598) Colonel (reserve) Yu. Khramov, "Vozdushnaya razvedka voyenno-morskikh baz" (Air Reconnaissance of Naval Bases), Naval Digest, September 1974, pp. 20-23. (A)

*599) Professor, Rear Admiral N. Pavlovich. "Osnovnyye faktory razvitiya voyenno-morskogo iskusstva" (Fundamental Factors in the Development of Naval Art,), Military-Historical Journal, December 1974, pp. 48-53. (A)

600) Fleet Admiral S. Gorshkov, "Nekotoryye voprosy razvitiya voyenno-morskogo flota" (Some Questions on the Development of the Navy), Naval Digest, December 1974, pp. 24-32. (A)

*601) Captain 2nd Rank (reserve) G. Polyakov, "Na zashchite morskikh kommunikatsky" (In the Defense of Maritime Communications), Naval Digest, December 1974, pp. 64-67. (A)

*602) "Kreysera" (Cruisers), Naval Digest, December, 1974, pp. 64-67. (P)

*603) Captain First Rank E. Shoshdov, "Razvitiye otechestvennoy gidroakustiki" (The Development of the Homeland's Hydroacoustics), Naval Digest, December 1974, pp. 76-77. (A)

*604) Colonel I. Kustsayev, "Samolety protiv podvodnykh lodok" (Aircraft Against Submarines), Naval Digest, December 1974, pp. 86-90. (A)

*605) Fleet Admiral S. Lobov, "Moguchiye, nepobedimyye" (Powerful, invincible), Naval Digest, December 1974, pp. 97-100. Review of book by A. A. Grechko, Vooruzhennyye Sily Sovetskogo gosudarstva, Military Press of the Ministry of Defense, 1974. (A)

BIBLIOGRAPHY OF SOURCES ON SOVIET PERCEPTIONS OF U.S. NAV

1975

606) Doctor of Naval Science, Captain First Rank N. V'yunenko, "Razvitiye podvodnykh sil" (The Development of Submarine Forces), Naval Digest, January 1975, pp. 26-37. (A)

607) Colonel S. Yashin, V kil'vatere 7-go flota SShA" (In the Wake of the U.S. 7th Fleet), Naval Digest, January 1975, pp. 91-93. (F)

608) "Podgotovka ofitserov protivolodochnykh sil v SShA" (The Training of the Officers of the U.S. Antisubmarine Forces), Naval Digest, January 1975, pp. 93-94. (F)

(609) "Chislennost' korabel'nogo sostava VMS osnovnykh kapitalisticheskikh gosudarstv i perspektivy ego razvitiya" (The Number of Ships in the Navies of the Principal Capitalist States and the Outlook for their Development), Naval Digest, January 1975, pp. 97-100. (F)

610) Captain First Rank I. Popov, "Mili otvagi i muzhestva" (The Miles of Valour and Courage), Naval Digest, January 1975, pp. 105-108. (Review of book by V. I. Dmitriyev, Atakuyut Podvodniki, Military Press of the Ministry of Defense, 1973). (F)

611) Marshal A. A. Grechko, Vooruzhennyye sily Sovetskogo gosudarstva (The Armed Forces of the Soviet State), 2nd edition, Military Press of the Ministry of Defense, signed to press 26 March 1975, 440 pp. (F)

*612) "Opyt voyny - nashe beztsennoye bogatstvo" (The Experience of the War is Our Priceless Wealth), Naval Digest, March 1975, p. 29. (R)

613) Rear-Admiral-Engineer I. Tynyankin, Rear-Admiral-Engineer (reserve) F. Kryachok and Captain First Rank-Engineer Shoshkov, "Gidroakustika v gody Velikoy Otechestvennoy voyny" (Hydroacoustics in the Years of the Great Patriotic War), Naval Digest, March 1975, pp. 32-35. (F)

614) Captain First Rank-Engineer V. Savinykh and Lieutenant-Colonel-Engineer V. Konovalov, "Meropriyatiya po snizheniyu shuma atomnykh podvodnykh lodok" (Measures in the Lowering of the Noise of Atomic Submarines), Naval Digest, March 1975, pp. 36-38. (F)

615) Lieutenant-Colonel E. Golosuyev, "Samolety aviatsii VMF" (Airplanes of Naval Aviation), Naval Digest, March 1975, pp. 89-91. (F)

616) "'Kharriyer' vzletayet s korabley" (The "Harrier" Takes Off from the Ship), Naval Digest, March 1975, pp. 102-103. (F)

617) "Divego-Garsiya baza SShA" (Diego-Garcia is a U.S. Base), Naval Digest, March 1975, pp. 105-106. (F)

618) Colonel B. Zveryev, Voploshcheniye leninskikh idey o zashchite sotsializma" (The Personification of the Leninist Ideas on the Defense of Socialism), Naval Digest, April 1975, pp. 8-13. (A)

619) Vice-Admiral F. Savel'yev, "Na strakhe morskikh rubezhey sotsializma" (On Guard of the Maritime Perimeters of Socialism), Naval Digest, April 1975, pp. 14-17. (R)

620) V. Kostriko, "Boyevyye katera" (Combatant Craft), Naval Digest, April 1975, pp. 73-76. (F)

621) Vice-Admiral A. Gontayev, "Flot v voyne: opyt i uroki" (The Navy in War: Experience and Lessons), Naval Digest, April 1975, pp. 104-109. Review of book by S. Roskill, Flot i voyna, (The Navy and War), Translation from English, Military Press of the Ministry of Defense, 1974. (F)

622) Fleet Admiral S. G. Gorshkov, "The Sailors' Feat", Labor, 11 April 1975 (FBIS translation, 22 April, pp. V-1 and V-2). (R)

623) Fleet Admiral S. Gorshkov, "Voyenno-morskoy flot do kontsa vypolnil svoy dolg pered Rodiny" (The Navy Fulfilled Its Duty to the Homeland to the End), Naval Digest, May 1975, pp. 8-15. (A)

624) Fleet Admiral G. Yegorov and Rear-Admiral A. Sorokin, "Severomorskaya khvatka" (The Northern Sea Grip), Naval Digest, May 1975, pp. 23-27. (R)

*625) Commander of Naval Aviation, Aviation Colonel-General A. Mironenko, "V nebe Rodiny" (In the Skies of the Homeland), Naval Digest, May 1975, pp. 44-49. (R)

626) Fleet Admiral S. G. Gorshkov, "Admiral Gorshkov Interviewed on Role of Navy" Soviet Military Review, in (English), No. 6, June 1975, pp. 2-5. (A)

627) Captain First Rank-Engineer Yu. Belyakov, "Sverkhmalyye vozvrashchayutsya v stroy (Razvitiye sverkhmalykh podvodnykh lodok za rubezhom i vzglyady na ikh ispol'zovaniye)" (Midgets Are Returning to the Ranks The Development of Midget Submarines Abroad and Views on Their Use), Naval Digest, June 1975, pp. 92-96. (A)

628) "Protivolodochnyye bombomety i glubinnyye bomby VMS kapitalisticheskikh gosudarstv" (Antisubmarine Depth-Charge Launchers and Depth Charges of the Capitalist States), Naval Digest, June 1975, pp. 97-98. (F)

629) Fleet Admiral S. Gorshkov, "Okeanskiy shchit Rodiny" (Oceanic Shield of the Homeland), Communist of the Armed Forces, No. 14, July 1975, pp. 9-17. (R)

630) "Vernost' geroicheskim traditsiyam" (Loyalty to the Heroic Traditions), Naval Digest, July 1975, pp. 3-6. (R)

*631) Fleet Admiral N. Sergeyev, "Okeanskiy flot nashey Rodiny" (Oceanic Navy of the Homeland), Naval Digest, July 1975, pp. 7-10. (R)

*632) Captain First Rank (reserve) D. Sokha, "Suda na vozdushnoy podushke" (Air-Cushion Ships), Naval Digest, July 1975, pp. 26-31. (F)

633) "Minnoye oruzhiye protiv podvodnykh lodok" (Mine Weapons Against Submarines), Naval Digest, July 1975, pp. 101-102. (A)

634) A. I. Zarionov and Yu. A. Negvitskiy, Nadvodnyy flot NATO (The Surface Fleet of NATO), Military Press of the Ministry of Defense, signed to press 2 July 1975, 318 pp. (F)

635) Fleet Admiral S. Gorshkov, "Flying the Motherland's Flag", Pravda, 27 July 1975. (FBIS translation, 30 July, pp. V-2 thru V-5). (R)

636) Fleet Admiral Gorshkov, "Admiral Gorshkov Gives Navy Day Talk" Moscow TV in Russian 1335 GMT, 27 July 1975 (FBIS translation, 15 August, pp. V-1 thru V-3). (R)

637) Fleet Admiral N. Smirnov, "Na strazhe Otechestva" (On Guard of the Fatherland), Red Star, 27 July 1975. (R)

638) Deputy Chief of the Main Staff of the Navy, Vice Admiral Igor' Andreyevich Sornev, "Raketonosnyy, Okeanskiy" (Missile-carrying, Oceanic), Soviet Kirgiziya, 27 July 1975. (R)

639) Chief of the Political Directorate of the Baltic Fleet, Vice Admiral N. Shablikov, "Na strazh morskikh rubezhev" (On Guard of the Maritime Perimeters), Soviet Lithuania, 27 July 1975. (R)

*640) First Deputy Commander-in-Chief Baltic Fleet, Vice Admiral A. Kosov, "Na strazhe mirnogo truda" (On Guard of Peaceful Labor), Soviet Latvia, 27 July 1975. (R)

641) Naval Aviation Chief of Staff, Aviation Colonel-General G. Kuznetsov, "Na strazhe mirnogo neba" (On Guard of the Peaceful Skies), Naval Digest, August 1975, pp. 28-33. (R)

642) Captains 2nd Rank-Engineers V. Dorodnykh and V. Polenin, "Podvodnyye torpednyye apparaty" (Submarine Torpedo Apparati), Naval Digest, August 1975, pp. 82-86. (F)

643) Captain First Rank B. Komkov, "Korabli - nositeli protivolodochnoy aviatsii" (Ships are Carriers of Antisubmarine Aviation), Naval Digest, August 1975, pp. 89-95. (A)

644) "Korabel'nyye protivolodochnyye vertolety inostrannykh VMS" (Shipboard Antisubmarine Helicopters of Foreign Navies), Naval Digest, August 1975, pp. 97-98. (F)

645) Captain First Rank V. Bagrov, "Devstviya flota v dal'nevostochnoy kampanii" (The Actions of the Navy in the Far-East Campaign), Naval Digest, September 1975, pp. 22-28. (A)

*646) Engineer Captain First Rank Yu. Nevskiy, "Razvitiye protivolodochnogo torpednogo oruzhiya v stranakh NATO" (The Development of Antisubmarine Torpedo Weapons of the NATO Countries), Naval Digest, September 1975, pp. 101-103. (A)

647) "Navstrechu XXV s"yezdu KPSS" (Greeting the XXV Congress of the CPSU), Naval Digest, October 1975, pp. 3-9. (R)

*648) Doctor of Naval Science, Captain First Rank N. V'yunenko, "O nekotorykh tendentsiyakh v razvitii morskoy taktiki" (On Some Trends in the Development of Naval Tactics), Naval Digest, October 1975, p. 21-26. (A)

*649) Colonel (reserve) A. Pyatkov, "Torpedonostsy" (Torpedo-Carriers), Naval Digest, October 1975, pp. 53-56. (F)

650) Captains 2nd Rank-Engineers V. Dorofeyev and V. Polenin, "Sredstva bor'by s samonavodyashchimisya torpedami" (Means of Combat with Self-Guiding Torpedoes), Naval Digest, October 1975, pp. 78-81. (F)

651) B. Chizhiv, "SOSUS obnaruzhivayet podvodnuyu lodku" (SOSUS Detects the Submarine), Naval Digest, October 1975, pp. 93-97. (F)

*652) Admiral N. Amel'ko "Ognennye mili" (The Fiery Miles), Naval Digest, November 1975, pp. 82-84. (F)

653) Captain First Rank-Engineer A. Kondratovich and Candidate of Technical Sciences Yu. Skorokhod, "Miny - oruzhiye universal'noye" (Mines are a Universal Weapon), Naval Digest, November 1975, pp. 110-114. (A)

654) "Aviatsionnaya poiskovo-udarnaya gruppa (AVPUG)" (Aviation Hunter-Killer Group, AVPUG), Soviet Military Encyclopedia, Vol. 1, signed to press 5 November 1975, pp. 27-28. (F)

655) Admiral N. N. Amel'ko, "Bor'ba s podvodnymi lodkami" (The Struggle with Submarines), Soviet Military encyclopedia, Vol 1, signed to press 5 November 1975, pp. 375-376. (A)

656) Fleet Admiral S. G. Gorshkov, Morskaya moshch' gosudarstva (Seapower of the State), Military Press of the Ministry of Defense, signed to press 27 November 1975, 464 pp. (A)

657) Captain First Rank-Engineer N. Yur'yev, "Eskadrennyye minonostsy tipa 'Spruyens' VMS SShA" (Destroyers of the "Spruance" Class of the U.S. Navy), Naval Digest, December 1975, pp. 87-90. (F)

658) "Eskortnyye korabli VMS kapitalisticheskikh stran" (Escort Ships of the Navies of the Capitalist Countries), Naval Digest, December 1975, pp. 91-92. (F)

659) Captain First Rank F. K. Morozov, Raketnoye oruzhiye na more (Missile Weapons at Sea), DOSAAF Press, signed to press 12 December 1975, 160 pp. (A)

BIBLIOGRAPHY OF SOURCES ON SOVIET PERCEPTIONS OF U.S. NAVY

1976

660) N. A. Brunsentsev, Voyenno-morskaya aviatsiya (Naval Aviation), Military Press of the Ministry of Defense, 1976. (A)

661) "Organizatsiya protivolodochnykh sil Tikho-okeanskogo flota SShA" (Organization of the Antisubmarine Forces of the U.S. Pacific Fleet), Naval Digest, January 1976, pp. 94-95. (F)

*662) "Atomnyye torpednyye podvodnyye lodki VMS SShA" (Atomic Torpedo Submarines of the U.S. Navy), Naval Digest, January 1976, pp. 97-99. (F)

*663) "'Nimits' vykhodit v more" (The "Nimitz" Heads Out to Sea), Naval Digest, January 1976, pp. 100-101. (F)

664) Fleet Admiral S. Gorshkov, "Vstrechaya XXV s"yezd KPSS" (Greeting the XXVth Congress of the CPSU), Naval Digest, February 1976, pp. 3-13. (R)

665) Captain First Rank A. Basov, "Voyenno-morskoy flot v zashchity morskikh ommunikatsiy" (The Navy in Defense of the Maritime Communications), Naval Digest, February 1976, pp. 31-16. (A)

666) Captain 2nd Rank E. Rakitin, "Novaya podvodnaya raketnoyadernaya sistema 'Traydent'" (The New "Trident" Submarine Nuclear-Missile System), Naval Digest, February 1976, pp. 90-96. (F)

*667) "Atomnyye raketnyye podvodnyye lodki VMS SShA", Anglii i Frantsii" (Atomic Missile Submarines of the Navies of the U.S.A., England, and France), Naval Digest, February 1976, pp. 97-98. (F)

668) Fleet Admiral S. Gorshkov, "Na okeanskoy vakhte" (On Oceanic Watch), Red Star, 11 February 1976. (R)

*669) B. Chizhov and A. Zheludev, "Protivolodochnyye podvodnyye lodki: taktika ikh deystviy" (Antisubmarine Submarines: The Tactics of their Actions), Naval Digest, March 1976, pp. 94-98. (F)

*670) "Organizatsiya protivolodochnykh sil OVMS NATO na Sredizemnom more" (Organization of the Antisubmarine Forces of the Unified NATO Forces in the Mediterranean), Naval Digest, March 1976, pp. 101-102. (F)

671) "Resheniya XXV s"yezda partii - v zhizn'!" (The Resolutions of the XXV Congress of the Party - into Practice!), Naval Digest, April 1976, pp. 3-6. (P)

672) Captain First Rank V. Konovalov, "Novyy etap stroitel'stva kommunizma" (A New Stage of the Building of Communism), Naval Digest, April 1976, pp. 7-11. (P)

673) Yu. Maslennikov, "Farvaterom 'kholodnoy voyny'" (In the Channel of 'the Cold War'), Naval Digest, April 1976, pp. 86-92. (P)

674) Fleet Admiral S. Lobov, "Morskaya moshch' gosudarstva i ego oboronosposobnost'" (The Sea Power of the State and its Defense Capability), Naval Digest, April 1976, pp. 99-105. (Review of Fleet Admiral S. G. Gorshkov's book, Morskaya moshch' gosudarstva (The Sea Power of the State), Military Press of the Ministry of Defense, 1976. (A)

*675) Captain First Rank V. Zhuravlev, "XXV s"yezd KPSS i ukrepleniye oboronosposobnosti strany" (The XXVth Congress of the CPSU and the Strengthening of the Defense Potential of the Country), Naval Digest, May 1976, pp. 3-8. (P)

676) Captains First Rank G. Morozov and B. Krivinskiy, "Nekotoryye uroki i vyvody iz opyta bor'by na morskikh kommunikatsiyakh vo Vtoroy Mirovoy voyne" (Some Lessons and Conclusions from the Experience of the Struggle on the Maritime Communications in the Second World War), Naval Digest, May 1976, pp. 23-28. (A)

*677) Captain 2nd Rank I. Kosikov, "Torpednoye oruzhiye v Velikoy Otechestvennoy voyne" (Torpedo Weapons in the Great Patriotic War), Naval Digest, May 1976, pp. 72-77. (P)

*678) Captain First Rank Yu. Bol'shakov and B. Komkov, "Taktika poiska podvodnykh lodok samoletami" (Tactics of Submarine Search for Aircraft), Naval Digest, May 1976, pp. 88-93. (P)

679) Fleet Admiral N. Sergeyev, "Kapital'nyy voyenno-istoricheskiy trud" (A Fundamental Military-Historical Work), Naval Digest, May 1976, pp. 101-105. (Review of the first six volumes of the twelve-volume Istoriya Vtoroy Mirovoy voyny 1939-1945 (History of the Second World War 1939-1945), Military Press of the Ministry of Defense, publishing dates from 1973 for Vol. 1 to 1976 for Vol. 6) (A)

680) M. A. Prusentsev, Voyenno-morskaya aviatsiya, Military Press of the Ministry of Defense, signed to press 21 May 1976, 227 pp. (A)

681) Captain 2nd Rank V. Grisenko, "Aviatsiya VMS v 'radio-electronnoy voyne: Po inostrannym flotam" (Naval Aviation in the "Radioelectronic War": In Foreign Navies), Naval Digest, June 1976, pp. 99-105. (A)

682) "Okeanskaya vakhta voyennykh moryakov; materialy dlya dokladov i besed o Dne Voyenno-morskogo Flota" (The Oceanic Watch of Naval Personnel), Communist of the Armed Forces, No. 13, July 1976, pp. 16-22. (R)

683) "Vooruzhennyye sily SSSR v poslevoyennyy period; rukovoditelyam politicheskikh zanyatiy" (The Armed Forces of the USSR in the Postwar Period; for Leaders of Political Discussions), Communist of the Armed Forces, No. 13, July 1976, pp. 68-73. (PP)

684) "Morskoy shchit Rodiny" (Maritime Shield of the Homeland), Naval Digest, July 1976, pp. 3-7. (R)

*685) Rear Admiral (retired) A. Rodionov, "Voyenno-morskoy flot v koalitsionnoy voyne" (The Navy in a Coalition War), Naval Digest, July 1976, pp. 21-26. (A)

686) B. Komkov and Captain First Rank Yu. Bol'shakov, "Nadvodnyye korali protiv podvodnykh lodok" (Surface Ships Against Submarines), Naval Digest, July 1976, pp. 87-92. (A)

687) "Sistema postoyannogo protivolodochnogo nablyudeniya" (A System of Constant Submarine Surveillance), Naval Digest, July 1976, pp 99-100. (F)

*688) Fleet Admiral S. G. Gorshkov, "Morskaya moshch' Otchizny" (Seapower of the Fatherland), Pravda, 25 July 1976. (A)

689) Fleet Admiral S. G. Gorshkov, Navy Day Speech, Radio Moscow in Russian, 0840 GMT 24 July 1976 (FBIS translation, 26 July , pp. V-2 thru V-4). (R)

690) Fleet Admiral N. Smirnov, "Okeanskiy strazh Otechestva" (Oceanic Guard of the Fatherland), Red Star, 25 July 1976. (R)

691) Captain Third Rank (retired) I. Velichko, "Dirizhabli proshlogo i nastoyashchego" (Dirigibles of the Past and Present), Naval Digest, August 1976, pp. 64-69. (F)

692) Captain First Rank (reserve) D. Sokha, "Suda i korabli na podvodnykh kryl'yakh (Vessels and Warships on Underwater Wings), Naval Digest, August 1976, pp. 68-73. (F)

*693) Captain First Rank B. Rodionov and Colonel (reserve) S. Yashin, "Doktrina novaya - iseli staryye (O novoy tikhookeanskoy doktrine SShA)" (The Doctrine is New - the Goals are Old; on the New U.S. Pacific Ocean Doctrine), Naval Digest, August 1976, pp. 92-98. (A)

694) "Krylatyye rakety dlya podvodnykh lodok VMS SShA" (Cruise Missiles for Submarines of the U.S. Navy), Naval Digest, August 1976, p. 103. (A)

695) Rear-Admiral K. Stalbo, "Voyenno-morskiye sily v lokal'nykh voynakh" (Naval Forces in Local Wars), Naval Digest, September 1976, pp. 23-29. (A)

696) Rear-Admiral B. Yashin, "Sushchnost' osnovnykh strategic-heskikh zadach VMS SShA" (The Essence of the Basic Strategic Missions of the U.S. Navy), Naval Digest, September 1976, pp. 91-97. (A)

697) Captain First Rank A. Gakkel', "Sovetskoye voyenno-morskoye iskusstvo v mezhvoyennyy period (1921-1941 gg.)" (Soviet Naval Art in the Inter-War Period (1921-1941), Naval Digest, September 1976, pp. 13-17.

698) Captain 2nd Rank S. Shapovalov, "Vzglyady komandovaniya SShA i NATO na vedeniye 'protivolodochnoy voyny'" (The Views of the U.S. and NATO Commands on the Conduct of "Antisubmarine Warfare'"), Naval Digest, November 1976, pp. 85-91. (A)

699) Admiral V. Sysoyev, "O morskoy blokade" (On Sea Blockade), Naval Digest, December 1976, pp. 32-36. (A)

700) Captain First Rank (reserve) I. Gorin, "Evolyutsiya minonostsev" (The Evolution of Destroyers), Naval Digest, December 1976, pp. 71-72. (A)

*701) Candidate of Economic Sciences I Isachenko, "'Flitsatkom' i 'Marisat' v sisteme svyazi VMS SShA" ("Fleetsatcom" and "Marisat" in the Communications System of the U.S. Navy), Naval Digest, December 1976, pp. 36-38. (F)

702) Captain 2nd Rank V. Dankovtsev, "Bryatsayut oruzhiyem (Ucheniye OVS NATO 'Timeuork-76)" (They are Rattling the Saber; The Exercise of the NATO Combined Forces "Team Work-76), Naval Digest, December 1976, pp. 39-00. (P)

BIBLIOGRAPHY OF SOURCES ON SOVIET PERCEPTIONS OF U.S. ASW

1977

703) A. A. Narusbayev, "Voyennoye korablestroyeniye v kapitalisticheskikh stranakh v 1977 g." (Military Ship Construction in the Capitalist Countries in 1977). Shipbuilding, January 1977, pp. 17-32. (F)

704) Fleet Admiral S. Gorshkov, "Vsegda na strazhe" (Always on Guard), Red Star, 7 February 1977. (R)

705) Candidate of Naval Science, Captain First Rank B. Makeyev, "Vooruzheniye i voyenno-morskoye iskusstvo" (Armament and Naval Art), Naval Digest, February 1977, pp. 16-20. (A)

*706) Captain Third Rank A.Grigor'yev, "Vozniknoveniye i razvitiye korabel'noy aviatsii" (The Emergence and Development of Ship-Borne Aviation), Naval Digest, February 1977, pp. 85-91. (A)

*707) "Korabel'nyy raketnyy kompleks 'Si Feniks' (proyekt)" (The Ship Missile Complex "Sea Phoenix" (Design), Naval Digest, February 1977, pp. 109-110. (F)

708) "O perspektivakh razvitiya VMS SShA" (On the Outlook of Development of the U.S. Navy), Naval Digest, February 1977, p. 114. (A)

709) Fleet Admiral Sergey Gorshkov, "Admiral Gorshkov Views Roles, Tasks of Armed Forces", Narodna Armiya (Bulgarian Army newspaper), 23 February 1977, (FBIS Translation, 2 March, pp. V-4 and V-5). (A)

710) Captain First Rank Yu. Bystrov, "Zavoyevaniye gospodstva na more" (The Victory of Supremacy at Sea), Naval Digest, March 1977, pp. 15-20. (A)

711) Captain 2nd Rank L. Gorozhanin, "Obespecheniye skrytnosti plavaniya podvodnoy lodki" (The Ensuring of the Cruising Secrecy of a Submarine), Naval Digest, March 1977, pp. 35-36. (F)

712) Captain First Rank B. I. Rodionov, Protivolodochnyye sily i sredstva flotov (Antisubmarine Forces and Means of Navies), Military Press of the Ministry of Defense, signed to press 5 April 1977, 136 pp. (A)

713) Captain First Rank V. Mamchits, "Osnovnyye osobennosti sovremennogo morskogo boya" (The Principle Features of Contemporary Naval Battle), Naval Digest, April 1977, pp. 23-27. (A)

714) Captain First Rank A. Zamchalov, "Obobschcheniye opyta boyevoy deyatel'nosti voyenno-morskogo flota v khode Velikoy Otechestvennoy voyny" (A General Conclusion of the Experience of the Combat Activity of the Navy in the course of the Great Patriotic War), Naval Digest, May 1977, pp. 27-31. (A)

715) Doctor of Historical Science, Captain First Rank A. Basov, "Bor'ba s podvodnymi lodkami protivnika" (The Struggle with the Submarines of an Opponent), Military-Historical Journal, June 1977, pp. 40-47. (A)

716) "Okeanskiy shchit Otchizny; materialy dlya dokladov i besed o Dne Voyenno-Morskogo Flota" (The Oceanic Shield of the Fatherland; Materials for Reports and Discussions for Navy Day of the USSR), Communist of the Armed Forces, No. 12, June 1977, pp. 41-45. (PP)

717) Yu. Maslennikov, "Kursom protiv razryadki (Soderzhaniye i napravlennost' operativnoy i boyevoy pod gotovki VMS kapitalist-icheskikh stran v 1976 g.)" (On Course Against Relaxation (of Tensions) (The Content and Direction of Operational and Military Training of the Navies of the Capitalist Countries in 1976)), Naval Digest, June 1977, pp. 83-93. (F)

*718) "Perechen' korabley zarubezhnykh flotov, vooruzhennykh zenitnymi, protivokora'nymi i protivolodochnymi raketnymi kompleksami" (An Enumeration of the Ships of Foreign Navies which are Armed with Anti-Air, Anti-Ship, and Antisubmarine Missile Complexes), Naval Digest, June 1977, pp. 95-96; July 1977, pp. 97-98; and August 1977, pp. 99-100. (F)

719) Colonel G. Arzumanov and Captain 2nd Rank G. Grachikov, "V krivom zerkale imperialisticheskoy propagandy (Pechat' stran NATO o Sovetskom Voyenno-Morskom Flote)" (In the Distorted Mirror of Imperialist Propaganda; The Press of the NATO Countries on the Soviet Navy); Naval Digest, June 1977, pp. 100-104. (F)

720) Captain First Rank I.M. Potapov, Nauchno-tekhnicheskiy progress i flot (Scientific Technological Progress and the Navy), Military Press of the Ministry of Defense, signed to press 27 June 1977, pp. 154 pp. (A)

721) Fleet Admiral N. Smirnov, "Iz opyta vzaimodeystviya rodov sil VMF v khode voyny" (From the Experience of Joint Action of the Types of Forces of the Navy in the Course of the War), Military Historical Journal, July 1977, pp. 10-18. (A)

*722) First Deputy Commander-in-Chief of the Navy, Fleet Admiral N. Smirnov, "Okean - shkola boyevogo masterstva" (The Ocean - the School of Combat Mastery), Technology and Armaments, July 1977, pp. 2-3. (T)

723) "Voyenno-morskoy flot na oktyabr'skoy vakhte" (The Navy on the October Watch), Naval Digest, July 1977, pp. 6-11. (R)

724) Captain First Rank (reserve) I. Bykhovskiy, "Ispol'zovaniye minnogo oruzhiya s podvodnykh lodok" (The use of Mine Weapons from Submarines), Naval Digest, July 1977, pp. 25-29. (A)

725) Captain First Rank I. Kosikov, "Bor'ba s torpedami" (The Struggle with Torpedoes), Naval Digest, July 1977, pp. 73-77. (A)

726) Captain 2nd Rank-Engineer A. Proshin and Captain Third Rank-Engineer G. Shatayev, 'Osnovnyye napravleniya bor'by s shumnost'yu podvodnykh lodok' (Principal Directions of the Struggle with the Noisiness of Submarines), Naval Digest, July 1977, 78-79. (F)

727) Captain First Rank B. Rodionov and V. Novichkov, "Krylataya raketa 'Tomagavk'" (The Cruise Missile "Tomahawk"), Naval Digest, July 1977, pp. 86-91.

*728) E. Rakitin, 'Realizatsiya programmy 'Traydent'" (The Realization of the "Trident" Program), Naval Digest, July 1977, p. 91-94. (F)

729) Fleet Admiral S. G. Gorshkov, Voyenno-morskoy flot (The Navy), Knowledge Press, signed to press 11 July 1977, 63 pp. (A)

*730) Admiral V. Grishanov, "Slava i gordost' Rodiny" (Glory and Pride of the Homeland), Izvestiya, 30 July 1977. (R)

731) Fleet Admiral S. G. Gorshkov, "Na morskikh rubezhakh" (On the Maritime Perimeters), Pravda, 31 July 1977. (R)

732) Fleet Admiral N. Smirnov, "Okeanskaya vakhta" (Oceanic Watch), Red Star, 31 July 1977. (R)

733) Deputy Commander-in-Chief of the Navy, Admiral V. V. Mikhaylin, "Okeanskiy, raketonosnyy" (Oceanic, Missile-carrying), Rural Life, 31 July 1977. (R)

*734) Chief of Staff Black Sea Fleet, Vice Admiral V. Akimov, "Pod flagom Rodiny" (Under the Flag of the Homeland), Red Star, 18 August 1977. (R)

735) Captain First Rank M. Ruban, "Vneshnyaya politika KPSS i rol' vooruzhennykh sil SSSR v obespechenii mira i bezopasnosti narodov" (The Foreign Policy of the CPSU and the Role of the Armed Forces of the U.S.S.R. in the Ensuring of Peace and Security of Peoples), Naval Digest, August 1977, pp. 9-13. (P)

736) Colonel B. Platonov, "Samolety amerikanskikh avianostsev" (The Airplanes of American Aircraft Carriers), Naval Digest, August 1977, pp. 90-96. (P)

737) Lieutenant-Colonel Yu. Savel'yev, "Samolet 'Kharriyer': ego nastoyashcheye i budushcheye" (The Airplane "Harrier": Its Present and Future), Naval Digest, August 1977, pp. 96-98. (A)

738) Aviation Major-General N. Vishenskiy, "Kniga ob udarnoy sile sovremennykh flotov" (A Book on the Strike Force of Modern Navies), Naval Digest, August 1977, pp. 102-104. (Review of book by N. A. Drusentsov, Voyenno-morskaya aviatsiya, Military Press of the Ministry of Defense, 1977). (A)

739) Colonel (retired) S. Kurtenkov, "Nadezhnyye kryl'ya flota" (Reliable Wings of the Navy), Naval Digest, August 1977, pp. 105-106. (Review of book by V. S. Boyko, Kryl'ya flota, Murmansk Book Press, 1976. (R)

*740) Fleet Admiral S. G. Gorshkov, Voyenno-morskoy flot (The Navy), Knowledge Press, signed to press 22 September 1977, 64 pp. (A)

*741) Rear-Admiral S. Filonov, "Morskaya operatsiya" (Naval Operation), Naval Digest, September 1977, pp. 21-25. (A)

*742) Fleet Admiral S. Gorshkov, "Voyenno-morskoy flot" (The Navy), Military-Historical Journal, October 1977, pp. 11-21. (A)

743) Candidate of Philosophical Science, Captain First Rank N. Shumikhin, "Kharakter i osobennosti sovremennykh voyn; rukovoditelyam grupp politicheskikh zanyatiy" (The Character and Particularities of Modern War; for Leaders of Group Political Discussions), Communist of the Armed Forces, No. 20, October 1977, pp. 82-89.

744) Candidate of Military Science, Lieutenant-General M. Gareyev, "Vsegda na strazhe zavoevaniy Oktyabrya" (Always on Guard over the Gains of October), Military-Historical Journal, November 1977, pp. 19-29. (R)

745) D. N. Korolev and N. M. Karlosh, Sovetskiy Voyenno-Morskoy Flot (The Soviet Navy), Military Press of the ministry of Defense, signed to press 1977, 34 pp. (A)

746) Rear Admiral A. I. Rodionov, Udarnaya sila flota (The Strike Force of the Navy), 2nd edition, DOSAAF Press, 1977, 30 pp. (A)

*747) Fleet Admiral S. G. Gorshkov, "Na strazhe zavoevaniy Oktyabrya" (On Guard over the Gains of October), Naval Digest, November 1977, pp. 3-12. (R)

748) Engineer-Admiral P. Kotov, "Ekonomicheskaya moshch' strany - osnova razvitiya okeanskogo raketno-yadernogo flota" (The Economic Power of the Country is the Basis of the Development of an Oceanic Nuclear-Missile Navy), Naval Digest, November 1977, pp. 13-23. (A)

749) Admiral V. Sisoyev, "Leninskiye printsipy zashchity sotsialisticheskogo Otechestva i razvitiye Sovetskogo voyenno-morskogo iskusstva" (The Leninist Principles for Protection of the Socialist Fatherland and the Development of Soviet Naval Art), Naval Digest, November 1977, pp. 24-33. (A)

750) Captain 2nd Rank V. Semanov, "Pod znamenem 'Oktyabr'skoy Revolyutsii'" (Beneath the Banner of the "October Revolution"), Naval Digest, November 1977, pp. 50-51. (R)

751) "Blokovaya strategiya imperializma SShA" (The Bloc Strategy of U.S. Imperialism), Naval Digest, November 1977, pp. 113-114. (PP)

752) Sovetskiye vooruzhennyye sily. Istoriya stroitel'stva, (The Soviet Armed Forces. History of Construction). S.A. Tyushkevich (Ed.), Military Press of the Ministry of Defense, signed to press 22 November 1977, 516 pp. (MA)

753) Engineer-Captain Third Rank A. Lyalikov, "Tendentskii razvitiya sredstv dal'nego obnaruzheniya podvodnykh lodok v VMS SShA" (Trends in the Development of Long-Range Means of Submarines Detection of the U.S. Navy), Naval Digest, December 1977, pp. 87-91. (A)

BIBLIOGRAPHY OF SOURCES ON SOVIET PERCEPTIONS OF U.S. ASW

1978

754) Deputy Chief of the Main Political Directorate of the Soviet Army and Navy, Vice Admiral A. Sorokin, "V. I. Lenin i Sovetskiye Vooruzhennyye Sily" (V. I. Lenin and the Soviet Armed Forces), Communist of the Armed Forces, No. 1, January 1978, pp. 17-26. (PP)

*755) "Navstrechu yubileyu vooruzhennykh sil SSSR" (Meeting the Anniversary of the Armed Forces of the USSR), Naval Digest, January 1978, pp. 3-6. (R)

756) Captain First Rank Zh. Sverbilov, "Osobennosti upravleniya podvodnoy lodkoy pri plavanii vo l'dakh i pod l'dom" (Features of Guiding a Submarine while Sailing in Ice and Under Ice), Naval Digest, January 1978, pp. 46-49. (F)

757) "Voyenno-morskoy flot" (The Navy), Technology and Armaments, February 1978, p. 22. (R)

758) Fleet Admiral S. G. Gorshkov, "60 let Vooruzhennym Silam SSSR" (60 Years of the Armed Forces of the USSR), Shipbuilding, February 1978, pp. 3-5. (R)

759) Fleet Admiral S. Gorshkov, "Morskaya moshch' Rodiny" (The Seapower of the Homeland), Communist of the Armed Forces, No. 3, February 1978, pp. 9-16. (R)

*760) Fleet Admiral N. Smirnov, "Morskaya moshch' sotsialisticheskoy Rodiny" (The Seapower of the Homeland), Naval Digest, February 1978, pp. 6-12. (R)

761) Vice-Admiral V. Chernavin and Rear-Admiral Yu. Padorin, "Okeanskaya vakhta severomortsev" (The Oceanic Watch of the Northern Sea Sailors), Naval Digest, February 1978, pp. 17-21. (R)

762) Admiral V. Maslov and Rear-Admiral V. Sabaneyev, "Na rubezhakh Tikhogo okeana" (On the Perimeters of the Pacific Ocean), Naval Digest, February 1978, pp. 22-26. (R)

*763) Vice-Admiral A. Kosov and Vice-Admiral N. Shavlikov, "Estafeta 'Avrory' v nadezhnykh rukakh" (The Baton of the "Aurora" is in Reliable Hands), Naval Digest, February 1978, pp. 33-36. (R)

764) Aviation Colonel-General A. Mironenko, "Kryl'ya flota" (Wings of the Navy), Naval Digest, February 1978, pp. 45-48. (R)

765) Vice-Admiral A. Gontayev, "Amerikanskaya voyennaya doktrina" (American Military Doctrine), Naval Digest, February 1978, pp. 110-117. (A)

766) Fleet Admiral Sergev Gorshkov, "Speech on Armed Forces Day", Radio Moscow in Russian, 0545 GMT 23 February 1978 (FBIS translation, 24 February, pp. V-15 through V-17. (R)

767) Vice-Admiral (retired) G. Shchedrin, "Kursom Oktyabrya" (By October's Course), Naval Digest, March 1978, pp. 16-22. (R)

*768) Vice-Admiral V. Solov'yev, "Voyenno-morskaya teoriya na stranitskh 'Morskogo Sbornika'" (Naval Theory in the Pages of "Naval Digest"), Naval Digest, March 1978, pp. 22-23. (A)

769) Captain First Rank-Engineer V. Dorodnykh and Captain 2nd Rank-Engineer V. Bolkhovskoy, "Upravleniye dvizheniyem torped" (The Guiding of the Motion of Torpedoes), Naval Digest, March 1978, pp. 87-91. (F)

770) Vice-Admiral A. Gontayev, "Poleznoye izdaniye" (A Useful Publication), Naval Digest, March 1978, pp. 108-109. A review of Rodionov, Antisubmarine Forces and Means of Navies, 1977. (A)

771) G. G. Gromov, "Oborona i zashchita korablev" (Defense and Protection of Warships), Soviet Military Encyclopedia, Vol V, signed to press 3 March 1978, p. 485. (F)

772) "Carter's Naval Modernization Program Called Insufficient", Moscow Tass in English, 1143 GMT, 27 March 1978 (FBIS 28, March, p. B-11. (F)

773) Captain 2nd Rank S. Nekrasov, 'Optimal'nyy variant" (The Optimum Variant), Leningrad Pravda, 12 March 1978. (F)

774) L. I. Brezhnev, "Vystupleniye tovarishcha L. I. Brezhneva pered moryakami Tikhookeanskogo flota' (Remarks of Comrad Brezhnev before the Naval Personnel of the Pacific Fleet), Communist, No. 6, April 1978, pp. 23-26. (R)

775) Midshipman T. Bagryantsev, "Sredizemnomorskiy ekzamen" (Mediterranean Examination), Red Star, 13 April 1978. (F)

*776) Captain First Rank G. Ammon, "Obespecheniye morskikh kommunikatsiy (Po opytu boyevykh deystviy Severnogo flota v 1941-1945gg.)" (The Securing of Maritime Communications (According to the Experience of the Combat Actions of the Northern Fleet in 1941-1945), Naval Digest, May 1978, pp. 26-32. (A)

*777) Aviation Major-General N. Vishenskiy, "Sovetskoy morskoy aviatsii - 60 let" (Soviet Naval Aviation - 60 Years), Naval Digest, May 1978, pp. 74-75. (R)

*778) Marshal N. Ogarkov, "Voyennaya nauka i zashchita sotsialisticheskogo Otechestva" (Military Science and the Defense of The Socialist Fatherland), Communist, No. 3, May 1978, pp. 110-121. (MA)

779) Captain 2nd Rank-Engineer A. Boyko, "Torpedy VMS kapitalisticheskikh gosudarstv" (Torpedoes of the Navies of the Capitalist States), Foreign Military Review, June 1978, pp. 80-83. (F)

780) "Otechestva strazh okeanskiy; materialy dlya dokladov i beseds o Dne Voyenno-morskogo Flota SSSR" (The Oceanic Guard of the Fatherland), Communist of the Armed Forces, No. 12, June 1978, pp. 31-36. (R)

*781) Commander-in-Chief Pacific Fleet, Admiral V. Maslov, "Vyuchka okeanskoy proby" (Training in Ocean Trials), Red Star, 9 June 1978. (T)

*782) "V duel'noy situatsii" (In a Dueling Situation), Red Star, 20 June 1978, p. 1. (F)

783) Vice-Admiral (reserve) V. Solov'yev, "Okeanskiy platsdarm agressii" (The Oceanic Staging Area of Aggression), Naval Digest, June 1978, pp. 20-24. (A)

784) Vice-Admiral K. Stalbo, "Avianostsy v poslevoyennyy period" (Aircraft Carriers in the Postwar Period), Naval Digest, June 1978, pp. 91-100. (A)

785) S. Yashin, "Ucheniye 'Tim Spirit - 78'" (The Exercise "Team Spirit - 78"), Naval Digest, June 1978, p. 101. (F)

786) Captain 2nd Rank-Engineer A. Boyko), "Sistemy PLURO" (Systems of Antisubmarine Guided Missile Weapons), Foreign Military Review, July 1978, pp. 78-84. (R)

*787) Chief of the Rear of the Navy, Admiral L. Mizin, "Dal' nim morskim pokhodam - otlichnoye obespecheniye (For Distant Sea Cruises - Outstanding Support), Rear and Supply, July 1978, pp. 26-30. (T)

788) Chief of the Main Staff of the Navy, Fleet Admiral G. Yegorov, "Dal'niye pokhody - shkola vyuchki i masterstva" (Distant Cruises - School of Training and Mastery), Naval Digest, July 1978, pp. 3-9. (T)

789) N. S. Suvorov et. al., Sovremennyye boyevyye korabli (Modern Warships), DOSAAF Press, signed to press 20 July 1978, 288 pp. (T)

*790) Admiral V. Grishanov, "Okeanskiy strazh Otchizny" (The Oceanic Guard of the Fatherland), Izvestiya, 29 July 1978. (R)

791) Fleet Admiral S. G. Gorshkov, "Okeanskaya sila derzhavy" (The Oceanic Forces of the Power), Pravda, 30 July 1978. (R)

792) Fleet Admiral N. Smirnov, "Na okeanskoy vakhte" (On Oceanic Watch), Red Star, 30 July 1978. (R)

793) Commander-in-Chief of Naval Aviation, Aviation Colonel-General A. Mironenko, "Okeanskaya vakhta" (Oceanic Watch), Labor, 30 July 1978. (R)

794) Vice-Admiral N. Shablikov, "Na strazhe morskikh rubezhey" (On Guard of the Maritime Perimeters), Labor, 30 July 1978. (R)

*795) Candidate of Philosophical Science, Captain First Rank A. Skryl'nik, "Deyatel'nost' KPSS po osushchestvleniyu Leninskikh idey ob ukreplenii oboronosposobnosti strany na sovremennom etape" (Activity of the CPSU for the Realization of the Leninist Idea of Strengthening the Defense Potential of the Country at the Contemporary Stage), Communist of the Armed Forces, No. 15, August 1978, pp. 75-78. (P)

796) Commander-in-Chief of Naval Aviation, Aviation Colonel-General A. Mironenko, "Opyt voyny - Bestsennoye dostoyaniye" (The Experience of the War - A Priceless Legacy), Naval Digest, August 1978, pp. 33-36. (R)

797) Captain Third Rank N. Kabalin, "Ucheniye 'Okean Safari - 77'" (The Exercise "Ocean Safari - 77"), Naval Digest, August 1978, pp. 88-90. (T)

798) Captain First Rank Yu. Bal'shakov, "'Novaya filosofskaya kontseptsiya' ministra Brauna" (The "New Philosophical Conception" of Secretary Brown), Naval Digest, August 1978, pp. 91-92. (F)

799) Captain Third Rank V. Meshcheryakov, "Vertolet nad okeanom" (Helicopter Over the Ocean), Red Star, 16 August 1978, p. 1. (F)

*800) Rear-Admiral B. Yashin, "Retsidiv 'Kholodnoy voyny'?" (Return of the "Cold War"?), Naval Digest, September 1978, pp. 96-102. (P)

*801) Yu. Maslennikov, "Kogda ne khotyat voyennoy razryadki (Operativno-takticheskaya i bovevava podgotovka VMS stran NATO v 1977 g.)" (When They Do Not Want Military Relaxation (Operational-Tactical and Combat Training of the Navies of the NATO Countries in 1977), Naval Digest, October 1978, pp. 85-90; 93. (PP)

*302) Sistema bazirovaniva VMS SShA" (The System of Basing of the U.S. Navy), Naval Digest, September 1978, pp. 91-92. (F)

*303) "Oktyabr' i flot" (October and the Navy), Naval Digest, November 1978, pp. 3-6. (R)

304) Admiral N. N. Amel'ko "Protivolodochnyy korabl'" (Antisubmarine Ship), Soviet Military Encyclopedia, Vol 6, signed to press 10 November 1978, pp. 597-598. (F)

305) "Protivolodochnyy rubezh (PLR)" (Antisubmarine Perimeter), Soviet Military Encyclopedia, Vol. 6, signed to press 10 November 1978, p. 599. (F)

306) N. I. Vishenskiy, "Protivolodochnaya aviatsiya" (Antisubmarine Aviation), Soviet Military Encyclopedia, Vol. 6, signed to press 10 November 1978, p. 596. (F)

307) V. G. Yefremenko, "Protivolodochnyye sily" (Antisubmarine Forces), Soviet Military Encyclopedia, Vol. 6, signed to press 10 November 1978, p. 597. (F)

*308) Admiral N. N. Amel'ko, "Protivolodochnaya oborona (PLO)" Antisubmarine Defense, PLO), Soviet Military Encyclopedia, Vol. 6 signed to press 10 November 1978, p. 596. (F)

809) Commander-in-Chief of Naval Aviation, Candidate of Naval Science, Aviation Colonel-General A. Mironenko, "Aviatsiya Voyenno-morskogo flota v poslevoyennyye gody" (Aviation of the Navy in the Postwar Years), Military-Historical Journal, December 1978, pp. 25-32. (A)

810) I. Kuz'min, "Razvedka v blokadnykh deystviyakh na more" (Reconnaissance in Blockade Actions at Sea), Naval Digest, December 1978, pp. 30-36. (A)

811) Engineer N. Novichkov, "'Tomagavk' na ispytaniyakh" (The "Tomahawk" in Testing), Naval Digest, December 1978, pp. 106-109. (F)

BIBLIOGRAPHY OF SOURCES ON SOVIET PERCEPTIONS OF U.S. AEW

1979

*812) Captain Third Rank B. Sergeyev, "Kiyev derzhit ekzamen" (The Kiev Takes an Examination), Red Star, 16 January 1979, p. 1. (F)

813) N. Zhukov, "Voyenno-morskiye sily SShA: Poslevoyennyy period), (The U.S. Naval Forces: The Postwar Period), Naval Digest, January 1979, pp. 65-69. (A)

814) "Voyenno-morskiye bazy SShA na inostrannoy territorii" (U.S. Naval Bases on Foreign Territory), Naval Digest, January 1979, pp. 71-72. (F)

815) "Na strazhe zavoyevaniy Oktyabrya" (On Guard Over the Victories of October), Naval Digest, February 1979, pp. 3-6. (R)

816) Rear Admiral B. Yashin, Retired and Candidate of Naval Science, Captain First Rank B. Rodionov, "Voyenno-morskiye sily SShA: nastoyashcheye i blizhaysheye budushcheye" (The Naval Forces of the U.S.: The Present and the Near Future), Naval Digest, February 1979, pp. 66-71. (FT)

817) "Manevry NATO 'Otem Fordzh - 73'" (The NATO Maneuvers "Autumn Forge - 73"), Naval Digest, February 1979, pp. 72-73. (F)

818) Colonel M. Pletushkov, "Nadezhnyy Shchit Rodiny" (The Reliable Shield of the Homeland), Naval Digest, February 1979, pp. 74-75. (Review of book by a collective of authors, Sovetskiye Vooruzhennyye Sily.Istoriya stroitel'stva, Military Press of the Ministry of Defense, 1978. (R)

819) Professor, Admiral V. Sysoyev, "Sovetskoye voyenno-morskoye iskusstvo v Velikoy Otechestvennoy voyne" (Soviet Naval Art in the Great Fatherland War), Naval Digest, March 1979, pp. 11-15. (A)

*820) Captain First Rank-Engineer V. Dorodnykh, "Torpednoye oruzhiye kapitalisticheskikh gosudarstv" (Torpedo Weapons of the Capitalist States), Naval Digest, March 1979, pp. 50-57. (F)

821) "Podvodnaya duel'" (Underwater Duel), Red Star, 10 March 1979. (F)

322) Captain First Rank Yu. Galich and Captain First Rank-Engineer N. Kocheshkov, "Voyennomorskiye sily i kosmicheskaya programma SShA" (The Navy and the Outer-Space Program of the U.S.A.), Naval Digest, April 1979, pp. 68-71. (F)

*823) Fleet-Admiral N. Smirnov, "Nastoychivo izuchat' opyt Velikoy Otechestvennoyy voyny" (Persistantly Study the Experience of the Great Patriotic War), Naval Digest, May 1979, pp. 3-7. (R)

824) I. Kuz'min, "Razvedka atomnykh raketnykh podvodnykh lodok" (Surveillance of Nuclear-powered Missile Submarines), Naval Digest, May 1979, pp. 66-67. (F)

825) "Effektivno reshat' zadachi v okeane" (To Effectively Carry Out Missions in the Ocean), Red Star, 27 May 1979, p. 1. (R)

826) Candidate of Historical Science, Instructor, Colonel V. Bokarev, "Vooruzhennyye sily SSSR v poslevoyennyy period" (The Armed Forces of the USSR in the Postwar Period), Communist of the Armed Forces, No. 12, June 1979, pp. 69-80. (MA)

827) "Moguchiy flot Strany Sovetov; materialy dlya dokladov i besed o Dne Voyenno-morskogo flota SSSR" (The Mighty Navy of the Land of the Soviets; Materials for Reports and Discussions on Navy Day of the USSR), Communist of the Armed Forces, No. 12, June 1979, pp. 23-29. (PP)

828) Captain First Rank V. Tsema and Lieutenant-Colonel G. Sezin, "Militarizm - korennoye svoystvo imperializma" (Militarism is the Basic Characteristic of Imperialism), Naval Digest, June 1979, pp. 12-15. (P)

829) Captain First Rank A. Aristov, "Nekotoryye voprosy dialektiki razvitiya form i sposobov vooruzhennoy bor'by na more" (Some Questions of the Dialectics of the Development of Forms and Methods of Armed Combat at Sea), Naval Digest, June 1979, pp. 13-22. (A)

830) Captain First Rank M. Sokolov and Captain First Rank Yu. Pechenkin, "Oruzhiye korabley" (Weapons of Warships), Naval Digest, June 1979, pp. 75-78. (F)

831) A. Prostakov, "Gidroakusticheskiye sredstva protivolodochnykh VMS stran NATO" (Hydroacoustic Means of Antisubmarine Ships of the Navies of the NATO Countries), Foreign Military Review, June 1979, pp. 68-71. (F)

832) Fleet Admiral S. Gorshkov, "Okeanskiye vakhty flota" (Oceanic Watch of the Navy), Naval Digest, July 1979, pp. 3-7. (R)

833) Captain First Rank B. Makeyev, "Transokeanskiye soob-shcheniya v sovremennykh usloviyakh" (Transoceanic Communications in Contemporary Conditions), Naval Digest, July 1979, pp. 19-22. (F)

834) Vice-Admiral A. Mikhaylovskiy, "Pod ledovym pantserem" (Under the Ice Coating), Naval Digest, July 1979, pp. 67-70. (F)

*835) Captain First Rank V. Pustov, (retired), "Pentagon sozdayet sily vtorzheniya" (The Pentagon is Creating Interventionary Forces), Red Star, 1 July 1979. (P)

836) Deputy Commander-in-Chief of the Navy, Engineer Admiral P. Kotov, "Okeaniskiy, raketonosnyy" (Oceanic, Missile-carrying), Red Star, 24 July 1979. (R)

837) Fleet Admiral S. G. Gorshkov, "Na okeanskikh rubezhakh" (On Oceanic Perimeters), Pravda, 29 July 1979. (R)

*838) Admiral V. Grishanov, "Motherland's Proud Pennants", Izvestiya, 29 July 1979. (FBIS translation, 3 August, pp. V-1 and V-2). (R)

839) First Deputy Commander-in-Chief of the Navy, Fleet Admiral N. Smirnov, "Okeanskaya vakhta" (Oceanic Watch), Red Star, 29 July 1979. (R)

840) Chief of the Main Staff of the Navy, Fleet Admiral G. M. Yegorov, "Na strazhe morskikh rubezhey" (On Guard of the Maritime Perimeters), Labor, 29 July 1979. (R)

841) Deputy Commander-in-Chief of the Navy, Engineer Admiral P. Kotov, "Okeanskiy strazh Rodiny" (Oceanic Guard of the Motherland), Socialist Industry, 29 July 1979. (R)

*842) Deputy Commander-in-Chief of the Navy, Engineer Admiral V. G. Novikov, "Na strazhe mira" (On Guard Over Peace), Light of the East, 29 July 1979. (R)

843) Lieutenant-Colonel-Engineer Yu. Artem'yev, Colonel-Engineer G. Maksimov and Engineer Yu. Filaretov, "Sistemy blizhney navigatsii i posadki palubnoy aviatsii VMS SShA" (Systems of Near Navigation and Landing of Ship-Borne Aviation of the U.S. Navy), Naval Digest, August 1979, pp. 69-72. (F)

344) Captains Third Rank-Engineers V. Pozdov and A. Vetoshkin, "Dirizhabli vozvrashchayutsya" (Dirigibles Return), Naval Digest, August 1979, pp. 32-36. (F)

*345) I. Kutsev, "Novyye korabel'nyye vertolety VMS stran NATO" (New Shipboard Helicopters of the Navies of the NATO Countries), Naval Digest, August 1979, pp. 86-88. (F)

346) Doctor of Military Science, Major-General R. Simonyan, "Na Severnom flange aggressivnogo bloka" (On the Northern Flank of the Aggressive Bloc), Red Star, 3 August 1979. (F)

347) Colonel B. Zverev, "Uroki istorii (K 40-letiyu nachala Vtoroy Mirovoy voyny)" (The Lessons of History (To the 40 Years Since the Beginning of the Second World War)), Naval Digest, September 1979, pp. 3-8. (NA)

*348) Rear-Admiral A. Pushkin, "Boyevyye deystviya amerikanskikh i yaponskikh podvodnykh lodok protiv avianostsev v period Vtoroy Mirovoy voyny" (Combat Actions of American and Japanese Submarines against Aircraft Carriers in the Period of the Second World War), Naval Digest, September 1979, pp. 11-26. (A)

349) Captain 2nd Rank-Engineer V. Kochnev, "Sostoyaniye avtomatizatsii PLARB v zarubezhnykh flotakh" (The State of the Automation of Nuclear-Powered Submarines in Foreign Navies), Naval Digest, September 1979, pp. 69-72. (F)

350) Professor, Doctor of Naval Science, Vice Admiral K. Stalbo, "Razvitiye vzglyadov na podvodnyye sily" (The Development of Views on Submarines), Naval Digest, September 1979, pp. 31-37. (A)

351) Engineer V. Rudakov, Colonel-Engineer (retired) A. Il'ichev and Captain 2nd Rank-Engineer N. Andreyev, "Protivominnyye korabli: istoriya razvitiya, uroki i vyvody" (Anti-Mine Ships: History of Development, Lessons and Conclusion), Naval Digest, October 1979, pp. 71-78. (A)

*352) Captain First Rank (reserve) V. Zhuchkov, "Vnimaniye: miny! (Iz opyt primeneniya morskikh min vo Vtoroy Mirovoy voyne)" Attention: Mines! (From the Experience of the Application of Sea Mines in the Second World War), Naval Digest, October 1979, pp. 82-86. (A)

353) "Zarubezhnaya voyenno-morskaya khronika" (Foreign Naval Chronicle), Naval Digest, October 1979, p. 86. (F)

APPENDIX H

CHRONOLOGY

1961

U.S.

- First POLARIS deployment (began December, 1960).

- In his first State of the Union address, President John F. Kennedy announces a reappraisal of U.S. defense strategy: there will be a rapid acceleration of the Minuteman and POLARIS programs. Kennedy's revised defense budget calls for $1.954 billion increase, and includes plans for ten more POLARIS submarines and one more POLARIS tender. One SSBN per month is to be delivered, beginning June 1963.

- Defense Department announces call-up of naval reservists for 18 ASW air squadrons to be added to the active fleet.

- ASW expenditures account for $1.36 billion (11.3 percent) of the $12.01 billion Navy appropriation for FY 1961.

- ASROC becomes operational. It employs the Mark 44/45 acoustic homing ASW torpedo (which is in quantity production) or a nuclear depth charge.

- First submerged POLARIS A-2 launch attains 1,500 mile range.

- USS LEXINGTON (CVA-16), scheduled for CVS conversion, is retained as an attack carrier. (LEXINGTON is converted in 1962, replacing the mothballed ANTIETAM).

- Navy approves Lockheed ORION P3V-1 for service.

- First QH-50 DASH (Drone Anti-Submarine Helicopter) is delivered to the Navy, after completing tests aboard the USS HAZELWOOD (DD-531).

- U.S. Navy takes delivery of Sikorsky SH-3A SEA KING -- the first amphibious helicopter to be equipped as a hunter/killer for ASW. A total of 255 will be produced. The SH-3A carries AQS-10 dipping sonar.

- THRESHER (SSN 593) is commissioned. This class is the first to [illegible] SUBROC with BQQ-2 sonar. Fourteen in the class [illegible] built by the end of the construction program [illegible]

1961 - Continued

- The last four SKIPJACK class SSNs are commissioned. A total of five were built.

- ESSEX class aircraft carrier ASW modernization under FRAM II (Fleet Rehabilitation and Modernization) begins (continues to 1966).

- LONG BEACH (CGN-9) is commissioned -- only one in class.

- Final ship of the COONTZ class (DDG-37) is commissioned.

- CHARLES F. ADAMS (DDG-2) commissioned. A total of 23 in class are built by 1964.

- Ten operational S2F squadrons in Atlantic Fleet and eight in Pacific; five ASW helicopter squadrons in Atlantic and four in Pacific.

1961

USSR

- SOVIET shift to forward deployment decided at this time (1961-1963).
- Extension of Soviet Fleet activity into the Norwegian Sea. Necessity of sustaining distant deployments is acknowledged.
- Decision is made to build the MOSKVA class anti-submarine cruiser to extend range of airborne ASW.
- First KYNDA class CG launching. Four are built in class.
- ROMEO class SS building is completed, after construction of only twelve. Deployment in Soviet home waters.
- PETYA I FF building begins. The first is probably completed in this year.
- Prototype of the HORMONE KA-25 ASW helicopter is shown.
- BE-10 MALLOW enters service.
- BADGER C first seen at Soviet Aviation Day display (adapted for launch of anti-ship cruise missiles).
- First of the NOVEMBER class SSNs is completed (1960-1961). It is the first Soviet nuclear powered attack submarine. Too noisy for good ASW operations.
- Construction of the first OSA guided missile patrol boat is completed. About 100 will be built by the end of the construction program.
- First Soviet SSBN forward deployment (HOTEL class).
- Construction of VANYA class coastal minesweepers begins. Seventy-three will be built.

1962

U.S.

- Cuban missile crisis -- Navy detects and tracks all six Soviet submarines deployed to area.

- Of the $14.59 billion Navy budget for FY 1962, $1.85 billion (12.7 percent) is for ASW.

- Five fully equipped POLARIS submarines are committed to NATO.

- First P3V-1 ORION is assigned to and received by Navy fleet squadron as replacement for P-2 NEPTUNE.

- First test launching of POLARIS A-3 (2,500 mile range) flight model.

- First S2F-3 TRACKERS are accepted by fleet squadron. They are capable of carrying JULIE and JEZEBEL sonobuoy detection systems.

- Fleet introduction of DASH (QH-50C) weapon system begins.

- SKATE and SEADRAGON (SSN-578 and SSN-584) rendezvous and surface together near the North Pole.

- INTREPID (CVA-11) and LEXINGTON (CVA-16) reclassified as CVSs.

- LEAHY (CG-16) is commissioned. Eight additional in class are commissioned by 1964.

- BAINBRIDGE (CGN-25) commissioned.

1962

USSR

- Building of HOTEL class SSBNs is completed after nine built (since 1958). Conversion from SS-N-4 system (300 nm range) to SS-N-5s with 700 nm range takes place from 1963-1967.

- GOLF SSB class construction is completed after 22 GOLF I and IIs built. Half are converted to carry the 700 nm SS-N-5 after 1967.

- First of the JULIETT class SSGs appears, carrying four SS-N-3 missiles, which must be surface launched. Production is later cut from 72 to 16.

- Construction of ECHO I class SSNs finished after only five are constructed.

- KASHIN class (DDG) delivery begins - first warship to rely entirely on gas-turbine propulsion.

- Building of the first KYNDA class CG is completed. The reduction of this class from 12 to 4 allows the conversion of eight KOTLIN class destroyers to missile destroyers with a strengthened ASW capability, using weapons procured for the KYNDA program. Proto-type conversion of KOTLIN class begins.

- First of SHERSHEN class patrol torpedo boats is laid down. Construction of the first in class is completed in 1963. About 49 are built for Soviet use by the end of the construction program.

1963

U.S.

- ASW is allocated $2.21 billion (or 15.1 percent) of the $14.66 billion FY 1963 Navy appropriation.
- A P3A ORION becomes the first patrol plane to make a non-stop transpacific crossing -- 5,135 miles.
- USS BELKNAP (DLG-26 - late CG-26) is launched. It is the first ship designed especially to carry DASH.
- Project SEAHAWK (ASW ship building) is canceled in favor of more specialized ships.
- THRESHER (SSN-593) sinks 240 miles from Boston.
- First firing of the 2,500 nm POLARIS A-3 missile from a submerged submarine.
- Navy discloses details of SUBROC.
- Both BRONSTEIN (FF-1037) class frigates are commissioned.
- DASH is deployed.
- Nuclear Test Ban Treaty is ratified.

1963

USSR

- First ECHO II SSGN is laid down. Like the JULLIETT, it carries SS-N-3 missiles, but its nuclear power plant gives it better characteristics for anti-carrier warfare.

- Thirteenth and last NOVEMBER class SSN enters service.

- Conversion of WHISKEY class to WHISKEY LONG BIN class SSG is completed (6).

- MOSKVA - the first Soviet helicopter carrier described as an "anti-submarine carrier" - is laid down. It had been developed in response to the POLARIS program, and designed to carry 18 KA-26 helicopters. One other in class - LENINGRAD - will also be built.

- Building of YURKA class minesweepers begins. Forty-seven will be built by completion of construction in late 1960s, succeeded by the NATYA class.

- First SHERSHEN class patrol torpedo boat completed.

1964

U.S.

- Navy announces an increase in ASW development expenditures, and assigns the ASW program a priority second only to POLARIS.

- Navy signs a contract with TRW-Space Technology Laboratories to "organize the diverse elements of ASW into an integrated system".

- Secretary of Defense McNamara announces a four to one U.S. superiority in ICBMs/bombers, and nearly two-to-one advantage in submarine launched missiles.

- Navy announces that the U.S. and Canada are engaging in the largest ASW exercise since World War II.

- Introduction of the S2F-3 TRACKER into the fleet is complete.

- Navy announces characteristics of the new Mark 46 anti-submarine homing torpedo. The first to be propelled by solid rocket propellent, it is to be launched from both ships and aircraft.

- The FY 1964 Navy appropriation is $14.45 billion; $2.11 billion (14.6 percent) is for ASW.

- Vice Admiral Charles B. Martell is named the first Director of Anti-submarine Warfare Programs (OP-95), and is charged with determining the Navy's ASW development and other needs.

- Navy awards contract for construction of twenty-six new class destroyer escorts designed for ASW (FF-1052, originally DE-1052).

- Navy awards contract for a new nuclear powered attack submarine -- the NARWHAL type (SSN-671).

- First deployment of the 2,500 nm POLARIS A-3 missile.

- Nine plane P3A squadrons sent to Far East in extension of anti-submarine patrol lines.

- Lockheed awarded contract for expanded P3A production.

- Three POLARIS missiles launched from submerged submarine using the new gas-steam launching system.

1964 - Continued

- BELKNAP (CG-26) is commissioned. Nine in class built by 1967.
- First of the GARCIA class (FF-1040) commissioned. Ten are constructed by the end of building program in 1968.
- Contract award for Mark 48 (MOD 0) torpedo.
- Studies begin for a new, extremely quiet SSN, leading eventually to GERALD LIPSCOMB.
- US/UK hold discussions about base at Diego Garcia in Indian Ocean.

1964

USSR

- Soviet military press acknowledges that the POLARIS threat is greater than that of CVAs.

- The maritime reconnaissance and ASW aircraft BE-12 MAIL enters service. Ninety will be in service in 1977.

- First KRESTA I class cruiser is laid down. It has a strengthened anti-aircraft and anti-submarine defense capability over its predecessors, and it is the first Soviet ship to be called a "large anti-submarine ship". It is designed to carry on-board helicopters and the SS-N-3 SSM.

- First substantial deployment of Soviet surface ships in the Mediterranean, accompanied by pressure on Egypt for the use of support facilities. This may well be related to a perceived need to patrol the Mediterranean operating areas of POLARIS SSBNs.

- In 1963-1964, decision made to develop a long-range SLBM with a capability of striking at North America from the safety of home fleet areas. This is ultimately the 4,200 nm SS-N-8, fitted into the DELTA class SSBN with delivery beginning in 1973. Decision is also made at this time to fit the 1,300 nm SLBM (SS-N-6) in the YANKEE class SSBN (delivery to begin in 1968).

- MIRKA I/II class FF building begins. This is an improved version of the PETYA class. Twenty will be built by the end of the construction program.

- Building of the PETYA class FF is complete after construction of 45-49. The PETYA is the first "small anti-submarine ship" (building began in 1960).

- LENINGRAD (MOSKVA class helicopter carrier) is laid down.

- GOLF II class SSB created. (GOLF is refitted for SS-N-5 missiles via alteration in the sail.)

- Construction of T58 class minesweepers ends after 20 built.

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1965

U.S.

- President Johnson announces POSEIDON missile development in annual defense message. Lockheed named prime contractor.

- Results of THRESHER investigation made public. Navy is cited for allowing the submarine to go to sea in spite of faulty design and workmanship.

- Despite cuts in Army and Air Force budgets, Navy receives an increase in R&D funds for ASW.

- US/USSR trade complaints about harassment of shipping.

- Indo-Pakistani conflict.

- Bombing of Hanoi. Strikes on North Vietnam by aircraft from CORAL SEA, (CVA-43), HANCOCK (CVA-19) and RANGER (CVA-61) signify increased U.S. involvement in hostilities.

- Of a FY 1965 Navy appropriation of $14.86 billion, $2.06 billion (13.9 percent) is for ASW.

- Navy V/STOL aircraft shown for the first time.

- SH3A helicopter sets world's distance record.

- In a public announcement, Vice Admiral Martell announces that Soviet submarines are no longer acting in a strictly defensive role, but are freely operating in the Mediterranean, Norwegian and Philippine Seas. He cites recent Soviet operations in the Norwegian Sea that made use of more submarines than are available in the entire U.S Atlantic Fleet. He further notes that the Soviet Union has built 150 long-range submarines in the last five to ten years.

- Improved DASH (QH-50D) is introduced.

- The GLOVER (AGDE-1) is launched and commissioned -- an experimental ship for testing ASW weapons and equipment.

- ASW Fighter Squadron One (VFS-1) is commissioned to provide air defense detachments to CVSs, flying A-4 SKYHAWK aircraft.

1965 - Continued

- Navy takes delivery of Mark 46 torpedoes.
- Production and operational deployment of SUBROC begins.
- (Mid-60s) CAESAR begins to be augmented by the newer, long-range SOSUS system.

1965

USSR

- First KRESTA I class missile cruiser is launched -- the first claimed by Soviets to be capable of operating alone beyond range of shore-based air cover.

- Construction of first ECHO II class SSGN is completed. Twenty-nine will be built by the end of construction program.

- First Soviet communications satellite (SATCOM) - MOLNIYA-1 is launched.

1966

U.S.

- Secretary of Defense announces that the Administration will recommend immediate production and deployment of the POSEIDON missile, which is longer-ranged than the POLARIS.

- USS INTREPID (CVS-11) switched from anti-submarine role to act in attack role in Vietnam.

- USS LAKE CHAMPLAIN (CVS-39) decommissioned, leaving only eight CVSs on active duty: four in Atlantic (including the training carrier LEXINGTON) and four in Pacific.

- Anti-submarine Warfare allocated $1.94 billion (10.1 percent) of the $19.2 billion Navy appropriation.

- DoD announces development of a helicopter radar system which will affect helicopters' capability to fly at night and in fog.

- Lockheed is awarded contract for P3B.

- Grumman awarded contract for S2E TRACKER aircraft.

- The first seven STURGEON class SSNs are launched (including the STURGEON, SSN-637). By 1975, 37 STURGEON class will be commissioned.

- Institute of Strategic Studies reports claims that the Soviet Union now has 400 submarines, 40 of which carry strategic missiles.

- The 41st and last authorized POLARIS-type submarine is launched (WILL ROGERS -- SSBN-659).

- XC 142Z V/STOL aircraft is successfully tested off the BENNINGTON (CVS-20).

- Lead ship of the BROOKE class (FFG-1) commissioned. Six built by 1967.

- First delivery of SH-3D SEA KING.

- LAAV (Light Airborne ASW Vehicle) program begins -- precursor to the LAMPS program.

1966

USSR

- At XXIII Congress, the Soviet Union commits itself to further forward deployment.

- In Red Star, officials claim that a "squadron" of Soviet submarines circumnavigated the globe without detection by U.S. forces.

1967

U.S.

- Arab-Israeli Six Day War.
- Officials disclose that latest U.S. missiles (POSEIDON) will have multiple independently targetable warheads.
- Secretary of the Navy announces that 31 of the Navy's 41 POLARIS submarines will be converted to carry POSEIDON missiles.
- $1.76 billion of the Navy's FY 1967 appropriation of $21.2 billion (8.3 percent) is allocated to ASW.
- Carrier force: eight CVSs, fifteen CVAs during 1967.
- NARWHAL (SSN-671) is launched.
- TRUXTON (CGN-35) is commissioned.
- New U.S. production of SH-3 series is terminated with the FY '967 procurement of SH-3Ds.
- Discussions on the experimental Surface Effect Ship (SES) program begin.
- Lead ship of the STURGEON (SSN-637) class is commissioned. Thirty-seven will be built before construction ends in 1975.

1967

USSR

- Gorshkov named Admiral of the Fleet of the Soviet Union.
- Construction of ECHO II class SSGNs is completed. Deployment will be evenly divided between Pacific and Northern Fleets.
- JULIETT class SSG construction is complete. Sixteen built between 1962 and 1967.
- First of the VICTOR I class SSNs enters service - the majority will be deployed with the Northern Fleet. VICTOR is believed to have an ASW role as its primary mission. Sixteen will be built.
- Testing of the 1,300 nm SS-N-6 ballistic missile is completed and ready for installation in the YANKEE class.
- First YANKEE class SSBN is laid down. Thirty-four will be built by completion of construction in 1974. (The average construction rate of five per year shows its high priority.)
- Conversion from KRUPNY class DDG to KANIN class begins. KRUPNY was designed to attack surface ships: KANIN is an ASW ship.
- Public appearance of the first Soviet V/STOL aircraft - the Yakolev FREEHAND.
- HORMONE KA-25 enters service; to be carried aboard MOSKVA and LENINGRAD.
- Construction of MOSKVA is completed.
- First of the STENKA class patrol craft is laid down.

1968

U.S.

- NATO inaugurates new air command to search for Soviet ships and submarines in Mediterranean.

- DoD announces that 50 ships and 8 naval air squadrons (involving 100 ASW aircraft) will be deactivated due to FY 1969 expenditure reductions. Thirty two of the deactivated ships will be from the Atlantic Fleet, 18 from the Pacific Fleet.

- Special subcommittee of the House Armed Services Committee lends support to proposal to continue SSN production after 1969, by which time all 69 authorized will have been built. Navy recommends that construction be expanded to a total of 100-110.

- Much Congressional discussion of the "submarine gap" resulting from Soviet construction programs.

- Defense Secretary Clark Clifford announces the Administration's decision to proceed with "high speed" submarine development and begin construction of a "quiet turbine-electric drive-submarine". The result was the contract signed with General Dynamics for the LIPSCOMB, SSN-685 (1970).

- USS SCORPION (SSN-589) lost at sea.

- USS RANDOLPH (CVS-15) deactivated.

- "Contract definition" begins for VSX (developmental anti-submarine) weapon system to replace the S2 TRACKER (becomes S3A).

- Navy appropriation for FY 1968 is $20.8 billion; $1.41 billion (6.8 percent) is for ASW.

- First P3C flight. The P3C is an advanced version which includes the A-NEW system that integrates all ASW information and permits retrieval, display and transmission of tactical data.

1968

USSR

- USSR indicates its willingness to begin strategic arms limitation talks.

- First CHARLIE class SSGN with eight SS-N-7s is delivered. It is a considerable advance over its predecessor, the ECHO class, with a speed of 30 knots and organic missile system control. CHARLIE class is also capable of launching its missiles when submerged. Eleven will be built by completion of construction.

- First four YANKEE class SSBNs are completed and deployed to the U.S. eastern seaboard. (As the number of YANKEEs increases in subsequent years, others are deployed to California coast). As built, the YANKEEs carry sixteen SS-N-6 missiles with a 1,300 nm range.

- Construction of first BRAVO class SS is completed.

- KRESTA I production terminated, signifying the transfer of the anti-ship mission from KYNDA/KRESTA I classes to the submarine force. Future ships (KARA, KRIVAK, KIEV, KRESTA II) will be charged primarily with ASW, carrying SS-N-14 missiles and variable depth sonar.

- KRESTA II class CG building begins. Nine will be built. The KRESTA II class carries the dual-purpose ASW and surface-to-surface SS-N-14 and surface-to-air SA-N-3.

- SS-N-14 missile is introduced. It will be deployed on KIEV, KARA, KRIVAK and KRESTA II classes.

- LENINGRAD (MOSKVA class) is completed.

- GOLF class SSB sinks in Pacific.

1969

U.S.

- Due to a cut in FY 70 defense expenditures, the Navy will deactivate more than 100 ships, including the BENNINGTON (CVS-20) and KEARSARGE (CVS-33).

- Contract awarded for 33 DD-963 destroyers. These are the first escorts to carry manned helicopters (two SH-3 LAMPS I).

- DASH program is phased out with no substitute designated.

- Contract awarded for development of S3A -- a follow-on to S2 series.

- FY 1969 Navy appropriation is $21.6 billion; $1.31 billion is for ASW (6.1 percent).

- Navy announces that USS TICONDEROGA (CVA-14) will be overhauled and reconfigured as CVS to replace the HORNET (to be deactivated in March 1970).

- *USS ESSEX (CVS-9) and USS TRITON (SSN-586) are decommissioned as part of Navy's expenditure reduction.*

- Navy announces that YORKTOWN (CVS-10) will be deactivated in June 1970.

- INTREPID (CVS-11), having acted in an attack role sinc 1966, to go into overhaul to replace ESSEX (CVS-9).

- SHANGRA LA (CVA-38) reclassified as CVS, although it will continue to function in a light attack role.

- Lead ship of the KNOX class (FF-1052) is commissioned. Designed originally to operate with DASH helicopters, KNOX class frigates were later modified for LAMPS. Total of 46 constructed by the end of the building program in 1974/1975. Equipped with SQS-26 sonar and designed for SQS-35 VDS.

- P3C enters service.

- NARWHAL (SSN-671) is commissioned.

1969

USSR

- Building of MIRKA I/II class complete after construction of 20.

- GRISHA I class corvette production begins.

- Construction of the first NANUCHKA class guided missile patrol boat is completed. NANUCHKAs carry the SS-N-9 (SIREN) surface-to-surface missile, which was specially designed for it, as well as surface-to-air missiles. Sixteen will be built.

- MAY (IL 38) anti-submarine/maritime patrol aircraft put into service. It is a conversion of IL-18 COOT. About 60 will be in service by 1977.

- The existence of the BACKFIRE bomber is first acknowledged in the U.S. (prototype observed in 1970; testing, trials, and evaluation by 1973).

- SS-NX-13 submarine launched anti-ship ballistic missile tested with 300-400 mile range.

1970

U.S.

- Pentagon reports that the Soviet Union is now building missile submarines at the rate of eight per year.
- General Dynamics receives a contract for construction of an experimental electric-drive nuclear submarine (LIPSCOMB).
- ASW allocated $2.18 billion of the $22.5 billion FY 1970 Navy appropriation (9.7 percent).
- USS DAVIS (DD-973) recommissioned after ASW modernization.
- 1970 carrier force: four CVSs, 15 CVAs.
- A U.S./USSR "understanding" is reached precluding Soviet use of Cuba as a nuclear submarine base (after evidence of extensive Soviet deployment in area).
- First underwater firing of POSEIDON missiles.
- Navy announces plans to retire 58 additional ships, including the SHANGRI LA (CVS-38), which had been acting in a limited attack role.
- House Appropriations Committee gives Navy an additional $417.5 million for new submarines/surface ships not included in DoD appropriation request.
- Destroyer JONAS INGRAM is recommissioned after one year ASW modernization.
- USS KEARSARGE (CVS-33), BENNINGTON (CVS-20), and HORNET (CV-12) are decommissioned.
- First three of SPRUANCE class approved for construction in 1970 program.
- Conversion of H-2s to SH-2D/F for LAMPS programs begins.
- Navy proposes the Sea Control Ship.
- Contract award for MK 48 Mod 1 torpedo production -- can be operated with or without wire command guidance and uses active and/or passive acoustic homing. It is called the "most complex torpedo ever designed."

1970 - Continued

- Conversion of BENJAMIN FRANKLIN and LAFAYETTE SSBN classes to carry the POSEIDON missile begins. Thirty-one will be completed by 1975.

1970

USSR

- ALPHA class SSN prototype is delivered. It is a high speed, deep diving, titanium alloy submarine.
- Soviet nuclear attack submarine sinks in the Atlantic.
- First OKEAN exercise takes place - largest peacetime naval maneuvers in history, involving 200 ships.
- First TURYA class torpedo patrol hydrofoil is laid down (first is completed in 1972). A total of 26 will be built.
- NATYA class minesweeper first reported. NATYA is a successor class to YURKA.
- First KRESTA II class CG becomes operational.

1971

U.S.

- P-3 sets new world's distance record: 7,010 miles.
- USS EDWARDS (DD-950) recommissioned after ASW modernization.
- FY 1971 Navy appropriation: $21.7 billion. ASW allocation is $2.38 billion (11 percent).
- Carrier force: 4 CVSs, 14 CVAs.
- First flight of SH-2D (interim LAMPS version). Operational deployment begins with assignment of unit to USS BELKNAP.
- Contract signed for SH-3H conversion (from SH-3G) involving the addition of new ASW equipment (light weight sonar, active and passive sonobuoys, MAD and radar). Will continue into 1980.
- SARATOGA deploys to test the concept of converting CVAs to multipurpose carriers (CVs).
- Based on successful SARATOGA deployment, decision is made to convert all post-war CVAs to CVs by 1977, limited by the rate that new S-3A aircraft become available.
- LAMPS I modifications of FF-1040, FF-1052, and FFG-1 classes begin.
- DoD decision to upgrade ocean surveillance results in the study of the Suspended Array Sub-System (SASS) -- an attempt to place SOSUS type sensors in the middle of ocean basins. SASS was never produced.
- Initiation of Computer Assisted Array Processing (CAAP). Program investigated a computer system to process SOSUS data.

1971

USSR

- PAPA SSGN prototype is delivered. PAPA may be an experimental type.

- Soviet naval activity in the Mediterranean and Norwegian Sea levels off.

- First ship of the variable depth sonar-equipped KRIVAK class appears.

- KIEV VTOL carrier is laid down.

- First VICTOR II class SSN is laid down (completed in 1973). VICTOR II was first thought to be an entirely new class called UNIFORM.

- DELTA I class SSBN becomes operational (conversion of YANKEE class). DELTA I is designed to carry 12 SS-N-8 missiles with a 4200 nm range - as a result, DELTA I can cover its targets from the Norwegian Sea and Western Pacific. About 17 Delta Is will be constructed.

1972

U.S.

- SARATOGA is redesignated as the first general purpose CV on 30 June. Carriers now include 3 CVSs, 14 CVAs, and 1 CV.

- Out of a Navy appropriation for FY 1972 of $21.4 billion, $3.41 billion (15.9 percent) is for ASW.

- Prime contractor is selected for the CAPTOR ASW mine.

- TRIDENT program is announced; Senate approves construction program.

- Construction of DD-963 destroyers 6 months ahead of schedule.

- Lockheed receives new contract for P-3C aircraft.

- USS WASP (CVS-18) is decommissioned.

- MK 48 Mod 1 torpedo becomes operational. MK 48 is a high performance ASW weapon.

- Contract awarded for production of S3A aircraft -- a significant improvement in area search capability and contact conversions over the S2F. Originally, only enough to equip the 6 ASW carriers expected to be operational at time of S3A deployment were ordered -- but 187 were finally authorized through FY 1975. By 1977, aircraft were operating in the Atlantic, Pacific and Mediterranean, and 12 of the 13 planned VIKING squadrons were equipped.

- USS GUAM (LPH-9) is designated as Interim Sea Control Ship for testing and evaluation. It will carry SH-3H and AV-8A aircraft.

- About 20 NAVFACS (Naval Facilities (SOSUS/CAESAR)) now in existence.

1972

USSR

- KASHIN DDG modernization begins.
- Delivery of first of four TANGO class SS begins. TANGO carries a SUBROC type anti-submarine weapon system and torpedoes.
- GRISHA II class corvette appears.
- ZHENYA class coastal minesweeper first reported.
- Production of EVGENYA class inshore minesweeper begins.
- First TURYA class torpedo patrol hydrofoil is completed.

1973

U.S.

- CVS service ends with the final deployment of the INTREPID.
- ASW receives $3.34 billion or 13.2 percent of the $25.3 billion Navy appropriation.
- LIPSCOMB type SSN is launched. Quieting improvements incorporated in LOS ANGELES class design.
- KITTY HAWK (CVA-63) reclassified as CV after modification for S-3 VIKING aircraft and SH-3 SEA KING helicopters.
- INDEPENDENCE (CVA-62) redesignated as CV on 28 February.
- S-3 VIKING delivered to Navy for testing.
- Navy announces plans to mothball INTREPID (CVS-11) and nine destroyers.
- First SPRUANCE class destroyer is launched -- the first of 30 authorized in the class.
- The lead ship of the OLIVER HAZARD PERRY class is authorized in the FY 1973 program.
- First deployment of SH-2F LAMPS.
- Yom Kippur War. Soviet ships (96) outnumber Sixth Fleet in the Mediterranean.

1973

USSR

- First of three VICTOR II class SSNs commissioned. It carries the SS-N-15: a SUBROC-type, submerged launch, air flight, rocket-propelled weapon which delivers an anti-submarine, nuclear armed homing torpedo or depth bomb up to 25 miles.

- U.S. Secretary of Defense acknowledges DELTA II SSBN construction.

- First deployment of the KARA class large ASW ship.

- First modification of the KILDIN class DDG is complete.

- KIEV is launched.

- BEAR F (TU-95) (advanced maritime version) is first identified by observers. About 15 are operational by 1977.

- SONYA class coastal minesweeper first reported.

1974

U.S.

- Navy appropriation for FY 1974 is $26.9 billion. The ASW allocation is $3.09 billion (11.5 percent).

- Carrier force includes 14 CVAs, 3 CVs.

- Two LOS ANGELES class SSNs (SSN-688) launched, including the LOS ANGELES. Thirty-eight are expected to be commissioned by 1985.

- LIPSCOMB type SSN (SSN-685) is commissioned.

- CVA-67 JOHN F. KENNEDY reclassified as CV after conversion for S-3 VIKING and SH-3 SEA KING helicopters.

- First VIKING S-3A delivered to Navy by Lockheed.

- First of CALIFORNIA class CGN commissioned (2 by 1975).

- First operational deployment of Grumman E-2C aboard the SARATOGA.

- Sea Control Ship program canceled for lack of suitable VTOL aircraft and budgetary limitations.

- Defense Advanced Research Projects Agency proposes the SEA GUARD program utlizing the Burrough's ILLIAC IV computer to process SOSUS contacts. The dramatic results led to increased SEA GUARD funding in 1975 and 1976. Program also included testing of new long hydrophone arrays.

1974

USSR

- YANKEE SSBN production ends after 34 built.
- Production of MI-14 HAZE ASW helicopter begins.

1975

U.S.

- S-3A is first deployed on USS JOHN F. KENNEDY (CV-67). It is called "the single largest program, and probably the most expensive development ever undertaken in ASW."

- The FY 1975 Navy appropriation is $27.9 billion. ASW related activities receive $2.92 billion of the total (10.5 percent).

- CAPTOR scheduled to enter service.

- The final two STURGEON class SSNs are commissioned.

- NIMITZ (CVN-68) commissioned.

- EISENHOWER (CVAN-69), NIMITZ (CVAN-68), and ENTERPRISE (CVAN-65) reclassified as CVNs on 30 June. FORRESTAL (CVA-59), RANGER (CVA-61), MIDWAY (CVA-41), HANCOCK, FRANKLIN D. ROOSEVELT (CVA-42), CORAL SEA (CVA-43), ORISKANY (CVA-34) redesignated as CVs on 30 June.

- CONSTELLATION (CVA-64) and AMERICA (CVA-66) reclassified as CVs prior to modification (30 June).

- SPRUANCE (DD-963) commissioned and deployed. Equipped for LAMPS helicopters (SH-2D) and SQS-53 (bow mounted sonar). Fifteen in class are scheduled to be in operation by mid-1978. The SPRUANCE class contains the same ASW equipment as in the PERRY class, as well as an acoustic torpedo decoy system.

- Contract awarded for advanced development model of an escort towed array sensor.

1975

USSR

- BACKFIRE (TU-V-G) begins to operate in maritime reconnaissance role.
- V/STOL FORGER is evaluated aboard KIEV.
- OKEAN 75 exercises are held.
- DELTA Is patrol in Barents Sea.
- MI-14 HAZE land-based anti-submarine helicopter enters service at about this time. Sensors may include dipping sonar and sonobuoys.

1976

U.S.

- Carrier force now includes 3 CVAs, 10 CVs.
- First of the VIRGINIA class CGNs commissioned (four commissioned by 1980).
- Conversion of H-2 to SH-2D/F LAMPS complete.
- First of the P3C UPDATE program aircraft enters service (new electronics and software).
- ORISKANY (CV-34) is decommissioned.
- Contract awarded for prototype Surface Effect Ship (SES).
- LOS ANGELES (SSN-688) is commissioned. The LOS ANGELES class includes significant advances in sensor and countermeasure systems, a central computer complex to integrate navigational and fire control data processing, and improved noise reduction.
- Out of a $31.5 billion Navy appropriation, ASW receives $3.24 billion (10.3 percent).
- After years of competition General Electric is selected as contractor for MSS (Moored Surveillance System) -- air dropped sonobuoys designed to moor in deep water, acting as a semi-permanent barrier (up to 6 months). MSS is primarily to be used in high interest areas such as the Dardenelles, Baltic approaches, Straits of Gibraltar and G-I-UK Gap. Soon after the award, Navy re-defines the product to include DIFAR and VLAD (Vertical Line Array DIFAR).

1976

USSR

- DELTA II SSBN begins delivery. The DELTA II is the largest submarine in the world, carrying 16 vertical launchers for the 4200 nm SS-N-8 missile. The DELTA may be assigned to carry the new SS-N-18 missile.

- KIEV becomes operational. It carries SS-N-12 missiles with a range of about 250 miles and probably hull-mounted sonar and VDS. The ship can carry 30-35 V/STOL aircraft and ASW helicopters (KA-25), depending on the mix.

- Deployment of YAK-36 FORGER V/STOL aboard the KIEV. It is a variation of the early V/STOL aircraft YAK FREEHAND.

- DELTA II sea trials put Soviet Union in violation of SALT limits on submarine launchers.

- SS-NX-18 missile is tested. The SS-NX-18 is thought to be capable of carrying 3 warheads to a range of 4600 nm.

- CHARLIE II SSGN enters service.

1977

U.S.

- Designation of LAMPS III helicopter -- SH-60B. The SH-60B is a multisensor vehicle relying on sonobuoys, IR and MAD. Two are to be deployed on each DD-963 and FFG-7.

- FY 1977 Navy appropriation is 36.5 billion. ASW receives $4.23 billion (11.6 percent).

- Carrier Force: 2 CVAs, 11 CVs.

- EISENHOWER (CVN-69) commissioned.

- First P-3C Update II enters service -- Harpoon missile and control system; improved ASW electronics.

- Development begins for P3C Update III; its further improved ASW electronics include an advanced signal processing system -- PROTEUS -- which replaced DIFAR.

- OLIVER HAZARD PERRY (FFG-7) commissioned. The PERRY class are the first U.S. surface warships with gas-turbine power, and carry the MK 13 launcher and Standard/Harpoon missile, the PHALANX close in defense system and designed for TACTASS. The PERRY class is also LAMPS equipped.

- SOSUS upgraded at US coastal and Azores sites.

- Final testing of VLAD (Vertical Line Array Difar).

- SVLA (Steered Vertical Line Array) enters development.

- First simultaneous deployment of nuclear task group in both Atlantic and Pacific fleets.

- Navy displays new XFV-12A VTOL prototype.

- Procurement of first ships designed to use SURTASS.

1977

USSR

- CHARLIE I/II class SSGN construction is complete after 15 built.
- Construction of VICTOR class SSNs ends.
- After 60 are built, the FOXTROT construction program continues for export.
- Reports of Soviet construction of a new class of nuclear-powered ballistic missile submarines similar to the planned TRIDENT II class, called TYPHOON.
- Reports of Soviet problems with the YAK-36 V/STOL aircraft, causing a fire on the flight deck of the KIEV.

1978

U.S.

- Of a $39.7 billion Navy appropriation, ASW received $3.81 billion (9.6 percent).
- First AEGIS ship proposed FY 1978.
- DoD requests funding for development of P-3X aircraft (FY 1978).
- Major funding approved for SURTASS (Surveillance Towed Array Sonar) development in FY 1978 appropriation.
- First satellite of Navy's Fleet Satellite Communication system is launched.
- BQR-15 Towed Array Sonar becomes operational on submarines.
- Problems with funding for Tactical Towed Array Sonar development.

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1978

USSR

- Soviet naval build-up in Indian Ocean.

1979

U.S.

- The FY 1979 Navy appropriation is $41.7 billion; $4.86 billion is for ASW (11.7 percent).

- Contract for model development of ALWT (Advanced Lightweight Torpedo) is signed. This weapon system will replace the MK-48 torpedo as the Navy's standard, lightweight ASW weapon. It will probably be placed on P-3, S-3 and LAMPS aircraft, as well as ships using the ASROC launcher. ALWT's initial operating capability (IOC) is the late 1980's.

- Award made for production of the MK-46 MOD 5 torpedo. This is the only light torpedo available until the ALWT becomes operational. Under another contract, MK-46 MOD 2s are being converted to MOD 5s under the near-term improvement program -- ordnance alternation (NEARTIP/ORDALT).

- Concept formulation for IWD (Intermediate Water Depth) mine to fill the gap between the shallow water QUICK STRIKE mine and the deep water CAPTOR mine. The IWD mine will be programmable to attack both submarines and surface ships.

- Proposals are received for improvement of the heavyweight submarine launched MK-48. IOC is the late 1980s.

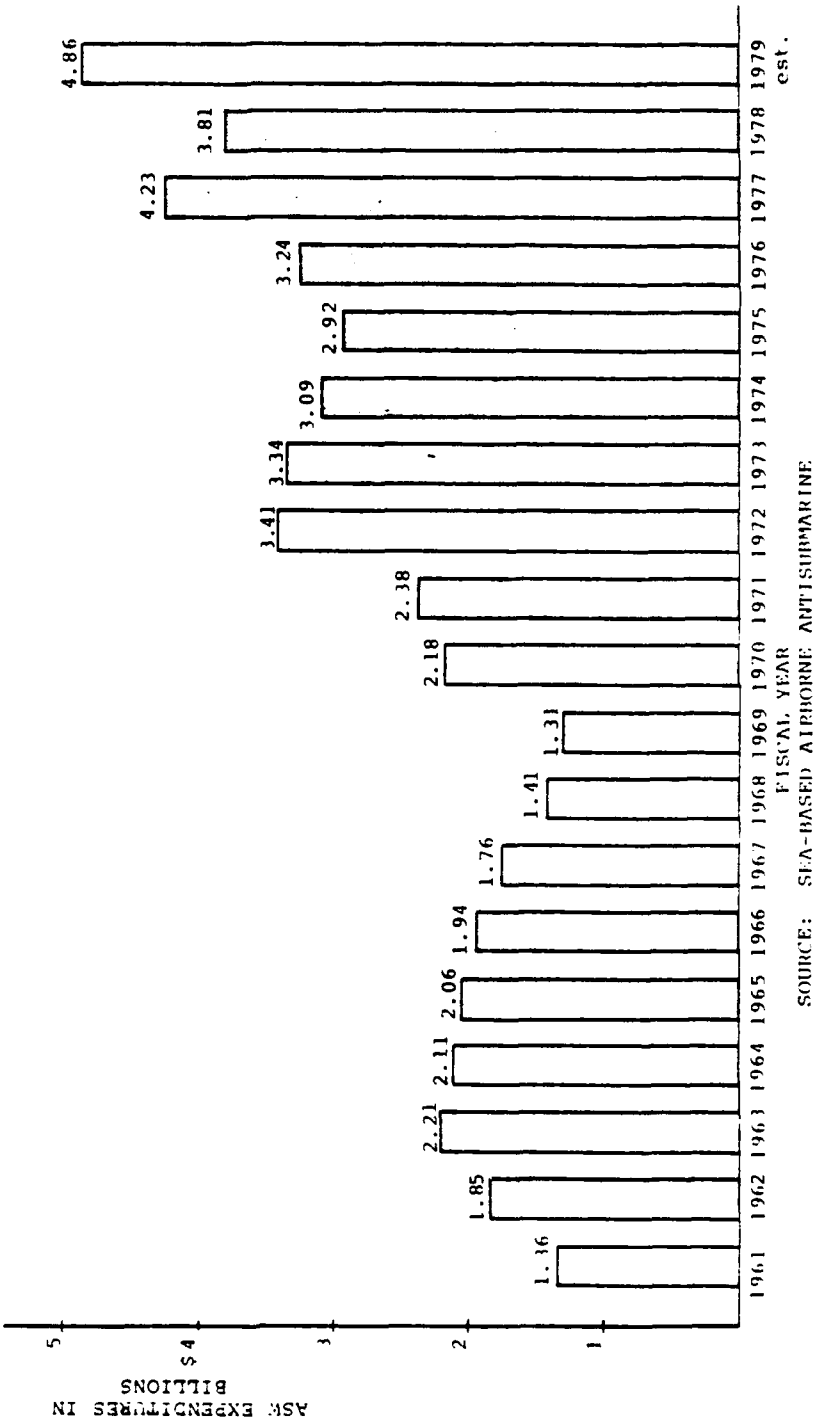
- New submarine-launched ASW stand-off weapon in concept formulation phase.

- Contract award for Rapidly Deployable Surveillance System (RDSS).

- Surface Effect Ship (SES) program is deleted from FY 1980 budget.

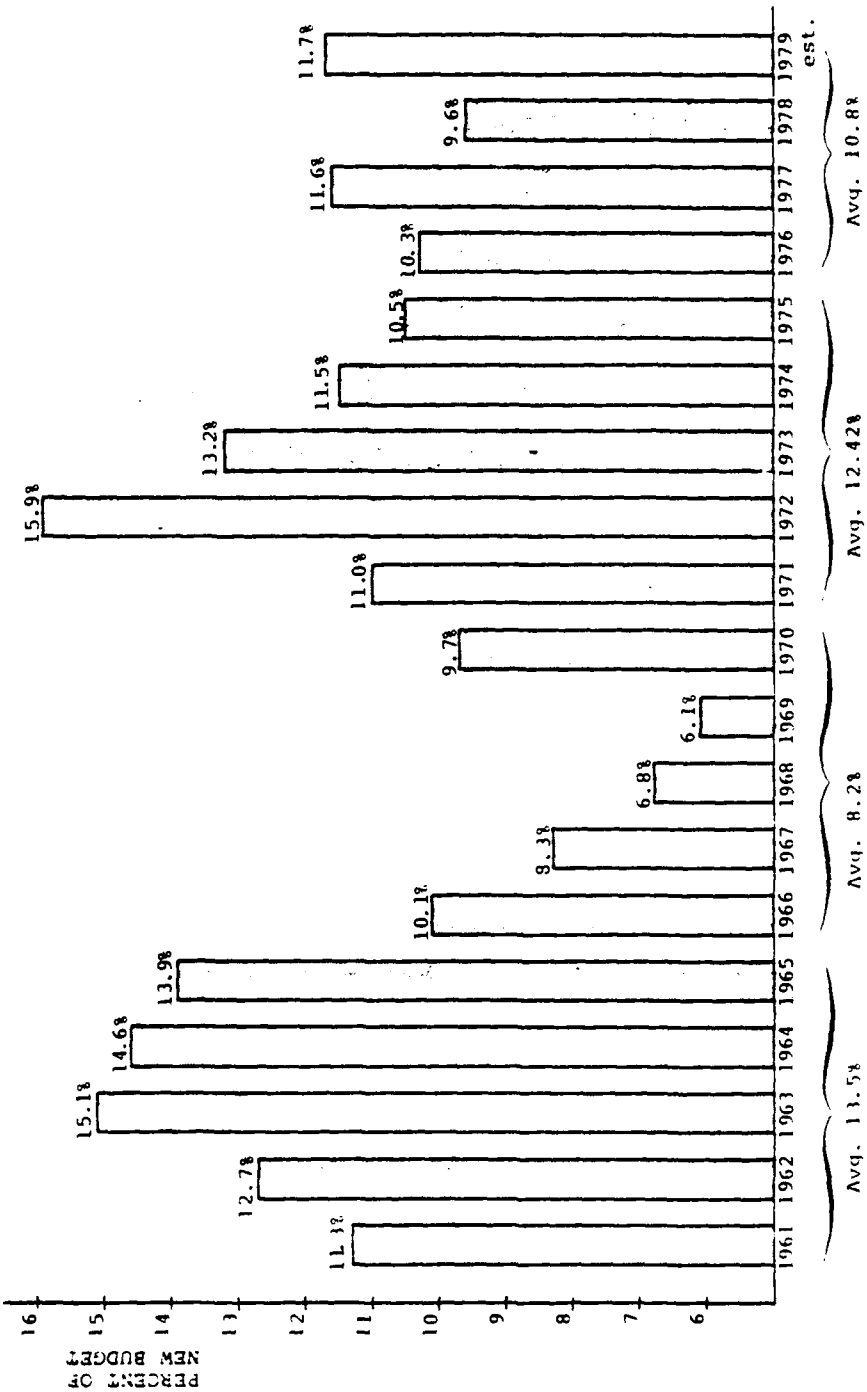
- Discussions begin on developing a new nuclear powered attack submarine, slower and cheaper than the LOS ANGELES class (SSN-688).

FIGURE V-1. U.S. ASW EXPENDITURES: 1961-1979
(in billions)

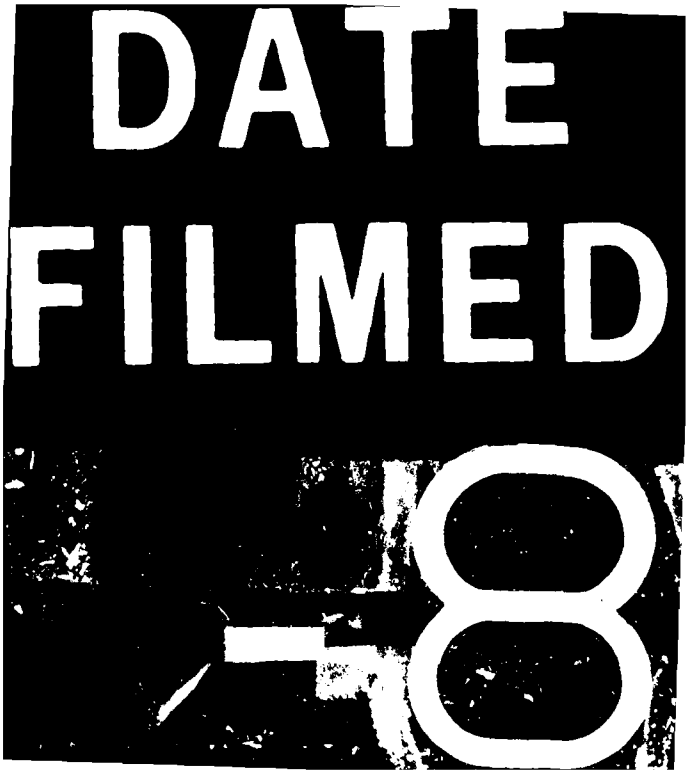


SOURCE: SEA-BASED AIRBORNE ANTISUBMARINE WARFARE R.F. CROSS ASSOCIATES FOR OP-095 (1978)

FIGURE V-2. ASW EXPENDITURES AS PERCENTAGE OF NAVY BUDGET: 1961-1979



SOURCE: SEA-BASED AIRBORNE ANTISUBMARINE WARFARE R.F. CROSS ASSOCIATES FOR OP-095 (1978)


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