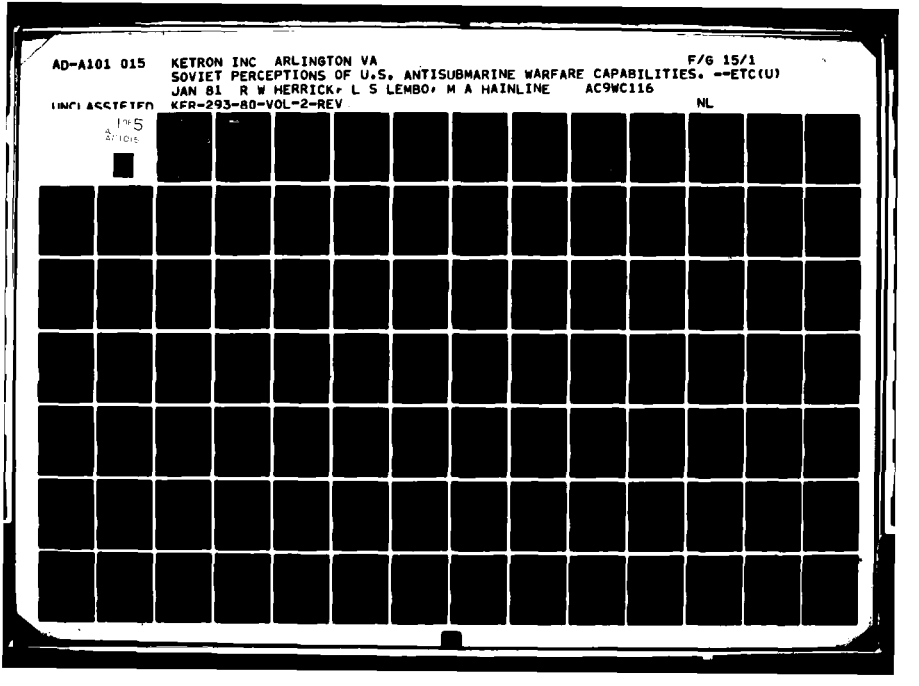
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SOVIET PERCEPTIONS OF U.S. ANTISUBMARINE WARFARE CAPABILITIES

VOLUME II: ANALYSIS AND CONCLUSIONS

KFR 293-80

30 September 1980

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PREPARED FOR

U.S. ARMS CONTROL AND DISARMAMENT AGENCY

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This study addresses four primary questions: How frequently and in what contexts do the Soviets discuss U.S. ASW capabilities? How have the frequency and nature of Soviet commentaries on the subject changed? What U.S. ASW programs are the particular focus of Soviet commentary? What is the Soviet perception of U.S. anti-submarine warfare capabilities and how has it changed over the period 1960 - 1980?

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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b. Identifiers/Open-Ended Terms

SOSUS, Attack Submarines (SSN), ASW mines, P-3 Orion, Strategic ASW

c. COSATI Field/Group: Military sciences (Antisubmarine warfare) 15 01

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VOLUME II: ANALYSIS AND CONCLUSIONS

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AC9WC116-II

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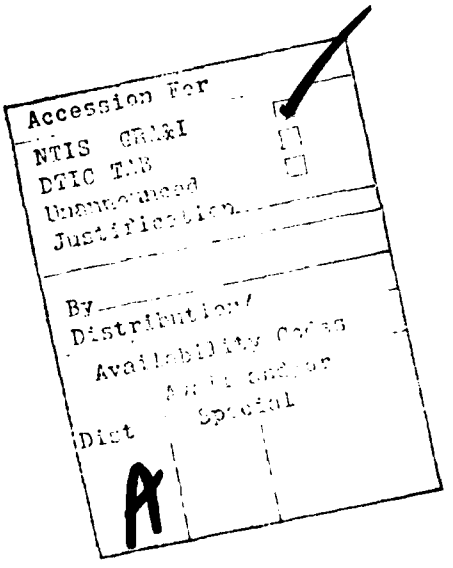
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PART I

PREFATORY MATERIAL



A. INTRODUCTION

PURPOSE OF THE REPORT

This draft final report is submitted in partial fulfillment of the requirements of Contract No. AC9WC116 with the U.S. Arms Control and Disarmament Agency. It attempts to answer by the use of content analysis the following four questions:

- What is the Soviet perception of U.S. anti-submarine warfare (ASW) capabilities and how has it changed over the period 1961-1979?
- How have the frequency and nature of Soviet commentaries on the subject changed?
- How frequently and in what contexts do the Soviets discuss U.S. ASW capabilities?
- What U.S. ASW programs are the particular focus of Soviet commentary?

Content analysis is actually a group of methodologies, not a single approach. It is defined as "any research technique for making inferences by objectively and systematically identifying specified characteristics within a text".[1] There exist two main streams of content analysis, one of which is based on quantitative counts of content indicators and the other of which depends upon the qualitative interpretation of discrete content items. Each of these streams has strengths and weaknesses which complement those of the other approach; for this reason, both have been employed in this study.

[1]Stone, et. al., The General Inquirer, MIT Press, 1966, p. 5.

ORGANIZATION OF THE REPORT

This report is organized into four parts, along with an executive summary and appendices. The first part contains prefatory material which applies equally to both substantive portions of the work. It includes a general explanation of the two different approaches, a description of the data sources and a chronology of ASW developments. The second part describes the quantitative content analysis effort and its results, and the third does similarly for the qualitative analysis. The fourth part compares and contrasts the results of the two analyses. The appendices contain a variety of project materials and data.

B. AN INTRODUCTION TO CONTENT ANALYSIS

Content analysis originated before World War II as an effort to improve the documentary analyses used in many of the social sciences. The traditional methods of unsystematially reading documents, abstracting their content, and putting the data together without an explicit analytic scheme were rejected. In the new methodology, mensuration of data and quantitative analysis were employed to produce results which could be checked or replicated by another investigator.

Although versions of the original techniques had met with considerable success when employed in intelligence analyses of propaganda during the Second World War and continue to be used today, it has become progressively clearer that the early formulations of content analysis suffer from a number of mechanical and conceptual flaws. To overcome these, a new qualitative content analysis movement has emerged; although its techniques are also not troublefree, they constitute a useful and often vital supplement to quantitative research into communication content.

It can be said, therefore, that two major branches of content analysis exist today. Quantitative content analysis emphasizes the statistical analysis of the frequency of appearance of so-called content indicators. Qualitative content analysis focuses on the interpretation on an individual content indicator within a broad context of events, institutional relationsnips and communications.

QUANTITATIVE CONTENT ANALYSIS

Quantitative content analysis is a research technique that attempts to determine by the rigid definition of content variables and the structuring of hypotheses what is being said on a given topic by a given set of people at a given time. Analysts using the method aim at attaining reproducibility of results and claim that the tool will better achieve that goal than will the classical scholarly methods of textual analysis.

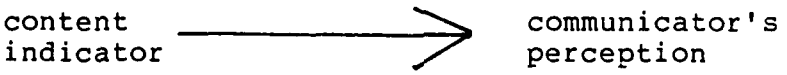
Given the ill-defined state of social science theory on human communication, the first stage of a quantitative content research project -- variable definition and hypothesis formulation -- is critical to the success of the entire effort. Among the goals which must be achieved at this early stage are the definition of the unit of content, the creation of coding rules to direct data collection and the bounding in time and space of the universe of communication

to be studied. These goals are achieved by a reading-in period. Through the use of classical methods of analysis applied during the reading-in stage, analysts gain a broad familiarity with the material which is to be analyzed.

The data generation stage is accomplished in two phases. In the first, known as pretesting, the variables identified during the reading-in period are checked and, if necessary, are refined. In the second, the coding rules are applied in processing the sources to generate data which later will be analyzed.

The actual generation of data is straightforward and needs litle description. Analysts read the material in the sample and record the appearance of symbols, or such other content indicators as are necessary, assigning them to categories according to the coding rules. Following completion of the phase, the data are then ready to be subjected to statistical analysis.

In the final stage -- statistical analysis -- inference is generally made according to a simple model:



For instance, a Soviet statement to the effect that SSBNs are invulnerable to detection and attack by hostile antisubmarine forces would be interpreted as reflecting the communicator's view that SSBNs are indeed invulnerable.

Weaknesses of Quantitative Content Analysis

Quantitative content analysis suffers from a number of mechanical and conceptual problems which make it wise to supplement it by additional analytic tools.

The most important mechanical problem is implied by the need for a pretesting phase of a quantitative content research effort. That is, there presently is no good theory which describes how humans select among a set of symbols to communicate perception. The state-of-the-art is such that iterative approaches often have to be adopted, with multiple extensive pretesting "runs" used to refine the hypotheses, symbols and coding rules until they are satisfactory. The result is that quantitative content research is frequently lengthy and expensive.

A second mechanical problem stems from the adoption of rigid symbol definitions and the use of statistical techniques by which an analyst strives to attain the specific

goal of reproducibility of results. These techniques aim at removing flexibility by symbol interpretation from analysis, although humans retaining the same perception might very well shift in what they say depending on the audience which they address. Quantitative analysis may therefore simply be unable to cope with such changes of communicator strategy or, at the least, it may lead to misinterpretation of what is meant.

A final mechanical difficulty arises when multi-media analytic efforts are undertaken. Comparisons of content between the media -- or even within a single medium -- can be perilous because of the structural differences which distinguish types of communication. For instance, it is difficult to make a comparative analysis of material concerning Soviet perceptions of U.S. hunter-killer submarines taken from speeches delivered over the radio, newspapers aimed at a general readership, and articles in professional journals, because structurally each medium places different limits on its coverage of a topic by shaping how its aspects are discussed and the degree of detail in which they are covered.

The worst of the conceptual difficulties of quantitative content analysis is that it is founded upon the assumption that all units of content are equal; that is, certeris paribus, if symbol y appears five times when symbol z appears twenty times, symbol z is more important than symbol y. This was demonstrated to be untrue during World War II, when analyses of German propaganda detected important shifts in elite perceptions based upon one appearance of a content indicator.

Finally, the simple model on which quantitative analysis is based is probably wrong in many areas of communication. For instance, elite perceptins are probably not directly reflected by content indicators in propaganda; a much more complex model is more realistic.

As stated above, quantitative content analysis is a useful technique especially because it moves the explication of content away from the old social science debate over the selection of relevant data and focuses attention of the data's implications. Nevertheless, the mechanical and conceptual flaws which it suffers usually lead to a loss of firmness in the research process as a series of "quick fixes" patch up conceptual holes or to a general loss of descriptive power. An alternative approach to that of the quick fix offers greater benefits, however; that is the approach of qualitative content analysis.

QUALITATIVE CONTENT ANALYSIS

Qualitative content analysis is more than supplementary to quantitive content research; its practitioners strive to produce scientifically valid results which can stand on their own. Its aim is to go beyond the simple description of content indicator frequency offered by quantitative techniques and lay bare the purposes for which a communication is made. Qualitative content analysis differs from its quantitative counterpart chiefly in assuming that single occurrences of symbols in goal-oriented communications can be significant; a further important difference is that it considers the full context in which a content indicator appears.

Qualitative content analysis of communications such as propaganda structures a research effort using a model of elite behavior such as the one shown below.

Situational Factors → Elite Assessment → Elite Perception → Speaker's Goal ⟶ Communication Content

Although this model still is quite abstract, it has considerably more descriptive power then does the simple two-step model of quantitive content analysis.

Qualitative content research is likely to proceed as follows: after either an extensive reading-in period or a quantitative content analysis effort, apparently important expressions of content are isolated. Taking into account the total context of the communication -- who delivered it, how it was delivered, and to whom it was delivered -- the analyst constructs a complete chain of events leading from one step to another as described by the model.

Qualitative content analysis is a useful tool because it escapes many of the mechanical and conceptual problems of quantitative techniques. It is inherently flexible, and therefore is sensitive to changes of communicator strategy. Because it allows the analyst to consider a complete communication, it enables both inference based on the subtleties of contextual interaction between the different parts of a message and comparison of content across media. Most importantly, it escapes the assumption that one symbol of content is never any more or any less important than another.

Nonetheless, qualitative content analysis remains prey to many of the same arguments used against traditional document analysis. The flexibility which is its strength is also a weakness; because it opens the way to analytic inter-

pretation of a statement, it also opens the way to analytic disagreement over a statement's meaning. This fault, and the danger of the "circularity" in reasoning -- i.e., the analyst's unconsciously selecting those supporting data which led him to a hypothesis in the first place and suppressing conflicting data -- are precisely the problems of traditional document analysis which the application of quantitative methods was intended to avoid. The result is that qualitative content analysis often cannot create results which are reproducible or upon which two different analysts can agree. However, the utility of the technique was proven in the prediction of enemy actions during the Second World War by analysis of propaganda. Furthermore, by combining both qualitative and quantitative content analysis, an analyst can supplement the weakness of one with the strength of the other. The lack of flexibility, sensitivity, and comparability inherent in the quantitative method is filled by that of the qualitative, while the dangers of inference introduced by the qualitative technique's reliance on analytic interpretation and ambiguous non-content data are similarly backstopped by the strengths of the quantitative method.

C. THF DATA SOURCES

COMPILATION OF THE BIBLIOGRAPHY

A preliminary bibliography of 476 Soviet articles and books potentially related to ASW was assembled and submitted to ACDA shortly after the contract award. This initial list comprised publications previously known to Ketron analysts and those located through a review of indices of pertinent journals.

In order to limit bias in the data base, a more thorough search of sources was subsequently conducted. The Full Bibliography was compiled through an exhaustive search of Soviet literature held by the Library of Congress; it includes every item located which was judged to concern submarine or antisubmarine warfare. Although this meant that many items potentially held no information on U.S. ASW capabilities, this approach was chosen both bacause preselection of sources would be costly and might bias the results and because it would provide one measure of the proportion of attention the Soviets devote to consideratin of U.S. ASW as compared to ASW topics in general.

The literature review uncovered a total of 853 sources spanning the years from 1960 to 1979. These entries are listed in the Full Bibliography in the appendices (Volume III) to this report.

SOURCES FOR CONTENT ANALYSES

The bibliography comprises entries from fifty-three books, twenty-four journals, twenty-six newspapers, stenographic records and speeches. Sources included in the Full Bibliography are shown in Table I-1. The total number of entries in each of the time periods* (1960-1965, 1966-1970, 1971-1975, 1976-1979) varies considerably, but a broad selection of material is represented in each. Table I-2 shows the breakdown of the bibliography in each time period according to source of the entry.

*The nineteen years of this study have been aggregated into four temporal periods corresponding to the timing of Communist Party Congresses. The approach was adopted because the data available will not support a year-by-year analysis and because shifts of opinion and policy in the Soviet Union tend to occur in conjunction with the Congresses.

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TABLE I-1

SOURCES APPEARING IN THE FULL ASW BIBLIOGRAPHY

NEWSPAPERS

Soviet Navy
Pradva
Izvestiya
Red Star
Pravda of the Ukraine
Turkemenian Spark
Labor
Soviet Lithuania
Leningrad Pravda
Baku Worker
Kazakhstan Pravda
People's Army (Bulgarian)
Communist of Tadzhikistan

JOURNALS

Agitator
Naval Digest
Soviet Soldier
International Life
Aviation and Cosmonautics
Rear and Supply of the Soviet Armed Forces
Technology and Armaments
World Economics and International Relations
Around the World
History of the USSR
Science and Life
Soviet Military Review
Soviet Patriot
Water Transport
Soviet Russia
Rural Life
Soviet Kirgiziya
Light of the East
Komsomol Pravda
Moscow Pravda
Soviet Latvia
Economic Gazette
Literary Russia

BOOKS

Hunters for Submarines
Seapower Today
Antisubmarine Defense of Merchant Ships
The Struggle on the Ocean Lines of Communications
Military Strategy (1st, 2nd, and 3rd editions)
Antisubmarine Defense in Modern War
The Struggle with Submarines
In the Depth of the Polar Seas
Nuclear Powered Submarines
Submarines in the Russian and Soviet Navies
The Navy
The Soviet Navy
Modern Warships
Naval Aviation
The Submariners Attack
Hydroacoustics in Foreign Navies
Aviation Equipment of Capitalist Countries
Combat Course of the Soviet Navy (1st, 2nd, and 3rd editions)
Aircraft Carriers
Problems of the Revolution in Military Affairs
Naval Weapons
Handbook of Foreign Navies
The Soviet Navy (1st, 2nd editions)
Threat from the Deep
Missle Ships
Fifty Years of the Armed Forces of the USSR
Underwater Victory
Nuclear-Powered Submarines
A History of Naval Art
Aviation Against Submarines
The Strike Force of the Navy 1st and 2nd Editions

TABLE I-1 (cont'd)

JOURNALS	BOOKS
Soviet White Russia	Officer's Handbook
Communist of the Armed Forces	Development of Navies in the Postwar Period
Military Historical Journal	On Guard over Peace and the Construction of Communism
Times	We Are From the Nuclear-powered Submarines
Military Knowledge	Aircraft Carriers and New Helicopter Carriers
Shipbuilding	Antisubmarine Weapons and Their Delivery Platforms
Little Flame	The Armed Forces of the Soviet State (1st and 2nd editions)
Technology-Youth	Hydroacoustic Means of a Navy
Military Thought	The Surface Fleet of NATO
Petty Officer Sergeant	Soviet Military Encyclopedia*
USA: Economics, Politics, Ideology	Seapower of the State (1st and 2nd Editions)
Communist	Missile Weapons at Sea
Foreign Military Review	The Soviet Armed Forces: History of Construction
Socialist Industry	

STENOGRAPHIC RECORDS	SPEECHES
XXIInd Party Congress of the CPSU	In honor of the graduates of the military academies over Radio Moscow
XXXIIIrd Party Congress of the CPSU	
XXIVth Party Congress of the CPSU	

*NB: Articles found in this source are treated as journal articles in the analysis.

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TABLE I-2

BIBLIOGRAPHIC ENTRIES BY SOURCE CATEGORY

Period	Total Number of Entries	Percent Newspaper	Percent Journals	Percent Books	Percent Steno Records	Percent Speeches
1961-65*	179	28	61	9	1	0
1966-70	230	27	64	7	0	1
1971-75	236	16	78	6	0	0
1976-79**	194	16	77	5	0	2

* 1960 not included in this compilation.

** Four year period.

SAMPLING

The quantitative content analysis involved the random sampling of fifty bibliographic entries from each time period. Results of the quantitative analysis are shown as percentages of period totals to correct for differences in the number of pages sampled in each period. This procedure also corrects for structural differences in the material included in the study.

Sampled material for the quantitative content analysis contained entries from a variety of books, journals and newspapers, listed below in Table 1-3.

The quantitative analysis contained in Chapter II of this report refers to three distinct bibliographies:

- The Full Bibliography, containing all 853 entries.
- The Sample Bibliography, comprising the fifty randomly sampled entries from each time period.
- The Coded Material Bibliography which represents only those items containing codable material on US ASW.

TABLE I-3

SOURCES IN QUANTITATIVE SAMPLE

SPEECHES:

Grechko: Speech to the XXIV Congress of the CPSU
Gorshkov: Speech on Armed Forces Day (Feb., 1978)

BOOKS AND PAMPHLETS:

Military Strategy (2nd edition: Sokolovskiy)
The Soviet Navy (1st edition: Yakovlev)
The Struggle on the Ocean Lines of Communications (Andreyev)
The Struggle with Submarines (Kvitnitskiy)

NEWSPAPERS

Pravda
Izvestiya
Soviet Patriot
Labor
Red Star
Pravda of the Ukraine
Water Transport
Communist of Tadzhikistan
Soviet White Russian
Soviet Latvia
Moscow Pravda
Light of the East

JOURNALS

Naval Digest

TABLE I-3 (Cont'd)

BOOKS AND PAMPHLETS	JOURNALS
The Armed Forces of the Communist States (Sergeyev (ed.))	Military-Historical Journal
The Navy (Gorshkov)	Agitator
The Strike Force of the Navy (Rodionov)	Military Thought
The Submariners Attack (Dmitriyev)	Military Knowledge
	Shipbuilding Technology and Armaments
	Aviation and Cosmonautics
	Soviet Warrior
	Communist
	Rear and Supply

The qualitative content analysis involved a purposive sample of the Full Bibliography, i.e., all of the most "promising" entries were reviewed for pertinent information. In a few instances, political and military statements included in the FBIS "Pass Key" system were analyzed. Some of these entries do not appear in the Full Bibliography, as they are excerpts from a larger body of unrelated material.

CLASSIFICATION OF SOURCE CONTENT

Soviet open-source communications on national security issues are couched in esoteric, or Aesopian language; that is, the literal meaning of what the writer places on paper is not necessarily what he wishes to convey to his intended audience. We therefore classified each bibliographic entry according to which of seven purposes it was primarily intended to serve. These categories are:

- Advocacy - an expression -- frequently overstated -- made to advocate a naval political position in the Soviet bureaucracy.
- Military Advocacy - an expression -- frequently overstated -- advocating the military's political position in the Soviet bureaucracy.
- Party - material relating to the Party's standpoint on an issue.
- Factual - a statement of fact about U.S. platform of system characteristics, their capabilities or movements.

- Routine - often repeated statements giving the accepted "line".

- Propaganda - the blatant overstatement of Soviet capabilities in relation to those of foreign navies.

- Training - excerpts dealing with operational matters written to assist in the training of naval officers.

Because of overlap of these categories and incomplete knowledge of political conflicts within the Soviet bureaucracy, the application of these categories has been of necessity subjective. However, classification is based on extensive experience and long-term familiarity with Soviet publications and is believed to be an accurate representation of the writer's intent. The classification of each entry is noted in the Full Bibliography in Volume III.

D. OVERVIEW OF ASW CHRONOLOGY

METHODS AND SOURCES

A chronology summarizing important developments in antisubmarine warfare from 1961-1979 has been prepared as background to the qualitative and quantitative content analyses. The chronology appears in full in Volume III and is abstracted below for each of the four periods studied. The chronology highlights major events and changes in U.S. ASW over the four periods and Soviet initiatives which have affected the efficacy of U.S. ASW efforts.

The evolution of U.S. and Soviet platform types dominates the chronology. When possible, the dates of R&D milestones, authorization, contract award, launching, commissioning, deployment and deactivation of each major U.S. platform class are listed. The chronology also notes the number constructed in each class and the significance of new developments is briefly described. Information on Soviet platforms is, of course, less complete and dates of construction and deployment are sometimes approximate. In many cases, the year included in the chronology is the first "public observation" of a platform. More precise information could not be found in unclassified source material.

Similarly, the chronology details weapon and sensor system developments. Dates typically included are developmental contract award, testing, production and deployment. When pertinent to ASW, world political events, Washington debates and shifts in priorities and strategy are also included.

Finally, the chronology cites U.S. ASW expenditures and those expenditures as a percentage of the Navy budget for each of the twenty years under study. These figures are graphically displayed at the end of the chronology in Volume III.

A large amount of publicly available material was reviewed during chronology preparation. This was necessary because no comprehensive, unclassified information source could be found and because of the diversity of information to be included. The yearly maritime chronology appearing in the Naval Institute Press Proceedings was helpful, as were standard reference books such as the Jane's series. Other source material included unclassified U.S. Navy publications and articles from U.S. professional naval and trade journals and newspapers.

ASW CHRONOLOGY: 1960-1965

The first POLARIS deployment in December 1960 and the Soviet Union's initial SSBN deployment in 1961 changed the nature and priority of the submarine threat. During the years 1961 through 1965, the U.S. rapidly accelerated its ASW programs. In fact, the U.S. Navy devoted a larger percentage of its budget to ASW (13.5 percent average) during this period than in any other.

By 1965, the U.S. had deployed two new nuclear attack submarine classes: SKIPJACK (SSN-585) and THRESHER (SSN-594), both of which showed significant improvements in ASW technology. The SKIPJACK class was the first to have the hydrodynamically advanced "tear drop" shaped hull design, and introduced a new nuclear power plant which was used on most later SSN classes. The THRESHER class incorporated an improved passive detection system (BQQ-2 Sonar) and the new SUBROC weapon system.

The primary U.S. ASW platform during Period 1, however, continued to be the CVS. With the reclassification of the INTREPID (CVA-11) and LEXINGTON (CVA-16) as CVSs in 1962, the U.S. CVS force included nine anti-submarine carriers, with seven completing FRAM II modernization during the period. The ASW capabilities of the carriers were enhanced by the new S2F-3 (later S-2D) TRACKER anti-submarine aircraft, a follow-on to the S2F-2. By 1964, introduction of the S2F-3 TRACKER into the Atlantic and Pacific Fleets was nearly complete. Improvements in the new TRACKER aircraft included a capability to carry both JULIE and JEZEBEL sonobuoy detection systems.

In 1961, the Navy took delivery of the first of two hundred fifty-five HSS-2 (SH-3A) SEA KING amphibious helicopters, which carried AQS-10 dipping sonar. Both the S2F-3 and SH-3A were equipped to carry the MK 43, MK 44 and MK 46 torpedoes (delivery of the latter beginning in 1965) and the depth charge LULU.

A more important development was the long range, land-based P3V-1 ORION. A significant improvement over the P2 NEPTUNE it was designed to replace, the P3V-1 was received by the first naval fleet squadron in 1962. The ORION, as well as the new carrier-based aircraft, was capable of operating in conjuction with the newly developed and deployed SOSUS system.

Although a large number of ships had completed conversion to carry the new DASH weapon system by 1964, DASH's development and deployment were plagued with a series of

problems and delays. The first DASH system, DSN-1, was delivered to the Navy in 1961, but the design was revised in 1962 and the new DASH did not reach the fleet until the end of that year. Throughout the period there were many more DASH-capable ships than DASH vehicles deployed.

During these years, the U.S. introduced eight new classes of surface combatants. These included the LONG BEACH (CGN-9) and CHARLES F. ADAMS (DDG-2) classes in 1961, the LEAHY (CG-16) and BAINBRIDGE (CG-25) in 1962, the BRONSTEIN class in 1963, the BELKNAP (CG-26) and GARCIA (FF-1040) in 1964 and the experimental GLOVER (ADGE-1) in 1965. Additionally, ASROC was approved and deployed.

By 1961, the Soviet Navy had moved away from its coastal orientation, extending fleet activity into the Norwegian Sea and shifting its focus to forward deployment.

The Soviet Union also introduced a large number of new surface ship classes in the period, many with a greater ASW capability than their predecessors. Completed during the period were the first KYNDA Class CG, PETYA I FF, KASHIN Class DDG and SHERSHEN Class patrol torpedo boat. Additionally, the MOSKVA helicopter carrier -- designed to carry eighteen KA-25 helicopters - was laid down in 1963 and the KRESTA Class cruiser -- the first claimed to be capable of operating alone beyond range of shore-based air cover -- was launched in 1965. By 1964, a large number of Soviet surface ships were deployed in the Mediterranean.

Soviet submarines introduced during the period were the NOVEMBER Class SSN (1960-61), the JULIETT Class SSG (using the surface-launched SS-N-3 missle), and the ECHO II SSGN, well adapted to its task of anti-carrier warfare.

ASW CHRONOLOGY: 1966-1970

By the second period (1966-70) Soviet submarine development programs had come to fruition. In 1967, the VICTOR I Class SSN entered service; in 1968 the significantly improved YANKEE Class SSBN was deployed, construction of the first BRAVO Class SS was completed, and the first of the CHARLIE Class SSGNs was delivered; and in 1970 the ALPHA SSN prototype was introduced. The introduction of these submarines represented missile developments. The 1300 nm SS-N-6 ballistic missle was ready for installation in the YANKEE in 1967 and the submerged-launched SS-N-7 was introduced in 1968 on the CHARLIE Class SSGN.

In the U.S., Soviet submarine construction programs caused considerable debate about the developing "submarine

gap" between the U.S. and USSR. Construction of the earlier THRESHER Class SSN was completed in 1967 after fourteen were built, with only the STURGEON Class SSN (SSN 637) in building for the rest of the period. Similar to but slightly larger (and slower) than its predecessor THRESHER, the STURGEON was to become the largest class of nuclear ships built by the U.S. Navy. Thirty-seven would be constructed by 1975.

Also commissioned in the second period (1969) was the NARWHAL (SSN-671), a prototype submarine fitted with a natural circulation reactor, resulting in noise reduction.

In general, U.S. efforts in ASW declined considerably in the years 1966-1970 as a result of budget cuts and the reallocation of resources for the Vietnam War. While the Soviet Union built up the ASW oriented components of its navy, U.S. ASW expenditures were at the lowest level of the four periods.

The Vietnam War had led to the deemphasis of the CVS as a component of U.S. ASW forces. In 1965, the USS INTREPID (CVS-11) was switched from its anti-submarine role to serve in an attack role in Vietnam and the USS LAKE CHAMPLAIN (CVS-39) was recommissioned, leaving only eight CVSs on active duty. Others were deactivated in the following years in response to cuts in defense expenditures, and by 1970 only four CVSs remained in the active fleet.

Other U.S. programs were beset with problems. The improved SH-3D SEA KING helicopter was introduced in 1968, but the long-standing limitations of the helicopter continued. In 1967, new production of the SH-3 series was terminated.

There were, however, some significant developments in U.S. ASW. Perhaps the most significant was the 1969 deployment of the advanced P3C ORION land-based aircraft, equipped with the A-NEW system for integrating ASW information. Although DASH was phased out in 1969 with no replacement designated, the LAMPS program was initiated. In 1969, a contract was signed for thirty-two destroyers (DD-963) to carry the new manned helicopters. In the same year the lead ship of the KNOX Class (FF-1052) was commissioned. Originally designed to carry DASH, it was later modified for LAMPS. An additional period 2 development was the deployment of the six Brooke Class (FFG-1) ships.

In the USSR the HORMONE KA-25 entered service in 1967, to be deployed in future years on the new classes of "helicopter carriers". New weapons were also first deployed

during the period. Of particular note is the dual-purpose ASW and surface-to-surface SS-N-14 missile, destined to carried by the KRESTA II, KRIVAK, KARA and KIEV Classes. By 1970 the first KRESTA II Class CG, and with it the SS-N-14, became operational.

ASW CHRONOLOGY: 1971-1975

In spite of the continuation of the Vietnam War, the increase in ASW expenditures first shown in 1970 continued into the third period. By 1972, ASW expenditures reached $3.41 billion or 15.9 percent of the Navy budget. The average percentage for this five year period, 12.4 percent, contrasted favorably with the 8.2 percent allocated to ASW during the prior period, and nearly reached the 13.5 percent level attained from 1961-1965.

The primary submarine development in U.S. ASW occurring during the period was the beginning of construction of the LOS ANGELES Class SSN (SSN-688). The LOS ANGELES design incorporated some of the quieting features of the experimental, turbine-electric drive LIPSCOMB, commissioned in 1974. The MK 48 submarine-launched torpedo was also introduced in 1974 after twelve years of development.

The multipurpose CV was born in 1972, following the successful testing of the concept on the USS SARATOGA. All post-war CVAs were to be converted to CVs by 1977, with the timing of conversion limited only by the rate at which new S-3A VIKING aircraft were to become available. The first of these aircraft was delivered to the Navy in 1974; by 1975, 187 S-3s were authorized. The S-3, first deployed on the USS JOHN F. KENNEDY (CV-67) in 1975, offered significant improvements in area search capability and contact conversions. The development program for the S-3A aircraft has been called the "single largest program and probably the most expensive development ever undertaken in ASW".

The first flight of the interim LAMPS SH-2D occurred in 1972; deployment began with the assignment of a unit to the USS BELKNAP (CG-26). In the same year, FF-1040, FF-1052 and FFG-1 classes began their modifications for the LAMPS vehicle. The SH-2F LAMPS was deployed in 1973. Ship classes introduced during Period 3 included the CALIFORNIA Class (CGN-36) and the LAMPS-equipped SPRUANCE Class (DD-963). An additional development was the testing of the Sea Control Ship concept with the USS GUAM (LPH-9), fitted to carry helicopters and V/STOL aircraft. The program was subsequently cancelled because of increasing costs and delays in developing a suitable V/STOL aircraft.

The Soviets continued to introduce new submarine classes, incorporating new technologies. The DELTA I SSBN, with its 4200 nm SS N-8 missiles, became operational in 1971; the PAPA SSGN prototype was delivered in 1971; and the VICTOR II Class SSN was completed in 1973. The VICTOR II was the first to carry the SS-N-15, a SUBROC-type weapon.

Also during this period, the variable depth sonar equipped KRIVAK appeared, the KIEV was launched and the KARA was first deployed.

ASW CHRONOLOGY: 1976-1979

In 1976, the U.S. commissioned the first LOS ANGELES Class SSN(SSN-688). The LOS ANGELES included significantly advanced sensor and countermeasure systems, a central computer complex to integrate navigational data and improved noise reduction. At the same time, the Soviets were refining previous classes of submarines, producing the DELTA II, DELTA III (TYPHOON) and improved CHARLIE classes. The DELTA II may have been designed to carry the 4600 nm SS-N-18 missile first tested during the period.

In the U.S., all CVAs and CVSs had been reclassified as CVs by 1976. Further, the EISENHOWER, (CVN-69) was commissioned, strengthening the CV-based fleet. The S-3A VIKING continued to enter the fleet in increasing numbers, and the first of the new P3C "UPDATE" ORION aircraft, with new electronics and software, entered service.

The conversion of the H-2 to SH-2D/F LAMPS was complete by 1977, and designation of the SH-60B relying on sonobuoys, IR and MAD as LAMPS III was made in 1976.

U.S. surface combatant developments during Period 4 included the commissioning of the OLIVER HAZARD PERRY (FFG-7), designed to carry LAMPS.

Numerous U.S. sensor and weapon developments took place during the period. In addition to the upgrading of the SOSUS system, funding was approved for SURTASS and a contract was awarded for the Rapidly Deployable Surveillance System (RDSS). In development were also the ALWT (Advanced Lightweight Torpedo) (Initial Operating Capability (IOC) late 1980s), the MK 46 MOD 5 torpedo, the IWD (Intermediate Water Depth) mine and the MK 48 torpedo (IOC) late 1980s).

In the Soviet Union, the KIEV became operational, carrying the SS-N-12 missile and a mix of V/STOL aircraft and KA-25 helicopters.

PART II

QUANTITATIVE CONTENT ANALYSIS

A. INTRODUCTION

This chapter summarizes the quantitative methodology and the conclusions of the quantitative content analysis phase. These conclusions are compared and contrasted with those of the qualitative effort in Part IV. Supplementary and supporting data can be found in the appendices.

The strengths and weaknesses of the quantitative approace to content analysis were reviewed briefly in Part I. The methodology which follows was designed to minimize the impact of inherent weaknesses of the technique--particularly those which are exacerbated in the study of Soviet national security literature.

Discovery of Soviet perceptions of any national security issue by means of quantitative content analysis cannot be done directly; it requires a round-about approach. In the Soviet Union, the expression of private opinion at variance with official policy is tolerated to a much lesser extent than in the United States, and the explicit revelation of military or naval capabilities and vulnerability is not permitted at all. As a result, material which is, or may be, indicative of Soviet perceptions of an issue are expressed in an esoteric language, and analysis of these communications is open to alternative interpretations.

In answering the questions listed in Part I, therefore, we present one interpretation of its meaning. We believe it to be the best one, but we cannot exclude others. For those wishing to find alternative explanations, we have given our data in Volume III of this report.

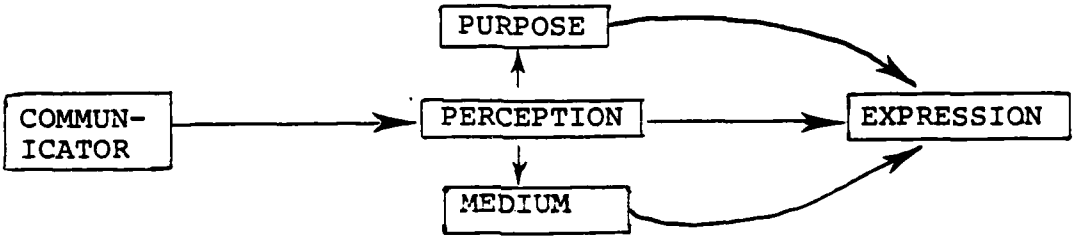
B. QUANTITATIVE METHODOLOGY

CONCEPTUAL FRAMEWORK

The basic model for performing a quantitative content analysis was described in Part I. According to that simple model, the literal content of the expression and the underlying perception are synonymous. In reality, however, the relationship between a perception and its written manifestation is seldom so clear. The content reflects not only the perception, but also the communicator's purpose in writing and the characteristic of the medium in which the content appears. This more complex analytic model is shown below in Figure II-1.

FIGURE II-1

ANALYTIC MODEL



The interpretation of content with respect to casual and situational variables such as communicator, purpose and medium are generally the province of qualitative content analysis. That does not mean, however, that they can be completely ignored in the quantitative effort. Unless the variables are carefully specified and their interaction understood, quantitative results may be devoid of meaning.

The fact that this paper was to concern "Soviet perceptions of U.S. ASW capabilities from 1961-1979" provided only a starting point for the definitional effort. For example, a study on "Soviet perceptions" begs the question, "Which Soviets?". It should be obvious that there is no single Soviet perception on any subject, anv more than there exists an undifferentiated U.S. perception. Given sufficient time and resources, a universe of perceivers could be constructed which accurately reflects the complex body of Soviet opinion on ASW. Given the constraints on this project, several simplifying assumptions were made.

Based on our understanding of the Soviet national security structure, these assumptions were that:

- Three distinct bodies of perception on ASW can distinguished in the Soviet national security hierarchy; these are the Party, the Military and the Navy;
- The perceptions of these bodies are summarized in the opinion of certain highly placed individuals, whom we called "leaders"; and
- Leaders' perceptions to some extent rest upon and are supplemented by those of experts in the field, whom we called "specialists".

Each of these three sets of perceivers has written in a variety of media, including books, journals, speeches and newspapers. The media, of course, sets structural limits on the communication. Coverage of ASW-related topics would be much more thorough in a professional naval article than in a newspaper, for example, but the medium in which an expression appears is also an indicator of the audience to which it is directed: an item in Pravda would likely be written for the general public while an article in Naval Digest would be oriented to the naval professional. Each entry in the bibliography has been coded and analyzed with respect to medium.

The purpose of the communication was subjectively determined by Ketron analysts, based on their knowledge of the source material. The purpose of each entry was classified as being naval or military advocacy, factual, routine, propaganda, party or training. These concepts were defined in detail in Part I.

Finally, expressions coded were simple substantive statements about U.S. ASW platforms and systems.

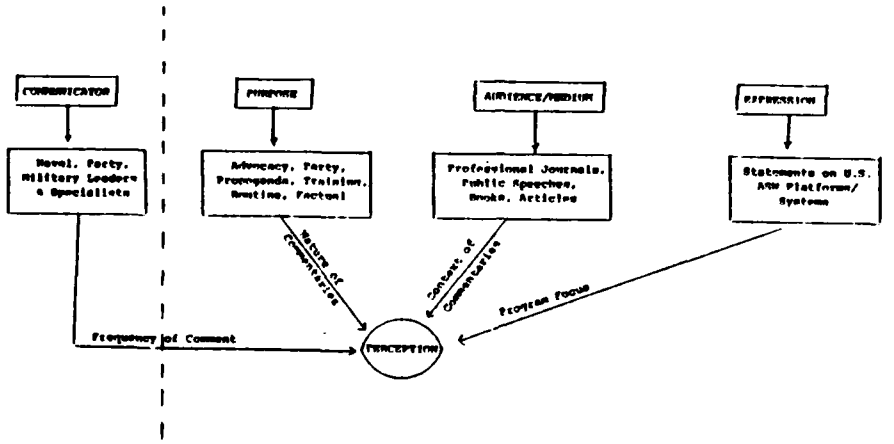
Each of these perceptual components -- communicator, purpose, medium and expression -- relates directly to the research questions cited in Part I. An appreciation of the context of Soviet commentaries has been derived from an analysis of the media in which expressions appeared. The purpose of each entry is indicative of the nature of the commentary. Program focus of commentaries is inferred from the substantive content of the expression. Frequency of comment results from a simple count of all expressions of all communicators. Finally, an assessment of Soviet perceptions of U.S. ASW capabilities is made, based on the analyses of context, nature, program focus and frequency.

The relationship between the elements of the analytic model and research goals is displayed schematically in Figure II-2.

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FIGURE II-2

CONCEPTUAL APPROACH



REVIEW OF THE METHODOLOGY

Variable Definition

During the first phase of this quantitative content analysis effort the conceptual approach was established and corresponding decisions on the unit of content, the symbology, the universe of communication and sampling were made. In this early phase many of our initial assumptions about the source material and its content were tested and revised. The final step in the variable definition stage was sample selection. A random sample of fifty entries was taken from each of the four time periods. As shown in the concluding section of this chapter, the sample reflects the important characteristics of the population in terms of communicator, purpose and medium.

There were three possible approaches which initially appeared fruitful. One was to take Soviet statements on what we called "ASW-in-general" (i.e., pronouncements on the general topic of ASW without direct reference to the United States) and assessments attributed to "foreign specialists" (an Aesopian device frequently used for concealing Soviet views), and assume that perceptions reflected by them were in fact Soviet perceptions. These could then be used as a Soviet standard for ASW requirements, against which statements on U.S ASW capabilities could be compared. Unfortunately, the pretest showed that there were too few "ASW-in-general" and "Foreign Specialist" statements to be useful.

A second approach was to take Soviet statements on the operational capabilities of U.S. ASW platforms or systems

and array them in a matrix according to which step in the mission profile of a Soviet SSBN they threatened. (By mission profile we mean the various stages through which a Soviet SSBN would pass as it transited to station from a port and then returned.) Unfortunately, Soviet statements on U.S. operational capabilities within the mission structure were so few and so general that the matrix was not a useful device.

The third approach was the one adopted for this report. In it, we relate content indicators of communicator, medium, purpose and the expressions themselves directly to research questions on the context, nature and focus of commentaries. Perceptions are inferred through a synthesis of data and a comparison of data with trends in the ASW chronology. This is the approach shown above as Figure II-2.

Data Generation

The pretest stage indicated that some revisions of the proposed methodology, as well as of the conceptual approach, were necessary; these changes were made prior to data generation. The most important of the changes included the broadening of the data-base and the inclusion of an entire expression on the coding sheet in addition to coded supplementary and summary information. Identification of surrogate statements (for example, attributing internal limitations or capabilities to "foreign navies") could thus be made by Ketron analysts for study rather than by the reader during coding operations. We believe that this increased the objectivity and accuracy of the analysis.

The fifty entries for each period were read by the project reader in the original Russian. Allowable expressions were those relating directly to U.S. ASW or which were attributed to "U.S. Specialists". These references comprise the "Coded Material Bibliography" which is referred to later in this part of the report.

Data Preparation

Coded expressions were classified according to their content and the platform or system to which they referred.

Content categories used are:

- Advantage over other means;
- Effective Threat;

- Operational Capability;
- Operational Limitation;
- Technical Description;
- Improving;
- Mention; and
- Other.

The content categories and rules used to classify expressions into each are described below:

- Advantage over other means was noted whenever one platform or system is favorably compared to another platform or system. This category has not been used for intra-platform comparisons. The "other means" to which the subject platform or system is compared can be either explicit ("advantage over shipborne") or implied ("better than other"). An example is the:

  > ...serious advantages of aviation means of ASW search over those which, until recently, have been installed on ships.

- Effective threat was used when the effectiveness or primacy of a platform or system is noted, or when it was characterized as a threat to Soviet forces. For example, one reference described helicopters with sonar systems as "the more effective forces for combat with high-speed submarines".

- Operational Capability describes the mission a system or platform is projected for, assigned to or capable of. The following statements are examples of this class of expressions:

  > Not only the tasks of independent search of enemy submarines, but also investigation of sonar contacts determined by missile submarines are assigned to ASW submarines.

  > Sonobuoys as well as improved sonar systems capable of detecting subs while transiting to a barrier are employed during ASW varrier operation.

- Operating Limitation was noted when the use (particularly the successful use of a platform or system is contingent on another event: a well trained staff, specific equipment, certain weather conditions, or adequate support, for example. This category was also used when a platform or system was considered to be of only limited effectiveness. Examples are: "The use of sonar by small ships and helicopters is practically impossible in stormy weather" and "...a magnetic detector may be used effectively for searching for a submarine only after its initial detection by other means".

- Technical description occurs when a platform or system's components are described in detail (as with AN/AQS-10, for example, or the placement of the sensing device on the S2F TRACKER) with little or no evaluative comment.

- Improving includes allusions to a new platform or system under development, one projected for future use or the focus of particular interest. Illustrations are found in the statements, "Much attention is being devoted to improving sonar systems" and "A considerable number of combat ships...are continually being modernized and re-equipped with new...ASW equipment".

- Mention indicates that system or platform was mentioned, with little or no associated evaluation or content.

- Other indicated composition of a fleet and other miscellaneous expressions.

There was, as one might expect, considerable ambiguity in the coding process. Subjective interpretation of passages was kept to a minimum by dual coding; that is, two analysts familiar with the literature agreed upon that proper coding of each item. It should also be noted that neither content categories nor subject platforms/systems are mutually exclusive. For example, the reference "The advantage of helicopters is considered to be the ability to increase speed of search" would be classified as both "Advantage over other means" and "Operational Capability".

In addition to the tabulation of content for each platform type, a frequency count of platforms and systems mentioned by name was made without regard to the content of the expression.

C. QUANTITATIVE ANALYSIS AND CONCLUSIONS

In this section we relate coded data to the frequency, nature, context and program focus of Soviet open-source commentaries on U.S. ASW, and show how those commentaries have changed over the 1961-1979 period. In the final subsection, we give conclusions which can be drawn from these data alone and a comparison of trends in the data with events in the ASW chronology.

FREQUENCY OF SOVIET COMMENT ON U.S. ASW CAPABILITIES

Quantitative content analysis assumes that the frequency of comment on a given topic is an indication of level of interest in that subject. As a measurement of Soviet interest in ASW in general, we have looked at the composition of the full ASW bibliography. We have measured interest in U.S. ASW in particular by assessing the frequency with which sampled entries refer to U.S. ASW.

Table II-1 shows the number and the percentage of the total universe of entries contained in the Full and Sample Bibliographies, broken down by period. For the Full Bibliography, of course, the entries for one hundred percent of the total population; for the Sample Bibliography these percentages fluctuate considerably, since sample size was held constant and the population size varied from period to period.

As it can be seen from Table II-1, Soviet interest in ASW in general -- as measured by the number of entries in the Full Bibliography -- is relatively stable over the last three periods. There is, however, less material dealing with ASW in Period 1 than in the other periods.

Table II-2 indicates the level of Soviet interest in U.S. ASW, as opposed to general ASW topics. The figures for entries in the Coded Material Bibliography show that a moderately large portion of general writings on ASW include substantive comment* on U.S. ASW efforts. Between sixteen and thirty-four percent of sampled entries contained codable material on U.S. platforms and systems. Although one must interpret these results with care, as the numbers are small and the use of percentages appears to inflate differences,

*For the purposes of our discussion, a "substantive" statement is one which can be coded according to the project coding rules.

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TABLE II-1

NUMBER AND PROPORTION OF TOTAL ENTRIES

IN FULL AND SAMPLE BIBLIOGRAPHIES

Period	Full Bibliography		Sample Bibliography	
	Number	Percent	Number	Percent
1961-1965	179	100	50	27
1966-1970	230	100	50	22
1971-1975	236	100	50	21
1976-1979	194/ 248*	100	50	26/ 20

*This final period covers only four years rather than five. For comparative purposes, we took an average of the yearly number of entries for the last four years and added it to the total. This result is shown to the right of a slash in the cell, with the actual four-year total shown to its left.

there is considerable variability in the level of comment over the four periods studied.

TABLE II-2

ENTRIES CONTAINING REFERENCES TO U.S. ASW

Period	Number	Percent of Full Bibliography	Percent of Sample Bibliography
1961-1965	12	7	24
1966-1970	8	4	16
1971-1975	17	7	34
1976-1979	10	5	20

In summary, Soviet interest in ASW in general has remained relatively stable while interest in U.S. ASW has fluctuated considerably over the last nineteen years.

CONTEXT OF SOVIET COMENTARIES

The context of Soviet commentaries on U.S. ASW can be seen as where the comment appeared, as this is indicative of the audience to whom it was directed. As discussed in Part I, comment may be published in a wide variety of sources, including newspapers, journals of various types, books, speeches and stenographic records of CPSU Congresses. For comparative purposes we have analyzed the Full Bibliography, the Sample Bibliography and Coded Material Bibliography according to these categories.

The percentage contribution of each source category to the total number of bibliographic entries for each time period is shown in Table II-3.

As a glance at the table demonstrates, in the Full Bibliography most entries appeared in journals, with the second most important category being books. The dominance of these two sources is also found in the Sample Bibliography, indicating that the structure of the sample faithfully reflects the entire population.

In the Coded Material Bibliography, however, the relative importance of the various source categories changes. Journal articles and books are virtually the only sources which contained codeable material. Furthermore, as shown in Table II-4, the journals and books in which codable material appears are overwhelmingly aimed at, and their contents produced by, naval professionals.

TABLE II-3

PERCENTAGE OF SOURCE CATEGORY BY PERIOD IN...

FULL ASW BIBLIOGRAPHY

	Newspapers	Journals	Books	Steno Records	Speeches
1961-1965	28	61	9	1	0
1966-1970	27	64	7	0	1
1971-1975	16	78	6	0	0
1976-1979	16	77	5	0	2

SAMPLE ASW BIBLIOGRAPHY

	Newspapers	Journals	Books	Steno Records	Speeches
1961-1965	22	70	8	0	0
1966-1970	26	66	8	0	0
1971-1975	16	82	0	2	0
1976-1979	20	76	2	0	0

U.S. CODED MATERIAL BIBLIOGRAPHY

	Newspapers	Journals	Books	Steno Records	Speeches
1961-1965	0	67	33	0	0
1966-1970	0	87	13	0	0
1971-1975	5	95	0	0	0
1976-1979	0	90	10	0	0

TABLE II-4

SOURCES IN WHICH CODABLE MATERIAL ON ASW APPEARED

1961-65

Naval Digest (8 times)
The Struggle on the Ocean Lines of Communications (Book)
The Struggle with Submarines (Book)
Military Strategy (Book)
The Submarines Attack (Book)

1966-70

Naval Digest (6 times)
Military Thought (Journal)
The Armed Forces of the Capitalist States (Book)

1971-75

Naval Digest (15 times)
Military Thought (Journal)
Red Star (Newspaper)

1976-79

Naval Digest (9 times)
The Navy (Book)

NATURE OF SOVIET COMMENTARIES

Just as the source in which an expression appears may vary, the writer's intent may also vary widely. It may range from advocacy of a policy to factual presentation or to the routine dissemination of the accepted "line".

One may obtain an idea of the distribution of Soviet writings on ASW across intent categories by looking at Table II-5.

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TABLE II-5

PERCENTAGE OF INTENT CATEGORY* IN FULL ASW BIBLIOGRAPHY

BY PERIOD

	A	F	R	PP	P	T	MA
1961-65	21	28	37	6	2	3	3
1966-70	29	17	42	3	7	1	2
1971-75	34	31	25	4	3	1	2
1976-79	30	30	26	4	5	2	3

* Key: A - Advocacy PP - Propaganda MA - Military Advocacy
F - Factual P - Party
R - Routine T - Training

As the table shows, three categories prodominate: advocacy, factual and routine. Between 86 and 90 percent of the entries for each time period fall into one of these three categories. Proportions among the categories remain fairly consistent with the exceptions that:

- There is an increase in the proportion of advocacy entries after 1965.
- There is a sharp decrease in the proportion of factual articles appearing in 1966-1970 compared to other periods.
- There is a decrease in routine articles following 1970.

As might be expected, the same three categories are dominant in the Sample ASW Bibliography, comprising 84-90 percent of all entries. As shown in Table II-6, each intent category retains roughly the same importance in the Sample Bibliography as in the Full Bibliography, although in 1971-75 and 1976-79 advocacy articles are somewhat overrepresented in the sample, and factual entries are somewhat underrepresented for 1971-75. The general agreement with the distribution of the Full Bibliography again tends to confirm that the sample accurately represents the contents of the population.

TABLE II-6

PERCENTAGE OF INTENT CATEGORY IN SAMPLE ASW BIBLIOGRAPHY BY PERIOD

	A	F	R	PP	P	T	MA
1961-65	22	24	38	6	4	4	2
1966-70	26	22	38	4	10	0	0
1971-75	44	22	24	6	2	2	0
1976-79	22	34	28	2	8	4	2

Examination of the entries which contained material bearing on U.S ASW capabilities shows that a very high percentage of such material -- 80-100 percent -- appears in advocacy or factual entries. An interesting pattern appears when one looks at Table II-7, where these results are shown: during 1966-1975 much more material relevent to U.S. ASW capabilities appeared in advocacy entries, while there was a corresponding decline in appearances in factual entries. Since that time, there has been a sharp increase of appearances in factual entries, while there has been a similarly sharp decline in advocacy entries. Although this might be partially explained by the overrepresentation of advocacy articles and underrepresentation of factual articles in the sample for 1970-75, it is likely that some fluctuation actually occurred.

TABLE II-7

PERCENTAGE OF CODED MATERIAL BY INTENT CATEGORY IN THE U.S. CODED MATERIAL BIBLIOGRAPHY BY TIME PERIOD

	A	F	R	PP	P	T	MA
1961-65	33	50	8	0	0	0	8
1966-70	50	38	0	0	12	0	0
1971-75	65	35	0	0	0	0	0
1976-79	10	70	0	10	10	0	0

CONTENT OF SOVIET COMMENTARIES

As explained in the Methodology section, we used eight categories to examine the content structure of Soviet writings on ASW. Five* of these content categories can be considered as reflecting Soviet perceptions of ASW. They are:

- Advantage Over Other Means of ASW
- Effective Threat
- Operational Limitation
- Operational Capability
- Improving.

Table II-8 displays the perceptual structure of Soviet comment on U.S. ASW for each of the four time periods. To obtain the figures shown we summed the number of coded items appearing in each of the perceptual categories and then calculated in percentage the contribution each category made to the total. Thus, there were a total of 303 coded items on U.S. ASW in the five categories appearing in the first period, 13, or four percent, of these were assigned to the category "Advantage over other means". Figure II-3 displays these same figures in graphic form.

*The remaining categories are Technical Description, Mention and Other.

TABLE II-8

PERCENTAGE COMPOSITION OF SOVIET PERCEPTUAL COMMENT ON U.S. ASW

Perceptual Category \ Time Period	1961-65	1966-70	1971-75	1976-79
Advantage Over Other Means	4	3	4	6
Effective Threat	8	11	9	5
Operational Limitation	15	8	12	6
Operational Capability	31	47	18	30
Improving	42	31	57	55

These data show clearly that most Soviet perceptual comment is directed at: (1) how the United States is improving its ASW forces; and (2) discussion of their operational capabilities. Rather little comment is aimed at their (1) operational limitations; (2) the effective threat they present; or (3) their advantage over other means of ASW.

FOCUS OF SOVIET COMMENTARY

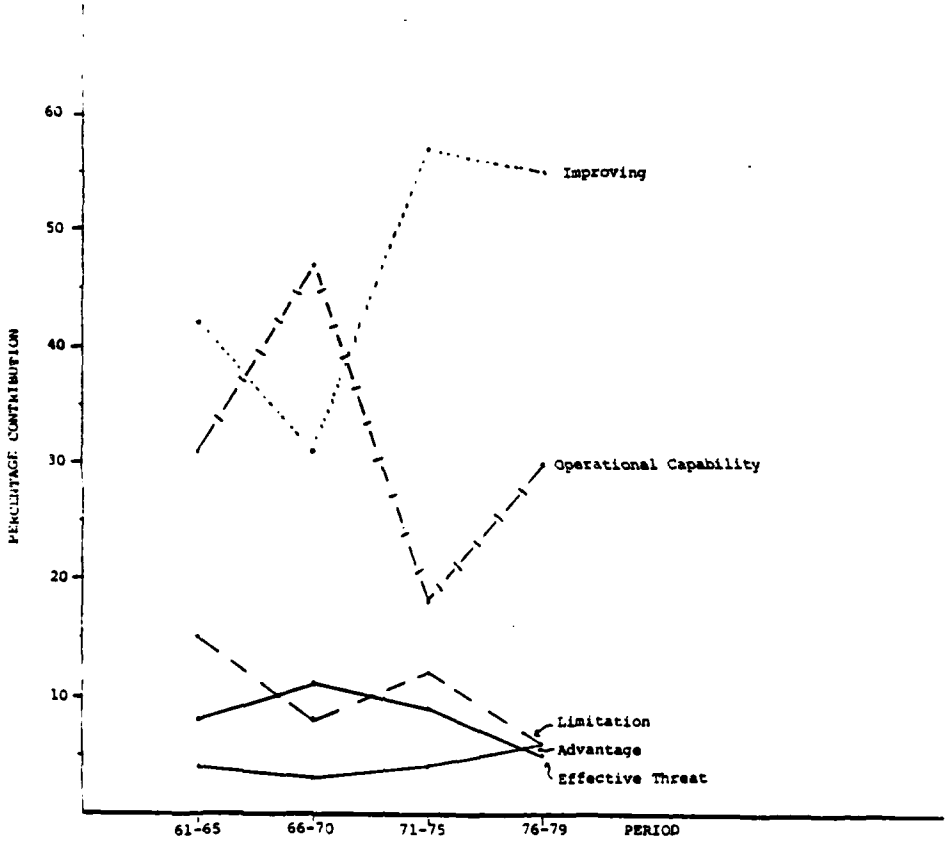
Soviet mentions of U.S. ASW programs can be divided into eight groups, almost all of which pertain to a specific type of ASW platform. These eight groups are:

- Submarines
- Surface Combatants
- Aircraft Carriers
- ASW Helicopters
- Carrier-based ASW Aircraft
- Land-based ASW Aircraft
- ASW Sensors and
- ASW Weapons.

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FIGURE II-3

PERCENTAGE CONTRIBUTION OF PERCEPTUAL CATEGORIES
TO ALL PERCEPTUAL STATEMENTS ON U.S. ASW



The percentage of total expressions contributed by each of these specific groups is shown in Table II-9. The figures in the table indicate rather sharp fluctuations in levels of interest, so that one cannot say that any particular area of U.S. ASW developments has consistently been of high interest to the Soviets -- although in a given time period such expressions of interest do appear. Discussions of these particular peaks of interest, and their correlation to chronological events is reserved to the final, concluding subsection.

TABLE II-9

PERCENTAGE CONTRIBUTION OF PROGRAM GROUPS TO THE TOTAL OF ALL SOVIET PROGRAM MENTIONS, BY PERIOD

Group \ Period	1961-1965	1966-1970	1971-1975	1976-1979	Average
Submarines	14	12	6	12	11
Surface Combatants	6	21	6	30	16
Aircraft Carriers	1	10	10	9	7
ASW Helicopters*	5	2	13	6	6
Carrier-based ASW Aircraft	6	23	4	2	9
Land-based ASW Aircraft	10	0	25	5	10
ASW Sensors	26	4	14	21	16
ASW Weapons	32	29	23	15	25

The group of programs to which the Soviets have generally devoted the most attention over the entire period studied is that of ASW weapons.

Soviet interest in specific U.S. ASW programs -- as manifested by the number of times they are mentioned by name is relatively low.

*Note: All helicopters mentioned are sea-based, unlike many such platforms in the USSR which are land based.

Table II-10 lists, in order of percentage score, the major programs treated with special interest during each of the study's four time periods. Again, the relationship of these findings to events in the chronology will be analyzed in the next subsection of this chapter. Here, however, we shall point out that fixed-wing ASW aircraft (S-2, P-2, P-3, A-NEW), submarines (THRESHER/PERMIT, LOS ANGELES), helicopters (SH-3, SH-60) and ASW weaons (SUBROC (twice), ASROC (twice), DASH, MK 48, MK 46) were of major concern in each of the four periods.* Surface combatants, aircraft carriers, and, most significantly, ASW sensors are not mentioned often enough to be considered important.

GENERAL CONCLUSIONS

Frequency and Context of Soviet Comment on U.S. ASW

Soviet open-source national security literature reflects a moderate level of interest in U.S. ASW; about a quarter of the sampled entries contained some substantive discussion on the topic. However, the average number of coded statements per bibliographic entry has remained relatively low over the entire period studied. When the Soviets do write of U.S. ASW, their work appears almost exclusively in books and journal articles directed at the naval professional; these sources are likely to be read less consistently in Party and military circles. To some extent, this situation in the Soviet Union is similar to that obtaining in the United States, where an analysis would doubtlessly show that Soviet ASW capabilities are discussed predominantely in professional naval circles and that the U.S. military and political leadership is relatively little concerned with them.

Nature of Soviet Commentary

Soviet interest in U.S. ASW is usually expressed in bibliographic entries discussing substantive topics, i.e., those announcing or advocating a naval policy or those recounting factual material. That U.S. ASW capabilities are not generally discussed in propaganda pieces suggests that the Soviets are not highly concerned with them; as recent experience with the neutron bomb and ground-launched cruise missiles indicates, when the Soviets are worried by weapons developments they react strongly with propaganda.

*A platform type was considered to be of "major" concern only if it received over five percent of the specific comment within that period.

TABLE II-10

SPECIFIC U.S. ASW PROGRAMS PERCEIVED AS SIGNIFICANT BY THE SOVIETS

Time Period/ Program	Percentage of Total Appearances in Period
Period 1: 1961-65	
THRESHER/PERMIT-Class SSN	7
SUBROC	7
TRACKER/TRACER (S-2)	6
NEPTUNE (P-2)	5
ORION (P-3)	5
Period 2: 1966-70	
TRACKER/TRACER	23
ASROC	12
THRESHER/PERMIT	6
DASH (QH-50)	6
SUBROC	6
Period 3: 1971-75	
ORION	20
SEA KING (SH-3)	10
MK 48 Torpedo	8
A-NEW*	5
MK 46 Torpedo	5
Period 4: 1976-79	
LAMPS (SH-60B)	6
ASROC	6
LOS ANGELES-Class SSN	5

*P-3C ASW Data Integration System.

Similarly, the fact that rote presentations, such as the routine celebrations of Navy Day and/or invocations to improved training, do not contain references to U.S. ASW capabilities suggests that these capabilities do not loom large in the Soviet mind. Finally, the fact that, quantitatively, the Soviet military does not use U.S. ASW as a weapon in its quarrels with the Soviet Navy (at least as far as these quarrels surface in the open press) suggests that it is not perceived as a useful tool. This may be because: (1) the rules governing publication in the open literature do not permit such an admission of weakness; (2) they perceive that, in fact, no major threat exists; or (3) for the military to take note of ASW could be seized on by the Navy to justify larger general purpose naval forces, at least nominally to protect Soviet SSBNs.

Focus of Soviet Commentaries

Soviet discussions of U.S. ASW focus primarily on U.S. efforts at improving U.S. ASW forces and their operational capabilities. Their advantages, effectiveness and limitations are much less frequently discussed. This suggests that the Soviets in general see the United States as possessing relatively capable ASW forces and that it is making considerable efforts to improve them further. The low level of discussion of their effectiveness suggests that they are not, however, seen as being as yet of sufficient caliber to overcome the numerous problems of antisubmarine warfare and present a major threat to the Soviet submarine fleet.

Soviet Comment on U.S. Anti-SSBN Capabilities

The Soviets virtually never discuss explicitly the capabilities of U.S. ASW forces vis-a-vis Soviet SSBNs. This has made it impossible to draw any quantitatively-based conclusions as to the perceived threat offered by these forces. It does suggest, however, that the topic is a sensitive one and that at least some threat is perceived. Elucidation of its precise extent and nature must be reserved for the qualitative analysis in the next part of this report.

Changes in Perception

Changes in each of the five perceptual categories ("Improving", "Operational Capability", "Operational Limitation", "Advantage Over Other Means", and "Effective Threat") can be linked to developments in the ASW chronology to show that Soviet peceptions are realistic, at least insofar as they reflect real-world changes. This link is a tenuous one, however, because our data have had to be highly aggre-

gated, the categories are relatively gross and to be useful here the periods of the chronology must be characterized broadly.

A summary description of U.S. ASW developments between 1961 and 1979 would be as follows. Between 1961 and 1965 the United States invested heavily in many programs, beginning deployments of a wide variety of aircraft, submarines, weapons and sensors. The Soviet submarine force was dependent on relatively noisy diesel-electric and first-generation nuclear boats; strategic missile submarines possessed only extremely short-ranged missiles. During the heaviest years of U.S. involvement in the Vietnam War, 1966-1970, U.S. funding for ASW sank to its lowest level, as operations in Indochina consumed most resources. Nonetheless, construction and system deployment programs begun earlier continued and reached fruition. The Soviets began introducing less noisy, more capable nuclear submarines, including the YANKEE SSBN, whose SS-N-6s greatly increased range enhanced the boat's survivability. In the third period U.S. ASW operating forces began shrinking, as did the entire U.S. Navy, but funding for ASW and, to a great extent R&D, climbed considerably. The appearance of the DELTA SSBN in the Soviet Fleet now meant that at least a portion of the Soviet Union's strategic submarines could operate in sanctuaries close to the Soviet coast throughout a war. From 1976 onward the percentage share of ASW in the Navy's budget has declined slightly, and force levels have continued their slide; but new, highly capable ASW platforms and sensors have been deployed or have reached advanced stages of development. Proportionately, more of the Soviet strategic submarine fleet was composed of DELTAs than had been the case earlier, so that more than ever before the fleet would be able to survive a war.

Soviet perceptions of U.S. ASW capabilities seem to follow in rough agreement with these historical patterns. As U.S. funding for ASW fell, rose sharply and then slackened off, expressions of the Soviet perception that the United States was improving its ASW forces and means followed the pattern.

If one accepts that operational capabilities lag platform and sensor developments by some years, then it is possible to see Soviet expressions of U.S. operational capabilities as following a realistic pattern. These were displayed in Figure II-3. According to this view, U.S. capabilities against the Soviet submarine fleet rose during the second period as the impact of U.S. ASW investments was felt and the modernization of the Soviet force only began. U.S. capabilities then fell due to the influence of the Vietnam

War and growth in Soviet submarine capabilities, and finally, U.S. capabilities have climbed once more as a result of increased investment. Soviet perceptions of the operational limitations of U.S. ASW have followed an inverse course to that of operational capabilities; as the one has risen, the other has fallen.

The remaining two perceptual categories also appear to be inversely related. It is possible to interpret the gradual (and very limited) increase in Soviet statements classified as indicating a platform or system's "advantage over other means" as reflecting a perceived improvement in U.S. capabilities vis-a-vis Soviet submarines, say in an one-on-one encounter. However, the decline in perceptions of the effective threat posed by U.S. ASW forces from a high point in 1966-1970 mirrors the increasing ability of Soviet submarines -- both tactical and strategic -- to evade detection and hit targets from greater ranges.

Specific Program Focus

Soviet mentions either of groups of U.S. ASW platforms (e.g., submarines) or of specific programs (e.g., SPRUANCE destroyers) does not appear to be correlated with chronological developments by Soviet writers and U.S. interest in either program groups or specific programs. Although certain new programs receive a high level of interest when they first appear, such as with SUBROC in Period 1, other programs may be considered interesting even when they have long been in existence. Furthermore, few U.S. efforts have been mentioned prior to substantial deployment.

One can conclude from an analysis of Soviet mentions of specific programs that the Soviets have been most interested in aircraft, submarine and weapon developments. They have consistently betrayed little interest in surface combatants, aircraft carriers and ASW sensors. To some extent this is not surprising; given the value structure of the Soviet Navy, which accords aircraft and submarines predominant importance, Soviet interest in similar platforms might be expected. However, given what is generally considered superiority of U.S. ASW sensors, the lack of Soviet interest--particularly in SOSUS--is somewhat surprising. Repeated Soviet protestations that the magnitude of the operational task of detecting submarines with conventional ASW sensors is intractable, however, make it likely that this is, in fact, a genuine perception.

PART III

QUALITATIVE CONTENT ANALYSIS

PREFATORY NOTES TO QUALITATIVE CONTENT ANALYSIS OF ACDA ASW STUDY

The four questions posed for this study by the ACDA Task Statement are treated in reverse order so that the reader will have the benefit of the largely contextual information in the answers to Questions #2 through #4 prior to coming to the analysis that responds to the key, umbrella Question #1 as to what Soviet perceptions of U.S. ASW have been found to be.

Three sections have been prepared for each of the four periods of this study in order to provide the context deemed essential to an adequate understanding of Soviet perceptions of U.S. ASW over the past two decades. These three contextual sections are:

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?"

1 (b) - "Is the U.S. Navy seen as assigned a priority mission for anti-SSBN ASW?"

2 (d)- "Are the mission-completion capabilities of Soviet SSBNs perceived by the Soviets as good or not?"

Since these questions do not address directly any of the four questions posed by the ACDA Task Statement and have been provided just for contextual use, the consideration of these three questions has been reversed until just before the key number 1 question of the ACDA Task Statement is treated after the other three questions, as explained above.

It should be noted that within the material provided for the analysis and conclusions to ACDA Question #1, the detailed "forces and means" of ASW are covered first in a logically desirable progression to the more general questions whose answers, in turn, lead to the appropriate overall conclusions.

Finally, it merits mention that there is some redundancy involved in Questions #1 and #2 of the ACDA Task Statement in that Question #2 asked for the "nature" as well as the frequency of changes in Soviet commentaries on U.S. ASW. In giving a full answer to this question, there is some unavoidable redundancy with answers to Question #1 as to what constituted Soviet perceptions of U.S. ASW and how those perceptions have changed. The preparing analyst tried

combining the two questions with not very fortuitous consequences and decided that it would be more satisfactory to answer the questions fully as stated despite the unavoidable redundancy, which is not so extensive as to seem objectionable. However, when it comes to drawing the final conclusions, the redundancy becomes repetitious and confusing, so Question #2 was not addressed per se. It is fully covered, nevertheless, in Question #3 which covers the "frequency" aspect and Question #1 which treats the "nature" of Soviet commentaries in full. A reminder to this effect has been inserted in place of the findings in the final conclusions for the entire 1960-1980 period.

ANALYSIS AND CONCLUSIONS RE. QUESTION #4 OF ACDA TASK STATEMENT FOR THE 1960-1966 PERIOD

A "What U.S. ASW programs are the particular focus of Soviet commentary?"

U.S. ASW programs taken together constituted the cynosure of Soviet attention qualitatively speaking.* In decreasing order of importance, based on the degree of interest reflected in each, they are:

1) SSNs (especially re. the Thresher Class and SUBROC);

2) SOSUS (primarily CAESAR and particularly plans for ARTEMIS -- which was never built); and

3) Surface ASW combatants (plus ASROC and DASH).

A moderately high level of interest was shown in the U.S. Navy's non-program for construction of a modern CVS (or CVSN). The Soviet Navy had decided to build their own CVSs ("ASW cruisers") as the best approach to the SSBN-protection and anti-SSBN missions and the fact that the U.S. was not doing so seemed to disturb them -- quite possibly because they could not cite any U.S. example to justify these expensive ships to the Defense Ministry and Party leaders.

Considering the potential importance of the subject, a relatively small amount of attention was paid by Soviet naval sources to U.S. research in non-acoustic means for long-range submarine detection. Beyond mentioning the various physical fields being investigated by U.S. ASW research, little of the abundant details available in U.S. technical journals found its way into Soviet descriptions of the U.S. ASW research effort.

The P-3A ORION program for replacement of the P-2V NEPTUNE was given an objective amount of coverage. More might have been expected considering the Soviets' traditional reliance on shore-based air for naval use. Quite possibly the quite limited coverage of the subject reflected the sources' awareness that the emphasis in the Soviet Navy was on the development and construction of air-capable ships for ASW.

*For a frequency count, see the quantitative content analysis section of this report.

ANALYSIS AND CONCLUSIONS RE. QUESTION #3 OF ACDA TASK STATEMENT FOR THE 1960-1966 PERIOD

B. "How frequently and in what contexts do the Soviets discuss U.S. ASW capabilities?"

During the 1960-1966 period, the Soviets may be seen to have discussed U.S. ASW capabilities with high frequency. This was the case not only with respect to the large number of newspaper articles, books and speeches which treated the subject but also may be noted to be the case with regard to the relative large number of naval articles devoted to ASW in the Soviet Navy's professional journal, Naval Digest. It was a rare issue of that journal throughout the period which did not give significant attention to ASW.

The contexts of these discussions during the period were noted to fall into three main categories:

1) More or less* factual and general descriptions of U.S./NATO ASW forces and means;

2) U.S. efforts to develop an adequate antisubmarine defense against Soviet submarines; and

3) Largely mirror-image portrayals of U.S. efforts to protect the continental U.S. against SSBN strikes that might be caused by the United States' allegedly aggressive policies.

In the latter case it usually was either readily apparent that the anti-SSBN efforts attributed to the U.S. Navy were actually surrogate descriptions of the Soviet Navy's own efforts to develop the forces, sensors, weapons, and

*"More or less" is used to draw attention to the very frequent Soviet resort to surrogate descriptions of the U.S. Navy for internal advocacy of what the Soviet Navy wants to obtain authorization to build in the way of general purpose forces. This causes no analytical difficulty when the facts are distorted to a recognizable extent (e.g., the Soviet assertion that the U.S. was building two SSNs for every SSBN for SSBN protection) but there are undoubtedly less obviously distorted claims that potentially might escape detection and thereby adversely effect any analysis of Soviet perceptions. Hopefully, such potentially twisted statements have been detected and adequately caveated in the subsequent analysis so that one is left with a reasonably accurate appreciation of Soviet perceptions.

tactics that would enable it to improve its capabilities for protecting Soviet SSBNs or there were persuasive reasons for concluding that such were the case.

ANALYSIS AND CONCLUSIONS RE. QUESTION #2 OF ACDA TASK STATEMENT FOR THE 1960-1966 PERIOD

C. "How have the frequency and nature of Soviet commentaries changed?"

3 (a) - SOSUS - This subject was discussed extensively as appropriate to its potentially critical importance should the U.S. eventually be able to cover the key oceanic areas with an effective long-range underwater detection system. Understandably the great potential threat from SOSUS of premature detection (and subsequent destruction) of Soviet submarines before they could launch their missile (or torpedo) strikes was not stated in so many words. Nevertheless, the essential facts were presented in sufficient detail for an informed reader to draw the accurate conclusions that SOSUS was the potentially critical threat to the successful operations of Soviet submarines in wartime, particularly since it was made clear that a fully-developed SOSUS system would allow the continuous tracking and classification of those Soviet submarines on combat patrol in peacetime and their prompt destruction at the outbreak of war.

A tipoff to the Soviet reader of the emerging threat from SOSUS was given repeatedly by data on CAESAR and the tentative plans for ARTEMIS with variants of the assertion made in 1963 that "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 status of the number one problem of the U.S. Naval forces." It was specifically noted that all of the advances in U.S. ASW weapons systems (e.g., SUBROC, ASROC, DASH, ORION) would be of no avail until an effective system of long-range detection of submarines could be developed. Such statements increased in frequency and detail in the second half of the period (1963-1965), probably providing an accurate reflection of Soviet concern even though there was no verbal escalation of the nature of the threat.

Nevertheless, the SOSUS system was described as "sophisticated" and as intended eventually to "encircle" the North Atlantic and be able to detect Soviet submarines transiting the GIUK Gap or the exits from the Sea of Japan, as well as any submarines exiting from the Baltic or Black Sea.

This could scarcely have failed to cause some concern to the extent that realization of such a globally comprehensive system was perceived to be imminent. However, in 1964 a Soviet naval source reported that U.S. research in non-acoustic detection means was becoming "much more active" and in 1965 it was said that submarine detection remained "an admitted difficulty", seemingly implying that SOSUS was not perceived in the U.S. as an adequate means of long-range detection. So, if the Soviet Navy felt any great concern over the steady development of the SOSUS system of underwater detection, no such concern was permitted to show in the public media. On balance, however, it seems well warranted to conclude that the SOSUS threat was perceived as a long-term one rather than an immediate or even mid-term problem.

Of no little interest is the fact that the subject of SOSUS was not even mentioned in the major military and naval book-length works of the 1960-1966 period. This was true of contexts that logically would have required some mention of the subject. It seems most likely to the preparing analyst that the Defense Ministry had banned wide, general discussion of SOSUS (that is outside the narrow naval professional literature) for fear of undermining the strategic-deterrent credibility of the USSR's SSBN force.

It is also of particular note that Soviet naval writers generally claimed either that Soviet nuclear-powered submarines were capable of operating successfully either in a hostile ASW environment or by avoiding it, including by under-ice operations in the Arctic. Since Soviet naval writers are prone to exaggerating the combat capabilities of their naval forces, and particularly of their main submarine arm, such statements must be viewed with reserve until and unless substantiated by other evidence.

Accordingly, we need only find that they are at least not inconsistent with our already adequately substantiated conclusion that the Soviet Navy not only did not give any signs of perceiving SOSUS an unacceptable hazard for the foreseeable future but gave numerous positive indications that SOSUS was viewed as a potential long-term threat that must be kept constantly under scrutiny.

3 (b) - VP Development and Production - There was nothing out of the ordinary in the nature or frequency of Soviet naval sources' descriptions of the development and deployment of U.S. shore-based ASW aircraft. It was factually reported in 1964 and 1965 that the P-3A ORION was "steadily" replacing the P-2V NEPTUNE. Development of the air-droppable, passive JEZEBEL and active JULIE sonobuoys was duly noted in 1963. The only item of any interest at all was the report in 1964 of Project A-NEW for designing a VP airplane task-specifically for ASW. Frequency-wise somewhat less coverage was given to VP aircraft than might have been expected considering the Soviet Navy's long-standing dependence on shore-based aircraft to the exclusion of sea-based aircraft. Most notably, no mention was made of the capability of U.S. VP aircraft, using SOSUS position data on Soviet submarines, for localizing the contacts and engaging in protracted tracking in peacetime or delivering attacks in wartime.

3 (c) - SSN Development and Construction - In 1960 Soviet commentaries dealt with the alleged U.S. long-range submarine sonar ANSOUND and the projected ASW "missile-torpedo" SUBROC. From 1962 on, the Soviet commentary was concerned not only with new developments in sensors and weapons systems but even more, with SSN construction, both as to the size of the program and also as to the military characteristics of the SSNs being constructed, especially maximum submerged operating depth, speed, and noise reduction. It seems highly likely that the greater attention given to these subjects reflected the preoccupation of the Soviet naval sources with profiting from U.S. experience in submarine design as much as it did with concern for any emerging threat. This likelihood is increased by the fact that the Soviets perceived U.S. construction of SSNs as being far smaller than required to meet the U.S. Navy's mission requirements.

3 (d) - CVS Development and Construction - Both the low frequency and the nature of Soviet commentary (all naval) on U.S. antisubmarine aircraft carriers reflected a seeming frustration on the part of the naval writers that the U.S. had not undertaken series construction of a modern CVS that could be pointed to in justification for the Navy's desire to obtain the funds and authorization to build a substantial number of such ships. This apparent

frustration was revealed with particular clarity in 1964 when one naval source went to the length of citing a U.S. admiral to argue that construction of a new U.S. CVS especially designed for ASW was "not excluded" from construction a decade hence and might even have nuclear-propulsion.

3 (e) - Other ASW Surface Combatants - Although the nature and frequency of commentary on the frigates, destroyers, and cruisers employed by the U.S. Navy was unremarkable, the extent of the coverage was about on a level with that accorded to SSNs. However, since it was made clear that such U.S. ships were considered by the Soviet Navy as far less effective for ASW than the more air-capable Soviet "ASW cruisers" or even the U.S. Navy's CVSs, one would surmise that the rather extensive coverage was partly due to the mindset of naval persons to think of navies as comprised essentially of surface ships. Another likely factor may be found in the numerous classes of ships involved. Also, Soviet reporting on the development of ASROC and DASH, the two technical improvements of note in the armament of surface ASW combatants in the 1960-1966 period, received considerable coverage. An even more causative factor was that the Soviets had recognized that, by adding one or two ASW helicopters to the armament of such ships, the speed advantage of nuclear-powered submarines over surface ships operating at low enough speeds to be able to use their sonar gear effectively could be overcome. At any rate, the more extensive coverage accorded to such ships over the CVS should not be interpreted to imply a Soviet preference for the former. Such clearly was not the case.

3 (f) - Mines -- Since there were only two pieces of data on U.S. interest (or, rather, total lack of interest) in this subject, there is virtually nothing to go on to draw any conclusions as to how the nature and frequency of Soviet perceptions of U.S. interest in mines changed over the 1960-1966 period. One can only observe that the frequency was extremely low and reflected accurately the lack of any publicly perceptible U.S. interest in the subject for the 1960-1966 period".

2 (a) - General Soviet Appraisals of U.S. ASW -- There were one or two general appraisals each year from 1960 through 1965 limited largely to the amount of effort and resources that the U.S. was perceived to

be investing in ASW. From "exceptional attention" and "great efforts" in 1960 and 1961, respectively, the nature of the comment escalated verbally, at least, to "enormous attention" in 1965. As the comparable commentary for subsequent years would show, the escalation proved temporary and so may be concluded to have reflected internal advocacy needs rather than any change in basic perceptions.

Despite this perceived high level of U.S. ASW development, the six pieces of relevant data (Section 2 (a), pp. A-13/14 of Appendix A) make it abundantly clear that a solution to the initial detection problem was merely the aim of great U.S. efforts but there was no indication that a solution was in sight. In 1961 a report by the U.S. Secretary of Defense was cited to the effect that not only was "the state of the forces and means of combat with modern, nuclear-powered submarines" acknowledged by the U.S. to be of "insufficient effectiveness" but U.S. plans for remedying the situation were "unsatisfactory" (2, A-13). Although there were no comparably unfavorable appraisals for the remaining four years of the period, the general tenor of the four comments for those years gave an adequate reason to conclude that the 1961 appraisal held good. Moreover, as the reader will find subsequently, similarly negative appraisals reoccur in late 1966, in 1973 and in later years.

2 (b) - U.S. Budget Allocations to ASW - There was a single commentary each year with the exception of 1963. While the data given remained generally inflated by inclusion of all costs that could be in any way related to ASW, the data did show increasing realism in reducing the percentage of the total U.S. naval budget said to be allotted to ASW from sixty percent in 1960, to fifty percent in 1961, and finally to thirty-three and a third percent in 1965. In addition to being greatly inflated, these figures were, in their essential nature, inaccurate. Published U.S. data showed that expenditures for ASW were highest in 1963, having risen to about fifteen percent of the naval budget from about eleven percent in 1961 and then declined to about fourteen percent by 1965 (see the Chronology for this study).

2 (c) - U.S. ASW Force Levels and Forward Deployment/ Readiness -- This subject was given frequent and rela-

tively comprehensive coverage consistent with the Soviet view that "aircraft-carrier search-strike groups" factually and fittinglv comprised "the basic ASW forces of the U.S. Atlantic and Pacific Fleets". The roles and missions of hunter-killer groups ALPHA through DELTA were described for both peacetime and wartime employment. The participation of VP squadrons was given commensurate coverage. There was nothing exceptional in the nature of the coverage accorded this subject except that in one instance U.S. ASW hunter-killer groups were indicated to have a larger role in anti-SSBN ASW than the objective facts and the other Soviet descriptions would seem to have warranted.

This completes consideration of the three ancillary questions posed by the ACDA Task Statements in Questions #2, 3, and 4. With this as essential contextual background for what follows, attention now may be turned to the ensuing analysis and final conclusions concerning the key Question #1 of the ACDA Task Statement which goes to the heart of the basic aim of determining Soviet perceptions of U.S. ASW.

ANALYSIS AND CONCLUSIONS RE. QUESTION #1 OF ACDA TASK STATEMENT FOR THE 1960-1966 PERIOD

D. "What is the Soviet perception of U.S. ASW capabilities and how has it changed?"

3 (a) - SOSUS (plus compatible mobile/portable subsystems). This one single kind of ASW "forces and means" is of such critical importance to the analysis of Soviet perceptions of U.S. ASW capabilities that the key points of the data on this subject have been summarized from section 3 (a) of Appendix A and, wherever relevant, information on the source and essential commentary have been added:

1961 - What is needed is not new weapons/tactics but basic R&D in oceanography and improvement of existing hydrophones/sonar and MAD gear. Rationale for this conclusion was that any state-of-the-art "breakthrough" in ASW in "the immediate future" was not to be expected and that improving existing means of longer range detection was the name of the game (2, A-23).

1962 - The Soviet Armed Forces' General Staff classic Military Strategy (edited by Marshal Sokolovsky), did not mention U.S. SOSUS as part of the otherwise vividly portrayed U.S. military threat -- but it did call for a Soviet equivalent -- presumably mobile vice a stationary system like SOSUS since USSR lacks the oceanfront property to install a SOSUS-like system. The value of such a SOSUS equivalent, although stressed "especially" for anti-SSBN vs. Polaris, left room for anti-SSN ASW to provide protection for Soviet SSBNs (25, A-23/24).

- U.S. SOSUS described in Red Star with conclusion that "the advantage will go to that side which is first to detect a submarine" -- an implicit assertion that the USSR could not afford to let the development of the SOSUS system go uncountered because it held promise to develop the capability to neutralize the Soviet SSBN force before it could launch a missile (?2, A-24).

- In the Soviet Navy's preface to a 1962 book-length collection of translations of the best western articles on ASW, the initial detection

and classification of underwater targets were stressed as the two critical problems on the solution of which would depend any really significant success in ASW. The U.S. was pictured as going all-out to solve these problems with half of its one hundred some military R&D projects alleged to be concerned with hydroacoustics and more than 300 various firms and organizations involved in the effort. Described were the CAESAR installation of SOSUS on the continental shelf off the U.S. East Coast and the ARTEMIS system by which SOSUS might be effectively extended into the deep ocean so as eventually "to encircle the North Atlantic". These two systems were to be supplemented by data from NATO hydrographic and U.S. missile-range ships to permit "the monitoring of wide oceanic regions" (3, A-24/25).

1963 - The first Soviet-authored book on ASW (by Captain First Rank Kvitnitskiy) asserted that U.S. military specialists viewed the detection of submarines at long-range as "the key to the resolution of the entire problem of ASW". Without this key, "accomplishments in other areas of antisubmarine defense, and in ASW weapons development in particular, lost their meaning for the most part..." (4, A-25/26).

- American war planning for establishing an ASW barrier across the Greenland-Iceland-UK (GIUK) Gap and probably across the exits from the Sea of Japan was reported in a Military-Historical Review article (by Captain First Rank Kvitnitskiy) (12, A-27).

- The importance of SOSUS was minimized in a book on military uses of hydroacoustics by two naval-engineering captains. In particular, it was described in a manner consonant with what the Soviet Union, with its limited ocean-front holding, might hope to develop for itself: a system of underwater sound surveillance for detection of submarines "approaching" the coasts (to within missile-launch range) in general -- and, in particular, for "protection of the shore on the far approaches to naval bases" (28, A-28).

- The 2nd edition of the Armed Forces' General Staff-authored Military Strategy was unchanged

from the 1st edition of 15 months earlier in that it again passed over in silence the nascent threat to neutralize the Soviet SSBN force posed by the U.S. SOSUS system while repeating the Soviet military requirement for an equivalent capability (whether by stationary or mobile means) (26, A-28/29).

1964 - The first edition of the only official history of the USSR's navy, Combat Course of the Soviet Navy, like the first two editions of Military Strategy in 1962 and 1963, made no mention of the U.S. SOSUS system despite an attempt to give a realistic portrayal of the "strong naval opponent" (27, A-28).

1965 - "Only the detection of submarines remains an admitted difficulty", according to an article in the naval professional journal which first mentioned possible use of earth satellites for detection of not only the launch of SLBMs but of the submerged SSBNs before any missile launchings had betrayed their positions (21, A-29/30).

- The lack of any description of SOSUS in a third major study (I. N. Potapov's The Postwar Doctrine and Development of the Navies of the Imperialist States), which appeared in November, only a few months before the XXIIIrd Party Congress, added support to the earlier hypothesis that Soviet policy was not to give SOSUS undue publicity until some seemingly credible means of countering it were in hand.

1966 - "The 1st edition of the DOSAAF booklet The Soviet Navy, by Rear Admiral Yakovlev, discussed Soviet ASW as though the U.S. SOSUS system did not exist (34, A-30).

- Despite the substantial U.S. efforts for the upgrading of the SOSUS system, the U.S. was perceived as having no effective long-range system for the initial detection of nuclear-powered submarines operating in or near missile launch areas in the Atlantic or Pacific. The Arctic was seen to offer Soviet SSBNs a fall-back position, should the need develop, where they could only be hunted by SSNs while on missile-launch station under the Arctic ice cover. And there Soviet SSBNs,

patrolling at slow speeds (and so generating little noise) would have the critical advantage of being able to use passive sonar to detect U.S. SSNs entering their patrol areas and so be first to launch a torpedo attack.

SOSUS was portrayed in 1962 as being comprised of an array of CAESAR hydrophones on the continental shelf along the U.S. East Coast with a range of only about 100 miles. Since Soviet submarine missiles had much longer range, the SOSUS system was perceived as constituting no threat of detection to Soviet SSBNs. Also in 1962, the project development of the ARTEMIS system of deep-water hydrophone arrays was portrayed as only completing the R&D phase and nearing the start of possible installation work -- and so several years away at best from being placed in operation. Even three years later, in late 1965, ARTEMIS was portrayed as still in the R&D stage with no forecast as to when if ever installation would begin. Consequently, it was implied clearly at the end of the 1960-1966 period that the U.S. still lacked an "effective" system for the long-range detection of nuclear-powered submarines. Thus, while the naval technical literature regularly updated the Soviet naval professions' knowledge of the SOSUS system, there was no implication in the very factual accounts that there was any present or prospective great threat to the "combat stability" of the USSR's nuclear-powered submarines.

3 (b) - Shore-based VP Airplanes (plus Satellites) -- The Soviets routinely reported that the standard U.S. VP airplane, the P-2V NEPTUNE, was being steadily replaced by the P-3A ORION. Considerable detail on the nature of the improvements to the airplane and its sensors was provided. However, it was also reported that VP airplanes had no long-range means of underwater surveillance and so were useful only for the localization and attack of contacts located "by other means" (i.e., primarily by SOSUS). There were no statements reporting that the ORIONs were planned for normal use by being vectored to submarine contacts using SOSUS-generated data.

3 (c) - SSNs (plus SUBROC) -- U.S. nuclear-powered attack submarines were portrayed as being less effective than they otherwise might be due to having been designed as "multipurpose" weapons platforms for use against both surface and underwater targets rather than having been optimized for antisubmarine

warfare. While the Soviet Navy soon realized that the U.S. loss of the SSN Thresher in 1963 was not to be taken as indicative of any persisting U.S. submarine-design weakness, the Soviet Army professed to perceive that loss as assurance that the ASW capabilities of U.S. SSNs suffered from fundamental weaknesses.

3 (d) - CVSs (plus aircraft) -- The eleven old antisubmarine aircraft carriers which the U.S. put in operation by converting World War II vintage Essex Class attack carriers were seen as primarily assigned for wartime employment to provide a defense-in-depth for the CVAs rather than for searching likely ocean areas for Soviet SSBNs. Rather than being forward-deployed and used for "daily activity" on ASW barriers in peacetime so that they would be maintained in a high state of combat readiness, the ASW carriers were noted to be based mainly in the U.S. and Hawaii and preoccupied with tactical development and training.

3 (e) - DLs, DDs, and DEs (plus ASROC and DASH) -- Instead of the U.S. taking the route obviously considered more promising in the USSR of developing modern helicopter and VTOL ASW aircraft carriers (or "antisubmarine cruisers" as the Soviets term them), the U.S. was considered to be misapplying its ASW resources on the new construction and refitting of destroyers and cruisers (and providing some of them with nuclear propulsion) when the funds could have been far better spent (particularly as far as developing capabilities for the anti-SSBN mission was concerned) in designing and building aircraft carriers specifically for ASW rather than continuing to rely on the obsolescent CVSs and on destroyers, even when refitted with ASROC and DASH.

3 (f) - Mines -- The lack of any new development in mine warfare in the U.S. during the 1960-1966 period was reflected accurately in the Soviet naval literature by the paucity of comment. As may be seen from this subsection in Appendix A, there was only one comment each in 1964 and 1965. One reported that all U.S. minelayers were in reserve and that the Mine Forces only included a small number of divisions of minesweepers. The other merely mentioned in passing that the P-3A ORION could be modified for laying mines. One can conclude with assurance that the Soviets perceived no potential mine threat to their submarines of any great magnitude should war break out during the period.

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?"

The statements found in the Soviet open literature that can contribute to an answer to this question for the 1960-'66 period may all be subsumed under one of four categories according to their nature:

1) Affirmative answers which express optimism that the ASW forces and means in existence and under development, especially of nuclear-powered attack (ASW) submarines, can be successful against nuclear-powered missile submarines;

2) Negative answers based mainly on the vastness of the oceans and/or the inherent covertness of nuclear-powered submarines derived from their great submerged endurance;

3) Negative answers claiming explicitly or implicitly across the board or for individual types of weapons platforms and sensors that the ASW state-of-the-art still lags behind that of submarine development; and

4) Negative answers asserting that the ASW state-of-the-art continues to fall further behind due to the steady improvement in the capabilities of nuclear-powered submarines.

In the first category the 17 pieces of evidence in section 1 (a) of Appendix A (pp. A-2 through A-7) yield only three affirmative answers to the question, one of which appeared in 1963 and two in 1965. In the first of these Captain First Rank Kvitnitskiy noted in his book Antisubmarine Warfare that, while the advent of nuclear-powered submarines "had shown up the inadequacies of the technical means for submarine search and detection" (4, A-3/4), recognition of this situation already had "led to the development of new weapons and sensors" -- which by implication had righted the balance between submarine and antisubmarine warfare. In the second of these statements a Rear Admiral, who was identified as an "instructor" (i.e., at one of the naval academies or, more often, at the Naval War College) stated in a Naval Digest article on the current nature of naval warfare that "substantial improvement" to ASW "forces and means" had been made, that SSNs had become "formidable" ASW platforms, and that "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, A-5). Unmodified by any accompanying statement as to the great problems posed by ASW, these claims could be taken to imply that the ASW state-of-the-art was abreast that of submarine warfare. Important here, however, is the fact that the author did not make such an explicit claim.

The third piece of evidence that expressed optimism about the ASW state-of-the-art was contained in an article which appeared in Red Star by a naval engineering officer who was a candidate of military science and which, in effect, cited the dialectic of weapons development to argue that nuclear-powered missile submarines could not be considered to possess "complete invulnerability" because the historically inevitable effort to counter each new weapon had led to the development of "antisubmarine missiles, torpedoes, and depth charges carrying nuclear charges". These latter were described as constituting "a formidable adversary for nuclear-powered submarines". In this case, however, the optimism over ASW was balanced off by a subsequent statement that "detecting a submarine underwater and determining its coordinates... is a most difficult matter and, in fact, not always a possible one" (32, A-6/7).

In view of the inexplicit nature of the first two of these three affirmative answers and the internally contradictory assertions of the third, it seems well warranted to conclude that the substance of these three claims is insubstantial. This conclusion will be seen to be well supported if indirectly by the bulk of negative statements whose consideration follows.

In the second category, the one giving a negative reply to the question of section 1 (a) on the basis of the inherent covertness possessed by nuclear-powered submarines by virtue of their operating in the vast expanses of the oceans, there are two such assertions to be found. The first, taken from a 1962 Red Star article, noted that "the antisubmarine zone now must embrace tremendous areas of our seas and oceans" and that a correspondingly "tremendous number of new weapons" would be required "to detect and destroy a modern submarine" (7, A-4). The second of these assertions comes from a 1965 article in Naval Digest summarizing the ASW problem as follows: "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 sensors are comparatively short." The article went on to analyze the consequence of this situation: "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 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, A-5/6).

In the third category, that of explicit statements that the ASW state-of-the-art lags that of submarine warfare, two pieces of evidence are at hand that require consideration. The first is to be found in the preface by two Soviet naval captains to the USSR Ministry of Defense's translation of a 1962 collection of articles on ASW entitled Antisubmarine Defense in Modern War. In an obvious surrogate use of the opinions of "foreign specialists" to air the Soviet Navy's current viewpoint, it was observed that "existing forces, means, and methods for combat with submarines, particularly with nuclear-powered missile submarines, are insufficiently effective". The underlying reason was seen as the fact that "the development of submarines has considerably outstripped the development of the forces and means for combat with them" (3, A-2/3). A 1962 article on ASW in Red Star by a Captain Second Rank provides the second statement relevant here. Despite the "qualitative leap forward" being made in ASW, it was said to be "still lagging far behind... the much greater leap forward in the development of submarines" (22, A-3). The third piece of evidence of this nature is taken from a mid-'64 article in Naval Digest. ASW was evaluated as "not very effective in actual use" and as only "slightly better than in World War II". The reason for this was seen to lie in "the considerable lag in the development of sensors for submarine detection" (7, A-4).

There are also two pieces of evidence which fall in the fourth and final category of negative answers asserting that the ASW state-of-the-art continues to fall further behind in the technological contest with submarine development. The first is dated 1965 and comes from a book by a Soviet naval historian which notes that the probability of detection and destruction of any given submarine is not high because nuclear-powered submarines already enjoy a speed advantage over surface ASW ships and "the speed at which submarines can operate noiselessly is increasing steadily" while surface ship speeds have reached the limits at which their sonar can operate effectively (30, A-4).

The second and final statement in the fourth category was included in a 1965 Naval Digest article which first noted that the combat capabilities of both submarines and ASW had been considerably improved in "recent years" but then

observed: "However, the development of the latter has been taking place at a somewhat slower pace and... has fallen behind the development of submarines" (6, A-5).

In view of the evidence considered above regarding Soviet perceptions of the ASW state-of-the-art for the 1960-1966 period, the preparing analyst concludes that ASW was viewed generally as lagging substantially behind that of submarine development -- seemingly a not unobjective viewpoint but one calculated to predispose Soviet subscribers to this viewpoint to regard US/NATO ASW more lightly than their objective capabilities would warrant.

1 (b) - "Is the U.S. Navy seen as assigned a priority mission for anti-SSBN ASW?"

Only one of the 14 relevant statements compiled in Appendix A (pp. A-8 through A-12) made any claim that could be construed to assert that anti-SSBN ASW was a priority role for the U.S. Navy. This single case stems from a 1964 Naval Digest article by a Captain Third Rank who asserted that the U.S. reorganized its ASW forces in the late '50s to create standing peacetime forces that would be in readiness for immediate "counteraction in the event of the territory of the U.S. coming under fire from missile submarines" (13, A-9/10). The nature of the anticipated "counteraction" by the U.S. ASW forces was not even hinted at but from a consideration of the Soviet Navy's often-expressed allegation that SSBN protection looms large on the U.S. scale of mission priorities, it would be at least a fair bet that the "counteraction" held in view was not anti-SSBN ASW (which logically could be seen as pointless anyway once Soviet SSBNs had launched their missiles) but rather protection for U.S. SSBNs while they launched a retaliatory strike.

A second one of the 14 statements found on this subject pictured the U.S. as paying "considerable attention" to the construction of multipurpose submarines "for combat with submarines (above all, with missile submarines)" (36, A-10). This is the closest that the Soviet open literature comes to yielding any claim that even a single type of ASW forces is intended "above all" to be employed for anti-SSBN ASW. It is to be found in an article by Admiral Chabanenko published in the newspaper Literary Russia where it could be expected to have been noted by a significant share of the USSR's intellectual elite. Since the claim constituted an isolated case, it may possibly have been an effort to further the Navy's campaign for more general purpose forces on the basis of the most compelling argument available (and one that came under the most persuasive "nuclear criterion") -- that much larger general purpose naval forces were required to provide

the escort forces for Soviet SSBNs to give them "combat stability" in the hostile ASW environment existing in the open oceans. However it is true to say, as will be documented below, that U.S. SSNs are the single force type whose priority wartime missions cannot be shown conclusively to be perceived by the Soviet Navy as other than for anti-SSBN ASW.

Thus a 1963 statement by Captain First Rank Kvitnitskiy was vague as to the missions to which U.S. SSNs are assigned. Writing of the second generation SSNs that were being constructed in the U.S. at that time, Kvitnitskiy merely noted, with unusual indefiniteness, that they were capable of carrying out "various missions". Subsequently, these U.S. multipurpose submarines were criticized in the same article for being unable to meet the requirements for "the search and detection of submarines". This point may be construed reasonably as an effort to persuade the senior military readership of the Military-Historical Journal in which the article appeared that U.S. SSN capabilities against Soviet SSBNs were not so great as to warrant continuing to deny them some share with the Stragegic Missile Forces in the initial "deep" strategic strike against the key counter-force and industrial-administrative targets in the U.S. However, the author's failure to spell out the wartime missions of U.S. SSNs probably was to avoid having to omit anti-SSBN ASW (to be consistent with his subsequent statement that U.S. SSNs lacked the capability for ASW) and thereby undercut the Navy's campaign for more general purpose forces ostensibly for SSBN protection.

A third and final indication of the wartime role perceived for U.S. SSNs was contained in a 1965 book by (Naval War College?) Instructor I. N. Potapov that was even more abstruse and ponderous than its title -- The Postware Doctrine and Development of the Navies of the Imperialist Powers. Despite a fairly lengthy but convoluted description of the U.S. Navy including the ASW forces, the only role mentioned for SSNs was as escorts for SSBNs, CVAs, and amphibious forces (16, pp. A-10 to A-12).

Antisubmarine hunter-killer groups formed around ASW aircraft carriers (CVSs) were indicated by five of the 14 quotations spread from 1960 to 1965 to be intended for SLOC protection and/or for CVA protection, with no hint that anti SSBN ASW might be a factor (29, A-8; 3, A-8; 4, A-8; 16, A-11; and 35, A-12). Destroyers, frigates, and destroyer-escorts were said to be assigned primarily for providing ASW point defense for CVAs, other naval combatants and merchant ship convoys. Nothing was mentioned about their having any role in anti-SSBN ASW (24, A-8; 16, A-10 and A-11).

Finally on this aspect, even the U.S. Atlantic Fleet despite being located in the fleet area of most critical importance for anti-SSBN ASW, did not have such a role listed among the three main missions it was said in a 1962 Red Star article to have: 1) strategic strike; 2) SLOC protection; and 3) amphibious landings (7, A-10).

In view of all the foregoing, it is clear that a preponderance of the evidence supports a rather confident negative answer to the question: no, the U.S. Navy was not seen as assigned a priority mission for anti-SSBN during the 1960-'66 period. If correct, this fact alone would go far to account for the seeming lack of any great concern on the part of the leadership of the Party and the Defense Ministry for the security and credibility of their SSBN force.

2 (a) - General Soviet Apraisals of U.S. ASW -- As already shown above in answer to Question #2 on the changes in the frequency and nature of Soviet appraisals of U.S. ASW, the Soviets perceived a very high level of U.S. effort over the 1960-'66 period aimed at improving U.S. ASW in general and to the key problem of initial detection of submarines in particular. Moveover, it was concluded in the earlier section that there was adequate reason to conclude that a 1961 perception that U.S. ASW was of "insufficient effectiveness" persisted over the ensuing four years of the period.

Since Soviet naval officers, like miliary men the world over, take a "proof-of-the-pudding" approach to evaluating military capabilities, it is likely that their estimate of U.S. ASW capabilities was substantially influenced by the U.S. Secretary of Defense's complaint that the "insufficient effectiveness" of U.S. ASW had been demonstrated by an exercise in which a nuclear-powerered submarine had passed under an antisubmarine hunter-killer group three times without being detected (2, A-13). If this could transpire, one can imagine the unlikelihood perceived by the Soviets that U.S. ASW could be effective in open-ocean ASW search for Soviet SSBNs!

It merits noting that of the six general appraisals of U.S. ASW for the 1960-'66 period (pp. A-13 and A-14), five of them merely stated that the "great" or "enormous" attention being accorded to ASW development in the U.S. was directed at across-the-board improvements. Only one specified, in effect,

the long-range means for the initial detection of Soviet submarines, i.e., the SOSUS system (2, A-13).

In 1964 a naval-engineering captain, writing in Naval Digest, used the revealing adjective "effective" in describing the "antisubmarine forces and means" that he perceived the U.S. was attempting to develop (5, A-13). From this one may deduce that to his technically trained mind, at least, existing U.S. forces were seen as not effective. Since articles appearing in the official house organ of the Soviet Navy, Naval Digest, are almost invariably reflective of Gorshkov's views, it is a fair assumption that existing U.S. ASW forces were generally appraised by senior Soviet naval officers as ineffective. Certainly such as assumption re. the 1960-'66 period is generally consistent with the body of evidence found for these five years.

2 (b) - U.S. Budget Allocations to ASW -- It may be noted in the preceding coverage from the data on this subject in Appendix A (page A-15) that the individual entries reflect a steady reduction in the percentage of the U.S. naval budget devoted to ASW over the 1960-1965 period from sixty percent in 1960 to about half in 1961 down to about one third in 1965. None of the published Soviet material commented on this quasi-decline -- which should not be a cause for surprise in any event since the Soviet Navy's interest lay in portraying the U.S. ASW expenditures as a maximum to provide an argument for larger Soviet appropriations for building more ASW forces. It is unlikely, however, that any such decline would go unnoted by Admiral Gorshkov and his staff.

In this case, though, it appears that the implied reduction was more seeming that real and probably was caused by either deliberate exaggeration of the situation in the first years of the period or by a more realistic statistical computation in the latter years. It may be seen from the U.S. budget data given in the appended Chronology that the percentage of the U.S. Navy's budget devoted to ASW actually rose from 11.3 percent in 1961 to a peak of 15.1 percent in 1963 and then declined to 13.9 percent by 1965.

Consequently, it is clear from the much higher Soviet percentages that Soviet naval analysts were

including the costs of every ship and aircraft with any ASW capability in order to inflate the percentages to better support their advocacy of greater appropriations for more ASW forces. This was not wholly unsupportable and the Soviet percentages likely were an approximate reflection of the Soviet Navy's general perception of the scope of the U.S. ASW effort -- but a more accurate, realistic perception at the end of the period than at the beginning.

2 (c) - U.S. ASW Force Levels and Forward Deployment/Readiness -- From all of the details on U.S. Navy order of battle which was turned up by the research for this study (and not all of which was included in the appendices) the following composite picture of U.S. ASW forces in the 1960-1966 period emerges as set out below:

A. Overall Order-of-Battle of U.S. ASW Forces:

1) CVS-11
2) CVS aircraft (two Tracer/Tracker squadrons of ten to twelve planes each, plus one helo squadron of fourteen helos):

   a) Airplanes - 220-264
   b) Helicopters - 154

3) VP - Inadequate data (just sixteen squadrons in U.S. Second Fleet and "about 500 airplanes" in the Pacific Fleet)

4) Attack submarines:

	Jan '61	Jul '63	Jan '65
a) Diesel SS (Old & New)	(?)+20	-	30
b) SSNs	9	16	21

5) Postwar frigates and destroyers: 125 total plus one CGN (1961)

   a) DDs/DLs with only ASW torpedoes - 21
   b) DDs/DLs with ASROC also - 34 (including one DLGN)
   c) DDs/DLs with ASROC plus two helos - 70
   d) 1961 totals (including some wartime DDs and DEs): eight DL, 290 DD, and 33 DE

6) Minelayers - Not given but those in Pacific Fleet said to all be in the reserve.

7) Reserves:
   a) DD/DE - 91
   b) VP Squadrons - 100 (roughly)
   c) Personnel - 28,300

B. Fleet Order-of-Battle of U.S. ASW Forces:

1) Atlantic Fleet:

CVS-7

CVS aircraft:

a) Airplanes - 140-154
b) Helicopters - 98

VP Aircraft - Inadequate data (sixteen squadrons in the Second Fleet).

ASW surface ships (DL, DD, DE) - Inadequate data.

2) Pacific Fleet:

CVS-4

CVS aircraft:

a) Airplanes - 80-88
b) Helicopters - 56

VP Airplanes - six air wings

Other ASW surface ships (DL, DD, DE) - Inadequate data (about 100 surface ships).

From the data initially presented on U.S. ASW order of battle and the above tallies of overall and fleet orders-of-battle, it seems warranted to conclude that U.S. ASW forces were perceived by Soviet naval sources from 1960 to 1966 as very substantial in numbers and, from a numerical standpoint alone, should have been perceived as an opponent to be respected and taken into strict account.

The formation of ASW hunter-killer groups in the U.S. Atlantic and Pacific Fleets in the late '50s was described as an effort to improve the combat readiness of the Navy for ASW at the outbreak of any future hostilities. The organization of an ASW command in each fleet in 1960-1961 probably was perceived as aimed at the same goal. The "basic ASW forces of the U.S. Atlantic and Pacific Fleets" were said, with "complete obviousness" to be comprised of these "aircraft-carrier search-strike groups".

In the Atlantic, all of the ASW carriers apparently were perceived as being homeported on the U.S. East Coast. One ASW carrier group was said to be deployed to the Mediterranean "periodically". Another allegedly had been proposed (by the U.S. NAVY presumably) for peacetime ASW patrol in the GIUK Gap from a base in Iceland. At least one ASW carrier hunter-killer group was alleged to "usually" be "constantly at sea on combat alert and patrol". VP crews were said to be kept under great strain by alleged "round-the-clock" ASW search operations. Land-based ASW aircraft of the Atlantic Fleet were said in 1965 to have been playing an "intermittent" ASW role on the radar picket barriers that had been maintained off Newfoundland and the Azores since 1956.

In the Pacific, the initial planning when the four ASW hunter-killer groups were formed in late 1959 was to station two on the U.S. West Coast, the third in Hawaii, and to deploy the fourth to the Far East. In 1964 such a group was noted to be included in the Seventh Fleet Task Group 70.4. Task Force 72 of th Seventh Fleet, which was assigned at least a secondary mission of ASW, was reportedly stationed "in the region of Taiwan". Of the six air wings in the Pacific Fleet, three were based on the U.S. West Coast, one in Hawaii, and the other two were permanently deployed to bases to the Western Pacific (one on Okinawa and one in Japan).

The CVS hunter-killer groups were seen, with the exception of one group that was stated to "usually" be at sea in combat readiness, to be committed to providing protection to U.S. naval forces (primarily CVAs) and, in wartime, also to convoy protection. The all-VP "search-strike" groups' roles were not so specifically delineated. It was indicated that such VP groups were included in the composition of naval forces used for CVA (and convoy) protection but nothing was stated to indicate a perception that some of them, at least,might be assigned to ASW barrier patrols. Only one hunter-killer group was reported to be forward deployed beyond continental U.S. and Hawaiian ports and it was noted to be committed to the (protection of the CVAs being employed constantly on the) Taiwan Patrol to protect Taiwan and the offshore islands from asault by Communist China.

The bulk of the sizable ASW reserve forces of the U.S Navy were reported as being in a high readiness status requiring only t..enty-four hours for the personnel and ships to be ready for action. Presumably all of the reserve ships were in U.S. ports.

Taken by itself, the care and completeness with which Soviet naval sources reported the forward deployments of U.S. ASW forces would seem to constitute a valid indication of actual Soviet concern for anti-SSBN ASW and for the protection of their own forward-deployed submarines (by persuading the Army marshals and Party leaders to build more general purpose naval forces to provide such protection).

2 (d) - Mission-completion Capabilities of Soviet SSBNs -- The Soviet open literature yielded nine pieces of data for the 1960-'66 period which amounted to more or less explicit claims that Soviet SSBNs would be able to carry out strategic strike missions successfully in wartime (see pp. A-19 through A-22 of the appendices). There was a tenth statement which took the position that the introduction of ASW weapons carrying nuclear warheads was depriving even nuclear-powered submarines of their superiority (since they could be disabled of destroyed without being hit directly) (32, A-20/21).

At least one of the statements bore the unmistakable signs of deterrent propaganda. That was one made by Marshal Malinovskiy, in his accountability report as Defense Minister to the XXIInd Party Congress in 1961. First quoting Khrushchev's "reminder" to "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", Malinovskiy asserted that "our missile-armed submarines have learned to operate well uner the ice cover of the Arctic and to assume positions for launching missiles with precision -- which is very important for hitting objectives on land...." (31, A-19).

The claim that Soviet SSBNs could operate and launch their missiles from under the Arctic ice cover for protection against US/NATO ASW forces was repeated in different forms in 1963 (30, A-19/20) and 1964 (13, A-20). In 1963 and 1964 three of the nine positive statements merely cited the inherent covertness of nuclear-powered submarines as enouch to insure their successful operation in the open oceans (30, A-19/20), (12, A-20) and (13, A-20) and one of these in 1964 even asserted the capability to do so "even in regions where there are substantial antisubmarine forces of the enemy" (13, A-20). Two more of the nine positive claims asserted in 1962 and 1965 that Soviet SSBNs could find adequate protection, in effect, by playing needle-in-

a-haystack "in the tremendous area" or "most various parts of the World Ocean" (22, A-19) and (21, A-20). Worthy of final note is the claim made in 1963 by Captain Kvitnitskiy in the book Antisubmarine Warfare that Soviet submarines would be able to fulfill their missions without penetrating any of the U.S./NATO ASW barriers: "...for the delivery of such /strategic/ strikes, it will not even be necessary to enter the zone protected by the forces and means of a submarine barrier" (4, A-19). While this may well have been written with the Arctic refuge in view, the context does not reveal with certainty what the author had in mind. It may have been additional deterrent propaganda -- which is more likely in a book designed for a wide readership that if it had appeared in Naval Digest -- or it may hve resulted from an unfounded optimism that the Navy would soon be authorized to maintain the bulk of its SSBN force on combat patrol in peacetime like the U.S. Polaris force. Whatever the inspiration for this claim, it is noteworthy that it was not to appear again until a decade later in 1972 -- when it appeared to be made with the Delta Class SSBN in mind (15 and 16, C-27/28 and 88, C-33).

Interestingly and relevantly, no single one of the nine claims to the mission-accomplishment capabilty of Soviet SSBNs ever combined all of the above-cited grounds to build a reasoned "case" for the claim. This cavalier attitude toward a subject of such importance has a number of possible explanations, including that such claims were made as concessions to the Party line on deterrent propaganda and, consequently, no one in the Navy ever thought of going beyond the minimum requirements. As will be seen from the analysis of this question for the 1966-1971 period, there is substantial evidence to support just such an hypothesis.

Having completed the detailed analysis of each of the key components of the U.S ASW problem as perceived by the Soviets as well as of the necessary contextual factors, let us turn next to drawing the appropriate conlusions for this first period. We will first draw the rather detailed "general" conclusions to address each of the ACDA Task Statement questions specifically and then the briefer, most relevant overall conclusions will be drawn.

GENERAL CONCLUSIONS RE. SOVIET PERCEPTIONS OF U.S. ASW FOR THE 1960-'66 PERIOD

- Soviet commentary from 1960-'66 focussed particularly on SSNs, SOSUS, and destroyer-type surface combatants. U.S. failure to design an antisubmarine aircraft carrier from the keel up and build them in large numbers was perplexing since so doing seemed to the Soviet Navy to proffer the only feasible way for a superpower Navy (with or without SOSUS or mobile equivalent) to develop a significant damage-limiting capability against an adversary's SSBNs already operating in the open oceans at the outbreak of war.

- U.S. ASW capabilities were discussed by the Soviets with high frequency during the 1960-'66 period. The commentaries largely were made in one of three contextual frameworks: 1) Factual descriptions of U.S./NATO ASW forces, weapons, and sensors: 2) U.S. efforts to develop an adequate antisubmarine defense against Soviet submarines; and 3) Portrayals of U.S. efforts to protect the country against SSBN strikes that (largely consciously) mirror-imaged Soviet thinking and planning in this regard.

- SOSUS was perceived by Soviet naval sources no later than 1962 as being of absolutely vital importance to any eventual success the U.S. ASW effort might be able to achieve in open-ocean detection and peacetime tracking or wartime destruction of those of the Soviet Navy's SSBNs maintained in readiness for strategic strike on combat patrol on the high seas. Several allegations appeared between 1963 and 1966 that all of the U.S advances in ASW weapons systems (SUBROC, ASROC, DASH, ORION) would be of no help until the key problem of initial detection of submarines in the open ocean had been resolved (either by SOSUS or a "technological breakthrougn" that would make the oceans "transparent" for ASW forces). While the projected (but unsuccessful) ARTEMIS deep-water hydrophone system was reported on frequently, the likelihood that it would never go beyond the R&D stage appears to have registered in Soviet naval perceptions by the beginning of 1966 and the period ended with Soviet naval writers reporting that the U.S. did not, at least at that time, hve an "effective" system for long-range detection of Soviet submarines operating in the open Atlantic or Pacific. So, while the Soviet naval profession was kept well abreast of SOSUS developments, both what was said and what was not said supported the existence of a general Soviet consensus, at least among senior naval officers and other naval specialists, that SOSUS did not constitute a short-term (3-5 years) or even mid-term (5-10 years) threat. On the other hand, there was an unmistakable if never voiced recognition tht SOSUS potentially consti-

tuted an eventually effective substitute for the "technological breakthrough' that could make the oceans transparent. Or, perhaps more accurately, the Soviets realized that SOSUS was the actual shape that "breakthrough" was destined to take, although slow and laborious in development.

- Shore-based VP airplanes were given routine but quite limited coverage in 1960-1966 considering the importance the U.S. accorded to them for ASW and the USSR's traditional total dependence on shore-based aircraft. The steady U.S. replacement of the P2V NEPTUNE by the P-3A ORION was reported but not a single mention found its way into print about the capability of the P-3A to employ SOSUS vectors to make initial contact on Soviet submarines in the open oceans. First mention was made concerning U.S. development of A-NEW,which was billed as an integrated system of sensors and weapons for the next generaton of U.S. VP airplanes.

- SSN development and construction by the U.S. in the 1960-'66 period was professed to be concerned primarily with designing nuclear-powered boats that could dive deeper and run quieter and faster than the early designs. While there doubtless was more than a little truth in this, the emphasis on those three features (and especially on speed) seemed to reflect the Soviet Navy's preoccupation with designing the very fast, deep-diving titanium-hulled Alpha Class SSN more than it did U.S. military requirements. From 1962 onward to the present the Soviet's have evinced concern at the prospect of the U.S. eventually having a large force of highly ASW-capable SSNs. The loss of the U.S. SSN Thresher in 1963 was soon realized by the Soviet Navy not to reflect any basic design weaknesses that could not be corrected. The criticism that the "multipurpose" SSNs being constructed by the U.S. were not as satisfactory for ASW as if they were task-specifically designed for ASW did not last long and is likely also to have been related mainly to development of the Soviet Navy's Alpha Class SSN. The underwater-launchable "missile-torpedo" SUBROC was mentioned only a moderate number of times,an average of once a year,despite its intrinsic importance.

- CVSs,the eleven World War II-vintage Essex Class CVAs that the U.S. had converted to antisubmarine aircraft carriers, were perceived by Soviet naval sources during the initial 1960-'66 period as being misused for point-defense of the CVAs rather than for open-ocean ASW hunter-killer force searches for the enemy's SSBNs. The fact that the U.S. was not building CVSs designed from the keel up for ASW against nuclear-powered submarines appeared to be considered by Soviet naval sources as a serious error in judgement and,

probably, as missing the best developmental route for producing an eventual capability to achieve some meaningful degree of damage-limitation against the opponents'strategic submarines. Soviet commentary of this initial period seemed to have a note of frustation that the U.S. Navy had not chosen the task-specific CVS-construction route that the Soviet Navy so strongly favored and thereby deprived the latter of the most relevant example that conceivably could be cited to silence or outshout the objections of the Army detractors of building the many large air-capable ASW ships that were central to the Navy's planning to eventually have a significant open-ocean ASW capability. At this stage, the SEA KING helicopters and TRACKER airplanes then aboard CVSs were not of any great interest, probably because they had such limited capabilities against nuclear-powered submarines, as Soviet naval writers subsequently were to comment. The first mention of the VTOL alternative to TRACKER-type conventional carrier aircraft was not to be discussed in the Soviet media until later in 1966,after the XXIIIrd Party Congress and the start of the second period of this study.

- Destroyer-type ASW ships of the U.S. were perceived by the early '60s as distinctly inferior to antisubmarine aircraft carriers for open-ocean ASW. This remained the Soviet Navy's general perception even though it was acknowledged that the addition of the pilotless helicopter DASH and the "missile-torpedo" or missile-depth charge ASROC would compensate substantially for the rapidly disappearing speed advantage of surface ships over nuclear-powered submarines and the less-than-maximum speed at which surface combatants must operate to be able to employ their own sonar. It seemed virtually certain that the Soviet Navy did not consider that the destroyers of the U.S. navy constituted any significant danger to Soviet SSBNs in the event a war should break out in the '60s. Lacking any major air-capable ships to take ASW airplanes to sea,the Soviet Navy also lacked any surface ship-carrier air "team" approach to ASW in the early '60s. Hence, the destroyer-type surface ASW ship was not valued as highly for anti-SSBN ASW as it subsequently has become in Soviet naval circles.

- Mines of the U.S. Navy were virtually ignored in the Soviet open literature in the 1960-'66 period, even in the naval professional journal, Naval Digest. This fact correlates fully with the lack of interest in the subject being evinced by the U.S. Navy during this period when the mine had lost out compelely, although only temporarily, to the general preoccupation with nuclear-missile weapons. There was no evidence of any U.S. plans for a mining campaign against SSBNs at any stage in their wartime mission profile

from their bases, through the chokepoints out to the open ocean and return. It was noted that even the P-3A ORION would need modification before it could carry mines and there was no evidence of plans for using Air Force or commercial aircraft for mining -- nor were there any indications of the U.S. having any modern ASW mines available, let along in the quantity required for a mine blockade of Soviet submarine bases.

- Anti-SSBN ASW was seen by the Soviets during the 1960-1966 period as beyond the technological state-of-the-art given the substantial lag of ASW behind that of submarine warfare.

- No priority wartime mission for anti-SSBN ASW was seen during the 1960-1966 period as assigned the U.S. Navy.

- General Soviet appraisals of U.S. ASW from 1960 to 1966 gave the U.S. a big "E" for effort but a very small "c" for the open-ocean ASW capabilities of the U.S. Navy on the basis that no adequate solution was in sight to the key ASW problem of initially locating enemy submarines, a judgement that ostensibly took SOSUS into account and still found U.S. capabilities for initial detection of submarines to be of "insufficient effectiveness".

- U.S. budget allocations to ASW were distortd to maximize the results to support the Soviet Navy's advocacy of greater appropriations for larger general-purpose naval forces for SSBN ASW. The data became less exaggerated towards the end of the period but failed to reflect significant decreases in the actual U.S. ASW budgets for 1964 and 1965

- U.S. force levels of ASW types suitable for open-ocean search throughout the 1960-1966 period were: CVSs - down two to 9; VP airplanes - unreported; SSNs - increased 9 to 21; and 104 destroyers and frigates, each with two pilotless DASH helicopters and/or ASROC.

- U.S. ASW forces' forward deployment/readiness was perceived as nearly continuous and at "combat-alert" status with at least one ASW aircraft carrier hunter-killer group in the North Atlantic and one in the Western Pacific. VP airplanes were reported to be constantly engaged in ASW search operations. The bulk of the sizable reserve ASW forces of the U.S. Navy were reported as held in 24-hour readiness from U.S. homeports.

- Mission-completion capabilties of Soviet SSBNs were extolled but in such a fragmentary and haphazard manner as to suggest that the Soviet naval writers were merely conforming

to the military censors' guidelines for not undercutting the credibility of the USSR'S seaborne stragetic deterrent force. The net effect was to introduce an unmistakable element of doubt as to their mission-accomplishment capabilities both regarding Soviet SSBNs already deployed in the open oceans prior to the outbreak of war and those that might be required to leave their bases, effect a "breakout" of the chokepoints and ASW barriers across them, and transit the missile-launch areas through the hostile ASW environment created by the ASW forces and hydroacoustic-detection infrastructure of the U.S. Navy and its NATO and Japanese allies.

OVERALL CONCLUSIONS RE. SOVIET PERCEPTIONS OF U.S. ASW FOR THE 1960-'66 PERIOD

- SOSUS was perceived from the outset as a potential long-term substitute for a technological breakthrough in ASW by the U.S. and must have given impetus to the development of an SSBN, the Delta Class, with missiles of transoceanic range that could be launched from the relative safety of Soviet home waters.

- The potential efficacy of the SOSUS-vectored VP airplanes for open-ocean ASW was ignored, perhaps studiously, during this period and Soviet naval circles made much of the U.S. failure to design and build an antisubmarine aircraft carrier task-specifically for use against nuclear-powered submarines. If the realization existed in Soviet naval circles that the U.S. could carry out open-ocean ASW with SOSUS-vectored VP airplanes without the necessity for large numbers of ASW hunter-killer groups formed around new-construction CVSs, no recognition of the fact ever found its way into the otherwise extensive and discursive coverage given to U.S. ASW. However, mention that the U.S. had found CVS hunter-killer groups to lack "cost-effectiveness" for ASW may have been a partial reflecton of such an appreciation -- but one that was not voiced for far of undermining the chances of the SOSUS-less Soviet Navy for getting authorization to build the substantial number of major air-capable ships with which to try to achieve some substantial degree of damage limitation against the Polaris SSBNs and to provide protection to their own SSBNs.

- SSN producton and plans for future construction of a substantial U.S. force of highly ASW-capable nuclear-powered submarines should have provided all the justification needed by the Soviet Navy to win funding for development of the fast, deep-diving titanium-hulled Alpha Class SSN which, among other roles, would be potentially irreplaceable for protecting Soviet SSBN havens from incursions by unfriendly SSNs.

- Destroyer-type combatants of the U.S. Navy were perceived by the Soviet Navy as neither intended by the U.S. for wartime use for open-ocean ASW nor sufficiently modernized to be of much value should they be impressed into use in wartime.

- Mine warfare was seen as a totally neglected area in U.S. ASW during this period -- a situation for which the Soviet Navy had good reason to be grateful.

● With the U.S. SOSUS system still limited largely to the coastal waters of the North American continent, the Soviet Navy held the view that successful anti-SSBN ASW (in the sense of some high percentage of damage limitation by destroying the opponents' predeployed SSBNs before they could launch their missiles and preventing the deployment of the others) was beyond the technological state-of-the-art for ASW for both superpowers' navies. And for this reason the U.S. Navy (and probably the Soviet Navy too) was perceived as not having been assigned a priority anti-SSBN ASW mission which, despite its vital military importance, was not one which could be carried out with any substantial degree of success given the lagging state of ASW compared to the rapid advances still being made in nuclear-powered submarines. In the case of Soviet naval views of the mission-completion capabilities of their own SSBNs, a logical inconsistency appears. If the U.S. were not assigned an anti-SSBN mission, then why should the Soviet Navy have entertained doubts as to the mission-completion capabilities of its SSBNs? The answer that would seem to adequately reconcile this quasi-inconsistency is that wartime ASW efforts would prosecute to a kill all enemy submarine contacts regardless of their type and wherever made -- whether from ambush off Soviet submarine bases,in Soviet home waters, on ASW barriers, or in the open ocean. So, even though the enemy ASW effort might be wholly dedicated to protecting the vital sealines of communication (by both point defense of convoys and by blocading/ambushing Soviet submarines in home waters), any SSBNs venturing into any of the geographic areas concerned would be as liable to be sunk as the attack submarines that were the actual targets of the ASW effort. In short, a very considerable number of Soviet SSBNs could be lost as an unplanned bonus spin-off to the SLOC protection efforts of the U.S. and its NATO and Japanese naval allies.

BOTTOM LINE: The key Soviet perceptions of U.S. ASW in the 1960-1966 period are that: (1) It was wholly inadequate to the anti-SSBN mission and would remain so throughout the decade of the 1960s; but

(2) It was greatly aided by geography that barred free access to the open oceans to Soviet submarines while providing the putative enemy with the waterfront real estate for a global SOSUS system denied to the USSR.

ANALYSIS AND CONCLUSIONS RE. QUESTION #4 OF ACDA TASK STATEMENT FOR THE 1966-1971 PERIOD

A. "What U.S. ASW programs are the particular focus of Soviet commentary?"

As the U.S. announced ever larger goals for SSN construction, numerically-speaking, this program took a commanding lead over all other U.S. ASW programs in the attention accorded them. While SOSUS developments continued to be reported routinely, mainly in the naval professional journal Naval Digest, it was barely mentioned in books on military subjects published by the Soviet Ministry of Defense. This great emphasis on SSN development in the U.S. in comparison with the much less attention accorded to SOSUS seems to make sense only if one assumes that Soviet military planning involved retaining in home waters the great bulk of Soviet submarines out of detection's way from SOSUS.

Two aspects of the U.S. development of SSNs were given priority treatment:

1) The overall size of the SSN force which the U.S. expected eventually to build -- which kept being increased during the period from 64 in 1966 to as many as 110 by 1971; and

2) The rate of construction of SSNs -- which fluctuated from six annually at the start of the period, only three per annum through 1969, back up to a higher but unspecified level at the end of the period that was variously reported between 17 and 23 under construction simultaneously.

Interest in whether or not the U.S. would continue with antisubmarine aircraft carriers by new construction or further conversion of existing CVAs was the subject of a sotto voce difference of opinion between the Navy and the Defense Ministry during the 1966-'71 period. As will be related more fully in response to Question #1 in Part D of the chapter for this period, the Navy persisted in advocating their "ASW cruiser" version of the CVS despite a Defense Ministry admonition that the U.S. had not only no plans for new construction but was in the process of decreasing those CVSs remaining in commission. While the public reflection of this difference of opinion was not enough to infer a raging "debate" on the subject, it seems quite likely that the evidence which did find its way into print reflected a continuing concern in the Soviet Navy that the U.S. was not going to continue with the CVSs as the

nucleus of ASW hunter-killer groups -- but largely because this fact might be used by Army opponents of surface ships to reduce the Soviet Navy's ASW-cruiser building programs. So, while privately the U.S. non-program for CVS construction is likely to have been a major focus of Soviet interest in U.S. ASW programs, this cannot be said of the public commentary -- which averaged only one item per year over the five-year period.

Soviet attention to DLs, DDs, and DEs increased markedly during the second half of the 1960s, with the number of commentaries tripling in number from five to 15. The ASROC missile system and the DASH helicopter were given about the share of coverage that could be expected and, toward the end of the period, attention shifted to the U.S. planning and start of production of the first destroyer ships built since the 15 postwar DDs that had been built in the 1950s. The first reference to U.S. interest in surface-effects ships for ASW made its appearance.

The previous low-level of attention paid to VP airplanes decreased even further to less than two references a year and they found nothing new and interesting to report. Newly modified ORION aircraft were gradually replacing older VP airplanes and some R&D work on non-acoustic sensors was being conducted and that was about the size of the program.

Mine warfare developments in the U.S. continued to be almost a non-topic. Statistically the attention increased 50 percent, but only from two to three items over five years! What little there was in the way of commentary did focus on the areas of logical concern to the Soviets: offensive minelaying by airplanes and submarines.

From the above, it may be summarized that the focus of Soviet commentary during the 1966-'71 period was on SSNs, while destroyer types came in a weak second, and SOSUS a poor third. Public notice of CVSs was small but perhaps revealing of greater private concern. VP airplanes continued to receive routine attention only while U.S. mine development was one program whose moribund status in the U.S. was reflected accurately by the miniscule notice taken of them in Soviet commentary.

ANALYSIS AND CONCLUSIONS RE. QUESTION #3 OF ACDA TASK STATEMENT FOR THE 1966-1971 PERIOD

B. "How frequently and in what contexts do the Soviets discuss U.S. ASW capabilities?

The total number of meaningful commentaries on U.S. ASW in general or one of its major aspects rose from 36 in 1960-1966 to 58 for the subsequent period (see Appendices A and B), an increase of two-thirds. Represented in these totals were the following changes in the three source categories of significance for this study:

SOURCE	1960-1966 SOURCES	1966-1971 SOURCES
Navy	30	44
Defense Ministry	5	13
Party and Government (exclusing Defense Ministry sources)	1	1
TOTALS	36	58

TABLE 1: FREQUENCY OF SOVIET COMMENTARIES ON U.S ASW BY NAVAL, DEFENSE MINISTRY AND PARTY-GOVERNMENT SOURCES IN THE 1960-1966 AND 1966-1971 PERIODS

As to the contexts in which these sources discussed U.S. ASW, they remained generally unchanged from the first period:

1) Fairly factual descriptions of U.S./NATO ASW forces, sensors, weapons, and equipment;

2) U.S. efforts to develop an adequate antisubmarine defense against Soviet submarines, especially to protect U.S. CVA forces and merchant convoys; and

3) Portrayals of U.S. efforts to protect the continental U.S. against the strategic strike capabilities of Soviet SSBNs that were often surrogate mirror images of the Soviet Navy's own efforts to develop a defense against the U.S. force of Polaris SSBNs that had reached its full complement of 41 units in 1967.

The naval-sourced articles in the professional naval journal Naval Digest, quite understandably, discussed the whole range of U.S. ASW capabilities, existing and emergent, in the context of their professional concerns. The same was true regarding the sizable number of books by Soviet naval authors and writers. In the case of the baker's dozen of articles and speeches stemming from Defense Ministry sources, they were comprised largely of either factual handbook data or "materials for reports and discussion" by the Soviet Armed Forces on the strengths and weaknesses of the "capitalist" protagonist.

ANALYSIS AND CONCLUSIONS RE. QUESTION #2 OF ACDA TASK STATEMENT FOR THE 1966-1970 PERIOD

C. "How have the frequency and nature of Soviet commentaries changed?"

3 (a) - SOSUS - The frequency of either specific or clearly indicated references to the SOSUS system averaged two to three per year over the 1966-'71 period for a total of twelve references. This amounts to a doubling over the six items for the 1960-'66 period. However, caution must be taken here since all six of the items from the 1960-'66 period were concentrated in 1962-1963 with not a single mention in the ensuing three years. This total absence of any reference whatsoever for two years suggests that there may have been a ban on references to SOSUS for that span of time -- perhaps from indecision as to how to treat a system so potentially damaging to the deterrent credibility of the Soviet seabased strategic force. Had there not been this three-year hiatus in discussion of SOSUS and had articles continued to appear with the same frequency as in 1962 and 1963, there would not have been the apparent doubling of the frequency of references to SOSUS in Soviet books and articles noted above. Consequently, it seems well-advised to conclude only that there may have been a doubling in Soviet attention to SOSUS or at least a significant increase -- but one cannot be sure.

As to changes in the nature of the commentaries, they remained basically the same in that new developments such as COLOSSUS were reported as information about them was gained. Another aspect of the nature of Soviet commentary on SOSUS that remained unchanged was the practice of ignoring SOSUS in virtually all of the military and naval books in which U.S. ASW was discussed and in which, consequently, some mention of SOSUS logically was to be expected. Even in one book on ASW submarines, SOSUS was passed off as only one of a number of "larger scale measures" to improve U.S. ASW (30, B-37). One noticable change was that the conclusion was voiced (in Naval Digest in 1967) that the potential for further development of SOSUS was so limited that, in effect, a breakthrough in non-acoustic long-range detection would be required before the U.S. could hope ever to have an effective long-range underwater detection system (12, B-35).

The intrinsic importance of SOSUS (or some non-acoustic alternative) was reaffirmed in this period almost verbatim from the earlier period: "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, B-38; compare this with the 1963 entry 4, A-25/26).

A change in Soviet perceptions of undoubted significance, at least for the long-term threat of premature detection of Soviet submarines on combat patrol in the open-ocean, was the shift between 1969 and 1970 from portraying SOSUS as limited only to the "oceanic approaches" to the U.S. (40, B-38) to viewing it as intended eventually to be "global" in its coverage (45, B-39/44). This "global" description was to become the norm throughout the decade of the '70s and would seem objectively to reflect an increased concern over the long-term SOSUS potential.

Nevertheless, in the same year of 1970 that the SOSUS system was presented as intended eventually for "global" implementation, it was pictured as currently incapable of determining the location of submarine contacts with adequate precision to enable aircraft or ships vectored out to the area of a contact to pick it up for subsequent tracking and/or destruction.

3 (b) - Shore-Based VP Airplanes (plus Satellites) -- As compared to the nine sources found for the 1960-1966 period which contained reference to VP ASW forces or equipment, the 1966-1971 period yielded only seven. The basic appreciation of VP development remained unchanged as that of older models being gradually replaced by newer ones -- in this case, instead of ORION P-3As replacing NEPTUNE P-2Vs, ORION P-3Cs with the A-NEW integrated ASW system replacing the P-3As and the remaining P-2Vs (45, B-47/48).

There were several items that discussed U.S. efforts to develop various types of non-acoustic aviation gear for ASW but these were viewed realistically as of limited potential use for localizing contacts rather than for initial long-range detection. Since the latter is the key problem of ASW, no further description of these items here or in the the two subsequent periods is required.

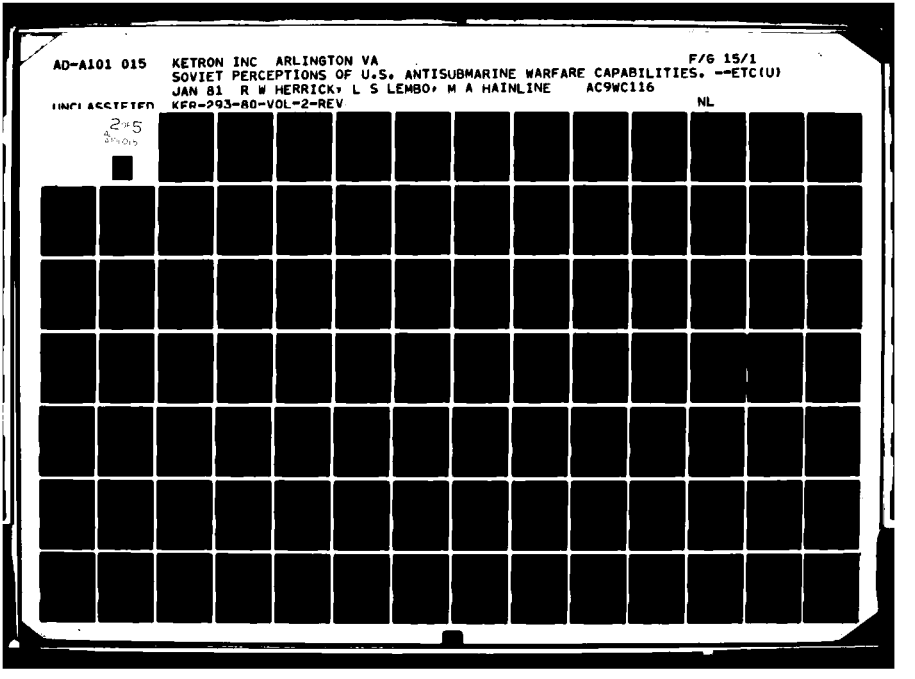
The first references to the possible eventual use of space satellites for ASW made their appearance during this period -- a brief one on 1969 (37, B-47) and a relatively lengthly one in 1970 (45, B-47/48). There was nothing in their nature to suggest that the Soviets viewed any successful U.S. development in this field as imminent or even likely.

3 (c) - SSNs (and SUBROC) -- From nine references to SSN construction and force levels in the 1960-'66 period, the ensuing five years brought no less than 18 items. R&D on U.S. SSNs was discussed eight times in 1966-'71 compared to four times in the earlier period. Mention of SUBROC dropped from five references in 1960-66 to two in the subsequent period.

The loss of Thresher in 1963 had been mentioned three times in the remaining two years of the earlier period and was mentioned twice more in the first two years of the latter period. The loss of Scorpion in early 1968, was referred to once later in 1968 and once more in 1969. The relative importance of SSNs as an ASW force type was referred to six times in 1966-'71. As will be enlarged on in the corresponding section providing the analysis and conclusions for Question #1 on Soviet perceptions of U.S. ASW, this theme was a new one as yet of uncertain significance.

Since that section also will contain a somewhat extended discussion of Soviet commentary on U.S. SSNs, as befits the importance of the subject, further comment, especially on the "nature" of the changes noted, will be reserved for that section. Suffice it to say at this juncture that the doubling in frequency of Soviet treatment of U.S. construction of SSNs and R&D on SSNs was indicative of a heightened Soviet concern at the mid-term prospect of a larger, better U.S. force of SSNs. On the other hand, the decrease in interest in SUBROC very likely stemmed from the frequently stated awareness that the weapon, despite being the latest word in ASW weaponry (as the Soviets noted), was no better than the sensors available -- and they clearly left much to be done by future R&D.

3 (d) - CVSs (plus Aircraft) -- The frequency of mention of antisubmarine aircraft carriers continued at the same low level of an average single item yearly that had been the case in the earlier five-year


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SOVIET PERCEPTIONS OF U.S. ANTISUBMARINE WARFARE CAPABILITIES. --ETC(U)
JAN 81 R W HERRICK, L S LEMBO, M A HAINLINE
KER-293-80-VOL-2-REV
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2 #5

period. Descriptions of the types and numbers of CVS airplanes numbered five in the 1966-'71 period as compared to two in the earlier period. There were three references to aircraft carrier helicopters in the 1966-'71 period as opposed to one before. The first mention of VTOL airplanes turned up was a 1966 item which claimed that their use for ASW was being "examined" in the U.S. There was nothing remarkable about the nature of the coverage given to CVSs and their aircraft except that several sources persisted in trying to support the Soviet predilection for ASW aircraft carriers by alleging a continued high interest in them in the U.S.

3 (e) - DLs, DDs and DEs (plus ASROC and DASH) -- Throughout the 1960-'66 period there have been only five commentaries on these main ASW ship types and one each on ASROC and DASH. In the 1966-'71 period, by comparison, there were 15 entries on the ship types, four on the ASROC missile and four on the DASH helicopter system. The first mention of U.S. interest in surface-effects ships for ASW came in this period. This tripling of the frequency of mention of these ASW surface combatant types seem more likely to be due more to the substantial numbers of comparable "big antisubmarine ships" and DE-size "antisubmarine ships" then entering service in the Soviet Navy and a consequent greater appreciation for the ASW capabilities of these types than to any perceived quantum leap in the capabilities of U.S. ships of these types. However, the increase in the capabilities of U.S. destroyer-type ships due to the gradual arming of them with ASROC and DASH is likely also to help account for the much higher frequency. This is also the case with the reported U.S. program for building 100 destroyer escorts in the ensuing decade after 1968 and the program reported in early 1971 for the eventual construction of 55 Spruance Class destroyers. However, the reporting of these two programs, especially the latter, came late in the period and so are likely to have contributed less to the greater frequency of commentaries.

3 (f) - Mines -- The two references to U.S. mines and mine warfare in 1960-1966 increased in the 1966-'71 period to an unimpressive grand total of three while the number of lines of text devoted to the subject quadrupled. Half of this was due to the discussion of a new topic, offensive minelaying. Air minelaying was mentioned again and the first

discussion of U.S. air-droppable mines was published. Finally, the first mention of minelaying by U.S submarines was made. Again, as in the previous period, the lack of any substantial amount of Soviet attention to U.S. developments in mine warfare seemed to be fully accounted for by the lack of any such developments meriting discussion.

2 (a) - General Appraisals of U.S. ASW -- There were two general appraisals of U.S. ASW in 1966, none in 1967, six in 1968, three in 1969, and three in 1970 for a total of 15 for the 1966-1971 period. This was a marked increase over the six for the previous period and may be taken as a fair indication of a growing Soviet interest in gauging the significance of present and prospective U.S. capabilities in ASW. As will be examined in detail subsequently in Part D on actual Soviet perceptions of U.S. ASW, the attention continued to be reported as "great" and the number of such level-of-effort appraisals rose from five in the earlier period to ten in 1966-1971.

2 (b) - U.S. Budget Allocations to ASW -- The frequency of publication of data on the U.S. ASW budget remained at the same level as for the previous five-year period -- one each year for a total of five. Also as in the 1960-1966 period, the estimates of the total U.S. naval budget expended for ASW "forces and means" fluctuated inconsistently, although not as wildly as in the earlier period. In 1967 the percentage was reported as "about 50 percent" (13, B-26) while only a year later that share was reduced to the less exaggerated one-third (30, B-26). Further analysis of these budget percentages and the actual amounts the U.S. Navy was alleged to have expended or allocated for ASW may be found in the comparable section in Part D following that covers the actual nature of Soviet perceptions.

2 (c) - U.S. ASW Force Levels and Forward Deployment/Readiness -- There were 13 relevant items in this aspect of Soviet perceptions of U.S. ASW for the 1966-1971 period as opposed to five in the earlier 1960-1966 period. They are collated in Section 2 (c) of Appendix B, pages B-27 through B-31. Although the average item tended to be shorter than in the earlier period, the total coverage was somewhat more substantial and comprehensive than even before. The major difference in the nature of

the evidence for this period was a noticeably greater attention to the forward deployment and readiness of U.S. ASW forces (particularly on the ASW barriers) and by the shore-based VP airplanes.

Having completed consideration of the changes in the frequency and nature of the appropriate topics, we now turn to Part D, the final section of the analysis and conclusions for the 1966-'71 period.

ANALYSIS AND CONCLUSIONS RE. QUESTION #1 OF ACDA TASK STATEMENT FOR THE 1966-1971 PERIOD

D. "What is the Soviet perception of U.S. ASW capabilities and how has it changed?

3 (a) - SOSUS (plus compatible mobile/portable sub-systems) -- Due to the vital importance to this analysis of the capabilities of the SOSUS system with its compatible sub-systems of mobile and portable sensors, a summary is appended here, just as for the first period, of the key points of the data in section 3 (a) of Appendix B, adding information on the sources of the data and interim evaluations where necessary:

1966 - The COLOSSUS subsystem of hydrophones on the continental shelf of the U.S. West Coast, the SOSUS subsystem comparable to CAESAR on the East Coast, is reported under development as part of the overall SOSUS system development under Project Trident (8, B-35).

- U.S. portrayed as considering the detection and identification of submarines as still an unsolved problem and as concentrating on improving SOSUS in view of expectation that non-acoustic methods for long-range detection would not be available for a decade (8, B-35).

1967 - In the Naval Digest, the U.S. is alleged to be "turning increasingly to /R&D on/ non-acoustic means of search" out of conviction that the SOSUS potential for further development is too limited ever to solve the problems of the initial detection and classification of submarines in their oceanic missile-launch patrol areas (12, B-35).

- SOSUS development portrayed as motivated by a U.S. military requirement for an anti-SSBN ASW capability for countering seaborne strategic strike and no mention is made of anti-SSN/SS/SSGN ASW for exercising command-of-the-sea in general and SLOC-protection in particular (13, B-36).

- Americans asserted by Soviet Navy Captain First Rank to no longer be depending wholly on, in effect, being able to ambush Soviet submarines near their bases but to have begun

developing "deeply-echeloned antisubmarine barriers on the probable /mission-deployment/ routes of our submarines" /15, B-36/.

- The 3rd edition of Military Strategy still carried no description of SOSUS, remaining unchanged from the 2nd edition of 1963 (19, B-36).

1968 - No mention of SOSUS in Army-authored Handbook of Foreign Armed Forces, even though a brief description of U.S. ASW was included (24, B-36/37).

- SOSUS development presented in a book on ASW submarines as just one of a number of "large-scale measures" intended to improve U.S. ASW (30, B-37).

- "The problems 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, B-37/38).

- The 2nd edition of the DOSAAF booklet The Soviet Navy, by Rear Admiral Yakovlev, like the first edition of January 1966, discussed Soviet ASW as though the U.S. SOSUS system did not exist (35, B-38).

1969 - SOSUS portrayed as limited to "oceanic approaches" to U. S. and necessitated to help counter capabilities claimed for Soviet submarines to successfully "breakout" into mid-Atlantic (through the GIUK Gap and other ASW barriers) (40, B-38).

1970 - In Defense Ministry booklet on the Soviet submarine forces (Rear Admiral A. I. Rodionov's 1st edition of The Strike Force of the Navy) "U.S. specialists" claimed to consider that the "most important mission" for "torpedo submarine, primarily nuclear-powered ones" is "combat with the nuclear-powered missile submarines of an opponent". The focus of ASW will be concentrated near enemy submarines bases, in their missile-launch areas, and on the ASW barriers established between the two. Hydrophones, mines, surface

ships and aircraft will all be used to supplement the ASW submarines in making the ASW barriers impenetrable (47, B-38).

- A book on positional hydroacoustic means by naval engineering-captain Prostakov reported U.S. paying "great attention" to SOSUS and that the "great sum" of 22 million dollars was being spent on it. Three alleged "shortcomings" of SOSUS were straw horses with the possible exception of "low accuracy of fixing the position of submarines" (44, B-39).

- "The Officers' Handbook, although describing the U.S. Navy at considerable length and even commenting on its sonar gear, said nothing of SOSUS (55, B-39).

- Although caveated to apply only to "many regions of the World Ocean", an effective U.S. SOSUS system was first portrayed as intended eventually to be "global" in extent by a 1970 book Aviation Against Submarines. The date for completion was stated only vaguely as "in the '70s".

  In the Atlantic, this "global" system was to include an "Eastern ASW Barrier" between northern Norway and Spitsbergen and a "Western ASW Barrier" across the GIUK Gap. Despite unfavorable conditions (great depths and strong tides), the U.S. was trying to install stationary hydroacoustic means on the Eastern Barrier but it was considered unfeasible to do so on the Western Barrier. A "Coastal ASW Zone" of depth up to 600 miles was to be established off the U.S. East Coast (CAESAR) and to be supplemented by an ARTEMIS deep-ocean sub-system to provide the necessary depth against the range of Soviet SLBMs.

  In the Pacific, the U.S. "global" system was to be comprised of three zones: 1) the "Forward ASW Zone" in the Western Pacific (about which nothing was said in the text but an accompanying map on p. 154 showed an absence of stationary means or air patrols and only ASW submarines off the Kamchatka Peninsula -- presumably off the submarine base Petropavlovsk); 2) the "Hawaiian-Aleutians ASW Zone" intended to give the necessary depth

of 1,500 miles to 3) the "Pacific Coastal Zone" of a planned 600- mile depth.

In the Arctic, which "numerous American military specialists" are said to assert is considered by the Pentagon to be "an important theater of military action" for any future war, the U.S. was claimed to be "expediting" installation of ASW barriers "in all of the exits into the Atlantic and Pacific" (although the only specific indication of ASW infrastructuring was the reported "development of a considerable number of airfields in the northern regions of Canada").

- The completed "global" system was reported to involve both stationary and mobile means integrated into a single system that would provide a "real-time" presentation of the underwater situation for vectoring mobile naval forces to submarine contacts that had been accurately located and reliably classified (45, B-39 through B-44).

- Soviet naval professionals were told by a Naval Digest article that "the fate of antisubmarine warfare" would be "largely decided" by "extensive use of such stationary means of surveillance of the underwater situation as hydrophone grids /CAESAR and COLOSSUS/ and heavy buoys with hydroacoustic and other detection means installed on them /ARTEMIS?/. The point was driven home epigrammatically with the assertion that victory in a war at sea "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, B-45).

1971 - The Handbook on Foreign Navies mentioned that the U.S. was modernizing existing means of submarine detection and developing new ones but without specifying SOSUS or even "stationary means" (57, B-45).

- In November 1966, the U.S. was seen as still not having solved either of the key problems of the initial detection and classification of underwater contacts despite the continuing upgrading of the SOSUS system. Moreover, the

Soviet naval estimate of the prospects for the development of a non-acoustic system of long-range underwater detection was that such a technological development was at least a decade away (8, B-35).

- Furthermore, in 1967 a Soviet Naval Digest article concluded that the potential of SOSUS was so limited inherently that nothing short of a technological breakthrough in non-acoustic means of detection would enable the U.S. to solve the initial detection and classification problems (12, B-35).

- In 1968 these problems were still perceived as "especially difficult" of solution (33, B-37/38). In 1969 SOSUS was portrayed as limited to the "oceanic approaches" to the U.S. coasts (40, B-38). In 1970 SOSUS was seen as unable to fix the position of submarine contacts with sufficient accuracy to be able to successfully vector the mobile U.S. ASW forces to pick up the contact (44, B-41). Throughout the 1966-1971 period, although articles on the development and capabilities of SOSUS appeared regularly in the naval technical literature, both the military literature (e.g., the third (1968) edition of the Armed Forces' General Staff book Military Strategy) and the major naval professional books discussed the U.S. ASW problem as though SOSUS did not exist. While this benign neglect conceivably might have been due to a decision not to publicize a major U.S. military capability for which the USSR had as yet been able to find adequate countermeasures, the weight of evidence indicates rather convincingly that SOSUS simply was not seen as sufficiently effective to merit mentioning in the brief appraisals of U.S. ASW that were the rule in military and naval books.

The Soviet perception of U.S. SOSUS capabilities by the time of the convocation of the XXIVth Party Congress in late March 1971 was that they had improved considerably but still did not constitute an unmanageable threat of detection to the USSR's nuclear-powered submarines, and particularly not to the USSR's SSBN force -- with perhaps the partial exception of the less than half-dozen SSBNs

maintained on peacetime combat patrol as a token deterrent force.

While this was not an unimportant exception inasmuch as the creditability of the USSR's sea-based strategic deterrent force was involved, the facts that the greater share of the Soviet SSBN force could be held in reserve in home waters until after the initial nuclear exchange and in a few years the DELTA Class SSBNs could obviate any real necessity of subjecting the YANKEE Class SSBNs to continuous SOSUS surveillance by sending them out on oceanic patrols are likely to have provided considerable reassurance that SOSUS not only did not constitute an unacceptably great threat to the Soviet SSBN force by March 1971 but would be increasingly less of a hazard to that force.

3 (b) Shore-based VP Airplanes (plus Satellites) -- Although the Soviet media reported routinely on the steady replacement of the last of the P-2V NEPTUNE and the first-generation P-3A ORION by the P-3C with the integrated ASW system A-NEW, it was reported explicitly ASW system will not be able to fundamentally solve the critical problem of the initial search for modern submarines...since all the subsystems involved have limited search capabilities" (45, B-47). While it also was reported that the U.S. recently had initiated "intensive research aimed at developing aviation equipment...for detecting submarines at great depths" (37, B-47), it was obvious that even such a capability would only be of aid in localizing contacts made initially by SOSUS.

It appeared that the Soviets perceived the U.S. as having virtually written off shore-based ASW aircraft as holding any promise for significant further development. Among the signs to that effect were a 1970 Naval Digest article that failed even to mention VP airplanes along with SSNs, CVSs, and "frigates, destroyers, and escort ships" as among the ASW forces "constantly at the center of the attention of the American command" (51, B-48). A more explicit indication was provided by an other Naval Digest article later in the same year (1970) which revealed that the Soviet Navy itself held to the view it had earlier imputed to the "American command". Resorting to a convention employed to include Soviet views, "specialists" (not "foreign specialists" as usual) were said to be convinced that the future of shore-based ASW aircraft was "wholly dependent" on success

in "increasing the detection ranges" of existing or future VP airplanes (52, B-48).

As concerns the use of satellite-borne sensors for submarine detection (or for collection and relay of SOSUS data), the first reference to satellites for ASW in the data on this subject was a brief statement in 1969 that the "American command was not limiting itself to the development of just aviation equipment" for ASW but also was conducting "extensive work for development of space systems for antisubmarine warfare" (37, B-47). More detail was provided the following year in a book published by the Ministry of Defense entitled Aviation Against Submarines. The potential employment of "Artificial earth satellites" for detecting submerged submarines was said to be being "studied persistently" abroad.

It was further stated that the U.S. was developing a manned space laboratory under "special Project 287" for ASW. Moreover, satellites were said to have the widest potential employment for "picking up and relaying information from a global system of powerful sonobuoys" (45, B-48). It was clear from the Soviet descriptions that U.S. use of satellites for ASW still was very much a drawingboard proposition and no guesses were hazarded as to when, if ever, the U.S. could expect to have an operational capability for ASW employing satellite-borne sensors.

3 (c)- SSNs (plus SUBROC) -- In 1968 a wholly new theme was introduced into Soviet writings regarding U.S. SSNs. They were noted to be considered by the U.S. to be "one of the most important" types of ASW forces (15, B-49). This was unexceptional in itself as also was a 1968 entry which stated that "foreign specialists" considered nuclear-powered submarines to be "one of the most promising" platforms for ASW (30, B-50). However, the "one-of" qualifier was dropped that year and assertions were made in 1968 and 1969 that submarines were the "most important means" for ASW (24, B-50 and 40, B-53). In 1970 a variation on this theme claimed that "the leading place in combat against submarines is shifting steadily from surface ships and aviation to antisubmarine submarines" and that the "American command" held ASW submarines to "correspond in the highest degree to the tasks for antisubmarine warfare at sea" (52, B-55). The fact that it be came apparent during this same period that the U.S. Navy was not going to build any new ASW aircraft carriers (as the Soviets were then doing

with their air-capable "ASW cruisers") makes it not implausible that this was an actual Soviet perception. However, the long-standing priority accorded to submarines by Soviet military doctrine and the USSR's strategy for naval warfare make it equally or more plausible that these claims to submarine superiority over surface ships and aircraft in the ASW role were the work of submarine enthusiasts. That such was likely to be the case was evidenced by a criticism in Submarines Against Submarines in 1968 against "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 submarines operate in the same medium... (30, B-15). Such assertions certainly were not based on an objective appraisal of the strengths and weaknesses of the various ASW platforms that had made a team approach with the VP airplanes using SOSUS vectors the preferred U.S. approach.

SUBROC was given only occasional and routine attention. In 1970 an article in the Naval Digest on U.S. naval developments did report that the U.S. was making a feasibility study of a "Submarine Tactical Air Missile (STAM)" that would be superior to SUBROC (51, B-54). However, nothing more was to be heard on the subject (27, D-66).

Probably of most significance regarding Soviet perceptions of U.S. SSNs for the 1966-1971 period was the vacillation perceived in the U.S. construction program, particularly the yearly production rate and the total number of SSNs to be built. At the start of the period the Soviets anticipated the U.S. would construct a half-dozen SSNs annually until the U.S. SSN force reached a total of 64 (1, B-49). In 1967 and 1968, the construction rate was noted to have been cut in half to only three yearly in order to increase construction of aircraft carriers, allegedly for use in the Vietnam War (20, B-49 and 34, B-51). A total of 29 new SSNs were reported in 1968 to either be under construction or programmed for construction (34, B-51). By the following year, 33 new SSNs were noted to "have been financed by long-range programs" but it was noted that their construction and delivery to the Navy was experiencing "a considerable lag" (which was attributed to design weaknesses of U.S. SSNs). The "admirals" and other U.S. "hawks" were seen as likely to be successful "as usual" in having their way in gaining an increase in

the total number of SSNs to be constructed to 100 to 110 (36, B-52/53). In 1970 it was claimed that 29 SSNs were actually under construction simultaneously (47, B-53). Another 1970 report stated with much less exaggeration that three SSNs were to be built in FY 1970/71. It added, however, that the U.S. "naval command was achieving the realization of the plan for the construction of 100-110 units" but more accurately listed a total of 49 SSNs in commission in the U.S. Navy (51, B-53/54). Later in 1970 the reference work The Armed Forces of the Capitalist States listed the number of SSNs under construction in the U.S. as 23 (53, B-55). At the very end of the period The Handbook of Foreign Navies gave the number of SSNs under actual construction in the U.S. as 17 (57, B-56).

From all of the foregoing it is apparent that the U.S. Navy was perceived as destined eventually to have a very sizeable SSN force despite the "considerable lag" in actual deliveries. Since the Soviets could not help but be well aware of the fact that SSNs were the only ASW platform that had the capabilities to pose a threat to the bulk of Soviet SSBNs being retained in home waters or in "maneuvering" bases (or that might be operated under the Article ice cover), the U.S. construction program for SSNs must have been regarded in Party, military, and naval circles alike with considerable concern. The exactly double increase in items (from 9 to 18) on SSN construction in the 1966-1971 period over the previous five years and the doubling (4 to 8) of comments on SSN R&D may be taken as reflections of that concern.

3 (d)- CVSs (plus Aircraft) -- Two 1966 sources and one in 1970 gave exaggerated accounts of U.S. interest in ASW aircraft carriers. The first asserted that U.S. "naval circles" were asserting a military requirement for the construction of nuclear-powered ASW aircraft carriers (8, B-57). The second allegation attributed to "American specialists" the view that aircraft-carrier ASW hunter-killer groups had demonstrated in naval exercises that they could be "adequately effective" (11, B-57).

Prior to the third such exaggeration a handbook on the armaments of non-communist countries' armed forces edited by an army major-general made an obvious effort to quash such talk by reminding the Soviet Navy proponents of building large numbers of

air-capable "antisubmarine cruisers" that submarines were the type of ship approved by Soviet military doctrine for ASW as for other major combatant roles. The second edition of Major General P. I. Sergeyev's Organization and Armaments of the Armies and Navies of Capitalist States uncompromisingly proclaimed the ASW aircraft carrier as a ship type to be headed, in effect, for the much-used "dustbin of history":

> 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 being steadily decreased in the future in correspondence with the growth in the numbers of more effective antisubmarine forces and means, in particular of nuclear-powered antisubmarine submarines (24, B-58)

The Navy did not fall into line but remained adamant in its desire to build a force of CVS-cum-"ASW cruisers". A de facto reclama to the Defense Ministry position that had been expressed by Major General Sergeyev in 1968 appeared in the Naval Digest in 1970. The article, which bore the title "The Contemporary State and Direction of Development of the U.S. Navy", conceded that the U.S. planned no construction of new ASW aircraft carriers. However, this admission was followed without pause with the Soviet Navy's new (and somewhat exaggerated) reclama: "but the Americans plan to provide replacements from those /CVAs/ being taken out of the complement of the carrier strike forces". It was also conceded that the number of U.S. ASW aircraft carriers would be "further curtailed" (if present planning were implemented). That eventuality would come about only "ultimately" (if at all) and in the meantime the combat capabilities of the CVS could be "substantially increased" by the replacement of the CVS ASW aircraft, the S-2 TRACKER, by the improved S-3A TRACKER then still under development (51, B-59/60).

Beyond the foregoing, the coverage of U.S. ASW carriers and their aircraft was largely unremarkable. The previously cited claim that the U.S. was examining the feasibility of developing vertical takeoff/landing airplanes for ASW use mirror-imaged

Soviet developments more than those of the U.S. (8, B-57). Finally, one 1967 report derogated helicopters in the ASW role as having a number of "inherent shortcomings" (13, B-58/59) while an article the following year defended them, arguing that, despite its shortcomings, it still might "prove in the future to be quite an effective antisubmarine means" (30, B-58).

3 (e)- DLs, DDs, and DEs (plus ASROC and DASH) -- Subsequent to having been observed to have built only 14 destroyers since World War II and those in the '50s, the U.S. was noted in the 1966-'71 period finally to be planning the construction in the ensuing decade of substantial numbers of new surface ASW ships of these types. The U.S. was even reported to be contemplating the construction of a destroyer-size surface effects ship for ASW that would regain for surface ships the speed advantage that had been lost to nuclear-powered submarines (32, B-62/63).

There were seemingly contradictory views expressed as to whether or not U.S. destroyers would be employed for anti-SSBN ASW. Thus in 1967, this main ASW ship type was said to be being armed with ASROC and DASH to enable them better to carry out their roles for screening surface combatant ships and merchant convoys (13, B-61). In 1970 the surface combatants of "foreign navies" were said to be conducting exercises that involved not only ASW barrier operations but also "searches in the open zones of /"sea and ocean"/ theaters...in particular in the regions of the most likely location of missile submarines" (52, B-64).

Also of note was the fact that destroyer leaders (DLs) were written off for such work as being too large to be cost-effectively employed for ASW. This was alleged in 1967 to be the reason why the U.S. had not undertaken the construction of any new destroyer leaders in the preceding two years (13, B-61).

As noted earlier in 1960-1965, the assets that helicopters constituted for "considerably" enhancing the ASW capabilities of surface combatants was noted in 1966 (11, B-61) and again in early 1971 (56, B-65). The capabilities of DASH and ASROC for "attacking submarines at greater ranges" was said to have increased their combat capabilities "substantially" (40, B-63). The increasingly important advantage of surface combatants over submarines and

aircraft in being able to carry the ever greater "weight and size of antisubmarine weaponry" was touted (30, B-62). The U.S. also was claimed to value surface combatants highly for their capabilities for the prolonged tracking of submarines and for "repeatedly moving out to the attack" (40, B-63). All in all, "definite success" was said to be expected of ASW surface combatants in any future warfare at sea (52, B-64).

3 (f)- Mines -- The three brief items on U.S. mines and mine warfare published in the 1966-'71 period were most noteworthy for including in 1968 a public acknowledgement of the feasibility of (U.S.) submarines covertly laying "mine barriers across the exits from enemy submarine bases and in the navigational narrows through which pass the deployment routes of enemy submarines" (30, B-66).

The only hint of any forward motion in U.S. ASW mine development came in the 1970 report that the MK-52 and MK-55 air-droppable ASW bottom mines were being modernized, including to permit them to be dropped effectively from aircraft flying at high speeds. U.S. ASW mine development was said to be focused on more reliable, cheaper mines (45, B-66).

Finally, a one sentence assertion of 1971 claimed that the nuclear-powered submarines of the U.S. were being armed with bottom and anchored mines (47, B-66). Although it was not explicitly stated that they were intended for anti-SSBN ASW, the likely areas for their laying (off submarine bases and in straits) could be expected to sink any type of submarine -- as the Soviets themselves have noted to be the case.

1 (a)- "Is anti-SSBN seen by the Soviets as within the technological state-of-the art given the great lead of submarine warfare?"

For this 1966-1971 period, the statements from Soviet open sources relevant to answering this question may be divided conveniently into the same four categories as for the first period to facilitate a clear analysis:

1) Affirmative answers which express confidence that the ASW forces and means in existence and under development, expecially of nuclear-powered attack, (ASW) submarines, can be successful against nuclear-powered missile submarines;

2) Negative answers based mainly on the vastness of the oceans and/or the inherent covertness of nuclear-powered submarines derived from their great submerged endurance;

3) Negative answers claiming explicitly or implying by citing the great capabilities of SSBNs that the ASW state-of-the-art still lags behind that of submarine development; and

4) Negative answers asserting that the ASW state-of-the-art continues to fall further behind due to the steady improvement in the capabilities of nuclear-powered submarines.

In the first category the 38 pieces of evidence compiled in section 1 (a) of Appendix B (pp. B-2 through B-10) contain six affirmative answers (as compared to three in the previous period). Four of these were from naval sources and two from Army-authored books edited by the incumbent or a previous chief of the Armed Forces General Staff. In 50 Years of the Armed Forces of the USSR, which was edited by Marshal Zakharov, the assertion was made that Soviet Naval Aviation could "fight the...missile submarines of the enemy successfully" (18, B-4). In the 3rd edition of Military Strategy, edited by Marshal Sokolovskiy, the more complete, doctrinally correct asertion was made that nuclear-powered submarines could be combated successfully (only) by the various ASW forces of the Navy with the aid of the Strategic Missile Forces and the Long-range Air Force to destroy Polaris submarines at their bases (19, B-5). A similar if less specific note had been struck by the Naval Digest in 1966, a year before the two Army-sourced statements cited above had made their appearance; it claimed that the USSR had "reliable means of combat with the submarines of the enemy" (9, B-2). Of the remaining three subsequent statements by Soviet Navy sources, one concerned the Moskva Class ASW cruisers' asserted capabilities for conducting "search for the fast-moving nuclear-powered submarines at great distances from their bases" (17, B-4). The other two remarked the ASW capabilities of nuclear-powered ASW submarines. The first of them observed that submarines had "proven to be fairly effective means of conducting combat operations against submarines themselves" (30, B-6). The other made the more specific claim that U.S. SSNs of the Permit Class were capable of "patrolling a 60-mile stretch of an anti-submarine barrier and fully insuring the detection of a target traversing that stretch" (46, B-9). The six

affirmative answers just described at least were not so internally inconsistent as had been the three positive statements for the 1960-1966 period. Nevertheless, as the 32 corresponding negative answers to the question (as to whether or not the Soviets considered anti-SSBN ASW as within the technological state-of-the-art) will next be seen to demonstrate, the negative opinion carries the day for this period by the convincing detail of their content as well as by virtue of being more than five times as numerous.

In the second category, the first three negative kinds of evidence, there were seven pieces of commentary indicating that nuclear-powered submarines possessed a critical advantage over the ASW forces available to oppose them as a result of the vast expanses of the "World Ocean" in which they could hide or due to the "covertness" that nuclear-propulsion gave them in the resultant ability to remain submerged for months at a time. The first of these in 1966 and the last in 1970 both claim that Soviet SSBNs could carry out their missions and launch their missiles in a hostile ASW environment -- "despite the opposition of the surface and submarine forces of the enemy", as the 1966 entry expressed it (5, B-2) and (50, B-10). Four of the remaining five statements referred to the vastness of the oceans in one way or another: "the broad expanses of the seas and oceans" (21, B-5), "the remote sea and oceanic regions" (37, B-7), "the colossal expanses and depths of the oceans" (38, B-8), and "the more than one billion square kilometers" of water that comprise 70 percent of the Earth's surface" (45, B-9). The fifth and last one cited the "endurance and covertness" which was said to make nuclear-powered submarines superior to "the most modern" surface ASW ship (35, B-7).

Three of the entries already cited also implied a lag in the ASW state-of-the-art by stressing the great odds against detecting nuclear-powered submarines in the open ocean. A 1968 statement by the Chief of the Navy's Main Staff, Admiral Sergeyev, termed anti-SSBN ASW as "one of the biggest problems of nuclear war" and added that the "most difficult" task involved in carrying out that mission was "the search for missile submarines in the broad expanses of the seas and oceans" (21, B-5). The following year Vice Admiral Surabekov stated that the "high mobility, enormous radius of action...low vulnerability, and great endurance" of nuclear-powered submarines and the "colossal" expanses of the oceans made "fully understandable" the "inherent difficulties" in ASW and made it feasible for a small number of submarines to deliver strikes at any place on earth (38, B-8). A 1970 entry (45, B-9) referred specifically to the "lag" in ASW development: the book Aviation Against Sub-

marines attributed to the immense area of the oceans "the obvious disparity between the considerably increased combat capabilities of nuclear-powered submarines and the lag in the development of means of combat with them".

Twenty-three of the entries in Section 1 (a) of Appendix B fall into the third of the categories enumerated above. They all evidence a Soviet perception that the ASW state-of-the-art lags that of submarine warfare. This is stated in a variety of ways, including ten which noted the lack of adequate means for the detection of submarines at longrange and/or at great depths (8, B-2; 11, B-2; 12, B-3; 21, B-5; 30 B-6; 33, B-7; 37, B-7; 45, B-9; and 52, B-10). One statement, which was already quoted above, explicitly cited a "lag" in ASW capabilities that was indicated to be so great as to constitute as "obvious" disparity between ASW and submarine warfare (45, B-9).

In the fourth category, that for assertions that the "lag" could not be expected to decrease and/or would increase with the passage of time, two pieces of evidence were found (21, B-5 and 34, B-7). Admiral Chabanenko, writing in the restricted-distribution journal of the Armed Forces' General Staff Military Thought, made two relevant observations. In the first, doubt was expressed that the ASW capabilities of surface ships could be increased "substantially", even in "the coming years". In the same article it was observed with candor that, if U.S./NATO scientists were successful in their current efforts to "decrease the intensity of the various physical fields of submarines, the initial detection of submarines would become "even more difficult" (21, B-5). In the second source, Engineer-Captain 2nd Rank G.I. Svyatov stated in his 1968 book Nuclear-powered Submarines that "a competition to enable submarines to operate at ever greater depths" was being carried on (between the U.S. and USSR). That some successes were likely (with the result that the ASW lag would become greater not less) was implicit in the further statement that, because nuclear-powered submarines possesed "the highest combat importance", the competition not only was not subsiding but was growing worse (34, B-7).

In view of the great preponderance of the negative evidence above, of its internal consistency, and its large amount of credible detail, it seems well justified to conclude that during the 1966-1971 period a plurality of Soviet naval sources considered that U.S. (and Soviet) efforts at ASW held little promise of success barring the long-sought but elusive technolgical breakthrough that would make the oceans transparent and so rectify the lag in ASW. And despite all of the self-serving exaggeration to be found

in Soviet descriptions of U.S. ASW, no Soviet source had gone to the extreme of predicting such a breakthrough in ASW as a possibility in less than a decade.

1 (b)- "Is the U.S. Navy seen as assigned a priority mission for anti-SSBN ASW?"

Of the 12 relevant statements compiled in section 1 (b) of Appendix B (pp. B-11 through B-21) six gave affirmative answers to this question. The first, which is contained in December 1966 Naval Digest article, stated that "the U.S. Naval Command distinguishes three basic types of ASW" and listed as the third of them operations for "the search and destruction of submarines in the regions of missile launching positions" (11, B-11). Of course to say that the U.S. Navy divided ASW into three "basic types" of actions was not tantamount to claiming that all (or any) of the basic types were actually assigned to wartime missions -- but the author seemed to want to leave that impression. Besides this unambiguous designation of anti-SSBN ASW in the combat patrol areas of submarines, the article also listed in first place "nuclear strikes on naval bases and on the shipbuilding and repair yards of enemy submarines". In second place was "the establishment of antisubmarine barriers in the straits and narrows on the routes of transit of enemy submarines". Theoretically, at least, these two first-listed "types" of "basic" ASW operations could be assigned primarily in furtherance of the SLOC-protection mission rather than as mainly an anti-SSBN effort. Yet, of course, since all submarine contacts would be prosecuted in wartime to destruction, if possible, the first-listed two types of operations would also serve for anti-SSBN as well as for pro-SLOC. However, it may be another example of the frequently professed perception by the Soviets that the SLOC protection-mission holds a top priority in U.S. thinking that the only one of the three types of ASW operations that was unambiguously and exclusively anti-SSBN in nature was listed in third and last place.

The second affirmative answer is to be found in the lengthy passages on ASW in Captain First Rank Belavin's 1967 book Missile Ships. As the third of four "basic missions" which were said to be assigned to the naval forces of NATO was included: "defense of the shore from the strikes by the missile submarines of the enemy" (13, B-12). This statement, obviously, is as definitely an affirmative answer to the question stated at the outset above as could be made: yes, the naval forces of the U.S. (and of other NATO naval powers) are actually "assigned" for the wartime "basic mission" of protecting the shore from SSBN strikes. While this mission statement was broad enough to include strikes

at the enemy's SSBN at base and at SSBN construction and repair yards and, at that time three years before the ABM Treaty, also to contributing to any NORAD anti-SLBM efforts, it was clear from the context that anti-SSBN ASW was also considered to be included.

Missile Ships also asserted that DLs, DDs, and DEs would be employed, according to U.S. NATO planning, "for strengthening the antisubmarine barriers". They would be supplemented with shore-based VP airplanes. Aircraft carrier strike groups and aircraft-carrier hunter-killer groups would only be employed in "special circumstances" (e.g., attempted transit of the GIUK Gap by a group of Soviet submarines?). Aircraft-carrier hunter-killer groups, along with torpedo-attack submarines and shore-based airplanes, (normally) would be "assigned for insuring the antisubmarine defense of aircraft-carrier strike forces and large convoys and also for mobile antisubmarine to their combat patrol stations and on the approaches to the U.S. Coast". The "and also" is underlined by the preparing analyst to draw attention to the fact that Soviet naval writers customarily use "and also" to designate a mission of much lesser priority than the one(s) listed before the two words. In this case, we have just one more of the many Soviet perceptions that SLOC-protection ranked higher in U.S. priorities than anti-SSBN ASW. Explicit acknowledgement of this situation followed in Belavin's book insofar as concerns DLs, DDs, and DEs -- they were said to be being constructed by "foreign navies" for three roles (protecting naval strike forces, protecting antisubmarine and amphibious forces, and for SLOC protection), none of which involved anti-SSBN ASW. The antisubmarine capabilities of cruisers, too were indicated to be intended for other missions than anti-SSBN ASW, "primarily for self-protection"

In 1968, in the 2nd edition of the Army-authored handbook Organization and Armaments of the Armies and Navies of Capitalist States, the plans of "the naval commands of the U.S. and Great Britain" were said to place particular reliance for destroying Soviet SSBNs on employing nuclear-missile strikes at their bases: "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 areas" (24, B-14). The fact that the Soviets were maintaining only half a dozen SSBNs on peacetime combat patrols had been reported in the Western press often enough so that there could be no doubt but that the Soviets appreciated that such nuclear-missile strikes could destroy a fair number of Soviet SSBNs in their bases provided the USSR had received no stretegic warning of impending attack.

With this major caveat that the U.S. anti-SSBN effort would place particular reliance on nuclear-missile strikes at Soviet SSBN bases rather than on anti-SSBN ASW, the Army handbook continued to credit the U.S. with plans for an ASW effort against all Soviet submarines by either ambushing them off their bases or on the deployment routes to their combat patrol areas. The handbook very noticeably omitted listing the actual SSBN combat patrol areas themselves as areas for U.S. ASW effort, as had the two naval sources mentioned above. However, when the book went on to list the missions of the ASW forces of the U.S. Atlantic Fleet, it did, in effect, credit the U.S. Navy as planning to conduct anti-SSBN ASW "on the approaches to the U.S. East Coast and on the Antisubmarine barriers in the central and northern parts of the Atlantic". This omission of the SSBN combat patrol areas is interpreted by the preparing analyst as a rather obvious attempt to avoid presenting the Soviet Navy with a justification for demanding greater general-purpose naval forces on the grounds that if the "strong naval opponent" has large enough forces for such a force-intensive mission, the Defense Ministry should do no less well for the Navy in the way of providing the necessary forces for "defense of the Homeland". At any rate, whatever the Army's motive for differing with the standard Soviet Navy view on this score, the Army authors of this book and Major General P. I. Sergeyev (its editor) had undercut their own positon by continuing on so inconsistently as to portray the U.S. Atlantic Fleet, where most of the ASW action would take place in any war, as having antisubmaring role "in the approaches to the U.S. East Coast and on the antisubmarine barriers in the central and northern Atlantic", i.e., in areas peculiarly suited for anti-SSBN ASW.

Later in 1968 there appeared a naval book which included a passage that seemed to constitute a reclama to the claim in the Army-authored handbook edited by Major General Gergeyev which, as noted above, claimed that the U.S. was placing particular reliance on destroying Soviet SSBNs at their bases at the outset of any war. In the book Submarines Against Submarines the Navy took an opposing position:

> 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 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 their combat patrol areas (30, B-15).

It seems likely that this indeed was a Navy reclama to the Army position stated in General Sergeyev's work. Without trying to argue against the likelihood of strategic strikes at Soviet SSBN bases being a part of NATO planning, the Navy had reasserted, in effect, the need for the very large numbers of general purpose forces in the form of ASW forces and naval escort forces to protect them to provide the Soviet Navy with a comparable capability to conduct ASW against U.S. SSBNs on their probable routes of deployment.

Just how much the mission of the U.S. Navy (and, equally, that of the Soviet Navy) were perceived as having become concentrated in the nuclear-missile age on the strategic offensive (with a lower priority accorded to the strategic defense, including to anti-SSBN ASW) was well illustrated by the 2nd edition of the DOSAAF booklet The Soviet Navy by Vice Admiral V. D. Yakovlev which appeared in 1968. It stated unequivocally 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" (35, B-17). As evidence, Admiral Yakovlev cited the recent report of "a special interdepartmental /U.S./ 'Poseidon Commission'" which was said to have concluded that "the mission for the protection of oceanic communications is yielding to the mission of projecting seapower against objectives on land.

This "navy-against-the-shore" thesis, which Admiral Gorshkov was to make his own in his "Navies in War and Peace" series in the Naval Digest in the early '70s and in the two editions of his Seapower of the State later in the decade, logically could be construed to mean that the U.S. is perceived as giving priority to the mission of seaborne strategic strike by its SSBNs (and CVAs, if need be) than to that for anti-SSBN ASW. While it is conceivable that Gorshkov really believes this thesis, the fact that it has been exploited assiduously by him and other senior Soviet naval officers and naval theorists to support his campaign to win for his SSBN force a share with the Strategic Missile Forces in the initial "deep strike" against counterforce and industrial-administratice targets in the continental U.S. suggests that it would be advisable to withhold a final judgement until more evidence is available. At any rate, even should Gorshkov be convinced that strategic strike is, in fact, the top priority role for the U.S. Navy, this does

not mean that anti-SSBN ASW might not be perceived as a high second priority in his estimation and in that of the marshals in the Soviet Defense Ministry and Armed Forces' General Staff who still seem to be in firm control of the formulation of Soviet military services of the defense budget. In view of this situation, the effort in this study to gain an accurate appreciation of the Soviet perception of the state-of-the-art feasibility of anti-SSBN ASW must be continued.

In the fall of 1969 a third affirmative answer to the question under consideration here was given in a Naval Digest article signed by Captain 2nd Rank. Although the context was abstruse and could be taken to be self-contradictory in describing both SLOC protection and anti-SSBN ASW as the "main" mission of U.S. ASW forces, the most logical interpretation was that the article was asserting unequivocally that "the 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" (40, B-17).

The fourth affirmative answer appeared in the textbook for Soviet naval academies A History of Naval Art published in 1969. In a first passage this text appeared to place anti-SSBN in an also-ran position after CVA-protection as the two goals pictured as having been the inspiration for the postwar ASW efforts of the U.S. -- "for the defense of aircraft carrier strike forces and also for the defense of their territory from possible strikes by the missile submarines of the Soviet Navy" (58, B-18). However, in a later paragraph the "basic direction" of postwar naval science of "the capitalist countries" was alleged to have been the development of "methods" (i.e., strategy and tactics) for employing missile submarines for strategic strike against ground targets "and also" for "the development of methods of warfare against missile submarines". The second and only other "basic direction" professed to be perceived in the postwar naval doctrine of the "capitalist states" was "the development of systems of combat with submarines, first of all measures for the disruption or weakening of nuclear strikes of an opponent from underwater on objectives located on their territory". This was clear enough and were it not for the first statement quoted above which placed CVA protection ahead of anti-SSBN ASW as the aim of all U.S. postwar developments, one could conclude al least that Soviet midshipmen were being taught that anti-SSBN ASW was considered to enjoy a higher priority than CVA (or, SLOC) protection. As it was, there remained an ambiguity that the second statement created and did not quite resolve. Perhaps this was the

result of the "collective authorship" of A History of Naval Art but the preparing analyst would surmise that, as seemed often to be the case with the three editions of the collectively-authored Military Strategy, the ambiguities left were too serious to lightly attribute to sloppy editing.

In 1970 there appeared a naval book Aviation Against Submarines that clearly implied a fifth afirmative answer to the question as concerns the main mission imputed to the antisubmarine hunter-killer forces of the U.S. Atlantic Fleet. Without ever menioning the words "missile submarines" or SSBNs in any way, the tasks of those forces were distorted in such a way that their main, if not sole, role could logically be nothing other than anti-SSBN ASW. One ASW task force was described as "mainly" assigned to the conduct of antisubmarine warfare on "the near approaches of the Atlantic coast of the U.S.". A second was said to cover "the distant approaches" to the same coast while a third was asserted to be assigned to the ASW barrier across the GIUK Gap. This was scarcely a description for ASW forces oriented to the protection of the main Atlantic sea lines of communications and seems likely to have been intended to imply that the main role of the ASW forces of the U.S. Atlantic Fleet was anti-SSBN ASW -- but without having to make such an explicit misrepresentation of the situation.

The sixth and final affirmative answer to the question of immediate concern here is contained in the first edition of a booklet The Strike Force of the Navy by Rear Admiral A. I. Rodionov. It stated that, in the view of American and British naval "specialists", "it is essential to conduct antisubmarine warfare not only for the defense of ground objectives /i.e., anti-SSBN ASW/ but also for insuring the successful operation of their attack aircraft carriers and amphibious forces and of the /oceanic/ transits of their convoys" (47, B-20).

From the remaining six statements in section 1 (b) of Appendix B only three of them contained even partial negative answers concerning one or more of the various types of U.S. ASW forces. The first was found in Captain Belavin's book Missile Ships which contained an indication that antisubmarine aircraft carriers had other than the anti-SSBN mission as their main assignments. It states that "aircraft-carrier hunter-killer groups are assigned for insuring the antisubmarine defense of strike-carrier forces and convoys" (13, B-12). This not necessarily exclusive, and hence not definitive, statement was further undercut by a subsequent statement in which ASW hunter-killer forces were said to "be assigned for insuring the antisubmarine

defense of aircraft strike forces and also for mobile antisubmarine barriers, both on the routes of deployment of submarines to their combat patrol areas and on the approaches to the U.S. coasts". While theoretically SSNs bent on anti-SLOC missions could also have "combat patrol stations" assigned and be assigned to attack the coastal tanker routes "on the approaches to the U.S. coasts", the formulation almost certainly was calculated to suggest anti-SSBN ASW.

Belavin perhaps got the matter more correctly on a third try when he stated that aircraft-carrier hunter-killer groups would be assigned to ASW barrier patrols (only) in unexplained "special circumstances" -- which, when mentioned above in connection with the second affirmative answer, was accompanied by the preparing analyst's parenthetical speculation that a plausible example of such "special circumstances" might be the attemped transit of the GIUK Gap by a group of Soviet submarines. On balance it would seem that the Soviets did not perceive U.S. CVS groups as having anti-SSBN ASW as a priority assignment, whether on the carriers or in the open ocean. Many of the misleading implications to the contrary are likely to have resulted from the obvious Soviet Navy view that ASW hunter-killer groups formed around an air-capable ship (whether called a CVS or an ASW cruiser) were far and away the most potentially effective force for anti-SSBN ASW in the open ocean. While actual misperception due to subconscious mirror-imaging possibly may play a role in this and innumerably similar cases, it seems more likely that the dominant factor is the tendency of Soviet naval "specialists" to deliberately misrepresent U.S. naval matters as being identical with the preferred Soviet Navy ways of doing things. This is done to justify those ways to an Army-dominated Defense Ministry whose officials are ever watchful and ready to find chinks in the Navy's armor through which barbed criticisms can be driven in an effort to weaken the strength of the Navy's incessant clamoring for the far greater forces that would be required to contest on an equal basis with their "strong and cunning naval opponent" -- as the U.S. Navy has been described more than once in the Soviet naval literature. Some examples of such special pleading have been so patently false as to be unmistakable -- as in the case when it was alleged with no basis in fact whatsoever that the size of the U.S. SSN force was to be determined by a supposed U.S. military requrement to provide two SSNs to protect each Polaris/Poseidon SSBN. As in generally known, it is the Soviet Navy not the U.S. Navy that has deemed it necessary to provide other naval forces to protect their SSBNs while on combat patrol outside home waters.

In the 1968 book Submarines Against Submarines a negative vote was cast at least as far as concerns any high priority role for DLs, DDs or DEs in anti-SSBN ASW -- and for CVSs too since they certainly fall into the category of "surface ships" used in the book:

> 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 strike forces (30, B-15).

That shore-based VP airplanes do not have anti-SSBN as a priority role but are "general-purpose" forces in the literal sense of the words was attested to by a listing of the "basic missions" of the main VP airplane in the U.S. Navy at the time, the Lockheed P-3A ORION:

1) "Patrolling of the coastal zone of the ocean for detecting the approach of amphibious-landing forces, groups of surface ships, and submarines;

2) "Patrolling in oceanic regions distant from base (airfield) during the escorting of naval strike forces and merchant ships and also during the conduct of general searches for submarines; and

3) "Minelaying and patrolling on an antisubmarine barrier or other line of suveillance (blockade, screen) for the detection, identification, and attack of penetrating submarines, surface combatants, or merchant ships of an enemy" (45, B-18/19).

It merits further comment regarding this formulation that submarines are listed after surface naval forces in the first VP mission above, that in coastal zones. Only in the third one, in which ASW barriers is the venue, are submarines listed first and even in this case there is no indication that SSBNs are a higher priority target than the Soviet SSNs, SSGNs, or diesel-powered propedo-attack boats trying to reach open oceans on anti-SLOC assignments.

Summing up the three pieces of negative evidence just described above, it is warranted to conclude that the Soviets perceived CVSs, other surface combatants (specifi-

cally DDs, DIs, and DEs) and shore-based VP airplanes as not assigned to anti-SSBN in anything other than "special circumstances" at most to back up ASW barriers and, as a general rule, to providing point-defense ASW protection for CVA forces and merchant convoys rather than area searches in the oceans for SSBNs -- whether just on their deployment routes or in the less unlikely potential areas for their combat patrols and missile-launch stations.

The seeming odd-man out here, of course, is the SSN. As remarked early in this section, the SSN was the only force that cannot be shown to be assigned to other missions to the seeming exclusion of having anti-SSBN as a priority mission. However, neither does the evidence provide any positive, definitive assertions that U.S. SSNs are assigned to a priority mission to destroy Soviet SSBNs. Rather, the statements regarding SSN missions invariably limit the description of SSN targets to "submarines" never "ballistic-missile submarines" or even "missile submarines." This seems unusual when one considers that Soviet naval writers commonly use both of these descriptions of SSBNs in other contexts. But in the evidence on this point we have only two statements:

1) The one in the 1967 book Missile Ships, quoted previously, that "extensive employment of the antisubmarine submarines of the Thresher Class is planned for combat with enemy submarines on the antisubmarine barriers and at the exits from their bases" (emphasis supplied) (13, B-12); and

2) A second one in Submarine Against Submarines in 1968: "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, B-16).

It may be recalled from the analysis on this subject for the earlier five-year period that the only statement that asserted that even a single type of the ASW forces of the U.S. Navy had a priority anti-SSBN mission was a claim by Admiral Chabanenko in Literary Russia that the U.S. was paying "considerable attention" to the construction of multipurpose submarines "for combat with submarines (above all, with missile submarines)" (36, A-10). This claim was noted to be unique for the 1960-'66 period and it now may be added that is has remained so for the following five

years. Consequently, we are left with only one such claim on the entire decade of the '60's.

While it seems anomalous that Soviet naval writers, who not infrequently call a spade a spade despite the constraints against doing so, should have pussyfooted around so consistently to avoid saying that U.S. SSNs, or some of them, are assigned to lying in ambush off Soviet submarine bases with the primary aim of sinking Soviet SSBNs. Conceivably there are rigid censorship rules against saying anything that might be taken to weaken the credibility of the USSR's seaborne strategic deterrent -- but if so they have been successfully circumnavigated by senior Soviet naval officers on a number of other occasions.

More weighty by far than the foregoing, however, is the closely related fact that while six statements implied in general terms that the U.S. Navy had an anti-SSBN mission of some substantial degree of priority, the statements with regard to the individual U.S. forces rule out all of the qualified participants with the possible exception of the SSBNs. Is this not curious? Could it not reasonably be concluded that the general statements were made primarily as internal propaganda to justify a much large Soviet Navy while the detailed comments on the roles and missions of the various types of U.S. ASW weapons platforms were objectively written to provide factual information for professional naval consumptiom? That at least is the favored hypothesis of the preparing analyst on the basis of the evidence available at this juncture.

2 (a) - General Soviet Appraisals of U.S. ASW --The U.S. was said in 1968, 1969, and twice in 1970 to be devoting "great attention" to improving and increasing the quantity of its ASW "forces and means". In 1966 the U.S. had been portrayed as paying "special attention" to that end while in 1968 "special, large operating forces for ASW" were said to be in formation in the U.S., Atlantic and Pacific Fleets. Also, in 1970, the U.S. was reported to have initiated a "special ten-year program of oceanographic and hydrographic research" codenamed TENOCK aimed at solving the problem of "effective search and detection of nuclear-powered submarines".

In 1968 there was an isolated instance in which the U.S. was claimed to be paying "extremely great attention" to developing ASW "forces", means", and "tactics". However, the general tenor of the 12 commentaries for this 1966-1971 period (Section 2 (a); pp. B-23/25 of Appendix B), as well as the

commentary for subsequent years, shows that the 1968 statement was atypical.

Similarly, two comments in 1968 portrayed ASW as "the most important" part of naval warfare or of strategic planning in the U.S. view while by 1969 the claim had been moderated to "one of the main conditions for gaining command of the sea" and in 1970 to "one of the most important strategic missions of the U.S. Navy in a future war against the USSR".

Again as for the earlier period, there were no statements or hints that a solution was in view to the ASW problems of initial detection and classification of nuclear-powered submarines operating in oceanic missile-launch areas. Rather a comment by Captain Kvitnitskiy in the November 1966 issue of Naval Digest seemed to provide a fair description of the Soviet perception for the entire period. Regardless or the "large scale and comprehensiveness" of U.S. ASW measures, they were seen as having been overestimated by the American press which nevertheless had "been forced to acknowledge the difficulties and serious shortcomings in its development". The article concluded with the view: "Despite the considerable outlay of material means and effort, the U.S. Navy does not have effective antisubmarine defense means at its disposal" (8, B-21).

2 (b) - U.S. Budget Allocations to ASW -- As may be seen from the four entries on this topic (one for each year from 1966 through 1969) in Section 2 (b) of Appendix B (page B-26), the first entry claims that "U.S. allocations for antisubmarines forces and means" had grown from 1,253 billion dollars in FY 1960/61 to 3.5 billion by 1965/66 (8, B-26. This claim compares with the official U.S. figures (see the Chronology appended) of an average of exactly two billion for the two years 1965 and 1966.

The underlying cause for this 75 percent exaggeration likely was due to the Soviet Navy's desire to persuade the Defense Ministry and Party Central Committee that much greater funds should be allocated to the Navy to provide faster, deeper-running submarines and more general purpose surface forces and aircraft to provide greater protection for Soviet submarines against the costly ASW effort. Whatever the truth of the matter, this

statement marked a reversion by Soviet reporting to the exageration of the early 1960s and away from the less unrealistic statistics that had been published at the end of that period in 1965. Presumably the exaggeration was achieved in part by including the costs of all "forces and means" that had any ASW capabilities at all -- e.g., of U.S. cruisers whose ASW capabilities had been acknowledged by one Soviet source to be largely for self-defense.

Soviet reporting on U.S. expenditures for ASW showed great integral inconsistencies -- suggesting the lack at least of any coordinated Soviet Navy "line" on the subject. For example, in 1967 it was claimed that about 50 percent of all U.S. Navy allocations had gone just for "ships" (i.e., submarines as well as surface ships) whose "primary role" was ASW (13, B-26). Only a year later that percentage had dropped to one-third for not only surface ships and submarines as above but for all ASW "forces and means" (30, B-26) -- which also would have included ASW R&D, SOSUS, and VP airplanes.

Unlike the reporting of the U.S. ASW budget in the earlier period, in 1966-'71 (or better 1966-1969, since no data was published in 1970 or in the first couple months of 1971) the reporting remained fairly consistent over the four years reported in that it was almost as exaggerated in 1969 as in 1966. The fourth and last piece of data claimed in 1969 that the U.S. had been spending "about three billion dollars yearly for ASW forces and means" (36, B-26).

The comparable official U.S. figures*, as given in the appended Chronology, were:

Year	U.S. Navy Budget (in Billions)	ASW Share	Percent of Budget
1966	19.2	1.94	10.1
1967	21.2	1.76	8.3
1968	20.8	1.21	6.8
1969	21.6	1.31	6.1

*Since the Soviets reported no data for 1970, the official U.S. figures given in the Chronology for that year will be reserved for consideration in the analysis of the next five-year period.

As may be seen from this official U.S. data, not only had U.S. ASW expenditures not been at the 3.5 to 3 billion-dollar level claimed by Soviet sources, it decreased by more than one third over the four years from almost 2 billions to only 1.3 billions. This highly significant decline could scarcely have gone unnoted by Soviet naval officials since it was reported annually in the U.S. Defense Department's annual defense "posture" reports to Congress.

Obviously is suited the Soviet Navy's own purposes not to publicize this rather precipitous decline in U.S. ASW expenditures but to claim, instead, that the U.S. was maintaining level expenditures for ASW at a very high figure. Moreover, since Soviet statistics did not reflect at all the steady, sizeable and publicly reported reduction in U.S. ASW expenditures over such an extended period, it may be seen that the exaggeration was deliberate rather than the result of merely based on the total costs of every U.S. Navy weapons platforms and weapons system that had even a secondary ASW capability. Accordingly, it must be concluded that Soviet reporting of U.S. ASW expenditures for 1966-1971 are too exaggerated for internal consumption as to merit any consideration at all in judging actual Soviet perceptions of U.S. ASW capabilities.

2 (c)- U.S. ASW Force Levels and Forward Deployment/Readiness -- The data on this subject for the 1966-'71 period is given on pages B-27 through B-31 of the appendices. Without repeating the elaborate lists of order of battle provided for 1960-'66 as a context and data base for this study, the significant changes reported are set out below. The non-appearance of several order-of-battle categories included in the 1960-'66 lists is simply due to the fact that they went unreported during 1966-'71:

A. Force Levels:

1) CVSs - The eight in commission in 1966 were reported to have been reduced to four by 1970 but in late 1970 and early 1971 military handbooks carried nine CVSs, five in the Atlantic and four in the Pacific. In actual fact, as may be seen in the appended Chronology, there were only for CVSs in commission in 1970 and early 1971;

2) CVS Aircraft - Twenty ASW airplanes (S-2D TRACKER) and 16 ASW helicopters (SH-3A or SH-3D SEA KING) on each ship;

3) VP Airplanes - Twenty-seven squadrons with 10-12 planes in each;

4) SSNs - Forty-six (in late 1970);

5) DDs - 140 filled with either ASROC or DASH (not counting 28 SAM DDs);

DLs - None primarily for ASW (28 SAM DLs); and

DEs - Forty-two (omitting 6 SAM DEs).

B. Forward Deployment/Readiness:

- Only one CVS was reported to be forward deployed and that was one stationed in the Western Pacific with the 7th Fleet.

- A general statement in Naval Digest in 1967 noted the advantages for ASW of permanent forward deployment in peacetime: "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 operations of submarines in order to carry out their detection, localization, and destruction at the outset of a war (12, B-27).

- ASW barriers of the U.S. and other NATO navies were said to be in peacetime "operation with a limited composition of antisubmarine forces" which "can be built up quickly in accordance with the situation" (30, B-27/28). "In the Atlantic, even in peacetime, /NATO/ airplanes patrol systematically in the region between Greenland, Iceland, England, and the coast of Norway....In the Pacfic, comparable patrolling by the Shore-based air of antisubmarine defense is established in the regions from Kamchatka to the Philippine Islands" (40, B-29).

- Forward air bases for VP airplanes in the Atlantic were noted to be in peacetime use in Norway, Iceland, Ireland, Scotland, Newfoundland, Azores, and Spain to permit the shore-

based aviation of the U.S. Navy to be in combat readiness (45, B-32). (This was not actually the case except for Norway.)

C. Summary:

- While the number of CVSs were indicated to have dropped only from 11 to nine (rather than to four as noted above actually was the case) the real 64 percent reduction may be expected to have been noted with particular relief since the Soviets considered them essential to effective ASW hunter-killer groups which in turn were perceived as the only really effective ASW force for use in open-ocean search. In the 1967 book Submarines Against Submarines, CVS hunter-killer groups were praised as being "a well-developed form of organization for heterogeneous anti-submarine forces" including SSNs which the book noted had "begun to be included in the aircraft-carrier hunter-killer groups of the U.S. Navy" (30, B-28).

- VP airplanes numbering between 270 and 324 organized into 27 squadrons enjoying a well-developed network of immediately available bases must have been considered a significant ASW force of high combat readiness. However, limitations on the ORION's capabilities to use SOSUS data, due to is inadequate size for carrying the necessary data-processing equipment, very likely made these VP seem less formidable than otherwise would have been the case.

- SSNs were seen to have increased from 22 in late 1966 to 39 in mid-1968 and further to 46 by late 1970. That this threat to Soviet naval forces, particularly to their vaunted nuclear-powered submarines (including even while being held in reserve in home waters), was taken seriously was evidenced by the much greater discussions in 1966-1971 than earlier of U.S. SSNs (as already has been remarked).

- DLs, DDs, and DEs - Although the Soviets had indicated both that frigates were too large to be cost effective for ASW and were assigned largely to provide anti-air protection for CVA forces and convoys, their capabilities for anti-SSBN ASW in the open oceans, should the U.S. be lead to so employ them, is not likely to have

gone unnoted by Soviet war planners. DDs to the number of 140 of the 240 operational units had received either ASROC missiles or DASH helicopters but Soviet commentary suggested they were not impressed with either system or the capabilities of destroyer type ships in general. While the large new DD and DE construction programs announced at the end of the decade were noted in the professional literature, it was clear that the Soviets thought the money would be far better spent on constructing new CVSs/ASW cruisers.

2 (d) - Mission-completion Capabilities of Soviet SSBNs -- For the 1966-1971 period, the evidence on this subject includes five claims explicit or implied, out of a total of 12 statements (pp. B-32 through B-34), that Soviet SSBNs would be able to carry out their missile-launches successfully in any general war. Of note is the fact that four of the five statements stemmed from Army sources. The thick 1967 book 50 Years of the Armed Forces of the USSR, which Marchal Zakharov had edited for a "collective" of Army authors, claimed that Soviet SSBNs were capable "of remaining in any area of the World Ocean for an extended period of time" as might be required "to protect the state interests of the Soviet Union" and of "delivering powerful strikes on land objectives" (18, B-32). In the 3rd (1968) edition of Military Strategy, which had been prepared by an all-Army group of authors and edited by Marshal Sololvbskiy, it was stated with equal unequivocalness: "These characteristics /high self-concealment, rapidity of submergence, and great submerged endurance/ enable the /Soviet/ Submarine Force to deliver nuclear-missile strikes against shore objectives" (19, B-32). The third Army statement on this score was found in the second (1969) edition of V. I. Lenin and the Soviet Armed Forces which had been edited by an Army colonel-general. While only an implicit claim that SSBNs as well as other Soviet submarines could carry out their missions, it also suggested that these Army statements might well not be an accurate reflection at all of the real views of the senior Army Officers in the Defense Ministry and on the Armed Forces' General Staff inasmuch as they gave every indication of being primarily intended to deny the Soviet Navy a much larger share of the Soviet military budget for building general purpose forces ostensibly for protection of Soviet SSBNs. The statement under

discussion was very short and read: "Submarines possess the greatest self-reliance, so additional forces do not have to be provided for their protection" (42, B-33).

The fourth Army-sources statement came in June 1970 in the house organ of the Party-controlled Main Political Administration of the Ministry of Defense, Communist of the Armed Forces. In a collection of "materials for reports and discussions" for Navy Day, it was stated that "our cruiser submarines are capable of carrying out long cruises of many months' duration and in submerged condition without 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, B-34).

Of equal note with the fact that four of the five statements that connoted a mission-completion capability for Soviet SSBNs were Army-sources was that the fifth and only naval-sourced statement was found in a booklet on The Soviet Navy written to educate/propagandize the paramilitary youth group DOSAAF. Moreover, the author, Vice Admiral V. D. Yakovlev, did not specifically claim mission-completion capabilities for SSBNs, limiting his claim to "nuclear-powered submarines" of any kind. He did not even specify Soviet submarines although the context as well as the title of the booklet would have led the average reader to assume that the admiral was speaking first and foremost if not exclusively, of Soviet submarines. Furthermore, Yakovlev did not even claim a capability for nuclear-powered submarines to deliver nuclear-missile strikes on shore targets. However, he effectively implied such a capability, at least to the extent that such a capability is implied by a claim to a capability for successfully following a Soviet SSBNs mission profile. The passage under analysis reads as follows:

> A particularly valuable quality of nuclear-powered submarines is their great mobility -- which enables them to rapidly carry out covert transits to their combat patrol areas and remain there for the greater 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, B-33).

It is highly instructive to note further that all of the other statements from naval sources which commented on this subject either skirted the topic or used such cautious phrasing as to avoid actually claiming that Soviet SSBNs could carry out strategic strike missions successfully. Thus Captain First Rank Belavin in Missile Ships limited himself merely to saying that nuclear-powered subs could operate at "great depths" and so could "penetrate antisubmarine barriers successfully" (14, B-32).

Another naval-authored book, Aviation Against Submarines, which appeared in 1970 damned with faint praise the covertness of nuclear-powered submarines which were credited only with "substantially facilitating their escaping detection and destruction" (45, B-33). Similarly, Rear Admiral Rodionov sidestepped crediting nuclear-powered submarines with "great covertness" or "virtual invulnerability" and limited himself to acknowledge that they are "difficult to detect while in the ocean" (47, B-33). Finally, in June 1970, Naval Digest joined the anvil chorus, disparaging the "covertness" and "invulnerability" of nulcear-powered submarines as nothing more than superior to that of the other types of ASW forces -- which of course have little of either quality intrinsically.

Most revealing of all of a seeming Soviet Navy viewpoint that Soviet SSBNs were far from being considered invulnerable, even though it would have undercut the deterrent credibility of Soviet SSBNs to come right out and say so unequivocally in public, were two statements from naval sources which imputed capabilities to U.S. SSNs for sinking Soviet SSBNs either on ASW barriers or by ambushing them off their bases. The first of these statements appeared in 1968 in the book Submarines Against Submarines and credited U.S. submarines equipped with AN/BQQ-2 sonar as having demonstrated during the NATO naval exercise QUICK PURSUIT that they could detect with "sufficient reliability" submarines attempting to penetrate the ASW barrier across the GIUK Gap, with each submarine capable of patrolling a 60-mile sector (30, B-32/33). Then in 1970 a Captain First Rank writing in Naval Digest

implied esoterically that Soviet naval officers disagreed with the Defense Ministry viewpoint and considered that U.S. SSNs would be able to penetrate the "strong antisubmarine defenses" in Soviet home waters and reconnoiter "the opponents submarine bases" first of all (46, B-33).

The preparing analyst considers that all of the foregoing adds up to the conclusion that the real Soviet naval viewpoint was that the mission-completion capabilities of Soviet SSBNs were far from being assured under existing circumstances.

GENERAL CONCLUSIONS RE. SOVIET PERCEPTIONS OF U.S. ASW FOR THE 1966-'71 PERIOD

- Soviet commentary from 1966 to 1971 focussed on the planned overall size of the U.S. SSN force (as estimates rose from 64 in 1966 to 100 by 1971) and on the rate of SSN construction (which lagged badly). While the subject of SOSUS continued to be discussed routinely at the professional level of Naval Digest, it appeared to be a proscribed topic for naval books intended for a wide readership. U.S. antisubmarine aircraft carriers (CVSs) and the ASW hunter-killer groups of which they formed the nuclei, probably were given less attention than they objectively merited due to a sensitive internal discussion over the potential effectiveness of such ships and the penchant of senior Soviet Navy officers and other naval writers for employing the CVSs as surrogates for employing for the comparable "ASW cruisers" which the Soviet Navy wanted to build in large numbers. Attention to destroyer-type ships for ASW tripled during the period as the gradual addition of ASROC "missile-torpedoes" and DASH drone helicopters provided the first significant changes to U.S. destroyer-type ships since World War II. VP airplanes were given limited but routine coverage while U.S. mine warfare capabilities still were ignored as too limited to merit any significant attention.

- The already high frequency with which the Soviets had discussed U.S. ASW capabilities in the preceding period, rose two-thirds during 1966-'71. This included increases in naval commentary of about 50% and 260% in Army statements, which earlier had amounted to only about one-seventh of the total. The three main contexts involved remained as given in the conclusions for the initial period.

- SOSUS continued to be perceived by Soviet naval sources throughout the 1966-'71 period as a development to be watched but not as one already constituting an unacceptable or major threat even to that small portion of the Soviet SSBN force maintained on open-ocean combat patrols in peacetime to afford credibility to the sea-based part of the USSR's nuclear deterrent. While in 1967 the chances of SOSUS ever becoming a deep-water, ocean-wide system seemed so slim that the Naval Digest over-hastily wrote the whole system off as of much too limited potential, only three years later the standard Soviet naval perception of SOSUS had changed from one limited to the "oceanic approaches" to the U.S. East and West coasts to that of a system intended eventually to be "global" in its coverage. Nevertheless, any such development clearly was seen as long-term while SOSUS was described in 1970 as incapable of determining the location of submarine contacts with adequate precision to

vector ships and planes close enough to the submarines to pick up the contacts.

- Shore-based VP airplanes were reported at an even lower level than before and the commentaries mainly addressed the gradual replacement of P-3A ORIONs with P-3C ORIONs. The latter were reported to carry the A-NEW integrated sensors-weapons suit which was recognized as a big improvement for localizing and attacking (or tracking continuously in peacetime). However, it was made pointedly clear that A-NEW contributed nothing in the way of a long-range detection capability to supplement or replace SOSUS. Soviet naval perceptions of the future of U.S. VP airplanes seems to have been subjectively eclipsed in the 1966-'71 period by the lack of prospects for the Soviet Navy's own VP airplanes which, lacking a SOSUS system or its mobile equivalent to provide vectors on submarine contacts, were pictured in 1970 as without a future in ASW barring successes in increasing detection ranges.

- Space satellites for ASW were reported in 1969 as the objective of "extensive work" in the U.S. Specific mention was made in 1970 of a Project 287 for a manned ASW space laboratory. However, no subsequent reports of significant progress on this or other ASW space satellites have appeared in the Soviet media as late as 1 March 1980.

- SSN development and construction by the U.S. in the 1966-'71 period was perceived by Soviet naval sources as vacillating and probably as reflecting a far lower priority than had been accorded the Polaris SSBN construction program. Nevertheless, the eventual possession by the U.S. of a larger, more ASW-capable force of SSNs clearly was in the making regardless of the seemingly half-hearted prosecution of the effort -- a fact that was evidenced by a doubling of the number of Soviet commentaries on U.S. SSNs compared to the previous period. SUBROC was only mentioned twice during the period, the interest in its newness having worn off. One 1970 report on a possible follow-on "Submarine Tactical Air Missile (STAM)" failed to bring any further reporting in the subsequent years of the 1971-'76 period. A new theme, that SSNs were considered by the U.S. to be the main ASW force, appeared in 1968 and was to continue for a decade before dying out. It was concluded likely to be due more to Soviet submarine protagonists plumping for a larger SSN force than to an actual Soviet perception that the U.S. had forsaken the team approach to ASW and the particular promise of VP aircraft vectored by SOSUS. From the goal of 64 SSNs in 1966, the U.S. was seen by the time of the XXIVth Party Congress in March 1971 as aiming at a force level of about 100 SSNs. Since the number

of SSNs in commission in the U.S. Navy at the end of the period was still only half this figure and since the planned rate of production of six SSNs per year had fallen to only half that, the threat of such a large U.S. force of SSNs would remain a long-term one unless the U.S. construction rate were to be increased greatly, in which case the threat could become a mid-term one.

- CVS development and construction in the U.S., or rather CVS non-development and non-constructionn, continued during the 1966-'71 period as among the most important reasons for Soviet Navy perceptions of the U.S. ASW effort being unfavorable. In failing to design and build a CVS specifically for ASW against nuclear-powered submarines the U.S. was perceived as overlooking or neglecting to act along the optimum-available ASW developmental route, and was thereby giving aid and comfort to the Soviet Navy's bureaucratic "enemy", the Soviet Defense Ministry and General Staff wherein resided the marshals and other senior Army officers who were all too eager to seize on the U.S. scorning of CVSs as not cost-effective to oppose the Navy's desire for substantial numbers of "ASW Cruisers." This situation led Soviet naval sources on several occasions to falsely allege a high U.S. interest in developing and building a considerable number of task-specific CVSs. This all transpired in the context of a continued low level of commentary of only about one per year on large air-capable ships for ASW. Only three commentaries on U.S. ASW mentioned the U.S. CVS's SEA KING helicopters, with one commentary derogating their value and another defending them. There was a marked increase in attention paid to CVS aircraft including the first mention of the preferred Soviet naval ASW-carrier aircraft, the VTOL. The VIKING S-3A, however, was given favorable mention as the first ASW airplane designed for carrier operation that had been designed for use against nuclear-powered submarines. Too large for use from the converted Essex Class CVSs, they were credited with the potential for making into an effective ASW platform CVAs converted into "multi-purpose" CVs.

- Destroyer-type ASW ships of the U.S. began to be regarded by the Soviet Navy with more interest toward the end of the 1966-'71 period after announcements in 1968 and 1971 respectively of plans for large construction programs for frigates and destroyers to be equipped with (improved) ASW helicopters and ASROC. The U.S. was alleged to be considering construction of a dynamic-lift ship of destroyer size that would regain for surface combatants their former speed advantage over submarines. Although an occasional Soviet naval commentator, in trying to make a case for the U.S. Navy having anti-SSBN ASW as a priority mission, would

claim that the U.S. Navy planned in wartime to employ at least a significant number of destroyer-type ships not only on the ASW barriers but for open-ocean search for submarines (i.e., anti-SSBN ASW), the general view was that the great build of the U.S. destroyer force would be required for point defense of the aircraft carrier forces and merchant ship convoys.

- Mines in the U.S. Navy during the 1966-'71 period were seen by Soviet naval sources as still of little interest to the U.S. Navy. What slight interest as was perceived was seen to be concentrated in the areas of logical concern to the Soviet Navy -- offensive mining not only by air but by submarine. The first suggestions of any forward movement in U.S. mine development were commentaries that the Mark-52 and Mark-55 air-droppable ASW mines were being improved and that U.S. submarines allegedly were being loaded with some ASW mines.

- Anti-SSBN ASW was seen by the Soviets during the 1966-'71 period as not only still lagging the technological state-of-the-art of submarine warfare but as fated to continue to lag behind, and perhaps increasingly further behind, barring a technological breakthrough in long-range submarine detection.

- No priority wartime mission for anti-SSBN ASW was seen during the 1966-'71 period as assigned to the U.S. Navy except possibly to some of the SSNs.

- General Soviet appraisals of U.S. ASW from 1966 to 1971 continued to credit the U.S. with giving "great attention" to improving its ASW "forces and means" including the formation of large ASW operating forces in both the Atlantic and Pacific. Nevertheless U.S. ASW was perceived as unsufficiently effective as to be a great cause for concern (other than to require keeping a watchful eye on U.S. R&D in ASW and on the future geographical expansion of SOSUS into the deep ocean).

- U.S. budget allocations to ASW were portrayed in as exaggerated form as they had been in the early 60's and with such inconsistency as to indicate that no Party line or internal Navy position had been established. As in the 1960-'66 period, large decreases in the latter half of the period (1968 and 1969) went unreported (although, as in the earlier period, official U.S. data had been published), pointing to deliberate exaggeration for internal advocacy purposes.

- U.S. force levels of ASW platforms suitable for open-ocean search during the 1966-'71 period were: CVSs -- decreased from 9 to 4; VP airplanes -- roughly 300; SSNs -- increased from 21 to 46; and destroyers and frigates with two DASH helicopters and/or ASROC increased from 104 to 182. The SSNs, particularly, were being seen as a growing threat to Soviet SSBNs.

- U.S. ASW forces' forward deployment/readiness was not perceived as nearly as high as during the preceding period from 1960 to '66. No longer was there an ASW carrier group that was credited with "usually" being at sea in the North Atlantic in combat-ready condition. The only CVS reported to be forward deployed was one assigned to the U.S. Seventh Fleet in the Western Pacific. Rather the emphasis was on the rapidity with which the "limited" ASW forces maintained in operation in peacetime could be built up whenever required. The VP airplanes of the U.S. and other NATO countries were said to make "systematic" peacetime ASW patrols in the GIUK Gap area and along the Kamchatka Peninsula and south to the Philippines.

- Mission-completion capabilities of Soviet SSBNs, while paid routine lip service in some commentaries, were revealed by others to be uncertain at best and particularly vulnerable to being ambushed while leaving or reentering port and while attempting the "breakthrough" of ASW barriers.

OVERALL CONCLUSIONS RE. SOVIET PERCEPTIONS OF U.S. ASW FOR THE 1966-1971 PERIOD

- SOSUS temporarily lapsed between 1967 and 1970 as even a long-term threat in Soviet naval perceptions to the continued covertness of Soviet submarines in the open ocean. This lapse appears to have been related to a misimpression that U.S. failure to vigorously prosecute a global deep-ocean system, specifically ARTEMIS, had signalled that the U.S. had given up in face of the great technical and financial problems involved. However, by the end of the period this misconception had been corrected and SOSUS was again perceived as a potential long-term problem that required watching. While the only explicit criticism at the end of the period was one in 1970 that SOSUS lacked accuracy in the positions it provided on submarine contacts, the other commentary and the historical background strongly suggested that it was actually the still-limited extent of deep-ocean coverage provided by SOSUS that offered seeming assurance that SOSUS had not yet become a major threat to the undetected operation of Soviet SSBNs in the open oceans.

- The capability of U.S. VP airplanes to rapidly exploit SOSUS contacts for vectoring them to within range of their own ASW sensors continued to be ignored in what could only have been deliberate by this time. The omission was glaring in such cases as the criticism of the A-NEW integrated weapons-sensors system on the new P-3C ORIONs as inadequate due to its short detection range or in the case of the report that the future of shore-based ASW airplanes depended "wholly" on increasing the detection ranges of such VP aircraft themselves. While these comments appeared to have been made more with an eye to Soviet problems with their SOSUS-less VPs, the result still was to fail to inform the naval profession of a rather critical U.S. ASW capability.

- With the U.S. SOSUS system perceived by early 1971 as still only a potential long-term "global" threat, the Soviet Navy held to its earlier view that successful anti-SSBN ASW was beyond the state-of-the-art of ASW for the U.S. (as for the USSR). Moreover, the lag in ASW seemed to be perceived as increasing with the growing submergence depths of submarines, quieting, and other improvements as compared to a lack of comparably great improvements in ASW. Yet, while no priority anti-SSBN mission was perceived as assigned to the U.S. Navy (although some U.S. SSNs could be expected to be tasked with ambushing any and all Soviet submarines as they sortied from their bases and returned an attempted "breakthrough" of ASW barriers), the Soviet Navy remained uncertain about the mission-completion capabilities of their own SSBNs since it was assumed that in wartime the U.S. would

sink a Soviet SSBN as readily or more readily than an SSN even if it could classify the different types and classes of Soviet submarines properly.

BOTTOM LINE: The key Soviet perceptions of U.S. ASW in the 1966-1971 period were that:

(1) U.S. ASW capabilities, SOSUS included, continued for the time being to be inadequate to carry out any high percentage of damage-limitation against Soviet SSBNs; however

(2) This situation was perceived as subject to change to the USSR's disadvantage during the 1970s as the U.S. continued to expand SOSUS and to increase its force of SSNs with their capabilities for exploiting the USSR's unfortunate maritime geography to sink Soviet submarines off Soviet naval bases and elsewhere in the USSR's home waters.

ANALYSIS AND CONCLUSIONS RE. QUESTION #4 OF ACDA TASK STATEMENT FOR THE 1971-1976 PERIOD

A. "What U.S. ASW programs are the particular focus of Soviet commentary?

Ordered simply by the total numbers of commentaries on each of the six major ASW programs, the focus of Soviet attention in gross terms appears as follows (with the numbers of commentaries in parentheses):

1 - SOSUS (26)
2 - SSNs (15)
3 - # 5 - VPs + CVs/CVEs/SCSs + DDs & FFs (14)
6 - MINES (7)

However, when ordered as percentage increase (or, decrease) over the comparable number of commentaries for each category in the preceding 1966-1971 period, the data give some interesting and significant results showing the trends in the shifting focus among the U.S. ASW programs. Most notably, the interest in air-capable surface ships (especially heavy aircraft carriers and sea-control ships) for ASW use tripled, that in SOSUS, VP, and mines doubled, while that in destroyer-type ships decreased slightly, and that in attack submarines decreased moderately. The data when so recorded appeared as follows (with the first number in parentheses being the number of commentaries in the earlier period of 1966-1971 and the second number giving the total for 1971-1976):

1 - CVs/CVEs/SCSs (5-15)
2 - SOSUS (12-26)
3 - MINES (3-7)
4 - VPs (7-14)
5 - DDs & FFs (15-14)
6 - SSNs (18-15)

While the data base is not so extensive as to warrant drawing any very detailed conclusions from the above, it probably is indicative of a heightened interest in both the intended U.S. employment of "multipurpose" heavy attack aircraft carriers in an additional role for ASW and the U.S. discussion about the merits of building a "sea-control ship" that the average annual commentaries tripled to three per year from the level of one per year over the two preceding five-year periods.

Likewise, the doubling of the number of items on SOSUS, mines, and VP airplanes may well have indicated a new focus of interest on these three ASW programs. This seems

particularly likely to be the case when it is noted that the two subjects that had received the most attention for the 1966-1971 period, SSNs and destroyer-type ships, had slipped to the bottom of the "growth stocks" in the 1971-1976 period. So, it seems likely that there was a redistribution of attention to a more balanced perspective.

Of particular note is that SOSUS became the #1 topic by sheer number of commentaries and more than doubled in total number over the preceding period. SSNs, while showing a moderate decrease from its peak in the preceding period, still remained at a high level and in second place for total number of commentaries. Nevertheless, the shift in top place between SOSUS and SSNs was remarkable: for the previous period, SSNs had received 50 percent greater frequency of commentary (18 vs. 12); in 1971-1976, the tables were turned around and SOSUS had a 73 percent lead over the SSNs. Looked at in this light, one can appreciate that the Soviet concern with SOSUS was even greater than reflected by the only moderately concerned tone and content of their commentary.

The caution above about interpreting this data with some care in view of the rather modest size of the data base should be taken into particular account with regard to the data on mines above which appears to have moved ASW mines into third place as a fast growing (if still the smallest) topic of attention. Since the U.S. was doing almost nothing in the field of mine development earlier, it seems advisable to merely note the increase from three to seven items between the two periods and wait until the results on mines for the last period can be considered before trying to make anything much out of the mine data for this penultimate period.

We are left, then, with a summary that states that CVs/SCSs were the hottest topic during the period but that SOSUS became the dominant one in terms of overall size. Moreover, SOSUS had very roughly double the number of commentaries of all of the others (with the exception of mines). While SOSUS had 26 commentaries the others had either 14 or 15. The attention accorded to mines, although more than doubled from three to seven, was still only half of that paid to the others (except SOSUS, in which case it was only about one-fourth).

Since SOSUS was the best (and only promising) substitute for the chimerical technological "breakthrough" that would solve the key problem of initial long-range detection of submarines in the open ocean, it seems reasonable that it should finally have gained the leading place in Soviet

perceptions after having been unduly minimized for a decade. The doubling in growth of the number of commentaries given to shore-based VP airplanes seems to have been objectively warranted in general (after a lapse of interest in VP in the preceding five-year period) and caused to a considerable extent by its more widely recognized role as the primary executor of SOSUS-induced submarine searches and localizations.

ANALYSIS AND CONCLUSIONS RE. QUESTION #3 OF ACDA TASK STATEMENT FOR THE 1971-1976 PERIOD

B. "How frequently and in what contexts do the Soviets discuss U.S. ASW capabilities?

The total number of commentaries on U.S. ASW rose to 92 in the 1971-1976 period from the 58 in the preceding five-years, an increase of roughly 60 percent. Breaking them down into categories (and contrasting with comparable data collated earlier in Table 1) gives the results shown in Table 2 below:

SOURCE	1960-1966	1966-1971	1971-1976
Navy	30	44	82
Defense Ministry	5	13	8
Party and Government (excluding Defense Ministry sources)	1	1	2
TOTALS	36	58	92

TABLE 2: FREQUENCY OF SOVIET COMMENTARIES ON U.S. ASW BY NAVAL, DEFENSE MINISTRY, AND PARTY-GOVERNMENT SOURCES IN THE 1960-1966, 1966-1971 AND 1971-1976 PERIODS

While the increase from one to two Party/Government commentaries over the 1971-1976 period is too small a statistical sample to be meaningful, the drop off from 13 to eight Defense Ministry commentaries may be tentatively taken to indicate that a high point of the Army's concern with ASW had passed. The matter of import from the above is that the number of Soviet Navy commentaries grew so much. After posting a growth of almost 50 percent over the initial 1960-1966 period in the second period, the further even faster growth from 44 to 82 represented an increase of 86 percent. As we shall see from the final period, this 1971-1976 period with its 86 percent growth rate in the number of naval commentaries was to be by far the period of the fastest increase in naval attention to U.S. ASW.

The contexts of all of these discussions of U.S. ASW were generally diffuse and so did not lend themselves as well to categorization as before. However, one of the most significant contexts was the renewed "state" importance of ASW to the USSR apparently stemming from an appreciation

that the former reliance on the National Air Defense Command (PVO Strany) to take care of SLBMs was no longer acceptable with an ABM treaty signed in 1972 between the U.S. and USSR. Another was the requirement, in effect, for a team approach to ASW, using aircraft, surface ships, submarines, mines, and SOSUS-type fixed detection systems. A very common context was that of the difficulties involved in ASW in general and particularly in the critical problems of initial detection and classification of submarines. The most common context was that of the various ASW "forces and means" available and the relative advantages and disadvantages of each. Favorable comparisons of the submarine at the expense of the surface ship was very common. The only new aspect was the serious commentary on the possible ways the new U.S. mines CAPTOR and QUICKSTRIKE could be employed in a general war.

ANALYSIS AND CONCLUSIONS RE. QUESTION #2 OF ACDA TASK STATEMENT FOR THE 1971-1976 PERIOD

C. "How have the frequency and nature of Soviet commentaries changed?"

3 (a) - SOSUS -- The average frequency of references to SOSUS during 1971-'76 increased 50% over the 1966-'71 period. There were a total of 19 commentaries -- two in 1971, three in 1972, seven in 1973, one in 1974, five in 1975, and one in 1976. Unlike the doubling in the previous period, which could not be interpreted with assurance to represent a markedly increased interest in SOSUS due to an unexplained two-year hiatus in references to the system in 1964 and 1965, there was no apparent reason not to interpret the increase to 19 commentaries in 1971-76 over 12 in the previous period as a valid indicator that the Soviets indeed had become more concerned with the threat of premature (pre-missile launch) detection of Soviet SSBNs maintained on combat patrols in peacetime. It is not that their number was large but that the implications for the credibility of the USSR's seaborne deterrent force were so adverse.

As to their nature, these commentaries gave even better coverage of Soviet perceptions of the development of the SOSUS system than before. This included a lengthy description of the SOSUS system and its subsystems in a book intended for a wide military readership. This was The Development of Navies in the Postwar Period by Professor I. N. Potapov (1, C-33). This was essentially a revision and updating of his 1965 book The Postwar Doctrine and Development of the Navies of the Imperialist States in which a description of SOSUS was noticeably missing (16, A-30).

If there actually had been a ban on the topic of SOSUS in books of wide general interest either it was lifted temporarily as a special concession or Professor Potapov managed to circumvent the ban. The latter case seems more likely in view of the scant attention paid to SOSUS in the other major naval books of general interest of the period. In the book, Aircraft Carriers and Helicopter Carriers that appeared in 1972, no hint was given of the existence of SOSUS despite a rather extensive discussion of the antisubmarine zones and barriers established by the U.S. and of the ASW "forces and

means" employed in the efforts to make those barriers and zones effective (21, C-35).

The following year the topic of SOSUS was skirted in Antisubmarine Weapons and Platforms by implicitly indicating that it was inadequate (36, C-37). Later in 1973, N. N. Ivanov's Wings Over the Sea could have at least mentioned SOSUS in its concluding chapter but did not (footnote 42). In the spring of 1974 neither the 3rd revised edition of Combat Course of the Soviet Navy (footnote 50) nor the first edition of Marshal Grechko's The Armed Forces of the Soviet State (footnote 51) included any mention of SOSUS where it might well have been mentioned in the descriptions of the U.S./NATO naval threat which they contained.

While a very technical book precisely on the topic of The Hydroacoustic Means of a Navy, which also appeared in the spring of 1974, did discuss SOSUS for its narrow, professional readership (53, C-38/39), two major military/naval works which appeared in 1975 contained no mention of SOSUS. The first was the second, revised edition of Marshal Grechko's book of a year earlier, The Armed Forces of the Soviet State (footnote 67) which continued to ignore SOSUS. The second book, which also failed to mention SOSUS explicitly, was the first edition of Admiral Gorshkov's Seapower of the State which just barely hinted at the possible existence of such a system in the world's leading navy by observing that "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" (85, C-41/42).

In view of this seemingly studious ignoring of SOSUS in the major military and naval works of the 1971-1976 period, it may be concluded that the subject either was considered of insufficient importance to warrant top level attention or, perhaps more likely, was avoided as an unnecessary derogation of the deterrent credibility of the roughly 15 percent of the Soviet SSBN force being kept forward deployed on combat patrol in peacetime. It seems most likely to the preparing analyst that a policy decision had been made in the Defense Ministry that, while the development of SOSUS could be reported and discussed in the naval professional literature, it would not be allowed to be widely discussed in the general

public domain to avoid possible weakening of the credibility of the SSBN force as a seabased deterrent.

3 (b) - Shore-based VP Airplanes (plus Satellites) -- The number of commentaries on VP ASW forces and/or equipment jumped up to 14 in the 1971-'76 period, double the seven found for the previous period. Several items contained passages that went out of their way to reassure readers that VP airplanes should be taken seriously in their ASW roles. What would have been gratuitous reassurances of the importance of VP airplanes in the 1960s could be legitimately interpreted at this juncture as required to undo the marked downplaying of U.S. shore-based ASW airplanes that was noted to have taken place in the 1966-'71 period. (This point is elaborated in detail in section 3 (b) of Part D for this period which follows later.)

Other than the above, the commentaries on shore-based patrol aircraft continued to give routine coverage to the (slow) replacement of older VP airplanes by the P-3C ORION. They also accorded substantial coverage to the improved DIFAR sonobuoy. The potential of satellites for collecting data from sonobuoys was mentioned once.

3 (c) - SSNs (plus SUBROC) -- The number of commentaries of SSNs decreased from 18 to 15 in 1971-1976 over the previous five-year period. (In addition there were 16 brief entries from the "Foreign Naval Chronicle" section of Naval Digest for which there were no counterparts in the earlier period.) R&D on U.S. SSNs was the subject of six of these items compared to eight in the preceding five-year period (and four in the initial 1960-1966 period). SUBROC was discussed by five different sources in the 1971-1976 period as compared to only two in the 1966-1971 period -- but was back to the same level of five as in the 1960-1966 period. Although the decreases from 18 to 15 in total commentaries and from eight to six on SSN R&D may be a fair indication that Soviet naval interest in SSNs had reached a peak in the second half of the 1960s (perhaps as their interest in using Soviet SSNs for ASW grew apace), the continued high level of attention to the subject would appear to be more important than the moderate decreases.

The loss of Thresher was referred to only twice, as it had been in the 1966-1971 period but there were no further references to the loss of Scorpion as compared to the three references in the earlier period. The relative importance of SSNs as an ASW force was mentioned four times, down from six in the 1966-1971 period. The nature of these three commentaries and their likely significance will be reserved for discussion in answer to the main qustion on actual Soviet perceptions which follows in the Part D of the coverage for 1971-1976.

3 (d) - CVSs/CVS/SCSs (plus Aircraft) -- From the low level of an average of only one mention a year of major air-capable ASW surface combatants that obtained in the 1966-'71 period, the subsequent five-year period saw nearly a tripling of the annual rate from five to 14. There were an additional four similar references in the "Foreign Naval Chronicle" /FNC/ section of Naval Digest (for which the data had no comparable coverage for the earlier period). (For later comparison with the 1976-1980 period, it is recorded here that a grand total of 18 such references were found.)

The frequency of references to the sea-based ASW airplanes TRACKER and VIKING rose from five to six (plus three more from the FNC). The ASW helicopters carried aboard the major air-capable ships of the U.S. Navy were mentioned six times, up from three earlier. (FNC had four additional commentaries). References to VTOL (or VSTOL) rose from one previously to seven in the 1971-'76 period. (One more was found in the FNCs).

The nature of the commentary during the 1971-'76 period was most noteworthy for its shifting the focus of interest away from CVSs to multipurpose CVs and to sea control ships (SCSs) and for a monologue against the opposition of the Army-dominated Defense Ministry to building large air-capable ships for ASW. Otherwise the commentary was comprised largely of routine descriptions of the airplanes and helicopters operated from carriers. There were several individual items of interest perception-wise on different subjects which will be treated in the final section for this period.

3 (e) - DDs and FFs (plus ASROC and LAMPS) -- Compared to 15 entries on these three destroyer-type ships in the preceding five-year period, there were 14 from 1971

to 1976 -- an insignificant drop in the level of interest. (In addition there were ten additional such items found in the Foreign Naval Chronicle of the Naval Digest for which there had been no equivalent data earlier.) References to ASROC increased from four to seven (plus two more in the Foreign Naval Chronicle). Commentaries on the DASH pilotless ASW helicopter remained at the same total of four as in the preceding period while the system slated to replace it, LAMPS, was first mentioned in the open literature in May 1971 and was mentioned 11 more times over the 1971-'76 period. Of marked significance, as will be explained when the actual Soviet perceptions of U.S. destroyer-type surface ASW ships are treated subsequently, was the fact that references to the U.S. developing large surface-effects ships (SES) for ASW multiplied from a single one-sentence reference in the preceding period to seven commentaries in 1971-'76, several of which were quite lengthy. The most striking changes in the nature of the commentary on the destroyer-type ships were twofold. First, because there finally were new classes of frigates (even nuclear-powered ones), destroyers, and destroyer escorts to consider, there was much more discussion of matters concerning them. This ranged from ASROC and LAMPS to limitations as an ASW platform. Two aspects that notably received a minimum of comment, however, were developments in sonar and in ASW torpedoes. Secondly, the rather extensive reporting on the possibilities of designing ocean-going ASW ships on hydrofoils or air cushions or wing-in-ground "ekranoplanes" suggests an unwarrantedly high assessment of those possibilities.

On balance, however, it seems that the discussion of the new displacement ship types, which were first reported only toward the end of the preceding five-year period, should have occurred with markedly greater frequency since they remained highly topical over the entire period. Perhaps this lack of an increase of frequency of commentaries was compensated to a considerable degree by the fact that their average length tripled between the two periods -- as shown by an increase in total pages of text from roughly four to twelve.

3 (f) - Mines -- The frequency of commentaries on U.S. mine developments during the 1971-'76 period increased to seven from three in the previous five-year period. In addition there were two items found in the

Foreign Naval Chronicle of Naval Digest which had no comparable predecessor. Besides this more than doubling of the number of sources, the average length of the commentaries more than doubled. (While the three items for the 1966-'71 period were less than a page in length, the total of nine for the period under consideration here filled 6 1/2 pages.)

The single largest reason for the more than double number and length of the commentaries on mines was readily apparent: the CAPTOR antisubmarine "mine-torpedo". First mentioned in September 1971 (FNC 9/71, C-83), it was discussed in five of the nine commentaries. There were also three commentaries, beginning in mid-74, which discussed the new U.S. bottom mine QUICKSTRIKE.

In addition to these, however, five of the commentaries discussed the value and employment of mines in naval warfare in a general way. Not surprisingly the belated renewal of U.S. interest in sea mines in the postwar period has caused the Soviet Navy to begin to discuss anew the naval uses of mines and, in particular, what the U.S. might be able to achieve with CAPTOR and QUICKSTRIKE mines.

2 (a) - General Appraisals of U.S. ASW -- In comparison with the 15 such appraisals in the previous five-year period, the 1971-'76 period brought only seven comparable ones. The decrease in the total amount of text devoted to analyzing the U.S. ASW effort, however, only amounted to about 20% (from five to four pages of text). The seven items were concentrated largely in the first half of the period: there was one item in 1971, two in 1972 and three in 1973. In the second half, there were no commentaries in 1974 and only Admiral Gorshkov's Seapower of the State in the rest of the period. The preparing analyst does not find these annual frequency fluctuations of any particular significance (especially since they were to pick up again to three in 1976). The reduction from 15 to seven total commentaries, however, does seem to betoken a substantial drop in Soviet efforts to broadly appraise U.S. ASw over the earlier period. What appears to have happened was that a peak of Soviet interest in making such public appraisals of U.S. ASW was reached in 1966-'71. This peak level was above a "floor" of six to eight for the five-years preceding (1960-'66) and the nine years following.

Commentaries in 1971, 1972, and 1973 characterized the level of U.S. ASW effort but were silent on this subject in the last two years of the period. The results of the perceived high level of effort were characterized quite inconsistently as inadequate in 1973 and as good in 1975. The general nature of the developments were summarized in 1972, 1973, and 1975, including the main directions of the U.S. ASW effort. The importance of ASW in the overall U.S. naval picture was characterized. At the end of the period, Admiral Gorshkov provided a tour d'horizon of U.S. ASW developments in the first edition of his book Seapower of the State.

2 (b) - U.S. Budget Allocations to ASW -- There were only four relevant commentaries on this topic for the 1971-'76 period. They occurred in 1972 (1), 1973 (2) and 1975 (1) and so spanned the period fairly well at least. This was (very roughly) the same frequency of one a year that obtained for the decade of the '60s.

The U.S. ASW budget estimates for this period were much improved in that the wide disparities had disappeared and the data at least bore a resemblance to the U.S. figures.

There was one particularly bad forecast in 1973 to the effect that the U.S. ASW budget would, in effect, increase 80% by 1975. Conceivably, there were some objective grounds for anticipating such a large jump -- but it more likely was fabricated for purposes of internal advocacy. However, the U.S. ASW budget did increase about 44% over the period.

Further analysis of this topic is reserved for the final section (Part D) of this chapter which covers the actual perceptions of all the various aspects of U.S. ASW for 1971-'76.

2 (c) - U.S. ASW Force Levels and Forward Deployment/Readiness -- These aspects of U.S. ASW were the subject of eight commentaries over the 1971-'76 period as compared to 13 in the 1966-'71 period. In addition, there were 14 relevant items from the "Foreign Naval Chronicle" of the Naval Digest for which there were no comparable data in the earlier period. These 22 commentaries are collated chronologically in Section 2 (c) of Appendix C, pages C-21 through C-25. Although more numerous in toto than for the preceding period, the total amount of text were

about the same -- five pages. The only marked changes in the nature of the commentary was the virtual disappearance of reporting on forces forward deployed and in readiness for employment on the ASW barriers.

The above paragraph on the frequency and nature of Soviet commentaries on U.S. ASW force levels, forward deployment, and readiness for the 1971-'76 period brings to an end the necessary contextual and ground-clearing analysis for the three subsidiary questions #2, 3, and 4 of the ACDA Task Statement, and allows us to resume building on the main structure of actual Soviet perceptions of the representative aspects of U.S. ASW which have been chosen for consideration.

ANALYSIS AND CONCLUSIONS RE. QUESTION #1 OF ACDA TASK STATEMENT FOR THE 1971-1976 PERIOD

D. "What is the Soviet perception of U.S. ASW capabilities and how has it changed?

3 (a) - SOSUS (plus compatible mobile/portable subsystems) -- As done for this section alone for the two previous periods, a summary of the key points of the data from part 3 (a) (of Appendix C for this period) has been prepared and is set out below -- as deemed necessary in view of the unique importance of the long-range underwater detection capability for any overall solution to the ASW problem against nuclear-powered submarines:

1971 - A book on the postwar development of navies by Professor Potapov stated that the U.S. had been according "great attention in recent times" to the continued "development and modernization of hydroacoustic systems for the detection of submarines and the classification of underwater contacts". Such "positional means of detection" of submarines were noted to fall into two categories as concerns their employment: 1) On the "very long antisubmarine barriers" established by the U.S. and 2) At "considerable distances from one's coasts". It was claimed that the U.S. was developing manned hydrophones for use at depths up to 2,000 meters but the potential of such a system was seen as only extending SOSUS on the continental shelf out to 200 miles from the U.S. coasts. A figure of 22 million dollars for annual U.S. expenditures on SOSUS was given and was termed "a significant amount" (7, C-34).

- Although without specifically relating them to the stationary hydroacoustic means of SOSUS, a Naval Digest article stated the requisite requirements for an effective SOSUS system as "the reliable detection...of low-noise targets that are moving at high speeds and great depths" (12, C-34/35).

1972 - The demonstrated effectiveness of SOSUS for detecting submarines in open-ocean areas covered by the SOSUS system was noted in connection with the determination by SOSUS of the location of the sinking of the U.S. SSN

Scorpion in May 1968 (16, C-35; see also 82, C-41).

- The existence of SOSUS was passed over in silence in the book Aircraft Carriers and Helicopter Carriers despite a discussion of ASW barriers and the "forces and means" for their establishment and effective operation. (21, C-35)

- The attention of the Soviet political/Party elite was drawn to the U.S. progress in development of "a global net" for submarine detection in the "entire vast expanse of the World Ocean" by an article in the journal USA: Politics, Economics, and Ideology, the house organ of the Institute for the Study of the U.S. and Canada. The SEA SPIDER hydrophone system was reported as "being installed along the Pacific coast and near the Hawaiian Islands". The ARTEMIS project was described as "extremely powerful low-frequency sonar" which "should become the active component" of "the overall SOSUS detection system". BARRIER and BRONCO were mentioned as additional components to the SOSUS system but were not further described. (29, C-35/36)

1973 - The U.S. was reported in the Naval Digest to have approved a plan the previous year for the modernization and extension of SOSUS. Top priority was said to have been given to a sub-system called AFAR for monitoring the eastern Atlantic and the approaches to the Straits of Gibraltar. Mention was made of the MSS self-anchoring sonobuoys which could be dropped from airplanes or ships for which a prototype was reported to have been scheduled for delivery by February of the year before and whose advantage would be that it could be "deployed rapidly in any operational direction". It was also stated, in effect, that the SOSUS system still did not meet "the expanding requirements for reliable monitoring of the underwater environment for the timely detection and, most importantly, for the classification of the new low-noise submarines". As a consequence, it was stated, the U.S. was continuing R&D for developing "other means of detection". (35, C-37)

- The alleged limitations of SOSUS were stated flatly if implicitly in a book Antisubmarine Weapons and Platforms by Captain First Rank Kvitnitskiy which asserted: "No effective means for the long-range detection of submarines has been found up to this time". It was added that, as a consequence apparently of the perceived limitations of SOSUS, "the continuous surveillance of a submarine of a potential enemey is a virtually impossible task". (36, C-37)

- A Red Star article on the U.S. Atlantic Fleet informed its wide military readership that the U.S., in effect, had successfully integrated its submarines, surface ships and aircraft (both shore-based and shipborne) with the SOSUS system in the Atlantic and had established ASW barriers "on the probable routes of transit of /Soviet/ submarines" (37, C-37)

- In a Naval Digest article on U.S. development of hydroacoustic means of submarine detection, establishment of a "global" system was seen as merely the "ultimate aim" of U.S. efforts in ASw rather than an accomplished fact. Figures were given to indicate that the U.S. ASW budget would nearly double in the next two years and it was claimed that the greater part of it would go for "detection means". A new SOSUS sub-system SAS was reported as a deep-ocean supplement to the hydrophone nets on the U.S. continental shelf. It would include a network of hydrophones of improved sensitivity installed on bottom-mounted tripods. More than a billion dollars was to be expended on it. Also reported was a U.S. "special information system OSIS" for real-time transmission of SOSUS data to the mobile ASW forces (41, C-38).

1974 - In a book The Hydroacoustic Means of a Navy by A. L. Prostakov it was stated that Canada had undertaken in 1971 to install an ASW barrier in the Canadian Arctic. Employing earth satellites for the collection of data from the positional means of SOSUS was mentioned as a possible way of furthering the development by the U.S. of the "global"

system of submarine detection but it was left unclear as to whether or not this was a serious U.S. developmental effort (53, C-38/39).

1975 - The hydrophone net installed under the CAESAR program was reported to extend from Nova Scotia to Florida (FNC 2/75, C-40).

- The U.S. Navy was said to "have turned to the development of a global net for the detection and identification of submarines". Such a system "would permit not only the detection of missile submarines but also the determination of their location". This in turn would permit ASW forces to attack them "without warning and within a few minutes" (81, C-40).

- An article "SOSUS Detects the Submarine" in Naval Digest claimed that "as SOSUS is perfected and its zones of operation are expanded over the World Ocean, the Pentagon plans to form a single operating system of underwater surveillance under the global command of the Armed Forces". The "effectiveness" of SOSUS was said to have been "confirmed" in September 1968 when it accurately revealed the location of the sunken Scorpion (82, C-40).

1976 - The SEA SPIDER sub-system of SOSUS was pinpointed in a January article in Naval Digest on U.S. ASW in the Pacific as installed in the area north of the Hawaiian Islands and operating at a depth of 4,900 meters. Hydrophones were reported to be operating as part of SOSUS in the "Kuriles-Kamchatka Trench" and "in the approaches to Taiwan, Okinawa, Korea, and the Philippine Islands". A "joint intelligence center for the SOSUS system" was reported to be in the process of establishment in Hawaii. Earth satellites were claimed to be in use by the U.S. to detect Soviet submarines when departing their bases and while cruising at shallow depths (90, C-42/43).

Summary re. SOSUS, 1971-76 -- According to an unsigned article on U.S. submarine sonar in the June 1973 issue of Naval Digest, SOSUS was perceived as a system of submarine

detection whose nucleus consisted of long-range hydrophone detection nets installed in the oceans and among the components of which were all airplanes, surface ships, and even submarines (41, C-38). In another Naval Digest article, one in October 1975 on naval tactical developments by Captain First Rank N. V'yunenko, the "high importance" to submarines was stressed of retaining their "covertness, which of course is precisely the one being threatened by SOSUS. V'yunenko, one of Admiral Gorshkov's small group of top naval theoreticians, concluded that the ongoing technological competition between submarines for "improving their covertness" and antisubmarine forces for "depriving submarines of that advantage" constituted "one of the leading trends in the development of naval tactics".

At the same time he opined that anti-SSBN ASW "has become one of the top-priority missions of navies". Although he very likely had the Soviet Navy primarily in mind, it is clear that he by no means meant to exclude the U.S. Navy. He went on to observe that "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". As a "for example", he noted that "the U.S. Navy already has turned to the development of a hydroacoustical field...for the detection of any submarine which enters the limits of the field". He cited "specialists" (i.e., including Soviet, according to standard usage in Soviet military writings) as estimating that "such a system 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 /i.e., those out in the oceans on combat patrol/ to allow 'the inflicting on it of a strike without warning and within a few minutes'" (81, C-40).

Since the U.S. had just "such a system" in SOSUS while the USSR lacked the ocean-front real estate to build a comparable system of stationary means, it is obvious that this description was written with the U.S. SOSUS system specifically in mind. As such, it was an unprecedented if implicit portrayal of the threat constituted by SOSUS to the deterrent credibility of the USSR's seaborne strategic deterrent.

The professed Soviet perceptions of the importance the U.S. attached to improving the SOSUS system during the 1971-1976 period were uniformly high. In 1971 Professor Potapov of the Naval War College noted that "the U.S. Naval Command has been according great attention in recent times to the modernization /of existing/, and the development of new,

positional means of detection" (7, C-34). In 1973 an unsigned article appeared in Naval Digest on the hydroacoustic means used for ASW by foreign navies. In very understated terms it warned the Soviet naval professionals that "stationary (positional) hydroacoustic means have received special development in the U.S." (35, C-37). Before going on to describe the system, the article explained that "the basic function" of those "stationary (positional) hydroacoustic means" was "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)". Then in 1974, The Hydroacoustic Means of a Navy spoke of "the exceptional importance" ascribed to SOSUS by the U.S. (53, C-38/39).

By way of attesting the great importance the U.S. ascribed to SOSUS, statements in 1971, 1973, and 1975 commented on the costs involved in developing the SOSUS system. Professor Potapov wrote in The Development of Navies in the Postwar Period in 1971 that the U.S. had spent 20 million dollars on SOSUS in 1965, 22 million in 1967, and "about the same" in 1970 (7, C-34). In 1973, a Naval Digest article described a projected (SAS) extension of SOSUS coverage further into the open oceans from the U.S. continental shelf as apparently slated to cost over a billion dollars (41, C-38). In 1975, another Naval Digest article (entitled "SOSUS Detects a Submarine"), claimed that in FY 1975 90 million dollars of a U.S. ASW budget of 327 million, or almost 25 percent, had been spent on the development of "a global system of long-range hydroacoustic surveillance" (82, C-40/41).

Soviet naval writers continued throughout the first half of the 1970s, as they had in the late 1960s, to show particular concern over this long-term potential of SOSUS as a "global" system that would encompass all the important areas of the "World Ocean". In addition to the above reference in 1975 to a "global" SOSUS system, there were four similar references in 1972, 1973, 1974, and a second one in 1975 (29, C-35/36; 41, C-38; 53, C-38/39; and 81, C-40).

The most comprehensive, if confusingly organized, summary of how the further development of SOSUS was perceived during the 1971-76 period comes in a Naval Digest article in February 1973. Reorganized to more clearly present what the unsigned article seems most likely to have intended to convey, it first claimed that some unspecified U.S. budget committee had approved a plan "for the modernization of existing /antisubmarine/ barriers and zones on the far approaches to the shores /of the U.S./ and in straits and the establishment of new ones" (35, C-37).

Piecing together the subsequent remarks of this article, the following perception of projected SOSUS developments is obtained:

A. New Fixed Hydrophone Installations for Long-range Underwater Surveillance

1) In "the new antisubmarine zones established for NATO" -- quite likely a first reference to the BARRIER BRONCO hydrophone installations later reported in 1976 to "exist" off the coasts of Denmark, Great Britain, Portugal, Italy, and Turkey (5, D-46); and

2) Installation of SASS (which was not explained at all until four months later another Naval Digest article said it was to be a net of hydrophones (installed on tripods on the ocean floor) that in effect would extend the range of those along the continental shelf off the U.S. Atlantic Coast. (Whether or not this was another passive system or an active system intended to replace the terminally ill ARTEMIS system was not clarified).

3) In the Eastern Atlantic near the Azores, a system codenamed AFAR and considered to be of particular importance since it would enable constant surveillance of that region of the Eastern Atlantic, specifically of the approaches to the Straits of Gibraltar at the western entrances to the Mediterranean.

B. Modernization of Existing ASW Barriers and Zones:

1) Better hydrophones for the Atlantic SOSUS, apparently of a type not yet developed when the (CAESAR) installation of the Atlantic SOSUS on the continental shelf off the U.S. East Coast was carried out in the 1950s but that subsequently were used in the 1960s for the (COLOSSUS) installation of hydrophones in the Pacific on the continental shelf off the U.S. West Coast;

2) A MSS system of self-anchoring sonobuoys with a longer operational life expectancy (90 hours) than normal sonobuoys. After their production, they would be held ready for rapid deployment to cover gaps in the ASW barriers

in the event of war or a severe international crisis.

In 1972 and 1973 two references to U.S. Project ARTEMIS (for an active, deep-water sonar system) proved to be the last ever to appear on this defunct proposal. In 1972 an article in U.S.A.: Politics, Economics, Ideology, the house organ of a Party-directed think tank of the U.S. and Canada, still proclaimed that ARTEMIS "should becomes the active component of SOSUS" (29, C-36). Just four months later the Naval Digest reported, with the nearest approach to accuracy of all references to ARTEMIS, that it was just a possibility that the U.S. had "under investigation." The U.S. decision in this period not to build ARTEMIS went unreported in the Soviet open writings.

The commentaries on the effectiveness of SOSUS to detect and track the USSR's nuclear-powered submarines were the subject of a number of implicitly contradictory statements. These fell into two categories: 1) Six factual statements that left readers with the impression that SOSUS must be a matter of great concern to the Navy; and 2) Six statements that stated or implied serious limitations on SOSUS capabilities that would indicate that the system was inadequate for U.S. needs and not a serious threat to Soviet submarines.

The first of the factual but implicitly favorable statements about SOSUS was found in Red Star in early 1973: "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, C-37).

The second of the statements implicitly favorable to SOSUS which appeared in May 1974 in The Hydroacoustic Means of a Navy, merely stated that "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, C-39). This is the kind of circumlocution that Soviet military/naval writers resort to habitually when they consider it impolitic or a potential security violation to call a spade a spade. The author, A.L. Prostakov, long an established writer on hydroacoustics, had earlier pointed out that the U.S. ascribed "exceptional

importance" to SOSUS. He seemed to be warning his naval colleagues against underestimating the capabilities of SOSUS.

The third of the six pro-SOSUS commentaries was found in an item in the "Foreign Naval Chronicle" section of the Naval Digest for February 1975. After noting that the U.S. East Coast SOSUS extended from Nova Scotia to Florida, the item made the only favorable remark to be found in the Soviet open literature on the range of SOSUS: "Due to the exploitation of underwater sound channels, an extended range of detection is obtained" (FNC 2/75, C-40).

The fourth commentary came in a Naval Digest article "SOSUS Detects a Submarine" in October 1975 and made the flat statement that the success of SOSUS in pinpointing the location 450 miles southwest of the Azores where the SSN Scorpion had gone down had "confirmed the effectiveness" of SOSUS (82, C-40/41).

The fifth of these favorable statements was to be found in the first edition of Gorshkov's book Seapower of the State. Without ever mentioning SOSUS by name, he made it clear that he considered it was a system with which Soviet military planners would have to reckon: "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..." (85, C-42).

The sixth and last of the comments implying that SOSUS was effective came at the end of the 1971-1976 period in a January 1975 article in Naval Digest on the ASW forces of the U.S. Pacific Fleet. In a passage too lengthy to quote, the item appeared to sum up the USSR's unclassified knowledge of SOSUS but without a single word of criticism about its limitations. All systems were reported, in effect, to be in place and operating. All planes and ships and even some satellites were asserted to be providing grist for the SOSUS mill. Shore-based VP airplanes were noted to be cooperating with SOSUS (i.e., being vectored to contacts) in a "highly effective" manner. While the "ultimate goal" of a capability for continuous tracking of all submarine contacts lay in the future, the tone of the article was cautionary (90, C-42/43).

The six articles which were critical of SOSUS for not being all that was perceived as required by the U.S. began with one in Naval Digest in November 1971 which cautiously implied that any solution to the ASW "problem" depended on the prior development of new "means for the reliable detection and destruction of low-noise targets that are moving at high speeds and at great depths" (12, C-34/35).

A second negative comment came only two months later and flagged the same three characteristics of nuclear-powered submarines (quietness, high-speeds, and deep-running). After citing the success of SOSUS in pinpointing the location where the Scorpion had been lost, the Science and Life article by two senior naval officers continued:

> Such /fixed, hydroacoustical/ systems permit the detection of submarines hundreds of kilometers from the shore... /but/ 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 (16, C-35)

The third comment critical of SOSUS claimed that "the stationary means presently available do not meet the expanding requirements for the reliable monitoring of the underwater medium 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" (35, C-37). This report was contained in an unsigned article in Naval Digest in February 1973 and was noteworthy for its claim that SOSUS had inadequate capabilities to classify its underwater targets.

A fourth commentary was found in a 1973 DOSAAF booklet on Antisubmarine Weapons and Platforms and asserted as categorically as the Science and Life article that "no effective means of long-range detection of submarines has been found" (36, C-37). The author, Captain First Rank Kvitnitskiy, added that "the continuous surveillance of a submarine of a potential enemy is a virtually impossible task".

In 1974 Prostakov's book The Hydroacoustic Means of a Navy asserted that "great difficulties" confronted

U.S. efforts to "widen the coastal zone of submarine detection" (53, C-39). The only plan for doing this that struck him as "feasible" and worth mentioning was to supplement SOSUS by "extensive" use of air-droppable /MSS/ sonobuoys of longer usability than the normal sonobuoy.

The sixth and final comment was indirect and inferred that only after further improvement and the extension of SOSUS would it meet U.S. requirements. This came in a Naval Digest article on SOSUS in October 1975 (82, C-40/41).

From all of the foregoing, the following interim conclusions re. SOSUS in the 1971-1976 period seem to be warranted:

- SOSUS was perceived as continuing to make progress toward the ultimate aim of affording the U.S. "global" coverage. Moreover, it was seen as being rapidly integrated into a world-wide surveillance system of the U.S. Armed Forces in which all feasible means of submarine surveillance from satellites to merchant ship reporting would provide nearly real-time vectors on submarine contacts to the "mobile forces" of ASW.

- The SOSUS system was perceived by six negative commentaries as still of inadequate range and effectiveness by late 1975 to constitute a major threat but its longer term potential (considering the efforts at modernization and its oceanic coverage underway as well as portable means such as MSS) was stressed by an equal number of further commentaries which were tantamount to earnest warnings to Soviet naval officers not to make the mistake of underestimating the potential of SOSUS.

3 (b) - Shore-based VP Airplanes -- A rather obvious process of rehabilitating the shore-based VP airplane as an important ASW platform (after the downgrading it had suffered in the 1966-1971 period) began within two months after the end of the XXIIIrd Party Congress in early April 1971. After noting that the U.S. had about 300 VP airplanes, Professor I. N. Potapov stated in his book The Development of Navies in the Postwar Period that shore-based patrol aviation "is considered as before to be an important means for antisubmarine warfare" (1, C-44). Six months later

the Naval Digest carried an article on the evolution of ASW which seemingly should have completed the job of reinstating VP airplanes in the perceptions of the professional naval officer corps:

> A special place in the military plans of the imperialist countries is assigned to antisubmarine aviation which...is capable of significantly facilitating the carrying out of the mission for warfare against submarines... (12, C-44).

While the above reference to "antisubmarine aviation" was so broad as to apply to shipboard aircraft as well as shore based ones, the context suggests that VP airplanes were had equally or uppermost in mind.

Another statement to this effect is to be found in 1973 in Antisubmarine Weapons and Their Platforms by Captain First Rank Kvitnitskiy. This indicated a perception that shore-based ASW aircraft were being developed more "intensively" than shipborne ones. In explaining the rationale for this, Captain Kvitnitskiy very likely also revealed the underlying reason that the ASW role for VP airplanes was being rehabilitated: "This is explained by the growing effectiveness of shore-based airplanes of antisubmarine defense" (36, C-45).

A third contribution to reestablishing U.S. VP airplanes in Soviet perceptions as a significant ASW platform was made by Admiral Gorshkov himself in a July 1973 interview for a journal for the Soviet serviceman Soviet Warrier. The Navy chief stated: "Antisubmarine airplanes...have proven themselves an effective means of fighting submarines no matter at what depth they may be located" (44, C-46).

Then on Navy Day a year later, two of Gorshkov's top deputies, Admirals Alekseyev and Bondarenko, had unusually kind words for shore-based ASW airplanes. The former credited their sensors and weapons with being "effective for the search and destruction of the submarine opponent" and, in general, credited VP aircraft with being of "important significance" among ASW forces (40, C-45). Admiral Bondarenko, the Deputy Chief for Operations, went even further and credited VP airplanes with a capability for "locating and destroying a submarine opponent in the oceans' expanses" (58, C-46).

While these two comments were exaggerated portrayals of the capabilities of the VP aircraft of the Soviet Navy, they did reflect a quite different and enhanced opinion of VP aircraft in the ASW role than the 1970 estimate of four years earlier that the future of VP aircraft in that role was "wholly dependent on the possibilities of increasing the detection ranges of existing sensors and developing new ones" (52, B-48).

That this renewed high estimate of VP airplanes actually did apply to the U.S. Navy's VP airplanes was made explicit the following month by an article in the August 1974 issue of Naval Digest by a colonel of the Soviet Naval Air Force in an article on "Airplanes Against Submarines". While not "denying the many merits of the ORION", the article cited their great unit cost (seven million dollars), great weight, and alleged "lack of economy" (i.e., cost-ineffectiveness). Nevertheless, the ORION P-3C was praised as possessing "sufficiently high flight characteristics" for carrying out "a vast complex of antisubmarine tasks". The A-NEW system was said to "considerably enhance" the P-3C's ASW capabilities. In a burst of enthusiasm the article added:

> The ORION is literally stuffed with sensors,...systems for the collection, processing, and display of information... The /P-3C/ system reportedly can handle the processing of three times as great a volume of signals from sonobuoys as the earlier modifications (63, C-46/47).

Next, in October 1975, the Naval Digest carried an article which made obvious the specific basis for the enhanced appreciation of VP airplanes for ASW as having "growing effectiveness" -- as we noted above had been stated two years earlier in Antisubmarine Weapons and Their Platforms (36, C-45). And that was their capability to employ SOSUS vectors to make initial contact with enemy submarines. In an article "SOSUS Detects a Submarine", the Soviet naval profession finally was given a clear appreciation of the capabilities of U.S. VP airplanes when directed by SOSUS to the general area of an enemy submarine:

> After detection of a target is made by means of SOSUS, the mobile forces (most often the airplanes of shore-based

> patrol aviation) are vectored to the contact area for the localization and final classification of the target. Continuous surveillance (tracking) is maintained on the submarine (82, C-47).

Finally, in January 1976, an article on the ASW Forces of the U.S. Pacific Fleet carried an appraisal of SOSUS-vectored VP aircraft as "highly effective":

> Special attention is accorded by the U.S. Navy to the antisubmarine operations of the 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 (90, C-47).

Thus, it seems apparent that the Soviet perception of the capabilities of U.S. VP airplanes for ASW was restored to an objectively high level during the 1971-1976 period over the low point it had reached in the previous five-year period. Moreover, it appears probable that the main reason for this was the improved capability of the ORION P-3C to employ SOSUS vectors to make initial contact with a submarine target and then to track it continuously for long periods.

3 (c) - SSNs (plus SUBROC) -- The theme which had first appeared in 1968 that submarines were better for ASW than surface ships or aircraft was continued in the 1971-1976 period and was reiterated twice in 1971 and one time each in 1972 and 1973 (and was to reappear once in the final period). In May 1971 Professor Potapov stated in his book The Development of Navies in the Postwar Period: "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" (1, C-48). Potapov asserted that it was to fill the ASW requirement for submarines that SSN construction had been "stepped up in recent years

along with the intensive construction of nuclear-powered missile submarines". A month later an article on NATO SSNs, which was indicated to be intended to provide reference information for Soviet naval officers, claimed that "the military-political leadership of NATO accords exceptionally great significance to the development of nuclear-powered torpedo submarines: (2, C-48/49). In this case a more objective appraisal was given in that ASW was not cited as the only reason for construction of SSNs. Rather SSNs, with either conventional or nuclear warheads, were said to be considered "most effective" for ASW as well as required for traditional roles.

The 1972 item claiming the superiority of the submarine for ASW was found in an article by a prominent submarine officer, Vice Admiral Sorokin, so might easily be set aside as special pleading. However, his comment on this subject was so tentative that it semed apparent that it did not accurately reflect the Navy's policy line. Sorokin wrote in a January 1972 in the journal Science and Life:

> Despite the merits of surface ships and aircraft as platforms for antisubmarine weapons, naval experts are more inclined to think that the most powerful opponent of a nuclear-powered submarine, a special antisubmarine submarine or, as the Americans call it, an attack submarine (16, C-50).

By ascribing this view to "naval experts" rather than the usual "foreign" naval experts, Admiral Sorokin was employing a standard convention used to make certain that his knowledgeable readers would appreciate that he was referring primarily to Soviet "naval experts". So, for this reason too (in addition to the likelihood that Sorokin was beating the drums for more SSNs in his capacity as a submarine officer than as a general line officer), one is well-advised not to accept the above-quoted statement as accurately reflecting the officially approved Soviet Navy perception of U.S. SSNs in their ASW role.

The fourth and last such statement found in the Soviet open literature during the 1971-1976 period appeared in Captain Kvitnitskiy's DOSAAF booklet Antisubmarine Weapons and Their Platforms which was

published in February 1973. His comment was interesting on two grounds. First, he made it very clear that the proponents of submarine superiority for ASW were merely advocating that Soviet SSNs deserved to be recognized as playing the leading role in ASW. Secondly, he took the same line as the June 1971 Naval Digest article which had gainsayed the implication of Professor Potapov's book a month earlier that ASW alone was the raison d'etre for the U.S. construction of SSNs. Kvitnitskiy's statement merits quoting:

> 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 viewpoint by saying that the combat qualities of submarines have grown sharply. This has seriously hampered their search and detection and their tracking and destruction by surface ships and aviation...The most effective of the antisubmarine 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 rate of construction of such submarines has been increasing (36, C-51/52).

Kvitnitskiy's mention in this quotation that the "defenders" of the view that anti-SSBN ASW has become "one of the most important missions of submarines" resort to the rationalization that ASW submarines owe their effectiveness to the fact that they operate in the same underwater environment as their quarry recalls the only other commentary found which cited the same argument. This was a 1968 criticism 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" (30, B-15/16). A particularly telling example was adduced to discredit the submarine enthusiasts. The Canadian

Navy was said to have concluded from analysis of NATO ASW exercises that SSNs should only be used for ASW in circumstances of "dire necessity" since "the losses of its own submarines would be equal to the number of enemy submarines destroyed" -- an unacceptably high loss rate, apparently, in the view of the opponents in the Soviet Navy of "excessive praise" of submarines as being the single really effective ASW force.

From the commentary on this subject discussed above it seems abundantly clear that the Soviet statements crediting or discrediting ASW submarines as the ASW force type have far more to do with an internal dispute on the subject than any difference in perceptions of U.S. plans with regard to employing SSNs for ASW. The uncertainty of the analysis on this subject for the 1966-1971 period now has been clarified by the additional commentary found for this period and the conclusion is warranted that the internal debate over the value of the submarine for ASW should not be taken as necessarily indicative of a Soviet perception that the U.S. was putting primary reliance on SSNs for ASW.

To the contrary, these statements seemingly can tell us little or nothing of help in determining the prevailing Soviet perception of U.S. SSNs in an ASW role. Here we will do better to turn to the more factual data available in the commentaries before us -- most importantly to the SSN construction rates planned and the programmed goals for the ultimate size of the U.S. SSN force and to those force levels actually achieved.

Turning attention to the SSN construction rates planned and achieved and the total SSN force goals proposed and approved at different junctures, it will be recalled from the previous period that these varied greatly over the 1966-1971 period. In 1966 the Soviets reported that the U.S. would build six SSNs per year until 64 were in commission. Only half this rate was noted to have been achieved for most of the period and the "considerable lag" in SSN construction was noted. However, by early 1971 it was reported that 17 SSNs actually were in various stages of construction and the ultimate force goal was reported to have leaped up to 100-110. With this background in mind, the further erratic developments for 1971-1976 become more meaningful.

Shortly after the XXIV Party Congress ended in April 1971, Professor Potapov recounted in his book The Development of Navies in the Postwar Period that, after completion of the program McNamara had approved in 1966 for the construction of 45 SSNs to bring the U.S. SSN Force up to a total of "about 64" first-line" boats, "a new program was adopted to build 35 nuclear-powered submarines of a new design /i.e., the SSN-688 Los Angeles Class/ with an overall cost of three billion dollars" (a, C-48). The book added that, with the completion of this program, the overall total of SSNs (counting one in reserve) would reach 100. In view of the increasing delays in SSN construction in the U.S., Professor Potapov wisely refrained from predicting when the 100 total would be reached.

In June 1971, an article providing reference data for Soviet naval officers on NATO SSNs again claimed that the U.S. goal was 105-110 SSNs (2, C-48/49). It also inflated the number of U.S. SSNs as of 1 June 1971 as 50 with 26 more authorized. An even more exaggerated total figure of 57 as of mid-1971 was stated in Captain Kvitnitskiy's DOSAAF booklet of February 1973, Antisubmarine Weapons and Their Platform (36, C-51/52). This source repeated that the eventual goal was 100 to 110 boats but noted that the rate of construction was (only) three to four yearly.

The overestimates of total SSNs as 50 in the June 1971 Naval Digest and of 57 in Kvitnitskiy's February 1973 were downgraded in March 1973 in a Naval Digest article to a more realistic 46 (39, C-54). In August of the same year, Naval Digest reported that 46 more were "planned" for construction over the ensuing ten years (FNC 8/73, C-54). By November of 1973, the readers of Naval Digest were advised that four SSNs had been completed in the 13 months from April 1972 through April 1973 (FNC 11/73, C-55). Then in December 1973, the same audience was informed that the U.S. planned to have 88 SSNs "by 1981" (48, C-55). To achieve such a goal would have required an average construction rate over the intervening eight years on the order of five boats per year. Such a planned construction rate was further reported in the February 1974 Naval Digest for FY 1973/74 and it was claimed that this would raise the total to 64 (FNC 2/74, C-55).

However, when the Naval Digest gave the total for mid-'74 in its December 1974 issue, it was only 61, apparently a reestimate allowing for the perceived lag in the U.S. construction of SSNs (FNC 12/74, C-56). In a January 1975 article in Naval Digest by Doctor of Historical Science and Captain First Rank N. V'yunenko, it was said that the U.S. had been planning all along (just) to have 60 "first-line" SSNs by the mid-'70s but that it was planning to have 40 more "by 1980" (64, C-56). This indicated a construction rate of eight SSNs/year and a total of 100. That such a large program was not in the cards began to be evident by October 1975 when Naval Digest reported in a "Foreign Naval Chronicle" item that the U.S. was requesting funding for only two SSNs in FY 1975/76 (FNC 10/75, C-56).

Even by 1 June 1976, three months after the XXVth Congress, the total number of SSNs in the U.S. Navy was reported as (only) 62 (20, D-25). Thus, for the five years from 1 June 1971 to 1 June 1976 the U.S. was perceived to have only built 12 SSNs, and average, of course, of under 2 1/2 per year.

Not all of the difference in the estimates recorded above of four to eight per year can be ascribed reasonably to understandable misperception or confusion resulting from the lag of actual construction behind planning. This substantially smaller numbers actually authorized in the U.S. budget for successive years were reported frequently enough in the "Foreign Naval Chronicle" items in Naval Digest to suggest that the exaggeration in Soviet naval articles and books was deliberate -- and quite likely intended to serve the Navy's aim of obtaining the much larger number of general purpose naval forces, especially ASW cruisers and SSNs, that obviously would be needed to fight the U.S. and NATO navies in any general war.

Consequently, the preparing analyst concludes that, despite the much larger-than-life estimates of U.S. SSN construction published in the Soviet naval literature, the appreciation existed on the part of the naval leadership that the U.S. SSN construction program was a very modest one and not of a size that need naval planners awake nights until or unless it were continued for many years.

3 (d) - CVSs/CVs/SCSs (plus Aircraft) -- It will be recalled that in the 1966-'71 period an Army assertion that

the CVS was on the way out and was being replaced by "more effective" ASW forces particularly SSNs (24, B-58) met with determined resistance from the Navy which obviously wanted to justify continuing to build larger, more air-capable ships for ASW. The Navy rebuttal had two main lines of argumentation. First, the U.S. Navy was not giving up ASW aircraft carriers in favor primarily of ASW submarines. Secondly, it would replace the CVSs with CVAs from which the improved (S-2) TRACKER would be flown (51, B-59/60).

In the 1971-'76 period, U.S. developments enabled the Soviet Navy to make a logically more plausible case with which to counter Army opposition. In essence it was that the newest ASW airplane designed for use from aircraft carriers, the S-3A VIKING, was too large for flying off the Essex Class CVSs and hence they were to be based aboard attack carriers (CVAs) and the designation of the latter was to be changed appropriately to CV for "multipurpose" to reflect the additional ASW role (78, C-68).

While there is reason to conclude that this argument had more to do with the Soviet Navy's desire to build larger and more air-capable ASW ships of its own than an objective perception of U.S. trends in ASW, it did reflect a continuing confidence that the ASW aircraft carrier was such a promising developmental route to follow that it could not be neglected in favor of SSNs -- even though they were to be further developed for ASW too. Since the subject is of some considerable importance, the evidence in this regard for the 1971-'76 period merits examination in some detail.

As noted earlier, the USSR's military doctrine provided (and still provides) that the "main striking force" of the naval component of the Soviet Armed Forces should be comprised of submarines and aircraft while surface ships (due to their alleged great vulnerability in an era of nuclear-missile weapons) should only play a supporting role (primarily to provide "combat stability" to "the basic force" of the Soviet Navy, the submarines). It was in reference to this situation of apparent continuing "military" (i.e., Army) opposition to the construction of ever larger, more air-capable ASW ships (ASW "cruisers") that Professor Potapov included the following passage in his book The Development of Navies in the Postwar Period which appeared in May 1971:

> Military specialists /i.e., especially in the Soviet Defense Ministry and Armed Forces' General Staff/ believe that these hunter-killer groups /formed around a nucleus of ASW aircraft carriers/ can be replaced completely by modern airplanes of /shore-based/ patrol aviation...and by nuclear-powered antisubmarine submarines.

From the considerable amount of evidence extant regarding Army opposition to giving the Navy any valid grounds for obtaining a larger share of the military budget (whether for large ASW surface ships or for a share with the Strategic Missile Forces in the initial deep-strike mission against the U.S. which could justify much larger general purpose naval forces for protecting the SSBN Force), it seems probable that Potapov's above statement was an objective summary statement of the Army's position that the U.S. was giving up use of aircraft carriers for ASW and hence the U.S. Navy's use of them in such a role could no longer be cited by the Soviet Navy in justification of larger and more air-capable "ASW cruisers".

However, Potapov continued directly with a rather clever statement that in all likelihood misrepresented the Army's viewpoint by implying Army acceptance of the utility of aircraft carriers for ASW point defense of naval forces and merchant ship convoys:

> At the same time, they /the "military specialists"/ understand that the antisubmarine aircraft carrier remains the only antisubmarine ship which is capable of carrying antisubmarine aviation on board for conducting the antisubmarine defense of naval (and merchant) ships during sea transits.

Since "antisubmarine ship" by Soviet usage includes ASW submarines as well as surface ships, this passage may be seen to be a double-edged rejoinder to the Army: it not only asserted that ASW aircraft carriers continued to be essential for ASW but implied quite clearly that ASW submarines, contrary to the Army viewpoint, were inherently unable to fulfill the requirements for ASW by themselves.

Six months later an article on "The Evolution of Antisubmarine Warfare," which appeared in the November 1971 issue of Naval Digest signed by an active-duty Captain First Rank, acknowledged (objectively) both the growing role of SSNs in ASW and the decreasing role of CVSs. The article seemed to be an attempt to give the Army as much credit as possible and even may have raised the hopes of Army readers that the Navy finally was capitulating and agreeing that aircraft carriers really could play no significant role in ASW. If any such hopes flickered momentarily in reading the article, they were rudely doused by the final phrase of the statement (as underlined below by the preparing analyst) in a turnabout surprise ending worthy of an O. Henry novel:

> 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 60's, 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 subclass apparently will cease to exist, surrendering their place to multipurpose aircraft carriers and helicopter carriers (12, C-59/60).

In January 1972 the Navy even went so far as to deliberately mislead the generally well-educated elite readers of the journal Science and Life that the U.S. was going to build a nuclear-powered ASW aircraft carrier. By placing an assertion that the U.S. was planning to build a nuclear-powered aircraft carrier in a context of alleged great U.S.

attention to ASW aircraft carriers, Vice Admiral Sorokin, a Hero of the Soviet Union for his exploits in nuclear-powered submarines, led his readers astray at a time when the Soviet Navy may have felt it was about to lose its campaign to gain approval of the nuclear-powered ASW carrier currently reported in the Western press to have been launched not long ago from a Northern Fleet shipyard. Sorokin phrased the Navy's deceptive ploy as follows:

> 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, C-60).

The Navy's "big (CVSN) lie", as voiced by Vice Admiral Sorokin above, seemingly was ineffective overcoming Army opposition in general to construction of large ASW surface ships (and probably particularly to the even much more expensive nuclear-powered ones). At least one can infer such continuing opposition from the fact that no less than five more statements like the November 1971 Naval Digest article appeared in the remaining four years of the period. All of them took positions strongly at odds with the Army position that derogated the value of CVAs. One of these appeared each year in 1972, 1973 and 1974 and two appeared in 1975. The latter, as will be seen when this study turns to them for consideration shortly, reached new heights of intensity and ingenuity in asserting the continuing necessity for large surface ships for ASW.

The first of these five (or the second of the six, counting the November 1971 article in Naval Digest) came in May 1972 with publication of the book Aircraft Carriers and Helicopter Carriers by a "collective" of naval authors. As may be noted in the relevant quote below, the Navy followed the general pattern of the November 1971 Naval Digest article in conceding the decreasing role of the CVs. In this case, though, that phenomena was accounted for by every conceivable actor other than the one the Army wanted to hear (that the antisubmarine hunter-killer groups based on aircraft carriers were ineffective in general and in particular

when compared to submarines). Rather the book cited U.S. Secretary of Defense McNamara as saying that the aircraft-carrier hunter-killer group was not cost effective (a factor that presumably would lose considerable relevance in wartime and particularly if their mission involved defense-of-the-Homeland against U.S. SSBNs). Also given as reasons were that the Essex Class were too worn out to undergo modernization and that other ASW ships (i.e., destroyer types and SSNs) were being given priority.

A slick formulation was found that directly accounted for what was portrayed as only a "gradual turning away of the U.S. Navy from antisubmarine aircraft carriers" by asserting that "the continued arming of attack carriers with antisubmarine airplanes and SEA KING helicopters" was the relevant evidence which "attested" to the "gradual" decrease in the importance of the CVS. While the passage concluded with the quasi-conciliatory admission (as far as the Army was concerned) that the CVS was indeed obsolescent and on its way out, the penultimate sentence was a deep thrust at the military doctrinal point that the submarine had become the "universal" weapons platform of nuclear era navies. In a statement that one would expect to be highly irritating to the Army marshals and generals, it was claimed, in effect, that the addition of ASW aircraft or attack carriers was making them "more universal".

Since the passage under discussions from Aircraft Carriers and Helicopters Carriers contained some additional nuances of interest it is quoted for ready reference:

> 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 McNamara 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, C-61).

The next statement of particular note for the subject at hand came in February 1973 in Captain Kvitnitskiy's short but exceptionally informative book Antisubmarine Weapons and Their Platforms. It cited the classic Soviet military reason of "a lack of unity of views" as the allegedly basic reason that the U.S. had not built any new task-specific antisubmarine aircraft carriers. Moreover, the book advanced the highly dubious proposition (especially as far as the anti-SSBN role was concerned) that "the strengthening of the antisubmarine capabilities of attack aircraft carriers" was expected by the U.S. to "compensate to a great extent for the absence of antisubmarine aircraft carriers" (36, C-63). The relatively very long passage accorded to this subject in Antisubmarine Weapons and Their Platforms may be noted in the quotation of it below. It should be remarked that the assertion it contains that "diametrically opposed views continued to be espoused in the West" on "whether these ships /CVSs/ are needed at all", although factually correct, still is one of the more obvious surrogate uses to discuss the Soviet situation -- in this case, the Army's insistence that the type of surface ships Admiral Gorshkov and his top staff officers

wanted most to continue building in ever bigger and more air-capable versions was superfluous to the USSR's military requirements for the naval side of any general war:

> 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 carrier and whether these ships are needed at all...the circumstances that antisubmarine aircraft carriers 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.
>
> Great attention is being paid in the U.S. to finding ways of replacing 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 (36, C-63/64).

The year 1974 brought an article in the August Naval Digest which discussed the subject of "Multipurpose Air-Capable Ships" but with a circumlocution that may well have reflected a considerable exacerbation of the disagreement between the Army and Navy over ASW-capable aircraft carriers. In an article attributed to a Captain Second Rank (whose name was new to the preparing analyst and was never to appear again, perhaps denoting that he had been used as a stalking horse), the esoteric device was employed of indicating the potential importance of the proposed U.S. sea control ship for ASW by stating that such ships would increase the U.S. Navy's capabilities for "gaining command of the sea" (61, C-66/67).

For those familiar with Soviet naval discourse this immediately suggests ASW since it is virtually the only problem which Soviet naval writers mention as "one of the main" ones the U.S. must solve to counter the Soviet Navy's intended effort to deny the U.S. Navy effective command of the sea by means of its large force of nuclear-powered and modern conventional attack submarines. (See both the 1973 entry 36, C-6 where this relationship is made clear by the assertion that the submarine will retain mastery of the seas unless the problem is solved of initial detection of submarines at long range and the 1969 entry 40, B-23 which explicitly states that the U.S. naval command considers solving the ASW problem to be "one of the main conditions for gaining command of the sea").

The relevant quotation is set out in full below so that reader may appreciate fully, in comparison with the four earlier and two subsequent quotes, both how delicately and esoterically it was found politic by the Navy in 1974 to treat the subject of ASW-capable aircraft carriers and how it was put across that the U.S. sea control ship, if ever built, would be no substitute (for the USSR but could only be useful in the absence of attack carriers:

> 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. Chief of Naval Operations. On them, in the opinion of specialists, should be based an air group of mixed composition, including airplanes with vertical (shortened) take-off and landing, and also helicopters. Multipurpose air-capable ships would operate in those situations when 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, C-66/67).

Coming now to the first of the two 1975 commentaries which, as commented earlier, revealed a new intensity in the difference between the Army and Navy over whether or not there was a military requirement for any large (even nuclear-powered) ASW-capable aircraft carriers, note must be taken of the least

conciliatory and most disputatious but most comprehensively argued of all of the six relevant statements. In this case the relevant quotation is given first before the analysis of its implications:

> 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 are in reserve.
>
> The removal from operation of the antisubmarine aircraft carriers does not evidence 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 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 a result of a change in the views of military

> specialists on the prospects for...the employment of antisubmarine aircraft carriers (71, C-67/68).

A number of points in this quote merit elucidation. In the first place all of the available arguments were marshalled to support a flat contradiction of the Army position that the fact that the U.S. Navy had decommissioned its CVSs showed that they were not a viable ASW means. To the contrary, the boot The Surface Fleet of NATO emphatically asserted that the U.S. "removal from operation of the antisubmarine aircraft carriers does not indicate a downgrading of the role of shipborne antisubmarine aviation". As may be seen from the above quotation, this assertion was backed up with the following three points of argumentation:

1) The U.S. Navy had ordered the development and production of a large number of the S-3A VIKING, the latest of the airplanes designed for "shipborne" ASW (and only from attack/multipurpose aircraft carriers due to the large size of the plane);

2) The U.S. Navy had developed the multipurpose (CV) concept for its CVAs to make them capable of ASW (as well as their power projection, ASUW and AA roles); and

3) The claim that only antisubmarine aircraft carriers could be effective in "certain conditions" which encompassed most of those for which aircraft carriers are valued for naval warfare at sea as opposed to power projection ashore (open-ocean operations beyond the range of /continuous/ shore-based air /coverage/, wherever continuous ASW patrolling were required /e.g., on the GIUK Gap and other ASW barriers/, and other open-ended "etcetera" cases).

This unprecedentedly full presentation of the Soviet Navy's case for large ASW-capable surface combatant ships was concluded with a restatement of the initial flat contradiction of the Army's position but with addition of the implication that the Soviet Navy viewed the mothballing of the U.S. Navy's CVSs as due to U.S. "financial difficulties" (that would

disappear with the outbreak of war) and not at all to the reason advanced by the Army -- "as the result of a change in the views of military specialists on the prospects...for the employment of antisubmarine aircraft carriers". All in all, this was about as persuasive a case as the Navy could hope to make. It remained only for the second 1975 commentary to add to the arguments the possibly newly discovered fact that the S-3A VIKING Class CVSs and hence their placing in reserve rather than being scrapped. The VIKING was indicated by the August 1975 Naval Digest article in which the additional argument mentioned above was placed on public record to be the first aircraft-carrier airplane designed "especially for combat against nuclear-powered submarines" (78, C-68). The implication seemed quite clear that the ASW shortcomings noted in the case of the Essex Class CVSs with an airplane (TRACKER) useful only against diesel-powered submarines would be remedied by VIKING operating from multipurpose CV conversions of attack carriers.

This completes the lengthy but significant chronicle of that part of the Army-Navy controversy over the utility of large ASW-capable surface combatant ships which transpired in the 1971-'76 period. Subsequent events for the four years since the XXV the Party Congress in early 1976 will be covered in the final section of this study. Since the Defense Ministry/Army side of the controversy, as is usual with interservice policy difference, remained largely unexpressed publicly, we can gain little insight into what compromises resulted between the proposed Navy shipbuilding proposals for large ASW-capable surface ships and what was approved finally by the Defense Ministry and the Party. However, we do come away from hearing out the Navy's side of the debate with the better appreciation of how very strongly the Soviet Navy believes in the intrinsic value of such ships for a balanced Navy approach to effective ASW. This in turn suggests unmistakably that what the U.S. Navy does in the ASW carrier field has a significant effect on the Soviet Navy's perception of U.S. ASW.

The total of 18 items on large air-capable ships having (or intended to have if ever constructed) a major ASW role included CVSs, CVs, the projected sea control ships (SCSs) and helicopter carriers. Taking these four types in reverse order, there were three reports (one each in 1971, 1972, and 1973) on

a projected DH Class helicopter-carrier intended to have ASW on the oceanic SLOC as one of its roles. In 1971 construction of such a ship, reported to be of 12,000 tons displacement, was said to be slated to start "series construction" in "the near future" (FNC 12/71, C-60). In 1972 it was reported that the helicopter carrier USS Guam was to serve as a prototype for operational testing of a composite air group comprised of six heavy ASW helicopters (i.e., SEA KINGs) and six VTOL (HARRIERs) (28, C-62). The third and last mention ever of this DH Class (which was never built) came in 1973 and was described as a "multipurpose helicopter carrier" of 12,000 tons. It was asserted again that "series construction" was scheduled to be started "in the near future" (36, C-63/64).

As for the projected but never constructed sea control ships (SCSs), in March 1973 the first report of them said that a 17,000 ton "light aircraft carrier" was being designed in the U.S. to carry helicopters and VSTOL airplanes and to conduct "limited antisubmarine and anti-air tasks" for "control of sea communications". The report also stated that "it is planned to order 8-12 of these ships in the coming decade" (40, C-64).

Later in the year, in June 1973, the Naval Digest reported that the U.S. Navy expected to receive authorization for a first SCS among the 19 ships proposed in the FY 1973/74 defense budget. The SCS was termed just that for the first time and described as "a light multipurpose aircraft carrier" (FNC 6/73, C-65). Another 1973 report had it that the contract for the first SCS was to be awarded in December 1973, the ship was to be laid down in June 1974 and delivered to the Navy in May 1977. It was to cost (only) 100 million dollars and to be a first production run of eight SCS that would be completed by 1980 (FNC 5/73, C-65).

After ignoring the SCS for over a year, the Naval Digest, in its August 1974 issue, stated that the role of the SCS was intended to be that of "gaining command of the sea". This role, obviously, included ASW as well as ASuW and AAW. The U.S. Navy was said to be "moving toward" the construction of SCSs and it was added that it had been proposed that such ships be forward deployed "constantly in those regions through which transit the main oceanic communications" (61, C-66/67).

However, despite the foregoing reports anticipating the imminent start on construction of the first of at least eight SCS, after a hiatus of twelve months in which nothing more was said about U.S. construction of SCSs, the August 1975 Naval Digest reported that the U.S. government had disapproved of SCS construction. Unspecified "other projects" reportedly were being worked out in the U.S. for an air-capable ship but, it was added: "a final decision still has not been adopted as to which type of air-capable ship to give preference" (78, C-68).

In the case of the CVAs converted to "heavy multipurpose" aircraft carriers (CVs) largely by the addition of ASW helicopters (SEA KING) and aircraft carrier-borne ASW airplanes (S-3A VIKINGs), the testing of such aircraft from the CVA USS Saratoga was reported in 1971 (FNC 6/71, C-59). The success of this testing was reported seven months later and the decisions stemming from it: 12 such multipurpose aircraft carriers were included in the plan for the 1980s. Of these four were to be nuclear-powered and all of them, apparently, were to have in their composite air groups 10 S-3A VIKING airplanes and eight SEA KING helicopters (FNC 1/72, C-61).

Then in August 1973 it was reported that the U.S. would have completed the conversion of three attack carriers to multipurpose ones by the end of June 1974 (FNC 8/73), C-65). Another report in February 1974 named three CVAs said to have completed such conversion already (FNC 2/74, C-66).

Nothing more was reported on the conversion of an additional seven CVAs to CVs by 1976 (see Chronology) but in August 1975 a Naval Digest article by a Captain First Rank asserted: "Trends have been set abroad for the construction of heavy, multipurpose aircraft carriers (only the U.S. is building them)...and light, air-capable ships..." (78, C-68). While it is true that the U.S. had decided to build CVAN-70 as a multipurpose carrier rather than an attack one, it was midleading in terms of the US. investment required to imply that U.S. CVs would be new construction ships rather than just refits of existing attack carriers to handle ASW helicopters and VIKING ASW airplanes. Whether or not this was deliberate deception as part of the Soviet Navy's lobbying for construction of much larger general purpose forces is moot but it very well might have been.

Part of just such an effort may have been the failure to report the well-publicized decommissionings of the last four CVSs between 1971 and 1973 (see Chronology). In fact, the open literature not only did not report the decommissionings but gave the misleading impression that the CVSs were being continued in service considerably longer and in larger numbers that was actually the case (1, C-59; 21, C-61; 36, C-61/62). Finally in November 1973 an item in the "Foreign Naval Chronicle" of the Naval Digest reported that "five antisubmarine aircraft carriers have been decommissioned' (FNC 11/73. C-65). As late as August 1974, a year after the last CVSs had been taken out of service readers of Naval Digest were only told that the CVSs of the "obsolete" Essex Class were "generally ending their existence" (61, C-66/67)) but it was neither explained that they had done so the year before nor that there were no more CVSs operational in the U.S. Navy. Not until 1975 did Soviet readers learn even that four Essex Class CVS had been retired to the reserved fleet (FNC 1/75, C-67). Even then it was not made clear that the type of ASW ships most favored by the Soviet Navy no longer had a counterpart in the U.S. Navy.

In addition to this data on ship types, there were a few other items of interest. The nine references to carrier-borne helicopters contained no attack and defense of the merits of ASW helicopters as in the 1966-'71 period. Rather it was taken for granted they they contituted an integral part of the air group of every type of air capable ship. One 1971 report said that the air group of the air-capable ship being "studied intensively in the U.S." (I.E., of the SCS) would have six ASW helicopters (20, C-60/61). This proved to be the number reported the following year as included in the composite air group assigned to the USS Guam to test the SCS concept (28, C-62). A 1975 report made the observation that the "main assignment" of the ASW helicopter was to conduct ASW beyond the limits of the range of the torpedoes and missiles of its parent ship (79, C-69). CVs were reported in 1973 to have a squadron of 14-16 SH-3D SEA KINGs (36, C-63), which were replacing the SH-3A SEA KING operational since 1961 (36, C-63). The multipurpose aircraft carriers were said in January '72 to be intended to carry (only) eight SEA KINGs (FNC 1/72, C-61). The CVAN Nimitz was reported in February 1976 as slated to have a squadron of SH-3H SEA KINGs but the number of this

latest modification of the SEA KING was not given (FNC 2/76, C-69).

To increase from a single mention of VTOL airplanes in the 1966-'71 period to eight in 1971-'76 was to be expected in connection with Admiral Zumwalt's ill-fated project to build air-capable sea-control ships that would carry VTOL airplanes. All eight of the references to VTOL described the ship that the U.S. was contemplating building as "air-capable" and designed to carry VTOL while two sources also mentioned that they would be small aircraft carriers carrying VTOL. The "sea control ship" (SCS) project was mentioned first in 1972 as intended to carry VTOL (36, C-63. By 1975 when the source material again mentioned SCSs, they were described as designed to carry helicopters and VTOL aircraft (78, C-68).

Last to merit mention was a report in January 1976 that the U.S. Navy had evinced enough interest in "an aircraft carrier on an air cushion" that it had contracted with Lockheed to prepare a "preliminary design". Without even using the conditional tense to reflect appreciation of the fact that many ship designs are born to go unbuilt, the report continued on, in what sounded like a sales pitch for the Soviet Navy to be allocated funds to design and/or build such a surface-effects ship (SES), to remark that "this SES-CV is intended for antisubmarine warfare" and that "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, C-69).

From the foregoing, it seems highly unlikely that the Soviet perception was one of being impressed by the modest developments that actually took place during 1971-'76 in the U.S. development of large, air-capable ships for ASW (as opposed to the failed plans for building a DH Class helo carrier and an SCS). While they may have exaggerated quite a number of their reports to further Gorshkov's campaign for more general purpose naval forces, the underlying perception probably was one of the U.S. having eliminated the U.S. Navy's only task-specific ASW ship, the CVSs, without providing an equivalent substitute in the CVs, neither in terms of the number of ASW airplanes and helicopters that could be taken to sea in ships nor in the priority of the

ASW role among the multi-purposes assigned those ships.

3 (e) - DDs and FFs (plus ASROC and LAMPS) -- Despite the fact one 1971 source, Professor Potapov's book The Development of Navies in the Postwar Period, claimed that the U.S. had adopted a ten-year shipbuilding program that provided for the construction of 200 destroyer-type ships (to replace 300 "destroyers, frigates, and escort ships" of World War II vintage) (1, C-70), the open literature otherwise shows no reflection of programs exceeding 108 ships for the decade of the 1970s. This included 30 DD-963 Spruance Class destroyers (18, C-74), four nuclear-powered missile frigates (DLGNs), 28 DXG conventionally-powered missile frigates of the Oliver Hazard Perry Class of FFGs (36, C-76), and 46 Knox Class (FF-1052) Frigates (19, C-74), These four classes of ships were said, in effect, to have been given top priority in being provided "the most improved antisubmarine weapons and air-defense weapons" but they were also noted to have other roles to play in addition to ASW in correspondence with their designation as "multipurpose" ships (36, C-76).

In December 1975 it was noted that construction costs of the Spruance Class DD had inflated to nearly double just during the construction period -- from 60 to 110 million (86, C-82). One implication seemed to be that the U.S. would be unable to build enough of such expensive destroyers to begin to meet its wartime requirements for large numbers of destroyers for ASW alone. Moreover, it was readily apparent from the fact that the construction program for the Spruance Class destroyer was reported no less than ten times over the 1971-1976 period (compared to only six references to the three classes of frigates) that the Soviet Navy considered the U.S. Navy's destroyer building program of particular interest.

It was equally apparent from the data reported that the Spruance Class DD building program was lagging ever further behind and that the construction rate was barely half that intended of six per year. Reported as scheduled for completion of all 30 of the Spruance Class by 1978 (36, C-76), the lead ship was not even commissioned until the end of 1975 (86, C-82) and only 12 by October 1978 (FNC 10/78, D-85). With this considerable lag in construction of the Spruance Class added to the escalating costs

mentioned above, it seems unlikely that Soviet naval analysts would have been greatly concerned that the U.S. would undertake an adequately large destroyer building program to be a cause for any concern to the USSR that any number of them would be available in wartime for anti-SSBN ASW after the higher priority requirements, especially for escorting aircraft carrier task forces, had been met.

In addition to the Soviet commentaries on the three destroyer-types of ships, two sources reported on U.S. Navy modernization of existing destroyers. The first, in 1973, reported that all of the (18) Sherman Class DDs were undergoing a modernization which included providing them with, in effect, the latest ASW weapon (ASROC) and "a piloted, multipurpose helicopter" (LAMPS). The modernization was said to be programmed for completion by the end of 1974 (FNC 6/73, C-77).

The second commentary came in 1975 and was particularly interesting for its appraisal of the U.S. destroyer new construction and modernization programs as, in effect, wholly inadequate. After describing the FRAM-I program (which was noted to have added ASROC but not DASH to the unspecified number of destroyers involved) and the FRAM-II program (which added DASH and towed variable-depth sonar, VDS), the commentary went on to make it quite clear that only very large destroyer-type building programs could lead the Soviets to perceive the ASW capabilities of such types as a factor of any great significance:

> The FRAM program, however, /merely/ enabled the /U.S./ 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 (71, C-79/80).

And, as was made manifest above, the construction rate of Spruance Class destroyers, far from meeting the criterion of an accelerated construction rate, which was small by Soviet standards to begin with, must have further diminished Soviet perceptions by being allowed to lag to something less than half the intended construction rate of about six per year.

While the references to ASROC increased from four to seven for the 1971-'76 period over the preceding five years, four of these references were only passing mention of the fact that the new Spruance Class destroyers would carry an ASROC and another mentioned that the Sherman Class DD would be backfitted with ASROC. There was no other indication in the evidence that ASROC per se was receiving more attention than earlier. To the contrary, ASROC was portrayed in far less favorable terms than those used in 1966-'71.

One 1973 source noted that the accuracy of ASROC "is certainly not very good" in view of the fact that it was unguided throughout its airborne (ballistic) trajectory (36, C-76). The same source added that the ASROC launcher could not be reloaded by its crew except on large ships (i.e., excluding DDs and DEs) and that the homing system of ASROC could be jammed by (the active sonar of) surface ships or helicopters conducting ASW search).

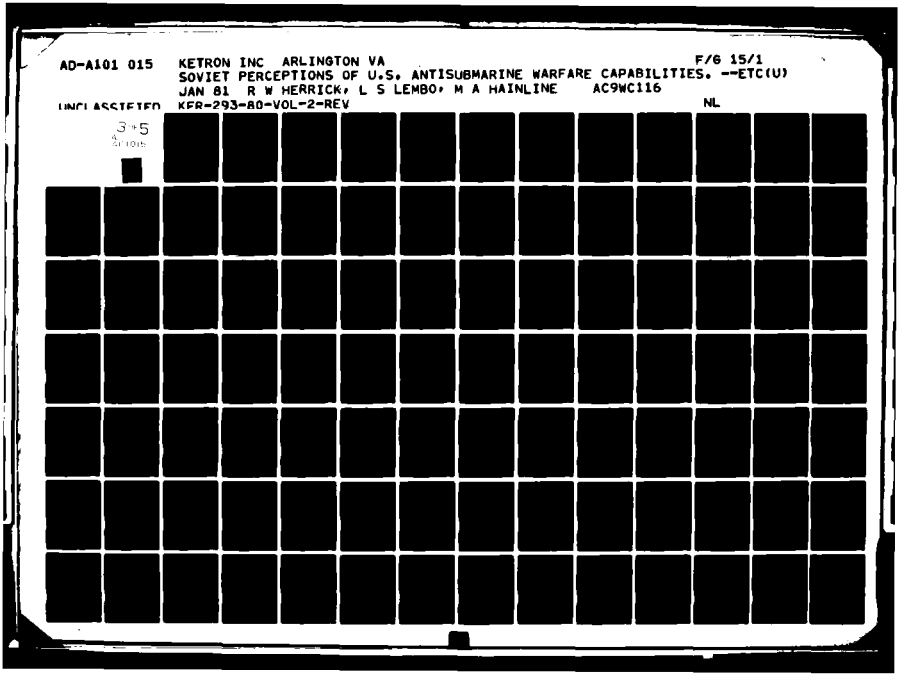
Another report in 1973 claimed that the firing accuracy of ASROC was "low" against a maneuvering submarine and that the Mark-44 torpedo used in the ASROC "missile-torpedo" had such limited range that it was ineffectual against submarines moving at more than 18 knots (46, C-78). Although it was reported in mid-'75 that the U.S. was engaged in improving ASROC to double or triple its range, incorporate a better ASW torpedo, the Mark 46, and provide in-flight guidance (71, C-79/80), this report came within only eight months of the end of the 1971-1976 period and there were no indications of anything having been achieved in any one of these three respects.

The LAMPS (Light Airborne Multipurpose System) Program was reported to have been initiated by the U.S. Navy in 1969 (13, C-71) and an (interim) design approved in April 1970 to modify the first 20 of the Navy's 115 SEA SPRITE helicopters to begin replacing the DASH drone helicopters in 1971/72 (28, C-74/75). These first 20 were all slated for "screening" ships (FNC 1-72, C-72), not for any ships that might be used for open-ocean ASW against Soviet SSBNs. It was also reported that it had been decided that the (30) Spruance Class DDs and the (46) Knox Class FFs of new construction would be equipped with these LAMPS-modified SEA SPRITE helicopters (18, C-73/74 and 19, C-74). According

to a 1972 report, the final choice of a helicopter design was to be delayed until the mid-'70s saw the successful testing of the armaments/electronics suit which the LAMPS helicopter would have to carry (28, C-74/75).

In June 1974 it was reported that the Navy had under consideration 13 different designs for a new (Mark 3) LAMPS (FNC 6/74, C-78). Even fourteen months later, in August 1975, the Navy was reported to be (still) evaluating the 13 designs but that a final choice was to be made by the end of year (79, C-81/82). Meanwhile, however, by mid-'74 a dozen SEA SPRITE helicopters had been given a SH-2D modification and were operational while a contract had been awarded for 55 more of an SH-2F (LAMPS Mark-1) modification (FNC 6/74, C-78). The same report added that 30 more, for a total of 105, would be contracted for in FY 1974/75. The 105 LAMPS-modified SEA SPRITE helicopters were reported, in effect, to be scheduled to complete delivery to the Navy in 1975, to "provide antisubmarine and antiair defense of ships", specifically for the (two) Belknap Class DLGs and the (30) Spruance Class DDs. A later 1975 report stated that the Spruance DDs would each have two LAMPS helicopters (86, C-82).

The LAMPS Mark-3 helicopter, said to be "substantially superior" to the Mark-1 SH-2F, was reported in August 1975 to be programmed for procurement of "only 200" (79, C-80/81). When this Mark 3 LAMPS had first been mentioned a year earlier, it had been noted that it was expected to have a combat radius of 130 km. (FNC 6/74, C-78). Not long after the start of the LAMPS development, it had been reported (in 1971) that the LAMPS helicopters were intended to "provide frigates, destroyers, and destroyer escorts with a reliable helicopter that would be capable of carrying out tasks for the search for and destruction of submarines, for ferrying missiles, and for conducting electronic countermeasures" (13, C-71). In 1972 it had been observed that, although the (46) Knox Class FFs (most of which were operational) were scheduled to receive a LAMPS helicopter, the latter were not as yet available (19, C-72). Three years later a similar comment was made: "LAMPS are to be provided to the majority of new-construction destroyer escorts /i.e., to the 49 Knox Class frigates/ but they are /still/ temporarily missing from many ships" (71, C-79/80).


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UNCLASSIFIED
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From the foregoing, and from what already has been reported earlier on the great store the Soviet Navy placed n helicopters for keeping surface ships in the ASW picture, it seems warranted to conclude that LAMPS was perceived as a development of potential importance for overcoming the inferior speeds of surface ships compared to submarines, especially when the former were attempting to track nuclear-powered submarines and so had to keep their speed below the limits at which the greater cavitation at higher speeds blanked out their own sonar. While sevral years had been required to develop LAMPS, this was quite normal and was not perceived as of any great significance other than still requiring a considerable period of time beyond 1975 before many destroyer types actually would have LAMPS. More significant perhaps was the comment that the U.S. Navy only planned to order 200 of the Mark-3 LAMPS, at least according to initial plans. This is likely to have been interpreted by Soviet naval-observers to mean that it would be at least the mid-'80s or later before most of the destroyers and frigates could be provided with LAMPS.

In addition to the nine commentaries found for the 1971-'76 period specifically on the LAMPS helicopter, there were seven general comments on the advantages and employment of ASW helicopters on destroyer-type ships. Several of them provide useful insights as to how the use of such helicopters by the U.S. Navy was perceived over the period. In 1971, at the start of the period under study at the moment, shipborne helicopters were credited as having won a lasting place in the short period of their existence and as gaining "ever greater importance". Due to their "significant superiority in speed and maneuverability" over nuclear-powered submarines, they could be expected to remain "a highly effective means" for ASW barring development of an air defense system for submarines (13, C-71). Near the end of the period, in August 1975, shipborne helicopters for ASW were said to be suitable for basing even on destroyer escorts and to constitute "a highly important element" of antisubmarine surface ships (79, C-81/82).

In between these overall appraisals at the beginning and end of the 1971-1976 period, there were several other commentaries that are of interest. In 1971 shipborne helicopters were indicated to be valued for their capabilities for searching a substantial

water area in a short time (13, C-71). Admiral Zumwalt was quoted as having stated that helicopters had become an "essential" part of the systems of weapons and sensors of the ships to which they were assigned (29, C-75). Finally, in 1974 it was claimed that the ASW capabilities of shipborne helicopters had been convincingly demonstrated in actual practice during "naval exercises" -- presumably by Soviet as well as US/NATO naval forces (59, C-78/79).

The above would seem to constitute sufficient evidence that the helicopter had found a lasting place in Soviet naval affections to the point that the U.S. Navy's development of the LAMPS piloted ASW helicopter to replace the DASH drone helicopter was perceived as a potentially significant enhancement of U.S. ASW capabilities.

Surprisingly little was reported on U.S. developments regarding surface ship sonar and torpedoes. Of the four brief references to the former subject, two mentioned the sonar gear on the Knox Class FF, the third discussed the ranges of new low-frequency sonars abroad, and the fourth was about the towed sonar of a hydrofoil prototype. The sonar of the KNOX Class FF was reported in 1972 to be comprised of the AN/SQS-26 and the towed sonar AN/SQA-13. The former was described as "the best sonar system in the U.S. Navy" (19, C-74). In 1975 the same sonar was accorded praise of seeming relevance to Soviet perceptions of U.S. capabilities for anti-SSBN ASW in a commentary that said that the AN/SQS-26 had "given destroyer escorts great capabilities for antisubmarine warfare /out/ on the /World/ Ocean" (71, C-80). The third short commentary came in a discussion of the limits on use of surface ships for ASW and noted that the "low-frequency sonar installed on the newest foreign ships permit the detection of submarines at ranges of 35-40 miles under favorable conditions" but (only) 3-14 miles when bottom reflection was not possible (16, C-72/73). The fourth and last reference to surface-ship sonar stated that the DEH Class prototype hydrofoil ship High Point had successfully towed AN/SQS-10 and AN/SQA-13 sonars at speeds up to 42 knots and at a depth of about 100 meters (78, C-81)

In the case of ASW torpedoes, the open literature on ASW surface ships of the U.S. for the 1971-'76

period yielded only two short references. The first was a 1972 report that a wire-guided torpedo was being developed "abroad" and that "according to the press", it will be faster-running and less noisy and will operate in very deep water", i.e., down to 1,800 meters (16, C-13). In this instance, it was left to the reader to divine that it was the U.S. that was developing such an ASW torpedo. It was not until three years later that the Mark 46 torpedo was mentioned specifically and even then it was only in the context of being in the process of replacing the Mark 44 as the torpedo component of the ASROC "missile-torpedo". And even in this case nothing more was said about the Mark-46 than that it was "more effective" than the Mark-44. Since the development of the Mark 48 ASW torpedo for employment by U.S. submarines had been reported in considerable detail (46, C-55 and 74, C-56), the lack of comparable reporting on the Mark 46 quite likely is a reflection of the undoubtedly greater interest on the part of the Soviet Navy in ASW submarines than in destroyer types.

Another reported reflection of the Soviet Navy's seeming disenchantment with the future potential of surface ships for ASW (even when carrying helicopters it would seem) was the extraordinary faith placed in surface effects ships as the white hope for the future. From only one reference in the earlier period to nine in the 1971-'76 period was a remarkable jump compared to other frequency changes noted in this study and is probably a fair indication of how thoroughly the SES idea had captured the collective mind of the Soviet Navy, a key part of whose tradition and mental outlook (as usually the underdog in naval competition) is both innovative and receptive to any new technological development (such as the mine, the airplane, and the submarine) that offers less expensive solutions to the USSR's naval problems. In 1971 the U.S. was reported to be paying "serious attention to developing ASW ships on hydrofoils and on air cushions" (12, C-71).

A 1972 report, after noting that the sonar of ships moving at high speed operates at "low effectiveness" due to cavitation noise, asserted that " it is considered" that "a high-speed ship moving on hydrofoils or an air cushion holds promise for antisubmarine defense" (16, C-72). Another 1972 report described the "new classes" of hydrofoil and

air-cushion ships being developed in the U.S. as being of "large tonnage" (i.e., suitable for the open-ocean search that would be required to hunt SSBNs) (29, C-75).

The first and only realistic discussion of the great problems lying in store for would-be designers of SES ships for ASW came in November 1972 when an unsigned article on "The Small Antisubmarine Ships and Craft of Capitalist Countries" appeared in the Naval Digest -- as a well-advised effort to curb the over-enthusiasm being widely exhibited. Concerning hydrofoil ships, it was noted that the results of a decade of designing and testing experimental hydrofoil were small and that the designers found themsleves confronted with "many new and difficult problems" (30, C-75/76). These included the fact that the results of attempting to tow sonars at high speed had proven unsatisfactory due to vibration in the towing cables and the interference with sonar effectiveness caused by the noise generated by high-speed towing. Moreover, the hydrofoils had been found to be "very vulnerable" to every floating object they struck.

Air cushion ships were found to have comparably great problems. They could only take advantage of operating on the air cushion in a final attack while an extended search had to be performed in a displacement mode -- which, of course, deprived the ship of the main advantage sought of high-speed operation with minimal sonarinteference from the cavitation of the screws of displacement ships. Moreover, the "skirt" of an air cushion ship was vulnerable to even moderately high sea states, thereby disqualifying air-cushion ships for open-ocean operations.

Despite these quasi-insuperable obstacles to developing open-ocean SES ships for ASW, the Naval Digest reported in a Foreign Naval Chronical item in November 1973 that the U.S. Navy's long-range shipbuilding program included construction of one hydrofoil "destroyer" and one aircushion "destroyer" (FNC 11/73, C-77). Similarly a March 1974 article in Naval Digest on the future of surface ships asserted that "foreign naval specialists" considered air-cushion and wing-in ground "ekranoplanes" the most "highly promising" SES for ASW development (52, C-78). Apparently the Soviet Navy had come to realize that hydrofoils were not a very promising

candidate for development into a "destroyer" for open ocean ASW.

The last two of the nine commentaries on SES developments for ASW came in 1975 with the first being a very optimistic claim, allegedly citing the U.S. Chief of Naval Operations, to the effect that not only was an air cushion ship of about 2,000 tons for ASW against nuclear-powered submarines a feasible developmental goal but also that such an air cushion ASW ship could "effect a basic change in the nature of war at sea" (70, C-79).

The final commentary was less visionary and impractical. In an August 1975 article in Naval Digest on shipborne ASW helicopters it was merely observed that the U.S. experimental test prototypes of the DEH Class hydrofoil and a DSX Class air cushion ship were "most interesting" (79, C-81/82). The hydrofoil ship was noted to have a displacement of 1,360 tons, a cruising speed of 50 knots, and a 3,500-mile range at 42 knots. It was further reported to carry a helicopter and to have a sonar which it could tow at speeds up to 42 knots while at a depth of 100 meters. It was said to be seaworthy enough for North Atlantic operations 98.5% of the time -- but the curious reader was left wondering what would happen to such ships during the other 1.5% of the time.

The air cushion ship of the DSX was said to have been initiated only after the experimental SVP SES 100B air cushion ship had reached a speed of 92 knots in trials. However, it was acknowledged that the development work on the DSX air cushion ship was "still in the early experimental stage".

From this summary of Soviet writings on SES during the 1971-'76 period, it seems clear that, despite the Soviet Navy's own high hopes for developing effective SES for ASW, at least for home waters where they could be of potentially great assistance in carrying out the priority SSBN protection mission against U.S. SSNs bent on anti-SSBN forays, there was no perception of any short or medium term threat to Soviet SSBNs, even those few on peacetime combat patrols. Even the possible longterm threat from ASW SES could be seen in reality to amount to little more than the gleam in the eyes of SES designers and enthusiasts.

As implied a few pages earlier, the Soviet naval specialists' fascination with applying SES principles to destroyer type ship design may be taken as an accurate gauge of their appreciation of the lack of ASW growth potential of destroyer-type ships even with ASW helicopters embarked.

This analysis of the situation is further supported by the demonstrated Soviet predilection for air-capable ships with the larger number of ASW helicopters and the VTOL airplanes which such "ASW cruisers" can carry.

3 (f) - Mines -- The U.S. development of the first half of the '70s of its first new mines for ASW in the postwar period, the "mine-torpedo" CAPTOR (capsulated torpedo) and the bottom-laid QUICKSTRIKE sparked a rather dramatic reaction in Soviet perceptions. Between the ending of the XXIVth Party Congress in March 1971 and the fall of the same yar the subject of U.S. mine warfare for ASW was transformed from a virtual non-subject to one of marked interest to the Soviet Navy. Although the total number of commentaries (nine) averaged just under two per year, the length and nature of those comments revealed a quickening Soviet interest in divining future U.S. capabilities and intentions in mine warfare.

The very first item, appropriately enough, reported in September 1971 that the U.S. had awarded a contract for the development of a "CAPTOR/PAROSS anti-submarine system" (FNC 9/71, C-83). CAPTOR was described as a Mark-46 homing torpedo encapsulated in a container that could either be laid on the bottom or anchored at depths of 750 meters. The PAROSS part of the system was identified as a "Passive-Active Reporting Ocean Surveillance System" that the reader was expected to understand would detect submarines within range of its sonar and cause the launching of the Mark-46 torpedo so it could home against the target. CAPTOR was further described as to be designed to be laid by airplanes, surface ships and submarines. The sum of twenty million dollars was reported to have been earmarked for its development.

The intended use of CAPTOR was described in a way that made it implicitly clear that it would be particularly useful against SSBNs near their bases and at maritime chokepoints (since Soviet attack

submarines have to approach their quarry at sea and so are more readily locatable than are SSBNs hiding in the ocean vastness). As the commentary put it: "The weapon is intended for antisubmarine warfare in narrows, straits, and on the approaches to submarine bases". And, it was added meaningfully, "which, in the opinion of foreign specialists, will permit the freeing of antisubmarine submarines for the carrying out of other missions".

This theme of the use of mines against Soviet submarines in general and implicitly against the USSR's strategic submarines in particular (off their bases and on ASW barriers across straits and narrows) was the subject of a brief commentary in Captain Kvitnitskiy's 1973 booklet Antisubmarine Weapons and Their Platforms. In a notable statement on the importance the U.S. accorded to mines, and one that could not have ben made with any credible basis three years earlier, the book made the following claims:

> 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 (36, C-83).

The following year, in June 1974, a "Foreign Naval Chronicle" item specifically described the QUICKSTRIKE bottom mine as intended for laying "in coastal and internal waterways and also in ports and bases" (FNC 6/74, C-85). Then in 1975 CAPTOR was presented as potentially (most) useful for employment in ASW barriers such as at the GIUK Cap, at the entrances to the Mediterranean, and on the exits from the Sea of Japan (69, C-85/86).

This information was accompanied over the 1973-'75 period by a stacatto of criticism (some of it implicit but much of it explicit) for the perceived shortcomings of the U.S. mine warfare program. Mine development had been "neglected" due to the preoccupation with the new nuclear-missile weapons and there were not enough minelayers in any of the "foreign navies" to conduct "the large-scale operations for the laying of minefields" (36, C-83). CAPTOR and QUICKSTRIKE would (only) "gradually" replace eight types of mines (left over

from World War II) (FNC 6/74, C-85). The existing U.S. mines were stated to be of only "limited use" for ASW (69, C-86).

At the same time, the newly revived U.S. mine warfare program, although modest in size and long-term rather than "crash" in nature, was given credit for its positive sides, and particularly for the bright prospects it opened for the future.

The U.S. was reported to be spending 60 million a year for mine warfare (including mine countermeasures) (83, C-87/89) while the entire CAPTOR program alone was one-third of a billion dollars (69, C-86) or enough to swallow the entire allocation for mine-warfare for well over five years.

CAPTOR itself which was described as intended to have "a great radius of action", was reported to have entered "production" in 1972 but not to be slated to start even "series production" until 1975/76 and not "mass" production until 1977 or 1978. The unit cost of CAPTOR was reported as $135,000 and the U.S. Navy was said to intend to order 4,000 to 4,500 (69, C-86).

An article in the November 1975 issue of Naval Digest co-authored by an Engineering Captain First Rank and a Candidate of Technical Science on "Mines -- A Universal Weapon" was interesting for its listing of six roles and missions for which mines would be useful "in military conflicts of any scale, both for defensive as well as offensive goals" but especially in conventional war;

1) Blockading enemy forces;

2) In the sea lines of comunications (largely coastal, presumably?);

3) Protection of amphibious landing forces;

4) Defending against enemy landings across the beach;

5) Protection of one's own naval forces (especially submarines); and

6) Supporting the coastal flank of the Ground Forces (83, C-87/89

These six were described, after they had been listed, as constituting, "in short, the majority of missions assigned to a navy".

A July 1975 Naval Digest article on mines vs submarines took the prize for maximizing the potential of ASW mines in general and CAPTOR in particular. Instead of a 60-90 day campaign to make effective a blockade by U.S. Naval forces of the GIUK Gap, use of CAPTOR mines (laid by B-52s) would achieve the same goal in just "a few days" (69, C-86).

From the data on U.S. mine development and prospects for mine warfare that have been canvassed above, a number of salient points should be remarked:

- The U.S. effort was reported with more-than-average objectivity and both shortcomings and the potential future advantages were given a fair play.

- The emphasis all seemed to be on using both of the two major new ASW mines -- CAPTOR and QUICKSTRIKE -- for mining the approaches to the bases of Soviet submarines and the "straits and narrows" where the submarines would have to penetrate ASW barriers (including mines). This effort very likely seemed of a nature aimed primarily at SSBNs since Soviet attack submarines could be combated as well or better by the point defenses of U.S. CVA/CV and convoy screening forces while SSBNs would become an extremely elusive target in the open oceans, especially if not operating in areas of effective SOSUS coverage.

- However, the scale of the annual U.S. investment in mine warefare was relatively modest at only 60 million per annum and it became apparent that the new mines were being procured with marked slowness.

On balance, then the Soviets appear to have regarded the U.S. Navy's new postwar interest in mine warfare much as it had SOSUS a decade earlier -- as an interesting development that posed no short or

medium term threat but which required continuing observation to insure that such counter actions as might be desirable and feasible be initiated in time to prevent the emergence of an unmanageable threat in the long run.

1 (a) - "Is anti-SSBN ASW seen by the Soviets as within the technological state-of-the-art?"

For the 1971-1976 period, the data relevant to this question all may be subsumed under one of the following categories for clarity of the analysis:

A. Affirmative answers -- Yes, effective ASW is within the current state-of-the-art:

1) For the U.S. (whether or not use of SOSUS indicated); and

2) For the USSR (without any SOSUS equivalent, either fixed or moble).

B. Negative answers -- No, for any one or more of the following reasons:

1) The vastness of the oceans and/or the inherent covertness of operation of nuclear-powered submarines stemming from their great submerged endurance;

2) The inadequacies of existing U.S. ASW "Forces and means" in general and of surface ships and SOSUS in particular;

3) The perceived lag of ASW behind submarine warfare is not only not being diminished but is increasing even more due to the constantly increasing submergence depths, speed, and capabilities for quiet operation of the newest nuclear-powered submarines.

Of the 16 sources which contributed one or more paragraphs to the data relevant to this question which have been collated in section 1 (a) of the appendices (pp. C-2 through C-9), only one was found which gave even a tentatively affirmative answer that U.S. ASW (category A.1 above) was "expected" by the U.S. Navy to be able to establish effective ASW zones and barriers over "great distances" in the oceanic TVDS -- and this, it was noted, could "only" be done with the help of SOSUS for initial detection and classification of underwater contacts. This statement came in the October 1975 issue of Naval Digest in an article by an active-duty Captain First Rank that bore the title: "SOSUS Detects the Submarine". In view of its unique importance, the passage briefly described above is set out in full in the following quotation:

> 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 crises 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. Constant surveillance (tracking) is maintained on the submarine (82, C-8).

While the foregoing portrayal of the capabilities of SOSUS might be considered to be what we might term a "best-case analysis"nevertheless it was closer to the mark than most of the earlier commentaries which had unduly minimized SOSUS capabilities. Probably of most significance in this connection is the fact that the only single statement which professed to see ASW within the state-of-the-art of U.S. ASW made it explicitly clear that this only obtained when SOSUS was providing the initial detection and classification of submarines in the broad ocean areas.

Admiral Gorshkov, in the first edition of his book Seapower of the State which appeared in November 1975, indirectly affirms the potential efficacy of U.S. ASW against the USSR's nuclear-powered submarines by implying that they can achieve "high effectiveness only if given (direct) "combat support" (escort and cover) by other naval forces. He asks rhetorically, with obvious reference to Soviet submarines: "Can submarines, despite the constant

modernization of antisubmarine means, accomplish stategic aims in a war at sea? His reply is: "A great deal of research has affirmed the high effectiveness of submarines when properly employed and provided with combat support" (85, C-9). It is likely that Gorshkov's main concern in making this statement was to imply the need for more general purpose naval forces to provide "combat support" to the submarines that were "the basic striking force" of the Soviet Navy in approved military doctrine. At the same time, the facts that the U.S. Navy and the naval forces of the other NATO powers could establish ASW barriers across key "straits and narrows" in periods of heightened international tension or war and could detect and track at least some Soviet submarines on combat patrol in the open ocean in peacetime by means of SOSUS gave Gorshkov a legitimate basis to call for a larger general-force navy. However, since Gorshkov was engaged in advocacy, his subjective motivation for portraying an implicit threat from U.S. ASW was undeniably great and, therefore, his statement cannot be accepted as valid evidence that U.S. ASW actually was viewed by the Soviet Navy as having adequately overcome the large in comparison with submarine warfare.

The second (*A.2) category of affirmative answers are those regarding Soviet claims, in effect, that their own ASW had achieved such advances that effective detection and destruction of nuclear-powered submarines now lay within the capabilities of Soviet ASW forces. This is a standard Soviet propaganda claim and patently bears no relation to reality. It is heard most often in Navy Day speeches and in popular books on the Soviet Navy and clearly is intended for domestic consumption primarily. Six such statements were included in section 1(a) of Appendix C simply for illustrative purposes to make the point that such propagandistic claims may safely be dismissed from this analysis. Five of these statements were taken from the newspaper articles for Navy Day 1972 and all make the same claim to having modern ASW forces but only one claims ASW omnicompetence. Thus, Fleet Admiral Gorshkov, writing in Pravda on Navy Day (30 July) 1972, gave torpedo submarines pride of place in the Soviet ASW panoply (which lacks any hint of any equivalent to SOSUS, either stationary or mobile) and asserted that submarines, surface ships, and aviation together are able to "reliably detect and destroy submarine targets in any hydrometeorological conditions" (23, C-4). The remaining five, while repeating Gorshkov's claim that Soviet ASW forces were modern, stopped short of any specific claims to be able to conduct effective ASW against nuclear-powered submarines. Thus, Fleet Admiral Kasatonov, writing in Red Star, mentioned the "modern submarines...with homing torpedoes" that constituted the "basis" of the Soviet Navy

along with the USSR's "most modern" ASW surface ships and aviation (24, C-4) but he adduced no estimate of the capabilities of these forces. Similarly, Fleet Admiral Lobov mentioned in Moscow Pravda the "modern" torpedo submarines, antisubmarine surface ships, and naval aviation that constituted the "basis" of the Soviet Navy (25, C-4), but with no corresponding claim to their having redressed the lag in the ASW state-of-the-art. Engineering-Admiral Kotov, who had long been responsible for the design and production of naval armaments, came closer to Admiral Gorshkov's unwarranted claim to an effective ASW capability against nuclear-powered submarines. Kotov claimed in the newspaper Rural Life that submarines were the main strike force" of the Soviet Navy and that they could destroy enemy strike aircraft carriers and SSBNs. The striking power of Soviet Naval Aviation, with its missiles and "antisubmarine weapons" was claimed to have grown "immeasurably". Surface ASW ships were noted to have been given "maximum development" but, nevertheless, were credited with only the vague capability of "carrying out difficult missions" (26, C-4). The fifth and last of the five Navy Day-1972 articles mentioned here, of the many more that could be added for the 1971-1976 period, was one by Rear Admiral Shabilkov in Soviet Lithuania which limited itself to praising aviation alone for ASW and neglecting the ASW capabilities of Soviet submarines and surface ships. Without explicitly claiming the capability for effective "search and destruction of a submarine opponent", Shablikov worded his statement to give that impression as strongly as possible without actually lying as bald-facedly as Gorshkov had found it expedient to do: "The capabilities of antisubmarine aviation, which is equipped with modern equipment for the search and destruction of a submarine opponent, have increased immeasurably" (27, C-4).

The sixth and last of the sources routing Soviet ASW capabilities (category A.2 above) was the 3rd edition of the popular account of the Combat Course of the Soviet Navy which appeared in 1974. Like the Shablikov article of 18 months earlier, it just addressed the ASW capabilities of the Soviet Navy's ASW aviation. The book stated that ASW airplanes and helicopters had "modern means of combat with the submarines of an opponent" and that these aviation forces could "successfully search for enemy submarines at sea, including nuclear-powered ones, and track and destroy them" (50, C-7). Here, too, there was a detectable hedge: literally the claim made was limited to a capability for tracking and destroying those submarines that had been located by "successful" searches at sea by Soviet naval aviation. Of course, without a long-range submarine detection system equivalent to SOSUS, this is the most that could be claimed with any credibility.

Five of the seven negative answers found among the 16 pieces of evidence on the question indicated that nuclear-powered submarines were perceived as continuing to enjoy either a critical advantage over ASW forces by virtue of the "covertness" that their nuclear-propulsion afforded them alont with the great capacity for remaining submerged for extended periods and/or the vast ocean expanses within SLBM range of the enemy's heartland in which to play needle-in-a-haystask with the opponnent's ASW forces (as well as great thickness of water under which to hide. Thus, "covertness" stemming from nuclear propulsion for submarines was cited by Captain First Rank Aleshkin in Naval Digest in January 1972 (14, C-2) by Vice Admiral Sorokin and Captain First Rank Krasnov in Science and Life in the same month (16, C-2), by Captain First Rank Knitnitskiy in Antisubmarine Weapons and Their Platforms in February 1973 (36, C-5), and by Captain First Rank V'yunenko in Naval Digest in October 1975 (81, C-8). Sorokin, himself a famous first-generation nuclear-powered submarine commander, was the only source during this period to mention the cover afforded by the Arctic ice as well as the protection to be had by operating at great depths "hidden by a layer of water hundreds of meters thick" (16, C-2). Only one of the seven sources cited the "vast" ocean expanses in which SSBNs can hide and still be in (or near) firing range of the enemy's homeland. This is a notable change from the 1966-1971 period when four of seven such statements cited some form of the "vastness" of the World Ocean. The sole mention this time came from the 1973 booklet ASW Weapons and Their Platforms by Captain First Rank Kvitnitskiy (36, C-5). It spoke of "the vast sea and ocean expanses within the bounds of which can be placed firing positions for nuclear-powered missile submarines". Perhaps SOSUS was making the World Ocean shrink in Soviet perpections to less "vast" size.

Six of the seven negative answers found to this question cited one or another alleged inadequacy of U.S. ASW against the USSR's nuclear-powered submarines. Among these six statements critical of U.S. ASW limitations were four of the five statements already cited above that mentioned the great advantage of "covertness" enjoyed by nuclear-powered submarines by virtue of their great submerged endurance. Clearly the Soviet naval sources attributed the inadequacies to U.S. ASW in large part to an ascribed inability to overcome that "covertness" with a more extensive and reliable system of initial detection than even SOSUS.

Of these six negative answers, three cited the lack of initial detection capabilities at long range and the other three gave various and more general answers. As Captain Aleshkin expressed it in Naval Digest in January 1972, "It

is difficult to 'illuminate' this underwater environment with available means of detection" (14, C-2). Admiral Sorokin in Science and Life the same month gave the SOSUS "threat" and implicit accolade by referring to "the rather great reliability of submarines being detected by shore hydrophone stations" but went on to discount SOSUS by asserting that "low-noise missile submarines can launch their missiles from positions beyond the effective detection range of /such stationary/ detection systems" (16, C-2). The third source to cite U.S. lack of adequate initial detection capabilities was Captain First Rank Kvitnitskiy in 1973 in his booklet Antisubmarine Weapons and Their Platforms. In it the flat assertion was made that "up to this time, an effective means for the long-range detection of submarines has not been found" (36, C-6).

The first of the other three sources which gave more general negative answers was the collectively authored book Aircraft Carriers and Helicopter Carriers which appeared in the spring of 1972. It stated without qualification that the existing "means for the detection and destruction of submarines are still of slight effectiveness" (21, C-3). In a March 1973 article in the Naval Digest an active-duty Captain First Rank Kostev wrote in "Underwater Battle" that ASW surface ships were unable to detect a submarine at depths over 500 meters and that the "radical increase" in the submerged speeds of which nuclear-powered submarines had become capable was making surface ASW ships and their sonar obsolete (39, C-7). The last general negative answer came from Admiral Amel'ko in the entry for "antisubmarine defense" in the Soviet Militery Encyclopedia, the first volume of which appeared in November 1975. He observed that what he considered to be a fact that "the resolution of the problems" of ASW held "one of the top places in the combat training" of "foreign navies" was attested to adequately by the importance accorded to ASW in the naval exercises and maneuvers of those navies. It was noteworthy that on one hand Admiral Amel'ko acknowledged the capability, in effect, of SOSUS to "monitor tens of millions of square kilometers" of the oceans and that earth satellites and nuclear-missiles (ASROC and SUBROC) were among the "forces and means" of U.S. ASW and yet implied clearly on the other hand that ASW remained so "difficult" for all major navies that it had been necessary to enlist the services of other branches of the armed forces (e.g., of the Strategic Missile Forces and Long-range Air Force to destroy SSBNs at their bases) (84, C-8/9). The Admiral clearly was striving for a balanced appraisal as expected of encyclopedia articles but, all things considered, he seemed to come down rather firmly on the negative side of the question.

Finally, in the third and last of the negative subcategories, four of the seven negative answers not only indicated that the ASW state-of-the-art still lagged behind that of submarine warfare but stated or implied that the lag was increasing rather than being diminished. The first of these four came in 1972 in Aircraft Carriers and Helicopter Carriers and addresed the limited aspect of U.S. ASW of the carrier-borne aircraft used for that purpose. The S-2 TRACKER was said to have proven itself in use but, nevertheless, its effectiveness was said to have dropped "with each passing year" due to the improvements in the combat characteristics of nuclear-powered submarines (21, C-3). More significant was the next comment, which came in 1973 in Captain Knitnitskiy's Antisubmarine Weapons and Their Platforms. It spoke of the still "growing" difficulty of detecting submarines which it inferred to be the result of both the increase in the still-improving characteristics of nuclear-powered submarines and the still-growing range of their missiles (36, C-5). The third comment to indicate an ever increasing lag of ASW behind submarine warfare turned up in Captain Kostev's March 1973 article on "Underwater Battles" in the Naval Digest. He asserted that the submerged speed of submarines already had been increased to the point that they equalled those of surface ships and that "in the not far distant future" would exceed them by 20-30 knots (39, C-7). A similar note was struck in another Naval Digest article in October 1975 in which Captain First Rank V'Yunenko claimed that submerged submarine speeds already had surpassed those of ASW surface ships and that in "the near future" would reach 40 knots and thereby "exceed the limit of the capabilities of surface ships to track them" (81, C-8).

It merits noting explicitly at this point that there were no interventions by Army authors of the kind found in the preceding five years in which it was asserted that the ASW problem was manageable with the forces in hand., Seemingly, the Army had become reconciled to the inevitability of spending some of the defense budget on general purpose naval forces justified for pro-SSBN ASW and anti-SSBN ASW.

While the verdict for this period remains basically the same as for the preceding period, that the weight of evidence gives a negative answer to the question as to whether anto-SSBN ASW was perceived as within the tchnological state-of-the-art, a degree of ambivalence is to be noted. Both Vice Admiral Sorokin in early 1972 and Admiral Amel'ko in late 1975 found it appropriate to credit SOSUS, implicitly at least, with more effectiveness than was to be expected considering the extensive downplaying of

SOSUS in the past. Implicit in these acknowledgements of SOSUS capabilities was that those capabilities could be extended and improved until they could become the essential equivalent of that long-sought technological "breakthrough" in ASW that would "illuminate" the underwater environment and deprive nuclear-powered submarines of their "covertness".

1 (b)- "Is the U.S. Navy seen as assigned a priority mission for anti-SSBN ASW?"

A total of 20 items are given in Section 1 (b) of Appendix C (pages C-10 through C-15) which were selected for their relevance to answering the above question. Eleven of these gave negative answers, all of which were implicit, and the other nine were affirmative indications. Of these nine, seven were merely implicit while only two were explicitly afirmative. One of these two was limited to SSNs and the other to aircraft carriers. The first asserted: "There are torpedo submarines in the navies of a number of capitalist countries...which are assigned primarily to the search for and destruction of the nuclear-powered missile and torpedo submarines of the enemy and also for the support of their own forces" (14, C-10). This was stated by Captain First Tank Aleshkin in the January 1972 issue of Naval Digest and as made in a context of the ASW uses of the SSNs of the U.S. and other NATO navies. *It was not focused directly on the* matter of whether or not U.S. SSNs had a priority anti-SSBN role assigned to them or not. Nevertheless, it is the first statement in the Soviet open literature since 1964 to even mention the word "missile" in connection with the "submarines" often said to be the target for U.S. SSNs. Like Admimral Chabanenko's comparable claim eight years earlier, this on in 1972 by Captain Aleshkin remained an exception and found no support in other commentaries.

The other affirmative answer, the one indicating that U.S. "antisubmarine aircraft carriers" had an anti-SSBN role, came in a 1975 book The Surface Fleet of NATO which listed as the second of four missions that of "defense of the territory of the U.S. from submarines armed with ballistic missiles" (71, C-13). (The first was for point-defense of CVAs and amphibious forces and the third was for protecting merchant ships on the sea lines of communication). It was noteworthy that this attribution of an anti-SSBN role to CVSs appeared two years after the U.S. had mothballed the last of them -- a fact not reported clearly in the Soviet press, as commented earlier in section 3(d) above.

The likelihood seems great that both the failure to make clear the departure of the CVSs from the U.S. Navy's operational forces and the belated attribution to them of an anti-SSBN role had much to do with the fact that the USSR, lacking any equivalent of SOSUS, had settled on ASW aircraft carriers as the best means of conducting open-ocean ASW against U.S. SSBNs and, apparently more importantly for the present and until some long-range equivalent of SOSUS can be developed, for providing open-ocean protection to Soviet SSBNs. Since no similar claim was made with regard to the "multipurpose" CV conversion of the U.S. attack carriers (CVAs) that was giving the big carriers a significant ASW capability, the claim relative to"antisubmarine aircraft carriers" having an anti-SSBN mission may be dismissed as having nothing to do with any objective reality of U.S. Navy ASW capabilities or likely Soviet perceptions thereof.

In addition to these two explicitly affirmative answers there were seven others which all spoke only of "submarines" being the target of either U.S. SSBNs (three cases) or simply did not specify any paritcular force types (four cases). The three which stressed the ASW role of U.S. SSNs and left open the possibility that anti-SSBN was intended as well as anti-SSN/SSGN/SS were distributed over the period fairly evenly, with one in 1971, the second in 1973, and the third in 1975. All were by Captains First Rank in Naval Digest articles.

In 1971 Captain Sokha, writing about the evolution of the roles and missions of submarines, claimed that the "basic missions of U.S. SSNs at that juncture were twofold: 1) "combat with submarines"; and 2) "protection of own missile submarines" (11, C-10). The second of these three statements was made in 1973 by a Captain Kostev writing about ASW submarines. Apparently referring to the difficulty experienced by the Soviet Navy in equipping its submarines to classify submarine contacts as SSBNs or other types, Kostev asserted that "one of the main missions for torpedo submarines (especially nuclear-powered ones) has become anti-submarine warfare in accordance with the principle "Sink all submarines!' regardless of whether it is a missile submarine or a torpedo one" (39, C-12). This statement suggests that the Soviet practice of not specifying "missile" submarines in all but the two exceptions in 1964 and 1972 mentioned above may have been due to as simple a reason as inability to distinguish between them on the part of Soviet ASW forces.

Be that as it may, the third and last of the three commentaries which lend themselves to the interpretation that U.S. SSNs were being implied to have an anti-SSBN

mission was the 1975 statement by Captain V'yunenko that the "basic role" of the U.S. SSNs was "combat with the submarine and surface forces of the enemy" (64, C-13). Like the other two of these commentaries, this contained nothing that could be taken to mean that the SSNs had anti-SSBN ASW as their top priority role.

The remaining four implicitly affirmative answers that specified no particular force type or types in their roles against unspecified types of "submarines" also were well-distributed over the 1971-1976 period: there was one each in May 1971, February 1973, February 1974, and November 1975. In the first of these, Professor Potapov maintained in his book The Development of Navies in the Postwar Period that ASW was viewed as "one of the top priorities" by the U.S. Navy and was considered to require "active operations of antisubmarine forces in regions adjacent to the bases to a probable opponent's submarines, on their transit routes to the areas of combat operations, and in the areas of combat operations themselves...and also...to provide escort protection for naval and merchant ship forces" (1, C-10).

The second such statement was made in Captain Kvitnitskiy's booklet on Antisubmarine Weapons and Their Platforms in February 1973. Without explicitly stating that anti-SSBN ASW was a role in U.S. naval forces, Kvitnitskiy made the intended implication abundantly clear by mentioning "missile" submarines in a sentence immediately preceding his punch line: "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, C-11).

The third of these implicitly affirmative but unspecific answers to the question as to whether or not U.S. ASW forces were considered to have a priority mission for anti-SSBN ASW came in February 1974 in a Naval Digest article on NATO naval exercises by a Captain First Rank and a Captain Third Rank. They pictured NATO ASW as planning for "active, offensive operations" that foresaw "the continuous tracking of each submarine during transit from its base and quick destruction at the outset of a war" (49, C-12). This at least was more definitive than the earlier two statements in specifying that all submarines would be tracked during transit and destroyed at the outset of a war. Even this may not be very meaningful in view of the Soviet practice of keeping all but a handful of their SSBNs in home waters until at least after the initial nuclear exchange. Finally, the fourth of these commentaries was the item on ASW in the

first (November 1975) volume of the Soviet Military Encyclopedia. This commentary went as follows:

> 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 shipyears, at their bases, in transits at sea, in their combat patrol areas and combat positions, antisubmarine defense of the strike forces of the navy, antisubmarine defense convoys, transports and for the antisubmarine defense of important regions and objectives in the open sea (ocean) and offshore (84, C-14).

Two comments are in order with regard to Admiral Amel'ko's explanation of ASW. First, although he, too, refrains from spelling out "ballistic-missile" submarines, or even "missile" submarines, his new formulation of hunting down submarines in their "combat patrol areas and combat positions" seems clearly intended to suggest anti-SSBN ASW operations. Secondly, with regard to the final type of ASW operation listed, that for "the antisubmarine defense of important regions and objectives in the open sea (ocean) and "offshore", this could conceivably refer to anti-SSBN ASW (especially since the Soviets use "anti-submarine defense" where we would use "antisubmarine warfare") but it seems far more likely to refer to the protection of SSBN sanctuaries and the SSBNs in them -- and hence of no further concern to this analysis.

Turning now to a consideration of the eleven negative answers which all indicated that one or more of the U.S ASW force types did not have anti-SSBN as a priority mission in wartime, it should be noted that six of the eleven applied to particular force types. Thus, the U.S. Navy's multi-purpose aircraft carriers were said to be assigned to protecting U.S. SSBNs in their combat patrol areas, a mission which (if actually assigned) could absorb all of the capabilities of our entire force of aircraft carriers (92, C-15). More credibly, another commentary implied that the role of the ASW airplanes and helicopters carried by multipurpose aircraft carriers were "mainly" for protecting the CVs themselves (78, C-13).

The roles of destroyers in modern naval warfare were listed but nothing that pointed particularly at anti-SSBN ASW made the list (87, C-14). Similarly, the LAMPS helicopters being provided to the destroyers and frigates of the U.S. Navy were noted to be intended for the antisubmarine defense of the ships on which they were based (FNC 6/75. C-13).

One report even claimed that the Los Angeles Class SSNs were "assigned in particular for the antisubmarine defense of aircraft carrier groups" (48, C-12). However, since this was an isolated report, there was no reason to think that the underlying element of fact that SSNs were being used in such a role had led to a general Soviet misperception that the U.S. Navy was devoting its fastest and quietest SSN "particularly" to escorting aircraft carrier task forces.

Unlike the preceding five-year period for which the negative statements on each of the individual force types except SSNs was definitive enough to warrant concluding that they were not assigned to an anti-SSBN role on a priority basis, the foregoing data is insufficient to reach such a conclusion for the 1971-1976 period. However, let us look at four of the remaining statements to see what they can contribute.

The first two of them, both from 1972, indicated that ASW was viewed by the U.S. as a means to the end of gaining a general sea control -- which, as explained earlier, has everything to do with the pro-SLOC mission and nothing inherently to do with anti-SSBN ASW (21, C-10 and 29, C-10/11). The third commentary of relevance here appeared in the journal International Life in March 1973 and made the patently false claim that the Trident SSBNs, because of the intercontinental range of their missiles, would be retained in the safety of home waters where they would be protected by the "main" ASW forces (38, C-11). This hadn't the remotest basis in fact and was a particularly obvious surrogate use of the U.S. Navy to convey to the informed Soviet reader how the Soviet Navy would protect the new Delta Class SSBNs in the relative security of Soviet home waters.

Most revealing of all was the last of the negative commentaries worthy of comment. It was made by Captain First Rank V'yunenko in an October 1975 Naval Digest article. On the face of it, it seemed to be an affirmative answer to the question under consideration since it asserted that SSBNs were "the basic target for the operations of all the other forces of a navy" (81, C-13/14). However,

included was a further statement which warrants concluding that the article was a particularly meaningful and credible negative answer. After asserting that the "real way" to conduct ASW was by employing all of the available mobile forces in coordination with "stationary systems of hydroacoustic surveillance" (i.e., SOSUS), the article went on to list the ASW missions which then could be "effectively carried out". They included SSBN protection, screening of CV forces, and convoy escorting (81, C-14). Noticeably missing was any mention of anti-SSBN ASW or even of anything that conceivably might serve as an umbrella heading under which anti-SSBN might implicitly be subsumed. This statement by V'yunenko quite possibly was intended to make it clear to the insiders among the readers of his article that anti-SSBN ASW in fact was not a priority wartime mission of U.S. naval forces. We shall return to this statement and a further analysis of this section in the general conclusions with which consideration of the 1971-1976 period will be brought to an end.

2 (a) - General Appraisals of U.S. ASW -- The high level of U.S. ASW efforts that had been perceived for the two preceding five-year periods continued to be reported in 1971 as "enormous" (12, C-16) but in 1972 and thereafter in noticeably less general and effusive terms. Thus, in 1972, the overall U.S. effort had moderated to "vigorous" and only "the development and improvement of antisubmarine aircraft carriers and helicopter carriers" of all the various U.S. ASW programs, was presented as being accorded "great attention" by the U.S. Navy (21, C-16).

Then in 1973 came what was by far the most devasting criticism of the U.S. ASW efforts to date in terms of the degree or improved effectiveness obtained from them. Like the most damaging appraisal of the preceding period, that by Captain Kvitnitskiy in the November 1966 Naval Digest (8, B-21), the 1973 criticism also was from the same author. In Kvitnitskiy's booklet Antisubmarine Weapons and Their Platforms U.S. ASW was portrayed as "little effective" against nuclear-powered submarines despite "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" that was said to have characterized the U.S. ASW effort (36, C-16/17). In what appeared to be repetition for emphasis to make his point unmistakably clear, Kvitnitskiy claimed both that "much still needs to be done before a sufficiently effective system of

antisubmarine weaponry will have been developed" and that the U.S. (the "West") recognized that its ASW remained "to a large extent undeveloped and incapable of fully preventing modern nuclear-powered submarines from carrying out the missions assigned them" (36, C-17).

That the central role in ASW of initial detection was not being overlooked in general Soviet appraisals of U.S. ASW was made evident in an article by a Ph.D. in naval sciences on "The Navies of the Great Powers in the Postwar Period" that appeared in the November 1973 issue of Naval Digest. In addition to "the very large number of various ships and aircraft" seen from the perspective of the author of the article, a Professor Zvyagin, to have been provided the U.S. Navy for ASW, it was said also to have been equipped with unnamed "stationary systems for the monitoring of the underwater situation" (47, C-18).

The only general appraisal of U.S. ASW for the more than two years remaining in the 1971-'76 period was that by Admiral Gorshkov in the first edition of his book Seapower of the State which was leared for publication in November 1975. Since it had the twin merits of coming right at the end of the period and from the Navy's top officer and since it has a number of points requiring comment, the relevant passage is quoted in full below for ready reference for the analytical remarks that follow:

> 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 torpedoes. These ships are primarily assigned to antisubmarine warfare....it is obvious that the main assignment of the modern navies of the Western powers is actions 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 antisubmarine 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 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 patrol ships that are being built by 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, C-18/19).

Gorshkov, it should be noted, perceived ASW as the first among the "great capabilities" of the NATO navies and the leading role for the "multipurpose" attack submarines and for the surface ships of NATO's naval forces. Also, the Navy chief does refer to SOSUS, although only indirectly, as "positional systems of long-range hydroacoustic surveillance". In addition, Seapower of the State, included the fairly accurate summary of NATO ASW developments quoted above. Gorshkov's restraint in neither exaggerating nor minimizing the U.S. ASW threat is likely to have been the result of conflicting policy interests. If he had exaggerated NATO's ASW capabilities to justify larger general purpose naval forces to counter the alleged threat,

he would have diminished correspondingly the credibility of his SSBNs as a nuclear deterrent force. If on the other hand, the Navy Commander-in-Chief subjectively minimized the capabilities of the ASW "forces and means" of the U.S. and other NATO navies he ran the obviously great risk of providing ammunition to the Army marshals and other opponents of expending a substantial share of the annual military budget on surface ships--they could argue with unimpeachable logic that if U.S. ASW were poor, the large general purpose forces that Gorshkov wanted to justify under "the nuclear criterion" of pro-SSBN ASW were not necessary.

So, while conflicting policy interests are likely to have led the Navy chief to a low-key presentation of the ASW capabilities of the U.S. and its NATO allies, it is notable that he described those capabilities at some length and that there was more progress to record than in the past on shipbuilding programs for highly ASW capable ships, specifically 40 Los Angeles Class SNs (for a total of 90 SSNs), 30 Spruance Class DDs and 46 *Knox* Class FFs. All of these classes were reported to be designed to carry ASW missile-torpedoes and the two classes of surface ships were noted to be slated for piloted ASW helicopters. Finally R&D on new types of ASW ships was said to be increasing. These "new types" of ASW "ships" would have included new submarines as well as surface ships of both conventional displacement and non-displacement types. Thus, on balance, Gorshkov's catalogue of U.S./NATO developments very likely struck him as so substantial and obvious that he did not feel it necessary to be explicit to make the point that the U.S./NATO ASW threat was growing rapidly and, therefore, so should the Soviet Navy's general purpose forces to counter them.

2 (b)- U.S. Budget Allocations to ASW - The comment recorded on page C-20 of the appendices. The first of them, a "foreign Naval Chronicle" note from the September 1972 issue of Naval Digest, reported that $2.9 billion already had been allocated to ASW from the FY 1971/72 budget and that 3.5 billion was proposed by the Navy for the FY 1972/73 budget. Before proceeding to analysis of this first commentary and the three subsequent ones, it is desirable to adduce the official U.S. data on this subject as can be derived and complied from the appended Chronology:

Fiscal Year	U.S. Navy Budget (in $ billions)	ASW Share (in $ billions)	ASW Share (as % of Budget)
1970/71	22.5	2.18	9.7
1971/72	21.7	2.38	11.0
1972/73	21.4	3.41	15.9
1973/74	25.3	3.34	13.2
1974/75	26.9	3.09	11.5
1975/76	27.9	2.92	10.5

From the official U.S. figures above, it may be noted that the $2.9 billion allocated to ASW in FY 1971/72 according to the Soviet report is given as 2.38 above. While the Soviet figure was exaggerated by 21%, it at least shows an improvement over the 75% inflation of the first entry for the preceding five-year period that was typical of the period and led to the conclusion that all of the reported budget data for that 1966-1971 period was so exaggeratged that it all had to be set aside an immaterial.

The second of the four reports came in Antisubmarine Weapons and Their Platforms, a booklet that appeared in February 1973 and was intended for the paramilitary youth volunteers of the DOSAAF organization. Obviously attempting to use the published U.S. data in a credible way while still portraying U.S. military expenditures for ASW as a maximum, its author, active-duty Captain First Rank Kvitnitskiy, gave a ball-park figure of 2.3 billion dollars for 1971 and 3.5 billion as supposedly allocated to ASW for FY 1972/73 (36, C-20). Since this latter figure was off a mere $90 million, it must be considered ballpark too. Kvitnitskiy's comment was noteworthy. He pointed out that the 2.3 billion appropriated in 1971 was itself "unprecedentedly high" and so left the impression that the 3.5 million figure for a year later which he gave his readers meant that the U.S. had decided to go all out in ASW development -- something that senior Soviet naval officers, including Admiral Gorshkov, all seemed to feel to be a prerequisite for the USSR to do if the Soviet Navy were ever to become capable of discharging its ASW missions with a modicum of success.

The third commentary came only four months later in a June 1973 article in Naval Digest on SOSUS (41, C-

20). This was the 1973 report already referred to earlier as 80% exaggerated in the text in answer to ACDA Question # 2 on the frequency and nature of Soviet commentaries. At the earlier juncture, the preparing analyst dismissed as unlikely that this statement could have been made objectively and suggested it had been done for internal propaganda reasons (even though the U.S. ASW budget had increased by slightly over half as much as the unsigned Naval Digest article had claimed). Having reached that tentative conclusion, it is necesary to point out that the 1975 estimate of $4.5 billion was a projection two years into the future and, if merely an extrapolation of the growth the ASW budget had enjoyed from 1970 to 1972, probably had as adequate a basis as any other method of prediction.

However that may be, the fourth and final commentary came two years and four months later in another Naval Digest article on SOSUS. In the October 1975 issue, we find the unsourced assertion: "In FY 1975, 327 million dollars were appropriated for carrying out the antisubmarne programs". Since there has been no comparable set of figures in use for program sub-totals to the overall U.S. ASW budget figure, the preparing analyst (very) tentatively concludes that the author, or an editor of Naval Digest, miscounted several digits and that the intended figure was 3.27 billion -- which then would bring the Soviet figure to within 12% of the 2.92 billion shown for FY 1975/76 in the compilation of official U.S. figures given above.

This foregoing data provides pretty thin gruel on which to conduct much of an analytical effort. While not writing it off as was deemed necessary for the preceding period, we are not very much further ahead on the basis of this budget data. Some of the reports were more objective than others but taken together were not indicative of very much. Finally, the reduction in the total number of general appraisals from 15 in the 1966-'71 time span to only seven in the 1971-'76 period merits some comment. Obviously this diminution of Soviet attention to publishing general estimates of U.S. ASW capabilities could be a reflection of any number of changes in interest or perceptions. It seems well advised at this point merely to hypothesize that perhaps the prospect for the 1980s of being able relatively soon to protect their SSBN force in the far greater security of home waters, when combined with the

continuing failure of either side to achieve the long and ardently sought technological development in long range submarine detection to make the ASW problem tractable, had caused U.S. ASW capabilities to appear somewhat less central to Soviet naval concerns in the first half of the '70s than it had in the last half of the '60s. Then, to, as a corollary to such a hypothesis, it would not be inaccurate to suggest that the ASW situation may well have appeared to the Soviets to have stabilized itself somewhat and so not to have required such frequent comment after 15 years of rapid change brought on by the advent of nuclear-power for submarine propulsion and missile and torpedo warheads.

2 (c) - U.S. ASW Force Levels and Forward Deployment/Readiness -- The relevent data covering Soviet perceptions of these aspects of U.S. ASW for the 1971-'76 period, as set forth mainly in the 22 commentaries assembled in Section 2(c) of Appendix (pages C-21 through C-25), are as follows:

A. Force Levels:

1) CVSs/CVs/SCSs - The four CVSs still operational at the start of the 1971-'76 period are reduced to three by mid-'71 and to zero by 1 July 1973. The numbers of CVSs in reserve dropped from none in late 1971 to five in mid-'73 to four by the end of calendar 1974. The only report on the conversion of CVAs to multipurpose CVs claimed that three such ships would be operational by 1 July 1974. (This number would grow to 13 by 1979 and with each CV said to carry ten VIKING airplanes - 80, D-78). The U.S. Navy was credited as having a first SCS operational as of 1 July 1973, apparently by a reference to the helicopter carrier GUAM used to test the SCS concept.

2) VP Airplanes - The total numbers of the U.S. Navy's shore-based ASW patrol airplanes was reported as 300 (largely P-3C ORIONs) in 1971 and as 250 by 1 July 1975. These airplanes were reported to be organized into 24

squadrons of P-3B and P-3C ORIONs. In addition, 12 squadrons of P-2 NEPTUNES and P-3A ORIONs were reported in the Naval Reserve.

3) SSNs - The number of nuclear-powered torpedo-attack submarines was reported as 50 on 1 June 1971 and to have increased to 65 by the end of five years. One SSN was reported in reserve. (The number of diesel-powered attack submarines was reported as 42 in January 1972 and as down to 15 on 1 July 1975.)

4) DDs/DEs - From 151 operational destroyers at the end of 1971, the U.S. Navy was reported to have cut back to 67 by July 1975. Only one of the new Spruance Class had been commissioned. From 120 DDs in the reserve fleet in January 1972, the number had dropped to only 34 by January 1975. There were 63 DRs reported in commission in 1972. Of the projected 46 Knox Class FFs 37 were reported operational by March 1973.

B. Forward Deployment/Readiness:

- After deactivation of five U.S. Pacific Fleet destroyer squadrons by 1 July 1973, the only squadron deployed in the Western Pacific was Destroyer Squadron 15 based at Yokosuka, Japan. In its composition were four destroyers plus one FFG and one DDG (FNC 7/73, C-22).

- A second U.S. Pacific Fleet destroyer squadron, DESRON 9, was reported in September 1974 as slated to be forward-based as of the spring of 1975 -- to Guam (FNC 9/74, C-23).

- VP squadrons (of 10-12 P-3B and P-3C ORION airplanes) were reported in December 1974 to be forward based as follows:

Western Pacific	Atlantic-Mediterranean
Guam (Agana)	Bermuda (Kinley)
Aleutians (Adak)	Iceland (Keflavik)
Japan (Iwakuni)	Azores (Lajes)
Okinawa (Naha)	Spain (Rota)
	Italy (Sigonella)

C. Summary. The earlier assertion by a Soviet naval source that the CVSs would be replaced by CVs as the former were mothballed was given the lie by the rapidity with which the CVSs were retired and the slowness with which the CVAs were converted to CVs. Thus it was clear, for example, that there would be a year's lapse between the decommissioning of the last three CVSs and the conversion of the first three CVAs to multipurpose CVs.

- The fact that the U.S. Navy actually was claimed to have a sea-control ship in its order of battle when no such ships were building or planned (and it was merely that the USS Guam had been used for operational development of the SCS concept before that concept was dropped) probably was a typical reflection of how much the Soviet Navy wanted to maintain the illusion that the U.S. was investing heavily in small air-capable ships for ASW like the "ASW cruiser" -- in order to justify more of the latter for Soviet ASW.

- The total number of VP squadrons was down three from the 1966-'71 period from 27 to 24. Most of these were the P-3B and P-3C ORION patrol airplanes with half as many more (12) squadrons of older VP airplanes of the P-3A ORION and P-2V NEPTUNES available in the Naval Reserve. Nothing was reported about any of these airplanes being employed on ASW barrier patrols or being kept in readiness for such patrols.

- SSN production must have appeared as a relatively successful program compared to the very slow progress of CVA conversions to CVs or to production of the P-3C ORIONS or construction of the Spruance Class DDS. Although slower than planned, the 15 SSNs produced over five years at least averaged a respectable, if modest, three per year.

- Forward deployment of U.S. ASW forces was given noticeably less attention in 1971-'76 than the preceding five years. This seems likely to have been due to a U.S. retrenchment in overall size and forward basing of its naval forces and perhaps a feeling that the 1972 ABM Treaty and SALT-1 accords made the sudden outbreak of a general war even more remote.

2 (d) - Mission-completion Capabilities of Soviet SSBNs -- In the five years between the XXIVth and XXVth Party congresses, there were five Army-sourced and 13 Navy commentaries which indicated that Soviet SSBNs would be able to reach their missile-launch areas successfully and begin launching their SSBNs before being detected. There also were two more commentaries from Army sources and none additional from Navy sources which eschewed mentioning SSBNs when describing the Soviet Navy's roles and, therefore, appropriately could have included the standard claim to a strategic strike "capability". Also, there was one Army statement denying and five Navy commentaries reasserting a need for other naval forces to provide support to the USSR's nuclear-powered submarines before they would have adequate "combat stability" (survivability) to perform their missions successfully. Finally, one remarkably frank commentary helpfully made it clear that talk of the strategic strike "capability" of a submarine denoted an unopposed situation while the wartime realization of such a capability would depend on remaining undetected, despite a hostile ASW environment, until the first missile were launched. Let us examine the comments in each of these categories before drawing conclusions as to their likely significance for Soviet perceptions of U.S. ASW.

Four of the five Army-sourced statements that indicated that Soviet SSBNs would be able to carry out strategic strikes successfully in wartime were all by the then Defense Minister, Marshal Grechko. Writing in the spring of 1971 in his short, paperback book On Guard Over Peace and the Construction of Communism; Implementing the Decisions of the XXIVth Party Congress, Defense Minister Grechko credited the Navy's "nuclear-powered submarines" with the "capability" for "destroying from great distances both targets at sea and important objectives situated on the seacoast and in the rear of an enemy" (3, C-26). Then just a month or two later, in an article published in the June 1971 issue of Naval Digest, the Defense Minister credited the SSBN force, along with the Strategic Missile Forces, as constituting the "main deterrent means" of the USSR (4, C-26). Such a claim clearly was intended to imply a reliable strategic strike capability for the Soviet SSBNs as the basis of the credibility desirable for the USSR's sea-based deterrent force. The only one of the five Army commentaries which was not by the Defense Minister was by the Chief of Staff of

the Armed Forces, General of the Army Kulikov, and was published in the Party journal Communist in February 1973. Without explicitly mentioning enemy ground targets he spoke of the "great striking power" of ballistic missile submarines said to be "virtually invulverable" (34, C-28).

The other two Grechko commentaries came in April 1974 and March 1975 in the first and second editions of his book The Armed Forces of the Soviet State. Despite a fair number of changes in other passages of this book in the revised second edition, the statement of interest here remained substantially unchanged both from the first edition and from his 1971 On guard Over Peace paperback: "nuclear-powered submarines" were credited with the capability" of "delivering strikes from great distances both on targets at sea and on objectives on land situated on the coast or in the rear" (51, C-30 and 67, C-31). Unlike all four of the Army-sourced statements from the 1966-'71 period which had asserted the mission-completion capabilities of Soviet SSBNs, none of Grechko's commentaries carried any indication one way or another as to whether additional naval forces would be required to provide "combat stability" to the SSBNs. This was not the case with Kulikov's comment nor with six Navy commentaries -- a situation to which we shall return shortly.

The 13 Navy commentaries which asserted a mission-completion capability for Soviet SSBNs were spread over the entire period with five in 1971, two each in 1972, 1973, and 1974, and only one in 1975 (but that one was Gorshkov's Seapower of the State). In addition to their straight-forward claims to a strategic strike capability for Soviet SSBNs, six of them used phrases that intimated that no additional forces were required for SSBN protection. For example, in Red Star in July 1971, Fleet Admiral Kasatonov spoke of the "covertness and surprise" with which SSBNs could "inflict powerful strikes on mulitary objectives on the enemy shore from any point in the World Ocean" (8, C-26). Also in July 1971, Admirsl Oleynik wrote in a newspaper article for Navy Day that an SSBN could launch its missiles "from a submerged position thousands of miles away from the target while itself remaining virtually invulnerable" (9, C-26/27). Similarly, in 1973 Captain First Rank Kvitnitskiy wrote in his DOSAAF booklet Antisubmarine Weapons and Their Platforms that:

> 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.
>
> Over the 25 postwar years, the diving depth of submarines has more than doubled and the significance of this factor of increasing the covertness of submarines is difficult to overestimate.
>
> In the tactics of /U.S./ antisubmarine 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 (36, C-29).

This was an unmistakable, if implicit, assertion that the inherent covertness of Soviet SSBNs, SOSUS notwithstanding, was sufficiently great to enable them to complete their strategic strike roles successfully.

Similarly in 1974, in a Navy Day newspaper article on 28 July, a Rear Admiral Rudnev asserted that "in the event of necessity", a Soviet SSBN could "cover a great distance covertly and take up a favorable position for the delivery of a strike on an aggressor: (59, C-30/31). While this statement did not explicitly indicate that a strategic strike at land targets was involved, that clearly was the intended implication as was also that the SSBNs could maintain their covertness in the hostile ASW environment created by the ASW "forces and means" of the U.S. and NATO. The implication had been made explicit the year before in Antisubmarine Weapons and Their

Platforms by Captain Kvitnitskiy's assertion that the USSR's SSBNs were "prepared for successful operations /even/ under conditions of a /highly/ developed antisubmarine defense" (36, C-29).

Most interesting and more significant for the future were three commentaries among the 13 positive Navy ones which implied the capabilities of the new Soviet Delta Class SSBN to fire its missiles from the relative security of home waters. The first of these three appeared in the Naval Digest issue of January 1972. Written by a naval-engineering captain, the article spoke of a submarine armed with such long-range missiles that it could fire from the area of its bases and from coastal waters (15, C-27). The second of these three happened to occur in the same month of January 1972 but in the journal Science and Life. It was stated inter alia that quiet submarines could launch their missiles from positions beyond the effective detection range of /such stationary/ detection systems" (16, C-27/28). The two senior naval officers who authored this article are quite likely to have had the Delta Class SSBN at least partly in mind in making this claim.

The third of these three claims came near the end of the 1971-'76 period in a book Missile Weapons at Sea which appeared in December 1975. In an obvious surrogate for the existing Soviet Delta Class SSBN, the planned U.S. Trident Class SSBN was cited to inform the Soviet naval profession that the USSR possessed an SSBN with such range that it could launch its missiles against the continental U.S. right from their bases in the USSR or from Soviet coastal waters (88, C-33).

Neither the fact of the existence of two Army and nine Navy commentaries that did not mention any mission-completion capabilities of Soviet SSBNs when the context was conductive to doing so nor the content of actual statements themselves appeared to have any significance for the subject under consideration other than to indicate that the requirement for deterrent propaganda regarding the SSBN, while well orchestrated, was not all-pervasive. Of significance, however, was the fact that the Armed Forces' Chief of Staff Army General Kulikov, did assert thet Soviet SSBNs were "virtually invulnerable" (34, C-28). This is very likely of a piece with the 1969 Army statement reported in this same

Section 2(d) for the preceding 5-yr. period: "Submarines possess the greatest self-reliance, so additional forces do not have to be provided for their protection" (42, B-33). By 1973, however, the policy difference between the Navy and the rest of the defense establishment was so clearly defined that it was only necessary for a senior defense official to assert the invulnerability of Soviet SSBNs for his informed readers to understand that the Navy's claims for much larger general purpose forces nominally for SSBN protection were being rejected. Just how insistent the Navy's claims were are well illustrated by the five statements found for this 1971-'76 period which restated this claim with one formula or another.

The first of the five Navy claims for more general purpose forces to provide necessary support for Soviet SSBNs to realize their strategic strike capabilities when opposed by the naval forces of the U.S. and other NATO states came in a January 1972 article in Naval Digest on the trends in naval development. In this article, Captain First Rank Aleshkin asserted, in effect, that Soviet SSBNs ("the strategic forces of navies") are "not capable of realizing their capabilities in full measure without the appropriate support of other forces" (14, C-27). Nor surprisingly for a Navy that doctrinally is held to submarines constituting the "basic" striking force (and submarines and aircraft the "main" striking forces), the real submarine enthusiasts were arguing to provide all of the support considered necessary for SSBNs by means of SSNs rather than by "balanced" forces including surface ships and aircraft too.

Evidence of this advocacy of SSNs as the exclusive pro-SSBN force does not show up in the evidence adduced in this study until an article in the Naval Digest in October 1975 in which Captain First Rank V'yunenko observed tactfully but pointedly:

> Submarines of operational-tactical designation /that is, torpedo- attack submarines/ are increasingly...being employed for the protection of the combat patrolling 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, C-32).

However, this disagreement has been going on for some time and Gorshkov had tried to settle the dispute with an ober dictum in the last of his "Navies in War and Peace" series in Naval Digest throughout 1972 and in February 1973. He also first summarized this general point on the need for submarines to be given surface help and air support (that he had illustrated a number of times thoughout the series) in his February 1973 article:

> 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, C-28).

In December 1974, Professor, Rear Admiral Pavlovich discoursed abstrusely on "Basic Factors in the Development of Naval Art" in the Military-Historical Journal. One of the more deadly discernible points he was making was that Soviet SSBNs could not realize their full potential for strategic strike unless other naval forces be assigned to provide them a greater "defense-in-depth" than they were then being accorded. It is fair assumption that Pavlovich was referring as much or more to the Delta Class SSBNs (with their intercontinental-range SLBMs that could be given optimum protection in the "maneuvering" bases and coastal Soviet waters) as to the far less defensible Yankee Class submarines in the open ocean where they were subject to SOSUS tracking in peacetime/international crisis and prompt destruction at the outbreak of war.

The fifth and last of these statements comes from Admiral Gorshkov in the first (1976) edition of Seapower of the State which appeared in November 1975. In it, Gorshkov asserted that Soviet submarines could carry out their missions successfully in wartime "despite the constant modernization of ASW means" -- but only if two conditions were met: 1) "proper /strategic and tactical/ employment"; and 2) provision of "combat support". Here Gorshkov was denying the "virtual invulnerability" of the USSR's nuclear-powered submarines that Armed Forces' Chief of Staff Kulikov had asserted in February 1973 (34, C-28) and reasserting his view that "a great deal of research" had "affirmed the high effectiveness of submarines"

but only "when properly employed and provided with combat support" (85, C-33).

Finally, as previewed in very general terms at the beginning of this section, there was one particularly revealing commentary that made it clear that Soviet usage of the term "capability" (like the West's) means only an ability to accomplish a task under circumstances of no opposition from enemy forces -- from U.S. and other NATO ASW forces in the case of Soviet SSBNs' strategic strike capabilities. The commentary in question appeared in Red Star on 9 June 1974 in an article on "The Tactical Aspect of Secrecy" by Rear Admiral Mikhailovskiy. The relevant passage went as follows:

> 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 (50, C-30).

In this statement, it would seem, the author told it pretty much as it actually appeared to be. Soviet SSBNs did not really enjoy the "virtual invulnerability" that had become the shibboleth for both Army detractors of large numbers of general purpose naval forces for SSBN protection and for Navy lip servicers to the Party line on the combat stability of the USSR's seaborne strategic deterrent. Rather, it was concluded the mission-completion of Soviet SSBNs would depend heavily on the skill of Soviet SSBN crews in remaining undetected for long periods in a hostile and "difficult" ASW environment.

GENERAL CONCLUSIONS RE. SOVIET PERCEPTIONS OF U.S. ASW FOR THE 1971-'76 PERIOD

- Soviet commentary from 1971-'76 focussed particularly on SOSUS although the greatest increase in attention was a tripling of commentaries on air-capable surface ships (especially CVs and projects for SCSs). Attention to SOSUS itself doubled, giving the ASW "means" the numerical lead in frequency of commentaries on U.S. ASW "forces and means". A doubling of commentaries also was posted by VP airplanes and mines. Although the numerical lead enjoyed by SSNs in the preceding five-year period was far surpassed by SOSUS and the number of commentaries on SSNs decreased moderately, they still remained at a respectably high level. While destroyer-type ships also continued to be given substantial attention, the tripling of commentaries during the preceding period gave way to slight decline in total numbers of commentaries on these not so air-capable combatants.

- The fact that SOSUS had moved to center stage as the dominant topic seemed eminently reasonable and inevitable after a decade-long delaying action in according SOSUS its due -- which delay probably was caused by concern over the deterrent credibility of Soviet SSBNs. The doubling of commentaries on VP airplanes seemed to have been caused to a considerable extent by its wider recognition as the fastest and so the primary executor of SOSUS-initiated submarine contacts and localizations.

- The unbroken trend to even higher frequencies of Soviet discussion on U.S. ASW capabilities continued in the 1971-'76 period with roughly a 60% further growth on top of the 67% growth of the preceding five-year period. This included an increase in naval commentaries of 86%, but a dropoff in army commentaries of 61%. The 86% increase is noted to be by far the period of greatest growth in Soviet naval attention to U.S. ASW (including the final 1976-'80 period, as will be discussed).

- The most common context of Soviet commentaries on U.S. ASW during the 1971'76 period was that of the various ASW "forces and means" in the U.S. ASW inventory and their relative advantages. The continuing difficulty of the initial detection of a submarine was a frequent context. The "state" importance of ASW to the USSR was a renewed if only occasional context and probably was engendered by the 1972 ABM Treaty. Prior to that Treaty it appeared that the USSR anticipated eventually developing an ABM capability against our POLARIS/ POSEIDON missiles. Once that long-term expectation was ruled out by the signing of the Treaty, the Navy's lack of ASW capability against nuclear-powered submarines in

the open oceans led to the emphasis on ASW as a mission of "state" importance to which not only must every service contribute according to their individual capabilities, but also which could, on a priority basis, command resources for R&D work related to finding adequate means for detecting SSBNs initially and locating and tracking them continuously in peacetime or destroying them in wartime."

- SOSUS was portrayed in Soviet naval writings during the 1971-1976 period as still intended eventually to afford "global" coverage and to be undergoing rapid integration into a world-wide surveillance system of the U.S. Armed Forces that would incorporate all feasible means of submarine surveillance (from satellites and commercial airlines to reporting by oceanographic survey and merchant ships) to provide nearly real-time vectors on submarine contacts to the ASW forces, particularly to VP airplanes. The area-limited deep-ocean systems such as AFAR in the region of the Azores and SEA SPIDER in mid-Pacific north of the Hawaiian Islands were demonstrating the possibilities for wide-ocean SOSUS coverage sufficiently well to leave little room for doubt that SOSUS eventually would be able to detect a large proportion of SSBNs maintained on peacetime combat patrols in the open ocean. And in wartime or international crisis, air-droppable, long-life MSS sonobuoys could be used to afford optimum coverage on otherwise unsatisfactory areas of SOSUS detection. Soviet commentary was divided between warnings to the naval professionals that SOSUS must be taken as a serious development (for which planning to counter in wartime was in order) and reassurances that for the time being it still was of inadequate range and effectiveness to constitute a short-term threat to Soviet submarine operations.

- Shore-based VP airplanes were the subject of double the number of commentaries in the 1971-'76 period than in the preceding five-year period and a marked qualitative rehabilitation of VP aircraft took place, including the first two references in late 1975 and early 1976 to the P-3C ORION's capability to exploit SOSUS data for vectoring them into direct contact with submarines operating in the open oceans. The January 1976 commentary in Naval Digest provided the first public acknowledgement that VP aircraft vectored by SOSUS constituted "a highly effective" ASW force. It seemed readily apparent that the U.S. VP had gained a greatly enhanced position in Soviet naval perception due primarily to its SOSUS connection.

- SSN construction and development by the U.S. continued to command a high level of Soviet naval interest in the 1971-'76 period although the construction rate over the five

years lagged even further behind to an average of less than 2 1/2 attack boats per year for a total of only 12 over the five years and with only 62 in commission by June 1976. The numbers of SSNs reported in commission were exaggerated by about 20% for most of the period, only a part of which seems likely to have been the result of the lagging U.S. construction rate while deliberate exaggeration by the Soviet Navy to help justify more ASW forces is seen as accounting for a substantial share of the exaggeration. The commentaries on SUBROC rose again to the 1960-'66 level of an average of one per year from its low of only two in 1966-'71 -- but for no discernible reason. Considering the smallness of the data base the fluctuation quite possibly had no real significance.

- CVs and SCS replaced CVSs as the main focus of Soviet naval commentary which nearly tripled in the 1971-'76 period but the ASW capabilities of each of these three major U.S. air-capable ship types were exaggerated in pursuit of Gorshkov's campaign to overcome army opposition to, and win Party authorization for, the sizeable numbers of "ASW cruisers" and other major air-capable ships that would be required to begin to address the ASW problem. The Essex Class CVs were pictured as still operational long after they had been sent to either the breakers or mothballers. The conversion of existing CVAs to "multipurpose" CVs with an add-on, marginal ASW capability useful for little more than for protection of the CV itself was misrepresented as projected new construction ships (with nuclear-powered versions to follow) which had major open-ocean hunter-killer capabilities against Soviet SSBNs. The CVSs had been abandoned, allegedly, because the new S-3A VIKING replacement for the S-2 TRACKER was too large to operate from a CVS. The dreams of sea-control ships (SCSs) for open-ocean ASW died on the U.S. drawing boards except for the fictional half-life given them in this period by one commentary which implied that the U.S. would (soon) select some kind of large air-capable ship to build for ASW. Despite all of the exaggeration, however, there was evident an underlying Soviet naval perception that the potential effectiveness of U.S. ASW in the future had been diminished greatly by the U.S, failure to actually build large numbers of major ASW surface ships for open-ocean ASW. The criticism of carrier-based helicopters of the previous period was not repeated nor did any Soviet naval sources find it necessary to further defend the value of helicopters operated from large air-capable ships. There was considerble commentary portraying a high level of U.S. interest in developing ocean-going hydrofoil and air-cushion ships for ASW but, like the commentary on the three displacement types, it was more reflective of internal advocacy than of a conviction that the U.S. Navy was moving rapidly to embrace such a radical solution to the ASW problem.

● Destroyer-type ASW ships of the U.S. were given substantial attention in Soviet naval commentary during the 1971-'76 period, particularly the projected 30 DDs of the Spruance class. They were noted to be slated to receive the latest in weapons and sensors, including piloted LAMPS helicopters to replace the remote-controlled DASH helicopters and ASROC with inflight guidance and a better ASW torpedo component (the Mark-46 to replace the Mark-44). However, the cost of the SPRUANCE destroyer was noted to have increased greatly, from $60 million to $110 million each, just since the start of construction. In effect, this was seen to have priced the U.S. Navy out of the market for the large number of such ships required just to do all of the point defense of aircraft carriers and merchant ship convoys anticipated in wartime let alone enough additional ships to make a major damage-limiting contribution to anti-SSBN ASW by open-ocean search. Less important but still noteworthy, the Spruance construction program had been allowed to fall two years behind schedule. Even without this desultory performance, it is unlikely that the Soviets would have been impressed greatly with a program of 30 DDs where up to ten times that number would have been appropriate to the huge ASW and other mission requirements for which they were needed. Adding to this generally unimpressive performance, U.S. plans for modernizing more of the World War II built DDs were discussed as merely a pretext to avoid facing up to the need for new destroyers and in large numbers. Little was said about the on-board and towed sonar for surface ASW ships, but that was positive, even praising the shipboard sonar in general use, the AN/SQS-26, as the best sonar in the U.S. Navy. ASROC was pictured in a much more critical light than before. The accuracy of the missile was asserted to be low (due to the fact of its ballistic-trajetory flight being unguided) and the (Mark-44) torpedo part was criticized as ineffectual against submarines moving at speeds over 18 knots. The piloted LAMPS helicopter, reported as slated to gradually replace the remote-controlled DASH helicopter, was appreciated to be a much more effective system than DASH for compensating for the inadequate or no-longer-existent speed advantage of surface ASW combatants over their nuclear-powered quarry. However, Soviet commentaries faulted the U.S. Navy for the limited initial procurement of 20 planned for LAMPS as, in effect, only about one-fourth of the 800 required. The net perception presumably was that it would be the mid-'80s or later before the great bulk of the U.S. Navy's destroyers and frigates had all received their LAMPS. The undisguised and overly enthusiastic approach to U.S. Navy experiments with new dynamic-lift ships probably was a fair indicator of the limited growth potential for ASW which the Soviet Navy leadership perceived in surface displacement ships, even with ASW helicopters. Despite a Naval

Digest article in August 1975 which attempted to temper the general enthusiasm, prototype U.S.-hydrofoil and air-cushion ASW ships for possible ocean ASW were viewed with unwarranted enthusiasm. One writer even attributed the unfortunate remark to a U.S. Chief of Naval Operations that the 92-knot DSX Class prototype air-cushion ship, SVO SES 100B, could "fundamentally change the nature of war at sea".

- Mines in the U.S. Navy during the 1971-'76 period were seen in a radically changed light just six months after the end of the XXIVth Party Congress in March 1971 due to the first prewar development by the U.S. of the new mines for ASW: the "mine-torpedo" CAPTOR and the bottom-laid QUICKSTRIKE mine. Particularly noteworthy was the fact that CAPTOR was described in ways that implicitly emphasized their particular suitability for use against SSBNs by mine blockade of Soviet submarine bases and by use on the ASW barriers across the major geographic chokepoints of the "World Ocean". CAPTOR was reported to have begun unit production in 1972 but not to be scheduled for mass production until 1977 or 1978 but eventually to provide a stockpile of 4,000 to 4,500 of these sophisticated mines which were noted to have a "great radius of action". In July 1975 Naval Digest presented a remarkable scenario in which CAPTOR mines were air-dropped into the GIUK Gap by U.S. Air Force B-52s and succeeded in just "a few days" in establishing an effective mine barrier blocking transit of Northern Fleet and Baltic Fleet submarines into the open Atlantic that otherwise allegedly would have required 60 to 90 days to effectively blockade the GIUK Gap by means of U.S. naval forces. Probably because it became apparent that CAPTOR mines were being procured with marked slowness as the 1971-'76 period ended, the Soviets regarded U.S. mine warfare as they had SOSUS a decade earlier -- as a professionally interesting development that posed no short or medium term threat but that required continuing observation to avoid any unpleasant surprises in the event of war from unanticipated offensive minefields laid by the U.S.

- Anti-SSBN ASW still was seen by the Soviets during the 1971-'76 period as beyond the state-of-the-art but commentaries on SOSUS in 1972 and 1975 by two Soviet admirals implied a realization that further improvements of SOSUS sensors and continued geographic expansion into the deep oceans could give the U.S. the equivalent of the long-sought technological breakthrough in ASW that would make the oceans transparent and deprive submarines of the covertness on which their utility and efficacy largely depends.

- The U.S. Navy still was not perceived from 1971 to 1976 as being assigned a priority anti-SSBN mission for war-

time. While only CVs were explicitly stated to have other priority missions, and while it can not be definitely ruled out that some U.S. SSNs were perceived as having priority wartime mission assignments against Soviet SSBNs, an October 1975 statement of U.S. ASW missions (that could be carried out by U.S. ASW forces provided with SOSUS vectors) failed to include even a general heading under which anti-SSBN ASW could have been even implicitly subsumed.

- General Soviet appraisals of U.S. ASW from 1971 to 1976, which had been exaggeratedly favorable throughout the '60s, in 1972 took a decided turn toward more realistic and less effusive praise. The overall effort was reduced from "enormous" or "great" to "vigorous". No single ASW program was singled out any longer as the recipient of great effort. The more realistic general appraisals of U.S. ASW seemingly reflect a more even handed treatment to sufficiently balance the previous exaggeration of the U.S. ASW "threat" (to justify more general-purpose naval forces ostensibly for SSBN protection) to avoid creating a morale problem among submarine personnel. In November 1975 the Navy Chief, Fleet Admiral Gorshkov, gave an accurate assessment in his book Seapower of the State of the ASW forces being developed for the U.S. Navy and merely alleged that the "tempo" of U.S. R&D in ASW was "being increased".

- U.S. budget allocations to ASW were too few and too scrambled to indicate anything other than the data presented were being carefully selected more with an eye to internal advocacy needs to support larger general purpose naval forces than to provide the readers with the objective facts.

- U.S. force levels of ASW platforms suitable for open-ocean search during the 1971-'76 period were: CVSs - decreased from 4 to 0; VP airplanes decreased 300 to 250, a reduction from 27 to 24 squadrons; SSNs increased from 46 to 65; while no data was reported on the number of destroyers and frigates with LAMPS and/or ASROC. Only one of the projected 30 Spruance Class DDs had been commissioned while the numbers of other destroyers operational were reported to have been cut back from 151 to 67.

- U.S. ASW forces' forward deployment/readiness was perceived during the 1971-'76 period as continuing at the reduced levels reported for 1966-'71 over the initial 1960-'66 period. There were no more CVSs in operation by the end of the period so the one forward-base CVS (with the Seventh Fleet in the Western Pacific) was no more. There were reports of single VP squadrons of 10-12 airplanes each being forward based at Bermuda, Ireland, the Azores, Spain, and Italy in the Atlantic-Mediterreanean and at Guam, in the

Aleutians, Japan, and on Okinawa in the Western Pacific. One six-ship destroyer squadron also was reported as based in Japan and a second was reported as planned for basing on Guam from the spring of 1975.

- Mission-completion capabilities of Soviet SSBNs continued to be paid routine lip service in a number of commentaries that claimed adequate capabilities. However, it was made clear that such claims refer to gross capabilities and do not make any allowances for the strength of enemy opposition. Moreover, the commentaries implied doubt regarding the opposed mission-completion capabilities of Soviet SSBNs. Most notably, Admiral Gorshkov was emphatic in the first edition of his Seapower of the State, in late 1975, that even the Navy's nuclear-powered submarines required the "support" of other naval forces to give them the "combat stability" required to complete their missions successfully.

OVERALL CONCLUSIONS RE. SOVIET PERCEPTIONS OF U.S. ASW FOR THE 1971-1976 PERIOD

- SOSUS was perceived as an expanded system of underwater detection that not only embraced stationary hydrophone nets and shore stations but also virtually every conceivable mobile means of submarine detection, whether underwater, surface air, or space. Several operational deep-ocean systems of limited geographic extent were observed to be operating satisfactorily, inferring that only time and money would be required to give the U.S. Navy a SOSUS substitute for the technological breakthrough in long-range ASW sensors that had eluded the extensive research of both superpowers. While SOSUS was portrayed as of inadequate range and effectiveness to constitute an immediate danger, the Soviet naval profession was being admonished, in effect, to start planning in earnest on how to disrupt SOSUS immediately upon the outbreak of war.

- The capability of U.S. VP airplanes to exploit rapidly SOSUS contacts, after a decade of being concealed, was finally at least mentioned in the Soviet open literature in late 1975 and in January 1976 SOSUS-vectored VP were acknowledged to be "highly effective".

- The ASW state-of-the-art in the United States during the five years from 1971 to 1976 seemed to be perceived by Soviet naval sources as being brought gradually but steadily abreast that of submarine warfare by the expansion of SOSUS into the deep ocean and the integration of its stationary and mobile components. Admiral Gorshkov, in his Seapower of the State in late 1975, made it abundantly clear that it was the SOSUS "means" rather than the VP or SSN "forces" that had made it imperative that Soviet submarines of all types be given the support of other naval forces in order to successfully carry out their wartime mission assignments.

- While the U.S. still was not perceived by 1980 as according top priority in its ASW efforts to anti-SSBN (as the "strategic" strike capabilities of the USSR's ballistic-missile submarines would seem to the Soviets to make necessary), nevertheless, the undifferentiated ASW capabilities of the US/ NATO naval forces against strategic and tactical submarines alike were seen as substantial enough as to require careful consideration and remedial action to the extent feasible.

BOTTOM LINE: The key Soviet perceptions of U.S. ASW in the 1971-1976 period were that:

(1) U.S. ASW capabilities, while still far from adequate for the anti-SSBN ASW mission, are steadily progressing toward a capability (on the basis of continuous SOSUS tracking and VP vectoring) for a substantial percentage of quick kills of those Soviet SSBNs on open-ocean combat station in peacetime; and

(2) The steadily increasing SSN force and the design and production of new ASW m..es constitute a major threat of blockade in their bases of all Soviet submarines, SSBNs included, and of their destruction while in transit in home waters or while attempting the "breakthrough" of ASW barriers at the key "straits and narrows" of the World Ocean.

ANALYSIS AND CONCLUSIONS RE. QUESTION #4 OF ACDA TASK STATEMENT FOR THE 1976-1980 PERIOD

A. "What U.S. ASW programs are the particular focus of Soviet commentary?"

For the most recent 1976-1980 period, the total number of commentaries on each of the six major ASW programs and the resultant ranking is as follows:

1 - SONUS(28)
2 - SSNs(26)
3 - DDs&FFs(22)
4 - VPs(17)
5 - CVs/CVSs/SCSs(16)
6 - MINES(10)

However, when this data is reordered according to the greatest percentage increase, the following results are obtained.

1 - SOSUS(34.4%)
2 - VPs(25.0%)
3 - MINES(3.9%)
4 - DDs&FFs(1.7%)
5 - CVs/CVSs/SCSs(1.1%)
6 - SSNs(0.5%)

While the limited size of the data base necessitates caution in drawing any hard and fast conclusions from the foregoing, the result shows trends that are consistant with the content of the data, as will be brought out in the conclusions drawn subsequently from this final period. The significant shifts since the XXVth Party Congress in February-March 1976 are seen to be:

- The interest in aircraft carriers and other air-capable ships, after having shown the most rapid rate of increase during 1971-'76, leveled off to only about one percent increase -- thereby dropping from first to fifth place.

- SOSUS, which had doubled in the preceding period, was one of only two ASW forces and means to continue any significant growth -- just over one-third -- and thereby moving it from second into first place.

- VP airplanes were the other growth stock, increasing a substantial 25%, thereby entitling it to move up from fourth to second place.

- SSNs, although last-ranking in rate of increase, have continued to merit a very high frequency of Soviet commentary -- which attests to the Soviets unflagging high interest in the one type of ASW force that can threaten the USSR's submarines in their own underwater environment.

- Mines maintained their third place in rate of growth by dint of an increase of just under 4%.

- The surface and subsurface ASW types showed a remarkable consistency and similarity in maintaining a very stable, high level of commentary, suggesting that there had been no significant alteration of basic Soviet naval perceptions of the importance of these ASW types for point defense of aircraft-carrier forces and merchant-ship convoys.

From the foregoing, it seem warranted to associate the quantitative results of SOSUS and VP airplanes being the two growth leaders (and the only two to have grown very rapidly) with the fact that the two in combination (i.e., VP airplanes vectored by SOSUS contact reports) have been accorded markedly greater recognition in the past four years than ever before. This suggests that the SOSUS/VP combination is being watched closely as the one potential source of threat to Soviet submarines operating in the open oceans.

ANALYSIS AND CONCLUSIONS RE. QUESTION #3 OF ACDA TASK STATEMENT FOR THE 1976-1980 PERIOD

B. "How frequently and in what context do the Soviets discuss U.S. ASW capabilities?"

The average number of commentaries per year rose from 18 to 22. This continued the unbroken rise in the number of commentaries over the four main periods into which this study was divided. As shown in the parenthetical figures in the 1976-'70 column in Table 3 below, had this final period been five years instead of only four and had the average yearly number of commentaries continued, the total for the five years would have amounted to 109 as compared to 92 for the preceding five-year period. This amounted to an increase of 22 percent over the total commentaries for the preceding period. This compared with about a 50 percent increase of the 1971-1976 period over the preceding 1966-1971 period, which in turn was about a 100 percent increase over the initial 1960-1966 period. Thus, the rate of increase had been dropping steadily and rapidly over the 20 years even though there was a substantial numerical increase each year. This may be seen statistically from Table 3 below:

SOURCE	1960-'66	1966-'71	1971-'76	1976-'80
Naval	30	44	82	71(90)*
Defense Ministry	5	13	8	10(12)
Party and Government (excluding Defense Ministry sources)	1	1	1	6 (7)
TOTALS	36	58	92	87(109)

TABLE 3: FREQUENCY OF SOVIET COMMENTARIES ON U.S. ASW BY NAVAL, DEFENSE MINISTRY, AND PARTY-GOVERNMENT SOURCES BY FIVE-YEAR-PLAN PERIODS FROM 1960 TO 1980

*Since the last period was only four years in duration, the actual number of sources has been increased by one-fourth to provide data comparable to that for the three earlier periods.

It appears from the above that naval attention to ASW has continued to increase over the two decades but with the major increase having come in the first half of the '70s when the number of items very roughly doubled, rising from 44 to 82. The fluctuations in the number of Defense Ministry sources were not great enough or of such a nature as to warrant any conclusions of significant change. The increase in Party-Government notices taken of ASW reasonably may be taken as a heightened awareness, at least, that ASW was not wholly unimportant in the scheme of things military.

As to the contexts for these Soviet commentaries on U.S. ASW over the final four years of the whole 1960-1980 time span, the discussion and comparison of the effectiveness of the various forces and means continued to provide a frequent context. Discussion of ASW in the naval exercises and operations of the U.S. and the other NATO Naval powers took a noticeable upswing. Also there was a marked increase in discussion of U.S. ASW in propaganda pieces. Other than these changes, the contexts took a wide variety of forms too diffuse to lend themselves to neat categorization.

ANALYSIS AND CONCLUSIONS RE. QUESTION #2 OF ACDA TASK STATEMENT FR THE 1976-1980 PERIOD

C. "How have the frequency and nature of Soviet commentaries changed?"

3 (a)- SOSUS -- The average frequency of references to SOSUS during this final period rose to seven per year compared to just under four yearly for the 1971-'76 period. This near doubling of Soviet commentaries on SOSUS appears to constitute an accurate indication of the rapidly growing significance being attributed by the Soviets to SOSUS as a key to the ASW equation.

Concerning the nature of the commentaries of SOSUS during this final period, there was a marked increase in the coverage of the development of new mobile (towable) and portable adjuncts to the stationary means. In addition, the commentaries gave the general impression that the many new developments would greatly enhance the effectiveness of the system in the 1980s. There was an unprecedented assertion that SOSUS constituted the "basis" of the "entire antisubmarine system" of the U.S./NATO. Perhaps not unrelated in Soviet perception and war planning there was also an unprecedented reference to the vulnerability of the SOSUS system. (These two new aspects of Soviet commentary on SOSUS are treated in detail in the "summary" on SOSUS in Part D following.)

The apparent restrictions commented on earlier that limited publication of accounts of SOSUS in books intended for a wide readership seemed to have been further relaxed in the 1976-'80 period but not eliminated. There were no references either open or veiled regarding SOSUS in two Army-authored books which appropriately could have discussed this ASW "means": The Soviet Armed Forces: A History of Construction (footnote 41) and The Armed Forces of Capitalist States (footnote 66).

Of seven naval books in which a discussion of SOSUS would have been relevant, three did contain such a discussion, two made only passing references to SOSUS, and the other two avoided mentioning SOSUS in contexts where omitting to do so left obvious voids. Thus substantial coverage was given to SOSUS in the 2nd edition of Rear Admiral A. I. Rodionov's DOSAFF booklet The Strike Force of the Navy (20, D-

47), in Captain First Rank B. I. Rodionov's booklet Antisubmarine Forces and Means of Navies (27, D-48), and in Deep Watch, a popular account of nuclear powered submarines (57, D-51). The two books which made unduly brief and vague references to SOSUS were N. A. Brusentsev's 1976 book Naval Aviation (6, D-46) and the 2nd (1979 edition of Admiral Gorshkov's Seapower of the State (70, D-52).

The first of the two books in which some mention of SOSUS seemed called for was Professor Potapov's 1977 hard-cover Scientific-Technological Progress and the Navy (31, D-49). In this book some description of SOSUS was to be expected on three grounds. First was that the subject logically required it. Second, it was Professor Potapov's 1971 book The Development of Navies in the Postwar Period (1, C-34) that was the exception to the rule in the 1971-'76 period that SOSUS was studiously ignored or given very short shrift in the major books of the period. Thirdly, in a book which offered the perfect opportunity to update his discussion of SOSUS of six years earlier, he did mention the related topics of detecting submarines by using airborne laser detection gear and by towed or stationary equipment for detecting a submarine's wake -- but passed over SOSUS in silence. Strange indeed! The second of these two books in which some mention of SOSUS seemed called for was the 1978 reference equivalent of Jane's Fighting Ships: Modern Combatant Warships. Like Jane's, it did not limit itself just to giving data on ships. Rather it addressed the very problem SOSUS is intended to resolve, that of the initial detection and classification of submarines, and even described it as the "most difficult" problem of ASW, but with nary a hint that anything had been done toward resolving the problem (52, D-50). This omission is so obvious that one suspects censorship more than oversight.

In view of this seeming system of selective authorization for military/naval books to discuss SOSUS, it would appear that the general tendency to suppress discussion of the subject in books intended for "a wide circle of readers" (as the Soviet phraseology usually puts it) is increasingly being eroded by the obvious need to disseminate the information to a farily wide spectrum of the military elite.

3 (b) - Shore-based VP Airplanes -- The total number of commentaries for the final (four-year) period was

the same (17) as for the preceding (five-year) period, so the commentaries per year increased 25 percent from somewhat over three per year to slightly more than four per year. This was consistent with the noticeably somewhat greater importance attributed to VP aircraft for ASW during the final four years than even in the preceding period.

While the employment of VP aircraft with SOSUS had only been mentioned twice in the preceding five-year period (once in October 1975 and again in January 1976), it was mentioned seven times in the final four year period (four more times in 1976, twice in 1977, and once in 1978). Six items reported on the production rate and total number of ORION airplanes provided the U.S. Navy. Only one mentioned weapons (the HARPOON missile), three mentioned equipment (A-NEW in two cases), and three mentioned R&D for a follow-on to the ORION P-3C, possibly a larger airplane.

Only two commentaries contained adverse remarks about the ASW capabilities of the ORION, while nine favorable commentaries appeared. Five of these nine were due to the capability of U.S. VP aircraft to be vectored to contact areas by SOSUS data while one of the negative remarks was that the ORION was not big enough to carry all the equipment that would be required for onboard processing of data from the hydrophones installed off the Atlantic coast of the U.S. (Project CAESAR). The general tenor of the commentaries was noticeably more positive and laudatory of VP aircraft than even those of the 1971-1976 period.

3 (c) - SSNs (plus SUBROC) -- Commentaries on SSNs went up slightly to 6.5/year from 6.2/year for 1971-1976 (to 26 for the final four years from 31 for the preceding five). R&D on SSNs by the U.S. was the subject of three of the 26 items. This was down from six for the preceding five years or from an average of 1.2/year to only .75/year or a 62 percent decrease. SUBROC, which had been discussed five times in 1971-1976 was dropped back to its 1966-1971 level of only two mentions.

No further references to the loss of the U.S. SSNs Thresher or Scorpion were made. Nor were there any other commentaries that stressed negative aspects of U.S. SSN development. However, the theme of the importance of SSNs relative to the other ASW forces

appeared only once more in the March 1976 issue of the Naval Digest and has not been heard from since. This was in contrast to four treatments in 1971-1976 and six in the 1966-1971 period. In both frequency and content, Soviet naval writers continued to evince a high level of interest in U.S. development of SSNs for ASW.

3 (d) - CVs/CVSs/SCSs (plus Aircraft) -- In comparison with an average of 3.6 commentaries per year on major air-capable ASW surface combatants during the preceding 1971-1976 period, this final four-year period yielded 16 relevant entries for an average of 4.0 per year -- virtually a steady-state of attention to the subject. In addition, there were 17 references to the ASW aircraft to be carried on these CVs and SCSs. The S-3A VIKING was mentioned 11 times as compared to nine times in 1971-1976 for its predecessor the S-2 TRACKER. Attention appears to have shifted away from the ASW helicopters carried aboard the major air-capable ships, i.e., the CVs, since references to them dropped from ten to four -- to the SH-3 SEA KING. References to VTOL (or VSTOL) airplanes remained the same numerically as for the preceding period (i.e., eight) but amounted to an increase in frequency from 1.6 to 2.0 items per year.

Content-wise, the commentaries continued the Soviet Navy side of the controversy with the Army over the need for major air-capable combatant ships, with ten of the commentaries arguing the Navy's adamant support for such ships for its own use and in the process, exaggerating the numbers and types of the U.S. Navy's air-capable ships both existing and projected. This applied to the mothballed anti-submarine aircraft carriers (CVSs), to the multi-purpose aircraft carriers (CVs or CVVs) and to the projected sea-control ships (SCSs). The eight references to VTOL aircraft also may be taken as more the reflection of an effort to justify the construction of additional Kiev Class VTOL-carrying "ASW cruisers" than as a perception that the U.S. Navy was making any real progress in VTOL development. Two commentaries discussed U.S. progress in developing larger air-capable surface effects ships. There was nothing very new in any of this.

3 (e) - DDs and FFs (plus ASROC and LAMPS) -- A total of 22 commentaries on these two ship types for the final four years of this study represented a moderate

increase in attention to ASW by destroyer types from an average of 4.8 entries per year for 1971-1976 to 5.5 for the final period. The attention to the ASROC antisubmarine missile-torpedo dropped to four, a drop in frequency from 1971-1976 to 1.0 year from 1.8. There were only six references to the LAMPS piloted helicopter system, which represented a drop to 1.5 mentions per year from 2.4 for the preceding five-year plan period. The frequency of references to developments of destroyer-type ships employing surface effects principles dropped slightly from an average of 1.40 per year to 1.25 for a total of five for the final four years.

As to the nature of the Soviet comment on U.S. destroyer-type ships, five of the 22 commentaries were general appraisals of the value of such types for ASW -- as will be discussed at some length further on in Part D re. actual Soviet perceptions. Of the remaining 17, 15 dealt with the construction of such types, two with destroyer modernization programs, and one with the decommissioning of old destroyers. Eight of the 15 items discussed the Spruance Class DD construction program, two concerned the follow-on DDG-47 program, two summarized the U.S. naval construction program for the next five years, and six treated the Oliver Hazard Perry DE construction program. All in all there was nothing to take special note of other than again coverage on torpedoes and sonar for destroyer type ships was surprisingly low -- just two on the Mark 46 torpedo and no references at all to sonar gear for surface ships.

3 (f) - Mines -- The frequency of commentaries on ASW mines increased from an average of 1.8 per year for 1971-1976 to 2.5 for 1976-1980. This involved a total of ten commentaries over the past four years. (The average length of the commentaries decreased somewhat since the ten commentaries filled only 5 1/2 typed pages while the nine for the preceding five-year period occupied 6 1/2 pages.)

The CAPTOR antisubmarine "mine-torpedo" continued to be the focus of attention with six of the ten commentaries discussing or at least mentioning it. The bottom-laid mine QUICKSTRIKE was described once and mentioned a second time while a brief description was given of the SLMM project for a submarine-launchable mobile mine. There was one extended commentary apiece on minelaying by airplanes and by

submarines. In addition there were three statements on the total number of CAPTOR mines that the U.S. planned to procure and two on the costs involved in U.S. mine development. Although one 1976 statement claimed that the U.S. was developing a total of five models of new mines, nothing was reported then or subsequently on what R&D might be going on in addition to CAPTOR, QUICKSTRIKE, and the SLMM project. Most interesting was the fact that seven of the ten commentaries included remarks about the perceived U.S. intentions for employing mines in any future war and that those perceptions, although showing considerable agreement that the U.S. would lay mines off Soviet submarine bases and in "straits and narrows" (especially in the GIUK Gap), otherwise varied widely over six additional missions -- as will be shown in Part D following on the actual Soviet perceptions of the U.S. mine warfare developments, capabilities, and intentions for wartime employment of mines.

2 (a) - General Appraisals of U.S. ASW -- In comparison with the frequency of 1.4 commentaries per year for the 1971-1976 period, these past four years have brought an average of 2.0 per year for a total of eight such entries. The increase in pages of typed text was slight, up to four and one-half from the four filled by the appraisals of the 1971-'76 period. The eight commentaries were fairly well spread over four years, with three in '76, two in '77, one in '78, and two in '79.

As to the nature of the appraisals, they tended mainly to let the somewhat tailored facts speak for themselves rather than attempting the politically tricky matter of characterizing U.S. ASW as either good or bad. (If it were made to look too good, the deterrent credibility of Soviet SSGNs would suffer; if it were painted in dark colors, Gorshkov's campaign for larger general purpose naval forces, nominally, at least to protect his strategic submarines, would be countered by Army opponents repeating the Army's argument of the late '60s that submarines require no support from other naval forces, especially if U.S. ASW were so bad).

The general approach was merely to list new U.S. ASW forces and to leave the reader to conclude that U.S. ASW must be quite good.

There were two notable exceptions to this formula. One greatly discounted U.S. ASW capabilities. The other foresaw the U.S. about to achieve a technological breakthrough in ASW. These both will be considered in part D on the actual Soviet perceptions themselves.

2 (b) - U.S. Budget Allocations to ASW -- The frequency of appearance of relevant commentaries on this subject increased from 0.8/year to 1.5/year -- but only from four in the 1971-'76 period to six for the final four years. The distribution of these six was satisfactory to cover the most recent period adequately: one commentary in 1976, two in 1977, one in 1978, and two in 1979.

Fortunately for the analysis, these were three separate reports of the total U.S. ASW expenditures that were well distributed over the period and were internally consistent enough to permit drawing the conclusion potentially obtainable from such budget data.

As before, the actual analysis is reserved for the final section, Part D, of this chapter concerning the reported perceptions of all various aspects of U.S. ASW for 1976-'80.

2 (c)- U.S. ASW Force Levels and Forward Deployment/ Readiness -- The frequency of commentaries on these aspects of the problem dropped from 4.4/year to 2.5 with the total number of commentaries in the final four years totalling only ten. They are contained on pages C-21 through C-25 of the appendices. Despite the reduction in total numbers, the text is only one half page short of the five pages taken up by the 22 items for the 1971-'76 period. The disappearance of reporting on U.S. ASW forces forward deployed and in readiness for employment on the ASW barriers that was noted in the 1971-'76 period was not altered by the commentaries of the 1976-'80 period and otherwise the nature of the reporting remained very similar.

With the necessary contextual preliminaries completed, let us now turn to the last part of this study, Part D on actual perceptions, for the final 1976-'80 period.

ANALYSIS AND CONCLUSIONS RE. QUESTION #1 OF ACDA TASK STATEMENT FOR THE 1976-1980 PERIOD

D. "What is the Soviet perception of U.S. ASW capabilities and how has it changed?"

3 (a) - SOSUS (plus compatible mobile/portable subystems) -- Again here as in the corresponding section on SOSUS for the earlier periods, the central importance of the SOSUS system for the analysis of this study has been recognized by introducing the intermediate analytical step by providing a chronological summary of the key points of the data as provided in the appendices (Appendix D) for this final period:

1976 - Without explaining the remark, a Naval Digest article on ASW tactics asserted that the U.S. Navy "is cognizant of the fact that the effectiveness of the system of long-range hydroacoustic detection of submarines can be lowered significantly by the employment of electronic countermeasures and that with their help a submarine being tracked /by SOSUS/ can escape" (1, D-44).

- A mobile SOSUS subsystem of towed sonar for specially-designed "small, quiet ships" named SURTASS (Surveillance Towed Array Sensors System) was reported to be under development by the U.S. "for patrolling in assigned regions", obviously in ones like the GIUK Gap where unfavorable conditions such as great depths and strong tides made it unfeasible to install stationary hydroacoustic listening nets. (FNC 3/76, D-44/45).

- The dependence of mobile antisubmarine forces on stationary detection means for initial detection of submarines and vectoring to the target was underlined for emphasis in a Naval Digest article on SOSUS. Also emphasized was the need for such systems to be developed in peacetime in order to be ready for immediate use at the outbreak of war. To attain its SOSUS capability, the U.S. was said to have expended "great efforts" to the extent of "marshaling the material resources of the country". The U.S. was credited with having "succeeded in completing the first stage in the development of a global system of submarine surveillance.". From the ensuing

description, this "first stage" apparently was perceived as embracing CAESAR (which was reported have been extended to cover the Caribbean and Gulf of Mexico), COLOSSUS, SEA SPIDER (reported to be operational), an unnamed SOSUS subsystem of hydrophones along the Aleutian chain and the Kurile-Kamchatka Trench, BARRIER and BRONCO hydrophone nets off the coasts of Denmark, Great Britain, Portugal, Italy, and Turkey, and the AFAR subsystem in the Atlantic Ocean approaches to the Straits of Gibraltar. Just what was to constitute the "second stage" was not specified but seemed to be implied, at least in part, by a subsequent remark that by the end of the '70s the U.S. would have an integrated computer system for ASW under the operational control of the U.S. fleet commanders-in-chief. (5, D-45/46).

- Deep-ocean SOSUS means were spoken of in the present imperfect tense as still "being developed" in the second edition of the DOSAAF booklet The Strike Force of the Navy by Rear Admiral A. I. Rodionov along with the assertion 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". Nevertheless, the U.S. was said to be paying "great attention" to extending SOSUS to the ocean depths (20, D-47).

1977 - SOSUS was treated even more favorably by another book which appeared four months later by the Defense Ministry's press and written by another Rodionov. In Antisubmarine Forces and Means of Navies Captain B. I. Rodionov credited the U.S. with having "succeeded in establishing a global system of antisubmarine surveillance" which provided for the "centralized collection" of information on the underwater situation from all ASW forces and means at sea, in the air, and in space. Satellites were said to be providing surveillance of warships at their bases and to have the capability to detect submarines at shallow depths as well as on the surface. The "main role" in the "long-range detection and initial classification" of

underwater targets was said to be allotted to the SOSUS system because "the effective range of sonar systems aboard mobile platforms was quite short" and because employment of aircraft resulted in "a considerable expenditure of sonobuoys". (27, D-48).

- The "basis" of the "entire antisubmarine system" of the U.S./NATO was said to be constituted by "positional hydroacoustic means" (30, D-48).

- In Scientific and Technological Progress and the Navy, Professor I. N. Potapov made the only mention found in the Soviet open literature of the possibility of developing stationary as well as towed sensors for detecting submarines by their wakes. (31, D-49).

- The U.S. was said in an article on SOSUS in the Naval Digest to be devoting a lot of attention to developing "a global military surveillance and control system". It was added that the system "will consist of 35 peripheral computer centers and a joint center in the Hawaiian Islands". The system was said to include detection, classification, and continuous tracking in peacetime. The primacy of hydroacoustic signals for long detection ranges and informational content was noted and all other means were said to be of "secondary importance" even though research in other types of detection was being continued. (42, D-49).

- The sole mention to be found in the Soviet open literature on the subject of the vulnerability or invulnerability of the SOSUS system was a clear if indirect implication by a naval-engineering captain third rank in Naval Digest that the system is vulnerable. In noting the advantages of towed sonar, its relative invulnerability compared to stationary hydroacoustic means was stated with such emphasis as to suggest that SOSUS is considered quite vulnerable. (42, D-49/50).

- A hydrocoustic sensor called SEA GUARD designed for towing by "special ships" was reported to have been developed by the U.S. for use against the less noisy submarines being built for the Soviet Navy. (42, D-49/50).

1978 - The U.S. was reported to be planning construction between 1979 and 1983 of 12 underwater ocean surveillance ships. (55, D-50 and 67, D-52).

- The SOSUS subsystems along the Aleutian chain and off Taiwan, Okinawa, Korea, and the Philippines were said to be the subject of research aimed at finding ways of improving them. The aim was said to be "a global system of long-range hydroacoustic surveillance", according to Deep Watch a popular account of nuclear-powered submarines! (57, D-50/51).

1979 - SASS, a "deep-water hydroacoustic surveillance system", was said to be under development and scheduled for completion of a protype by the end of FY 1982. (FNC 1/79, D-52).

- A new generation of improved sensors for fixed SOSUS arrays was reported to have begun production in 1977 after experimental work had shown that development of such improved gear was the most promising method available for increasing detection ranges (FNC 1/79, D-52).

- Fleet Admiral Gorshkov repeated in the second edition of Seapower of the State that the ASW development effort of the U.S. and its NATO allies was being accomplished mainly by the construction of more submarines, by refitting existing surface combatant ships, by the production of new antisubmarine aircraft with the latest weapons, and by "the installation of positional systems of long-range hydroacoustic surveillance". The latter were said to occupy "a special place" among "means for illumination of the underwater environment" and to have potentials for further development that were "far from exhausted" (70, D-52).

- "The main components" of the SOSUS system were said by a Naval Digest article to be operational -- and since 1973 to have included 22 SOSUS "stations" in the Atlantic and Pacific. The system was said to be inadequate to meet operational requirements "fully" for two reasons" 1) lack of sufficient geographic coverage of "all possible deployment routes" of Soviet submarines and "especially" of the combat patrol areas of the USSR's SSBNs, and 2) even in the areas covered by SOSUS, there were only "islands" in which coverage was satisfactory. Although the U.S. was said to be working to "eliminate the weak spots", it was claimed that SOSUS alone was not expected to be sufficient. A remedy was being sought in two new mutually supporting systems: 1) RDSS and SASS, an "anchored, stationary system" and 2) FDS, an "integrated towed system" for use on ASW barriers. (72, D-53).

- The U.S. was reported in Naval Digest to be conducting studies aimed at making "substantial improvement" in ASW, basically seeking "new approaches and new equipment which will insure detection and extended tracking of SSBNs in the World Ocean". The impetus for the studies was said to have stemmed from an appraisal of U.S. ASW by Vice Admiral Fritz Harlfinger as only 20 percent effective overall. (72, D-53/54).

- U.S. capabilities for employment of earth satellites as a submarine surveillance system was implied to be only in the earliest stage of consideration as a "possibility" that was being given "serious consideration". (72, D-54/55).

- An article on alleged U.S. efforts to provide protection for its SSBNs in the December issue of Foreign Military Observer by a captain first rank claimed that the U.S. was paying "intense attention" to ASW and was achieving a "close coordination" between the antisubmarine forces and the SOSUS system. (82, D-55).

- A second article in the December issue of Foreign Military Observer, also by an active-

duty captain first rank, was devoted to the prospects for SOSUS. The requirement for a system capable of continuous surveillance of submarines in the open ocean was stated as the sina qua non of successful ASW but the SOSUS system was found wanting on the score of insufficiently rapid processing of submarine contact reports to insure "the timely employment of weapons against them". The efforts being made by the U.S. to correct this shortcoming were described as "extensive" and to involve the following programs: SEA GUARD, LAMBDA (not described), LRAPP, TASS, RDSS, and SASS. It was added that the U.S. solution for obtaining underwater surveillance in areas where either no stationary detection means exist at all or they were inadequate would be to make use of "special hydroacoustic surveillance ships". RDSS (Rapid Deployment Surveillance System) was described as anchored sonobuoys with a 90-day operational life expectancy that required either an earth satellite or an airplane to transmit their surveillance data to the nearest shore station. The SASS program (Suspended Array Surveillance System) was to be a stationary system at depths of up to 6,000 meters and intended for use against quiet, deep-running submarines. In the R&D category, possible non-acoustic means were being subjected to "extensive" research, including lasers and magnetic anomaly detection by stationary systems. Centralized data processing on a "close to real-time" basis was expected to double the effectiveness of U.S. ASW. To this end a new computer system named PROTEUS had been developed and was expected to be operational within a year. U.S. plans called for installing it on (all) 240 ORION ASW patrol planes, on 100 frigates and destroyers, and on 12 hydroacoustic surveillance ships. A comparable system reportedly had been developed for the nuclear-powered submarines of the U.S. The problem of classification was said to have been addressed by a "special method" called FACT (Fast Asymtotic Coherent Transmission) that was viewed as of "great significance" for providing automatic classification of underwater contacts. The Ocean Surveillance Information System (OSIS)

was to tie together a fleet ASW organization as a further contribution to "the development of a global system of surveillance" in the oceanic TVDs. (83, D-55/58).

Summary re SOSUS, 1976-80 -- A statement unprecedented in Soviet media releases before or since and seemingly revealing of a critically important Soviet perception of U.S. ASW was made in a June 1977 article in Naval Digest. The "entire antisubmarine system" of the U.S. and other NATO naval powers was said to have been organized on the "basis" of SOSUS (30, D-48). That this was a general perception in Soviet naval circles seemed more likely in view of the fact that it appeared in a rather propagandistic article on the "course against detente" of "capitalist" navies in 1976 by a Naval Digest staff writer who most likely was repeating what he had picked up eclectically for the article. Whether or not this speculation is valid, the fact that any Soviet naval source might view SOSUS as the "basis" of the entire NATO ASW "system" also carries the logical implication that it might be viewed correlatively as the Achilles heel of that system.

That such might indeed be the case was suggested later the same year by a December 1977 article in Naval Digest by an engineering-captain third rank who mentioned in another context and in passing (and so quite possibly inadvertently) that "fixed hydroacoustic facilities" could "by no means' be considered invulnerable "to enemy ordnance" (42, D-49). (The context was one of "towed arrays" and their lesser vulnerabililty -- which, in itself, suggested that the Soviets were making a virtue out of the lack of coastal real estate for establishing their own SOSUS system and had decided to concentrate on hydroacoustic antennae towed by the "mobile" naval forces.)

It will be recalled from the comparable "Summary re. SOSUS" for the preceding 1971-'76 period that 1975 had brought an unprecedented if implicit portrayal of the threat constituted by SOSUS to the deterrent credibility of the USSR's seaborne strategic deterrent. This had come in an October 1975 article in Naval Digest by Captain First Rank V'yunenko that had indicated that establishment of a "hydroacoustical field" such as the one he said the U.S. had under development would enable SSBNs' prompt destruction in a war. Nothing nearly so definitive appeared again for two and a half years -- but when a comparable statement did appear, it abandoned the implicit approach taken by V'yunenko and stated explicitly both that the capability was not just under development but already was in existence and that it no longer was just a vague, indeterminate "hydro-

acoustical field" but was an operational system named "SOSUS" that had been under development for over 20 years, that already covered "vast underwater expanses", and was being even further improved. These statements came in an article in the May 1979 issue of Naval Digest that directly addressed the problems of ASW against SSBNs. It stated inter alia:

> The passive hydroacoustic system SOSUS has been in operation for over 20 years... By mid-'73, 22 SOSUS stations had been installed in the Atlantic and Pacific 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 (72, D-53).

Although this article threw up an evanescent smoke screen to satisfy censorship requirements -- such as asserting that even the SOSUS zone had only "islands" of optimum detection, that the current capability did not "fully" meet U.S. requirements, and that more work was underway to eliminate "the weak spots" -- the net result of the article was one of loudly praising SOSUS with faint damns.

The published descriptions of the importance of the U.S. was held to attach to improving SOSUS continued to be expressed in superlatives throughout the 1976-1980 period. Thus, in May 1976, an article in the Naval Digest on "The System of Continuous Antisubmarine Surveillance" (5, D-46) presented U.S. "efforts" to develop SOSUS as having been "great" in extent, allegedly even involving "concentration of the material resources of the country" -- a favorite Soviet military expression to denote an all-out national effort in one or another defense field such as shipbuilding, ICBM construction, etc. In November of the same year, the second edition of Rear Admiral A. I. Rodionov's DOSAAF booklet The Strike Force of the Navy twice used the same description of "great" to describe the "attention being given abroad" to the major aspects of ASW including first 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, D-47). The second use of "great" in the booklet for the paramilitary youth organization was to characterize the

development which the U.S. had been giving since the end of World War II to "stationary (positional) hydroacoustic means for the detection of nuclear-powered missile submarines" (20, D-47).

The following year two comparable statements appeared. The first only characterized as "considerable" the "cost and effort" that the "U.S. Armed Forces and their NATO allies" had been devoting to a "global system of antisubmarine surveillance" but went on to make it clear that the "considerable" was intended as an understatement since this effort had required "the concentration of the material resources of all of the NATO countries" (27, D-48). This assertion was contained in Captain B. I. Rodionov's booklet Antisubmarine Forces and Means of Navies which appeared in April 1977 under the imprimatur of the Military Press of the Soviet Defense Ministry. It will be noted that the claim in the May 1976 Naval Digest article on SOSUS (considered above) that U.S. resources had been mobilized to build the system was now expanded by Captain Rodionov to apply the economies of all of the NATO countries -- a laughable exaggeration even with regard to the U.S. let alone applied to NATO allies who contributed only peripherally. The second such statement to appear in 1977 was one by an engineering-captain third rank in the December issue of Naval Digest who informed readers that the U.S. was according "a lot of attention" at that time " to the development of a system for the continuous surveillance of submarines in the World Ocean" (42, D-49).

The two most recent of such evaluations of U.S. efforts extend the geographic coverage and enhance the effectiveness of SOSUS came in 1978 and 1979. An item in the "Foreign Naval Chronicle" in the August 1978 issue of the Naval Digest stated that the United States was paying "special attention" to extending SOSUS into the deep oceans by development of a towed antenna array (FNC 8/78, D-50). Finally, in May 1979, a Naval Digest article on detection of SSBNs asserted that "very great importance" was accorded by "American military experts" to SOSUS as constituting "a very important component" part of ASW (72, D-53).

Thus, if one were to judge Soviet perceptions of SOSUS solely from the declarative statements quoted above, these perceptions would have to be adjudged as reflecting "great" concern or, at least, a "very high" level of concern. The same holds true in general with regard to the three Soviet commentaries during the 1976-1980 period on the dollar expenditures being made for SOSUS. The first of these was a "Foreign Naval Chronicle" item in the March 1976 Naval Digest which claimed that "one billion dollars" had been

appropriated for SOSUS development alone in the past two or three years (FNC 3/76, D-45). The second commentary to quote a price came in the December 1977 issue of Naval Digest and gave $800 million per year for the 1975-1978 period as the price for SOSUS research and development (42, D-49). The third and latest figure appeared in an account of nuclear-powered submarines, Deep Watch, which appeared in October 1978. The 800 million dollars/per year figure of a year before was repeated and, more interestingly, it was observed that this amounted to one-fourth of the entire U.S. budget for ASW (57, D-51).

The same particular concern evidenced since the early '70s of a perceived trend in the evolution of SOSUS toward becoming a "global" system that would embrace the ocean depths of virtually the whole World Ocean rather than just the continental shelf off the U.S. East and West coasts has continued to be exhibited during the most recent four years. Use of the adjective "global" to describe the intended eventual (or already existing) nature of the U.S. system of submarine surveillance is to be found five times during the final 1976-1980 period, distributed one each year except for two in 1977.

The first, in May 1976, came in an unsigned Naval Digest article on such systems which credited the U.S. with only having completed an undefined, undescribed "first stage" in the development of "a global system of submarine surveillance" (5, D-46). The second came just a year later in Captain B. I. Rodionv's booklet on ASW, Antisubmarine Forces and Means of Navies which was released by the censors in April 1977. It stated that SOSUS constituted the "basis" for a "global system of surveillance of the underwater environment" and that, as such, was charged with "the main role" in the resolution of the problem of long-range detection and the initial classification of enemy submarines (27, D-48). It sounded very much as though Captain Rodionov had set out to correct any misperceptions as to the completeness of the SOSUS system augmented by mobile/portable means (including any misconception resulting from the statement in the May 1976 Naval Digest article described just above that (only) a "first stage" of SOSUS had been completed). At least his Antisubmarine Forces and Means stated with unusual explicitness in discussions regarding SOSUS that "the policy-makers of the U.S. Armed Forces and their NATO allies have succeeded in establishing a global system of antisubmarine surveillance" period!

The third use of "global" to describe SOSUS during the 1976-1980 period came in December 1977 in an article on submarine-detection trends in the U.S. Navy by a naval

engineering officer of junior rank. As befitting his juniority, he approached the matter of asserting that SOSUS was "global" with some caution, making his point indirectly by asserting that SOSUS was to be incorporated into "a global military surveillance and control system" (42, D-49/50).

In the book Deep Watch edited by Vice Admiral Sorokin and which made its appearance in the fall of 1978, it was stated that about one-fourth of U.S. ASW funds were being expended at that time "for the development of a global system of long-range hydroacoustic surveillance" (57, D-51). Occupying the post of the top political admiral of the Navy, Sorokin presumably found it impolitic to assert that such a "global" SOSUS system had been completed since that would have reflected directly on the deterrent credibility of the USSR's handful of deployed Yankee Class SSBNs.

The final commentary on the allegedly "global" nature of SOSUS to appear up to the present was one in the December 1979 issue of the Foreign Military Observer. In a long and meaty article by a Captain First Rank Irinin entitled "Prospects of U.S. Navy Development of Hydroacoustic Systems for Surveillance of the Underwater Situation", it was stated in conclusion that the article had treated "the basic direction of the 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, D-58).

It is noteworthy that this article, like Admiral Sorokin's the year before, failed to reaffirm Captain Rodinov's April 1977 assertion, in effect, that a global SOSUS system had been completed. Probably of most analytical significance is that the April 1977 statement had not been refuted.

For the final 1976-1980 period, on which our current estimate of Soviet perceptions of the potential threat of premature detection of Soviet SSBNs must be based, the following composite picture of the overall SOSUS system has been put together by drawing on all of the material contained in Sections 2(a) of Appendices A through D:

A. The Hardware Components of SOSUS (and portable/towable subsystems):

1) Hydrophone arrays for offshore use at depths of a few hundred meters;

2) Hydrophone arrays for deep-ocean use down to 6,000 meters -- a test model of such a Suspended Array Surveillance System (SASS) to be completed by the end of FY 1982;

3) Air-droppable, long-lasting, self-anchoring sonobuoys of the Rapid Deployment Surveillance System (RDSS); and

4) Towable hyroacoustic antenna arrays of various designations for various types of surface ships and submarines.

B. The "Mobile" ASW Surveillance Forces of SOSUS:

1) Aircraft -- All long-range U.S. military, naval, and civil aircraft;

2) Submarines -- Usually listed but omitted from a May 1979 article in Naval Digest by I. Kuz'min (72, D-53/54).

3) Surface ships -- All U.S. naval, Army, and merchant ships; also twelve special ocean surveillance ships with Surveillance Towed Arrays Sensors System (SURTASS); and

4) Space satellites -- For detection of submarines in port or while surfaced when entering or leaving port, or while at shallow depths.

C. The ASW "Zones" and "Barriers" of SOSUS:

1) Atlantic:

a) The "approaches" to the U.S. East Coast -- the first SOSUS installation (starting in the late 40's) under Project CAESAR;

b) The Caribbean and Gulf of Mexico -- installed in the 1970s;

c) In the Eastern Atlantic in the vicinity of the Azores under Project AFAR to give coverage of the Atlantic approaches to the Straits of Gibraltar;

d) The Greenland-Iceland-United Kingdom (GIUK) ASW barrier which is only patrolled occasionally except in periods of international tension; and

e) Offshore hydrophones in the coastal waters of Denmark (and in the Danish Straits), the UK, Portugal, Italy, and Turkey (including the Turkish Straits), installed under U.S./NATO projects BARRIER and BRONCO.

2) Pacific:

a) The "approaches" to the U.S. West Coast -- installed in the late 1960s under Project COLOSSUS;

b) Mid-Pacific north of the Hawaiian Islands, operational by 1976 at the latest and known as SEA SPIDER;

c) A Northern-Pacific ASW barrier between Japan and Alaska which only patrolled occasionally except in periods of heightened international tension;

d) Along the Aleutian chain and the Kuriles-Kamachatka Trench -- bottom-installed hydrophones not associated in the Soviet media with any project name; and

e) Offshore hydrophone arrays in the vicinity of Okinawa, the Korean Peninsula, Taiwan, and the Philippines -- also not associated in the Soviet media with any project names.

D. New ASW Data-Processing Systems:

1) OSIS - The "Ocean Surveillance Information System" which collects, processes, and transmits nearly real-time data to all of the "mobile" elements of the SOSUS system;

2) PROTEUS - A digital-processing system for SOSUS contacts which is said to have improved data processing 100 percent; and

3) FACT - "Fast Asymptotic Coherent Transmission" -- beautiful bureaucratese for an

automatic system for classification of underwater contacts.

E. New ASW Organizations:

a) The Joint Intelligence Center "for the SOSUS system" located in the Hawaiian Islands;

b) Fleet Command Centers (FCC) -- "for control of U.S. naval forces in the ASW zones";

c) The ASW Command and Control Centers Systems (ASWCCCS) -- the "centers for control of ASW forces"; and

d) Task Force Command Centers (TFCC) -- "an automated flag command center".

F. Research and Development Programs in Progress:

a) SASS -- see sub paragraph A.2 above

b) LRAPP -- An acoustic modelling program for determining optimal hydroacoustic equipment for any given locality as determined by such variables as temperatures, salinity, and depths.

c) ETAS -- Escort Towed Array System -- "eventually" to replace an interim ETAS reported as nearly operational in early 1976.

d) A low-frequency directional hydrophone reported in August 1976 to be under development by the Naval Research Lab; and

e) Stationary and towable wake-detection gear.

f) A stationary magnetic anomaly detection system.

As in the preceding five-year period, Soviet commentaries on the effectiveness of SOSUS to detect and track the USSR's nuclear-powered submarines have been the subject during the past four years of many conflicting claims. A clear appreciation of the real direction of thrust of these

at least outwardly unreconcilable assertions is central to understanding the obviously critical role of SOSUS in Soviet perceptions of U.S. ASW. Accordingly, they will be examined carefully.

The 1976-1980 evidence on the effectiveness of SOSUS again fell into the same two categories: 1) Factual-sounding statements as to the high effectiveness of SOSUS that would lead readers to conclude that the Soviet Navy had cause for great concern; and 2) Assertions that SOSUS still suffered from such limitations that it constituted no threat of premature detection of Soviet SSBNs should war break out tomorrow or in the next few years. The 1976-1980 Soviet open sources yielded the same number (six) of commentaries claming high effectiveness for SOSUS as was found for the earlier five-year period. However, compared to the equal number (six) of negative commentaries for the earlier period, only two were to be found for the current period -- and they were much weaker than what had gone before.

Let us look at these two negative reactions first before turning to the six positive statements. The first came in November 1976 with the publication of the 2nd edition of Rear Admiral A. I. Rodionov's DOSAAF booklet The Strike Force of the Navy. In it was asserted that "those 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, D-47).

The second negative appraisal of SOSUS occurred in mid-1978 in the handbook Modern Combatant Ships. It stated much less explicitly than had Admiral Rodinov 19 months earlier that:

> 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, D-50).

It will be noted that this passage really went no further than to repeat the truism that initial detection and classification were the key problems of ASW. However, by not going on even far enough to mention SOSUS, an uniformed reader would have assumed logically that no significant partial solution to these problems had been found.

In any case, the commentaries for these last four years are most significant for several specific points mentioned in 1971-1976 that were notably absent from the commentary for 1976-1980. In the first place, the location by SOSUS of the sinking of the U.S. SSN Scorpion was no longer cited as proof of the effectiveness of the SOSUS system. Secondly, the claim that Soviet SSBNs could fire from beyond the detection range of SOSUS was not reiterated (surprisingly since the advent of the Delta Class SSBN gave the claim more apparent validity). Thirdly, there was no repetition of the earlier assertion that continuous surveillance of an enemy submarine was "virtually impossible". Rather, the subject simply was not discussed. Finally, the 1974 talk of the "great difficulties" confronting U.S. efforts to "widen the coastal zone of submarine detection" (53, C-38/39) gave way completely to discussion of the Suspended Array Surveillance system (SASS) which, Soviet writings seemed to take for granted, would do precisely that during the 1980s.

Turning now to the "weight" of evidence on the side of the six positive commentaries, it should be noted at the outset that they contained even more favorable comments on the present and prospective effectiveness of SOSUS than had the equal number of such commentaries for the preceding five years. The first of these came in an April 1976 Naval Digest article on the organization of NATO ASW forces in the Mediterranean which mentioned indirectly that a peacetime "system of continuous antisubmarine surveillance" was functioning in the Atlantic and Pacific (2, D-44). Equally important here was the further assertion that shore-based patrol aviation could "operate very effectively" for ASW (provided air bases were available) "in combination with the stationary means" of submarine detection.

The second came just a month later in May 1976, and also in Naval Digest -- this time in an article about SOSUS entitled "A System for Continuous Antisubmarine Surveillance" (5, D-46). First positing in boldface type that the "only" adequate basis for anti-SSBN ASW is a system of "continuous and systematic tracking that has been developed in peacetime of each nuclear-powered missile submarine", the unsigned article then goes on to make it clear that SOSUS has been constituted on just such a basis. Once SOSUS has detected a submarine, it was said to be tracked continuously with the position data retransmitted by one of 22 SOSUS shore stations to an ASW "command post" which, in turn, passed the information to the mobile ASW forces.

The third of the positive appraisals of SOSUS found in the msot recent (1976-1980) period turned up in Captain

First Rank B. I. Rodionov's 1977 booklet The Antisubmarine Forces and Means of Navies. In an unusually unequivocal assertion of the global scope and unqualified effectiveness of SOSUS, it was stated:

> Inasmuch as the effective range of sonar systems aboard mobile platforms is quite low, 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 (27, D-48).

The next (fourth) good word entered on the record for SOSUS since the XXVth Party Congress ended in March 1976 did not appear for two full years. Finally in May 1979 Naval Digest carried an article on "Surveillance of Nuclear-powered Missile Submarines" which already was quoted at the outset of this section as according unprecedentedly strong and explicit praise to SOSUS as capable of keeping "vast underwater expanses" of the Atlantic and Pacific under ASW surveillance and to detect, track, and classify submarines (72, D-53). For these capabilities, it was noted, the U.S allotted a "major role" to SOSUS in anti-SSBN ASW intended to sink Soviet SSBNs before they had time to launch their missiles.

The fifth of the positive statements about SOSUS came in the 2nd edition of Admiral Gorshkov's Seapower of the State. Released for publication in August 1979, the second edition repeated with only inconsequential changes the observations regarding SOSUS that had been carried in the first edition more than three years before. This included the passage quoted at the comparable point in the analysis for the 1971-1976 period at which the remarks of the first edition concerning SOSUS where made:

> Means for the illumination of the underwter environment...have acquired a most important significance under contemporary conditions. Among them, a special place has been occupied by hydroacoustic stations and systems...(70, D-52/53).

It should be added that Gorshkov also remarked in both editions that "the establishment of positional systems of long-range hydroacoustic surveillance" was one of the "main" foci of the U.S. ASW developmental efforts along with the construction and modernization of more submarines, surface combatant ships, and aircraft for ASW.

The sixth and final contribution to the "weight-of-evidence" conclusion that SOSUS is perceived as a system that must be taken strictly into account in Soviet military calculations came in December 1979 in an article by a Captain First Rank on the U.S. prospects for the further development of SOSUS. Published in the Foreign Military Observer, the article was notable for implying that within a year digital data processing equipment for hydroacoustic signals would have been installed on U.S. SSNs, on 240 ORION VP airplanes, on 100 DDs/DLs, and on 12 hydroacoustic surveillance ships, thereby doubling the data processing capability and increasing overall ASW effectiveness by 50 percent (83, D-57).

In consideration of the above material reflecting Soviet perceptions of SOSUS over the four years up to March of this year (1980), the following interim final conclusions are drawn:

- The two comments implying significant shortcomings in SOSUS are either quite adequately accountable for a propaganda aimed at Soviet youth (Rear Admiral Rodionov's DOSAAF booklet) or as insubstantial in its nature (Modern Combatant Ships).

- The absence of any real criticism of SOSUS in the Naval Digest and in the important books published during the period must be considered of major significance.

- When the weight of the six positive comments on SOSUS are added to the scales, it is apparent that a significant change in Soviet perceptions of SOSUS has taken place in the past four years in the direction of taking it markedly more seriously than before.

- On balance, SOSUS is perceived as "global" in scope, already of considerable effectiveness and programmed to become highly effective by the mid-80s against Soviet submarines operating in the open oceans.

As will be seen from the immediately following section, the greatly increased mention of SOSUS data being used effectively by VP airplanes suggests one likely reason for SOSUS being taken more seriously.

3 (b) - Shore-based VP Airplanes -- As mentioned earlier in Part C on the frequency and nature of Soviet commentary on U.S. VP airplanes for this final period, there were only two negative comments on the ASW capabilities of the ORION P-3C as compared with nine positive assessments. Also mentioned at the same juncture was that these favorable commentaries were even more laudatory of the ASW capabilities of the ORION than in the preceding period. Also noted was that five of these nine commentaries grounded their favorable appraisal on the VP capability to utilize SOSUS vectors to make initial contact. These five commentaries are of sufficient importance to the analysis at hand to merit particular note and the drawing of such conclusions as the evidence warrants.

The first of these appeared in an unsigned Naval Digest article in March 1976 and was to the effect that the ASW VP of the U.S. and other NATO naval powers in the Mediterranean could "operate very effectively in combination with stationary means" (2, D-59). The context of this two-page article on "Organization of the Antisubmarine Forces of the Unified NATO Forces in the Mediterranean" suggested that this claimed effectiveness may have been perceived by senior Soviet naval officers as dependent on the simultaneously noted "existence of a developed net of air bases dispersed throughout the entire theater". However, it should be noted that this article was a follow on to a very similar short article on "Organization of the Antisubmarine Forces of the U.S. Pacific Fleet" that had appeared two months earlier, just before the XXVth Party Congress, and had claimed, even with regard to the much larger Pacific theater where VP bases are fewer and much further apart, that the U.S. considered that VP airplanes are "highly effective in combination with the stationary means of surveillance" (90, C-47).

The second of these five commentaries whose favorable nature were predicated on ASW VP use of SOSUS vectors appeared two months later and again in Naval Digest. In an article in the May 1976 issue on air ASW tactics, a Captain First Rank and a

civilian colleague noted that aviation was "especially effective" when it could be "vectored to targets by positional hydroacoustic systems" (4, D-59).

The third of these commentaries came in the same May 1976 issue of Naval Digest in a two-page factual summary of SOSUS entitled "A System for Continuous Antisubmarine Surveillance". This unsigned summary included the implicitly favorable observations.

> 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, D-59).

The next to the last of these five commentaries made its appearance 13 months later, and again in an issue of Naval Digest, that of June 1977. The occasion was a review of naval developments during 1976 in the major non-Communist navies and the relevant remark was simply that NATO naval training in that year had demonstrated the scarcely surprising fact that "U.S. airplanes of shore-based patrol aviation were the most effective of the forces in arriving rapidly in the area of the contacts made by stationary means" (30, D-61).

The fifth and final one of these commentaries appeared in November 1978 with the release by the censors of Volume VI of the still incomplete ten-volume Soviet Military Encyclopedia. In an article on "Antisubmarine Aviation", N. I. Vishenskiy wrote that "operations of antisubmarine aviation based on data from positional hydroacoustic means (systems) are acquiring ever greater importance" (59, D-62). Since Vishenskiy is an Aviation Major General and Deputy Commander-in-Chief of the Soviet Naval Air Force, the statement takes on particular authority.

Although it did not praise VP aircraft due to their capability to use SOSUS vectors as did the five commentaries just noted, a sixth one deserves mention to make this account of the most significant commentaries complete. In his 1977 Defense ministry booklet Antisubmarine Forces and Means of Navies, Captain B. I. Rodionov gave at least a passing nod to SOSUS-vectored VP capabilities. Shore-based aviation was said to be viewed by the postwar leaders of the U.S. and other NATO navies as "a most

important, integral part of the antisubmarine forces" at least the last of whose tasks was listed as "localizing submarine contacts detected by other means (primarily by stationary ones)" (27, D-61).

From the foregoing it seems clear that the restoration of VP aircraft to general good repute for ASW, that we noted in the 1971-1976 period, has been followed in the 1976-1980 period by specific recognition of them as particularly effective when given SOSUS vectors to make initial contacts.

3 (c) - SSNs (plus SUBROC) -- It will be recalled from the comparable section 3(c) for the preceding 1971-1976 period that the conclusion was drawn that, despite Soviet publication of numerous inflated estimates of U.S. SSN construction rates and final force goals that served the Navy's internal advocacy needs, U.S. achievements in SSN construction were perceived clearly by the Soviet leadership to amount to the very modest level (by Soviet submarine building standards) of only about two SSNs per year. It was further surmised that such a SSN construction rate would not cause Soviet naval planners to lose any sleep unless, and until it had been continued over many years.[1]

During the final four years, the construction of U.S. SSNs has been perceived by Soviet naval sources as having been subjected to even greater delays than before. Thus, in the fall of 1977 Naval Digest noted that the U.S. Navy's program for SSN construction was "lagging about two years behind schedule" (FNC 9/77, D-67). At the time the SSN 688 Los Angeles, lead ship of the class, was commissioned in mid-November 1976, the Soviets apparently perceived the U.S. as having 60 SSNs operational, still four short of the 64 goal that had been announced ten years earlier by then Secretary of Defense McNamara as necessary to meet U.S. military

1/That is not to say that construction of even a few Los Angeles Class SSNs would not prompt naval planners to look hard at the security of their Delta Class SSBNs in protected home-water sanctuaries of "maneuvering" bases, but ASW in home waters that can be patrolled by the Soviet Navy's largely land-based air arm is at least within the realm of the possible and has been the main focus of Soviet ASW efforts.

requirements at that time (1, C-48). Then in FY 1977, the U.S. Navy only received three of the seven of the projected 36 additional Los Angeles Class SSNs that had been programmed for delivery (FNC 4/78 and 52, D-67). And since then only one additional SSN has been reported as even launched (and that after two years, two months, and two weeks on the ways). This was SSN-698, USS Bremerton, in July 1978 (FNC 3/79, D-69). Moreover, the SSN construction rate has been noted in effect to have dropped off to only a little more if any than one boat per year (55 and 67, D-68).

Admiral Gorshkov had had the last work so far. In the second edition of his Seapower of the State, which was submitted to the censors at the end of April 1979 and passed by them for publication in August, he claimed that the U.S. plans to build "more than 40" of the Los Angeles Class SSN for an SSN force goal of "about 90 nuclear-powered multipurpose submarines" (70, D-69). Like Professor Potapov in his 1971 reporting of a force goal of 100 (1, C-48), the Navy chief took the slow and lagging U.S. production record into account and refrained from predicting when (if ever) the planned force level of 90 could be expected to be reached.

Perhaps likely to have had an even more adverse effect on Soviet perceptions of the U.S. development of attack submarines is the failure to carry through on plans bruited in the mid-'70s to develop a wholly new, deeper-diving, faster attack submarine and complete construction of the first two of them by the end of the decade. In 1977 there appeared the latest of Professor Potapov's books on postwar naval developments, this one entitled Scientific-Technological Progress and the Navy. It included the following relevant passage:

> 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, D-66).

While the Soviet Navy, as we now can easily reconstruct from hindsight, was developing its own wholly new, deeper-diving, faster attack submarine of the Alpha Class, the U.S. Navy must have been perceived as resting overlong on its laurels for having developed the Los Angeles Class -- and perhaps as too preoccupied with seeing construction of that class to its completion to effectively promote the new class.

3 (d) - CVs/CVSs/SCSs (plus Aircraft) -- Soviet commentary on the ASW value of the major types of air-capable, U.S. combatants has continued in the last four years of our study to be less directly reflective of any Soviet perceptions of the threat posed by such ships to their submarines and more often used as foreign-navy surrogates to discuss the Soviet Navy's requirements for large numbers of such ships to prosecute the anti-SSBN mission less ineffectively. While a dozen years have passed since the Army last publicly inferred that the Navy should forego building large air-capable ships and rely on SSNs for the anti-SSBN mission (24, B-58), the Navy is still publishing counter arguments to the Army's position, which was noted earlier to be consonant with Soviet military doctrine which holds that the naval part of any general war will be fought with "main striking forces" of submarines and aircraft and that large surface ships are only required in limited numbers in auxiliary roles, primarily to enhance the "combat stability" (survivability) of the submarines and especially the SSBNs.

In the preceding 1971-1976 period, it will be recalled, Professor Potapov produced a book (The Development of Navies in the Postwar Period) which included a counter argument to the Army position by clearly implying that ASW submarines inherently lacked the capabilities for singlehandedly fulfilling the ASW tasks with which the Soviet Navy was confronted. In mid-1977, when there appeared the third of Professor Potapov's major books on naval developments since Khrushchev's removal, he could be seen to still be arguing against the Army position -- but, considering that follow-on classes to the large air-capable ships of the Kiev Class must have been approved by that time (including the first with nuclear propulsion), these arguments seem

likely to have more the nature of a rear-guard or flank-protection action against possible renewed Army assault against theoretical ground already won than of a renewal of the internecine warfare of a decade earlier between the Army marshals and the Navy admirals over budget allocations for large surface ships. In this most recent of Potapov's naval books, Scientific-Technological Progress and the Navy (which was submitted for censorship in February and released for publication in June 1977), the good professor again demonstrated his great usefulness for furthering Admiral Gorshkov's goals for the Soviet Navy by first contriving a new and (to many Soviet readers) plausible theory to account for the alleged great U.S. interest in large air-capable ships for ASW and by then manufacturing out of whole cloth and his fertile imagination a wholly non-existent program for construction by the U.S. of 75 sea-control ships by 1990. This updated version of Admiral Sorokin's 1972 "big lie" allegation that the U.S. was building a nuclear-powered aircraft carrier designed task-specifically for ASW (16, C-50) now falsely claimed that the U.S. actually had begun a large SCS-construction program in 1975 and that 25 were scheduled for completion by 1980. Potapov wove his tangled web intended to deceive the Army marshals and Party officials concerned with slicing the military-budget pie with such consumately credible detail that even the probably case-hardened preparing analyst rubbed his eyes in disbelief on first reading at the crass and blatant deception being perpetrated:

> 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 1934-1938 was 24 million dollars, the nuclear-powered Enterprise built in 1958-1961 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 /only/ about 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/

As for the "plausible theory" alluded to by the preparing analyst above as having been fabricated by Potapov to account for the great U.S. interest in large air-capable ships for ASW, this took the form of adapting to this purpose the long standing propaganda myth of the U.S. having adopted an "oceanic strategy" in which prime dependence was being placed on sea-based nuclear weapons for strategic deterrence. With his customary resourcefulness, Potapov now argued that it was adoption of such an "oceanic strategy" that had made it necessary for the navy to convert all of its strike carriers to multipurpose ones that also would be able to conduct ASW. Implicit in the argument devised by Potapov was that the "global general-purpose naval forces" of which these multipurpose CVs would be the nucleus would provide essential ASW support to the "oceanic strategy", by insuring the survivability of the U.S. SSBNs against the USSR's torpedo and "missile-torpedo" attack submarines. Potapov formulated as follows the theoretical part

of his rejoinder to Army deprecators of the need for large air-capable ASW surface ships:

> The "oceanic strategy' 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 stike, aircraft carriers, carrying on board not only strike aircraft but also antisubmarine aviation. For this reason, all of the U.S. strike aircraft carriers in commission in the mid-1970s are being converted to multipurpose ones with an antisubmarine air group based on board consisting of ten airplanes of the S-3A VIKING type (31, D-75).

Potapov continued his effort, in effect, to exaggerate to the maximum extent possible the ASW capabilities of the U.S. Navy's aircraft carriers. Following on the above quotation, he gave an overestimate of the number of such ships that would remain operational by 1980 and the total number of antisubmarine airplanes, "of the latest model" of course, which the alleged 15 U.S. CVs would be able to carry:

> ...Construction has been started on a fourth nuclear-powered aircraft carrier, the Carl Vinson, which was designed as multi-purpose. Its commissioning is expected in 1981...Thus, besides four aircraft carriers with nuclear propulsion, there will remain in the complement of the U.S. Navy at the end of the 1970s 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, D-75).

With the same cleverness that he had exhibited in his 1971 book by brushing away Army opposition to

building large numbers of surface ships for ASW by asserting, in effect, that even Army officers could understand the necessity of such ships for ASW point defense of naval forces and merchant ships convoys, Potapov now appealed to the Army marshals' economy-mindedness (with respect to the Navy) with the twin arguments that sea-control ships were "less-expensive" and "probably" would "ultimately replace strike aircraft carriers", i.e., obviate the necessity for the Army marshals having to counter a third major Navy campaign for authorization to build heavy attack carriers such as had taken place twice before under Stalin in the late 1930s and early 1950s. As Potapov phrased this punch line to his argument:

> New less-expensive combatant ships of a Navy can successfully carry out the indicated tasks /for gaining and maintaining command of the sea in general and ASW in particular/. Air-capable ships are the principal ships of this nature. Probably such ships will first supplement and ultimately replace strike aircraft carriers (31, D-75).

At the same time Potapov's book was undergoing censorship in the late winter of 1977, Vice Admiral Stalbo, another of Gorshkov's stable of naval theoreticians, added his prestigious voice to the Navy chorus chanting paeans to air-capable ships and, thereby, attempting to discourage or drown out any further Army objections. In a prolix commentary too lengthy and convoluted to quote, Stalbo argued essentially that: (1) Heavy aircraft carriers were not the answer to open-ocean ASW since they were too vulnerable to nuclear-powered attack submarines unless provided with a strong (and very expensive) screen of escort ships; (2) Moreover, in view of their great cost, the large aircraft carriers were inevitably too few in number to make more than a limited contribution to a solution to the ASW problem; (3) Anyway, they were assigned mainly for power projection ashore and to a surface warfare role; and (4) The construction of "air-capable" ships (i.e., SCSs since under 20,000 tons) was justified on the grounds that they would be the only air-capable ships with both the mission assignment and capability for carrying out open-ocean (anti-SSBN) ASW (26, D-72/73).

There have been eight other commentaries since the XXVth Party Congress ended in March 1976 in addition to those of Potapov and Stalbo which contributed in one way or another to the Navy's case for building substantial numbers of air-capable ships (Foreign Naval Chronicle items 3/76 and 5/76 and footnotes 20, 27, 30, 37, 52, and 62). While they need not be detailed for our purposes here, it should be noted that a common theme was the alleged large U.S. expenditures projected for air-capable ships and aircraft for ASW. The most persuasive and most frequent argument to emerge from these eight additional commentaries were three which asserted that the S-3A VIKING would be eight to ten times more effective in open-ocean ASW search due to its greater speed and range (27, D-73; 30, D-73; and 37, D-75).

Thirteen of the sixteen items on large air-capable ships turned up by research for the final four years of this study either mainly concerned or at least included some mention of multipurpose aircraft carriers with conventional or nuclear propulsion. Two more each concerned projected but never-to-be-built nuclear-powered light multipurpose aircraft carriers (CVLNs) and VSTOL support ships (VSS). Three mentions were made of sea-control ships (SCSs) and antisubmarine aircraft carriers (CVSs). While both were defunct (the former having never gotten off the drawing boards and the latter having been scrapped or mothballed), the Soviet Navy's internal advocacy needs had prevented publication of proper obituaries. Taking these CVs/CVNs, VSS, SCSs, and CVSs in reverse order, we shall essay to discern the current corporate perception held by Gorshkov and company of the present and projected U.S. capabilities and intentions for ASW employing aircraft carriers and other air-capable ships.

Starting with the CVSs, it may be recalled that, although the last had been decommissioned in 1973, the misimpression was given through the end of the period at the time of the XXVth Party Congress in February-March 1976 that some CVSs remained operational in the U.S. Navy. Rear Admiral A. I. Rodionov contributed to continuing this deliberate misimpression in the second edition of his DOSAAF booklet The Strike Force of the Navy which appeared in November 1976.

In one deceptively worded sentence he managed to further Gorshkov's campaign for larger general purpose surface naval forces both by implying that the U.S. was still interested in building sea control ships and by leaving unwary, uninformed readers under the incorrect impression that the U.S. still had some CVSs in operation ("unwieldy" though they might be):

> In the U.S. and U.K. in recent times they have turned to the development of so-called "air-capable" ships -- platforms for airplanes with vehicle takeoff and landing and for helicopters -- in place of the unwieldy antisubmarine aircraft carriers which were converted from attack aircraft carriers of old designs (20, D-71).

Similarly, Vice Admiral Stalbo, an article in the June 1978 issue of Naval Digest on "Aircraft Carriers in the Postwar Period" left the same misimpression, specifically that the CVSs were still in the process of being phased out while the CVAs were being converted to CVSs (50, D-76). Stalbo's apparent objective was to show the less cost-effective CVSs being replaced by the more ASW cost-effective CVs but with the former still being deactivated gradually to retain a maximum degree of ASW capability with air-capable ships in the changeover. Obviously to make clear that the U.S. had not found the CVSs of sufficient value to maintain operational until the CVAs could be converted to multipurpose CVs would have invited attack by Army critics of building large air-capable ships designed specifically for ASW.

The third and last commentary to have appeared on CVSs came in the nearest equivalent to Jane's Fighting Ships, published in the USSR in 1978. This was a DOSAAF Press reference work on the Modern Combatant Ships of the non-Communist countries. After claiming that the U.S. CVSs were "in reserve", this reference work proceeded to describe their operations in a manner that could leave an average reader with the final impression that they were in a very active reserve status: "These ships normally operate in the composition of hunter-killer groups...which include an aircraft carrier and five to eight destroyers and frigates" (52, D-76). The intent to mislead here seems unmistakable as was true of two following sentences:

> 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, D-76).

Obviously, if a "multipurpose" aircraft carrier was mainly an antisubmrine ship, no diminution is implied in its ASW role and capability. Since in fact the ASW role and capability of the multipurpose CV was distinctly secondary to its power-projection role and capability, this statement of Modern Combatant Ships too may be seen as deliberately calculated to exaggerate the importance of the potential contribution of U.S. CVs to solving the ASW problem in any war.

Next to take account of the three Soviet comments on sea-control ships (SCSs) over the past four years, it must first be recalled that we have already noted a few pages earlier Professor Potapov's "big lie" of 1977 that the U.S. actually had undertaken the construction of the first SCSs of a series of 75 of them projected for completion by the end of the 1980s (31, D-75).

There has been nothing further said publicly about SCSs specifically since Professor Potapov perpetrated his "big lie" in 1977. As will be detailed at more length shortly, the really thorough and perceptive reader could deduce from a 1978 article on "Antisubmarine Ship" in the Soviet Military Encyclopedia that no program for construction of any kind of major air-capable ships is being carried out in the U.S. at present. The average reader, however, should still have in his mind's eye a picture of U.S. shipyards completing SCSs at a rate of five to six per year.

Prior to the publication of Professor Potapov's book in mid-1977, Vice Admiral Stalbo had left the misimpression in an article in the March 1977 issue of Naval Digest that the U.S. was still interested in ASW ships in the SCS displacement range of "up to 20,000 tons" for carrying VTOL airplanes and helicopters (26, D-73). And four months before that Rear Admiral Rodionov, in the second, revised edition of his DOSAAF booklet The Strike Force of the Navy had made the comment already quoted in the CVS context that such VTOL and helicopter-carrying "air-capable" ASW ships were under "development" in

the U.S. (20, D-71). The point to be remarked is that the basic idea of the U.S. building sea-control ships for ASW was so useful for Soviet Navy leaders to cite as a justification for the USSR to build more major air-capable ships that they could not bring themselves to consign the SCS to its niche in naval history. It may be recalled from the earlier period that the August 1975 Naval Digest had acknowledged that the U.S. administration had disapproved of SCS construction but then confused the issue for their readers by concluding that "a final decision still has not be adopted as to which type of air-capable ship to give preference" (78, C-68).

Turning now to the two reports apiece on alleged U.S. plans for constructing CVLNs and VSS, they need detain us only long enough to note the nature of the claims made for each and the fact that the claims objectively provided the Soviet Navy with further "evidence" of U.S. intentions to spend heavily for ASW surface ships that might be usefully cited by the Soviet Navy to justify more general purpose naval forces both to protect its own submarines by combating such ships and to conduct ASW by means of similar air-capable ASW surface ships.

The VSS was only mentioned twice (in March 1976 and in March 1977) and has not been heard from since. The "Foreign Naval Chronicle' in the March 1976 Naval Digest reported that the U.S. Navy proposed to build "VSTOL support ships" of a displacement between 17,000 and 35,000 tons which would carry not only the VTOL airplanes and the helicopters earlier proposed for the SCS but would also be fitted with the catapults and arresting gear to handle the S-3A VIKING fixed-wing airplane (FNC 3/76, D-70). Then a year later Vice Admiral Stalbo asserted in a Naval Digest article on "Creativity in Researching the Problems of Naval History" that "variants of ships for light aviation support (VSS)" with a displacement of 22-23 thousand tons "were being worked out" in the U.S. (26, D-72).

Similarly, the CVLN had an even briefer propaganda "service life" of only three months. Born in March 1976 in the "Foreign Naval Chronicle" it made one further appearance two months later in the same medium before passing into oblivion. In the March item these 60,000 ton light multi-purpose nuclear-powered ships, which were to have a displacement of

60,000 tons, were to be built so as to start replacing six CVs of the Forrestal Class in 1984-5 (FNC 3/76, D-70). The May item increased the maximum number of CVLNs projected to nine and had the first one slated for commissioning as early as 1979. It was to be 60-70 percent as effective as the Nimitz Class CVN at an implied fraction of the six billion dollar cost of a Nimitz and its aircraft (FNC 5/76, D-70). Although nothing more has appeared in the Soviet media on the CVLN, readers paying close attention to U.S. aircraft carrier construction could have deduced that the CVLN project was dead from a November 1978 item in "Foreign Naval Chronicle" which reported U.S. adoption of a program of major overhauls and modernization of the Forrestal Class CVs that would extend their service life until 2000 A.D. (FNC 11/78, D-77).

In the same month of November 1978, an article by Admiral Amel'ko on the "Antisubmarine Ship" in Volume VI of the Soviet Military Encyclopedia should have made it clear to anyone reading it that all the various reports that the U.S. was developing new air-capable ship types for ASW -- whether SCS, VSS, CVLN or whatever -- were unfounded in fact. Amel'ko, in effect, sank all these by then phantom ship types with a few short strokes of his pen:

> Instead of constructing specialized anti-submarine combatant ships in the U.S...it is planned to utilize the strike aircraft carriers, destroyers, frigates, and other warships for antisubmarine warfare by arming them with the appropriate means (62, D-78).

Finally turning our attention to the multipurpose aircraft carriers themselves, it should be noted that the discussion or at least mention of them in 13 sources as opposed to no more than three for any of the other four types (or ten for them altogether) indicates a correct Soviet perception that it was with the conventional and nuclear-powered CVs where the potential action lay in the area of ASW by air-capable ships of the U.S. Navy.

In May 1976 it was reported that the U.S. Navy would have only 12 multipurpose aircraft carriers in the 1980s (FNC 5/76, D-70). Each of these would have an air wing embarked to include two ASW squadrons among the different types of aircraft. One squadron was

to be comprised of 10 S-3A VIKING airplanes and another squadron of eight SH-3D SEA KING helicopters (FNC 7/76, D-70). Aircraft carriers designed from the keel up as multipurpose were listed in Modern Combatant Ships in 1978 as intended to carry just double the number of ASW aircraft of each category, i.e., 20 S-3A VIKING airplanes and 16 SH-3D SEA KING helicopters (57, D-77). The USS Vinson was to be the first such ship as well as the U.S. Navy's third nuclear-powered heavy aircraft carrier of the Nimitz Class (26, D-72). It was reported as expected to cost one billion dollars (for the ship alone apparently, without aircraft or escorts) and to be scheduled for completion and commissioning in 1981 (31, D-74).

In addition to the construction of the nuclear-powered USS Vinson, the construction of one large conventionally powered aircraft carrier was reported in August 1978 as planned for construction between 1979 and 1983 (55, D-77). The previously referenced plan to extend the service life of the Forrestal Class CVs until the end of the century by overhauling and modernizing them was projected to cost nearly half a billion dollars for each. Each of the four ships already scheduled for such work would be out of service for 2½ years, so work was only to be undertaken on one about every two years to avoid having four out of operation at once (FNC 11/78, D-77). A projection of unspecified source as to the composition of the U.S. Navy by 1990 listed the likely number of large aircraft carriers as "not less than ten" (FNC 11/78, D-77). The U.S. Navy's complement of CVs was last reported as 13 in the general article on the "U.S.A." in Volume VII of the Soviet Military Encyclopedia which was released by the censors in September 1979 and was delivered to foreign subscribers in early 1980 (80, D-78).

In additon to the foregoing information on the various types of air-capable ships and large aircraft carriers, two related points merit mention. The first is VTOL aircraft and the second is large, air-capable surface-effects ships (SES).

In the earlier section of this part on the last period that covered the frequency and nature of the relevant commentary it was mentioned that the eight references to VTOL airplanes in these final four years lend themselves better to the interpretation that they reflected more an effort to justify

building more air-capable ASW ships for the Soviet Navy than they accurately mirrored a Soviet perception that the U.S. Navy really was making any great progress toward putting a successful VTOL to sea on any kind of air-capable ship. This observation is particularly warranted since the projected SCS that was to carry them had been dropped and no other hot candidate for a VTOL-carrying ship had been nominated by the Navy and seconded by the Defense Department let alone elected by the Congress.

Rather the VSTOL support ship (VSS) had been touted as a candidate once in 1976 and a final time in early 1977 (FNC 3/76, D-70). In November 1976, Rear Admiral A. I. Rodionov had claimed in the second edition of his DOSAAF booklet The Striking Force of the Navy that the U.S. and U.K. had turned to VTOL-carrying air-capable ships to replace the CVS (20, D-71).

This was an out-and-out fallacious foreign-surrogate use of alleged U.S. developments to esoterically inform knowledgeable Soviet readers that the Soviet Navy was pinning its hopes on Kiev-Class "ASW cruisers" with VTOL aircraft rather than building the larger (and much more expensive) heavy multipurpose aircraft carriers that the U.S. Navy had decided on.

However, by the time Vice Admiral Stalbo published an article in the March 1977 Naval Digest, he found it advisable to take a sober approach to the prospects for VTOL airplanes in the U.S. Navy. After mentioning that the U.S. Navy had worked out design specifications for various air-capable ships of displacements up to 20,000 tons, he employed the conditional tense to say very tentatively that they "could" carry heavy antisubmarine helicopters and VTOL airplanes (26, D-72). A few paragraphs later, with quite likely the U.K., France and the USSR particularly in mind, Stalbo added that, there was a discernible "trend" (reportedly noted by observers "abroad") toward the construction of air-capable ships "which would carry antisubmarine helicopters and also airplanes with verticle takeoff and landing" (26, D-73).

Then in June 1977 Professor Potapov's latest book on naval developments stated that "intensive" development of VTOL airplanes was being carried out

"abroad". And as part of his "big lie" about a 75-unit SCS construction program being in progress in the U.S., the professor armed each of his propaganda creations with three HARRIER VTOL airplanes (31, D-74). Moreover, these VTOL ships "probably" would "replace strike aircraft carriers ultimately" (31, D-75).

The height of Soviet Navy VTOL-itis was reached in August 1977 when a Lieutenant Colonel, probably of the Soviet Naval Air Force, wrote in an article in the Naval Digest that by 1985 there would be modified versions of the HARRIER for fighter-interceptors, as attack aircraft for reconnaissance, and "also as an antisubmarine airplane" (38, D-75). In short, in the brief span of seven years VTOL airplanes would be available to perform all of the missions of all of the main types of aircraft carried aboard large aircraft carriers and yet could be operated from smaller, cheaper air-capable ships. No further comments on this subject are to be found since 1977 -- quite likely because the usual authors are too busy dodging the pie falling out of the sky.

Finally to be mentioned are two commentaries portraying the U.S. Navy as earnestly looking ahead to having air-capable surface-effects ships that presumably would have major ASW capabilities. The first of these two claims was made in an article on hydrofoil craft and ships in the August 1976 issue of Naval Digest. Reserve Captain First Rank Sokha told his readers that the U.S. was developing a hydrofoil ship of 1,000 tons displacement that would carry VTOL airplanes and cruise for 2,000 miles on the foils at 50 knots (17, D-71).

Nothing more was reported on the hydrofoil ship but by November 1978 the U.S. Navy was pictured as having displayed "great interest" in air-capable ships on air cushions. Design specifications were reported to have been drawing up for multipurpose aircraft carriers on air cushions to operate either conventional fixed-wing airplanes or VSTOL jets. One design version was said to be for a nuclear-powered air-cushion "VSTOL/SES-CVN equipped with a catapult and arresting gear" (FNC 11/78, D-77). Nothing more has been heard about these dreamboats either but one comes away with the feeling that such reports are not to be taken as reflecting the objective Soviet Navy perception of U.S. reality but

more as a handful of hay thrown occasionally on the Navy's appropriations propaganda bonfire to make it blaze up brightly whenever it is useful to portray intense activity by the putative enemy.

From this commentary on U.S. development of air-capable ships for the last four years, the same conclusion is warranted as for the 1971-1976 period -- it seems highly unlikely that the Soviet Navy leadership was impressed by the modest developments that actually took place for improving U.S. ASW by aircraft carriers and, particularly, by the lack of any U.S. shipbuilding program for air-capable ships carrying the VTOL airplanes so favored by the Soviet Navy.

However, it should be added to what was said in conclusion to the comparable data for the 1971-1976 period that to whatever extent the Soviet military and political leaders actually have been mislead by the occasional gross exaggerations in Soviet naval accounts of U.S. developments in the area of ocean-going air-capable ships for ASW, the Defense Ministry and Party leaderships can be expected to have an unwarrantedly high opinion of the U.S. Navy's present and future ASW capabilities based on such ships. Perhaps Gorshkov would act in time to counter any such misimpressions caused by his own "disinformation" campaign against his superiors in the Defense Ministry and upper Party echelons of the Central Committee, Military Council,and Politburo -- particularly in the unlikely event that to fail to do so would bring anything but favorable results for the Navy in terms of Soviet refusal to negotiate any limitations in naval armaments for the many years that would be required for the Soviet Navy to be built up at least to priority with the U.S. Navy in capability to take air power to sea.

3 (e) - DDs and FFs (plus ASROC and LAMPS) -- The U.S. destroyer construction program that had been initiated in 1969 when contracts were awarded for 30 Spruance (DD-963) Class units (see Chronology) was noted in 1977 to be still "lagging" behind schedule (26, D-80). When last reported in 1979, 17 of the 30 finally approved for construction had been completed and the remaining 13 were scheduled for delivery to the Navy in FY 1980 (FNC 3/79, D-85/86; 52, D-84/85). Thus the Soviet Navy observed the U.S. Navy take 12 years to build 30 destroyers or an average of no more than 2½ per year -- a most

unimpressive performance in shipbuilding for a program intended to see six units completed yearly and the whole program completed in less than half the time.

Having witnessed from the Polaris program what U.S. shipbuilder's could do when pushed, Soviet naval observers could only conclude that destroyers for ASW were not high on the U.S. Navy's priority list. It may be recalled that as early as 1971 Professor Potapov in his book The Development of Navies in the Postwar Period had noted that the U.S. Navy had 300 "destroyers, frigates, and escort ships" of World War II vintage that he alleged were to be replaced by 200 destroyer-type ships by a ten-year shipbuilding program (1, C-70).

This apparently was Potapov's earlier version of the "big lie" of his 1977 book that the U.S. had started construction on 75 sea-control ships. However, its 20/year construction rate gives a measure of what the professor considered it would take to impress the Soviet Army marshals and Party leaders.

In March 1979 a "Foreign Naval Chronicle" item in the Naval Digest reported that an order had been placed for the lead ship of a projected 15 guided-missile destroyers of the DDG-47 Class which were to be built over the ensuing ten years and to cost 14 billion dollars (FNC 3/79, D-86). Even if this program should be carried out without the inordinate delays that plagued the Spruance Class destroyer construction program, its small size and slow construction rate of an average of 1.5 ships/year is scarcely calculated to impress the Soviet leaders that the U.S. plans to have any great open-ocean ASW capability left over after the heavy requirements for point defense of the large aircraft carriers have been met.

This perception is unlikely to have been altered by the U.S. decision to modernize 23 Charles F Adams Class DDGs to extend their service life by 15 years, as reported in 1977 in the Naval Digest (26, D-80; FNC 12/77, D-84). This is particularly the case since the Soviets had long since noted publicly that the SAM-missile destroyers of the U.S. would be employed primarily for anti-air warfare and that ASW would be left for less expensive ships to carry out.

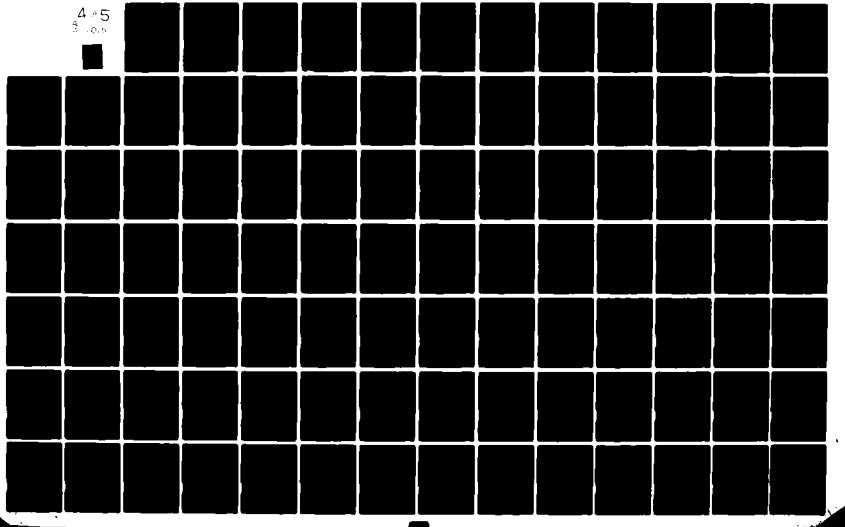
In this connection it will be recalled that programs to build 46 Knox (FF-1052) Class and 28 Oliver Hazard Perry (FFG-7) Class frigates had been reported in the 1971-1976 period (19, C-74; 36, C-76). The number of the Perry Class FFG was reported to have been increased to 50-56 units by early 1977 (FNC 2/77; D-81) and to 74 units in the fall of 1977 (26, D-80); (70, D-86). The lead ship's delivery to the Navy was reported in May 1978 (FNC 5/78, D-84) and an average construction rate of slightly over five per year was projected for the five-years from 1979 to 1983 (55, D-85).

In late 1976 a senior Soviet naval officer emphasized the ineffectiveness of destroyer-type ships for ASW against nuclear-powered submarines, for point defense let alone wide-area search, because of the destroyer's and frigate's "low speeds" (20, D-80). This statement was made in the second edition of a DOSAAF booklet on submarines, The Strike Force of the Navy, by a Rear Admiral A. I. Rodionov whose writings show him to be a Party-line advocate of the superiority of submarines for carrying out all of the Navy's main missions.

Accordingly, it should be noted that while no one was likely to stop such an orthodox presentation of the USSR's official military doctrine, it was clear that Gorshkov places somewhat higher value on destroyer-type ships for ASW and was not prepared to write them off as quickly and completely as did Rear Admiral Rodionov. And like any true adherent of the USSR's still-official "Young School" strategy of sea denial by means of submarines, aircraft, and light, fast surface craft, Rear Admiral Rodionov alleged that naval R&D had turned to surface-effects ships capable of speeds up to 90 knots (20, D-80).

Only five months later, in April 1977, a generally similar but much more detailed commentary appeared in a thin Defense Ministry book Antisubmarine Forces and Means of Navies signed by another senior Soviet naval officer named Rodionov, this time Captain First Rank B. I. Rodionov. He observed for openers that the role of destroyer-type ships had decreased with the adaption to submarines of nuclear propulsion but added that such surface ships "still remain significant, especially for point defense" (27, D-82/83). Captain Rodionov pointed out, in effect, that the requirements for cruisers, destroyers, and frigates were based on the multi-

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SOVIET PERCEPTIONS OF U.S. ANTISUBMARINE WARFARE CAPABILITIES. --ETC(U)
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UNCLASSIFIED KER-293-80-VOL-2-REV NL



mission utility of such ships and seemed to be implying that they could not be justified objectively solely on the basis of their ASW value. In the case of destroyers, mention was first made of the series construction of the Spruance Class destroyers by the U.S. and then it was observed that destroyers can carry too little AA protection and are so expensive (up to 100 million dollars apiece) that only the U.S. could afford them in any quantity. Consequently, it was alleged, destroyers were becoming "ever less numerous" and losing their role as the leading force of a navy (in the antisubmarine context) and were said to be being replaced by smaller and cheaper ships -- by frigates in the U.S. Navy. Antisubmarine Forces and Means of Navies cited those always useful (and always anonymous) "foreign specialists" who held that surface ship speeds would not surmount 35 knots under ideal conditions. "Lagging behind significantly in their speed of search for nuclear-powered submarines" /i.e., at the lower-than-maximum speed at which a surface ship's sonar is not blanked out by own ships cavitation noise/, surface ships are losing the capability for the conduct of successful search for them, especially in heavy seas". Captain Rodionov, like his namesake superior whose views were discussed above, also professed an SES solution -- and like Rear Admiral Rodionov did not explicitly allege that this was the preferred U.S. solution. As Captain Rodionov put it:

> 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 (27, D-82).

Another commentary included in an article on NATO naval exercises that appeared in the June 1977 issue of Naval Digest made explicit the point both of the Rodinovs had failed to make clear -- that it is the noise of a ship's own screws (which creates so much interference with sonar reception) rather than the maximum speed of which a ship is capable which limits the speed at which either a destroyer or frigate can prosecute a submarine datum without losing sonar contact during localization and attack. This mid-1977 article also made it clear that point defense (rather than open-ocean search) was the ASW role had in mind for U.S. destroyer-type ships. The passage is significant enough to warrant quoting it:

> On antisubmarine /surface/ ships /according to this survey of NATO exercises in 1976/ basically were laid only 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, D-83).

So, while in his April book on ASW Captain Rodionov told his readers that destroyers and frigates had utility only for point defense, Naval Digest two months later tells an even broader naval readership that such ships aren't really of great value even for that. Clearly destroyers and frigates weren't perceived as comparable to air-capable ships for the anti-SSBN mission.

If this weren't clear enough, the message was spelled out with great clarity in the Soviet reference work on non-Communist navies, Modern Combatant Ships which appeared in June 1978. By explicitly defining the missions of destroyers and frigates, the publication made clear that destroyers had a considerable number of other missions than ASW and that the really "basic" mission of U.S. frigates was seen as the ASW and AAW protection of the aircraft carriers. This statement, too, merits quoting for its importance in revealing how little U.S. destroyers and frigates were associated with area ASW search as opposed to point defense. It will be noted in the destroyer missions only the very last-mentioned destroyer mission for "the conduct of blockade operations" could even remotely be considered to be intended to include an anti-SSBN role as opposed to being primarily against the USSR's attack submarines, naval strike planes, and "ASW cruisers" and other large combatant surface ships. The commentary being discussed read as follows:

> 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. The basic task of frigates of the U.S. Navy is the provision of anti-air and antisubmarine defense for strike aircraft carriers (52, D-84/85).

Not only were Soviet naval officers taken by the idea of building "light aircraft carriers" and other air-capable ships on hydrofoils and air cushions, as had been made clear by the two Rodionovs, but in addition they also seemed equally fascinated by the possibilities of overcoming the ASW limitations of destroyer-type ships by developing designs for surface-effects ships of various kinds. Accordingly, this underlying enthusiasm for SES ships may be seen to have predisposed Soviet naval writers to exaggerate the prospects for eventual development of successful surface-effects ships for ASW. Thus, in the August 1976 issue of Naval Digest Reserve Captain First Rank Sokha greatly overstated the actual situation by the assertion that various hydrofoil ships, which he indicated held particular promise for ASW, were being accorded "a prominent place in the plans for the renewal of the ship complement of the /U.S./ Navy". He also left the incorrect impression that the U.S. was undertaking large-series construction of DEH Class hydrofoil ships (1,600 tons) by stating:

> Specialists consider that /escort/ ships of the 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 (17, D-79).

The following year the Naval Digest reported U.S. interest in developing a 3,000 ton "escort" ship on an air cushion that would carry "an antisubmarine missile system and helicopters or VTOL airplanes" (26, D-80). It was added, overoptimistically as

time would show, that it was "expected" that the U.S. Navy would award a contract for construction of a prototype in 1977 or 1978.

The latest Soviet commentary on U.S. Navy development of SES for open ocean use appeared in April 1977 in Captain First Rank B. I. Rodionov's booklet, published by the Ministry of Defense Press, Antisubmarine Forces and Means of Navies. It was made clear that the DEH Class hydrofoil ship was still under development rather than in series production, that work on an air-cushion ship "still has not gotten out of the stage of early experimentation", and that the U.S. was (only) at the "research" stage of R&D on the wing-in-ground "ekranoplane" (27, D-82/83). The very fact that nothing more has been reported in over three years on U.S. developments in SES seems to indicate a situation in which Soviet naval reporting of those developments is biased toward just the successful ones and ignores the setbacks, reversals and disillusionments encountered. Obviously such biased reporting could be calculated to support maximum funding for the Soviet Navy's own development of SES.

Considering next Soviet commentary on the U.S. Navy's antisubmarine missile system ASROC, it requires recalling from the preceding 1971-1976 period that substantial criticism of ASROC had been voiced in 1973 on various grounds (36, C-76; 46; C-77/78) but that efforts to correct ASROC's shortcomings were noted to be underway by mid-1975 (71, C-79/81). None of the four commentaries made any further references either to the shortcomings or the remedial action. However, a "Foreign Naval Chronicle" note in the October 1976 issue of Naval Digest did say that a feasibility study was being made of using the HARPOON missile to replace the missile part of ASROC and (still) using the Mark-46 ASW torpedo as the homing warhead part (FNC 10/76, D-79).

A 1979 item indicated that the Mark 46 now constitutes the torpedo part of ASROC (69, D-85). A third commentary, one primarily about the DDG-47 Class follow-on to the Spruance Class destroyer, merely stated that each ship of the class would carry one ASROC "antisubmarine missile system" (FNC 3/79, D-86). The last reference to ASROC noted to have appeared thus far was Admiral Gorshkov's

implicit mention of it in 1979 in the second edition of Seapower of the State in which he gave no hint of any perceived shortcomings in "the antisubmarine missile systems" which he stated were to be included in the armament of "all cruisers, destroyers, and frigates building in the U.S. and /other/ NATO countries" (70, D-86).

The ASW torpedoes used by U.S. surface ships (and their helicopters) have been mentioned only twice in the past four years, and both times in 1979 and regarding the Mark 46. The first time was in an article specifically on the torpedoes of non-Communist navies which was written by an Engineering-Captain First Rank and published in the March issue of Naval Digest. There was no indication of any shortcomings or possible successor to the Mark 46 about which the following description was given:

> 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, D-85).

The second reference to the Mark 46 ASW torpedo also appeared in the Naval Digest, this time in the August 1979 issue and in an article about the shipboard helicopters of NATO. Regarding the Mark 46, the article merely observed that two of them were included in the armaments of the Mark 3 LAMPS helicopter, the experimental model of which was reported to be undergoing flight testing (79, D-86).

In the earlier consideration of the LAMPS (Light Airborne Multipurpose System) helicopter for the 1971-1976 period it was reported that in June 1972 the U.S. Navy had decided to delay the final choice of a new helicopter to carry the armaments/electronics suit being developed for a substantially improved LAMPS helicopter (mainly) for shipborne ASW (28, C-74/75). Two years later, in June 1974, it was reported further that the Navy had under consideration 13 competing designs for what would be the LAMPS Mark-3 helicopter (FNC 6/74, C-78). More than a year later, in August 1975, this evaluation was still in progress but it was indicated that a decision was expected by the end of 1975 (79, C-81/82). Actually it required an additional two full

years (to the end of 1977) before the Navy finally reached a decision on the construction of the SH-60B SEA HAWK helicopter for the LAMPS Mark-3 from among what had grown from 13 to 17 competing helicopter designs (79, D-86). The U.S. Navy was reported as expecting to buy 204 SEA HAWKs to replace the SH-2F LAMPS Mark 1. The Mark 3 was reported to have a maximum speed of 300 km/hr, to carry two Mark-46 torpedoes, and to have cost 3.5 billion dollars by the time the production costs had been added to R&D costs for over 200 copies costing 14.5 million dollars each (79 and 84, D-86/87). Although this price tag may have impressed the Soviets somewhat the size of the program was scarcely above one-fourth of the 800 which it had been estimated in 1976 were required to meet NATO requirements (11, D-79). Delivery of these 204 SEA HAWKS to the fleet was scheduled to be completed in 1983 and to be parcelled out just to the 30 Spruance Class DDs, the 74 Perry Class missile frigates, and to the 15 DDG-47 Class and any air-cushion SES as they were constructed (79, D-86).

In addition to the six commentaries explicitly on LAMPS in these last four years, there were three general comments on the advantages and the extent and nature of the employment of ASW helicopters on destroyer-type ships. A 1976 commentary pointed out that all destroyers and frigates had been equipped with ASW helicopters and that they constituted "the main means of warfare with a submarine opponent at intermediate ranges (30-40 miles)" (11, D-79).

In the 1977 Defense Ministry booklet Antisubmarine Forces and Means of Navies by Captain First Rank B. I. Rodionov, substantially the same point was made but the additional perception was added that these ASW helicopters were "important" because their "relatively small size" allows them to operate from "many screening-force warships" as an "integral part of the antisubmarine defense systems for surface combatant ships" (27, D-83). Not a word was said to suggest that ASW helicopters in general, or LAMPS Mark-3 in particular, would have any real utility for use in wide-area search as opposed to point defense.

The third and last general comment on ASW helicopters was just the passing mention in 1979 in the second edition of Admiral Gorshkov's Seapower of the State that "all cruisers, destroyers, and frigates

building in the U.S. and /other/ NATO countries" would have ASW helicopters as part of their armament along with "antisubmarine missile systems" (70, D-85/86).

From all of the foregoing evidence on Soviet naval perceptions of the utility, or rather non-utility, of destroyers and frigates for area ASW search, there is little if any room for questioning that without helicopters such ships are considered of little use for ASW. The real question is how much this situation is perceived as redressed by having embarked an ASW helicopter or two, even the Mark-3 LAMPS. Judging from the foregoing commentary, it appears likely that the Soviets do expect that LAMPS Mark-3 helicopters will be able to restore the speed advantage to destroyers and frigates over even nuclear-powered submarines when and if the LAMPS-equipped destroyers and frigates become available in sufficient numbers and as long as they continue to be used for point defense and not in wide-area search.

3 (f) - Mines -- The quickening Soviet interest in divining U.S. mine warfare capabilities and intentions that had become so marked by mid-1971 has continued to increase during the final four years of the decade of the 1970s -- as attested to both by the increase in the frequency from 1.8 to 2.5 items per year and by a comparable increase in the amount of consideration given to the likely roles and missions for which the U.S. would be likely to employ ASW mines in any war. Whereas only five (of the nine) commentaries treated that aspect of U.S. mine warfare planning in the 1971-1976 period, seven of the ten commentaries over the past four years considered how the U.S. would employ mines.

Although the frequency and total volume of commentary was substantially greater than even in the 1971-1976 period, the basic nature of the perceived employment of U.S. ASW mines, particulary CAPTOR, remained similar in that employment of mines to blockade Soviet submarine bases and to establish mine barriers across "straits and narrows" (particularly across the GIUK Gap) received the most emphasis between themselves and between periods (four mentions of each in both periods). (For blockade of bases, see pp. D 88-92, entries 6, 25, 31 and 52; for barriers of straits, see 6, 25, 27 and 69). Two commentaries (25 and 52) also added as

two further roles for mines the transit routes of enemy submarines and protection of own home waters. While the later, mining of one's own coastal waters, also can protect the USSR's vital coastal SLOC, protect against amphibious landings, and protect the Army's coastal flank from naval bombardment by the missiles and guns of surface ships, it shares in common with the blockade of submarine bases and the establishment of ASW barriers across straits that these are all areas where the anti-SSBN mission can be carried on most productively -- as opposed to the transit routes and combat patrol areas where SSBNs are so extremely difficult to detect initially unless by SOSUS.

The most interesting and important difference to emerge from the commentary of the past four years as opposed to that for the preceding five years was a 1977 claim that mining would be important for a nuclear missile war "above all" because it would "permit the conduct of effective combat with nuclear-powered missile submarines" (25, D-90). In the earlier five year period mines had been viewed as "especially" valuable in conventional war and their use in a nuclear war had been ignored (83, C-89). From this and from the nature of the missions given priority attention for accomplishment by mining, it becomes doubly certain that the anti-SSBN mission loomed large in Soviet perceptions of the purposes for which U.S. ASW mines would be employed.

Also of particular note in the most recent period is the absence of the stacatto of criticism that characterized the 1971-1976 interval. No longer was mine warfare in the U.S. described as "neglected" nor the U.S. mine stockpile dismissed as of "limited use". Nor was the "gradualness of the replacement of World War II mines by the new types criticized anymore although the situation did not appear to have changed much for the better. The one mild criticism that was voiced was that the U.S. did not have a single aircraft configured for minelaying (6, D-88). This served as a more relevant replacement for an earlier remark that the U.S. did not have enough minelayers for laying any sizeable minefields (36, C-83/84). Since all of the areas in which the U.S. might conduct offensive minelaying would be within easy range of the Soviet Navy's shore-based strike aviation, there would be little prospect of the employment of minelaying surface ships while airplanes would be suitable.

Three items on U.S. Navy procurement of CAPTOR mines indicate that these mines were produced in any number only in 1977 (FNC 11/76), although a few may have been delivered in late 1976 (31,D-91). Series reproduction had been scheduled for 1976 (see Chronology). By the end of 1978 the Navy was supposed to have received 1,000 of these, according to an article in Naval Digest in March 1979 (69, D-92). This apparently meant that the U.S. Navy had received about 600 in 1977 and about the same number in 1978. A July 1975 report that the U.S. planned a total procurement of CAPTORs of 4,000 to 4,500 over an unspecified period (69, C-86) was repeated unchanged in a Red Star article on "sea mines" by two naval-engineering captains first rank which appeared in February 1977 (25, D-90).

In September 1976 a "Foreign Naval Chronicle" item reported that the U.S. Navy's mine-warfare effort for developing new mines had increased from only one type in 1974 (CAPTOR) to five by 1976 and that the funds allocated for this purpose had increased "considerably" from 1.7 million dollars in 1974 to 18.3 million in 1976 and that 22.7 million were proposed in the 1977 draft budget. Only CAPTOR and QUICKSTRIKE were mentioned correctly by name and some incorrect information given on an allegedly remote-control mine that could be used on ASW barrier and in minefields laid in coastal waters (FNC 9/76, D-89).

In June of the following year information on a third type of new U.S. ASW mine was reported -- a submarine-launchable mobile mine (SLMM) intended especially for mining enemy submarine bases or (at least) the approaches to them. The SLMM was described as an improved Mark-22 mobile mine which had been developed from an electric torpedo and was fired from a submarine torpedo tube and, after "traversing a considerable distance" at slow speed, would "settle on the bottom, becoming a conventional, non-contract bottom mine" (31, D-91). As shown in our Chronology, in 1979 the U.S. conceived of an intermediate water depth (IWD) mine (for use against submarines and/or surface ships) to fill a gap between the shallow-water QUICKSTRIKE and the deep-water CAPTOR. However, rather surprisingly, nothing of this has yet found its way into the Soviet media.

The latest comment on U.S. mine capabilities came from Admiral Gorshkov's First Deputy Commander-in-Chief, Fleet Admiral Kasatonov, who gave an interview to the newspaper Labor on the occasion of Armed Forces Day 1980 this past February. Kasatonov first cited the recent experience gained by the U.S. Navy in laying over 11,000 tons of mines during the Vietnam War. He then added that the U.S. has developed "new models of more powerful mines" for laying "at the entrance to naval bases and ports" (85, D-92).

Of interest is the non-repetition of the claim made in July 1975 (in an unsigned article on ASW mines in Naval Digest) that the U.S. could establish an effective blockade of the GIUK Gap in just "a few days" by using B-52s to lay a mine barrier (69, C-86). Since crediting such a capability to the U.S. for denying access to the open Atlantic casts doubt on the capability of the Yankee Class SSBNs to maintain a posture of deterrent readiness or for Soviet attack submarines to threaten the major trans-Atlantic shipping lanes, perhaps the only cause for surprise is that such a claim ever passed censorship in the first place. However, a variant of it was to appear in 1977 and again in 1979.

These were to the effect that the GIUK Gap could be mined with a not overly large number of CAPTOR mines and at far less expense than by other feasible means. Nothing was said explicitly about how rapidly this could be done but the possibility was too obvious to require mention. The first of these two comments was contained in a book published by the Defense Ministry in April 1977 on Antisubmarine Forces and Means by Captain First Rank B. I. Rodionov. It stated on this point:

> 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, D-90/91).

Two years later, Naval Digest published an article by a senior naval engineering officer which cut the number of mines required to mine the GIUK Gap by 60 percent and calculated the modest cost that would be involved compared to the 20 nuclear-powered submarines that it would take to do the job:

> 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 amounts to the cost of /only/ one nuclear-powered torpedo submarine of which not less than 20 would be required to fulfill this task (69, D-92).

From the foregoing data a number of conclusions are in order on the apparent Soviet Navy perceptions of the U.S. Navy's capabilities and intentions for employing mines for ASW:

- The reporting on U.S. mine developments generally remained more dispassionate and objective than that for other ASW "forces and means".

- The emphasis in Soviet perceptions as before was on use of the new U.S. mines for blockading submarine bases and establishing ASW barriers across the straits which Soviet submarines, whether attack or Yankee Class SSBN, would have to penetrate to gain access to the open Atlantic or Pacific.

- The assertion in 1977 that mining would be important for a nuclear missile war (not just in conventional warfare as before) was a radical shift and of key significance for this study since this importance was attributed "above all" to their potential efficacy for anti-SSBN use.

- In addition to this explicit identification of U.S. ASW mining capabilities with the anti-SSBN role, a strong implicit identification is noticeable in the fact that the three main areas stressed in Soviet perceptions of the most likely U.S. areas of ASW mine employment were precisely the ones where some reasonable chances exist of initially locating Soviet SSBNs (other than with SOSUS) before they reach the vast expanses of the open ocean and can play their improved version of needle-in-a-haystack; these three areas offering optimum possibilities for sinking Soviet SSBNs that were heavily favored in the evidence were: 1) On

the approaches to Soviet submarine bases; 2) On the ASW barriers, especially of the GIUK Gap; and 3) In Soviet home waters from which the Delta Class SSBNs need never sortie to be within missile range of the U.S and through which the Yankee Class must transit in going to and returning from their combat patrol stations.

- While mine warfare development in the U.S. clearly was not being funded with the huge amounts allotted to more glamorous weapons systems, the conjunction of three related developments gave marked new significance to Soviet perceptions of U.S. capabilities and intentions with regard to employing ASW mines in any future general war: 1) The funding of substantial numbers of the CAPTOR deep-water ASW mine had been approved; 2) Despite considerable initial delay, enough CAPTOR mines had been delivered to the U.S. Navy to establish an effective ASW barrier across the GIUK Gap (according to unsourced Soviet estimates) two to five times over; and 3) The budget allocations for development of new mines, although still modest in the extreme, had quadrupled between 1975 and 1977 so presumably could continue the successful design work of the earlier years of even more austere budgets.

In conclusion, then, it would appear that the Soviet naval perception of U.S. capabilities and intentions for ASW mining in the event of a general war, nuclear as well as conventional, have been considerably enhanced just since the XXVth Party Congress ended in March 1976. In particular, with the possible exception of lacking aircraft especially configured for minelaying, the U.S. is perceived as having a very substantial and steadily improving capability for ASW mining, especially in those areas where the possibilities for destroying Soviet SSBNs are greatest.

1 (a) - "Is anti-SSBN ASW seen by the Soviets as within the technological state-of-the-art?"

For the final 1976-1980 period the ten relevant commentaries lend themselves well to analysis without the necessity of first categorizing them as done previously. Three of the ten quotations

collated in section 1 (a) of Appendix D (pp. D-2 through D-7) give essentially affirmative answers to the question above while the remaining seven are negative in their overall implications. Before turning first to analysis of the three affirmative answers, it should be noted that, for the previous 1971-1976 period, there had been only one out of a total of 16 entries that gave even a tentatively affirmative answer. Thus, the share of affirmative answers had multiplied fivefold from 6 percent to 30 percent -- a statistic to which we shall return later.

Of the three affirmative commentaries, two were very much like the single affirmative answer from the preceding five-year period in implicitly qualifying the answer to apply only to areas where SOSUS was effective. Thus, an article in the April 1976 issue of Naval Digest on NATO naval training asserted that "an analysis" of that training for the year 1975 had indicated that "success in antisubmarine operations can be won only by the joint employment of surface ships, submarines, aviation, and also of the positional means" (3, D-2). Although phrased clearly to indicate that the use of a joint air-surface-submarine ASW team aided by SOSUS was essential for success, the logical corollary was that, given U.S. Navy joint use of the forces and means known to be at its disposal already, U.S. ASW could be effective in war.

The second of the two commentaries which predicated U.S. success in ASW on its employment of SOSUS was even more categorical that SOSUS played an absolutely essential role:

> ASW forces and means of all arms (nuclear-powered and diesel submarines, surface combatants, and ASW aviation) will be employed in antisubmarine warfare in close coordination with stationary hydroacoustic means. The basic condition for success in combating the underwater threat is organization of continuous tracking, primarly of submarines with ballistic missiles...(19, D-3).

The third and last of the affirmative answers to the question posed at the outset implied that ASW could be conducted effectively by "the most powerful states" with the ASW forces whose modernization had

been "necessitated" by the "radically increased combat capabilities of submarines". The latter had resulted from the postwar "development of nuclear-powered plants, missile weapons, and nuclear warheads". The modernization was described in the following manner and seemed to be calculated to leave the reader with the impression that such new ASW forces, weapons, and sensors could be effective even against nuclear-powered submarines:

> 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 anti-submarine helicopters. Added to their armaments were 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 were employed equipment sensitive to various physical fields and to submarine wakes...and computers for plotting attacks on detected submarines (61, D-6).

The source of this implicitly favorable general portrayal of the ASW state-of-the-art as practiced by such "powerful states" as the U.S. and the USSR was an article on "Antisubmarine Forces" in Volume VI of the Soviet Military Encyclopedia which was released for publication in November 1978. Since encyclopedia articles are assigned by editors the world over to specialists in the field to be covered, it probably should not be a cause for surprise that anyone specialized on ASW enough to be chosen to write the definitive article on the subject would not be the one likely to give a broad assessment of the relative importance of the subject in the grand scheme of things -- and even more unlikely to give a devastating critique of their assigned subject even if it were deserved. In this case, too, if ASW were indicated to be ineffective, that would amount to public acknowledgement of the painful truth that the USSR had no substantial open-ocean ASW capability againt U.S. SSBNs. On the other hand, to praise the ASW state-of-the-art would

have been to undercut the deterrent credibility of the USSR's seaborne deterrent force.

If that should be agreed to be the case, then one can dismiss this encyclopedia entry as too likely to reflect a specialist's enthusiasm for his field rather than any objective conclusion that ASW forces and means actually had caught up with that of submarine warfare. The preparing analyst does accept this view as at least a working hypothesis and revises his initial estimate of this encyclopedia article as an affirmative answer to our questions. Instead it is viewed as neutral. Accordingly, the number of affirmative answers is considered to be reduced from three to only two.

On the negative side of the question stand seven commentaries. Two of them are based mainly on the inherent capabilities Soviet naval authors ascribe to the nuclear-powered submarine to elude or vanquish any opponent. Four other commentaries place all the emphasis on the inadequacies of U.S. ASW. The sixth entry was unique in heavily stressing both of these negative sides of the question. The seventh and final commentary was by Admiral Gorshkov, implying a negative answer to the question provided certain conditions were met. Let us look at these seven commentaries closely before trying to draw up a qualitative balance sheet on how the Soviets perceive the ASW state-of-the-art at the present time and what this perception might mean for our analysis.

Taking first the two commentaries that were evaluated as providing negative answers to our question because they place most emphasis on the inherent capabilities professedly perceived in nuclear-powered submarines to evade or defeat any ASW forces that might be encountered. The first of these commentaries to be considered is found in Captain B. I. Rodionov's 1977 booklet Antisubmarine Forces and Means of Navies. It stressed that SSBNs are relatively free to select their combat-patrol/missile-launch areas from "enormous expanses of water" which, in the case of the latest SSBNs is noted to include "the greater part of the World Ocean" (27, D-5). Rodionov also showed that the ASW problem is not considered solved by noting at the outset of his observations on this subject that the advent of nuclear-propulsion plants for submarines had created a "highly complex" ASW problem and one

that was proving difficult of solution. That the author did not feel that any really significant progress had been made was evident from the fact that not only was nothing mentioned that could be construed as progress but that the foregoing characterization of the difficulty of the ASW problem was followed by a lengthy description of how the 8,242,500 square miles had to choose combat patrol areas would be "radically increased" for the Trident Class SSBN and then would cover "the greater part of the World Ocean".

The second of the two negative answers based on the allegedly unassailable superiority of modern submarines was another 1977 commentary like the first but it was published in Military-Historical Journal, the house organ of the Army's Institute of Military History. Written by an active-duty Captain First Rank Basov, it was nominally on the subject of ASW in general but actually addressed a policy concern of the USSR's unified military strategy: how to counter the SSBN. First pointing out in an understated way that there had been a "considerable" increase in "the armaments, endurance, diving depth, cruising speed, and the range of submarines", Basov told his audience of senior Army officers that the importance of ASW was still "growing" with "the increasing capabilities of submarines and the broadening of their missions" (28, D-5). The wording here is even vaguer than usual and the passage therefore particularly susceptible to misinterpretation. Accordingly, while it was included in the material as potentially valid evidence, the preparing analyst accords no substantive importance to it in his subsequent considerations beyond its seeming implication that the lag in ASW actually was increasing.

As to the four other negative commentaries which base their case on the inadequacies of U.S. ASW, the first is taken from an article on surface combatant ships in ASW. This was coauthored by an active-duty Captain First Rank Bol'shakov and a civilian named Komkov and appeared in the Naval Digest in July 1976. Selecting their words carefully to be suitably opaque, the authors stated and implied that "the extensive introduction" of "nuclear-powered plants, missile weapons, and modern torpedoes" had so reduced the ASW utility of surface ships ("changed their role commensurate with the degree of improvement in the submarine fleet") that they

were of no use for wide-area search (had "gradually surrendered their former primacy to nuclear-powered submarines and aviation for all other operations") but retained ASW value only for point defense ("defense of an objective") of naval forces and merchant ship convoys (11, D-2).

The second of the four negative comments regarding U.S. ASW inadequacies turned up in Modern Combatant Ships in July 1978. Since this reference work was directed to the ships (including the armaments) of the non-Communist naval powers, its criticism seemed to be only incidental to its remarks on ASW weapons. The statement was made that "antisubmarine missiles", which were noted to be found "in the armaments of many classes of surface combatant ships and submarines", were weapons whose ranges were limited by the ranges of the sensors capable of detecting enemy submarines initially (and SUBROC was mentioned and noted to have a range of /only/ 50-60 km). This was fair enough up to this point but Modern Combatant Ships did not rest at having made the relevant point. Rather, it added rather gratuitously in the preparing analyst's view that:

> 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, D-6).

The third and penultimate one of the negative comments about U.S. ASW capabilities came in an article on SSBN surveillance contained in the May 1979 issue of Naval Digest (72, D-7). The article's rather diffusely expressed criticism of the ASW state-of-the-art in general, and specifically U.S. ASW, can be summarized adequately under four points:

1) The advent of "nuclear-powered multi-purpose and missile submarines" had confronted the naval commands of the U.S. and other NATO naval powers with a problem of unequalled difficulty;

2) Existing ASW forces basically are those that were designed for use against diesel submarines in World War II and only for point defense but the ASW problem now has

"far exceeded the bounds" of even that period;

3) As Gorshkov says, the problem even in World War II was so difficult that the Western Allies had to field ASW forces that were vastly disproportionate to the number of German submarines and crews involved; and

4) U.S. ASW is 80 percent wasted effort -- and this on the authority of a respected U.S. admiral well-versed in ASW matters.

We come next to the one commentary which went to the pains of dicusssing both of the main aspects of a negative reply to the question under discussion. On the one hand, nuclear-powered submarines were found to be so mobile, to have such great endurance, to dive so deeply, to have such high submerged speed, and to be armed with such powerful modern weapons that their high combat effectiveness was insured even in a hostile ASW environment. Moreover not only the nuclear-powered but also the diesel-powered Soviet submarines were claimed to have such sterling qualities, including "various means of cover and deception", that they allegedly enjoyed "high combat stability" (survivability). On the other hand, the improvements made to submarines were said to have led "American naval specialists" to the conclusion that "the antisubmarine forces and means which are now in the inventory of the U.S. Navy continue to be insufficiently effective" (20, D-4). Since SOSUS is considered an ASW "means", that system too was being criticized as inadequate to meet U.S. requirements for ASW. Without any question, the foregoing comments add up to a rather telling critique of U.S. ASW. However, when the subject matter, the author and the publisher are considered, the analyst is inclined to discount this particular piece of evidence substantially: the subject was Soviet submarine warfare, the author was a submarine enthusiast, and the publisher was the paramilitary youth group DOSAAF -- for whom propaganda is more at a premium than facts. However, it is worth noting that our final negative commentary comes from the second edition of Admiral Gorshkov's master work, Seapower of the State and reaffirms the official Soviet view that the submarine still sails the seven seas supreme provided only that it be given intelligent direction and adequate support by other

forces. His statement takes the form of a rhetorical question to which he makes a rather predictable rejoinder:

> 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, D-6).

When the identical passage from the late 1975 first edition of Seapower of the State was discussed, it was concluded that the caveat that Soviet submarines required naval escort and covering forces for "high effectiveness" carried the reverse implication that Soviet submarines would not be very effective if not given such "combat support" -- that is, Gorshkov was basing this statement on an underlying perception that U.S. ASW had made up the lag behind submarine warfare. However, this conclusion in turn was devalued on the grounds that Gorshkov was engaged in advocacy of much larger general purpose forces which he was trying to justify by magnifying the threat of U.S. ASW to the USSR's "main striking force" at sea, its submarines. It was determined that in such a subjective context there was no way of imputting any validity to Gorshkov's portrayal of U.S. ASW capabilities in general, and in particular the relative capabilities of ASW and submarine warfare.

So, what are we left with analytically from this unusually mixed bag of evidence? In the preparing analyst's view, the following conclusions are most apropos:

- The only real basis for affirming that U.S. ASW had caught up with submarine warfare in state-of-the-art effectiveness was the existence of the SOSUS system. Used for initial detection and classification of Soviet submarines and to vector the mobile ASW forces to the contact position, SOSUS, in effect, was perceived by some Soviet naval sources as constituting a substantial substitute for the long-sought technological breakthrough in long-range submarine detection means to make the oceans "transparent" to new ASW sensors.

- The quantitative weight of evidence, remains -- as for the preceding two five-year periods -- on the negative side, arguing that ASW still was perceived generally as lagging significantly behind submarine warfare. However, in the case of U.S. ASW, a degree of ambivalence persisted due to the continuing improvement of SOSUS -- as was remarked in the concluding paragraph of the comparable section 1 (b) for the 1971-1976 period.

- The qualitative balance, thus, is much less on the negative side of the question than the quantitative weight of evidence suggests. Given the fact that the naval side of the USSR's unified military strategy is based so predominantly on submarines as "the basic striking force" of the Navy, it would be unrealistic to expect Soviet naval writings not to reflect a general bias toward submarines and their combat effectiveness. Unfortunately, the comments contained no single piece of evidence that provided a unique insight into what the prevailing Soviet naval view is on the probable wartime effectiveness of U.S. ASW.

- The preparing analyst concludes that the ambivalence may well reflect a "wait-and-see" attitude on the part of the Soviet navy collectively as to how much SOSUS will be improved and what the USSR can do by way of countermeasures. If this should be shown by subsequent evidence to be the actual case, it would indicate that the Soviet Navy still considers that, while the answer is still negative at present, it is subject to change with the further qualitative improvement and physical extension of the SOSUS system.

1 (b)- "Is the U.S. Navy seen as assigned a priority mission for anti-SSBN ASW?"

It will be recalled from the treatment of this subject in the earlier five-year periods that in 1966-1971 all of the other types of naval forces except SSNs were seen to have priority missions other than for anti-SSBN. Then in the immediately preceding period, while the evidence was not sufficiently definitive to warrant any definite conclusion, there was nothing to indicate that the

situation had changed and the commentaries were all consistent with an unchanged conclusion that U.S. SSNs were the only force type that might have a priority mission for anti-SSBN ASW.

It should be further recalled that the only two explicit claims ever made in the Soviet media regarding the attack submarines of the USSR's potential enemies having Soviet SSBNs as their priority targets were made by Admiral Chabanenko in 1964 and Captain Aleshkin in January 1972 (14, C-10). This evidence was too slim by itself and too inconsistent with the negative evidence to warrant any conclusion that U.S. SSNs actually were perceived as having Soviet SSBNs as their priority target.

This situation changed perceptibly at the very outset of the post-XXVth Party Congress when an article in the March 1976 issue of Naval Digest asserted flatly:

> 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, D-8).

This statement was repeated in closely paraphrased form in the 1977 Defense Ministry book Antisubmarine Forces and Means:

> 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, D-11).

Similar statements are to be found in our material which, without specifying SSNs, lend themselves to the interpretation that Soviet naval sources consider the U.S. Navy to be assigned a priority anti-SSBN mission. In April 1977 Captain First Rank B. I. Rodionov's Antisubmarine Forces and Means of Navies listed as the first of four "basic missions for warfare with the submarines of an opponent" that for "the defense of own territory from oceanic and sea directions" (27, D-10) -- as unambiguous a reference to anti-SSBN ASW as one can hope to find short of naming the role explicitly. The same Defense Ministry study put the matter only slightly

less clearly when it subsequently summarized the "views of the NATO command on the employment of antisubmarine forces" as holding that "to neutralize the delivery systems of nuclear weapons in a global nuclear war is of primary importance" (27, D-11).

In September 1977 Admiral Gorshkov's name appeared on a booklet entitled simply The Navy which was published by Knowledge Press and was intended for popular consumption. The Navy Commander-in-Chief found an effective indirect but unmistakably clear way of saying that the navies of both superpowers had anti-SSBN ASW as a "main mission":

> 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, D-13).

The following year, Vice Admiral Stalbo, writing on "Aircraft Carriers in the Postwar Period" in the June 1978 issue of Naval Digest, made the following claim which has not been duplicated in any other commentary of this final four-year period: that air-capable ships were considered by the U.S. to have a "significant role" in anti-SSBN and, in order of listing, only second in importance to the SSBN-protection mission:

> 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, D-14).

An unprecedented statement appeared in a naval reference book in July 1978 which asserted that anti-SSBN ASW was a "no less important mission" for "the navies of the world powers" than the SSBN role in strategic strike (52, D-14/15).

However, despite these circuitous but clear assertions from Soviet naval sources that the U.S. Navy was considered to have a priority anti-SSBN mission assignment, several other statements made during the period (or, not made in one case) cast considerable doubt on whether such a mission really is thought to be an assigned mission and, in the event that it is, whether it enjoys a high priority

call on U.S. ASW-capable forces. The first analytical hint that all might not actually be as well with Soviet perceptions of the anti-SSBN role as it appeared on the surface to be came when Rear Admiral A. I. Rodionov characterized the anti-SSBN mission as (only) "important" instead of "most important" as would have been de rigueur if the admiral had not been bent on deliberately minimizing the significance of anti-SSBN ASW. In his April 1977 second edition of the booklet Striking Force of the Navy Admiral Rodionov stated:

> In the military plans of the U.S., the defense of their own territory from the missiles of submarines occupies an important place (20, D-9).

An even more definitive derogating of the anti-SSBN mission appeared in the June issue of Naval Digest by a reserve vice admiral who listed anti-SSBN as next to last in a list of six missions for the U.S. and other NATO naval forces that otherwise appeared to be in a descending order of priority. Starting with nuclear strikes against ground targets, the anti-SSBN was only listed in the fifth place, being expressed not too esoterically for general understanding as "the antisubmarine defense of the East Coast of the American continent":

> 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, D-14).

The third and last but most telling bit of evidence to cast doubt on the outward appearance of a general Soviet naval perception that anti-SSBN ASW is presently an assigned mission of the U.S. Navy and one of rather high priority is derived from the omission in 1978 of any mention of that mission from the third of a series of annual Naval Digest articles summarizing NATO naval exercise missions of the previous year when the fist two articles had asserted that the U.S. Navy did have an assigned

anti-SSBN role. All three articles were by the same author and closely followed the same general format so that the analyst could quite easily identify the paragraph in the third article from which reference to the U.S. having such a mission was missing. Moreover, the third article made it clear that the omission of the customary reference was deliberate by specifying that NATO had apparently decided that ASW-barriers backed by naval ships and aircraft no longer "corresponded to modern conditions". This was highly revealing because the two earlier articles had listed ASW barriers along with the naval TVDs as the locus of US/NATO anti-SSBN efforts. To present the barebones of this evidence, the 1976 article, which appeared in the April issue of the Naval Digest stated in part:

> The main missions which were worked out /in 1975 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, D-8).

The following year, in 1977, the 1976 NATO exercise missions were similarly summarized in the June issue of the naval professional journal:

> Special attention was accorded to anti-submarine 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, D-12).

However, when the third annual article on NATO exercises for 1977 appeared in the Naval Digest in 1978 (October), the following statement had replaced the mission statement of the two preceding years:

> 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 (56, D-16).

Even more revealing was the statement which followed (and whose relevance was not discovered in time for inclusion in the otherwise complete collection of material in Appendix D):

> In the foreign press publication has stopped recently regarding the establishment of operational antisubmarine barriers (those involving mobile forces /in addition to positional means such as mines and SOSUS hydrophones/). Apparently their employment is no longer considered by the NATO command to correspond to contemporary conditions" (56, p. 90 of article).

From all of the foregoing three pieces of evidence, it seems logical to entertain a "reasonable doubt" as to the objectivity of sincerity of the several preceding assertions that the U.S. did have a priority assignment for anti-SSBN ASW.

The possible lack of "objectivity" is raised as a likely alternative conclusion to lack of sincerity or an effort at misleading the readership since the very thought of the U.S. Navy not being assigned an anti-SSBN ASW mission would be particularly difficult to grasp for minds steeped in Soviet military doctrine which calls for every threat to be countered as well as possible, almost regardless of how futile the effort may seem.

In fact, at the risk of raising the "art" of Kremlinological textual analysis to wholly unbelievable heights that unduly strain the reader's forebearance, the preparing analyst finds in Rear Admiral Rodionov's 1977 booklet Striking Force of the Navy what appears to be a highly esoteric communication to his fellow submarine enthusiasts that they need have no fear of the U.S. Navy making a concerted effort to sink SSBNs should a general war break out:

> 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....Foreign military

> theorists <u>believe</u> 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 (20, D-9/10).

The words "must" and "believe" were underlined by the preparing analyst because they are, in themselves, unusual enough in such contexts to flag attention. To make a long analysis short, the "must" is interpreted as "ought to be but isn't" as concerns "submarines with ballistic missiles" and the 'believe' should be taken to mean that if they only "believe" it but don't know it for a fact, there's probably good reason to doubt it!"

2 (a) - <u>General Soviet Appraisals of U.S. ASW</u> -- The pre-1972 descriptions of U.S. ASW efforts as "enormous" (or some comparable description) also have not reappeared in the late '70s. There were two partial exceptions to this non-return to the effusive exaggerations normal prior to the XXIVth Party Congress in 1971. The first came in an April 1977 assertion in Captain B. I. Rodionov's booklet <u>Antisubmarine Forces and Means of Navies</u> which pictured "the leading maritime powers of the West and Japan" as carrying out "a major buildup with priority assigned to strategic and antisubmarine forces" (27, D-19/20). The second exception was a description of the ASW capability of the U.S. and NATO navies as "great". This was from the pen of Admiral Gorshkov in the 1979 2nd edition of <u>Seapower of the State</u>, and was repeated from the 1976 first edition. He also repeated that "the tempo of R&D and operational development of new types of antisubmarine ships is being increased" and asserting that the ASW forces of the U.S. and other NATO countries were being developed "mainly by increasing the numbers of nuclear-powered and diesel-powered submarines, renovation of the ship component of the antisubmarine forces, acquisition of new antisubmarine airplanes and helicopters with the latest antisubmarine weapons, and the development of positional systems of long-range hydroacoustic surveillance" (70, D-21). Other than these two partial exceptions, important as they undoubtedly were, the extravagant claims of a decade earlier remained notable for their absence.

However, in the November 1979 issue of <u>International Life</u> (English version), alleged U.S. press comments

were cited to the effect that the long-sought technological "breakthrough" in ASW was imminent that would make the oceans "transparent" and submarines vulnerable:

> 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 non-acoustical (infrared, laser, etc.) means of detection and also the latest developments in computer technology. These achievements are being extensively incorporated in the global system for monitoring the underwater environment that is being established by the United States (80, D-22).

The title of the article in which this unprecedented suggestion was made that the U.S. actually might be on the verge of solving the open-ocean ASW problem was "The Navy in the U.S.A's Expansionist Policy" by an Izvestiya political correspondent G. Sturua who was explicitly identifying SOSUS as the "technological breakthrough" in ASW which the U.S. was seen to be achieving.

The most recent period has produced one strongly negative appraisal of U.S. ASW. It may be recalled that one such critique had come in the earlier period from Captain First Rank Kvitnitskiy's booklet Antisubmarine Weapons and Their Platforms, which had asserted that U.S. ASW was "little effective" against nuclear-powered submarines (36, C-17). A comparable criticism from the present 1976-'80 period appeared in 1977 in Rear Admiral A. I. Rodionov's booklet The Striking Force of the Navy and not only professed to perceive that U.S. ASW "forces and means" still are "insufficiently effective" but that SOSUS was unreliable for its key roles of initial detection and classification of submerged submarines. The relevant parts read as follows:

> 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.

> 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, D-19).

The following year there appeared a second negative appraisal of U.S. ASW, this time by Captain B. I. Rodionov in the booklet Antisubmarine Forces and Means of Navies. In the same vein as most of the criticism of the decade of the '60s, the U.S. was first credited with having made "great efforts" (and even with having "considerably enhanced" U.S. ASW capabilities by SOSUS) but then those efforts were stated to have been in vain in solving the anti-SSBN ASW problem:

> 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, D-19/20).

Again in these past four years, just as in the preceding five, the central ASW problem of initial detection (and the key role of SOSUS in it), has not been neglected. Of the eight appraisals for the 1976-'80 period in Section 2(a) of Appendix D, six of them make some direct or indirect reference to the problem itself or to the best solution as yet available. Since this topic already has been treated extensively under the SOSUS rubric in Section 3(a), it will not be further investigated here beyond giving the six references: 3, D-18; 19,

D-18/19; 20, D-19; 27, D-20/21; 70, D-21; and 80, D-22.

The lengthiest as well as the most authoritative Soviet appraisal of U.S. ASW in the past four years was that contained in the 2nd edition of Seapower of the State. It has only minor changes from the 1st edition of 1976 but is quoted again in full for ready reference (since it is the latest information and from the Navy's chief himself) and as a text for the comments which follow:

> 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 torpedoes...These ships are assigned to warfare against submarines and surface ships...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 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, renovation of the ship component of the antisubmarine forces, acquistion of new antisubmarine airplanes and helicopters with the latest antisubmarine weapons, and the development of positional systems 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 hydroacoustical 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, D-22/23).

As in the first 1976 edition of Seapower of the State, Gorshkov still perceives ASW as first among the "great capabilities" of the U.S. and other NATO navies and the primary role for both attack submarines and surface combatant ships. To the ranks of the latter, to the ASW-dedicated surface ship types of destroyers and frigates specified in the 1st edition, cruisers were added in the 2nd edition (see the final sentence above). The same indirect reference to SOSUS that had been contained in the first edition reappeared unchanged in the 2nd: "development of positional systems of long-range hydroacoustic surveillance" was listed among the main ways in which ASW was being developed by the navies of the U.S. and other NATO numbers.

Additionally, the 2nd edition contained basically the same reasonably accurate summary of NATO ASW developments given in the long quote above. The only significant change was the dropping of the 46 older Knox Class FFs for the 74 programmed Oliver Hazard Perry Class FFGs.

As remarked before, the relative objectivity of Gorshkov's description of U.S. ASW capabilities is likely to have been due in considerable part to the conflicting policy interests of portraying his SSBN force as largely invulnerable to U.S. ASW (so as to win some share with the Strategic Missile Forces in the initial strike against the U.S.) and justifying the need for much larger general purpose naval forces (at least nominally for SSBN protection). Nevertheless, as for the preceding 1971-'76 period (but not for the '60s) there still were substantial if not impressive (by Soviet mass-production standards) shipbuilding programs being carried out. The 40 Los Angeles Class SSN still were coming on line as were the 30 Spruance Class DDs. And the large construction program of Perry Class FFGs was duly included in the new edition. Moreover, Gorshkov repeated from the first edition the the R&D on (unidentified) new types of ASW ships was increasing. The fact of life that the LAMPS helicopter system was accepted and DASH drone helicopters seen as weapons of the past was made clear by the deletion from the 2nd edition of the descriptive adjective "piloted" to refer to the (LAMPS) helicopters that the 2nd edition noted again were to be provided to all of the new ASW surface ships along with "antisubmarine missile systems" (ASROC).

As implied for the preceding five-year period and the 1976 (first) edition of Gorshkov's book, it seems probable to the preparing analyst that the Navy boss provided the rather lengthy and unusually factual description of U.S. ASW to avoid having to characterize it as either good or bad and so prejudice one of his two major policy campaigns (for a greater role in the inital nuclear exchange for his SSBNs and for a larger general purpose navy). But the thrust and general tenor of his remarks were unmistakable: U.S. ASW had been a force to be reckoned with since before the first edition of Seapower of the State went to press in late 1975 and it was seen as still constituting such a force when the 2nd edition passed censorship in August 1979.

2 (b) - U.S. Budget Allocations to ASW -- The six commentaries on this subject for the four years from 1976 through 1979 are collated on p. D-24 of the appendices. Before turning to these six relevant commentaries, note should be taken of the official U.S. data as given in the Chronology to this report and summarized below:

Fiscal Year	U.S. Navy Budget (in $ billions)	ASW Share (in $ billions)	ASW Share (as % of Budget)
1975/76	31.5	3.24	10.5
1976/77	36.6	4.23	11.6
1977/78	39.7	3.81	9.6
1978/79	41.7	4.86	11.7

Of the six commentaries, three provided data roughly consistent with the official budget data bove. The first, a Red Star article in August 1976, stated that the U.S. Navy was planning to allocate $20 billion for ASW "forces and means" over the following five years (18, D-24). This average of $4 billion/year is reasonably close to the $4.23 billion official figure and to the $4.3 billion obtained by averaging the "ASW-share" data from the above table for the three years of the period that remained when the Red Star article appeared. Then eight months later Captain B. I. Rodionov's booklet Antisubmarine Forces and Means of Navies stated that the U.S. "spends about four billion dollars annually on the developmemt of antisubmarine forces" (27, D-24). This matches the average of the $20 billion-over-five-years given in the first commentary and, as explained above, is compatible with the official data in the table.

The third commentary with data roughly consistant with the official figures was an aritcle in International Affairs for November 1979. It claimed that annual expenditures for ASW by the U.S. were running at $5 billion (81, D-24). A glance at the official information in the list tabulated above shows that official expenditures, in fact, were running close to the claimed figure, the list showing $4.86 billion for 1978/79.

The remaining commentaries provided only partial ASW budget figures for which corresponding data by which to judge them are unavailable. The qualitative comments are more of the same of what has been adduced already under the preceding Section 2(a) and require an elaboration. In conclusion it need only be remarked that the internal consistency of the gross ASW expenditures of four to five billion dollars a year makes the data on this final period more informative and useful than was the case with that of the two earlier periods. While the Soviet observers noted and reported the data reflecting a trend toward higher ASW expenditures by the U.S., they not surprisingly failed to report what they also probably noted -- that the ASW share of the U.S. defense budget decreased a full 2% in FY 1977/78 and in 1978/79, although the ASW budget increased by a whole billion, still only returned to the level of two years before. All in all; the Soviet commentators made it clear that U.S. ASW expenditures had increased in gross terms and left the impression that this was a "great" increase in percentage terms too. Yet, as can be seen by looking back on the comparable official list of U.S. ASW expenditures for the preceding period, it is to be noted that the 11.7% ASW share figure for FY 1978/79, which is the highest in the past four years, does not even come close to the 15.9 level reached in FY 1972/73.

2 (c)- U.S. ASW Force Levels and Forward Development/Readiness -- The evidence on these aspects for the past four years is assembled in Section 2(c) of Appendix D, pages D-25 through D-29. From the ten commentaries involved, the following composite but incomplete picture emerges:

A. Force Levels - General

1) Ships:

ASW Platform	1/7/77 OB	1/1/80 (Est.)
CV	13	13
SSN	67	82

DDG	39	39
DD	66	44
FFG	6	34
FF	58	35

2) Aircraft (as of 1/7/77):

a) VP Airplanes - 250

b) ASW helicopters - 200

B. Forward Deployment/Readiness

1) Atlantic and Mediterranean:

CVs - Two forward deployed to Mediterranean with the Sixth Fleet while the remaining three or four assigned to the Second fleet homeported on the U.S. East Coast (50, D-28).

VPs - A squadron of 13 ORION P-3Cs forward deployed to the Mediterranean, operating from bases in Italy (Sigonella), Crete (Suda Bay), and Spain (Rota). The shore-based aviation of the Atlantic Fleet was reported to be organized as Task Force 85, indicating that a substantial number of VP were involved, but no numbers were given. The statements were made that 90 U.S./NATO airfields permitted stationing VP around "the entire perimeter of the Atlantic" (49, D-27) with "rapid access to any point". Bermuda, Newfoundland, and Iceland were mentioned as continuously available for U.S. Navy use (65, D-29).

DDs - No data other than that all of the first eight of the Spruance Class DD to be completed had been homeported in the U.S. (four each in Norfolk and San Diego) (FNC 4/78, D-26)

SSNs - Nothing reported but assumed, probably, that all of the Atlantic Fleet boats were homeported on the U.S. East coast.

2) Pacific

CVs - Two to four CVs were reported forward deployed to the Western Pacific with the U.S. Seventh Fleet. The remaining four to six CVs of the U.S. Pacific Fleet were with the Third Fleet based and operating in eastern/mid Pacific (50, D-28).

VPs - The shore-based ASW patrol airplanes were reported as dispersed throughout the entire Western Pacific theater of the U.S. Seventh Fleet (27, D-25). VP bases were reported near Adak (63,D-28) and in Japan and the Philippines (27, D-25). Task Force 72 was reported to include nine VP airplanes which would be in addition to an unspecified number included in Composite Task Force 70, the ASW task force of the Seventh Fleet (27, D-25).

DDs&FFs - The Seventh Fleet's ASW task force, Composite TF70, was reported to include "several operational hunter-killer groups of heterogeneous forces" and a division of 3-4 destroyers in Task Force 72, probably suggesting about 12 to 16 destroyers/frigates overall. In addition an unspecified number of frigates were said to be based at Adak in the Aleutian Islands "near the Kamchatka Peninsula" (i.e., near Petropavolovsk, the USSR's only submarine base with direct access to the Pacific) (63,D-28).

SSNs - Not a word.

C. Summary. The CVSs were belatedly retired in Soviet writings during the past four years and all 13 of the big carriers were reported to have been converted to CVs to add an ASW capability. The big carriers were perceived as the ready

force of the U.S. Navy as stated in the following passage which implicitly makes it clear that ASW was not the only wartime role of the CVs despite their redesignation from "attack" to "multipurpose":

> 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 (60, D-28).

As shown from the table of force levels given above, only the numbers of guided missile frigates were seen as increasing while the numbers of DDs and FFs were decreasing--certainly not activity likely to cause any concern at Naval Headquarters in Moscow.

The continued non-use of VP airplanes on ASW barrier patrols was accurately reflected by a continued total silence on the subject. In general, the noticeably less attention given to the whole matter of forward deployment during the 1971-'76 period has continued in the subsequent four years. Since it was an observable (and understandable) phenomenon that Soviet naval writers give most attention to those aspects of the major NATO navies that are of greatest concern to them, it may well be that the ability of the new Delta Class SSBNs to carry out their deterrent/strategic strike role from Soviet home waters may have tended to lessen the USSR's overall interest in forward deployment--particularly since advent of the Deltas must have lessened the need for forward deployment of the USSR's general purpose naval forces for the priority role of protecting the SSBNs.

2 (d) - Mission - Completion Capabilities of Soviet SSBNs -- As we learned from a 1974 Red Star article by Rear Admiral Mikhailovsky, while an SSBN may have the "capability" for strategic strike, it may succeed or fail depending "largely on whether the missile platform can remain undetected until the moment its weapons are used" (50, C-29). From this it is clear that "capability" describes merely the physical/

technical capacity for an action in a non-hostile, unopposed environment. Accordingly, from among the 17 positive commentaries collated in Appendix D for this Section 2(d), consideration will be given only to the five which mention opposition-related characteristics of submarines (such as covertness, great submergence depth, etc.). Two other statements indicate that Soviet SSBNs can only carry out their strategic strike roles if provided the protection of other naval forces. The remaining ten commentaries, including the only two positive ones from Army sources, are found to refer only to an unopposed "capability" and so are of no use for determining the Soviet naval perception of the mission-completion capabilities of Soviet SSBNs in a hostile U.S./NATO ASW environment.

Of the five potentially meaningful positive commentaries, three cite the "stealth" or "covertness" of submarines as the key factor allegedly according Soviet SSBNs "invulverability" to U.S./NATO ASW or, at least, proclaiming them "less vulnerable". One of these three plus the remaining two cite the vastly greater areas in which to hide (even extending to home waters) that are available to the latest generation SSBNs with their much longer range missiles. Whether these commentaries merely cite the vastness of the ocean areas in which Soviet SSBNs can hide (ignoring SOSUS, of course) or whether they refer directly to the resultant attribute of "covertness" obstensibly gained by having such large options for choosing combat patrol areas, the result is the same in the sense that all of those five commentaries implicitly contradict the need for SSBN protection by other naval forces which, as mentioned just above, was asserted in two of the commentaries. These two pro-SSBN statements will first be noted and then the commentaries that claim or imply a capability for Soviet SSBNs to carry out opposed strategic strikes without protection. With the relevant commentaries tabled we then will be in a position to determine how to reconcile these conflicting statements -- if that is possible. After that we will turn to the negative commentary.

The first of the two pro-SSBN statements came in the November 1976 issue of Naval Digest in an article by a Captain 2nd Rank Shapovalov that professed to set out the views on ASW of the U.S. and other NATO naval powers. As more often than

not, the real purpose of the article was to set forth Soviet views, largely by means of foreign-Navy surrogates. In the case at point of SSBN protection, the claimed Soviet capability was set out without resort to a foreign-navy surrogate and with a rare directness that likely reflected a desire on the part of Admiral Gorshkov to have the point on the record in unmistakable form. The relevant sentence read as follows:

> 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 antisubmarines armed with ballistic missiles (19, D-32).

The second pro-SSBN statement was by Admiral Gorshkov in 1979 in the 2nd edition of Seapower of the State:

> 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, D-41).

This was a verbatim repeat from the 1st edition that had appeared in 1976 (85, C-32) not long before the Shapovalov article. This suggests that the pro-SSBN statement from the latter quoted above was intended in amplification of Gorshov's very policy-minded and politically expedient remarks in his book to tell his officers, in effect, that his public policy line was that pro-SSBN would be a wartime mission (and that the Soviet Navy would gradually get the ASW cruisers and other air-capable ships with which to carry out such a rigorously demanding mission with its implications of contesting with the U.S. and other NATO naval forces for sea control in the areas selected for SSBN combat patrol areas and for safe-havens in home waters). That this was indeed the thrust of Gorshkov's thinking was evidenced by a statement he published in September 1977 in a booklet The Navy published for the wide readership of the Knowledge Press. In it the Navy chief observed that "various surface ships and airplanes are coming into the composition of our Navy to provide combat stability to the submarines..." (40, D-38).

Holding in abeyance further conjecture and comment on these two pro-SSBN assertions until examination has been made of the five pieces of evidence claiming or implying a mission-completion capability for Soviet SSBNs despite the ASW opposition, let us inspect these five commentaries which imply a mission-completion capability for Soviet SSBNs without any protection by other naval forces. Before inspecting them individually, it should be noted that they are distributed fairly well over the four years -- two in '76, and one in '77, and two in '79 -- suggesting that the claim that Soviet SSBNs carry out their missions without the protection of other naval forces is still the prevailing public position, at least.

The first of the positive assertions that SSBNs could carry out their strategic strike roles unaided came in a July 1976 editorial or Navy Day in Naval Digest, entitled "Sea Shield of the Homeland". The editorial asserted:

> 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 mightly nuclear-powered submarines, which are invulnerable to an enemy, have assumed the leading role in our Navy (10, D-31).

The second of these statements came from the pen of an ardent submarine proponent, Rear Admiral A.I. Rodionov, who was writing with the somewhat greater latitude afforded in a booklet intended for the apparent purpose of recruiting submarine personnel from among the paramilitary youth organization DOSAAF. It is worthy of note that this DOSAAF booklet, which was published in November 1976 and bore the title Strike Force of the Navy, was the only commentary which developed the case for SSBN invulnerability in any detail and at any length:

> "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.

"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.

"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 (70, D-34/35).

The third of these six commentaries appeared eight months later in the July 1977 issue of Naval Digest. In an article ostensibly about the Trident submarine development program, the Soviet naval profession was advised with regard to the new Delta Class SSBN that its longer-range missile would increase its combat patrol areas 10 to 14 times over that of the Yankee Class and make the Delta Class "less vulnerable to antisubmarine defense forces" (33,D-38). This statement was doubly interesting on the following two counts: 1) for its implicit

admission that the Yankees had been perceived to be vulnerable; and 2) for the unprecedented moderation of the claim that the great increase in missile-launch areas only resulted in making the SSBNs sent out on combat patrol "less vulnerable" ratner than the usual claim to their having been made "invulnerable".

The penultimate commentary of the five appeared in the May 1979 issue of the Naval Digest in an article on the problems involved in initially detecting and maintaining contact on "nuclear-powered missile submarines". The article first cited the "vast expanses of the World Ocean" in which SSBNs can be hidden and then went on to a relevant discussion of other factors favoring mission accomplishment by (unprotected) SSBNs:

> 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...Surveillance is rendered more difficult too, as noted abroad by the covertness of operation of submarines, by their capability to remain submerged at great depths for extended periods. Especially important is the quiet running of the ballistic-missile submarines....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, D-41).

The fifth and final positive commentary was one that appeared in the journal International Affairs in November 1979. In a propagandistic article by an Izvestiya correspondent, it was implied in normal surrogate style that the ranges of submarine ballistic missiles were becoming so great that the areas in which SSBNs could conduct their combat patrols (and so be "on station" for launching their strategic strikes if required) were being pushed back right into the coastal waters of the superpowers themselves. The result of these transoceanic SLBM ranges, the article concluded, would be "to make the task of the adversary's antisubmarine forces more difficult" and so make SSBNs "invulnerable" (81, D-42).

Looking back over these five "postive" statements, one is struck by their unsubstantial nature. The first was an editorial written for Navy Day, and occasion celebrated traditionally with upbeat and exaggerated claims to capabilities with as little substance as election campaign promises in the U.S. The proclaimed "invulnerability" of the USSR's "mighty nuclear-powered submarines" are considered by the preparing analyst to be nothing more than the usual Navy Day rhetoric.

The second positive commentary was discounted in the process of reporting it as designed primarily to obtain DOSAAF recruits for the submarine force and hence (like the Navy Day editorial) to provide an acceptable excuse for crediting the Navy's "basic" force with total invulnerability.

The third of the positive commentaries, it will be recalled, was the one that made the unprecedentedly moderate claim that the greater ranges of the latest missile submarines would only make them "less vulnerable" to ASW rather than invulnerable. This was tantamount, of course, to an admission that even the vaunted nuclear-powered submarine, including Soviet SSBNs, were not invulnerable -- and some reasons for this will be noted when we come shortly to the body of negative commentary, especially that on U.S. plans for the ASW barriering of the GIUK Gap.

The fourth positive commentary (the May 1979 Naval Digest article) was the least unsubstantial of the five in that it made a plausible case for SSBNs having a mission-accomplishment capability despite the ASW opposition. To do so, however, would require writing off SOSUS more fully than was done. The result was also, like the one before, unusually moderate and claimed only that the SSBNs constituted "extremely complex and difficult" targets for ASW surveillance systems -- which is far from an assertion that Soviet SSBNs could accomplish their missions if they were being tracked by SOSUS at the outbreak of war.

The fifth positive commentary was written by a newspaper journalist as a routine piece for a journal published in English and a number of other non-Soviet languages to propagandize the Soviet line abroad. The subject was "The Navy in the U.S.A.'s Expansionist Policy". While the fact of the increasing SLBM ranges pushing combat patrol areas back to home waters was accurate enough, as was the claim that this development made anti-SSBN ASW more difficult", more than a little journalistic license was involved when one considers the capabilities of Los Angeles Class SSNs, CAPTOR and QUICKSTRIKE mines or tactical nuclear weapons delivered on submarine bases and building yards.

In view of the questionable objectivity of the positive commentary, as first examined, one finds it even more logically appealing to accept the Soviet Navy Commander-in-Chief's own admission that Soviet SSGNs would require the support of other naval forces to be enabled to carry out this strategic strike role in the wartime circumstance of ASW opposition. And while Gorshov may well have resorted again to a practice he has been known to have employed before of having younger seving officers (like Captain 2nd Rank Shapovalov in this case) make statements that the Navy chief found impolitic or otherwise hardly expedient to make himself and so had Shapovalov claim for him that the Navy would be able to carry out the SSBN-protection mission in wartime, this statement can only be taken seriously with regard to those Delta Class SSBNs withheld in home waters and not to any that must "breakout" through "straits and narrows" and conduct strategic strike missions from the open oceans.

With this much ground covered, it remains only to take note of a number of commentaries that individually provide only partially negative indications regarding the mission-completion capabilities of Soviet SSBNs yet, when taken collectively, do present an important dimension of the Soviet naval perception of the likely wartime performance of their SSBNs.

In addition to the increasing Soviet naval attention to SOSUS and its use to vector U.S./NATO ASW forces (particularly VP aircraft) to Soviet submarines operating in the open ocean (a subject on which the persistent reader is already well apprised), the additional hazard to Soviet SSBNs constituted by nuclear-powered attack or "multi-purpose" submarines has come into clear focus in the past few years. The first commentary in this section (2d) of Appendix D, a Naval Digest article of March 1976, dealt with this problem with unprecedented length and bluntness:

> A lowered noise level at the optimum cruising speed, a capacity 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) task 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, D-30).

The matter of whether or not SSNs could trail SSBNs for protracted periods is likely, by its nature and important implications for the credibility of the USSR's seabased nuclear deterrent, to have been the subject of a lively internal discussion. A possible reflection of such a discussion and perhaps of an initial Defense Ministry position that such capability was not within current state-of-the-art was contained in a curiously equivocal

and hesitating presentation contrined in a 1978 collection of articles on submarines titled Deep Watch:

> 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, D-40).

The preparing analyst's reading of this sentence is that a Defense Ministry position probably was being paid lip service by the acknowledgement that such trailing is "very difficult" but the "still" was intended to say that it would become less difficult with time and, in any event, even by 1978, such trailing was "technically possible".

The most graphic and realistic portrayal of how extremely difficult the ASW barrier would be for Soviet submarines to penetrate in wartime was provided in 1977 in a Defense Ministry booklet on Antisubmarine Forces and Means of Navies by Captain 1st Rank B.I. Rodionov. If two other Soviet writers quoted earlier had been unusually moderate in avoiding the standard flat claim to invulnerability for Soviet SSBNs, this could well have been derived from an appreciation of what hazards awaited Soviet submarines attempting to effect a "breakthrough" of the ASW barrier that could be expected to be established across the GIUK Gap shortly after the outbreak of war. As described by Captain Rodionov the odds against an undetected and unopposed transit must have seemed formidably high:

> 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 /under-water sound surveillance shore facilities/ and lay minefields of CAPTOR mines (27, D-36).

Judging from a recent one of Red Star's frequent front-page vignettes on training, realism requires that Soviet submarines be detected while transiting the GIUK Gap. Yet then, by great skill, they succeed in eluding the heavy concentration of ASW "forces and means". Such training vinettes invariably have a happy ending and this one from Red Star of 1 March 1980 was no exception. The reader has been spared the melodramatic ending but the relevant part is of substantial potential importance for determining the Soviet perceptions of U.S. ASW:

> 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 (87, D-44).

During OKEAN-70 a Red Star correspondent's account of the "breakthrough" of the GIUK Gap commented that under wartime conditions breaking through such ASW barriers would require "great skill and heroism" on the part of the individual submarine commander. That comment and the Red Star vignette quoted above are suggestive of an anticipated replay of the Russian Baltic Fleet submarines' experience in the two world wars in effecting the "breakthrough" of the German "ASW barriers" (largely minefields) across the Gulf of Finland. Should there be available the surface ships and air cover to fight their way through the main ASW barriers to escort Soviet submarines out in the open oceans, assignment of such a task could be expected to be given careful consideration. Otherwise, as in the

Red Star vignette, the individual submarine commanding oficers would be left to their own resources -- and their skill and heroism would be pitted against heavy odds indeed.

Having completed this review of the mission-completion capabilities of Soviet SSBNs with the clearly-indicated results that they are not such as to make the USSR increase the number of its SSBNs maintained on peacetime combat patrols in the open oceans, let us now turn first to the "general" and "overall" conclusions for this final period -- and then to the summary conclusions for the report.

GENERAL CONCLUSIONS RE. SOVIET PERCEPTIONS OF U.S. ASW FOR THE 1976-'80 PERIOD

- Soviet commentary from 1976-'80 focussed particularly on SOSUS. Not only were there more commentaries on this subject than on any one of the other five types of ASW "forces and "means" but SOSUS received the greatest percentage increase in commentaries over the preceding years. The only other ASW categories to receive significant percentage increases in coverage were those of VP airplanes and mines. The simultaneously rapid growth of SOSUS and VP is attributed to the synergistic relation between the two of VP airplanes being the most suitable ASW force for timely prosecution of SOSUS contacts in the opean oceans.

- Although the rate of growth in the number of Soviet commentaries on U.S. ASW slowed from about 60% for 1971-'76 to 22% for the subsequent four years, even the reduced rate of growth evidences a continued increase in Soviet interest in the subject. All these source categories for the commentaries shared in the growth: naval commentaries showed roughly a 10% increase; army commentary increased 50% and almost returned to the 1966-'71 level after a drop in 1971-'76; and Party and other government-sourced commentary (besides the Defense Ministry's) finally increased enough to become a real category for the first time -- if only just to an average of two commentaries per year that shows that ASW now is at least perceived by Party and non-defense government officials as actually a meaningful aspect of the USSR's military problems. The only changes in contexts for the Soviet commentaries on U.S. ASW in the final four years subsequent to the XXVth Party Congress in March 1976 were noticeable increases in the attention accorded to ASW in commentary on U.S./Nato naval exercises and operations, and in propaganda material (including some for recruiting).

- SOSUS commentaries have nearly doubled in the four years subsequent to the close of the XXVth Party Congress in March 1976, seemingly an accurate reflection of increased Soviet concern over the potential of premature detection of both Soviet SSBNs and attack submarines before their missions could be accomplished. This increased concern appears to center around a number of improvements that could be expected to enhance the SOSUS system in the '80s including new towable and portable supplements. For the first time there was a reference to the vulnerability of the SOSUS system, suggesting that Soviet concern has become great enough to provoke some thought as to how the SOSUS system might be disrupted in the event a war should erupt. SOSUS is perceived as substantially "global" in scope, already of considerable effectiveness and likely in the '80s to become

highly effective against Soviet submarines operating in the open oceans.

- Shore-based VP airplanes have been given 25% greater attention in the four years since March 1976 while the P-3C ORION's capabilities to exploit SOSUS data to establish and maintain contact with Soviet submarines in many key areas of the open-ocean has been mentioned no less than seven times. The general tenor of commentary has been more laudable of U.S. VP aircraft than ever before and it appears that the Soviets have an objective perception of the threat to their submarines (premature detection and destruction or protracted tracking in crises) that is constituted by SOSUS and VP airplanes.

- SSN development and construction in the U.S. continue to evoke a high and even slightly increased level of interest from Soviet naval sources during the four years following the end of the XXVth Party Congress in March 1976. The commentary has been remarkable in all being favorable to SSNs without a dissenting voice. Of uncertain significance is that the SUBROC commentary fell off again to only two in the four years. SSN construction was seen to have suffered a further lag and have decreased to only one per year being delivered to the U.S. Navy. The last and presumably definitive Soviet naval perception of the SSN force level aimed at by the U.S. was given in 1979 in the 2nd edition of Admiral Gorshkov's Seapower of the State as about 90. U.S. failure to build a new class of submarines with the improved ASW characteristics that the U.S. Chief of Naval Operations was reported in 1977 to have announced is likely to have convinced Soviet naval sources that the U.S. Navy, in point of fact, was far from putting all of its ASW eggs in the submarine basket, as earlier alleged by Soviet submarine proponents in their efforts to win increased construction of ASW submarines for the Soviet Navy.

- CVs continued over the final four years to share Soviet commentaries on major U.S. air-capable ships with the no-longer operational CVSs and the SCS concept that had died aborning. Patently the Soviet Navy found the continued existence of these ship-types, even if wholly fictional, too valuable for its internal advocacy of more such ships to be foregone. Consequently, a fictional program of over six dozen of each ships to carry VTOL aircraft was dreamed up and propagated. These 75 imaginary ships are alleged to be intended to implement an equally imaginary "oceanic strategy" in which the U.S. has placed most of its strategic nuclear eggs in SSBN baskets and requires an armada of sea control ships to provide protection for them against Soviet ASW forces. The extent to which this disinformation

campaign may have mislead the Party officials and Defense Ministry marshals who determine naval appropriations can only be conjectured. The Navy, for its part, however, continued to perceive the U.S. Navy as much the worse off ASW-wise for neither developing VTOL-carrying large ASW surface ships for open-ocean pursuit of the putative opponents' SSBNs nor building task-specific antisubmarine aircraft carriers optimized for open-ocean ASW. The repeated comment by Soviet naval sources that the S-3A VIKING, the latest operational ASW aircraft for use from large air-capable ships, is eight to ten times more effective than its predecessor, the S-2 TRACKER, suggests that the Soviet experience with VTOL aircraft on the Kiev Class ASW cruisers may have persuaded the naval leadership of the need for higher performance ASW aircraft than VTOL for the nuclear-powered aircraft carrier re-portedly under construction in the USSR. At any rate, they clearly hold the S-3A VIKING in high regard and feel that it deserves a nuclear-powered antisubmarine aircraft carrier designed from the keel up for ASW against the fast, deep-diving submarines of the latest generation.

- Destroyer-type ASW ships have continued since the end of the XXVth Party Congress in March 1976 to be perceived as low on the Navy's priority list in view of the unimpressive performance tolerated in the construction program of the Spruance Class destroyers. And over the past 12 years the U.S. is seen to have only built an average of no more than 2 1/2 destroyers a year for a total of 30 -- wholly inadequate to meet U.S. naval requirements in the Soviet view. As early as 1971 a Soviet naval historian-cum-propagandist had falsely alleged that the U.S. was building 200 destroyer-type ships in a ten-year program to replace the 300 such ships of World War II construction which the Navy had retained. While this was a "big lie" calculated to help the Soviet Navy win larger naval shipbuilding funds, it did show that the Soviet naval leadership considered that it would take a U.S. destroyer-type construction rate on the order of 20 per year to impress the army marshals and Party leaders who controlled the military budget. The actual U.S. destroyer-type construction programs taken altogether did not add up to an impressive total. With the 30 Spruance Class seen as due to be completed by the end of FY 80, the U.S. was seen to be building 15 DDG-47 Class AA-missile destroyers at 1.5 per year and 72 Perry (FFG-7) Class frigates at five/year through 1983. The U.S. was also reported to be modernizing 23 Adams class DDGs over an unspecified period after 1977. In addition to what seemed to the Soviets like an indifferent U.S. approach to destroyer construction, the unsuitability of destroyers and frigates for open-ocean search due to their low-speeds was

noted. Moreover, it was noted that destroyers had become too expensive to build in adequate numbers and were being replaced by the less expensive frigates. Soviet naval commentaries have continued to insinuate in many ways over the past four years that development of ocean-going ASW ships based on principles of dynamic life it preferred the long-term U.S. solution to the problem of restoring to surface combatants the requisite speed advantage over nuclear-powered submarines that has been irretrievably lost by displacement ships. However, this allegation that the U.S. prefers dynamic-lift ships has not been made explicitly -- and probably for the reason that the Soviet Navy realizes that the U.S. naval officers do not match the Soviet Navy's officers in the latters' enthusiasm for such ships for ASW, either for point defense or for wide-area search. Much of Soviet naval commentary on hydrofoil and air-cushion ships under development is not in accord with the facts and appears aimed at the internal audience in the Defense Ministry and Party Central Committee that will have the final word on what is built for the Navy in the way of dynamic-lift ships. Thus, two false reports in 1976 and 1977 (that the U.S. had begun construction of the DEH Class hydrofoil ship and would shortly award a contract for construction of a prototype of a 3,000 ton ASW ship on an air-cushion) appear to be designed for such internal advocacy. ASROC, while not specifically credited with having been improved in its torpedo part by replacement of the inadequate Mark-44 torpedo, has been correctly described in recent commentary as now incorporating the far superior Mark-46 which the Soviets perceive as adequate for use against nuclear-powered submarines. Nothing more has been reported in the Soviet media, however, concerning needed improvements to the missile part of ASROC since a 1976 commentary said the U.S. Navy was conducting a feasibility study on adapting the HARPOON missile to that purpose. The most significant progress doubtless was the bringing to fruition of the LAMPS Mark-3 helicopter, the SH-60 SEA HAWK (after a design competition that had been reported as requiring 5 1/2 years to conduct), and the announcement that the navy would purchase 204 of them to replace the Mark-1 SH-2F LAMPS. The potential importance of the advent of the Mark-3 LAMPS seemed to be weakened in the Soviet perception by the fact, that the number planned for procurement, at least initially, was only one-fourth of NATO requirements and so could only be provided to the very newest destroyer-type ships. Despite its greatly improved capabilities, the descriptions of the Mark-3 LAMPS made it clear that, as for the destroyers and frigates that were to carry it, open-ocean search was not envisioned as an effective task for these relatively fast but not-so-long-range ASW helicopters.

● Mines in the U.S. Navy since the start of this final period in March 1976 have taken a second "great leap forward" in Soviet naval perceptions in just the past four years. The U.S. is no longer criticized for neglecting mine warfare nor is the U.S. mine stockpile dismissed as of "limited value". Rather, the U.S. is now seen (as it was not even four years ago) as having very substantial capabilities for ASW mine-laying, and especially in those areas where the possibilities for destroying Soviet SSBNs are greatest. These areas are the approaches to submarine bases, those of homewater stationing or transits, and at geographic chokepoints. All are areas of fairly shallow water in which ASW mines can be most effectively employed. It is true, of course, that all types/classes of Soviet submarines are present and vulnerable to mines in these areas, yet the salient point is that, while attack submarines can most effectively be hunted in wartime out in the oceans when the position of the submarines are betrayed by attacks on the SLOCs, SSBNs cannot be effectively hunted in the oceans (except when they can be detected by SOSUS) and so their destruction must be accomplished largely in the homewaters portion of their missile profile. And for this purpose the mine has great advantages and advantages for which Russian naval oficers have a historical tradition of appreciation. As in the 1971-'76 period, commentary on the anticipated employment of U.S. ASW mines in general, and the CAPTOR "mine-torpedo" in particular, reflected a consensus view by Soviet naval sources that they would be employed most to blockade submarine bases and to establish mine barriers as part of the ASW barriers across the geographic chokepoints. A critically significant new fact emerged in 1977 in the form of a claim that mining would be important in a nuclear-missile war as well as in a conventional war. This could only have been considered a warranted assertion if a strategic end were to be served -- and logically the strategic end in view is virtually certain to be anti-SSBN ASW. The claim from the 1971-'76 period that the GIUK Gap could be mined "in just a few days" by B-52s laying CAPTOR mines was replaced by two claims in this final period that it could be done with an impressively small number of mines: 500 per a 1977 claim and with only 200 according to the latest mention of the subject in 1979. These two estimates were only one-half and one-fifth, respectively, of the 1,000 CAPTORs reportedly delivered to the U.S. already, so mining the GIUK Gap, at least as far as the availability of mines was concerned, already was perceived as a U.S. capability. The fact was glossed over that use of even CAPTOR mines at the considerable depths in the GIUK Gap is seen as marginal. This makes it even more apparent that the Soviet naval sources involved are using "worst-case analysis" to support Navy requests for more minesweepers and

general purpose naval forces to give them escort and cover. The U.S. budget for mine warfare, although modest by any relevant comparison with that of other naval "forces or means", was noted to have quadrupled between 1975 and 1977, so presumably would support continuing the successful R&D work of recent years that had produced the new CAPTORS, QUICKSTRIKES, and SLMMs (submarine-launchable mobile mines).

- Anti-SSBN ASW has been perceived by most Soviet naval sources since at least early 1977 as within the state-of-the-art for U.S. ASW whose indispensable basis has been recognized as constituted by a SOSUS system of "global" scope. An undescribed "first stage" of SOSUS is been as successfully completed and its "zone of surveillance" is acknowledged to cover "vast" oceanic expanses. SOSUS is now being supplemented by mobile means, towed sonar, and long-lived sonobuoys that will take up the slack to provide coverage in those deep-ocean areas not feasible of coverage by stationary hydroacoustic means.

- While the U.S. Navy finally was claimed by a number of commentaries over the past four years to be assigned an anti-SSBN ASW role, considerable doubt has been cast on the veracity of this assertion by several other commentaries, including one which gave a listing of missions from which anti-SSBN was conspicuously missing and another which claimed the U.S. and other NATO states had determined that ASW barriers were no longer to be employed against Soviet submarines (!?).

- A few Soviet appraisals of U.S. ASW since March 1976 have returned to the pre-1972 effusiveness with the hyperbole of "major buildup" applied by a Captain First Rank in 1977 and of "great" by Admiral Gorshkov in 1979. Except for these two not insignificant exceptions, however, the U.S. ASW effort has been portrayed in less exaggerated, more realistic terms. Of particularly revealing importance was an article in International Life in November 1979 which identified SOSUS, in effect, as being the "technological breakthrough" in ASW which the U.S. was achieving. This made explicit the previously cited veiled implications that such were the case. Also, unlike the commentary in the previous period, several of the various "forces and means" of U.S. ASW were singled out as the recipients of particular attention/investment. Among these, SOSUS was the most prominent and Goshkov singled out ASW R&D. He has had the most recent word on U.S. ASW in the 2nd edition of Seapower of the State and he has clearly implied, as in the 1976 (1st) edition, that it is a force that must be taken strictly into account.

- U.S. budget allocations to ASW over the last four years have been the most accurate yet to appear but, nevertheless, they have been employed selectively to obscure a substantial, if temporary, decrease in the FY 1977/'78 ASW budget. They have also presented the data in terms that create the false impression that allocations to ASW, as a percentage of the overall military budget, have been greatly increased. As in the preceding periods, the U.S. ASW budget data appears to be undergoing distorting manipulation for internal-political purposes.

- U.S. force levels of ASW platforms suitable for open-ocean search are perceived by Soviet naval sources to have undergone the following changes since March 1976: VP airplanes have been carried as remaining constant at 250. SSNs have further increased from 65 to an estimated 82. Although most of the 30 Spruance Class DDs are completed, the overall number of destroyers retained in operation is estimated as only 44 on 1 January 1980. Similarly, the number of frigates estimated at numbering only 35, cut back from 58 only 30 months earlier. While the numbers of DDs have not been increased commensurate with the decrease in DDs, the FFGs have been increased roughly proportionately to the decrease in conventional frigates. As Soviet commentary has observed, however, destroyers and frigates equipped with anti-aircraft missiles are going to be employed primarily for ASW since to divert them to ASW would not be a cost-effective use of such considerably more expensive ships.

- U.S. ASW forces' forward deployment/readiness is currently perceived as consisting largely of some undetermined but fairly small share of the CVs' total capabilities for conducting "all" naval missions, as one Soviet source expressed it. The two CVs of the U.S. Atlantic Fleet which are normally "forward deployed" are with the U.S. Sixth Fleet in the Mediterranean and, in practice, are even less available for open-ocean ASW than would be the remaining three or four reported as retained in the Atlantic but homeported on the U.S. East Coast. Thus, their readiness for immediate use in the Eastern Atlantic must be considered by Soviet naval observers as low. The situation is better in the Western Pacific where the two to four of the eight normally assigned to the Pacific Fleet are assigned to the Seventh Fleet in the Western Pacific. The VP aircraft forward deployed in the Atlantic and Pacific were not reported but more relevant, in view of the rapidity with which aircraft can be forward deployed if bases are available, were the listing of such forward bases in both theaters and the acknowledgement that these bases provided VP airplanes with rapid access to any point in these oceans. Destroyers and frigates in the Atlantic were not

reported in connection with any forward deployments to the Eastern Atlantic with the logical implication being that there were none to report. In the Pacific, reports made it appear that a dozen or so destroyers and frigates were forward deployed to the Western Pacific with the Seventh Fleet and a few additional frigates to Adak to be close to the USSR's submarine base at Petropavlovsk-on-Kamchatka. There were no explicit comments on alleged increases (or decreases) in forward deployment and/or readiness of U.S. ASW-capable ships, and none at all on SSNs, suggesting there were no increases to report and, if anything, the continued slowdown and retrenchment of U.S. naval forces had been perceived.

- Mission-completion capabilities of Soviet SSBNs, although claimed by a half-dozen singularly unsubstantial and very unconvincing Soviet naval commentaries, were evaluated as likely to be just as presented by Admiral Gorshkov in the 1976 and 1979 editions of Seapower of the State -- i.e., as not sufficiently capable of taking on enemy ASW forces individually and unsupported but rather requiring the support of other naval forces for protection and cover.

OVERALL CONCLUSIONS RE. SOVIET PERCEPTIONS OF U.S. ASW FOR THE 1976-1980 PERIOD

- SOSUS is generally perceived by Soviet sources as the sine qua non of successful U.S. ASW against Soviet SSBNs deployed out into the open oceans either prior to the outbreak of war or subsequently. The very fact that there have been none of the explicit and detailed commentaries on the vulnerabilities of SOSUS, as have always been standard fare in the Soviet commentary on all other types of ASW "forces and means", gives one pause to reflect that the subject of potential SOSUS vulnerabilities would seem to be taboo for the Soviet media, quite possibly to avoid alerting the U.S. and causing it to make extensive preparations to counter Soviet capabilities to disrupt SOSUS.

- The U.S. Navy is perceived as eventually to have 90 SSNs and an adequate stock of modern ASW mines to blockade the known submarine bases of the USSR and establish and maintain effective ASW barriers to bar egress of Soviet submarines to the open oceans.

- U.S. shore-based VP airplanes have "arrived" in the Soviet Navy's collective view due to their ability to exploit SOSUS data promptly for picking up direct contact with an unidentified submarine, classifying it, and localizing the submarine so that it either can be attacked or tracked continuously for protracted periods.

- Commentary on the capabilities of ASW submarines for prolonged trailing of enemy submarines has been too tentative and qualified to conclude that the SSNs of the U.S. Navy are perceived as capable of prolonged trailing of Soviet submarines as a substitute to a disrupted SOSUS system in a period of extreme tension prior to the outbreak of war.

- One general implication of the whole corpus of Soviet commentary for the past four years is that U.S. ASW is roughly the state-of-the-art equal of Soviet submarine warfare as long as SOSUS is operating effectively. However, should the SOSUS system be put out of operation, the ASW advantage would then be with the side with the largest, best-supported ASW forces in general and of SSNs and ASW mines in particular. Clearly, the Soviets' perception of the wartime mission assignments of the naval forces of the U.S., despite the Soviet view that every military threat must be countered to the maximum extent feasible, nevertheless reflects doubt that the U.S. actually is planning to give priority to anti-SSBN ASW.

- Even without the U.S. explicitly assigning a high priority to anti-SSBN ASW as a wartime mission, the fact that every hostile submarine would be sought out and attacked could lead to an unacceptably high degree of attrition of Soviet SSBNs, especially in home waters and at chokepoints. It is this situation that has led to some marked departures on the part of some naval sources from repeating the standard Navy Day propaganda claim that Soviet SSBNs could surmount U.S./NATO ASW and execute strategic strikes should circumstances ever require them to do so.

BOTTOM LINE: The key Soviet perceptions of U.S. ASW as of 1 March 1980 are:

1) ASW capability against Soviet SSBNs in the open ocean is considerable and growing but is predicated on the continued operation of SOSUS to provide initial location of Soviet SSBNs on combat patrol in the open oceans.

2) Even with a small share of the programmed 90 SSNs and the available stock of ASW mines, the U.S. Navy could cause large losses to the Soviet SSBN force barring effective Soviet measures to offset these gross U.S. capabilities in submarine and mine warfare.

FINAL CONCLUSIONS RE. SOVIET PERCEPTIONS OF U.S. ASW, 1960-1980

A. "What U.S. ASW programs are the particular focus of Soviet commentary?" (Question #4 of ACDA Task Statement)

Here, as in all the following answers to the ACDA Task Statement questions, the conclusions arrived at previously for each of the four periods studied will be reiterated for ease of reference and to facilitate analysis of such trends as they reflect. This done, a final conclusion to each separate question (or to the various aspects of each) will be drawn.

- Soviet commentary from 1960-'66 focussed particularly on SSNs, SOSUS, and destroyer-type surface combatants. U.S. failure to design an antisubmarine aircraft carrier from the keel up and build them in large numbers was perplexing since so doing seemed to the Soviet Navy to proffer the only feasible way for a superpower Navy (with or without SOSUS or mobile equivalent) to develop a significant damage-limiting anti-SSBN capability in the open oceans at the outbreak of war. Mines were ignored.

- Soviet commentary from 1966 to 1971 focussed on the planned overall size of the U.S. SSN force (as estimates rose from 64 in 1966 to 110 by 1971) and on the rate of SSN construction (which lagged badly). While the subject of SOSUS continued to be discussed routinely at the professional level of Naval Digest, it appeared to be a proscribed topic for naval books intended for a wide readership. U.S. antisubmarine aircraft carriers (CVSs), and the ASW hunter-killer groups of which they formed the nuclear, probably were given less attention than they objectively merited due to a sensitive internal discussion over the potential effectiveness of such ships. A marked penchant of senior Soviet Navy officers and other naval writers for employing the CVSs as surrogates for the numerous "ASW cruisers" which the Soviet Navy wanted to build was quite evident. Attention to destroyer-type ships for ASW tripled during the period as the gradual addition of ASROC "mission-torpedoes" and DASH drone helicopters provided the first significant changes to U.S. destroyer-type ships since World

War II. VP airplanes were given limited but routine coverage while U.S. mine warfare capabilities still were ignored as too limited to merit any significant attention.

- Soviet commentary from 1971-'76 focussed particularly on SOSUS although the greatest increase in attention was a tripling of commentaries on air-capable surface ships (especially CVs and projects for SCSs). Attention to SOSUS itself doubled, giving that ASW "means" the numerical lead in frequency of commentaries on U.S. ASW "forces and means". A doubling of commentaries also was posted by VP airplanes and mines. Although the numerical lead enjoyed by SSNs in the preceding five-year period was far surpassed by SOSUS and the number of commentaries on SSNs decreased moderately, they still remained at a respectively high level. While destroyer-type ships also continued to be given substantial attention, the tripling of commentaries during the preceding period gave way to a slight decline in total numbers of commentaries on those not so air-capable combatants.

- Soviet commentary from 1976-'80 focussed particularly on SOSUS. Not only were there more commentaries on this subject than on any one of the other five types of ASW "forces and means" but SOSUS received the greatest percentage increase in commentaries over the preceding five years. The only other ASW categories to receive significant percentage increases in coverage were these of VP airplanes and mines. The simultaneously rapid growth of SOSUS and VP is attributed to the synergistic relation between the two of VP airplanes being the most suitable ASW force for timely prosecution of SOSUS contacts in the open-ocean.

CONCLUSIONS: SOSUS, land based VP airplanes, SSNs, and mines are the particular focus of Soviet commentary on ASW programs at present. SOSUS, after running second to attack submarines (SSNs) throughout the 1960s, gained the lead in the early '70s and has continued to increase it. VP airplanes, after a low and decreasing level of attention in the 1960s, jumped up to double the previous level of attention from 1971 to '76 and has been the subject of increasing commentary ever since then -- primarily because of their

capabilities, using SOSUS data, to destroy Soviet SSBNs on combat patrol in the open oceans. SSNs have continued to be the focus of a high level of comment. Mines have gone from a virtual non-subject throughout the '60s to one that received a doubled number of commentaries in 1971-'76 as the U.S. Navy produced the CAPTOR "mine-torpedo" and other ASW mines. Attention to U.S. developments in mine warfare continues to increase with the growth of U.S. capabilities to use this cost-effective and particularly well-suited weapon against Soviet submarines operating in home waters.

B. "How frequently and what contexts to the Soviets discuss U.S. ASW capabilities?" (Question 33 of ACDA Task Statement)

- U.S. ASW capabilities were discussed by the Soviets with high frequency during the 1960-1966 period. The commentaries largely were made in one of three contextual frameworks: (1) Factual descriptions of U.S./NATO ASW forces, weapons, and sensors; (2) U.S. efforts to develop an adequate antisubmarine defense against Soviet submarines; and (3) Portrayals of U.S. efforts to protect the country against SSBN strikes that (largely unconsciously) mirror-imaged Soviet thinking and planning in this regard.

- The already high frequency with which the Soviets had discussed the U.S. ASW capabilities in the preceding period, rose two-thirds during 1966-1971. This included increases in naval commentary of about 50 percent and 260 percent in Army statements which earlier had amounted to only about one-seventh of the total. The three main contexts involved remained as given in the conclusions for the initial period.

- The unbroken trend to even higher frequencies of Soviet discussion on U.S. ASW capabilities continued in the 1971-1976 period with roughly a 60 percent further growth on top of the 67 percent growth of the preceding five-year period. This included an increase in naval commentaries of 86 percent, but a 61 percent dropoff in Army commentaries. The most common context of Soviet commentaries on U.S ASW during the 1971-1976 period was that of the various ASW "forces and means" in the U.S. ASW inventory and their rel-

ative advantages. The continuing difficulty of the initial detection of a submarine was a frequent context. The "state" importance of ASW to the USSR was a renewed if only occasional context and probably was engendered by the 1972 ABM Treaty. Prior to that Treaty it appeared that the USSR anticipated eventually developing an ABM capability against our POLARIS/POSEIDON missiles. Once that long-term expectation was ruled out by the signing of the Treaty, the Navy's lack of ASW capability against nuclear-powered submarines in the open oceans led to the emphasis on ASW as a mission of "state" importance to which not only must every service contribute according to their individual capabilities, but also which could, on a priority basis, command resources for R&D work related to finding adequate means for detecting SSBNs initially and locating and tracking them continuously in peacetime for destroying them in wartime.

- Although the rate of growth in the number of Soviet commentaries on U.S. ASW slowed from about 60 percent for 1971-1976 to 22 percent for the subsequent four years, even the reduced rate of growth evidences a continued increase in Soviet interest in the subject. All of the source categories for the commentaries shared in the growth: naval commentaries showed roughly a 10 percent increase; Army commentary increased 50 percent and almost returned to the 1966-1971 level after a drop in 1971-1976; and Party and other government-sourced commentary (besides the Defense Ministry's) finally increased enough to become a real category for the first time -- if only just to an average of two commentaries per year that shows that ASW now is at least perceived by Party and non-defense government officials as actually a meaningful aspect of the USSR's military problems. The only changes in contexts for the Soviet commentaries on U.S. ASW in the final four years subsequent to the XXVth Party Congress in March 1976 were noticeable increases in the attention accorded to ASW in commentary on U.S./NATO naval exercises and operations, and in propaganda material (including some for recruiting).

CONCLUSIONS: U.S. ASW capabilities were already being discussed in Soviet naval circles with high frequency

in 1960 when this study started and have commanded increasing Soviet naval attention ever since. While the rate of growth in the number of naval commentaries had decreased markedly, this fact seems of little consequence since the level of commentary is high and still growing at the not inconsiderable annual rate of over 20%. The frequency of Army commentary, quite understandably, is issue-related and appears to peak whenever the Navy's campaign for more naval forces uses U.S. ASW as a justification. The frequency of Party commentary has only recently increased to the point that one can cite it as evidence that ASW has gained recognition as a significant factor in the military-political equation.

The Soviets discuss U.S. ASW capabilities in a number of contexts. First there is the objective reporting of information of professional interest to Soviet naval officers. The Foreign Naval Chronicle items and short, unsigned articles in the Naval Digest have been the typical sources of commentaries of such factual nature. Most of the signed articles in the journals and newspapers and virtually all of the books that at least touch on the subject of U.S. ASW, however, appear quite unmistakably to be maximizing (*or minimizing*) the "threat" of U.S. ASW capabilities for ulterior motives connected with policy debates over various issues.

C. "How have the frequency and nature of Soviet commentaries changes?" (Question #2 of ACDA Task Statement)

The careful reader may have noted already that this question was not addressed specifically in any of the bulleted conclusions to each of the four periods. The reason for this, as mentioned earlier, is that there is redundancy between the "frequency" part of this question with the "how frequently" part of Question #3 and a further redundancy between the "nature" portion of this question and the "What-is-the-Soviet-perception-of" part of Question #1. While earlier separate data were collected for a subsequent full explication and analysis of this question for each of the four periods, it now seems highly advisable to exclude any "general" and "overall" conclusions to this question to avoid the repetition and possible confusion that would ensue.

NOTE: In another innovation to lend clarity to the final analysis, the three contextual questions that appeared in sections 1 (a), 1 (b), and 2 (d) are pulled together next to provide the contextual

background the preparing analyst deems essential before addressing the key, unbrella question, Question #1 of the ACDA Task Statement, as to the actual Soviet perceptions of the various aspects of U.S. ASW.

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?" (contextual question)

- Anti-SSBN ASW was seen by the Soviets during the 1960-1966 period as beyond the technological state-of-the-art given the substantial lag of ASW behind that of submarine warfare.

- Anti-SSBN ASW was seen by the Soviets during the 1966-'71 period as not only still lagging the technological state-of-the-art of submarine warfare but as fated to continue to lag behind, and perhaps increasingly further behind, barring a technological breakthrough in long-range submarine detection.

- Anti-SSBN ASW still was seen by the Soviets during the 1971-'76 period as beyond the state-of-the-art but commentaries on SOSUS in 1972 and 1975 by two Soviet admirals implied a realization that further improvements of SOSUS sensors and continued geographic expansion into the deep oceans could give the U.S. the equivalent of the long-sought the chronological breakthrough in ASW that would make the oceans transparent and deprive submarines of the covertness of which their utility and efficacy largely depends.

- Anti-SSBN ASW has been perceived by most SOviet naval sources since at least early 1977 as within the state-of-the-art for U.S. ASW whose indispensable basis has been recognized as constituted by a SOSUS system of "global" scope. An undescribed "first state" of SOSUS is seen as successfully completed and its "zone of surveillance" is acknowledged to cover "vast" oceanic expanses. SOSUS is now being supplemented by mobile means, towed sonar, and long-lived sonobuoys that will take up the slack to provide coverage in those deep-ocean areas not feasible of coverage by stationary hydroacoustic means.

CONCLUSIONS: Anti-SSBN ASW in the open oceans is seen by the Soviets as, in effect, within the technological state-of-the-art for the U.S. Navy using the SOSUS system supplemented by mobile means, towed sonar, and long-lived sonobuoys. The U.S. is perceived, in effect, as gradually developing a system that has the potential in the 1980s to compensate adequately for the continued failure to achieve that long-sought technological "breakthrough" that, in one fell swoop, would "illuminate" the whole "World Ocean" and neutralize the USSR's large submarine force.

1 (b)- "Is the U.S. Navy seen as assigned a priority mission for anti-SSBN ASW?" (contextual question)

- No priority wartime mission for anti-SSBN ASW was seen during the 1960-1966 period as assigned the U.S. Navy.

- No priority wartime mission for anti-SSBN ASW was seen during the 1966-'71 period as assigned to the U.S. Navy except possibly to some of the SSNs.

- The U.S. Navy still was not perceived from 1971 to 1976 as being assigned a priority anti-SSBN mission for wartime. While only CVs were explicitly stated to have other priority missions, and while it cannot be definitely ruled out that some U.S. SSNs were perceived as having priority wartime mission assignments against Soviet SSBNs, an October 1975 statement of U.S. ASW missions (that could be carried out by U.S. ASW forces provided with SOSUS vectors) failed to include even a general heading under which anti-SSBN ASW could have been even implicitly subsumed.

- While the U.S. Navy finally was claimed by a number of commentaries over the past four years to be assigned an anti-SSBN ASW role, considerable doubt has been cast on the veracity of this assertion by several other commentaries, including one which gave a listing of missions for which anti-SSBN was conspiciously missing and another which claimed the U.S. and other NATO states had determined that ASW barriers were no longer to be employed against Soviet submarines (!?).

CONCLUSIONS: There is good reason to doubt that the U.S. Navy is not, or ever has been, perceived by the Soviet Navy as actually assigned a priority mission for anti-SSBN ASW. Rather, SSBNs are seen as likely to be destroyed in significant but not crippling numbers as part of the U.S./NATO naval effort to prevent Soviet attack submarines from denying the use of the Atlantic to U.S. shipping by an anti-SLOC campaign against convoys and their escorting forces. Whether by SSNs and mines in the USSR's home waters or SOSUS-vectored VP in the open oceans, the Soviet SSBN force faces the prospect of serious but acceptable attrition since the Soviets have to expect the "enemy" to make every effort for the destruction of all detected submarines regardless of type.

2 (d) - "Are the mission-completion capabilities of Soviet SSBNs perceived by the Soviets to be good or not?" (contextual question)

- Mission-completion capabilities of Soviet SSBNs were extolled in the 1960-1966 series but in such a fragmentary and haphazard manner as to suggest that the Soviet naval writers were merely conforming to the military censors' guidelines for not undercutting the credibility of the USSR's seaborne strategic deterrent force. So, the net effect was to introduce an unmistakable element of doubt as to their mission-accomplishment capabilities both regarding Soviet SSBNs already deployed in the open oceans prior to the outbreak of war and those that might be required to leave their bases, effect a "breakout" of the chokepoints and ASW carriers across them, and transit to missile-launch areas through the hostile ASW environment created by the ASW forces and hydroacoustic-detection infrastructure of the U.S. Navy and its NATO and Japanese allies.

- Mission-completion capabilities of Soviet SSBNs, while paid routine lip service in some commentaries during the 1966-'71 period, were revealed by others to be uncertain at best and particularly vulnerable to being ambushed while leaving or reentering port and while attempting the "breakthrough" of ASW barriers.

- Mission-completion capabilities of Soviet SSBNs continued to be paid routine lip service in a number of commentaries that claimed adequate

capabilities. However, it was made clear that such claims refer to gross capabilities and do not make any allowances for the strength of enemy opposition. Moreover, other commentaries implied doubt regarding the opposed mission-completion capabilities of Soviet SSBNs. Most notably, Admiral Gorshkov was emphatic in the first edition of his Seapower of the State, in late 1975, that even the Navy's nuclear-powered submarines required the "support" of other naval forces to give them the "combat stability" required to complete their missions successfully.

- Mission-completion capabilities of Soviet SSBNs, although claimed by a half-dozen singularly unsubstantial and very unconvincing Soviet naval commentaries, were evaluated as likely to be just as presented by Admiral Gorshkov in the 1976 and 1979 editions of Seapower of the State -- i.e., as not sufficiently capable of taking on enemy ASW forces individually and unsupported but rather requiring the support of other naval forces for protection and cover.

CONCLUSIONS The mission-completion capabilities of Soviet SSBN are perceived by the Soviets to be anything but assured. Those out in the ocean on pre-hostilities combat patrol (only Yankees, in all likelihood) are perceived as subject to continuous tracking by SOSUS (or, conceivably to prolonged trailing by SSNs) and prompt destruction at the outset of hostilties. Those SSBNs retained in home waters (including, with virtual certainly, all of the Deltas) have to anticipate operating in a hostile ASW environment of mines and SSNs. Gorshkov, with good reason, expects to be forced to provide his submarines with the cover and escort forces necessary to fight through the ASW barriers and to neutralize or destroy any aircraft carrier task forces providing cover for the barrier forces. This potential requirement to engage the stronger U.S./NATO naval forces, it must be noted, would become an actual requirement only for any of the Yankees that the Supreme High Command might direct be sortied after the initial nuclear exchange as a reserve, backup force for the Strategic Missile Forces. The Deltas of course, could be retained in undetected out-of-the-way "maneuvering" bases, under the Arctic ice cover, or in safe havens in Soviet home waters where they could be given optimum protection with a deeply-echeloned defense by other Soviet naval

and air forces, shore and ship-based ASW aircraft, the large numbers of coastal ASW ships extant, tactical submarines, and defensive coastal mine barriers backed up with coastal missile batteries with OTH ranges.

D. "What is the Soviet perception of the ASW capabilities of the U.S. SOSUS system and how has it changed?" (Question #1, part 3 (a), of ACDA Task Statement).

- SOSUS was perceived by Soviet naval sources no later than 1962 as being of absolutely vital importance to any eventual success the U.S. ASW effort might be able to achieve in open-ocean detection and peacetime tracking or wartime destruction of those of the Soviet Navy's SSBNs maintained in readiness for strategic strike on combat patrol on the high seas. Several allegations appeared between 1963 and 1966 that all of the U.S. advances in ASW weapons systems (SUBROC, ASROC, DASH, ORION) would be of no help until the key problem of initial detection of submarines in the open ocean had been resolved (either by SOSUS or a "technological breakthrough" that would make the oceans "transparent" for ASW forces). While the projected (but unsuccessful) ARTEMIS deep-water hydrophone system was reported on frequently, the likelihood that it would never go beyond the R&D stage appears to have registered in Soviet naval perceptions by the beginning of 1966 and the period ended with Soviet naval writers reporting that the U.S. did not, at least at that time, have an "effective" system for long-range detection of Soviet submarines operating in the open Atlantic or Pacific. So, while the Soviet naval profession was kept well abreast of SOSUS developments, both what was said and what was not said supported the existence of a general Soviet consensus, at least among senior naval officers and other specialists, that SOSUS did not constitute a short-term (3-5 years) or even mid-term (5-10 years) threat. On the other hand, there was an unmistakable if never voiced recognition that SOSUS potentially constituted an eventually effective substitute for the "technological breakthrough" that could make the oceans transparent. Or, perhaps more accurately, the Soviets realized that SOSUS was the actual shape that "breakthrough" was destined to take, although slow and laborious in development.

- SOSUS continued to be perceived by Soviet naval sources throughout the 1966-'71 period as a development to be watched but not as one already constituting an unacceptable or major threat even to that small portion of the Soviet SSBN force maintained on open-ocean combat patrols in peacetime to afford credibility to the sea-based part of the USSR's nuclear deterrent. While in 1967 the chances of SOSUS ever becoming a deep-water, ocean-wide system seemed so slim that the Naval Digest over-hastily wrote the whole system off as much too limited potential, only three years later the standard Soviet naval perception of SOSUS had changed from one limited to the "oceanic approaches" to the U.S. East and West Coasts to that of a system intended eventually to be "global" in its coverage. Nevertheless, any such development clearly was seen as long-term while SOSUS was described in 1970 as incapable of determining the location of submarine contacts with adequate precision to vector ships and planes close enough to the submarines to pick up the contacts.

- SOSUS was portrayed in Soviet naval writings during the 1971-1976 period as still intended eventually to afford "global" coverage and to be undergoing rapid integration into a worldwide surveillance system of the U.S. Armed Forces that would incorporate all feasible means of submarine surveillance (from satellites and commercial airlines to reporting by oceanographic survey and merchant ships) so as to provide nearly real-time vectors on submarine contacts to the ASW in the region of the Azores and SEA SPIDER in mid-Pacific north of the Hawaiian Islands were demonstrating the possibilities for wide-ocean SOSUS coverage sufficiently well to leave little room for doubt that SOSUS eventually would be able to detect a large proportion of SSBNs maintained on peacetime combat patrols in the open ocean. And in wartime or international crises, air-droppable, long-life coverage on otherwise unsatisfactory areas of SOSUS detection. Soviet commentary was divided between warnings to the naval professionals that SOSUS must be taken as a serious development (for which planning to counter in wartime was in order) and reassurances that for the time being it still was of inadequate range and effectiveness to constitute a short-term threat to Soviet submarine operations.

- SOSUS commentaries have nearly doubled in the four years subsequent to the close of the XXXth Party Congress in March 1976, seemingly an accurate reflection of increased Soviet concern over the potential of premature detection of both Soviet SSBNs and attack submarines before their missions could be accomplished. This increased concern appears to center around a number of improvements that could be expected to enhance the SOSUS system in the 1980s including new towable and portable supplements. For the first time there was a reference to the vulnerability of the SOSUS system, suggesting that Soviet concern has become great enough to provoke some thought as to how the SOSUS system might be disrupted in the event a war should erupt. SOSUS currently is perceived as"global" in scope, already of considerble effectiveness, and likely in the 1980s to become highly effective against Soviet submarines operating in the open oceans.

CONCLUSIONS: SOSUS has been perceived since the early '60s as indispensable to provide the initial contacts that the key to solution of the open-ocean ASW problem. Since a temporary faltering in 1967 when the U.S. failed to prosecute the installation of the ARTEMIS deep-ocean hydrophone system, Soviet naval conviction has not wavered that SOSUS has long-term potential to become a de facato "breakthrough that in the '80s may "illluminate" so much of the World Ocean's key areas that Soviet submarines will lose the advantage of covertness and require escorting and/or covering forces of attack submarines, surface ships and aircraft against the ASW forces of the U.S. and its allies. The preparing analyst believes this to be the underlying but unvoiced rationale for Admiral Gorshkov's unyielding insistence that Soviet submarines must be given the support of other naval forces to enjoy the "combat stability" (survivability) necessary for them to carry out their assigned missions in a hostile wartime ASW environment. The Navy Commander-in-Chief expressed this view in both the 1976 and 1979 editions of his book Seapower of the State along with a conviction that hydroacoustic systems of underwater surveillance were of primary importance for ASW and would undergo further major improvements. It is apparent that SOSUS had become sufficiently effective by the time of the XXVth Party Congress in March 1976 that Soviet naval officers were being warned that SOSUS must be taken seriously and

plans made to disrupt its operation at the outbreak of war to preserve the covertness essential to independent (unprotected) submarine operations. With a prototype of a deep-ocean stationary system SASS perceived to be slated to be ready by 1982, in effect, to take over where ARTEMIS left off when work on it was suspended 15 years ago, and with R&D on deep-ocean systems based on detection of the wakes or magnetic anomalies caused by submarines in progress, the still-increasing annual rate of growth naval commentaries on SOSUS is quite understandable. When the eventual prospects are considered of Soviet submarines having to contend with an effective U.S. deep-ocean ASW surveillance capability in all of the likely areas of Soviet submarine operations (based on a stationary SOSUS system with multiple towable and air-droppable supplements), it becomes abundantly clear why the Navy chief insists on the support of other naval forces for his submarines (and a strategic-scale campaign against the opponents' ASW forces both in port and at sea). It is equally clear why Soviet naval officers would be warned to take SOSUS seriously and why a military requirement for putting the SOSUS system out of operation right at the start of any war would lead to the censoring of all but the most inadvertent mentions of the vulnerability of SOSUS -- a subject that otherwise would have been discussed with high frequency.

On balance, SOSUS is perceived by the most credible naval sources as being already of considerable effectiveness over sufficiently large areas of the oceans to be reasonably termed "global" in extent. Moreover, the towable and air-droppable supplemental subsystems are seen as having substantial capabilities for filling in the major gaps in existing SOSUS coverage. Even without any stationary deep-ocean system such as SASS may become eventually, SOSUS clearly has become a matter of major concern to the Soviet Navy.

D. "What is the Soviet perception of the ASW capabilities of U.S. shore-based VP airplanes and how has it changed?" (Question #1, part 3 (b)), of ACDA Task Statement)

- Shore-based VP airplanes were given routine but quite limited coverage in 1960-1966 cnsidering the impotance the U.S. accorded to them for ASW and the USSR's traditional total dependence on shore-based aircraft. The steady U.S. replace-

ment of the P-2V NEPTUNE by the P-3A ORION was reported but not a single mention found its way into print about the capability of the P-3A to employ SOSUS vectors to make initial contact on Soviet submarines in the open oceans. First mention was made concerning U.S. development of A-NEW, which was billed as an integreated system of sensors and weapons for the next generation of U.S. VP airplanes.

- Shore-based VP airplanes were reported at an even lower level that before and the commentaries mainly addressed the gradual replacement of P-3A ORIONs with P-3C ORIONs. The latter were reported to carry the A-NEW integrated sensors-weapons suit which was recognized as a big improvement for localizing and attacking (or tracking continuously in peacetime). However, it was made pointedly clear that A-NEW contributed nothing in the way of a long-range detection capability to supplement or replace SOSUS. Soviet naval perceptions of the future of U.S. VP airplanes seems to have been subjectively eclipsed in 1966-1971 period by the lack of prospects for the Soviet Navy's own VP airplanes which, lacking a SOSUS system or its mobile equivalent to provide vectors on submarines contacts, were pictured in 1970 as without a future in ASW barring successes in increasing detection ranges.

- Shore-based VP airplanes were the subject of double the number of commentaries in the 1971-1976 period than in the preceding five-year period and a marked qualitative rehabilitation of VP aircraft took place, including the first two references in late 1975 and early 1976 to the P-3C ORION's capability to exploit SOSUS data for vectoring them into direct contact with submarines operating in the open oceans. The January 1976 commentary in Naval Digest provided the first public acknowledgement that VP aircraft vectored by SOSUS constituted "a highly effective" ASW force. It seemed readily apparent that the U.S. VP had gained a greatly enhanced position in Soviet naval perceptions due primarily to its SOSUS connection.

- Shore-based VP airplanes have been given 25 percent greater attention in the four years since

March 1976 while the P-3C ORIONs capabilities to exploit SOSUS data to establish and maintain contact with Soviet submarines in many key areas of the open-ocean has been mentioned no less then seven times. The general tenor of commentary has been more laudable of U.S. VP aircraft than ever before and it appears that the Soviets have an objective perception of the threat to their submarines (premature detection and destruction or protracted tracking in crises) that is constituted by SOSUS and VP airplanes.

CONCLUSIONS: VP airplanes were given remarkably little attention from 1960-'66 and even less attention from 1966-'71. After the latter date, the number of commentaries increased 100% in 1971-'76 and another 25% in the four years that have elapsed since 1976. The preparing analyst attributes the otherwise inexplicable slighting of VP airplanes as as ASW force during the '60s to the difficulty of trying to say anything meaningful about the ASW capabilities of such airplanes when there was an apparent censors' ban on discussing their primary capability for open-ocean ASW using SOSUS vectors. Once that capability could be mentioned, it was discussed twice before the XXVth Party Congress in March 1976 and no less than seven times since -- a high frequency for discussion of any one particular ASW capability of a single type of ASW force. The general tenor or the commentary has been quite favorable and it appears that the Soviets have a full appreciation of the threat of immediate destruction once a war started that confronts Soviet submarines operating in the open oceans in peacetime where they are subject to continuous tracking by SOSUS and prompt attack by SOSUS-vectored VP aircraft at the outbreak of hostilities.

D. "What is the Soviet perception of the ASW capabilities of the attack submarines (SSNs) of the U.S. Navy and how has it changed?" (Question #1, part 3 (c) of the ACDA Task Statement).

- SSN development and construction by the U.S. in the 1960-'66 period was professed to be concerned primarily with designing nuclear-powered boats that could dive deeper and run quieter and faster than the early designs. While there doubtless was more than a little truth in this, the emphasis on those three features (and especially on speed) seemed to

reflect the Soviet Navy's preoccupation with designing the very fast, deep-diving titanium-hulled Alpha Class SSN more than it did U.S. military requirements. From 1962 onward to the present the Soviets have evinced concern at the prospect of the U.S. eventually having a large force of highly ASW-capable SSNs. The loss of the U.S. SSN Thresher in 1963 was soon realized by the Soviet Navy not to reflect any basic design weaknesses that could not be corrected. The criticism that the "multipurpose" SSNs being constructed by the U.S. were not as satisfactory for ASW as if they were task-specifically designed for ASW did not last long and is likely also to have been related mainly to development of the Soviet Navy's Alpha Class SSN. The underwater-launchable "missile-torpedo" SUBROC was mentioned only a moderate number of times, an average of once a year, despite its intrinsic importance.

- SSN development and construction by the U.S. in the 1966-'77 period was perceived by Soviet naval sources as vacillating and probably as reflecting a far lower priority than had been accorded the Polaris SSBN construction program. Nevertheless, the eventual possession by the U.S. of a larger, more ASW-capable force of SSNs clearly was in the making regardless of the seemingly half-hearted prosecution of the effort -- a fact that was evidenced by a doubling of the number of Soviet commentaries on U.S. SSNs compared to the previous period. SUBROC was only mentioned twice during the period, the interest in its newness having worn off. One 1970 report on a possible follow-on "Submarine Tactical Air Missile (STAM)" failed to bring any further reporting in the subsequent years of the 1971-'76 period. A new theme, that SSNs were considered by the U.S. to be the main ASW force, appeared in 1968 and was to continue for a decade before dying out. This was concluded likely to be due more to Soviet submarine protagonists plumping for a larger SSN force than to an actual Soviet perception that the U.S. had foresaken the team approach to ASW and the particular promise of VP aircraft vectored by SOSUS. From the goal of 64 SSNs in 1966, the U.S. was seen by the time of the XXIVth Party Congress in March 1971 as aiming at a force level of about 100 SSNs. Since the

number of SSNs in commission in the U.S. Navy at the end of the period was still only half this figure and since the planned rate of production of six SSNs per year had fallen to only half that, the threat of such a large U.S. force of SSNs would remain a long-term one unless the U.S. construction rate were to be increased greatly, in which case the threat could become a mid-term one.

- SSN construction and development by the U.S. continued to command a high level of Soviet naval interest in the 1971-'76 period although the construction rate over the five years lagged even further behind to an average of less then 2 1/2 attack boats per year for a total of only 12 over the five years and with only 62 in commission by June 1976. The numbers of SSNs reported in commission were exaggerated by about 20% for most of the period, only a part of which seems likely to have been the result of the lagging U.S. construction rate while deliberate exaggeration by the Soviet Navy to help justify more ASW forces is seen as accounting for a substantial share of the exaggeration. The commentaries on SUBROC rose again to the 1960-'66 level of an average of one per year from its low of only two in 1966'-71 -- but for no discernible reason. Considering the smallness of the data base the fluctuation quite possibly had no real significance.

- SSN development and construction in the U.S. continue to evoke a high and even slightly increased level of interest from Soviet naval sources during the four years following the end of the XXVth Parth Congress in March 1976. The commentary has been remarkable in being favorable to SSNs without a dissenting voice. Of uncertain significance is that the SUBROC commentary fell off again to only two in these four years. SSN construction was seen to have suffered a further lag and have decreased to only one per year being delivered to the U.S. Navy. The last and presumably definitive Soviet naval perception of the SSN force level aimed at by the U.S. was given in 1979 in the 2nd edition of Admiral Gorshkov's Seapower of the State as about 90. U.S. failure to build a new class of submarines with the improved ASW characteristics that the U.S. Chief of Naval Operations was

reported in 1977 to have announced is likely to have convinced Soviet naval sources that the U.S. Navy, in point of fact, was far from putting all of its ASW eggs in the submarine basket, as earlier alleged by Soviet submarine proponents in their efforts to win increased construction of ASW submarines for the Soviet Navy.

CONCLUSIONS: The Soviet perception of the ASW capabilities of the attack submarines (SSNs) of the U.S. Navy is that they have geat potential, if not sufficiently opposed, for ambushing Soviet submarines while sortieing from their known bases (or while reentering port), for successfully hunting them down while the Soviet boats are transiting or patrolling in the USSR's home waters, and while attempting the "breakout" through the geographic chokepoints that obstruct free access to the open oceans for Soviet naval forces. The very fact that the USSR maintains by far the largest coastal ASW forces of any Navy is an unspoken tribute to the capabilities ascribed to U.S. SSNs for ASW operations in Soviet home waters.

It is noteworthy, however, that Soviet naval commentary has been chary of alleging that any substantial share of U.S. SSNs are or would be assigned to penetrate Soviet home waters in wartime for the conduct of ASW missions. It may be that Soviet Navy sources, while convinced that a good share of the several dozen Los Angeles Class SSNs actually would be assigned such missions in view of their superior quieting (and it may be that preventing such penetrations is the main reason the fast, deep-diving Alpha Class SSN has been built by the USSR), are reluctant to publicize such a statement since it would likely prove detrimental to the credibility of not only the sea-based portion of the USSR's strategic deterrent and its "basic striking force", its attack submarines, but might adversely affect the submarine force's morale and recruiting. The very fact that SSN construction has been allowed to lag badly behind schedule (rather than being pushed ahead over all obstacles as done with the Polaris SSBN program) has been noted by Soviet Navy commentary and must cause doubt that the SSNs are intended for anti-SSBN ASW, a mission which the Soviets class as "strategic" and so consider to merit a high priority in a superpower Navy.

The noticeably slight attention paid to SUBROC, which is surprising at first blush, has a number of possible answers including that already cited with regard to U.S. SSNs as a whole -- of not wanting them to look so threatening as to undermine the credibility of the large Soviet submarine forces. A less likely additional or alternative possibility, one which cannot be excluded on the basis of the available Soviet commentary, is that the Soviets perceive the bulk of U.S. SSNs as intended for ASW use in Soviet home waters, and anticipate that the conventional torpedo rather than SUBROC would be the chosen weapon in the expectation that it would not attract so much attention as a missile and, consequently, a slower counteraction.

Be that as it may, Soviet naval sources have commented on the probable effectiveness of ASW mines air-dropped off Soviet ports and on ASW barriers. One commentary even compared the relatively low cost of blockading the GIUK Gap effectively with a few hundred CAPTOR mine-torpedoes rather than diverting about 20 SSNs for the job. Such comments suggest that the relative cost effectiveness of ASW mines over SSNs leads the Soviet Navy, with its historically-whetted appetite for mines, to conclude that the U.S. "logically" (in the mirror-image sense of the word) will "do it with mines" and save its SSNs for escorting aircraft carrier task forces, merchant ship convoying, and other missions more certain of success.

D. "What is the Soviet perception of the ASW capabilities of U.S. aircraft carriers and any other major air-capable ships and how has it changed? (Question #1, part 3 (d) of the ACDA Task Statement).

- CVSs, the eleven World War II-vintage Essex Class CVAs that the U.S. had converted to antisubmarine aircraft carriers, were perceived by Soviet naval sources during the initial 1960-'66 period as being misused for point-defense of the CVAs rather than for open-ocean ASW hunter-killer force searches for the enemy's SSBNs. The fact that the U.S. was not building CVSs designed from the keel up for ASW against nuclear-powered submarines appeared to be considered by Soviet naval sources as a serious error in judgment and, probably, as missing the best developmental route for producing an eventual capability to achieve some meaningful degree of damage-limitation against the

opponents' strategic submarines. Soviet commentary of this initial period seemed to have a note of frustration that the U.S. Navy had not chosen the task-specific CVS-construction route that the Soviet Navy so strongly favored and thereby deprived the latter of the most relevant example that conceivably could be cited to silence or outshout the objections of the Army detractor of building the many large air-capable ASW ships that were central to the Navy's planning to eventually have a significant open-ocean ASW capability. At this stage, the SEA KING helicopters and TRACKER airplanes then aboard CVSs were not of any great interest, probably because they had such limited capabilities against nuclear-powered submarines, as Soviet naval writers subsequently were to comment. The first mention of the VTOL alternative to TRACKER-type conventional carrier aircraft was not to be discussed in the Soviet media until later in 1966, after the XXIIIrd Party Congress and the start of the second period of this study.

- CVS development and construction in the U.S., or rather CVS non-development and non-construction, continued during the 1966-'71 period as among the most important reasons for Soviet Navy perceptions of the U.S. ASW efforts being unfavorable. In failing to design and build a CVS specifically for ASW against nuclear-powered submarines the U.S. was perceived as overlooking or neglecting to act along the optimum-available ASW developmental route, and was thereby giving aid and comfort to the Soviet Navy's bureaucratic "enemy", the Soviet Defense Ministry and General Staff wherein resided the marshals and other senior Army officers who were all to eager to seize on the U.S. scorning of CVSs as not cost-effective to oppose the Navy's desire for substantial numbers of "ASW cruisers". This situation led Soviet naval sources on several occasions to falsely allege a high U.S. interest in developing and building a considerable number of task-specific CVSs. This all transpired in the context of a continued low level of commentary of only about one per year on large air-capable ships of ASW. Only three commentaries on U.S. ASW mentioned the U.S. CVS's SEA KING helicopters, with one commentary derogating their value and another defending

them. There was a marked increase in attention paid to CVS aircraft including the first mention of the preferred Soviet naval ASW-carrier aircraft, the VTOL. The VIKING S-3A, however, was given favorable mention as the first ASW airplane designed for carrier operation that had been designed for use against nuclear-powered submarines. Too large for use from the converted Essex Class CVSs, they were credited with the potential for making into an effective ASW platform CVAs converted into "multipurpose" CVs.

- CVs and SCS replaced CVSs as the main focus of Soviet naval commentary which nearly tripled in the 1971-1976 period but the ASW capabilities of each of these three major U.S. air-capable ship types were exaggerated in pursuit of Gorshkov's campaign to overcome Army opposition to, and win Party authorization for, the sizeable number of "ASW cruisers" and other major air-capable ships that would be required to begin to address the ASW problem. The Essex Class CVs were pictured as still operational long after they had been sent to either the breakers or mothballers. The conversion of existing CVAs to "multipurpose" CVs with an add-on, marginal ASW capability useful for little more than for protection of the CV itself was misrepresented as projected new construction ships (with nuclear-powered versions to follow) which had major open-ocean hunter-killer capabilities against Soviet SSBNs. The CVSs had been abandoned, allegedly, only because the new S-3A VIKING replacement for the S-2 TRACKER was too large to operate from a CVS. The dreams of sea-control ships (SCSs) for open-ocean ASW died in the U.S. and were interred except for the fictional half-life given them in this period by one commentary which implied that the U.S. would (soon) select some kind of large air-capable ship to build for ASW. Despite all of the exaggeration, however, there was evident an underlying Soviet naval perception that the potential effectiveness of U.S. ASW in the future had been diminished very much by the U.S. failure to actually build large numbers of major ASW surface ships for open-ocean ASW. The criticism of carrier-based helicoptes of the previous period was not repeated nor did any Soviet naval sources find it necessary to further defend the value of

helicopters operated from large air-capable ships. There was considerable commentary portraying a high level of U.S. interest in developing ocean-going hydrofoil and air-cushion ships for ASW but, like the commentary on the three displacement types, it was more reflective of internal advocacy than of a conviction that the U.S. Navy was moving rapidly to embrace such a radical solution to the ASW problem.

- CVs have continued over the past four years to share Soviet commentaries on major U.S. air-capable ships with the no-longer operational CVSs and the SCS concept that had died aborning. Patently the Soviet Navy found the continued existence of these ship-types, even if wholly fictional, too valuable for its internal advocacy of more such ships to be foregone. Consequently, a fictional program of over six dozen of such ships to carry VTOL aircraft was dreamed up and propagated. These 75 imaginary ships are alleged to be intended to implement an equally imaginary "oceanic strategy" in which the U.S. has placed most of its strategic nuclear eggs in SSBN baskets and requires an armada of sea control ships to provide protection for them against Soviet ASW forces. The extent to which this disinformation campaign may have mislead the Party officials and Defense Ministry marshals who determine naval appropriations can only be conjectured. The Navy, for its part, continues to perceive the U.S. Navy as much the worse off ASW-wise for neither developing VTOL-carrying large ASW surface ships for open-ocean pursuit of the putative opponents' SSBNs nor building task-specific antisubmarine aircraft carriers optimized for open-ocean ASW. The repeated comment by Soviet naval sources that the S-3A VIKING, the latest operational ASW aircraft for use from large air-capable ships, is eight to ten times more effective than its predecessor, the S-2 TRACKER, suggests that the Soviet experience with VTOL aircraft on the Kiev Class ASW cruisers may have persuaded the naval leadership of the need for higher performance ASW aircraft than VTOL for the nuclear-powered aircraft carrier reportedly under construction in the USSR. At any rate, they clearly hold the S-3A VIKING in high regard and feel that it deserves a nuclear-powered antisubmarine

aircraft carrier designed from the keel up for ASW against the fast, deep-diving submarines of the latest generation.

CONCLUSIONS: The Soviet perception of the ASW capabilities of U.S. aircraft carriers (the only major air-capable ships with significant ASW capabilities operational in the U.S. Navy at present) is that the dozen U.S. "multipurpose" CVs have a great potential capability for ASW, including for wide-area search in the open oceans -- but a capability that is most unlikely to be used much if at all for open-ocean search (i.e., for anti-SSBN ASW) because of their higher priority missions for power projection and sea control.

While Soviet naval commentary on the major air-capable ships employed for ASW (CVSs and CVs) or contemplated for that purpose (SCSs) has been seriously distorted by its misuse for internal advocacy of larger naval forces, the conclusion seemed to be warranted nevertheless that the U.S. had foreclosed its best option for effective open-ocean ASW when it failed to replace the converted Essex Class antisubmarine aircraft carriers with new CVSs designed specifically for ASW against nuclear-powered submarines. However, the logical possibility, and perhaps even the likelihood, exists that this seemingly warranted conclusion really was intended to apply only to the SOSUS-less Soviet Navy and that the option open to the U.S. of SOSUS-vectored VP, as a far more cost-effective solution to open-ocean ASW, was appreciated by the Soviet Navy from a least the mid-'60s.

Be that as it may, the seeming Soviet enthusiasm for the projected but never built U.S. sea-control ship with virtual certainty had little to do with any likelihood that the U.S. would ever employ such SCSs for anti-SSBN ASW in wide-area search in the open oceans. Rather, it had everything to do with the Soviet Navy's desire to win authorization to build the maximum number of major air-capable ships for ASW, primarily for providing ASW protection of its own SSBNs until and unless the USSR were able to develop some (probably mobile) equivalent of SOSUS to provide initial detection of U.S. SSBNs in the great oceans. So, despite the potential value of CVs and CVNs for ASW, Soviet commentary reflects an appreciation that it is extremely unlikely that these ships would be employed for anti-SSBN ASW. And for lack of any CVSs

task-specifically designed for ASW, the U.S. Navy actually has no major air-capable ships available for wartime ASW.

D. "What is the Soviet perception of the ASW capabilities of U.S. destroyer-type ships and how has it changed?" (Question #1, part 3 (e), of ACDA Task Statement).

- Destroyer-type ASW ships of the U.S. were perceived by the early '60s as distinctly inferior to antisubmarine aircraft carriers for open-ocean ASW. This remained the Soviet Navy's general perception even though it was acknowledged that the addition of the pilotless helicopter DASH and the "missile-torpedo" or missile-depth charge ASROC would compensate substantially for the rapidly disappearing speed advantage of surface ships over nuclear-powered submarines and the less-than-maximum speed at which surface combatants must operate to be able to employ their own sonar. It seemed virtually certain that the Soviet Navy did not consider that the destroyers of the U.S. Navy constituted any significant danger to Soviet SSBNs in the event a war should break out in the '60s. Lacking any major air-capable ships to take ASW airplanes to sea, the Soviet Navy also lacked any surface ship-carrier air "team" approach to ASW in the early '60s. Hence, the destroyer-type surface ASW ship was not valued as highly for anti-SSBN ASW as it subsequently has become in Soviet naval circles.

- Destroyer-type ASW ships of the U.S. began to be regarded by the Soviet Navy with more interest toward the end of the 1966-1971 period after announcements in 1968 and 1971 respectively of plans for large construction programs for frigates and destroyers to be equipped with (improved) ASW helicopters and ASROC. The U.S. was alleged to be considering construction of a dynamic-lift ship of destroyer size that would regain for surface combatants their former speed advantage over submarines. Although an occasional Soviet naval commentator, in trying to make a case for the U.S. Navy having anti-SSBN ASW as a priority mission, would claim that the U.S. Navy planned in wartime to employ at least a significant number of destroyer-type ships not only on the ASW barriers but for open

ocean search for submarines (i.e., anti-SSBN ASW), the general view was that the great bulk of the U.S. destroyer force would be required for point defense of the aircraft-carrier forces and merchant ship convoys.

- Destroyer-type ASW ships of the U.S. were given substantial attention in Soviet naval commentary during the 1971-1976 period, particularly the projected 30 DDs of the Spruance Class. They were noted to be slated to receive the latest in weapons and sensors, including piloted LAMPS helicopters to replace the remote-controlled DASH helicopters and ASROC with inflight guidance and a better ASW torpedo component (the Mark-46 to replace the Mark-44). However, the cost of the Spruance destroyer was noted to have increased greatly, from $60 million to $110 million each, just since the start of construction. In effect, this was seen to have priced the U.S. Navy out of the market for the large number of such ships required just to do all of the point defense of aircraft carriers and merchant ship convoys anticipated in wartime let alone enough additional ships to make a major damage-limiting contribution to anti-SSBN ASW by open-ocean search. Less important but still noteworthy, the Spruance construction program had been allowed to fall two years behind schedule. Even without this desultory performance, it is unlikely that the Soviets would have been impressed greatly with a program of 30 DDs where up to ten times that number would have been appropriate to the huge ASW and other mission requirements for which they were needed. Adding to this generally unimpressive performance, U.S. plans for modernizing more of the World War II built DDs were dismissed as merely a pretext to avoid facing up to the need for new destroyers and in large numbers. Little was said aobut the on-board and towed sonar for surface ASW ships, but that little was positive, praising the shipboard sonar in general use, the AN/SQS-26, as the best sonar in the U.S. Navy. ASROC was pictured in a much more critical light than before. The accuracy of the missile was asserted to be low (due to the fact of its ballistic-trajectory flight being unguided) and the (Mark-44) torpedo part was criticized as ineffectual against submarines moving at speeds over 18 knots. The piloted LAMPS helicopter,

reported as slated to gradually replace the remote-controlled DASH helicopter, was appreciated to be a much more effective system than DASH for compensating for the inadequate or no-longer-existent speed advantage of surface ASW combatants over their nuclear-powered quarry. However, Soviet commentaries faulted the U.S. Navy for the limited initial procurement of 200 planned for LAMPS as, in effect, only about one-fourth of the 800 required. The net perception presumably was that it would be the mid-1980s or later before the great bulk of the U.S. Navy's destroyers and frigates had all received their LAMPS. The indiscriminate and overly enthusiastic approach to U.S. Navy experiments with new dynamic-lift ships probably was a fair indicator of the limited growth potential for ASW which the Soviet Navy leadership perceived in surface displacement ships, even with ASW helicopters. Despite a Naval Digest article in August 1975 which attempted to temper the general enthusiasm, prototype U.S.-hydrofoil and air-cushion ASW ships for possible ocean ASW were viewed with unwarranted enthusiasm. One writer even attributed the unfortunate remark to a U.S. Chief of Naval Operations that the 92-knot DSX Class prototype air-cushion ship, SVP SES 100B, could "fundamentally change the nature of war at sea".

- Destroyer-type ASW ships have continued since the end of the XXVth Party Congress in March 1976 to be perceived as low on the U.S. Navy's priority listing view of the unimpressive performance tolerated in the construction program of the Spruance Class destroyers. And over the past 12 years the U.S. is seen to have only built an average of no more than two and one half destroyers a year for a total of 30 -- wholly inadequate to meet U.S. naval requirements in the Soviet view. As early as 1971 a Soviet naval historian-cum-propagandist had falsely alleged that the U.S. was building 200 destroyer-type ships in a ten-year program to replace the 300 such ships of World War II construction which the Navy had retained. While this was a "big lie" calculated to help the Soviet Navy win larger naval shipbuilding funds, it did show that the Soviet naval leadership considered that it would take a U.S. destroyer-

type construction rate on the order of 20 per year to impress the Army marshals and Party leaders who controlled the military budget. The actual U.S. destroyer-type construction programs taken altogether did not add up to an impressive total. With the 30 Spruance Class seen as due to be completed by the end of FY 1980, the U.S. was seen to be building 15 DDG-47 Class AA-missile destroyers at 1.5 per year and 72 Perry (FFG-7) Class frigates at five/year through 1983. The U.S. was also reported to be modernizing 23 Adams Class DDGs over an unspecified period after 1977. In addition to what seemed to the Soviets like an indifferent U.S. approach to destroyer construction, the unsuitability of destroyers and frigates for open-ocean search due to their low-speeds was noted. Moreover, it was noted that destroyers had become too expensive to build in adequate numbers and so were being replaced by the less expensive frigates. Soviet naval commentaries have continued to insinuate in many ways over the past four years that development of ocean-going ASW ships based on principles of dynamic lift if the preferred long-term U.S. solution to the problem of restoring to surface combatants the requisite speed advantage over nuclear-powered submarines that has been irretrievably lost by displacement ships. However, this allegation that the U.S. prefers dynamic-lift ships has not been made explicitly -- and probably for the reason that the Soviet Navy realizes that the U.S. naval officers do not match the Soviet Navy's officers in the latters' enthusiasm for such ships for ASW, either for point defense or for wide-area search. Much of Soviet naval commentary on hydrofoil and air-cushion ships under development is not in accord with the facts and appears aimed at the internal audience in the Defense Ministry and Party Central Committee that will have the final word on what is built for the Navy in the way of dynamic-lift ships. Thus, two false reports in 1976 and 1977 (that the U.S. had begun construction of the DEH Class hydrofoil ship and would shortly award a contract for construction of a prototype of a 3,000 ton ASW ship on an air-cushion) appeared to be designed for such internal advocacy. ASROC, while not specifically credited with having been improved in its torpedo part by replacement of the inade-

quate Mark-44 torpedo, has been correctly described in recent commentary as now incorporating the far superior Mark-46 which the Soviets perceive as adequate for use against nuclear-powered submarines. Nothing more has been reported in the Soviet media, however, concerning needed improvements to the missile part of ASROC since a 1976 commentary said the U.S. Navy was conducting a feasibility study on adapting the HARPOON missile to that purpose. The most significant progress doubtless was the bringing to fruition of the LAMPS Mark-3 helicopter, the SH-60 SEA HAWK (after a design competition that had been reported as requiring five and one half years to conduct), and the announcement that the Navy would purchase 204 of them to replace the Mark-1 SH-2F LAMPS. The potential importance of the advent of the Mark-3 LAMPS seemed to be weakened in the Soviet perception by the fact, that the number planned for procurement, at least initially, was only one-fourth of NATO requirements and so could only be provided to the very newest destroyer-type ships. Despite its greatly improved capabilities, the descriptions of the Mark-3 LAMPS made it clear that, as for the destroyers and frigates that were to carry it, open-ocean search was not envisioned as an effective task for these relatively fast but not-so-long-range ASW helicopters.

CONCLUSIONS: Both destroyers and frigates, even those with LAMPS helicopters and ASROC, are perceived by the Soviets as of only marginal effectiveness in ASW point defense and of no practical use for open-ocean search for nuclear-powered submarines. Moreover, destroyers have become so expensive that they are no longer cost-effective ASW platforms and even point-defense ASW for convoy escort work is seen by the Soviets as being relegated largely to frigates. Destroyers, when used for maintaining an ASW barrier along with other ASW forces, have not been derogated and several commentaries imply that such employment would be cost-effective.

The U.S. Navy's requirement for convoy escort let alone for all the other tasks laid on destroyer-type ships, the "work-horse" ship type of all major navies, is perceived by Soviet naval sources with virtual certainty to exceed the number of such type ships either currently operational in the U.S. Navy or as

supplemented by those programmed for construction. Consequently, the likelihood that any such ships would be assigned in wartime to open-ocean search for Soviet SSBNs is perceived as remote. All in all, except for limited employment on ASW barriers, where they would sink all Soviet submarines, strategic or tactical, the U.S. Navy's destroyers and frigates are seen by Soviet naval sources without exception as not intended for operations against Soviet SSBNs.

In addition to basic unsuitability of displacement ships for wide-area search of ocean areas, the fact that the U.S. has tolerated such extensive delays in destroyer construction (the Spruance Class) must serve as confirmation to the Soviet military/naval mind that the U.S. is not building the destroyers for a strategic mission (such as is constituted by anti-SSBN ASW in the Soviet scheme of things) or, otherwise, the production would have been expedited after the manner of the Polaris SSBN construction program. The high hopes ascribed to the U.S. Navy with respect to developing dynamic-lift ships for oceanic ASW, while probably largely a reflection of the Soviet Navy's own hopes of developing fast surface combatants that would be effective in Soviet home waters against marauding U.S./NATO SSNs on ASW missions, are likely also to reflect the Soviet Navy's stated convictions that displacement ships have no prospects for sufficient development to ever be effective against nuclear-powered submarines and only the higher speeds and lesser cavitation noise of dynamic-lift ships offer a solution for viable ASW surface combatant ships.

D. "What is the Soviet perception of U.S. mine warfare capabilities in ASW and how has it changed?" (Question #1, part 3 (f), of the ACDA Task Statement)

- Mines of the U.S. Navy were virtually ignored in the Soviet open literature in the 1960-1966 period, even in the naval professional journal, Naval Digest. This fact correlates fully with the lack of interest in the subject being evinced by the U.S. Navy during this period when the mine had lost out completely, although only temporarily, to the general preoccupation with nuclear-missile weapons. There was no evidence of any U.S. plans for a mining campaign against SSBNs at any stage in their wartime mission profile from their bases, through the choke-points out to the open ocean and return. It was noted that even the P-3A ORION would need

modification before it could carry mines and there was no evidence of plans for using Air Force or commercial aircraft for mining -- nor were there any indications of the U.S. having any modern ASW mines available, let alone in the quantity required for a mine blockade of Soviet submarine bases.

- Mines in the U.S. Navy during the 1966-1971 period were seen by Soviet naval sources as still of little interest to the U.S. Navy. What slight interest as was perceived was seen to be concentrated in the areas of logical concern to the Soviet Navy -- offensive mining not only by air but by submarine. The first suggestions of any forward movement in U.S. mine development were commentaries that the Mark-52 and Mark-55 air-droppable ASW mines were being improved and that U.S. submarines allegedly were being loaded with some ASW mines.

- Mines in the U.S. Navy during the 1971-1976 period were seen in a radically changed light just six months after the end of the XXIVth Party Congress in March 1971 due to the first prewar development by the U.S. of new mines for ASW: the "mine-torpedo' CAPTOR and the bottom-laid QUICKSTRIKE mine. Particularly noteworthy was the fact that CAPTOR was described in ways that implicitly emphasized their particular suitablity for use against SSBNs by mine blockade of Soviet submarine bases and by use on the ASW barriers across the major geographic choke-points of the "World Ocean". CAPTOR was reported to have begun unit production in 1972 and not to be scheduled for mass production until 1977 or 1978. Eventually there is to be a stockpile of 4,000 to 4,500 of these sophisticated mines which are noted to have "a great radius of action". In July 1975 Naval Digest presented a remarkable scenario in which CAPTOR mines were air-dropped into the GIUK Gap by U.S. Air Force B-52s and succeeded in just "a few days" in establishing an effective mine barrier blocking transit of Northern Fleet and Baltic Fleet submarines into the open Atlantic that otherwise allegedly would have required 60 to 90 days to effectively blockade the GIUK Gap by means of U.S. naval forces. Probably because it became apparent that CAPTOR mines were being procured with marked slowness as the 1971-1976

period ended, the Soviets regarded U.S. mine warfare as they had SOSUS a decade earlier -- as a professionally interesting development that posed no short or medium term threat but that required continuing observation to avoid any unpleasant surprises in the event of war from unanticipated offensive minefields laid by the U.S.

- Mines in the U.S. Navy since the start of this final period in March 1976 have taken a second "great leap forward" in Soviet naval perceptions in just the past four years. The U.S. is no longer criticized for neglecting mine warfare nor is the U.S. mine stockpile dismissed as of "limited value". Rather, the U.S. is now seen (as it was not even four years ago) as having very substantial capabilities for ASW mine-laying, and especially in those areas where the possibilities for destroying Soviet SSBNs are greatest. These areas are the approaches to submarine bases, those of home-water stationing or transits, and at geographic chokepoints. All are areas of fairly shallow water in which ASW mines can be most effectively employed. It is true, of course, that all types/classes of Soviet submarines are present and vulnerable to mines in these areas, yet the salient point is that, while attack submarines can most effectively be hunted in wartime out in the oceans when the position of the submarines are betrayed by attacks on the SLOCs, SSBNs cannot be effectively hunted in the oceans (except when they can be detected by SOSUS) and so their destruction must be accomplished largely in the homewaters portion of their missile profile. And for this purpose the mine has great advantages and advantages for which Russian naval officers have a historical tradition of appreciation. As in the 1971-1976 period, commentary on the anticipated employment of U.S. ASW mines in general, and the CAPTOR "mine-torpedo" in particular, reflected a consensus view by Soviet naval sources that they would be employed most to blockade submarine bases and to establish mine barriers as part of the ASW barriers across the geographic chokepoints. A critically significant new fact emerged in 1977 in the form of a claim that mining would be important in a nuclear-missile war as well as in a conventional war. This could only have been

considered a warranted assertion if a strategic end were to be served -- and logically the strategic end in view is virtually certain to be anti-SSBN ASW. The claim from the 1971-1976 period that the GIUK Gap could be mined "in just a few days" by B-52s laying CAPTOR mines was replaced by two claims in this final period that it could be done with an impressively small number of mines: 500 per a 1977 claim and with only 200 according to the latest mention of the subject in 1979. These two estimates were only one half and one fifth, respectively, of the 1,000 CAPTORs reportedly delivered to the U.S. already, so mining the GIUK Gap, at least as far as the availability of mines was concerned, already was perceived as a U.S. capability. The fact was glossed over that use of even CAPTOR mines at the considerable depths in the GIUK Gap is seen as marginal. This makes it even more apparent that the Soviet naval sources involved are using "worst-case analysis" to support Navy requests for more mine-sweepers and general purpose naval forces to give them escort and cover. The U.S. budget for mine warfare, although modest by any relevant comparison with that of other naval "forces or means", was noted to have quadrupled between 1975 and 1977, so presumably would support continuing the successful R&D work of recent years that had produced the new CAPTORs, QUICKSTRIKEs, and SLMMs (submarine-launchable mobile mines).

CONCLUSION: Although the Soviet naval sources from whom all of the commentary on U.S. mines has come have played budget politics with U.S. mine warfare programs just as they have with virtually all other U.S. ASW programs, it is clear, nevertheless, that the Soviets expect the U.S. to conduct offensive mining campaigns against Soviet submarine bases at the outbreak of any general war. Employing air-dropped CAPTOR mine-torpedoes among other types of ASW mines, the U.S. is expected to establish mine barrages for blockading Soviet submarine bases, to reinforce ASW barriers of mobile ASW forces, and to make Soviet home waters generally hazardous for submarine operations. U.S R&D in ASW is expected to result in further significant improvements in mine warfare in the 1980s.

D. "What are the general Soviet appraisals of U.S. ASW capabilities and how have they changed?" (Question #1, part 2 (a), of ACDA Task Statement)

- General Soviet appraisals of U.S. ASW from 1960 to 1966 gave the U.S. a big "E" for effort but a very small "c" for the open-ocean ASW capabilities of the U.S. Navy on the basis that no adequate solution was in sight to the key ASW problem of initially locating enemy submarines, a judgment that ostensibly took SOSUS into account and still found U.S. capabilities for initial detection of submarines to be of insufficient effectiveness".

- General Soviet appraisals of U.S. ASW from 1966 to 1971 continued to credit the U.S. with giving "great attention" to improving its ASW "forces and means" including the formation of large ASW operating forces in both the Atlantic and Pacific. Nevertheless, U.S. ASW was perceived as unsufficiently effective as to be a great cause for concern (other than to require keeping a watchful eye on US R&D in ASW and on the further geographical expansion of SOSUS into the deep ocean).

- General Soviet appraisals of U.S. ASW from 1971 to 1976, which had been exaggeratedly favorable throughout the 1960s, in 1972 took a decided turn toward more realistic and less effusive praise. The overall effort was reduced from "enormous" or "great" to "vigorous". No single ASW program was singled out any longer as the recipient of "great" effort. A 1973 appraisal saw the U.S. ASW R&D effort as "continuously widening" but still "little effective" despite greater allocations. In November 1975 the Navy Chief, Fleet Admiral Gorshkov, gave an accurate assessment in his book Seapower of the State of the ASW forces being developed for the U.S. Navy and merely alleged that the "tempo" of U.S. R&D in ASW was "being increased".

- A few Soviet appraisals of U.S. ASW since March 1976 have returned to the pre-1972 effusiveness with the hyperbole of "major buildup" applied by a Captain First Rank in 1977 and of "great" by Admiral Gorshkov in 1979. Except for these two not insignificant exceptions, however, the U.S. ASW effort has been portrayed in less exaggerated, more realistic terms. Of particularly revealing importance was an article in International Life in November 1979 which identified SOSUS, in effect, as being the "tech-

nological breakthrough" in ASW which the U.S. was achieving. This made explicit the previously cited veiled implications that such was the case. Also, unlike the commentary in the previous period, several of the various "forces and means" of U.S. ASW were singled out as the recipients of particular attention/ investment. Among these, SOSUS was the most prominent and Gorshkov singled out U.S. ASW in the 2nd edition of Seapower of the State and he has clearly implied, as in the 1976 (1st) edition, that it is a force that must be taken strictly into account.

CONCLUSION: General Soviet appraisals of U.S. ASW are seen to have been very frequently distorted for internal-advocacy purposes and so to constitute an unreliable tool for determining actual Soviet perceptions of U.S. ASW. Hence they are disregarded in the final analysis for answering Question #1 of the ACDA Task Statement.

D. "What is the Soviet perception of U.S. budget allocations to ASW and how has it changed?" (Question #1, part 2 (b), of ACDA Task Statement)

- U.S. budget allocations to ASW from 1960 to 1966 were distorted to maximize the results to support the Soviet Navy's advocacy of greater appropriations for larger general-purpose naval forces for SSBN protection and for anti-SSBN ASW. The data became less exaggerated towards the end of the period but failed to reflect significant decreases in the actual U.S. ASW budgets for 1964 and 1965.

- U.S. budget allocations to ASW in the 1966-1971 period were portrayed in as exaggerated form as they had been in the early 1960s and with inconsistency as to indicate that no Party line or internal Navy position had been established. As in the 1960-1966 period, big budget decreases in the latter half of the period (1968 and 1969) went unreported (although, as in the earlier period, official U.S. data had been published), pointing to deliberate exaggeration for internal advocacy purposes.

- Soviet commentaries on U.S. budget allocations to ASW between 1971 and 1976 were too few and too scrambled to indicate anything other than

that the data given was being carefully selected with an eye more to internal advocacy needs to support larger general purpose naval forces than to provide the readers with the objective facts.

- U.S. budget allocations to ASW over the last four years have been the most accurate yet to appear but, nevertheless, they have been employed selectively to obscure a substantial, if temporary, decrease in the FY 1977-1978 ASW budget. They have also presented the data in terms that create the false impression that allocations to ASW, as a percentage of the overall military budget, have been greatly increased. As in the preceding periods, the U.S. ASW budget data appears to be undergoing distorting manipulation for internal-political purposes.

CONCLUSION: The actual Soviet naval perception of U.S. budget allocations to ASW is not discernible with any assurance from Soviet public-media commentary because it is consistently exaggerated to support the Navy's campaign for more and better naval forces of all kinds. Unfortunately, the top Defense Ministry and Party officials have refrained from discussing the subject and providing figures to compare with the Navy's inflated ones. Consequently, budget data like general appraisals are disregarded in the final, overall answers to Question #1 of the ACDA Task Statement.

D. "What are the Soviet perceptions of U.S. ASW capabilities as affected by ASW force levels?" (Question #1, first half of part 2 (c), of ACDA Task Statement)

- U.S. force levels of ASW types suitable for open-ocean search throughout the 1960-1966 period were: CVSs - down 2 to 9; VP airplanes - unreported; SSNs - increased 9 to 21; and 104 destroyers and frigates, each with two pilotless DASH helicopters and/or ASROC.

- U.S. force levels of ASW platforms suitable for open-ocean search during the 1966-1971 period were: CVSs - decreased from 9 to four; VP airplanes - roughly 300; SSNs - increased from 21 to 46; and destroyers and frigates with two DASH helicopters and/or ASROC increased from 104 to 182. The SSNs, particularly, were being seen as a growing threat to Soviet SSBNs.

- U.S. force levels of ASW platforms suitable for open-ocean search during the 1971-1976 period were: CVSs - decreased from 4 to 0; VP airplanes decreased 300 to 250, a reduction from 27 to 24 squadrons; SSNs increased from 46 to 65; while no data was reported on the number of destroyers and frigates with LAMPS and/or ASROC. Only one of the projected 30 Spruance Class DDs had been commissioned while the numbers of other destroyers operational were reported to have been cut back from 151 to 67.

- U.S. force levels of ASW platforms suitable for open-ocean search are perceived by Soviet naval sources to have undergone the following changes since March 1976: VP airplanes have been carried as remaining constant at 250. SSNs have further increased from 65 to an estimated 82. Although most of the 30 Spruance Class DDs are completed, the overall number of destroyers retained in operation is estimated as only 44 on 1 January 1980. Similarly, the number of frigates is estimated as numbering only 35, cut back from 58 only 30 months earlier. While the numbers of DDs have not been increased commensurate with the decrease of DDs, the FFGs have been increased roughly proportionately to the decrease in conventional frigates. As Soviet commentary has observed, however, destroyers and frigates equipped with anti-aircraft missiles are going to be employed primarily for AAW since to divert them to ASW would not be a cost-effective use of such considerably more expensive ships.

CONCLUSION: The 240 VP airplanes and 80-odd SSNs are seen as the only mobile U.S. ASW forces that would be effective (including cost-effective) for anti-SSBN ASW -- the VP in the open oceans using SOSUS vectors and the SSNs in Soviet home waters. Despite the addition of VIKING airplanes and SEA HAWK helicopters to the big carriers to give them an ASW capability, considerations of cost and higher priority missions for power projection ashore and SLOC protection are seen by the Soviets to largely rule out use of the CVs for anti-SSBN ASW. Similarly, destroyers and frigates, despite the inherent capabilities conferred by ASROC and LAMPS, are considered too slow, too few, and too monopolized for higher priority assignments.

D. "What are the Soviet perceptions of U.S. ASW capabilities as determined by the forward deployment and readiness of U.S. ASW forces?" (Question #1, second half of part 2 (c), of ACDA Task Statement)

- U.S. ASW forces' forward deployment/readiness was perceived during the 1960-1966 period as nearly continuous and at "combat-alert" status with at least one ASW aircraft carrier hunter-killer group in the North Atlantic and one in tne Western Pacific. VP airplanes were reported to be constantly engaged in ASW search operations. the bulk of the sizable reserve ASW forces of the U.S. Navy were reported as held in 24-hour readiness from U.S. homeports.

- U.S. ASW forces' forward deployment/readiness was not perceived as nearly as high from 1966-1971 as during the preceding period. No longer was there an ASW carrier group that was credited with "usually" being at sea in the North Atlantic in combat-ready condition. The only CVS reported to be forward deployed was one assigned to the U.S. Seventh Fleet in the Western Pacific. Rather the emphasis was on the rapidity with which the "limited" ASW forces maintained in operation in peacetime could be built up whenever required. The VP airplanes of the U.S. and other NATO countries were said to make "systematic" peacetime ASW patrols in the GIUK Gap area and along the Kamchatka Peninsula and south to the Philippines.

- U.S. ASW forces' forward deployment/readiness was perceived during the 1971-1976 period as continuing at the reduced levels reported for 1966-1971 over the initial 1960-1966 period. There were no more CVSs in operation by the end of the period so tne one forward-based CVS (with Seventh Fleet in the Western Pacific) was no more. There were reports of single VP squadrons of 10-12 airplanes each being forward based at Bermuda, Ireland, the Azores, Spain and Italy in the Atlantic-Mediterranean and at Guam, in the Aleutians, Japan, and on Okinawa in the Western Pacific. One six ship destroyer squadron also was reported as based in Japan and a second was reported as planned for basing on Guam from the Spring of 1975.

- U.S. ASW forces' forward deployment/readiness is currently perceived as consisting largely of some undetermined but fairly small share of the CVs' total capabilities for conducting "all" naval missions, as one Soviet source expressed it. The two CVs of the U.S. Atlantic Fleet which are normally "forward deployed" are with the U.S. Sixth Fleet in the Mediterranean and, in practice, are even less available for open-ocean ASW than would be the remaining three or four reported as retained in the Atlantic but homeported on the U.S. East Coast. Thus, their readiness for immediate use in the Eastern Atlantic must be considered by Soviet naval observers as low. The situation is better in the Western Pacific where the two to four of the eight normally assigned to the Pacific Fleet are assigned to the Seventh Fleet in the Western Pacific. The VP aircraft forward deployed in the Atlantic and Pacific were not reported but more relevant, in view of the rapidity with which aircraft can be forward deployed if bases are available, were the listing of such forward bases in both theaters and the acknowledgement that these bases provided VP airplanes with rapid access to any point in these oceans. Destroyers and frigates in the Atlantic were not reported in connection with any forward deployments to the Eastern Atlantic with the logical implication being that there were none to report. In the Pacific, reports made it appear that a dozen or so destroyers and frigates were forward deployed to the Western Pacific with the Seventh Fleet and a few additional frigates to Adak to be close to the USSR's submarine base at Petropavlovsk-on-Kamchatka. There were no explicit comments on alleged increases (or decreases) in forward deployment and/or readiness of U.S. ASW-capable ships, and none at all on SSNs, suggesting there were no increases to report and, if anything, the continued slowdown and retrenchment of U.S. naval forces had been perceived.

CONCLUSION: While the Soviet Navy clearly is impressed with the continuous high readiness of U.S. CVs for carrying out any of the many tasks of which they are capable, including ASW, the fact that anti-SSBN ASW is not a priority mission assignment of the CVs in war seems to be the general Soviet naval perception. The VP airplanes, however, are another

matter. Utilizing SOSUS vectors from a network of bases around the Atlantic and Pacific Ocean peripheries, VP airplanes are perceived as constituting an immediately ready force that could wreak havoc on Soviet SSBNs in the open oceans as long as the SOSUS systems were functioning. U.S. SSNs in the crucial Atlantic area are perceived as a force homeported in the U.S. and requiring an appreciable period of time to transit to the home waters of the Soviet Northern Fleet to undertake any anti-SSBN missions they might be assigned.

FINAL, OVERALL CONCLUSIONS RE. QUESTION #1 OF ACDA TASK STATEMENT FOR THE ENTIRE 1960-1980 PERIOD

D. "What is the Soviet perception of U.S. ASW capabilities and how has it changed?"

1) The logical contextual question of whether or not the state-of-the-art in ASW had improved sufficiently in Soviet perceptions to be considered to have adequately overcome the great lag behind the state-of-the-art of submarine warfare incident to the provisions of nuclear propulsion and nuclear-missile weapons to submarines in the '50s must now be answered in the affirmative. This is seen by Soviet naval sources to be the case only for the U.S. as a result of its development of SOSUS as a system that appears to the preparing analyst to be generally perceived, in effect, as an off-the-shelf substitute for a breakthrough in ASW that increasingly is capable of 'illuminating' the underwater environment and so facilitating submarine detection.

2) SOSUS has been perceived by the senior officers and specialists of the Soviet Navy since the early 1960s as potentially the key element in providing the initial contacts on enemy submarines, that, otherwise, could be even more difficult to locate in the open oceans than the proverbial needle in a haystack. By exploiting existing technology with constant incremental improvements, the U.S. is seen as having produced a system that, if not truly "global" in scope, covers large areas of the Atlantic and Pacific including a good share of Soviet home waters and has the capability for continuous peacetime tracking of all submarines within the SOSUS zone of coverage. The fact that SOSUS in the only U.S./NATO ASW system whose alleged vulnerability has not been extensively discussed in the open Soviet media (except for one sotto voice mention that SOSUS is vulnerable to Soviet weaponry) suggests that the prompt disablement of the system at the outbreak of war is a concern of Soviet war planners.

3) While both the land-based P-3C ORION and the aircraft carrier-based S-3A VIKING are noted in Soviet writings to have outstanding open-ocean area search capabilities, the latter (along with

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its CV platform) will be absorbed in point-defense ASW and only the former is expected to be available for open ocean search for the USSR's strategic submarines. Whether used with SOSUS vectors or without them to fill in the oceanic gaps in SOSUS coverage, the VP (after being minimized or ignored in the '60s) has been seen ever since as the most mobile of the various ASW forces and with an incomparable capability for rapidly searching sizeable ocean areas with a high probability of detecting any submarines present.

4) In not constructing large ASW mission-specific aircraft carriers (CVSs) or even the smaller, less-expensive ASW mission-specific sea control ships (SCSs), the U.S. was perceived as having missed both the boats which could have provided it with the only general type of surface combatant ship (DDs and FFs wouldn't do) which would be capable of carrying out the open-ocean, wide-area search necessary for successful anti-SSBN ASW.

5) Destroyers and frigates, due to their much slower speeds, have lost out completely in Soviet perceptions to aircraft as open-ocean ASW search platforms. The great initial enthusiasm to find for the Soviet Navy a substitute for displacement ships in ones operating on dynamic lift principles (an over-enthusiasm which was attributed with marked exaggeration to the U.S. Navy in an apparent effort to justify greater appropriations to the Soviet Navy for development of such craft) has been tempered by time and the failure of both countries to develop really successful hydrofoil, air-cushion, or wing-in-ground prototypes that could even partially replace either aircraft carriers (and other major air-capable ships, the "ASW cruiser" in the Soviet case) or even destroyer-type escort ships.

6) Before committing the mobile ASW forces of the U.S. Navy (its surface combatants, ASW aircraft, and especially the ASW submarines) to ASW missions in Soviet home waters, the U.S. is perceived as intending to attempt to resolve the ASW problem by laying mine barrages off the known naval bases and in the key "straits and narrows" that restrict the Soviet Navy's access to the open oceans.

7) The Soviets perceive the losses by enemy SSNs and mines as unlikely to grow to an unacceptable level in view of the Soviet Navy's already great and steadily improving capabilities for protecting its SSBNS in home waters (including with the Kiev Class ASW cruisers, with the USSR's considerable mine-countermeasures capabilities, and especially with the new, fast, deep-diving Alpha Class SSN).

8) Soviet comments have noted that the ASW practice of both sides would involve the destruction of all unfriendly submarines detected, whether tactical or strategic. Consequently, Soviet SSBNs would be sunk along with Soviet attack submarines at any point in the home waters part of their mission profiles, even if the U.S./NATO ASW effort had been mounted primarily against the Soviet attack submarines as part of a sea-control/SLOC protection mission.

9) The U.S. is perceived as unlikely to mount a major anti-SSBN ASW effort in the open ocean since it would require dedicating a necessarily large share of its very limited ASW resources to that mission at the expense of its basic sea control mission for SLOC protection.

THE VERY BOTTOM LINE:

10) The Soviet naval perception of U.S. ASW capabilities is that, while U.S./NATO ASW forces could sink a crippling large percentage of Soviet submarines in the initial period of a war if adequate preparations for protecting them were not made in advance of hostilities, the Soviet Navy possesses extensive capabilities for protecting its submarines while in home waters and, if required at all to sortie the bulk of its submarines into open ocean, has the option of waiting until the initial strategic exchange of a nuclear war has degraded U.S./NATO ASW "forces and means" (including SOSUS). Nevertheless, the gross U.S./NATO ASW capability (largely employing SOSUS-vectored shore-based VP airplanes in the open oceans and attack submarines and ASW mines in Soviet home waters) is perceived as a formidable threat against which the mission-completion capabilities of Soviet submarines, including the SSBNs, are anything but assured. Rather the results are unpredictably shrouded by

the "fog of war" and will depend to a considerable extent on the skill and fortitude of the Soviet Navy's (untested) command personnel. In the '60s when SOSUS was perceived as only a long-term threat, when the U.S. force of SSNs was only half its present size, and before the U.S. Navy had developed an ASW mine capability of substantial proportions, the combined U.S./NATO ASW threat was perceived as a considerable but quite manageable problem. Today the SOSUS system appears to constitute a real and expanding global threat of premature detection of all Soviet submarines. The U.S. force of SSNs has almost reached ten score in number. The ASW mining capability of the U.S. has grown to impressive size. As these U.S. ASW capabilities continue to improve in the 1980s, the problems they create for the mission-completion capabilities of the Yankees, Deltas, and follow-on classes of Soviet SSBNs are most likely to be perceived by the Soviet Navy as increasingly unmanageable.

PART IV

COMPARISON OF RESULTS

A. INTRODUCTION TO THE COMPARISON OF RESULTS

In the following section, the results of the quantitative and qualitative content analyses for 1960-1980 are compared, forming a summary of Soviet perceptions of U.S. ASW capability for the two decades. The organization of the comparison is loosely chronological, paralleling the structure of the two analyses which precede it. This enables us to highlight the changes in Soviet thought which have occurred over time.

The comparison cannot begin to capture all of the quantitative and qualitative conclusions in the detail which has been presented earlier in this paper. Rather, our intent has been to integrate the two analyses in a summation of the major findings. This points out areas of disagreement as well as of agreement. As we have noted in our introduction to the quantitative and qualitative content analysis techniques, the objectivity of the quantitative approach and the richness of the qualitative approach cause them to be natural partners. The strengths of each methodology mutually fortify the weaknesses of the other. In these concluding observations, therefore, qualitative inferences have allowed us to understand the dynamics behind frequency-based results and quantitative data lend support to the inherently more subjective interpretations of the qualitative analysis.

B. COMPARISON OF RESULTS

Early 1960s

Early in the 1960's, Soviet naval writers published a large number of articles on ASW; there are considerably more entries in the full ASW bibliography representing Period 1 (1961-1965) than any other period. The quantitative analysis shows that about a quarter of the sampled publications contained lengthy and detailed commentary on U.S. ASW efforts.

The greatest proportion of all bibliographic entries were routine or factually oriented.* These articles comprised comments on improvements and new developments in U.S. ASW technology and factual descriptions of U.S. and NATO ASW forces, weapons and sensors, written primarily to benefit the professional knowledge of the naval community. This preponderance of factual and routine entries -- chiefly appearing in naval journals -- continues throughout the twenty years studied in this report. Nearly a third of the ASW entries for the first half of the decade appeared in newspapers, a percentage that would decline steadily throughout the four time periods. But while the general topic of ASW was of some importance in the public mind as the 1960s began, no material on U.S. ASW appeared in that source. Throughout the two decades, commentaries on U.S. ASW were meant for professional rather than public consumption.

In spite of the large volume of material on ASW written during the early 1960s, there is little evidence of concern about the immediate threat posed by U.S. antisubmarine warfare, particularly the threat to the emerging Soviet SSBN force. Many U.S. ASW programs were still in their infancy, and SSBNs were believed by the Soviets to possess some degree of invulnerability. Where a high level of concern is expressed, the qualitative study showed it to be an overstatement of the type that is characteristic of naval advocacy. The motive for exaggerating U.S. ASW expenditures lay, for example, in advocating larger Soviet appropriations for ASW forces. This view is substantiated by the quantitative approach. Although more commentaries were classified as dealing with improvements in U.S. ASW platforms than any other topic, very few discussed their advantages and effectiveness. U.S. ASW forces were, in the early 1960s at

* See description of purpose of content in Part I Section C: "Classification of Source Content".

least, regarded with interest but viewed as relatively ineffective in the present and as offering only a minimal threat for the near future.

The reasons for the seeming lack of Soviet concern are not explicit in the literature -- neither discussions of platform limitations nor general appraisals of U.S. ASW are prevalent -- but some understanding of the Soviet view can be inferred. Most importantly, the Soviet naval professionals saw ASW technology as lagging substantially behind the state-of-the-art in submarine development and believed that no solution to the problem of the initial detection of submarines was in sight. Although the numbers are small, this conclusion is substantiated by the quantitative data. Over 42% of the general appraisals of U.S. ASW discussed improvements, but nearly a third noted fundamental problems in the conduct of antisubmarine warfare. Further, qualitative evidence suggests that the Soviets believed that ASW was of relatively low priority for the U.S. Navy, and that sufficient resources to ensure the initial detection of Soviet submarines would not be forthcoming.

During the early 60s, the range of CAESER hydrophones was limited to a hundred miles off the U.S. continental shelf and Soviet SLBMs were already of sufficient range to nullify CAESER's effectiveness. ARTEMIS and a fully deployed SOSUS system were viewed as an extremely long-term threat. There is virtually no quantitative data which support conclusions drawn on Soviet perceptions of SOSUS throughout this investigation, as the importance of SOSUS to U.S. ASW efforts and its corresponding threat to Soviet submarines were seldom explicitly discussed. The qualitative analysis indicates that the potential of SOSUS for long-range detection of submarines was not unappreciated by the Soviet Navy as early as 1962. This acknowledgment of SOSUS is manifested in 1962 and 1963 articles in the naval technical literature which regularly updated the Soviet naval professionals' understanding of the system's development. There was then a hiatus on discussion of SOSUS which lasted three years, indicating that dissemination of information on SOSUS was banned until the mid-sixties. The U.S. was seen as possessing no adequate long-range detection system, and therefore as presenting no real threat to Soviet submarines in the event of outbreak of war. The qualitative analysis concludes that general Soviet appraisals of U.S. ASW from 1960 to 1966 gave the U.S. a big "E" for effort but a very small "e" for the open-ocean capabilities of the U.S. Navy. This judgement ostensibly took SOSUS into account and still found U.S. capabilities for initial detection of submarines to be of "insufficient effectiveness".

Both the quantitative and qualitative analyses showed that U.S. SSNs and the newly deployed SUBROC were of the greatest immediate concern to Soviet leaders early in the decade. Despite a belief that the U.S. had erred in designing "multi-purpose" submarines rather than optimizing SSNs for ASW, commentaries on THRESHER, SUBROC and other SSN developments were frequent and detailed. Soviet naval writers exaggerated the numbers in construction and technological improvements, described U.S. SSN characteristics, and discussed SSN capabilities and the missions to which they would be assigned. Quantitatively, submarines and their weapon and sensor systems received more attention than any other platform or system, and specific classes (particularly THRESHER/PERMIT and, SUBROC) were frequently mentioned by name. This high degree of apparent concern must be moderated, however, by the Soviet obsession with specific features of the new U.S. SSNs: their nuclear power plants and capability of diving deeper and running quieter and faster than their predecessors. In fact, a good part of their interest may be attributed to Soviet plans for building the deep diving titanium hulled ALPHA class SSN.

The entries covered in the qualitative and quantitative analyses displayed a substantial amount of interest in surface combatants, ASROC and DASH. Qualitatively, the degree of interest was about equivalent with that accorded SSNs; the quantitative approach showed the topic as being of somewhat lesser importance. Given the preponderance of new surface ship classes (eight were introduced from 1961 to 1965), the amount of comment is hardly surprising. Frequency, however, is not necessarily an indication of concern or perceived threat, and there is evidence that Soviet perceptions were indeed otherwise. The limitations of surface ships were discussed somewhat more often than those of other platforms, and the qualitative reading suggests that the Soviets believed that the U.S. was squandering its resources on investment in new conventional surface combatants and modernization of existing ships. In fact, Soviet actions later in the decade prove that they saw the VTOL ASW aircraft carrier (ASW cruiser) evolution as a more promising one.

Similarly, the Soviet naval hierarchy was critical of the United States lack of commitment to the antisubmarine aircraft carrier (CVS) and carrier-based ASW aircraft. The low frequency of comment on carriers (quantitatively, less than 3% of the period's commentary) belies the Soviet Navy's frustration in not being able to justify expenditures on carriers to military and political audiences on the basis of U.S. eff[illegible] Further, they saw CVS deployment patterns as indicative of an assignment to point defense of CVAs rather

than for open-ocean ASW hunter-killer force searches for the enemy's SSBNs or for activity on ASW barriers. In summary, U.S. CVSs were viewed as being of so negligible a threat that they provided no grounds even for naval advocacy, to the frustration of the Naval hierarchy and probable satisfaction of the military.

Neither were VP airplanes of great interest or concern during the early 60s. Replacement of the P2V Neptune with the P3A ORION was cited often, and the characteristics and capabilities of the new ORION were described, but the potential threat from land-based aircraft was asserted to be predicated upon future improvement of the range of ASW sensors carried on board the ORION.

The quantitative analyses uncovered a wide interest in weapons systems during the early sixties: over a quarter of the coded statements pertained to ASW weapons. Both improvements and capabilities were discussed; however, attack submarine weapons systems are the only ones which appear to be individually significant.

Late 1960s

For the second half of the decade, internal disputes between naval and military leaders are exhibited in the sampled material. There are considerably more bibliographic entries representing the Defense Ministry point of view than before (although the majority of entries continues to be directed toward the naval professional), and nearly half of the articles have advocacy as their primary purpose.

Because of the aforementioned difficulty in interpreting Soviet perceptions by means of quantitative measures -- particularly as the use of commentary for advocacy purposes renders the assumption of "manifest" content nearly meaningless -- quantitative results for the period must be only tentatively incorporated with the qualitative findings. On the one hand, it appears that a decline in Soviet concern with U.S. antisubmarine warfare is clearly indicated by the quantitative decrease in the raw frequency of commentary on U.S. ASW. Although the number of entries in the ASW bibliography is substantially greater than before, evidencing increased interest in ASW topics in general, only 16% of the items sampled in the quantitative analysis contained codable data on U.S. ASW, in contrast to 24% during the previous period. On the other hand, the qualitative reading uncovered more comment on U.S. ASW than had previously appeared.

Unfortunately, it is not always possible to reconcile differences between qualitative and quantitatively-based

conclusions. Although it is likely that different frequencies arise from the two distinct samples chosen -- the quantitative analysis is based on a random sample of 50 entries from the time period while the qualitative study involved a "purposive" sample, e.g. the choice of the most promising material -- one is unable to draw definitive conclusions as to which approach yielded the "best" information on Soviet concern with U.S. ASW.

As the U.S. became more involved in the Vietnam War and U.S. naval resources allocated to ASW-related development reached their lowest point in the two decades studied, Soviet commentary focused more on the actual capabilities of U.S. ASW forces than on improvements in capabilities. Comments on platform effectiveness also increased -- albeit only slightly -- over the prior period. As a cause of this shift, the qualitative findings postulate that the Soviets were becoming increasingly aware of the mid-term SSN threat, the long-term implications of SOSUS and the impact of earlier R&D. Although the general Soviet appraisal was that U.S. ASW was still relatively ineffective -- the feared technological breakthrough for long-range detection was still nowhere in sight -- the United States' ASW force was viewed as an increasingly capable one. This perception of emerging U.S. strength was found to be particularly clear with regard to SSNs. The qualitative reading finally concludes that "...the real Soviet naval viewpoint was that the mission-completion capabilities of Soviet SSBNs were far from being assured under existing circumstances."

SSNs received more Soviet attention than any other platform or system during the second half of the sixties, as they did during the earlier half. Both quantitative and qualitative analyses show the paramount significance of SSNs -- their improvements, capabilities, and even effectiveness -- in the Soviet mind. It is clear that the prospect of a larger, better U.S. SSN force in the mid to long-term -- depending on future rates of construction -- was carefully noted by the Soviets. By 1968-1969, SSNs were being called "the most important means" of ASW. The concern with SUBROC displayed duri - the earlier years all but disappeared as the sixties drew to a close, quite likely because weapons became viewed as no better than the sensors available and the "newness" of the weapon had worn off by this time.

During the latter part of the 60s, ASW hunter-killer groups began to emerge as an important topic. Quantitatively, hunter-killer operations -- and the tasks undertaken by the various types of platforms involved -- received substantial attention. In particular, the roles of submarines and carrier-based aircraft were stressed.

But the fundamental ASW problem, long-range detection, was still unsolved, and the Soviets continued to view it as nearly intractable through the end of the decade. In 1966 the presumed ban on discussion of SOSUS was lifted, as the Soviets indicated that SOSUS detection capabilities, especially against Soviet SSBNs, were little improved and would be largely ineffectual if war broke out. By 1970 the implications of U.S. attempts to develop a global SOSUS increasingly implied to the Soviets that their SSBNs would be threatened in the long term future, although this threat was not yet perceived to be an "unmanageable" one. As the seventies began, SOSUS was described as incapable of determining the location of submarine contacts with a precision adequate for vectoring aircraft and ships to the contact, but its potential ability to do so was implicitly understood.

Because of the perceived limitations of the SOSUS system and the resultant difficulty in long-range detection, shore-based VP aircraft were of little interest. Improvements in the ORION were noted, but these were viewed as enhancing its capabilities for localization rather than for long-range detection, and therefore evaluated as being of little consequence. A-NEW, it was made clear, contributed nothing in the way of a long-range detection capability to supplement or replace SOSUS. Only a negligible number of references to VP aircraft were found in the quantitative analysis for the 1966-70 period, a result substantiated by the qualitative study.

U.S. CVSs were seldom discussed -- except occasionally, in reference to their role in ASW hunter-killer groups -- but they formed the basis for a debate between the Navy and Defense Ministry which would continue into the seventies. The Navy was still unable to justify increased expenditures on large ASW cruisers on the basis of the U.S. experience, and the U.S. "non-construction" program was, understandably, a "non-topic". In spite of the declining number of CVSs resulting from their deactivation or reallocation for the Vietnam War, a few Soviet naval writers still spoke of a high degree of U.S. interest in the CVS in passages redolent of naval advocacy. The quantitative study did indicate some Soviet interest in carrier-based aircraft, displayed primarily in discussions of their tasks and capabilities. Many of these comments did, again, discuss their activities during joint operations with other platforms.

The qualitative analysis ultimately suggests that the lack of a U.S. commitment to the CVS and carrier-based airplanes is one of the most important reasons for the Soviet Navy's unfavorable perceptions of the U.S. ASW effort. In

failing to design and build a CVS specifically for ASW against nuclear-powered submarines, the U.S. was perceived as overlooking or neglecting the optimum-available ASW development route.

The attention given to destroyer-type surface combatants increased but continued to be routine, as it had been during the early sixties. Qualitatively, a new appreciation of the role of surface ships in ASW was expressed. This was, no doubt, an extension of the introduction of new destroyer-type classes with enhanced ASW capability into the Soviet Navy, and the potential of increasing the effective range of ships by means of helicopters. The commentaries, therefore, are likely to have been written as a part of internal debates and simply used U.S. capabilities as a surrogate.

In summary, U.S. ASW capabilities were perceived during the late 60s as being insufficient to threaten the Soviet SSBN force seriously; however, the situation was viewed as having the potential to change to the disadvantage of the USSR in the event of expansion of SOSUS and growth of the U.S. force of SSNs.

Early 1970s

The 1970s saw an increase in commentary on U.S. ASW; the proportion of quantitatively sampled items containing references to U.S. ASW was larger than that from any other period. There was also an increase in advocacy and factual articles appearing in the full bibliography. Nearly all content (95%) on U.S. ASW was found in professional journals. Although the number of general assessments of U.S. capabilities decreased, it appears that the Soviets were modestly impressed with U.S. innovations during the period and believed that the antisubmarine warfare capability of the United States was improving significantly. The actual threat may have been negated somewhat by the advent of the DELTA SSBN, whose missiles could reach the U.S. from home waters, but SOSUS' global pretensions for detection began to bear fruit and the Soviets acknowledged the ASW environment to be hostile and difficult. This qualitative view is strongly reinforced by the quantitative results. The frequency of comment substantially increased over that of the previous period and the platform focus of commentaries shifted considerably.

As was the case in previous periods, the quantitative analysis found few explicit references to SOSUS (only 6) while the sensitivity of the qualitative approach allowed it to gather considerable information on the topic. For the

first time, a description of the SOSUS system appeared in a book with a "general" (e.g. other than naval) readership, but the subject was still avoided in nearly all major military and naval works. The tone and content of commentaries were only moderately concerned; even by late 1975 SOSUS was viewed as having inadequate range and effectiveness and therefore as not constituting a major threat. But its previously long-term implications were even clearer than before as it began to give the U.S. increased coverage and began to be integrated into a world-wide surveillance network.

The most startling change in Soviet attitudes over the previous decade was on the topic of VP aircraft. Despite the introduction of improved ORION airplanes, the potential threat from shore-based VP had previously been downplayed (when acknowledged at all). For the first part of the 70s, however, the quantitative analysis shows a jump in the proportion of commentaries relating to VP, with a concentration of those entries in the category of improvements in VP capabilities; the qualitative reading suggests that the importance of VP was stressed to "undo" the past downgrading of the threat. It is likely that this change in frequency may have been an acknowledgement of the potential impact of land-based ASW aircraft when vectored by SOSUS.

The quantitative analysis displays little change in attention paid to SSNs, and a slight decrease was noted on the qualitative side. Most of the quantitatively assessed commentary dealt with improvements in and technical descriptions of SSNs, no doubt spurred on by the beginning of construction of the LOS ANGELES class (SSN-688) and of the experimental, turbine-electric drive LIPSCOMB. The MK48 submarine-launched torpedo, introduced in 1974 after 12 years of development, also received substantial attention in the media reviewed in the quantitative reading.

Interest in submarines was fueled, however, by an internal Soviet debate between the Navy and Defense Ministry. The qualitative study hypothesizes that the Soviets were not so much impressed by U.S. SSN technological development and submarine construction rates as they were engaging in an internal policy dispute as to whether submarines or air-capable surface ships would emerge as the main ASW force type. The Defense Ministry, supported by traditional Soviet military doctrine, asserted that surface combatant ships should serve only a supporting role because of their inherent vulnerability, leaving submarines and aircraft to act as the "main striking force". The naval view was that ASW aircraft carriers are essential to ASW in many cases, as lead rather than supporting players. To bolster their argument, naval writers frequently referred to con-

tinued U.S. interest in ship-based ASW. It is consequently difficult to separate advocacy from perception of threat. The quantitative approach shows that helicopters, aircraft carriers and surface combatants each received substantial notice during the period, but can do little to sort out the perceptual component. But the qualitative conclusion is that the Soviet perception was one of being impressed by the developments that took place during 1971-1976 with respect to destroyer-type ships for ASW. In particular, the Soviets viewed the SPRUANCE (DD-963) class with interest, although concern was tempered by lags in construction. More importantly, LAMPS was seen as holding promise to enhance U.S. ASW capabilities significantly in the near and mid-term and to be of great importance in over-coming the inferior speed of ships as compared to submarines, although full deployment of LAMPS would not be immediate. The concern with LAMPS inferred in the qualitative anlaysis is borne out in the quantitative phase: helicopters received more comment than any other U.S. platform.

Qualitatively, more interest in mines was expressed during the early to mid-seventies than before, but mines were not viewed by the Soviets as an immediate danger. Rather, the Soviets regarded the development of the CAPTOR and QUICKSTRIKE mines as they had SOSUS a decade earlier -- as a professionally interesting development that posed no medium-term threat, but that required continuing observation to avoid unpleasant surprises. As the U.S. was seen as progressing toward a capability for a substantial percentage of "quick kills" of Soviet SSBNs on open-ocean station in peacetime through SOSUS, mines could potentially contribute to the destruction of SSBNs while in transit in home waters or while attempting to break through ASW barriers.

Mid 1970s to Present

The trend toward increased Soviet concern about U.S. ASW which is indicated above continues into the latter portion of the 1970s and into 1980. Clearly, Soviet writers view U.S. ASW capabilities as an increasingly real threat to their SSBN force. By far the biggest single factor in this shift in Soviet perceptions (from a seeming lack of concern displayed in the 1960s to a substantial degree of present concern) is SOSUS. The qualitative analysis concludes that the Soviets believe that U.S. ASW is roughly the state-of-the-art equal of Soviet submarine warfare as long as SOSUS is operating effectively. Although anti-SSBN ASW is not believed to be a priority mission of the U.S. Navy, the Soviets perceive that every "unfriendly" submarine detected would be sought out and attacked in the event of war -- including SSBNs -- and that an unacceptably high degree of attrition of Soviet SSBNs could result.

As was the case during the earlier periods, little evidence of Soviet perceptions regarding SOSUS was unearthed by the quantitative research, while the qualitative study found that SOSUS was the primary focus of 1976-80 commentaries. Changes in Soviet attitudes toward SOSUS were also evident: improvements that could potentially enhance SOSUS in the 1980s were cited. For the first time, the United States' SOSUS system was acknowledged by Soviet naval figures as presenting a present threat to both SSBNs and attack submarines. This concern about SOSUS expressed in the media was carried over to VP airplanes, most likely because of their synergistic interaction in the prosecution of submarine contacts in the open-ocean. These findings disagree significantly with quantitative results: the quantitative data analysis indicates that these developments (e.g. VP aircraft and SOSUS) were given only scant attention by Soviet naval sources.* Both the qualitative and quantitative studies agree, however, on the recent importance of U.S. submarines in the Soviet view. Over a third of the quantitative coded data from the fourth period (1976-1979) referred to U.S. submarines and their sensors. As has been the case with other platforms and time periods, improvements were of primary interest and operational capabilities of secondary importance in the literature. The qualitative analysis also concludes that SSN development and construction evoked a high level of Soviet interest, even showing an increase over prior years. Atypically, not one of the SSN-related passages was qualitatively unfavorable. Considerable interest in the LOS ANGELES class was noted in both analyses.

During these years, Party awareness of and concern with U.S. ASW increased. Although the number of articles reflecting the Party point of view and the number written for

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* As we have noted before, it is not always possible to reconcile qualitative and quantitative conclusions. The depth of analysis which is characteristic of qualitative content analysis cannot be matched by the quantitative approach, which relies on a more explicit set of data. This structural difference has previously been cited as a reason for the few SOSUS-related comments picked up by the quantitative effort in contrast to the many references found during the qualitative stage. Additional causes of the discrepency may be attributed to differences in sampled material. The qualitative sample is larger (and chosen differently) than the quantitative one and also includes some items from 1980 which were not included in the quantitative sample.

propaganda purposes are consistent with other time periods, entries in these categories contain considerably more commentary on U.S. ASW than before. The seriousness of ASW may also be inferred by the quantitative distribution of coded material on U.S. ASW among "purpose" categories. The number of factual entries has almost doubled over the prior period, encompassing 70% of coded data, and advocacy has declined from 65% during period 3 to 10% of the period 4 total. The primary purpose of these articles was not, therefore, to cite U.S. efforts as substantiation for increased internal budget requests; rather, they were to share information and discuss what is perceived to be a very real threat.

This increased concern is particularly true with respect to U.S. mine warfare. The Soviets' criticism of the United States' lack of attention to mines earlier in the decade turned sharply into an acknowledgement of an immediate and growing capability. Although this finding is not supported by quantitative data, the qualitative analysis concludes that the threat from the U.S. new mines is seen by the Soviets as especially acute in areas where the potential for destroying Soviet SSBNs is the greatest: in the approaches to submarine bases, in home-water stationing and transits, and at geographic choke points.

Other U.S. programs are viewed by the Soviets in a less favorable light. Construction of destroyer-type ASW ships, particularly of the SPRUANCE class, is seen as unimpressive; the Mark III LAMPS is believed to be of insufficient range for open-ocean search; and the U.S. decision not to build VTOL-carrying large ASW surface ships or task-specific ASW carriers continues to be viewed as unwise.