THE WHITE HOUSE
WASHINGTON

Oct 29, 1981

Mike,

A more detailed abstract is possible, if you wish.

John

John d'Amecourt

SOVIET vs U.S. FORCES: NUMERICAL COMPARISON

U.S. strength relative to the Soviets cannot be determined by comparing numbers of troops and armaments. Imbalances in numbers may be offset by tactics. For example, Soviet numerical advantage in tanks may be offset by superior U.S. anti-tank weapons.

Soviet numbers are based on what is "known to exist". There is a good possibility that some items have not been detected. For example, some regions of the USSR have not been surveyed for ICBM launchers.

U.S. numbers are approximate and include only forces actually under direct U.S. control and currently deployed -- not in mothballs or in reserve units.

Aside from troops, numbers do not include Warsaw Pact and NATO controlled armaments.

	SOVIET	U.S.
TOTAL PERSONNEL IN UNIFORM	4.8 million	2 million
GROUND FORCES		
Combat Divisions	180	28 (incl Marines)
Total manpower	2+ million	.5 million
Tanks	50,000	10-12,000
Artillery	20,000	5,000
Helicopters (all purposes)	5,200	5,900
NAVAL FORCES		
Combatant Ships	1,297	4-500
Submarines	377	135
(Nuclear incl above)	198	130
Auxiliaries	755	80
Naval Aircraft	1,440	1,100
AIR FORCES		
Helicopters (see Ground Forces)		
Naval aircraft (see Naval Forces)		
Long range bombers	880	350
(Strategic incl above)	150	300+
Frontal (fixed wing-combat support)	4,800	3,400
Air Defense interceptors	2,500	350

(Air Forces-con't)

Surface-to-air missile sites (SAMs)	1,000	-0-
SAM missiles (all types) deployed	10-12,000	-0-

NUCLEAR FORCES

ICBMs (loaded launchers)	1,398	1,050
IRBMs (intermediate range)	320	-0-
MRBMs (medium range)	385+	-0-
SLBMs (sea-launched)	950	575

MILITARY PRODUCTION BASE

Major plants	35	?
Floor space plants	410 mil sq ft	?
Rate of growth since 1970	34%	?

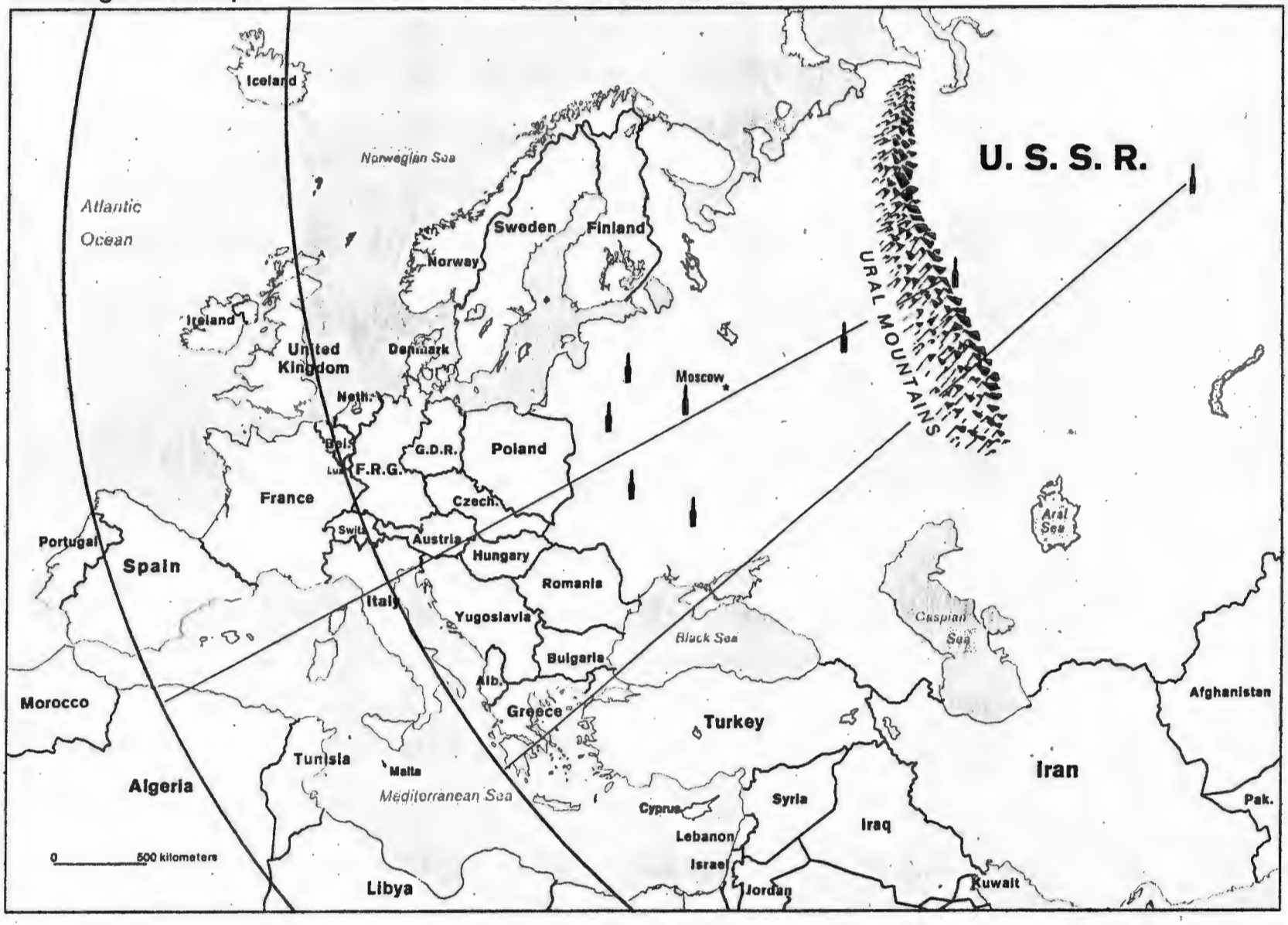
Sources of Information

Data on Soviet forces: Soviet Military Power, published by Defense Intelligence Agency, September, 1981.
Data on U.S. forces: U.S. Military Posture, issued by Secretary of Defense, 1980.

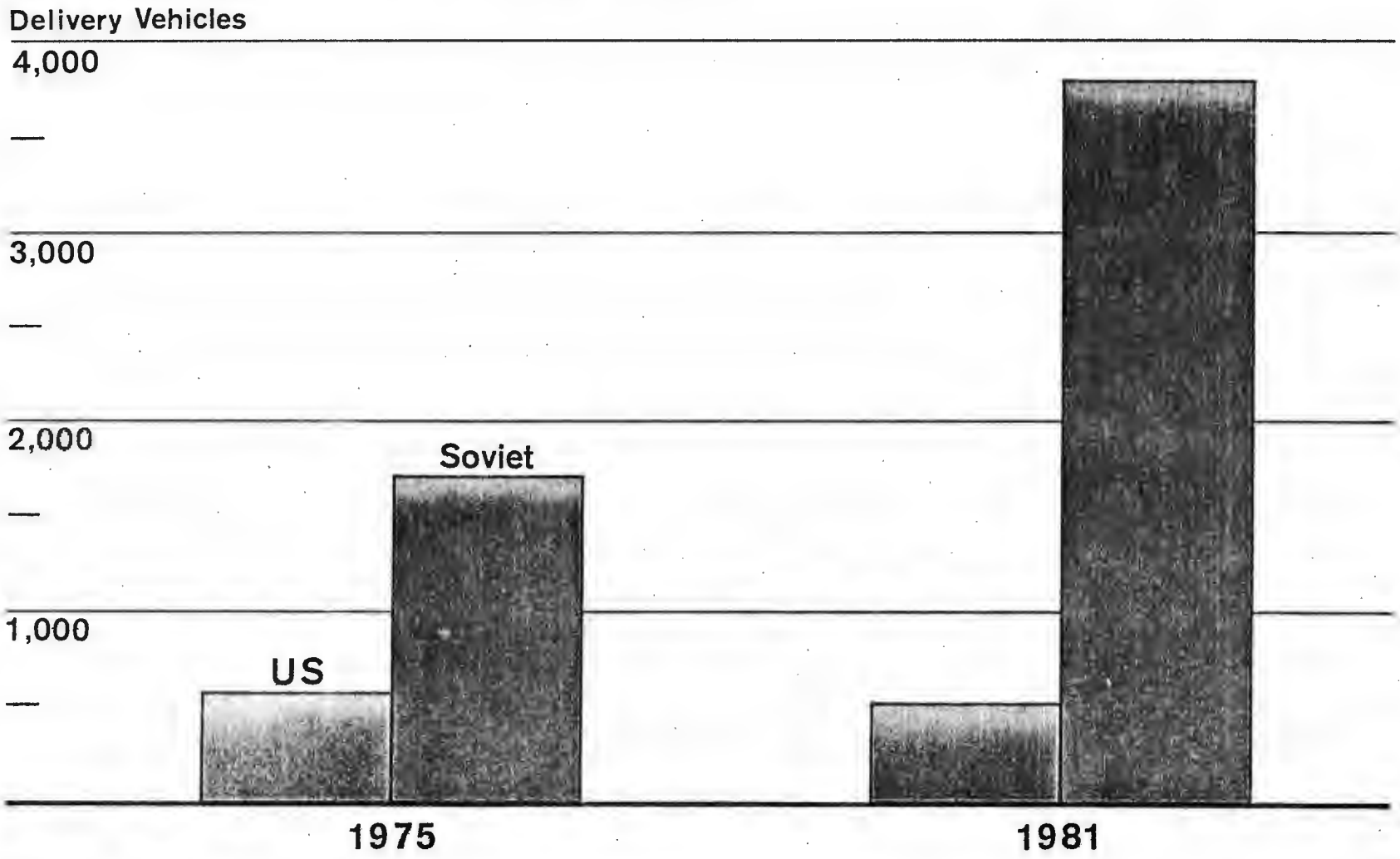
Key Intermediate Range Land-Based Missiles

Soviet					US			
Type	Warheads per Missile	Number of Launchers Deployed	Total Warheads on Launchers	Range (km)	Total Warheads on Launchers	Number of Launchers Deployed	Warheads per Missile	Type
SS-20	3	250	750	4,400 to 5,000		–		–
SS-5	1	35	35	4,100		–		–
–				2,500	0 (464 Planned)	0 (116 Launchers, 4 Missiles per Launcher Planned)	1	GLCM (Ground-launched Cruise Missile)
SS-4	1	315	315	1,900		–		–
–		–		1,800	0 (108 Planned)	0 (108 Planned)	1	Pershing II
Total		600	1,100		0 (572 Planned)	0 (224 Planned)		Total

Coverage of Europe From SS-20 Bases East of the Urals



Balance of Comparable US and Soviet Intermediate Range Nuclear Forces



SJITS

STRATEGIC MISSILES AND TECHNOLOGY - DEFENSE

Grayson D. Tate, Jr., Major General, US Army,
Ballistic Missile Defense Program Manager

TATE - BMD

Introduction

In contemplating the task of forecasting what US strategic defensive systems and their associated technologies will look like by the year 2000, I was reminded that there is a long history of failures in the business of predicting future technology. A notable example is Frederick Engels' prophecy at the end of the Franko-Prussian War that the weapons of war had reached such a state of perfection that further avenues for improvements were essentially closed.

My thought is that the ability to forecast future technology is not much more sophisticated in our own era. For example, a high level governmental study on future technology published in 1937 (see Fig. 1) failed to predict the development of the jet engine, radar, inertial guidance, rocket-propelled missiles, electronic data processing computers, artificial satellites, and nuclear weapons; and, in 1948, a leading science magazine wrote, "Landing and moving around on the moon offers so many serious problems for human beings that it may take science another two hundred years to lick them."

Therefore, I intend to describe what I see as shaping US strategic defense policy today, and let you make your own technological predictions for the year 2000.

1937 TECHNOLOGY FORECAST

FAILED TO PREDICT . .

- **JET ENGINES**
- **RADAR**
- **INERTIAL GUIDANCE**
- **ROCKET PROPELLED MISSILES**
- **EDP COMPUTERS**
- **SATELLITES**
- **NUCLEAR WEAPONS**

Fig. 1

I. The Developing Soviet Strategic Offense Capability

To set the theme for the remainder of this paper, let me say that I believe that offense alone is not a good defense. For you football buffs, note that Vince Lombardi and I agree on this point. I also believe that technology is not the decisive factor in achieving a satisfactory defense. Rather, the decisive factor is the decision to get a satisfactory defense. The technological problems in virtually everything we have undertaken have been solved, once we decided to solve them.

The three most important things which bode an active role for strategic defense are the threat, The Threat and THE THREAT.

According to Dr. Jack Vorona of the Defense Intelligence Agency, the Soviet effort in strategic offensive capability will continue to increase at an alarming rate during the remainder of this century (see Fig. 2).

SOVIET STRATEGIC OFFENSE

• **BOMBERS**	**156 (+100 BACKFIRES)**
• **ICBM's**	**1398**
• **SLBM's**	**950**
• **WARHEADS**	**6000**
• **ANTISATELLITE**	**OPERATIONAL**

Fig. 2

I will not go into the Soviet strategic bomber force capability, except to say that it is significant and growing.

The central element of the USSR's strategic offensive force is a triad of ICBM's, bombers, and SLBM's, which at present can launch about 6,000 independently targeted weapons against the United States. The bulk of this capability is provided by 1,398 ICBM launchers. New ICBM's are replacing the older generation of weapons at the rate of about 150 launchers annually. In addition, a new generation of ICBM's is under development. The evidence suggests that, during the remainder of this century, the Russians will continue to improve the quality of their strategic land-based missile force, striving for higher reliability, faster response time and even greater accuracy. This quality improvement is quite independent of SALT II.

Although only a small portion of the Soviet missile submarine force is maintained on operational patrol, the long-range missiles of the DELTA class submarines can reach the United States from their Soviet ports. The Soviets now have more than 30 operational DELTA's and 950 SLBM's. As a result of the Soviets' continual improvement of their sea-launched missile capability the percentage of submarines whose missiles can hit the United States will rise significantly in the near future.

With well over 75 space launches in each of the last 10 years, the Soviets are also making great strides in space. Their space program, although extremely diverse, is predominately military in character. For example, they have demonstrated an operational, non-nuclear, anti-satellite capability.

It is, I believe, this formidable, and increasing Soviet strategic offensive capability which will shape or influence the development of US strategic defensive capabilities for the balance of this century.

II. US Policy and Strategic Defense

Now that I have provided an overview of the threat, I will consider briefly US policy and strategic defense. The central purpose of American military power is to deter conflict and, in the event deterrence fails, to control escalation and produce victory with minimal losses to the US and its national interests. In the BMD research and development community, we believe that Soviet perceptions of US technology and capabilities in strategic defense significantly add to the contribution of US strategic offensive capabilities in achieving this purpose.

However, unlike the Soviets, the US no longer has an operational BMD system, and strategic air defense for the continental US (CONUS) is minimal. Thus, the basic elements of US strategic defense consist largely of surveillance and warning systems to detect and characterize hostile actions by strategic aircraft, missiles, and spacecraft.

It is useful at this point to distinguish between "passive" and "active" strategic defense systems (see Fig. 3). Passive strategic defense, in my terminology, consists of surveillance and early warning systems which the US has deployed. It also includes measures such as civil defense which I will not address. An active strategic defensive system, on the other hand, provides the means to engage and defeat or destroy the attacking forces. In addition to interceptor missiles, active strategic defense can also include interceptor aircraft and spacecraft, and various ground based air defense weapons. One day we may be able to add directed energy weapons, lasers and/or particle beams to the list as well.

STRATEGIC DEFENSES

- **PASSIVE**
  - SURVEILLANCE & WARNING
  - CIVIL DEFENSE
- **ACTIVE**
  - INCLUDES INTERCEPTOR (MISSILES, AIRCRAFT, SPACECRAFT)
  - POSSIBLY DIRECTED ENERGY WEAPONS

Fig. 3

Because US strategic policy during the last decade has emphasized the offense and passive (rather than active) defense one has to reach back to SALT I for a clear example of the contribution an active defense can make to national security. Many knowledgable observers believe that it was US successes in developing and deploying the SAFEGUARD Ballistic Missile Defense System that convinced the Soviets to negotiate at the SALT I table. The US clearly had a significant technological advantage at that time. The 1972 ABM Treaty, negotiated from this position of strength, is the only permanent agreement to date on the limitation of strategic weapons systems.

III. Trends in Strategic Defense

A. Passive Strategic Defense

As a result of conscious decisions by the administrations and Congresses of the last 15 years, today the US has little but passive strategic defensive systems deployed (see Fig. 4). They include the Ballistic Missile Early Warning System (BMEWS); the Perimeter Acquisition Radar Characterization System (PARCS); PAVE PAWS radars on both the East and West coasts; and early warning satellites. All of these passive defensive systems have been updated in an evolutionary manner over the years and a vigorous R&D program to make further improvements is continuing. The BMD Program will take maximum advantage of these passive defense capabilities as they are developed.

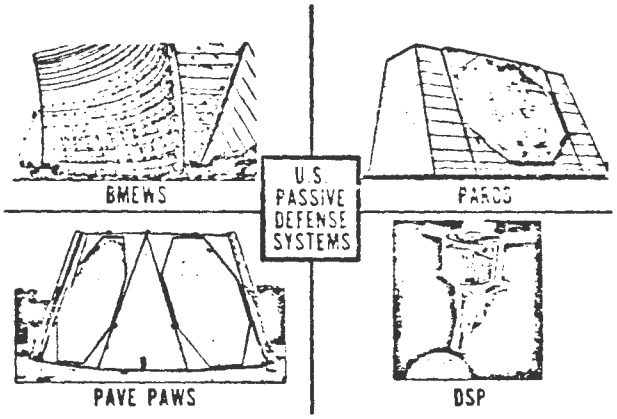


Fig. 4

B. Active Strategic Defense

Ballistic missile defense is the only US active strategic defense program which has received sustained emphasis during the past two decades. Since managing the BMD Program is my job, I will use it as my example for active strategic defense.

The physical arena in which future BMD capabilities will be developing is shown in Fig. 5. The battle space is divided into three regimes related to the phases of an ICBM trajectory. These are boost phase (approximately the first five minutes of a typical trajectory); midcourse phase (approximately the next 25-30 minutes); and the terminal phase (approximately the last minute).

ICBM TRAJECTORY

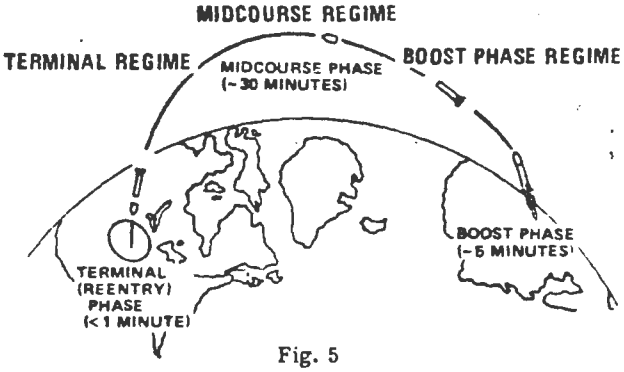


Fig. 5

Historically, the ballistic missile defense program began in 1955, as an extension of the Army's work in air defense. The first decade of work confirmed that we could, indeed, "hit a bullet with a bullet" and developed the Nike Zeus system for a deployment that was never authorized (see Fig. 6). The Zeus system advanced the state of the art in radar, data processing, and missiles--but not sufficiently to cope economically with the prospect of an adversary who would have enough missiles to launch a heavy attack.

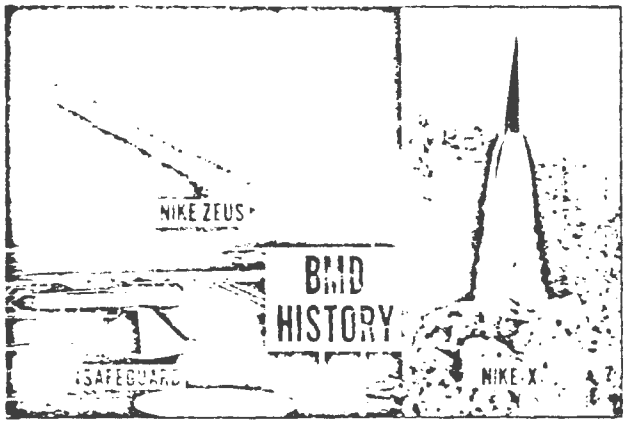


Fig. 6

In the latter half of the 1960's, the Nike-X Project further advanced the state-of-the-art and solved most of those problems. Notable technical advancements in the transition between Nike Zeus and Nike-X were phased-array radars in place of dish radars and the high acceleration interceptor technology of the SPRINT missile. The first half of the 1970's was dedicated to efforts to deploy the Nike-X components, at first as the SENTINEL System to protect major US industrial centers, and finally as the SAFEGUARD System to protect our MINUTEMAN ICBM's. The single SAFEGUARD System site permitted by the ABM Treaty was deployed in North Dakota, became fully operational in October 1975, and was shut down in February 1976 in response to direction from Congress.

The next generation of BMD was a terminal defense system called Site Defense, it was designed primarily for MINUTEMAN defense. Site Defense embodied many improvements over SAFEGUARD, including modular netting of smaller radars to reduce vulnerability; the use of high capacity computers; a lower cost, more capable interceptor; preferential defense firing doctrine; and sophisticated discrimination capability (see Fig. 7). Under congressional direction, the Site Defense program evolved into the BMD Systems Technology Program and provided the basis for our present Terminal Defense System. The Terminal Defense technology program is now nearing completion of field testing at Kwajelein Missile Range (KMR). All of the critical Site Defense improvements have been, or will be proven by the end of fiscal year 1980.

Looking to the 1990's and beyond, the BMD program is now and will be working a broad base of technologies that will be useful.

In 1980, near-term emphasis in the terminal regime is focusing on preprototype demonstration of technology for a Low Altitude Defense (LoAD) system (see Fig. 8). LoAD is low risk, builds on our experience

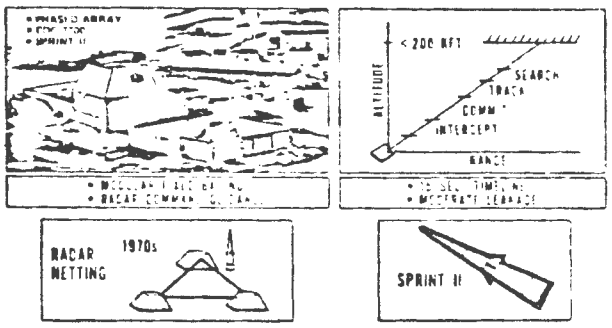


Fig. 7

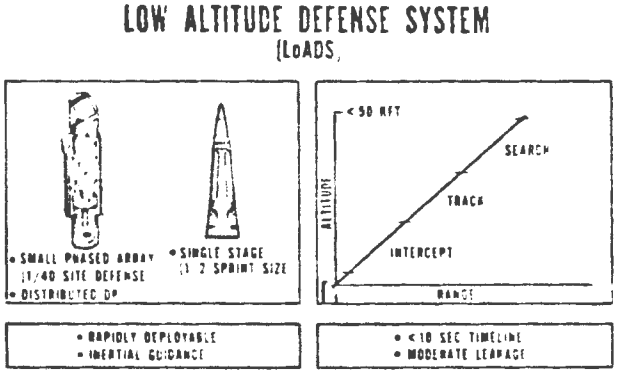


Fig. 8

with SAFEGUARD and Site Defense, and is expected to be cost effective. LoAD will operate below 50 thousand feet and will take advantage of atmospheric filtering for discrimination.

The key to coping with the compressed terminal defense timeline lies in massive data and signal processing capabilities. These capabilities are now, more than ever, achievable thanks to the revolution in very large scale integration (VLSI) and very high speed integrated circuit (VHSIC) technology, which allows small, relatively inexpensive specialized computers to be distributed throughout a system (see Fig. 9). This technology which makes distributed data processing possible, means greater hardness through chip design and selection, reduced power requirements, higher reliability, faster producibility and a broader production base as well as lower cost.

With the compactness of microelectronic technology, LoAD components are small enough to be adapted to a variety of basing modes, including the "racetrack" for MX. The point to be noted here is that the technology to obtain the high computational throughput rate necessary for terminal defense is either here or not far out of reach.

In the exoatmospheric midcourse regime there is greater time to detect, discriminate and destroy reentry vehicles.

Exoatmospheric BMD (see Fig. 10) provides greater coverage per site and, thus, lower system cost. It also conceptually permits use of multiple nonnuclear kill

vehicles on a single interceptor. This increases system leverage, reduces cost, obviates the requirement for nuclear release authority, and eliminates the problem of self-induced nuclear blackout.

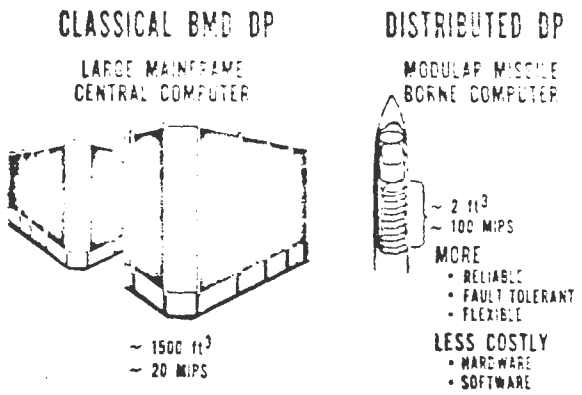


Fig. 9

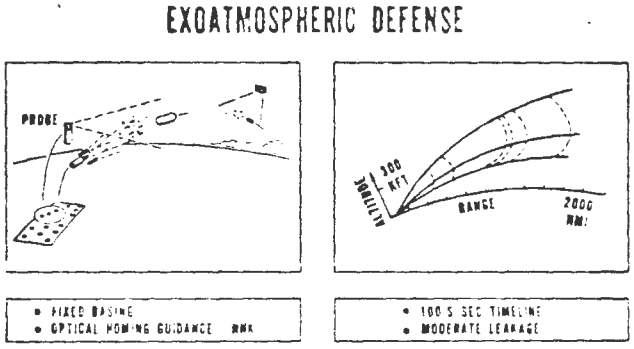


Fig. 10

Distributed data processing is one of two technological advances associated with extending BMD into the midcourse regime; the other is optics. The marriage of microelectronic distributed data processing and optics makes feasible an interceptor with sufficient capability to operate autonomously after launch. This autonomous interceptor, launched from the ground, can start the engagement more than 1000 miles away, observe the threat cloud for a long period, and home on a reentry vehicle with enough precision to permit a nonnuclear kill. We expect to test this concept at Kwajalein Missile Range in 1982.

Combining exoatmospheric BMD with terminal BMD (see Fig. 11) yields a two-tiered, or Layered Defense--the first layer to thin the attack, the second to catch the leakers. The two in combination are much more effective than either is alone. With dual phenomenology discrimination--optics in one layer, radar in the other--the combination is also much less sensitive to penetration aids. The technology for terminal BMD has been under development for more than a decade. The technology for exoatmospheric BMD, on the other hand, is less mature and higher risk, but attainable within the 80's with adequate funding.

Least mature is the technology for a boost-phase defense, but the potential is so great that the lure is strong. The development of a cost-effective boost-phase BMD system (see Fig. 12) would provide a quantum increase in defensive leverage. The class of defensive weapons which theoretically shows great promise for applicability in this regime are directed energy weapons such as high energy lasers (HEL) and particle beam weapons (PBW).

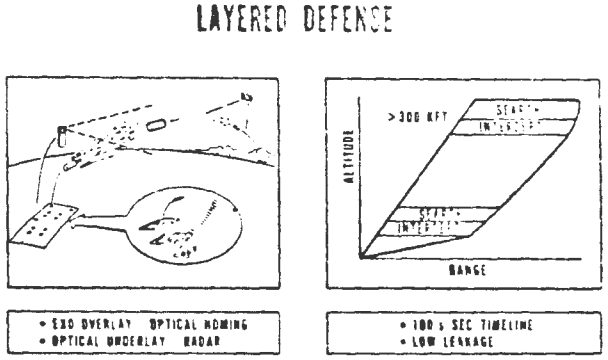


Fig. 11

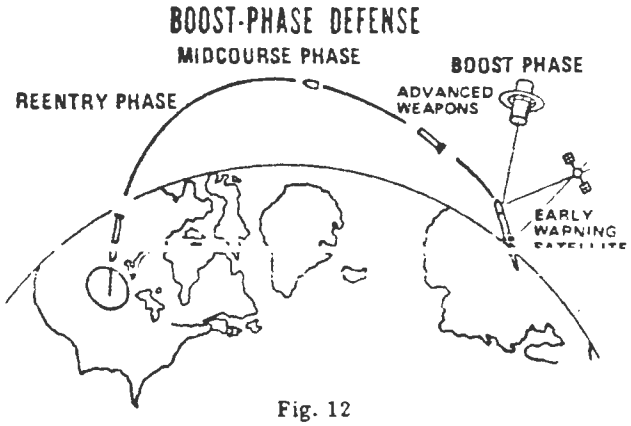


Fig. 12

A boost-phase BMD system based on lasers or particle beam systems could be deployed on a large space platform. These weapons could attack ballistic missiles during boost phase when the number of targets is small, detection and discrimination are relatively simple, and vulnerability is at a maximum. Today, existing directed energy weapon concepts suffer from several weaknesses. Will the weaknesses be resolved? I think they can be! Nevertheless, because of our arms control agreements, one must wonder whether we will decide to develop and deploy directed energy BMD weapons during this century.

IV. Trends and Forecast

What else may be expected for BMD between now and the year 2000? So far, I have painted a fairly optimistic picture that technology will be available to solve our most pressing problems. By way of summary and projection, let me make a few general observations on technology trends (see Fig. 13).

There are three technologies I would like to comment on: sensors, data processing, and kill mechanisms. These technologies cut across a number of strategic defense missions. They are particularly crucial to BMD. I have already alluded to all of them,

TECHNOLOGY TRENDS

- SENSORS
- DATA PROCESSING
- KILL MECHANISMS

Fig. 13

although I have probably emphasized data processing more than the other two. The reason for the relative emphasis on data processing is that it has historically lagged the capabilities of sensors, at least in the case of BMD. We have always had a greater capability to acquire data with our sensors than to digest it with signal processors and central computers. This, I believe, will change in the future.

With respect to sensors, we have need to improve them even though they frequently outstrip their companion data processors. Here, I am talking about both radar and optical sensors, spanning the electromagnetic spectrum from UHF to the visible region. We have a continuing need for improvements in sensitivity, resolution, and hardness to nuclear effects. With respect to microwave radars, our future plans tend to be dominated by hardness requirements. Our LWIR sensors are generally adequate in sensitivity but need improvements in resolution and hardness. In millimeter sensors, we are in an early state of development and we need improvements across-the-board. In laser technology, we see the advent of visible or ultraviolet devices as key to the future of high energy lasers.

Data processing technology is exploding; we are witnessing exponential progress in even higher levels of integration, circuit speed and miniaturization. Hailed in the trade journals as the "era of computational plenty", we are entering a period where computational capacity will catch up with the demands of advanced sensors and provide hitherto unattainable levels of reliability. In the BMD community, we are excited about the prospect of applying advanced data processing technology to on-board missile processors.

The kill mechanism historically used in BMD has been the nuclear warhead. As previously noted, a major objective of the BMD program during the 1980's is to achieve non-nuclear kill. This is estimated to be feasible first in the exoatmosphere and later in the endoatmosphere. After that, the next major step forseen in kill mechanisms is to transport the energy necessary for kill in the form of a beam rather than an interceptor. The achievement of this form of ballistic missile kill, with its zero time-of-flight and other unique attributes would represent a revolutionary milestone in strategic defensive technology.

In 1948 a walk on the moon was estimated to be two hundred years away. Today it is history. What brought man to the moon was a need to get there and a decision. What will make effective strategic defense a technological reality is a need to make it a technological reality, and a decision. So, to do your own forecasting (see Fig. 14), look at the needs for strategic defense. Just as we satisfied the need to get to the moon, we will satisfy other technological needs, no matter how impossible they seem today. The recent experience of mankind has told us that the things we say are impossible are confined to those tasks that require just a little more effort than we are presently willing to exert.

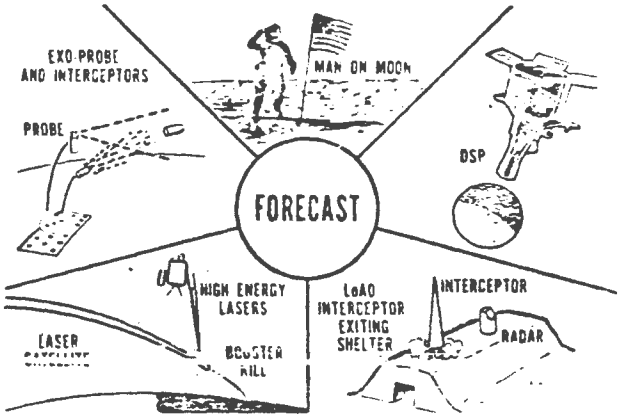


Fig. 14

Convenient myopia will not hide the fact that the Soviets continue to deploy new offensive systems at a high rate as well as devoting a serious effort in the area of strategic defense, including BMD. It seems unrealistic to expect that the pace of Soviet efforts can be pursued for much longer without the serious possibility they will achieve major new technological breakthroughs. As a result, I believe that the recognition of our own need for active strategic defense and the resolve to get on with it will not be long in coming.

SOVIET MILITARY POWER

"The more constructive East-West relationship which the Allies seek requires tangible signs that the Soviet Union is prepared to abandon the disturbing buildup of its military strength, to desist from resorting to force and intimidation and to cease creating or exploiting situations of crisis and instability in the Third World."

From the Communique of the
NATO Foreign Ministers Meeting
May 1981

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CONTENTS

The illustrations of new Soviet weapons systems introducing each chapter are derived from various U.S. sources; while not precise in every detail, they are as authentic as possible.

PREFACE

The Soviet Armed Forces today number more than 4.8 million men. For the past quarter century, we have witnessed the continuing growth of Soviet military power at a pace that shows no signs of slackening in the future.

All elements of the Soviet Armed Forces—the Strategic Rocket Forces, the Ground Forces of the Army, the Air Forces, the Navy and the Air Defense Forces—continue to modernize with an unending flow of new weapons systems, tanks, missiles, ships, artillery and aircraft. The Soviet defense budget continues to grow to fund this force buildup, to fund the projection of Soviet power far from Soviet shores and to fund Soviet use of proxy forces to support revolutionary factions and conflict in an increasing threat to international stability.

To comprehend the threat to Western strategic interests posed by the growth and power projection of the Soviet Armed Forces it is useful to consider in detail the composition, organization and doctrine of these forces, their ideological underpinning, and their steady acquisition of new, increasingly capable conventional, theater nuclear and strategic nuclear weapons systems. It is equally important to examine the USSR's industrial base, military resource allocations, and continuing quest for military/technological superiority which contribute to the effectiveness of its armed forces and proxy forces, and which support the Soviets' position as a world leader in arms exports.

The facts are stark:

- The Soviet Ground Forces have grown to more than 180 divisions—motorized rifle divisions, tank divisions and airborne divisions—stationed in Eastern Europe, in the USSR, in Mongolia, and in combat in Afghanistan. Soviet Ground Forces have achieved the capacity for extended intensive combat in the Central Region of Europe.
- The Soviets have fielded 50,000 tanks and 20,000 artillery pieces. The Soviet divisions are being equipped with the newer, faster, better armored T-64 and T-72 tanks. Some artillery units, organic to each division, include new, heavy mobile artillery, multiple rocket launchers and self-propelled, armored 122-mm and 152-mm guns.
- More than 5,200 helicopters are available to the Soviet Armed Forces, including increasing numbers of Mi-8 and Mi-24 helicopter gunships used in direct support of ground forces on the battlefield.
- More than 3,500 Soviet and Warsaw Pact tactical bombers and fighter aircraft are located in Eastern Europe alone. In each of the last eight years, the Soviets have produced more than 1,000 fighter aircraft.
- Against Western Europe, China and Japan, the Soviets are adding constantly to deliverable nuclear warheads, with the number of launchers growing, with some 250 mobile, SS-20 Intermediate Range Ballistic Missile launchers in the field, and with three nuclear warheads on each SS-20 missile.

• The Soviets continue to give high priority to the modernization of their Intercontinental Ballistic Missile (ICBM) force and their Submarine Launched Ballistic Missile (SLBM) force stressing increased accuracy and greater warhead throwweight. The Soviet intercontinental strategic arsenal includes 7,000 nuclear warheads, with 1,398 ICBM launchers, 950 SLBM launchers and 156 long-range bombers. This does not include some 150 nuclear-capable BACKFIRE bombers.

• The Soviets have eight classes of submarines and eight classes of major surface warships, including nuclear-powered cruisers and new aircraft carriers, presently under construction. This growing naval force emerging from large, modern shipyards is designed to support sustained operations in remote areas in order to project Soviet power around the world.

• The Soviet Air Defense Forces man 10,000 surface-to-air missile launchers at 1,000 fixed missile sites across the Soviet Union.

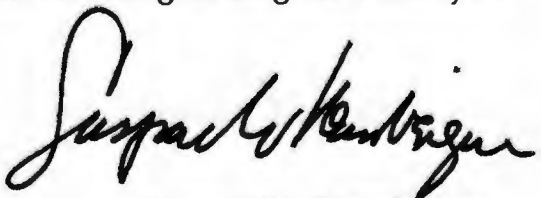
• The growth of the Soviet Armed Forces is made possible by the USSR's military production base which continues to grow at the expense of all other components of the Soviet economy. There are 135 major military industrial plants now operating in the Soviet Union with over 40 million square meters in floor space, a 34 percent increase since 1970. In 1980, these plants produced more than 150 different types of weapons systems for Soviet forces and for export to client states and developing countries.

• Today, the Soviets have more than 85,000 men fighting in Afghanistan. Soviet naval forces are deployed in the major oceans of the world. The USSR is gaining increased access to military facilities and is supporting proxy conflicts in Africa, Southwest Asia, Southeast Asia and the Western hemisphere.

There is nothing hypothetical about the Soviet military machine. Its expansion, modernization, and contribution to projection of power beyond Soviet boundaries are obvious.

A clear understanding of Soviet Armed Forces, their doctrine, their capabilities, their strengths and their weaknesses is essential to the shaping and maintenance of effective U.S. and Allied Armed Forces.

The greatest defense forces in the world are those of free people in free nations well informed as to the challenge they face, firmly united in their resolve to provide fully for the common defense, thereby deterring aggression and safeguarding the security of the world's democracies.



Caspar W. Weinberger
Secretary of Defense

I SOVIET MILITARY POV

ER

This document, which is a distillation of briefings provided to the NATO Ministers of Defense, describes the totality of the Soviet military buildup in some detail. Free people can better determine the challenges they face and the decisions required if armed with adequate factual knowledge of the threat. For this reason, the Secretary of Defense has had this document prepared and published.

Soviet Military Power presents a factual portrayal of the Soviet Armed Forces, a review intended to be as informative as possible on an issue of the utmost importance to the United States and its Allies.

The chart "Soviet Military Forces," on pages six and seven of Chapter I, depicts the size, composition and deployment of the USSR's Strategic Nuclear Forces, Ground Forces, Air Forces, Air Defense Forces and Naval Forces.

Chapter II, Military Resource Allocation, examines the Soviet and non-Soviet Warsaw Pact military industrial base, the world's largest in facilities and physical size.

Chapter III, Organization of Soviet Armed Forces, describes the USSR's strategic command structure, command and control, logistic support and combat doctrine.

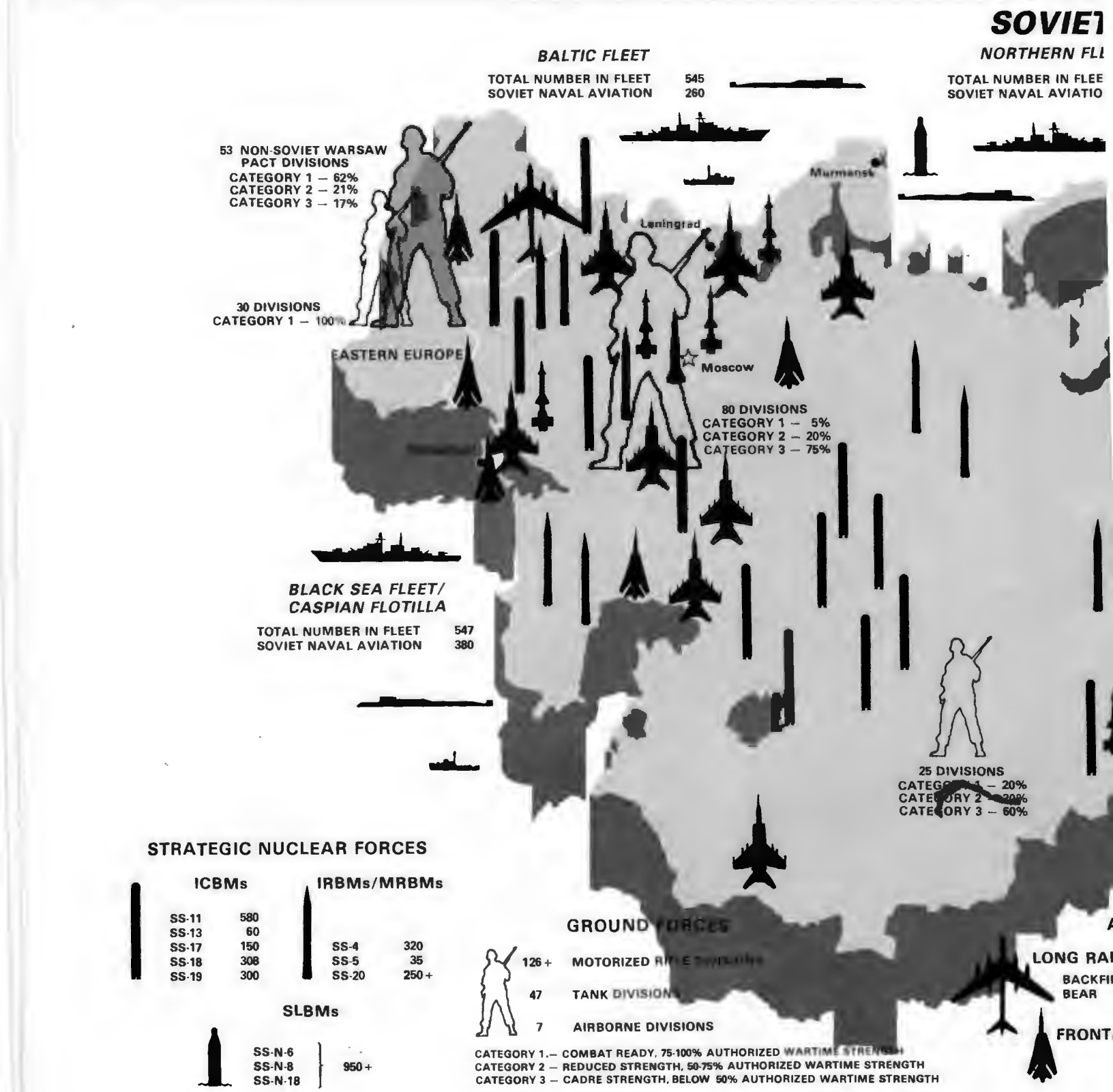
Chapter IV reviews those Soviet Armed Forces designated for theater operations, nuclear and conventional land, sea and air forces— forces geared to fast-paced offensive operations, forces arrayed against the nations of Western Europe.

Chapter V describes the increasing capabilities of the Soviet Strategic Forces, including the SS-17, SS-18, and SS-19 missiles of the ICBM forces, and the continuing modernization of the submarine launched ballistic missile forces.

Chapter VI reports on the Research and Development effort behind the USSR's drive for modern military technology.

Chapter VII reviews the application of Soviet military power today, and Chapter VIII summarizes the challenge posed by the Soviet Armed Forces.

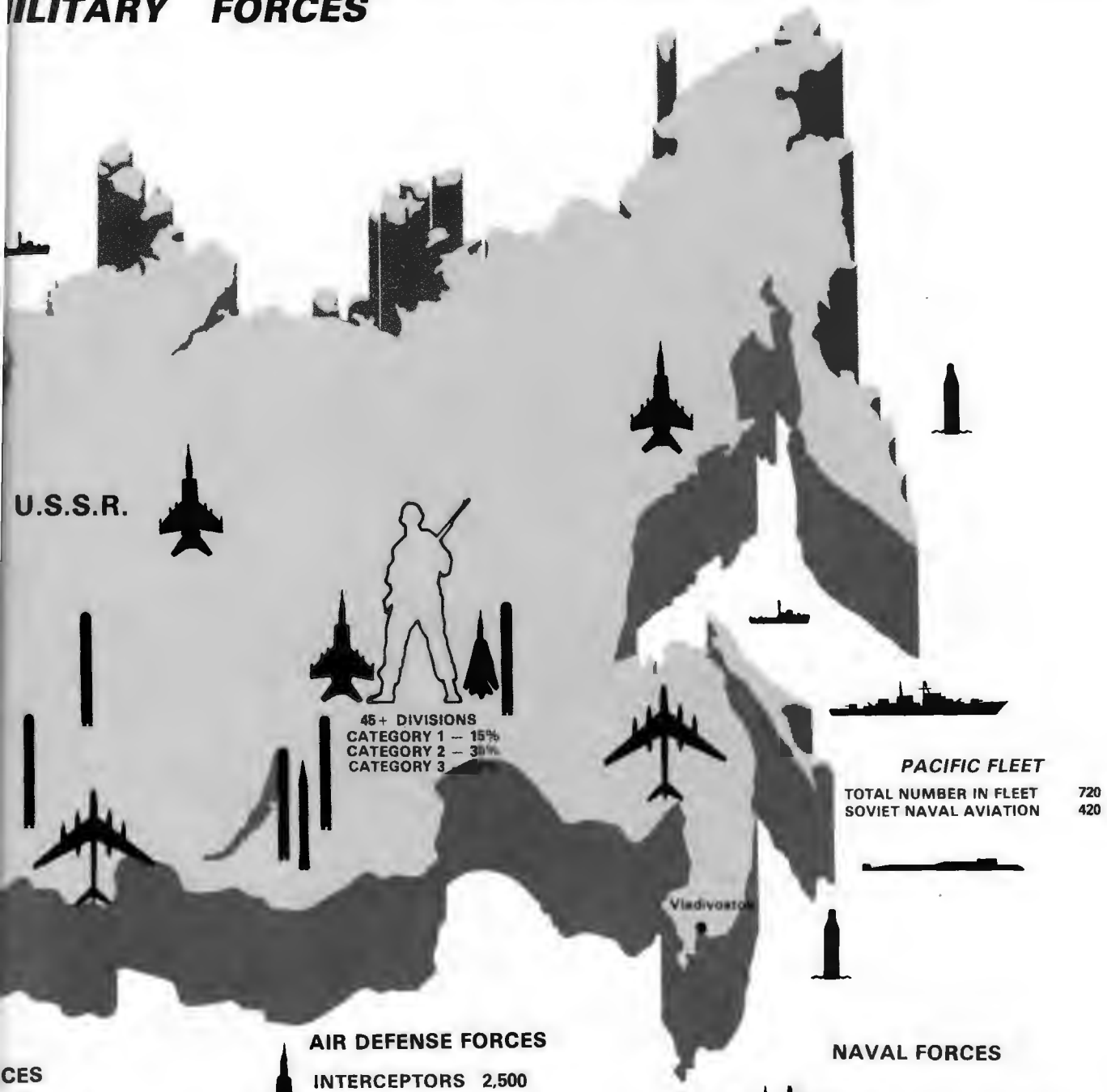
The Tupolev BACKFIRE, swing-wing, turbofan powered bomber capable of carrying free-fall bombs or air-to-surface missiles entered service in the mid-1970s. Thirty new BACKFIRES are being built each year in the continuing expansion and modernization of Soviet military power.


SOVIE
BALTIC FLEET
TOTAL NUMBER IN FLEET 545
SOVIET NAVAL AVIATION 260
NORTHERN FL
TOTAL NUMBER IN FLEE
SOVIET NAVAL AVIATIO
53 NON-SOVIET WARSAW PACT DIVISIONS
CATEGORY 1 — 62%
CATEGORY 2 — 21%
CATEGORY 3 — 17%
Murmansk
Leningrad
30 DIVISIONS
CATEGORY 1 — 100%
EASTERN EUROPE
Moscow
80 DIVISIONS
CATEGORY 1 — 5%
CATEGORY 2 — 20%
CATEGORY 3 — 75%
BLACK SEA FLEET/
CASPIAN FLOTILLA
TOTAL NUMBER IN FLEET 547
SOVIET NAVAL AVIATION 380
25 DIVISIONS
CATEGORY 1 — 20%
CATEGORY 2 — 20%
CATEGORY 3 — 60%
STRATEGIC NUCLEAR FORCES
ICBMs
SS-11 580
SS-13 60
SS-17 150
SS-18 308
SS-19 300
IRBMs/MRBMs
SS-4 320
SS-5 35
SS-20 250+
SLBMs
SS-N-6
SS-N-8
SS-N-18
950+
GROUND FORCES
126+ MOTORIZED RIFLE DIVISIONS
47 TANK DIVISIONS
7 AIRBORNE DIVISIONS
LONG RA
BACKFI
BEAR
FRONT
CATEGORY 1.— COMBAT READY, 75-100% AUTHORIZED WARTIME STRENGTH
CATEGORY 2 — REDUCED STRENGTH, 50-75% AUTHORIZED WARTIME STRENGTH
CATEGORY 3 — CADRE STRENGTH, BELOW 50% AUTHORIZED WARTIME STRENGTH

Division Strength -

U.S.		Soviet	
17,000	Infantry	12,000	Mot Rifle Div
18,000	Armored	9,500	Tank
"	Mech	8,000	Airborne
"	Air Assault		
16,000	airborne		

ILITARY FORCES



PACIFIC FLEET

TOTAL NUMBER IN FLEET	720
SOVIET NAVAL AVIATION	420

CES

ATION 880
ADGER
SON

ATION 4,800

AIR DEFENSE FORCES

INTERCEPTORS 2,500

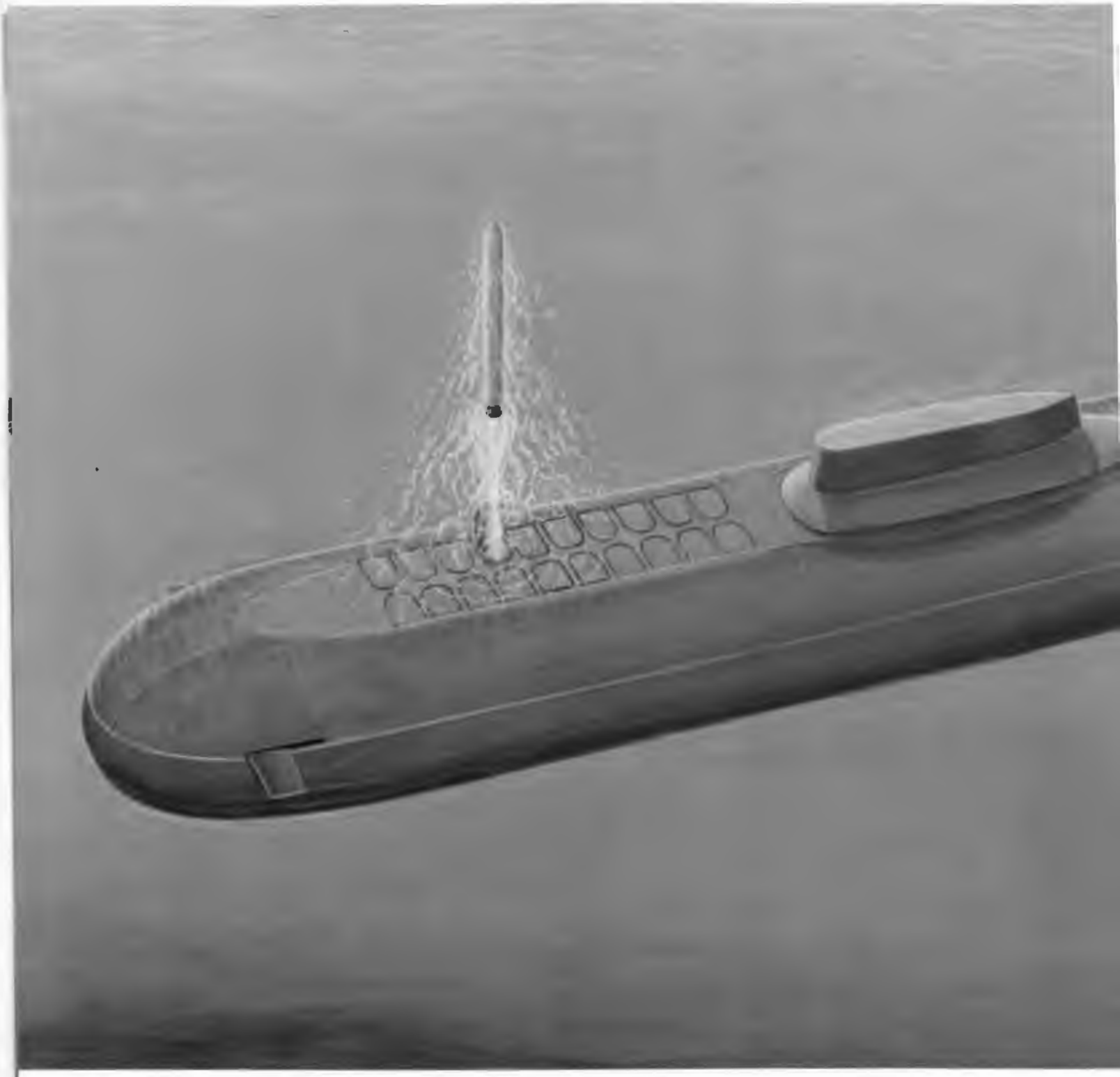
SAM LAUNCHERS 10,000

ABM LAUNCHERS 32

NAVAL FORCES

SURFACE COMBATANTS	1,297
SUBMARINES	377
AUXILIARIES	755
SOVIET NAVAL AVIATION	1,440

II MILITARY RESOURCE



ALLOCATION

In 1980, the first of the Soviets' TYPHOON-Class 25,000-ton strategic ballistic missile submarines was launched from a newly completed construction hall at the Severodvinsk Shipyard on the White Sea. Earlier in the year the same shipyard launched the first of the extremely large OSCAR-Class guided missile nuclear submarines, a submarine capable of firing 24 long-range, antiship cruise missiles while remaining submerged.

In 1980, some 2,400 kilometers southeast of Severodvinsk, the mammoth Nizhniy Tagil Railroad Car and Tank Plant, an industrial facility covering 827,000 square meters of floor-space, manufactured 2,500 T-72 tanks.

To support the continuing growth and modernization of the armed forces, the Soviet Union over the past quarter century has increased military expenditures in real terms, devoting an average of 12-to-14 percent of its Gross National Product each year to the Soviet military. The estimated dollar costs of Soviet military investment exceeded comparable US spending by 70 percent in 1979. The defense sector is the first priority of Soviet industrial production.

The Soviet and non-Soviet Warsaw Pact military industrial base is by far the world's largest in number of facilities and physical size. The Soviet Union alone produces more weapons systems in greater quantities than any other country.

The Soviet military industry has grown steadily and consistently over the past 20-to-25 years. Its physical growth and the commitment of large quantities of financial and human resources is its most dynamic aspect, but its

The TYPHOON 25,000-ton strategic ballistic missile submarine was launched from the Severodvinsk Naval Shipyard in 1980. Severodvinsk, one of five Soviet yards building submarines, has produced seven different classes in the last decade.

cyclical production is its most important. Production plants remain at work. As old weapons programs are phased out, new ones are begun, leaving no down times or long periods of layoffs and inactivity. The cyclical process, the continuing facility growth and the high rates of production keep the arms industry in a high state of readiness to meet any contingency and any demand for new weapons. The military production industry includes 135 major final assembly plants involved in producing weapons as end products. Over 3,500 individual factories and related installations provide support to these final assembly plants.

Major Soviet Manufacturing Areas

1. Strategic and Defensive Missiles
   Missile Engines and Motors
   Major Surface Combatants
2. Strategic Aircraft
   Aircraft Engines
   Major Surface Combatants
3. Armored Vehicles
   Tanks
4. Tactical Aircraft
   Aircraft Engines
   Strategic and Defensive Missiles
   Missile Engines and Motors
5. Major Surface Combatants
   Submarines
   Tanks
   Aircraft Engines
   Missile Engines and Motors
   Defensive Missiles
6. Submarines
   Tactical Aircraft
   Armored Vehicles
7. Major Surface Combatants
   Strategic and Tactical Aircraft
   Aircraft Engines
   Strategic Missiles
   Missile Engines and Motors
   Armored Vehicles
   Artillery, SP Guns and Multiple Rocket Launchers
8. Tactical Aircraft
   Missile Engines and Motors
9. Tactical Aircraft
10. Strategic Aircraft
11. Aircraft Engines
    Strategic Missiles
    Defensive Missiles
    Armored Vehicles
    Artillery, SP Guns and Multiple Rocket Launchers
    Tanks
12. Tactical Aircraft
    Aircraft Engines
    Missile Engines and Motors
    Armored Vehicles
    Tanks
    Artillery, SP Guns and Multiple Rocket Launchers
13. Strategic Missiles
    Tactical Aircraft
14. Major Surface Combatants
    Submarines
    Strategic Missiles
    Tactical Aircraft

Construction at the Severodvinsk Naval Shipyard illustrates the growth of Soviet facilities over time. Over the past decade seven classes of submarines have been produced, and during this time, floor space has increased by several hundred thousand square meters, or approximately three-quarters again the yard's size ten years earlier. The new large construction hall used to assemble the TYPHOON and OSCAR submarines accounted for about 25 percent of this increase. Moreover, Severodvinsk is only one of five Soviet yards producing submarines.

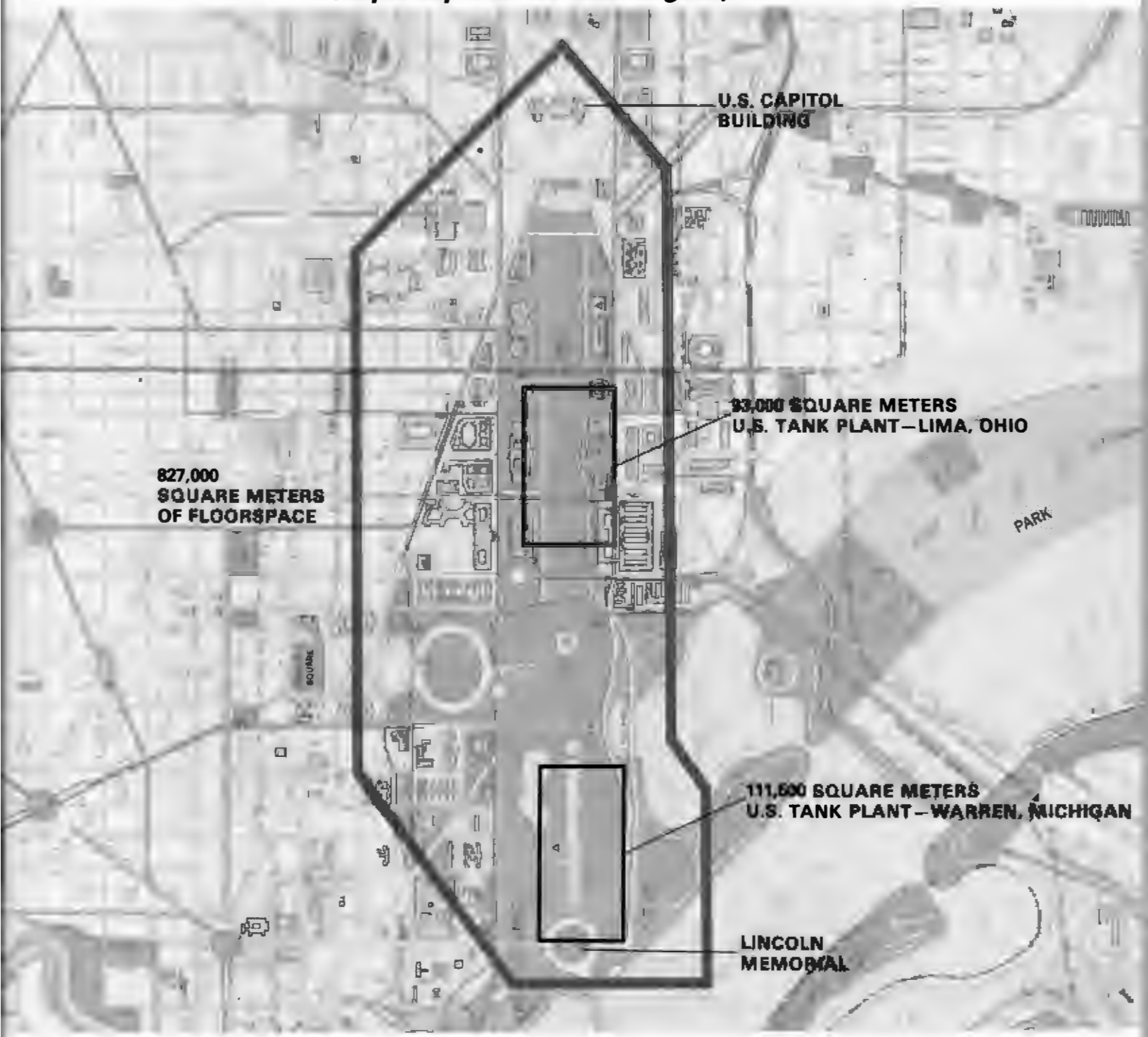
In the aerospace industry, even though there has been significant construction in recent years including a number of new large final assembly buildings at established plants, the Soviets have revealed that they are constructing a wholly new, large aircraft plant at Ulyanovsk. This plant, when completed, will be well-suited for the fabrication and assembly of large aircraft—transports or bombers—underscoring the Soviets' continuing drive to improve further their industrial base. Qualitative improvements in production technology, which typically accompany new and more sophisticated aircraft, have paralleled the physical growth of the industry.

The Army's sector of Soviet military industry is traditionally large to support the growing Ground Forces. Army industrial floorspace has expanded by over ten percent in the late 1970s. All segments of the Army's industrial base have been expanded despite their already massive size. For instance, a major Soviet tank producer which was already nearly five times as large as the US manufacturers, has again been expanded.

The Soviet Union and Warsaw Pact need all of these facilities for the large number of major weapons and support systems currently in production—more than 150 in all.

The following tables show estimates of production by weapon systems type over the past

AREA OF NIZHNIY TAGIL TANK PLANT
(Superimposed on Washington, D.C.)



Production of Ground Forces Materiel
USSR and Non-Soviet Warsaw Pact

	1976		1977		1978		1979		1980	
	USSR	NSWP	USSR	NSWP	USSR	NSWP	USSR	NSWP	USSR	NSWP
Tanks	2500	800	2500	800	2500	800	3000	800	3000	750
T-55	500	800	500	800	500	800	500	800	—	750
T-64	500	—	500	—	500	—	500	—	500	—
T-72	1500	—	1500	—	1500	—	2000	—	2500	—
T-80	—	—	—	—	—	—	Trial Output	—	Trial Output	—
Other Armored Fighting Vehicles	4500	1800	4500	1900	5500	1700	5500	1600	5500	1200
Towed Field Artillery	900	50	1300	50	1500	100	1500	100	1300	100
Self-Propelled Field Artillery	900	—	950	—	650	—	250	50	150	50
Multiple Rocket Launchers	500	250	550	200	550	150	450	150	300	150
Self-Propelled AA Artillery	500	100	500	100	100	50	100	50	100	50
Towed-AA Artillery	500	300	250	250	100	200	—	200	—	150
Infantry Weapons	250,000	140,000	350,000	120,000	450,000	200,000	450,000	115,000	400,000	100,000

five years. A five year period was selected to demonstrate the Soviet ability to sustain high rates of production.

Aircraft Production
USSR

Aircraft Type	1976	1977	1978	1979	1980
Bombers	25	30	30	30	30
Fighters/ Fighter-Bombers	1,200	1,200	1,300	1,300	1,300
Transports	450	400	400	400	350
Trainers	50	50	50	25	225
ASW	5	10	10	10	10
Helicopters	1,400	900	600	700	750
Utility	125	100	100	100	100
Total	3,255	2,690	2,490	2,565	2,765

The most important aspect of aircraft production is the sustained high rates of fighter aircraft production. Helicopter production shows a decline at midpoint, but then a gradual build-up probably indicating a phase-out/phase-in of a new system, or increased orders for helicopters.

Missile Production
USSR

Missile Type	1976	1977	1978	1979	1980
ICBMs	300	300	200	200	200
IRBMs	50	100	100	100	100
SRBMs	100	200	250	300	300
SLCMs	600	600	600	700	700
SLBMs	150	175	225	175	175
ASMs	1,500	1,500	1,500	1,500	1,500
SAMs	40,000	50,000	50,000	50,000	50,000

Missile production shows the wide range of missiles in production. Every class of missiles, from Surface-to-Air to ICBMs, is produced in significant quantities.

Naval ship construction demonstrates the USSR's capability to sustain high rates throughout. Moreover, the number of auxiliary ships produced in Eastern Europe has freed Soviet building ways for other projects.

Naval Ship Construction
USSR

	1976	1977	1978	1979	1980
Submarines	10	13	12	12	11
Major Combatants	12	12	12	11	11
Minor Combatants	58	56	52	48	52
Auxiliaries	4	6	4	7	5

Ground Forces Materiel Production
USSR

	1976	1977	1978	1979	1980
Tanks	2,500	2,500	2,500	3,000	3,000
T-55	500	500	500	500	—
T-64	500	500	500	500	500
T-72	1,500	1,500	1,500	2,000	2,500
T-80				Trial Output	Trial Output
Other Armored Vehicles	4,500	4,500	5,500	5,500	5,500
Self-Propelled Field Artillery	900	950	650	250	150

Soviet Army materiel production shows a jump in the output of tanks and other armored vehicles in 1979 and 1980. The production of self-propelled artillery, however, exhibits a steady decline since 1977. This probably represents the phasing out of production of an old weapon and the introduction of a new one. Such transition is fairly common in Soviet production practices. The evolutionary introduction of new systems continues. Overall, Soviet Ground Forces materiel production has increased over the past five years.

An even greater increase is evident when Soviet Ground Forces materiel production is combined with that of the Warsaw Pact allies.

These weapons systems are produced to equip Soviet and Warsaw Pact forces and for export. In recent years, in addition to being the world's largest producer, the USSR has become the world's largest exporter of major items of military equipment to the Third World.

To provide nuclear weapons for their Armed Forces, the Soviets have an adequate number of plutonium and uranium production facilities to ensure a sufficient quantity of necessary material for those forces, and to ensure the provision of material for other high priority needs as well.

What impact does this massive dedication of resources to military products have on the USSR? The Soviet Union and the countries of the Warsaw Pact have, over the past decade, faced deteriorating economies while at the same time sustaining high levels of military equipment production for an across-the-board force modernization. The Soviets' own economy is in difficulty and facing competing priorities for scarce resources as it begins the 11th Five Year Plan. The problems include food shortages, low labor productivity, transportation disruptions and energy constraints which have all combined to bring industrial growth to a post-1945 low. Externally, the high costs of supporting other communist regimes, also in difficulty, such as Cuba, Vietnam, Afghanistan and Poland have created an additional burden. These difficulties have grown at the end of a decade during which Moscow's policy has been to stress guns over butter. Throughout the 1970s the Soviets have consistently allocated from 12-to-14 percent of Gross National Product to military programs in spite of a marked downward trend in the rate of economic growth. If this trend continues, the percentage allocated to the military will increase. There are no signs of a deemphasis of military programs.

The economic burden of defense spending, as viewed in the West, is viewed differently in the Soviet Union. To the Soviets, defense spending is a necessity and a priority above all else. Productivity might continue to decline and the Soviets might have to face a negative growth rate, but the system of fostering massive military industrial production will continue.

III ORGANIZATION OF

OVIET ARMED FORCES

Marshal of the Soviet Union and Warsaw Pact Commander-in-Chief Kulikov has written that the traumatic experience of World War II has taught the Soviets the necessity of having a fully operational strategic command structure in being prior to the onset of hostilities. To this end, the Soviets have created a wartime management structure which provides a unified system of command capable of exerting centralized direction, but designed to permit decentralization of functions to lower levels as necessary.

Immediate control of the Soviet land, sea and air forces is exercised by the Minister of Defense. Within the Soviet Government, the Minister of Defense is a member of the Council of Ministers, appointed by and technically answerable to the Supreme Soviet or to its Presidium. In practice he is responsible to the Central Committee of the Communist Party of the Soviet Union (CPSU) and its Politburo. The current Minister of Defense, Marshal of the Soviet Union Ustinov, is a member of the Politburo, as was his predecessor. The Defense Council, a subset of the Politburo chaired by the General Secretary of the CPSU, in effect functions as the controlling authority. In 1976, General Secretary Leonid Brezhnev was awarded the highest military rank, that of Marshal of the Soviet Union, possibly indicating that ultimate operational—as well as policymaking—control of the Soviet Union's Armed Forces was being vested in the Defense Council.

The combined arms army, the basic Soviet field army, includes four motorized rifle divisions, a tank division, an artillery brigade, missile units, frontal air support, and intelligence, chemical, engineer and signal units. There are more than 180 divisions in the Soviet Armed Forces today.

The key point to understand about the Soviet military control structure is that the reins of the instruments of state policy and power—not just the purely military—are in the hands of a tested political leadership supported by very experienced and long-established staffs. President Brezhnev and his key colleagues have been at the center of power for decades. Ustinov has guided the Soviet armaments industry since the early 1940s and has proven to be an able and decisive leader. These men, aided by such others as KGB Chief Andropov, Premier Tikhonov, Foreign Minister Gromyko, the ageless ideologue Suslov, Chief of General Staff Ogarkov, Warsaw Pact Commander Kulikov and lesser but equally experienced subchiefs of the military and industry, know how the Soviet military machine runs and what they want to achieve. They are able to marshal all available Soviet resources toward their strategic objective. They exercise absolute control of all instruments of Soviet power.

At the apex of the Soviet wartime strategic command structure is the State Defense Committee or GKO. The Defense Committee serves to unify the highest military and civilian leadership to insure centralized political direction of the entire war effort. This committee appears to consist of the permanent members of the peacetime Defense Council. Just as in World War II, the Defense Committee and its subordinate managerial entities would play a critical role in wartime economic mobilization and in overseeing sustained wartime production. Beneath the Defense Committee and its component elements is the vast ministerial structure of the Soviet government.

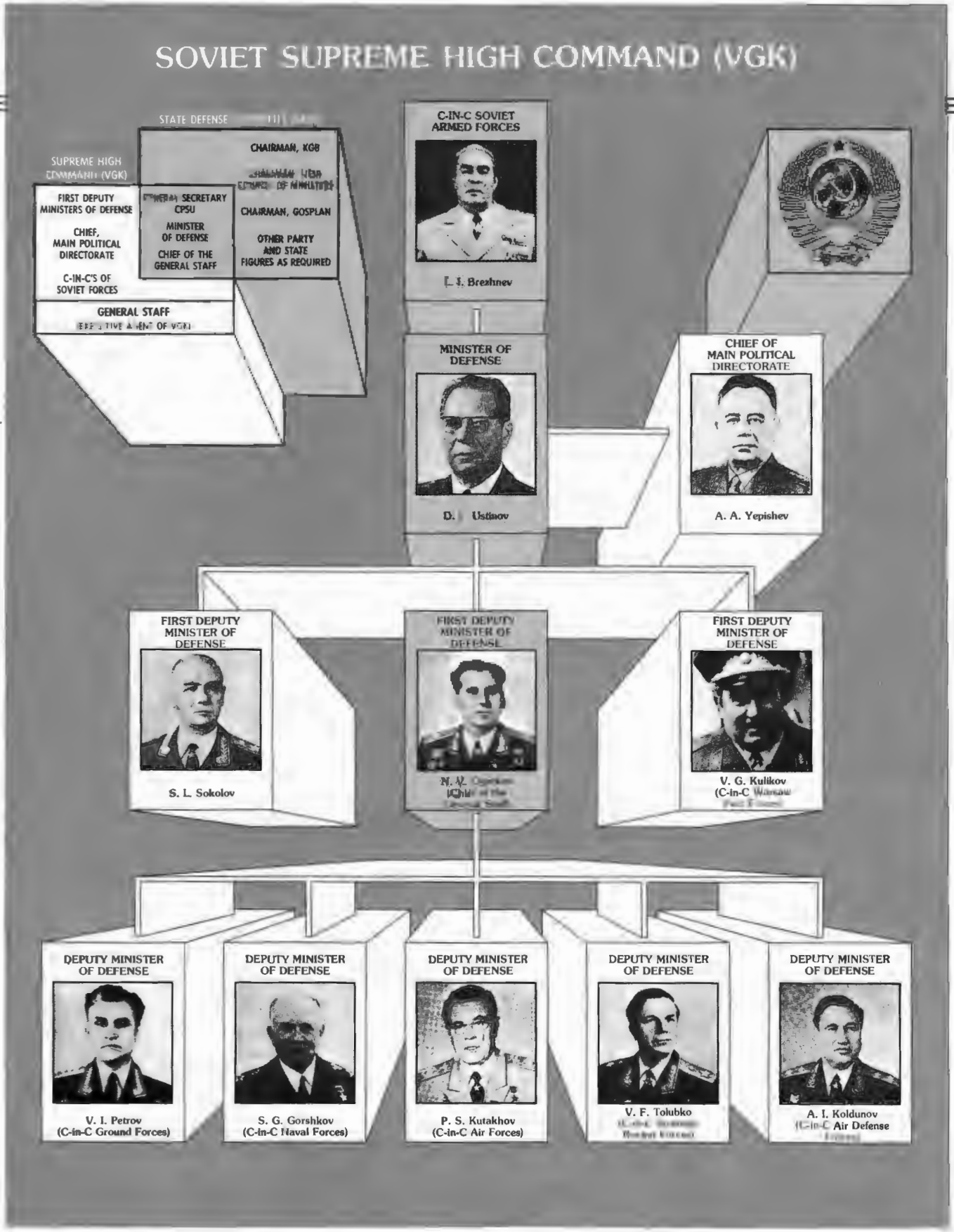
Under the guidance of the Defense Committee, a Supreme High Command (VGK) would serve as the highest organization of strategic military leadership. The Supreme High Command apparently includes the CPSU General Secretary, the Minister of Defense, the first Deputy Ministers of Defense, the Chief of the Main Political Directorate, and the Commanders in Chief of each of the five services. The contribution of the General Staff, serving as an executive agent for the VGK, would be to insure the development and execution of a unified military strategy for the operational commands.

In order to simplify the planning for war, the Soviets have divided the world into 13 Theaters of Military Operations, or TVDs. The Theater of Military Operations is a geographical concept used to denote an area within which their armed forces would function in wartime. There appear to be possibly five continental TVDs, four maritime or naval TVDs, and four intercontinental TVDs.

Recognizing that the Soviet Supreme High Command would find it difficult to exercise the direction of multi-theater operations without an intermediate command echelon, the Soviets have apparently established intermediate-level high commands. This Soviet conceptual frame-

Soviet Military Districts and Groups of Forces

1. Group of Soviet Forces, Germany
2. Central Group of Forces
3. Northern Group of Forces
4. Southern Group of Forces
5. Baltic
6. Leningrad
7. Ural
8. Siberian
9. Transbaykal
10. Far East
11. Carpathian
12. Belorussian
13. Moscow
14. Odessa
15. Kiev
16. Volga
17. North Caucasus
18. Transcaucasus
19. Central Asia
20. Turkestan


SOVIET SUPREME HIGH COMMAND (VGK)
STATE DEFENSE
CHAIRMAN, KGB
SUPREME HIGH
FIRST DEPUTY
MINISTERS OF DEFENSE
CHIEF,
MAIN POLITICAL
DIRECTORATE
C-IN-C'S OF
SOVIET FORCES
SECRETARY
CPSU
MINISTER
OF DEFENSE
CHIEF OF THE
GENERAL STAFF
CHAIRMAN, GOSPLAN
OTHER PARTY
AND STATE
FIGURES AS REQUIRED
GENERAL STAFF
C-IN-C SOVIET
ARMED FORCES
L. I. Brezhnev
MINISTER OF
DEFENSE
D. Ustinov
CHIEF OF
MAIN POLITICAL
DIRECTORATE
A. A. Yepishev
FIRST DEPUTY
MINISTER OF
DEFENSE
S. L. Sokolov
FIRST DEPUTY
MINISTER OF
DEFENSE
FIRST DEPUTY
MINISTER OF
DEFENSE
V. G. Kulikov
(C-in-C
DEPUTY MINISTER
OF DEFENSE
V. I. Petrov
(C-in-C Ground Forces)
DEPUTY MINISTER
OF DEFENSE
S. G. Gorshkov
(C-in-C Naval Forces)
DEPUTY MINISTER
OF DEFENSE
P. S. Kutakhov
(C-in-C Air Forces)
DEPUTY MINISTER
OF DEFENSE
V. F. Tolubko
DEPUTY MINISTER
OF DEFENSE
A. I. Koldunov
(C-in-C Air Defense

work for intermediate-level strategic leadership is intended to accommodate centralized strategic planning with decentralized battle management.

The Theaters of Military Operations not only include the terrain upon which the *Fronts* would conduct their operations, but include those Military Districts that would support such operations. Thus, while forces may depart a Military District as battlefield operations progress, the Military District structure would be retained to serve as a principal wartime administrative entity.

The Soviets have carefully thought out and continue to develop the details of the system of strategic leadership. The system required for war fighting and war survival is now in place. Central to this system is the establishment of the means to ensure the survival of state control. The Soviets have, for years, been building an infrastructure of facilities and procedures which is geared to the survival of the means of control for the Communist Party of the Soviet Union during even the worst of conflict situations—a nuclear war. Alternative locations have been established for virtually the entire structure of the Soviet leadership—political, military, security and industrial—from the highest to the lowest levels. Many of these are bunkered facilities and certain levels of leadership are provided with mobile equipment as well.

COMMAND AND CONTROL

Utilizing the General Staff of the Ministry of Defense as its agent, the Soviet Defense Committee controls its military commands. To achieve this goal the Soviets have developed extensive and modern command, control and communications (C^3) systems. Soviet doctrine emphasizes centralized control, survivability, redundancy and flexibility within the system.

Survivability is achieved through dispersal, redundancy, hardness, concealment and mobility. Survivability is also enhanced by airborne command posts, which can be deployed to different locations to serve as alternate communications hubs in the event of war, hedging against the destruction of groundbase facilities.

Redundancy includes multiple command centers to assure continuity of the control of armed forces, and a wide variety of communications means and modes. Redundancy of Soviet C^3 facilities is also achieved through the establishment of main and alternate command posts.

In the Soviet Union, the strategic command and control system maintains contact with widespread civil and military authorities. The system includes extensive networks of cable and open-wire lines, radio-relay links, radio-communications stations, and communications satellites. Modern Soviet telecommunications engineering concepts stress the flexibility, survivability and reliability of the system to meet national military command and control requirements for continuous telecommunications operations. The major national telecommunications complex is known as the unified communications system. In the event of war, the entire system could be readily converted into a nationwide military communications network.

Automation of Soviet command and control is evolving. The Soviet Air Defense Forces and the Moscow antiballistic missile system employ automation most extensively. The major strength of the Soviet/Warsaw Pact automation program is that systems are being developed specifically for military requirements rather than adapting other systems to military use.

Soviet satellites provide communications support to military, diplomatic, intelligence, and civilian organizations. The predominant communications satellite used in support of military command and control has been the MOLNIYA

I system. Since the mid-1960s, when the first MOLNIYA I was launched, the Soviet Union has continued to improve its communications satellite program. The Soviet Union has launched the improved MOLNIYA II and MOLNIYA III systems which can be used for military command and control. The MOLNIYA I and II military ground sites are deployed at major headquarters throughout the Soviet Union, and stations are beginning to be deployed in Eastern Europe.

The Soviets are maintaining vigorous research and development programs to upgrade their C^3 systems emphasizing the use of cable as the primary means of communication when practicable, and increasing use of satellite and point-to-point systems operating in a number of frequency ranges.

The Soviets can be expected to increase their use of automated systems which will increase their data handling capabilities as well as increase reaction times. As in the past, Soviet command and control systems will continue to employ redundancy, hardness and mobility to enhance survivability.

LOGISTIC SUPPORT OF THE SOVIET ARMED FORCES

The Deputy Defense Minister who is Chief of the Rear of the Soviet Armed Forces (NTVS) has management responsibility for the overall system of rear service support to the armed forces.

The Deputy Minister and his staff are located at Ministry of Defense Headquarters in Moscow. The first deputy to the NTVS serves as Chief of the Main Staff of the Rear, which plays a key role in the logistic establishment. From the Ministry headquarters, the Staff administers the fuel, food, clothing, military trade and technical supply organizations, the military medical and veterinary organizations, and other directorates and departments. This centralized system also includes a large number of Rear Services brigades, regiments and battalions as well as installations, bases, depots, arsenals, repair plants and other support assets for all armed forces components. All aspects of the movement of military supplies received from the national economy are managed by the Rear Services staff. In this management capacity, the Rear Services staff coordinates the activities of the deputy commanders for Rear Services of each of the branches as well as at the Military District, groups of forces and tactical levels.

Soviet wartime logistic planning is carried on at three general levels: strategic, operational and tactical. The NTVS is the principal controller of the numerous and diverse logistic organizations and assets comprising what Soviet planners call the "central Rear Services." There is a Rear Services counterpart at each subordinate echelon down to regiment. This officer, who is designated a deputy commander as well as the Chief of the Rear, is directly subordinate to his unit or formation commander, and in addition carries out the policies and guidelines of Rear Service representatives at higher levels.

The entire Rear Services establishment is designed to support military operations of all the Armed Forces with consumable supplies, weapon system stocks, maintenance assets, transportation resources, local security and a variety of logistic services deemed integral to the successful conduct of combat operations. In wartime, central logistic units, resources and command/control entities, in addition to serving as a USSR-based resource pool, may be moved into Theaters of Military Operations directly to support operational formations and organize the use of theater resources. Military command post complexes are present at all tactical and operational echelons.

The Soviets, and their Warsaw Pact military allies, conceived a system for automating Pact

Rear Service command and control in the early 1960s. Variations of this system have been field tested over the last decade. The system is designed principally to enable the Chief of the Rear at operational/strategic levels rapidly to evaluate his resources and assets in light of an envisioned operation; to formulate a Rear Service plan which optimally supports the commander's concept of operations; and to respond to the support requirements generated by rapidly changing battlefield situations.

Today, in the European Theater, for example, the Rear Services of the Soviet Armed Forces already have in place vast stocks of all the logistic supplies—from fuel, to ammunition, to weapon systems stocks—required for sustained combat.

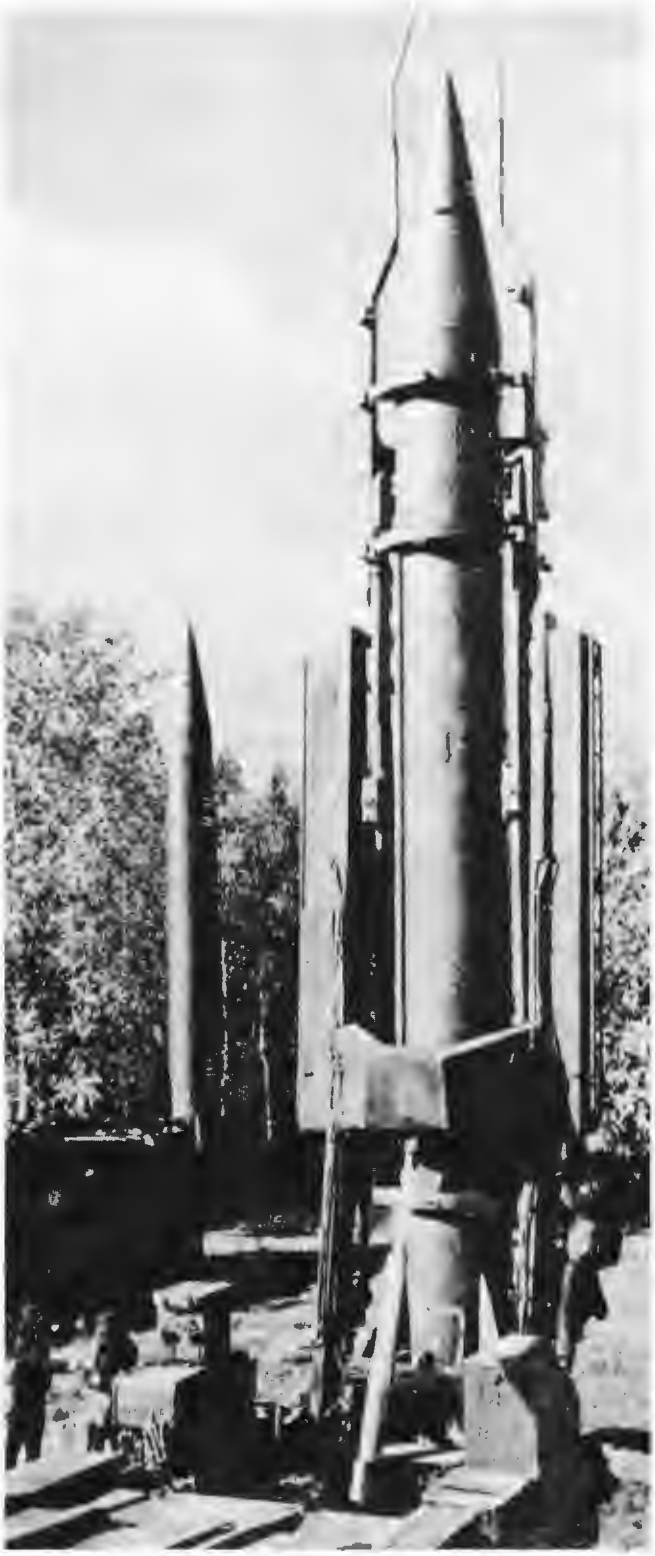
COMBINED ARMS WARFARE

At the heart of Soviet combat doctrine is the concept of combined arms operations. To the Soviets, combined arms operations are more than the joint use of weapon systems and forces. The concept involves the bringing to bear of all systems and forces as needed in a unified and effective manner.

The Soviet Union's concept of combined arms operations, particularly at *Front* or theater levels, is much broader and more structured organizationally than the Western combined arms concept envisioning the joint and cooperative employment of ground, air and, if applicable, naval forces to achieve an objective. The operational definitions as provided by the Soviets in their combat doctrine permit a fuller understanding of the combined arms warfare concept.

- The Combined Arms Battle is a battle fought by a combined arms formation or unit together with attached formations or units of other service branches and aviation; and in maritime sectors, with naval forces as well. The use of nuclear weapons and the participation of the various service branches or forces, in conjunction with the great mobility of the troops, impart an especially decisive and maneuver-oriented character to combined arms battle.
- The Combined Arms Commander is the sole commander of a combined arms formation, unit, or subunit. He organizes the combined arms combat of the forces subordinated to him, and leads them in battle. He makes the decision to engage the enemy, assigns combat missions to subunits, coordinates the actions of his own combined armed troops with those of neighboring troops, and directs his staff, and the commanders of the service branches and Services.
- The Combined Arms Staff is the staff of a major field force or of a formation or unit which includes formations, units or subunits of various service branches. The combined arms staff ensures coordination between the staffs of the subordinated and cooperating troops, and those of the service branches, special troops, services and rear. The combined arms staff takes all measures necessary to ensure the comprehensive preparation of the troops for their combat missions, and to ensure constant command and control of the troops during the course of battle (or operation).

At the *Front* level the Soviets are organized to control and employ coordinated ground, air, missile, air defense and, if appropriate, naval formations. The combined military power of all weapon systems is applied in a fully integrated plan. To insure the control of activities, the *Front* has a combined arms commander who is responsible for carrying out missions approved



Combined Arms Warfare, at the heart of Soviet combat doctrine, brings units from the different services, such as the tank, infantry, self-propelled artillery and missile units shown here, under one Combined Arms Commander.

by the General Staff Plan. It is his responsibility to oversee and coordinate the operations of his subordinate units and the commanders of the other services subordinated under his command. If the *Front* is operating near or in a maritime sector, naval forces will be under his command. As stated in the definition, he must also coordinate his activities with neighboring troops, most probably another *Front*.

The *Front* is the largest field formation in wartime. It is a tactical and administrative unit with size and composition subject to considerable variation depending upon the situation. A *Front* could be composed of three-to-five combined arms armies, one or two tank armies, plus aviation, air assault, diversionary, artillery, missile, air defense, engineer, signal, intelligence, reconnaissance and rear service units.

A combined arms army might include three or four motorized rifle divisions and a tank division, plus artillery, missile, air defense, engineer, chemical defense, signal, intelligence, reconnaissance and rear service units.

The role of the tank army, a heavily armored force of tanks and motorized rifle troops, is to rupture and penetrate enemy defenses and to exploit breakthroughs deep into the enemy's rear areas. This army is a tactical and administrative unit capable of independent operations, although its normal employment, like that of the combined arms army, is as a component of a *Front*. The size of the army and its force composition are dependent upon the mission, the situation and the area of operations. There are three different types of maneuver divisions in the field forces: motorized rifle, tank, and airborne. The motorized rifle and tank divisions are the major combat and maneuver elements of the ground combat forces. Divisions are organized on a triangular basis. The motorized rifle division has three motorized rifle regiments, one tank regiment, one artillery

Armored Command Vehicle

Mi-24/HIND A Assault Helicopter

regiment, one air defense regiment and other support elements. The tank division forms around three tank regiments, one motorized rifle regiment, one artillery regiment, one air defense regiment and other support elements. Three airborne rifle regiments are the nucleus of the airborne division.

As few as one *Front* and as many as five may exist in a Theater of Military Operations (TVD). A High Command of Forces in a TVD is commanded by at least a three star general who is directly responsible to the Soviet General Staff. The commander is supported by a combined arms staff with the responsibility for overseeing and coordinating the activities of the various strategic formations. At the theater level the commander insures that the plans of the General Staff for his forces in the theater are carried out.

The General Staff controls the operations of the five services, while individual service chiefs are responsible for the training and support of troops, the development of tactics and the acquisition of weapons systems for their respective services. The services function under the General Staff to assure the mutual supportiveness of their training, tactics, and weapons acquisitions. In a wartime situation, the same system would apply, but the General Staff would operate as the executive agent of the national leadership and would adopt plans for control of the forces. The Soviets have organizationally structured their forces to form a unified command structure under the General Staff. This provides the Soviets with the command structure to apply the totality of their military power in warfare so that the whole of the operation is greater than the sum of its parts.

IV SOVIET THEATER FO

RCES

Over the past 15 years the Soviets have steadily expanded and upgraded their military forces designated for theater operations with particular attention directed toward the European theater. During this period, the Soviet objective for this modernization has been the conversion of the Red Army from a balanced offensive-defensive force to one geared to fast-paced offensive operations. A key aim appears to have been the provision in peacetime of a standing Army at the leading edge of the potential battlefield such that it could begin operations with minimal mobilization and, thereby, with little warning.

The forces are highly mobile, and they are organized and supplied for a rapid initial push from a peacetime posture. At the outset of a war, the Soviets plan to move quickly slicing through NATO forces in the Central Region and driving to the English Channel, while concurrently securing the northern and southern flanks. During the initial operations, necessary additional forces would be mobilized and moved to the battlefield. All of this the Soviets aim to accomplish before the full weight of NATO reinforcements could be brought to bear. The Soviets have given priority attention to all elements of their Armed Forces with a role to play in the sweep across Europe. Modernization and upgrading is underway in each of the following elements of Soviet Theater Forces:

Long Range Missile and Air Forces
Ground Forces
Frontal Aviation
Military Transport Aviation
Special Purpose Forces
Navy

Soviet theater nuclear forces are being deployed in increasing numbers against Western Europe and Asia. Some 250 SS-20 mobile, MIRVed nuclear warhead, Intermediate Range Ballistic Missiles have been deployed. Three warheads per missile greatly increase Soviet firepower; mobility increases survivability.

LONG-RANGE THEATER MISSILES

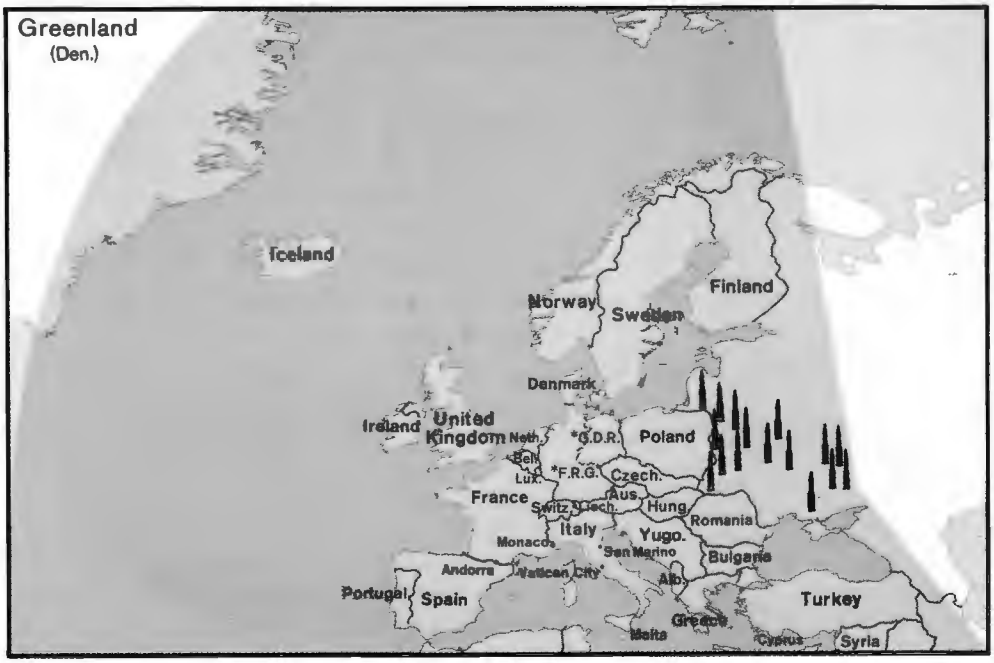
Since the advent of the nuclear-tipped ballistic missile, the Soviets have dedicated significant numbers of nuclear, land-based missiles to theater warfare missions. No theater has been neglected, but the European theater has always commanded the greatest attention. The first medium-range ballistic missiles (MRBMs—1,000-to-3,000 kilometers) were fielded in the late 1950s, followed by improved MRBMs and new intermediate-range ballistic missiles (IRBMs—3,000-to-5,000 kilometers) in the early 1960s.

Soviet MRBM/IRBM Characteristics

	Warhead	*Range*	*Propellant*	*Mobility*
MRBM				
SS-4 SANDAL	*1*	*2,000*	*Liquid*	*Fixed*
IRBM				
SS-5 SKEAN	*1*	*4,100*	*Liquid*	*Fixed*
SS-20	*3*	*5,000*	*Solid*	*Mobile*

More than 700 fixed launchers for these systems—the SS-3 and SS-4 MRBMs and the SS-5 IRBM—were operational at peak deployment in the mid-1960s. All but approximately 100 were directed at targets in or related to the European theater. The remainder were directed against the Middle East, South Asia and the Western Pacific littoral. China was not then a target. In the late 1960s, the Soviets began to draw down these, by then, obsolescent missiles, replacing them with ICBMs and adding coverage of the new enemy—China.

This situation remained unchanged until 1977 when the SS-20 IRBM first reached operational status. Previously, the theater-dedicated strategic nuclear missiles were based at fixed, vulnerable sites, and each missile carried only one warhead—although provisions for force reconstitution and refire were made. The SS-20 eliminated most of these weaknesses. Its launchers are highly mobile, and each SS-20 is fitted with three, very accurate and independently targetable (MIRVed) warheads. Moreover,

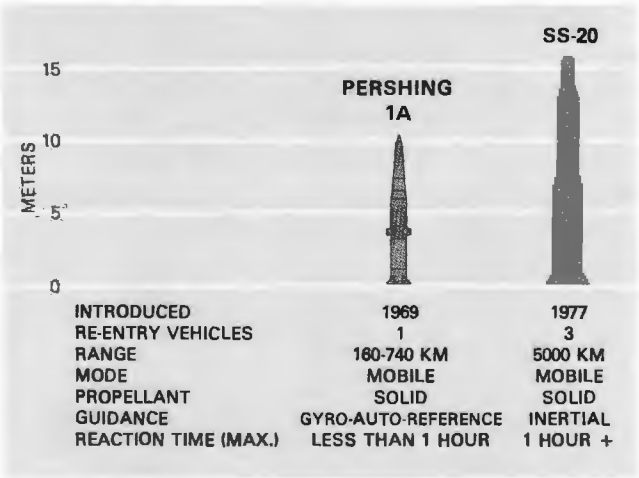


As the number of SS-20 missile launch sites in the Western USSR continues to grow, the Soviets intensify their tactical nuclear strike capability specifically targeted against Western Europe—SS-20 range and coverage extend beyond the shaded area.

Soviet Medium and Intermediate Range Ballistic Missiles

each SS-20 unit is equipped with refire missiles—one per launcher—and each refire missile is fitted with three warheads. Thus the firepower of the theater strategic nuclear missile forces is being greatly multiplied, even though the Soviets are withdrawing older SS-4s and SS-5s from the forces as the SS-20s are deployed.

As of July 1981, some 250 SS-20 launcher/missile sets equipped with a total of 750 nuclear warheads had been deployed. Of these, 175 with 525 warheads are deployed opposite the NATO countries. There is no sign that the deployment is slackening. Since January 1981, the pace of SS-20 base construction has increased, particularly opposite the NATO nations. At bases known to be under construction, another 65 launchers with some 195 warheads will be deployed. Perhaps as many as 100-to-150 additional launchers—300-to-450 warheads—could be fielded before the deployment program reaches its conclusion. While this modern nuclear force will continue to exhibit the full coverage of theater targets around the Soviet Union's periphery, it will be concentrated primarily against the European theater.



	PERSHING 1A	SS-20
INTRODUCED	1969	1977
RE-ENTRY VEHICLES	1	3
RANGE	160-740 KM	5000 KM
MODE	MOBILE	MOBILE
PROPELLANT	SOLID	SOLID
GUIDANCE	GYRO-AUTO-REFERENCE	INERTIAL
REACTION TIME (MAX.)	LESS THAN 1 HOUR	1 HOUR +

Characteristics of Primary US & Soviet Theater Missiles

THE SOVIET GROUND FORCES

The Ground Forces, with a strength of 1,825,000, constitute the largest of the five major components of the Soviet Armed Forces. Traditionally, Imperial Russian and Soviet armies have been characterized by great numbers. Today, the Ground Forces are highly modernized and well equipped, possessing great firepower and mobility. Manpower and materiel combine to make the present Soviet Ground Forces the most powerful land army in the world.

Soviet leaders view an upgrading of the Soviet Ground Forces, in concert with an expanded Navy and improved strategic air transport capabilities, as adding a desirable flexibility to the exercise of Soviet military power on a global basis. The addition of some 30 divisions since about 1967 also reflects the Soviet view that war without resort to nuclear weapons, or at least without resort to strategic nuclear exchange, may be possible. To achieve these aims Soviet doctrine calls for clear-cut superiority at the outset of a conflict. Increased availability of helicopters, armored vehicles, amphibious vehicles, self-propelled artillery weapons and surface-launched guided missiles has provided the Ground Forces with unprecedented flexibility, mobility and firepower.

Strength and Disposition: The Soviet Ground Forces currently contain more than 180 divisions at various stages of combat readiness. Of this total, 71 percent are motorized rifle divisions, 25 percent are tank divisions and four percent are airborne divisions.

These divisions are disposed as follows:

79 percent of the total are stationed inside the Soviet Union.

16 percent are stationed in Eastern Europe (East Germany, Poland, Czechoslovakia, and Hungary).

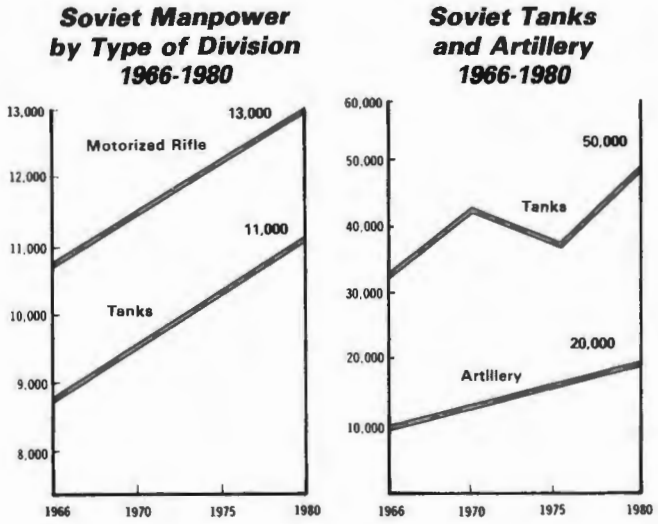
3 percent are stationed in Mongolia.

2 percent are engaged in combat operations in Afghanistan.

There are four basic deployment groupings: against NATO, against China, against the Middle East, and a strategic reserve. The largest, best-equipped and most combat ready of these is the Ground Forces group deployed against NATO.

Modernization Program: The following graphs show the changes in manpower by type of division and the changes in the number of deployed tanks and artillery since 1966. Increases in personnel to 11,000 men in a tank division and almost 13,000 men in a motorized rifle division have resulted in an increase in the number of tanks and mobile combat vehicles per division.

Since the mid-1960s, the Soviets have engaged in a program of modernizing and upgrading ground forces to ensure a capability for carrying out offensive doctrine. Comprehensive in scope, this program has involved large-scale improvements in mobility, fire power, shock action, command and control, obstacle crossing capability, air defense, electronic warfare and logistical support. New and advanced equipment has been introduced. Highlights of this program, which has resulted in formidable and increasingly capable ground forces that now face NATO Europe and other areas contiguous to the USSR, include:



- Deployment of T-64 tanks in the Group of Soviet Forces, Germany (GSFG); fielding of T-72 tanks into Soviet units in the Western Military Districts; introduction of small numbers of T-72s in most non-Soviet Warsaw Pact armies; and continued development of a new tank, designated the T-80.
- Expansion of both division and non-division artillery units and some replacement of older, towed guns by self-propelled 122- and 152-mm weapons.
- Upgrading tactical capabilities by deployment of nuclear-capable heavy artillery brigades equipped with 203-mm howitzers and 240-mm mortars, and the introduction of the more accurate, longer-range and more mobile SS-21 and SS-X-23 tactical surface-to-surface missiles (SSMs) in ground forces as replacements for older FROGs and SCUDs.
- Replacement of the 900 kilometer SS-12/SCALEBOARD tactical missile with the more accurate SS-22.
- Replacement of older air defense gun

systems by a new family of surface-to-air missiles, some of which could have capabilities against enemy tactical ballistic missiles.

- Introduction of advanced radio systems and communications satellite equipment, airborne command posts and the gradual development of automated systems to enhance command, control and communications.
- Introduction of infantry combat vehicles into Soviet motorized rifle units, and the use of airborne assault vehicles and newly identified variants in airborne units.
- Introduction of Air Assault Brigades at the *Front* level.

Each of these deployments increases the Ground Forces' capability to launch a rapid thrust through Europe, the central theme of Soviet military thought.

122mm Self-Propelled Howitzer

152mm Self-Propelled Howitzer

T-64A Main Battle Tank

T-72 Main Battle Tank

The evolution of Soviet tanks illustrates the extent of Soviet Ground Forces modernization. Beginning in the late 1960s, the Soviets fielded the first and most sophisticated of their modern family of main battle tanks, the T-64A incorporating a number of unique and innovative features including:

- A 125-mm smoothbore gun and an automatic loader which allows reduction in crew size from four to three.
- Unconventional frontal armor and the inclusion of movable armored plates along the side of the hull.
- A compact, turbocharged diesel engine with a high horsepower-to-ton ratio.

The T-64A began deployment to the Group of Soviet Forces, Germany in 1976, and, since 1980, has been deployed to the Southern Group of Forces in Hungary.

The T-72, a high production tank complementary to the T-64A, entered operation in the

Main Battle Tanks

	T-54/55	T-62	T-64	T-72
				
WEIGHT (TONS)	36	37	35	41
SPEED (KM/HR)	50	50	50	60
MAIN ARMAMENT	100mm TANK GUN	115mm SMOOTHBORE	125mm SMOOTHBORE	125mm SMOOTHBORE
MUZZLE VELOCITY (MPS)	1,400	1,600	1,750	1,750

mid 1970s. This tank incorporates many of the features of the T-64A such as the 125-mm smoothbore gun and automatic loader and unconventional armor in the form of layered or laminate armor in the upper hull.

The direct fire range for the 125-mm gun is 2,000 meters firing the kinetic energy round. This means that at all ranges out to 2,000 meters, the gunner merely places a crosshair on the target and fires. In the 125-mm gun the automatic loader allows a rate of fire up to eight rounds per minute. For mobility, the 41 metric ton T-72 is powered by a 780 horsepower diesel which allows a top road speed of 60 kilometers per hour, and a cross country trail speed of up to 45 kilometers per hour.

While the T-64A and T-72 are formidable systems, the Soviets are nearing production of an even newer tank, the T-80.

Simultaneously with modernization activities, Soviet ground divisions also are undergoing a personnel and equipment expansion program. Major aspects involve the addition of an artillery battalion to the tank regiments of tank and motorized rifle divisions; expansion of the motorized rifle company to a battalion within tank regiments of tank divisions; and the addition of medium tanks to the reconnaissance battalions of both types of divisions. The expansion program has included the Group of Soviet Forces, Germany.

TACTICAL NUCLEAR WEAPONS

The Soviets have deployed large numbers of tactical nuclear delivery systems, and we believe they have stockpiled reloads for these systems. The Soviets rely on dual-capable systems for most of their shorter-range theater nuclear delivery capability and have adapted some of their 203-mm and 240-mm artillery pieces deployed in the USSR to fire nuclear projectiles. Towed 203-mm and 240-mm weapons are being re-

FROG Tactical Nuclear Surface-to-Surface Missile

placed with self-propelled models. Their medium-range launchers are capable of firing nuclear, conventional, or chemical munitions, and consist of the FROG (and its SS-21 replacement), the SCUD B (and its SS-X-23 replacement), and the SS-12/SCALEBOARD (and its SS-22 replacement). An increase in the number of nuclear-capable systems combined with modernization of these systems give the Warsaw Pact improved nuclear options. A *Front* normally has tactical rockets, such as the free-rocket-over-ground (FROG), and operational-tactical missiles (SCUDs) to complement nuclear-capable artillery, aviation and other longer-range missiles.

The follow-on to the FROG, the SS-21, has improved accuracy and range. Initial operational capability for the SS-21 was attained in 1976; however, only a few have been deployed.

Until recently, the West relied extensively upon the qualitative superiority of its forces to offset the numerical superiority of the USSR and its allies. That margin of quality is rapidly diminishing in the face of a massive Soviet effort to modernize its forces and those of its Warsaw Pact allies. Modern tanks, armored fighting vehicles, artillery, rocket launchers, antiaircraft artillery, surface-to-air and surface-to-surface missiles, and other weapons now being fielded in large quantities are the direct result of an intensive, multi-year Soviet investment program. This program is expected to continue in spite of predicted Soviet economic problems. The Soviet advantage in tanks, presently about three to one in the European theater alone, will grow throughout the decade.

THEATER BOMBERS

BADGER, BLINDER and BACKFIRE aircraft assigned to both Soviet Long Range Aviation and Soviet Naval Aviation could be used to carry out missions covering all of NATO Europe. While the BEAR and BISON bombers also could perform theater roles, they are reserved primarily for intercontinental strike missions. The most notable feature of the theater bomber force is its age: fully three quarters of the aircraft are over ten years old, and only the BACKFIRE remains in production.

These medium bombers have a primary land attack role, intended for either a nuclear or a conventional war scenario. In their nuclear use, the bombers would complement strikes by the Soviets' medium and intermediate range ballistic missiles. The primary objective in either case would be to free the Strategic Rocket Forces to concentrate on highest priority, time-urgent NATO targets.

FRONTAL AVIATION

The Soviet Air Force is separated into three distinct air arms to include: Long Range Aviation, Frontal or Tactical Aviation and Military Transport Aviation.

Frontal Aviation is the largest component of the Soviet Air Force and is organized into Tactical Air Armies consisting generally of fighter, fighter-bombers, transports, helicopters and reconnaissance units as well as miscellaneous support units. Tactical Air Armies are located

in 12 Soviet Military Districts and with the Groups of Soviet Forces in East Germany, Poland, Czechoslovakia and Hungary. These tactical air armies account for some 4,800 fixed wing combat aircraft, 250 transports and 3,500 helicopters.

Since the early 1970s, the introduction of modern aircraft such as the FENCER, FITTER C&D, FOXBAT and FLOGGER has steadily improved the offensive capabilities of Frontal Aviation, turning the Soviets' Tactical Air Forces from a force basically defensively-oriented to one now with significantly enhanced offensive capabilities for theater warfare. These aircraft carry loads of bombs, rockets and guided munitions, 2,000-to-8,000 kilograms in weight, to radii between 350 and 1,500 kilometers. The counterair fighters carry improved air-to-air missiles to ranges in excess of 900 kilometers. These aircraft also incorporate upgraded avionics. The entire counterair and about 75 percent of the ground attack force are comprised of aircraft introduced in the past decade.

Frontal Aviation possesses five basic aircraft in support of ground force operations.

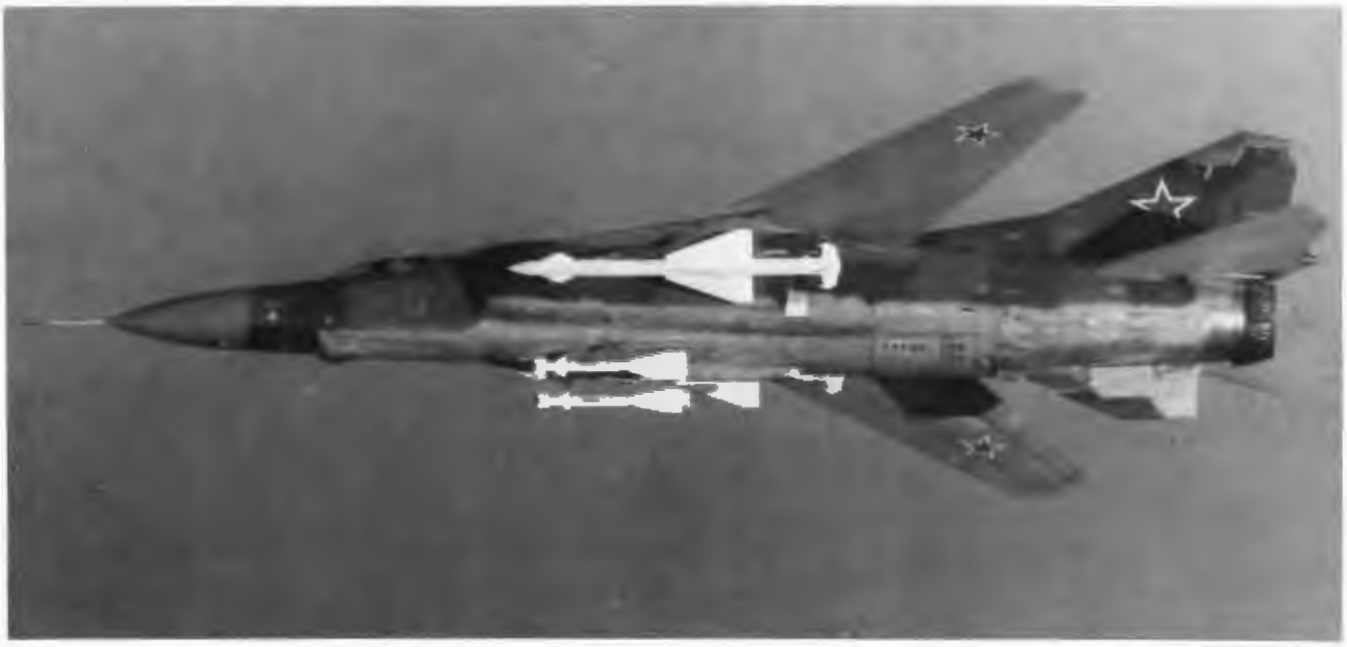
FLOGGER

Currently 1,400 FLOGGER B/D/G/J are operational in Frontal Aviation.

FLOGGER B/G — all-weather counterair fighter
FLOGGER D/J — all-weather ground attack aircraft
FLOGGER E — export version of FLOGGER B
FLOGGER F — export version of FLOGGER D
FLOGGER H — export version of FLOGGER D

Flogger

	FLOGGER B/G	FLOGGER D/J
Max Payload (kg)	6xAAMs	3,500
Combat Radius (km)	900-1,200	550-800
Service Ceiling (m)	18,000	16,000



MiG-23/FLOGGER B All-Weather Counterair Fighter

FISHBED

Some 1,300 FISHBED can be found in Soviet units, although the FLOGGER is replacing the FISHBED as the standard combat fighter in the Soviet Air Force.

FISHBED E — short-range, clear-air fighter
FISHBED D through N — (except H and M — all-weather counterair fighters
FISHBED H — reconnaissance platform

Fishbed

	FISHBED E	FISHBED L/N
Max Payload (kg)	2xAAMs	4xAAMs
Combat Radius (km)	350-650	550-900
Service Ceiling (m)	17,000	18,000

MiG-21/FISHBED N All-Weather Interceptor

FITTER

There are four ground attack and one reconnaissance variants of the FITTER operationally deployed with Warsaw Pact Forces, with only FITTER A and C in the national air arms thus far.

FITTER A — swept wing clear-air ground attack aircraft (200 operational with Soviet units)
FITTER C/D/H — swing-wing all-weather ground attack aircraft (650 operational in Soviet units)

Fitter

	FITTER A	FITTER C/D/H
Max Payload (kg)	2,000	3,500-4,000
Combat Radius (km)	250-350	550-900
Service Ceiling (m)	15,000	18,000

Su-17/FITTER C Swing-Wing Ground Support Fighter

FOXBAT

Two variants of the FOXBAT are deployed in operational service with Soviet frontal aviation; both are reconnaissance platforms.

Foxbat B/D

Max Payload:	Reconnaissance package only
Combat Radius (km)	1,100
Service Ceiling (m)	27,000

MiG-25/FOXBAT High Altitude Supersonic Interceptor

FENCER

The FENCER, operational since 1974, was the first modern Soviet aircraft designed specifically for a ground attack role and the first to carry a weapons system officer. There are 400 FENCERs operational.

Fencer

Max Payload (kg)	**8,000**
Combat Radius (km)	**1,800**
Service Ceiling (m)	**17,500**

Su-24/FENCER Ground Support Aircraft

Replacing the old Yak-28/BREWER tactical bomber with the FENCER gives Frontal Aviation the ability to strike targets throughout most of NATO Europe from home bases in the USSR. The addition of this aircraft along with the latest ground attack variants of FLOGGER and FITTER greatly increases the tonnage which can be delivered over a far greater range. To complement the growing inventory of modern aircraft, the Soviets are developing new types of armament which should greatly increase the effectiveness of sorties against hardened ground targets.

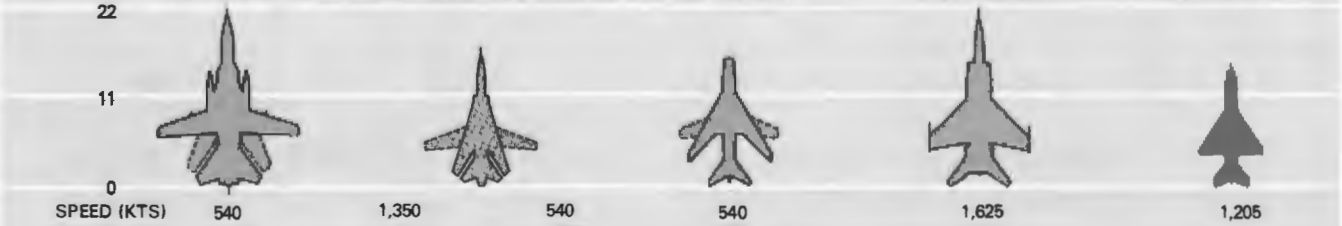
HELICOPTERS

The majority of the Soviet helicopter forces are assigned to Frontal Aviation units to be employed near the forward edge of a battle area.

During the 1950s and early 1960s, Soviet helicopter design and production was limited to medium and heavy lift aircraft intended for use as transports only. During the late 1960s and early 1970s, the Soviets began to experiment with the use of the helicopter in the assault and attack roles. The Soviets installed 128x57 mm rockets on the Mi-8/HIP C to be employed as an assault helicopter. Later, the Mi-8/HIP E was identified. It remains the world's most heavily armed helicopter. The HIP E helicopter has 192x57-mm rockets, four AT-2/SWATTER Antitank Guided Missiles (ATGM), and a 12.7-mm nose gun. The Mi-8/HIP F is an export version of the HIP E with the major change that six AT-3/SAGGER ATGMs replace the four SWATTERs.

While the Mi-8/HIP was undergoing modification to improve its assault capabilities, the

Frontal Aviation Ground Attack Aircraft



	Su-24 FENCER A	MiG-23 FLOGGER B/G	MiG-27 FLOGGER D/J	Su-17 FITTER D/H	MiG-25 FOXBAT B/D	MiG-21 FISHBED L
SPEED (KTS)	540	1,350	540	540	1,625	1,205
RADIUS (KM)	1,800	1,300	1,200	700	900	900
ARMAMENT	2,500 KG Bombs	6 AAMs	3,000 KG Bombs	3,000 KG Bombs	—	4 AAMs
WINGSPAN (M)	10.2 (swept)	8.1 (swept)	8.1 (swept)	9.9 (swept)	13.4	7.2

Mi-24/HIND E with Tube-Launched Anti-Tank Guided Missiles

Soviets were developing the Mi-24/HIND, an attack helicopter and the first Soviet helicopter to be produced that has an integral weapon system and retractable landing gear. The HIND A is armed with 128x57-mm rockets, four AT-2/SWATTER ATGMs, and a 12.7-mm machine gun in the nose. The helicopter also has a small cargo bay that is used to transport up to eight troops. The Mi-24/HIND D is a streamlined variant of HIND A with the pilot seated above and behind the co-pilot gunner. The 12.7 mm nose gun has been replaced with a turreted Gatling-type gun, but other armament remains unchanged from the HIND A. The latest version

Mi-24/HIND D with Turreted Gatling Gun

of the HIND E is similar to the HIND D except that it has the tube-launched AT-6/SPIRAL.

TRANSPORT AVIATION

Soviet Military Transport Aviation (VTA) is charged with the primary responsibility for providing airlift services for the Soviet Airborne Troops and air assault brigades.

VTA also operates an air logistics system to supply other deployed Soviet and allied armed forces and to support other Soviet political and economic interests.

Over 600 medium and long-range cargo transports are currently assigned to VTA airlift units. Il-76/CANDID long-range jet transports, which are replacing CUBs, now number over

Transport Aircraft

	An-22 COCK	Il-76 CANDID	An-12 CUB
MAX PAYLOAD (MT)	80	40	20
TROOP/PARATROOP CAPACITY	175/175	140/140	90/60
RANGE (MAX PAYLOAD) (KM)	4,200	5,300	1,400

Il-76/CANDID Long Range Jet Transport

130. Over 50 An-22/COCK long-range turboprop transports are in the VTA inventory. The COCK and CANDID units are based in the western USSR, as are most of the remaining CUB units, although some VTA CUB units are stationed along the southern and far eastern periphery of the Soviet Union. This concentration in the western USSR places the main VTA assets near the airborne divisions they would support, as well as positioning the force opposite NATO. Nevertheless, VTA is capable of quickly concentrating its aircraft to support an operation anywhere along the Soviet periphery, as demonstrated in the December 1979 Soviet invasion of Afghanistan.

The CUB continues to be the mainstay of VTA. It is a four-engine turboprop which can carry up to 90-to-100 troops or cargo up to a maximum payload of 20 metric tons. It first entered VTA in the late 1950s.

In the mid-1970s, CANDID transports were introduced to meet VTA's increasing worldwide airlift requirements. The CANDID is comparable to the U.S. C-141, and can airlift up to 140 troops or 40 metric tons of cargo. Its main asset, however, is its greatly improved radius/range over that of the CUB it is replacing. A CANDID can thus theoretically lift twice the payload weight to five times the radius/range of the CUB.

During times of military emergency, VTA

An-22/COCK Long Range Turboprop Transport

can call upon the considerable reserve offered by Soviet civil aviation, Aeroflot. The civil fleet is equipped with about 200 CUBs and CANDIDs, about 1,100 medium- and long-range passenger transports and several thousand short-range transports and helicopters.

ELECTRONIC WARFARE

The Soviets continue to improve their capability to conduct Electronic Warfare (EW) and Signals Intelligence (SIGINT). Technical advancements in both Electronic Counter Measures (ECM) and Electronic Warfare Support Measures are noted in all Soviet forces. The air forces have numerous aircraft devoted to EW as escort and standoff jammer platforms. Additionally, since 1979, there has been increased emphasis on Soviet offensive, penetrating air forces equipped with ECM and accompanied by dedicated EW aircraft. The USSR has made a major investment in Electronic Counter Countermeasures (ECCM), as well as lethal and nonlethal countermeasures. Ground forces continue to introduce new jammers, as well as a new series of improved SIGINT vehicles. Strategic fixed jammers are located throughout the Soviet Union.

The Soviets have developed their EW capabilities into an integrated system called Radioelectronic Combat, combining all forms of intelligence, direction finding, intensive jamming, deception and suppressive fires from ground, air and seabased platforms to attack enemy organization and systems through their electronic means of control. Its purpose is to limit, delay or nullify the enemy's use of his command and control systems while protecting Soviet systems by ECCM. An estimated goal of the system is to destroy or disrupt a significant proportion of the enemy's command, control and weapon system communications, either by jamming or by destructive fire.

The Soviet ECCM objective is the satisfactory operation of USSR electronic equipment in the face of enemy disruption. Thus, physical protection of the equipment is included as well as other practices beyond the scope of western ECCM. Modern ECCM features have been designed into the newer air defense equipment. The greatest emphasis, however, has been on individual and organizational techniques that can be applied in the field.

To cite one example, the Soviets use antiradar camouflage to conceal military equipment against detection by ground, airborne and shipborne radars. Depending on the radar visibility of the objects to be camouflaged, antiradar camouflaging is achieved by the creation of false targets or by blending into the terrain background those objects that might serve for orientation. Equipment may be concealed behind local features or by making use of the camouflaging properties of the ground relief.

In addition to natural cover, timber, brush wood, metallic nets and angle reflectors are used by Soviet forces for radar camouflage. Mockups of military equipment can also be used as antiradar reflectors.

CHEMICAL WARFARE

The armed forces of the Soviet Union in particular and the Warsaw Pact forces in general are better equipped, structured and trained than any other military force in the world to conduct offensive and defensive chemical warfare operations. Their capabilities are steadily improving.

The Soviets have deployed a variety of modern agents and multiple delivery systems, and have the tactical doctrine for large-scale employment of chemical weapons. A significant portion of all Soviet delivery systems—including missile and rocket systems, aerial bombs and artillery—are chemical-weapon capable. War-

saw Pact forces are well-trained, organized and equipped for offensive CW operations.

In Soviet military doctrine, toxic chemicals are associated primarily with theater warfare. The basic principle is to achieve surprise by using massive quantities of chemical agents against unprotected troops or against equipment or on terrain to deny its use.

A large chemical warfare organization is organic to the Soviet service structure. Throughout the Warsaw Pact each combat unit down to regimental level has a sizable contingent for chemical defense. Chemical specialists are also assigned at the company level. All Warsaw Pact combat and combat support forces are well equipped and realistically trained to insure their survivability and to increase their operational effectiveness in toxic environments.

SPECIAL PURPOSE FORCES AND UNCONVENTIONAL WARFARE

In the context of Special Purpose Forces, Soviet unconventional warfare is defined as a variety of military and paramilitary operations including partisan warfare, subversion, and sabotage, conducted during periods of peace and war, and including other operations of a covert or clandestine nature.

The Soviets have used unconventional forces and methods in the past:

- Bolsheviks employed partisan guerrilla units against the Czarists and other opponents during the Russian Civil War of 1917 to 1920.
- Soviet partisan forces were extensively used against the Germans during World War II.
- Special purpose troops were used to crush resistance to Soviet domination over Eastern Europe.
- Soviet special purpose forces were used in the Soviet invasion of Czechoslovakia in 1968 to arrest Czech leadership and secure key objectives in Prague.
- Soviet special purpose forces played an important role in the invasion of Afghanistan and the elimination of President Amin.

Soviet unconventional warfare activities are managed at the highest level of government authority. The Committee for State Security (KGB) and the Main Intelligence Directorate (GRU) of the General Staff can be assumed to plan and execute Soviet unconventional warfare operations. These activities are protected by stringent security measures.

The Soviet leadership has a variety of elite forces for conducting unconventional warfare missions: special units of the KGB, GRU, Airborne and Ground and Naval Forces. The KGB special purpose units have a sabotage mission, and are thought to be targeted primarily against the civilian sector. Their tasks would be to create general panic among the civilian population, to disrupt civil government and public utilities, and to damage or destroy key production facilities.

The regular Soviet Armed Forces maintain elite airborne units, special sabotage/reconnaissance units and special long-range reconnaissance units for missions. The most powerful and numerous are the airborne troops under the direct control of the General Staff in Moscow. Some of these airborne units are designated as "special purpose" troops and are intended to operate in small groups against key political, military, command and control, transportation and industrial targets in the enemy rear area.

Soviet unconventional warfare units receive very intensive training. Small groups of men are trained as teams. Each team has an officer in charge who speaks the language of the target country fluently; a senior sergeant serves as sec-

ond in command. Other members of the group are trained as radio operators, weapons and demolition experts. In addition to the normal military training, the following special skills are emphasized:

- tactics of infiltrating and exfiltrating the target area
- night operational linkups
- sabotage methods using explosives, incendiaries, acids and abrasives
- parachute training
- clandestine communications
- hand to hand combat and silent killing techniques
- language/customs of target country
- survival behind enemy lines
- identifying and locating targets.

To make training as realistic as possible, the Soviet training centers are equipped with realistic models of key targets such as enemy facilities and weapon systems.

Soviet writings point out the effectiveness of UW units and record the accomplishments in World War II:

"During the war the partisans killed, wounded or took prisoner hundreds of thousands of German troops, collaborators and officials of the occupation administration. They derailed more than 18,000 trains, and destroyed or damaged thousands of locomotives and tens of thousands of railway cars and cisterns. The partisan war affected the morale of the German Army, keeping the German troops in a constant state of fear."

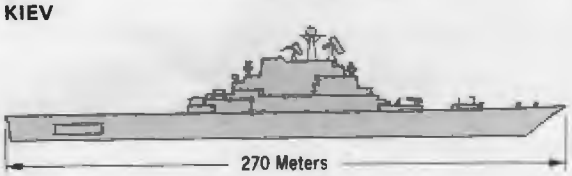
Use of unconventional warfare is a basic element of Soviet doctrine, and Soviet capabilities in this respect constitute a formidable threat.

THE SOVIET NAVY

Over the last two decades the Soviet Navy has been transformed from a basically coastal defense force into an ocean-going force designed to extend the military capability of the USSR well out to sea and to perform the functions of tactical, theater and strategic naval power in waters distant from the Soviet Union. The Soviets have a larger array of general purpose submarines, surface warships and combat naval aircraft than any other nation. The submarines, about 70 of which carry antiship cruise

Major Surface Ships

KIEV

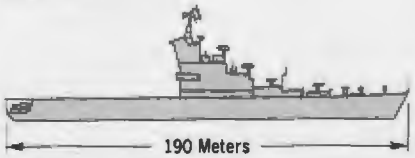


270 Meters
Displacement 37,000 Tons

KIROV

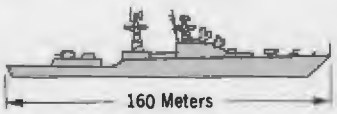
245 Meters
Displacement 23,000 Tons

MOSKVA



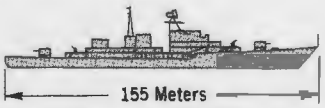
190 Meters
Displacement 17,000 Tons

UDALOY



160 Meters
Displacement 8,000 Tons

SOVREMENNYY



155 Meters
Displacement 7,500 Tons

missiles, constitute the most serious threat to US and Allied naval forces and the worldwide sea lines of communication upon which we and our Allies depend. In the mid-1960s the Soviets had 260 major surface warships and amphibious ships. Today they have 362.

In the European theater, Soviet naval forces would have a variety of key missions. These would include securing vital areas of the sea and strategic passages such as the waters north of the Greenland/Iceland/United Kingdom Gap, the Gap itself, the Baltic Sea, the Gulf of Finland, the passages on either side of Denmark, the Bosporus and Dardenelles and the Mediterranean Sea. Additionally, the Soviet Navy would seek to interdict the sea lanes to Europe, and would mount operations on the high seas against NATO carrier task forces, other surface warships and submarines.

The largest Soviet surface warship is the KIEV-Class aircraft carrier. At present, two KIEVs are deployed and two more are under construction. The KIEVs are armed with antiship cruise missiles, antisubmarine and over-

Soviet Navy Order of Battle

Submarines—Nuclear Powered

*SSBN	Ballistic Missile Submarines (YANKEE, DELTA classes)	62
SSBN	Ballistic Missile Submarines (HOTEL class)	7
*SSGN	Cruise Missile Submarines	50
*SSN	Torpedo-Attack Submarines	60

Submarines—Diesel-electric Powered

SSB	Ballistic Missile Submarines	18
SSG	Cruise Missile Submarines	20
*SS	Torpedo-Attack Submarines	160

Aircraft Carriers and Aviation Cruisers

CVHG	VSTOL Carriers (KIEV class)	2
CHG	Aviation Cruisers (MOSKVA class)	2

Cruisers

*CGN	Guided Missile Cruiser (Nuclear) (KIROV class)	1
*CG	Guided Missile Cruisers (SAM/SSM)	26
CL	Light Cruisers (SVERDLOV class)	9

Destroyers

*DDG	Guided Missile Destroyers (SAM/SSM)	38
DD	Destroyers	30

Frigates (Escorts)

*FFG	Guided Missile Frigates (KRIVAK class)	28
*FF/FFL	Frigates /small frigates	140

Small Combatants

*Missile Craft	145
*Patrol /ASW/ Torpedo Craft	395
*Minesweepers	395

Amphibious Ships

*LPD	Amphibious Assault Transport Dock (IVAN ROGOV class)	1
LST	Amphibious Vehicle Landing Ships (ALLIGATOR, ROPUCHA classes)	25
LSM	Medium Landing Ships (POLNOCNY/MP-4 classes)	60

Auxiliary Ships

*Mobile Logistics Ships	150
*Other Auxiliaries	605

* Indicates additional units under construction in these categories.

the-horizon target acquisition helicopters, anti-aircraft missiles, anti-submarine rockets and missiles, believed to be nuclear-capable, and the FORGER vertical- and short-takeoff and landing (VSTOL) jet aircraft.

The principal surface warships which the Soviets are building today have greater range, firepower and electronics capabilities than in the past. The modern ships of the Soviet Navy are among the fastest and most heavily armed in the world.

Present surface warship building programs include about 12 hulls under construction in four new classes of large warships, including a 23,000-ton nuclear-powered cruiser as well as the continued construction of KIEV-Class carriers and destroyer and frigate classes. The Soviet Navy has led the world in the use of cruise missiles in naval warfare. Since the installation of the SS-N-1 cruise missile on the KILDIN and KRUPNYY classes of destroyers in the late 1950s, the Soviets have extensively developed and deployed this type of weapon. Today the Soviet Navy has some 20 cruisers, carriers, and destroyers, about 70 submarines and 300 land-based aircraft armed with anti-ship cruise missiles.

AIRCRAFT CARRIERS

The widely publicized KIEV-Class aircraft carriers are the largest warships ever completed by the Soviet Union.

With the commissioning of KIEV in 1976, the Soviets, for the first time, have seabased, fixed-wing aircraft in operation. The second KIEV-Class ship, MINSK, is now in the Pacific Ocean Fleet, a third carrier is fitting out, and a fourth is under construction. A logical advance on the KIEV design could be a nuclear-powered carrier of about 60,000 tons with catapults and an air wing of some 60 aircraft. Such a ship could join the fleet late in this decade.

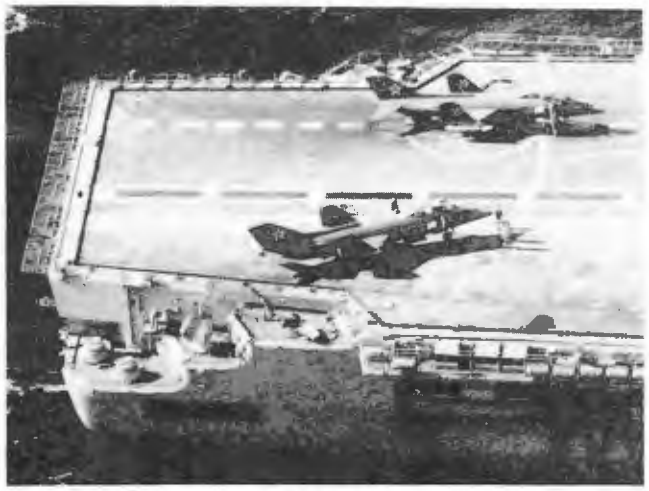
The KIEVs have an unusual design. They have a full load displacement of about 37,000 tons, are 270 meters long, have an angled flight deck some 185 meters long and an island super-

KIEV, Lead Ship of the KIEV-Class Guided Missile VSTOL Aircraft Carriers

In this view from astern, the nuclear-powered guided missile cruiser KIROV reveals a superstructure massed with radars and electronic sensors, a stern door for ASW sonar, helicopter deck bordered by Gatling guns and 100mm dual purpose gun mounts.

structure to starboard in the tradition of Western carriers. However, the forward part of these ships is similar to Soviet missile cruisers, with antiship, antisubmarine and antiaircraft missile launchers. They also have a profusion of more traditional weapons, electronic warfare systems, and a number of advanced communications devices.

The lack of aircraft arresting wires and catapults on the fight deck limits the ships to helicopters and VSTOL aircraft. A mix of about 20 Ka-25/HORMONE helicopters and 15 Yak-36/FORGER VSTOL aircraft is a nominal air group, although this mix could be changed to meet varied mission requirements.



Yak-36/FORGERs on KIEV-Class Carrier

Although the primary mission of the KIEV Class is stated by the Soviets as antisubmarine warfare, the ships also have powerful antiship capability in their cruise missile battery. They have eight large launching tubes with reloads for SS-N-12 missiles, which are an improvement over the older SS-N-3 antiship missiles. The HORMONE B helicopter, capable of providing over-the-horizon targeting information for the SS-N-12/SANDBOX missiles which have a maximum range of some 550 kilometers, has been seen aboard the KIEV Class.

KIEV is a second generation class of Soviet "aviation ship," following the helicopter carrier missile cruisers MOSKVA and LENINGRAD, which were completed in 1967 and 1968, respectively. These earlier ships also were of innovative design, being essentially missile cruisers forward with a clear flight deck aft for the operation of up to 18 HORMONE antisubmarine helicopters. The latter ships are rated as "antisubmarine cruisers" by the Soviet Navy and have been used primarily in that role as well as serving as flagships.

SURFACE COMBATANTS

In May 1980 the Soviets began sea trials of their first nuclear-powered surface combatant, the guided missile cruiser KIROV. This is a ship of 23,000 tons, larger than any surface combatant other than an aircraft carrier built since World War II. Its primary armament is heavy, new generation, highly sophisticated surface-to-air and long-range antiship cruise missiles. The Soviets have also fitted her with ASW missiles, two 100-mm dual purpose guns, short-range surface-to-air missiles, Gatling guns for close-in defense, and Ka-25/HORMONE ASW helicopters.

KIROV is designed to provide improved fleet air defense against attack from Western aircraft carriers or from long-range cruise missiles. Conversely, the KIROV's new long-range, antiship cruise missiles will significantly enhance Soviet abilities to strike opposing surface action groups. KIROV marks an important developmental step in the technical evolution of Soviet sea power. A second unit is well along in construction.

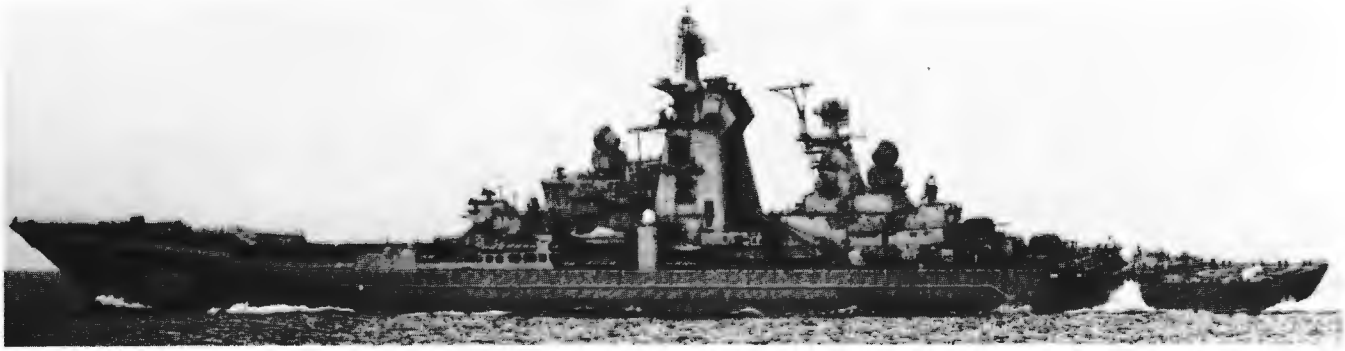
In July 1980, the Soviets began sea trials of their second new class of major surface combatant in 1980, the 7,000-to-8,000-ton, steam-powered, guided missile destroyer (DDG) SOVREMENNYY. While KIROV is clearly a multipurpose ship, SOVREMENNYY appears

UDALOY, Guided Missile Destroyer

primarily designed for antisurface warfare with four 30-mm Gatling guns, surface-to-surface antiship cruise missiles, and new, medium range, surface-to-air missile systems. The SOVREMENNYY has a secondary ASW mission and can carry HORMONE variant helicopters in its telescoping hangar. This new DDG is the first gun ship constructed by the Soviets since the late 50s and is their first major combatant since 1970 to deploy without significant ASW capability. It is now in series production with additional units expected through the mid-1980s. Ships of the SOVREMENNYY Class can be expected to support amphibious assault forces, provide naval gunfire, and oppose Western air, surface and submarine forces in all ocean areas.

In November 1980, the Soviets began sea trials of still another new class of mission-specific guided missile destroyer, the UDALOY. This unit is designed primarily for antisubmarine warfare, displaces about 8,000-to-9,000 tons, is armed with eight ASW missiles, two 100-mm guns, four Gatling guns for close-in defense and two hangars for ASW helicopters. The UDALOY appears to be a follow-on class to previous Soviet large antisubmarine ship programs and probably will be employed as the main ASW platform within an integrated Soviet task force. All available evidence suggests that the UDALOY program will be a large-scale effort with a number of units to be deployed through the 1980s.

Finally in 1980, a fourth major surface combatant program was identified in the Soviet Union. This new class of large, conventionally powered, multipurpose guided missile cruiser is being constructed in the Black Sea and has been temporarily designated "BLACK-COM-1." This new cruiser has supplanted KARA-class cruiser construction and will probably carry long-range cruise missiles. The new ship displaces approximately 11,000-to-13,000 tons and is further evidence of the Soviet trend toward larger, more technically sophisticated combatants. Although BLACK-COM-1 is conventionally powered, it is expected to function like KIROV as a multipurpose command ship capable of providing a Soviet battle group with enhanced air defense and surface strike capabilities. Series production of this new class is already underway.



KIROV, Nuclear-Powered Guided Missile Cruiser

SOVREMENNYY, Guided Missile Destroyer

SUBMARINES

The Soviet Navy currently operates some 377 submarines, including 180 nuclear-powered submarines compared to some 115 in the U.S. Navy.

Attack Submarines: The Soviet Navy operates about 220 attack submarines. Most are diesel-electric powered and many are of recent construction. About 60 of the torpedo attack submarines are nuclear powered, being of the NOVEMBER, ECHO, VICTOR, and ALFA Classes. The last is believed to be the fastest submarine in service today in any Navy. An improved VICTOR Class is now in production and the small, ALFA Class, which combines deep-diving capabilities with its high speed, may well be in series production. The Soviet Navy continues to build diesel-powered submarines, the FOXTROT Class, for overseas sales, i.e., India, Libya and Cuba, and the new TANGO Class for use by the Soviet Navy. The prime weapons of these attack submarines are antisubmarine

VICTOR I-Class Nuclear-Powered Attack Submarine

ECHO-Class Nuclear-Powered Attack Submarine

and antiship torpedoes; however, mines also can be carried. The newer submarines have rocket-delivered ASW weapons as well.

Cruise Missile Submarines: Even while ambitious surface combatant construction programs were underway, the Soviets continued to turn out submarines at virtually the same pace they have maintained through the 1970s. One new class introduced in 1980, the OSCAR, is an extremely large SSGN capable of launching up to 24 long-range, antiship cruise missiles while remaining submerged. The missile fired by the OSCAR is probably a submarine variant of the same new antiship cruise missile first deployed aboard KIROV. This missile has an estimated range of over 450 kilometers. The Soviets began their submarine cruise missile programs in the 1950s converting existing submarines to fire the long-range SS-N-3 missile. Then, newer submarines designed to carry the SS-N-3 joined the Soviet fleet, the diesel-powered JULIETT Class and the nuclear-powered ECHO I and II Classes.

After producing about 50 submarines of the JULIETT and ECHO Classes, the Soviets completed the first CHARLIE I Class SSGN in 1968 with the improved CHARLIE II following several years later. These nuclear-powered submarines can fire eight antiship cruise missiles while remaining submerged at a range of up to 100 kilometers from the intended target. Soviet cruise missile submarines also carry ASW and antiship torpedoes.

The Soviet Navy's cruise missile submarines and their missile-armed bombers form the greatest threat to Allied naval surface forces

operating on the high seas. This is especially so when within range of Soviet air bases where the Soviets can launch coordinated attacks using not only reconnaissance aircraft to provide target data for submarine-launched missiles, but also their extensive force of naval and air force missile-equipped bombers.

NAVAL AVIATION

Soviet Naval Aviation is subordinate to the Soviet Navy, with regiments being assigned to each of the four fleets under an aviation officer reporting directly to the fleet commander. Soviet Naval Aviation consists of some 1,440 aircraft, most of which are based ashore except for helicopters assigned to various cruisers and the helicopters and VSTOL aircraft that fly from the KIEV-Class aircraft carriers.

Soviet Naval Aviation has four basic missions: reconnaissance and surveillance, antiship strike, antisubmarine and aviation support.

Naval aircraft are employed in long-range reconnaissance and ocean surveillance, with some aircraft equipped to provide midcourse target data for antiship missiles launched "over the horizon" from surface ships, submarines, and other aircraft. Reconnaissance aircraft now in use include about 50 of the larger Tu-95/BEAR D turbo-prop planes; about 100 twin-jet Tu-16/BADGER aircraft, and Tu-22/BLINDER jet aircraft that have a supersonic dash speed. Additionally, the Il-38/MAY maritime patrol aircraft are used for surveillance and reconnaissance missions.

The prime strike force of Soviet Naval Aviation consists of over 300 twin-jet BADGER and BLINDER aircraft which are fitted to carry one or two of several types of antiship cruise missiles with "standoff" ranges varying from 90 to over 300 kilometers. Some missiles have variable flight paths and various homing techniques to help penetrate ship defenses. All these missiles are assessed to carry either a nuclear or a high explosive warhead of about 1,000 to 2,000 pounds (450 to 900 kilograms).

Soviet Naval Aviation also flies the twin-jet BACKFIRE, a supersonic aircraft with variable-sweep wings. This plane carries stand-off missiles and is slowly replacing the BADGER in strike squadrons. The Navy is receiving this aircraft at about the same rate as the Soviet Long Range Aviation strategic bombing force and

Soviet Navy Aircraft

Strike/Bombers 390

BACKFIRE
BADGER
BLINDER

Fighter/Fighter Bombers 70

FITTER
FORGER

Reconnaissance/Electronic Warfare Aircraft 180

BADGER
BEAR D
BLINDER

Antisubmarine Aircraft 400

BEAR F
HAZE A
HORMONE A
HOUND
MAIL
MAY

Tanker 70

BADGER

Transport/Training Aircraft 330

Su-17/FITTER Fighter-Bomber

the inventory has climbed to more than 70 aircraft. The BACKFIRE greatly increases the capability and extends the range at which strike aircraft can attack Western surface forces such as aircraft carrier or amphibious battle groups.

The introduction of aircraft carriers and FORGER aircraft gives Soviet Naval Aviation another dimension of antiship strike. The FORGER can be fitted with short-range air-to-surface missiles, rockets, or bombs for use against ship or shore targets.

The FITTER fighter-bomber has been introduced into Soviet Naval Aviation over the last several years. These aircraft are assigned to the Baltic Fleet primarily to provide antiship strike and support to amphibious operations in the Baltic.

In addition to naval aircraft armed with antiship missiles, certain BEAR and BADGER bombers of Soviet Long Range Aviation can be used for attacks against ships, and these aircraft regularly participate in naval exercises. Most of these strike aircraft can be refueled in-flight by naval BADGERs fitted as tankers as well as by Long Range Aviation tankers.

For antisubmarine warfare the Soviet Navy has a force of about 400 fixed-wing aircraft and helicopters configured for submarine detection and attack. This force currently includes BEAR F aircraft, MAY turbo-prop aircraft and MAIL twin-engine flying boat aircraft. Only the BEAR F appears to be still in production. These aircraft operate from Soviet land bases to search out seaward areas for foreign submarines.

An increasing number of antisubmarine helicopters are being flown by the Soviet Navy. The HORMONE A, a twin turboshaft helicopter, is flown from the newer Soviet cruisers, as well as from the helicopter carriers MOSKVA and LENINGRAD and the KIEV-Class aircraft

carriers. Additionally, an ASW version of the Mi-14/HAZE helicopter flies from land bases.

Soviet Naval Aviation also operates some 125 transport and utility aircraft of various types. Although basic and advanced training are provided by the Soviet Air Forces, maritime operational training is accomplished within the Navy. Soviet Naval Aviation retains a number of transports to provide a logistics capability better to meet the Navy's priority needs.

AMPHIBIOUS FORCES

Another area of continuing development in the Soviet Navy has been the amphibious assault forces. In April 1980, the recently constructed IVAN ROGOV, the Soviets' newest amphibious warfare ship, deployed to the Indian Ocean. At about 13,000 tons, the IVAN ROGOV is nearly three times the size of previous Soviet amphibious ships and is designed to operate both helicopters and high-speed air-cushioned landing craft. The ROGOV can embark about 550 naval infantry troops and significantly enhances Soviet amphibious warfare projection to distant areas, especially the Third World.

Amphibious lift for the naval infantry is provided primarily by IVAN ROGOV-Class LPDs, ALLIGATOR-Class and ROPUCHA-Class LSTs, and POLNOCNY-Class LSMs. The Soviet amphibious forces exercise regularly in their respective fleet areas and regularly deploy to the Mediterranean, off West Africa and the Indian Ocean. The Soviet Navy has about 25 LSTs and some 60 LSMs, plus numerous lesser landing craft and air-cushion vehicles for amphibious operations.

The Soviet Navy is now the world's largest operator of military air-cushion vehicles for which development continues. There are three classes currently in use: the GUS, LEBED and large AIST Class.

Although small by comparison to the U.S. Marine Corps, the Soviet Naval Infantry is the second largest marine force in the world. The potential power of even a few hundred Soviet marines afloat during a crisis provides the Soviet Union with a valuable political-military instrument.

The Soviets have in hand, or are developing, the elements necessary to provide a formidable

IVAN ROGOV, Lead Ship of a New Amphibious Assault Class

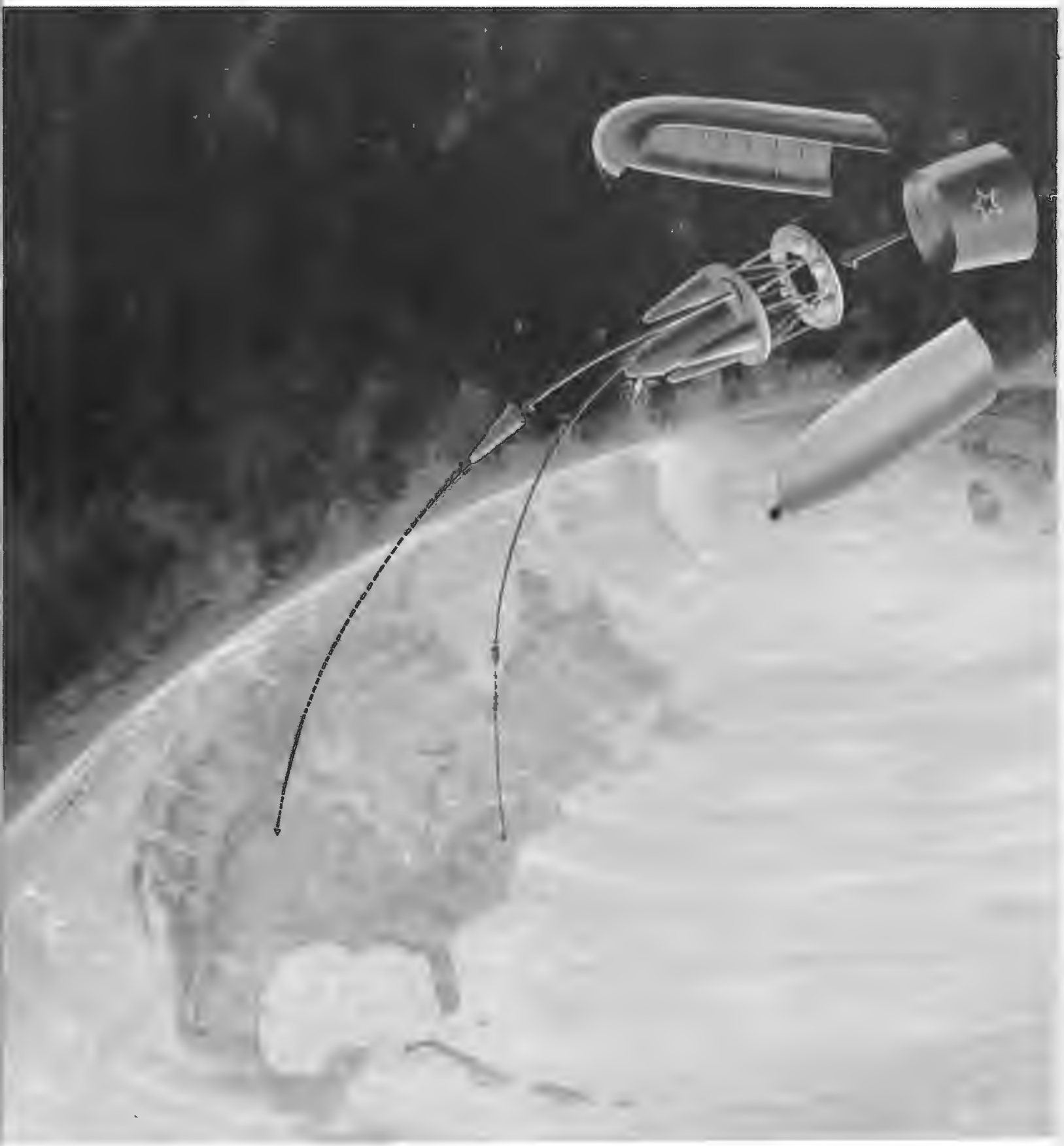
The 13,000-ton amphibious assault transport dock IVAN ROGOV entered service in 1978, the largest amphibious ship in the Soviet Navy. IVAN ROGOV has two helicopter decks and helicopter hangers, and a floodable welldeck, behind the large stern gate, which can carry three air-cushion landing craft. Judging by IVAN ROGOV's characteristics, the amphibious ship can carry a Soviet Naval Infantry Battalion—550 men—30 armored personnel carriers and ten tanks, enhancing the USSR's capability to project naval and military power at great distances from the Soviet homeland.

MINSK, Second of the KIEV-Class VSTOL Aircraft Carriers

projection into distant waters. These include the improvement in assault lift capability, the expansion of a large administrative lift ability designed into certain ships of the Merchant Marine, the retention of a substantial gunfire support strength in cruisers and destroyers, development of sea-based tactical air power, and an improving underway replenishment capability. The Soviet Navy's ability to project tactical power ashore at some distance from the Soviet littoral may be part of Admiral Gorshkov's grand plan of achieving a "balanced fleet."

Soviet naval policy and programs for the 1980s can be expected to be directed toward broadening the range of military and political options available to the leadership across the entire spectrum of conflict—from competition in peacetime to hostilities in the event of a nuclear war. Having achieved rough parity in general war capabilities, the Soviets can be expected to increase their emphasis on making general purpose naval forces more capable in distant waters, of performing a variety of missions and of challenging the West's traditional dominance of the open oceans. We believe that Soviet naval policies also intend gradually to achieve greatly improved capabilities for sustained, long-range naval operations, even against substantial opposition.

V SOVIET STRATEGIC



FORCES

Over the past 20 years, the Soviet Union has devoted substantial resources to the development and deployment of intercontinental ballistic missile (ICBM) and submarine launched ballistic missile (SLBM) forces. Fewer resources have been allocated to bomber forces, although new weapons systems—primarily the BACKFIRE bomber—have been deployed.

Under Brezhnev, the Soviet missile forces have moved from a position of clear inferiority in the early-to-middle 1960s to one in which they are generally recognized as equal or superior in certain measures to those of the West. In 1964, the Soviets had only a few operational SLBMs, many of which had to be launched from surfaced submarines. While the USSR had more ICBMs than SLBMs, the number was significantly fewer than US ICBMs. Moreover, the majority of Soviet ICBMs were inaccurate systems housed in launchers that were clustered together and unhardened, making them vulnerable to attack. The USSR then embarked on high-priority development and deployment programs first focused on increasing single-silo ICBM deployment to a level greater than that of the United States. A similar buildup of SLBM launchers on modern, nuclear-powered ballistic missile submarines (SSBNs) was underway by the late 1960s. These massive 1960s ICBM and SLBM deployment programs, largely centered on the SS-9 and SS-11 ICBMs and the SS-N-6/YANKEE SLBM/SSBN weapons systems, provided the foundation from which subsequent strategic nuclear modernization programs were to grow.

Since the mid-1970s the Soviet Union has completely upgraded its strategic Intercontinental Ballistic Missile force with the introduction of the SS-17, SS-18 and SS-19, equipped with multiple, independently targetable reentry vehicles—missiles with improved reliability, range, payload accuracy and survivability.

The 1970s modernizations, which only now are reaching a conclusion, were largely technological in nature. More than half of the 1,398 Soviet ICBM launchers have been rebuilt to house the SS-17, SS-18 and SS-19 ICBMs in vastly more survivable, hardened silos. These ICBMs, all of which are MIRVed, are in the forefront of ICBM technology. Certain versions of the SS-18 and SS-19 are among the most accurate ICBMs operational anywhere. Together, these systems have the capability to destroy a large percentage of the more than 1,000 US ICBM launchers, using only part of their total numbers.

The Soviet SLBM/SSBN modernizations began in the early 1970s with the introduction of the long-range SS-N-8 SLBM deployed on DELTA-Class SSBNs. By the late 1970s, the Soviets were producing the MIRVed SS-N-18 and deploying it in a modified version of the DELTA-Class submarines. In 1979, a new SLBM, the MIRVed SS-NX-20, was first tested. This SLBM will probably reach operational status by the mid-1980s, deployed in the new TYPHOON-Class SSBN submarine.

These technological advances in ICBM and SLBM weapons systems have been accompanied by major improvements in communications systems and in the organization of the forces as well.

Soviet intercontinental bomber forces retain most of the BEAR and BISON bombers and refueling tankers which were initially produced in the 1950s and 1960s. Improvements to their avionics and weapons systems have been made, however. Since the early 1970s, the USSR has also deployed over 70 BACKFIRE bombers to operational LRA units and is producing about 30 more of these supersonic bombers each year. While BACKFIRE appears to have been given primarily theater and maritime missions, it has a strategic capability and cannot be ignored as a potential intercontinental bomber threat.

Current force levels of Soviet intercontinental strategic nuclear forces include 1,398 ICBM launchers, 950 SLBM launchers and 156 long-range bombers, excluding BACKFIRE. These delivery systems are loaded with some 7,000 nuclear warheads. Deployment programs now underway indicate that the number of warheads will increase over the next few years.

STRATEGIC ROCKET FORCE

The Strategic Rocket Force (SRF), the largest missile force in the world, controls all Soviet military units in the Soviet Union equipped with ICBMs, IRBMs and MRBMs. The mission of the SRF is to destroy an enemy's means of nuclear attack, military-industrial production facilities, civil and military command and control capabilities and logistics and transport facilities. The SRF's secondary mission is to support tactical joint forces and naval fleets.

Soviet strategic operational employment plans, based on Soviet writings, point to seizing the initiative through preemptive attack. Such an attack would effectively reduce the impact of a retaliatory strike, limiting damage to the USSR. While this is the preferred Soviet scenario, the Soviets also have the capability to launch on tactical warning if necessary. Regardless of how a war started, the Soviets view the nuclear forces and command and control of an enemy as their first priority targeting objectives. This would include such targets as ICBM launch silos, launch control facilities, support and maintenance facilities, strategic bomber bases, submarine berths and loading facilities and nuclear storage and production facilities. Priority two targets would be those that would negate the ability to project military power abroad. Such targets would include depots, transportation centers, military stockpiles, conventional force bases and training centers. Other targets

would be those that limit the capacity of the enemy to conduct a protracted war such as military industries, refineries and electrical power plants.

The SRF is under the command of General of the Army Tolubko. He is responsible for the administrative and technical control of the forces and equipment under his command. The General Staff of the Ministry of Defense has the responsibility for executing operational decisions of the Supreme High Command which affect the SRF. In addition, the General Staff can bypass the SRF headquarters and exercise direct operational control of the missile forces. Organization within the SRF is based on army, division, regiment, battalion, and battery. A battery consists of single ICBM, IRBM, and MRBM launchers.

The ICBM force of the SRF is deployed in missile complexes generally located along, and within access of, the Trans-Siberian Railway. A typical ICBM complex includes a main base support area, a facility for transferring missiles and equipment from rail to roads, and launch control centers, each with a group of launch silos it controls. Each complex is comprised of a number of launch groups. Each launch group is comprised of either six or ten launch silos.

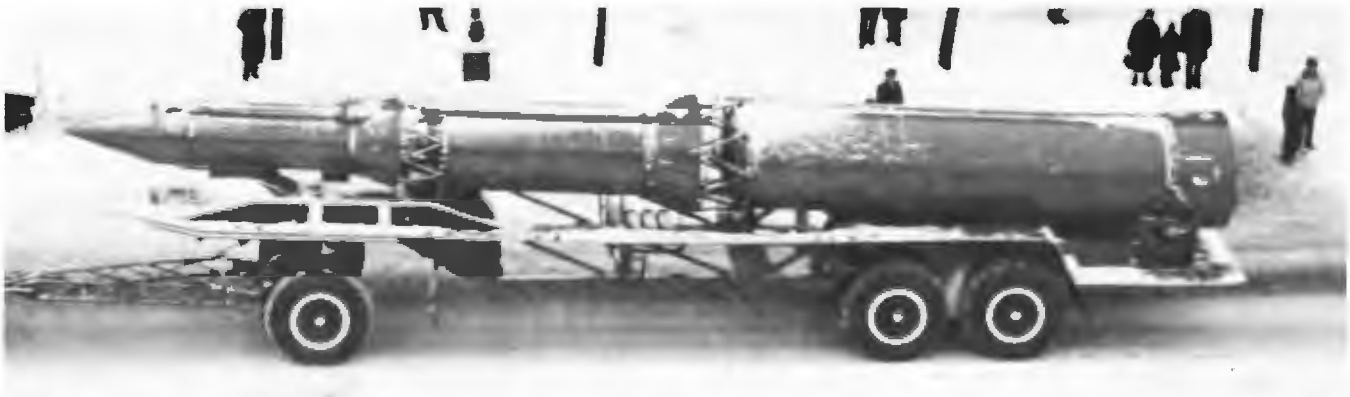
ICBM DEPLOYMENT

The Soviet ICBM force currently consists of 580 SS-11s, 60 SS-13s, 150 SS-17s, 308 SS-18s, and about 300 SS-19s. The great majority of the 17s, 18s and 19s are equipped with MIRVs. The Soviets are expected to complete their current ICBM modernization program (SS-17, SS-18 and SS-19) in the early 1980s.

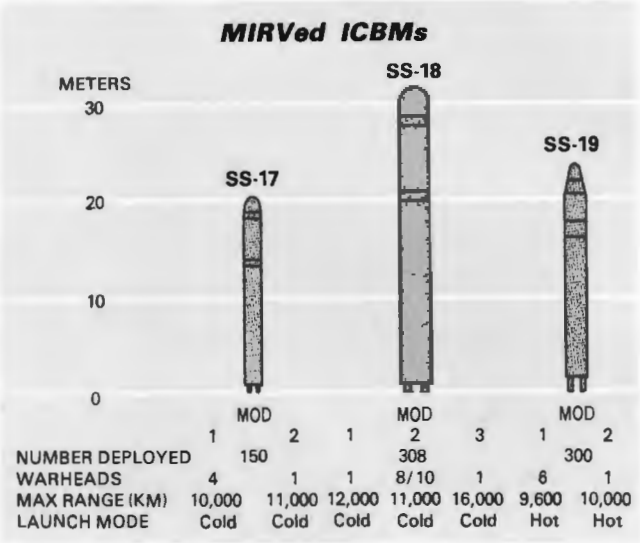
Soviet ICBM Deployment

SOVIET MIRVed ICBMs

SS-17: Since it first became operational in 1975, the SS-17 has been deployed in 150 converted SS-11 silos. Both single and multiple reentry vehicle (RV) versions of the SS-17 have been developed, but few if any of the single RV versions are deployed. The maximum range of



At present, there are 1,398 Intercontinental Ballistic Missile launchers in the Strategic Rocket Force. An SS-13 ICBM is seen here during public display in Moscow.



the SS-17 is believed to be about 10,000 kilometers. Although much more accurate than its predecessor, the SS-11, the SS-17 is not as accurate as the SS-18 and SS-19 ICBMs.

The SS-17 employs a cold-launch technique which delays main engine ignition until the missile has exited its hardened silo. This technique minimizes launch damage to the silo and is consistent with the notion of building in the capability to reload and refire missiles during a protracted nuclear conflict.

SS-18: The SS-18, the largest of the current Soviet ICBMs, is similar in dimensions to the SS-9, which it replaced, and is about twice the size of the proposed US MX missile. Like the SS-17, the SS-18 also uses a cold-launch technique. Both single and MIRVed versions of the SS-18 have been tested. The MIRVed versions carry eight or ten reentry vehicles. Each warhead of the ten RV variants has a better than 50 percent chance of destroying a MINUTEMAN silo. When used in pairs against a single target, the warheads are even more destructive. The single RV versions of the SS-18, with their large destructive power and accuracy, are capable of destroying any known fixed target with high probability.

SS-19: The SS-19 ICBM became operational in 1974. It uses a hot-launch technique with engine ignition occuring while the missile is in its silo. The SS-19 is estimated to have three-to-four times the payload carrying capacity of the SS-11, and the missile is much larger in volume, comparable in size to the proposed US MX. There are both single and multiple RV versions of the SS-19. The MIRVed version, which makes up most of the SS-19 force, is believed capable of delivering six RVs to a range of about 9,000 kilometers.

ICBM RELOAD CAPABILITY

The Soviets could have contingency plans for reloading and refiring missiles from ICBM launchers which already have fired an initial round. The cold-launch technique employed by the SS-17 and SS-18 lends itself to such a capability in a protracted nuclear conflict. Additionally the Soviets may be able to reconstitute a portion of their hot-launched missile force—SS-11, SS-13 and SS-19—as well. The Soviets probably cannot refurbish and reload silo launchers in a period less than several days— thereby avoiding violation of the SALT II Agreement which precludes a rapid reload capability for ICBM launchers.

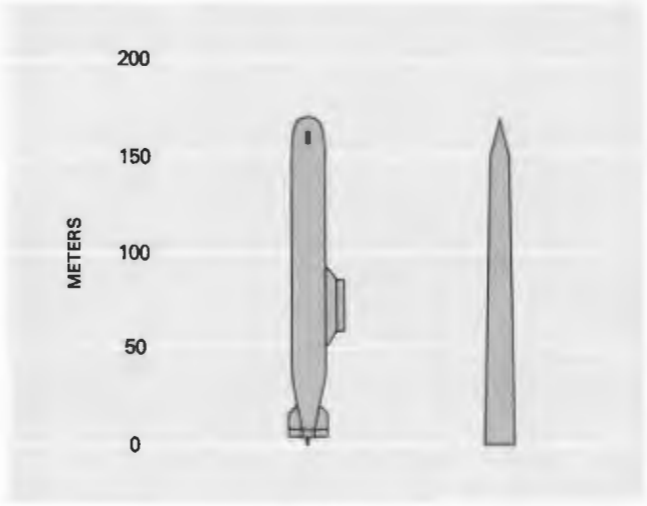
ICBM PRODUCTION

Four major Soviet design bureaus specialize in strategic missiles development. These bureaus are supported by activities at main assembly plants, at hundreds of component production plants, at test ranges, and at launch complexes. The Soviet missile development program shows no signs of slackening. We expect improvements leading to new missiles and to the modification of existing missile systems. These improvements are expected to continue the trend towards greater capabilities against such hard-

ened military structures as ICBM silos. As the accuracy of future Soviet missiles increases, it will be feasible for the Soviets to reduce the size of individual RVs and thereby to increase the number of MIRVs carried on each missile, assuming no external constraint such as that imposed by arms limitations. It is anticipated that the Soviets will develop solid-propellant ICBMs to supplement or replace some of the current liquid propellant systems. The SS-16, a small ICBM about the same size as the MINUTEMAN, is a solid-propellant ICBM which was developed by the Soviets in the early 1970s for mobile deployment. The system was never deployed. Future solid-propellant ICBM development and deployment could give the Soviets additional flexibility in handling and in basing their missile forces. Future missiles are expected to include upgraded versions of the present systems as well as new missiles.

SLBM FORCE

The Soviets continue to expand and modernize their SLBM force, now consisting of some 62 submarines carrying 950 modern SLBMs with a total of almost 2,000 nuclear warhead reentry vehicles. In the past seven years, the USSR has produced 30 SSBNs, and the new 20-tube, very

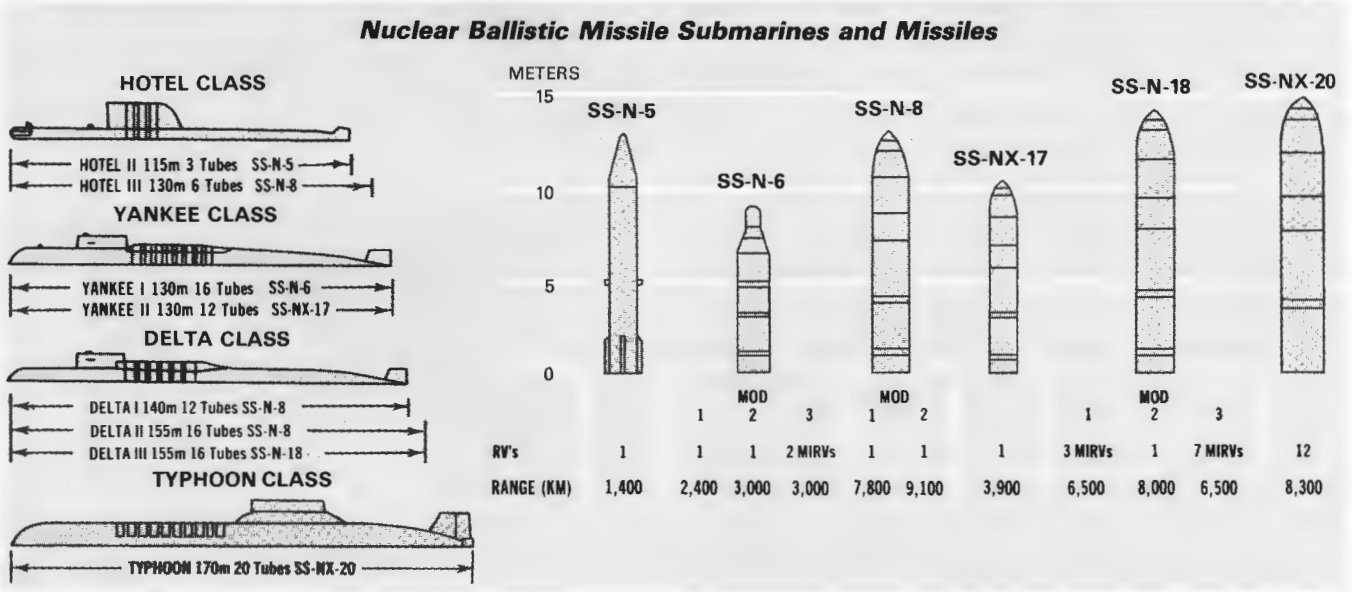


Length of TYPHOON Compared to Height of Washington Monument

large TYPHOON SSBN was launched in 1980. This new SSBN/SLBM system will be operational in the mid 1980s and is expected to include the SS-NX-20 missile. The SS-N-8 and SS-N-18 on DELTA-Class SSBNs permit the Soviets to hit targets in the United States from their home ports, and it is possible that the Soviets will develop follow-on SLBMs for these as well as the SS-N-6 on the YANKEE SSBNs.

The Soviet effort leading to this current capability began with the conversion of existing diesel-powered submarines in the mid-1950s to fire

YANKEE-Class SSBN



short-range ballistic missiles. In the early 1960s, the GOLF-Class diesel and HOTEL-Class nuclear-powered ballistic missile submarines were completed.

By the end of 1974, the Soviet Navy had 34 YANKEE-Class SSBNs in service, each carrying 16 nuclear-tipped missiles. During 1973, following the signing of SALT I, the first of the larger DELTA-Class submarines was completed. The early DELTAs displace some 11,000 tons submerged and have an overall length of about 140 meters. The modern deployed strategic Soviet SLBM/SSBN force includes the SS-N-18/DELTA III weapon system.

SS-N-6/YANKEE I: The SS-N-6/YANKEE I weapon system is composed of the liquid-propellant SS-N-6 missile and the 16-missile tube YANKEE I-Class SSBN submarine. The SS-N-6/YANKEE I weapon system became operational in 1968. There are different versions of the SS-N-6 SLBM. One version carries a single RV and has a maximum operational range

DELTA I-Class SSBN

of about 2,400 to 3,000 kilometers. Another version carries two RVs and was the first Soviet SLBM to carry multiple RVs. This SS-N-6 has a maximum operational range of about 3,000 kilometers.

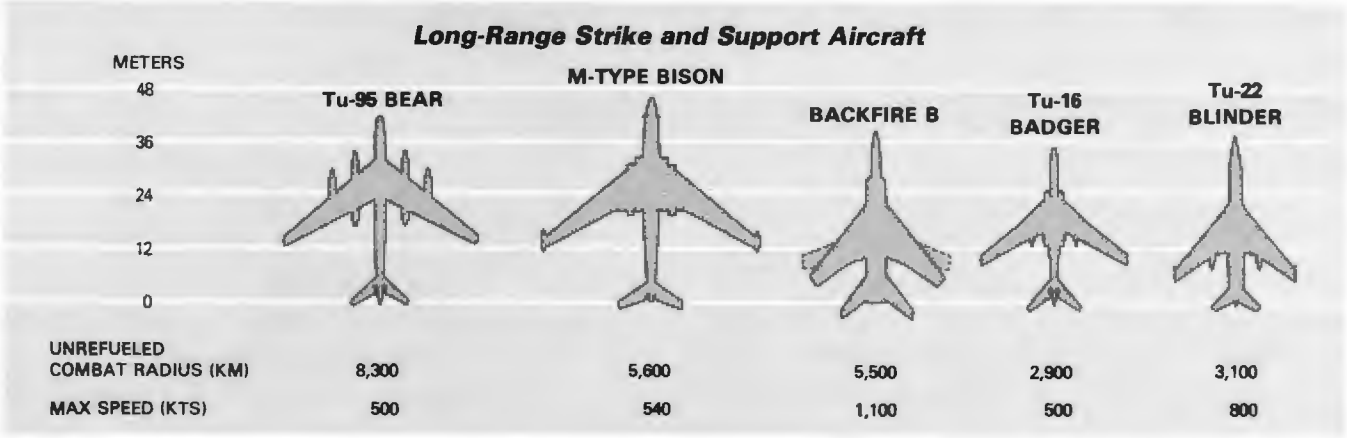
SS-N-8/DELTA I and II: The SS-N-8/DELTA weapon system includes the long-range, two-stage, liquid-propellant SS-N-8 SLBM and the 12-missile tube DELTA I and 16-missile tube DELTA II-Class SSBN submarines. The SS-N-8 was a significant change from previous Soviet SLBMs, even though liquid-propulsion technology was employed, because this was the first two-stage SLBM. The SS-N-8 has a maximum operational range of about 9,000 kilometers and carries one RV.

SS-N-18/DELTA III: The SS-N-18/DELTA III weapon system is composed of the SS-N-18 two-stage, liquid-propellant SLBM and the 16-missile tube DELTA III-Class SSBN.

The SS-N-18 is the first Soviet SLBM to demonstrate a MIRV capability. Its maximum operational booster range is about 6,500 to 8,000 kilometers depending on the payload configuration. Greater range is possible if the SS-N-18 post-boost vehicle, or small third stage, is used to push the payload further along its trajectory, in addition to maneuvering to place reentry

DELTA II-Class SSBN

DELTA III-Class SSBN



vehicles in line with intended targets. A single RV version is also operational.

With the advances achieved in other Soviet strategic missile programs, it is assumed the missile for the new TYPHOON will be more capable than the SS-N-18 carried on the DELTA III, possibly having greater range, better accuracy, higher payload and more warheads. Today the DELTA III submarines can cover most US targets from the relative security of their home waters. The TYPHOON at 25,000 tons submerged displacement, twice the size of the DELTA III, will certainly have no less capability.

LONG RANGE AVIATION

Long Range Aviation is comprised of more than 800 strike and support aircraft. Three-quarters of these are intermediate-range Tu-16/BADGER and Tu-22/BLINDER; the long-

M-TYPE/BISON Long Range Bomber

The Tupolev BACKFIRE Swing-Wing Bomber

range force includes more than 150 Tu-95/BEAR and M-Type/BISON, as well as some 70 Tupolev BACKFIREs.

The primary mission of LRA is to perform intercontinental and peripheral nuclear or conventional strike operations. The force also performs long-range reconnaissance, anti-naval strikes, and electronic warfare missions. Soviet long-range bombers complement the land and sea-based strategic missile forces, and in the event of intercontinental nuclear war they probably would be employed in follow-on nuclear strikes after initial missile strikes. The manned bombers provide the Soviets a degree of flexibility and diversity in their strategic attack forces not available with ballistic missiles.

The *Tu-95/BEAR* is a four-engine, swept wing, turboprop-powered bomber capable of carrying free-fall bombs or air-to-surface missiles. First seen in the mid 1950s, about 100 BEARs are still in service with LRA. Able to carry a payload in excess of 25,000 pounds (12,000 kilograms) to a range greater than 11,300 kilometers, it is both the largest and longest range Soviet bomber. The range and flexibility of some models can be further increased with mid-air refueling. Six variants of the BEAR have been produced, three for the strike mission, two for reconnaissance and one for antisubmarine warfare. Two of the strike versions are configured to carry the 650 kilometer AS-3/KANGAROO air-to-surface missile.

The *M-4/BISON* is a four-engine, swept wing, turbojet-powered bomber capable of carrying free-fall bombs. First seen in the mid 1950's, about 75 are still in service with LRA. About 45 of these are still configured as bombers while about 30 have been modified as air refueling tankers. They could be returned to

bomber configurations with little effort. This long-range, heavy bomber is able to carry a payload in excess of 12,000 pounds (5,500 kilograms) to a range of about 8,000 kilometers. The range and flexibility of some models can also be increased with mid-air refueling.

The *Tupolev BACKFIRE* is the latest addition to the LRA forces. The BACKFIRE is a twin-engine, swing-wing, turbofan-powered bomber capable of carrying free-fall bombs or

air-to-surface missiles. Placed in service in the mid 1970s, over 70 are deployed with Long Range Aviation with a like number assigned to Soviet Naval Aviation. This aircraft is still in production at the rate of about two and one-half aircraft per month, 30 a year.

The BACKFIRE is a versatile, multipurpose aircraft capable of performing nuclear strike, conventional attack, antiship and reconnaissance missions. Its range and payload capabilities are comparable to those of BISON—more than 12,000 pounds (5,500 kilograms) payload and a range in excess of 8,900 kilometers with a bomb load. Its versatility makes it an excellent strike aircraft for peripheral and possibly for intercontinental missions. The BACKFIRE can be equipped with probes to permit inflight refueling which would increase its range and flexibility.

Intermediate Range Bombers: The 600 intermediate range Tu-16/BADGER and Tu-22/BLINDER aircraft represent a significant capability for use in theater strike operations. The Tu-16/BADGER is by far the most numerous aircraft in the force. Ten variants of this twin-jet, subsonic aircraft have been produced. These variants have expanded the mission of the BADGER beyond standard bombing to include electronic countermeasures, air-to- surface missile delivery, reconnaissance, and refueling. The BADGER G can carry two AS-5/KELT to a range greater than 3,200 kilometers while the BADGER A with a 8,360 pounds (3,800 kilograms) bomb load has a range of over 4,800 kilometers. The swept-wing, supersonic Tu-22/BLINDER is powered by two afterburning turbojet engines. The missile-carrier variant can deliver an AS-4 to a range of about 4,000 kilometers. The BLINDER has also been produced in free-fall bomber, reconnaissance and trainer versions.

Air-to-Air Refueling: The Soviets have an air-to-air refueling capability for Long Range Aviation. While they have not yet developed an

Tu-95/BEAR A, the Largest, Long Range Soviet Bomber

aircraft specifically for refueling, some 30 modified BISON aircraft serve as tankers. The Soviets evidently are developing a tanker version of the Il-76/CANDID transport aircraft. If so, the system is not yet deployed in sizable numbers.

SOVIET STRATEGIC DEFENSE FORCES

Since the end of World War II, the Soviets have built and maintained the world's largest strategic defense force. Soviet efforts include each of the primary areas of defense concern: air defense, ballistic missile defense, antisatellite defense, antisubmarine warfare and civil defense. When combined with the strong counterforce orientation of Soviet strategic offensive forces, these defense efforts point to a strategic concept of layered, in-depth defense of the homeland. This concept starts with preemptive attacks, if possible, against Western nuclear offensive forces and their command and control. It then proceeds to active defense against weapons enroute to targets and to the preparation of passive defenses to protect the Soviet governmental infrastructure and society against the effect of weapons penetrating the defenses.

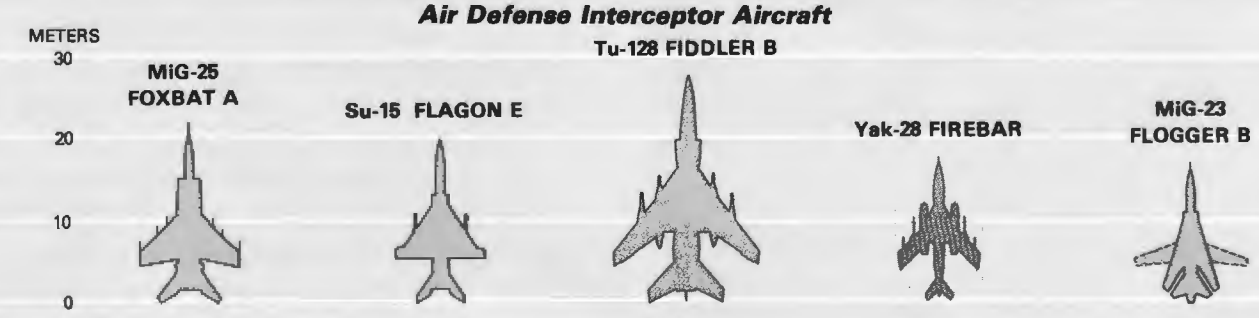
The technical problems associated with defense against air and missile attack are immense. Although Soviet defenses characteristically have fallen short of being able to handle fully the tasks they face, the USSR has persevered and is today entering a period of weapons system deployment aimed at measurably improving capabilities, primarily in air defense.

AIR DEFENSE

Manned Interceptors: Soviet air defenses combine the interceptor aircraft with early warning networks and surface-to-air missiles. There are more than 5,000 early warning and height-finding air defense radars throughout the USSR. Throughout the past decade, the USSR has continued to modernize its air defense forces which currently consist of some 2,500 aircraft, including the MiG-23/FLOGGER, MiG-25/FOXBAT, Su-9/FISHPOT, Su-15/FLAGON, Tu-128/FIDDLER and Yak-28/FIREBAR.

The number of older FISHPOT, FIDDLER and FIREBAR aircraft is decreasing as more modern interceptors are introduced to the inventory. FLAGON and the FLOGGER swing-wing interceptor aircraft are the workhorses of today's air defense interceptor force, comprising two thirds of the total inventory. The FLAGON, first deployed in the late 1960s, has been improved during the 1970s through additional armament and modernized avionics. The

Air Defense Interceptor Aircraft



	MiG-25 FOXBAT A	Su-15 FLAGON E	Tu-128 FIDDLER B	Yak-28 FIREBAR	MiG-23 FLOGGER B
SPEED (KTS)	1,625	1,200	950	1,080	1,350
RADIUS (KM)	1,450	1,000	1,250	900	1,100
ARMAMENT	4 AAMs	2 AAMs	4 AAMs	2 AAMs	4 AAMs
WINGSPAN (M)	14	9	18	12	8 (swept)

MiG-25/FOXBAT Interceptor

FLOGGER is the most widely deployed interceptor.

The Mach 3 FOXBAT, designed to counter a high-altitude threat, can operate at 25,000 meters. A cutback in its production in 1977-1978 suggests that Soviet policy shifted to meet requirements for a low rather than a high-level threat. A number of new interceptor aircraft types could enter the air defense force over the next decade. Soviet research and development most likely will emphasize the development of look-down/shoot-down systems designed to be able to operate above their intended targets, identify and track them against the cluttered background of the earth and fire missiles capable of functioning in the same environment.

AWACS: To increase the effectiveness of their force, the Soviets are developing an increasingly effective Airborne Warning and Control System (AWACS) to detect low-altitude penetrators. An earlier attempt, the Tu-126/MOSS, carrying a large rotodome radar on its back, does not appear to have met the need.

Organization: APVO's interceptor regiments are subordinate to ten air defense districts, each with its specific geographic areas of responsibility. The high concentration of interceptor regiments west of the Ural Mountains, and in the south, reflects the degree of Soviet concern over its perceived major threats—NATO and the People's Republic of China.

Soviet air defense systems are unsurpassed and are deployed in great variety and quantities. The Soviet air defense umbrella is integrated and overlapping and includes both tactical—associated with the Ground Forces—and strategic components. If not occupied with Ground Forces requirements, the tactical air defenses could be available to supplement the strategic forces.

Tactical Surface-to-Air Missiles: The first truly mobile tactical SAM, the SA-4/GANEF, was introduced around 1967. The SA-9/GASKIN infrared homing missile, mounted on a scout car, was deployed in 1968 and the shoulder-fired SA-7/GRAIL was introduced in 1968.

During the last ten years, the Soviets continued to improve the mobility, firepower and target-handling capability of their Ground Forces' air defense umbrella.

In the early and mid-1970s, they introduced the SA-6/GAINFUL and SA-8/GECKO at maneuver division level. The GECKO has a range of over ten kilometers and is unique

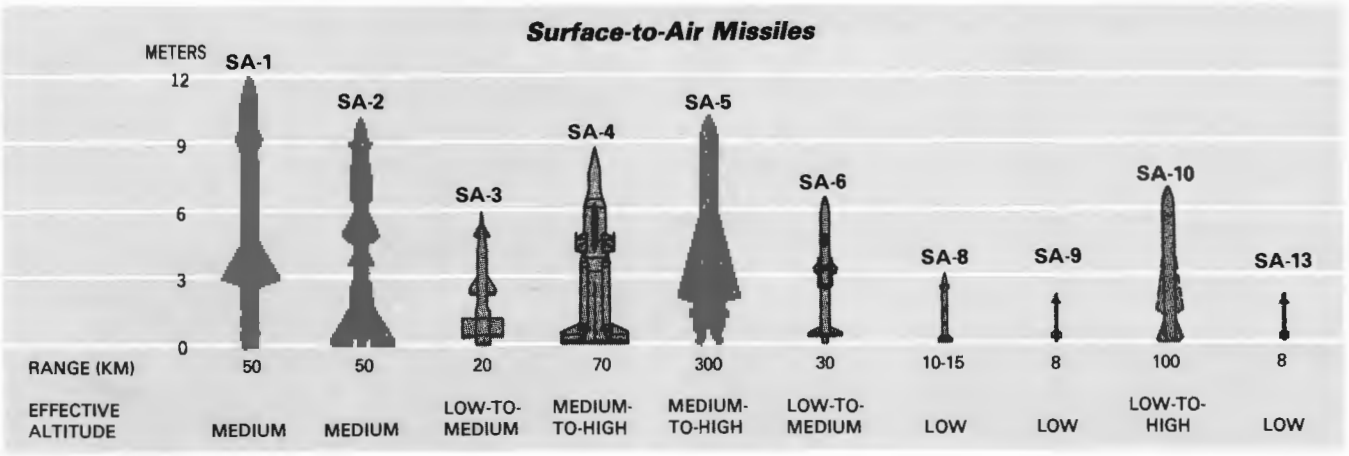
among Soviet tactical air defense systems in that all the components needed to conduct a target engagement are on a single vehicle. The GAINFUL has a range of about 30 kilometers. These new SAMs can keep pace with rapidly advancing maneuver forces.

In the late 1970s, the Soviets fielded the short-range SA-13 on a tracked vehicle. The SA-13 has been deployed along with the ZSU-23-4 in the antiaircraft battery of motorized rifle and tank regiments. The SA-13 is probably a replacement for the SA-9.

The trend of improving air defense coverage is expected to continue through the modification of existing systems and the introduction of new systems to supplement or replace them. This will be accomplished by improved technology. The diverse capabilities of Soviet air defense systems will be enhanced by improved command and control procedures to avoid destroying friendly aircraft while rendering the airspace over the ground forces virtually impenetrable to enemy aircraft. Other trends have been to increase the size of the engagement envelope, improve mobility, increase firepower, and increase target handling capability.

Strategic SAMs: The Soviet strategic surface-to-air missile (SAM) force is composed of some 10,000 launchers deployed at over 1,000 fixed sites within the borders of the USSR. These

SA-2/GUIDELINE Missiles on Transporters



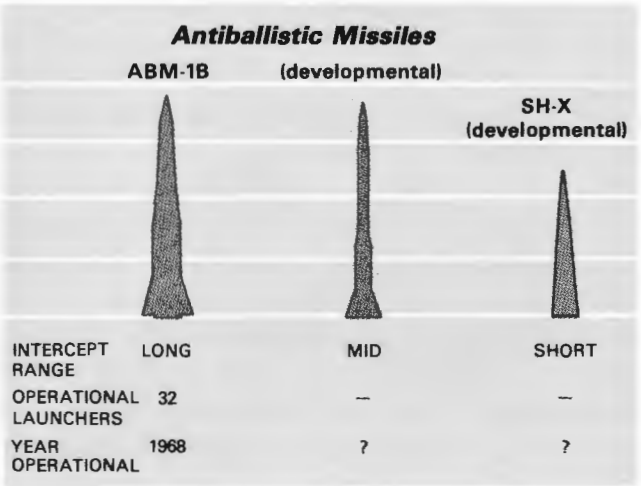
launchers can actually accommodate over 12,000 missiles because many of the launchers have multiple launch rails. In addition, other Warsaw Pact countries have over 1,000 launchers deployed in Eastern Europe. Four different SAM systems have been employed at these sites, and a new system—the SA-10—is now becoming operational. The four older systems are the SA-1/GUILD, SA-2/GUIDELINE, SA-3/GOA, and the SA-5/GAMMON, deployed in the USSR only. These systems are under the control of PVO Strany, the Air Defense of the Homeland, a separate service of the Soviet Armed Forces charged with protecting the Soviet Union from attack from the air.

The SA-2, initially operational in 1959, has been the backbone of Soviet SAM defenses. It is deployed throughout the Soviet Union and is used by non-Soviet Warsaw Pact and other communist and Third World nations as well. The SA-3 is now deployed throughout the USSR and Warsaw Pact at over 400 sites. It provides low-altitude coverage and point defense to selected strategic areas. Over half the sites use newer four-rail launchers, rather than the two-rail launchers, thus doubling the numbers of missiles in the ready-launch position.

The SA-5 was first deployed in 1963, and deployment continues today with over 100 complexes operational throughout the Soviet Union. The SA-5 is a long-range interceptor designed to counter the threat of high-performance aircraft.

The SA-10 system is the latest Soviet strategic SAM system and is designed for increased low-altitude capability. With radars which are more advanced than previous systems, the SA-10 was designed to counter low-altitude manned aircraft, although it may have some capability against cruise missiles.

In all, the Soviets maintain a vast network of SAM sites which are constantly being upgraded. This network, which acts in concert with the



ABM-1B/GALOSH Antiballistic Missile In Transporter/Launcher Canister

large numbers of interceptor aircraft and antiaircraft artillery, and is enhanced by a virtual 100 percent high-altitude coverage of early warning radars, presents a formidable barrier to any would-be attacker from the air.

ABM DEFENSE

The Soviets maintain the world's only deployed antiballistic missile (ABM) defense. The system includes peripherally located HEN HOUSE ballistic missile early warning (BMEW) radars and four operational ABM launch complexes near Moscow. The Moscow defenses currently include the ABM-1B/GALOSH interceptor missiles, battle management radars and missile engagement radars.

The Soviets have continued to improve their BMEW capability by constructing large phased-array radars to supplement the old HEN HOUSE network and to close existing gaps in coverage.

They also continue to engage in an active and costly ABM research and development effort, which they are permitted to do under the ABM Treaty of 1972. Their main concentration appears to be on improving the performance of their large phased-array detection and tracking radars and developing a rapidly deployable ABM system. When development of this system is completed, its main elements could be deployed in the Moscow area to replace or supplement the existing system. Such deployment would further upgrade Moscow's defenses, and could provide operational experience for broader deployment. Improving the Moscow defenses is allowed by the 1972 ABM Treaty as long as the 100 interceptor launcher limit is not exceeded. Deployment in additional locations is prohibited by the Treaty.

ANTISATELLITE DEFENSE

The Soviets' defensive posture extends into space as well with the only antisatellite (ASAT) system known to be operational. The demonstrated Soviet nonnuclear low-altitude orbital ASAT interceptor poses a known, if presently limited, threat to some US satellites. It is anticipated the Soviets will continue work in this area with a goal of negating satellites in high orbit, as well as developing more effective kill mechanisms, perhaps using a laser or some other type of directed energy weapons.

SOVIET CIVIL DEFENSE

Soviet civil defense is a nationwide program under military control. The chief of Soviet civil defense is a deputy minister of defense and general of the army. Full-time civil defense staffs

exist at each echelon of the Soviet administrative structure: national republic, *oblast,* city, and urban and rural *rayon*. Civil defense staffs also exist at significant industrial and other installations. In peacetime, more than 115,000 people work full-time in the program. In wartime, the number could be upwards of 16 million. The program costs more than the equivalent of $2 billion annually.

Protection of their leadership has been a primary objective of the Soviets. Given a war-crisis warning of only a few hours, the survival and effective functioning of the 110,000 government and other officials necessary to lead the Soviet Union may be possible. This protection has been achieved through the construction of deep, hard urban shelters and countless relocation sites. Leadership protection, from the national to *rayon* level, is intended to assure the maintenance of control throughout the society.

A civil defense problem of vital concern to the Soviets is their continuing inability to provide physical protection for their industrial installations. Although there have been numerous references in Soviet civil defense literature to the desirability of dispersal of key industries for protection purposes, little has been done to achieve this goal.

The Soviet leadership considers the protection of these resources through their civil defense program to be an indispensable element of their strategy. They continue a longstanding commitment to heavy investment in their civil defense program.

VI QUEST FOR TECHNO

LOGICAL SUPERIORITY

The Soviets have often stated their goal of superiority in science and technology. The present, growing Soviet military capability reflects the achievements of a technological base that has grown steadily since the late 1950s, despite the fact that the Soviets have nothing comparable to the commercial technology base in the Western World.

The recent increase in the level of deployed Soviet military technology is significant, because the West has customarily relied on its now eroding technological superiority to offset the Soviet Union's historical quantitative advantage in deployed weapons. Even the United States' lead in basic military technology is presently being challenged.

During the 1970s, the Soviets have dramatically reduced the US lead in virtually every important basic technology. The United States is losing its lead in key technologies, including electro-optical sensors, guidance and navigation, hydro-acoustics, optics and propulsion. In many areas where the United States continues to lead the Soviets, their technology has achieved a level of adequacy with respect to present military requirements.

Over the past ten years, the Soviet Union is estimated to have taken the lead in the development of directed energy weapons such as high-power lasers and possibly radio frequency devices. The USSR is also thought to have enlarged its lead in electrical power sources for such directed energy weapons, as well as its more customary lead in chemical explosives.

The T-80 tank, now in experimental production, is the third, new class of tanks with markedly improved firepower, armor and mobility produced by the USSR in recent years, a weapons system underscoring the across-the-board Soviet quest for quantitative and qualitative weapons superiority.

At present the United States still leads the Soviets by two-to-seven years in microelectronics, computers and jet engines critical to the development of advanced weapon systems.

In the past, to offset the superior quality of Western weapons, the Soviets have deployed larger quantities of military equipment. Furthermore, they have typically fielded one-and-one-half-to-two generations of equipment while the West fielded a single generation. And, they have often modified each of these generations two or three times, upgrading their technology with each modification. This combination of a high rate of deployment and an almost continuous program of modifying fielded equipment substantially reduces the average age of deployed technology. The West's technological lead is thus doubly eroded by the much younger age, as well as by the very large number, of fielded Soviet equipment.

The Soviets' weapons development effort, paced by a weapons acquisition process in which key national decision-makers directly participate, represents a systematic correction of deficiencies in the USSR's existing military capabilities and the methodical addition of new weapons capabilities.

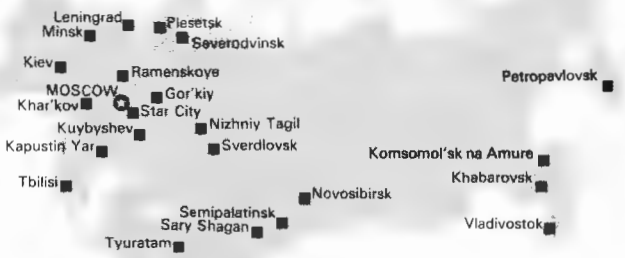
The momentum of the Soviet research and development program is likely to continue. Scores of major Soviet systems are now in various stages of test and evaluation. Many of these systems are quite significant, for example, the T-80 tank, the TYPHOON ballistic missile submarine, the OSCAR cruise missile submarine, a new interceptor and associated look-down/shoot-down missile and a variety of precision-guided munitions.

Pacing each of the Soviet weapon system developments is a very large research effort in the sciences and technologies. Over the past ten years, the high-priority military research and development sector received large infusions of

capital investment leading to significant growth in those research, design and test facilities critical to Soviet weapons development.

A concurrent increase in the size of the Soviet R&D manpower force has also been noted. In 1980 the USSR was believed to have had nearly 900,000 full-time equivalent scientists and engineers engaged in research and development. This is the world's largest aggregation of scientists and engineers and is compared to about 600,000 for the United States. While the number of scientists and engineers specifically engaged in Soviet military R&D is unknown, it is clearly a large percentage of their total effort.

Soviet Research and Development Centers



In 1980 the Soviets graduated about 300,000 engineers and 150,000 natural scientists (including life sciences and medicine) out of a total of over 800,000 graduates. The trend in Soviet higher education graduates has been one of steady increase, although the rate of increase has declined in recent years. By 1990 the total number of graduates in the USSR is expected to be at least 950,000 per year.

ALFA-Class Nuclear-Powered Attack Submarine: Deep-Diving, Titanium Hull, Submerged Speed Estimated to be Over 40 Knots.

MILITARY TECHNOLOGIES

Certain critical military technologies including electronics, propulsion, materials and life sciences are receiving highest priority in the USSR today.

Electronics and Computers: Although the United States remains the world leader in the field of microelectronics and computers, Soviet progress in the past 15 years has been impressive.

Advanced miniaturized electronics or microelectronics are vital and necessary elements of modern computers. Since modern electronic computers are the "heart" and "brain" of military weapons, and industrial, economic, management and other complexes or systems, Soviet achievements in microelectronics greatly benefit the military.

In 1965, Soviet development and production of microelectronics and computers was about 10-to-12 years behind US capability. Today, the average relative position or "gap" is three-to-five years with a few outstanding developments following US technology by only two years and some problem areas lagging by as much as seven years. Important Soviet decisions to acquire US and Western technology and copy, or "reverse engineer," microelectronics and computers by

Soviet RYAD Computers

any means available have played a fundamentally important role in their success. The Soviet RYAD series of computers are based on existing US computer equipment. Similarly, Soviet microcomputers and microprocessors are clearly based on US minicomputer and microprocessing equipment already on the market. The Soviets have also copied many different types of US integrated circuits including computer logic and memory chips from practically all the major US microcircuit manufacturing facilities. Without the transfusion of US technology and equipment, the Soviet Union's capabilities would almost certainly have remained at the 10-to-12 year gap of the 1965 era.

Directed Energy Weapons: The Soviets have devoted substantial resources to high technology developments applicable to directed energy weapons. Their knowledge of radio frequency weapons, as demonstrated in Soviet open literature, and the fact that they are developing very high peak-power microwave generators, gives rise to suspicions of possible weapon intent in this area as well. The Soviets have been interested in particle beam weapons (PBW) concepts since the early 1950s. There is considerable work within the USSR in areas of technology relevant to such weapons.

Artist's Concept of Soviet Surface-to-Air Laser Weapons

The Soviet high energy laser program is three-to-five times the US level of effort and is tailored to the development of specific laser weapon systems. In contrast, the United States largely confines its laser programs to exploratory work. The Soviet laser-beam weapons program began in about the mid-1960s. Since then the Soviets have been actively pursuing the development of all the high energy laser types considered most promising for future weapons applications. They have worked on the gas dynamic laser, the electric discharge laser and the chemical laser. Available information suggests that the Soviet laser weapon effort is by far the world's largest. Their development of moderate power weapons capable of short-range ground-based applications, such as tactical air defense and anti-personnel weapons, may well be far enough along for such systems to be fielded by the mid-1980s. In the latter half of this decade, it is possible that the Soviets could demonstrate laser weapons in a wide variety of ground, ship and aerospace applications.

Pulse Power and Technology: Pulsive power and energy conversion have been recognized as key technologies in the development of directed energy weapons. Possible applications include tactical airborne electric discharge lasers, tank and helicopter-mounted laser weapons, strategic or defensive antiballistic missile and antisatellite weapons and beam weapons for both short and long-range antiship missile defense. A principal pacing factor in the development of directed energy weapons is the availability of a suitable supply of energy. Pulse power technology may be the pacing factor in a weapons program even after the feasibility of beam propagation and adequate lethality is demonstrated. Because the requirements of beam weapons are unique and, in many cases, exceed current state-of-the-art, they have driven the major research and development efforts in the USSR.

Propulsion: The Soviet Union customarily provides the propulsion units for all its aircraft, ships and land vehicles. The Soviets have conducted research and experimentation on new types of propulsion concepts for generations and have often produced innovative designs. For example, the SA-6/GAINFUL missile unveiled in 1967 used the world's first integral rocket ramjet. The Soviet recognition of the advantages in gas turbines for naval propulsion resulted in an impressive shift to this form of propulsion in the past 20 years. In addition to their low weight and volume, the advantages of gas turbines include operational flexibility, reduced manning levels, and ease of maintenance.

Until recently, the Soviet Navy's KARA-Class guided missile cruiser, operational since the early 1970s, was the world's largest gas turbine-powered warship. The USSR still leads the world in the widespread use of naval gas-turbine propulsion. It has applied this mode of propulsion to over 200 major and minor combatants.

Propellants: Soviet scientists are investigating all aspects of propellant chemistry and performance characteristics at several academic institutions throughout the USSR. The Soviets design their artillery and other propellant charges to obtain maximum performance, although they tend to use low energy propellant formulations in most of their large-caliber ammunition to maximize safety and storage life.

Explosives: The USSR is active in all facets of explosives research and development. The Soviets can now synthesize every known explosive compound with a military application, including research for fuel-air explosives. They can load their newest weapons with warheads containing TNT (trinitrotoluene), RDX (cyclo-

trimethylene trinitramine) or HMX (cyclotetramethylene tetranitramine). Western fuel-air explosive munitions are capable of clearing paths through minefields to permit the passage of armored vehicles. Such explosives can also do extreme damage to unarmored targets such as radar vans and aircraft.

MANUFACTURING

The success or failure of all weapons is heavily dependent on the quality and quantity of the materials used in their construction. The USSR has the largest raw materials base in the world and claims deposits of nearly all minerals needed by a modern economy. Since the 1950s, materials used in Soviet weapon systems have steadily improved.

Through considerable efforts and a combination of foreign and indigenous technology, the Soviets have built an imposing industrial base. While frequently less efficient in their use of capital, raw materials and manpower, the Soviets have nonetheless assembled the plant and equipment necessary to build annually thousands of tanks, trucks and aircraft and dozens of naval vessels.

Welding has assumed a high position among the fabrication techniques used by the Soviets because it permits complex shapes to be formed from a limited variety of mill products (e.g., sheet, plate, tube and rods). To augment their strong position in this area, the Soviets graduate several thousand welding engineers annually. The Soviets have been important innovators of welding methods, e.g., friction welding, submerged-arc welding, glue welding and certain aspects of pulse-arc welding. They have been creative in their development of methods for welding dissimilar and difficult-to-weld materials. Their construction in the late 1950s of what continues to be the world's largest forging and extrusion presses at 75,000 tons and 20,000 tons, respectively, was a bold move that enables the Soviets to fabricate aircraft structural components in sizes and with efficiencies that are unsurpassed.

By the late-1960s, the Soviets had perfected two new methods for refining steel and other alloys—electroslag remelting and plasma-arc melting—advancements in the methods to improve the properties of alloy materials.

The vast amount of technical data published by the industralized Free World on materials technology has permitted, and has probably encouraged, the USSR to emulate and adopt Western developments. The differences in the materials used in Soviet and US weapon systems are thought to be approaching the point where the differences are no longer militarily meaningful.

Metallic Materials: Soviet achievements in metallurgy cover the complete spectrum of research and development emphasizing alloy development and materials processing.

The Soviet Union produces a full range of structural steels from the plain carbon and high-strength low-alloy steels to the stainless and maraging steels. The Soviets also are producing a unique high-manganese steel for cryogenic applications due to their abundant supply of manganese-bearing ores.

While high energy costs have reduced Western use of magnesium alloys, the Soviet Union's production of magnesium alloys was increasing in the 1970s. The weight advantages of their magnesium-lithium alloys may cause this material to be useful in aerospace systems.

Since the 1940s, the major industralized nations have committed great amounts of R&D manpower and resources to improving the performance of the superalloys. The term "superalloy" refers to alloys that possess good strength and oxidation resistance in the temperature range of 650°C-2000°C. These alloys are of

critical importance in the high temperature sections of gas turbine engines. The Soviet superalloys are thought to be as capable as Western alloys with respect to temperature capability but may possess shorter service lives.

The USSR is the world's largest producer of titanium alloys. The Soviets' titanium alloys are being extensively applied to enhance the performance of aircraft, missile, and naval ship systems using modern welding techniques.

Composite Materials: Since the mid 1960s, the Soviets have been constructing small naval vessels from glass-fiber-reinforced plastics. The glass-fiber-reinforced plastics also have been introduced into aircraft, missile and ground weapons applications. Based on Western successes in the late 1960s on high-performance carbon and boron-fiber reinforced materials, the Soviets launched a parallel effort in the mid 1970s. Their program is progressing along similar lines to that taken by the US and other Western countries by first incorporating such materials into aircraft secondary structures and control surfaces. The large Soviet commitment of physical and manpower resources to the development of a variety of high-modulus fiber-reinforced metal, organic and inorganic matrix composites should enable them to gain ground quickly in this field.

Organic Materials: By the early 1960s, the Soviets realized the importance of organic materials—resins, elastomers, adhesives, synthetic fibers—to a modern economy and military preparedness. Since that time, the USSR's chemical industry has been expanding at a formidable rate. Much of the technical knowledge has been directed at achieving high temperature capabilities.

LIFE SCIENCES

The Soviet Union has extensive R&D programs in the life sciences, the medical, biological, and behavioral sciences, and, in some areas, their capabilities equal or exceed those of the United States.

In general, the Soviet Union's life science research program centers on those areas that permit them to establish or maintain a military advantage, and those areas that will contribute to the solution of critical economic, industrial and political problems. While their early efforts in manned space flight, for example, were devised to gain maximum political benefit, their current efforts seem to be related to the establishment of a military presence in space. Man-related problems and life support systems capability are the chief limiting factors in Soviet manned space flight.

The Soviets also conduct extensive research in other areas that contribute to the establishment of a military advantage. Underwater physiology, submarine habitability, human factors engineering and aviation physiology are examples of this type of research. The research goals in these areas are related to improving the performance of the biological component of their weapon systems.

The Soviet Union also conducts biomedical research in many other areas that affect their military capability. There is continuing Soviet interest in the recognition of emotional and physiological stress by voice analysis. Battlefield troops, pilots, submarine personnel and other isolated individuals could be monitored by voice analysis. The only constraints would be the quality of voice transmission and the analytic techniques.

Other areas of biological science research in the Soviet Union are directly applicable to developing weapon systems. Research in behaviorial modification, biological warfare and genetic engineering all have the potential to result in the development of new and extremely effective weapons.

Behavior Modification: The Soviets are currently engaged in a number of research efforts directed at modifying the brain, its activity and ultimately the behavior of individuals and large groups of people. Significant work in this area—including psychosurgery, microelectrode implantation, electromagnetic radiation, drugs and physical methods for altering behavior—has been conducted. The Soviets have political and military goals for conducting behavior modification research.

Biological Warfare: Since the summer of 1979, information has been obtained from a variety of sources that presents strong circumstantial evidence of an inadvertent release of anthrax bacteria from a highly secured military installation in Sverdlovsk, in the USSR. The available information and our technical analysis point strongly to biological R&D activities that exceed those one would normally expect for biological warfare protection purposes. Furthermore, we cannot discount the probability that the Soviets have continued to pursue other microbiological agents for possible development and standardization as weapons of biological warfare.

Genetic Engineering: The Soviet Union is currently conducting extensive work in genetic engineering, which is the ability to selectively modify the composition of the genetic blueprint (DNA) in order to engineer biological organisms to meet specific design criteria. Although there is no work with genetic engineering being done in the Soviet Union that is known to be directly related to biological warfare, there is interest in this area. Soviet scientists are researching genetic regulatory mechanisms, recombinant gene vectors, recombinant gene stability, and basic aspects of viral and bacterial genetics, all of which have potential value for development of biological warfare agents. Similar research is, however, being pursued on a broader scale in the United States and may serve as an impetus for increased Soviet interest. Of greatest potential benefit to the military is the development of vaccines using recombinant technology for troop immunization.

SPACE PROGRAM

The Soviets have a vigorous and constantly expanding military space program. In the past ten years they have been launching spacecraft at over 75 per year, at the rate of four-to-five times that of the United States. The annual payload weight placed into orbit by the Soviets is even more impressive—660,000 pounds—ten times that of the United States. Some, but by no means all, of this differential can be accounted for by long-life US satellites using miniaturized high technology components. Such an activity rate is expensive to underwrite, yet the Soviets are willing to expend resources on space hardware at an approximate eight percent per year growth rate in constant dollars.

We estimate that 70 percent of Soviet space systems serve a purely military role, another 15 percent serve dual military/civil roles, and the remaining 15 percent are purely civil. The Soviet military satellites perform a wide variety of reconnaissance and collection missions. Military R&D experiments are performed onboard Soviet manned space stations, and the Soviets continue to develop and test an ASAT antisatellite co-orbital interceptor.

The Soviets appear to be interested in and possibly developing an improved ASAT. A very large space booster similar in performance to the Apollo program's Saturn V is under development and will have the capability to launch very heavy payloads into orbit, including even larger and more capable laser weapons. This booster is estimated to have six-to-seven times the launch weight capability of the Space Shuttle.

Soviet space research and development, test,

production, and launch facilities are all undergoing a continuing buildup. The new booster will be capable of putting very large permanently manned space stations into orbit. The Soviet goal of having continuously manned space stations may support both defensive and offensive weapons in space with man in the space station for target selection, repairs and adjustments and positive command and control. The Soviet's predominantly military space program is expected to continue to produce steady gains in reliability, sophistication and operational capability.

TECHNOLOGY TRANSFER

In addition to being the source of much of the Soviet Union's electronic and computer technology and advanced manufacturing capability, the industrialized Free World, during the past decade, has supplied the Soviet industrial sector with billions of dollars worth of efficient machine tools, transfer lines, chemical plants, precision instrumentation and associated technologies. These goods and technologies have unquestionably played a major role in the modernization and expansion of Soviet industry. Although much of the technology embodied in the Western equipment is known and understood by Soviet technicians, the purchase of such equipment via long-term low interest loans has enabled the Soviet Union and other Warsaw Pact countries to achieve an industrial expansion at a substantially faster rate than would have been possible with indigenous resources.

In addition to the acquisition of Western industrial plants and equipment, the decade of the 1970s has also witnessed greatly expanded contact between the Free World and Soviet scientists and engineers. The scope and depth of their interest in the advanced and emerging technologies is exemplified by the exchange agreements that the Soviet Union has negotiated with the United States since 1972.

Bilateral S&T Exchanges: In 1972 the Soviets signed the first four of 11 agreements with the United States dealing with cooperation in the fields of science and technology. These 11, now combined into ten agreements, have encompassed as many as 250 different working groups and subgroups for the exchange of scientists, scientific and technical information and documentation, and joint research, development, testing and exchange of research results and experience.

Another mechanism of technology transfer under seven of the ten agreements is contained in a provision, "Article IV," stating that both parties encourage and facilitate the establishment and development of direct contacts and cooperation between agencies, organizations, and firms of both countries. The majority of the "Article IV" agreements are with the Soviet State Committee for Science and Technology. This is the unit charged with the responsibility of coordinating technology acquisitions from the West.

Student Exchanges: Student exchanges usually occur under the aegis of a cultural agreement. The student exchanges with the Soviet Union and the East European communist countries are administered by the International Research and Exchanges Board (IREX). The average Soviet student in such exchanges is 33-to-35 years of age, possesses a Candidate degree, roughly equivalent to a Ph.D., and has about eight years of practical experience, almost all of which apply to the study and conduct of research in the hard sciences or engineering. Further, the students want to concentrate in the emerging technological areas, with many of these areas having immediate military application.

In the senior scholar program, each side sends a number of scholars for a total of 50 man

months per year. As with the student exchange program, the Soviets tend to send scientists, while the United States sends persons specializing in the arts, literature, and history. Until a few years ago, most Soviets in this program conducted very basic scientific research. Now, nearly all of them propose to study in the emerging scientific fields, with most of these fields having direct and immediate military application.

Inter-Academy Exchange: The exchange between the US and Soviet Academies of Science makes available another mechanism of technology transfer. The provisions of this agreement permit the exchange of 12 scientists per year (one month each) for the purpose of survey and familiarization visits, and as many as 18 scientists for periods of three to 12 months each for a maximum of 88 man months per year.

Conferences/Symposia: The problem of technology transfer at conferences is one of additional concern. US companies use such gatherings to advertise the results of their work to industry, government, and the academic community in the hopes of securing additional contracts. The academic community uses conferences and symposia for the presentation of major papers. The government frequently uses this media to advertise its requirements and to provide status reports. For whatever reasons, this media makes available a wealth of scientific and technological data that is probably not surpassed by any other nation.

Unclassified Reports: All research reports and studies conducted by, or for, the US government are placed in one or more repositories. In defense, most reports and studies are sent to the Defense Technical Information Center (DTIC), where they are accessioned and the classified documents stored. Such classified documents are readily available to other government agencies and personnel who have the requisite clearances and need-to-know. They are also available to government contractors who have established a valid need through their contracting officer and possess the necessary facilities and cleared personnel. Unclassified reports received by DTIC are forwarded to the National Technical Information Services (NTIS) operated by the Department of Commerce. These reports are available to anyone for a very nominal fee.

The communist countries are some of NTIS' best customers. Until their subscription was terminated in February 1980, the Soviets purchased each of the estimated 80,000 documents entering NTIS each year. The remaining Warsaw Pact countries and individuals acting on behalf of the Soviets still purchase from the NTIS.

Professional/Open Literature: For many years professional and open literature has been exploited for technology transfer information. There is believed to be a great imbalance in the value of such literature in favor of the communist countries.

The Soviets are seeking Western technology and equipment by any and all means in their quest for technological superiority. In the past, Soviet weapon designers appeared to be somewhat constrained in the effectiveness of the products they could develop by a limited technological base for specialized components. Technology transfer affords them the opportunity to rectify such deficiencies. The vast amount of information gained from the United States saves the Soviets a considerable amount of time and money by pointing out the fruitful avenues of research and development.

VII SOVIET GLOBAL P

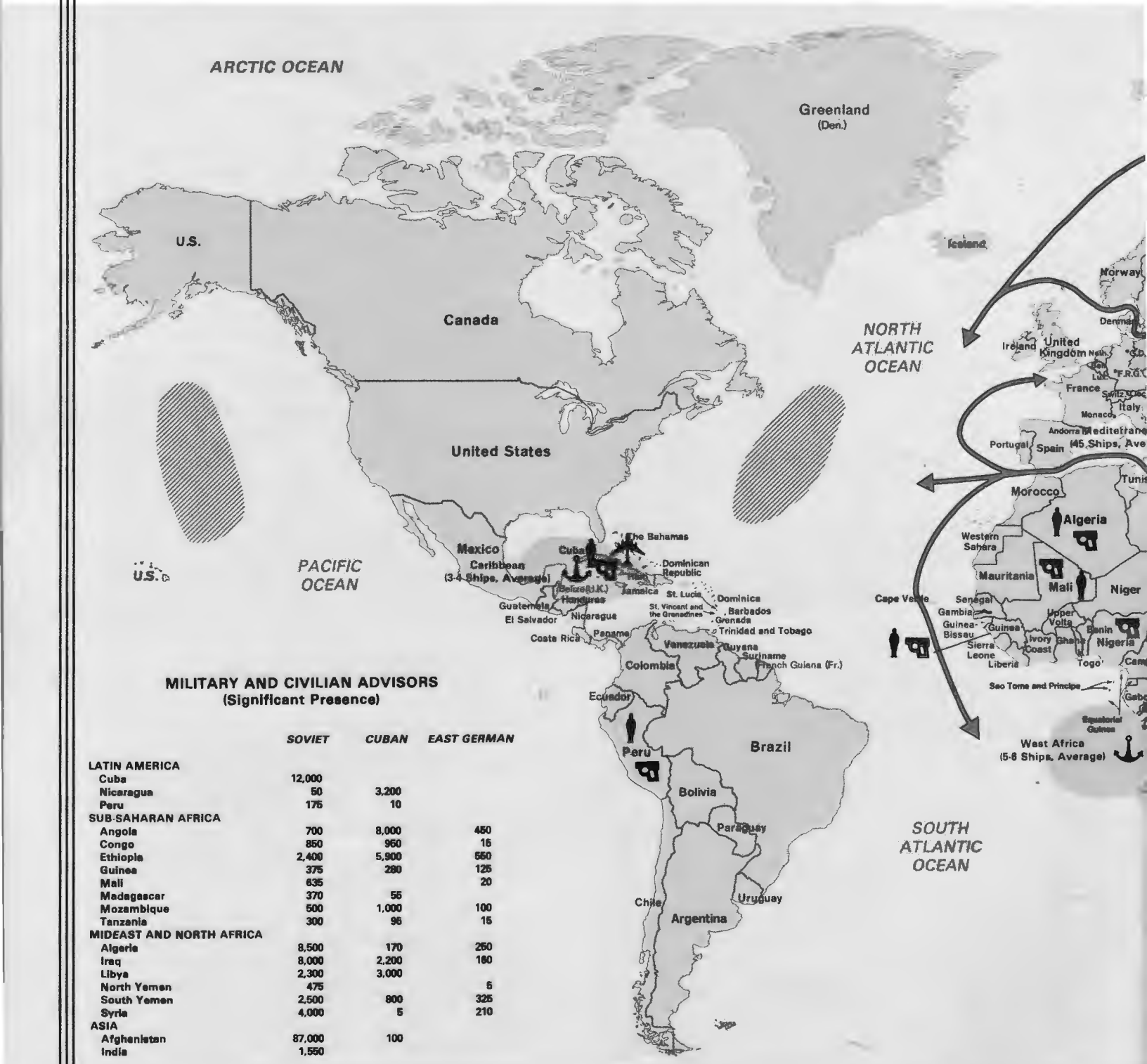
OWER PROJECTION

As self-designated leader of the communist world and as a superpower with global ambitions, the USSR and its expansionist efforts abroad are targeted at spreading and solidifying USSR political, economic and military influence and drawing nations into its orbit. The Soviets view the projection of power in much more comprehensive terms than commonly understood in the West. Their programs seek to integrate all instruments at their disposal in pursuit of their goals. In the past decade, Moscow's increasing boldness can be linked directly to the growing capabilities and utility of its military forces, applied in a pragmatic, coordinated and flexible manner with other military, political, economic and subversive measures to influence world events. The USSR's enhanced confidence in its capabilities to project power through a variety of military and non-military means has widened Soviet options and has been a key factor underlying its increased activities in Africa, the Middle East, Asia and Latin America. In the military realm alone, involvement abroad has progressed steadily from the limited use of military assistance in the 1950s, to the occasional use of its armed forces in defensive roles in the early 1970s, to the extensive use of proxies in advisory positions and combat operations over the last five years, to the direct application of large-scale Soviet military force in Afghanistan since December 1979.

Violence and coercion have played a central role in the establishment and maintenance of

The CANDID jet transport, which can carry 140 troops or 40 tons of cargo, entered service in the mid-1970s to help meet the USSR's worldwide military airlift requirements. Because of their mobility, the USSR's seven airborne divisions are particularly well-suited for the rapid introduction of Soviet combat forces.

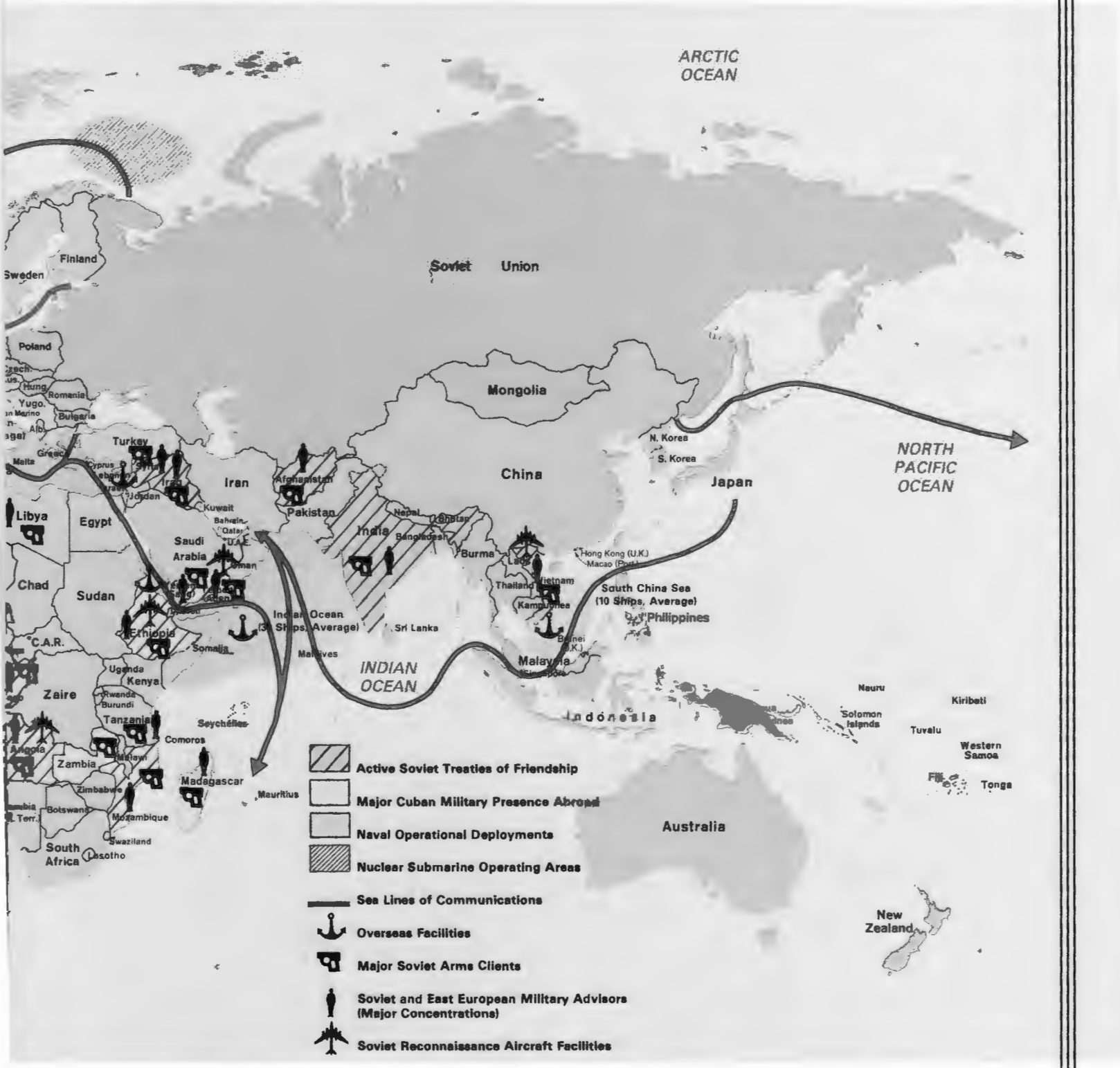
SOVIET GLOBAL



MILITARY AND CIVILIAN ADVISORS
(Significant Presence)

	SOVIET	CUBAN	EAST GERMAN
LATIN AMERICA			
Cuba	12,000		
Nicaragua	50	3,200	
Peru	175	10	
SUB-SAHARAN AFRICA			
Angola	700	8,000	450
Congo	850	950	16
Ethiopia	2,400	5,900	550
Guinea	375	280	125
Mali	635		20
Madagascar	370	55	
Mozambique	500	1,000	100
Tanzania	300	96	15
MIDEAST AND NORTH AFRICA			
Algeria	8,500	170	250
Iraq	8,000	2,200	160
Libya	2,300	3,000	
North Yemen	475		5
South Yemen	2,500	800	325
Syria	4,000	5	210
ASIA			
Afghanistan	87,000	100	
India	1,550		

POWER PROJECTION



the Soviet Union and its East European satellites. The Soviet need for and use of force as a tool of domestic control, combined with the historic Russian policy of security through territorial aggrandizement, have given it the impetus to attempt to transform conflicts, tensions and resentments into concrete political gains. While the Soviets no longer wholly subscribe to Lenin's dictum that the advance of socialism "...is impossible without a violent revolution...and the destruction of the apparatus of state power...," they do believe that military force is the major propellant of change in international affairs. They see growing Soviet military strength as providing a favorable backdrop for the conduct of their dual-track foreign policy: the maintenance of traditional diplomatic and economic ties on the one hand, while promoting subversion and revolution in the same states on the other.

Trends in the Soviet military force buildup over the past 15 years have resulted in a number of improvements allowing for the increased use of military power to support foreign policy goals. Primary among these have been the development of an effective Navy with global capability and the expansion of strategic airlift capability. Soviet military leaders have long recognized the political significance of these improvements, and in the early 1970s began making authoritative statements about the utility of Soviet Armed Forces beyond the borders of the USSR.

Soviet adventurism has been buttressed by the USSR's belief that the correlation of forces has shifted in Moscow's favor. Soviet leaders continue to refute any inconsistency between detente with the West and their growing support of revolutionary activism and insurgencies in the Third World. They believe that comprehensive aid to progressive forces is a moral requirement rather than interference by an external power. Article 28 of the 1977 Soviet Constitution specifically commits the Soviet Union to support wars of "national liberation."

To the Soviets, power projection does not involve the episodic military reaction to regional or world crises. Rather, it is a continuously applied means of foreign policy activity. Besides military forces, the Soviets project power and influence through the employment of a mixture of less visible, integrated elements including the KGB, diplomats and traditional state-to-state activities, military advisers and aid, treaties and legal ties, support for terrorists and pro-Soviet guerrilla groups, economic aid, cultural, media, and educational diplomacy, and the use of what the Soviets call active measures such as propaganda, blackmail and forgery. The coordinated use of these tools allows Moscow to develop an "infrastructure of influence" in a target country and to react rapidly to changing situations by applying the appropriate instruments, allowing the penetration of areas that may be beyond the immediate reach of Soviet military forces.

In their projection of power the Soviets include the pursuit of specific military objectives, for example, the acquisition of overflight clearances and access to facilities abroad to support the military operations of Soviet and friendly forces and to expedite the air- and sea-lift of military equipment to Third World clients and insurgent forces. Overseas facilities ease the logistic problems of operating naval forces and aircraft at great distances from the Soviet homeland.

A broader, basic Soviet objective is the termination of Western and Chinese influence in the developing countries, and the concomitant expansion of the USSR's own political, military, and economic power and influence. The Soviets seek to gain strategic footholds in a number of client states and to promote the accession to

power of radical, anti-Western regimes. In this process and in order to demonstrate that they retain their leadership of the world communist movement, the Soviets portray themselves as the ideological vanguard of the world's "national-liberation" movements.

The Soviets are also seeking to develop a viable oil and strategic minerals denial strategy, either through physical disruption, market manipulation, or domination of producing or neighboring states. Soviet statements clearly reflect the USSR's understanding of the extent to which the United States and Western Europe currently depend on imports of vital strategic materials from the developing regions. By undermining Western ties with the oil and raw materials producers and exacerbating differences in the Western Alliance over policies toward these regions, the Soviets seek to erode both the economic health and political cohesion of the West.

The planning and control of foreign policy is the exclusive domain of the central organs of the Communist Party—the Politburo and the Central Committee. The orchestration of all foreign operations, including the broad range of subversive activities, is the responsibility of the Central Committee's International Department. The International Department's most important task is to advise on and implement the export of revolution. It maintains contact with scores of communist and radical parties and groups, allocating funds, providing training, and devising takeover strategies. The International Department plans, coordinates and oversees the work of various Soviet party, state and military organs involved in official activities abroad, as well as the KGB, front organizations, friendship societies, insurgent groups, and other elements engaged in illegal, subversive, and clandestine operations. Possession of a highly centralized, interlocking, authoritarian decision-making and decision-implementing apparatus facilitates the USSR's coordination of various tools and tactics toward basic goals and creates a synergistic effect difficult for Western democracies to match.

INSTRUMENTS OF EXPANSION

Arms Sales: Since their origin in 1955 with a $250 million arms agreement with Egypt, the Soviet Union's military sales have grown into a multi-billion dollar annual program. These sales form the basis for Soviet penetration of a number of Third World countries, providing Moscow access to nations and regions where it previously had little or no influence. In the last 25 years, the Soviets have granted over $50 billion in military assistance to 54 noncommunist nations, with 85 percent going to nine nations in the Middle East and along the Indian Ocean littoral. This is supplemented by $4.3 billion in arms sales by Warsaw Pact allies.

The Soviet Union's willingness to provide arms to almost any customer at low prices has been an important inducement to newly independent former colonies eager to improve their military capabilities. The favorable financial terms, eight-to-ten-year deferred payments at two percent interest, coupled with free training and maintenance services as well as fast delivery schedules, prove to be important enticements in gaining early contracts.

The Soviets have been adept at exploiting anticolonial nationalistic sentiments to the detriment of Western nations. The Arab-Israeli conflict, Indo-Pakistani tensions, as well as "liberation" movements in sub-Saharan Africa and Central America have all been utilized by the USSR to gain access and a subsequent political role in regional affairs. Major Soviet resupply efforts following the 1967 and 1973 Mideast wars contributed to the rapid growth in Soviet arms sales.

Provision of more complex equipment at higher prices resulted in a nearly threefold increase in Soviet arms sales in the period 1974-1980 in contrast to the previous 20 years. Four major Arab client states accounted for over 70 percent of the $37 billion in arms aid during this period. Sales to India and Ethiopia accounted for another 15 percent. Recent exports include such advanced systems as the MiG-25 and MiG-23 fighters, the SA-6 and SA-9 missiles, the Mi-24/HIND attack helicopter, and the T-72 tank. Occasionally, these weapon systems have been exported to important clients before they have been provided to Warsaw Pact allies.

Military Advisers: The dispatch of Soviet advisers is a natural—and often required— complement to the provision of arms and equipment. In 1980, approximately 20,000 Soviet military personnel were stationed in 28 countries, where they play a central role in organizing training and penetrating client-armed forces. Heavy concentrations of advisers are found in those countries with large amounts of Soviet arms: Algeria, Libya, Angola, Ethiopia, Iraq, Syria and South Yemen. Important missions are often headed by one or more Soviet flag or general officers.

Since 1955, some 52,000 military personnel from the less-developed countries have been trained in the USSR and East Europe. Soviet advisers are able to cultivate pro-Soviet sentiments, influence local military policies and pinpoint promising candidates for further training and indoctrination in the USSR. The importance the Soviets attach to the missions and roles of military advisers is underscored by the fact that a Main Directorate of the General Staff centrally controls their operations.

Economic Aid: Selective economic aid often follows arms sales in Soviet efforts to increase its influence in the Third World. However, total Soviet economic aid is well below arms aid, amounting to only $18 billion to 67 countries in the last 25 years. The USSR has achieved a number of important benefits from its small economic assistance program, at a very small cost to the Soviet economy. By concentrating on a number of highly visible showcase projects such as the Aswan Dam in Egypt, the Bokaro Steel Mill in India and the Tigris-Euphrates Dam in Syria, the Soviets have gained maximum political benefits.

The economic aid program has also resulted in an expansion in Soviet trade with the nations of the Third World. In 1955 total Soviet trade with Third World nations was $260 million. By 1978 that figure had increased to $13.4 billion, or roughly 15 percent of the Soviet total. An added advantage of this trade was that much of it was conducted in hard currency, which earned the Soviets funds with which they could purchase needed Western technology. Additional hard currency earnings from the nearly 33,000 Soviet economic advisers worldwide have grown to over $100 million. Projects such as a gas pipeline in Afghanistan and an alumina plant in Turkey exported needed raw materials back into the Soviet economy, another benefit of the aid program.

The economic aid program has also enabled the Soviets to provide training for Third World nationals in the Soviet Union. These trainees have returned to their native countries and now make up a considerable portion of the total number of professional and skilled workers in these nations. Roughly 31,000 students, mostly from African and Middle Eastern nations, were being trained in the Soviet Union in 1979. The Soviets view their economic aid program as an important tool for expanding Soviet influence in the Third World.

Proxies: The use of proxy forces has significantly augmented Soviet power projection

capabilities. The Soviets have drawn on the political, military, and economic dependence of such allies as Cuba and East Germany in order to promote anti-Western causes and extend the USSR's own influence. The dispatch of proxy military forces and advisers to contentious areas minimizes the USSR's risks and deflects charges of imperialism while also giving support to progressive forces in a regional conflict.

Since the large-scale introduction of Cuban troops into the Angolan civil war in 1975, Cuban units and military advisers have grown in numbers in sub-Saharan Africa and have also appeared in the Middle East. There are currently approximately 35,000 Cuban military personnel in nearly 20 countries—about 20 percent of Cuba's regular forces. In addition to Angola and Ethiopia, substantial numbers of Cubans are in Mozambique and South Yemen. Soviet-blessed or inspired Cuban activities in the Caribbean and Central America are on the upswing. Cuban roles abroad include military, economic, and intelligence and security operations.

Fidel Castro has declared that it is Cuba's duty to help liberate the Third World from colonial, imperialist bonds, but Havana's capability to send military personnel overseas would be considerably reduced without massive Soviet support and sponsorship. Castro's repeated assertion of a natural alliance between the less-developed, nonaligned nations and the Soviet camp is a classic case of a proxy espousing the Soviet Union's propaganda.

Among the East Europeans, the East Germans are the most active proxies, specializing in the training of police and security cadres and intelligence operatives, the penetration of local governments, and the development of communist parties and front organizations. To a lesser extent, Hungarian, Czechoslovak and Bulgarian involvement has been noted in Africa and the Middle East.

The Soviets have also gained international advantages through other nations whose interests and aims often converge with the USSR's. Vietnam's military activities in Southeast Asia and its posture as a counterweight to China, periodic South Yemeni instigation of instability on the Arabian Peninsula, the involvement of North Korean pilots in a number of overseas countries with sensitive political situations and Libya's support for a variety of radical and terrorist causes all serve as examples.

Treaties: As a major component of its efforts to consolidate its ties with less-developed nations, the USSR has signed 12 treaties of friendship and cooperation since 1971, of which ten are still in force. While such pacts do not reflect the true nature of the Soviet support, it is no coincidence that the signatories have been the recipients of substantial Soviet military and economic assistance. The signing of these treaties occurred at different stages of Soviet relations with the countries in question. With Angola and Ethiopia, treaties were signed after the principal objectives of military operations were basically achieved and the Soviet presence was entrenched. Moscow signed pacts with New Delhi and Hanoi shortly before they launched invasions of Pakistan and Kampuchea, respectively. The ruling regimes in the Congo, Syria and Afghanistan signed partly because they needed a tangible sign of Soviet backing against domestic opponents.

The treaties vary slightly, containing similar calls for mutual cooperation, respect for sovereignty, and consultation on issues of common interest. While none are mutual defense pacts like those between the USSR and Eastern Europe, they all contain a general provision calling for military cooperation in the face of "threats" to peace and security. The USSR used

that article in the treaty with Afghanistan as a legal pretext for its military intervention. A similar article in the Vietnam treaty provided the rationale for Moscow to support and supply its client during and after Vietnam's February 1979 war with China.

Subversion: Overt foreign programs are paralleled by covert action. The principal instrument for these activities is the KGB, although other Party and state organs are brought into play. The foreign operations of the KGB, which has a unique charter as the Party's action arm for the projection of Soviet power, are of two complementary types: destabilization and penetration. The destabilization of target countries is accomplished by the use of such techniques as economic disruption, labor strikes, sabotage, assassination, clandestine aid and—in conjunction with the Main Intelligence Directorate (GRU) of the General Staff—the training of local groups for terrorism, guerrilla and "national liberation" struggles. The Soviet intelligence and security apparatus has available a number of special purpose forces for sensitive peacetime and wartime missions abroad. The Soviets have a tradition, dating from the Civil War period following the 1917 Revolution, of employing unconventional forces and methods. Special purpose units were used in the Soviet invasion of Czechoslovakia in 1968 to arrest the Czechoslovak leadership and secure key objectives in Prague, and they played an important role in the invasion of Afghanistan and the elimination of President Amin. Soviet unconventional warfare operations are supported by agent networks in the target country. The KGB and GRU recruit local nationals and place their own agents in vital areas of a nation's social and political structure, such as the military, ruling and opposition parties, the press, labor, key industries, local intelligence services and student groups. Local communist parties, Soviet friendship societies, front organizations and leftist trade unions are often heavily funded by the Soviets and assist the USSR in consolidating its influence. Some of these operatives actively engage in subversion, while others are "sleepers," prepared to act only in the event of war. Both types are trained to operate as political agitators, intelligence collectors and saboteurs.

KGB subversive operations abroad are facilitated by allied Warsaw Pact and Cuban intelligence and security services. These services, which were either created by the KGB and its predecessors or are guided by Soviet advisers, often capitalize on diplomatic access or other overt types of presence denied to the USSR, and serve as useful "middlemen" for the execution of Soviet strategy.

KGB activities are aided by the official Soviet presence in the target country—embassies, consulates, journalists, trade organizations and military and civilian advisers. These entities not only pursue their normal overt functions, but also provide useful cover mechanisms for Soviet intelligence personnel. A large percentage of Soviets with diplomatic accreditation are KGB or GRU intelligence officers, and KGB operatives are present in every visiting political, economic, and cultural delegation.

Propaganda and disinformation are essential tools serving Soviet international objectives. The Soviet Union's application of overt propaganda and covert action techniques has been vividly demonstrated by its continuing attempts to prevent the deployment of US neutron warheads and to impede the modernization of NATO's theater nuclear forces.

Forces for Power Projection: The Soviets of late have been more aggressive in their use of military forces to project their power and influence. These activities have ranged from sizable Soviet and Cuban presence, including on-site

participation by the current Chief of Soviet Ground Forces, in Ethiopia during the war with Somalia, to the invasion of Afghanistan by Soviet troops in 1979.

In 1974 the late Minister of Defense Marshal Grechko wrote:

> "The historic function of the Soviet Armed Forces is not restricted merely to their defending our motherland and the other socialist countries. In its foreign policy activity the Soviet state actively and purposely opposes the export of counterrevolution and the policy of oppression, supports the national liberation struggle, and resolutely resists imperialist aggression in whatever distant region of our planet it may appear. The party and the Soviet government rely on the country's economic and defense might in fulfilling these tasks....
>
> The development of the external functions of the socialist armies is a natural process. It will continue."

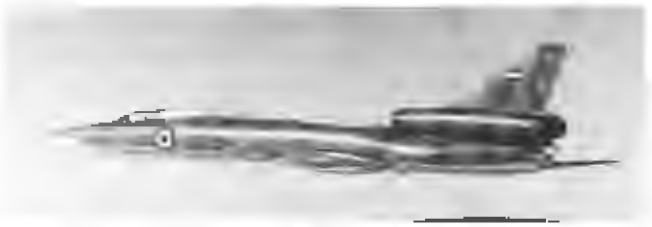
Grechko's statement is an echo of a similar theme expressed in 1969 by Marshal Sokolovskiy in *Soviet Military Strategy*.

> "We consider it our duty to support the sacred struggle of oppressed peoples and their just wars of liberation against imperialism. This duty the Soviet Union discharges consistently and steadily by helping the peoples in their struggle with imperialism not only ideologically and politically but materially as well. The USSR will render, when it is necessary, military support as well to people subject to imperialist aggression."

Airborne and Special Purpose Units: Because of their mobility, the Soviet Union's seven airborne divisions are particularly well-suited for the rapid introduction of combat forces into a foreign country. The Soviets threatened such action in the Middle East wars of 1967 and 1973, and in 1979 airborne units were the spearhead elements of the move into Afghanistan. Airborne divisions remain at a high state of readiness. While lightly equipped and not suitable for operations against a well armed adversary, the combat elements of an airborne division, delivered rapidly to a distant region by Military Transport Aviation and Aeroflot aircraft could overwhelm the indigenous forces of a number of less developed countries, at least in the initial stages of an assault.

MiG-23/FLOGGERs in Cuba

The speed with which Moscow can deploy an airborne force depends on a number of factors: the distance to be flown, the level and type of expected opposition, the granting of overflight and staging/refueling rights, and the availability of logistic support. While Soviet long distance airlift capabilities continue to lag behind those of the United States, the Soviets could move, under optimum conditions, major elements of an airborne division to a country such as Syria in three-to-five days. Utilizing its substantial geographic advantages, however, the USSR could attack vital regions such as Iran and the Persian Gulf with massive ground and air forces staging directly from the Soviet homeland and secured contiguous areas. The only constraint



Libyan Tu-22/BLINDER Supersonic Bomber

to the overt application of Soviet military forces in a number of less-developed nations—assuming the lack of success of more indirect means of penetration and takeover—is the USSR's assessment of the Western response.

The Soviet Navy: The Soviet Navy has proven to be the most effective force thus far in projecting power beyond the USSR's borders. Admiral of the Fleet Gorshkov has written:

> "The Soviet Navy is an instrument of a peace-loving policy and the friendship of peoples, a policy of suppressing the aggressive aspirations of imperialism, deterring military ventures and resolutely counteracting threats to the security of the peoples on the part of imperialist powers.
>
> "With the appearance of the Soviet Navy on the ocean expanses, the Soviet Union has been given new, wider potentialities for using the fleet in peacetime to support the country's state interests. And these potentialities are being successfully realized."

Since 1966 there has been a dramatic increase in Soviet port visits focused on the Mediterranean, the Indian Ocean and the coast of West Africa. Since 1967, the Soviets have established a number of forward naval deployments which provide the nucleus for augmentation during periods of tension. The Mediterranean and, most recently, the Indian Ocean squadron in 1980, have both been reinforced to counter Western navies during times of crises. These deployment patterns demonstrate the Soviets' capability rapidly to assert their interests in

A KRESTA II-Class Guided Missile Cruiser and KRIVAK II-Class Missile Frigate replenish from a Soviet oiler on the high seas.

Libyan FOXTROT-Class Attack Submarine

regions far from the Soviet Union's borders.

The USSR operates the largest fishing fleet in the world, with nearly 4,000 oceangoing ships. This fleet provides various types of support to Soviet naval units, including modest logistics aid and intelligence reports on Western naval units. The Soviets have also exported a substantial amount of fishing equipment and technology to Third World nations and entered into a number of agreements with 18 nations to help them develop their own fishing industries.

The Soviet merchant fleet has also grown considerably in the past decade, more than keeping pace with major Western shipping firms. Soviet market calls at Third World ports have increased by 60 percent in the past decade. In addition to its important economic activities, the merchant marine has also been used to ship Soviet arms to client states on a routine basis and during times of crisis. The addition of 40 roll-on/roll-off ships, which can unload cargo via large ramps, has increased the capability of the Soviet Union to deliver military cargo such as tanks to ports without sophisticated cargo handling facilities. In a contingency these ships could be used to support Soviet amphibious operations.

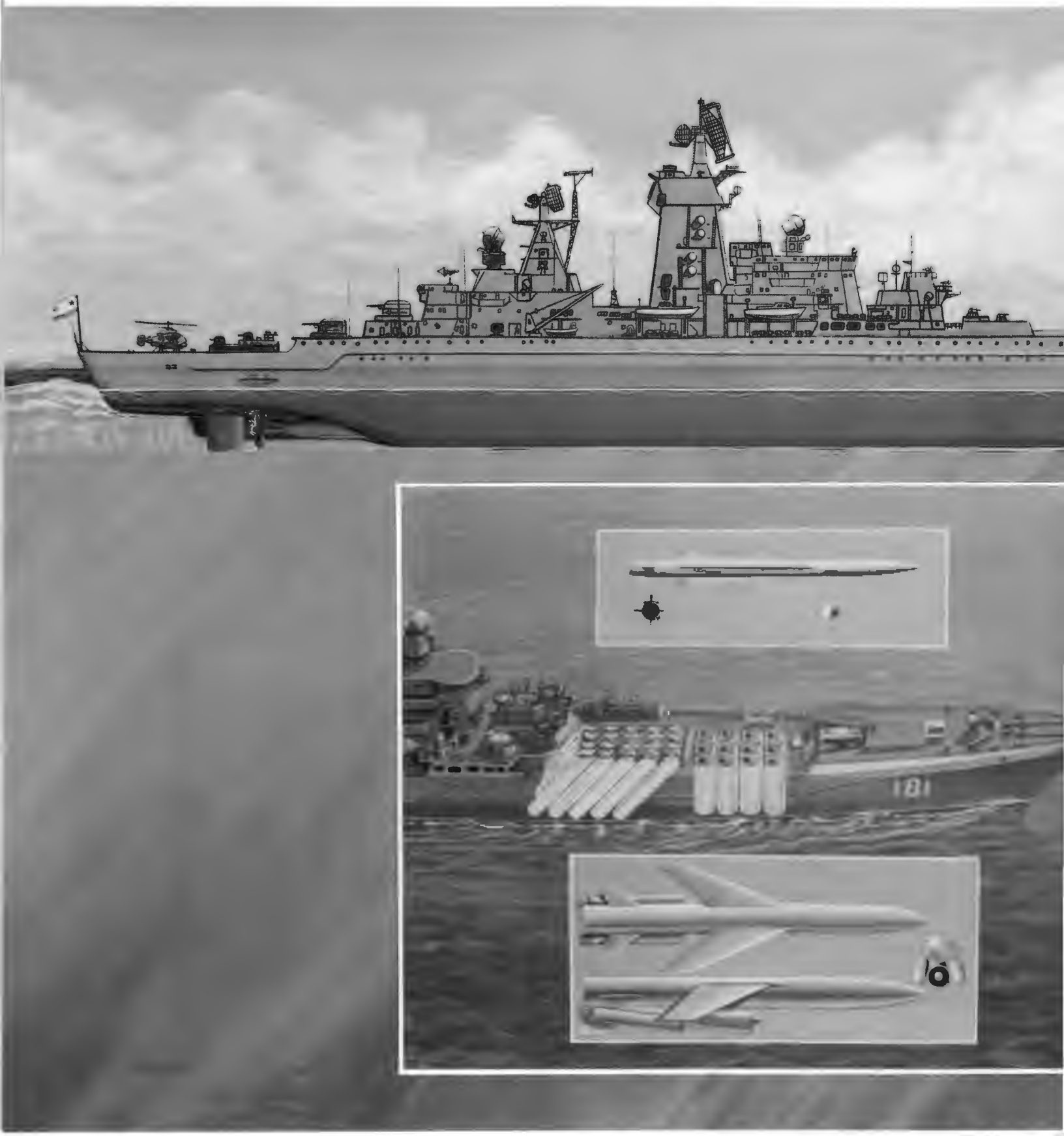
The merchant fleet also provides logistic support to Soviet naval units on a regular basis, particularly to units that are deployed to distant regions. Merchant ships possess an important advantage in that they can obtain water, fuel or food in ports which might be denied to warships or auxiliaries, thus giving the Soviets an additional degree of flexibility in support of their forces.

The Soviet Navy views access to support facilities and protected anchorages as an important adjunct to their operations in distant areas. Currently, the Soviets have access to such facilities in South Yemen, Ethiopia, Vietnam and Cuba and have recently made their first naval port call to Libya.

Access to foreign naval and air facilities has improved Soviet capabilities to monitor and counter Western naval units in the Atlantic and Indian Oceans and in the South China Sea. Soviet naval and antisubmarine warfare aircraft routinely deploy to nations offering such facilities to conduct surveillance and training missions. Access to air facilities in South Yemen and Ethiopia has been particularly useful for the Soviets in gathering intelligence on US naval units in the Indian Ocean and has improved their ability to conduct strike operations in this region. The operation of these aircraft from client state facilities gives a further visible presence to Soviet military power and influence in the region.

Distinct from enhancing the USSR's military capabilities, access to facilities also has important political utility. Political considerations certainly played an important part in Moscow's shift from supporting Somalia to aiding Ethiopia in 1977. Use of such facilities provides the Soviets with a presence in the region which they can then exploit to serve their interests. A recent example was the transit of the Soviet aircraft carrier MINSK far into the Gulf of Thailand, a not very subtle attempt to pressure Thailand to accept the Vietnamese invasion of Kampuchea. The USSR will continue to use the power projection capabilities of its military forces as well as other tactics to support Soviet political-military objectives and those of USSR client states.

VIII THE CHALLENGE

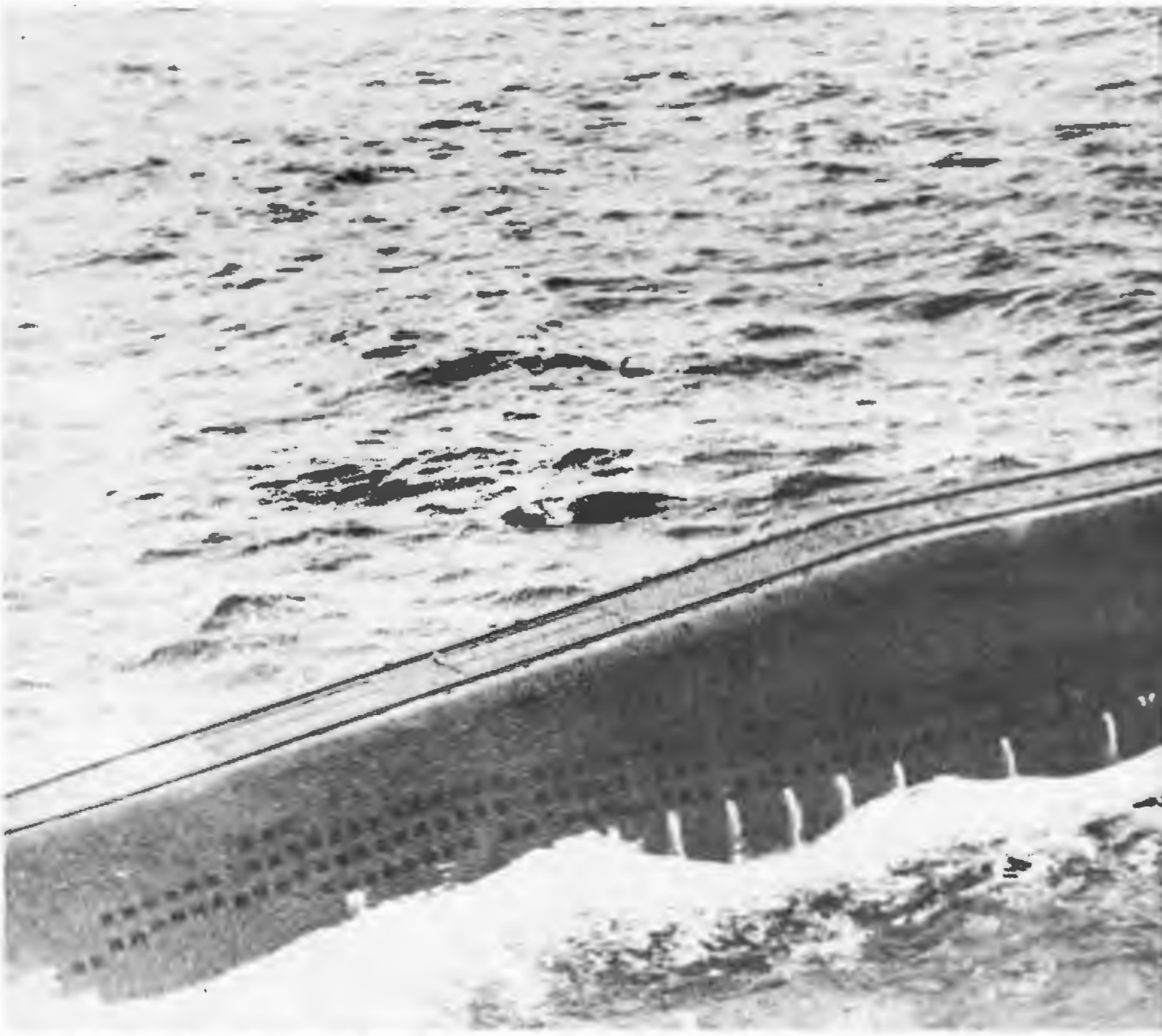


The Soviets begin the 1980s with strategic nuclear, theater nuclear and conventional armed forces and supporting elements that in both absolute and relative terms are substantially more capable than they were at the beginning of the 1970s.

The Soviet leadership, the key members of which have shepherded these forces for over 20 years, places great stock both in the international political influence and in the reality of military power that the forces underwrite in concert with other less visible means in the struggle with the West. In developing and deploying their strategic nuclear forces, the Soviets have subscribed neither to Western notions of strategic sufficiency nor to the concept of assured destruction. Instead, while they believe that nuclear war and its debilitating results must be avoided, they see the development of superior capabilities wedded to a strategy designed to achieve military victory and a dominant postwar position as the only rational approach to nuclear forces. The Soviet Union now exceeds the United States in the number of strategic nuclear vehicles. Soviet SS-20 theater nuclear forces are being deployed in increasing numbers against Western Europe and Asia.

As a result of a decade of missile force modernization and expansion, the Soviets have improved the reliability, payload and accuracy of their ballistic missiles allowing an improved hard-target kill capability. All evidence indicates that the Soviets will continue their steady effort to improve the quality of their land-based

KIROV, the USSR's first nuclear-powered surface warship, symbolizes the increasing strength of the Soviet Armed Forces and the increasing projection of USSR military power around the world. The KIROV carries 20 new-type long-range cruise missiles, and includes 12 vertical launch tubes for surface-to-air missiles in her heavy suit of weaponry.



The ballistic missiles of the DELTA III-Class SSBNs have a range of 7,500 kilometers.

missile force, striving for higher reliability, faster response time and greater accuracy.

In the last ten years, the Soviets have introduced four classes of new ballistic missile submarines. The long-range missiles of the DELTA-Class SSBNs can reach the United States while still in Soviet ports. The Soviets now have over 30 operational DELTAs. The SS-N-18, a missile installed in the DELTA III, has a range of about 7,500 kilometers and a post-

boost vehicle capable of dispensing MIRVs. The TYPHOON SSBN, twice the size of the DELTA, has been launched and will be deployed in the 1980s.

Throughout the past decade, the Soviets have maintained their heavy-bomber strike force and have developed and deployed the BACKFIRE bomber capable of both theater and intercontinental delivery. Evidence would indicate that the Soviets are in the process of developing a

new long-range bomber, and possibly a strategic cruise missile carrier.

In the tactical ballistic missile field the 40-mile FROG and 500-mile SCALEBOARD short-range ballistic missile systems were replaced by or augmented with the newly developed SS-21 and SS-22 SRBM systems. Soviet tactical missile systems of the next decade can be expected to incorporate new technology to make them lighter and more mobile, more accurate and more responsive.

During the 1970s, new generations of Soviet infantry weapons—assault rifles, antitank grenade launchers and multiple rocket launchers with greater range and lethality—were introduced. Heavily armed helicopter gunships now number in the thousands.

Over the past ten years the Soviets have expanded their ground forces to more than 180 divisions. The Soviets today have superior ground forces in Europe. They have a substantial advantage both in number of troops and quantity of armored assault vehicles.

During the 1970s, the Soviets fielded two new tanks, the T-64 and T-72. Both exhibit significant improvements in firepower and protection which place them in a family apart from previous Soviets tanks. The Soviets are now experimentally producing a T-80 tank which will likely fire improved ammunition and incorporate futher improved armor to meet the West's deployment of the 120-mm gun.

A new generation of Soviet antitank guided missiles was fielded in the mid-1970s to replace the manual systems of the early 1960s. The new antitank weapons are semiautomatic, more accurate, tube-launched systems with greater range and increased armor penetration. The design objectives of future Soviet antitank missiles will emphasize improved armor penetration and fully automatic guidance and control.

In the early 1970s, different Soviet self-propelled artillery pieces began to appear—first the 152-mm self-propelled howitzer, then the 122-mm self-propelled howitzer which, like the BMP all-purpose infantry fighting vehicle, is amphibious and has a nuclear, biological and chemical air filtration system. The 152-mm and 122-mm self-propelled artillery have ranges of over 17 kilometers and 15 kilometers respectively. The trend of at least six Soviet artillery, mortar and cannons developed in the past decade appear to be continuing in the 1980s. Continued application of the self-propelled design principle to different cannon and rocket artillery can be expected in the 1980s. Additionally, ammunition improvements will be made to achieve ever greater range and lethality.

Over the past ten years, the Soviets introduced two new versions of the VICTOR nuclear-powered attack submarine (SSN) and developed the ALFA high-technology attack submarine. In 1980, the Soviets produced OSCAR, the prototype of a new class of nuclear-powered cruise missile attack submarine (SSGN) which is about twice the size of any previous SSGN. High Soviet priority is being devoted to antisubmarine sensor technology applicable against ballistic missile submarines.

The Soviets have produced two new classes of air-capable ships, the MOSKVA-Class helicopter cruiser and KIEV-Class VSTOL carrier. The Soviets are expected to have a new larger class of carrier, capable of handling conventional aircraft in the late 1980s.

Four new classes of Soviet surface combatants are entering service. The most capable is the large, multipurpose KIROV-Class nuclear-powered guided missile carrier. These new surface combatant classes are to be outfitted with new suits of advanced weapon systems. The Soviets are expected to continue to develop ma-

jor naval combatants during the 1980s.

New Soviet ships and supporting auxiliaries reflect a thrust toward power projection capabilities at increasingly long ranges. The Soviet fleet is working constantly to introduce modern and sophisticated sensors and weapon systems, especially defensive missiles and cruise missiles.

Over the past decade the West's air superiority over Europe has been eroded by the capable aircraft being deployed in Soviet Air Defense Forces and Frontal Aviation. In the past decade, the Soviets introduced three types of new aircraft designed for the ground attack mission.

During the 1980s, the Soviets are expected to give high priority to the development of new fighter aircraft for both the ground attack and air superiority missions. They are expected to deploy precision guided munitions which use laser or antiradiation homing guidance. Improved navigation systems as well as more accurate bombing/navigation radars are expected to improve the all-weather capability of Soviet ground-attack aircraft.

During the past decade, the Soviets deployed a wide variety of new all-weather air defense intercept fighters. New Soviet interceptors, such as the Modified FOXBAT will be the Soviets' first look-down/shoot-down fighter. Armed with four new AA-X-9 missiles and possibly four shorter-range infrared air-to-air missiles, it will be able to detect, track and engage targets at very low altitudes. The Soviets are expected to deploy a new airborne warning and control system (AWACS) to replace the Tu-126/MOSS, beginning in the mid-1980s.

The trend of improving surface-to-air missile air defense coverage is expected to continue through the modification of existing systems and the introduction of new systems, enhanced by improved command and control procedures to avoid destroying friendly aircraft while rendering the airspace over the ground forces virtually impenetrable to enemy aircraft.

The Soviet Union is intensely engaged in a program designed to achieve a dominant role in space. Soviet space projects have matured into well-integrated systems contributing further to the Soviet military effort.

The Soviet Union's research and development priorities and continued expansion of military industrial production capabilities are keyed to supporting continuing military growth and modernization. In turn, the combined capabilities of the Soviet Ground Forces, Strategic Rocket Forces, Air Forces, Air Defense Forces and Navy are keyed to assisting the projection of Soviet power abroad and the spreading and solidifying of the Soviet Union's political, economic and military influence around the world. This is the challenge we face.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