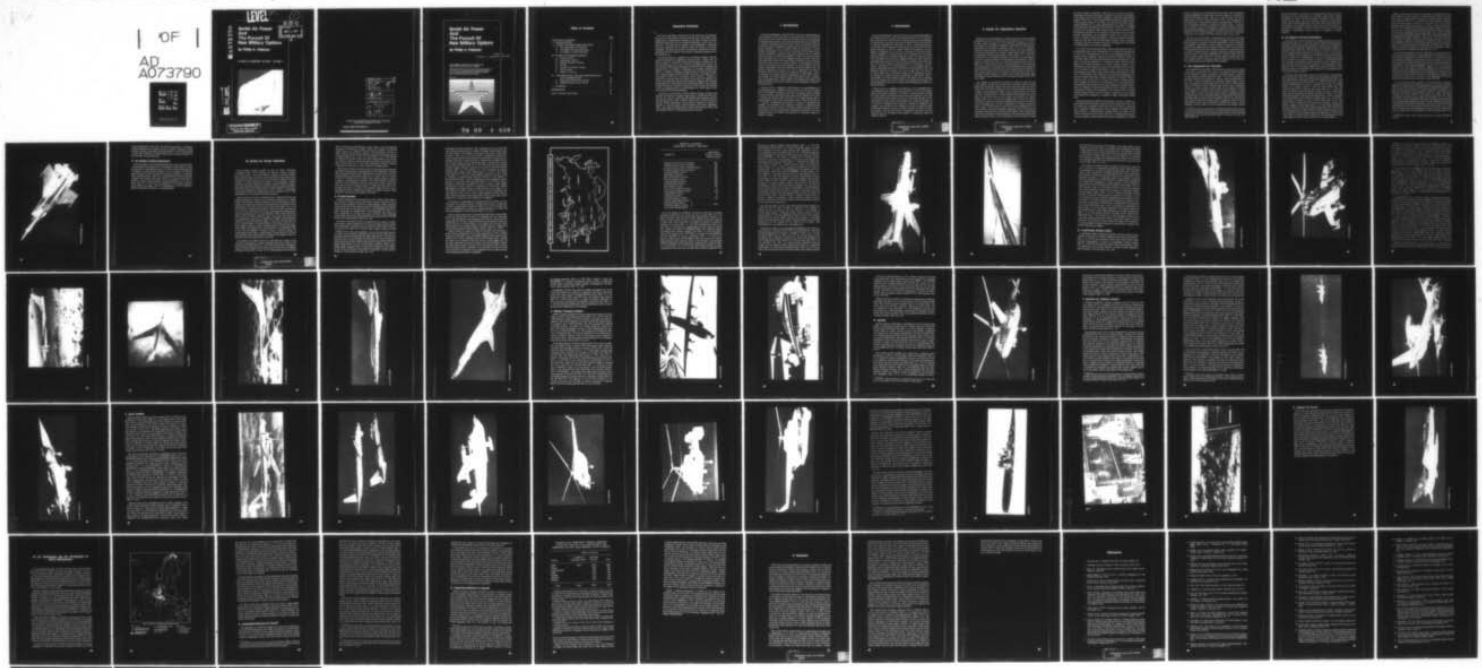
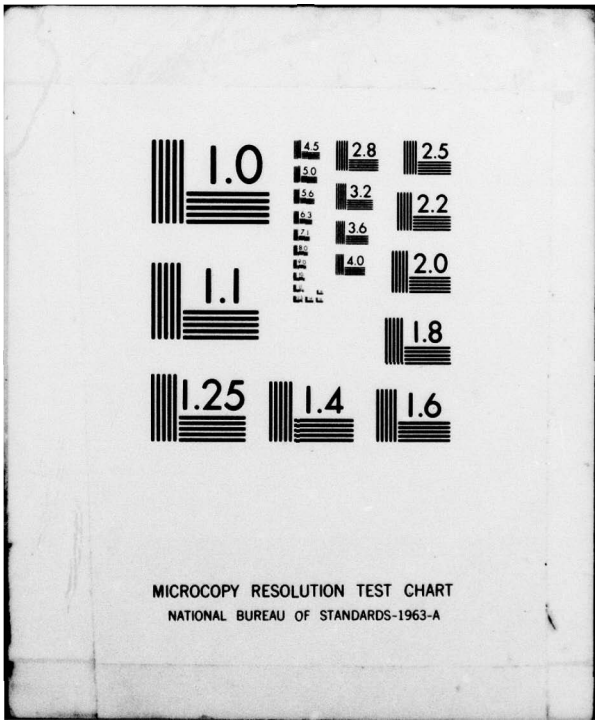
AD-A073 790 DEPARTMENT OF THE AIR FORCE WASHINGTON DC F/G 15/7
SOVIET AIR POWER AND THE PURSUIT OF NEW MILITARY OPTIONS. VOLUM--ETC(U)
1979 P A PETERSEN

UNCLASSIFIED NL

| OF |
AD
A073790



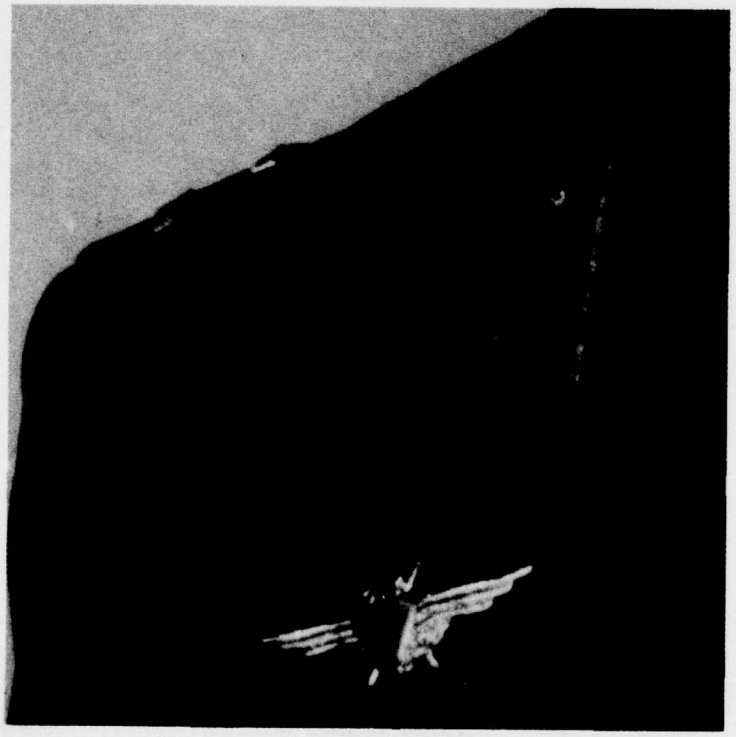
END
DATE
FILMED
10-79
DDC


1.0
1.1
1.25
1.4
1.6
1.8
2.0
2.2
2.5
2.8
3.2
3.6
4.0
4.5
5.0
5.6
6.3
MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

Soviet Air Power And The Pursuit Of New Military Options

By Phillip A. Petersen

STUDIES IN COMMUNIST AFFAIRS VOLUME 3



For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington D.C. 20402

Stock #008-070-00429-1

(11) 1979 (12) 69 p.

(6)

Soviet Air Power And The Pursuit Of New Military Options.

(10)

By Phillip A./Petersen

Volume 3.
Studies in Communist Affairs.

PUBLISHED UNDER THE AUSPICES OF
THE UNITED STATES AIR FORCE

Vol. 3

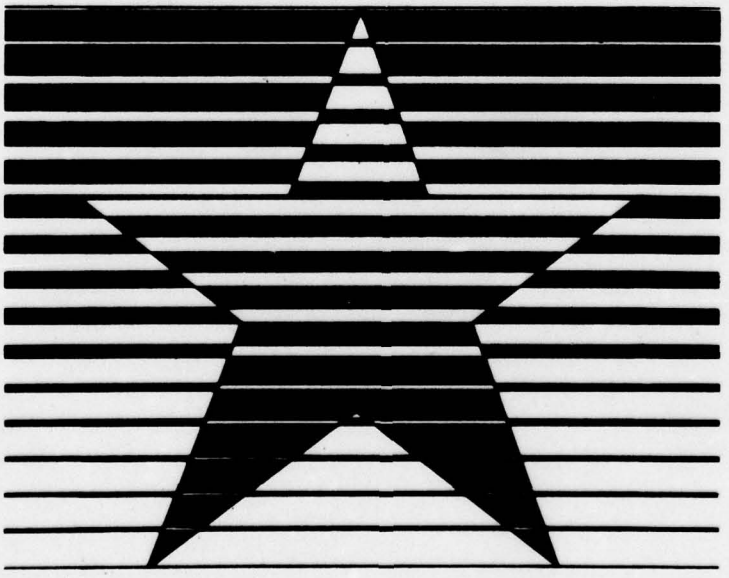


Table of Contents

Executive Summary

The Soviet leadership is acutely aware of the critical role of nonnuclear forces in the world balance of power and has since 1965 made a firm commitment to obtaining and exercising a full range of military options. While the momentum of Soviet military developments can be seen in all elements of the armed forces, military aviation capabilities in particular have been expanded, both in absolute terms and relative to American capabilities. Air power has become a fundamental instrument for power projection and the air offensive the linchpin of successful nonnuclear combat operations.

The Soviets accept the possibility of a nonnuclear conflict in Europe and have developed the capability to fight just such a conflict there. In order to prevent a nonnuclear conflict from becoming a nuclear one, the Soviets would hope to be able to present the United States with a *fait accompli* by preventing the mobilization of NATO forces by attacking the defense before it is capable of organizing its nonnuclear resistance and before it is capable of utilizing its nuclear means to redress the situation. Such a surprise attack requires the ability to launch a successful air operation against NATO's air and theater nuclear resources. Therefore, a switch in air priorities from the defense to the attack was required. The Soviets have made that change and are presently engaged in the modernization program to make the doctrinal change operational. The inevitable conclusion is that the evolution of Soviet air power has and will continue to have a fundamental role in the development of a wider range of military options for the Soviet leadership.

At present the central focus of Soviet military strategy is Europe, and, therefore, the increase of options suggests that, if the Soviets start a general war as a result of a deliberate and carefully executed policy, the conflict will center there. Such a conflict would involve a Soviet attempt to preempt NATO mobilization with nonnuclear weapons by means of a massive air operation against NATO aviation and nuclear capabilities. Thus, a most effective hedge against a Soviet attack upon the West is the survivability of NATO's aviation and nuclear resources.

I. Introduction

In the post-Khrushchev period the Soviet Union has demonstrated an acute awareness of the crucial role of nonnuclear forces in the world balance of power. Since 1965 the Soviet Union has made a firm commitment to obtaining and exercising a full range of military options. Increased Soviet military capabilities are therefore the result of a sustained dedication of resources to the development of ground, naval, and air forces that emphasize flexibility as well as strength. While the momentum of Soviet military developments can be seen in all elements of the armed forces, aviation capabilities in particular have been expanded both in absolute terms and relative to American capabilities. Clearly, the American qualitative advantages that some have suggested justify the Soviet numerical advantages have shrunk to the point where reasonable and prudent analysts of the Soviet-American military balance are beginning to indicate concern. Furthermore, the central military (as well as political and economic) relationship between the United States and the USSR is now, and should be expected to continue to be, one of competition. The thrust of the Soviet efforts can be expected to remain one of continuing to reduce, or eliminate and surpass, American superiority in those fields where it does remain. For Soviet military aviation, these efforts mean a continuation of its evolution into a force capable of providing Soviet leaders with greater flexibility in the means of attack, and providing greater mobility to the ground forces.

Soviet air power is engaged in contributing to the accomplishment of the multifarious tasks requisite of the armed forces of the world's largest nation. The USSR is confronted in the West by a military alliance abutting its *cordon sanitaire* consisting of states whose loyalty depends in part upon a strong Soviet presence and in the East by the hostile ideology and national interests of the world's most populous state. While the problem of a "two-front" commitment has resulted in a strategy of "negotiation *and* strength," the total effect of the expansion of Soviet air capabilities goes beyond these defensive concerns to include a dramatic extension of power and presence. Air power has become a fundamental instrument for power projection and the air offensive the linchpin of a nonnuclear option for conflict in Europe.

I. Introduction

In the post-Khrushchev period the Soviet Union has demonstrated an acute awareness of the crucial role of nonnuclear forces in the world balance of power. Since 1965 the Soviet Union has made a firm commitment to obtaining and exercising a full range of military options. Increased Soviet military capabilities are therefore the result of a sustained dedication of resources to the development of ground, naval, and air forces that emphasize flexibility as well as strength. While the momentum of Soviet military developments can be seen in all elements of the armed forces, aviation capabilities in particular have been expanded both in absolute terms and relative to American capabilities. Clearly, the American qualitative advantages that some have suggested justify the Soviet numerical advantages have shrunk to the point where reasonable and prudent analysts of the Soviet-American military balance are beginning to indicate concern. Furthermore, the central military (as well as political and economic) relationship between the United States and the USSR is now, and should be expected to continue to be, one of competition. The thrust of the Soviet efforts can be expected to remain one of continuing to reduce, or eliminate and surpass, American superiority in those fields where it does remain. For Soviet military aviation, these efforts mean a continuation of its evolution into a force capable of providing Soviet leaders with greater flexibility in the means of attack, and providing greater mobility to the ground forces.

Soviet air power is engaged in contributing to the accomplishment of the multifarious tasks requisite of the armed forces of the world's largest nation. The USSR is confronted in the West by a military alliance abutting its *cordon sanitaire* consisting of states whose loyalty depends in part upon a strong Soviet presence and in the East by the hostile ideology and national interests of the world's most populous state. While the problem of a "two-front" commitment has resulted in a strategy of "negotiation *and* strength," the total effect of the expansion of Soviet air capabilities goes beyond these defensive concerns to include a dramatic extension of power and presence. Air power has become a fundamental instrument for power projection and the air offensive the linchpin of a nonnuclear option for conflict in Europe.

II. Soviet Air Operations Doctrine

Regardless of the development of missile weapons, the Soviets remain convinced that the role of aviation has not declined. [Ref. 27, p. 87] They feel that aviation continues to be an important multipurpose means of conducting war, providing the capability to wage effective military operations under the most diverse conditions. [Ref. 27, p. 87] In particular, aviation provides mobility, and the Soviets believe that force mobility is a necessary prerequisite for an attack at high tempos, which is what they are convinced can bring them military success. [Ref. 47, p. 167] Thus, for the Soviets, the principle of mobility, and therefore the instrument of air power, is closely connected with principles of concentration of efforts, surprise, combat activity, and, as a result, with the preservation of forces. [Ref. 47, p. 169] In effect, it has a deciding influence on the realization and implementation of the demands of the aforementioned principles, inasmuch as those forces which do not possess high mobility will hardly be able to amass superior forces and means in a timely manner at the necessary place, achieve surprise, or conduct active combat operations while retaining their combat effectiveness for the required length of time. [Ref. 47, p. 169]

Any attempt to comprehend the manner in which air power fits into Soviet military strategy must consider the evolutionary process through which that strategy has passed. The Soviets have had, since the end of World War II, a distinct concept for war in Europe. Without the means to fight an intercontinental conflict with the United States, the Soviets adopted a "hostage Europe" strategy emphasizing the preparation of their land, air, and naval forces for an invasion and occupation of Western Europe. [Ref. 67, pp. 32-35] The struggle between 1953 and 1960 to adjust Soviet strategy to the military-technological revolution was founded in the developing state of Soviet technology and weapons production. [Ref. 67, pp. 35-38] In effect, as the Soviet nuclear capability grew, the Soviet military underwent manpower reductions. This evolving process continued to the point where, had Nikita Khrushchev's idea of substituting firepower for manpower, laid out in January 1960, been fully implemented, there would have been a total transformation of Soviet military strategy

and force structure. Khrushchev stated that he felt that the military-technological revolution had made it possible to increase the firepower of the armed forces with "atomic, hydrogen, rocket and other modern weapons." [Ref. 23, p. 10] He stressed that these modern weapons would be the principal element in any future war, and that the Soviet Union's defense capability was no longer determined by the "number of soldiers it has under arms, the number of men in uniform." [Ref. 23, p. 10] While the Soviets did ultimately obtain nuclear parity with the United States, Khrushchev's proposal for the reduction of nonnuclear forces was only partially implemented, and subsequently reversed. The reversal contributed to a military buildup that began in 1965 and became undeniably evident by mid-1966. This post-Khrushchev buildup, which is presently continuing, seems to be directed toward the development of a full range of military options for the Soviet leadership.

As a result of the lessons the Soviets learned concerning the utility of conventional options in the 1958 landing of U.S. Marines in Lebanon and the 1962 U.S. naval quarantine of Cuba, and recognizing that their increasing nuclear capability created an increased American interest in restricting conflict below the intercontinental nuclear exchange level, they came to accept the possibility of a nonnuclear conflict with the United States. In the Soviet perception, "a concrete historical analysis of the contradictions of the modern era leads to the conclusion that it is necessary to be ready to wage various kinds of wars: world and local, swift and protracted, with the use of the nuclear weapon and without it." [Ref. 32, p. 127] However, there continue to exist some hard geographic and technical realities which have remained obstacles to the Soviet effort to develop "reach" in their drive to obtain a full range of military options. Thus, although the Soviets now view themselves as a truly global power with legitimate international interests and commitments, and have demonstrated a willingness to exercise their military power in support of those international interests and commitments, the central focus of military strategy remains Europe, and the increase in options has meant among other things the development of a capability to fight a nonnuclear conflict there.

Having recognized the difficulty of being able to prevent a theater nuclear conflict from escalating to a general nuclear conflict, [Ref. 58, p. 69] the Soviets have attempted to tailor their forces and tactics so that they have a capability of fighting without nuclear weapons in the hope of being able to execute a "hostage Europe" strategy before any nuclear use by NATO could escalate out of control. [Ref. 58, p. 253] Such action would, of course, require a surprise attack to prevent the mobilization of NATO

forces,[1] with the goal of catching NATO forces while "they are incapable of offering organized resistance and are forced to fight in a situation extremely unfavorable for them." [Ref. 47, p. 230] In effect, the Soviets would hope to be able to paralyze NATO's will to resist, depriving it of "the opportunity of taking quick, effective countermeasures." [Ref. 47, p. 230] A preemptive offensive—attacking the defense before it mobilizes and can deploy—offers the opportunity to supplant the dangers inherent in a massed breakthrough of a prepared defense with a fluid environment optimized for the "daring maneuver" with which the Soviets would hope to advance into the depth of NATO's defenses. [Ref. 46, pp. 16-17]

The role of air power within a program geared to obtain a wide range of military options was bound to require new equipment and some rather radical changes in functional concepts. Specifically, increased emphasis on preemptive attack within, at least initially, a nonnuclear environment means that the significance of aviation in combat and its close interaction with the ground forces has been markedly increased. A preemptive option to a Soviet "hostage Europe" strategy required that aviation obtain the ability to launch a successful independent air operation against NATO's air and theater nuclear resources, to directly support ground operations, and to support whatever naval operations are necessary for the success of the ground operations and defense of the homeland.

A. The Independent Air Operation

An independent air operation is performed in accordance with a single concept and in conformity with a plan of the Supreme High Command for the attainment of major operational or strategic goals in continental or ocean theaters of military operations. [Ref. 11, p. 45] The initiation of nonnuclear hostilities by the Soviets in Europe would unquestionably begin with a massive independent air operation against enemy nuclear forces, command posts, and airfields. [Ref. 39, pp. 47-51] Fixed-wing aircraft from Frontal Aviation, medium-range aircraft from Long-Range Aviation, and Naval Aviation aircraft would all be mobilized to execute the air offensive. Air strikes would continue around-the-clock in a single-minded effort to destroy the enemy's tactical nuclear capabilities, disrupt the organization of any coordinated defense, and neutralize the main force of enemy aviation on the first day of hostilities. [Ref. 26, pp. 20-28] Once these objectives had been achieved and air superiority insured, the air operations of these forces would shift to isolating the areas of combat operations from the influx of NATO operational and strategic reserves

[1] It could be expected that the Soviets would limit information about the operation even to their Warsaw Pact allies so as to attempt to prevent their allies from trying to head off the operation by informing the West about it. Once the operation began, however, the Pact would probably support it as long as the Soviets were winning. [Ref. 42]

and to the disruption of enemy lines of communications. [Ref. 26, pp. 20-28] Success of the independent air operation would require activity throughout the theater, involving thorough reconnaissance and skillful target selection, along with close coordination between aviation forces and the other elements taking part in the attack. [Ref. 26, pp. 20-28] Understandably, if the conflict became nuclear, most Frontal Aviation aircraft would be withdrawn in favor of the missile forces, and the aircraft belonging to Long-Range Aviation would be reassigned to nuclear missions.

B. Air Support of Ground Operations

In the past, Soviet Frontal Aviation was designed primarily for air defense missions. [Ref. 63, p. 43] More recently, improved ground-support capability, together with renewed emphasis on ground-to-air defense systems, indicate a fundamental change in Soviet air operations in support of the ground forces. [Ref. 63, p. 43] The Soviet Air Force can now be expected to support ground operations in at least four ways: 1) by performing its traditional role of assisting the Air Defense Troops of the Ground Forces (*Voyska PVO Sukhoputnykh voysk*) in protecting the ground forces and their rear area from enemy air attack; 2) by providing airlift for such things as helicopter assaults, paratroop assaults, transport landings of troops, and the movement of supplies; 3) by providing air reconnaissance; and 4) by providing a highly mobile means with which to suppress the enemy's fire and thereby assist immensely in the maintenance of the necessary tempo of attack.

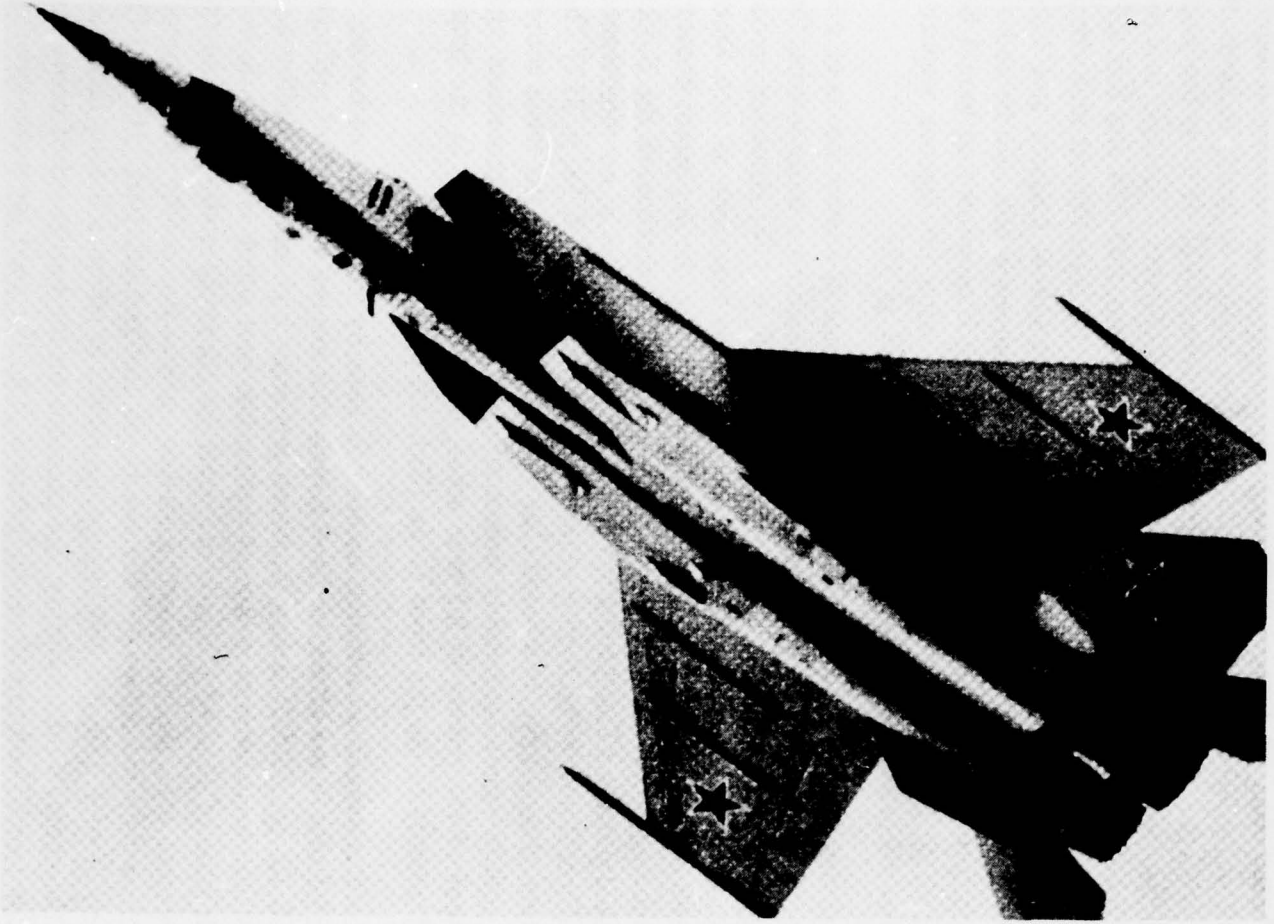
The Soviets will increasingly leave rear-area defense to their ground-based antiaircraft systems. For example, an enemy high-performance aircraft approaching a moving Soviet ground formation would first come under fire from the Soviet SA-6. [Ref. 10, p. 5297] The SA-6 fire would then be supplemented by the newer, all-weather SA-8. [Ref. 10, p. 5298] Further in, at ranges of about 5 miles, the man–portable SA-7 and vehicle-mounted SA-9 would join the attack. [Ref. 10, p. 5299] Still closer, the aircraft would come under fire from a variety of large automatic weapons, including the radar-directed ZSU-23-4. [Ref. 10, p. 5299] Of all these weapons, only the infrared homing SA-9 and SA-7 would be adversely affected by foul weather or darkness. [Ref. 10, p. 5299] Thus, ground-based air defense is clearly a Soviet strong point. In any comparison with the United States, the Soviets have far more weapons with which to engage far fewer targets. [Ref. 10, p. 5303] Their equipment is generally excellent, and they are skillful in employing it. [Ref. 10, p. 5303] In such an environment, Soviet Frontal Aviation elements tasked to provide air defense can increasingly become more aggressive in that they can "slide" their air defense zones forward over the advancing battle areas and perhaps even devote some of their efforts to ground attack.

Military Transport Aviation will be expected to provide the extra mobility required to make the Soviet armor-dominated offensive doctrine work. Soviet strategic airlift has continued to expand steadily, especially in lift capability. [Ref. 45, p. 97] With an air fleet consisting of approximately the same number of aircraft as in 1966, the Soviets can currently lift better than 50 percent more cargo to a range of 2,000 nautical miles. [Ref. 45, p. 97] Besides the more mundane logistic support, in time of war wide use would be made of tactical and operational airborne landings with the task of capturing nuclear storage areas,[1] river crossings, bridgeheads, and other important objectives. [Ref. 58, pp. 293-294 and Ref. 69, p. 86] Such tasks would normally be executed by a reinforced motorized rifle battalion, sometimes without armored personnel carriers and supporting subunits. [Ref. 61, p. 45] Smaller operations would also be undertaken. For example, specialized reconnaissance companies that would be utilized to gather information on targets and other intelligence requirements might also be transported by air. [Ref. 63, p. 45]

In view of the complexity of the reconnaissance of enemy means of nuclear attack and the necessity to acquire reliable data on those means, the role of aerial reconnaissance is critical. [Ref. 56, p. 136] However, aerial reconnaissance performs a broad range of other functions as well, both before and after an attack has begun. Aircraft have the important mission of lending aerial reconnaissance support to all the services of the Soviet Armed Forces. The MiG-25/FOXBAT employed as a reconnaissance platform is now being deployed in Frontal Aviation. [Ref. 58, p. 253] The Soviets clearly have concluded that air reconnaissance is the basic source of rapidly receiving reliable information concerning the intentions and actions of the enemy in his rear areas, on the approaches to the front, and directly in the pre-front areas. [Ref. 25, pp. 345-352]

In a conventional conflict, aviation is seen by the Soviets as having a crucial role in the attack on fixed targets that are out of reach of artillery. [Ref. 12, pp. 92-93] Aviation, which possesses high maneuverability and powerful conventional means of destruction and which is constantly in a high state of readiness, can concentrate its efforts in a short time on the necessary axis, deliver effective strikes against the enemy, and support continuously the actions of the troops on the ground. [Ref. 56, p. 149] The role of aviation in building up the tempo of advance is only increased by the enemy's high mobility, the presence on the battlefield of many important small and rapidly moving targets, and the need for reconnoitering and hitting them in extremely short periods of time. [Ref. 56, p. 149] Aircraft would operate in small groups in order to assure the broad maneuver of forces and create conditions for their redirection. [Ref. 56, p.

[1] An exercise in which a special weapons storage area is attacked is discussed in Ref. 69.



MiG–25/FOXBAT B

130] In furtherance of this goal, the Soviets would hope to coordinate artillery barrages and air strikes in order to provide a complete fire plan for their operations, generally utilizing helicopters over the forward edge of their own formations and fixed-wing aircraft at greater distances in front of their own ground troops.

C. Air Support of Naval Operations

Soviet air support of naval operations generally consists of three tasks: 1) providing air reconnaissance; 2) providing air strike support to naval landings; and 3) attacking the enemy at sea. Soviet aviation elements must be prepared to attack enemy warships at sea at a distance at which the ships would not be able to utilize their aircraft and missiles for attacking Soviet and allied forces. [Ref. 58, p. 254] Should the Soviets be successful against the enemy's naval forces, Soviet air elements would then be shifted to attacks directed against enemy transportation at sea and in ports. [Ref. 58, p. 254] Also, any significant naval landing operation would require air support, and air reconnaissance at sea is already a general requirement executed on a continuing basis.

III. Soviet Air Power Elements

Soviet military aviation consists of the Air Force (*Voyenno-Vozdushnyye Sily—VVS*), National Air Defense Aviation (*Aviatsiya voysk PVO strany*), and Naval Aviation (*Aviatsiya voyenno-morskogo flota*). The Air Force is a service of the armed forces of the Soviet Union, and includes Frontal Aviation (*frontovaya aviatsiya*), Military Transport Aviation (*voyenno-transportnaya aviatsiya*) and Long-Range Aviation (*dal'nyaya aviatsiya*). National Air Defense Aviation consists of fighter-interceptor units which form part of the air defense groupings and formations of the National Air Defense Forces. Naval Aviation is a component of the Navy intended for combat operations in maritime sectors, either independently or in cooperation with other elements.

The role of the Air Force is considered to be so important that no significant operation in a future war, nor military operations as a whole, could be successfully conducted without its active involvement; aviation is able to carry out major and diverse missions both independently and in collaboration with other services of the armed forces. [Ref. 27, p. 110] The Air Force is expected to provide air cover for troops and objectives of the rear area; attack targets at tactical, operational, and strategic depth; support troop maneuvers over great distances within limited periods of time, as well as transport important cargo to the troops; and provide the air reconnaissance necessary to establish and identify various important objectives in the enemy positions. [Ref. 27, pp. 109–110] Frontal Aviation is directed against the responsibilities of providing troops with protection against enemy air attacks, attacking targets at tactical and operational depth, and conducting air reconnaissance of the battlefield. [Ref. 27, pp. 109–110] Military Transport Aviation is directed against the responsibilities of providing a rapid means of transportation for airborne and motorized rifle troops and their equipment and supplies, and evacuating the sick and wounded. [Ref. 59, p. 201]

The National Air Defense Forces are responsible for carrying out the vital task of shielding the economic, political, and military centers of the nation from air attack. [Ref. 24, p. 114] These forces consist of communication and radio-technical troops, surface-to-air missile troops, and fighter-interceptor aircraft. [Ref. 24, pp. 114–115] Being required to execute the

task of detecting and identifying all aerial objects, and of insuring the destruction of unfriendly aerospace objects, the National Air Defense Forces include an antimissile defense (*Protivoraketnaya oborona* or *PRO*) element and an antispace defense (*Protivokosmicheskaya oborona* or *PKO*) element. [Ref. 11, pp. 177–178 and Ref. 15, p. 7] The National Air Defense Forces may execute their tasks independently or in cooperation with the Air Force and the air defense resources and facilities of the other services. [Ref. 24, p. 115] Thus, National Air Defense Aviation constitutes only one part of a rather extensive air defense effort.

The mission of Naval Aviation consists of detecting enemy submarines and either destroying them or guiding missiles or friendly ships to destroy them, destroying surface vessels, attacking ports and naval bases, and conducting maritime reconnaissance. [Ref. 43, p. 71; Ref. 6, pp. 12–16; Ref. 55, pp. 6–7; and Ref. 35, p. 2] While Naval Aviation could be expected to support any amphibious operations of the Naval Infantry (*morskaya pekhota*), it may eventually, with the construction of more aircraft carriers, enter the field of ground attack in a larger and more direct way. Certainly the Soviets are aware of the potential effectiveness of even a few hundred marines landed and provided air support in places where airfields or carriers are not available to the West.

A. Frontal Aviation

Frontal Aviation (*frontovaya aviatsiya* or *FA*), which is often referred to as Tactical Aviation in the United States, consists of those air forces that have been assigned the mission of supporting the combat operations of the ground forces. This support consists of providing protection against enemy air attacks, destroying enemy forces on the battlefield and in rear areas, conducting air reconnaissance of the battlefield and enemy rear areas, supporting air landings and assault operations while disrupting enemy airborne operations, and disrupting enemy communications through the use of electronic warfare. [Ref. 31, p. 72]

The forces of Frontal Aviation are organized into air armies (*vozdushnaya armiya*), which constitute the air arm at the disposal of the ground forces commander of a group of forces or military district (MD) in peace, or a *front*[1] in war. [Ref. 29, p. 178] The map on page 16 depicts the MD

[1] Unless a theater command is established, a *front* is the largest field formation in wartime. It is a tactical and administrative unit, with size and composition subject to wide variation depending upon the mission and situation. A *front* could be composed of three or four combined-arms armies (fifteen to twenty divisions) one tank army (four to five tank divisions), one tactical air army, and other appropriate combat and support elements. Airborne troops could be attached to the *front* as required. Forces organic to the *front* would include conventional artillery, tactical nuclear weapons, surface-to-surface and surface-to-air missile units, and engineer, chemical, signal, intelligence, and rear support units in battalion or larger strength. As can be seen, the Group of Soviet Forces in Germany is already about the strength of a wartime Soviet *front*. [Ref. 29, p. 178]

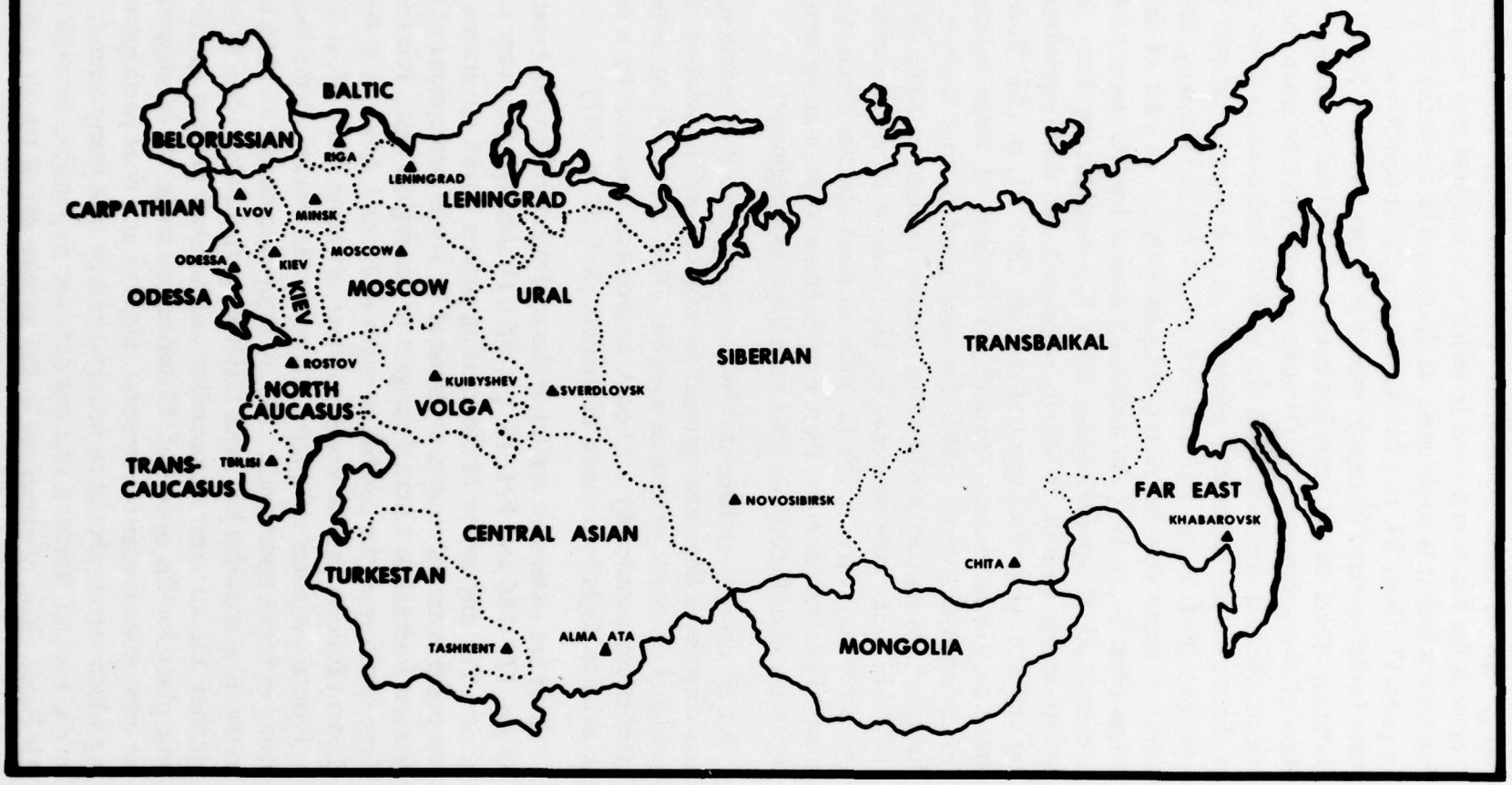
and groups of forces boundaries. The composition of an air army will vary with the functional zone in which it is assigned and the threat situation with which it is confronted, as illustrated in the order of battle chart on page 17. [Ref. 29, p. 178] An air army is comprised of aviation divisions (*aviatsionnaya diviziya*), except as in the Group of Soviet Forces in Germany where the air army has been so reinforced as to require the creation of two aviation corps (*aviatsionnyy korpus*) between the air army and its aviation divisions. [Ref. 51, p. 107] The aviation division consists of three aviation regiments, either all of one kind or aircraft mixed by regiment. [Ref. 51, p. 107 and Ref. 31, p. 74] In Germany, the aviation divisions might operate either independently or as part of an aviation corps. [Ref. 51, p. 107] An aviation regiment (*aviatsionnyy polk*), which is composed of approximately thirty-two bombers or forty fighters or ground-attack aircraft, is usually organized into three squadrons operating alone or with other types of aircraft. [Ref. 51, p. 107] Each aviation squadron (*aviatsionnaya eskadril'ya*) consists of three aviation flights (*aviatsionnoye zveno*), which are comprised of four aircraft. Aviation flight fighters and fighter-bombers usually operate in pairs. [Ref. 51, p. 107] While this structure may be the norm, it is not an inflexible rule, and units may vary in size in order to meet specific functional requirements. Thus, for example, there may be three corps in an air army, or four regiments in a division, or four squadrons in a regiment.

An air army is commanded by a colonel general of aviation, an aviation corps by a lieutenant general of aviation, and an aviation division by a colonel or major general of aviation. [Ref. 50, p. 78] An aviation regiment is commanded by a colonel, an aviation squadron by a major, and an aviation flight by a senior lieutenant. [Ref. 51, p. 107]

There are sixteen air armies or the equivalent in Frontal Aviation, [Ref. 29 pp. 175–186 and Ref. 19, pp. 62–71] although they vary extensively in size. The disposition of the existing sixteen Soviet air armies and their composition are, of course, determined by Soviet perceptions of where the greatest internal or external dangers to the regime exist. Presently, about three-quarters of the combat strength of Frontal Aviation is deployed in Eastern Europe and the western military districts. [Ref. 65, p. 185]

Frontal Aviation air armies are under the control of the local MD or group of forces commander. The air army commander is, in fact, a deputy to the local commander. After receiving preparation orders from his commander, the air army commander and his staff prepare specific aviation unit plans for his approval. Historical evidence would suggest that the air army commander can exercise initiative and does participate in deciding which targets should be attacked and by how many aircraft. At lower levels, Frontal Aviation commanders are responsible through the Soviet Air Force chain of command to the commander of the air army, and not to the supported ground force commander.

UNION OF SOVIET SOCIALIST REPUBLICS MILITARY DISTRICTS AND THE LOCATIONS OF THEIR HEADQUARTERS



FRONTAL AVIATION
FIXED-WING COMBAT AIRCRAFT

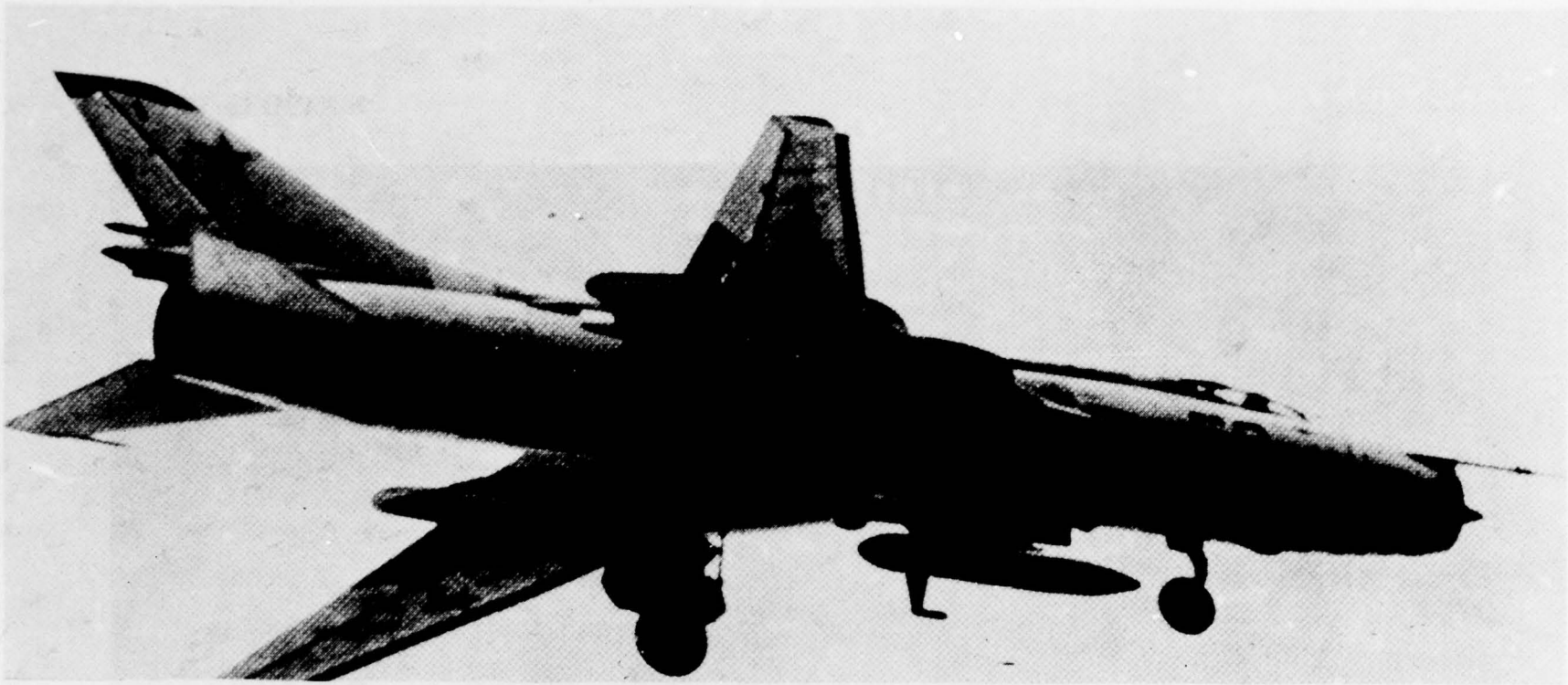
Assigned To	Approximate Number of Tactical Combat Aircraft
Group of Soviet Forces in Germany	975
Northern Group of Forces (Poland)	350
Central Group of Forces (Czechoslovakia)	100
Southern Group of Forces (Hungary)	275
Leningrad Military District	150
Baltic Military District	300
Belorussian Military District	300
Moscow Military District	200
Carpathian Military District	350
Odessa Military District	250
Kiev Military District	100
North Caucasus Military District	0
Transcaucasus Military District	300
Volga Military District	0
Ural Military District	0
Turkestan Military District	150
Central Asian Military District Siberian Military District Transbaykal Military District Far Eastern Military District	1225

In the last decade the capabilities of Frontal Aviation have increased fourfold in payload and two and one-half times in range. [Ref. 49, p. 31] While the Soviet Union has traditionally emphasized air defense in its Frontal Aviation, there has been a radical change in functional concepts in recent years. The first priority is no longer air defense, but rather air attack in all its forms. [Ref. 5, p. 193] The developmental work of the mid-1960s on new and more capable fighter-bombers initially produced new versions of the MiG–21/FISHBED fighter with improved payload and range for more effective, offensive roles. [Ref. 7, p. 443] Then beginning in 1973, the new Su–17/FITTER C, the MiG–23/FLOGGER B, and the FENCER A became operational. [Ref. 7, p. 443] Compared to earlier Frontal Aviation fighters, these new aircraft have substantially improved range, payload, avionics, and electronic countermeasure (ECM) capabilities, thereby providing a multiple-mission potential. [Ref. 7, p. 443 and Ref. 13, p. 10] The new types already comprise a significant portion of the total force and have been extensively supplied to the

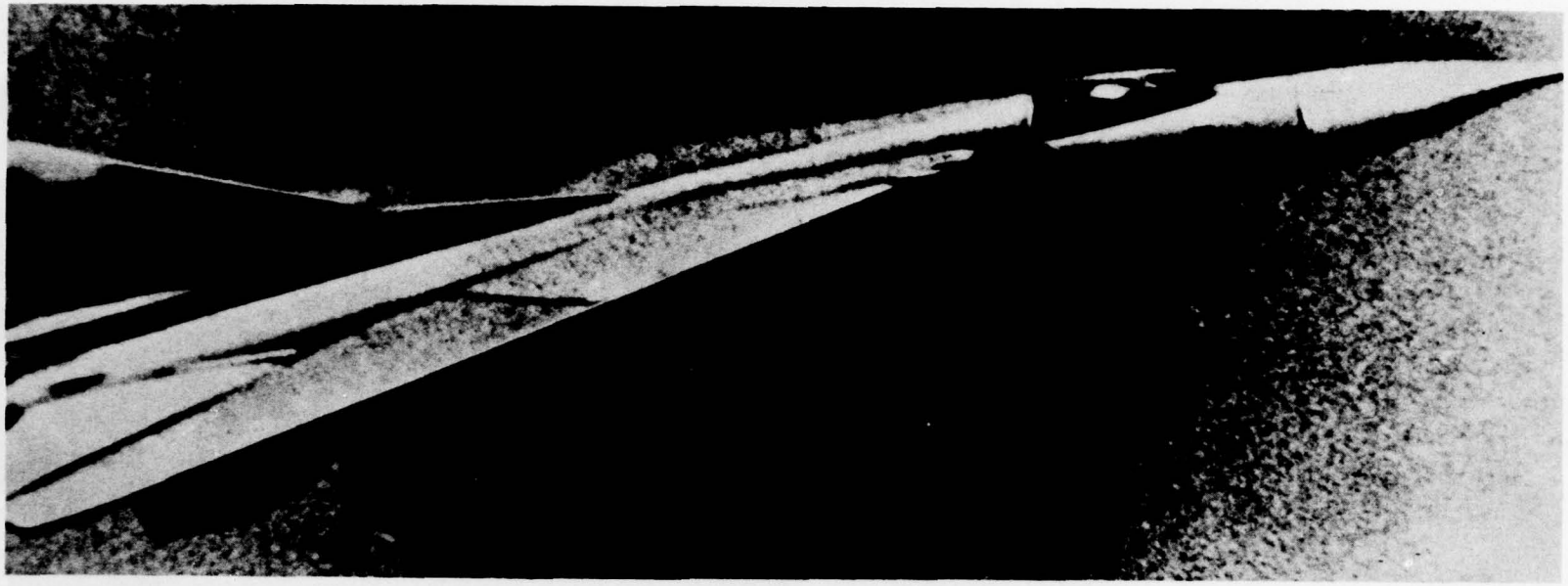
Soviet forces opposite NATO's Central Region. [Ref. 7, p. 444] The FLOGGER B and FITTER C are capable of striking targets in eastern West Germany from bases in the western USSR, especially if they recover to landing strips in Central Europe. [Ref. 7, p. 443] By moving these two aircraft types to forward bases, their payload and range can be maximized. FENCER A, also capable of striking most of Western Europe from bases in the Soviet Union, appears to be the first Soviet fighter specifically designed for ground attack. [Ref. 7, p. 446] The first modern Soviet aircraft to provide for a weapons systems officer, this interdiction fighter-bomber carries a variety of guided and unguided air-to-ground weapons. [Ref. 7, p. 446] The reintroduction of the integral cannon on Soviet fighters, which began with the FISHBED J model, remains a feature common to all new-generation Frontal Aviation fighter/attack aircraft. [Ref. 7, p. 445] The phasing-in of these third-generation aircraft has provided the technical capability to diversify ordnance delivery. During the 1960s, Frontal Aviation's nuclear role declined, with emphasis being given to surface-to-surface missiles. It had also been expected that Long-Range Aviation would carry the main burden of any air attack on Western Europe. With the introduction of FENCER A and FLOGGER, both nuclear capable, there has been a resurgence of doctrine concerning the flexibility provided by having Frontal Aviation possess the option of nuclear delivery. [Ref. 7, pp. 444–445] As a result, *FA* could now be expected to augment Long-Range Aviation operations against Western Europe in either mode, as well as perform the more traditional functions of escort and defense suppression.

New ground-support aircraft, both being developed and actually just coming into the inventory, constitute an extension of the changes in Frontal Aviation air doctrine. The new aircraft do not constitute a "mirror-image concept" of building specific weapons systems to match similar systems in a potential opponent's inventory, nor do they constitute replacements for specific planes. Instead, they constitute a continuing search for the equipment most capable of performing the necessary tasks required by the new doctrine of "air attack in all its forms." The FLOGGER D is an example of this continuing search.

Although the single-seat ground-attack FLOGGER D has many airframe features in common with the MiG–23/FLOGGER B, it has been officially designated by the Soviets as the MiG–27. [Ref. 40, p. 53] This new plane differs from the MiG–23 in that the forward portion of the fuselage has been completely redesigned as a result of the installation of a laser range finder and the elimination of the nose radar. [Ref. 40, p. 53] The shortened nose, which now droops sharply downward from the cockpit, and an enlarged cockpit glazing have resulted in considerable improvement in forward and downward visibility. [Ref. 40, p. 53] Consistent with its principal mission of ground attack, armor plating has been



Su–17/FITTER C



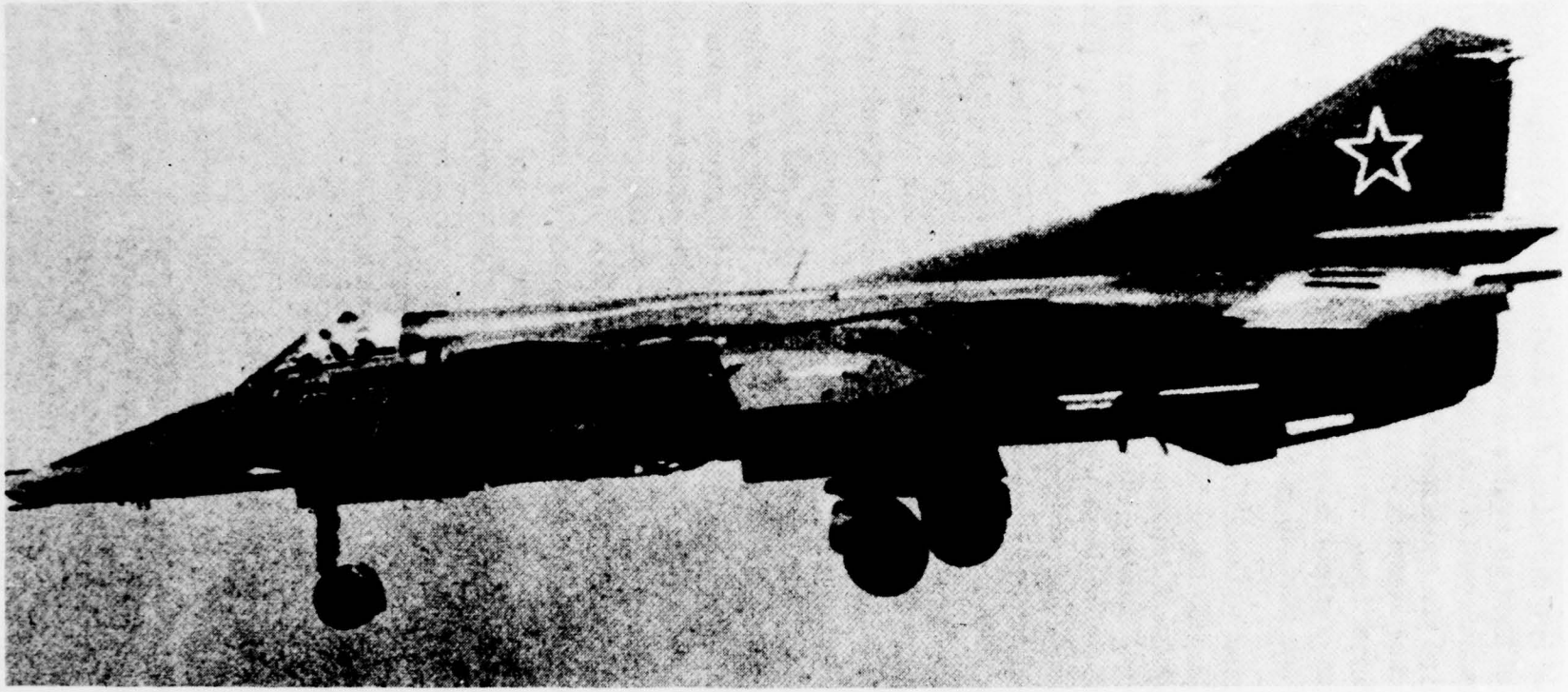
MiG–23/FLOGGER

incorporated into the sides of the fuselage in the cockpit region, and the utilization of fixed air intakes is consistent with the primary requirement of high subsonic speed at low altitude. [Ref. 40, p. 53] Firepower includes a Gatling-type gun and structural provisions for external stores, including tactical nuclear weapons. [Ref. 40, p. 53] The plane has low-pressure tires that permit operation from prepared grass runways, and provisions for the fitting of takeoff booster rockets have been made on the aft section of the fuselage. [Ref. 40, p. 53]

Also organic to Frontal Aviation air armies are helicopters whose mission is to provide air mobility for ground forces and armed helicopters for employment in antitank and general ground attack roles. Soviet helicopters, while operationally controlled through the Front commander's staff, belong to Frontal Aviation rather than to the Ground Force. These helicopters continue to be deployed rapidly as the doctrine concerning their use and deployment evolves. [Ref. 9, p. S14082] That the helicopter has already been recognized as a critical element in the air mobility of Soviet ground forces is indicated by the buildup in the number of Mi–8/HIP helicopters. [Ref. 7, p. 433] Soviet forces have in fact been equipped with various helicopters which include transport, reconnaissance/liaison, and fire-support vehicles. [Ref. 3, p. 30] Transport helicopters address problems of airborne landing operations, supply and evacuation, as well as occasionally serving as airborne command posts and medical aid stations. [Ref. 3, p. 30] Reconnaissance/liaison helicopters provide an effective means of supplying a combined-arms commander with reconnaissance data on the enemy and terrain, as well as providing fire adjustment and liaison. [Ref. 3, p. 31] Fire-support helicopters are to support subunits on the battlefield and to attack enemy ground and air targets independently. [Ref. 3, p. 31] The gunship variant of the HIP and the newer Mi–24/HIND [Ref. 48, p. 28 and Ref. 28, p. 879] helicopters provide rather formidable weapons systems with which to provide fire support of ground operations. The existence of these systems also might very well help insure air fire support of ground operations during weather conditions that prohibit fixed-wing air support.

B. Long-Range Aviation (LRA)

Long-Range Aviation (*Dal'nyaya aviatsiya*) consists of three air components, two deployed in European USSR and one in the Soviet Far East. [Ref. 31, p. 76] The two components based in the western Soviet Union constitute approximately 75 percent of Long-Range Aviation strength. [Ref. 65, p. 185] The unit structure, briefly, is based upon divisions, which are comprised of two to three regiments consisting of three squadrons, each with about 12 aircraft. [Ref. 16, p. 185]



MiG–27/FLOGGER D

Mi–24/HIND A

Perhaps due to the fact that the mission of Long-Range Aviation can include the use of nuclear weapons, the ranks of command officers tend to be higher than officers in some of the other elements of Soviet aviation. For example, in Long-Range Aviation a regiment might be commanded by a major general rather than a colonel. [Ref. 51, p. 107] The aviation squadron is commanded by a colonel or lieutenant colonel rather than by a major as in, say, Frontal Aviation. [Ref. 51, p. 107] The long-range bomber element of Long-Range Aviation is divided into detachments commanded by a lieutenant colonel or major, rather than the squadrons being subdivided further into flights. [Ref. 51, p. 107]

For the past 10 years Long-Range Aviation bombers have included the four-engine turboprop Tu–95/BEAR and the four-engine jet M–4/BISON. [Ref. 7, p. 383] The current strike force has about 100 BEAR and 40 BISON, about evenly divided between gravity bombers and air-to-surface missile carriers. [Ref. 7, p. 383] Along with these long-range bombers, LRA also possesses about 450 Tu–16/BADGER and 170 Tu–22/BLINDER medium-range bombers, as well as 35 BACKFIRE bombers.* [Ref. 33, p. 8] So as to extend the range of their bomber force, the Soviets have converted approximately 10 BADGER and 40 BISON bombers into tankers. [Ref. 34, p. 6] In addition, some of the BEAR bombers have been configured as reconnaissance and antisubmarine aircraft. [Ref. 7, p. 384]

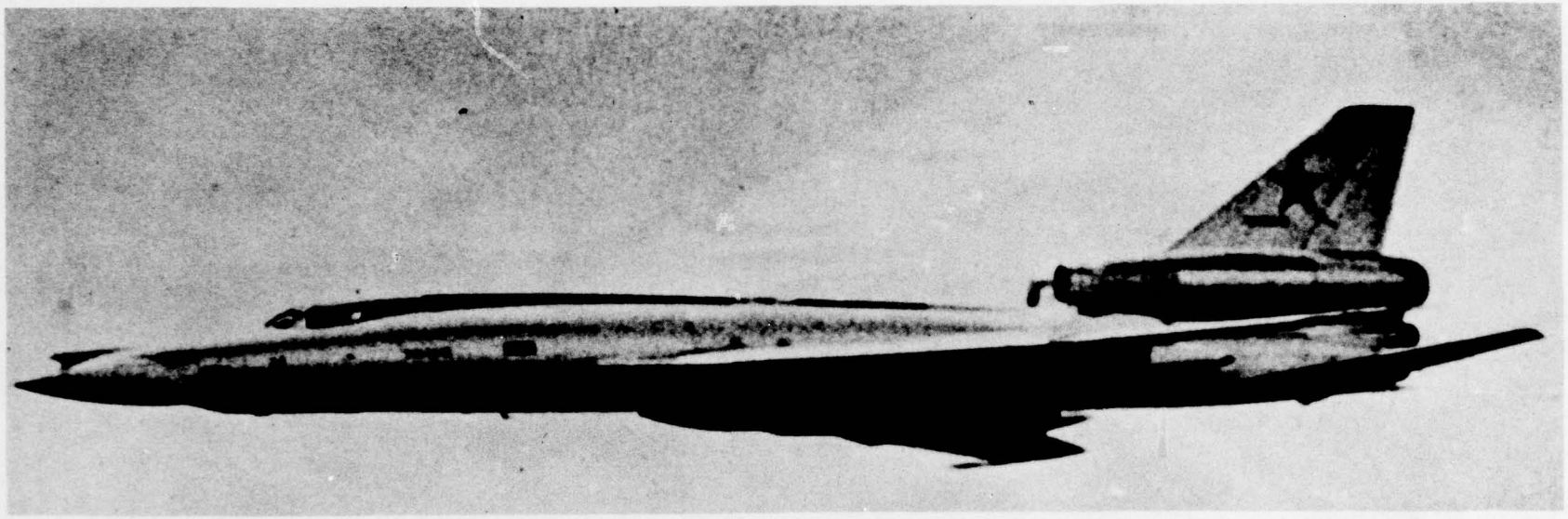
The BACKFIRE is the only Soviet bomber currently being produced and deployed to Long-Range Aviation, although it should be noted that the Soviets may be in the process of developing a new long-range bomber to replace their BEAR and BISON, since they have referred to such developments since 1974. [Ref. 60, p. 79] While the Soviets maintain that the BACKFIRE is a medium bomber intended for peripheral missions, it does have the capability for intercontinental missions against the United States. [Ref. 7, p. 384] Staging from the Arctic on one-way missions recovering in friendly or neutral territory, the BACKFIRE is capable of delivering weapons anywhere in the United States without aerial refueling. [Ref. 7, p. 385] Staging from Arctic bases and refueled, the BACKFIRE could cover virtually all of the United States on two-way, high-altitude, subsonic missions. [Ref. 7, p. 385] The unrefueled radius would cover the western United States in an arc generally extending from Los Angeles to the western tip of Lake Superior. [Ref. 7, p. 385] Carrying air-to-surface missiles, the BACKFIRE would have somewhat reduced capabilities, but the potential range of the missiles would produce comparable target coverage. [Ref. 7, p. 385] Tanker support would be required for intercontinental missions involving supersonic dash or extended

* While over 100 BACKFIRE have been produced [Ref. 72, p. 428], only about one-third of the force has been operationally assigned to LRA and one-third to Naval Aviation. The remaining aircraft are probably being tied up in testing and training.

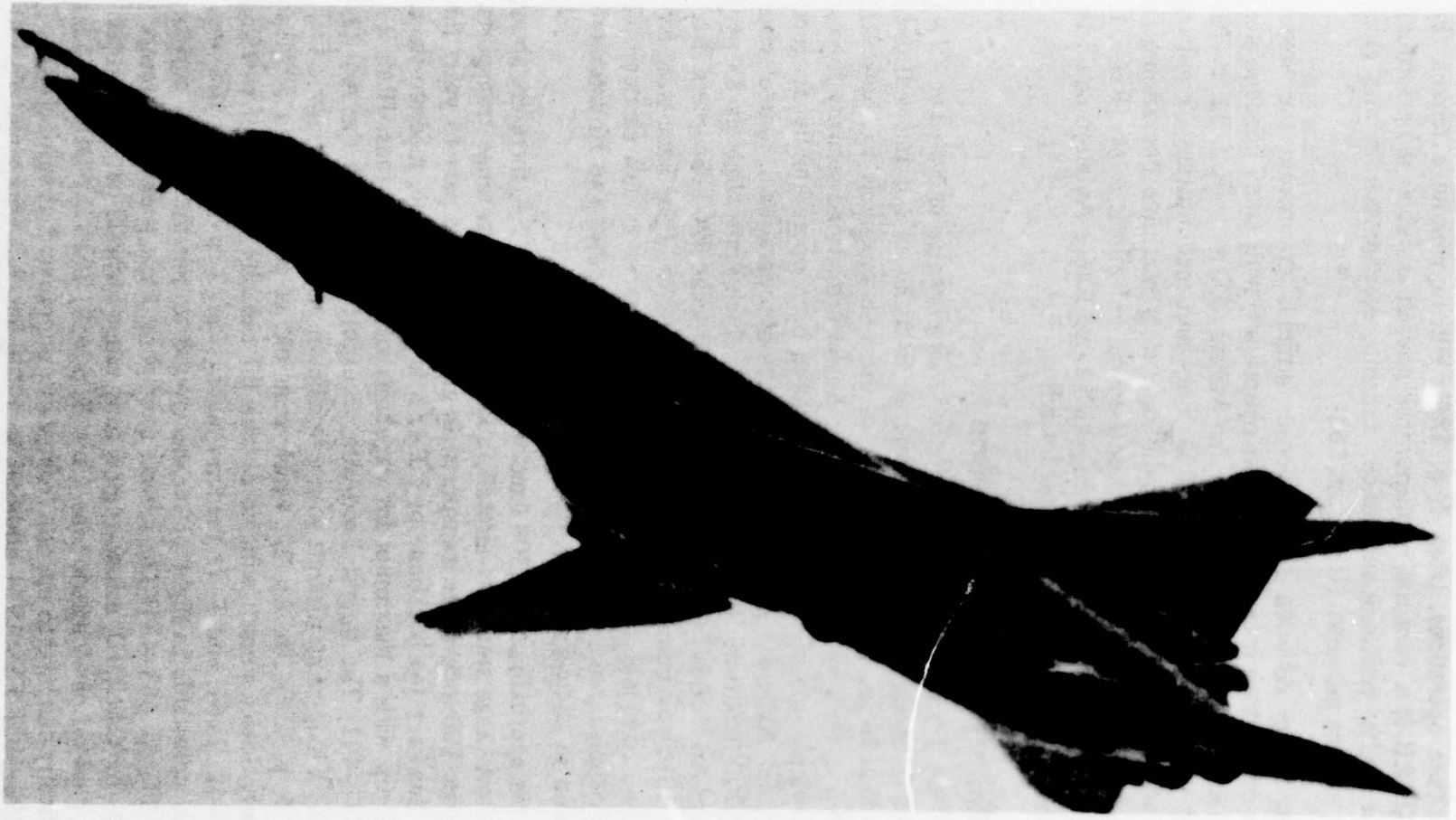
Tu–95/BEAR

M–4/BISON

Tu–16/BADGER



Tu–22/BLINDER



Tu–?/BACKFIRE

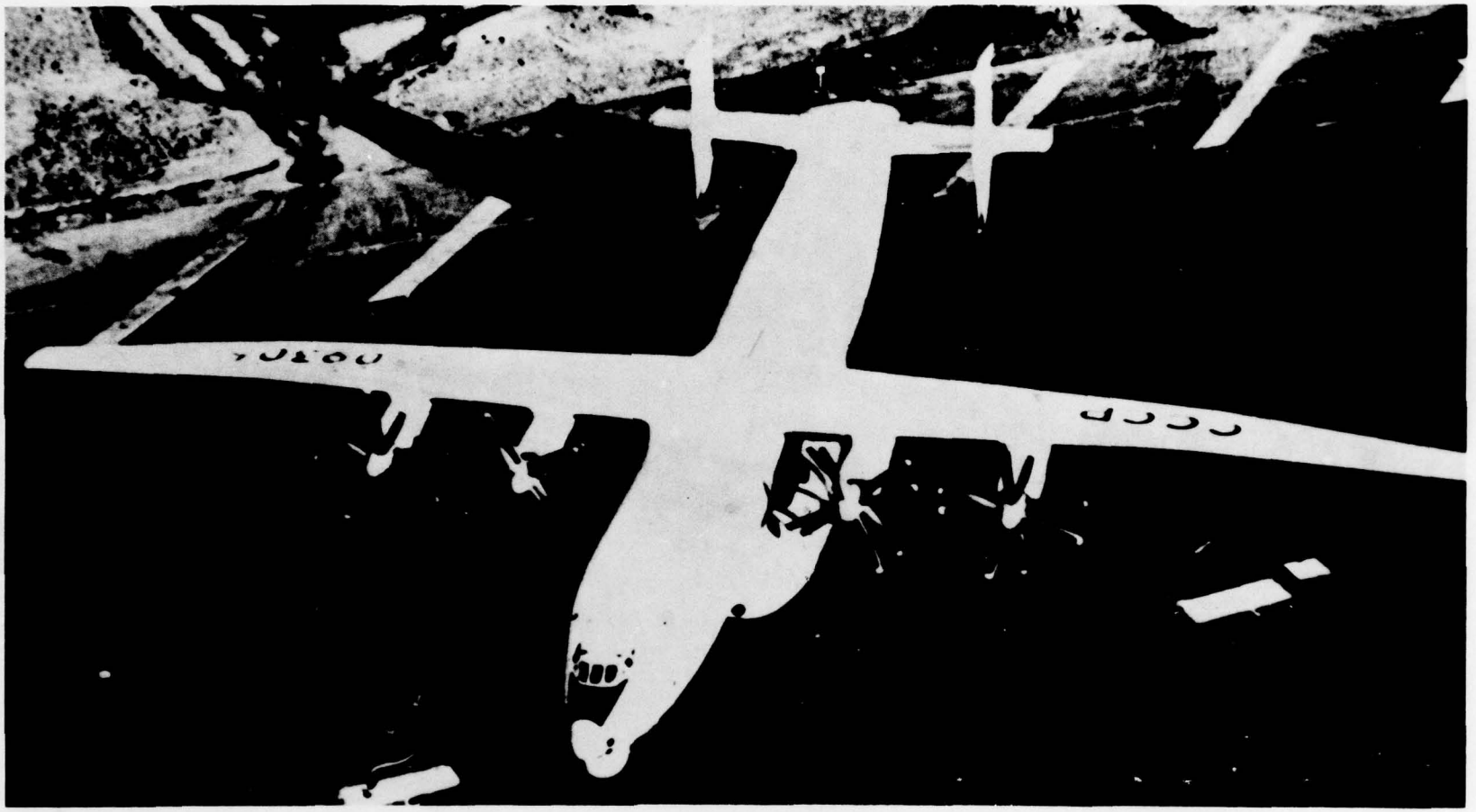
low-altitude operations. [Ref. 7, p. 385] With or without a tanker, the BACKFIRE is a versatile, multipurpose aircraft capable of performing nuclear strike, conventional attack, antiship, reconnaissance, and electronic warfare missions. [Ref. 7, p. 385]

Long-Range Aviation has numerous airfields throughout the Soviet Union from which it can conduct air operations, with many concentrated in the Arctic region and the Leningrad Military District. [Ref. 31, p. 78] Should war occur, LRA's some 800 long- and medium-range bombers [Ref. 66, p. 229] would function in support of maritime operations, as well as in more conventional reconnaissance and attack roles. [Ref. 31, p. 78] The numerous airfields from which Long-Range Aviation could be employed add significantly to this flexibility.

C. Military Transport Aviation

Military Transport Aviation (*Voyenno-transportnaya aviatsiya* or *VTA*) consists of about 1,500 fixed-wing aircraft [Ref. 34, p. 10] and well over 5,000 helicopters. Many, if not most, of these air machines are, however, assigned to the various elements of the Soviet armed and security forces. For example, about 3,800 helicopters have been operationally assigned to Frontal Aviation. At present *VTA* retains operational control over about 700 fixed-wing transport aircraft, of which approximately 85 percent are An–12BP/CUB [Ref. 7, p. 459], and some 320 helicopters [Ref. 33, p. 10] Operationally, *VTA* has the capability to lift by fixed-wing aircraft one complete airborne division or the combat assault elements of two divisions up to 1,000 miles, and to lift by helicopter 8 to 10 battalion-size units in tactical assaults. [Ref. 16, p. 51]

Of the approximately 1,500 fixed-wing aircraft in *VTA*, there are about 700 short-range transport aircraft, about 700 medium-range transports, and some 100 long-range transports. In general, for the past 15 years the CUB has been the backbone of *VTA*. It is a four-engine, medium-range turboprop with a maximum lift capability of 20 metric tons. [Ref. 21, pp. 481–482] The largest fixed-wing transport in *VTA* is the An–22/COCK, a long-range aircraft with a maximum payload of 80 metric tons. [Ref. 7, p. 459] The An–22, which went out of production in 1974, is the only Soviet aircraft with an outsize lift capacity capable of carrying the T–62, T–64, and T–72 medium tanks. [Ref. 7, p. 459] Its tire pressure is adjustable in flight or on the ground to suit the airfield surface. [Ref. 21, pp. 483–484] The newest fixed-wing *VTA* transport aircraft is the I1–76/CANDID, a four-engine, long-range turbofan jet with a maximum payload of 40 metric tons. [Ref. 7, p. 459] The CANDID has been specifically designed to operate from short, unprepared airstrips. [Ref. 21, pp. 492–493] This 1974 addition to *VTA* has full equipment for all-weather operation by day and night, to include a computer for automatic flight control and landing approach. [Ref. 21, pp. 492–493]



An–22/COCK

Il–76/ CANDID

Of the over 5,000 helicopters in *VTA*, reliance is placed in the main on the Mi–8/HIP. This twin-turbine-powered helicopter has navigation equipment for all-weather flying by day and night. [Ref. 21, pp. 502–504] External stores, including large rocket pods, can be carried on an outrigger structure on each side of the main cabin. [Ref. 21, pp. 502–504] The HIP constitutes at least one-third of the *VTA* helicopter assets. [Ref. 21, pp. 502–504] For its heavy lift requirements, *VTA* has the Mi–6/HOOK, with a maximum internal payload of over 26,000 pounds. [Ref. 21, pp. 505–506]

Military Transport Aviation is organized into regiments and smaller independent units. Most *VTA* units are deployed in the European USSR. These units and their aircraft are backed up by a very large reserve to be found in the Civil Air Fleet (*Aeroflot*), which is by far the largest civil air organization in the world. [Ref. 31, p. 82] Although it has been estimated that up to 1,300 nonmilitary aircraft could be mobilized, approximately 300 could be utilized without any significant disruption of *Aeroflot* flight schedules. [Ref. 54, p. 61]

D. Aeroflot

Aeroflot, which is subordinate to the Ministry of Civil Aviation of the USSR, is responsible for all Soviet civil aviation other than *DOSAAF** flying schools and gliding clubs. [Ref. 1, p. 82] In addition to being the world's largest air carrier, *Aeroflot* runs the civil airfields, navigational aids, maintenance and training establishments, and about 30 other activities including agricultural work, survey, newspaper matrix delivery, fishery and ice reconnaissance, and aeromedical services. [Ref. 2, p. 917] The operational control of *Aeroflot* activities is exercised by some 29 administrations, of which 26 cover the Soviet Union on a geographical basis. *Aeroflot* administrations, in general, run the entire logistical backup for its far-ranging operations, to include catering and transit hotels. [Ref. 2, p. 917]

The *Aeroflot* air fleet includes over 2,000 planes, excluding several thousand An–2/COLT aircraft utilized mainly for agriculture. [Ref. 2, p. 917] While the number of helicopters in service is not known, in 1974 it was officially stated that 600 helicopters of all types were employed in the Tyumen' gas and oilfields area alone. [Ref. 2, p. 917] In a general sense, all of these aircraft in *Aeroflot* may be regarded simply as a reserve of the Ministry of Defense. [Ref. 53, p. 46] Should a need ever arise, Military Transport Aviation (*VTA*) would undoubtedly call on the considerable resources of *Aeroflot* in order to supplement its lift and transport capabilities. [Ref. 16, p. 51] An interesting example of this is

* *DOSAAF*—Voluntary Society for Cooperation with the Army, Air Force, and Navy. An organization tasked with a pre-military training mission.

Mi–6/HOOK

provided by the semiannual utilization of *Aeroflot* aircraft to rotate personnel between the Soviet groups of forces in Europe and the Soviet Union proper. [Ref. 16, p. 51] The *Aeroflot* aircraft available to supplement the military airlift include 1,300 medium- and long-range aircraft which can provide intertheater support, thereby freeing military aircraft for tactical missions. [Ref. 7, p. 459] Although limited by its small percentage of rear loading cargo planes, *Aeroflot* could nevertheless increase the military cargo airlift capability by 25 percent and more than triple the personnel airlift capability. [Ref. 7, p. 459]

E. National Air Defense Aviation

National Air Defense Aviation (*Aviatsiya voysk PVO strany*, in the West simply *APVO* or sometimes *IAPVO* for the Russian *Istrebitel'naya aviatsiya PVO*) constitutes the most maneuverable and long-range arm of the air defense forces. [Ref. 22, p. 29] It consists of regiments of fighter-interceptor aircraft assigned, along with surface-to-air missile troops and radio technical troops, to 10 air defense districts* throughout the Soviet Union. [Ref. 30, p. 55] The control centers within the air defense districts coordinate air- and ground-based means of destroying the air enemy. These districts and the *PVO* command are linked with the six air defense districts of the non-Soviet members of the Warsaw Pact and, almost certainly, with Soviet Frontal Aviation elements in the groups of Soviet forces in Eastern Europe. [Ref. 30, p. 55]

The command center at *PVO Strany* headquarters in Moscow exercises centralized control over the air defense districts, insuring that resources are allocated, and reallocated if need be, to guarantee that the necessary forces are present to counter an air attack on the homeland. As information enters the system, it is the centralized command center in Moscow that would be responsible for insuring that sufficient assets are mobilized to perform the mission. It is most likely that control centers subordinated to the respective air defense district headquarters coordinate the detection and tracking radars, select and commit weapons systems, and manage localized air battles. Under the supervision of the control centers, interceptor direction centers guide aircraft to the targets. Although the decision whether to commit missiles or interceptors in a specific tactical situation can be made by the control center, long-standing Soviet practice has been to engage attacking aircraft or aerodynamic missiles at maximum control range with interceptors, to harass them en route to the target with a controlled mix of fighters and surface-to-air missiles (SAMs), and to rely on the missile sites for point defense of the target areas.

* While the Soviets refer to two of these units as air defense districts (Moscow and Baku) and the other eight as independent *PVO* (Air Defense) armies, all ten are for all practical purposes the same and are therefore commonly referred to as air defense districts by western sources. [Ref. 30, p. 55]

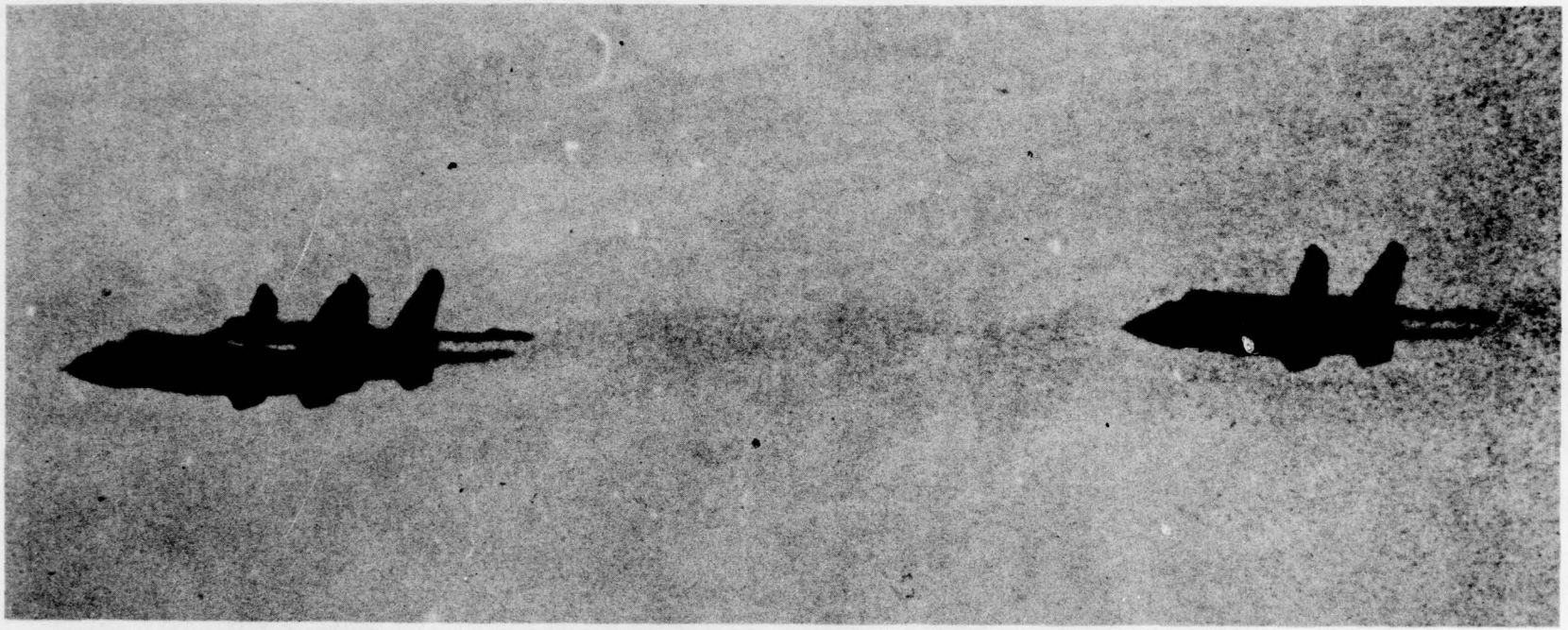
The National Air Defense Aviation interceptor force consists of about 2,600 aircraft. [Ref. 7, p. 391] Although the overall force level had been decreasing at a slow but steady rate since 1964, it has very recently been on the increase. [Ref. 7, p. 391] The aircraft that have been retired were primarily the older, clear-weather-only fighters, which have been replaced by more advanced all-weather aircraft. [Ref. 7, p. 391] The force has, therefore, been transformed into an all-weather one capable of intercepting targets at medium or high altitudes. The Soviets are, however, also continuing their efforts to improve their low-altitude intercept capabilities.

Although it was not a true look-down, shoot-down system,* the Soviets first began to correct their low-altitude intercept deficiency through the introduction into the inventory of the MiG–23S/FLOGGER B, which is credited with a limited intercept capability at low altitudes. A true downward-looking target search and tracking system has since appeared in the MiG–25M/FOXBAT E, which, as a result of its new or considerably modified radar and improved missile seeker heads, apparently has a much improved capability to attack low-flying aircraft. [Ref. 41, p. 260] However, even after the MiG–25M is deployed in sufficient numbers, there still would remain the problem of control. The difficulty that would still confront the MiG–25M is that of having to locate the area in which to look for the low-altitude target. A fleet of airborne warning and control (AWAC) aircraft capable of tracking low-altitude aircraft could be utilized to direct interceptors to counter penetrators, but the current MOSS early warning and control aircraft is not adequate to the task. [Ref. 62, p. 6060] While MOSS can under optimum conditions detect low-altitude targets over water, it has no such capability over land; and lacking a height-finding radar, it has only limited capabilities for airborne control and vectoring of interceptors. [Ref. 62, p. 6060] Undoubtedly, the Soviets are working toward improvements in this area as well.

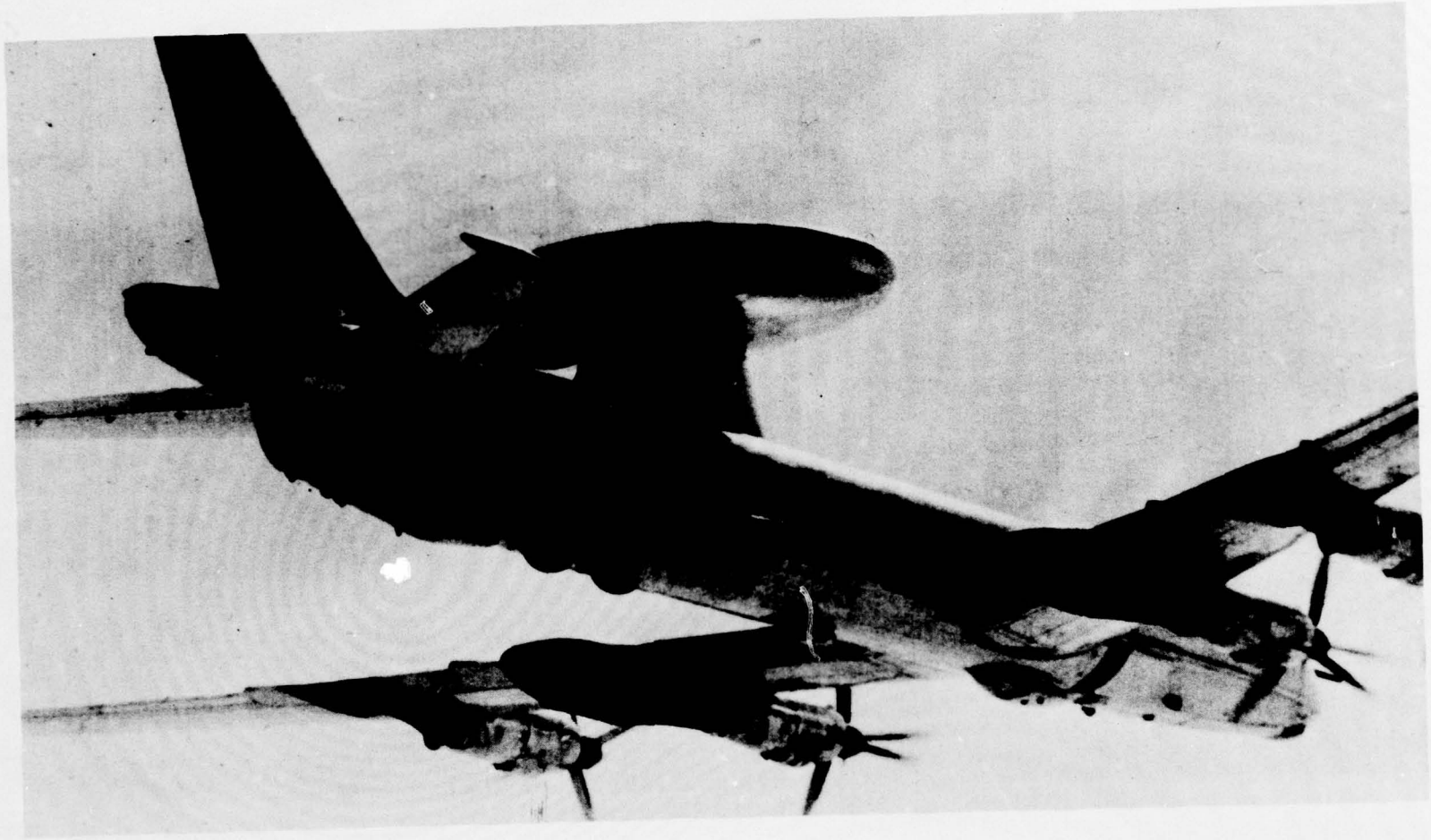
Since it will take a considerable amount of time to get the MiG–25M into production and deployed in adequate numbers, the Soviets are upgrading the Su–15/FLAGON E. The new FLAGON F and the MiG–25M, like the FLOGGER B, will probably be fitted with a cannon in addition to their missiles, presumably to provide an additional weapon that is also less vulnerable to electronic and maneuver countermeasures. [Ref. 37, p. 611 and Ref. 41, 260] Also part of the effort to upgrade Soviet air defense is a continuing program for the construction of hardened aircraft bunkers at air defense fields. [Ref. 7, p. 392]

---

* Look-down, shoot-down describes an interceptor system which can detect, track, and shoot down a low-altitude penetrator from a higher altitude under conditions in which ground clutter would preclude success with a conventional airborne intercept radar and missile guidance system.



MiG–25/FOXBAT A



Tu–126/MOSS

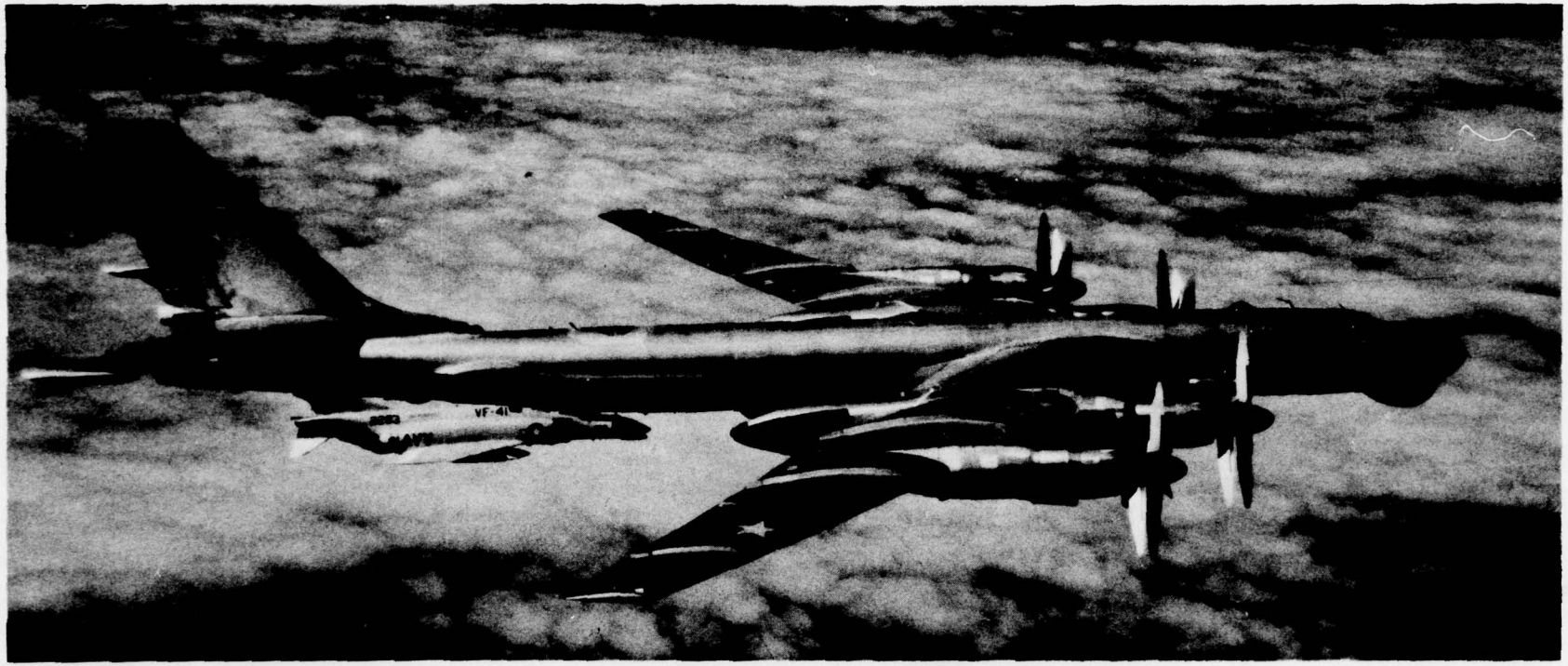
Su–15/FLAGON E

F. Naval Aviation

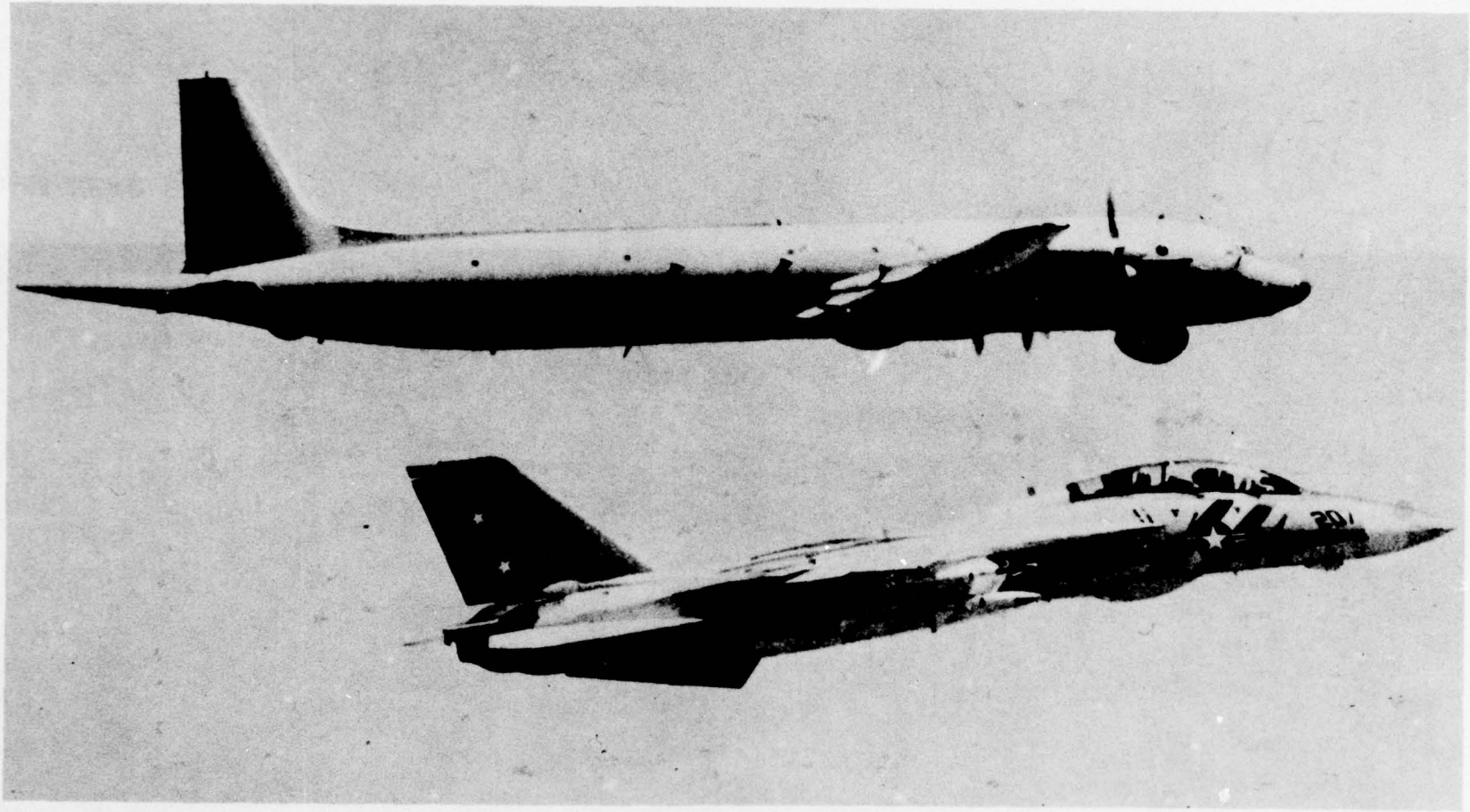
Naval Aviation (*Aviatsiya voyenno-morskogo flota or AVMF*) has approximately 1,200 aircraft, [Ref. 43, p. 69] which makes it more than twice the size of any non-American NATO air force. A careful evaluation of the composition of the *AVMF* aircraft will indicate how operational thought concerning the utilization of Naval Aviation has evolved over the last 20 years or so. The fighter-interceptor air defense of the fleet mission is now essentially the responsibility of *APVO* aircraft when the fleet is within the area of responsibility of the littoral air defense districts [Ref. 16, p. 60], while Naval Aviation is presently concentrated against reconnaissance, strike, and antisubmarine warfare tasks. Furthermore, although the Soviets have in the past claimed that aircraft carriers were too vulnerable in nuclear conflict, the extension of Soviet military power into the developing world has required yet another modification to provide a naval air capability in the more remote areas that could hardly be shore-based. [Ref. 36, pp. 551–552]

The main naval aviation strike force is comprised of about 280 air-to-surface missile (ASM) equipped Tu–16/BADGER bombers, 48 Tu–22/BLINDER bombers, and 35 supersonic BACKFIRE ASM bombers. [Ref. 4, p. 21] The introduction of BACKFIRE into the *AVMF* in late 1974 significantly enhanced the range and overall strike capability of Naval Aviation. [Ref. 7, p. 441] BACKFIRE is superior to BADGER and BLINDER in overall performance, range, speed, and maneuverability. [Ref. 7, p. 441] Although some difference of opinion exists concerning the maximum unrefueled range of BACKFIRE, it strengthens significantly the antiship strike capability of *AVMF*. [Ref. 7, p. 441] It is also important to note that these aircraft are supported by intermediate- and long-range reconnaissance and electronic countermeasures (ECM) aircraft, plus a BADGER tanker fleet. Naval Aviation conducts its long-range maritime surveillance with the TU–95/BEAR. Intermediate-range maritime reconnaissance can be accomplished with the I1–38/MAY, while the Be–12/MAIL, along with the Mi–4/HOUND, Ka–25/HORMONE, and Mi–14/HAZE helicopters, fulfill shorter range requirements. [Ref. 7, p. 441] Ultimately, some BACKFIRE probably will be deployed in a long-range reconnaissance role in support of this present division of labor. [Ref. 7, p. 441]

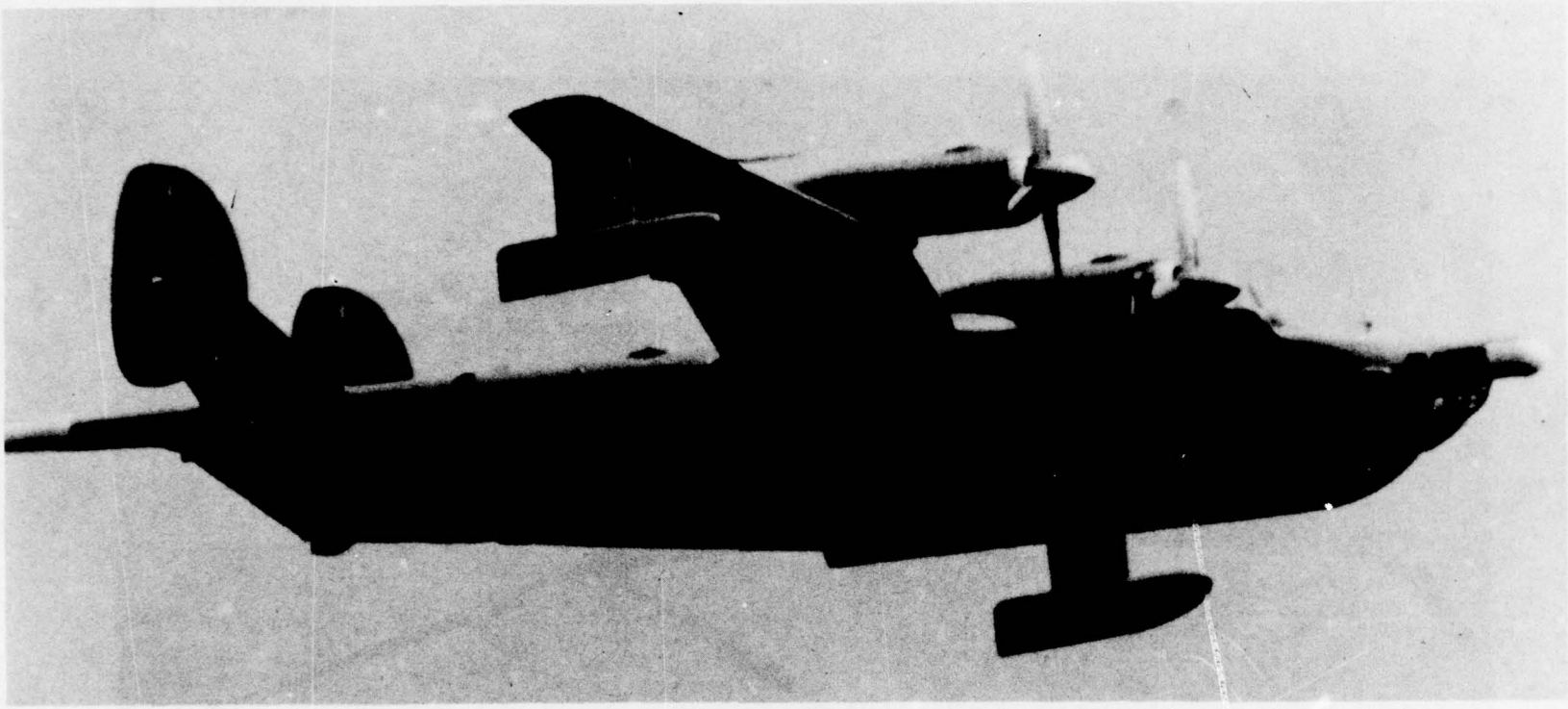
While the open-ocean antisubmarine warfare (ASW) capability of the *AVMF* consists primarily of MAY, BEAR, and the amphibian MAIL, Naval Aviation has a much more diversified ASW capability in contiguous areas. [Ref. 7, p. 441] However, changing Soviet naval force structure reflects an expansion from coastal waters control to the conduct of more extensive sea denial operations. The two Soviet ASW cruisers—MOSKVA and LENINGRAD—are extensively armed with antiair,



Tu–95/BEAR D



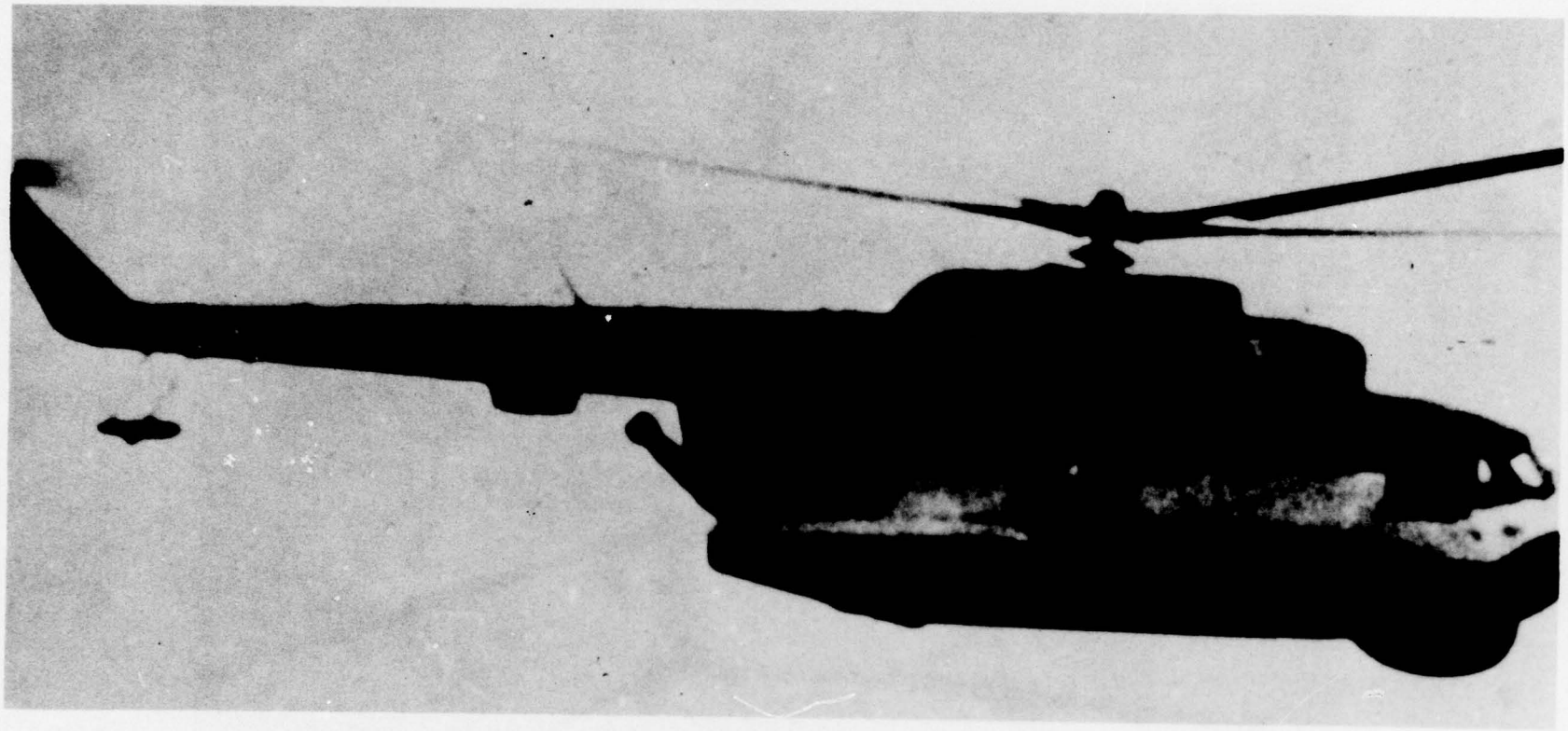
Il–38/MAY



Be–12/MAIL

Mi–4/HOUND

Ka–26/HORMONE



Mi–14/HAZE

antiship, and antisubmarine capabilities, plus shipboard sensors designed to provide an all-weather ASW capability whenever helicopters cannot be utilized. [Ref. 16, p. 60] Both MOSKVA and LENINGRAD operate approximately 20 HORMONE helicopters, which carry search radar and "dunking" sonar, in addition to having an internal weapons bay for either torpedoes or depth bombs. [Ref. 16, p. 60] The Naval Aviation ASW helicopter force also includes HOUND and HAZE, with the latter currently being deployed in a land-based ASW role as a replacement for HOUND. [Ref. 7, p. 441]

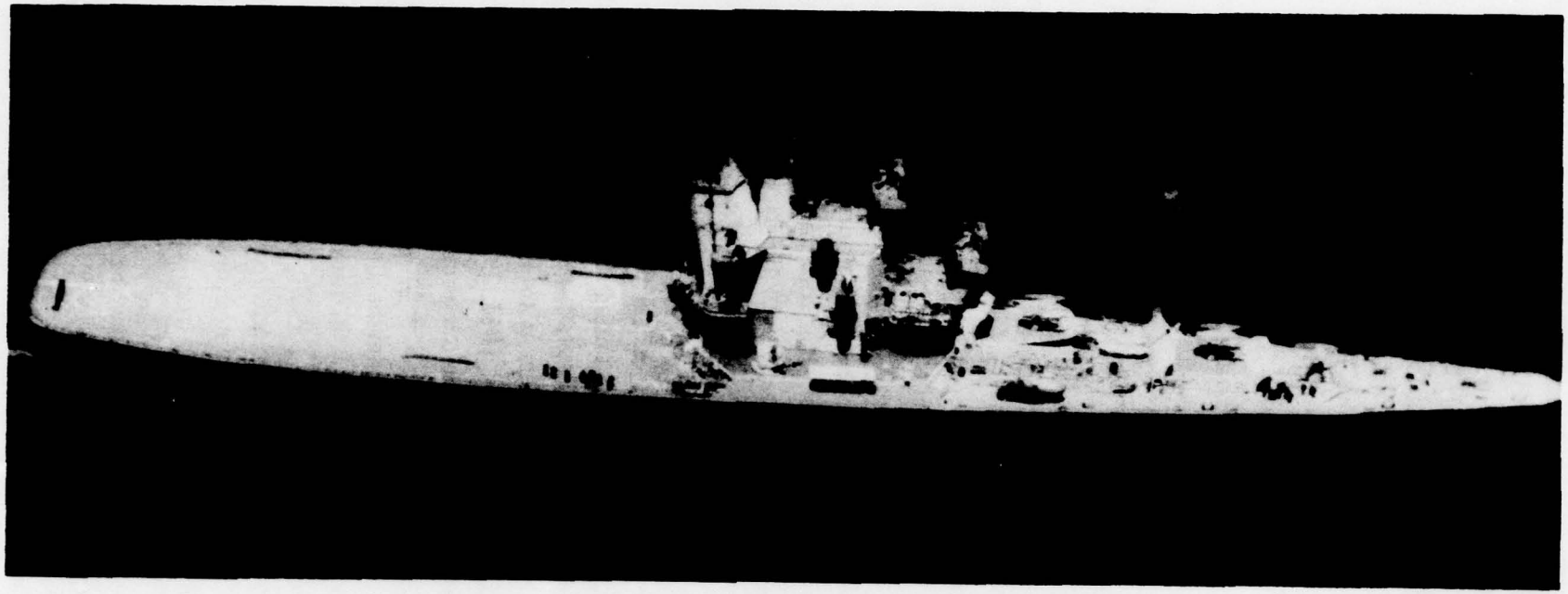
Perhaps most illustrative of the Soviet attempt to extend sea-denial operations, and maybe even illustrative of an effort to gain a limited potential for sea control, is the construction and development of a new class of "sea-control" ships. The KIEV-class aircraft carrier, well equipped for ASW, capable of providing tactical air support to forward deployed surface vessels and submarines, and with a potent array of antiship and antiaircraft missiles, antisubmarine rockets and torpedoes, and various gun systems, adds a new dimension to Soviet naval power. Expected to carry a mixed air wing complement of approximately 36 vertical short takeoff and landing (V/STOL)* aircraft and helicopters, the three ships of this class could also provide limited air support of amphibious operations. In this connection, *AVMF* also has some FITTER C fighter-bombers assigned to the Baltic Sea that could be used in support of amphibious operations in that area, as well as for limited antiship strike roles. [Ref. 7, p. 441]

The Soviet Navy's aircraft, except for a few training support and transport aircraft, are apportioned among the four fleets—the Baltic Fleet with headquarters (HQ) in Kaliningrad, the Northern Fleet with HQ in Severomorsk, the Black Sea Fleet with HQ in Sevastopol' and the Pacific Fleet with HQ in Vladivostok. [Ref. 29, p. 185] Fleet air units are operationally subordinate to the fleet commander and administratively subordinate to the commander of Naval Aviation† in Moscow. The largest operational component is the air regiment directly subordinate to the fleet commander of naval aviation, who in turn is subordinate to the fleet commander. Quite understandably the Northern and Pacific Fleets have most of the long-range reconnaissance aircraft because of their open-ocean missions. It should also be pointed out that *AVMF* sometimes receives assistance in its patrol activities from Long-Range Aviation.

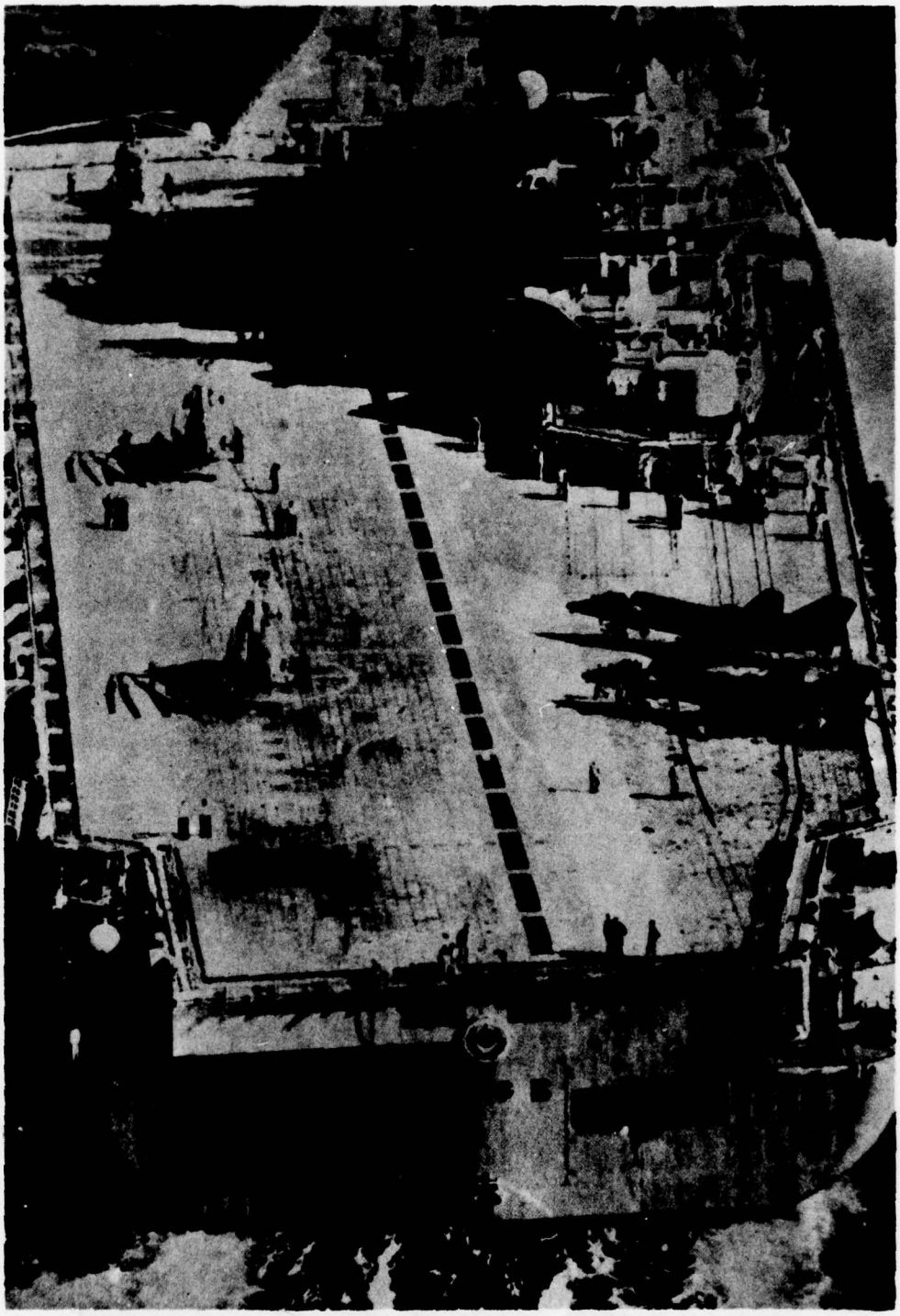
---

* The Soviets are presently deploying the Yak-36/FORGER with their carriers, although they are continuing to experiment with other aircraft designs.

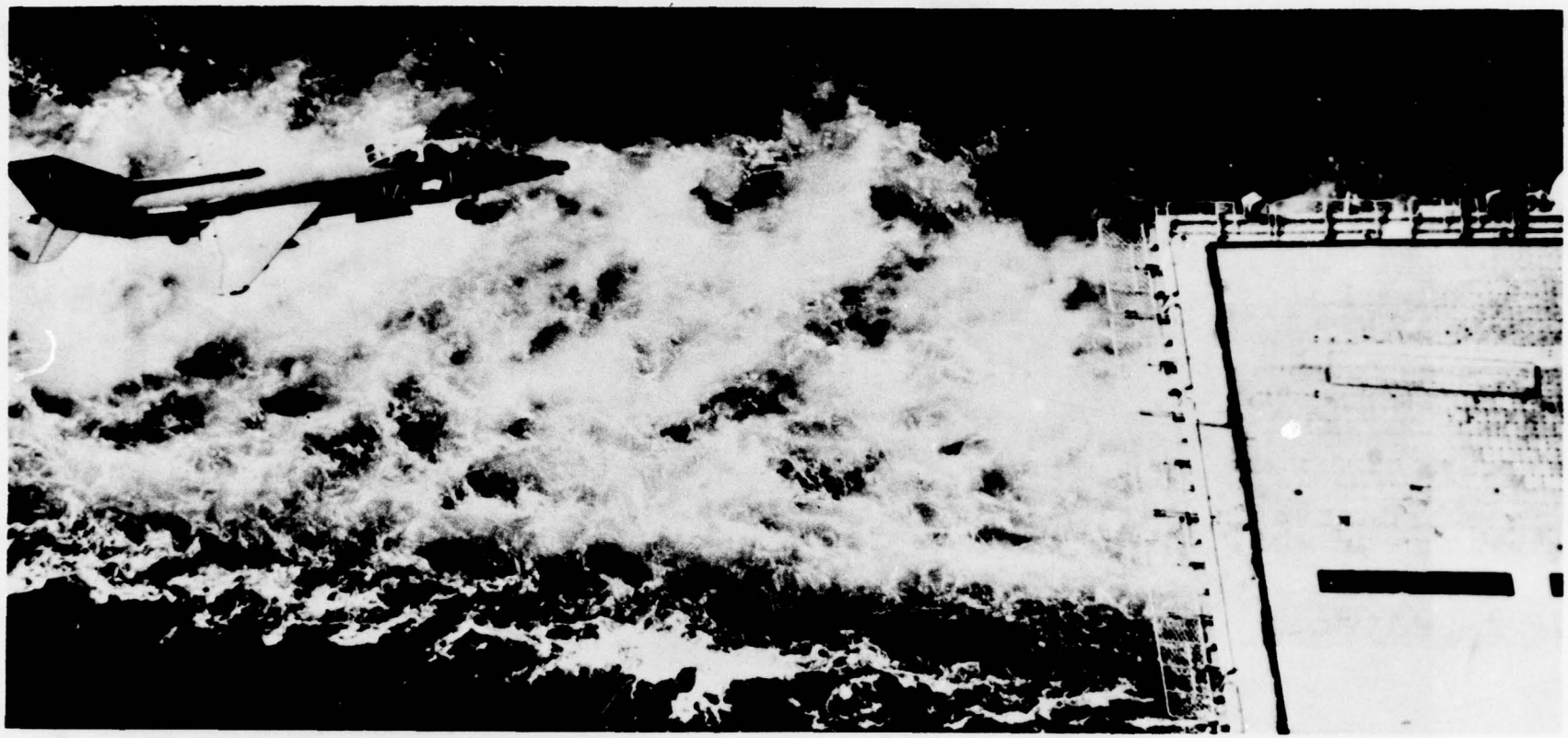
† *AVMF*, as do other specialized components of the Soviet Navy, uses "military" rather than "naval" ranks. [Ref. 43, p. 74]



MOSKVA



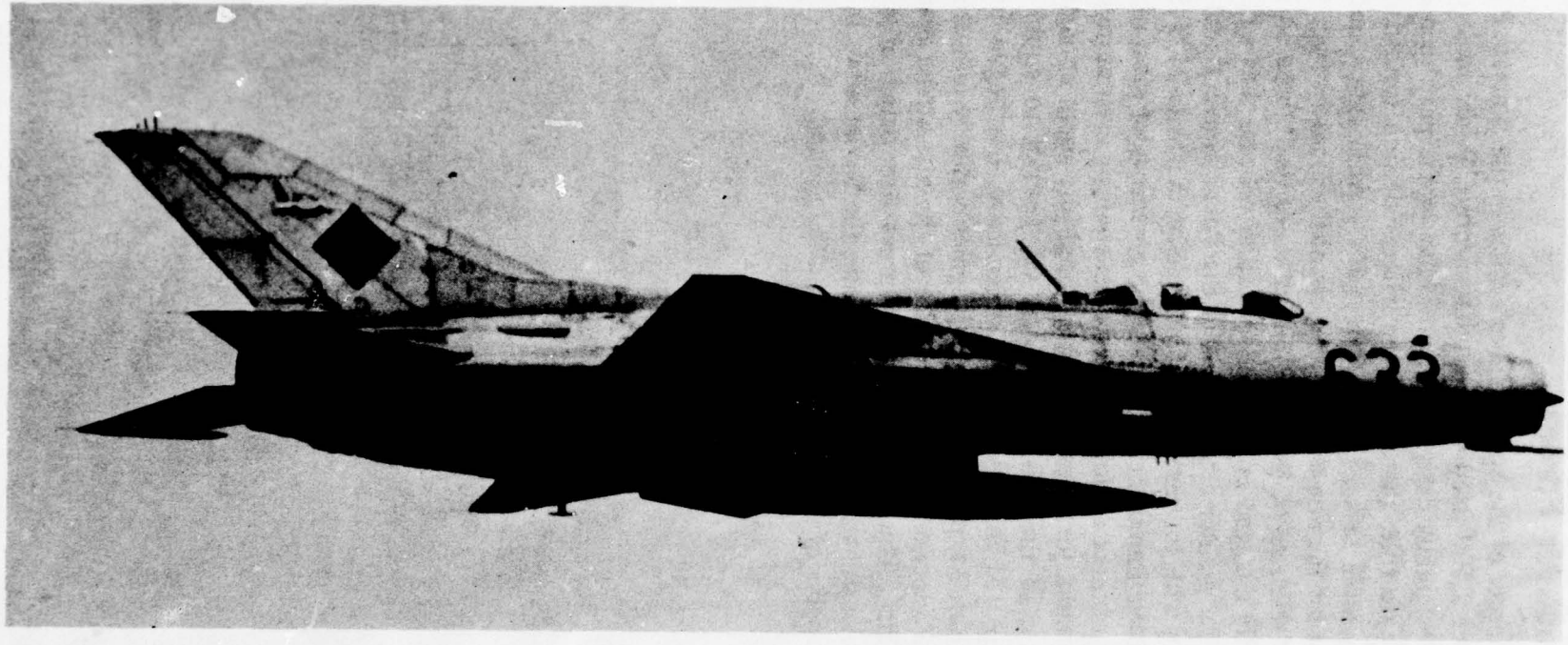
KIEV



Yak–36/FORGER

G. Adjunct Air Forces

The air forces of the Soviet Union's allies in the Warsaw Pact presently operate over 2,500 fixed-wing combat aircraft. While most of these aircraft were originally designed for and have in the past been employed in the air defense role, there has been a reorientation toward an ability to perform multiple tasks. [Ref. 4, pp. 36-37] Although it understandably took longer for the non-Soviet members of the Warsaw Pact to reflect the new Soviet doctrine of "air attack in all its forms," these allied air forces are presently engaged in the modernization process that will allow them to make a far greater contribution to the Pact's conventional air capabilities. Along with the more recent models of the MiG-21/FISHBED aircraft that have found their way into the air forces of most of the Warsaw Pact, some of these air forces have been acquiring even more sophisticated aircraft. Poland, for example, has acquired just about enough Su-20 (export version of the SU-17/FITTER C) aircraft to equip a regiment. [Ref. 34, p. 15] Bulgaria, on the other hand, has begun to receive the MiG-27. [Ref. 34, p. 13] These developments clearly indicate an assumption of new functions by at least some of the non-Soviet members of the Warsaw Pact. Thus, increasing resources are being allocated to the ground-attack function, and in the future the Soviet allies in the sky will be more capable of providing support on the ground.



MiG–21/FISHBED C/E

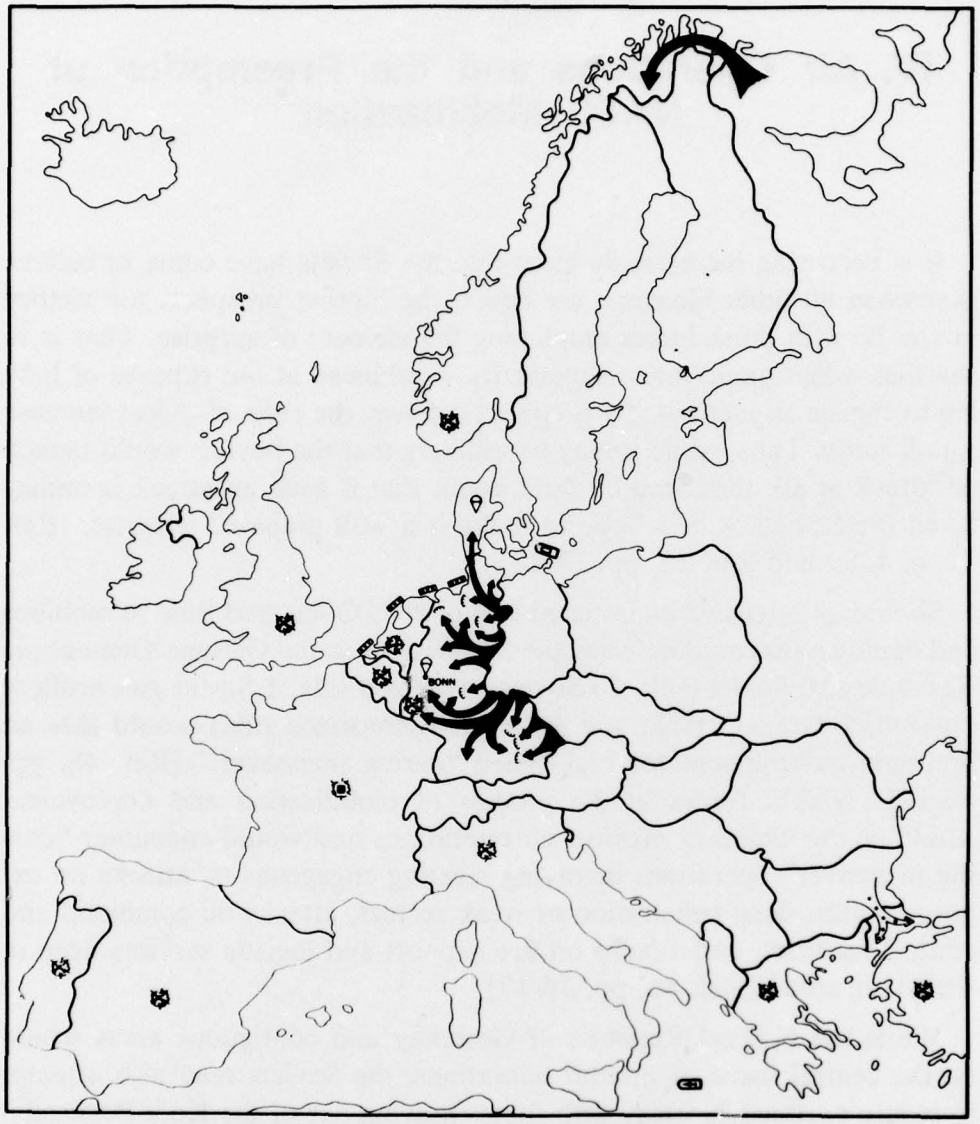
IV. Air Operations and the Preemption of NATO Mobilization

It is becoming increasingly clear that the Soviets have come to believe that when all other elements are equal, the highest prospects for victory in war lie with those forces employing the element of surprise. That is to say that, when quantitative superiority is achieved at the expense of having to engage an increasingly prepared defense, the risks of defeat increase significantly. Thus, while it may be unlikely that the Soviets would launch an attack at all, there can be little doubt that if such an attack is undertaken the Soviets would hope to make it a well-prepared surprise. [Ref. 73, p. 4389 and Ref. 12, pp. 27-28]

Should an offensive be initiated before NATO has had time to mobilize and deploy a prepared defense, the 27 divisions in the German Democratic Republic (10 Soviet tank, 10 Soviet motorized rifle, 1 Soviet gun artillery division, 2 German tank, and 4 German motorized rifle) would face an optimum environment for high-speed "daring maneuver." [Ref. 46, pp. 16-17] NATO forces in the process of mobilization and deployment would be the victim of massive air operations and would encounter "daring maneuver" operations involving meeting engagements, attacks on exposed flanks, deep penetration of weak sectors, attacks on command and control facilities, and attacks on fire support and logistic services deep in their rear areas. [Ref. 46, pp. 16-17]

While the Federal Republic of Germany and contiguous areas would be the central focus of ground operations, the Soviets may also attempt to secure northern Norway with forces moving out of the Kola Peninsula. They would have two motorized rifle divisions, an airborne division, and a Naval Infantry regiment to initiate this limited operation if such action is undertaken. [Ref. 16, p. 73] In addition, some Soviet ground force divisions in the Odessa Military District might be moved south to reinforce a Bulgarian ground thrust aimed at the limited task of securing the European shore of the Sea of Marmara, effectively sealing NATO out of the Black Sea and strengthening the Soviet demand for at least a share of the control of the Bosporus and Dardanelles in any post-conflict negotiations.

A Soviet nonnuclear attack on NATO would be initiated by a massive independent air operation (see the table on page 58). [Ref. 10, p. 5276]



SOVIET OFFENSIVE TO PRE-EMPT NATO MOBILIZATION

- Air attacks
- Soviets might hold off air attacks against France if they believe the French may stay neutral
- Daring maneuver operations of a soviet offensive to pre-empt NATO mobilization
- Warsaw Pact ground thrust delayed for soviet reinforcement
- Soviet ground thrust to secure northern Norway
- Naval attack
- Naval landing
- Major airborne operations
- Port entrances mined
- NATO ground forces

Most ground units would probably not be concentrated in attack zones until after the air operation was initiated, so as to avoid any chance of compromising the attack, and the Soviets would hope to utilize the tactic of "mobilization by maneuver" to conceal those ground forces that were prepared for the immediate initiation of hostilities. However, within the first 24 hours NATO would find itself facing several ground force thrusts. The main thing which would influence the methods of ground attack would be the continual threat of the use of nuclear weapons. [Ref. 68, pp. 2-3] Operating from a "nuclear-scared" position, the Soviets would hope that NATO would find it difficult to employ nuclear weapons to stabilize the situation with what remained of its nuclear capability because of the quantity and depth of penetrations, the interposition and close proximity of attacking targets to defending units, and the fact that the attacking forces would already be dispersed.

With the initiation of hostilities, all the armed forces of the Soviet Union and its Warsaw Pact allies would be fully mobilized. Certainly within 48 hours the combined Soviet-East German attack could be reinforced by seven Polish divisions (three tank and four motorized rifle) on the Northern *Front* and six Czech divisions (three tank and three motorized rifle) on the Southern *Front*. [Ref. 34, pp. 13-15] Soviet unit replacement to offset initial losses could be accomplished with the two Soviet tank divisions in Poland and the three motorized rifle and two tank divisions the Soviets have in Czechoslovakia. [Ref. 34, p. 9] Over the 10-14 days following the initiation of hostilities, the Soviets could move at least another 21 divisions into Germany in order to create a fresh reserve.*

The Soviets understand completely that they will be racing against time as they move toward the Rhine and then the Channel. [Ref. 10, p. 5278] Their overall planning is highly dependent on time-sequenced actions to accomplish critical functions. [Ref. 64, p. 4504] Therefore, the Soviets could be expected to make maximum use of airborne troops, airmobile operations, and naval infantry landings in attempts to increase the tempo of the attack.

A. Independent Missions for Aircraft

The independent air operation in support of a Warsaw Pact offensive to preempt NATO mobilization would begin with attacks on NATO installations and forces by Soviet aviation regiments utilizing nonnuclear means. A force of over 7,000 aircraft comprising elements from Soviet Frontal Aviation, Long-Range Aviation, and Naval Aviation, along with the East

* The Soviets have approximately 64 divisions in European USSR, of which approximately one-third are nearly full strength. Thus, about 21 divisions could begin the movement to Germany shortly after the initiation of hostilities.

European air forces, would be available for participation in the operation.* In the initial mass strike, a number of Frontal Aviation aircraft would be assigned to attack the NATO air defense system so that following aircraft could conduct a massive attack on NATO airfields. [Ref. 4, p. 71] Some BACKFIRE bombers, along with the medium-range bombers of LRA and Naval Aviation assigned to the operation, would quite likely be used to attack the airfields in Great Britain, on the Iberian Peninsula, and along the Mediterranean, [Ref. 10, p. 5266] and any NATO aircraft carriers in waters contiguous to Europe. It is generally accepted that, despite NATO air defenses, attackers would penetrate and achieve significant damage at NATO airfields. [Ref. 57, p. 4220] The second mass strike would probably be directed against command and control centers, as well as the fixed and field storage sites for nuclear weapons. **[Ref. 4, page 72]** In between mass strikes, some Frontal Aviation fighter-bombers would support the tactical operations, while others would continue to keep the pressure on NATO airfields. While toxic chemical weapons might very well be utilized against some targets from the outset, it is likely that the Soviets would also hit all the other high priority targets with chemical bombs or missiles once the attacks with more conventional ordnance have been completed. [Ref. 18, p. 22 and Ref. 10, pp. 5269-5270] For example, once NATO airfields have been put out of action by conventional means, the Soviets would hope by chemical means to keep them out of action or at least lengthen the time required to return them to operational status.

The Soviets would probably hope that the independent air operation against priority targets would be completed within 48 hours. Ground turnaround time for some of the aircraft in Frontal Aviation could be as low as around 10 minutes. [Ref. 17, p. 444] Allowing for aircraft that have a much slower ground turnaround time, it would be safe to assume an average ground turnaround time of about 90 minutes per Frontal Aviation sortie. With the relatively short flying times to most targets, it should not be surprising to find the Soviets able to force a relatively high sortie rate early in the conflict. Some Frontal Aviation aircraft could fly six or more sorties per day† during this initial period, [Ref. 20, p. 11],

---

* That the Soviets have experience with handling such a large number of aircraft in such a major undertaking was demonstrated in World War II when 5,000 fighting planes took part in the Battle of Kursk, and in the Berlin operation it was 7,500. During the liberation of Belorussia, roughly 6,000 planes flew more than 153,000 sorties. Soviet strikes against important targets and enemy reserves were at times during the war carried out simultaneously by 600 to 700 aircraft. [Ref. 70, p. 37]

† Ref. 20 states that the F–15 sorties rate is being increased from six to nine per day. If the Soviets' ground turnaround time is faster, it would be safe to assume that they can match the U.S. rate.

although the total average for all aircraft surviving in the independent air operation would probably average closer to four sorties per day.*

If the Warsaw Pact lost 5 to 10 percent of the aircraft in each strike, they could lose about one-third of the aircraft available for the independent air operation by the time it was completed.† Even so, the Pact could have about 5,000 aircraft left, and the operation, if it went according to Soviet plans, would leave NATO ground forces practically without air resources. Furthermore, the Soviets could if need be replace about 15 percent of the Warsaw Pact losses from their own school systems. Instructor pilots would be comparable to the better pilots of units in the field, except that the instructor pilots do not get as much tactical training and utilization of armaments as those pilots in the regular units. However, the instructor pilots would most often be capable of exercising better aircraft control than pilots in the regular units. With each school possessing at least one regiment of the most current generation aircraft (out of an average of three regiments per school), the Soviets could therefore field an additional 10 or more first-rate aviation regiments to help replace aircraft and pilots lost in the independent air operation.

B. Supporting Missions for Aircraft

Military Transport Aviation (assisted by *Aeroflot*) would have to assume the principal responsibilities for the movement of personnel, equipment, and supplies in any operation in which the Soviets employ airborne and airmobile forces. While the seven full strength and one training airborne divisions within the Ground Forces constitute the major airborne strike force of the Soviet Union, there is also a strong commitment to airmobile operations. Helicopter regiments are available to lift 8 to 10 motorized rifle battalions well ahead of the main assault forces in any conflict with NATO. In fact, one battalion in each motorized rifle division receives training in helicopter operations. The Soviets could also draw upon Warsaw Pact airborne forces: the Hungarian and East German airborne battalions, the Bulgarian and Czechoslovak airborne regiments, and the Polish airborne division (whose men are trained in both the German and Danish languages). [Ref. 14, p. 184 and Ref. 34, pp. 13-15] With such

* The total average would be lower than five because of the distances medium-range bombers would have to fly and their much greater ground turnaround time (they would probably make two strikes the first day), and because the sustained rate of Frontal Aviation could be expected to fall from the surge of the first day.

† In order to lose one-third of the forces available for the independent air operation, the Soviets would have to have an attrition rate of 7.5 percent; i.e., 75 aircraft lost per 1,000 sorties. This compares to a U.S. attrition rate of 9/1,000 in World War II, 4.4/1,000 in the Korean Conflict, and 3/1,000 in Vietnam. In the 1973 Arab-Israeli War, the Israeli Air Force attrition rate was 8/1,000—while the loss rate for the A–4, used primarily for close air support, was between 10 and 15 aircraft lost per 1,000 sorties. The U.S. is said to consider 2 percent, i.e., 20 losses per 1,000 sorties as high. [Ref. 71, p. 1065]

WARSAW PACT FIXED-WING COMBAT AIRCRAFT AVAILABLE FOR USE IN AN INDEPENDENT AIR OPERATION AGAINST HIGH PRIORITY NATO TARGETS[a]

	Number of Aircraft		
Country	*Available for Immediate Attack*[b]	*Immediate Reserves*	*Total*
USSR	2644[c]	1950[d]	4594
Poland		805[e]	805
Czechoslovakia		558	558
GDR		416	416
Hungary		176	176
Romania		327	327
Bulgaria		270	270
Total	2644	4502	7146[f]

[a] All figures given might have to be reduced by as much as 15 percent (to allow for aircraft not ready to participate in the operation) should the Soviets choose not to attempt any stand-down that might raise NATO suspicions. A limited stand-down, however, would both lower nonavailability, and avoid maximizing the risk of losing surprise.

[b] Excludes Frontal Aviation in Central Asian MD, Siberian MD, Transbaykal MD, and Far East MD, which would be allocated for security in the East; all Soviet National Air Defense Aviation; all long-range aircraft and 25 percent of the medium-range bombers of LRA; 30 percent of Naval Aviation combat aircraft; and Frontal Aviation combat aircraft allocated to the reserve.

[c] Includes all Frontal Aviation fixed-wing combat aircraft in the GDR, Poland, Czechoslovakia, Hungary, and Leningrad MD, as well as 303 Soviet Naval Aviation fixed-wing combat aircraft and 491 LRA medium-range bombers.

[d] Includes Soviet Frontal Aviation fixed-wing combat aircraft in all military districts except Leningrad MD, Central Asian MD, Siberian MD, Transbaykal MD, and Far East MD.

[e] Includes 745 air force combat aircraft and 60 combat aircraft belonging to Polish naval aviation.

[f] Includes only fixed-wing combat aircraft that could be brought into the initial independent air operation NATO-wide within the first days of a conflict without reducing Soviet offensive air capabilities in Asia or reducing the air defense of the Soviet Union.

extensive troop preparations for airborne and airmobile operations, it becomes quite clear that Military Transport Aviation faces the possibility of some awesome demands, should it be called on to deliver.

Besides the less dynamic tactical operations to seize such objectives as bridges, the Soviets might also follow up air strikes against nuclear

weapons storage facilities with airmobile operations. The three most likely candidates for major Soviet airborne attacks would be the Bosporus and Dardanelles, Bonn, and Denmark. An airborne attack against Turkey would likely be only part of a previously mentioned mission to secure the shore of the Sea of Marmara. An airborne attack against Bonn, in conjunction with operations by Soviet and East German *rezident* agents in the West, could very well paralyze the central government, if not the control of military forces, in the Federal Republic of Germany. An airborne attack against Denmark would likely be only a part of a major operation involving East German and Polish ground forces, as well as Soviet naval infantry and the Polish amphibious assault division. While the three airborne operations would require substantial Military Transport Aviation support, the Danish operation would also undoubtedly require a considerable number of ground-attack missions by aircraft. The Naval Aviation FITTER C fighter-bombers assigned to the Baltic Fleet would most certainly play a role in the support of amphibious operations against Denmark, but they would have to receive rather substantial assistance from Naval Aviation's BADGER, BLINDER, and BACKFIRE bombers. Polish naval aviation combat aircraft would also probably be allocated to the support of the amphibious assault on Denmark.

Despite a traditional dependence on artillery for fire support of the Ground Forces, the Soviets have also integrated helicopter and fixed-wing aircraft fire support to augment an already impressive capability. In effect, comprehensive fire support would be available to the ground forces, with direct air strikes engaging any "hard" spots encountered by the advancing ground troops. At least early in any conflict the helicopters would assume most of the responsibilities for providing air fire support because of the allocation of the fixed-wing ground-attack aircraft to the initial independent air operation. Afterwards, however, it would not be surprising to find fixed-wing ground-attack aircraft assuming a significant share of the fire-support responsibilities.

V. Summary

The Soviets accept the possibility of a nonnuclear conflict in Europe and have developed the capability to fight just such a conflict there. In order to prevent a nonnuclear conflict from becoming a nuclear one, the Soviets would have to be able to present the United States with a *fait accompli* by preventing the mobilization of NATO forces by attacking the defense before it is capable of organizing its nonnuclear resistance and before it is capable of utilizing its nuclear means to redress the situation. Such a surprise attack requires the ability to launch a successful air operation against NATO's air and theater nuclear resources. Therefore, a switch in air priorities from the defense to the attack was required. The Soviets have made that change and are presently engaged in the modernization program to make the doctrinal change operational.

Put briefly, the Soviets subscribe to the thesis that war should involve the avoidance of costly battle by means of unraveling the opponent's ability to organize himself and to act, and, as such, the Soviets advocate maneuver against firepower. [Ref. 8, p. 164] They have prepared to wage a short war of singular violence preceded by little warning and characterized by "deep maneuver" operations which seem aimed at overwhelming NATO forces deployed in the frontline states before they can be augmented by forces from outside the European Theater. [Ref. 38, p. 5] This strategy is evidenced by the extraordinary emphasis on tanks and mechanized infantry; by the maintenance of an extensive airmobile capability; by the high ratio of combat capability to support capacity; by the assumption on the part of the Soviet air forces of a more offensive role; and by Soviet tactics and combat exercises, both of which commonly feature air strikes followed by rapid exploitation by tank and motorized rifle forces. [Ref. 38, pp. 5-6]

The fact that NATO's tactical doctrine, its organization for combat, and its deployment are not suited to countering the nonnuclear preemptive option of the Soviets—or for tactical nuclear warfare, should it come—is only made more dangerous by the implied retention of a nuclear tripwire strategy that supposedly shifts the risks of war to Soviet and American cities. [Ref. 8, pp. 167-168] In fact, the notion of "will" involved in an environment in which the United States does not possess a clearly

recognized nuclear superiority only heightens the risk of uncontrollable escalation. The deterrent value of even an invulnerable theater nuclear force with a clear "firebreak" that is also capable of inflicting upon the Soviet Union unacceptable damage in Eastern Europe would be questionable unless it were accompanied by general purpose forces capable of surviving a nonnuclear conflict as well as a nuclear conflict. [Ref. 44, p. 211] In fact, NATO's theater nuclear and conventional force postures invite preemption. [Ref. 44, p. 208] Ground combat forces are dependent upon a comparatively few *autobahns* and rail facilities for movement to their defense positions; critical command and communications centers remain unhardened; transatlantic reinforcement, upon which the Alliance is so dependent, must be funneled through a handful of large, easily interdictable airports and seaports; and in-theater arms and ammunition reserves are small and stockpiled at a few sites which are relatively unprotected from conventional air attack. [Ref. 44, p. 208] Even the 7,000 or so U.S. tactical nuclear warheads are stored at some one hundred readily identifiable sites.

The inevitable conclusion must be that the evolution of Soviet air power, while receiving far less public attention in the West than the buildup of the Soviet Navy, has played a fundamental role in the development of a wider range of military options for the Soviet leadership. Air power has unquestionably become a crucial instrument for Soviet power projection, whether it involves flying supplies and Cuban military forces to a civil-war-torn Angola, or flying the same to an Ethiopian government beset by religious and tribal conflicts. More critical, however, is the radical new role for Soviet aviation in Europe. No longer conceding air superiority anywhere to NATO forces, the Soviets have made the air offensive the linchpin of successful nonnuclear combat operations.

The transition from essentially a defensive role to an offensive role involves a basic decision to challenge NATO in its strongest area. Part of an attempt to gain a nonnuclear war-fighting option against NATO, the transition, when its present aircraft modernization programs are completed, could have devastating political effects as well as continue the military implications already being recognized. The political posturing bound to flourish in an environment in which it is widely accepted that NATO has no credible defense against Soviet nonnuclear warfare would most certainly constitute a danger on the domestic political scene in NATO states as well as on the international scene. Yet, aside from this matter of future perceptions, the hard facts already suggest that, if the Soviets start a general war with NATO as the result of a deliberately and carefully executed policy, the conflict will center in Europe, will initially involve only selected non-Soviet Warsaw Pact ground forces in addition to the Soviet ground forces, and will most likely at least begin with nonnuclear means. Such an attack would attempt to preempt NATO mobil-

ization with a massive Soviet air operation (joined within 2 hours by the rest of the Warsaw Pact) against NATO air defense and aviation elements. However, as long as the Soviets remain unconvinced that they can destroy NATO aviation and neutralize at least most of the NATO tactical nuclear forces, they will probably not go to war with NATO as a result of deliberate policy.

References

1. Alexander, Jean, "Aeroflot–50 Years Old," *Air Pictorial*, March 1973.

2. "Alphabetical Guide to Operators," *Flight International*, April 9, 1977.

3. Belov, M., "Helicopters Used by Ground Troops," *Soviet Military Review*, Number 4, April 1976.

4. Berman, Robert P., *Soviet Air Power in Transition* (Washington, D.C.: The Brookings Institution, 1978).

5. Borgart, Peter, "The Air Attack Potential of the Warsaw Pact," *International Defense Review*, Number 2, April 1976.

6. Borzov, I., "The Mighty Fleet of the Soviet Nation," *Vestnik protivovozdushnoy oborony* [Herald of Antiaircraft Defense], Number 7, July 1973.

7. Brown, George S., "Statement by the Chairman, Joint Chiefs of Staff, to the Congress on the Defense Posture of the United States for FY 1978," *Fiscal Year 1978 Authorization For Military Procurement, Research And Development, And Active Duty, Selected Reserve And Civilian Personnel Strengths, Part 1: Authorizations*, Hearings Before the Committee on Armed Services, United States Senate, Ninety-Fifth Congress, First Session, on S. 1210, January 25, February 24, 1977.

8. Canby, Steven, "NATO: Reassessing the Conventional Wisdoms," *Survival*, July/August, 1977.

9. Collins, John M., "American And Soviet Armed Services, Strengths Compared, 1970–76," *Congressional Record*, Number 135, Part III, August 5, 1977.

10. Cooksey, Howard H. and Miller, Edward A., "Prepared Statement of Hon. Edward A. Miller, Assistant Secretary of the Army for Research and Development, and Lt. General Howard H. Cooksey, U.S. Army Deputy Chief of Staff For Research, Development, And Acquisition," *Fiscal Year 1978 Authorization For Military Procurement, Research And Development, And Active Duty, Selected Reserve And Civilian Personnel Strengths, Part 8: Research And Development*, Hearings Before the Committee on Armed Services, United States Senate, Ninety-Fifth Congress, First Session, on S. 1210, March 2, 8, 10, 15, 17, 1977.

11. *Dictionary of Basic Military Terms (A Soviet View)*, (Moscow: 1965), trans. Canadian Government, (Washington, D.C.: U.S. Government Printing Office), Soviet Military Thought Series, No. 9.

12. Douglass, Joseph D., Jr., *The Soviet Theater Nuclear Offensive*, Studies in Communist Affairs, Volume 1 (Washington, D.C.: U.S. Government Printing Office).

13. Erickson, John "The Northern Theater: Soviet Capabilities and Concepts," *Strategic Review*, Volume IV, Summer 1976.

14. Erickson, John, "Soviet Military Posture and Policy in Europe," *Soviet Strategy in Europe*, ed. Richard Pipes (New York: Crane, Russak and Company, Inc. 1976).

15. Erickson, John, *The Soviet Military, Soviet Policy and Soviet Politics* (Washington, D.C.: United States Strategic Institute, 1973).

16. Erickson, John, *Soviet-Warsaw Pact Force Levels* (Washington, D.C.: United States Strategic Institute, 1976).

17. "Flying the Fishbed," *Flight International*, September 25, 1975.

18. Graham, Daniel O., as quoted in "Soviet Warheads Said Toxic-Tipped," *The Washington Post*, November 10, 1976.

19. Gray, Colin, "Soviet Tactical Airpower," *Air Force Magazine*, March 1977.

20. "Hustling F–15," *Aviation Week and Space Technology*, July 18, 1977.

21. *Jane's All The World's Aircraft 1975–76* (London: Macdonald and Company, Publishers, Ltd., 1975).

22. Kadyshev, V. ,"Interceptor Pilots' Navigation Training," *Soviet Military Review*, Number 11, November 1976.

23. Khrushchev, Nikita S., Report to the Fourth Session of the USSR Supreme Soviet, as translated in *The Current Digest of the Soviet Press*, Volume III, Number 2 (January 10, 1960), pp. 3–16.

24. Kozlov, S. N., editor, *The Officer's Handbook* (*A Soviet View*), (Moscow: 1971), trans. U.S. Air Force (Washington, D.C.: U.S. Government Printing Office, 1977), Soviet Military Thought Series, No. 13.

25. Krasovskiy, S. A., *Aviation and Cosmonautics of the USSR* (Moscow: *Voyenizdat*, 1968) as translated in Ref. 12, pp. 64–65.

26. Kutakhov, P. S., "The Conduct of Air Operations," *Voyenno-istoricheskiy zhurnal* [Military-Historical Journal], Number 6, Moscow, 1972, as translated in Ref. 52, pp. 240–250.

27. Lomov, N. A., ed., *Scientific-Technical Progress and the Revolution in Military Affairs* (*A Soviet View*), (Moscow: 1973), trans. U.S. Air Force (Washington, D.C.: U.S. Government Printing Office, 1974), Soviet Military Thought Series, No. 3.

28. Malzeyev, Alexander, "The Soviet Mi–24 (Hind) Combat Helicopter," *International Defense Review*, Number 6, December 1975.

29. Meller, R., "Europe's New Generation of Combat Aircraft, Part I: The Increasing Threat," *International Defense Review*, Number 2, April 1975.

30. Menaul, S. W. B., "Air Defense of the Homeland," *The Soviet War Machine*, ed. Ray Bonds (London: Salamander Books, Ltd., 1976).

31. Menaul, S. W. B., "The Soviet Air Forces," *The Soviet War Machine*, ed. Ray Bonds (London: Salamander Books, Ltd., 1976).

32. *Methodological Problems of Military Theory and Practice*, compiled by members of the Marxist-Leninist Department of the Lenin Military Political Academy, 1966.

33. *The Military Balance 1976–1977* (London: The International Institute For Strategic Studies, 1976).

34. *The Military Balance 1977–1978* (London: The International Institute For Strategic Studies, 1977).

35. Mironenko, A. A., "Under the Wing—the Ocean," *Komsomol'skaya pravda* [Komsomol Truth], August 15, 1976.

36. Mitchell, Donald W., *A History of Russian and Soviet Sea Power* (New York: Macmillan Publishing Company, Inc., 1974).

37. "New Features of the Su–15 Flagon," *International Defense Review*, Volume 10, Number 4, August 1977.

38. Nunn, Sam, "Deterring War in Europe: Some Basic Assumptions Need Revising," *NATO Review*, Number 1, February 1977.

39. Ostroumov, N., "War Experiences and Aviation Exercises," *Voyenno-istoricheskiy zhurnal* [Military-Historical Journal], Number 8, August 1977.

40. Panyalev, Georg, "The MiG–23 Flogger—A Versatile Family of Soviet Combat Aircraft," *International Defense Review*, Volume 10, Number 1, February 1977.

41. Panyalev, Georg, "Underestimated in the West: The MiG–25 Foxbat Weapon System," *International Defense Review*, Volume 10, Number 2, April 1977.

42. Papworth, Peter M., "The Integrity of the Warsaw Pact, Part II," *Air University Review*, May–June 1977.

43. Polmar, Norman, "Soviet Naval Aviation," *Air Force Magazine*, March 1976.

44. Record, Jeffrey, "Theatre Nuclear Weapons: Begging the Soviet Union to Preempt," *Survival*, September/October 1977.

45. Rumsfield, Donald H., "Report of Secretary of Defense Donald H. Rumsfeld to the Congress on the FY 1978 Budget, FY 1979 Authorization Request, and FY 1978–1982 Defense Programs," *Fiscal Year 1978 Authorization For Military Procurement, Research And Development, And Active Duty, Selected Reserve And Civilian Personnel Strengths, Part 1: Authorizations*, Hearings Before the Committee on Armed Services, United States Senate, Ninety-Fifth Congress, First Session, on S. 1210, January 25, February 24. 1977.

46. Savelyev, V., "Manoeuvre in an Offensive Battle," *Soviet Military Review*, Number 2, February 1976.

47. Savkin, Vasiliy Yefimovich, *The Basic Principles of Operational Art and Tactics* (*A Soviet View*), (Moscow: 1972), trans. U.S. Air Force (Washington, D.C.: U.S. Government Printing Office, 1974), Soviet Military Thought Series, No. 4.

48. Schemmer, Benjamin F., "Soviet Armed Helicopter Force Said to Double by Middle of 1977," *Armed Forces Journal International*, December 1976.

49. Schemmer, Benjamin F., "Soviet Build-up on Central Front Poses New Threat to NATO," *Armed Forces Journal International*, December 1976.

50. Scott, Harriet Fast, "The Military Profession in the USSR," *Air Force Magazine*, March 1976.

51. Scott, Harriet Fast, "Organization of Subordinate Aviation Units," *Air Force Magazine*, March 1977.

52. Scott, William F., editor, *Selected Soviet Military Writings 1970–1975* (Washington, D.C.: U.S. Government Printing Office, 1976), Soviet Military Thought Series, No. 11.

53. Scott, William F., "Soviet Aerospace Forces: Continuity and Contrast," *Air Force Magazine*, March 1976.

54. Scott, William F., "The USSR's Growing Global Mobility," *Air Force Magazine*, March 1977.

55. Serapionov, P. I., "Naval Aviators Are On Guard," *Bloknot Agitatora* [Agitator's Notebook], Number 13, July 1974.

56. Sidorenko, A. A., *The Offensive* (*A Soviet View*), (Moscow: 1970), trans. U.S. Air Force (Washington, D.C.: U.S. Government Printing Office, 1974), Soviet Military Thought Series, No. 1.

57. Slay, Alton D., Deputy Chief of Staff, Research and Development, U.S. Air Force, in *Fiscal Year 1978 Authorization For Military Procurement, Research And Development, And Active Duty, Selected Reserve, And Civilian Personnel Strengths, Part 6: Tactical Air*, Hearings Before the Committee on Armed Services, United States Senate, Ninety-Fifth Congress, First Session, on S. 1210, March 2, 3, 4, 7, 8, 1977.

58. Sokolovskiy, V. D., *Soviet Military Strategy*, 3rd (1968) edition, ed. and trans. Harriet Fast Scott (New York: Crane, Russak and Company, 1975).

59. *Sovetskaya voyennaya entsiklopediya* [Soviet Military Encyclopedia], (Moscow: *Voyenizdat*, 1976), Volume II.

60. *The Soviet Threat Against North America*, a reference document prepared by the Deputy Chief of Staff/Intelligence for the Commander in Chief of the North American Air Defense Command, undated.

61. "The Task, Important for All," *Voyennyy vestnik* [Military Herald], Number 6, June 1967, as translated in Ref. 12, p. 63.

62. Tighe, Eugene F., Jr., "Statement of Lt. Gen. Alton D. Slay, USAF, Deputy Chief of Staff, Research and Development, U.S. Air Force; Accompanied by Major General Eugene F. Tighe, Jr., USAF, Assistant Chief of Staff, Intelligence, U.S. Air Force; Lt. Col. Arnold L. Mabile, USAF, Intelligence Officer for Strategic Defense, Directorate of Threat Applications, Assistant Chief of Staff, Intelligence, USAF; and Capt. Walter M. Locke, USN, Joint Cruise Missile Project Manager," *Fiscal Year 1978 Authorization For Military Procurement, Research And Development, And Active Duty, Selected Reserve, And Civilian Personnel Strengths, Part 9: Research And Development,* Hearings Before the Committee on Armed Services, United States Senate, Ninety-Fifth Congress, First Session, S. 1210, March 17, 23, 29, 30, and 31, 1977.

63. *Understanding Soviet Military Developments* (Washington, D.C.: Office of the Assistant Chief of Staff for Intelligence, Department of Army, April 1977).

64. "USAF/ARMY Interface Joint Concept of Operations," *Fiscal Year 1978 Authorization For Military Procurement, Research And Development, And Active Duty, Selected Reserve, And Civilian Personnel Strengths, Part 6: Tactical Air,* Hearings Before the Committee on Armed Services, United States Senate, Ninety-Fifth Congress, First Session, on S. 1210, March 2, 3, 4, 7, 8, 1977.

65. Wheeler, Barry C., "World Air Forces 1974," *Flight International,* August 15, 1974.

66. Whiting, Kenneth R., *Soviet Air Power, 1917–1976* (Maxwell Air Force Base, Alabama: Air University, 1976).

67. Wolfe, Thomas W., *Soviet Power and Europe 1945–1970* (Baltimore: The Johns Hopkins Press, 1970).

68. Kavyalov, I., "New Weapons and the Art of War," *Krasnaya zvezda* [Red Star], October 30, 1970.

69. Zuyev, I., "BMD Ensures Maneuver (Experience of a Battalion Exercise)," *Voyennyy vestnik* [Military Herald], Number 2, February 1976.

70. Kutakhov, P., "The Air Force," *Voyenno-istoricheskiy zhurnal* [Military-Historical Journal], Number 10, October 1977.

71. Borgart, Peter, "The Vulnerability of the Manned Airborne Weapon System, Part 3: Influence on Tactics and Strategy," *International Defense Review,* Number 6, December 1977.

72. Brown, George S., "United States Military Posture for FY 1979," *Department Of Defense Authorization For Appropriations For Fiscal Year 1979, Part 1: Authorization,* Hearings Before the Committee on Armed Services, United States Senate, Ninety-Fifth Congress, Second Session, on S. 2571, February 7, 1978.

73. Robertson, William D.; Moran, Michael A.; Scott, Karren; Bradley, Louis A.; Uthe, Warren A.; and Krueger, Richard D., "DIA Threat Briefing," *Department Of Defense Authorization For Appropriations For Fiscal Year 1979, Part 6: Tactical Air,* Hearings Before the Committee on Armed Services, United States Senate, Ninety-Fifth Congress, Second Session, on S. 2571, March 3, 6, 8, 9, 15, and 16, 1978.

Index of Nato Code Names for Soviet Aircraft

NATO Code Name	Soviet Designation	NATO Code Name	Soviet Designation
BACKFIRE	Tu–?	CODLING	Yak–40/42
BADGER	Tu–16	COKE	An–24
BEAGLE	Il–28	COLT	An–2
BEAR	Tu–95	COOKPOT	Tu–124
BISON	M–4	COOT	Il–18
BLINDER	Tu–22	CRATE	Il–14
BREWER	Yak–28	CREEK	Yak–12
BULL	Tu–4	CRUSTY	Tu–134
CAB	Li–2	CUB A, C	An–12
CAMEL	Tu–104	CUFF	Be–30
CAMP	An–8	CURL	An–26
CANDID	Il–76	FAGOT	MiG–15
CAT	An–10	FAITHLESS	?
CARELESS	Tu–154	FARMER	MiG–19
CHARGER	Tu–144	FENCER A	Su–?
CLANK	An–30	FIDDLER	Tu–28P
CLASSIC	Il–62	FIREBAR	Yak–28P
CLEAT	Tu–114	FISHBED	MiG–21
CLOD	An–14/28	FISHPOT A, B	Su–9
COACH	Il–12	FISHPOT C	Su–11
COCK	An–22	FITTER A	Su–7

NATO Code Name	Soviet Designation
FITTER B, C, D, E	Su–17/20/22
FLAGON	Su–15
FLASHLIGHT A-D	Yak–25/27
FLIPPER	?
FLOGGER A, B, C, E,	MiG–23
FLOGGER D, F	MiG–27
FREEHAND	?
FRESCO	MiG–17
FORGER	Yak–36
FOXBAT	MiG–25
HARE	Mi–1
HARKE	Mi–10
HAZE	Mi–14
HEN	Ka–15
HIND	Mi–24
HIP	Mi–8
HOG	Ka–18
HOMER	Mi–12
HOODLUM	Ka–26
HOOK	Mi–6
HOOP	Ka–22
HOPLITE	Mi–2
HORMONE	Ka–25
HOUND	Mi–4
MADGE	Be–6
MAESTRO	Yak–28U
MAGNUM	Yak–30
MAIDEN	Su–9U
MAIL	Be–12
MANDRAKE	Yak–?
MANGROVE	Yak–27
MANTIS	Yak–32
MASCOT	Il–28U
MAY	Il–38
MAYA	L–29
MAX	Yak–18
MIDGET	MiG–15UTI
MONGOL	MiG–21UTI
MOOSE	Yak–11
MOSS	Tu–126
MOUJIK	Su–7U
MOUSE	Yak–18A/P