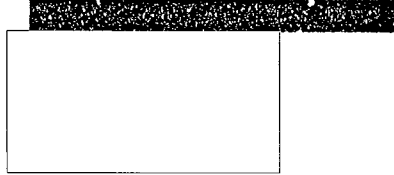


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Warsaw Pact Air Forces: Support of Strategic Operations in Central Europe



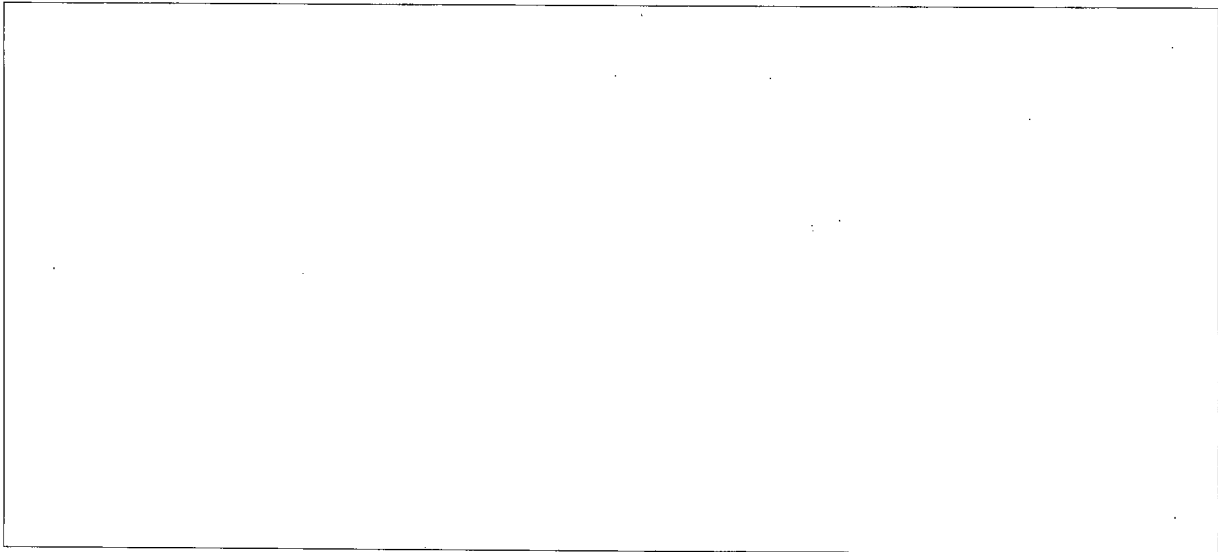
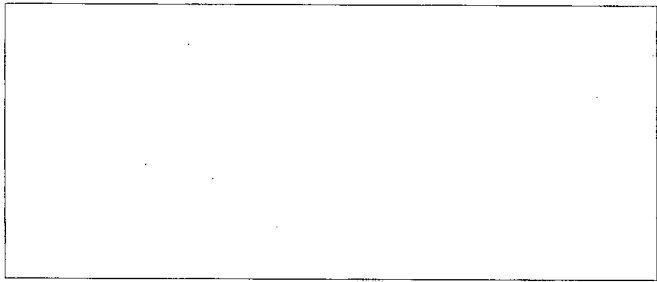
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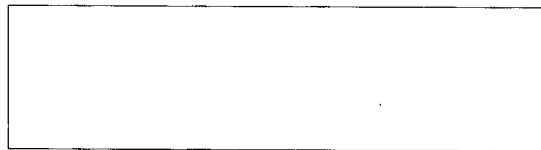
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Warsaw Pact Air Forces: Support of Strategic Operations in Central Europe



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Warsaw Pact Air Forces:
Support of Strategic Operations
in Central Europe []

Key Judgments

*Information available
as of July 1984
was used in this report.*

Soviet military writings confirm that the Soviets have a high regard for NATO's air forces and apparently believe that they constitute the greatest potential threat to the success of a Warsaw Pact ground offensive in a conventional war in Central Europe. Accordingly, senior Soviet military authorities have stressed the need to establish theaterwide air supremacy at the outset of a conventional war and have implied that its attainment would be second in importance only to preempting the first major NATO nuclear strike. []

Authoritative Warsaw Pact military writings indicate that in the mid-1970s the Pact planned to defeat NATO's air forces in an intense battle of attrition during the first two days of a war. It intended to win this brief air war by conducting an offensive air operation that would rely on surprise and overwhelming force to deliver a series of three crushing blows against NATO's airbases in Central Europe. []

Soviet military writings suggest that by the late 1970s, however, the Soviet General Staff had concluded that the existing Pact plans for the air supremacy campaign were no longer viable. These writings noted that it would be difficult to achieve sufficient surprise to catch most of NATO's aircraft on the ground in the airfield attacks. Moreover, senior Soviet military officials stated that the Pact air forces lacked sufficient firepower to accomplish their tasks, probably reflecting an altered Soviet perception of the Central European air balance that occurred during the late 1970s. This perceived shift in the air balance—probably caused by a combination of closer French cooperation with NATO, NATO's force modernization, and a possible Soviet switch to more conservative estimation techniques—had, in Soviet calculations, evidently turned a clear Pact advantage into a situation of near parity. Authoritative Soviet military writings suggest that near parity in the air balance would deny the Pact the overwhelming force necessary to launch a theaterwide air operation with high expectations of success. []

Revising the Offensive Air Operation. The Soviets changed their force employment concepts and reorganized their forces in 1980 and 1981—probably in large part to improve their prospects for attaining theater air supremacy. Senior Soviet military officials had cited their limited prospects of achieving air supremacy as a weak link in the Pact's ability to win a war in Central Europe. Classified Pact military writings indicate that by 1981 the Soviets had created a new variant of the offensive air operation that would achieve temporary localized force advantages by concentrating the


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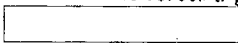
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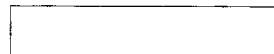
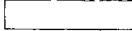
individual massed air raids in sectors, rather than attacking across the full width of the theater. This variant would permit the Pact to launch a synchronized ground and air offensive in the theater with only near parity in the overall theater air balance but by definition would entail greater risk of failure in the battle of attrition. 

Moreover, statements by senior Soviet military officials indicate that by 1980 the General Staff viewed the air operation as a more protracted campaign that would consume a substantially greater share of their efforts in the theater. We estimate they expected that they would have to increase the number of massed air raids in the operation twofold to threefold and that they would have to dedicate to it at least four or five times as much firepower as had been planned in the mid-1970s. Accordingly, the Soviets improved the Pact's ability to quickly concentrate firepower in the operation by doubling the number of bomber regiments assigned to strategic aviation opposite NATO, modernizing those regiments with bombers having greater action radii, and assigning ground forces artillery and missile forces a greater role in conventional air defense suppression. 

Developing the Defensive Alternative. Classified Warsaw Pact military writings indicate that the Soviet General Staff had become concerned in the mid-1970s that the Pact air offensive was vulnerable to disruption by a preemptive NATO offensive counterair campaign. Accordingly, by 1980 the Soviets established the so-called air defense operation—rather than the offensive air operation—as the most likely form of air combat for the Warsaw Pact at the start of a war if NATO seized the initiative in the air. According to classified Pact writings, an air defense operation would combine a coordinated theaterwide maximum air defense effort with numerous small-scale airbase attacks. Its purpose would be to blunt the NATO air offensive and destroy enough NATO aircraft to create a substantial Pact advantage in the air balance, thereby allowing the Pact to seize the initiative with an offensive air operation to complete the defeat of NATO's air forces. 

Additionally, the Soviets made major changes in their command and control system in 1980 and 1981 that probably were intended to alleviate serious execution problems that they had encountered with the Pact air defense operation  Authoritative Pact

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writings indicate that the newly created wartime theater high command headquarters was designated as the focal point for integrating the planning and direction of complex theaterwide air defense operations (and also offensive air operations)—a responsibility formerly shared by the Soviet Air Forces Main Staff and the multitude of regional air defense commands. The Soviets also unified their national and tactical air defense systems and established joint command posts for the air forces and the air defense forces at each command echelon to improve coordination of simultaneous offensive and defensive activity. [redacted]

Persistent Problems. Despite these initiatives, we believe the Pact air forces would have to overcome several serious problems to successfully complete their air supremacy campaign:

- Aircraft losses substantially higher than anticipated would probably prevent the Pact from decisively winning the air supremacy battle of attrition and force the cancellation of the offensive air operation. Losses higher than anticipated would be a distinct possibility, because the Soviet General Staff's aircraft attrition planning factors appear highly optimistic.
- Pact deep attack capabilities are limited by inadequate equipping and training of fighter forces for ensuring local air superiority in NATO's rear areas, a lack of efficient munitions for cutting runways or neutralizing clusters of hardened aircraft shelters, and a lack of suitable sensors and training in front aviation for conducting large offensive operations at night or in adverse weather.
- Pact air forces also have only a limited capability to find NATO's concealed mobile surface-to-surface missiles (SSMs)—yet we believe the Pact probably will plan to divert many more aircraft from attacking airfields to instead hunting for SSMs because of the introduction of Pershing IIs and GLCMs.
- Airspace management and staff coordination among the many force components and nationalities participating in such large, complex theater operations is vulnerable to breakdowns [redacted]

[redacted]

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[redacted]

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Future Soviet Initiatives. We believe the Soviets probably are giving high priority to new long-term initiatives aimed at improving their prospects for winning air supremacy in Central Europe. We base this conclusion on the great importance that the Soviets place on achieving this objective and on our judgment that the Soviets probably are not content with the less desirable alternatives to the theaterwide air operation that they recently have developed as a matter of necessity. The Soviets' intentions are not clear, but some of the initiatives that they might pursue could alter the character of their air supremacy campaign:

- The Soviets may hope that extensive force modernization with the new SU-27 and MIG-29 fighters will improve the air balance by the mid-1990s enough to justify a return to the theaterwide air operation as their best option at the outset of war.
- The deployment of large numbers of these advanced fighters also could, in conjunction with improved NATO airfield hardening and intelligence warning capabilities, lead the Soviets to rely more heavily on air-to-air combat to destroy NATO air forces in the air operation.
- The widespread use of terminal guidance on Soviet short-range ballistic missiles by the early-to-middle 1990s could give these conventionally armed missiles a major airfield pin-down role in the air operation as a prelude to the bomber attacks. This could help the Pact achieve tactical surprise and make NATO airfields more lucrative targets.
- The Soviets may eventually develop special air defense suppression drones and efficient air-delivered airfield attack munitions, which could allow them to execute the air operation using considerably fewer aircraft and less rigid and predictable employment concepts. 

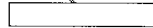
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Warsaw Pact Air Forces: Support of Strategic Operations in Central Europe

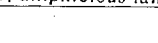



Background

The Soviets use the term "strategic operation" to describe the totality of their military actions in large geographic areas such as Central Europe or the Far East, which they call theaters of military operations (TMOs). A strategic operation would be conducted according to a single, centralized war plan at the direction of the Soviet Supreme High Command. It could incorporate the operations of several fronts, fleets, strategic air armies, Strategic Rocket Forces armies, national air defense formations, and airborne divisions.¹ 

The Soviets' military writings indicate that the concept of TMO strategic operations became the basic organizing principle for their military planning during the late 1970s, following more than a decade of development. Provision was made for the activation in wartime of high command headquarters in the most important TMOs as extensions of the Soviet General Staff to provide centralized management of the largest strategic operations. In 1980 and 1981 the Soviet air and air defense forces were reorganized,² largely to give the wartime high commands in the TMOs better control during these large joint forces operations.





This paper takes a fresh look at the Soviets' perceptions of how their airpower should be used to achieve the strategic-level objectives of large TMO strategic operations. Particular attention is paid to Soviet force employment concepts for the conventional air supremacy campaign and for the first major nuclear strike, because of the extreme importance that the Soviets accord these missions. It also covers Soviet concepts for conducting bomber offensives and for supporting airborne operations, amphibious landings, and strategic reconnaissance 

¹ The Warsaw Pact joint forces command structure is discussed in appendix A. 



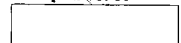
"Strategic," "Operational," and "Tactical"

Throughout this paper we use the terms "strategic," "operational," and "tactical" in the Soviet sense, which is not necessarily consistent with Western definitions. These terms define the three levels of military theory, command, and planning in the Soviet hierarchy of military concepts. In Soviet usage, "strategic" refers to the policies, objectives, plans, and forces of national-level command authorities and of the high commands in the main TMOs. In general, the term "operational" describes the objectives, plans, and forces of front-, army-, and corps-size joint forces formations, while the term "tactical" applies to those attributes of formations of division size and smaller. More detailed definitions of these and other Soviet terms used in this paper are contained in the glossary, appendix D. 

This paper does not cover in detail the roles of Soviet air forces in the more familiar front and army operations. Direct support of these smaller scale operations is discussed briefly in appendix A. The scope of this paper also is limited geographically to Central Europe—the theater for which we have the most comprehensive evidence of Soviet intentions for conducting wartime operations 

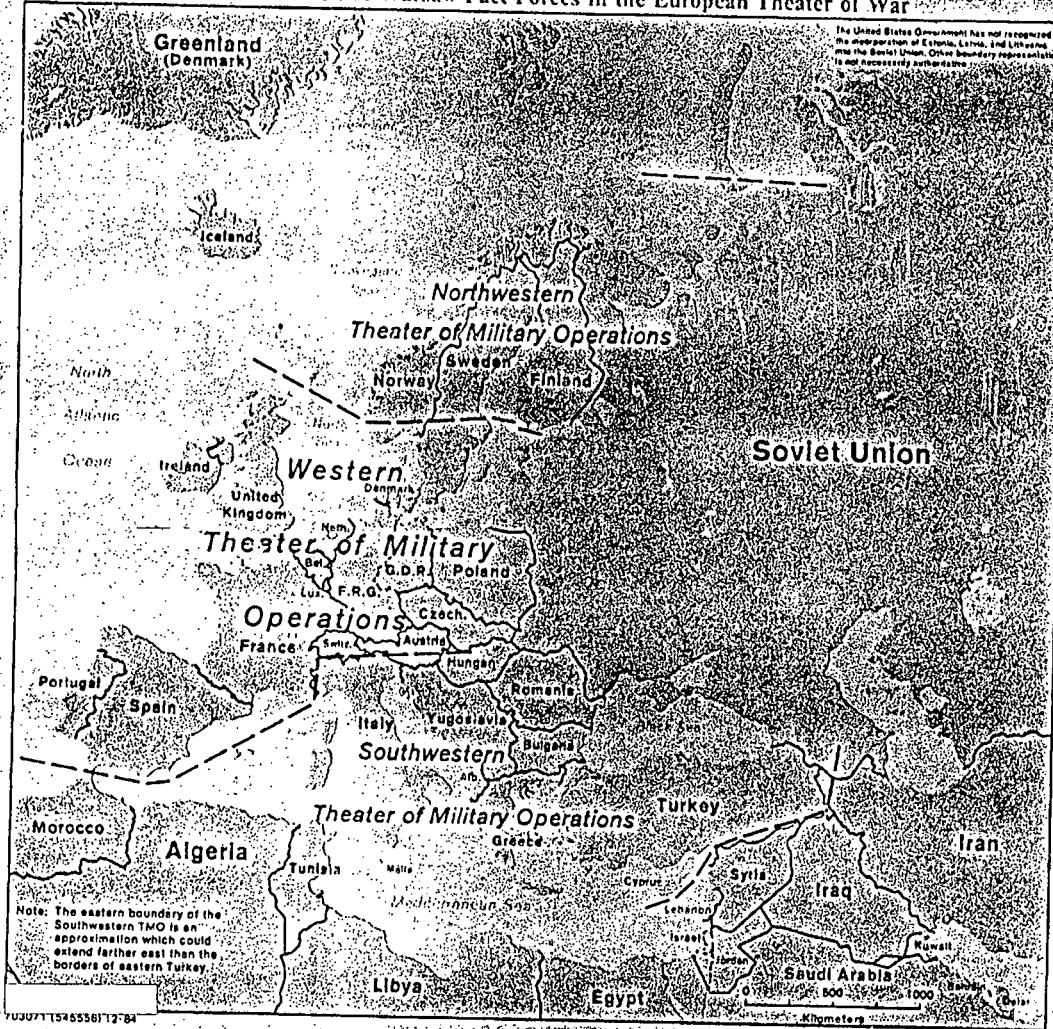
The Western Theater of Military Operations

Soviet military planners consider the Western TMO—Central Europe from the Baltic to the Alps—the most important of the three land TMOs in the European theater of war (figure 1), and some military writers have viewed it as the most important of the approximately seven or eight TMOs for which they may plan strategic operations for a general war.



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Figure 1
Estimated Wartime Distribution of Warsaw Pact Forces in the European Theater of War



Wartime operations in the Western TMO would determine control of the heart of Europe and would involve the main forces of NATO and the Warsaw Pact—pitting Pact forces in the GDR, Czechoslovakia, Poland, and the western USSR against NATO's Allied Forces Central Europe (AFCEM) and Allied Forces Baltic Approaches (BALTOP).

The Western TMO's importance to the Soviets is reflected in the allocation of forces to this region. Evidence from the peacetime disposition of forces suggest that roughly one-third of the Soviet Ground Forces (generally the best equipped units), more than 40 percent of the Soviet Air Forces, the entire Baltic Sea Fleet, several hundred missiles of the

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Figure 1 (continued)

Percent

Land Theaters of Military Operations	Ground Forces		Air Forces ^a		Strategic Rocket Forces Strikes ^f
	Ready Divisions ^b	Weapons Scores ^{c d}	Combat Aircraft ^e	Weapons Scores ^d	
Northwestern ^g	3	4	3	4	4
Western ^h	64	65	68	66	75
Southwestern ⁱ	33	31	29	30	21

^a Includes only front air forces, because the intended distribution of strategic aviation sorties is not clear—although we estimate it would be similar to the regional distribution of front air forces.

^b Includes only ready divisions (divisions assessed to be manned in peacetime at between 50 and 100 percent of their authorized wartime strength).

^c Includes all weapons in all units.

^d These are percentages of aggregated weapons effectiveness scores, based on Soviet perceptions of combat potential.

^e Includes fighter-interceptors, fixed-wing ground attack aircraft, and attack helicopters.

targets, preliminary SOVA analysis of the distribution of likely current SRF targets in Europe suggests that any such changes are probably small (no more than a 5- to 10-percent difference in the Western TMO allocation).

^g Includes only the forces of the Leningrad Military District.

^h Includes the forces of the Group of Soviet Forces Germany, Central Group of Forces, Northern Group of Forces, Baltic MD, Belorussian MD, Carpathian MD, East Germany, Czechoslovakia, and Poland. Forces from the Kiev MD could also be used but are counted in the Southwestern TMO in these calculations.

ⁱ Includes the forces of the Southern Group of Forces, Odessa MD, Transcaucasus MD, Kiev MD, North Caucasus MD, Hungary, Bulgaria, and Romania.

While the planned distribution of SRF targets may have changed since 1965 as the result of MR/IRBM force modernization and the evolution of the intended NATO

Strategic Rocket Forces (SRF), and the entire armed forces of the GDR, Czechoslovakia, and Poland would be committed to this single TMO. We estimate that the Soviet General Staff (acting as the executive agent of the Supreme High Command) would assign to the Western TMO about two-thirds of the ground and air forces and perhaps three-fourths of the SRF strikes allocated for use in the European theater of war (see figure 1).

Air Forces Participation

The participation of Pact air forces in those combat activities considered especially important in accomplishing the strategic operation's major objectives and those that required substantial use of Soviet strategic reserve air forces would be planned and directed by the TMO Deputy Commander in Chief for Air Forces and his air staff. The Deputy CinC for Air Forces would have at his disposal elements of two to four strategic air armies; three to seven front air forces; and various air defense, transport, and naval aviation

units. (The typical composition of air forces in the Western TMO is depicted in figure 2 and in table 1.)

Front Air Forces. Soviet exercises and military writings typically portray the first strategic offensive operation being initiated by at least three first-echelon fronts, although the number may vary depending on the reinforcement scenario. Each of the several fronts designated to participate in the TMO strategic operation would have a subordinate air force of fighters, ground attack aircraft, and reconnaissance aircraft. The front air forces would also include the front- and army-level army aviation forces—consisting primarily of helicopters. The composition of the individual front's air forces would vary through reassignment of aircraft among them by the Western high command.

Table 1
Representative Composition of Warsaw Pact Air Forces
Available for Participation in Strategic Operations in
the Western TMO, Mid-1983^a

	Strike/Attack ^b				Air to Air ^b				Support ^b			Total
	HB	MB	LB	FB	AH	TF	FI	EW	RE	TK		
In-place assigned forces												
Polish-GDR Front ^c												
Polish				200	150	110	90				70	620
German				200	110	110					70	
Soviet-GDR Front					40		90					
Soviet	30	365	450	315	190	15	15	15	85			1,450
German	30	315	425	315		15	70					
Czechoslovak-Soviet Front				50	25		190			15		
Czechoslovak	155	175	200	110	65							705
Soviet	155	95	110	110		50						
Combined Baltic Fleet					80	90				15		
Soviet	95		75					10	5	25		210
Polish	95		40					10	5	25		
Legnica strategic air army (SAA) (all Soviet)				35								
Total	95	195	810	775	760	390	35	255	25			3,340
In-place possible reinforcements												
Second-echelon national air defense forces (NAD)												
Polish							335					335
Czechoslovak							290					
Smolensk SAA (all Soviet)							45					
Moscow SAA (all Soviet)	40	265						155	35	10		465 ^d
Total	40	265					335	155	35	25		855

Possible reinforcements requiring redeployment

Vinnitsa SAA (all Soviet)	160	30	125	10	30	355
Belorussian Front (all Soviet)	135	90	135	30	30	390
Carpathian Front (all Soviet)	180	120	125	30	30	455
Baltic Front (all Soviet)	180	65	110	30	30	385
NAD reinforcements (all Soviet)					70	70
Total	160	525	275	495	120	1,655
	360	355	1,050	1,255	795	5,850

^a Numbers have been rounded to the nearest 5. Not included in this table are military transports, front helicopter electronic countermeasures aircraft, possible reinforcements from the Soviet-Hungarian Front air force which would be subordinate to the Southwest TMO, and the aircraft in storage and in the training establishment, as well as those in the Moscow MD which could be used as attrition replacements or to form a deep strategic reserve front. Reinforcements could also be drawn from other more distant TMOs at the discretion of the Supreme High Command.

^b Abbreviations for types of aircraft shown in this table are:

HB—heavy bombers (Bear and Bison).
 MB—medium bombers (Backfire, Blinder, and Badger).
 LB—light bombers (Fencer).
 FB—fighter-bombers (Flogger, Fitter CK, Fitter A, Fishbed, Fresco, and Albatross).
 AH—attack helicopters (Hind, Hip, Hound, and Hoplite).
 TF—tactical fighters (Flogger, Foxbat, and Fishbed).
 FI—air defense fighter-interceptors (Flogger, Foxbat, Flagon, and Fishbed).
 EW—electronic warfare aircraft (Brewer, Badger, and possibly Blinder).
 RE—reconnaissance aircraft (Bear, Blinder, Badger, Foxbat, Brewer, Fitter, Fishbed, Albatross, and Fagot).
 TK—aerial refueling tankers (Bison and Badger).

^c There is evidence that the Warsaw Pact intends the air force of the Polish-GDR Front to be in place and combat ready at the outbreak of war, even though this front usually is not committed to battle in exercises until about day three of the war.

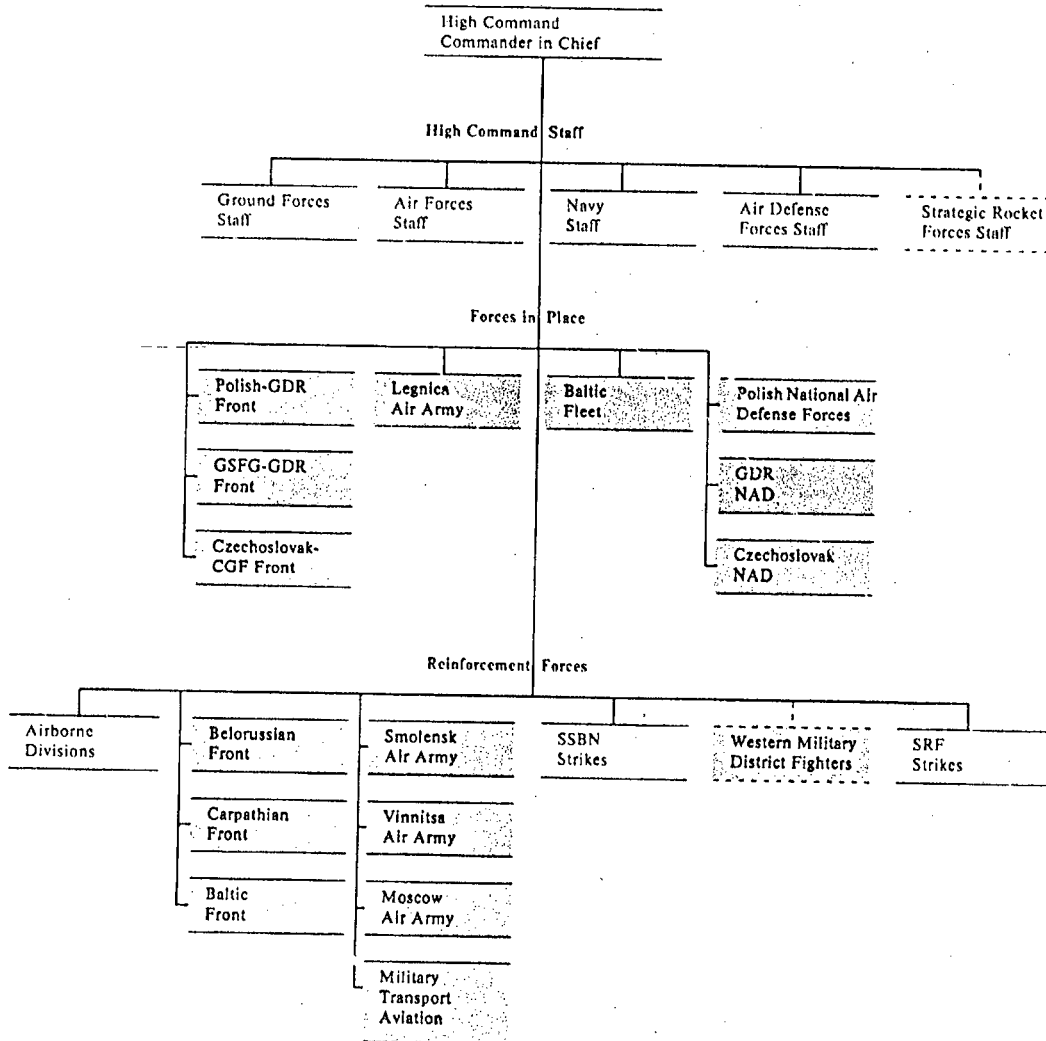
^d We estimate that about 65 to 75 percent of the overall effort of the Smolensk SAA is intended to be allocated to the Western TMO. Its full strength is depicted in this table, however, because it could be used in its entirety in the Western TMO on individual missions. We are considerably uncertain about the primary war-time roles of many of the Smolensk SAA aircraft. Our estimate is in appendix B.

^e Only that portion of the Moscow SAA that we estimate is likely to be used in operations in the Western TMO is depicted in this table. This estimate includes only the Bisons and Bear A's based in the western USSR, as we believe that similar aircraft based in the Far East would probably be used against China or held in reserve for intercontinental operations. We think the Bear BCGH missile carriers would be reserved for intercontinental operations and for strikes against aircraft carriers.

^f We do not know the intended wartime division of fighter-interceptors among the Baltic, Belorussian, and Carpathian MDs and the fronts that they would be called upon to generate. We estimate that the air forces of these fronts would each be assigned about three fighter regiments and the Soviets might choose to deploy about two of the five fighter regiments remaining in these three districts forward into the Western TMO under some circumstances.

Figure 2
Typical Force Composition in the Western Theater
of Military Operations

- Forces with Soviet air forces or non-Soviet Warsaw Pact air forces components
- Forces with aviation components that are not part of the air forces



Strategic Air Armies. The Legnica strategic air army—a light bomber force—is the only air army that is likely to be assigned in its entirety to the Western high command for most of any strategic operation. The medium bombers of the Smolensk strategic air army probably are intended to support operations in the entire European theater of war, but we estimate that about two-thirds to three-fourths of their sorties would probably be committed to the Western TMO (see appendix B for further discussion). The Fencer light bombers of the Vinnitsa strategic air army also could be assigned to the Western TMO. The addition of this large number of strategic aviation light bombers, however, would place greatly increased demands on the Pact's forward basing capabilities because, according to Soviet operational planning norms, the Fencer would not be able to cover targets in Western Europe from bases in the USSR.)

our analysis of Soviet force requirements suggest that the Vinnitsa strategic air army probably would be committed to the Western TMO for the first few days of the war and then transferred back to the Southwestern TMO under most circumstances in a general war (see appendix C for our force requirement analysis). Some heavy bombers from the Moscow strategic air army also could be used to attack distant targets in Britain and France during conventional operations.

Other Air Forces. Other aircraft supporting strategic operations in the Western TMO would include East European national air defense fighter-interceptors, naval aviation, and Soviet long-range transport aircraft. The national air defense fighter-interceptor forces of the GDR, Czechoslovakia, and Poland—possibly reinforced by a couple of Soviet regiments—would in some cases operate in territorial air defense formations and in other instances serve as part of the first-echelon fronts. Naval aircraft would be used primarily to support the Combined Baltic Sea Fleet, and large commitments of aircraft from Soviet Military Transport Aviation—a strategic reserve force—would be required during airborne operations.

Combat Potential. The Soviets' perception of their force disposition in the Western TMO would include an assessment of relative combat power, arrived at by multiplying their order of battle by a set of simple

weapon-system-specific combat potential scores. In a force disposition with three front and one fleet air forces and the Legnica and Smolensk strategic air armies, for example, the Soviets would perceive that collectively the two strategic air armies would contribute less than one-fifth of the ground attack aircraft but more than one-third of the ground attack combat potential (see figure 3). Commitment of these strategic aviation forces would allow the Western high command to quickly concentrate substantial firepower in any sector of the TMO to support either theaterwide or individual front objectives. The three front air forces would provide over half of the air forces' ground attack combat potential in the Western TMO—more than two-thirds of which would be concentrated in the TMO's most important, central Soviet-GDR front. Within each of the three front air forces, as the Soviets calculate, attack helicopters would contribute slightly more combat potential than fixed-wing ground attack aircraft. While the front air forces would provide extensive direct support to the strategic objectives of the Western high command, most of their efforts are intended to be spent in direct support of front and army objectives after the first days of the war (thereby contributing indirectly to the attainment of strategic objectives).

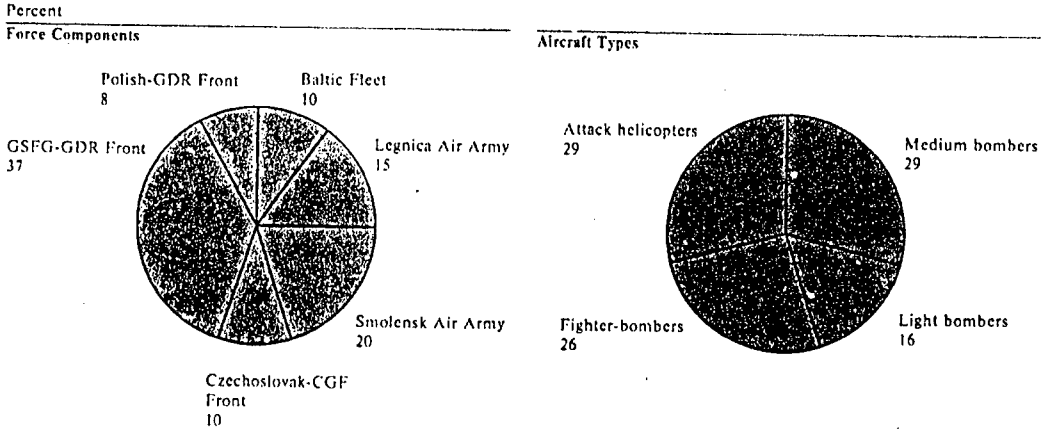
Strategic Operations

Soviet military writings and exercises indicate that the Commander in Chief of the forces in the Western TMO could be directed by the Supreme High Command to conduct a series of strategic operations, each of which probably would be divided into two stages. The main objectives in each stage might include the occupation of the territory of particular political-economic "strategic zones" (figure 4). The time

¹ The NATO side of the Western TMO is conceptually divided by the Soviets into four land "strategic zones" and at least three contiguous water "strategic zones." These zones are mid-Europe (the FRG, Denmark, the Netherlands, and Belgium), France, Iberia, Britain, the Danish Straits, the English Channel, and Gibraltar. The Soviets apparently also consider the GDR, Czechoslovakia, and Poland to constitute another strategic zone on the Pact side of the TMO. For planning, the Soviets divide each of the strategic zones into a series of main and secondary "operational axes," which constitute the anticipated sectors of major operations by front or army joint force formations.

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Figure 3
The Likely Distribution of Ground Attack Aircraft Combat Potential
in the Western Theater of Military Operations*



* These calculations were derived by using the Soviet method of estimating the relative combat potential of combat aircraft. We assume a force disposition in the Western TMO that includes three first-echelon fronts and full use of the Smolensk air army but no participation by the Vinnitsa or Moscow air armies.

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specified to accomplish each stage would correspond to the number of days the General Staff believed it should take the ground forces to occupy that particular territory.

Limited evidence suggests that the first strategic operation in the Western TMO would probably have as its first-stage objective the defeat of the main forces of AFCENT and BALTAP and the occupation of the mid-European strategic zone and the Danish Straits in about two weeks' time. The subsequent defeat and occupation of France in about another two weeks may constitute a typical second-stage task (figure 5).

Air Forces Missions

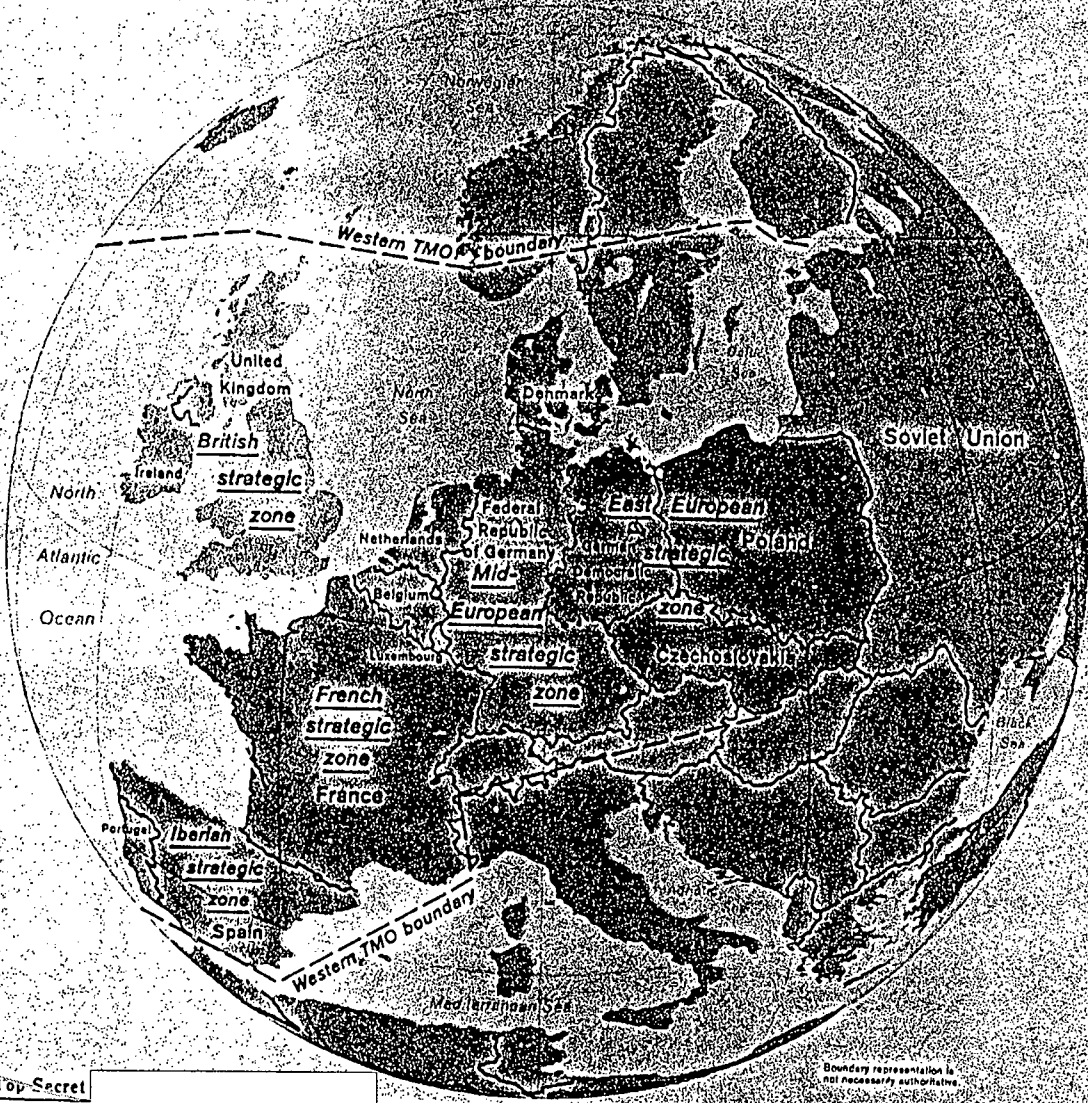
The Warsaw Pact air forces would be tasked by the Western high command to directly support its plan for

defeating NATO's AFCENT and BALTAP forces. These theater-level missions would include:

- Conducting air defense operations and conventional offensive air operations to achieve and maintain strategic air supremacy in the TMO and blunt NATO's nuclear capabilities.
- Participating in the first major nuclear strike in the theater (which the Soviets call the initial massed nuclear strike).
- Mounting subsequent offensive air operations against various key NATO rear area forces and installations.
- Participating in major airborne operations.
- Supporting amphibious landing operations.
- Providing strategic air reconnaissance in support of the General Staff and the Western high command.

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Figure 4
Land Strategic Zones Within the Western Theater of Military Operations



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Figure 5
Front Tasks in the First Strategic Operation in the Western Theater of Military Operations*



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* This depiction of a possible arrangement of operational axes is based on classified Soviet military writings.

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Of these missions, the Soviets place greatest emphasis on the first major nuclear strike and on attaining strategic air supremacy, apparently believing that these are the most critical to the success of their joint forces operations, as well as more complex. Although the Soviets give first priority to the effective execution of their first major nuclear strike, attaining air supremacy is discussed first in this paper because the Soviets believe that it probably would be important only in a conventional war (thus preceding any nuclear strikes) and because the Soviet concepts for achieving air supremacy have undergone greater change in recent years. [redacted]

Emergence of the Initial Air Operation. Air supremacy did not play an important role in Soviet military doctrine during the early 1960s, when Soviet planners were preoccupied with nuclear warfare, but the concept was reexamined later in the decade in reaction to NATO's flexible response strategy. In the course of this reexamination, the Soviet Air Forces (SAF) advocated air supremacy in conventional warfare, citing as examples of its importance the debilitating effect on the Red Army of the German seizure of air supremacy in the summer of 1941 and the decisive impact of Israel's stunning victory over the Egyptian Air Force at the start of the 1967 Middle East war. [redacted]

Attaining Air Supremacy

Strategic air supremacy—according to Soviet definition—is when the air forces have decisive superiority over enemy air forces, hold the initiative in the air, and are capable of imposing their will on the enemy throughout the TMO. Having air supremacy would permit Pact ground, naval, and air forces to perform their tasks without significant opposition from enemy air and air defense forces. Attaining air supremacy is the only joint forces strategic objective for which the Pact air forces would play the primary role. Senior Soviet military leaders have recently stressed the concept's criticality, indicating that it would be one of the two most important objectives for the Warsaw Pact joint forces at the outset of a conventional war in the Western TMO (the other would be the destruction of NATO's nuclear forces and the prevention of a preemptive NATO nuclear strike). [redacted]

By 1970 the Soviet Air Forces apparently had persuaded the General Staff of the need for air supremacy in a conventional war in Central Europe and that it could be won only through a massive preemptive air offensive against NATO airbases. Perhaps equally important, this initial air operation* also was promoted as the only viable way to destroy a large portion of NATO's nuclear forces before their inevitable use. The Soviet Air Forces focused extensive efforts during the early 1970s on refining force employment concepts for a brief but intense initial air operation designed to achieve a quick and relatively inexpensive victory in the air war and on acquiring aircraft that were better suited for conventional operations. [redacted]

Concept Development

In writings the Soviet General Staff expressed increasing concern during the 1970s about the difficulty and high cost of winning air supremacy in Central Europe. Nonetheless, the General Staff has remained firmly committed to that ambitious objective, believing that without it the Pact conventional ground campaign could fail. Accordingly, since the late 1970s, the Soviets have instituted major changes in their force employment concepts, their force structure, and their command and control system in the hope of improving their prospects for success in what they call the "struggle for air supremacy." [redacted]

By 1975 the initial air operation had been incorporated into Pact war plans, but it featured larger forces than the original SAF proposals because the Czechoslovak and Polish air forces were given a role and because Soviet front aviation forces had increased in size by about 10 percent. At the same time, the plan for the initial air operation was simplified by reducing from three to two the number of attacking waves (so-called echelons) of aircraft in each of the three massed air raids of the air operation. [redacted]

* We use the term "initial air operation" to distinguish the air operation for air supremacy that would be conducted early in a war with NATO from the other types of offensive air operations that could be conducted by strategic aviation later to achieve various objectives. [redacted]

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[redacted]

The Soviets' military writings suggest that they probably viewed success in the initial air operation largely in terms of winning a contest of attrition—calculating in the mid-1970s that they would have to destroy 40 to 50 percent of NATO's combat aircraft to establish air supremacy. They probably computed this requirement on the basis of:

- An estimate that the Warsaw Pact had a starting advantage in the qualitative air balance of probably between 1.5:1 and 1.8:1 (see appendix C).
- An assumed cumulative attrition of only about 15 percent of Pact aircraft for the entire air operation [redacted]
- A planning factor requiring that Pact forces achieve an advantage in the air balance—measured in terms of forcewide combat potential—exceeding 2.5:1 by the conclusion of the operation.¹ [redacted]

Problems With the Initial Air Operation. By 1974 the General Staff had become concerned that the initial air operation would be highly vulnerable to disruption by a preemptive NATO offensive counter-air campaign. The General Staff probably believed that NATO's awareness of the Soviet concept for the initial air operation could lead NATO to consider countering it by conducting preemptive attacks against Pact airbases. Rigid Soviet employment concepts in the mid-1970s evidently provided only for launching the initial air operation at the outset of a conventional war—regardless of NATO's course of action. The Soviets recognized, however, that they would not be able to defeat NATO's air forces with a brief series of airfield attacks if most of the NATO aircraft had already taken off before the Pact attack aircraft arrived at their targets. Moreover, they also may have believed that using most of the Pact combat

¹ Soviet military writings from the late 1960s state that an air balance advantage of better than 2.5:1 constitutes supremacy of forces. An advantage of only 1.3:1 is called unfavorable, with the note that operations begun on this basis in World War II resulted in a draw. They state further that, although it was permissible to begin operations with an advantage of between 1.4:1 and 1.7:1, a great deal of research demonstrated that, to have sufficient forces to defeat the enemy air forces, an air balance advantage of at least 1.8:1 was necessary. These writings did not describe how to calculate the air balance but strongly implied that it should be based on calculations of combat potential rather than on simple order of battle. The Soviets use weapon system combat potential scores as multipliers that they apply to the order of battle to take account in a simple way of the differences in the perceived combat utility of various aircraft. [redacted]

aircraft in a nearly simultaneous air operation would leave their air defense forces with insufficient numbers of fighter-interceptors to break up and inflict heavy losses on the large NATO air raids. [redacted]

By 1977 the Soviets probably began to perceive that their clear advantage in the qualitative Central European air balance had been turned into a situation of near parity, despite their massive modernization with more advanced aircraft. The Soviets' apparent belief in an altered air balance probably was derived from their perception of quantitative and qualitative gains by NATO's air forces during the 1970s and 1980s, and it may also have been due in part to changes in their method of using combat potential scores to calculate the air balance (for further discussion, see appendix C). France's increasing military cooperation with NATO evidently convinced the Soviets that France would fight with NATO from the outset of a war with the Warsaw Pact—leading the Soviets [redacted] in 1977 to start counting the approximately 500 combat aircraft in the French air force as part of NATO. At about the same time, the United States made substantial qualitative and quantitative improvements to its air forces in Central Europe by deploying advanced F-15s and additional F-111s. During the late 1970s the NATO nations also committed themselves to a major modernization of forces in the 1980s, based on the Tornado and F-16—aircraft that the Soviets believe to be far superior to late-model Soviet aircraft, such as the SU-24 and MIG-23/27. The perception of NATO gains in the air balance probably caused the Soviet General Staff to question whether the Pact could muster a sufficient airpower advantage through at least the rest of the 1980s to take the initiative theaterwide at the outset of war with the high expectation of winning a contest of attrition for air supremacy. [redacted]

Soviet military writings asserted in the late 1970s that an offensive counterair campaign is likely to fail if the intended victim maintains a good warning system, high air defense forces readiness, and adequate aircraft cover and dispersal capabilities. In light of these

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[redacted]

observations and ongoing NATO force improvements, the Soviet General Staff may have questioned the likelihood that enough NATO aircraft would be destroyed on the ground in a brief series of airfield attacks to substantially alter the overall balance. The Soviets must have been aware that NATO had decided to deploy a fleet of AWACS early warning aircraft, had started to improve national intelligence support to theater commanders, had taken measures to increase aircraft readiness rates, and had begun new initiatives to further harden airbases against air attacks. [redacted]

Moreover, Soviet military writings suggest that by 1979 the General Staff probably had concluded that the Pact's fleet of ground attack aircraft possessed insufficient striking power to ensure the destruction of NATO's air forces as called for in the plans for the initial air operation. These diminished expectations accompanied the general adoption of more conservative planning norms for conventional warfare during the late 1970s, which probably resulted from the more careful examination by the General Staff of the problems of conducting a strategic offensive operation in the Western TMO. The Soviets' doubts also may have stemmed from a greater appreciation of the problems posed by the proliferation of hardened aircraft shelters at NATO airbases, given their continued emphasis on destroying aircraft caught on the ground. [redacted]

The surfacing of these problems during the 1974-79 period evidently led the Soviet General Staff to doubt the viability of existing employment concepts for the initial air operation. As a result, the Soviets abandoned their expectation of achieving a quick, relatively inexpensive victory in the air war and came to view the struggle for air supremacy as a more complex endeavor that would probably require protracted operations. [redacted]

Development of the Initial Air Defense Operation. By 1976 the Soviets' concern about NATO's ability to preempt and disrupt their initial air operation with an

[redacted]

offensive counterair campaign had led to the development of a detailed plan for this contingency. This plan, a reactive variant of the air operation, included a nearly maximum theaterwide air defense effort to blunt the NATO air raid, accompanied by simultaneous attacks against NATO airbases. These attacks were to be smaller than those of an offensive air operation and were intended to force returning NATO aircraft to land at alternative airfields, where they could be destroyed in the open by Pact ground attack aircraft that had been waiting on airborne alert. [redacted]

[redacted] in 1978 [redacted] the Soviets were probably becoming more concerned over the shift in the air balance and the possibility that NATO was thus more likely to take the initiative in the air at the outset of war. It was reformulated in 1980 as the so-called initial air defense operation,¹ and elevated in importance to complement the initial air operation in the struggle for air supremacy. This reformulation by the General Staff made the so-called air defense operation analogous doctrinally to ground forces defensive operations—classifying it as an aggressive form of defense designed to blunt the NATO air offensive and create conditions favorable for going over to the offensive with the initial air operation. The air defense operation would thus make it possible to synchronize the air scenario with ground forces operations in the TMO if NATO attacked first or if the Pact ground campaign suffered a reversal. [redacted]

The Soviets had encountered serious problems [redacted] in executing the precursor to the initial air defense operation. They probably hoped that a series of major command and control changes that were instituted in 1980 would allow them to overcome these problems. These changes included

¹ The so-called initial air defense operation would include a substantial number of offensive counterair attacks and should not be confused with the purely defensive routine air defense activity that would follow much less intensely once the Pact went over to the offensive or established air supremacy [redacted]

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designating the Pact's newly authorized wartime Western high command to be the previously lacking focal point for integrating the planning and direction of the highly complex air defense operation—a function formerly left to the Soviet Air Forces Main Staff and the multitude of regional air defense commands. As part of the reorganization of Soviet air forces and air defense forces in 1980 and 1981, the national and tactical air defense forces around the Soviet periphery were combined under a unified system of control at all command echelons. Perhaps most important, the Soviets recognized that the air forces and the air defense forces must function as what they call an "operational team." Toward this end, they began to establish joint command posts for the battle staffs of the air forces and the newly unified air defense forces for the high command, front, and army headquarters, to allow them to more effectively coordinate and control simultaneous air defense and offensive air activity.

Recent Changes in the Initial Air Operation. Despite their efforts to develop the so-called air defense operation, the Soviets continued to believe that the final attainment of strategic air supremacy could come only through a successful initial air operation—a belief consistent with their doctrine that only the offensive can produce a victory. By 1979, however, the General Staff had concluded that the initial air operation was a weak link in the Warsaw Pact's ability to establish mastery over the Western TMO. Because of their apparent perception that the Central European air balance had been altered, the General Staff probably calculated that Pact air forces were unlikely to amass more than about a 1.2-to-1 combat potential advantage in the air balance at the start of a war (see appendix C). Near parity in the air balance meant substantially greater risk of failure with the initial air operation—a higher percentage of NATO's combat aircraft would have to be destroyed to attain air supremacy, and this would require a more lopsided Pact aircraft kill-ratio advantage.

* If—as their military writings and our analysis suggest—the Soviets now calculate that there would most likely be parity in the starting qualitative air balance in the Western TMO, they would have to destroy about two-thirds of NATO's combat aircraft to achieve the 2.55-to-1 ratio representing air supremacy (assuming the Pact suffered overall attrition of only 15 percent). This level of destruction would require a Pact aircraft kill-ratio advantage of about 3:1 in the operation.

According to Soviet military writings, by 1981 the General Staff had devised a new employment concept that, by emphasizing the principle of concentration of force, would allow the initial air operation to be conducted with near parity in the theaterwide air balance. According to the new concept, the initial air operation could be conducted either following the initial air defense operation or as a first attack at the outset of war, by concentrating the massed air raids in specific sectors of the TMO, rather than across its full width. This concept is intended to allow the Pact to temporarily achieve highly favorable force ratios in each sector and to minimize its aircraft losses by saturating NATO's air defenses.

The Soviets' revised perception of the initial air operation also emphasizes the need to increase the duration of the operation and the striking power that could be brought to bear in each massed air raid. Soviet military writings indicate that the reassessment of force requirements dictates six to eight massed air raids over a period of three to five days, as opposed to the earlier formulation of three massed air raids in a day and a half. This change may indicate the Soviets have concluded that, by accepting the higher overall Pact attrition implicit in a prolonged operation, they could achieve air supremacy with a much lower—and hence more achievable—kill ratio.* We estimate the Soviets' air operation plans now include at least four or five times the air forces ground attack firepower called for in their plans from the mid-1970s (figure 6).

These changes in the concept of the initial air operation were complemented by changes in the forces expected to execute it. The 1980-81 reorganization of the Soviet Air Forces improved their ability to quickly concentrate airpower against deep targets in various sectors of the TMO by doubling the total number of medium and light bomber strike regiments assigned to strategic aviation opposite NATO. Strategic aviation forces in the west subsequently have been given top

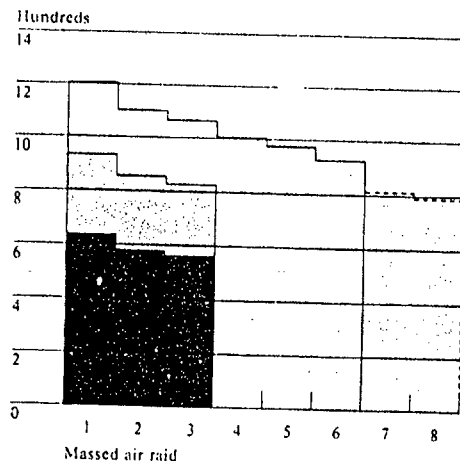
* If the Soviets plan to conduct eight massed air raids over five days and if they continue to project the low cumulative attrition rate of only about 25 percent for that point in the war (a value apparently used in the middle and late 1970s and probably in the early 1980s), they would have to reduce NATO air forces by about 70 percent, but at a more approachable aircraft kill-ratio advantage of about 1.9:1.

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Figure 6
Changed Soviet Perceptions of the Effort Required To Accomplish
the Objectives of the Initial Air Operation, 1969-83

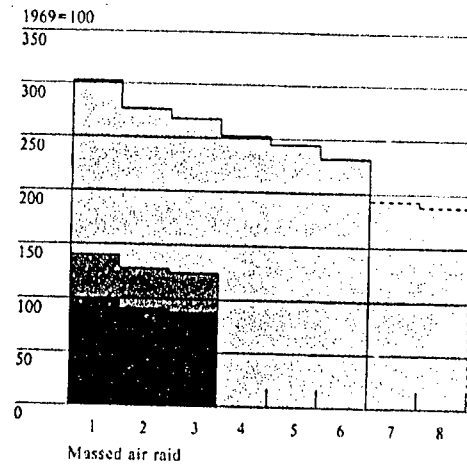
Number of Sorties by Ground Attack Aircraft^a ^b

Maximum 1983
 Minimum 1983
 1975
 1969



Combat Potential of Ground Attack Aircraft^c

Maximum 1983
 Minimum 1983
 1975
 1969



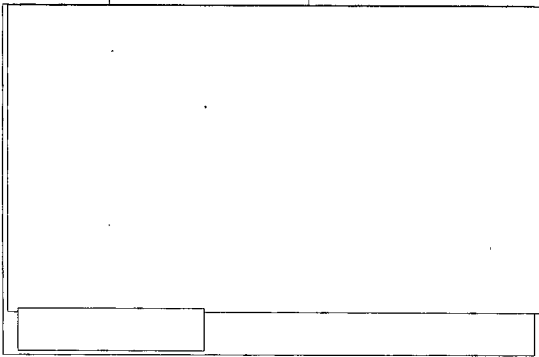
^a Military writings indicate the Soviets believed in 1969 and 1975 that the objectives of the air operation could be achieved with three massed air raids. By the early 1980s, however, they expected that six-to-eight raids would be required.

^b We assume that all massed air raids are conducted across the full width of the TMO, using all available medium bombers, light bombers, and fighter-bombers in the participating formations on each air raid. The 1969 force uses the aircraft of the two western Long Range Aviation bomber corps, GSFG, NGF, the light-bomber division from the Baltic MD, and the Baltic Fleet Air Forces. Nuclear reserve is 33 percent for medium bombers and 25 percent for all others. The 1975 force adds the non-Soviet Warsaw Pact tactical air forces and reduces the front aviation nuclear reserve to 10 percent. The 1983 force is taken from the moderate estimate in table 3, except that the heavy bombers are excluded. The Vinnitsa air army participates only for the first four days of the operation (six air raids).

Estimated operational readiness rates and aircraft attrition are based on an analysis of the data used by the Soviets. The uneven appearance of the force reductions due to attrition reflects variations in the magnitude of unrelated air activity conducted between the massed air raids.

^c The Soviets' method of estimating the relative combat potential of aircraft (see appendix C) has been applied to the data from the sortie graph to depict their perceptions of the impact of their force modernization program on the amount of firepower available for the operation.

priority for modernization with the longer range Backfire and Fencer bombers. Increased firepower for each massed air raid was also obtained by expanding the role of the ground forces artillery and missile forces in the suppression of NATO's forward air defenses.



We believe the Soviet military leadership—apparently expecting that NATO probably would attempt to seize the initiative in the air war—probably views a so-called air defense operation as the most likely form of Warsaw Pact air combat at the start of war in the Western TMO. The sector attack concept, however, gives the Soviets the option of launching an offensive air operation as part of a synchronized air and ground offensive at the outset of war without first substantially altering the air balance. The Soviets may thus view it as a more attractive alternative to the so-called air defense operation either at the outset of war or following a brief and inconclusive period of defensive operations.

The next two sections of this paper contain more detailed discussions of Soviet force employment concepts for executing the initial air defense operation and the initial air operation for theater air supremacy. Subsequent sections cover what the Soviets consider to be the other theater-level air forces' roles—participation in the first major nuclear strike, bomber offensives, airborne and amphibious landing operations, and strategic reconnaissance.

The Initial Air Defense Operation

The Soviets believe that a successful air defense operation would be critical to their prospects for seizing the strategic initiative in the TMO if NATO attacked first and that it would require a massive joint forces effort under the centralized direction of the

theater high command. Soviet military writings state that the primary objectives of the so-called initial air defense operation would be to:

- Break up NATO's offensive counterair campaign.
- Weaken the main body of NATO's air forces.
- Provide air defense against the NATO air raids for Warsaw Pact forces and important rear area installations.
- Create favorable conditions for winning air supremacy with the initial air operation in the early stages of a decisive strategic offensive operation.

Planning. Military writings and exercises indicate that the plans for the first phase of the initial air defense operation are drafted in peacetime by the Soviet General Staff, but the air and air defense staffs of the Western high command would be responsible for updating them before their execution and for drafting plans for subsequent phases of the operation. Each phase typically would contain two or three massed sorties,¹⁰ presumably allowing planners to compensate for lessons learned from previous phases. The Western high command would determine the specific objectives of the operation, the distribution of forces and assignment of blocks of targets among subordinate operational-level formations, and the selection of employment concepts.

Detailed planning, such as assigning specific targets to individual combat units and selecting flight routes with the aid of computers would be performed for one massed sortie at a time by the operations staffs of the various front air defense forces, second-echelon national air defense formations, strategic air armies, front and fleet air forces, and the ground forces artillery and missile forces staffs tasked to execute the operation.

Coordination between air and air defense planners and control of the operation would be accomplished at the joint air and air defense command posts at the high command, front, and ground army headquarters.

¹⁰ The Soviets use the term "massed strikes" to describe both what we call the "massed sorties" in air defense operations and what we refer to as the "massed air raids" in air operations.

Table 2
 Estimated Numbers of Warsaw Pact Combat
 Aircraft Available To Participate in the Initial Air
 Defense Operation in the Western TMO, Mid-1983^a

	Assigned Combat Aircraft	Combat-Ready Aircraft		Nuclear Alert		Available for First Massed Sortie
		Rate ^b (percent)	Aircraft	Rate ^c (percent)	Aircraft	
Moderate force						
Legnica strategic air army (SAA)						
Fighter	135	95	130			130
Attack	180	90 and 95	165	10	18	145
Support	40	95	40			40
Vinnitsa SAA						
Fighter	125	90	115			115
Attack	190	90	170	10	18	150
Support	40	90	35			35
Baltic Fleet Air Force (AF)						
Attack	75 ^d	85 and 90	65	10	4	60
Polish-GDR Front Air Force (FAF)						
Fighter	200	85	170			170
Attack	200	85	170	10	8	160
Support	70	85	60			60
GSFG-GDR FAF						
Fighter	505	85 and 95	460			460
Attack	395	85 and 95	370	10	35	335
Support	100	85 and 95	95			95
Czechoslovak-CGF FAF						
Fighter	310	85 and 95	270			270
Attack	155	85	130	10	12	120
Support	65	85 and 95	55			55
Second-echelon national air defense (NAD)						
Fighter	335	85	285			285
Belorussian FAF						
Fighter	135	90	120			120
Attack	45 ^e	90	40			40
Carpathian FAF						
Fighter	125	90	110			110
Attack	60 ^e	90	55			55
Total	3,485		3,110		95	3,015
Fighter	1,870		1,660			1,660
Attack	1,300		1,165		95	1,070
Support	315		285			285

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Table 2
Estimated Numbers of Warsaw Pact Combat
Aircraft Available To Participate in the Initial Air
Defense Operation in the Western TMO, Mid-1983 ^a

	Assigned Combat Aircraft	Combat-Ready Aircraft		Nuclear Alert		Available for First Massed Sortie
		Rate ^b (percent)	Aircraft	Rate ^c (percent)	Aircraft	
Maximum force						
Legnica SAA						
Fighter	135	95	130			130
Attack	180	90 and 55	165			165
Support	40	95	40			40
Vinnitsa SAA						
Fighter	125	90	115			115
Attack	190	90	170			170
Support	40	90	35			35
Smolensk SAA						
Attack	265	90	240			240
Support	200	90	180			180
Moscow SAA						
Attack	40	90	35			35
Baltic Fleet AF						
Attack	170	85 and 90	150			150
Support	40	90	35			35
Polish-GDR FAF						
Fighter	200	85	170			170
Attack	200	85	170			170
Support	70	85	60			60
GSFG-GDR FAF						
Fighter	505	85 and 95	460			460
Attack	395	85 and 95	370			370
Support	100	85 and 95	95			95
Belorussian FAF ^f						
Fighter	135	90	120			120
Attack	135	90	120			120
Support	30	90	25			25
Carpathian FAF ^f						
Fighter	125	90	110			110
Attack	180	90	160			160
Support	30	90	25			25
Czechoslovak-CGF FAF						
Fighter	310	85 and 95	270			270
Attack	155	85	130			130
Support	65	85 and 95	55			55
Second-echelon NAD						
Fighter	405 ^g	85 and 90	350			350

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Table 2 (continued)

	Assigned Combat Aircraft	Combat-Ready Aircraft		Nuclear Alert		Available for First Massed Sortie
		Rate ^b (percent)	Aircraft	Rate ^c (percent)	Aircraft	
Baltic FAF						
Fighter	110	90	100			100
Attack	60 ^e	90	55			55
Total	4,635		4,140			4,140
Fighter	2,050		1,825			1,825
Attack	1,970		1,765			1,765
Support	615		550			550
Minimum force						
Legnica SAA						
Fighter	135	95	130			130
Attack	180	90 and 95	165	30	54	110
Support	40	95	40			40
Baltic Fleet AF						
Attack	35 ^d	85	30			30
GSFG-GDR FAF						
Fighter	505	85 and 95	460			460
Attack	395	85 and 95	370	30	105	265
Support	100	85 and 95	95			95
Czechoslovak-CGF FAF						
Fighter	310	85 and 95	270			270
Attack	155	85	130	30	36	95
Support	65	85 and 95	55			55
Second-echelon NAD						
Fighter	335	85	285			285
Polish-GDR FAF						
Fighter	200	85	170			170
Attack	65 ^e	85	55			55
Total	2,520		2,255		195	2,060
Fighter	1,485		1,315			1,315
Attack	830		750		195	555
Support	205		190			190

^a Numbers are rounded to the nearest 5 except for nuclear reserves.

^b We assume that Soviet fighter, fighter-bomber, and light bomber regiments start with a 90-percent operational readiness rate if they had to deploy forward from bases in the USSR, rather than the 95-percent Soviet standard for the forward area. Non-Soviet Warsaw Pact units have an operational readiness rate of 85 percent.

^c Nuclear reserve percentages are approximate and follow the Soviet norm of being based on authorized unit strengths. We have followed the Soviet practice of specifying the nuclear reserve in terms of flights per regiment or division. In this case we used one flight per regiment in our moderate force estimate and three flights per regiment in the minimum force. Only units assessed to have nuclear roles are counted.

^d We assume forward deployment of Baltic Fleet fighter-bombers but insufficient warning for medium bombers to be used in our moderate force estimate. No forward deployment is assumed in the minimum case.

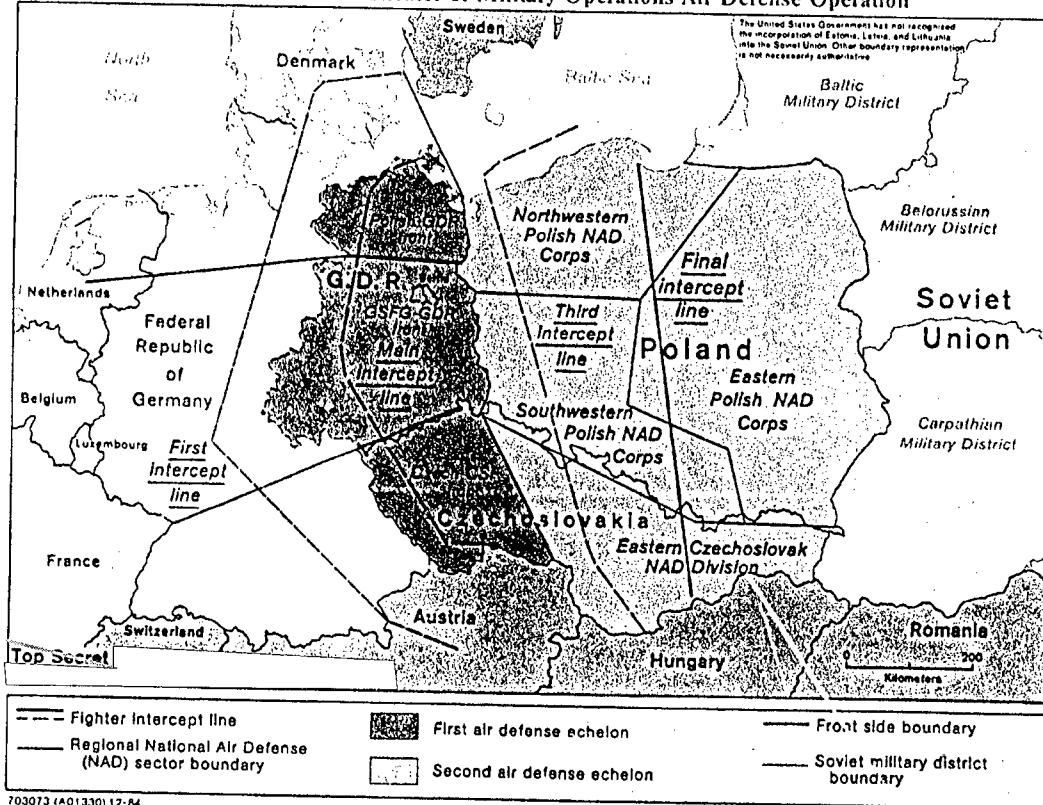
^e We have assumed that approximately one-third of the fighter-bombers assigned to second-echelon fronts located in Poland and Czechoslovakia would be used in an air defense role.

^f We have not redistributed air forces between the five first-echelon fronts, as the Soviets probably would do. Our figures for the forces of the Belorussian and Carpathian fronts simply reflect their point of origin.

^g Includes two Soviet territorial fighter-interceptor regiments deployed forward from the USSR.

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Figure 7
A Representative Concept for Operational Control of
Fighter-Interceptors in a Western Theater of Military Operations Air Defense Operation



Participants: The initial air defense operation would involve more aircraft than any other operation, as it probably would use all Pact fixed-wing aircraft and ground-based air defense forces in the TMO. We estimate that the Pact probably would have available for the first phase of the operation about 3,000 aircraft at the start of a war, assuming a force disposition of three first-echelon fronts and two second-echelon fronts, reinforced by the Legnica and Vinnitsa air armies. We believe that the first phase probably would have to be conducted without the medium bombers of the Smolensk air army and the Baltic Fleet, but that later phases could include over 500 additional aircraft from these forces. Participation of medium bombers in the later phases of the air defense operation would depend on the Pact's ability

to anticipate far enough in advance the approximate timing of subsequent massed NATO air raids.

With extensive reinforcement, however, including a total of five first-echelon fronts, no nuclear reserve force, and the inclusion of medium bombers based in the USSR, the first massed sortie could conceivably contain more than 4,000 aircraft. In contrast, with no reinforcement and a large nuclear reserve force, as few as 2,000 aircraft could participate in the first massed sortie (table 2)

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Figure 7 (continued)
Typical Fighter-Interceptor Distribution *

Regional Sector	National Air Defense (NAD) Interceptors	Tactical Fighters	Total
First Air Defense Echelon			
Polish-GDR front	90	110 ^b	200
GSFG-GDR front	190	315 ^b	505
Czechoslovak-CGF front	110	200 ^b	310
Subtotal	390	625	1,015
Second Air Defense Echelon (unreinforced)			
Northwestern Polish NAD Corps	110	135 ^c	245
Southwestern Polish NAD Corps	110	125 ^c	235
Eastern Polish NAD Corps	70	0	70
Eastern Czechoslovak NAD Corps	45	0	45
Subtotal	335	260	595
Total	725	885	1,610
Possible Air Defense Reinforcements			
Belorussian front	0	135 ^{b,d}	135
Carpathian front	0	125 ^{b,d}	125
Baltic front	0	110 ^{b,d}	110
Western Military District fighters	0 to 70 ^e		0 to 70
Subtotal	0 to 70	370	385 to 560
Total	725 to 795	1,235	1,980 to 2,050

* We assume a three-front force disposition and reinforcement by the Vinnitsa SAA. Aircraft strengths have not been reduced to account for likely operational readiness rates or prior attrition.

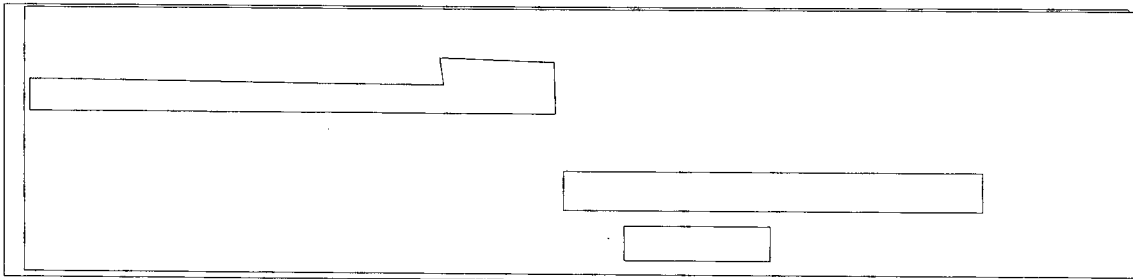
^b This number could be augmented by fighter-bombers if necessary.

^c If the fighters of the Legnica SAA use their peacetime bases in war, they would come under the operational control of the NW Polish NAD Corps when participating in air defense operations. The fighters of the Vinnitsa SAA are depicted in the SW Polish NAD Corps sector but could be based in the Eastern Czechoslovak sector.

^d We do not know the intended wartime fighter composition of the Belorussian, Carpathian, and Baltic fronts, but we estimate each is likely to have three regiments. These units would probably rebase twice during the forward movement of their fronts. The Belorussian air units have typically rebased

initially to the SW Polish NAD Corps sector, and the Carpathian air units have first moved into both that sector and the Eastern Czechoslovak NAD division sector. Baltic air units would probably initially rebase to the NW Polish NAD Corps sector.

^e The second air defense echelon of the Western TMO could be reinforced by some of the Soviet fighter units remaining in the Baltic, Belorussian, and Carpathian MDs. We estimate that as many as two of the remaining five fighter regiments probably would be deployed forward into the Western TMO.



[redacted] a concept for organizing the air defense forces in the Western TMO during an initial air defense operation. [redacted] these forces were organized into air defense first and second echelons. The air defense first echelon probably consisted of the tactical air defense forces of the first-echelon fronts and the colocated national air defense forces of the GDR and western Czechoslovakia (figure 7). The air defense second echelon probably included the three Polish national air defense (NAD) corps and the eastern Czechoslovak air defense division, augmented by the fighters of strategic aviation, the tactical air and air defense forces of any second-echelon fronts located in Poland and Czechoslovakia, and any forward-deployed territorial air defense forces from the Western Military Districts of the USSR.¹¹ We estimate that nearly two-thirds of the fighter-interceptors assigned to the Western high command at the outset of war probably would be committed to the air defense first echelon. Approximately half of the first-echelon fighter-interceptors probably would be assigned to the primary axis Soviet-GDR front sector.

[redacted]

This distribution of fighters could change during combat operations because fighters are particularly likely to be relocated to reinforce air defense forces in the areas subjected to the heaviest NATO air attacks. Soviet military writers view mobility as the greatest virtue of fighter-interceptors and use them in air defense plans primarily in areas not covered by surface-to-air missiles. The direction of the initial air defense operation by the high command is supposed to provide for an optimal distribution of air defense forces throughout the TMO—concentrating forces in the most threatened sectors and preventing unwanted gaps in coverage and duplication of effort.

[redacted]

Execution. We have not observed the full details of the execution of a massed sortie of the initial air defense operation. [redacted] We can only assume that they probably are generally similar to those [redacted] during the late

¹¹ Overall air defense of the western USSR apparently would be conducted under the direction of the headquarters of the Soviet Air Defense Forces in Moscow, rather than by the Deputy Commander in Chief for Air Defense Forces in the Western TMO. [redacted]

1970s—although we speculate that the Soviets may have had to simplify the exceedingly demanding offensive portion of the operation. [redacted] indicated that a large segment of the Warsaw Pact fighter force (perhaps about a third) would attempt to engage the lead elements of NATO's attack force as it entered Pact airspace. Most of the other Pact fighters and part of the fighter-bombers would be used to intercept subsequent groups of NATO aircraft at a series of sequential intercept lines extending to the depth of the Pact rear. Meanwhile, Pact fighter-bombers would attempt to cut penetration corridors through NATO's forward air defenses (aided by extensive attacks by ground forces artillery and missile forces). They would be followed immediately by other fighter-bombers and light bombers charged with locating and destroying on-alert Lance and Pershing SSM and Tomahawk GLCM launchers in the FRG (and ground forces missiles would attack previously located launchers). [redacted]

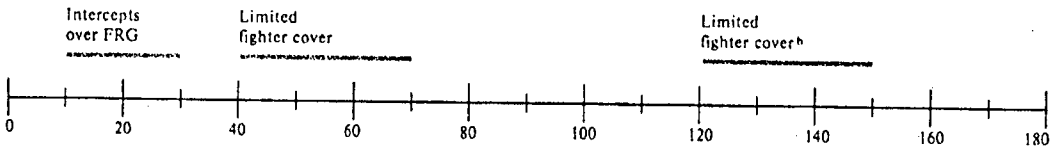
The so-called air defense operation also would involve a large number of attacks against NATO airbases as part of each massed sortie. For the most part these attacks would be smaller and more specialized than the airbase attacks in the initial air operation. According to Soviet employment concepts from the late 1970s, part of the front air force ground attack aircraft and forward-deployed strategic aviation light bombers would attempt to temporarily close the runways at key NATO airfields (primarily by mining), so as to force the NATO aircraft from those airfields to recover at alternative bases, where they could not be protected in hardened shelters. Most of the Pact ground attack aircraft, however, would be reserved in aerial holding zones near home airfields. These aircraft subsequently would be directed from airborne alert to attack specific NATO airfields to which returning NATO aircraft had been diverted, in the hope of destroying them in the open. Limited protective top cover support would be provided by uncommitted fighters. [redacted] If the medium bombers of the

Figure 8
A Representative Massed Sortie in an
Air Defense Operation*

Minutes after beginning of NATO air raid

Fighter-Interceptors

Intercepts over GDR and Czechoslovakia Intercepts over GDR and Czechoslovakia



Ground Attack Aircraft

Attack surface-to-air missiles

Attack surface-to-surface missiles

Attack airfield runways

Attack recovering aircraft

Attack surface-to-air missiles^b

Attack airfields and aircraft carriers (medium bombers)^b

* Late 1970s concepts -- the most recent comprehensive information available to us. [redacted] the Soviets probably have deleted medium bomber attacks from the air defense operation.

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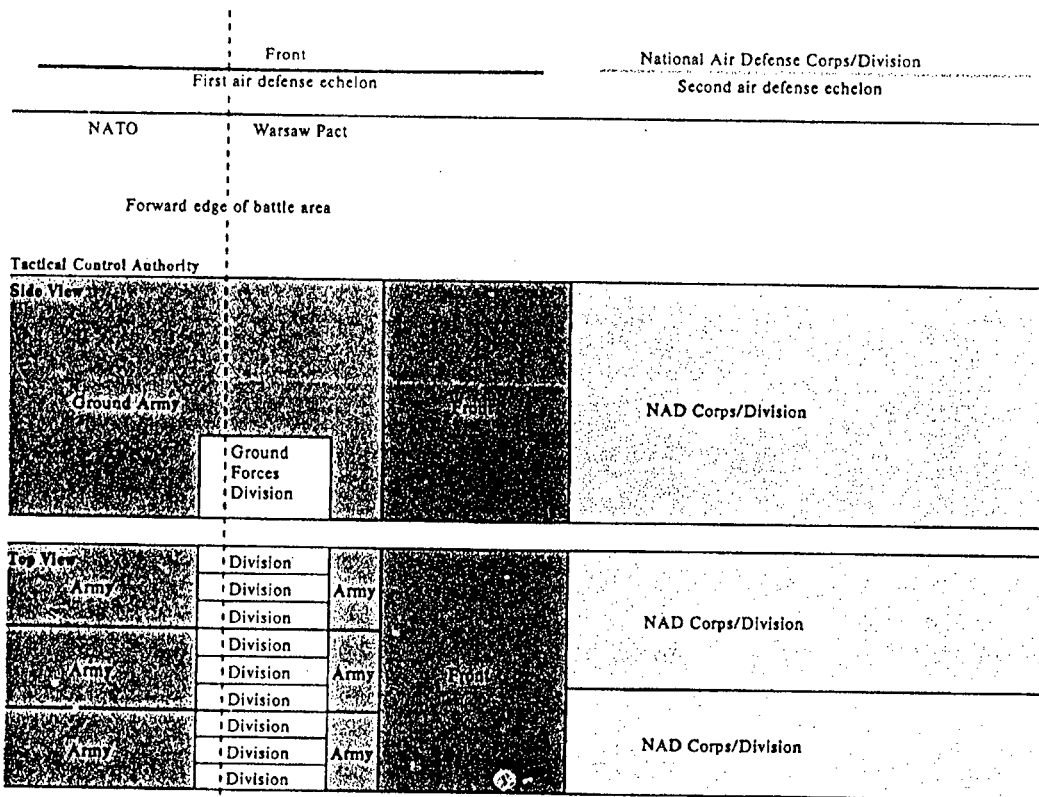
Smolensk strategic air army and the Baltic Sea Fleet air force were to be used in the air defense operation. [redacted] they would begin their attacks against airfields and aircraft carriers some two hours later, with limited front air force defense suppression and top cover support (figure 8). [redacted]

[redacted] regional operational command responsibility for the air defense forces would rest with the front air defense commanders in the air defense first echelon and with the national air defense corps and division commanders in

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Figure 9
Typical Control of Air Defense Forces in
Air Defense Operations

Operational Command Responsibility



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the air defense second echelon (figure 9). Within the air defense first echelon, tactical control authority over all forces participating in the air battle would be delegated to the first-echelon ground army air defense commanders for their sectors, and they in turn would delegate tactical control authority below an altitude of about 3,000 meters to the first-echelon division air defense commanders for their sectors.

planning indicates that fighter intercepts typically would be organized according to so-called intercept lines to simplify directing large groups of fighters against large groups of targets in a complex, integrated air defense system. These concentrated belts of interceptor activity also would be intended to

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break up NATO attack formations, increasing their exposure to Pact SAMs by forcing them to deviate from their planned defense penetration routes. The first intercept line would be located at the maximum practical distance at which NATO aircraft could be engaged over NATO territory ahead of Pact SAM coverage [redacted] this line has varied in depth for the most part about 70 to 120 kilometers inside the FRG border, as depicted in figure 7). The depth of this line would be constrained by the extent of Pact ground-controlled intercept (GCI) coverage and by the practical flight radii and the reaction times of the fighters. A second intercept line—the main one—typically would be established for the air defense first-echelon fighter-interceptors immediately behind the zones of responsibility of the forward SAMs. The second-echelon fighters would have a forward intercept line just behind the rear boundaries of the first-echelon fronts, as well as a final intercept line where a concerted effort would be made to destroy NATO's surviving deep intruders. The fighter-interceptors of the first and second air defense echelons could also be assigned zones of responsibility in the Pact's rear areas and in penetration corridors supporting its ground attack aircraft. [redacted]

Because of its reactive nature, the timing of the Warsaw Pact massed sorties in the initial air defense operation would be dictated by the commander of NATO's Allied Air Forces Central Europe (AAFCE). [redacted] the Soviets expect NATO to conduct two or three major air raids on the first day of a war and to attempt to conduct about two massed NATO air raids a day for the next couple of days. In Soviet operational planning, reactions to the first one or two massed NATO air raids would constitute the initial phase of the air defense operation. During this first phase, the Pact would be more uncertain about the timing and nature of NATO attacks than it would during subsequent phases. The Soviets expect that there may be insufficient warning for them to use their medium bombers in their initial response. While Soviet military writings and exercises have focused on the conduct of air defense operations at the outset of war, we assume that the Pact would also resort to such operations later if NATO were able to blunt the initial Pact air operation and launch a new NATO air offensive or perhaps if NATO ground forces launched a successful counteroffensive. [redacted]

The duration of the initial air defense operation ideally would be determined by the Pact's ability to create "favorable conditions" for launching its initial air operation (or by the execution of the first major nuclear strike, which would obviate the need for the initial air operation). While we do not know precisely what the Soviets consider favorable conditions, we assume that they would hope to have persuaded NATO that its counterair attacks were counterproductive; that they would want to have impaired AAFCE's ability to launch further major air raids that could seriously disrupt the initial Pact air operation; and that they would like to have improved their chances for success with the initial air operation by achieving a combat potential advantage in the air balance in the TMO of at least 1.4:1. [redacted] the transition to the initial air operation typically has occurred after about two days of combat, although the Soviets' writings reflect the belief that they might have to conduct air defense operations for as long as six days. [redacted]

The Soviets recognize that circumstances might arise, however, in which the TMO CinC would feel compelled to try to seize the strategic initiative after a brief period of inconclusive defensive operations by launching an integrated ground and air offensive before achieving a substantial air balance advantage. The greater risk of failure involved in transitioning to the initial air operation under these conditions might lead the high command to use this option only if they judged that air supremacy was no longer essential to winning the war—for instance, if NATO's political resolve were broken or if the Soviets believed that they had substantially overestimated the ability of NATO's air forces to disrupt the Pact ground offensive. [redacted]

Potential Problems. The Soviets are aware that execution of the defensive aspects of the initial air defense operation would place a severe strain on their airspace management system. They expect that more than 3,000 Warsaw Pact aircraft and over 2,000 NATO aircraft could take part in the first massed sortie in the Western TMO in a period of only about two hours. Organization and control of Pact air

[redacted]

defenses could be disrupted because each sector command post would have to contend with fluctuating mixes of collocated air defense forces from one or two fronts, national air defense components, and possibly a strategic air army, while dealing with the basic problems of coordinating SAM and fighter activities and discriminating between hostile and friendly aircraft. Military writings indicate that the procedures for accomplishing the necessary coordination and control of fluctuating sector force compositions are still in the developmental stage. Failing to implement simple, standardized procedures could result in confusion and substantial fratricide. [redacted]

Target detection may become an increasingly difficult problem for the Pact air defense system because of NATO's increasing use of aircraft like the US F-111 and the Anglo-German Tornado that are optimized for low-altitude penetration. NATO's extensive use of electronic countermeasures and possible introduction of conventionally armed cruise missiles would complicate matters further. These problems may be mitigated in the early 1990s, however, if Soviet AWACS and new SU-27 Flanker and MIG-29 Fulcrum lookdown/shootdown fighters are made available in the Western TMO in large numbers. [redacted]

The Soviets would face acute execution problems if they used employment concepts for the offensive aspects of the initial air defense operation similar to the ones that they tested [redacted] in the late 1970s, especially if they failed to respond quickly to warnings of impending NATO attack or if they were unable to rapidly exploit targeting information. These concepts also appear to risk disastrously high aircraft attrition—leading us to speculate that the Soviets may have had to modify this portion of the scheme of execution [redacted]

First, when the Soviets plan [redacted] for the contingency of NATO seizing the initiative in the air at the outset of war, the Soviets assume that they can obtain timely intelligence warning of NATO's preparations to launch its major air attacks. However, considerable disruption and high losses of aircraft

would occur on the ground if NATO achieved sufficient tactical surprise to catch them in an unalerted status. Moreover, many of the forward-based attack aircraft that would be able to take off might be inadequately armed to successfully perform their intended tasks. If the medium bombers were not already armed and alerted, they probably would miss the first phase of the operation entirely. [redacted]

Second, emphasis on the precise execution of closely timed events and dependence on the immediate operational exploitation of intelligence information on a grand scale (to attack alternative recovery bases) would demand extraordinarily efficient staff work at a large number of cooperating headquarters. It would also require the maintenance of reliable communications in a hostile ECM environment and sufficient redundancy to compensate for NATO attacks against key communications nodes. [redacted]

Third, if the Pact suffered high attrition or was unable to achieve a substantial kill-ratio advantage during the initial air defense operation, conditions probably would not be judged by the Soviets as favorable for launching the initial air operation—making the attainment of strategic air supremacy unlikely. Disastrously high attrition could result, because the Pact pilots of the last and most important attack wave probably would experience great difficulty in avoiding NATO SAM sites and in locating and attacking NATO airfields without the benefit of the usual detailed premission study of flight routes and targets. The final groups of front air force ground attack aircraft and strategic aviation light bombers also would have to fly to their targets at vulnerable, but fuel-efficient, medium altitudes to compensate for the fuel burned while in prestrike aerial holding zones. Our analysis of front aviation training suggests that this vulnerability would be compounded by the inadequate training of Pact ground attack pilots to defend

against NATO fighter-interceptors. High attrition could also result from limited fighter cover and defense suppression support for strike aircraft—especially the late-arriving medium bombers of the Smolensk strategic air army.

The Initial Air Operation

The Soviet General Staff still regards the initial air operation as the only means of ultimately establishing air supremacy in the TMO in a conventional war, despite its recent interest in first conducting a so-called air defense operation. Since overall responsibility for the initial air operation was transferred from the Soviet Air Forces Main Staff to the wartime high command in the Western TMO in 1980, military writers have stressed that it must be viewed as a joint forces operation. They have, nevertheless, reaffirmed that the primary role in destroying NATO's air forces in conventional warfare remains with the Warsaw Pact air forces. The General Staff's increased involvement probably is responsible for the reduced expectation of a quick victory through surprise airfield attacks and for the recent emphasis on protracted brute-force employment concepts that are more characteristic of Soviet joint forces operating style.

Participants. The number of aircraft that would directly participate in the initial air operation would be determined by many factors. These include the state of mobilization and reinforcement, whether the air operation was launched at the outset of hostilities or after attrition had been suffered in the initial air defense operation and other combat activity, whether the Soviets elected to attack across the entire width of the TMO or focus the attacks in smaller sectors, the operational readiness rates of the aircraft in combat units, the number of aircraft reserved from conventional operations to serve as a quick-reaction nuclear strike force, and the number of aircraft (if any) that would be given other missions during the massed air raids.

We believe the Soviets would attempt to maximize participation in the operation because of their apparent perception of an adverse shift in the Central

European air balance and their recently increased force sufficiency requirements for the operation. In addition to the Legnica and Smolensk strategic air armies, we believe the Soviets probably would dedicate the Vinnitsa air army to operations in the Western TMO in the initial period of war if they had sufficient time to deploy it forward.

We believe the Soviets may also contemplate using some heavy bombers from the Moscow strategic air army in limited attacks against the deepest targets in the TMO.

We doubt, however, that the Soviets intend to reinforce by detaching the air forces of second-echelon fronts and committing them to battle more than a couple of days before the front ground forces, as heavy aircraft attrition could seriously impair the fighting ability of the involved fronts. This belief is consistent with the inclusion of a fourth front air force at the outset of war, which has coincided with four-front ground forces dispositions. It also is consistent with statements by senior Soviet military officials that the numbered air armies of front aviation were disestablished in the 1980 SAF reorganization so that front aviation would be fully integrated into the joint forces fronts.

* If the strategic aviation Fencer light bombers are to participate in operations in the Western TMO, Soviet planning factors indicate that they must operate from forward area airfields (which are vulnerable to attacks by NATO fighter-bombers)—and even then the Fencer cannot attack the deepest targets within range of USSR-based Badgers and Blinders. The Fencers, nevertheless, would be able to respond more quickly and fly more sorties due to their closer proximity to the targets. Moreover, a Fencer regiment apparently has 70 to 80 percent more combat potential than a Badger or Blinder regiment—nearly as much as a Backfire regiment—according to the Soviet method of estimating relative ability to inflict losses on the enemy.

Moreover, the high-speed dash and large payload capabilities of the new Blackjack could be more useful in penetrating NATO's technically advanced air defenses to press conventional attacks against Western TMO targets than in penetrating those degraded North American air defenses that survived an intercontinental missile strike.

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Table 3
Estimated Numbers of Warsaw Pact Combat Aircraft
Available TMO-Wide To Participate in the Initial Air Operation
at the Outset of War in the Western TMO, mid-1983^a

	Assigned Combat Aircraft	Combat-Ready Aircraft		Nuclear Alert		Available for Air Operation
		Rate ^b (percent)	Aircraft	Rate ^c (percent)	Aircraft	
Moderate Force						
Legnica strategic air army (SAA)						
Attack	180	90 and 95	165	10	18	145
Fighter	135	95	130			130
Support	40	95	40			40
Vinnitsa SAA						
Attack	190	90	170	10	18	150
Fighter	125	90	115			115
Support	40	90	35			35
Smolensk SAA						
Attack	265	90	240	10	24	215
Support	200	90	180			180
Moscow SAA						
Attack	25	90	20			20
Baltic Fleet Air Force (AF)						
Attack	135	90	120	10	12	110
Support	40	90	35			35
Polish-GDR Front Air Force (FAF)						
Attack	200	85	170	10	8	160
Fighter	200 ^d	85	170			170
Support	70	85	60			60
GSFG-GDR FAF						
Attack	395	85 and 95	370	10	35	335
Fighter	505 ^d	85 and 95	460			460
Support	100	85 and 95	95			95
Czechoslovak-CGF FAF						
Attack	155	85	130	10	12	120
Fighter	310 ^d	85 and 95	270			270
Support	65	85 and 95	55			55
Total	3,375		3,030		127	2,900
Attack	1,545		1,385		127	1,255
Fighter	1,275		1,145			1,145
Support	555		500			500

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Table 3 (continued)

	Assigned Combat Aircraft	Combat-Ready Aircraft		Nuclear Alert		Available for Air Operation
		Rate ^b (percent)	Aircraft	Rate ^c (percent)	Aircraft	
Maximum force						
Legnica SAA						
Attack	180	90 and 95	165			165
Fighter	135	95	130			130
Support	40	95	40			40
Vinnitsa SAA						
Attack	190	90	170			170
Fighter	125	90	115			115
Support	40	90	35			35
Smolensk SAA						
Attack	335 ^e	90	300			300
Support	130 ^e	90	115			115
Moscow SAA						
Attack	40	90	35			35
Support	15	90	15			15
Baltic Fleet AF						
Attack	135	90	120			120
Support	40	90	35			35
Polish-GDR FAF						
Attack	200	85	170			170
Fighter	200 ^d	85	170			170
Support	70	85	60			60
GSGF-GDR FAF						
Attack	395	85 and 95	370			370
Fighter	505 ^d	85 and 95	460			460
Support	100	85 and 95	95			95
Belorussian FAF						
Attack	135	90	120			120
Fighter	135 ^f	90	120			120
Support	30	90	25			25
Carpathian FAF						
Attack	180	90	160			160
Fighter	125 ^f	90	110			110
Support	30	90	25			25

Table 3
Estimated Numbers of Warsaw Pact Combat Aircraft
Available TMO-Wide To Participate in the Initial Air Operation
at the Outset of War in the Western TMO, mid-1983^a (continued)

	Assigned Combat Aircraft	Combat-Ready Aircraft		Nuclear Alert		Available for Air Operation
		Rate ^b (percent)	Aircraft	Rate ^c (percent)	Aircraft	
Czechoslovak-CGF FAF						
Attack	155	85	130			130
Fighter	310 ^d	85 and 95	270			270
Support	65	85 and 95	55			55
Total	4,040		3,610			3,610
Attack	1,945		1,740			1,740
Fighter	1,535		1,375			1,375
Support	560		495			495

^a All numbers have been rounded to the nearest 5 except for the nuclear alert force. We assume a TMO-wide massed air raid and no prior attrition. There has been no reallocation of forces between the various peacetime forces that would make up the wartime fronts. The attack helicopters are not included because the Soviets exclude them from the air operation. Not depicted are front electronic countermeasures (ECM) helicopters and military transport aviation (VTA) ECM transports that would participate.

^b We assume that operational readiness rates at the outset of war are 95 percent for Soviet units based in Eastern Europe, 90 percent for Soviet units that deploy forward from the USSR, and 85 percent for NSWP units.

^c According to Soviet practice, the 10-percent nuclear reserve in our moderate estimate is based on authorized unit strengths and, except for the Smolensk SAA, is rounded to one flight per regiment (percent is applied only to units with nuclear roles). In our maximum force estimate the Soviets elect not to have a nuclear reserve of delivery aircraft.

^d The numbers of front air force fighters include the collocated "first-echelon" non-Soviet national air defense fighter-interceptors.

^e In the maximum-effort case, we assume that 70 Smolensk SAA Badgers and Blinders with primary ECM and reconnaissance roles are reconfigured to perform attack missions in the air operation.

^f The numbers of Soviet fighters that typically would be incorporated into these front air forces can be estimated with only moderate confidence.

We estimate that if the Pact chose to conduct a TMO-wide offensive air operation at the start of war—a choice we think less likely than an air defense operation or an initial offensive air operation using sector attacks—probably about 2,900 aircraft would be available (table 3). Over 1,200 of these aircraft would come from units with primary missions of ground attack (about 500 from strategic aviation, and the rest from the front and fleet air forces). With massive mobilization and reinforcement (assuming a total of five first-echelon fronts) and no nuclear reserve force, we estimate that as many as 3,600 aircraft, including over 1,700 ground attack aircraft, could be available to the Pact for the air operation. We believe, however, that Soviet planners doubt that they would be able to field such a large force before

the outbreak of war—as reflected in recent military writings that state that up to 3,000 aircraft could participate in the initial air operation in the Western TMO.

If the Soviets chose to conduct their initial air operation at the outset of war as a series of sector attacks, rather than across the full width of the TMO, we estimate that the first massed air raid probably would involve about 2,000 to 2,500 aircraft, including 900 to 1,100 ground attack aircraft (table 4). This estimate reflects our judgment that basing and penetration corridor constraints would limit participation in each massed raid to about 70 to 85 percent of the aircraft available for a TMO-wide raid (see appendix C for further discussion).

Table 4
Estimated Numbers of Warsaw Pact
Combat Aircraft Available To Participate
in the First Massed Air Raid
of the Initial Air Operation

	Attack Aircraft	Fighters	Support Aircraft	Total
Available TMO-wide at the onset of war ^a	1,255	1,145	500	2,900
70 to 85 percent employable in one sector attack at the onset of war ^b	880 to 1,065	800 to 975	350 to 425	2,030 to 2,465
Available TMO-wide at end of day two ^c	1,020	920	400	2,340
70 to 85 percent employable in one sector attack at end of day two ^b	715 to 870	645 to 780	275 to 350	1,635 to 2,000

^a This estimate is taken from the moderate force in table 3 and all numbers have been rounded to the nearest 5.

^b The actual percent employable would depend on the size and location of the sector and its penetration corridors and on the basing locations of the Warsaw Pact forces. Our preliminary analysis suggests that about 70 to 85 percent of the force could be employed in each massed air raid if the TMO is divided into two or three sectors.

^c This estimate reflects what we believe are highly optimistic Soviet expectations of force availability late on day two or early on day three of the war.

This estimate assumes only 15-percent cumulative attrition to WP forces in prior combat and a 5-percent reduction in the operational readiness rate of aircraft.

[Redacted]

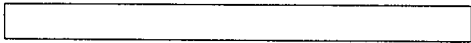
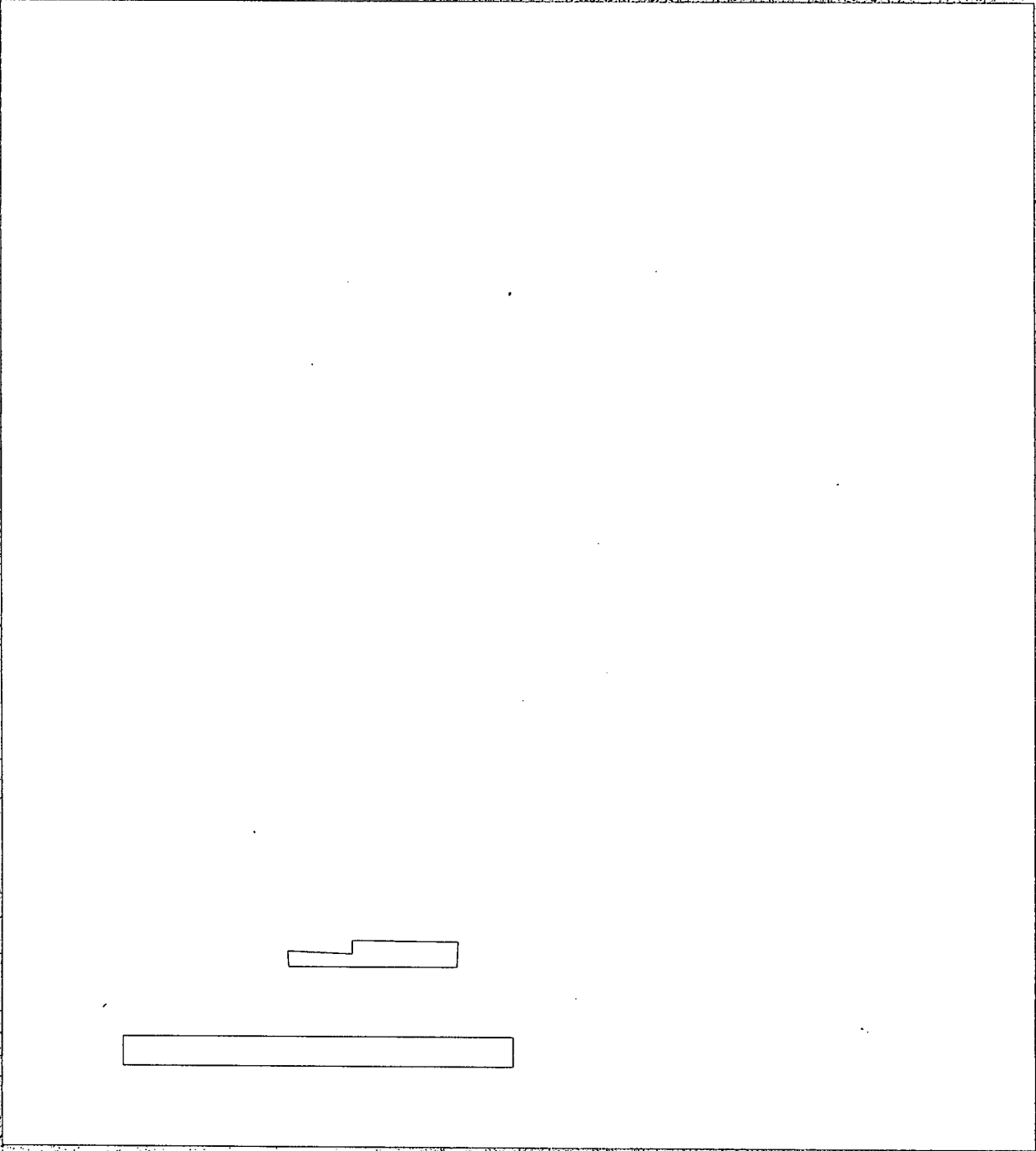
[Redacted] however, we believe the General Staff expects that the Pact probably would begin the war with the so-called air defense operation rather than the air operation, with the result that fewer aircraft probably would be available when the transition to the air operation occurred. These scenarios have most frequently depicted that transition as taking place late on the second day or early on the third day of the war, when cumulative attrition of Pact aircraft typically has been portrayed as only about 15 percent [Redacted]. In assuming this highly optimistic attrition factor and a slight reduction in the operational readiness rate of their aircraft, Soviet planners might hope to have more than 2,300 aircraft available TMO-wide for the initial air operation at the end of the second day of the war, including approximately 1,000 ground attack aircraft. If they elected to concentrate the massed air raids sequentially in two or three sectors of the TMO, however, we

estimate that only 1,600 to 2,000 of those aircraft would be expected to participate in the first massed raid, of which 700 to nearly 900 would be ground attack aircraft. [Redacted]

The extent to which fighter-bombers should be used in the initial air operation rather than in direct support of the ground forces has been a contentious issue among senior Soviet officers since the air operation's inception. Recent Soviet military writings [Redacted] indicate that almost all available fighter-bombers probably would participate in the massed air raids of the initial air operation, leaving only army aviation attack helicopters to provide air support for the ground forces during the air raids.¹⁴ Fighter-bomber air support would be made available to ground forces units, however, between massed air raids and presumably during any raids that were concentrated in distant sectors of the TMO. The Soviets plan to fly more than one-third of all fighter-bomber sorties between the massed air raids on the first two or three days of a war; thereafter, they would intend to devote over half of the fighter-bomber sorties to front and army objectives. Contrary to assertions made in military writings from the mid-1970s, authoritative statements from the early 1980s indicate that the Soviets probably do not intend to increase air support after the first massed raid by reducing the size of the subsequent massed air raids in the air operation. This shift probably reflects their perception of increased force requirements for meeting the objectives of the air operation. [Redacted]

¹⁴ Soviet military writings indicate that concern about the possibility of inadequate direct air support during the initial air operation was largely responsible for the massive buildup of army aviation attack helicopter forces that began in the early 1970s. As a result, the ground forces can now be assured of substantial air support during the initial air operation. In GSFG, for example, there are now more attack helicopters than fixed-wing ground attack aircraft; calculations using the Soviet method of quantifying combat potential indicate that the GSFG attack helicopter force is now viewed as being slightly more powerful than the fighter-bomber force (figure 3). The Soviets therefore probably believe that the present attack helicopter force is capable of providing more air support to the GSFG ground forces during the initial air operation than could have been provided by the entire GSFG fighter-bomber force in the early 1970s, when the issue first surfaced. [Redacted]

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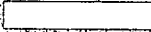


Figure 10 (continued)

The illustrated medium and heavy bomber flight profiles are optimized for defense penetration and are similar to missions planned by a Badger regiment. Accordingly, we assume that the bombers would attempt to avoid NATO radar detection by operating entirely at low altitudes on both the inbound and outbound segments of their missions while over NATO territory and most of the GDR and western Czechoslovakia.

Soviet planners consider the Fencer to have a maximum practical operational flight radius of nearly 700 km, but that the aircraft would have to fly at high altitudes, thereby making themselves vulnerable, to reach targets at that distance. US technical assessments, however, suggest that the Fencer could fly considerably farther. For a discussion of the differences between Soviet operational planning factors and US technical estimates of maximum capability.

A standard flight-route structure is likely to be used by USSR-based bombers to simplify airspace management over Pact territory.

The number and locations of the four penetration corridors assume a TMO-wide air raid.

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Location and Timing of Attack

nearly all of the attacks during at least the first few massed air raids of an initial conventional air operation in the Western TMO probably would be concentrated in the mid-European strategic zone and the North Sea. Most primary NATO targets lie in this area within 150 to 400 km of the FRG-GDR border and can be struck by strategic and naval aviation medium bombers flying low-altitude defense penetration flight profiles and by forward-deployed strategic aviation Fencer light bombers flying somewhat less advantageous profiles (figure 10).

The Soviets also may intend to attack deeper targets, such as key airbases in France and Britain during the initial conventional air operation. Recent military writings state that the operation would cover an area about 1,000 km deep and 1,000 to 1,500 km wide—which would include almost all of Britain and most of France. The Soviets probably envision conducting most of the attacks against the deeper targets during the later phases of the operation, however, because, according to Soviet planning factors, the only aircraft

capable of participating without first deploying to forward airbases would be medium bombers flying at high altitudes (and thus vulnerable to air defenses) or heavy bombers.

The area that would be brought under attack in each individual massed air raid would be substantially narrower if the Soviets chose to concentrate their attacks in sectors to compensate for near parity in the TMO-wide air balance. Soviet writers have referred to these sectors only as "operational axes," without specifying the extent of the area covered by each. We doubt, however, that they are referring to axes as small as the six land axes noted in figure 5. We estimate that the most effective plan would be to divide the TMO into two sectors separated near the boundary between AAFCE's 2ATAF and 4ATAF (see appendix C), because two sectors would reduce the burden of airspace management by providing room for a second penetration corridor in each sector, allow greater use of front aviation by easing basing constraints, and ensure that each sector contained enough high-value NATO airfield targets to warrant committing the force of an entire massed air raid to it.

If the TMO were divided into two sectors, we estimate that the Soviets would probably prefer an attack sequence in which they alternated between the two sectors a series of operational phases of two massed air raids apiece. Although the Soviets clearly could increase their effectiveness if they were to hit the same airfields in several consecutive massed air raids, we doubt that they would want to conduct more than two—or conceivably three—consecutive raids in any one sector.

The timing of the individual massed air raids would be influenced by several operational constraints. Soviet military writers often have noted that achieving some degree of tactical surprise could be critical to success, because it would allow the Pact to catch

substantial numbers of NATO aircraft on the ground during the airfield attacks and would reduce Pact losses to NATO air defenses. Even though they have expressed interest in conducting air raids at night—for which strategic aviation units have trained—to enhance surprise and impair NATO's air defenses, military writers repeatedly have rejected this possibility. This rejection is because of front aviation's very limited training and target-acquisition capabilities for offensive operations at night. The Soviets instead have shown a preference [redacted] for conducting the massed air raids at around dawn and dusk. Their writings have noted that the massed raids could be spaced as little as seven hours apart, however, with the limiting factor being the time required for the preparation and transit of the medium bomber force to their targets. [redacted]

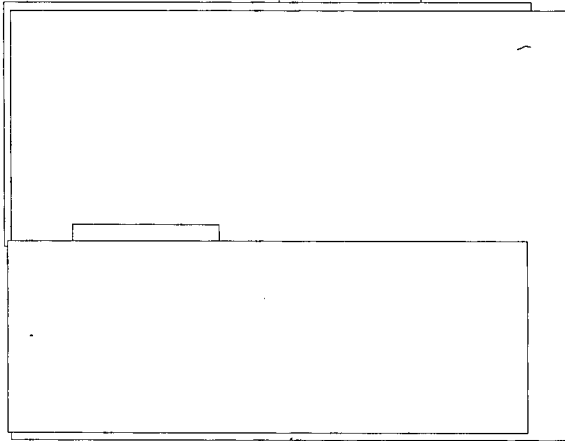
Airfield Attacks. The heart of the initial air operation would be a series of airfield attacks designed to destroy a sufficient portion of NATO's air forces to establish strategic air supremacy as well as to substantially reduce NATO's nuclear strike potential. Airbases housing fighter-bomber wings with nuclear strike roles generally are the top-priority targets [redacted] because their destruction would simultaneously satisfy both objectives. This preference for attacking fighter-bomber units with nuclear roles also demonstrates the primacy of preparing for nuclear escalation, however, because the qualitative air balance could be altered much more quickly if the Soviets were to instead concentrate on destroying fighter-interceptors (especially F-15s), which the Soviets credit with having substantially greater combat potential. Some fighter-interceptor and reconnaissance bases also would be attacked. Soviet military writings note that front aviation also would make less ambitious attacks against NATO airfields between the massed air raids and outside the framework of the air operation, because each front commander would be responsible for maintaining pressure on the NATO air forces in his sector of responsibility. [redacted]

[redacted]

The number of Pact aircraft used to attack each airfield has varied [redacted] from as little as a squadron to as much as a regiment of attack aircraft. [redacted] involving Badgers, two attack

squadrons, comprising about 17 to 20 aircraft, invariably are used against each airfield. Attacks by Blinder or Backfire medium bombers typically have used only half as many aircraft. Fencer airfield attacks [redacted] have ranged in size from one to three squadrons (six to 26 aircraft). Fighter-bomber attacks on airfields usually use a full regiment (30 to 40 aircraft), although smaller groups have been used to mine runways as a prelude to the main attack by another unit [redacted]

The Soviets probably do not now intend to supplement aircraft attacks against NATO airfields with major ground forces missile attacks using conventional cluster munitions.¹⁹ Because of the substantial expansion that is occurring in the Soviet SRBM force²⁰, its growing participation in other aspects of conventional operations, and the ongoing development of a terminal guidance capability for their SRBMs, however, we predict the Soviets may develop a significant airfield attack mission for their ground forces missile forces in the 1990s. SRBM-delivered cluster mines could be used to trap NATO aircraft on airfields immediately before the airfield attacks by Pact aircraft, with the Improved Scud and the SS-23 covering most airbases in the FRG and the Scaleboard covering the airbases in the Benelux countries and northeastern France. We have seen no evidence that the Soviets would use chemical warheads in the air operation and believe they do not intend to do so. [redacted]



Soviet military writings [redacted] indicate that the preferred targets at NATO airfields would be aircraft in the open, but the proliferation of hardened aircraft shelters has caused the Soviets to concentrate much of their emphasis on cutting runways. They also appear to recognize that resorting to closing runways probably would require more repeat attacks to keep them closed. Their writings have indicated that hardened aircraft shelters would be attacked as well, but we believe that such attacks probably would be deferred to the later phases of the air operation, because they require large numbers of aircraft—typically one fighter-bomber per shelter. Airfield attack plans in some cases also have included key base support facilities such as maintenance, fuel and ammunition storage areas. [redacted]

Air-to-Air and Antiship Activity. The Warsaw Pact fighter-interceptor forces would also be given a major role in destroying NATO aircraft through air-to-air engagements during the air operation. Soviet military writings from the early 1970s estimated that NATO could launch 60 percent of its aircraft before the arrival of the Pact airfield attack aircraft, leading the Soviets to conclude that aerial engagements by the Pact fighters flying top cover were likely to account for 30 to 40 percent of the NATO aircraft destroyed in the initial air operation. The Soviets probably now estimate that a higher percentage of NATO aircraft would have to be destroyed in air-to-air engagements because the proliferation of hardened shelters at NATO airfields has made it more difficult to destroy aircraft on the ground. NATO's warning capabilities have improved, and because they probably believe that a greater share of the struggle for air supremacy would be fought over Pact territory if NATO seized the initiative in the air at the war's outset. Renewed Soviet interest in fighter training for bomber escort missions and the development of an aircraft that appears to be well suited to conducting fighter sweeps (the SU-27 Flanker) suggest that top cover for the operation is being given greater emphasis. [redacted]

The other way that the Soviets expect to reduce the size of the NATO air forces in the Western TMO

during the air operation is by attacking aircraft carriers operating in the North Sea. This mission would be performed by the medium bombers of the Baltic Sea Fleet, although strategic aviation medium bombers could be called upon to augment the fleet. We doubt, however, that this would constitute a major mission for strategic aviation during the early stages of a war in the Western TMO because the fleet's three missile-armed bomber regiments would not have to be reinforced for this task under most scenarios.²² Moscow strategic air army Bear heavy bombers are responsible for engaging aircraft carrier battle groups in the approaches to the Norwegian and Greenland seas, but [redacted] these operations probably would be conducted from the Kola Peninsula in support of the Oceanic, instead of the Western TMO in the European theater of war. [redacted]

Attacks Against Surface-to-Surface Missiles.

NATO's nuclear-armed surface-to-surface missile forces also would be a major target in the initial air operation, despite their irrelevance to air supremacy and the fact that their attrition evidently is not a criterion for the Soviets' success in the initial air operation. We believe that this apparent inconsistency is explained by the extreme importance that the Soviets give to destroying SSMs, making it a "permanent task" for the air forces that has to be performed at all times regardless of other priorities, including gaining air supremacy. [redacted]

Despite their recognition of their limited capability to locate and destroy NATO's mobile SSMs and the growing conventional capabilities of Pact ground forces missile systems against identified NATO launchers, the Soviets apparently are prepared to devote large numbers of aircraft to the task. Military writings from the mid-1970s suggested that attacks against SSMs (primarily on-alert launchers) should consume about 40 percent of the fighter-bomber sorties and about 20 percent of the light-bomber sorties in the initial air operation. Concern about destroying NATO SSMs is so great that we believe

the Soviets would plan for diverting more sorties away from airfield attacks if there were a substantial increase in the SSM threat.

[redacted] the Soviets used strategic aviation light bombers and medium bombers to attack Pershing II MRBMs and Tomahawk GLCMs. Such use of Fencers indicates that the recent deployment of these weapons in Central Europe may have already caused them to plan for diverting additional aircraft away from airfield attack missions.

Air Defense Suppression. Air defense suppression would play an important part in satisfying both the basic goals and the immediate tactical requirements of the initial air operation. As strategic air supremacy is supposed to provide the Warsaw Pact air forces continuous freedom of action over NATO territory, degrading NATO's air defenses is one of the goals of the operation. A more immediate tactical requirement, however, would be attaining sufficient localized air defense suppression to achieve short-term "operational" air supremacy. This would be a prerequisite for keeping bomber attrition rates low enough to complete a protracted air operation.

Evidence [redacted] military writings suggests that the Soviets are prepared to accept only 5- to 10-percent losses on any one massed air raid, that they probably plan on average attrition rates of only 2 to 3 percent per massed raid for the first few days of the war, and that they expect these rates to decline to about 1 percent per sortie thereafter. Attrition as high as 7 or 8 percent has sometimes been depicted for the first massed sortie of the war, however. Although these attrition rates are similar to the historical record of US bomber losses over Germany in World War II and of Israeli aircraft losses in the 1973 Middle East war, we believe that these rates probably are optimistically low for a modern, high-intensity war in Central Europe, considering the great density and lethality of air defenses on both sides.

In an attempt to achieve these optimistically low rates of attrition, up to half the aircraft participating in the initial air operation could be used primarily against NATO air defenses and command and control facilities. The front forces would be directed to establish

several penetration corridors through NATO's forward air defenses by using fighter-bombers in conjunction with artillery and SRBMs in direct attacks and by performing extensive electronic jamming (see figure 10). The Soviets' military writings indicate that they have substantially increased the role of artillery and SRBMs armed with conventional cluster warheads in defense suppression since 1980, but we are uncertain of the planned extent of their participation.

We estimate that [redacted] the ground forces in the Western TMO conduct forward air defense suppression with the fire of more than 1,700 artillery tubes and roughly 30 conventionally armed SS-21 or FROG SRBMs to support the first Pact air attacks in the air defense operation—but we do not know whether this [redacted] typical of Soviet planning norms. Greater use of ground forces SRBMs to suppress NATO air defenses could free many fighter-bombers from these duties to perform other missions, such as attacking airfields and locating and destroying NATO SSM launchers.

[redacted] three or four penetration corridors through the NATO Hawk belt probably would be established in a TMO-wide air raid, but we estimate that only one or two would be used in each air raid when concentrated sector attacks were conducted. Soviet writings [redacted] typically have portrayed these penetration corridors as being 50 to 60 km wide and have suggested that each corridor could accommodate three to five parallel lanes of air traffic (about 10 to 15 km apart). We estimate that the Soviets may plan for over 800 aircraft to use each of the two central corridors in a first TMO-wide massed air raid and that more than 1,300 aircraft might use the main corridor in a concentrated sector attack.

Deeper attacks would also be conducted against air defense command and control facilities, and fighter-interceptors would perform fighter sweeps, barrier patrols, and airfield blockades to counter NATO interceptors. Finally, the main attack force would

make maximum use of low-altitude flight profiles" and electronic countermeasures (ECM) to avoid radar detection. In some cases the attack aircraft would be given a fighter escort, and as much as one-third of the ground attack aircraft in the deep attack groups would be used to attack the point defenses in the areas of the primary targets. [redacted]

Execution Sequence. The Soviets settled on an operational plan for the individual massed air raids of the initial air operation during the mid-1970s that would commit their air forces to battle in three successive echelons (figure 11). We cannot be certain that their employment concepts have remained unchanged, but we note that a similar overall scheme of two attack echelons and one reserve echelon was postulated in the massed air raids [redacted]

[redacted] In the mid-1970s concept of operations, the first group was called the support echelon and typically consisted of about 40 percent of the fighters, roughly half of the fighter-bombers, and some of the ECM aircraft of the front air forces. Its mission would be to establish the penetration corridors through NATO's forward air defenses in cooperation with ground forces artillery and missile forces, destroy air defense command posts, conduct fighter sweeps over NATO territory, and mine the runways and establish fighter "blockades" over key NATO airfields. The support echelon also probably would have

" Soviet military writings [redacted] have shown a strong preference for conducting flight operations at "low" (200 to 1,000 meters) and "extremely low" (50 to 200 meters) altitudes during conventional operations to minimize hostile radar tracking and thereby improve bomber survivability. Soviet writings credit NATO's ground-based radars with solid detection coverage against medium-altitude aircraft to a depth of 200 to 250 km inside the GDR and Czechoslovakia and to a depth of 40 to 50 km against low-altitude aircraft. Soviet electronic warfare doctrine asserts that NATO's air defense command and control system can be neutralized if one-third of the facilities are destroyed by direct attack and another third are effectively jammed. Soviet studies in the late 1960s concluded that using low-altitude flight profiles can reduce the losses to the strike force by a factor of three or four. The Soviets believe that the Nike SAMs can be avoided entirely by flying at altitudes of less than 1,500 meters. They also found that, in addition to using penetration corridors, losses to HAWK SAMs could be nearly cut in half by halving the interval between attack flights penetrating in trail (using a maximum interval of 10 seconds between aircraft), and that losses to interceptors could be reduced by 80 to 85 percent through the use of a combination of maneuvering, jamming, and chaff. The recent NATO deployments of F-15 lookdown/shootdown fighters and AWACS aircraft probably have reduced the expected effectiveness of these techniques. [redacted]

the responsibility for destroying NATO AWACS aircraft. The recently increased role of the ground forces artillery and missile forces in air defense suppression may have reduced the participation of fighter-bombers in this group. [redacted]

The so-called strike echelon would follow minutes behind the support echelon and would be composed of strategic aviation and naval bombers, about 20 percent of the fighters, the rest of the front air force fighter-bombers, front-subordinate light bombers, and most of the reconnaissance and ECM aircraft. The strike echelon would be charged with destroying the primary targets in the operation (airfields, SSM launchers, and aircraft carriers) and providing top cover and ECM support for the attack aircraft. [redacted]

The so-called third echelon (or reserve echelon) of the massed air raid would contain the remaining 40 percent of the front-subordinate fighter-interceptors, which would be used to maintain air cover in the penetration corridors and to guard the safe recovery of the first two echelons at the conclusion of the mission. [redacted] About one-third of the strategic aviation fighter force also has been used in the reserve echelon, rather than for escorting attack aircraft. [redacted]

Potential Problems. We believe the Soviets would find it extremely difficult to amass enough force to launch a TMO-wide air operation at the outset of war with high expectations of a successful outcome should France fight with NATO or the United States deploy significant reinforcements to Central Europe (see appendix C for our estimate of the Soviets' perceptions of the impact of reinforcements on the air balance). The Soviets' perceptions of the air balance are strongly influenced by their judgment that most Western aircraft enjoy a significant qualitative advantage over contemporary Soviet aircraft. [redacted]

We believe that aircraft attrition rates substantially higher than the Soviets expect could force the cancellation of the initial air operation after only one or two

Figure 11
Execution of the First Massed Air Raid of a
Typical Initial Air Operation in the Western
Theater of Military Operations

Echelon:	Support	Strike	Third
Roles and objectives	Penetration corridors Air defense command posts Fighter sweeps Blockade airfields Mine key runways	<i>Airfields</i> <i>Nuclear surface-to-surface missiles</i> <i>Aircraft carriers</i> <i>Nuclear storage</i> Fighter cover	Fighter cover
Timing of attacks (H= start)	H+3 to H+35 minutes	H+10 to H+50 minutes	H+25 to H+90 minutes
Force distribution ^a	50 percent of fighter-bombers 40 percent of fighters Some jammers Front missile and artillery forces	100 percent of bombers 50 percent of fighter-bombers 20 percent of fighters Jammer and reconnaissance aircraft	40 percent of fighters
Typical force composition ^b	270 Fighter-bombers 350 Fighters 15 Jammers	290 Medium bombers 280 Light bombers 270 Fighters-bombers 175 Fighters 430 Jammers and reconnaissance aircraft	350 Fighters

Note: Italics indicate primary targets of the operation.

^a The force distribution among echelons is based on mid-1970s Soviet employment concepts—the most recent available.

^b This force of over 2,400 aircraft concentrates a first massed air raid in the sector of the TMO that includes NATO's Second Allied Tactical Air Force and Allied Forces Baltic Approaches. These figures are based on the moderate force air order of battle in table 3, as modified by the force composition counting rules in figure 19. An undetermined number of front artillery and SSM units also would participate in defense suppression during the operation.

massed air raids—before it accomplished its objective of attaining air supremacy in the TMO. This high attrition would be likely because:

- Target-locating uncertainties would limit damage to NATO's technically advanced air defense system by the ground forces artillery and missile attacks with conventional munitions, which would immediately precede the attempts by Pact aircraft to penetrate NATO airspace.
- NATO AWACS aircraft and lookout/shutdown interceptors would limit the opportunities for Pact aircraft to evade NATO defenses by flying at low altitudes.
- The Soviet deep attack force would rely heavily on medium bombers, which are relatively large, unmaneuverable, and hence particularly vulnerable to SAMs and interceptors once identified.
- Fighter-bombers would be extensively exposed to air defenses while they searched NATO rear areas for mobile SSMs.
- Any bombers used in attacks against Britain would have to operate beyond the range of fighter sweeps and fighter escorts, and without air defense suppression support by front forces.
- The proliferation of hardened aircraft shelters at NATO airbases would force the Soviets to concentrate on closing runways without the benefit of good runway attack munitions (according to data [redacted])—thus requiring more air raids over a longer period of time and hence greater exposure to NATO air defenses.
- The Soviets do not have enough hardened shelters to protect most of the aircraft that would deploy forward from the western USSR in the event of a massive reinforcement. We doubt that a large-scale reinforcement by front aviation would be likely under most circumstances, however, until the ground forces of the affected second-echelon fronts also deployed forward. [redacted]

If the Soviets chose to start the war with the initial air operation, achievement of tactical surprise would be difficult. We believe that massed takeoffs of hundreds of medium bombers from rear area bases one and a half to two hours before the front air forces and the approach of the bombers to NATO territory could be detected [redacted] and failing that, the bombers could be detected by NATO AWACS aircraft by about the time they reached Poland. Warning of the attack could allow NATO sufficient time to launch most of its aircraft, exacerbating potential Pact aircraft attrition and making the NATO airfields less lucrative targets. [redacted]

If NATO were able to launch large numbers of aircraft before the Pact attack, the Pact would have to rely heavily on fighter sweeps and escorts to destroy them. Pact air forces are poorly equipped to conduct fighter sweeps over NATO rear areas, however, because of limitations in the technical capabilities of their Flogger and Fishbed fighters and the inadequate training of their fighter pilots for this mission. This problem could be partially rectified in the late 1980s or early 1990s with the deployment of substantial numbers of the SU-27 Flanker (and to a lesser extent MIG-29 Fulcrum) fighters, AWACS aircraft, and an all-aspect infrared-guided air-to-air missile. [redacted]

Finally, the large number of aircraft that the Soviets intend to use in the first massed air raid probably would strain Pact airspace management capabilities and lead to confusion. Additionally, bad weather would limit the size and effectiveness of the air raids or even force the postponement of the air operation at the outset of hostilities, thus compromising the element of surprise. [redacted]

The Initial Massed Nuclear Strike

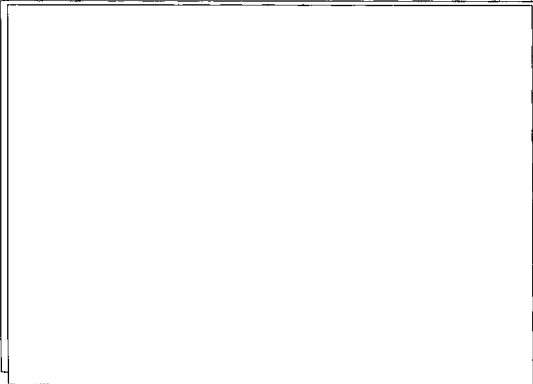
In their writings, the Soviets define the initial massed nuclear strike as the first full-scale nuclear exchange of a war and characterize it as the most decisive of all military actions. Because its effective execution is of

paramount importance, Soviet planners treat it separately from the more limited subsequent strikes. [redacted] it is always at least TMO-wide in scope and usually is carried out simultaneously with or within several hours of similar strikes in other TMOs—usually including North America. [redacted] The Soviets believe that successful execution would destroy or neutralize most major enemy military targets in a single stroke; thus, this strike probably would determine the outcome of the campaign in the theater and possibly of the entire war. [redacted]

Planning

Probably because it has the greatest potential to decide the outcome of a war, the initial massed nuclear strike receives first priority in staff activity at all levels and is centrally directed by the General Staff. The nuclear planning groups at front, fleet, and presumably high command headquarters would plan the distribution of groups of targets among the operational-level strike forces assigned to their sectors of responsibility. Nuclear planning groups in these strike forces would assign specific targets to individual strike units. These assignments would be adjusted continually on the basis of evidence from reconnaissance of the detection, destruction, or movement of targets. [redacted]

The Nuclear Strike Demarcation Line. Planning for the initial massed nuclear strike in the Western TMO is coordinated according to sectors of responsibility, separated in depth by a strike demarcation line designated by the General Staff. The line specifies the western limit of strikes by front-subordinate forces—and probably also by most forward-based strategic



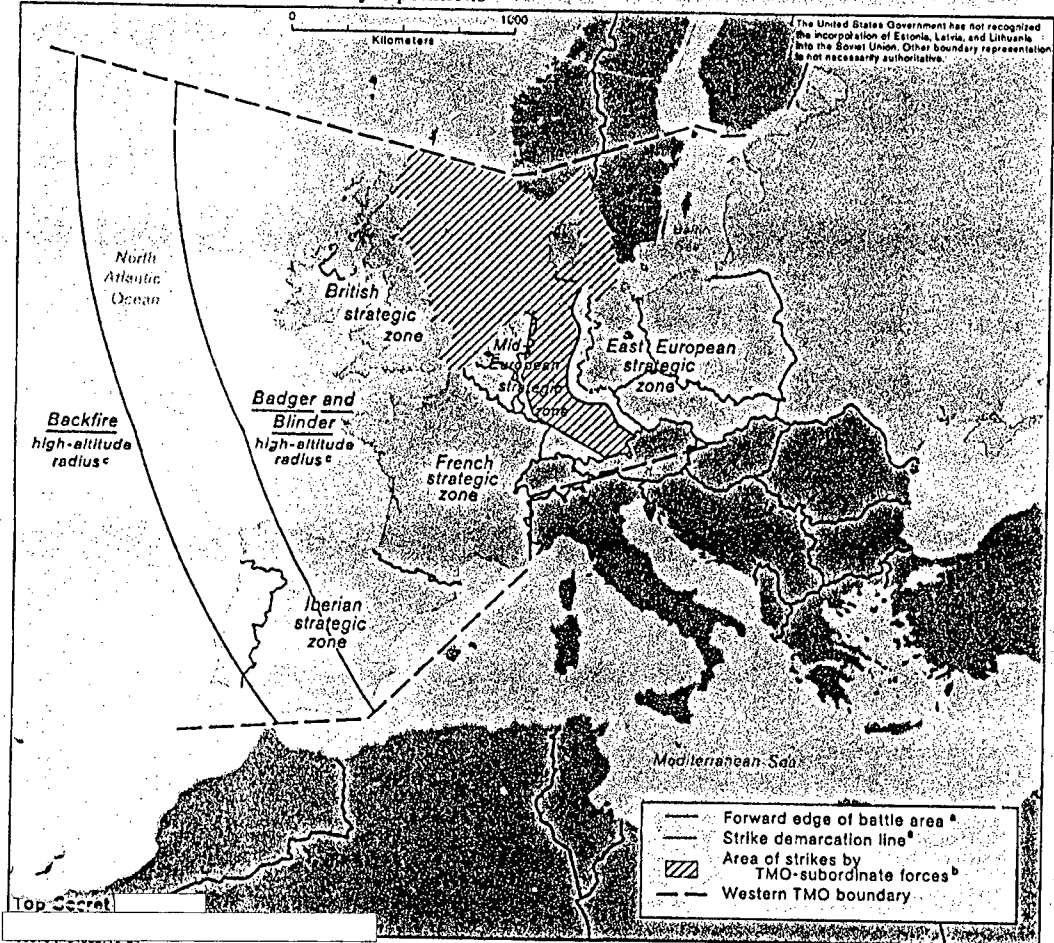
aviation light bombers that have been made operationally subordinate to the Western high command (figure 12). While this command would oversee planning for strikes short of the demarcation line, its responsibilities for targets beyond the line are not known. Tenuous evidence [redacted] however, suggests that the high command may designate or at least nominate targets beyond the line to the General Staff—which seems reasonable, because the high command would be responsible for monitoring and attacking most of those targets both before and after the initial massed nuclear strike. [redacted]

[redacted] the strike demarcation line probably would be set about 100 to 200 km forward of the FEBA and approximately parallel to it.²⁷ The General Staff probably would move the line as necessary to keep pace with the movement of the FEBA—perhaps as frequently as once a day during a rapidly moving Pact offensive. Thus, for example, most NATO tactical airbases in the FRG probably would be assigned as targets to SRF MR/IRBMs at the outset of the war, but they would normally be reassigned to front Scud SRBMs a few days into the Pact offensive, after the strike demarcation line was moved westward. Data [redacted] indicate that the area within the demarcation line is subdivided for planning purposes into regional target clusters that are assigned to individual divisions of fighter-bombers or light bombers. We assume that this procedure probably applies to assigning targets beyond the demarcation line as well. [redacted]

²⁷ The strike demarcation line was located at a depth of about 100 km in plans made before hostilities. [redacted] Planners may have assumed that NATO was in a relatively shallow offensive force disposition and that Warsaw Pact Scud SRBMs were farther away from the FEBA in a deeper defensive posture. This situation would place Soviet front SSMs at longer ranges from their potential targets, and most of those targets would be concentrated close to the FEBA, dictating a shallow strike demarcation line. [redacted]

[redacted] the demarcation line in the midst of a Pact conventional offensive, the line was located at a depth of about 200 km. In this case, the Scuds may have been deployed forward to keep pace with the other advancing front forces, and their NATO targets may have been in a deeper defensive disposition. [redacted]

Figure 12
Air Forces Operating Areas in the Initial Massed Nuclear Strike
in the Western Theater of Military Operations



^a In this example we assume that the initial massed nuclear strike occurs on the second or third day of the Pact offensive and that the strike demarcation line is located at a depth of up to 200 km beyond the FEBA.

^b We assume that the strategic aviation Fencers are subordinate to the Western TMO high command and are operating in the area within the demarcation line and that the Baltic Sea Fleet—also a Western TMO asset—is responsible for targets in the North Sea. We also assume that the strategic aviation medium bombers are not operationally subordinate to the Western TMO high command.

^c The action radii of medium bombers are measured from representative peacetime operating bases in the western USSR. These radii do not include in-flight refueling or the added coverage afforded by the range of air-to-surface missiles.

Strike Responsibilities. Targets short of the strike demarcation line normally would be assigned to ground forces short-range ballistic missiles (SRBMs) and nuclear artillery, the front air forces, the forward-based strategic aviation light bombers, and possibly to a small number of front-allocated SRF warheads. The time-urgent first-priority targets—NATO's nuclear forces and installations and its most important command and control facilities—would be struck primarily by ground forces missile and artillery forces, which also would conduct extensive air defense suppression strikes. Nuclear strikes delivered by front air forces and forward-based strategic aviation light bombers would be within about 150 km of the FEBA and would be directed against mobile targets, targets of secondary priority, and particularly important targets previously struck by SRBMs. The depth of airstrikes would be limited by the location of the demarcation line, the permitted aircraft takeoff times, the time of flight to and from targets, and by the relative brevity of the period between the first and second ground forces missile and artillery strikes in which the airstrikes would occur.

Aircraft would be used against mobile targets because the Soviets believe pilots require less precise target-locating data than SSMs. Aircraft usually are directed to deliver the majority of the Pact strikes against NATO's first- and second-echelon divisions and the command posts of the first-echelon army corps. This task consumes most of the air-delivered weapons in the shallow strike zone, because the Soviets typically target about a dozen nuclear bombs against each NATO division. Aircraft also frequently are used to restrike Lance and Pershing SSM units.

Targets beyond the strike demarcation line would be assigned mostly to the SRF and to the medium bombers of the Smolensk strategic air army and the Baltic Fleet. Those targets for which sufficiently precise target-locating data were available would be targeted primarily by SRF missile units. Mobile targets, targets of lower priority, and the most important SRF targets that were to be restri-

would be the primary targets of the Smolensk strategic air army. Soviet planning factors imply that medium bombers can cover all targets in the mid-European, French, and British strategic zones using the higher altitude flight profiles that would be suitable in the permissive air defense environment that might follow the air defense suppression strikes by SSMs (see figure 11).

Likely targets of strategic aviation medium bombers include operational and strategic reserve forces and materiel, transshipment points and key communications nodes, military-political command and administrative centers, military-industrial facilities, and—if the air force of the Baltic Sea Fleet required augmentation—aircraft carrier battle groups in the North Sea. Medium bomber targets are not likely to be time-urgent, because the flight time from bases in the western USSR to their targets typically would exceed two hours. Soviet writings suggest that medium bombers are not to take off before the first SRF launch, presumably to avoid compromising the element of surprise. Their later arrivals at targets in the strike sequence would also allow the medium bombers to avoid passing through front strikes being delivered in the shallow strike zone.

Participants

The Soviets expect that the initial massed nuclear strike in the Western TMO would entail a maximum effort by ballistic missile units of the SRF, aircraft from the first-echelon front and fleet air forces and at least two strategic air armies, and ground forces missiles and nuclear artillery.

Ballistic Missiles and Nuclear Artillery. In executing an initial massed nuclear strike, the Soviets would rely on the SRF and the ground forces missile and artillery forces for strikes against time-sensitive, precisely located targets throughout the theater. We estimate that the SRF might deliver about 600 to 700 MR/IRBM warheads and an undetermined (but probably rather small) number of ICBM strikes in the Western TMO (table 5). The missile forces of the Pact's three first-echelon

Table 5
Estimated Numbers of Strikes Planned for the
Western TMO in the Initial Massed Nuclear Strike
(One Possible Variant)^a

Zone of Strikes	Force Component	Surface-to-Surface Missile Strikes	Air Strikes	Total Strikes
FRG mostly within 100 to 200 km of the FEBA (including Denmark and the Baltic Sea)	Baltic Sea Fleet	10 ^b	35 ^b	45
	Polish-GDR Front	75 ^c	25 ^c	100
	GSFG-GDR Front	300 ^c	170 ^c	470
	Czechoslovak-CGF Front	125 ^c	50 ^c	175
	Legnica SAA	NA	200 ^c	200
	Subtotal (approximate)	500	500	1,000
Targets mostly in excess of 100 to 200 km beyond the FEBA (including the North Sea, Britain, France, and the Iberian Peninsula)	SRF MR/IRBMs	600 to 700 ^d	NA	600 to 700
	Smolensk SAA	NA	290 ^d	290
	Baltic Sea Fleet	15 ^b	35 ^b	50
	Subtotal (approximate)	600 to 700	300	900 to 1,000
Total (approximate)		1,100 to 1,200	800	1,900 to 2,000

^a We have assumed that the initial massed nuclear strike occurs at the outset of a war (attrition from conventional operations is not a factor) and that the General Staff estimates that a Warsaw Pact nuclear preemption is possible (front air forces participation has not been reduced to free fighter-bombers to hunt SSMs with conventional weapons prior to the strike).

^b The total number of Baltic Sea Fleet strikes is derived [redacted] but their distribution is speculative.

^c Figures for the numbers of strikes in the shallow zone are estimated [redacted] from the past eight years' [redacted] in the order of battle (including the forward deployment of Scaleboard SRBMs). These figures do not include the recent addition [redacted] of nuclear artillery, which we estimate probably would add about 100 to 150

more strikes to the total for the first-echelon fronts. The assumption has also been made that the Vinnitsa SAA and the Belorussian and Carpathian fronts do not participate in the initial massed nuclear strike. Their inclusion could add roughly 100 to 150 SSM strikes plus about 340 air-delivered strikes (all in the shallow zone).

^d The estimated figures for SRF MR/IRBM strikes in the deeper zone are speculative, due to a scarcity of [redacted] evidence, and strikes by SSBNs and ICBMs are not depicted, as we have not estimated the extent of participation of these systems. There also is considerable uncertainty in the estimated number of Smolensk SAA strikes due to an absence of evidence detailing nuclear strike planning and typical nuclear bomb loadings. See appendix B for the derivation of our medium bomber strike estimate.

fronts could deliver roughly 500 strikes at the outset of hostilities (which could increase to approximately 600 to 650 strikes if there were a total of five first-echelon fronts in the TMO). The use of nuclear artillery has been an increasingly common feature [redacted] but the likely extent of its participation is not clear to us (our preliminary estimate is that they would conduct about 100 to 150 strikes). We believe the extent of planned SSBN participation in the Western TMO during the initial massed nuclear strike would be relatively modest. [redacted]

Strategic Aviation. Strategic aviation aircraft would be major contributors to the initial massed nuclear strike in the Western TMO. We estimate that between 400 and 700 of the nuclear weapons directed to

be delivered in the initial massed nuclear strike would be carried by strategic aviation bombers if the strike occurred early in the war. Analysis [redacted] indicates that the Legnica strategic air army, with its two light bomber divisions, probably would be tasked to deliver about 200 of those nuclear weapons. Our analysis also leads us to estimate that all of the nuclear weapons probably would be carried by about 75 percent of the available light bombers (with more than half of them carrying two bombs apiece), and that the remaining bombers would support the strike by conducting conventional defense

suppression attacks and by augmenting the dedicated reconnaissance aircraft. If the light bombers of the Vinnitsa strategic air army also were assigned to the Western TMO at the time of the strike, we estimate they might be tasked to deliver as many as 200 additional nuclear strikes.

On the basis of an examination of its force composition and missions, we believe that the Smolensk strategic air army would be tasked to deliver between 240 and 320 nuclear weapons in the Western TMO during the initial massed nuclear strike (see appendix B). Our best estimate is that about 135 aircraft would attempt to deliver about 290 weapons, assuming no prior attrition. This estimate assumes that, instead of delivering nuclear weapons, about 25 percent of the potential strike aircraft would be used to conduct supporting conventional attacks and to augment the dedicated reconnaissance units and that about 75 percent of the strikes of that air army would be applied in the Western TMO.

Front Aviation. We believe the three-to-five front air forces that could be available in the Western TMO at the outset of a war could be tasked to deliver between 250 and 400 nuclear weapons during the initial massed nuclear strike. The Soviets expect these numbers to decline in proportion to aircraft losses if a period of conventional combat preceded nuclear strikes. Our estimate of the numbers of nuclear weapons likely to be delivered by front air forces is based on the numbers of aircraft likely to make up the front air forces in a three-to-five-front campaign in the Western TMO and on planning norms used for nuclear role aircraft (nuclear role aircraft are listed in table 6). These norms indicate that about 50 percent of the operationally ready fighter-bombers and about 75 percent of the ready light bombers usually would be tasked to conduct nuclear strikes in an initial massed nuclear strike. These percentages represent about 20 targets for each Soviet ground attack regiment in the front air forces at the outset of war (assuming operational readiness rates of 90 to 95 percent) and somewhat lower numbers of targets for non-Soviet Warsaw Pact (NSWP) units, because of their smaller unit strengths and lower readiness rate standard of 85 percent.

The remaining aircraft of the front air forces would fly missions in support of strike operations. 15 to 20 percent of the ground attack aircraft would use conventional weapons to attack NATO SAMs that had survived earlier Warsaw Pact SSM strikes and provide for a small airborne nuclear reserve force to strike any newly detected NATO SSMs. The remaining 30 to 35 percent of the fighter-bombers apparently would support the strike by augmenting the dedicated reconnaissance aircraft.

Soviet military writings suggest that the Soviets would consider reducing the number of strikes by front air forces in their initial massed nuclear strike if they unexpectedly discovered that NATO was, in their judgment, about to attempt a surprise first nuclear strike, while the Pact lacked time to ready its own nuclear strike forces to respond massively to the NATO strike preparations. with this drastic measure the Soviets would free perhaps as much as two-thirds of the front air forces' ground attack aircraft to locate and attack NATO nuclear forces and command centers in conjunction with less numerous attacks by ground forces missile and artillery forces. Soviet writings indicate that these attacks would occur during the transitional period immediately before the nuclear strike, using conventional and, possibly, some chemical weapons. The purpose of such attacks would be to disrupt and delay NATO's strike preparations, thereby buying time for the Pact to at least salvage a nearly simultaneous nuclear exchange using a large strike force. It would also be intended to reduce the magnitude of the coming NATO nuclear strike. The possible reductions in the number of front air force nuclear strikes could be partially offset by the increased number of nuclear strikes planned for ground forces artillery units and by the availability of a recently expanded strategic aviation light bomber force.

Table 6
Aircraft With Nuclear Roles Typically Available
to the Western High Command, Mid-1983^a

Formation	Number of Regiments	Nationality	Unit Type	Aircraft Type	Number of Aircraft
In-place forces					
Legnica strategic air army (SAA)	6	Soviet	Light bomber	Fencer ^b	180
GSFG-GDR Front Air Force (FAF)	1	Soviet	Light bomber	Fencer	30
	7	Soviet	Fighter-bomber	Fitter DK, Flogger BDJ, and Fishbed K	315
Czechoslovak-CGF FAF	1 ^c	German	Fighter-bomber	Flogger H	20
	2	Czechoslovak	Fighter-bomber	Flogger H and Fitter A	85
Polish-GDR FAF	1 ^c	Czechoslovak	Fighter-bomber	Fishbed JX	40
	2	Polish	Fighter-bomber	Fitter C and Fitter A	55
Baltic Fleet Air Force (AF)	3 ^d	Soviet	Medium bomber	Backfire and Badger	60
	1	Soviet	Fighter-bomber	Fitter C	40
Total in-place forces					825
Possible reinforcement forces					
Vinnitsa SAA	6	Soviet	Light bomber	Fencer ^b	190
Belorussian FAF	3	Soviet	Fighter-bomber	Flogger DJ, Fitter A, and Fishbed	135
Carpathian FAF	4	Soviet	Fighter-bomber	Fitter CK, Flogger DJ, and Fitter A	180
Baltic FAF	4	Soviet	Fighter-bomber	Flogger DJ, Fitter A, and Fishbed	180
Total reinforcement forces					685
Total forces available					1,510

^a This table does not include more than 1,000 Soviet tactical fighter-interceptors that are capable of delivering nuclear weapons but assessed to have only an emergency-reserve nuclear role. Also not included are about 265 medium bombers in the strike regiments of the Smolensk SAA. We estimate that about three-quarters of the medium bomber strikes might be tasked to be delivered in the Western TMO against targets that are located deeper than the TMO high command's area of direct control in the initial massed nuclear strike, but for which the high command may have target nomination responsibilities.

^b The Legnica and Vinnitsa SAAs each had one regiment in the process of converting from fighter-bombers to Fencer light bombers.

^c These two units probably have nuclear roles, but this has not been confirmed.

^d We estimate that the three medium bomber regiments in the missile strike air division of the Baltic Sea Fleet AF have nuclear roles but that the Blinders and Badgers of the medium bomber reconnaissance regiment would probably perform reconnaissance and penetration support missions. We cannot rule out the possibility, however, that some of the aircraft in the reconnaissance regiment also could be used to conduct nuclear strikes.

If the initial massed nuclear strike followed a protracted period of conventional conflict with heavy losses of nuclear delivery aircraft, the Soviets could, if necessary, draw on the large pool of other front air forces aircraft capable of delivering nuclear weapons. These include most Soviet fighter-interceptors—although only about one-third of Soviet fighter pilots

are believed to be trained in nuclear delivery techniques. The ground attack aircraft that would normally perform reconnaissance and defense suppress-

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mission strike support duties in the initial massed nuclear strike could also be used.

Soviets normally do not task their front air force reconnaissance aircraft with a nuclear delivery role. Soviet writings indicate that all reconnaissance aircraft would be needed to perform final reconnaissance tasks in support of the strike.

Execution

In Soviet writings NATO usually is portrayed as initiating the escalation to nuclear war by being the first to begin final strike preparations, which implies that the Soviets strongly prefer to fight the war entirely with conventional weapons. Soviet military writers nevertheless state emphatically that it is imperative to disrupt NATO's preparations and to preempt NATO's first nuclear strike with their own. If they should fail to preempt, the Soviets believe they might still avoid suffering disproportionately heavy losses and losing the strategic initiative if they could launch their strike before NATO's weapons detonate.

the Soviets probably believe their intelligence system could detect NATO preparations in time to permit the Pact to execute a preemptive or nearly simultaneous strike in response. We believe the Soviets have the technical capability to make such a preemption, but that they might not be able to execute it successfully. Since the mid-1970s, the frequent occurrence of nearly simultaneous exchanges and instances of NATO striking first, rather than successful Pact preemptions, suggests that the Soviets also have grave doubts about their ability to act on intelligence warning of NATO's final strike preparations in time to prepare their own nuclear strike forces for a full-scale preemptive strike.

Timing. The timing of the initial massed nuclear strike in the Western TMO has varied from the outset of war to after as much as a month of conventional combat. Soviet writings state that NATO would be most likely to initiate the transition to nuclear operations when confronted with a crisis such as the loss of important defense lines, the destruction of major forces, or the threat of losing key economic areas.

begin with NATO conventional offensive operations, the initial massed nuclear strike most frequently occurs about two to three days after the Warsaw Pact counteroffensive begins, as Warsaw Pact ground forces break through the defense lines of NATO's first-echelon army corps about 60 to 120 km into the FRG. The initial massed nuclear strike occurs by the time Warsaw Pact forces reach the Rhine River (typically five or six days into the Warsaw Pact offensive).

Nuclear Alert Forces. The Soviets would place most of the SRF and the ground forces SRBMs and a smaller fraction of their nuclear delivery aircraft on nuclear alert during periods of increased threat of war and during conventional operations, as a quick-response force to preempt a surprise first strike by NATO. Military writings indicate that both the size of the nuclear alert force and its degree of readiness would vary according to the Soviet assessment of the likelihood that NATO would soon use nuclear weapons.

we estimate that Pact commanders would typically place roughly 10 percent of their operationally ready ground attack aircraft in nuclear reserve status during a period of increasing threat of war and during the initial stages of a conventional conflict. This would include about 12 aircraft per fighter-bomber division, eight or nine aircraft per light bomber division, and about six aircraft per medium bomber division.³⁰ Some evidence suggests, however, that no nuclear reserve might

³⁰ Nuclear reserve planning factors for the medium bombers of what is now the Smolensk strategic air army declined from 60 to 70 percent in the mid-1960s to 33 percent in the early 1970s to accommodate the requirements of the initial conventional air operation. We postulate that this figure subsequently may have been lowered to a value closer to current front air force norms in response to the increased number of IRBM warheads provided by deployment of the SS-20 (and the pronounced improvement in their accuracy over the older SS-4 and SS-5) and continued dissatisfaction with the effectiveness of the planned air supremacy campaign. If this reduction has not already occurred, a substantial reduction in strategic aviation nuclear reserve requirements could be achieved during the latter half of the 1980s if the Soviets deploy the SSC-X-4 long-range GLCM as projected.

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be maintained at the outset of conventional combat if there were clear indications from intelligence that NATO had not begun to make preparations that would permit launch of a major nuclear strike on short notice. [redacted] the front air force nuclear reserve force was approximately doubled to about 20 to 30 percent of the remaining strike aircraft once the General Staff or the Western high command had determined that NATO was likely to launch its first major nuclear strike within about 24 hours. [redacted]

[redacted]

In the late 1970s, however, military writings [redacted] began to reflect high-level concern with the problems of disrupting NATO's final preparations for an unanticipated first nuclear strike by attempting to destroy its delivery vehicles in the period immediately preceding a nearly simultaneous nuclear exchange. Such action would depart from the Soviet doctrinal precept that the initial massed nuclear strike should use maximum force, because the disruptive attacks would be made by some of the front aircraft and missiles that would have otherwise prepared to deliver the nuclear strike. [redacted]

Strike Sequence. The exact sequence and timing of events in the execution of the initial massed nuclear strike would, of course, depend on the situation. The following sequence is based on Soviet writings [redacted] and reflects our estimate of Soviet planning for cases in which there is time to assemble the full strike force for a successful preemption. [redacted]

By about two or three hours before the intended start time (H-hour), all forces would be ordered to begin their final preparations to execute the initial massed nuclear strike plans. If conventional combat had already occurred, final reconnaissance of the nuclear strike targets would be performed by most of the reconnaissance aircraft and as much as one-third of the ground attack aircraft, beginning one and a half

to two hours before H-hour and ending about 30 minutes before H-hour. Final reconnaissance would consist mainly of radio-relayed visual checks to confirm or pinpoint the locations of previously identified targets. All reconnaissance aircraft and any conventionally armed fighter-bombers still hunting for NATO SSMs would attempt to clear the strike area not later than about 10 minutes before H-hour. The SRF MR/IRBMs would launch at H-hour, followed immediately by the SRBMs and nuclear artillery of the fronts (whose strikes would be completed by 10 minutes after H-hour). [redacted]

The timing of the first takeoffs of the air forces during the execution of the initial massed nuclear strike could vary. During the early 1970s the Soviets prohibited takeoffs before H-hour, apparently to avoid compromising the element of surprise in the first SSM strikes. This prohibition may still apply in cases where they judge tactical surprise to be critical. [redacted]

[redacted] a decline in their expectations of their ability to successfully preempt NATO and, hence, a reduced requirement for tactical surprise. [redacted]

Military writings indicate that the Soviets intend to commit their front air forces (and probably forward-based strategic aviation aircraft) to battle in the initial massed nuclear strike in three successive echelons if there is time to assemble the full strike force (figure 13). The first group, called the support echelon, would operate in two separate time blocks and would include most of the reconnaissance aircraft, about a third of the fighters, and about one-third of the fighter-bombers (most performing in a reconnaissance role). The reconnaissance sorties would be flown more than half an hour before the first SRBM launches. The remainder of the support echelon would immediately precede the strike aircraft into the target area after the initial missile strike to destroy surviving SAMs and air defense control centers with conventional weapons, conduct fighter sweeps over NATO territory, and establish fighter blockades over surviving interceptor airfields. [redacted]

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Figure 13
Execution of a Typical Initial Massed Nuclear
Strike by the Western High Command-
Subordinate Air Forces*

Echelon:	Support	Strike	Third
Roles	Final reconnaissance Fighter sweeps Defense suppression	<i>Nuclear strikes</i> Fighter cover Defense suppression Final reconnaissance	<i>Nuclear reserve</i> Fighter cover
Time over target (H= start)	H-90 to H-30 and H+15 to H+45 minutes	H+20 to H+45 minutes	H+25 to H+90 minutes
Force distribution	Most reconnaissance aircraft 33 percent of fighters About 33 percent of fighter-bombers	Nearly all light bombers 60 to 65 percent of fighter-bombers 33 percent of fighters	Less than 5 percent of light bombers and fighter-bombers 33 percent of fighters
Typical force composition ^b	175 Reconnaissance aircraft 235 Fighters 220 Fighter-bombers	180 Light bombers 420 Fighter-bombers 235 Fighters 50 Reconnaissance aircraft	335 Fighters 5 Light bombers 20 Fighter-bombers

Note: Italics indicate primary roles in the strike.

* Targets within the strike demarcation line except those covered by the Baltic Sea Fleet.

^b We assume sufficient time to ready the full strike force, a three-front force disposition, subordination of the Legnica SAA to the Western high command, nonparticipation of national air defense fighters, no prior attrition, and operational readiness rates of the air forces as in table 3.

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The strike echelon, composed of about a third of the fighters, nearly all of the light bombers, approximately two-thirds of the fighter-bombers, and the remaining reconnaissance aircraft would follow minutes later. They would deliver their nuclear strikes between about 20 and 45 minutes after H-hour, provide accompanying top cover, and perform final reconnaissance for the upcoming second strike of the ground forces missiles and nuclear artillery. Each group of

strike aircraft typically also would be accompanied by one or more conventionally armed defense suppression aircraft. The third echelon would contain the small airborne nuclear reserve force (to strike newly detected and surviving targets) and the remaining third of the fighters (charged with guarding the safe recovery of the first two echelons at the conclusion of the mission)

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All aircraft would again clear the shallow part of the strike zone to avoid ground forces missile and nuclear artillery restrikes that typically are planned for 60 to 70 minutes after H-hour. Strikes by Smolensk strategic air army medium bombers would probably follow at two hours or more after H-hour. Medium bomber poststrike reconnaissance of earlier SRF strikes and final reconnaissance for SRF follow-on strikes would probably coincide with the Smolensk strategic air army strikes—with results being passed by radio (figure 13). The SRF follow-on strikes could then begin about four hours after H-hour.

Problems of the Air Forces

The Warsaw Pact air forces would probably have only limited success in finding NATO's concealed mobile SSMs, as they would have to rely primarily on visual sightings. This would hamper their ability to effectively perform final reconnaissance for the front missile forces, and it would frustrate their attempts to attack NATO's nuclear forces with conventional weapons in hopes of disrupting preparations for an unanticipated NATO first strike.

Soviet concepts for employing air forces during the initial massed nuclear strike in the Western TMO also appear to confront the Warsaw Pact air forces with several aircraft attrition and procedural problems. If the Soviets choose to conduct a complete dispersal and standdown to prepare for nuclear strikes and if the dispersal airfields are targeted, they increase their vulnerability to a preemptive NATO SSM strike. Alternatively, if they elect to reduce the number of air-delivered strikes so that they can search NATO rear areas for SSMs immediately before the nuclear strike, they would expose large numbers of nuclear-capable aircraft to largely intact NATO air defenses.

Warsaw Pact aircraft also would be particularly vulnerable to NATO SSM strikes during a nearly simultaneous nuclear exchange because they typically are not permitted to begin takeoffs soon enough to all get off the ground before the first Pact SSM launches. Front air force attrition as high as 70 percent indicates the Soviets' awareness of this problem. Acceptance of such attrition probably reflects their belief that it is the unavoidable price for not jeopardizing their chances of

preempting, and they may rationalize potential air losses of this magnitude with the doctrinal consideration that air forces would play a decidedly diminished role once the transition to unlimited nuclear war had been made.

In a war that began with a massive nuclear exchange the effectiveness of Pact SSM strikes against deploying NATO forces would be impaired because the Soviets probably would have to conduct the strike largely without precise target location data from final reconnaissance. Even in circumstances where final reconnaissance missions could be flown before the strikes, Soviet radio communications needed to pass the reconnaissance results could be jammed.

Once under way, additional problems would remain for the Soviets in completing the initial massed nuclear strike. The large number of units involved and the precise timing required to fit aircraft strikes between the SSM strikes could strain Pact airspace management capabilities. The damage to aircraft and flashblinding of pilots flying through areas just hit by missiles would probably take their toll. The timing of events could also deprive the Smolensk strategic air army strike aircraft of front air force support when penetrating surviving NATO air defenses, thereby increasing their losses. Finally, after a nearly simultaneous exchange, the destruction of Pact airfields and command and control centers would be a major problem in recovering and reconstituting the strike force.

Other Air Force Roles in Direct Support of Strategic Operations

Soviet military writings state that the air forces would perform other roles—in addition to the initial massed nuclear strike and attainment of air supremacy—in direct support of the high command's strategic objectives in the TMO. These include subsequent air operations against various classes of targets in NATO rear areas, participating in major airborne landing

operations, supporting amphibious landing operations, and conducting strategic air reconnaissance. These activities would be largely planned and directed by the high command in the TMO, probably because their objectives, which are important to the success of the TMO strategic operation, cannot be accomplished by a single front or fleet. In almost all cases these activities also would require the use of Soviet national strategic reserve forces." The extensive support that would be provided by the Warsaw Pact air forces to the operational-level objectives of the fronts, fleet, and armies in the TMO would, in the Soviet view, support the strategic operation in the theater only indirectly and would not be planned by the high command (see appendix A for a brief discussion of these missions).

Subsequent Air Operations

After either successful initial air defense and air operations to attain strategic air supremacy or an initial massed nuclear strike, the Soviets intend to call on strategic aviation to conduct a variety of other offensive air operations in support of strategic objectives in the TMO. An air operation is any strategic aviation operation in which the main forces of at least one air army conduct a series of massed conventional or nuclear strikes to achieve a specific objective of the strategic operation in the theater, either alone or in conjunction with other forces. Such operations would have the greatest impact in a protracted conventional war, because air forces constitute the only means of quickly bringing substantial firepower to bear on important deep targets. Soviet military writings assert that air operations could be conducted to destroy key defense industrial facilities, to destroy reserve forces and materiel, to interdict supply shipments, to disrupt civil and military command and control, and to perform special tasks in support of individual fronts, fleets, or airborne troops.

Participants. Soviet military writings suggest that air operations always have been considered the main form of combat for strategic aviation. The extent and composition of strategic aviation's participation in an

" Soviet national strategic reserve forces include Military Transport Aviation, the airborne divisions, the SRF armies, and the SSBN flotillas, as well as those strategic air armies and ground forces and front aviation formations that have not been operationally incorporated into the strategic force grouping in one of the TMOs.

air operation would be determined by the depth, nature, importance, and priority of the targets. The Legnica and Smolensk strategic air armies would make up the primary attack forces for air operations in the Western TMO. Reinforcements could come from the Vinnitsa and Moscow air armies, and, in certain situations, even the Irkutsk air army. Fronts would provide air defense suppression and fighter cover support for strategic aviation bombers transiting their sectors of responsibility.

Execution. We believe that subsequent air operations would be conducted similarly to the initial conventional air operation, but on a smaller scale. The targets of subsequent air operations would in most cases be located in smaller geographic areas, and probably only one or two penetration corridors would be required through NATO's forward air defenses—considerably reducing the amount of support needed from the front air forces.

We have not observed the detailed simulation of a subsequent air operation [redacted] but we noted some of the planning for one such operation [redacted]. The second air operation [redacted] was notionally planned by the Western high command to be executed upon completion of the initial air operation and was to consist of at least three massed air raids by the Legnica and Smolensk strategic air armies. The apparent objective of this operation was to reduce the size of NATO's strategic second-echelon forces and to interdict key transportation choke points to impair NATO's ability to reinforce or withdraw the forces of Northern Army Group and Central Army Group. Most of the targets were elements of several French army corps that were notionally still located inside France [redacted]. Other targets included bridges and possibly dams in the FRG, railroad stations, rear airfields, and naval bases. We did not observe the full details of the Soviet scheme of execution.

If the Pact saw a continuing need to minimize losses by flying relatively short-range low-altitude penetration flight profiles, and, if Pact ground attack regiments were still located at their main operating bases, Soviet operational planning factors suggest that the depth of major air operations would probably not

extend beyond the Benelux countries and northeastern France (see figure 10). There is some evidence, however, that the Soviets have contingency plans to use Legnica air army Fencers in air operations against Britain. According to Soviet planning factors, the Fencers would first have to rebase to captured NATO airfields in the western FRG to conduct attacks against Britain or deep into France. Such rebasing requirements indicate that the deeper air operations would not include Fencer light bombers until the second stage of the first strategic operation in the TMO. The medium bombers of the Smolensk air army would be able to fly low-altitude flight profiles against targets in those areas if they rebased to vacated Pact airbases in the GDR, Poland, and Czechoslovakia. []

Potential Problems. The problems associated with subsequent air operations would probably be similar to the problems encountered in the Allied bomber offensive in World War II. On the average, bomber attrition would have to be limited to close to the historical 1-percent level on each air raid if sustained operations were to be conducted. The level of attrition would depend to a large degree on the extent to which NATO air defenses were weakened by the initial struggle for air supremacy or by the initial massed nuclear strike. The Soviets would also be confronted by the classic problem of finding and destroying enough high-value targets to justify continued deep attack missions on the basis of a trade-off between bomber attrition and the extent of the damage inflicted. []

Major Airborne Landing Operations

The major airborne operations [] are classified by the Soviets as "operational airborne operations" because they are intended to directly support the operations of a single front.¹² Soviet military writings assert that major

¹² Soviet doctrine also acknowledges the possibility of strategic airborne operations that would directly support the objectives of the Supreme High Command or a TMO high command. These ill-defined and seldom mentioned operations could involve multiple airborne divisions and would pursue such strategic objectives as the capture of a major national capital, important economic areas, or key military facilities in the deep rear areas. They have been mentioned only in the context of exploiting major nuclear strikes. We assume that, if they were conducted, strategic airborne operations probably would use employment concepts similar to those in operational airborne operations, but on a grander scale. []

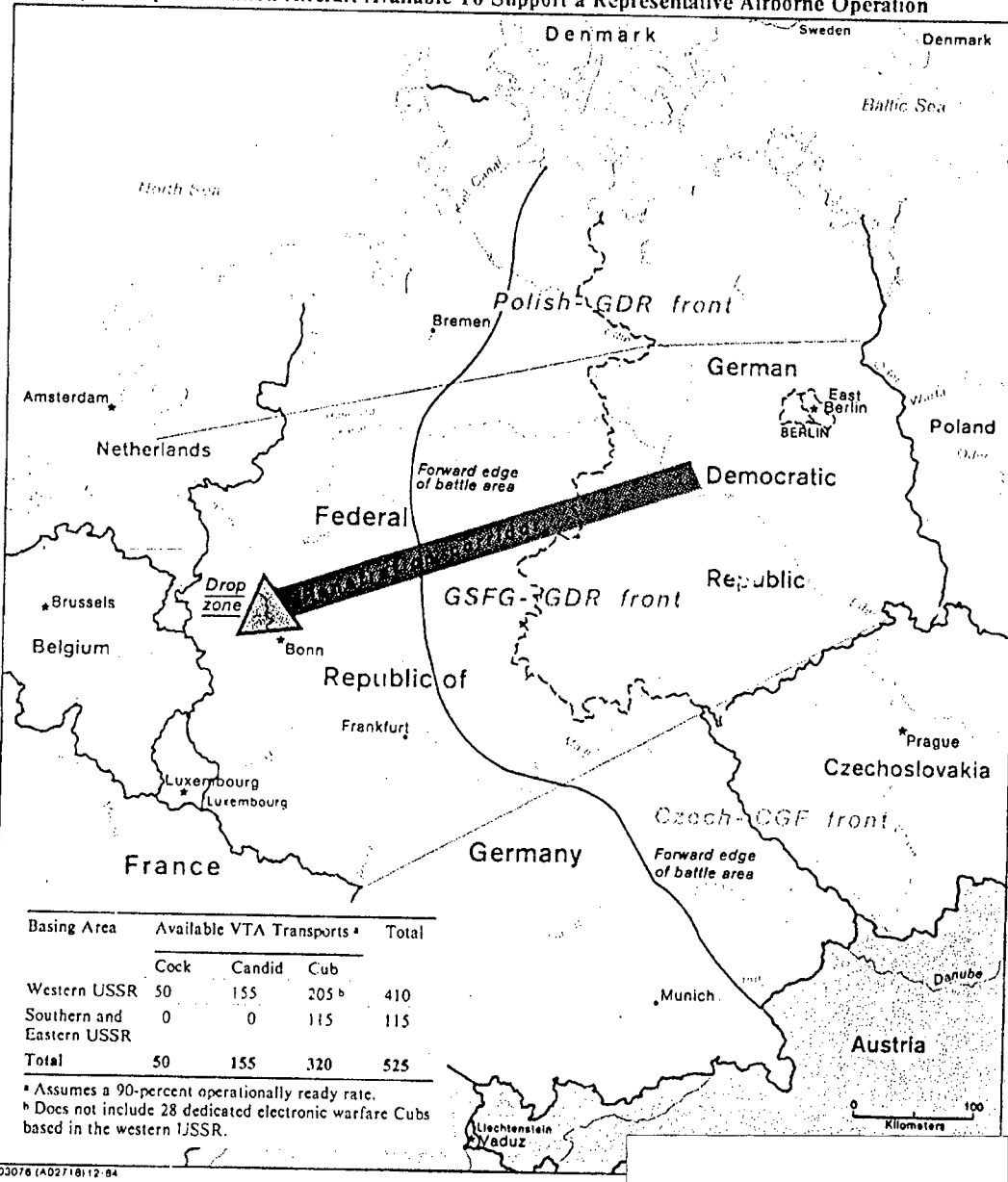
airborne operations are bold undertakings that would be conducted only in decisive situations because they involve great risk and require extensive support by transport and combat aircraft. Major airborne operations would be conducted to achieve such objectives as blocking the withdrawal of enemy forces to make possible their encirclement and destruction, establishing bridgeheads in support of major river crossings, blocking or disrupting the approach of a large enemy reserve force to sustain the momentum of a breakthrough, seizing maritime straits or ports, and destroying key rear area targets such as major nuclear forces and important command posts. []

Participants. Operational airborne operations could involve the insertion of less than a regiment to as much as a full division of airborne troops. They would be dropped by the transport aircraft of Military Transport Aviation (VTA), which, like the airborne troops, is a reserve of the Supreme High Command. We estimate that probably no more than two or three of the seven Soviet airborne divisions would be made available for operations in the Western TMO in a general war, as the others would probably be assigned missions in other theaters or be held in reserve. []

Soviet planning probably emphasizes airborne operations by airborne force groupings of regimental size or smaller, rather than the more complex division-size landings. Division-size airborne operations typically would be conducted at greater depth and over a longer period of time, thereby risking substantially higher Pact aircraft losses than would the smaller operations. Moreover, according to Soviet military writings, about 300 to 500 VTA transports would be required to drop an airborne division in a single massed sortie, which would require the participation of practically all such aircraft based in the western USSR (see figure 14). By contrast, only about 130 transport sorties would be required to conduct a regimental-size drop. []

Soviet writings [] suggest that the extent of support by other air forces for a division-size airborne drop could total between 250 and 350 front

Figure 14
 Military Transport Aviation Aircraft Available To Support a Representative Airborne Operation



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air force fighter sorties for escort and fighter sweeps and between about 150 and 200 front air force fighter-bomber and 50 to 100 strategic air army bomber sorties to neutralize air defenses and interdict NATO reserves advancing toward the drop zones. Support of this magnitude could consume one-third to one-half of the resources available to a large front air force, or almost all of the resources at the disposal of a typical front air force on the day of the drop. The front air force would also have to provide top cover and air support to the airborne troops on subsequent days, as it would for the other forces of the front.

Execution. Major airborne operations probably would be directed by the Western high command, but, once on the ground, the landing forces would come under the command of the front being supported. The airborne troops would be inserted as deep as 300 km (but usually only 100 to 200 km) behind NATO lines, with the hope of achieving a linkup with front ground forces in about three to four days. The drop would typically be planned to last about one to two hours (during which local air superiority would have to be maintained by front aviation). The Soviets plan for an airborne division to be inserted with enough supplies to last for two or three days, but estimate it would subsequently require resupply with between 200 and 300 tons of materiel each day (a task which could be accomplished by a single VTA regiment).

The Soviets consider defense suppression to be critical to the successful conduct of an airborne operation. Military writings state that VTA losses must be limited to 3 to 4 percent, while they express the fear that 10- to 15-percent losses may be more realistic and that losses could be as high as 50 percent. Support for an airborne operation would include the establishment of a penetration corridor through NATO air defenses using defense suppression attacks and extensive electronic countermeasures by front air forces and ground forces missile and artillery forces (see figure 14). VTA aircraft would overfly NATO territory at low altitudes (typically at 300 to 400 meters) and would be escorted by front air force fighters the entire way to the drop zones. The Soviets consider temporary air superiority in the drop zones to be a prerequisite for a successful airborne operation.

Some writers assert that during conventional operations it is preferable to delay the conduct of airborne operations until after the initial conventional air operation has achieved strategic air supremacy—or at least until the front main forces have overrun NATO's forward air defenses.

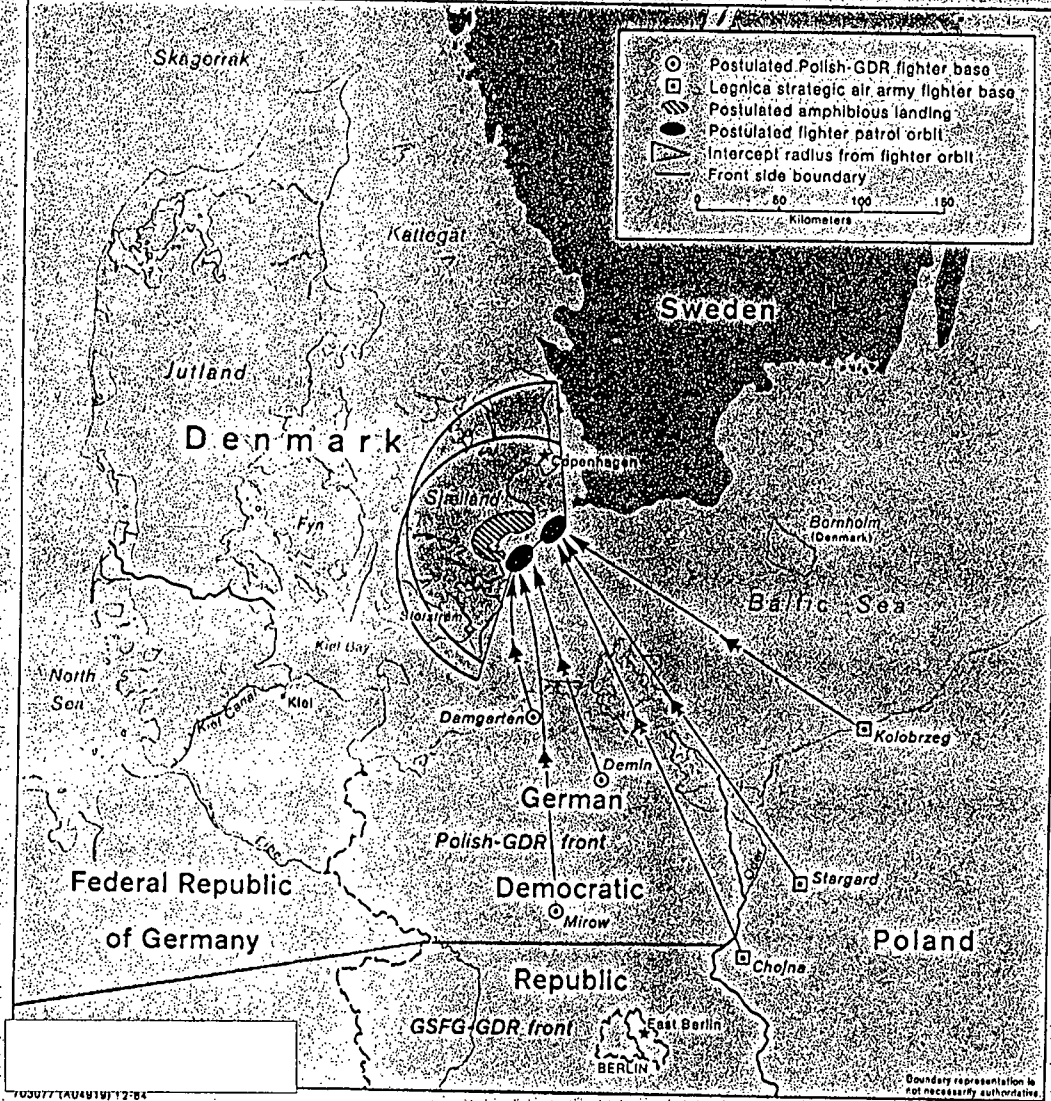
Potential Problems. The greatest threat to the success of a major airborne operation would be the high risk of devastating losses. The large, relatively unmaneuverable transport aircraft and the airborne troops they carry would be exceptionally vulnerable to any NATO air defenses. The Pact's weak capabilities to conduct fighter sweeps in NATO rear areas could make local air superiority in the drop zones difficult or impossible to maintain. Losses could be particularly disastrous, if coordination between VTA and the front air forces broke down and the expected front air forces support was not provided for the drop. Unexpectedly adverse weather in the drop zones—unexpected because of inadequate meteorological reconnaissance—could disorganize the paratroops and inflict substantial casualties by causing them to land at disadvantageous positions. Once on the ground, the comparatively lightly armed airborne troops would have to avoid engagements with major NATO reserve formations—which would require substantial air interdiction and direct air support. This would require extensive air reconnaissance and rigorous staff planning and coordination between the several participating forces both before and during the operation.

Amphibious Landing Operations

Military writings indicate that the Soviets intend to conduct amphibious landing operations in the area of the Danish Straits as part of the first strategic operation in the Western TMO. In so doing, they would seal off the Baltic Sea, securing the right flank of the TMO from attack by NATO naval forces during the first stage of the strategic operation.

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Figure 15
Fighter Cover for an Amphibious Landing Operation



This action would also gain the Warsaw Pact Combined Baltic Fleet access to the North Sea, a prerequisite for defeating naval forces there and securing the seaward flank of the Western TMO as part of the second stage of the strategic operation.

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Figure 15 (continued)
 Estimated Available Fighter Cover on Day Five of the War^a

Force	Available Resources		Tasked Sorties ^b	Aircraft on Station ^c	
	Aircraft ^d	Pilots ^e		Day	Night
Polish-GDR Front	65	125	216 to 324	Four to eight	Two
Legnica SAA	80	155	240 to 360	Four to eight	Two

^a Data have been rounded to the nearest 5.

^b The Soviets typically task a sortie rate of two regimental sorties on day five [redacted] but we believe they might specify the maximum planning surge rate of three regimental sorties to be flown in support of the amphibious operation on day one of the landing (the number spread in the tabulation reflects the difference between daily sortie rates of two and three). We believe that a regimental sortie is a standard firepower and logistic calculating factor that equates to 40 aircraft sorties for a Soviet fighter regiment. We estimate a Polish regimental sortie to be about 36 aircraft sorties. Soviet planning norms specify that pilots can fly an average of two sorties a day, but no more than three flights in any one 24-hour period. Aircraft, however, are said to be capable of making four to six flights in 24 hours under surge-operating conditions. A sortie rate of either two or three regimental sorties can thus be supported with the postulated resources available (each aircraft would fly three to five combat sorties, and each pilot would perform an average of about 1.5 or 2.5 flights a day).

^c The estimated number of aircraft that could be maintained on station in the fighter cover orbits is based on the assumptions that the aircraft always operate in two-ship formations, that each flight of fighters would spend about 20 minutes on station, and that the fighter cover would be maintained around the clock. We also assume that at least two-thirds of the fighter cover sorties would be flown during daylight when NATO would be expected to mount the heaviest opposition. The number spread reflects the difference between a daily sortie rate of two or three and provides for an intensified level of effort during part of daylight. The intercept radii that are 75 to 90 km beyond the fighter orbits depicted on the map were estimated using Soviet operational planning data. They reflect the average coverage for a fighter carrying one external fuel tank, four air-to-air missiles, and fuel allowance for five minutes of combat at "military power." These radii would be greater if they were based on US technical estimates of maximum aircraft

performance capabilities, without compensating for representative operational planning considerations. Ground control of interceptors is assumed not to be a limiting factor on these intercept radii, because shipboard controllers could be used. The Polish aircraft are MIG-21 Fishbeds, and the Legnica SAA aircraft are assumed to be MIG-23 Floggers. (Two of the Legnica SAA regiments, however, are currently operating the less capable MIG-21 Fishbed but are scheduled to reequip with the SU-27 Flanker during the mid-1980s—which we believe probably will have a radius of action similar to the Flogger's.)

^d We assume that the Polish tactical fighter division and the Legnica SAA fighter division are committed entirely to the amphibious operation, leaving only two GDR NAD fighter wings to provide all fighter support for coastal front operations and northern GDR airspace security. We also assume that both divisions have suffered 25-percent attrition during the first four days of combat and have operational readiness rates of 80 percent (these figures are representative of data [redacted]).

^e We assume that the pilot-to-combat aircraft ratio was 1.4:1 at the outset of the war and that none of the pilots shot down during the first four days of combat had returned for duty with their units.

[redacted]

[redacted]

contributed by Poland, the USSR, and the GDR.^M [redacted]
 [redacted] amphibious landings have been directly supported by airborne landings. [redacted]

Participants. Amphibious landing operations in the Baltic area would be conducted as joint operations between the Combined Baltic Sea Fleet and the coastal (normally Polish-GDR) front. The amphibious assault landing forces in these operations would be

[redacted]

The front air force of the Polish-GDR front and strategic aviation would normally augment the air force of the Combined Baltic Sea Fleet in supporting the amphibious operation. The coastal front air force would be responsible for providing most or all of the air cover for the operation, which would probably require the majority of its available fighter sorties. It would also augment the fleet fighter-bombers in providing air support once the amphibious assault forces had landed. []

The strategic aviation bombers of the Legnica and Smolensk strategic air armies would probably participate in softening defensive positions before the landings and attack NATO reserve forces to prevent their use in counterattacks. The planned extent of strategic aviation participation is, however, unclear. []

Execution. Soviet military writings state that amphibious landings should be conducted shortly after the execution of the initial massed nuclear strike in a nuclear war [] without nuclear strikes during the early stages of the war, the amphibious landings have been delayed until after about four to six days of conventional operations, with the exact timing dependent on the prospects for a rapid linkup with the advancing ground forces of the coastal front. Soviet writings also state that temporary air superiority in the landing area is necessary for the conduct of a successful amphibious landing. The writings note that the initial conventional air operation should, if possible, precede the landing to ensure air supremacy. Figure 15 depicts likely amphibious landing areas in the Danish Straits and the approximate extent of possible Polish-GDR front and Legnica air army fighter cover early in the war. []

Potential Problems. The fundamental problem Pact planners would have to confront in an amphibious operation would be the extensive minefields which would be sown by the Danish and West German Navies at the outset of hostilities (as well as possible subsequent mining by the Swedish Navy). NATO mines alone could thwart major amphibious landings in the Danish Straits and Jutland area. []

Maintaining air superiority over an amphibious landing area could be difficult for the Polish-GDR coastal front air force because its fighter force is small and

because it is primarily equipped with short-endurance Fishbed fighters that have modest radar and missile capabilities and are heavily dependent on jammable GCI control. A lack of undisputed air superiority could leave the Pact amphibious assault forces particularly vulnerable (because of their concentration and poor mobility) to NATO air attack. []

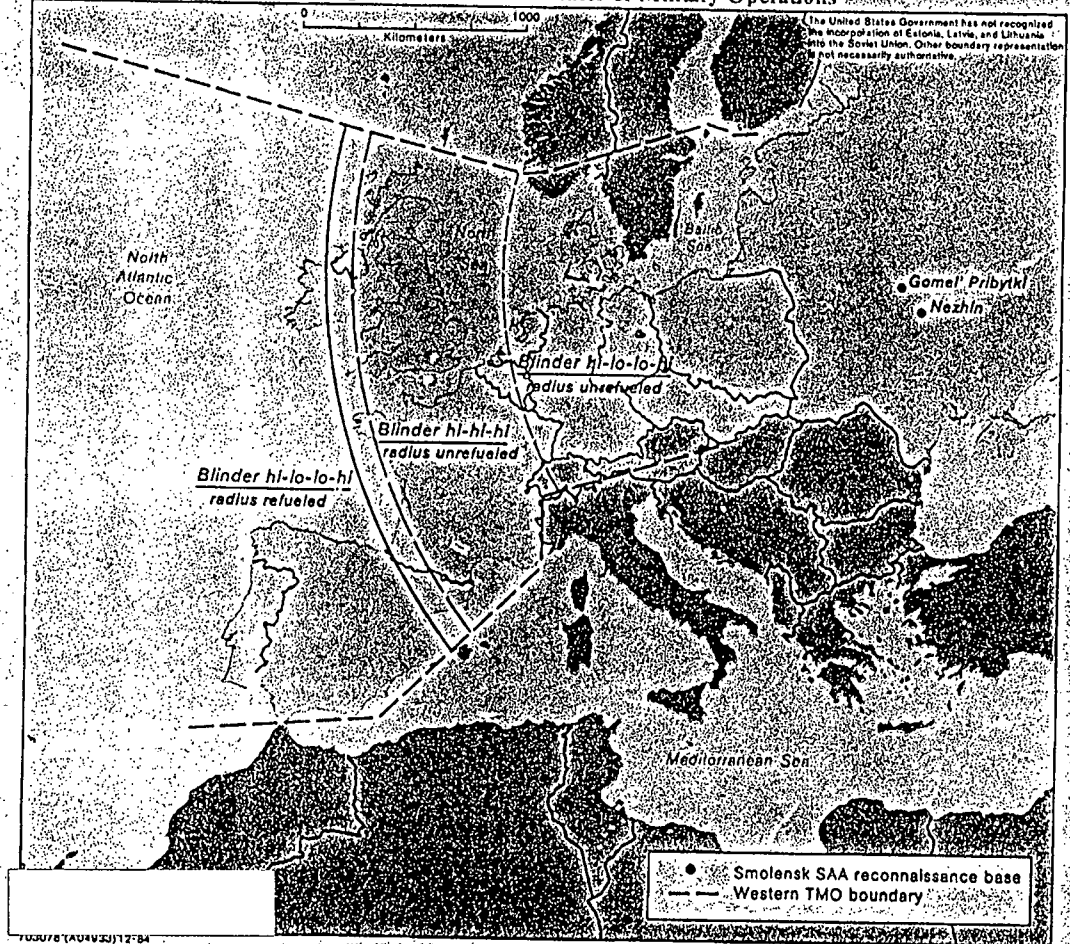
Sufficiency of air support could also be critical, given the decreased fire support capability of the Combined Baltic Fleet because of the retirement of many older gun-equipped ships. The Pact could also experience difficulty coordinating the allocated air support sorties because of the many different nationalities and joint forces formations that would be involved. During amphibious landing [] the Pact has had problems with establishing effective interservice cooperation and with understanding the responsibilities of each of the several commanders involved in each phase of these complex operations. []

Strategic Air Reconnaissance

Soviet doctrine dictates that strategic reconnaissance support the plans and operations of the General Staff and the TMO high commands. Strategic reconnaissance aircraft in the Western TMO probably would collect warning and targeting information which could not be obtained by agent sources, signals intelligence collection, or satellite imagery—and would confirm some of the information derived from those sources. [] strategic air reconnaissance would be used in the Western TMO to update the status of targets planned for destruction by the SRF in the initial massed nuclear strike, to perform damage assessments after these and subsequent nuclear strikes, and to monitor the location and movement of strategic reserve forces and materiel. It would also be used to support strategic aviation nuclear strikes and to perform preattack and postattack target assessments for conventional air operations. We assume that the majority of strategic



Figure 16
Blinder Reconnaissance Coverage of the Western Theater of Military Operations



air reconnaissance targets would be located at a depth greater than about 300 to 400 km from the FEBA because front and Legnica air army reconnaissance aircraft would normally cover the shallower targets. Immediately before the initial massed nuclear strike, however, all targets deeper than 100 to 200 km from the FEBA would be of strategic interest and could be objects of final reconnaissance operations by strategic reconnaissance aircraft (assuming prior conventional combat).

Participants. The strategic air reconnaissance resources available to support the Western high command probably would mainly consist of a large portion of the planned sorties of the two Blinder medium bomber reconnaissance regiments in the Smolensk strategic air army and a few Blinder reconnaissance aircraft from the Baltic Sea Fleet. The Blinder reconnaissance aircraft have the capability to cover any target in the Western TMO when using aerial refueling (figure 16). They could be augmented, if necessary, by strategic aviation medium bomber strike

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aircraft. These bombers have crews trained to perform visual reconnaissance and can be fitted with a rudimentary photographic capability. [redacted]

The reconnaissance aircraft of the Legnica strategic air army would also be available to the Western high command, but they are operational reconnaissance aircraft, most of whose targets would probably fall within the area also covered by the front air forces. The results of front air forces and strategic aviation operational reconnaissance missions would be made available to strategic planners, however, through summary reports. [redacted]

Execution. It is not clear to what extent the Western high command would be permitted to task strategic reconnaissance aircraft, because they would normally be held as part of the Soviet national strategic reserve forces. On the basis of our understanding of Soviet front reconnaissance tasking, we estimate that blocks of sorties from the Smolensk strategic air army reconnaissance regiments probably would be provided to the Western high command by the General Staff.

[redacted]

Potential Problems. During the final reconnaissance for the initial massed nuclear strike, insufficient tanker support could force many Smolensk strategic air army Blinders to conduct their missions against the deepest targets in the Western TMO at high altitudes, which might result in high rates of attrition. Soviet aircrews have also encountered difficulties locating mobile targets [redacted] which could limit their effectiveness in monitoring the movements of NATO reserves and mobile SSMs. [redacted]

The capability to conduct strategic reconnaissance with Blinder aircraft is limited by their inability to relay photographic and electronic intelligence data to ground processing centers. Instead, the aircraft must return to their bases before the information can be processed, delaying exploitation of the results by hours [redacted] in time-urgent cases the aircraft would have to resort to transmitting less accurate visual air reconnaissance results by jammable radio communications. Because imagery would be required to perform accurate initial targeting for SSMs, visual reconnaissance probably

would be limited for the most part to simply confirming the locations of known targets. [redacted]

Observations

We have a good understanding of Soviet doctrine and many of the force employment concepts that would form the basis for how the Warsaw Pact air forces would be used at the beginning of a war in Central Europe. We cannot, of course, say exactly how Pact air forces would be used throughout the course of a war because the Soviets undoubtedly would modify their priorities and force employment concepts to some extent during a protracted war. If Soviet thinking about air forces support of theater-level objectives continues to evolve according to current trends, however, we can predict many of the changes that the Soviets are likely to consider making to their air forces up to the mid-1990s. [redacted]

We believe the Soviets probably are giving high priority to new long-term initiatives aimed at improving the Warsaw Pact's prospects for winning strategic air supremacy in the Western TMO. We base this conclusion on authoritative Soviet statements that winning air supremacy would be the first priority of the Pact joint forces at the outset of war in support of their conventional strategic offensive in the Western TMO. This conclusion is also based on our judgment that the Soviet General Staff probably is not content with the less desirable alternatives to the theaterwide air operation that they recently have developed as a matter of necessity. The Soviets' intentions are not clear, but some of the initiatives that they might pursue could substantially alter the character of their air supremacy campaign:

- The Soviets may have committed themselves to an extensive modernization program to replace their fighter forces opposite NATO with the more advanced SU-27 and MIG-29, in the hope that by the mid-1990s sufficient qualitative gains could be made in the air balance to justify a return to the theaterwide air operation as their best option at the outset of war. To succeed, the Pact would have to introduce their new aircraft into the force at a substantially faster rate than the rate of modernization in NATO.

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- The deployment of large numbers of these advanced fighters also could, in conjunction with continued improvement in NATO airfield hardening and intelligence warning capabilities, lead the Soviets to rely on air-to-air combat to destroy a much larger share of NATO's aircraft in the air operation. This approach, however, would also require major improvements in Soviet fighter pilot training for conducting autonomous offensive aerial engagements.
- The expected widespread deployment of terminal guidance on Soviet short-range ballistic missiles and the continued expansion of that force could, by the early-to-middle 1990s, allow the Soviets to assign a major airfield pin-down role in the air operation to conventionally armed ballistic missiles as a prelude to the bomber attacks. This could substantially improve the Pact's prospects for achieving tactical surprise and make NATO airfields more lucrative targets.
- The Soviets eventually may develop special air defense suppression drones and efficient air-delivered airfield attack munitions, which could allow them to execute the air operation using considerably fewer aircraft in each massed air raid and improve their prospects for limiting their aircraft losses to acceptably low levels. Smaller attack forces also could ease the strains on their command and control system, and in turn might increase the likelihood that the Soviets would adopt less rigid and predictable employment concepts [redacted]
- Introduce jam-resistant communications that could be essential to the success of operations that involve retasking airborne strike aircraft, vectoring fighter sweep groups from AWACS aircraft, and retargeting SSMs on the basis of radio-relayed visual reconnaissance.
- Introduce improved reconnaissance and target-acquisition sensors for fighter-bombers and light bombers in response to the nagging shortcomings in the capability of Pact air forces to perform the high-priority task of locating and destroying NATO's mobile SSMs.
- Develop more advanced designs of such traditional penetration aids as onboard electronic countermeasures gear and antiradar missiles to help minimize aircraft losses.
- Expand their airfield network and war reserve stocks to facilitate rapid reinforcement by substantial numbers of strategic aviation light bombers and possibly some medium bombers.
- Replace some of their older, deeper based medium bombers with forward-based light bombers to achieve shorter reaction times and higher sortie rates.
- Conduct more frequent joint forces field training exercises, especially exercises that emphasize the precise execution of closely timed events and the ad hoc retasking of forces [redacted]

The roles that the Soviet General Staff intends the Pact air forces to perform in direct support of the strategic operations of the Western high command emphasize concentration of force, are particularly complex, and require extensive and timely coordination with many other forces. We therefore believe the Soviets may be impelled to take further initiatives to:

- Better integrate the air forces into the joint forces commands.
- Field more high-capacity interactive automated data systems to aid commanders and their battle staffs.

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Appendix A

The Joint Forces Command Structure
and the Roles of Air Forces
in Front and Army Operations

The Joint Forces Command System

Soviet and Warsaw Pact doctrine (which are identical) stipulate that all wartime operations are to be planned and directed by a hierarchical system of joint forces commands. At the apex of this command pyramid is the Soviet Supreme High Command (the leadership body that would command all Soviet and Pact armed forces on behalf of the Soviet national command authority) and its executive agent, the Soviet General Staff. Soviet control of the key Pact command positions is intended to ensure that the multinational joint forces commands would operate uniformly in war in accordance with the military objectives and the force employment concepts specified by the Soviet General Staff. The non-Soviet Warsaw Pact (NSWP) countries would provide forces and staffs for the armies and fronts but would not be actively involved in strategic planning [redacted]

The Soviet and NSWP air forces, like the other armed services, are merely responsible for providing combat-ready forces and staff elements to serve as integral components of the wartime joint forces commands. Their doctrine states that, rather than operating independently, air forces are to be used by the joint forces commanders in a manner complementary to the actions of the other forces in accordance with a single concept of operations. In general, Pact air forces formations are tailored to meet the needs of joint forces operations conducted at three levels of command—strategic, front, and army (figure 17 depicts the place of Soviet air forces formations in the hierarchical joint forces command structure). Strategic operations are discussed in the first section of this paper [redacted]

Front Operations

Warsaw Pact front operations would be directed by the joint forces front commanders according to objectives stipulated by the commander in chief (CinC) of [redacted]

the strategic force grouping in the TMO to which they are assigned. These directives would typically specify the defeat of the main forces of opposing NATO army groups and an advance to a particular line (typically 250 to 600 kilometers deep in the first front operations) in 10 to 15 days. Subsequent front offensive operations into France could have a depth of 700 to 800 km. The front commanders would have at their disposal several subordinate ground armies, front missile and artillery forces, front air defense forces, a front air force, and various combat support components, as well as specific temporary contributions from strategic forces from the high command to which they are assigned. [redacted]

A front air force is an operational-level air force formation, equipped predominantly with fighter-type aircraft, which is responsible for planning and directing air forces support of the front operation. The primary air forces roles in direct support of front objectives are:

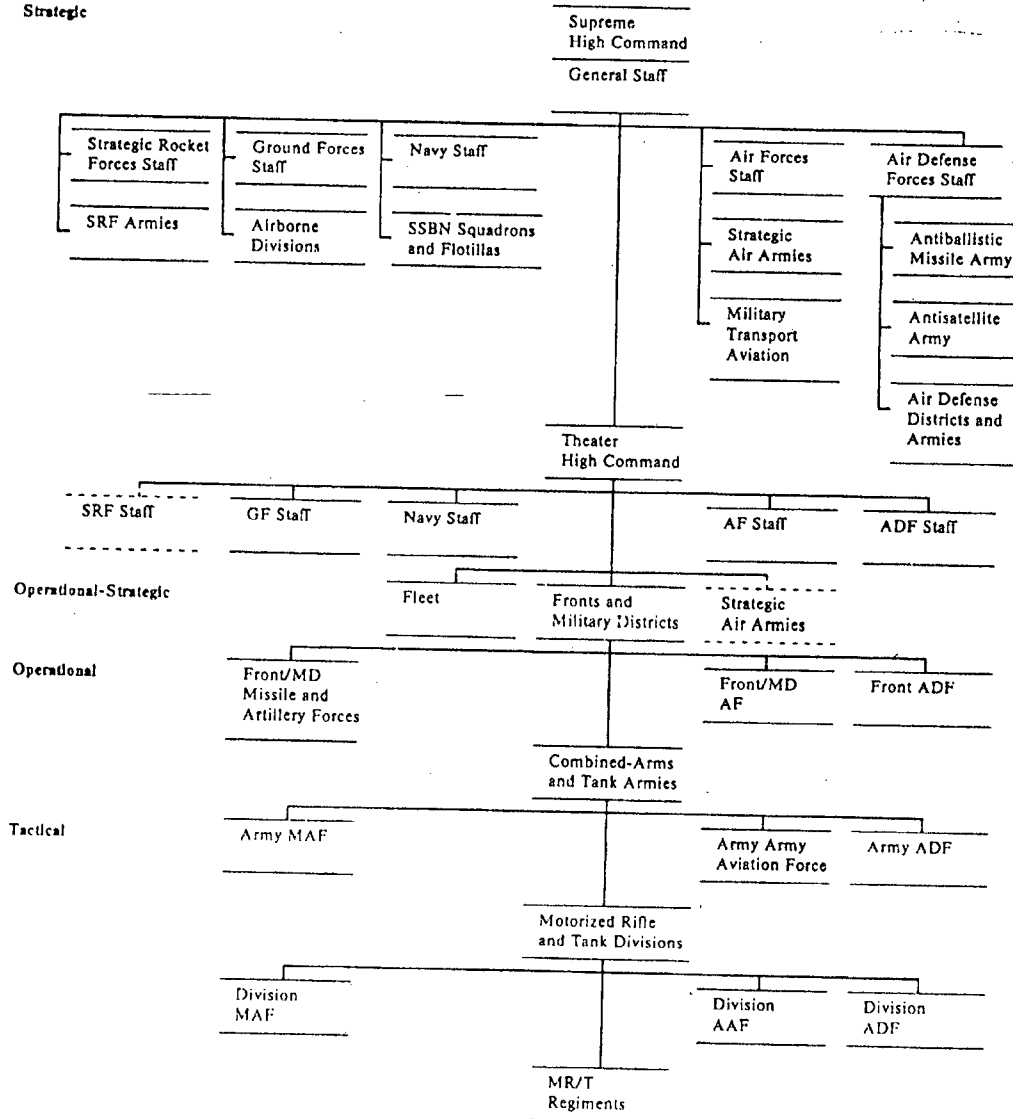
- Providing air cover of the front's forces and its rear area installations by contributing and directing front air force fighter-interceptors in accordance with the front air defense plan.
- Conducting offensive counterair missions to achieve and maintain air supremacy in the sector of front operations by performing front air force fighter sweeps and fighter-bomber attacks against NATO airfields.
- Locating and destroying NATO SSMs and nuclear weapons in the front sector of operations using front air force fighter-bombers as well as some allocated strategic aviation bomber sorties.
- Preventing NATO reinforcement by the reserve forces of the opposing army groups by attacking second-echelon NATO divisions, army corps, and their means of transportation with front air force fighter-bombers and some allocated strategic aviation bomber sorties.

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Figure 17
The Place of Soviet Air Forces Components in
the Joint Forces Wartime Command Structure

Level of Command

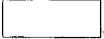
Strategic



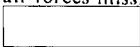
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
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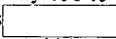

- Performing operational reconnaissance in support of the front staff, ground forces missile and artillery forces, and the front air force to a depth of at least 400 km using front air force reconnaissance aircraft.
- Tactical heliborne assault landings (normally to the depth of 25 to 70 km behind NATO lines with the aid of front-level army aviation transport helicopter regiments).

The Soviets would also dedicate a substantial number of their sorties to defense suppression and electronic warfare, but they treat these roles as an integral part of all other offensive air forces missions, rather than as separate missions. 

- Tactical air reconnaissance for the ground army staff and army missile and artillery forces (using the army aviation force's helicopters and drones as well as allocated front reconnaissance aircraft sorties to the depth of the army offensive operation—typically about 150 to 300 km behind NATO lines). 

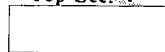


Army Operations

Army operations would be directed by the combined-arms and tank army commanders. The objectives of army offensive operations usually would be stipulated by front commanders to include the defeat of the main forces of specific opposing NATO army corps and an advance to a particular line (typically 150 to 300 km deep in the first army operations  in five to seven days. Army commanders would have at their disposal several subordinate motorized rifle and tank divisions, army missile and artillery forces, army air defense forces, an army aviation force, and various combat support components, as well as specific temporary contributions from forces assigned directly to their parent fronts. 

The army aviation force of a combined-arms or tank army is a tactical-level air force formation, equipped primarily with helicopters, that is responsible for coordinating and controlling all organic and external air force support to the army operation. The primary air forces roles in direct support of army operations are:

- Air support—which includes all ground attack missions in support of the army fire-support plan, using attack helicopters primarily against first-echelon NATO brigades, and concentrating the majority of front fighter-bomber sorties against the second-echelon targets in NATO's first-line divisions (although both types of aircraft would perform close air support and battlefield interdiction missions).



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Appendix B

Use of the Smolensk Strategic Air Army in the Western Theater of Military Operations

The Smolensk strategic air army, equipped with medium bombers, probably is intended to support operations throughout the European theater of war, but, lacking direct evidence, we can only estimate the likely extent of its participation in operations in the Western TMO. Moreover, our estimates contain some uncertainty due to incomplete information on the composition and primary roles of the Smolensk air army's component units. [redacted]

Force Composition and Primary Roles

The Smolensk strategic air army is composed of 12 strike regiments, two reconnaissance regiments, and one electronic warfare support regiment, but we are uncertain of the exact mix of aircraft types within each regiment and the primary roles of many of the aircraft. These uncertainties stem from the Soviets' widespread practice of producing numerous strike and support variants of their bombers. [redacted]

Strike Regiments

[redacted] there are probably two Badger G strike squadrons and one Badger HJK electronic countermeasures (ECM) support squadron in each of the six Badger strike regiments (one of which is presently upgrading to Backfire). The Badger G is capable of carrying air-to-surface missiles (ASMs) and dropping free-fall bombs. [redacted]

[redacted] Many of these redistributed Badgers appear to have been placed in flyable storage at the operational bases, however, and may be intended only

to compensate for wartime attrition. We believe that each of these regiments probably has only 22 to 24 Badger G strike aircraft in active flying status, and we estimate that roughly 25 to 30 of the 169 Badger G's listed in table 7 probably are in flyable storage. For an estimate of the full weapon delivery potential of the Badger regiments, we would also have to consider the possibility of reconfiguring Badger H chaff droppers for a secondary mission of delivering free-fall bombs. [redacted]

[redacted] estimate that the Badger strike regiments in the Smolensk air army may contain a total of about 25 to 35 of these aircraft. [redacted]

Each of the three Blinder strike regiments has been shown [redacted] to contain two Blinder B strike squadrons and one squadron of what we call Blinder A's. Contrary to most current technical estimates, [redacted]

[redacted] suggest that the Blinder B probably can carry either bombs or an ASM. Moreover, [redacted]

[redacted] suggest that the so-called Blinder A squadron is probably a mixture of unidentified Blinder variants that have ECM support as their primary mission. [redacted]

[redacted] we estimate that perhaps about five of the Blinder A's in each regiment could be dedicated jammers. The enormous chaff corridors that are sown by Binders [redacted] indicate that some of the Blinder A's probably have chaff-laying as their primary mission (like the Badger H). We continue to estimate, however, that most or all of the Blinder A's probably have either a residual bombing capability or can be readily reconfigured for a secondary free-fall bombing role. [redacted]

Table 7
Estimated Composition and Roles of the Smolensk Strategic Air Army (mid-1983)

Aircraft Type	Total Available	Strike/Attack Role			Electronic Countermeasures Role		Reconnaissance Role		Tanker Role
		Primary	Secondary	Flyable Storage	Primary	Flyable Storage	Primary	Secondary	Primary
Backfire BC	60	60						20*	
Blinder B	64	64						30*	
Blinder ACD	86		40 to 75 ^b		50 to 55 ^c		30 to 35 ^c		
Badger G	169	140 to 145 ^d		25 to 30 ^d				70*	
Badger HJK	103		35 to 50*		100 ^e	3 ^f			
Badger EF	3						3		
Badger (TD)	8								8
Total (rounded)	495	265 to 270	75 to 125	25 to 30	150 to 155	5	35 to 40	120	10

* We assume that one strike squadron in each strike regiment trains in a secondary reconnaissance role.

^b Assumes 10 to 20 reconnaissance aircraft and up to 25 jamming aircraft cannot be reconfigured to carry bombs.

^c Assumes one ECM support squadron for each of the five Blinder regiments and two reconnaissance squadrons in each of the two reconnaissance regiments.

^d Assumes Badger G's at main operating bases in excess of about 24 aircraft per regiment are in flyable storage.

^e Estimated number of Badger H aircraft, assuming four to six per Badger strike regiment and 10 to 15 in the ECM regiment.

^f Assumes one ECM support squadron for each Badger strike regiment plus four such squadrons in the ECM regiment. It is not clear whether any are in flyable storage.

All of the Backfires that are operationally deployed in the three (and part of a fourth) Backfire strike regiments of the Smolensk air army probably are strike aircraft capable of carrying bombs and ASMs. No Backfire support variants have yet been identified in service, and we have not observed training [redacted] that would indicate the use of specialized support aircraft. We project that the Soviets will probably elect to deploy some Backfire reconnaissance and dedicated jammer variants some time in the future, though probably in considerably fewer numbers than was the case with the Badger program. [redacted]

Support Regiments. We are unable to determine the composition of the two Blinder reconnaissance regiments. [redacted]

Because we have identified Blinder C's [redacted] we have estimated for many years that each regiment

probably contains at least one squadron of dedicated reconnaissance aircraft. Recent analysis [redacted] has revealed that one of these two regiments also has a full squadron of Blinders that have been modified with various configurations of blade antennas (possibly for electronic intelligence collection), and that at least one other aircraft has been modified to carry a side-looking airborne radar (SLAR) system. The flight-training programs of these two regiments, however, include free-fall bombing and dedicated ECM and chaff-support missions, as well as intelligence collection flights—implying a secondary ground attack role perhaps similar to that of front aviation reconnaissance regiments. [redacted] suggest that the bomb bays of most of these aircraft probably can be readily reconfigured to carry either bombs or

reconnaissance sensor packages. The absence of nuclear weapon storage facilities at their airbases, however, may indicate that they have only a conventional attack role (as is the case with front aviation reconnaissance regiments). Limited evidence [] and our estimate that the Soviets would have extensive requirements for strategic reconnaissance during nuclear operations also suggest that these two regiments probably do not have a nuclear strike role. We estimate that these two regiments are each comprised of two reconnaissance squadrons and one ECM support squadron, but that the majority of these aircraft can also be configured for a secondary conventional bombing role—possibly for long-range search-and-destroy missions against high-value mobile targets and for delivery of photo-flash bombs to support night reconnaissance []

The specialized electronic warfare regiment in the Smolensk air army probably is equipped entirely with Badger HJ support aircraft. [] all three squadrons of this regiment were equipped with Badger J's (except for a handful of Badger H's) in the late 1960s, and we know that this regiment used at least the equivalent of two squadrons of such aircraft in support of the invasion of Czechoslovakia in 1968. The regiment's flight-training program has not included live bombing since the mid-to-late 1960s, and the current limited and infrequent use of a bomb range could be accounted for by a requirement to maintain a minimum bombing proficiency for all bomber pilots or by a secondary bombing role for the Badger H's. This electronic warfare regiment appears to have gained a fourth ECM squadron in 1982 as part of the redistribution of old aircraft from a Badger G strike regiment that had upgraded to Backfire. []

Participation in the Western TMO

We have no direct evidence as to how the Soviets intend to distribute the efforts of the Smolensk strategic air army between the three TMOs of the European theater of war. While the entire force of the air army probably would frequently be concentrated in a single TMO for one massed air raid or for a series of massed raids, the Soviet General Staff probably would divide the overall efforts of the air army for a period of two or more weeks among the three TMOs. []

The Soviets normally plan to use most of their forces on the main axis of attack in any operation; we estimate therefore that about 65 to 75 percent of the efforts of the Smolensk air army probably would be spent in the Western TMO. This estimate is based on the assumption that the distribution of Smolensk air army efforts would be similar to the intended concentration of other Pact forces and the distribution of targets in each of the three TMOs. Evidence [] indicates that about two-thirds of the ground forces and front air forces in the European theater of war probably would be used in the Western TMO, and our analysis of the distribution of strategic-depth targets concludes that about 75 percent are contained in that TMO. []

We arrive at generally similar conclusions if we assume that the efforts of the 24 strike regiments of the Smolensk, Legnica, and Vinnitsa air armies might be collectively applied to the three TMOs in the same proportions as the front forces (about 5 percent to the Northwestern TMO, 65 percent to the Western TMO, and 30 percent to the Southwestern TMO). If the Legnica air army was assigned entirely to the Western TMO and the Vinnitsa air army was used only in the Southwestern TMO, to attain a 5-65-30 overall distribution of effort the Smolensk air army would devote about 10 percent of its effort to the Northwestern TMO, 80 percent to the Western TMO, and 10 percent to the Southwestern TMO. For the same distribution of effort among TMOs, if about one-third of the Vinnitsa air army's effort in the theater of war was instead used in the Western TMO, the Smolensk air army effort might be divided so that 10 percent went to the Northwestern TMO, 65 percent to the Western TMO, and 25 percent to the Southwestern TMO. We believe that the distribution of Smolensk air army efforts would favor the Western TMO more than would the division of front forces efforts, however, because of the relatively greater concentration of strategic-depth targets in the center of the theater of war and the comparatively greater availability of SNA medium bombers to attack targets on the flanks. []

[redacted]

The Numbers of Nuclear Strikes

We have no direct evidence concerning the number of nuclear strikes that the Soviets would expect the Smolensk air army to deliver during the first major strike or what portion of those strikes would be conducted in the Western TMO. On the basis of Soviet planning practices in front aviation, we estimate that probably only the aircraft from squadrons with primary strike roles normally would be tasked to deliver nuclear weapons, and a portion of the aircraft in those squadrons probably would be used instead to conduct supporting conventional defense suppression attacks and to augment the dedicated reconnaissance aircraft. We estimate that perhaps 25 percent of the strike aircraft would be used in support roles—possibly 10 percent for defense suppression and 15 percent for reconnaissance. Considering likely operational readiness rates, the remaining 75 percent would number about 180 aircraft, assuming no prior attrition. [redacted]

We lack evidence concerning typical Soviet nuclear weapon loads for bombers and the number of strikes that would be planned for the Smolensk air army. Our minimum estimate is derived by assuming that all 180 strike aircraft are armed with the one or two ASMs that constitute their basic missile loads. In our higher estimate, we assume that half of the bombers instead carry three bombs apiece. These calculations produce a range of about 320 to 430 nuclear weapons. Our best estimate is that about one-third of the strike aircraft would carry bombs and that a total of about 390 weapons would be used by the Smolensk air army. [redacted]

[redacted]

In sum, we estimate that the Soviets would plan for the delivery of about 75 percent of the Smolensk air army's nuclear strikes in the Western TMO. Therefore, about 135 of the 180 aircraft in this air army that probably would be tasked for nuclear weapons delivery would attempt to conduct strikes there. These 135 aircraft would carry about 290 (240 to 320) of the 390 (320 to 430) nuclear weapons that the Smolensk air army would be tasked to deliver in the European theater of war. [redacted]

[redacted]

Appendix C

Force Ratio Analysis

The Soviets' military writings indicate that their planners take force ratio norms into consideration when they decide which of their employment concepts are most appropriate for a given situation and when they try to create an optimum disposition of forces. In writings [redacted] the force ratio calculations are made by multiplying each side's order of battle by a set of static weapon system combat potential scores. These scores represent a rough approximation of the relative ability of each weapon system to inflict losses on the enemy. They were developed by the Soviet General Staff, which used linear formulas in conjunction with small- and large-scale models of combat operations. The Soviets consider the resultant force ratios a simple and effective way to compare the combat potential of similar types of technically advanced forces. [redacted]

The Soviets' writings in the early 1980s indicated that they were researching more advanced ways to estimate force balances—which probably will lead, as in the past, to the adoption of a new method for using combat potential scores. One proposal involved measuring the degree of achieved air superiority by contrasting the balance between NATO air forces and Pact air defense forces with that between Pact air forces and NATO air defense forces. Interest also has been expressed in more complex methods that would include a comparison of the capabilities of the opposing sides' integrated air and ground forces. This would allow calculation of the effect of relative air superiority on ground combat. We have no evidence that either of these more advanced methods has yet been implemented; we have therefore confined our calculations to a simple homogeneous forces application. [redacted]

Counting Assumptions

Our ability to confidently calculate air balances that fully reflect Soviet perceptions is constrained by our incomplete understanding of how and which forces would be counted and of Soviet estimates of the range of likely reinforcement scenarios. Our calculations of

the Central European air balance using the Soviets' combat potential scores, nevertheless, are generally consistent with their perceptions of the balance as expressed in their military writings. [redacted]

Warsaw Pact Air Forces Participants. We use four different Pact force dispositions in our calculations—a baseline estimate and three sequential air reinforcement packages that are consistent with [redacted] Soviet [redacted] logistic considerations:

- The baseline force, *Force 3F-2S*, reflects a minimally reinforced posture that comprises three front air forces and two strategic air armies. These are the air forces of the Polish-GDR, Group of Soviet Forces, Germany (GSFG)-GDR, and Czechoslovak-Central Group of Forces (CGF) fronts and the Legnica and Smolensk strategic air armies. This force also includes the Baltic Fleet air forces and the second-echelon non-Soviet Warsaw Pact (NSWP) interceptors—although it is likely that these interceptors would participate only in an air defense operation and not in the air operation.
- The second force, *Force 3F-3S*, adds an independent air force element—the Vinnitsa strategic air army—which requires considerable logistic support but not nearly as much as would be needed to move up an entire front. We chose not to add a detached front air force from a second-echelon front to this force because its use could result in sufficient aircraft attrition to seriously impair the front's fighting ability before its commitment to battle. [redacted] this is probably the Soviets' preference for committing reserve front air forces to battle. It also is consistent with their military writings, which state that the main reason for disestablishing the numbered tactical air armies in 1980 and 1981 was to fully integrate front aviation into the joint forces fronts. We also did not use Moscow strategic air army Bears or Bisons in

[redacted]

this force, because their attacks against targets in Britain would bring the British home interceptor force into our calculations of the overall air balance—to the noticeable disadvantage of the Warsaw Pact.

- The third force, *Force 4F-3S*, adds a fourth front air force. We used the Belorussian Front, as it is most frequently the fourth front committed to battle in Western TMO. [redacted] This force disposition probably is not appropriate for short warning scenarios, because we believe the Soviets intend to use their front air forces as integral components of their joint forces fronts, rather than committing them to battle in a piecemeal fashion.
- The fourth force, *Force 5F-3S*, adds the Carpathian front air force—usually the fifth front in Western TMO. [redacted] This is the largest force Soviet planners probably would assume they could assemble before the outbreak of war. Moreover, the Soviets may prefer not to use five fronts in the first strategic echelon because it would leave them with little in reserve to commit to the subsequent campaign through France. [redacted]

It is not clear whether the Soviets in their calculations reduce the number of available aircraft in these forces to account for operational readiness rates and nuclear reserves. We did not compensate for these factors in our calculations, because we believe such factors have little or no effect on the resultant force ratios in Soviet calculations. The Soviets usually ascribe to NATO their own planning norms when they estimate aircraft availability. [redacted] Because they often exclude support aircraft (such as reconnaissance aircraft) from their tabulations of combat aircraft [redacted] and because we do not know if support aircraft are included in the air supremacy campaign air balance calculations, we decided to omit them from our calculations. We also have excluded attack helicopters because the Soviets have not included them in their planning of air and air defense operations. [redacted]

[redacted]

NATO Air Forces Participants. It is unclear how many NATO combat aircraft [redacted]

[redacted]—the [redacted]

Soviets include in their calculations of the air balance when planning the air supremacy campaign. We believe the Soviets count only those aircraft that they expect to become actively engaged in those operations, because this has been their normal practice in planning other types of operations. [redacted] Information [redacted] indicated that at least 600 aircraft in the home air forces of Britain, Spain, and Portugal probably would be excluded from the total of 2,700 to 2,900 aircraft, because they were still listed by the Soviets as NATO's second strategic air echelon. [redacted] We believe, based on general characterizations of the NATO air forces in [redacted] military writings, that the Soviets expect 2ATAF, 4ATAF, the Danish Air Force, the FRG naval air arm, most or all of the French Air Force, and possibly aircraft carriers in the North Sea to be participants in the initial struggle for Central European air supremacy. The Soviets do not typically include the Swedish Air Force in their descriptions of the NATO air forces in the Western TMO, although they could conceivably count portions of that force in the first strategic air echelon. [redacted]

We excluded from our calculations several small NATO forces components, but we are uncertain whether the Soviets would count them. Consequently, our force ratio estimates may favor the Warsaw Pact slightly more than do Soviet calculations. We omit aircraft carriers, as it is not clear whether or under what conditions the Soviets believe they would be used in the North Sea. Adding two US carrier air wings in our calculations could increase a typical 1.05:1 qualitative air balance advantage for NATO into a 1.10:1 or 1.15:1 advantage (depending on the extent of other reinforcements). We did not count the fighter and fighter-bomber aircraft based in southern and southwestern France (because they probably would not be employable from their home airfields) and the Mirage IV bombers (which have only a nuclear delivery role). The British home interceptor forces also were excluded (assuming no Bison or Bear attacks against targets in Britain early in the war),

[redacted]

[redacted]

and we made no reinforcements to RAF-Germany (because of our uncertainty about intended timing, and because this force would be small in any case). The primary variable in our calculations of the likely composition of NATO air forces was the progressive reinforcement of 2ATAF and 4ATAF by the US Tactical Air Command. We believe that Soviet military intelligence has a reasonable approximation of NATO's intended reinforcement schedule. [redacted]

Applying Combat Potential Scores. We think that, since at least the late 1970s, Soviet theaterwide air balance calculations have contrasted high estimates of NATO air forces aggregate combat potential with more moderate estimates of Warsaw Pact air forces aggregate combat potential. This is likely because of dissimilarities in the NATO and Pact force structures and the way that we believe multirole aircraft are treated in the Soviet combat potential scores. Sometime between the late 1960s and 1977, the Soviets began to use a unitary combat potential score for each model of aircraft, rather than multiple scores (which had allowed planners to select an air-to-air, air-to-ground, or reconnaissance score for each aircraft). In the unitary set of scores, fighter-interceptors (like the MIG-21 and MIG-23) have substantially higher scores than their fighter-bomber counterparts (the SU-7 and MIG-27), and multirole fighter aircraft (such as the F-104, F-4, and F-16) apparently are given the higher scores associated with their part-time air-to-air role. This bias in the Soviet scores in favor of multirole aircraft produces a high estimate for NATO air forces because most of its fighter-bomber wings are equipped with multirole fighter aircraft that appear to be scored by the Soviets as if they operated entirely as fighter-interceptors. By contrast, nearly all Pact fighter-bomber regiments are equipped with specialized ground attack aircraft that score lower. [redacted]

Soviet General Staff planners may have decided to use the higher air-to-air scores for NATO multirole aircraft assigned to fighter-bomber wings because of their expectation that most of those aircraft would be used in their secondary air-to-air role to counter the massed air raids of Pact air operations and because most of the pilots in those units receive a significant amount of air-to-air training. Pact fighter-bomber pilots are more specialized, however, receiving only a

negligible amount of training in the air-to-air role. If the Soviets instead applied ground attack scores to NATO's multirole fighter-bombers—and we cannot be absolutely certain that this would not happen—we estimate that it would have the approximate effect of turning a typical 1.05-to-1 NATO air balance advantage in our calculations into a 1.15-to-1 Warsaw Pact advantage. [redacted]

Estimated Soviet Perceptions of the Air Balance Air Balance Trends 1975 to 1985. Based on Soviet combat potential scores, our analysis of trends in the qualitative air balance in the Western TMO from 1975 to 1985 is generally consistent with the Soviets' perceptions of it as expressed in their military writings. Our air balance calculations for the early and middle 1970s, however, match what we believe were Soviet perceptions only if we assume that the multiple combat potential scores for each aircraft type were still in use then. [redacted]

Through at least 1975 the Soviets wrote confidently about launching a TMO-wide air operation for air supremacy at the outset of war. By implication, the Soviets believed they could meet their doctrinal requirements for success, which probably stipulated a minimum starting advantage in the TMO-wide qualitative air balance of about 1.4:1. Moreover, authoritative Soviet military writings from the mid-1970s stated that the Warsaw Pact would have to destroy 40 to 50 percent of NATO's combat aircraft in the initial air operation to achieve air supremacy. [redacted]

[redacted] the Soviets expected to accomplish this while sustaining only about 15-percent losses of Pact aircraft. Thus, the Pact would have needed a starting advantage in the qualitative air balance of between 1.5:1 and 1.8:1 if, as we believe, the Soviets defined air supremacy for planning purposes as a qualitative advantage exceeding 2.5:1. [redacted]

Our air balance estimates for 1975 (table 8) show starting Warsaw Pact TMO-wide advantages in the 1.5:1 to 1.8:1 range when we use estimated ground

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Table 8
Estimated Soviet Perceptions of Trends in the
Western TMO Air Balance, 1975 to 1985 ^a

Air Forces Disposition ^b	1975, Using Unitary Scores ^c	1975, Using Multiple Scores ^c	1980, Using Unitary Scores ^c	1985, Using Unitary Scores ^c
NATO: Unreinforced Warsaw Pact: Force 3F-2S	1.25:1	1.55:1	1.10:1	1.15:1
NATO: Unreinforced Warsaw Pact: Force 3F-3S	NA	NA	NA	1+ :1
NATO: Unreinforced Warsaw Pact: Force 4F-3S	1.35:1	1.70:1	1.25:1	1.10:1
NATO: Unreinforced Warsaw Pact: Force 5F-3S	1.50:1	1.85:1	1.45:1	1.20:1

^a Warsaw Pact advantages are shown in red; NATO advantages, in black.

^b These force pairings were selected to illustrate a broad range of possibilities for the Warsaw Pact, but we do not believe the Soviets view all of these pairings as likely situations (the unreinforced NATO versus Warsaw Pact Force 5F-3S is particularly unlikely). The unreinforced NATO air forces include 2ATAF, 4ATAF, the Danish Air Force, the FRG naval air arm, and about 70 percent of the French Air Force. Warsaw Pact Force 3F-2S includes three front air forces (Polish-GDR, GDR, and Czechoslovak-CGF) and two strategic air armies (Legnica and Smolensk), as well as the non-Soviet Warsaw Pact fighter-interceptors and the Baltic Fleet Air Force in 1985, and similar forces under different subordination in 1975 and 1980. Warsaw Pact Force 3F-3S adds the Vinnitsa strategic air army (1985 only). Warsaw Pact Force 4F-3S also adds the Belorussian Front Air Force, and Warsaw Pact Force 5F-3S also adds the Carpathian Front Air Force.

^c In the unitary scores calculations, all aircraft that the Soviets consider to be multirole aircraft are multiplied by a set of combat potential scores that treat them as fighter-interceptors, whereas in the multiple scores calculations the multirole aircraft in fighter-bomber units are multiplied by estimated ground attack role combat potential scores.

attack role combat potential scores ⁹ for NATO multirole fighter-bombers, but advantages of only 1.25:1 to 1.5:1 when we apply the unitary combat potential scores. This leads us to speculate that the multiple scores for each aircraft may not have been

⁹ We had to develop an ersatz set of combat potential scores for our estimate of the 1975 air balance based on multiple scores for each aircraft type because we lacked the necessary Soviet data. Most of these weapon scores date from the late 1970s and are Soviet unitary scores. We derived the ground attack scores for multirole aircraft from the same data base by analogy. For example, we gave the F-4 the same score in the ground attack role as the MIG-27 because the Soviets assign similar unitary scores to the F-4 and the MIG-23 (the MIG-27 is a fighter-bomber variant of the MIG-23 fighter-interceptor). Likewise, we made the F-104 ground attack score the same as the SU-7, which is the fighter-bomber counterpart to the MIG-21 fighter-interceptor (the Soviets give similar unitary scores to the F-104G and the MIG-21BIS). We believe this technique produces scores that correspond reasonably with Soviet perceptions in the late 1970s of relative ground attack potential, but we cannot be certain that they accurately reflect Soviet perceptions in the early-to-middle 1970s.

replaced by the unitary scores until the late 1970s—a time when the Soviets were introducing several other new, more conservative, operational planning norms for their theater forces.

Our estimate of the air balance in 1980 is consistent with Soviet military writings from the late 1970s and early 1980s, which express concern over near parity in the air balance and are preoccupied with the need to develop less desirable alternatives to a TMO-wide air operation. According to our calculations (table 8), the Warsaw Pact would have had little or no chance in 1980 of achieving a doctrinally favorable qualitative advantage for launching a TMO-wide air operation at the outset of war. We cannot be certain, however, that the perceived air balance shift between 1975 and 1980 occurred in the Soviets' estimates for the same reasons that it did in our estimate.

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The substantial Pact air balance advantage in the mid-1970s is reduced to near parity by 1980 in our estimate because we assume that in the late 1970s the Soviets introduced new counting rules for calculating the air balance. Our scores data indicate the Soviets had switched from multiple to unitary combat potential scores by 1977, and our analysis of Soviet perceptions of the air balance in 1975 leads us to speculate that this switch probably occurred after 1975. Of equal importance to our calculations [redacted]

[redacted] Soviet planners probably started by 1977 to count French forces as part of NATO from the outset of hostilities. All of the air balance shift between 1975 and 1980 in our calculations is attributable to the addition of about 70 percent of the French Air Force to the NATO air forces and to applying unitary rather than multiple combat potential scores to NATO multirole fighter-bombers. Force modernization is not a major contributor to the air balance shift in our calculations, because there is no significant change in the balance between 1975 and 1980 if the combat potential scores are applied using the same method in both years and if the French are excluded [redacted]

We estimate that in 1980 the Soviets projected further NATO gains in the qualitative air balance by 1985 but that a situation of near parity would continue to exist (table 8). Unlike the preceding five years, however, NATO's gains between 1980 and 1985 are due to its higher rate of qualitative improvement through force modernization than that of the Warsaw Pact, rather than to changes in Soviet estimative techniques. This higher rate of improvement is almost entirely attributable to the introduction of substantial numbers of F-16s and Tornados—both of which the Soviets score much higher than the Pact MIG-23/27 and SU-24 counterparts during this period. We did not perform air balance projections for the less predictable years beyond 1985, but we believe the Soviets may hope to halt NATO's gains—and perhaps reverse them—if they are able to introduce enough SU-27 and MIG-29 fighters during the late 1980s and the 1990s, because they may view these aircraft as being qualitatively comparable to the F-15 and F-16, which they regard highly [redacted]

The Current TMO-Wide Balance. Our analysis suggests the Soviets now probably perceive that the most

likely starting qualitative air balance in the Western TMO would be one of near parity. Moreover, they probably also believe that it is unlikely that either side could achieve a sufficient lead in mobilization and reinforcement to establish a substantial air balance advantage. The peacetime in-place air forces on both sides are so large that it would take a massive reinforcement by one side in concert with the other's relative inactivity to substantially shift the starting balance. Both sides have sufficient air forces reserves to alter the balance, but a reinforcement of that magnitude would take at a minimum most of a week (perhaps as much as two weeks) and considerable logistic support to prepare and execute. We believe that typically conservative Soviet planners would assume that neither side would be able to conceal preparations on that scale for more than a couple of days, and that once detected, it would likely trigger a reciprocal response from the other side. [redacted]

If our air balance calculations are representative of Soviet estimates, the Soviets expect that neither side would be likely to amass a TMO-wide qualitative air balance advantage greater than about 1.2:1 at the outset of war, despite a Pact advantage of about 1.4:1 to 1.6:1 in the numbers of deployed combat aircraft (table 9). Even in the highly unlikely event that the Pact was able to deploy a force as large as our hypothetical Force 5F-3S against an unreinforced NATO, the Pact would have only a 1.30:1 qualitative advantage TMO-wide. Moreover, we estimate that the US Tactical Air Command's planned reinforcement after three days of mobilization would more than offset the addition of the Vinnitsa air army in Soviet calculations of the air balance and that the planned US reinforcement force after 14 days of mobilization would counterbalance the addition of that air army and the Belorussian and Carpathian Front air forces. In our estimate, we assume the Soviets count about 70 percent of the French Air Force as part of the NATO forces—the exclusion of which would turn a typical 1.05:1 NATO advantage in our calculations into a Pact advantage of 1.05:1 to 1.10:1 (depending on the extent of the reinforcement period). [redacted]

Table 9
 Estimated Soviet Perceptions of Likely
 Starting Air Balances in the Western TMO ^a

NATO Air Forces ^b	Warsaw Pact Air Forces			
	Force 3F-2S ^c	Force 3F-3S ^c	Force 4F-3S ^c	Force 5F-3S ^c
Unreinforced	1.05:1 (1.40:1)	1.10:1 (1.55:1)		
M+3	1.20:1 (1.30:1)	1.05:1 (1.45:1)	1.05:1 (1.60:1)	
M+5		1.10:1 (1.45:1)	1+ :1 (1.55:1)	1.10:1 (1.70:1)
M+7		1.15:1 (1.40:1)	1.05:1 (1.50:1)	1.05:1 (1.65:1)
M+10			1.10:1 (1.45:1)	1+ :1 (1.60:1)
M+14				1.05:1 (1.55:1)

^a Warsaw Pact advantages are shown in red; NATO advantages, in black. The air balance calculations are based on mid-1983 air order-of-battle data and Soviet unitary combat potential scores. The primary figures in each case are based on combat potential, and the smaller numbers in parentheses reflect simple air order of battle. In the belief that neither NATO nor the Pact could conduct major reinforcements for extended periods of time without a response from the other side, we have not depicted force balance calculations for force combinations that we estimate the Soviets would view as unlikely to occur.

^b The unreinforced NATO forces include the air forces of 2ATAF, 4ATAF, Denmark, the FRG naval air arm, and about 70 percent of the French Air Force. British home interceptor forces and aircraft

carriers are not included. The USAF reinforcement schedule is similar to that assumed by NATO, with most of the early reinforcements being F-15 fighter-interceptors (which have high combat potential scores).

^c Warsaw Pact Force 3F-2S includes three front air forces (Polish-GDR, GSFG-GDR, and Czechoslovak-CGF) and two strategic air armies (Legnica and Smolensk), as well as the non-Soviet Warsaw Pact fighter-interceptors and the Baltic Fleet Air Force. Force 3F-3S adds the Vinnitsa strategic air army, Force 4F-3S also adds the Belorussian Front Air Force, and Force 5F-3S also adds the Carpathian Front Air Force.

Air Balances in Air Operation Sectors. The Soviets' military writings indicate that by 1981 they had developed a new variant of the air operation for air supremacy. It was designed to overcome the predicament posed by the Soviets' doctrinal requirement for a substantial air balance advantage at the start of the air operation and their apparent expectation of near parity in the TMO-wide air balance. In this variant, rather than attacking across the full width of the Western TMO, the Soviets would concentrate the massed air raids sequentially in smaller sectors—thereby achieving substantial advantages in each sector only while it is being attacked. If the Soviets intend to attempt to seize the strategic initiative in the air at the outset of a war with NATO, this variant probably is their preferred form of combat in the

struggle for air supremacy. We cannot describe this variant in detail, but we are able to estimate some of the likely characteristics of its scheme of execution by analyzing the air balance in the context of known Soviet air operation planning considerations.

We believe that operational considerations would play a greater role in determining the number of "operational axes" (sectors) in the air operation than would air balance calculations, despite the fact that the sector attack variant evidently was created expressly

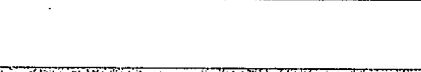
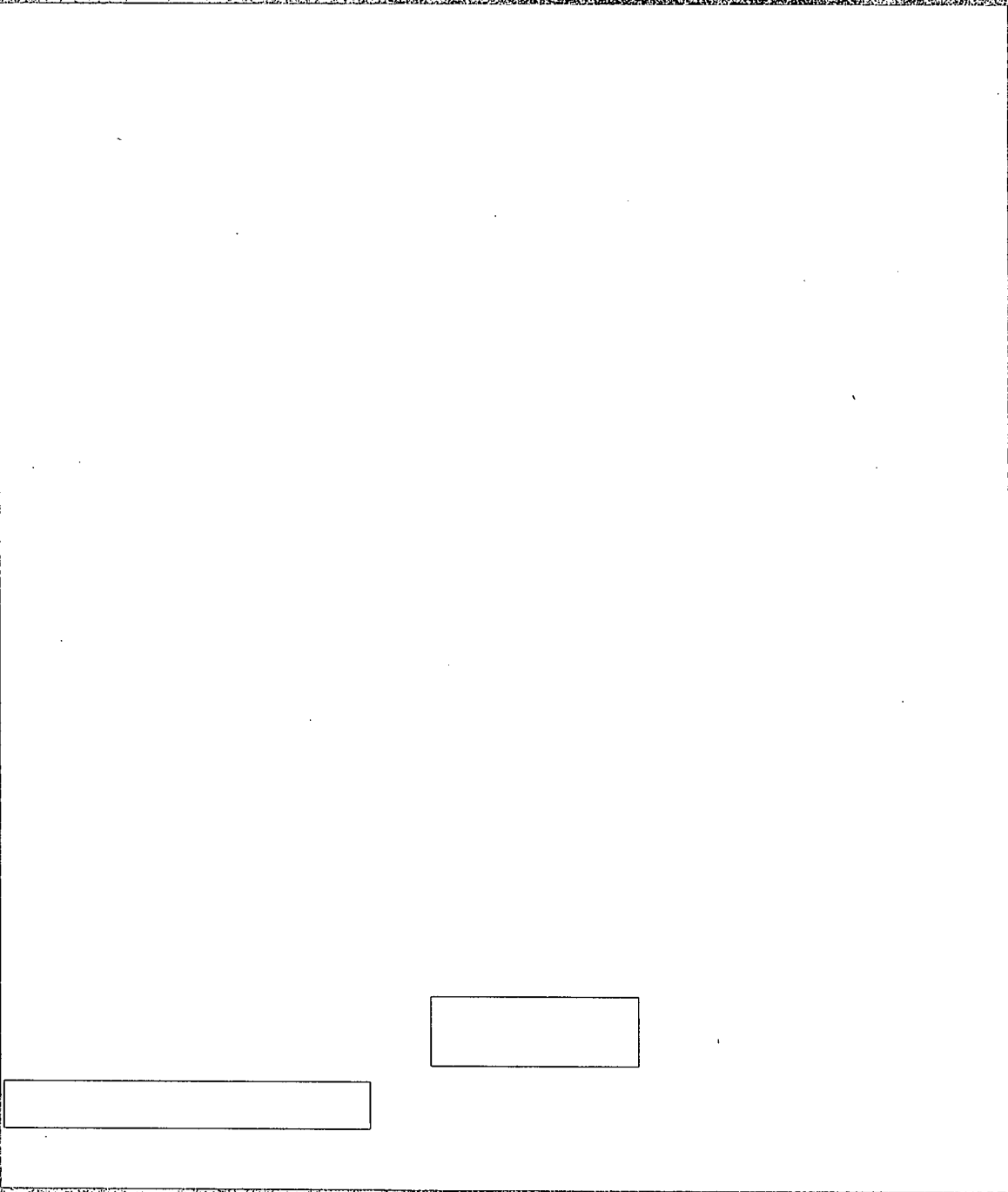
to obtain sector air balance advantages. Our analysis of the air balance indicates that sufficient advantages could be achieved easily by dividing the Western TMO into several relatively narrow "operational axes," such as the five or six that the Soviets describe in their writings about front and army operations (as shown in figure 5). We believe the Soviets plan to use no more than three sectors in the air operation, however, because their military writings state that they expect to conduct only six to eight massed air raids in the operation and that repeated attacks must be made against each target airfield (and hence against each sector). Using more than three attack sectors would, according to our analysis, also run counter to other operational considerations. Each of four or more sectors probably would be too narrow to accommodate more than one major air defense penetration corridor. We believe the Pact airspace management system would be overwhelmed if the Pact tried to funnel through a single corridor a massed air raid of the magnitude contemplated in Soviet writings. Major reductions in the size of the raids would necessarily prolong the operation. Moreover, the greater the number of sectors used, the longer it would take the Pact to subject the NATO nuclear forces in all of the sectors to intensive air attacks. [redacted]

The Soviets could simplify command and control of the massed air raids by using three air operation sectors that correspond with the sectors of responsibility of their typical three first-echelon fronts, but we believe this advantage would be overshadowed by failure to satisfy their air balance requirements. Coordination and airspace management could be simplified by using only a single front air force in each massed raid and by drawing on the same front for all the other joint forces front participants. According to our air balance calculations, this scheme would allow the Pact to easily achieve doctrinally favorable air balance advantages in the coastal and southwestern front sectors, but it would result in almost no chance of obtaining a sufficient advantage in the critical central front sector (figure 18). In our calculations, this is because the central sector would contain over 70 percent of the NATO air forces' combat potential in the TMO. We believe this scheme also is flawed because there may be too few airfield targets in the

flank sectors—especially airfields housing units with nuclear roles—to justify expending full-scale massed air raids on them. Nevertheless, with a substantial reinforcement advantage, the Soviets probably could devise a set of three attack sectors that would permit favorable air balance advantages in each sector by distributing the targets more evenly. Moving the air operation sector boundaries away from the front sector boundaries would, however, be done at the expense of a more complex command and control arrangement. [redacted]

Our preliminary analysis indicates that the Soviets are more likely to favor a system of two attack sectors than they are a set of three sectors, regardless of whether the Pact has three or four first-echelon fronts. A two-sector scheme probably permits the Pact to achieve its best possible combination of air balance advantages in all sectors, because most or all of the powerful Soviet front air forces in the center of the TMO could participate in both attack sectors. It also has the advantage of reducing to a minimum the number of massed air raids (and hence the length of time) required to subject NATO's nuclear forces in all sectors of the TMO to intensive air attacks. Similarly, it allows repeated airfield attacks to be made in each sector of the TMO in the shortest possible time. A two-sector system also could ease airspace management burdens somewhat by increasing the spacing between the penetration corridors to match that envisioned by the Soviets in TMO-wide massed raids (as illustrated in figure 10). Additionally, command and control might be simplified in a four-front disposition if the boundary between the air operation attack sectors was made to correspond with the boundary separating the objectives of the two fronts in the center. Despite all of the benefits inherent in a two-sector system, however, in our calculations (figure 19) the Pact still must achieve a distinct reinforcement lead over NATO to create better than a marginally favorable sector air balance advantage. [redacted]

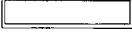
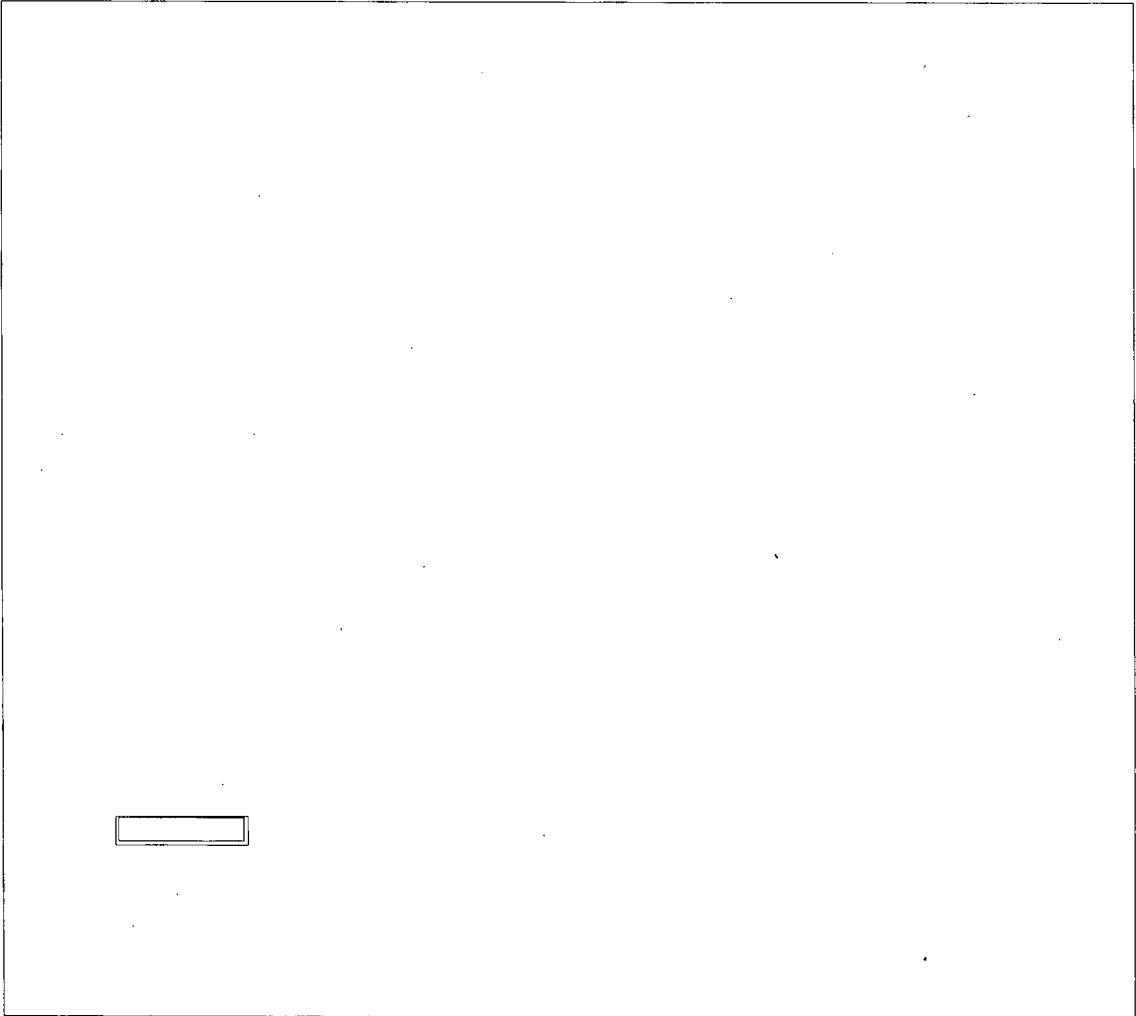
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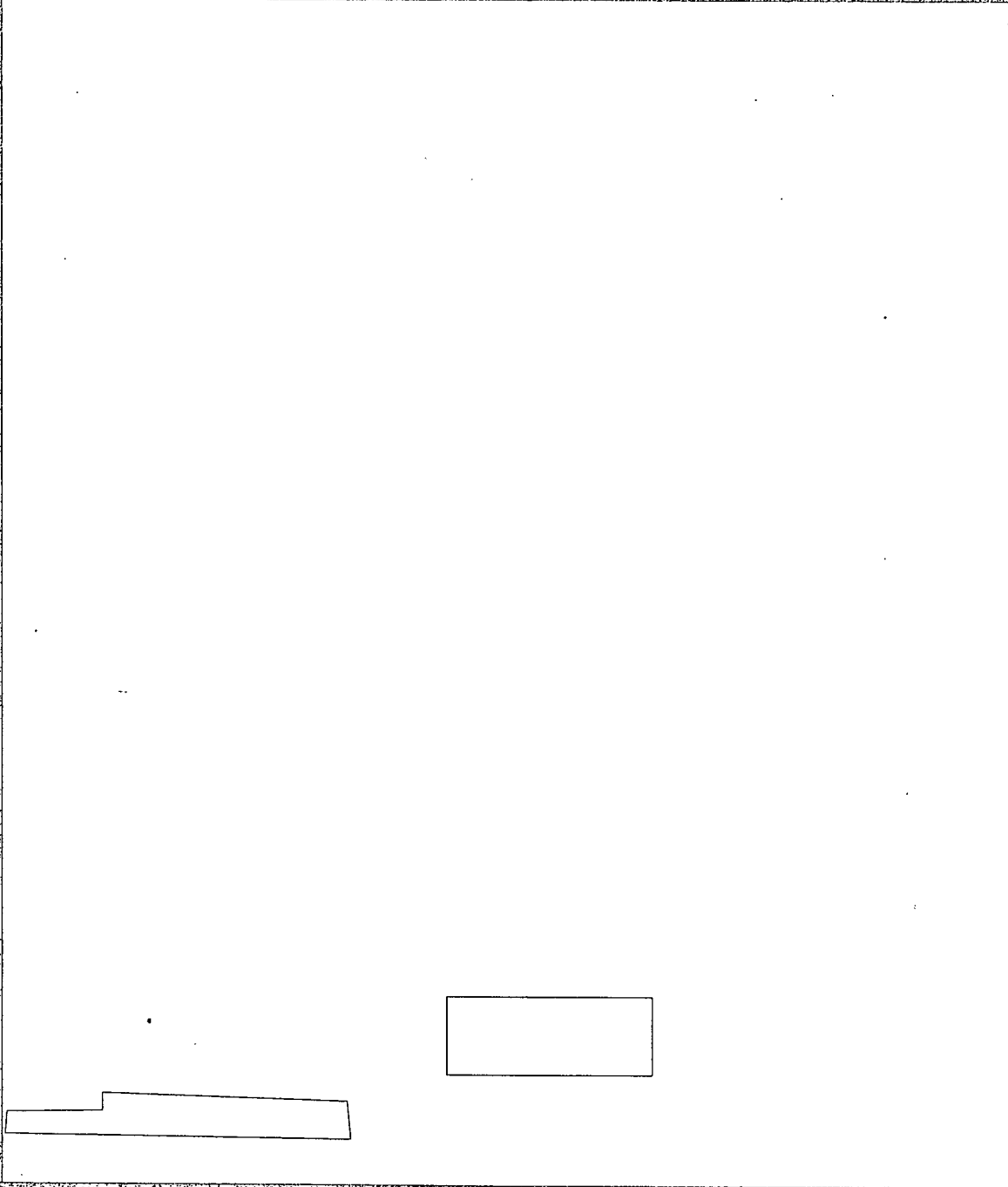
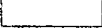
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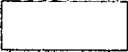
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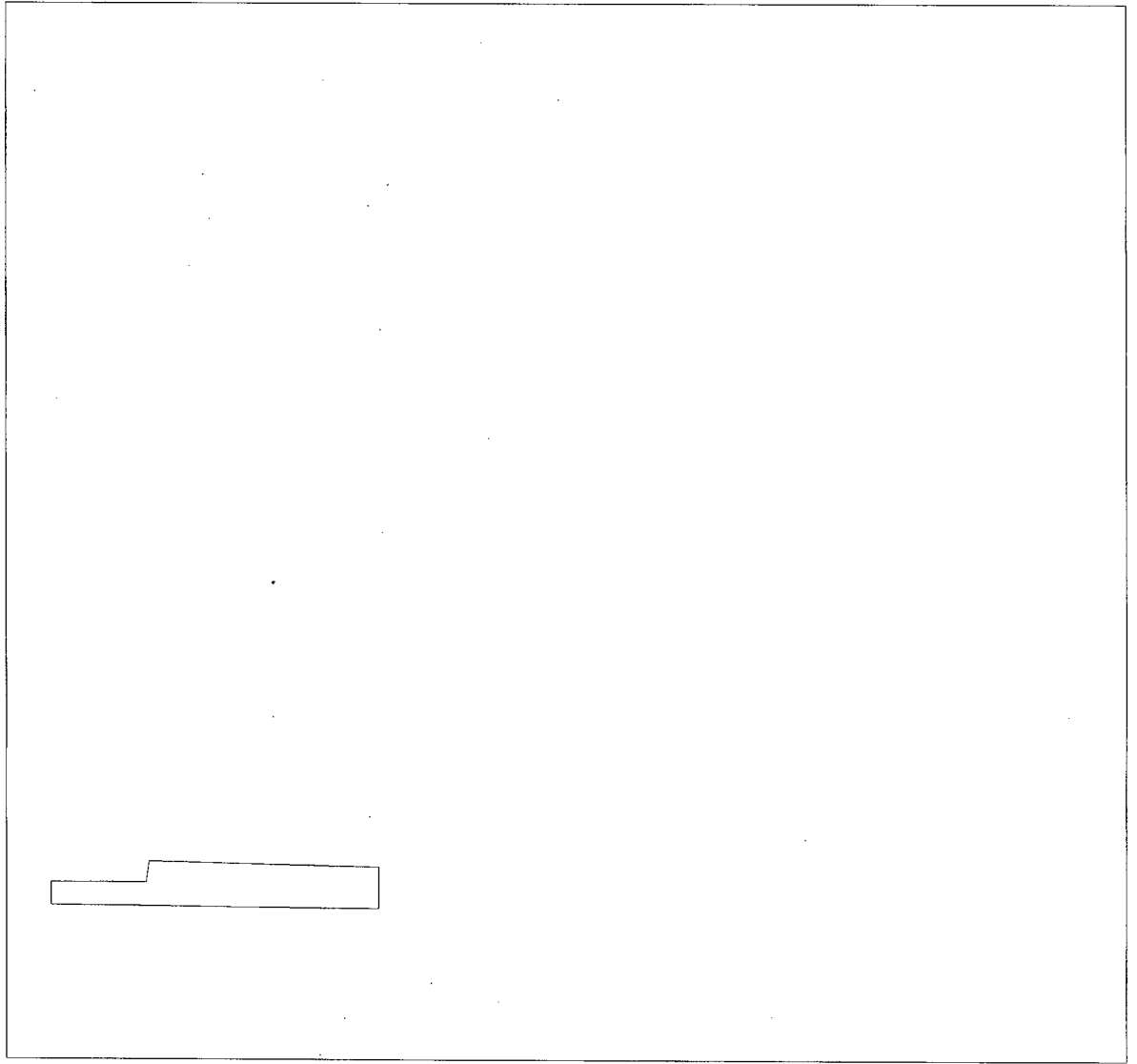
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Appendix D

Glossary of Terms

This glossary contains brief explanations of Soviet and hence Warsaw Pact military terms as well as some terms that we have created to describe Soviet military concepts discussed in this paper. These explanations are based on Pact military writings [redacted]

Air Defense Operation. Actions conducted throughout a theater of military operations (TMO) by air, air defense, and other forces under a unified plan to counter a large enemy offensive air campaign and to create favorable conditions for launching an offensive air operation to establish strategic air supremacy. The high commands in the main TMOs would plan and manage air defense operations, which would include offensive as well as defensive measures to blunt the enemy air campaign. This term also is used occasionally to refer to the routine air defense activities of operational-level forces. [redacted]

Airfield Blockade. Soviet tactic of using fighters to prevent enemy aircraft flights into or out of airfields in the area of a military objective by performing combat air patrols over those airfields. The Pact would use blockades to trap NATO aircraft on their airfields immediately before the airfield attacks in an air operation or as part of the fighter protection for airborne and amphibious operations and for strike aircraft conducting the initial massed nuclear strike. [redacted]

Air Operation. A major offensive air campaign conducted by one or more strategic aviation formations, usually with the cooperation of other forces. An air operation normally would consist of multiple massed air raids to achieve a strategic objective in a TMO. Air operations typically would be planned and directed by the high commands in the main TMOs and by the Soviet Air Forces Main Staff for the secondary TMOs, at the behest of the Soviet Supreme High Command. [redacted]

Air Supremacy. Soviet term for the situation in which the air forces have decisive superiority—possession of

the initiative and the capability to impose their will—over the enemy air forces. With air supremacy, the ground forces, navy, and air forces would have the opportunity to perform their assigned tasks without significant opposition from enemy air and air defense forces. In a conventional war, achieving air supremacy would be the chief task of the Pact air and air defense forces. The Soviets classify air supremacy as strategic, operational, or tactical. Strategic air supremacy is the control of the air over an entire TMO for the period of a strategic operation; operational air supremacy is control over an individual operational axis or a front sector for a more limited time (typically for a few days); tactical air supremacy is temporary control only over a particular tactical engagement. [redacted]

Army Aviation. The branch of the Soviet Air Forces that equips and trains the helicopter and drone units subordinate to front, army, and division commanders. These army aviation forces are intended to provide most of the direct air support to ground forces divisions during front and army operations. [redacted]

Army Aviation Force. Our term for tactical-size army aviation formations and army aviation headquarters elements that are fully integrated into the front air force, ground army, and ground division commands. The predominantly helicopter-equipped army aviation forces differ in size and function at each of the three levels of command. The army- and division-subordinate army aviation forces also play a key role in the front airspace management system. [redacted]

Army Operation. Employment of forces as planned and directed by the headquarters of a combined-arms or tank army. An army operation typically would pursue what the Soviets call an operational objective on a single operational axis within a front. It would be conducted according to a unified plan that incorporated the combat activities of all of the forces in the army's sector of operations. [redacted]

[]
Front. A Warsaw Pact joint forces formation that would be formed in wartime to carry out operational or strategic tasks. A front would be roughly analogous to a NATO army group and its associated allied tactical air force. []

Front Air Force. The operational-size air formation that would be fully integrated into each joint forces front. Front air forces would be equipped primarily with fighter-type aircraft drawn from the peacetime air forces of the Soviet military districts and groups of forces and from the non-Soviet Warsaw Pact (NSWP) national air forces. Front air forces headquarters would coordinate and control all air forces combat activity in the front's sector of operations. []

Front Aviation. The Soviet term for the branch of the Soviet Air Forces that equips and trains the predominately fighter-type units that would be directly subordinate to the fronts. These front air forces would provide most of the air forces support to joint forces front and army operations. []

Front Operation. An operation planned and directed by a front headquarters to pursue an operational or strategic goal along one to three operational axes within a TMO. Front operations would be conducted according to a unified plan incorporating all forces in the front's sector of operations. []

General Staff. The central Soviet military authority for planning and for controlling all Soviet and NSWP armed forces. In wartime, the General Staff would act as the executive agent of the Soviet Supreme High Command. []

High Command. The headquarters that would act as an extension of the Soviet General Staff for controlling the strategic grouping of forces encompassing all Soviet and NSWP armed forces in one of the main TMOs. It would plan and direct the strategic operations in its TMO at the behest of the Soviet Supreme High Command. []

Mining of Runways. Closing runways at enemy airfields by attacking them with bombs that have delayed-action fuses (we know the Soviets have fuses with delays of six to 18 hours, and they probably have

fuses of shorter duration) [] this tactic has been used in an effort to trap aircraft on airfields immediately before larger attacks on those facilities. Soviet planners also intend to use runway mining as the only form of attack against some airfields. []

Operational. The level of military theory, command, and planning between strategic and tactical in the Soviet hierarchy of military concepts. Operational military theory, objectives, and plans concern the conduct of joint forces operations using front-, army-, and corps-size groupings of tactical-level forces. Operations are carried out over hundreds of kilometers of territory and take several days of combat to complete. They require extensive staff planning and direction to ensure proper coordination among subordinate tactical-level forces and the provision of substantial rear services support. The term "operational" is also used by the Soviets to describe a piece of equipment that is used by operational-size forces and weapons intended for striking targets in the operational depth. []

Operational Axis. One of the sectors into which the strategic zones of TMOs are divided for planning front and army operations. Fronts typically would be assigned one to three operational axes, and one or two armies or corps would operate along each axis. The boundaries of the operational axes could be changed during the course of a TMO strategic operation to adjust to changes in the enemy force disposition or changes in the objectives of the strategic operation. []

Operational Depth. A Soviet targeting term for the area occupied by NATO forces that are the second echelons of the frontline NATO army corps and army groups. This depth typically is portrayed as beginning 25 to 40 kilometers behind the forward edge of the battle area (FEBA) and ending at a depth of 200 to 400 km. The Soviets also use the term "immediate operational depth" to describe the area from directly behind the first-echelon NATO divisions to a depth of at least 70 to 90 kilometers, and possibly up to 150 kilometers, through which NATO's frontline army corps would advance reinforcements for commitment to battle. []

Operational Formation. A grouping of tactical formations assembled to conduct an operation. The Soviets use this term to describe armies (including air armies and presumably front air forces), which comprise several divisions, independent units, and rear services elements. The Soviets sometimes refer to fronts and fleets as operational formations but more often characterize them as operational-strategic (because they are larger than armies and can be assigned strategic missions). Similarly, the Soviets sometimes refer to corps as operational formations, but usually describe them more specifically as being operational-tactical in character.

Operational Reconnaissance. Intelligence collection primarily in support of the planning and conduct of front and army operations. The Pact would perform operational air reconnaissance mostly against the second-echelon forces of NATO's frontline army corps and army groups and against air forces, nuclear forces, command and control centers, and other rear area installations in the area of the planned front operation. The initial front operations in the Western TMO probably would be planned to a depth of 400 to 600 kilometers. Front air force and forward-deployed strategic aviation operational reconnaissance squadrons would perform most of these missions.

Operational Reserves. Forces and material that are withheld as second-echelon resources by Warsaw Pact fronts and armies and by NATO army groups and army corps, rather than being committed to battle as part of their subordinate first-echelon divisions.

Operational-Strategic. A Soviet term sometimes used to describe fronts and fleets, which are operational formations but which can be assigned strategic missions.

Operational-Tactical. A Soviet term used to describe corps-size formations, which are smaller than armies (operational) but larger than divisions (tactical). The Soviets also use the term to refer to weapon systems

(for example, fighter-bombers and some SRBMs) that, although subordinate to operational-level commanders, are intended to be used to strike targets at operational and tactical depth. They use this term also more generally to refer collectively to the front, army, division, and lower levels of command or to describe a piece of equipment that is used at both the operational and tactical levels.

Regimental Sortie. A Soviet term for a unit of measure used to express the magnitude of flight activity in operational and logistic planning. We believe that the number of aircraft sorties needed to make up a regimental sortie is probably equal to the authorized (table of organization) strength of each type of air regiment. Hence, for a fighter regiment authorized 40 aircraft, 40 aircraft sorties by any combination of available aircraft would constitute one regimental sortie.

Sortie. One flight by one aircraft. The sortie rate is the average number of flights made by each aircraft in a unit during a 24-hour period. The computed sortie rate can vary, however, depending on whether the unit strength is based on operationally ready aircraft, assigned aircraft, or authorized aircraft.

Strategic. The highest level of military theory, command, and planning in the Soviet hierarchy of military concepts. The term "strategic" applies to the Soviet national-level command authorities and to the high commands of the main TMOs, as well as to the goals, missions, and military plans formulated by those authorities. Strategic military goals and missions are directly linked to Soviet national policy objectives, and their attainment in war would result in a radical change in the military and political situation in a TMO or in the war as a whole.

Strategic Air Army. A Western synonym for the cumbersome Soviet term "air army of the Supreme High Command," which denotes any of the five numbered air armies of strategic aviation. The five strategic air armies are equipped primarily with bombers and would normally operate in wartime

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under the TMO high commands or as part of the Soviet national strategic reserve. The Soviets actually call the two light bomber-equipped air armies opposite NATO operational air armies—presumably because of the relatively limited range of their Fencer aircraft.

Strategic Aviation. The branch of the Soviet Air Forces that equips and trains the predominately bomber-type units of the independent strategic air armies—which constitute the main forces for conducting offensive air operations in the Soviet armed forces.

Strategic Depth. A Soviet targeting term used to describe the area occupied by NATO's forces located behind its first-echelon army groups. The Soviets expect that the first-echelon NATO army groups would typically extend about 200 to 400 kilometers behind the FEBA. They describe NATO's overall force disposition in the Western TMO as having a depth of 1,200 to 1,800 kilometers.

Strategic Grouping. The forces that would be used to conduct a strategic operation in a TMO to accomplish a strategic goal of the war. A strategic grouping could include several fronts, one or more fleets, strategic air armies, national air defense formations, allocations from strategic missile forces, and various other independent reserve formations.

Strategic Operation. A large-scale operation planned and directed by the Soviet General Staff or by the high command in a TMO to achieve strategic goals. A strategic operation would be conducted according to a unified plan that incorporated the combat operations of all of the forces in the TMO (the so-called strategic grouping).

Strategic Reconnaissance. Intelligence collection conducted for the General Staff and the TMO high commands to support the planning and execution of strategic operations. Strategic reconnaissance would be conducted against rear-area targets of strategic interest to the full depth of the theater (for example, to a depth of 1,200 to 1,800 kilometers in the Western TMO). Strategic air reconnaissance would be performed primarily by strategic aviation reconnaissance aircraft (mostly medium and heavy bombers) and by

communications-intercept aircraft of the Main Intelligence Directorate of the General Staff.

Strategic Reserves. Forces and materiel retained under the control of national or theater commanders for use as supplementary resources, rather than being attached to the first-echelon Warsaw Pact fronts or NATO army groups.

Strategic Zone. A geographic, political, and economic subdivision of a TMO. The Soviets use this term in strategic planning to define areas of sufficient importance that conquering one of them could constitute a strategic goal of the war in the theater. For the purposes of operational-level planning, strategic zones are subdivided into operational axes, which are assigned as sectors of responsibility for fronts and armies.

Supreme High Command. The Soviet wartime authority that would provide strategic leadership for all Soviet and non-Soviet Warsaw Pact armed forces on behalf of the Soviet national command authorities (the Politburo and the Defense Council). We believe that the Supreme High Command would include the General Secretary of the Soviet Communist Party (acting as the Supreme Commander in Chief), the Minister of Defense, the Chief of the General Staff, the Commander in Chief (CinC) of the Combined Armed Forces of the Warsaw Pact, the Chief of the Main Political Administration, the First Deputy Minister of Defense for General Affairs, and the CinCs of the five services of the Soviet armed forces.

Tactical. The lowest of the three levels of military theory, command, and planning in the Soviet hierarchy of military concepts. The term applies to the forces and combat activities of division-size commands and their component elements. Tactical forces have headquarters staffs of limited size; their combat engagements are too small and brief to be classified as operations by the Soviets. Tactical-level objectives are most commonly expressed in the form of the task of the day. The term "tactical" is also used to describe pieces of equipment used by tactical forces and weapons intended for striking targets only in the tactical depth.

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Tactical Depth. A Soviet targeting term for the area occupied by NATO's first-echelon divisions. Tactical depth is typically portrayed as extending 25 to 40 kilometers behind the FEBA. [redacted]

Tactical Formation. Division-size forces, which include air divisions and presumably army-level army aviation forces. Tactical formations are comprised of what the Soviets call units (such as air regiments) and subunits (such as air squadrons and detachments). [redacted]

Tactical Reconnaissance. Intelligence collection performed for ground army and division headquarters, primarily to support the planning and conduct of the combat engagements of the first-echelon ground divisions. The Soviets believe that most of the tactical reconnaissance targets would be located within 40 kilometers of the FEBA, but they would conduct some tactical air reconnaissance missions to the full depth of the objectives of the parent ground armies (typically 150 to 300 kilometers). Front air force tactical reconnaissance squadrons and elements of the various army aviation forces would perform most of the tactical air reconnaissance missions. [redacted]

Theaters of Military Operations. Large geographic areas into which the Soviet General Staff divides the theaters of war for the purposes of strategic planning. TMOs can be continental, maritime, or intercontinental and are either main or secondary depending on their relative military, political, and economic importance. Directed by a high command headquarters, the strategic grouping of forces in a main TMO would conduct strategic operations to achieve strategic goals of the war. [redacted]

Theaters of War. The major geographic areas into which the Soviet General Staff divides the world for strategic planning. Each theater of war generally corresponds to an entire continent, such as the European Theater of War. We have no indication that the Soviets intend to establish special headquarters to direct operations in the various theaters of war. [redacted]

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