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DIVISION HR70-14 DATE:
07-18-2012

HR70-14

Warsaw Pact Ammunition Logistics in the Western Theater: Sustainability for Offensive Operations

An Intelligence Assessment

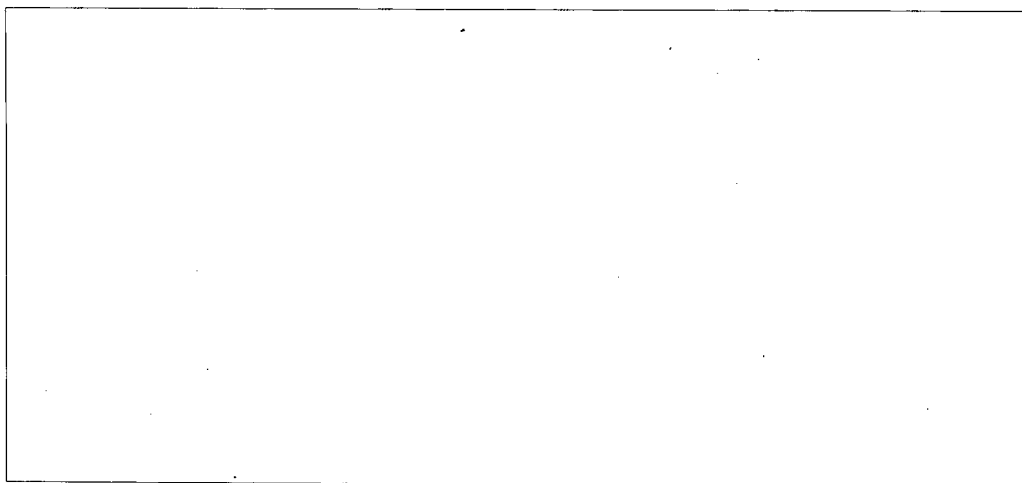
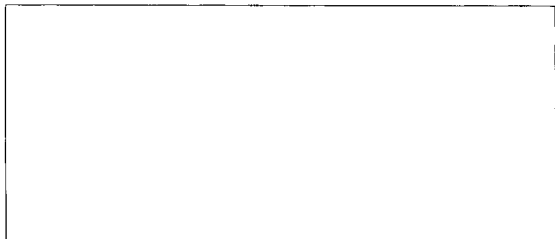
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**Warsaw Pact Ammunition
Logistics in the Western
Theater: Sustainability
for Offensive Operations** []

Key Judgments

*Information available
as of 1 June 1989
was used in this report.*

Warsaw Pact views on the nature and results of a theater war between NATO and the Pact have changed in recent years, forcing the Pact to re-evaluate its logistic planning. Through the mid-1970s, Pact planning was based on a belief that NATO's conventional capabilities were relatively weak, and the alliance was almost certain to initiate nuclear warfare in an effort to avoid conventional defeat. In contrast, Pact [] military writings now indicate a Pact perception that NATO conventional forces have become substantially more difficult to defeat and, consequently, that NATO has become more capable of delaying, and perhaps averting, the collapse of its conventional defenses. Therefore, the necessity for NATO to resort to early use of nuclear weapons has decreased. The Pact also believes that it has achieved the ability to at least match NATO's nuclear strength and that this, in turn, has reduced NATO's incentive to initiate nuclear use because NATO could achieve no decisive result with small-scale strikes, and large-scale strikes would bring about a devastating Pact response. In the Pact view, this nuclear stalemate could lead to a protracted, worldwide conflict between the two alliances that would be fought with conventional weapons and continue for weeks or months, perhaps even longer.

[]

In classified Pact writings, some Pact officers have expressed concern over the implications for logistic sustainability for an extended conventional war. They have challenged standing Pact planning assumptions used to estimate ammunition expenditure as outdated because they still assumed an early collapse of NATO's defenses and have questioned the adequacy of current stocks. The Pact has taken note of NATO's effort to increase its ammunition stocks and believes that NATO will eventually establish stocks to support 90 days of conventional combat. []

We have examined two scenarios for war in Europe that cover a range of possibilities, from the quick Pact victory now judged by senior Pact officers as unlikely to the more likely intense conventional war lasting for at least 30 days. Our calculations indicate that:

- The Pact has enough ammunition storage capacity in the Western Theater of Military Operations (TMO)—about 3 million metric tons—to support 60 to 90 days of conventional combat *if the Pact could overcome NATO's forward defenses within two to three days* and then maintain rates of advance of 40 to 50 kilometers a day.

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- Pact ammunition stocks in the Western TMO would last only about 30 days if NATO's defenses did not collapse and the Pact continued the offensive. Under these circumstances, the Pact would consume about 1.7 million metric tons of ammunition during the first 15 days of operations. Pact ammunition consumption would approach 3 million metric tons by the end of the first month.

These new calculations change some of our previous assessments of Pact ammunition sustainability in the Western TMO. Overall, we conclude:

- The Pact could meet its requirement to support the initial 15-day theater offensive operation out of stocks deployed in Eastern Europe. This is in consonance with previous assessments that the Pact would not have to move large stocks of ammunition into the forward area prior to the start of combat.
- The Pact would have to draw on ammunition stocks located in the western USSR between 15 and 30 days after the start of operations. This changes previous assessments that the Pact could support operations for an extended period from forward-deployed stocks.
- If the Pact were forced to fight at a high level of intensity for 15 days or more, forward-based Pact stocks would be exhausted and ammunition shortages would almost certainly begin to hinder its ability to continue large-scale offensive operations. This changes our previous assessment, currently used by NATO, that the Pact could sustain 60 to 90 days of conventional combat under all scenarios.
- The Pact could move ammunition stocks from other TMOs or from the strategic reserve to bolster sustainability. Depending on the level of combat, however, the Pact ultimately would have to move 1,000 to 2,400 four-axle railcars of ammunition—about 40,000 to 100,000 metric tons—into the forward area each day to support operations.

The sustainability judgments of this analysis are based on the ammunition consumption of Pact forces engaged in the type of theater offensive they would need to conduct to defeat current NATO forces. The Pact's announcement in May 1987 that it had adopted a defensive doctrine that abandons offensive operations beyond its borders, coupled with its announced unilateral force cuts, suggests a move away from this kind of

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theater offensive. The Commandant of the Soviet General Staff Academy, however, has stressed to a US military delegation that the Pact would destroy an intruder that attempted to continue a war after being expelled from Pact territory [redacted]

[redacted]

Even with the Pact's unilateral cuts, it would still be able to generate a multifront force—although more time would be needed to mobilize and prepare it. Although force restructuring resulting from the unilateral reductions may change the equipment mix of Pact forces assembled for an offensive and, therefore, the details of our calculations for ammunition expenditure, the basic conclusion of this analysis will remain—that ammunition sustainability is a potentially critical limiting factor to Pact offensive or counteroffensive operations against NATO. Substantial *mutual* force reductions, such as those currently proposed at the negotiations on Conventional Forces in Europe (CFE), would certainly require a reevaluation of Pact sustainability, together with most other aspects of a potential NATO-Pact conflict [redacted]

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Scope Note

This assessment analyzes how the Warsaw Pact commander in the Western Theater of Military Operations (TMO) and his staff might see the wartime logistic requirements for conventional ammunition in that theater and the current Pact capability to meet those needs. It reviews classified Pact planning factors used in computing expected ammunition consumption for offensive operations; applies them to compute total ammunition requirements for the theater; and compares requirements to existing stocks to estimate sustainability. This assessment addresses the Soviet perspective on sustainability; however, it makes some reference to US and NATO planning factors for purposes of comparison.

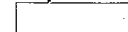


This assessment focuses only on ammunition expenditures required in any major Pact theater offensive operations into NATO territory in the Western TMO. It does not address the additional requirements that the Pact might envision if the offensive is preceded by an initial defensive phase.



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Warsaw Pact Ammunition Logistics in the Western Theater: Sustainability for Offensive Operations

Without the most careful organization of the rear services based on precise mathematical calculations, without organizing correct supply of the front with everything needed to conduct military operations, without the most precise calculation of shipments supporting rear supply, without organizing evacuation questions, the correct and reasonable conduct of large military operations is inconceivable. (U)

M. V. Frunze
Collected Works, Moscow-Leningrad, Gosizdat,
Vol. 2, 1926, pp. 37-38

Background

Pact views on the nature and results of a theater war between NATO and the Warsaw Pact have changed in recent years. Through the mid-1970s, Pact planning was based on a belief that NATO's conventional capabilities were relatively weak and the alliance was almost certain to initiate nuclear warfare in an effort to avoid conventional defeat. In contrast, the Pact now believes that NATO conventional forces have become substantially more difficult to defeat and, consequently, that NATO has become more capable of delaying and perhaps averting the collapse of its conventional defenses. Therefore, the necessity for NATO to resort to early use of nuclear weapons has decreased. The Pact also believes that it has achieved the ability to at least match NATO's nuclear strength and this, in turn, has reduced NATO's incentive to initiate nuclear use because NATO could achieve no decisive result with small-scale strikes, and large-scale strikes would bring a devastating Pact response. In the Pact view, nuclear stalemate could lead to a protracted, worldwide conflict between the two alliances fought with conventional weapons and continuing for weeks or months, perhaps even longer.

¹ For a more extended discussion on Pact views and doctrine on the likely nature of theater war against NATO, see NIE 11-14, February 1989, Trends and Developments in Warsaw Pact Theater Forces and Doctrine Through the 1990s. (S NF)

Pact ammunition planning requirements for war in the Western Theater of Military Operations (TMO) are directly related to the length and intensity of conventional operations. Classified Pact writings from the mid-1970s state that a front would require 120,000 to 150,000 metric tons of ammunition to support an operation lasting 12 to 15 days if—as the Pact then expected—the operation were conducted with nuclear weapons. These writings also state that the front would need one and a half to two times as much ammunition—as much as 300,000 metric tons—if the same operation were conducted solely with conventional weapons. According to classified Soviet writings from the mid-1980s, a high-ranking Soviet General Staff officer estimate that the quantity of material and ammunition to support a 12- to 15-day front conventional operation was continuing to increase and that 300,000 to 400,000 metric tons of ammunition might be required—about 2.5 times the previous requirements for operations using nuclear weapons. Pact ammunition storage capacity in the TMO was also increasing during this period (see inset), which would appear, on the surface, to improve the Pact's capability to conduct sustained combat operations against NATO.

Projected ammunition expenditure rates are a function of the concept of operations. Pact planning factors from the mid-1970s and those of the early 1980s both presupposed a rapid victory over NATO with or without the use of nuclear weapons. Specifically, they both assumed that ammunition consumption would be very high only in the early days of a conflict while the Pact was trying to break through NATO's forward defenses, and would drop off dramatically thereafter, as Pact forces exploited their initial success. Either nuclear or conventional operations, if they met their stated objectives, would have resulted in the decisive defeat of NATO within about 14 days.

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Growth in Conventional Ammunition Stocks

Since the mid-1970s, there has been a substantial increase in the conventional ammunition storage capacity of both Soviet and non-Soviet Warsaw Pact forces assigned to the Western TMO.* Soviet capacity^b in front-level depots in East Germany, for example, increased from 185,000 metric tons in 1976 to 473,000 metric tons in 1984. Total Soviet stocks in East Germany reached about 700,000 metric tons in 1984, while East German national stocks grew from 120,000 to 210,000 metric tons over the same period. We estimate that total Soviet and non-Soviet storage capacity in the Western TMO, including the western USSR, currently stands at approximately 3 million metric tons.

At least through the early 1980s, therefore, Pact logistic planning assumptions for wartime requirements for conventional ammunition were based on two basic expectations:

- Any war against NATO would either begin with the use of nuclear weapons or would escalate to their use within a few days. The firepower of nuclear weapons would largely substitute for the massed formations of artillery used to break through enemy defenses during World War II.
- Even if the war remained conventional, the Pact would achieve a quick breakthrough of NATO's forward defenses, followed by a rapid exploitation through the full depth of the Western TMO.

Regardless of how war was fought, the Pact expected heavy consumption of conventional ammunition only during the first days of operations.

Changing Expectations for War

Pact planners are no longer confident of a rapid Pact victory over NATO. Classified Pact writings from the mid-1980s state that the conventional phase of a NATO-Pact war could last weeks or even months—perhaps never escalating to nuclear war. Senior Pact officers believe that NATO expects that a NATO-Pact war would involve prolonged conventional operations and that NATO is gearing its force planning and preparation accordingly. They believe, as part of this preparation, that NATO is establishing stocks of materiel in central Europe, including ammunition, that will be able to sustain 90 days of conventional combat.

* The forces available to the Western TMO include the Soviet Groups of Forces and national forces in East Germany, Poland, and Czechoslovakia, and the Soviet forces in the Baltic, Belorussian, and Carpathian Military Districts (MDs).

Pact military threat assessments since the mid-1970s also show a concern for the steady improvement in NATO's defensive capabilities that could deny the

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Pact a quick victory and force a prolonged conventional war. According to these assessments:

- NATO's tactical defenses are thicker and denser than in the past and are heavily saturated with antitank-guided missiles.
- NATO's defenses are more responsive than they used to be, able to shift forces from one defensive sector to another, and mass tactical or operational reserves against any threatened breakthrough.
- NATO's ground-based and airborne air defenses have been modernized and expanded.
- NATO has increased its ability to augment its defenses through rapid reinforcement from the continental United States and the United Kingdom. The time required for the United States to fly 100 percent of its prescribed reinforcement aircraft and 60 percent of its reinforcement land forces is only 10 to 15 days after mobilization begins.
- Although NATO doctrine is built around forward defense, it has acquired significant strategic depth with the near-certain involvement of French territory and forces in a NATO-Pact conflict.

As a result of these NATO improvements, references in Pact writings to rapid breakthroughs achieved in one to two days have been replaced by such terms as "agonized gnawing" through NATO tactical defenses, operations that could take three to six days. Because of NATO's greater strategic depth, the Pact theater commander, even if successful initially, would have to extend the strategic objectives of the offensive past West Germany and the Low Countries another 300 to 400 kilometers to include France.

[redacted]

The Pact has implemented a number of responses to offset NATO's initiatives:

- The Pact apparently plans to dedicate more troops and equipment to the first strategic echelon to establish a greater preponderance of forces on line to force a breakthrough along narrower attack sectors [redacted]

sustained Pact theater offensive operation against NATO in Central Europe probably would begin with four—rather than three—fronts² in the first strategic echelon.³ Classified Pact writings from the mid-1980s also indicate that these first-echelon fronts might have subsequent tasks to the full depth of the TMO, which could require them to conduct two consecutive offensive operations.

- In wartime, the Pact would form new task-oriented formations, or operational maneuver groups (OMGs), at army and front level, whose primary objective would be to engage NATO reserve formations to prevent them from intervening in the battle on NATO's main defensive lines.
- To help overcome improved NATO defenses, the Pact has added independent artillery formations to its overall force structure and has increased the amount of artillery in tank and motorized rifle divisions (MRDs).
- The Pact has increased the number of refires available for surface-to-surface missiles (SSMs). It has also placed increasing emphasis on the use of SSMs with conventional warheads to destroy or suppress high-threat NATO systems, including air defenses.
- The Pact has developed new, more extended, integrated fire plans to make better use of air assets, both fixed wing and helicopter, to suppress NATO precision weapons while Pact forces are moving forward prior to the attack. [redacted]

² Pact doctrine specifies the front as the largest field force within a continental TMO. A front is similar—in size, level of command, and function—to a NATO army group and its associated air forces. While there is no standard organization for a front, it would usually include three to five tank and/or combined-arms armies and a front air force. (S, NF)

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Despite these force improvements, the Pact remains concerned that NATO could force the Pact to conduct protracted conventional operations.

time, Pact writings—both classified and unclassified—indicate that some senior Pact officers believe that there are serious problems with the planning techniques that have been used to generate wartime logistic requirements. They believe that these techniques have caused the Pact to seriously underestimate wartime logistic requirements and, as a result, have led the Pact to set logistic stock levels too low.

Criticism of Pact Planning

Pact ammunition planning factors are based on demonstrated consumption during major World War II operations, modified by logistic plans developed during post World War II. In authoritative writings, some Pact officers argue that the ammunition expenditure rates demonstrated by many of the World War II operations can be misleading when used to derive planning factors to support contemporary operations. Many of the World War II operations, they point out, were actually hampered by critical ammunition shortages, even though the overall operation was successful. These officers maintain that modern planners must be aware of these shortages and must compensate for them in developing current plans if earlier errors are not to be repeated.

As an example, one officer points out that most of the artillery ammunition expended during World War II offensives was expended during the first one to two days of operations, during the breakthrough of German forward defenses. As the offensive progressed, artillery ammunition was not available, either because stocks had already been depleted or, more commonly, because there was not enough transport to bring artillery and ammunition forward to support the advance. The offensive, in effect, had outrun its artillery support. This frequently resulted in serious reverses and high casualty rates when the advancing Soviet forces came up against subsequent defenses and had to attack without adequate fire support. The average expenditure rates of these operations, therefore, represent what was available to fire, and not what was either necessary or planned.

The basic changes in Pact force structure and operational plans require significant increases in ammunition stocks to support a successful conventional offensive. The possibility that the initial Pact offensive could fail to achieve a decisive result has forced it to address the potential requirements of an extended war for the first time since World War II. At the same

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Pact officers argue, moreover, that logistic plans based on the World War II model ignore fundamental changes in the expected conduct of operations. Modern operations, they point out, not only require heavy artillery support during the initial breakthrough of the enemy's forward defenses, but also require continuous artillery support as the offensive progresses—to fight off counterattacks by NATO reserves and to overcome deeper defensive positions set up to halt the Pact's advance. Pact planning factors in use as late as the early 1980s, however, did not allow for high rates of ammunition expenditure throughout the course of the operation. Specifically, they still assumed that ammunition consumption would be high only in the early days of a conflict—while the Pact was trying to break through NATO's forward defenses—and would drop off dramatically thereafter. If a breakthrough was not achieved quickly, however, the Pact would be forced to fight at an intense level of combat for a longer period than planned and with much higher rates of ammunition consumption. Thus, if future shortages are to be avoided, these officers argue, expected ammunition consumption should be based on expenditure experienced during intense periods of combat, and these expenditure rates should be extrapolated to cover the full period of operations.

Command-staff exercises, these same critics maintain, have not clarified the problem, because they address only specific segments of logistic planning and not the entire course of the theater operation. Command-staff exercises, these officers point out, do not play every day of the war in sufficient detail to develop realistic ammunition consumption figures for the total operation. Theater-level exercises, which often address the whole course of the initial operation, are played using front and army staff elements, which do not have the time or personnel to develop detailed fire plans. Army- and division-level exercises do play detailed fire plans but do not address the entire course of the theater operation. Pact officers complain that the results obtained from theater-, army-, and division-level exercises have not been properly integrated, which, if done, could highlight existing deficiencies. Instead, the intermediate consumption figures are provided by the umpires to the exercise staffs from tables containing the same average consumption rates

used in existing Pact logistic plans—a circular process with no prospect of informing or correcting Pact planning figures.

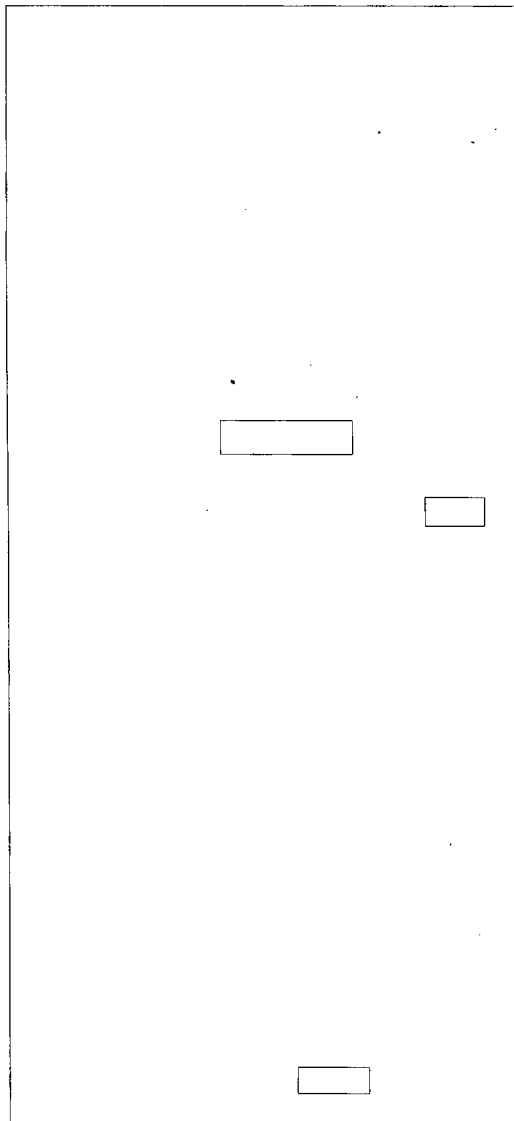
The concerns expressed by these Soviet officers probably are valid. The ammunition planning factors used by the Pact in the early 1980s allowed for an average expenditure by tube artillery during the first 90 days of combat of eight to 16 rounds per gun per day—depending on the type.¹ Classified Pact writings

show fire plans for breakthrough operations that call for expenditure of 200 to 300 rounds per gun per day during the first day of the theater offensive.

Ammunition Consumption and Sustainability Today

There can be no single estimate for Pact ammunition sustainability in the Western TMO. Estimates of sustainability must be calculated for specific scenarios

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to be meaningful, and must be based on clear assumptions on how the war is progressing and the level of intensity at which the Pact chooses—or is forced—to fight. The key factor in determining Pact sustainability is NATO's ability to maintain a cohesive defense. Our calculations indicate that the Pact will have a sustainability problem if NATO can maintain a cohesive forward defense for about two weeks and avoid a total collapse for the first month, *even if the Pact were to press the offensive with only a portion of the forces of its first strategic echelon.*

In our analysis, we have examined two scenarios that cover a range of possibilities—from a quick Pact victory to an intense conventional war between the Pact and NATO that lasts for at least the first 30 days. We calculate Pact ammunition consumption for each scenario on the basis of the forces committed to combat and an estimate of the rate at which these forces will expend ammunition. In the first scenario, we use the Pact planning factors contained in classified Pact writings from the early 1980s to compute expenditure rates for a quick victory. For the second scenario, we recompute ammunition consumption using other appropriate planning factors to estimate the effect of a longer period of intense conventional combat on theater sustainability.

We hold several assumptions constant for each scenario to simplify the calculations for ammunition sustainability, to provide a meaningful comparison, and to ensure that we do not *understate* Pact sustainability. For both scenarios, we assume:

- All of the ammunition storage facilities listed in the inset are filled to their estimated capacity. Classified Pact writings show that this is not true in every case. We do not, however, have sufficient information on these facilities to determine the total percentage of the theater's storage capacity actually in use.
- All of the ammunition stocks are dedicated to the ground forces. Classified Pact writings state that some depots contain stocks for both ground and air

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units. We lack sufficient information to estimate accurately the amount of ammunition held for air units (although there is evidence to indicate Pact air forces need only about 10 to 15 percent of the tonnage of the ground forces). As a result, our calculations assume that Pact air forces—both fixed-wing and helicopter—consume no ammunition during the operation.

- The Pact will apportion ammunition to the fronts as needed regardless of who owns the stocks in peacetime. Classified Pact writings indicate that each member of the Pact is responsible for providing logistic stocks and rear service units to support its own forces during war. The writings also indicate, however, that the Commander in Chief of the Warsaw Pact forces—a Soviet—has the authority to transfer stocks regardless of national ownership to meet operational needs.
- There is no compatibility problem between the existing ammunition stocks and the weapon systems deployed by the Pact forces. Classified Pact writings indicate that such problems do exist and that in certain instances they are quite severe. We assume, however, that one class of weapons would not run out of ammunition before another.
- There is no problem transporting ammunition from depots to the user. Classified Pact writings indicate that the transportation problem is severe and is one of the major limitations on operations. We do not, however, address the possibility of a Pact offensive that must be suspended because ammunition cannot be delivered to the forces.
- There has been no ammunition used in defensive operations before the start of the theater offensive. Also, no ammunition is allocated to support airborne operations, amphibious operations, or operations of internal and rear area security forces.
- There is no ammunition lost to enemy action.
- There is no reinforcement of the Western TMO by units from other TMOs or the strategic reserve. Also, we assume that second-echelon fronts do not deploy any of their subordinate units—such as

independent artillery divisions, regiments, and brigades—forward early to reinforce first-echelon fronts. We assume that second-echelon fronts expend no ammunition until committed to combat. In each scenario, we begin to replace the Coastal Front with the Belorussian Front on the 15th day of operations, with the Coastal Front moving into TMO reserve. The Baltic Front is held in reserve for the duration of operations and consumes no ammunition.

These assumptions could result in underestimating the theater's total ammunition consumption and overstating the amount of ammunition that would be available to support the ground forces by as much as 20 to 25 percent. Our calculations, therefore, provide an upper bound on ammunition sustainability based on the size of the total stock.

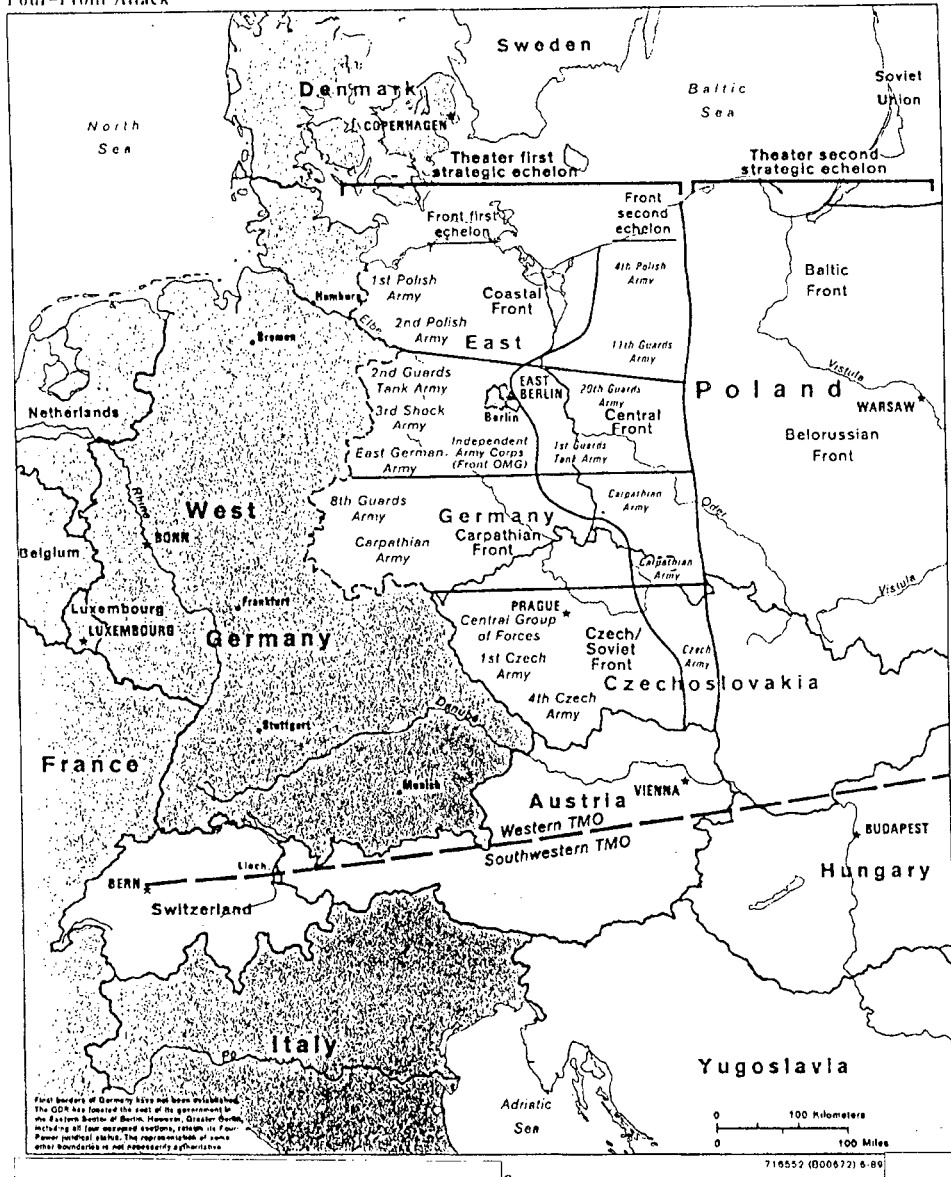
For both scenarios, Pact forces in the Western TMO are organized into six fronts, with four fronts deployed in the first strategic echelon (see figure 1). The important variable in each scenario is the length of time it takes the Pact to achieve a decisive breakthrough of NATO's defenses. In the first scenario, we assume that the Pact fights three days of intense combat before shifting to exploitation operations. Under these conditions, the Pact would succeed in occupying that portion of Western Europe down to the French/Spanish border in a period of about 30 days of offensive operations, with neither side using nuclear weapons. In the second scenario, we assume the Pact experiences about two weeks of intense combat before breaking through NATO's forward defenses. Only the Pact's two center fronts of the first strategic echelon experience intense combat.^a We assume, however, that the Pact puts its major effort behind one front—the Central. The flanking fronts are secondary axes with much lower ammunition consumption. We assume that, during the first two weeks of combat, NATO has time to move its theater reserves—such as the US III Corps—behind the threatened sector to prevent a clean breakthrough and

^a See appendix A for a detailed discussion of the composition of each front and the planning factors used to compute expected ammunition consumption.

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Figure 1
Projected Warsaw Pact Echelons in the Western TMO:
Four-Front Attack



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that the two Pact center fronts require a further two weeks of moderately intense combat to complete the defeat of NATO reserve forces before shifting to exploitation operations.⁷ []

Scenario One: A Quick Victory

Our calculations indicate that the Pact has enough ammunition storage capacity in the Western TMO to support 60 to 90 days of conventional combat if it can quickly overcome NATO's forward defenses and maintain the high rates of advance—40 to 50 km a day—associated with exploitation operations (see table 1 and figure 2). For such an operation, we calculate that the fronts of the first strategic echelon would need just over 1 million metric tons to support the first 15 days of operations—which would carry the Pact to the vicinity of the French border—and that the theater would need a total of about 1.8 million metric tons to complete the offensive through France.⁸ []

Ammunition stocks in Poland and the western USSR would have to be brought forward for use during the course of the operation, even if the Pact achieved a quick breakthrough of NATO's forward defenses. The Pact's approximately 1.4 million metric tons of ammunition in East Germany and Czechoslovakia—910,000 metric tons and 500,000 metric tons, respectively—are enough to meet the computed requirements of the first strategic echelon for about three weeks. Three of the first-echelon fronts, however, probably would be attacking out of East Germany and would draw on stocks located there. These three fronts would require just over 800,000 metric tons—out of the total requirement of just over 1 million metric tons—to support the first 15 days of offensive operations. Our calculations show that they would exhaust the 910,000 metric tons located in East Germany in less than three weeks. Polish stocks of about 400,000 metric tons would last for about another week, after which the theater would have to draw on stocks in the USSR.⁹ []

⁷ The scenario for an extended conventional operation is based on potential scenarios discussed in classified Pact writings. []

⁸ A Pact offensive that met the specified campaign objectives would, in effect, achieve a decisive defeat of NATO within the first 30 days. The assessment that the Pact would have 60 to 90 days of ammunition stocks is somewhat problematical since the war would probably not last that long. []

Table 1
Estimated Ammunition Consumption
in the Western TMO ^a

Thousand
metric tons

	15 Days	30 Days	60 Days	90 Days
Scenario one				
Quick victory	1,100	1,500 to 1,800	2,400 to 2,600	3,200 to 3,500
Scenario two				
Extended war	1,700	2,800 to 3,000	3,600 to 3,900	4,500 to 4,700

^a The range of consumption reflects different assumptions of overall ammunition expenditure after the Belorussian Front replaces the Coastal Front on day 15. The lower figure assumes that ammunition consumption by the Coastal Front drops to zero immediately on day 15. The higher figure assumes that there is a turnover period of about 15 days during which the Coastal Front gradually disengages from combat. During this period, the Coastal Front consumes ammunition at about half the rate experienced during the first 15 days.

Scenario Two: An Extended War

Our calculations indicate that Pact ammunition stocks in the Western TMO would last about 30 days if NATO's defenses did not collapse and the Pact continued the offensive to force a decision. Under these circumstances, the Pact would consume about 1.7 million metric tons of ammunition during the first 15 days of operations. This would exhaust ammunition stocks in East Germany and Czechoslovakia in less than two weeks. The total ammunition stock in the forward area—including the ammunition in Poland—would last just over two weeks. By the end of the first month, Pact ammunition consumption would approach 3 million metric tons—which would have to include stocks from the western USSR.¹⁰ []

Implications for the United States and NATO

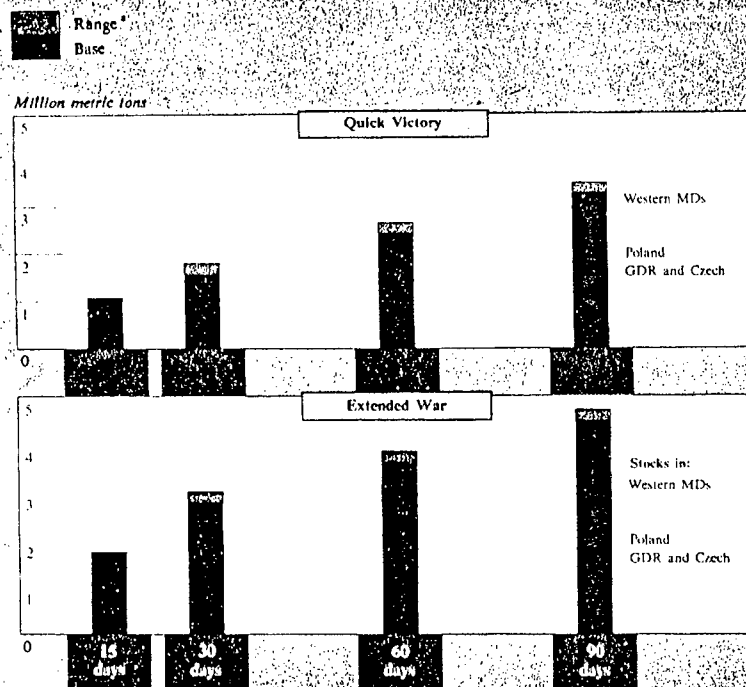
These new calculations change some of our previous assessments of Pact ammunition sustainability in offensive operations against NATO forces in the Western TMO. Overall, we now conclude that:

- The Pact could meet its requirement to support the initial 15-day theater offensive operation from stocks deployed in Eastern Europe. This judgment is

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Figure 2
Estimated Ammunition Consumption in the Western TMO



*Notes variation and assumptions in calculations.

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in consonance with previous assessments that the Pact would not have to move large stocks of ammunition forward prior to the start of combat. It would have to draw on stocks in Poland before the first two weeks were up, however, if NATO were able to maintain a cohesive defense and force the Pact to fight at a high level of intensity for more than two to three days.

- The Pact would have to begin to draw on ammunition stocks located in the western USSR between 15 and 30 days after the start of operations. This judgment differs from previous assessments that the Pact could support operations for an extended period from forward-deployed stocks. We now estimate that the Pact would have to begin transporting

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ammunition forward immediately after the outbreak of hostilities to prevent any disruption in ammunition supply after the initial forward-deployed stocks were consumed. This judgment supports our earlier assessment that the Pact would need two to three weeks to fully prepare its forces in Central Europe for sustained operations, in part because its front and theater rear services—which would have to begin intense operations almost immediately upon outbreak of war—are at a very low state of readiness during peacetime.

- The Pact would have enough ammunition stocks in the theater to support 60 to 90 days of conventional combat if it could achieve a decisive breakthrough of NATO's defenses within the first few days of hostilities.
- Severe ammunition shortages would almost certainly begin to hinder the Pact's ability to continue offensive operations if it were forced to fight at a high level of intensity for 15 days or more. The Pact would not have enough ammunition in the *forward area* to fight beyond the initial 15-day theater offensive operation, assuming that it expended ammunition at the rate experienced during intense combat. The Pact would not have enough ammunition in the *entire theater*, including the western USSR, to fight beyond 30 days at these high rates.
- If necessary, the Pact could move ammunition stocks from other TMOs, such as the Southern or Far Eastern, or from the military districts held in strategic reserve. The Southern TMO, however, has storage capacity for only about 1 million metric tons of conventional ammunition, while the Far Eastern TMO has a capacity of about 2 million metric tons. Moving significant amounts of these stocks would be time consuming and disruptive and would seriously weaken the military capability of these theaters. Depending on the level of combat, the Pact would need 1,000 to 2,400 four-axle railcars of ammunition—about 40,000 to 100,000 metric tons—arriving in the forward area each day to support operations.

Outlook

For the foreseeable future, the Pact commander in the Western TMO will not have sufficient stocks of ammunition in place to ensure that major shortages do not occur if he is forced to sustain conventional offensive operations against NATO for an extended period. If Pact ammunition consumption ran at levels close to that demonstrated during recent wars and NATO's defenses held for about 15 days, the Pact could be forced to limit the scope and pace of operations. If the Pact intended to wage extended conventional operations, it would either have to dramatically increase stocks, limit the theater's rate of expenditure by varying the intensity of operations across the theater, or balance expenditure from mobilized production (see appendix B).

The New Defensive Doctrine and Unilateral Pact Force Reductions

Pact spokesmen have long held that Pact military doctrine and forces are defensively oriented despite the fact that they embraced preemptive offensive operations to destroy potential "aggressors." The Pact moved to clarify the apparent contradiction at its Political Consultative Committee meeting in 1987 by formally adopting a defensive doctrine that abandons offensive operations even if provoked by potential "aggressors." This was followed by General Secretary Gorbachev's announcement in December 1988 that the Pact would make major unilateral cuts in its forces, including those oriented against NATO. The announced Pact arms reductions, once implemented, and the shift to a defensive doctrine will leave it with a smaller total force that should require less total logistic support.

Senior Soviet military officers, however, have stated that the new defensive doctrine does not mean that Pact forces will adopt a passive defense. In March 1989 the Commandant of the Voroshilov General Staff Academy, General of the Army Salmanov, stressed to a US military delegation that an intruding enemy would be destroyed if it continued the war after being expelled from Soviet territory.

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[redacted] as General Sal-
manov stated—that the Pact continues to plan for a
transition to multifront strategic counteroffensive op-
erations after about two weeks of conventional defen-
sive operations. The forces to be engaged in a strate-
gic counteroffensive [redacted] are not
substantially different from—indeed, in some cases
may even have been larger than—the Pact forces
formerly engaged in a theater offensive operation.
This is because the force requirement for a theater
offensive or counteroffensive against NATO—which
has not yet reduced its forces—is driven by the Pact's
perception of the force required to defeat NATO. We
estimate that the logistic requirements of a theater
offensive or counteroffensive would be driven by both
the size of the force committed and by the length and
intensity of combat. As a result, a theater offensive or
counteroffensive would need approximately the same
level of logistic support and be subject to similar
logistic constraints, depending on how the operation
progressed. [redacted]

Even after the announced unilateral Pact arms reduc-
tions have been implemented, the Pact still will be
able to generate the same size force we use in our
scenarios to estimate wartime ammunition expendi-
ture in the Western Theater. This is because the Pact
forces deployed in the first-echelon fronts in these
scenarios represent only a portion of the total force in
the theater (see table 2) and contain only about 25
percent of the Pact's fire-support assets and 40 per-
cent of its tanks currently opposite NATO. Conse-
quently, even the calculations for ammunition con-
sumption for the intense war scenario are based on a
higher ammunition expenditure rate for only about 15
percent of total Pact fire-support assets in the TMO.
[redacted]

The overall effect on ammunition requirements of
pending changes in Pact force structure is uncertain.
The Soviets, for example, have announced that they
will reduce the number of tanks by 20 percent in tank
divisions and by 40 percent in motorized rifle divisions
to decrease the "offensive" potential of Pact forces.
The Commander of the Group of Soviet Forces in
Germany, however, has stated the "defensive" poten-
tial of Soviet divisions will be raised by increasing the

number of antitank and artillery systems.* These
changes could easily increase the Pact's requirement
for ammunition, because artillery consumes far more
ammunition tonnage than tanks—from two to three
times as much—for a given level of combat. [redacted]

If future arms control negotiations lead to substantial
mutual NATO-Pact force reductions, such as those
proposed in May 1989 at the talks on Conventional
Forces in Europe (CFE), we will need to reevaluate
Pact sustainability. The implications of substantial
mutual force reductions, however, are so significant
that we would have to reevaluate not just logistics but
most of our current assessments on the nature of a
NATO-Pact conflict. [redacted]

The primary military effect of the Pact's initial
unilateral force reductions probably will be to in-
crease the time needed to generate forces for an
offensive operation against NATO, because the Pact
would have to rely more on units that require substan-
tial preparation to achieve adequate combat capabili-
ty. The Pact's ability to mount large-scale counterof-
fensive operations is subject to the same basic
constraints. The announced reductions do not yet
affect the fundamental conclusions of this analysis—
that the Pact would have a problem sustaining a
conventional offensive in the Western TMO if
NATO's defenses held. [redacted]

* The Soviets have been concerned, for some time, with establishing
the proper mix of infantry, tanks, and artillery in their divisions to
effectively conduct combined-arms operations. Some Soviet officers
have argued that their divisions had become "tank heavy" and
would suffer excessive losses of armored vehicles because of
inadequate infantry and artillery support. As an example, the
German armored divisions that moved against Poland in 1939 were
supposed to each be equipped with over 500 tanks, although most
had only between 300 and 400 because of a shortage of tanks. The
German armored divisions that overran France in 1940 had a
different structure and were equipped with between 200 and 300
tanks. The distinction between the "offensive" armored divisions of
1939 and the "defensive" armored divisions of 1940 was probably
lost on the French. [redacted]

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Table 2
Summary of Warsaw Pact Weapons in
the Western TMO and the Atlantic-to-
the-Urals Zone *

	First- Echelon Fronts	Second- Echelon Fronts	TMO Total	Atlantic-to- the-Urals Zone *	
				Pact Total 1989	Pact Total 1991
Artillery, mortars, and multiple rocket launchers	17,720	5,280	23,000	71,560	63,060
Surface-to- surface missiles	660	110	770	1,608	1,608
Tanks	23,600	5,100	28,700	59,470	48,020

* The number of weapons in the first- and second-echelon fronts and the TMO total—are those held by the combat units that are, by our assessment, included in those formations. The 1989 Pact total is the number released by the Pact on 30 January 1989. The 1991 Pact total assumes that the cuts announced by General Secretary Gorbachev and his Pact allies have been fully implemented.

Remedies

We do not expect the Pact to increase significantly its ammunition stocks in the short term. Classified Pact writings show that the Soviets have been unable to get their Pact allies to build stocks on the basis even of the early 1980s' requirements. According to these writings, the Pact wanted to have sufficient ammunition stocks by 1985 to support 60 days of operations and recognized it had to postpone the eventual goal of 90 days. Not all Pact countries, however, were able to meet even the 60-day goal by 1985. Poland, for example, indicated that it was not able to meet the 60-day requirement for artillery and tank ammunition because of production and funding constraints. If Pact military leaders were to accept the logic of those officers arguing for a higher ammunition requirement, they would compound an already difficult problem and generate new ones. Extending increased ammunition planning requirements to all conventional weapon systems in the Pact inventory would require growth in the Pact's logistic infrastructure at a pace and scale that would burden its economies far beyond current levels.

To compensate for existing ammunition shortages, the Pact could alter its operational plans. Excluding resort to nuclear weapons, it could take several steps:

- The theater commander could use his authority to allocate logistic stocks to ensure that forces on the main offensive axes received adequate supplies of ammunition. Secondary axes, however, would probably have to ration their ammunition, particularly artillery ammunition, and could pay a price in higher casualty rates and slower rates of advance. The theater commander probably would attempt to lower the theater's overall ammunition requirement by limiting the number of major breakthrough attempts (see inset).
- The Pact could make more use of airborne fire support as a substitute for artillery. Our analysis indicates that the Pact has been placing increasing reliance on helicopters and fixed-wing aircraft to supplement and extend the coverage of ground-based fire support. Pact planning factors rate airborne systems as more effective than artillery, requiring less tonnage delivered on target to achieve the same degree of target destruction.¹⁰ Aircraft, however, require support from ground-based systems to suppress enemy air defenses and impose additional logistic demands for fuel and maintenance support. Classified Pact writings from the mid-1980s, moreover, indicate that ground-based systems—even after considering the increase in airborne fire support—would still have to meet 80 to 85 percent of overall front fire-support requirements.
- The Pact could make more use of precision-guided munitions in its fire planning to achieve required damage levels with less ordnance. Classified writings indicate that high-ranking Pact officers believe this is one option that they must develop if conventional operations are to remain viable.

¹⁰ Pact calculations credit air support with higher effectiveness because it is more accurate than artillery fire. This assumes, however, that the prevailing weather permits ground attack operations by aircraft.

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The Main Axis of Attack

Logistic preparations and operational considerations strongly suggest that the major breakthrough axes of the first strategic echelon will be south and west of Berlin on the Ruhr Valley operational axis:

- According to basic principles of Pact military planning, logistic support, like other military assets, should be concentrated on the main axis of attack. Logistic facilities in East Germany (maintenance, engineer support, ammunition stocks, petroleum, oil, and lubricants) are positioned primarily in the area south of Berlin (see figure 3).
- The commitment of a fourth front in the first strategic echelon allows the Soviet-East German Front to concentrate against the I West German Corps, the I Belgian Corps, and the I UK Corps. Classified Pact writings have long identified this sector of NATO defenses as the most vulnerable and designate it as the primary axis in the Western TMO. [redacted]

A breakthrough attempt in the area south of Berlin against the I Belgian Corps or I UK Corps would focus the best equipped and supported forces in the Pact against the weakest point in NATO's defenses. Breakthrough attempts on a different axis, while attractive in theory, would be very difficult to support without repositioning a significant portion of the logistic assets in East Germany before starting the operation. [redacted]

The potential impact of the ammunition logistic problem is related to the amount of time the Pact has to prepare for war. Our current assessment is that the Pact would need at least two to three weeks to fully prepare its forces in Central Europe for sustained

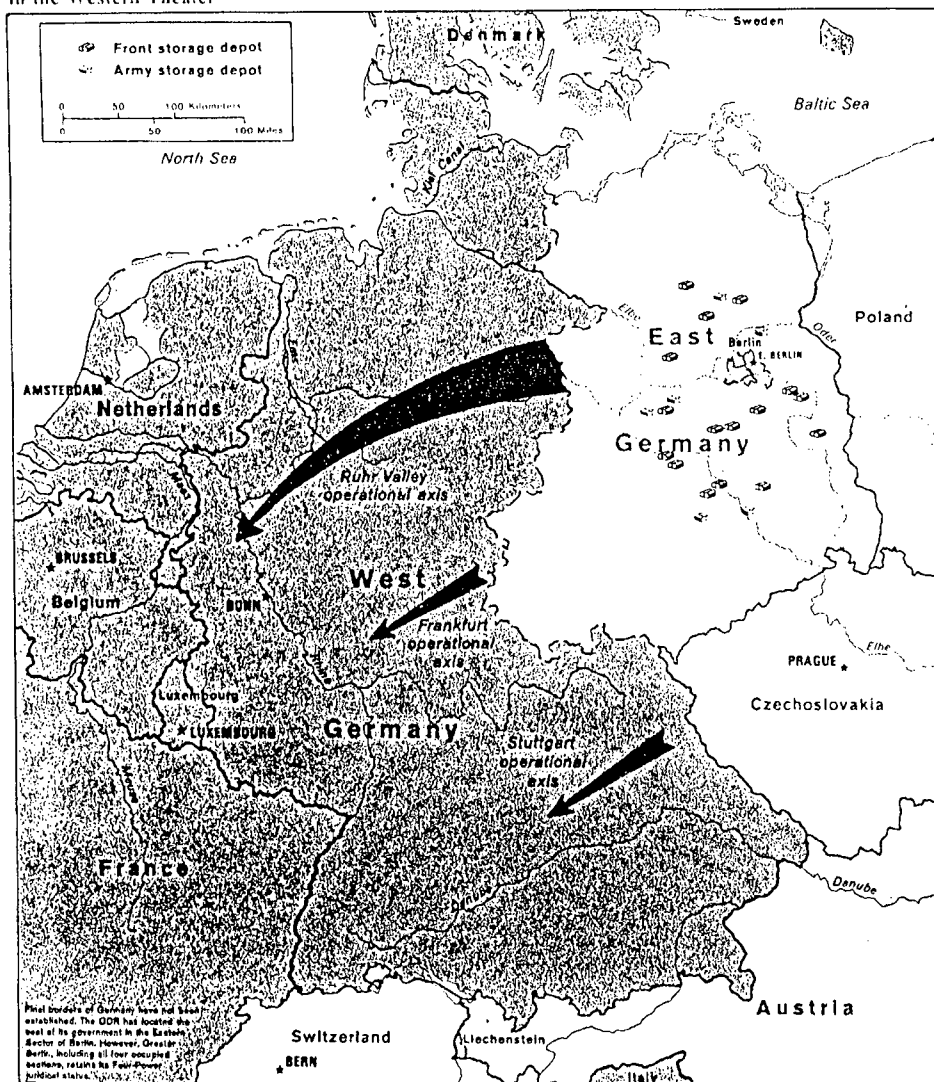
operations. [redacted] The start of sustained offensive operations would depend, in part, on the availability of the logistic units, which would have to move existing stocks into position to support that attack. Logistic units are at a much lower state of readiness than combat units and take more time to mobilize (see appendix B). After mobilization, the units then would have to move logistic stocks over a distance of 100 to 200 km to support a major attack on either the northern coastal axis or the southern Stuttgart axis. All of these activities would lengthen the time needed to prepare for the start of combat operations and probably telegraph their location to NATO. The Pact would also have to move these logistic stocks across the lines of communications of first-echelon forces engaged with NATO and the advancing forces of the second echelon, a procedure that would probably lead to confusion and severe supply problems. [redacted]

The main axis of attack of the second-echelon fronts would be difficult to predict. Our analysis indicates that the first strategic echelon would rapidly consume the stocks of ammunition in the forward area and that the second echelon would have to be supported primarily from stocks it would bring forward. The second echelon, therefore, would not be as limited as the first echelon by the placement of the existing logistic support facilities because it would have to establish new depots for its own support. These depots could be placed to reinforce the existing axis of attack or to change the direction of the main effort at the discretion of the theater commander. [redacted]

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Figure 3
Logistic Support for a Projected Warsaw Pact Offensive
in the Western Theater



Final borders of Germany have not been established. The GDR has located the seat of its government in the Eastern Sector of Berlin. However, Greater Berlin, including all four occupied sectors, remains the Four-Power jurisdiction status.

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Appendix A

Scenario Detail

We assume, for both scenarios, that the Pact has fully mobilized its forces in the Western TMO and that Pact peacetime ready and not-ready units are available at the start of operations. Pact forces in the Western TMO are organized into six fronts with four fronts deployed in the first strategic echelon. First-echelon fronts are the:

- *Coastal Front.* Three Polish armies reinforced by one Soviet army from the Baltic MD, for a total of 18 divisions.
- *Central Front.* Four Soviet armies based in East Germany, the East German Army, and the two Soviet divisions based in Poland, for a total of 26 divisions. This is the TMO's main front.
- *Carpathian Front.* Three Soviet armies from the Carpathian MD and one Soviet army transferred from those based in East Germany, for a total of 17 divisions.
- *Czech/Soviet Front.* The Czechoslovak Army and the Soviet forces based in Czechoslovakia, for a total of 18 divisions.

The first strategic echelon includes the New Army Corps from the Belorussian MD operating as an operational maneuver group. The second strategic echelon is comprised of the Belorussian Front (12 divisions from the Belorussian MD) and the Baltic Front (the six remaining divisions in the Baltic MD). The Baltic Front is an army-size formation that would have to be reinforced by units from the strategic reserve before being committed as a front.

Pact ammunition consumption is computed by applying Pact planning factors to the estimated wartime order of battle. Classified Pact writings from the early 1980s contain the planning factors Pact staff officers were to use to compute the expected consumption and the required reserve for the first 90 days of war (see tables 3 and 4). These plans assumed that Pact forces would conduct offensive operations for 15 days and then shift over to the defensive for 15 days. Consumption during the second and third months of combat was computed at 80 percent of consumption for the first 30 days to account for equipment losses. Total expected consumption during this period was below what would be required for sustained offensive operations, but above what would be needed for a static

defense. Extended combat, based on these estimated requirements, probably was assumed to include periods of both offensive and defensive operations.

The planning factors used by the Pact in the early 1980s were based on a single 15-day front offensive operation that probably did not include operations against France. By the mid-1980s, the Pact expected to continue the theater operation through France and anticipated at least 30 days of offensive operations. As a result, the early 1980s' planning factors were already obsolete.

The computations we use for our quick-victory scenario assume that the Pact would conduct a 30-day offensive. The planning factors we use for this scenario are based on the Pact factors from the early 1980s but updated to reflect the higher requirements for 30 days instead of the previously used 15 days of initial offensive operations (see table 5).

The extended war scenario is more stressful for the Pact. In this scenario, we assume that the Pact fights two weeks of intense combat before breaking through NATO's forward defenses. We also assume that the intense combat is confined to the Pact's two center fronts in the first strategic echelon and that the two flanking fronts are secondary axes. The ammunition consumption of the flanking fronts follows the same distribution as in the first scenario—three days of high consumption falling off to a lower rate thereafter. We apply higher rates of ammunition expenditure to the fire-support assets—artillery, mortars, multiple rocket launchers, and SSMS—in the two center fronts. We do not apply higher expenditure factors for any other weapon system—tanks, small arms, antitank, or air defense—to simplify the calculations.¹¹

¹¹ Classified Pact writings indicate that the Pact expects all weapon systems to expend ammunition at higher rates during intense combat; however, fire-support systems expend the majority of the front's allocated tonnage. As a result, our calculations will tend to underestimate Pact ammunition consumption.

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Table 3
Ninety-Day Ammunition Requirements in Units of Fire
(Early 1980s' Operation)

	Offensive First 15 Days	Defensive Second 15 Days	Minimum Reserve	Second 30 Days	Third 30 Days	Total
Artillery, mortars, and multiple rocket launchers	4.5	2.25	2.1	5.4	5.4	19.65
Rockets	4.5	2.25	2.1	5.4	5.4	19.65
Antitank weapons	3.75	2.25	2.3	4.8	4.8	17.90
Tanks	4.5	2.25	3.35	5.4	5.4	20.90
Air defense weapons	6.0	4.5	3.1	8.4	8.4	30.40
Small arms	3.0	1.5	1.65	3.6	3.6	13.35

* The Pact defines a unit of fire as a specific number of rounds/missiles for each weapon or combat vehicle. The Pact uses the unit of fire to simplify calculations for the overall supply situation and to specify supply requirements for performing combat missions.

Table 4
Ninety-Day Ammunition Requirements for Representative
Weapon Systems in Rounds per Gun/Launcher
per Day of Combat

	Offensive First 15 Days	Defensive Second 15 Days	Second 30 Days	Third 30 Days	Total Stock for 90 Days *
Artillery					
203 mm	12.00	6.00	7.20	7.20	786
152 mm	18.00	9.00	10.80	10.80	1,179
122 mm	24.00	12.00	14.40	14.40	1,572
Mortars					
120 mm	24.00	12.00	14.40	14.40	1,572
Rockets					
FROG	0.30	0.15	0.18	0.18	20
Tanks					
T72	12.00	6.00	7.20	7.20	836
Antitank weapons					
RPG7/16	5.00	3.00	3.20	3.20	368
AT3	1.00	0.60	0.64	0.64	72
Air defense weapons					
SA6	1.20	0.90	0.84	0.84	92
SA9	1.60	1.20	1.12	1.12	122

* Total stock figures include minimum reserve requirements (see table 3).

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Table 5
Ninety-Day Ammunition Requirements in Units of
Fire (Mid-1980s' Operation)

	Offensive First 30 Days	Minimum Reserve	Second 30 Days	Third 30 Days	Total
Artillery, mortars, and multiple rocket launchers	9.0	2.1	5.4	5.4	21.9
Rockets	9.0	2.1	5.4	5.4	21.9
Antitank weapons	7.5	2.3	4.8	4.8	19.4
Tanks	9.0	3.35	5.4	5.4	23.15
Air defense weapons	12.0	3.1	8.4	8.4	31.9
Small arms	6.0	1.65	3.6	3.6	14.85

Planning Factors for an Extended War

We estimate, on the basis of classified Pact writings since the mid-1960s, that the Pact would expect a front to expend an average of 1.5 units of fire of artillery ammunition a day when engaged in intense conventional combat.^a Even under the best of circumstances, the Pact expected that two to three days of intense conventional operations would be required to defeat NATO's forward defenses. A reasonable estimate of Pact

^a For our computations, we define ammunition consumption during intense combat as the average consumption experienced before shifting to exploitation operations. Although full-scale breakthrough operations would consume ammunition at a rate possibly twice as high, we do not believe that the Pact could fight at the highest level of intensity for more than a few days before pausing to reconstitute and resupply its forces. The average consumption during intense combat actually represents alternating periods of extremely high consumption during breakthrough attempts with much lower consumption during holding attacks or temporary shifts to local defensive operations.

ammunition requirements for an extended conventional war can be made by extrapolating the average ammunition consumption for this period to the first two weeks of intense combat.^b The ammunition expenditure rate for any level of command—in this case, the front—is applied to all weapons held at that echelon. Although the planned expenditure rate assumes that all of the front's weapons will not be actively engaged every day, it assumes that those engaged will fire at a proportionally higher rate to keep up the overall average. The front's commander anticipates losses of up to 25 percent of the front's artillery—and some ammunition—during the operation.

^b This is essentially the same technique advocated by some Pact logisticians.

The extended war scenario assumes that the Pact puts its major effort in the Western TMO behind one front—the Central—and that it consumes ammunition at the highest rate for the first two weeks. The Carpathian Front is engaged against the two US Corps in NATO's first echelon and expends ammunition at two-thirds the rate of the Central Front (see figure 4). We assume that, during the first two weeks of intense combat, NATO is able to move its theater

reserves—such as the US III Corps—behind the breakthrough sector and that NATO can prevent the Pact from shifting directly to exploitation operations after NATO's forward defenses are defeated. We assume that it takes the Central and Carpathian Fronts an additional two weeks of moderately intense combat to complete the defeat of these forces and shift to exploitation.

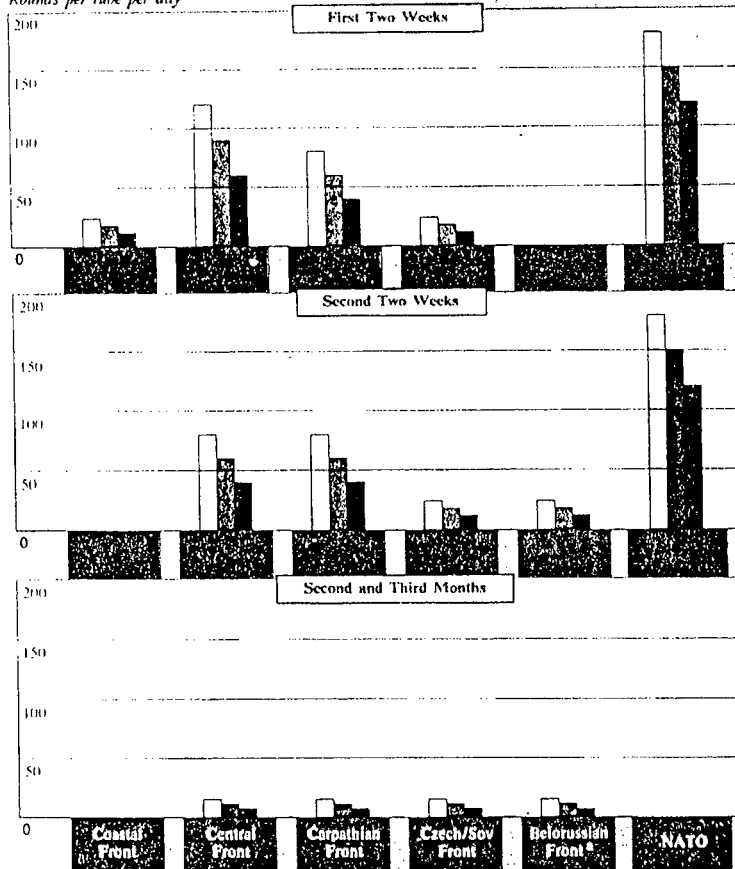
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Figure 4
Extended War Scenario: Warsaw Pact and NATO Artillery
Ammunition Expenditure Rates

122 mm 105 mm
152 mm 155 mm
203 mm 240 mm

Rounds per tube per day



* Replaces coastal front on day 15.

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Appendix B

Production Versus Expenditure

Classified Pact writings stress that prewar stocks of ammunition are expected to cover only the period needed to complete the mobilization of defense industry. Further ammunition supplies required to support the war effort would come from mobilized defense production. According to classified Pact writings, the Pact's goal of ammunition stocks to support 60 to 90 days of operations is directly related to the time required for the initial conversion, or expansion, of selected industrial facilities to wartime ammunition production. The Pact estimates that the conversion of industry to a full wartime footing would require about a year. Each Pact country is responsible for developing and maintaining its industrial mobilization plan for the first year of war.

Industrial mobilization, even if successful, would not solve all of the Pact's ammunition logistic requirements for a prolonged conventional war.

The four fronts of the first strategic echelon would require about 500,000 metric tons of large-caliber ammunition to support 30 days of defensive operations.¹² Mobilized Soviet defense industry, therefore, would meet the Pact's requirement for about 60 days of defensive operations—the least demanding requirement—from each year's production. Any attempt to conduct offensive operations would lead to higher consumption and reduced sustainability.

The Soviet Union was confronted with essentially the same situation during World War II. Soviet histories

¹² Pact planning factors show that defensive operations have the lowest expected rate of ammunition consumption—0.1 unit of fire or eight rounds per artillery tube per day—of any type of operation.

of World War II state that ammunition production—especially for artillery—was never able to fully meet the requirements of the major ground offensives of 1944 and 1945, and that ammunition supply was a major factor limiting the conduct of operations through the end of the war. According to these Soviet histories, even at peak production—achieved in mid-1944—the USSR could support only four of the 12 fronts in its order of battle with enough ammunition to conduct major offensive operations at the same time. The allocation of ammunition supplies was one of the major factors that determined the scale and pace of operations.

A recent Soviet book, *Economic Conflict in Warfare*, points out that the same conditions probably would occur during a modern war:

- Numerous problems arise when it is necessary to sharply increase the production of weapons and ammunition. One of them involves the need to accelerate and expand the rates of production of those raw and processed materials and equipment that are the farthest removed from the final stage, the finished military product.
- In a war, each of the opponents will attempt to satisfy as fully as possible its needs for military equipment, ammunition, and other material. It is important to calculate the true extent of the needs in advance, because the scale of development of military production and its dynamic will depend upon this.
- Even with a relatively correct estimate of the likely consumption of ammunition or level of losses of combat equipment, the norms may turn out to be different during war. The forces will experience the greatest pressure with respect to ammunition consumption or the greatest shortage of equipment at the most tense stage—before the restructuring of industry has been completed.

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Appendix C

The Transportation Problem Today

According to classified Pact writings, one Pact planning objective is to have eight to 11 days of mobile ammunition supplies loaded on trucks to support Pact forces as they advance. Some Pact officers maintain, however, that consumption estimates for mobile supplies are also derived from average consumption over the course of the entire operation and not from requirements during intense combat. The requirements for one day of breakthrough operations, they point out, exceed the capacity of all mobile stocks held inside the front. In fact, the ammunition requirements for one day of an integrated fire plan require supply trucks to dump all mobile stocks on the ground next to artillery firing positions and return to fixed depots to reload with additional stocks. Unless this is done, Pact forces would advance without mobile stocks and would outrun their artillery support, as they often did during World War II.

There is also a potential mismatch between the readiness of combat units and logistic supply units. During peacetime, divisional supply units are held at only a slightly lower level of readiness than the combat units they support. Army and front supply

units, however, are at much lower readiness—some units are mere cadres with less than 5 percent of their wartime strength. Extensive augmentation by reserve personnel and vehicles requisitioned from the civilian economy would be required before these units could carry out their wartime tasks. According to classified Pact writings, plans do not reflect the fact that these supply units can take twice as long to mobilize as the units they support. Classified Pact writings, however, stress that the front's total logistic support structure must be in place no later than the end of the first day of operations to avoid shortfalls in supply. As a result, Pact operational plans for committing forces to combat may be inhibited because of the time required to ready logistic support units.