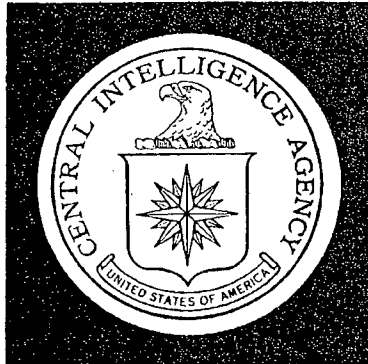


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DIRECTORATE OF
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Intelligence Report

*Operational Training and Ground Attack Proficiency
of Soviet Tactical Fighter Units*

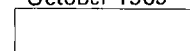


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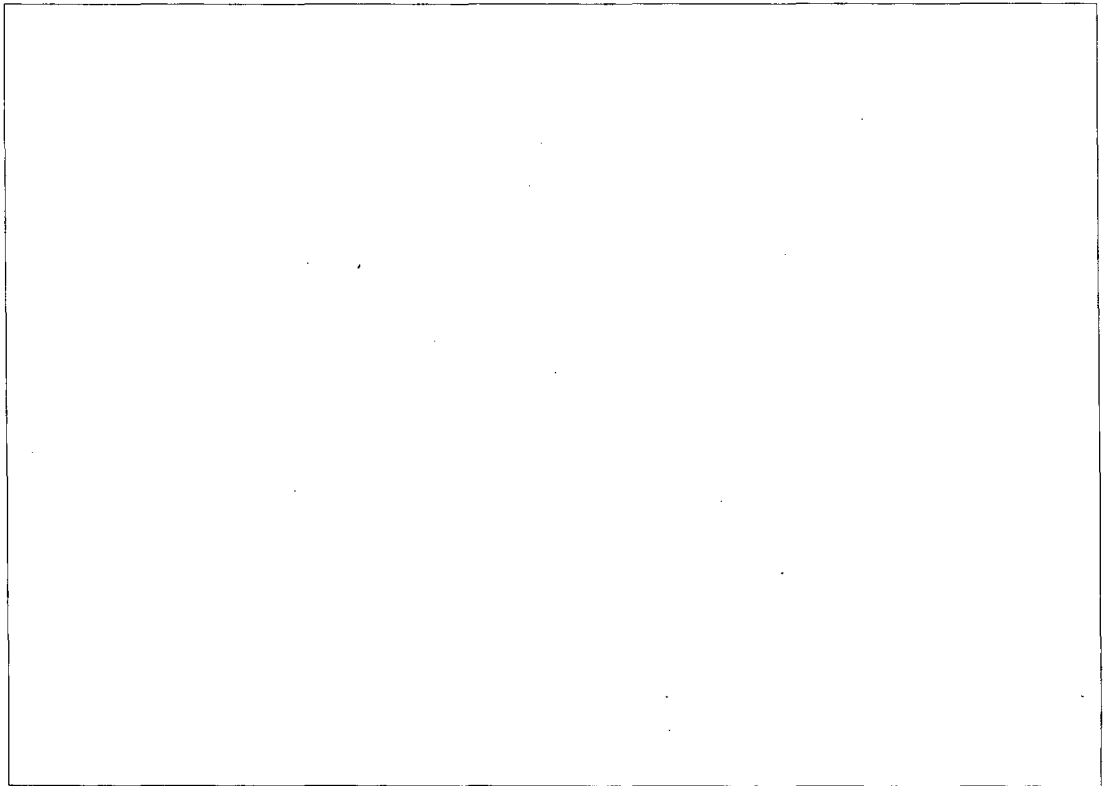
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CENTRAL INTELLIGENCE AGENCY
Directorate of Intelligence
October 1969

INTELLIGENCE REPORT

Operational Training and Ground Attack Proficiency
of Soviet Tactical Fighter Units

Introduction

Previous evaluations of the capabilities of Soviet tactical fighter units have largely concentrated on analysis of the numbers, disposition, and technical characteristics of the aircraft and weapon systems in the Tactical Air Forces (TAF). Also of importance in estimating the force's capabilities--and much less tangible--are the operational training practices and combat proficiency goals of the units.

This report examines combat training in Soviet tactical fighter elements, including the amount and nature of training and the distribution of training emphasis between primary and secondary missions. It also summarizes the available information on Soviet standards of combat proficiency in ground support operations. Conclusions begin on page 11.

Note: This report was produced solely by CIA. It was prepared by the Office of Strategic Research and coordinated with the Office of Scientific Intelligence.

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Tactical Air Mission

The principal function of Soviet tactical aviation is to support the ground forces. The Tactical Air Forces (TAF) are responsible for air defense of the battlefield, ground attacks in support of Soviet forces, tactical air strikes behind enemy lines, and battlefield reconnaissance. All operational units are assigned one of these tasks as a primary mission, and the aircraft and weapon systems of the unit are tailored to the performance of its mission.

Nearly three-fourths of TAF consists of fighter units with a primary mission of battlefield air defense and fighter-bomber units whose primary mission is ground attack. About 10 percent of the aircraft are light bombers deployed with tactical strike regiments, and the remainder of the aircraft are assigned to units concentrating on reconnaissance.

The organization, disposition, and mission of Soviet tactical aviation have been extensively studied and are well understood. The aircraft models, weapon systems, and supporting equipment in TAF have also received extensive technical and operational analysis. Less well understood are the training programs and practices and the actual operational effectiveness of the force. This report addresses these subjects and assesses Soviet capabilities in light of the available information.

Operational Training

Information on the training conducted by tactical fighter and fighter-bomber units of the Soviet Tactical Air Forces comes primarily from statements

[redacted] and analysis [redacted]
[redacted]

Pilot Flying Hours

[redacted] the minimum standard flying time per pilot is 100 to 110 hours a year. In giving 100 to 110 hours as a minimum standard [redacted] the number of hours flown to meet the requirements of the combat crew training course. [redacted] the curriculum for the 1967 combat course for a TAF regiment with the mission of ground attack. This curriculum would require about 100 hours to complete.

A combat training course for a regiment assigned to TAF's other main mission--battlefield air defense--has been derived from analysis [redacted] It has about the same number of required exercises as the ground attack course. Although the exercises are different, reflecting the different primary mission, the air defense combat course would also require about 100 hours to complete.

It is likely that most ground attack and air defense pilots fly more than the 100 hours, and probably average about 125 to 160 hours annually. Tactical fighter pilots take part in major combined arms exercises, which would not normally be included as part of the requirements of the combat training course. Some deployment exercises and other flight activity such as weather reconnaissance also cannot be scheduled as part of a training program. These activities probably account for an additional 25 to 50 hours of annual flight time.

[redacted] more flying is performed than that required for the training course [redacted] pilots [redacted] actually averaged about 12 hours a month flying time. [redacted] the monthly total varied considerably depending on leave schedules and sickness. [redacted] pilots never complete all of the exercises in the yearly combat course, but concentrate their time on those exercises in which they are weakest.

By comparison, US tactical fighter commands set about 240 to 250 hours a year as the minimum required flying time to maintain combat proficiency. Of this, from 160 to 200 hours are flown in combat training courses, and most of the remainder is devoted to exercises and deployments.

Allocation of Flying Time

Analysis [REDACTED]

[REDACTED] of the combat crew training courses for both air defense and ground attack regiments indicate that about 50 percent of the required training consists of actual weapon systems training. The remainder is devoted to instrument and hooded flights, night flying, navigational flights, and routine pilot proficiency exercises.

The weapons training of TAF fighter pilots is concentrated on the primary regimental mission-- battlefield air defense or ground attack or, in a small number of units, reconnaissance. Although each TAF fighter pilot is theoretically trained in all types of combat missions, only a small proportion of the training is devoted to functions outside the primary mission. [REDACTED]

[REDACTED] only about 10 percent [REDACTED] total flying time consisted of training in air-to-air combat and 40 percent was devoted to ground attack training. This is borne out by analysis of the combat training course [REDACTED]-only about a half dozen exercises out of more than a 100 listed concerned air-to-air combat or air defense operations.

The training program of battlefield air defense regiments [REDACTED]

[REDACTED] indicates that only 3 to 6 percent of the total training of air defense units is in ground attack operations. [REDACTED]



As a basis for calculating the general distribution of training time by type of activity, this is a large enough sample to yield a reliable estimate.

The estimated number of hours spent in training for a unit's alternate mission, based on total flying hours and the relative distribution of training emphasis, amounts to no more than 10 to 15 hours a year at most and some units probably spend less time in such crosstraining.

Combat Training Exercises

Tactical fighter units usually train for ground attack operations according to simplified routines which do not simulate combat conditions. For example, in the ground attack activity in major exercises the common practice is for pilots to fly over the target area two or three days prior to the exercise to become familiar with the area and the targets. During the exercise, the ground attacks are seldom opposed by "enemy" air, and no enemy air strikes are assumed on ground attack units prior to the launching of the strikes. Almost all of the ground attacks are preplanned, and are not carried out as if they were quick reactions to a fluid situation.

These Soviet ground attack training methods have drawn criticism both from foreign pilots trained in the USSR and in the unclassified Soviet military press. Foreign trainees have stated that the training is not carried out under actual tactical conditions--practice attacks are against large, well defined targets and rocket firing runs are characterized by high entry and recovery altitudes.

The release altitudes used in actual qualification programs bear out the criticism by the foreign trainees, and these same basic points were made in a *Red Star* editorial of 28 November 1968. This article criticized what it called the "simplified pattern"--which assumed unopposed flight--and the lack of training in low altitude fire and maneuver.



Combat Proficiency Standards in Ground Attack Operations

The ground attack qualification requirements of Soviet fighter pilots have been derived [redacted] [redacted]. The Soviet standards for evaluating dive bombing accuracy are:

Dive in degrees	Altitude (true) of bomb release	Deviation of bomb from center of target to obtain a score of		
		5	4	3
30	3,940 ft	180 ft	360 ft	540 ft
20	2,130 ft	215 ft	425 ft	640 ft

In this bomb scoring system, every drop counts as part of the pilot's score regardless of the point of impact. (For example, complete misses would be averaged into the pilot's total score even though no points were received.) [redacted] the minimum average score required for qualification was 3.

By comparison, the US requirement is that a given percentage of hits fall within a prescribed circle. As long as this is achieved, the distribution within the circle and the margin of error of the hits outside the circle does not affect qualification. For example, the US requirement for a 30-degree dive angle is that one-third of the bombs fall within a 140-foot circle.

Because of the different measuring criteria in US and Soviet evaluation techniques, direct comparisons of accuracy levels stipulated for ground attack training cannot be made in precise quantitative terms. Despite these differences, a general comparison can be made by expressing both the Soviet and US requirements and scores in terms of circular error probability (CEP, the radius of a circle centered on the target within which 50 percent of the hits will occur).

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The Soviet minimum required score of 3 for the 30-degree dive angle is equivalent to a CEP of about 410 feet, and the US qualification requirement for the same dive angle equates to a CEP of 165 feet.

The Soviet release altitude, and therefore the slant range, is nearly one-third greater than that of the US. Because of the number of variables affecting CEP, it is difficult to adjust the Soviet figures for the lower release altitude of the US scoring system (3,000 feet for the 30-degree dive and 1,500 feet for the 20-degree dive). Even with only a rough proportionate allowance, however, the Soviet minimum score for the 30-degree dive converts to a CEP of about 300 feet--some 80 percent greater than the equivalent US minimum CEP. The magnitude of this difference provides considerable margin for error in calculating the proper adjustment without changing the significance of the comparison.

Since both Soviet and US pilots average well above their minimum requirements, a comparison of known performances is more significant in evaluating their relative capabilities. [REDACTED]

[REDACTED] 40 percent [REDACTED] had scores of 5, 40 percent had scores of 4, 15 percent scored 3, and 5 percent had failing scores. Assuming an average score of 2 for those with failing scores, the weighted average of this Soviet regiment is 4.15, equivalent to a CEP of about 150 feet for the 30-degree dive and about 160 feet for the 20-degree dive. These CEPs are about 50 percent greater than those found in studies of US Air Force and Navy pilot performance.

Since average scores are known for only this one Soviet regiment, the comparison may not be representative of a comparison of the average Soviet tactical fighter regiment with an average US fighter unit. The Soviet regiment used in the comparison is attached to one of the first line Soviet tactical air armies, however, and is probably up to at least average standards. It is unlikely that other Soviet

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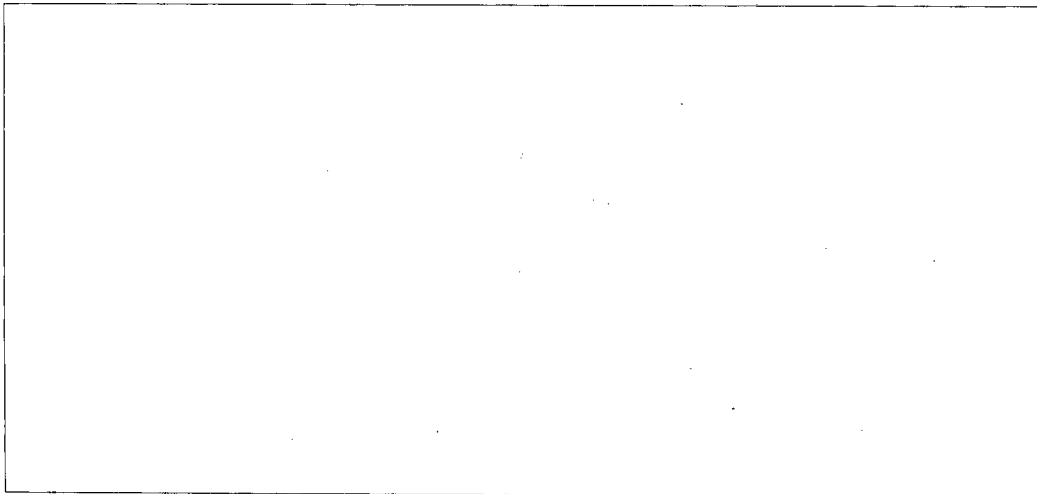
regiments equipped with the same aircraft would have averages enough above these to change the comparison.

[redacted] regiment was equipped with the older model MIG-17 aircraft. About half the Soviet ground attack regiments are now equipped with the more modern SU-7 aircraft. [redacted]

the qualification requirements for SU-7 regiments, [redacted] were somewhat higher [redacted]

[redacted] This is reasonable, since the SU-7 has more advanced fire control devices than the MIG-17, reducing some areas of pilot error in dive bombing. Higher qualification requirements would not in themselves indicate that actual performance was significantly greater, however, since 80 percent of the scores in [redacted] MIG-17 regiment were above the minimum Soviet standard of 3.

[redacted] regiment specialized in ground attack operations, and its scores are probably higher than those achieved by pilots from regiments with a primary mission of battlefield air defense. Even though air defense regiments are equipped with more modern aircraft--the MIG-21--capable of carrying larger bombs than the MIG-17, the CEPs would be greater because of the small amount of bombing practice received by the pilots.*



Training and Proficiency Related to Combat Goals

In the operational training of tactical fighter units the Soviets also stress mobility and dispersal, and a significant portion of training involves deployment exercises and operations from natural surface dispersal airstrips.

Soviet tactical fighters as a whole are better suited for this type of operation than those of the US. They are generally lighter and simpler, requiring less maintenance, and are easily operated from natural surface runways. On the average, they can be serviced, refueled, and rearmed between missions in less time than is required for US fighters. On the other hand, Soviet fighters have significantly lower payload capacities and shorter range capabilities than US tactical fighters.

The short range and low payload characteristics of Soviet tactical fighters are at least partially a result of Soviet concepts of tactical air operations in modern war. The tactical air forces are equipped and structured primarily for a conflict with NATO. During the period in which the current force was being formed and equipped, prevailing Soviet military thought assumed that any war with NATO would be nuclear. In such a conflict, the means of air superiority would be destruction of airfields, support facilities, and aircraft through strikes with nuclear weapons and not through air battles.

To survive in such an environment, according to Soviet theory, the tactical air forces had to be able to disperse quickly and operate with a minimum of service support. Since responsibility for destruction of many targets previously allocated to aircraft could be assumed by tactical missile forces, and since development of small nuclear weapons gave fighter aircraft the destructive capability formerly possessed only by bombers, sacrifices of payload for flexibility and dispersal capabilities apparently were deemed worthwhile.

Another Soviet combat goal is the maintenance of high sortie rates. [REDACTED] have indicated that the goal in combat for a ground attack regiment is about 200 sorties a day per regiment, based on an average of 5 sorties per aircraft with 40 aircraft (about 85 percent of the regiment) serviceable.

The low payload capacities of Soviet tactical fighters limit their destructive capabilities with conventional bombs. Because of the simplicity and ease of servicing of the aircraft, the Soviets might attempt to compensate for the low payloads through maintaining high sortie rates in a conventional conflict. With the low ground attack performance standards and proficiency indicated by analysis of Soviet ground attack training, however, the destructive effects, or kill probabilities, in the delivery of a given amount of ordnance are less than for the US and would require a more than proportionate increase in sortie rate to compensate for a given disparity in payload capacities. For example, with a 50 percent larger CEP, twice as many drops are required to score a given number of hits within a set distance from the target.

In addition, it remains to be proved that the Soviets can maintain high sortie rates beyond a few days. Sortie rates are not determined primarily by the characteristics of the aircraft but by logistics capabilities. Sortie levels during major Soviet exercises, together with studies of airfield facilities, indicate that enough supplies are available on the regimental bases to support the force for one to three days at high sortie rates. After that, major resupply would be required.

Information concerning the location, capacities, and material handling capability of major Soviet depots is incomplete at best. The assumption that the Soviets could sustain sortie rates significantly higher than those of US forces--high enough to offset their low payload and large CEPs--remains unproven in the absence of indications of an extensive resupply

capability for primary or dispersal bases. [REDACTED]
[REDACTED] although the combat goal [REDACTED] was 3 to 6 sorties a day per aircraft, realistically [REDACTED] could achieve only 2 to 3 a day, even if weather and logistic support were good.

Conclusions

Soviet tactical fighter pilots receive less total training than their US counterparts, and [REDACTED] information available on the proficiency of Soviet pilots indicates that at least in ground attack operations their standards and performance are below those of comparable US forces. In addition, training routines and exercises of Soviet tactical fighter units are usually carried out under conditions bearing little relation to actual combat conditions.

Operational training in Soviet tactical fighter units is heavily oriented toward a unit's primary mission--ground attack or battlefield air defense. Crosstraining for secondary roles has the appearance of perfunctory fulfillment of a training syllabus. This training is probably sufficient to enable a pilot in a battlefield air defense regiment to be reassigned to a ground attack regiment without extensive prior retraining and vice versa. It would not be sufficient to enable an air defense unit to be employed in ground attack operations without considerable reduction in effectiveness--well below that of regular ground attack units.

Soviet tactical fighters have smaller payload capacities than US tactical aircraft. In a conventional conflict, the Soviets might attempt to compensate for low payload capacities through operating at high sortie rates. The combined effect of the lower proficiency and smaller payloads of Soviet ground attack units compared to their US counterparts, however, would place a considerable burden on sortie rates as the means of achieving a comparable destructive capability with conventional ordnance. The high sortie rates that would be required could only be maintained with extensive logistic

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support, particularly fuel supply. Studies of Soviet airfield facilities indicate that supplies are available at operational tactical fighter bases for about one to three days of high sortie rates. Little is known of the Soviet capability to provide continuing resupply to the operating regiments. [REDACTED] [REDACTED] although [REDACTED] goal was 3 to 6 sorties a day it could realistically achieve only 2 to 3 even if weather and logistics support were good.

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