MEMORANDUM FOR: The Director of Central Intelligence

SUBJECT: MILITARY THOUGHT (USSR): Air Forces in Modern Local Wars

1. The enclosed Intelligence Information Special Report is part of a series now in preparation based on the SECRET USSR Ministry of Defense publication Collection of Articles of the Journal "Military Thought". This article draws upon the experience of the Vietnam, Korean and Egyptian conflicts in presenting a general analysis of the application of air forces to local warfare. Seizure of the initiative is considered the most important condition of success in establishing air supremacy in a remote, limited theater. The author notes the tasks and targets most appropriate to aviation, the strength and densities required, and the problems of negotiating air defense and conducting air reconnaissance under local war conditions. This article appeared in Issue No. 2 (75) for 1965.

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The following report is a translation from Russian of an article which appeared in Issue No. 2 (75) for 1965 of the SECRET USSR Ministry of Defense publication Collection of Articles of the Journal "Military Thought". The author of this article is General-Mayor of Aviation G. Yarotskiy. This article draws upon the experience of the Vietnam, Korean, and Egyptian conflicts in presenting a general analysis of the application of air forces to local warfare. Seizure of the initiative is considered the most important condition of success in establishing air supremacy in a remote, limited theater. The author notes the tasks and targets most appropriate to aviation, the strength and densities required, and the problems of negotiating air defense and conducting air reconnaissance under local war conditions.

Comment:

The author also contributed an article entitled "The Defeat of Enemy Aviation Groupings in a Theater of Military Operations During a Non-Nuclear Period" to Issue No. 3 (85) for 1968. The SECRET version of Military Thought was published three times annually and was distributed down to the level of division commander. It reportedly ceased publication at the end of 1970.
Air Forces in Modern Local Wars
by
General-Mayor of Aviation G. Yarotskiy

Modern local wars are characterized first and foremost by certain inherent limitations in military-political goals. Thus, if war with unlimited employment of nuclear weapons may have as its goal the total destruction, or, at minimum the capitulation, of an enemy state, local wars may be conducted, for example, to consolidate a political and strategic position in a certain area or to free this area from the influence of a given state.

Corresponding to the limited military-political goals of local wars, there are also limitations in the forces and means used in them, in the targets of armed combat, and in its methods. Strategic nuclear weapons are not employed in local wars. However, the very fact of their existence and the potential threat of their employment objectively limit the scale of armed combat. In contrast to war with unlimited use of nuclear weapons, in which the target of nuclear strikes will be primarily the enemy's home front, i.e., everything comprising his military-economic potential, the main target of armed conflict in local wars is the opposing armed forces. It is precisely for this reason that local wars are confined by the limits of the theater of military operations and usually are conducted by methods which are to a certain extent like those employed in the last war but which have been improved in line with the changed combat capabilities of troops, aviation, and the navy.

As a result of the localization of armed combat by the limits of theaters of military operations, the main role in local wars, depending on their nature, is played by ground forces or naval forces. However, the success of operations in both ground and naval theaters will depend to a decisive degree on aviation. Its great maneuverability, capability to carry out regroupings over large distances, and ability to combine independent search with immediate destruction of targets, including small and mobile targets, are particularly necessary under the conditions of the conduct of local wars.

The scale and nature of the employment of aviation in local wars depend to a great extent on the interests of which powers are clashing in
these wars, and on the goals these powers are pursuing. Local wars usually have no effect whatsoever on the territory, and thus no effect on the military-economic potential either, of those states which are actually feeding the war with weapons, equipment, materiel, and often with the best qualified personnel as well. This was so in Spain in 1937, in Korea 1950 to 1953, and in Egypt in 1956.

Because of this, armed conflict in which the number of participating armed forces actually is limited only by the operational capacity of the theater of military operations, and the expenditure of materiel only by the conditions for bringing it up, has a tendency toward extreme violence. From the very outset, local war becomes a competition of the best weapons and equipment, and the territory of the country in which the war is conducted -- a unique test ground for trying out the newest models. Thus in Korea the then newest MIG-15 and Sabre fighters were used for the first time. Hawk surface-to-air missiles and F-105 fighters are already in use at present in South Vietnam.

This tendency is intensified by the fact that in any wars in which the armed forces of countries of the socialist camp may participate in one way or another, the backbone and foundation of the opposing armed forces will be the aviation, navy, marines, and ground forces of the US. The inevitability of this derives from the essence of whatever military doctrine the US has followed in the years following the Second World War, whether it was called the doctrine of "massive retaliation" or "flexible response". This is evidenced by historical experience: in all instances in which peoples fighting for national liberation raise the question of overthrowing capitalism, the US ruling circles invariably come forth in the role of "world policeman", for the fulfilment of which the organization, armament, and disposition of their armed forces are fully suited.

The particular features of using aviation in modern local wars derive also from the changes over the past decade in the combat capabilities of armed forces and especially of aviation itself and of air defense means.

The decisive factor in producing these changes unquestionably is nuclear weapons, which have enormously increased fire power and consequently troop combat capabilities as well. However, armed forces organized and equipped according to the conditions of a nuclear world war have significantly lesser fire capabilities for conducting armed combat with conventional means of destruction, as is characteristic of local wars. For example, at exercises of the Northern Group of Forces in 1960, extensive use was made of fire by artillery and tanks from indirect
positions. With an overall density of artillery of 12 to 14 guns and mortars per kilometer of front in the zones of divisions, the density reached 40 to 70 guns in individual sectors. For comparison it may be recalled that in the experience of the Korean War of 1950 to 1953, artillery preparation was carried out by both sides with a density of about 100 guns and mortars per kilometer of front on the axis of the main strike. In addition, the Americans combined air preparation with artillery preparation. Even this example indicates that troops deprived of the power of nuclear weapons have a particularly urgent need for air support.

However, the tasks of aviation in joint actions with troops are not limited only to air preparation and support. In armed combat being conducted with conventional means of destruction, aviation is also the main means of exerting fire power to the full depth of the enemy's operational disposition. It also becomes a most important task of aviation here -- in addition to combating the enemy's reserves, destroying his control means, and disorganizing his rear -- to combat enemy aviation, and particularly to destroy his operational-tactical missile weapons if there are any in the theater of military operations.

Along with nuclear weapons, the combat capabilities of troops are greatly influenced by missile equipment and radioelectronics. Surface-to-air guided missiles and radioelectronic means have significantly increased the effectiveness of air defense, without at the same time materially reducing its combat capabilities under conditions of non-nuclear warfare.

These are the main features characterizing the conditions for using aviation in modern local wars.

From an analysis of our probable enemy’s doctrine and the nature of his preparation for conducting local wars, it follows that the most important condition for success in armed combat with him is seizure of the initiative, in which the main role belongs to the air forces. This is also fully affirmed by the experience of the wars in Korea (1950 to 1953) and Egypt (1956).

Depending on the conditions of the particular theater of military operations, the problem of seizing the initiative may be resolved in different ways. Where the armed forces of the socialist countries and the imperialist blocs are already deployed, this goal can be achieved only on the basis of an air grouping which is at a high level of combat readiness and has the necessary forces at its disposal to rout the enemy. And if,
when employing nuclear forces, aviation carries out a task in close cooperation with the rocket forces, it is obliged, when conventional warheads are being used, to carry out its task mainly with its own forces, in cooperation with the air defense forces.

Therefore, an aviation grouping which has been set up and is ready to carry out tasks in a nuclear world war must also be ready for local war conducted with conventional means of destruction, in case it should occur in the given area. Inasmuch as aviation is multipurpose, since all modern fighter-bombers as well as bombers can be delivery vehicles for nuclear warheads and at the same time can employ conventional means of destruction successfully, the problem which arises is primarily organizational in nature. It is thus obvious that aviation allocated for participation in an initial nuclear strike cannot be employed on any other axis, particularly not in detached theaters for participation in a local war. At the same time, as is evident from the experience of exercises and scientific research war games carried out in the recent past, aviation groupings which have been concentrated in anticipation of a nuclear war may not be strong enough to carry out tasks in a war conducted with conventional means of destruction. For this reason, either there should be aviation groupings allocated to conduct global nuclear war and also able with their own forces to carry out tasks on their own axes in a local war being conducted with conventional means of destruction, or commensurate aviation reserves should be available to reinforce these groupings in case of need.

Such reinforcement of existing aviation groupings as well as the creation of new ones can be carried out, it appears, by drawing upon aviation units and large units located in interior military districts or attached to adjacent aviation formations and capable of concentrating immediately in the required areas according to the situation.

In detached theaters where there are no groupings of armed forces, specifically no aviation groupings of countries of the socialist camp, but where a need for them may appear, the problem arises of preempting the enemy in concentrating and deploying aviation.

Resolving this problem requires the implementation of a whole complex of measures based on the consideration that against the mobility of our potential enemy's carrier-borne and amphibious forces we may place in opposition first and foremost mobility of aviation and air transport. Only aviation is capable of negotiating in a short time the enormous distances of the Eurasian continent, whose complex relief and poorly developed road network limit the capabilities of other forms of transport. Therefore, a
certain portion of combat aviation with its control means and rear services should be kept ready to concentrate in any area where the need for this may be imminent. In addition, a need arises for air transport capable of providing at least the initial supplying of the established aviation grouping with everything needed for combat activity.

However, the high mobility of aviation can be realized only if there is a previously prepared and deployed aviation rear. The very capability to concentrate aviation for combat actions is determined by the existence of airfields and of the conditions for bringing aircraft to full combat readiness without delay. They must be filled with fuel and oxygen, and must be armed. Consequently the forces and means needed to do this, and also to put the aircraft into the air and control them, must be at the airfields in advance.

On the territory of the Warsaw Pact countries, aviation rear units and the necessary materiel will be in place, in accord with existing plans. But in other areas, if the need to concentrate aviation arises suddenly, establishing an aviation rear may be a quite complicated problem. To facilitate its resolution, all areas in which it may become necessary to concentrate aviation must be prepared in advance with regard to setting up an aviation rear. Key steps in this direction would be the systematic construction of airfields in these areas and the establishment of reserves of materiel on the basis of treaties of friendship and mutual assistance or, for example, in the course of supporting the air lines of the Ministry of Civil Aviation.

Of greater effectiveness is the rendering of assistance to friendly countries in forming their combat aviation; this requires standardized materiel and means of control and servicing. It is obvious that their aviation must, at minimum, be no weaker than the aviation at the disposal of the armed forces of the countries comprising the aggressive imperialist blocs in the area. A deployed aviation rear and control means would substantially facilitate resolution of the problem of the timely concentration and combat readiness of extra aviation forces if this need arises.

What strength of aviation is needed to reinforce existing groupings or set up new groupings? The answer to this question is derived from the circumstance that "small" wars between states having opposite social systems will in all probability, under present conditions as in the past, be fought with substantial forces and means. The tasks of aviation in local wars are so varied and specific that virtually all types of front
aviation, and in addition large units of long range aviation and naval aviation, are needed in order to carry them out.

In quantity this aviation must be sufficient for successfully combating the strong carrier-borne and ground-based aviation groupings which our potential enemies are capable of establishing in the probable areas where local wars may break out. This being the case, it would be mistaken to assume that we will have to cope with large masses of aviation in a local war only in the European Theater of Military Operations. Experience indicates that in such areas as the Far East or Africa, the imperialists have established, and therefore also may establish today, large aviation groupings. Thus, by the end of the war in Korea in 1953, the American air forces there numbered 1,827 combat aircraft. By the beginning of their aggression in Egypt, the Anglo-French-Israeli air forces had 751 aircraft at their disposal.

The real possibility of massive enemy employment of powerful aviation makes it a vital task, for ensuring the seizure of the initiative, to rout the opposing aviation grouping.

The modern aircraft, whether it is armed with a nuclear bomb, napalm canisters, or missiles, is a formidable weapon. If aviation does not encounter organized resistance, experience shows that, even operating with inconsiderable forces, it is capable of employing its means of destruction with great accuracy, inflicting upon the enemy losses which are disproportionately larger than the aviation forces and means expended.

Therefore, the highest-priority task to be carried out by aviation in local wars is combat with powerful and well-prepared enemy aviation. The goal of such combat, in the final analysis, may be summarized as ensuring freedom of action for oneself and one's own troops and at the same time depriving the enemy of this freedom, i.e. creating the situation which in the recent past has been called "air supremacy".

Judging from the experience of past wars, enemy aviation can be deprived of freedom of action by weakening its groupings. Under present conditions, in connection with the development of air defense means and especially of surface-to-air guided missiles, combat for air supremacy takes on a new character. This is because in past wars the main means of air defense was fighter aviation. Thus combat with an enemy aviation grouping was combat with his air defense as well. At the present time, surface-to-air guided missiles are becoming more and more the main means of air defense. The high effectiveness of these missiles, as well as that of
missile-carrying fighter-interceptors, has sharply increased the power of air defense and has given it a completely new quality; for this reason its neutralization has become the basic condition for making aviation combat activity feasible. There is literally not one combat task which aviation could carry out without having neutralized or destroyed the air defense.

Even under the conditions of conducting local wars in areas remote from the Western Theater of Military Operations, there are no grounds to assume that the situation will be different. As is known, the air defense of the imperialist blocs is set up by geographical areas. The most developed air defense systems are those of North America and the European countries of NATO. In the Pacific zone, the combined air defense includes South Korea, Japan, the Philippines, the Hawaiian Islands, and the most important oceanic water areas. Planning and overall direction in this zone are carried out by the US Armed Forces Command. Consequently, even here, as well as in any other area where armed conflict may arise, the enemy may from the very beginning have an air defense based on use of the latest achievements in radioelectronic and missile equipment, which is supplied in quantities close to the operational-tactical norms of the US Army. Our potential enemy has the capabilities for this.

Surface-to-air missile defense can very effectively impede aviation actions. Combat against the air defense system on the whole is at the present time within the capability only of aviation large units and formations which have the appropriate armament. This does not, of course, exclude the possibility of negotiating an air defense in small groups in some instances, or even sometimes with single aircraft, on the principle of surprise.

Thus, in modern local wars, combat for air supremacy includes combat with enemy air defense means, demolition or capture of airfields and destruction of the aircraft on them, destruction of aircraft carriers and enemy aerodynamic attack means in the air in the course of covering one's own troops and rear installations, and neutralization and destruction of control means and organs.

The presence, in most areas where local wars may occur, of ground forces, aviation and naval forces of our potential enemies, contributes to the difficulty of accomplishing a mission. This applies particularly to Western Europe, where large groupings of NATO ground forces and aviation are concentrated and are at a high level of combat readiness. Seizure of the initiative here is possible only if we maintain our own aviation grouping at the highest level of combat readiness and achieve operational
surprise on this basis. However, the advantages of operational surprise may be quickly lost. To keep this from happening, the initial strike against enemy aviation must deprive it of the capability to respond with an equivalent strike. For an initial strike, therefore, it is necessary to have sufficient forces concentrated.

Like all armed combat, combat with an enemy aviation grouping and enemy air defense means, once begun, must be carried through to the end. No pauses are allowable, since the air enemy will immediately exploit any interruption in the activity of our aviation in order to seize the initiative.

After the initial strike has been delivered against the enemy aviation grouping, combat for air supremacy must be conducted while carrying out the task of covering the troops and ensuring freedom of action for one's own aviation.

On ground axes with a limited number of airfields and with difficult conditions for constructing them, which is characteristic of many areas of Southeast Asia, it may become necessary to preempt the enemy in capturing them. With the beginning of combat actions, all airfields in the zone of local war which can be retained until the approach of the ground forces, must be seized by airborne landing forces, which will ensure the rapid advance of the troops into the depth. Airfields located in the interior of the enemy territory must be put out of service by bombing strikes on the runways and mining of the landing strip.

On maritime axes and islands, the initiative can be seized by routing aircraft carrier groups or large units supporting the landing of amphibious forces. Fulfilment of this task will usually be equivalent to disrupting an amphibious landing operation, since the basic condition for conducting such an operation is considered by the armed forces of the Western bloc to be the existence of air supremacy. Failure in combating enemy aviation, however, inevitably leads to his gaining supremacy on the sea as well, which will make combat on the lines of communication and the task of antilanding defense highly complex. Under such conditions, for example, the Korean People's Army and the Chinese People's Volunteers in 1953 were obliged to allocate 38 divisions for the defense of the North Korean coast, i.e. as many divisions as defended the ground sector of the front.

Aviation possessing qualitative superiority has significant advantages in combat for air supremacy. However, under modern conditions superiority is determined not only by the speed and altitude factors of the aircraft
but also by the quality of their radioelectronic equipment (sights for conducting fire against ground and air targets with a variety of weapons, means for radio countermeasures and navigation, and others).

The quantity of aircraft, too, is no less important. In establishing a superiority in forces to fight for air supremacy, it must be taken into account that supremacy can be obtained not only by regrouping aviation on the ground but also by maneuvering in the air. It follows from this that superiority in flight range of aircraft is equivalent to a corresponding superiority in numbers of aircraft.

If forces are inadequate to fight for air supremacy in local wars, especially under conditions of limited territory, the aviation is doomed to destruction or expulsion. This is indicated by the experience of the wars in both Korea and Egypt.

Combat against enemy aviation and air defense means is not an end in itself for aviation but rather a means of ensuring freedom of action for one's own air forces, ground forces, and navy.

The nature of the tasks to be carried out by aviation jointly with the troops is influenced by the diversity of geographical conditions in which a local war may take place. However, not all geographical features of theaters of military operations are of equal significance. For example, the relief of the terrain, its vegetation, and the soil composition will exert only an indirect influence on the nature of the combat actions of aviation, although they will alter the operating methods of the ground forces and correspondingly the relative role and importance of any given task to be carried out by aviation.

In the jungles and swampy river valleys of Southeast Asia, under roadless conditions, airborne landings may be of decisive significance. Therefore important tasks of aviation here will be support of airborne landings, joint combat actions with airborne troops, and, of course, combat against enemy airborne landing forces.

In the mountains and deserts of the Middle and Near East, aviation will ensure the success of a swift ground forces attack by conducting joint combat actions with them and by routing the reserves moving forward on separate roads.

On coastal axes, the main tasks of aviation invariably will include combat with enemy naval forces. On islands, in fact, a local war may begin
and end with antilanding defense.

However, everywhere that ground forces battles and engagements develop using conventional means of destruction, the most important task of aviation will be close support. In this case, the relatively low density of fire from conventional means of destruction makes it necessary to concentrate them in the greatest quantities possible, for example in order to conduct preparatory fire and also when carrying out tasks in support of the troops.

As experience indicates, the necessary densities for preparatory fire may be attained, apart from using artillery and tank fire, mainly by means of aviation capable of delivering a massed strike within a short time from dispersed basing. But the capabilities of aviation are also far from unlimited. For example, for neutralizing a defended area or strong points, the required density of destruction equates to about 200 tons of bombs per square kilometer. Therefore, to neutralize a company strong point 1,000 by 500 meters in size will require 100 tons of bombs, i.e. a regimental sortie of front bombers.

This calculation testifies to the fact that under the conditions of armed combat conducted with conventional means of destruction, a great many aircraft will be required in order to obtain the necessary fire densities.

Experience from the Second World War and the war in Korea indicates that even the most powerful fire strike does not guarantee the destruction of infantry which has dug into the ground and is conducting a staunch defense. However, it is possible to break through an enemy defense after even a short artillery strike. Success in doing this was determined by neutralizing the enemy defense over its entire depth and by the ability of infantry and tanks to advance, staying closely within a rolling artillery barrage, in front of which ground-attack aviation "hovered" in the air. In such instances, the defending force, having no opportunity to conduct fire or maneuver with reserves, was destroyed by the attacking troops. It is evident that even under present conditions, the value of such a method of operating has not diminished. Modern aircraft, of course, do not have to "hover" over the field of battle. The new capabilities of aviation create the most favorable conditions for obtaining the required results with other methods as well, for example by echeloned strikes of small groups of aircraft.

Under the conditions of local wars, aviation will constantly be faced with tasks for close support of troops, and they will have to be carried
out in the short time periods dictated by the conditions of a rapidly changing situation. However, in comparison with past wars, close aviation support of troops today has become considerably more complex: on the one hand, it has become more difficult for modern high-altitude, high-speed aircraft to find and attack a target on the battlefield, and on the other hand, the effectiveness of ground forces air defense has increased substantially.

The modern front fighter-bomber, with a maximum speed of 2,230 kilometers per hour and a ceiling of about 20,000 meters, is insufficiently suited to such actions. In order to avoid destruction by surface-to-air guided missiles having a ceiling of 30,000 meters, it is forced to fly at low altitudes (100 meters and below). At such altitudes, a fighter-bomber can fly only at subsonic speeds. At the same time, only at a flight speed considerably below the sonic level will the pilot be able to visually detect and identify the targets which must be struck when supporting the troops.

Thus, the high flight-tactical specifications of the fighter-bomber are of no use for carrying out tasks on the battlefield. At the same time, they make it considerably more complicated, and therefore more expensive, to produce.

This suggests the conclusion that special aircraft are needed to support troops -- low-altitude aircraft capable of operating from unpaved airfields; in other words, we must have ground-attack aviation.

Among the tasks to be carried out jointly with ground forces, an important place in the combat activity of aviation is occupied by combat with enemy reserves. This is because the attainment of high rates of advance is to a considerable extent ensured by routing enemy reserves before they are committed to action. However, in their concentration areas troops are distributed over a considerable area, are carefully camouflaged, and are covered by air defense means. This makes it necessary to allocate large aviation forces in order to destroy them with conventional means. Aviation can inflict greater destruction on reserves when they are on the march. Under modern conditions, ground forces are moved for the most part by means of their own organic motor transport. In addition, motor transport is the main means of delivering to the troops all the necessities of daily living and combat. Consequently, motor transport columns will be the primary target of aviation actions during combat with reserves.
Aviation also must operate against railroads to be used for the maneuvering of troops, especially in areas with a poorly developed road network. But great efforts are required to carry out this task. It is known, for example, that during the war in Korea, operational and supply shipments in the Korean People's Democratic Republic were handled mainly by rail transport. Despite the constant strikes against them by American aviation and their poor technical condition, the North Korean railroads transported 17.3 million tons of different cargoes during the war.

The experience of the war in Korea and calculations which have been made indicate that in combat against operational reserves, aviation using conventional means of destruction is not in a position to accomplish such decisive objectives as their destruction. However, it is capable of containing the maneuvering of the reserves, which, in the overall conditions of an operational situation, especially in the initial period of a local war, may have decisive significance.

A shortage of fire means in conducting local wars may be compensated for to a considerable degree by maneuvering with forces and means by air. Under these circumstances, tactical airborne landing forces conducting combat actions simultaneously in different areas within the depth of the enemy disposition, are capable of breaking up his operational disposition, disorganizing his troop actions, and immobilizing his reserves.

Airborne landings may be employed extensively both in Europe and under the conditions of the mountainous and mountain-desert terrain of the Near Eastern, Middle Eastern, and Far Eastern Theaters of Military Operations, and also in the jungles and river valleys of the Indochina Peninsula and on islands. Thus, during the war in Vietnam (1946 to 1954) airborne landings often were used by the French to capture important targets, to set up ambushes on the routes of movement of people's army units, to destroy the army's depots and bases, and to maneuver with forces and means by air in order to create new centers of combat in the rear of the people's army and surround its groupings. The Americans also use airborne landings in a similar way in the war against the South Vietnamese patriots.

However, the employment of airborne landings on any scale is a measure which is taken only in areas and on march routes where there is no enemy air defense or where it has been neutralized. And if, under the conditions of non-European theaters of military operations, it is possible to count on the flying of transport aviation and helicopters over areas where there is no fire from air defense means, then under the conditions in Europe, which has an air defense system, the air defense system must be neutralized in
advance.

One of the most important tasks for which aviation is responsible in local wars is to conduct air reconnaissance. It will often be impossible to limit the scale of this reconnaissance to the territory on which the armed combat is taking place, because the sea and air lines of communication linking the area of combat actions with the sources supplying weapons, equipment, and personnel to the troops in action may be thousands of kilometers long.

It obviously will be necessary to know what is happening on these lines of communication, as well as to have accurate data on the location and activities of, for example, the enemy navy's carrier forces and enemy marines, even if they are based on the opposite shore of the ocean. In coastal theaters of military operations, reconnaissance of sea and air lines of communication is thus the most important element of the tasks of strategic air reconnaissance.

However, the value of operational air reconnaissance under conditions of local wars, where the success of combat actions is to a great extent decided by their swiftness, is determined by the capability of the reconnaissance aircraft's crew to simultaneously provide information on the enemy's grouping and forces and on the axis of advance of his mobile large units. The most complex problem in conducting air reconnaissance under these conditions may be the negotiation of the enemy air defense by the reconnaissance aircraft. Under the conditions of armed combat conducted in areas where the terrain is difficult of access, in jungles, mountains, and deserts, it may to a great extent be possible to carry out air reconnaissance tasks with the aircraft crew using maximally low flight altitudes or exploiting the gaps between the zones covered by the air defense. In Western Europe such opportunities will not always present themselves, since an air defense system set up to repulse massed air attacks will cope all the more successfully with a single reconnaissance aircraft. Under such conditions, air reconnaissance will often require the allocation of special forces and means to neutralize the air defense.