

Thanks to the repeated missions flown by the German, Italian, and Spanish air units over the Ebro bridges, the supply system of the enemy was seriously disrupted. In the confusion of renewed Red assaults and sporadic Nationalist counterattacks, there was at least time to bring up the nearest divisions of the approaching Nationalist force.

The Marroqui Corps, which had been entrusted with the counterattack, was divided into three groups, consisting of three divisions each, between Cherta and Fayon. The group on the right, which included the 4th Navarre Division, was under the command of General Alfonso Vega; the central group was under the command of General Baron Ortiz; and the group on the left was commanded by General Delgado Cerrano.

East of the Ebro, behind the breakthrough point near Falset, the Reds had deployed a new corps, ready to make the most of the breakthrough action from the strategic point of view. Thus the Nationalist counterattack was all the more urgent!

Nationalist leaders, however, considered it advisable to wait for the arrival of two more divisions if the planned attack was to have any prospect of success. Moreover, they considered it better to carry out preliminary attacks along the flanks of the enemy breakthrough force first, in order to provide a more favorable starting position for the main offensive.

In the meantime not even the dedicated missions flown by the German and Italian air units were able to keep the Reds from sending more and more troops across the river. The large-scale counterattack designed to restore the Ebro to the Nationalists was becoming more and more difficult.

The Red air forces were now much more in evidence than before. About fifty Katas and Curtiss' were involved in aerial combat over the Ebro bend with an equal number of German Me-109's and Italian Fiats. Red bombers, on the other hand, were rarely seen. There were two German antiaircraft artillery batteries stationed near Gandesa, where they were fully occupied in trying to keep down the enemy infantry, ward off Red aircraft, and keep the Ebro bridges under fire.

Four hot summer weeks went by with heavy fighting, and the Nationalist count-

erattack had still not been launched. In the vicinity of Mequinenza, the 82d Division had succeeded in driving the enemy back to the Ebro and in taking 2,000 prisoners. A Red assault north of Lerida was repulsed after violent combat. But at the Ebro bend itself, the situation remained unchanged. During the night the Red engineer troops rebuilt the bridges destroyed by the Nationalist air raids during the preceding day.

Every day now the German fighter pilots were encountering enemy fighters; Red observer stations in the mountains around Tortosa were able to report the approach of German aircraft from La Cenia in plenty of time to alert the Red fighters.

The battle was taking heavy toll on both sides, and it seemed to be a question of which side could sacrifice more blood. In spite of bitter hand-to-hand combat, the Nationalists were unable to dislodge the Reds from the mountain ridges.

Together with the commander of the Italian air forces, the commander of the Condor Legion suggested to Franco that he should restrict himself to defense at the bend of the Ebro and should carry out an attack north of the Ebro, on either side of Lerida, thus relieving the Ebro front. Five divisions were available for such an attack. But the suggestion was rejected, just as in the cases of Brunete and Teruel. The Generalissimo decided that the breakthrough point had to be eliminated first, before he could begin to think of a new operation.

The Ebro sector was now divided into two Corps -- the Maestrazgo Corps, under General Valino, was assigned with its three divisions to the section between Cherta and Gandesa, and the Marroqui Corps (four divisions) to the line between Gandesa and Mequinenza.

The staff of the northern army established its headquarters in the vicinity of Gandesa, where it was soon joined by the Condor Legion staff.

On 4 September and during the days which followed, a number of territorial gains were made at various points, but none of them was really significant. The losses the Nationalist forces had already suffered at the Ebro bend

were so serious that they were now followed by an inevitable period of complete exhaustion. The Reds were in a similar situation. As a result, the fighting gradually began to subside.

On 20 September the Reds made an attempt to relieve the Ebro bend by means of an attack in the south, along the Mediterranean front in the area of Segorbe and Sarrion. Thanks to the intervention of the Italian and Spanish air units and to a counterthrust carried out by an Italian division, however, the front could be stabilized in only two days. Then it began to rain, and the rainstorms continued for ten days.

At this point a new decision was made. Nationalist leaders abandoned the original plan, which had called for an attack at the center of the breakthrough point, in order to bring about the collapse of the wings. Instead, the point of main effort was now shifted to the right wing, in other words the area covered by the Maestrazgo Corps between Cherta and Gandesa.

The Corps was strengthened to five divisions and reinforced by seventy artillery batteries (of all calibers), two groups of tanks, the German antiaircraft artillery units, and the Lucht Artillery Group. All the available air units were assembled -- the Condor Legion, the Italian Aviazione Legionaria, and the two Spanish air brigades. This represented just about everything the Nationalists had at their disposal in the way of air forces, and their withdrawal from other fronts simply had to be accepted as a necessary evil.

The Reds had a total of seven divisions stationed on the sector in question, plus three brigades which they were holding in readiness across the river. The Reds were just as stubborn as the Nationalists in their determination to hold this sector, which they presumably needed as a starting point for the expansion of the breakthrough action; it would have been completely useless to them simply as the focal point of a costly defense action. They had paid for their assault across the Ebro and the establishment of their bridgeheads on the other side with 30,000 men,

and they were firmly determined not to abandon the barren ridges of the Caballo and Pandole range under any circumstances.

Thus, on 31 October 1938, the most costly battle of the entire Spanish Civil War began.

While the continuous bombardment attacks of the entire Nationalist air force covered the Caballo and Pandole ranges with a cloud of smoke, and the Spanish artillery -- together with the heavy antiaircraft artillery of the Condor Legion and the Lucht Artillery Group -- operating from the area around Gandesa and Cordoba, fired their salvos directly before the attacking infantry, the battalions of the 1st Navarre Division made their way, step by step, up the northern slopes and reached the peak. The international brigades on the Sierra de Pandole began to give way and withdrew, still fighting, to the village of Pinell and to the bank of the Ebro.

The Nationalist attack came to a standstill some thousand yards from the river, but was continued on the following day. While the Reds clung stubbornly to the eastern and southern slopes of the Sierra de Caballo, the battalions of the 4th Navarre Division advanced as far as Pinell and captured the village. There were a few Red battalions holding out south of Pinell, but these were cut off from the main force and were captured by 9 November.

General Vigon now ordered the two divisions to fan out towards the northwest and to advance on the highway connecting ~~MezazdexEbrnsVxxtazanz&mpozinx~~ Mora de Ebro and Venta de Camposina.

The Nationalist air units dropped heavy bomb loads over the bridges being used by the Reds in their headlong retreat. The German antiaircraft artillery batteries and the Lucht Artillery Group kept the roads under constant fire.

German and Spanish tank units were moving ahead to the Nationalist infantry troops to smooth the way for them.

The Reds made several desperate efforts to stage a counterattack, but without success. By 7 November the Nationalists were in possession of the entire highway

between Mora and Venta, and the bank of the Ebro between Cherta and Mora was firmly in the hands of the Nationalist divisions.

On 5 November, all available bomber units of the Spanish,

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German, and Italian air forces had carried out a large-scale attack on enemy airfields in an attempt to destroy the Red air forces at one blow. The naval air squadron in Mallorca also took part in the attack. Utilizing all its bomber units, the Condor Legion attacked the airfields at Reus and Valls (northwest of Tarragona). During the days which followed, the Red air units were seldom in evidence over the front, which made it possible for the Nationalist forces to carry out the final operations needed to regain the bend in the Ebro.

During the night of 6/7 November, the Reds launched a new attack on the Segre sector near Torres de Segre (southwest of Lerida) in an attempt to postpone the catastrophe threatening the Ebro bend. The first assault group managed to occupy a number of villages and took possession of the highway between Fraga and Lerida. A few days later, the Reds were forced to retreat from the highway. In the south as well, in the area south of Castellon, near Nules, the Reds undertook an attack to relieve the main front. With the help of strong tank and artillery forces, they succeeded in capturing a number of Nationalist positions, from which, however, they were dislodged the same day. The German bomber squadrons carried out two attacks in this area.

During 9 November the Maestrazgo Corps continued its advance along the Ebro towards the north and northwest; on 12 November, Corps troops reached the highway between Asco and Fatarella.

On 14 November the Marroqui Corps also got under way and occupied the town of Fatarella in the face of token enemy resistance.

On 16 November, after a delay of three and one-half months, the villages of Flix and Ribarroja, on the Ebro, were occupied by the Nationalists. This action brought the whole of the Ebro line from Cherta to Fayon into Nationalist hands. The Reds lost 20,000 prisoners and 15,000 dead on the battlefield; their total losses were estimated at 70,000 men. They also lost sixty artillery pieces, 400 machine-guns, thirty-five tanks, and 300 aircraft.

The Liberation of Catalonia (See the maps in Appendices 7, 9, and 10)

The problem of whether to continue the operations designed to liberate the province of Catalonia or to carry out a decision-seeking attack on Madrid was decided in favor

of an immediate attack in Catalonia. There were two factors strongly in favor of this decision: In the first place, the Catalonian operation could be launched without any delay, since the necessary forces were already assembled in northeastern Spain, and in the second place, the freedom of movement of the Red forces was gravely restricted by the fact that a large part of their troops were crowded together in the narrow area between the Ebro and the Pyrenees, and that their supplies now had to come primarily from southern France, since the growing effectiveness of the Condor Legion naval air squadron and of the Nationalist naval forces made ocean transport too hazardous. The Red supply lines to France, of course, would be easily cut off by a Nationalist victory over Catalonia. Lastly, political considerations also played a role in the decision -- Barcelona was the intellectual and political center of the Red movement, and the danger of Catalonian separatism (a movement which had always been surreptitiously supported by France) had to be eliminated before it could flame up again.

On 26 November 1938, General Franco set 10 December as the beginning of the offensive against Catalonia. Only fourteen days remained for the regrouping and recuperation of the troops -- a very short time indeed.

The northern army was divided into two army groups, the northern one under General Davila and the southern one (the Levante Army), between Castellon and Teruel, under General Orgaz. The northern group consisted of five Spanish army corps of three divisions each plus the Italian Corps with four divisions.

The objectives and missions of the individual corps were as follows:

The Marroqui Corps, assigned to the Ebro bend between Tortosa and Mequinenza, was to stand by until the attack on both sides of Lerida had successfully gotten under way and then to cross the Ebro and cut off the enemy forces in the Tortosa area. It was then to advance along the coast to Tarragona and capture this city.

The Navarre Corps and the Italian Corps were to form the main assault group, carrying out their attack south of Lerida, on both sides of Seros. The two Corps

were to unite at the bridgehead in Seros and to advance from there in a tightly concentrated group to take the passes near Montblanch and Valls, leading down into the Catalanian plain. The Aragon Corps, stationed between Lerida and Balaguer, was to fight a delaying action at first and then to join the advance of the neighboring assault group.

The Maestrazgo Corps and the newly established Urgel Corps formed the northern assault group of the northern army group. They were to advance between Balaguer and Tremp, encircling Artesa de Segre, and then to fan out towards the southeast for an assault on Cervera, calculated to bring about the collapse of the Red front line. Later the two Corps were to move on to Igualada and Manresa and, continually outflanking the enemy to the north, were to drive him back to Barcelona.

In practice, to be sure, a number of fundamental changes had to be made in the operational plans detailed above.

The Missions Assigned to the Air Units

The Condor Legion, now (i.e. after conclusion of the operations at the Ebro bend) under the command of Generalmajor Freiherr von Richthofen, with Lieutenant Colonel (GSC) Seidemann as chief of staff, was requested to distribute its units equally between the Marroqui Corps, at the bend of the Ebro, and the Navarre Corps, at the bridgehead of Seros.

The Italian air units were to support the operations of their own Corps.

The Spanish air units were distributed among the Aragon, Maestrazgo, and Urgel Corps.

All three groups were to carry out concentrated attacks on enemy troop assembly points, airfields, signal communications centers, highway junctures, and seaports two days before the beginning of the attack. During the attack itself, they were to support the operations of the divisions as usual.

At this time the Nationalist air units were composed of 98 aircraft of the Condor Legion, 134 of the Italian Legion, and 146 of the Spanish brigades. The number

of fighter aircraft was about the same as the number available to the Reds, whereas the Nationalist units had far more bombers at their disposal than the Reds. Despite the numerical superiority of the Nationalist air forces, the variety of aircraft models and the threefold command apparatus must be acknowledged as disadvantages.

The bomber group of the Condor Legion comprised forty He-111's, the dive-bomber flight three Ju-87's, the fighter group forty-five Me-109's and one squadron of He-51's, the reconnaissance squadron five Do-17's and five He-45's, and the naval air squadron on Mallorca eight He-59's.

The Legion's antiaircraft artillery still consisted of five heavy and two light batteries.

The signal communications battalion was also unchanged.

* The Panzer Group Drone, with its forward assault party, was standing by for action, as was the Lucht Artillery Group.

The schools set up for the training of the Spanish Army (at Toledo, Avila, Pamplona, Granada, Miranda, San Roque, and Soria) were still extremely busy.

In spite of the heavy losses it had suffered during the operations at the Ebro bend, the Red air force was still estimated at ten squadrons of Curtiss and Rata fighters. It had lost all but about ~~ten~~ ^{a dozen} bombers, however. After a few unsuccessful low-level attacks on the German airfield at La Cenia, the Red fighters began to hold back. Apparently they were saving their strength for the final struggle.

Evaluation of the enemy ground forces, based on aerial reconnaissance reports and on the statements of prisoners and deserters, gave the following picture:

Four enemy divisions were stationed at the mouth of the Ebro near Tortosa and Fayon, eight divisions between Fayon and Tremp, and three divisions between Tremp and the Pyrenees; another five divisions were being held in reserve between Artesa de Segre and Cervera. Thus the defenders had a total of twenty divisions as against nineteen for the attackers. It must be remembered, however, that as a rule the Red divisions were slightly smaller than the Nationalist ones and that they had far few-

er auxiliary arms. It was estimated that each Red division had been reduced to one-half or one-third of its authorized strength by the operations at the Ebro bend.

The international brigades had been so weakened by the preceding battles that their total strength was estimated to be only about 9,000 men. The stream of volunteers from abroad had dwindled considerably as a result of the change in the situation. But those brigade members still in Spain fought bravely, relentlessly, and stubbornly.

Nationalist commanders had very little to go on regarding the morale of the Red divisions. As it later turned out, their supply situation was not at all bad, but their fighting morale had reached a very low point.

The Reds had been waiting for the offensive in Catalonia for more than a year. After the Nationalist front had pushed forward to the Segre, in the spring of 1938, the Reds had concentrated every effort on fortify^{ing} the Segre sector and ~~to~~^{on} build^{ing} up a series of new defense lines between it and Barcelona. Thanks to aerial reconnaissance reports, the Nationalists were aware of this activity.

The character of the terrain was in favor of the defenders. There were the mountains of the Sierra de la L^ellana range and those just east of it, rising to 3,300 feet, there were countless canals traversing the countryside east of the cities of Lerida and Balaguer, and there were the many canyons, valleys, and ridges of the southern slopes of the Pyrenees -- all of these natural factors made the area an ideal one for defense operations.

The Accomplishment of Operations

The original date set for the beginning of the offensive, 10 December, had to be postponed because of poor weather. The new starting date was set at 17 December.

On 17 December, the Condor Legion began its mission in the form of a series of attacks over the area just ahead of the Marroqui Corps on the lower course of the Ebro. These attacks were directed against enemy troop concentrations, the railway depots of Reus and Tarragona, and the military barracks at Ampola. They were intend-

ed to deceive the enemy, whose attention was to be diverted from the main attacks at Leros, Lerida, and Balaguer.

Continued bad weather made it necessary to postpone the offensive several more times, each time by twenty-four hours. Finally, on 22 December, it was decided that the attack would be launched on the following day, regardless of conditions.

During the days prior to 23 December, the Condor Legion continued its attacks in the south so effectively that the Red commanders actually transferred two of their five reserve divisions to the Ebro front; they were sorely missed later on in the Segre sector.

As soon as the order to attack had been issued, the Legion shifted its activity to the areas ahead of the Navarre and Aragon Corps between Mequinenza and Balaguer.

The Italian and Spanish air units followed suit in the areas assigned to them, i.e. north and south of the Condor Legion.

On 23 December, two days before Christmas, the largest and most decisive offensive of the Spanish Civil War began at 0800 hours with two hours of artillery fire directed into the area ahead of the five assault corps between Mequinenza and Tremp. The day was gloomy and cold.

At 0945 hours all the Nationalist bomber forces flew over the front and, for three quarters of an hour, bombarded enemy trenches, battery positions, and any roads which might be used for the bringing up of reinforcements.

The infantry attack began at 1000 hours.

Strangely ^e enough, the Red air units kept completely out of sight. Presumably their airfields were located in a bad-weather area.

As the smoke from the bombardment attacks began to drift away, the first Nationalist low-level attack aircraft made their appearance. Their activity gave an indication of the enemy's position on the ground.

The first tanks of the Nationalist force broke through the lines, followed by smaller infantry details which, together with the tanks, engaged in combat with the

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enemy forces.

One hour later, the bomber squadrons appeared once more for their second run over the battlefield. By evening they had flown another four missions, always flying out ahead of the infantry. They were soon able to pick out enemy targets in the rear area.

The antiaircraft artillery forces, working with the artillery to smooth the way for the infantry,

had already shifted their positions, no easy matter in this difficult terrain, made all the more confusing by the shell-holes.

But despite the overwhelming efforts made by the Nationalist forces, the first day of the offensive failed to bring them any appreciable gains. The resistance offered by the Red divisions was far more stubborn than had been anticipated. In addition, the two northern Corps, Maestrazgo and Urgel, had had to contend with snow and fog.

It was already obvious that changes would have to be made in the original plan. The Maestrazgo and Urgel Corps had not advanced beyond the enemy forward line and still had to face the well constructed line of emplacements behind it. The Aragon Corps, on the middle sector, had acted in accordance with orders; its right wing had reached a point on the other side of Balaguer, while the center and the left wing had not moved out of their starting positions.

Under these circumstances the advance of the Navarre Corps and the Italian Corps, both of which had advanced from the bridgehead at Seros, seemed all the more significant. Thanks to their motor vehicles, the Italians had advanced at a good pace and were already approaching the mountains. Their left flank, however, was unprotected and in danger from an anticipated enemy counterattack.

The combat-seasoned divisions of the Navarre Corps, which had been supported all during the day by the air units and antiaircraft artillery units of the Condor Legion, succeeded in tearing the largest gap in the enemy front. Even at this early stage, their success was enough to make the commander of the Condor Legion wonder whether it might not be wise to concentrate all the Legion units at this point, in order to help the Navarre Corps to a victory so spectacular that it would carry the rest of the assault corps along with it and, by means of a sudden thrust to the sea, cut off the entire southern front of the Reds. But before one could think of exploiting the strategic success of the beginning, the victories of the first day had to be stabilized and expanded.

The Marroqui Corps, on the lower course of the Ebro, had made no progress whatsoever. Poor weather and the swollen waters of the river had made it impossible for it to get across the river. Besides, Nationalist leaders had no intention ~~ix~~ of driving the Reds out of their corner of the front along the sea ahead of time.

~~During~~ The days which followed, until 26 December, followed -- and intensified -- the pattern of the first day, in every respect.

The two northern corps, Maestrazgo and Urgel, made no advances at all.

The Aragon Corps managed to carry out a breakthrough action with its left wing, in the vicinity of Balaguer. The gap thus created opened up the prospect that the Corps might be able to fan out towards the southwest towards Cervera and thus gain access to the mountains. In any case, the general staff of the northern army was convinced that this would be possible. As a result, the staff withdrew two divisions from the Maestrazgo Corps and one division from the central sector of the Aragon Corps and transported them to Balaguer by truck; all available tanks and a good many artillery batteries were concentrated at Balaguer. The commander of the Condor Legion decided to dispatch three German antiaircraft artillery batteries to the area and to shift the focal point of activity of the flying units to the northern army group.

As regards the Italian Corps, the anticipated threat to its left flank had come into being. The Italian air units and tanks did everything in their power to protect the flank from the enemy but were unable to prevent the Corps' losing ground at a number of points. This was all the more serious in view of the fact that the central and right sections of the Corps continued their advance, and were rapidly approaching the mountains, on the eastern slopes of which the city of Montblanch was situated.

The Navarre Corps made every effort to continue its thrust, although the enemy had brought in a strong reserve force on 25 December.

The German bomber squadrons, active day and night, did their best to destroy the enemy troop concentration areas with their 110-lb bombs, while the antiaircraft artillery forces changed position rapidly to keep up with the attack force. Their

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light batteries were usually stationed along the forward line, where they participated directly in the combat being carried out by the infantry troops. They proved to be extremely valuable in defense operations against the enemy tanks.

The German dive bombers selected the enemy reserve troops in the Granadella area as their targets and eliminated them with a few direct hits. On 26 December the Navarre Corps reached the outskirts of Granddella.

The Marroqui Corps had still not moved out of its starting position.

In spite of the reinforcements it had received for the northern assault force, near Balaguer, the results of the new attack failed to come up to expectations.

Although the Condor Legion employed all its units day after day, although the antiaircraft artillery forces were tirelessly committed against enemy ground targets, and although the Nationalist infantry troops were supported by German and Spanish tanks, enemy resistance remained adamant. There were, of course, local victories, achieved at a tremendous cost in men and materiel. During these operations the German tank units evolved a new tactic -- they combined their activity with that of the heavy antiaircraft artillery batteries, directing the fire of the latter by radio from the front line. Very frequently the tanks were able to break through the enemy lines and to destroy pockets of resistance, but most of the time they had to return because there were no forces available to occupy the territory gained.

In spite of poor weather conditions and the haze lying over the battlefield, the Legion's bomber squadrons continued to attack the area just ahead of the Spanish infantry; their losses were high as a result of increased enemy defenses. On 27 December a Do-17 manned by a Spanish crew was hit by Red antiaircraft artillery fire and, during its plunge, caught another Spanish Do-17, forcing it to crash as well.

It often happened that the Spanish battalions occupied an enemy position during the day and were forced to give it up again during the night. It could no longer be denied that the battle on the northern wing had entered a critical stage. It was urgently necessary that a new plan be worked out.

And on the southern wing, in the sector assigned to the Marroqui Corps, there was nothing happening which might be calculated to give rise to Nationalist hopes. Several attempts to cross the Ebro failed, although enemy resistance was slight.

The crossing points prepared by the Corps were torn away by the flood waters. The Moroccan soldiers suffered from the unaccustomed snow and fog.

On the central sector, the Navarre Corps and the Italians were advancing slowly, but they were unable to cover more than a few thousand yards per day. The Italians still complained of strong enemy counterattacks along their exposed northern flank and spent a good deal of effort in warding them off.

The struggle for air supremacy had begun with a vengeance. Since the Reds had only a few bombers left, whose employment was made impossible by the German anti-aircraft artillery, they restricted themselves to frequent commitment of their Rata and Curtiss fighter aircraft. The German Me-109 units moved to an emergency landing field near the battlefield in order to obviate the long approach route from La Cenia. Wherever they appeared, the Me-109's dominated the skies; the Ratas and Curtiss' engaged in aerial combat only when they were numerically superior.

The bomber squadrons gradually adopted the practice of harassing the enemy in night attacks, which went far into the hinterland.

The naval air squadron was relentless in its attacks on Barcelona and the coast.

But none of these efforts on the part of the Condor Legion led to any real success because the offensive on the ground, with the exception of the assault of the Navarre Corps, had virtually come to a standstill.

Thus the situation was anything but encouraging as the year came to an end. Nationalist leaders began to wonder whether the striking power of the corps had not been exhausted by the previous campaigns in Zaragoza and Teruel and by the thrust to the sea.

On 3 January 1939, a change for the better finally seemed to be taking place. The Maestrazgo Corps, with the support of the entire Condor Legion, ^{had} gradually worked its way forward to a point just before Artesa de Segre, and it seemed certain that the town would fall into Nationalist hands on the following day. If this hope were fulfilled, then it seemed possible that the Corps could fan out as planned towards

the south to attack Cervera. This action, in turn, would be bound to bring the Aragon Corps into motion. During the evening the German light antiaircraft artillery succeeded in warding off a strong Red counterattack. Enemy low-level attacks on Cubells resulted in heavy losses (three dead and several wounded) among the courageous troops of the signal communications battalion.

On the next morning Artesa de Segre was captured by the 1st Division. But in spite of a concentrated effort on the part of the Nationalists, it proved impossible to continue the advance towards the south.

The Aragon Corps now began to reap the fruits of the attacks carried out by its neighboring corps. Step by step, the enemy abandoned the sector east of Lerida, which meant that the northern wing of the Italian Corps was finally safe.

On the same day, 4 January, ~~ix~~ a division from the Marroqui Corps crossed the Ebro near Asco and established a bridgehead there. This provided at least provisional contact to the Navarre Corps, which had penetrated far into enemy territory, and relieved it of the constant worry over its hitherto exposed right wing.

In the meantime the Reds had come to the conclusion that danger threatened on the central sector, occupied by the Navarre Corps and the Italians, rather than either in the north, near Artesa, or in the south, along the Ebro. They had brought up two new divisions, which were ordered into action for the first time on 5 January.

Red commanders wanted at all costs to relieve the steadily mounting pressure on the mountains around Montblanch and Valls and on the massif of Montsant and Tortosa. Although the progress of the Navarre Corps was slow, each day and each mile it advanced increased the danger for the Reds. If the Corps should succeed in cutting off the Red southern wing, the Reds would inevitably lose their strong positions in the mountain area of Falset and Reus, positions which were vitally necessary to their plans.

The commander of the Condor Legion was constantly aware of the favorableness of the situation. He was convinced that the two northern corps would not succeed

in bringing about a decisive victory on the Artesa de Segre sector, though the commanders of the northern army expected and hoped that this would be the case. The developments of the last ten days had served to substantiate the opinion of the Legion commander and had suggested to him the plan which he now put into action. On his own initiative, he decided to discontinue the air support of the northern corps and to concentrate all his forces on the sector occupied by the Navarre Corps. Together with this Corps, which had already shared so many victories with the Legion, he planned to drive a wedge against the enemy positions in Montblanch and Valls. Once these two towns had been captured, he assumed that the Corps would pivot towards the south, take the city of Tarragona, and then cut off the entire Red front along the Ebro and near Tortosa.

His decision was taken at a point when sudden and unexpected developments resulted in an entirely changed military situation, one which could just as well have justified completely different decisions.

The Red Relief Attack in Estremadura (See the map in Appendix 7)

On 4 January 1939 Nationalist leaders received the first, still unconfirmed rumors of a forthcoming Red relief attack in the southernmost area of the front, in the province of Estremadura. The attack was to be launched from the area north of Cordoba and to be directed against Seville.

The attack was launched sooner than the Nationalists expected, on 7 January. In a single, sudden blow, the Reds broke through the weak Nationalist defenses in the south and managed to insert a wedge some eleven miles deep along a front approximately nineteen miles long. The few ^{Red} Nationalist reserves stationed in the area were assembled to overcome a momentary setback occurring just before the final victory was achieved. General Franco dispatched only one division at first, which was withdrawn from the Catalonian front. It was bound to take weeks before it arrived in the south. On 7 January, Franco also ordered the transfer of both Spanish air brigades to Estremadura. Once again it seemed that, for reasons of prestige (as in

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the cases of Brunete and Teruel), the entire offensive in the north was to be abandoned in order to restore the situation in the south.

The commander of the Condor Legion was firmly convinced of the inadvisability of changing the strategic plan in any way which might jeopardize the Catalonian front. The Brunete affair came to his mind, when the Legion had to leave its preparations for the assault on Santander and fly to Madrid in order to salvage the situation. Nevertheless he made all the necessary arrangements to transfer his units to the southernmost point of the front, on the following day if need be, in the hope that they could quickly restore the ground situation from the air and then return immediately to the north.

On the following day, 7 January, there was a lull in the action in the south. The Red advance had come to a halt, and it looked as if the attack had merely been a last and desperate demonstration of strength. The Legion remained in the north, and the offensive in Catalonia was continued.

Continuation of the Offensive in Catalonia

8 January marked the beginning of the second phase of the Catalonian offensive, the phase during which the Navarre Corps was to bring about the final, decisive victory. In the early morning the German antiaircraft artillery batteries began their ground fire against the enemy targets, assisted by the Spanish artillery. The German bombers appeared and dropped their loads over the passage into the Montsant mountains. The fighters took up their dual mission of low-level attacks on ground targets and combat with the Red fighters, now hurrying to the scene of action. The German tanks moved to the head of the attack group. Although it was snowing and the battlefield was covered by impenetrable haze, the Navarre Corps attacked with its usual elan.

The Reds defended themselves bravely, but during the afternoon they were forced to give way before the repeated attacks of the Navarre divisions. Once again the 4th and 5th Divisions covered themselves with glory.

German antiaircraft artillery caught the Red divisions as they tried to retreat into the mountains and scattered them with heavy casualties. The Red reserves

standing by on the other side of the mountains were destroyed by the German bomber squadrons.

By the early afternoon of 8 January, the entire Montsant massif had been occupied by the Nationalists. The divisions were advancing on Montblanch. Their right flank was completely unprotected, but no one seemed to worry about it; the left was well covered by the advance of the Italian Corps.

On the morning of 9 January there was heavy fog to contend with. Nevertheless the German bombers climbed up above it, where visibility was better, and bombarded the Red retreat routes leading out of the mountains on the other side of Montblanch and Valls. They flew as far as Tarragona, bombarding the harbor and the railway depot. The German tanks were still engaged in the assault, while the antiaircraft artillery kept the Red tanks off.

The Italian Corps was right behind the advance force, and the Aragon Corps had also gotten under way. Under the pressure of the Navarre Corps, the enemy was already beginning to abandon his positions as far up as Balaguer and Artesa de Segre.

The Marroqui Corps now crossed the Ebro in broad front.

By the evening of 11 January, the Navarre divisions had reached the western outskirts of Montblanch.

On the morning of 11 January, the German bomber group had carried out a series of attacks on Montblanch and on the road leading via Valls to Tarragona. The fighter group, approaching over the Mediterranean, had attacked the enemy airfields at daybreak. Disregarding the Ratas, which had fled into the air to escape destruction, the Me-109 squadrons flew in at low altitude, raking the fields with their fire, then climbed up to attack again. When they returned to their base, they reported the destruction of twelve enemy aircraft, set on fire in front of their hangars.

, on the road between Montblanch and Valls,
At noon/German heavy antiaircraft artillery units came upon a Red artillery battery which was just shifting position and destroyed it.

During the afternoon the Navarre Corps took the city of Montblanch in a single

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assault and immediately began pursuit of the enemy troops, fleeing in disorder. The Corps took possession of the pass to Valls, from which one can look out over the coastal plain below.

Crowds of Red deserters, half-starved, went over to the Nationalists. A third of the Red force was now in the area bounded by Tortosa, Tarragona, Reus, and Falset.

In a conference to discuss the continuation of the operation, General Solchaga, commander of the Navarre Corps, and General Freiherr von Richthofen decided to march on to Tarragona. This decision ~~was~~ decided the final outcome of the war.

Valls was taken at noon on 14 January.

The attack was continued on the early morning of 15 January. Roadblocks set up by the enemy to delay the advance were removed by the heavy antiaircraft artillery units, moving out in front. The Nationalist troops left the mountains along two narrow roads.

In a number of attacks, the bomber group of the Condor Legion supported the advance of the Navarre divisions. The dive bombers were employed against naval targets and succeeded in destroying three steamers in the harbor of Tarragona. The naval air squadron continued to keep the ocean and the coast under surveillance. Thanks to the Legion, all enemy transport lines -- ocean traffic, railways, and highways -- were disrupted.

At this point the race began between the battalions of the Navarre divisions and the German antiaircraft artillery forces to see which could ~~reach~~ cover the twelve miles down to the sea more quickly. The heavy antiaircraft artillery had to drop out of the race, but one of the light batteries (under the command of First Lieutenant Deventer), personally entrusted with the thrust to Tarragona by the commander of the Condor Legion, suddenly appeared at the head of the Navarre Corps, made its way past the Spanish troops and, detouring around ruined bridges and craters in the road, reached the outskirts of Tarragona by the afternoon, where it fired its tracer shells with good effect against an enemy counterattack. At the side of the first Navarre battalions, the battery forced its way into the city and, after a short but violent struggle, managed to reach the harbor.

As darkness fell, the advance forces of the Marroqui Corps also entered the

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city and made contact with their comrades from the Navarre Corps. The encircling ring had been closed; one-third of the Red Catalonia army was trapped.

The Pursuit Action to Barcelona and the Pyrenees (See the maps in Appendices
7 and 10)

The operations which took place between Tarragona and Barcelona, in the areas of Vendrell, Villafranca, Villanueva, Igualada, and Manresa, had little in common with a battle. They were rather the breathless pursuit of an enemy fleeing in disorder, an enemy who had no idea whether he would succeed in reaching the safety of the border or whether the fates would trap him before he could get to it.

The divisions of the Navarre and Marroqui Corps encountered hardly any resistance.

The Italian Corps and the three northern corps were still engaged in combat, inasmuch as the Reds in the north were not yet aware of the defeat which had taken place in the south.

The Urgel Corps dispatched individual task forces into the Pyrenees, where there were still scattered pockets of enemy resistance.

The two southern corps along the coast made up mobile columns of tanks, bicycles, cavalry, infantry on trucks, and light artillery to set out in pursuit of the enemy. Thousands of Red soldiers were taken prisoner each day, and the stocks of captured materiel grew larger and larger, the closer the pursuers came to Barcelona. The Reds no longer took time to blow up bridges and roads. Disorganization was complete.

The Condor Legion units pursued the enemy on the ground, on the water, and in the air -- wherever they found him. Day and night they were busy over the retreat routes, the harbors, and along the coast.

Any large-scale operation designed to encircle the enemy would have been pointless in view of the complete chaos prevailing among his ranks. The important thing now was to keep him on the run by continuous pursuit.

Pursuit operations were hampered by cold, snow, and fog more than by the enemy.

The Red air forces still offered stubborn resistance; the Red antiaircraft artillery units were obviously beginning to suffer from a shortage of ammunition.

The Red troops seeking refuge in the Pyrenees were stopped by the French at the border, where they were disarmed and taken prisoner.

By 23 January the Spanish corps and the Italian Corps were within reach of the Catalonian capital, the Marroqui and Navarre Corps along the coast west of the city, and the Italian force to the northwest, at the edge of Montserrat, and at the Sabadell airfield.

For two days and nights the Condor Legion had been bombarding the harbor of Barcelona, in order to frustrate any escape attempt on the part of the Reds. The heavy antiaircraft artillery batteries were firing on the city. It was here that the last aerial combat with the Rata and Curtiss fighters took place.

The Generalissimo ordered the Marroqui, Navarre, and Italian Corps to form a ring around the southwest, west, and north of the city and to stand by for the order to attack simultaneously from all three sides. He still had hopes of being able to occupy the city without bloodshed and without any further destruction.

But on 26 January the troops of the Marroqui Corps, in the southwest of the city, could be held back no longer -- they forced their way into the city at 1500 hours and encountered resistance at several points.

The Navarre Corps followed the example of the Marroqui Corps, and by 1600 hours its battalions were also engaged in trying to force their way into Barcelona.

At 1700 hours the Italians began to march on the city.

By nightfall the last battle noise had died away, to be replaced by the rejoicing of the liberated population.

The Condor Legion immediately went to work to prepare the Sabadell airfield for its units. It took no part in the Spanish triumph, but let the Nationalists celebrate their victory alone.

Victory celebrations kept the Marroqui and Navarre Corps in Barcelona for four days. In the meantime the Italian Corps had moved to the coast and began pursuit operations.

The Condor Legion took twenty-four hours out to have the most necessary repairs done on their aircraft, which had seen very hard service during the past few weeks, at the airfields of Lerida and Sabadell. After this brief respite, the Legion units again resumed pursuit operations in the Pyrenees.

While the Italian Corps had already reached the town of San Feliu on the coast, the Navarre Corps was advancing by forced marches towards Gerona.

The Maestrazgo Corps had captured the town of Vich, the Aragon Corps that of Berga, and the Urgel Corps was engaged in clearing the enemy out of the mountains along the border towards Gerona.

The Condor Legion ordered its bomber squadrons to destroy any trains heading for France and to sink any ships or lighters appearing along the coast. The fighter squadrons carried out pursuit operations as far as the French border. The antiaircraft artillery batteries were distributed along the main route of march.

The last enemy resistance, in the area of Figueras, was quickly broken. The Maestrazgo Corps was the first to reach the border.

On 6 February German fighters carried out a low-level attack at dawn and managed to destroy eleven Ratas and Curtiss' which were caught on the ground. One Curtiss which had just taken off was shot down in flames, while fifteen more aircraft were so badly hit that they could no longer be repaired.

On the same day the bomber squadrons attacked six Red steamers near Puerto de la Selva; one was sunk, one set on fire, while the rest fled. On 9 February, the bombers flew their last mission over the highway north of Figueras.

On 8 February the naval air squadron on Mallorca received word that a Nationalist uprising against the Reds had broken out on the neighboring island of Menorca.

the squadron
Hereupon ~~they~~ took off for the Bay of Ciudadela, in the northwest of Menorca, and using it as a base -- bombarded the city of Mahon, where the Reds were still holding out, during the night of 8/9 February. By the morning of 9 February, all of Menorca was in Nationalist hands. The heavy antiaircraft artillery batteries were with-

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drawn to Sabadell, and the fighter squadrons soon followed. The bomber squadrons returned to Lerida. On 9 February Generalmajor Freiherr von Richthofen ordered the Condor Legion to relax at Sabadell.

On 10 February, all the Spanish corps reached the French border.

The campaign in Catalonia was over. It was too soon to tell whether this also meant the end of the war as a whole.

XIII. The Last Battles in the Liberation of Spain (11 February - 29 March 1939)¹⁷

(See the maps in Appendices 7 and 11)

On 10 February, just one day after Generalmajor Freiherr von Richthofen had told the Condor Legion that it could rest for a bit, the bomber squadrons were called into action once more. During the forenoon, fourteen He-111's bombarded the harbor and rail facilities of Valencia; the attack was repeated in the afternoon by a force of nine He-111's. The reconnaissance squadron gathered data which might be necessary for new attacks, either on the Catalonian front, near Guadalajara, near Toledo, or in Estramadura.

While these missions were being carried out, the Legion also devoted itself to overhauling and repairing its equipment and to making preparations for the future.

After the victory parade in Barcelona, with all the units of the Condor Legion participating at the express wish of General Franco, the Legion squadrons were transferred back to their old bases near Zaragoza. From these bases practice flights were carried out over the sector of the Guadarrama Mountains and in the Teruel area; the purpose of these flights was less to train the Legion crews than to keep the enemy worried and confused.

In spite of the political deliberations already under discussion, Nationalist leaders did not forget for a moment that hostilities could not be regarded as ended until the flag of liberation was flying over every single Spanish city. Towards the end of February it became clear that two more offensives in the south would be necessary, one in the Toledo sector north of Cordoba and the other in the Castellon area on the coast.

17 - Werner Beumelburg, The Struggle for Spain, The Story of the Condor Legion, Gerhard Stalling Verlagsbuchhandlung, Oldenburg/Berlin (Karlsruhe Document Collection)
Dagobert von Mikusch, France Liberates Spain, Wegweiser Verlag, Berlin.

The Condor Legion assigned its reconnaissance squadron to reconnoiter the area of Toledo. The units moved back to their old airfields at Avila, Salamanca, and Escalona.

In the meantime signs of collapse among the Red forces were growing more and more evident. At the beginning of March the first fighting took place in Madrid between the Radicals and the group around General Miaja, which was in favor of suing for peace. The outcome of this fighting was still uncertain. German pilots circling over the city, watched the slow death struggle of the capital but did not intervene, in order to avoid increasing the number of victims of the troubled country.

The Red Navy, which left Cartagena for French North Africa in order to avoid falling into Franco's hands, was attacked with bombs and torpedos by the naval air squadron from Mallorca. The Legion's bomber squadrons attacked Valencia, and burning ships in the harbor gave evidence of their effectiveness.

On 7 March, an attempted Nationalist uprising in Cartagena was put down, although the Condor Legion did its best to provide support from the air. The Radicals succeeded in gaining power and embarked upon what was to be the last bloodbath among the population.

The Red fleet had succeeded in its flight to Bizerte in North Africa, where it now lay at anchor under French surveillance.

On 10 March the staff of the Condor Legion moved to Toledo in order to make preparations for the coming offensive. The units had already been transferred into the operational area.

On 13 March it looked as though General Miaja were gaining the upper hand over the Radicals in Madrid. During the day the German fighter squadrons flew four missions over the capital in order to demonstrate the authority of the Nationalists and thus to hasten the surrender of the city. But the Red antiaircraft artillery and fighter aircraft still remained in action there.

On 16 March, in Burgos, the Generalissimo discussed his own evaluation of the

situation with the commander of the Condor Legion. Franco once again confirmed his intention to launch one last offensive and requested the assistance of the Legion.

On the following day the German air units began their preparations for the final act of the long struggle to liberate Spain.

On 23 March, the divisions having assembled, they were deployed for combat in the Toledo area.

On 25 March one last attempt to negotiate with the Reds broke down.

The next day the Nationalist southern army began its attack, which carried it easily over the enemy front. There was simply no more resistance! Prisoners and deserters were rounded up by the thousands. The flight of Red leaders from Valencia and Madrid was in full swing.

On 27 March the bomber squadrons, the fighter squadrons, and the reconnaissance squadron of the Condor Legion were employed to the full. The Spanish Toledo, Maestrazgo, and Navarre Corps, together with the Italian Corps, reported the successful breakthrough of the Toledo front. The southern army had already taken 10,000 prisoners.

By 1000 hours the first white flags began to appear in Madrid and Aranjuez. The German fighters were ordered to discontinue their low-level attacks and the bomber squadrons to release no more bombs.

On the morning of 29 March, hostilities came to an end. During the night the Red radio stations had reported the subjugation of the last Spanish cities.

The German reconnaissance pilots reported, "White and Nationalist flags over all of Red Spain". Thereupon the Spanish corps modified their advance to an occupation action. The German bombers and fighters, in perfect formation, flew in flight, squadron, and group strength over the Madrid, Aranjuez, and Toledo area once more, to demonstrate the strength of Nationalist Spain and to salute impressively the cause for which they had been fighting for the past three years.

From the first to the last day, the Condor Legion -- in spite of the friction

and difficulties often involved -- had carried out the tasks assigned to it in an exemplary fashion, thus giving ample evidence of the effectiveness of its leadership and its organization. The decisive factors in the success of the Legion's operations were the high standard of training, the fighting spirit, the flexibility, and the adaptability of each Legionaire -- from the commanding officer down to the last soldier. There is no doubt that Franco's brave troops could not have prevailed alone and that the role played by the Condor Legion was decisive, not only in the individual phases of operations but also for the final outcome of the war. And this fact has always been fully recognized by the Spanish.

XIV. The Losses Suffered by the Condor Legion

It is impossible to reconstruct an overall picture of the personnel and materiel losses of the Condor Legion from the sources available to us.

Werner Beumelburg (The Struggle for Spain, the Story of the Condor Legion)¹⁸

lists the following personnel and materiel losses:

Flying Forces

- 1 - One Ju-52 (K/88) crashed over Jerez de la Frontera in mid-August 1936
- 2 - One He-51, piloted by First Lieutenant Eberhard, Commander of the first fighter squadron, shot down in aerial combat over Madrid in the summer of 1936
- 3 - First Lieutenant von Kessel, squadron commander from the A/88, killed in action in the fighting in Asturia
- 4 - Two He-51's (J/88) shot down in flames on 9 February 1937 during aerial combat with Red fighters
- 5 - One aircraft (type unknown) shot down by Red ground defenses
- 6 - One fighter aircraft (J/88) shot down in flames on 1 April 1937 by Red artillery during a low-level attack
- 7 - Two He-70's (A/88) shot down in aerial combat on 10 July 1937 during the battle of Brunete
- 8 - One bomber (K/88) missing in action on 17 December 1938
- 9 - One bomber (K/88) crashed on 17 April 1938 while en route from Merilla to Seville for an attack on the harbors of Almaria and Cartagena (six dead)
- 10 - Heavy losses (no figures available) among the He-51 squadrons at the end of April 1938 during aerial combat with Ratas and Curtiss'
- 11 - Losses (no figures available) in the bomber group during the night of 9/10 July 1938 in combat with Red night fighters

18 - Beumelburg, op. cit., pages 28, 31, 60, 69, 73, 102, 118, 119, 193, 229, 231, and 274.

Antiaircraft Artillery Forces

No losses recorded, although it seems very unlikely that there should have been none in view of the fact that the antiaircraft artillery batteries were employed primarily in ground operations (the light batteries in joint operations with the infantry).

Signal Communications Battalion

On 11 June 1937, while engaged in setting up a communications line on the Buscargui (during the fighting at Bilbao), the Battalion suffered heavy losses (no figures available); on 3 January 1939, enemy low-level air attacks at Curbells claimed three dead and several wounded.

Exact Figures on Personnel Losses of the Condor Legion

from 1 November 1937 to 31 October 1938¹⁹

Killed in Action

Flying Forces	A/88	5
	AS/88	5
	J/88	10
	K/88	24
Antiaircraft Artillery	F/88	8
Signal Comm. Forces	Ln/88	2
Condor Legion Staff	S/88	1
(Army)		2
(Navy)		1
	Total:	58

Died of Illness

35

Taken Prisoner

25 (7 later exchanged)

19 - Generalleutnant Volkmann, "Kurzer Erfahrungsbericht über den Einsatz der Legion Condor in Spanien in der Zeit vom 1.XI.37 bis 31.X.38" (Brief Report on the Employment of the Condor Legion In Spain from 1 November 1937 to 31 October 1938), pages 21 and 22 (Karlsruhe Document Collection).

During the same period, the aircraft losses of the Legion were as follows:²⁰

As a result of enemy activity (confirmed):	35
As a result of enemy activity (presumable):	2
As a result of conditions beyond anyone's control:	9
As a result of technical deficiencies:	19
As a result of faulty operation:	<u>31</u>
Total:	96

Personnel losses entailed in the above:

Killed	41
Wounded	18
Taken prisoner	23

Generaloberst a.D. Jaenecke has the following to say in connection with the losses of the Condor Legion:

"The casualties suffered by the Condor Legion in Spain were very low in terms of numbers. They were, in fact, ridiculously low when compared with the exaggerated propaganda reports of the world's newspapers, which mentioned thousands of German dead on the battlefields of Madrid. All in all, to the best of my recollection, Germany lost no more than approximately 420 men, including the 82 killed during the Red bombardment of the armored vessel, "Deutschland", near Ibiza. Moreover, I venture the opinion that the majority of these 420 were killed as a result of careless driving on the torturous winding roads in the mountains of Spain."

Generaloberst a.D. Jaenecke has already mentioned (in Section I of Chapter III) the heroic deaths of Flight Captain Henke and First Lieutenant Freiherr von Moreau, commander of the air transport force and, later, of the first fighter squadron.

20 - Volkmann, op. cit., page 22.

Colonel a.D. Freiherr von Beust comments on the losses among the flying units as follows:²¹

"In view of the number of missions flown and the degree of success achieved, the losses (casualties and prisoners) suffered by the Legion during its employment in Spain were relatively low. This fact is naturally due in great part to the high quality of both officers and men, as we have already mentioned. The author has no exact statistics at his disposal, but feels himself justified in stating that the Legion's losses in dead, wounded, and prisoners as a result of enemy activity were far lower than the estimates made at the time by the various Luftwaffe staffs. The conclusions drawn from this were in part erroneous and, unfortunately, far-reaching in their effects, as will be discussed in greater detail later on. In the first place, the low losses must be attributed to the Legion's effective tactics and to its extremely high standard of training. It must be borne in mind, of course, that a good many of the missions flown -- particularly those in support of ground operations -- were relatively safe and easy, either because the aircraft spent such a very short time over enemy territory or because of the inadequacy of the enemy's air defenses. The losses due to weather factors, technical deficiencies, or faulty operation were greater than those attributable to direct enemy activity.

The Legionnaires who were taken prisoner by the enemy after being shot down over the enemy lines had the roughest time of it. During the entire campaign in Spain, there were no more than thirty men from the flying units who managed to survive enemy captivity, i.e. who were not killed immediately after capture. Not only did the prisoners have to contend with the abuses and atrocities traceable to the ideological and political background of the war and to the mentality of the Spanish people;

²¹ - Von Beust, op. cit., Part A, pages 80 and 81.

their position was all the more precarious due to the fact that they were not covered by any international agreements pertaining to the treatment of prisoners of war.

The fate of the majority of those taken prisoner by the Reds has never been clarified; there is no doubt that a good many were killed immediately after capture, while others died of illness or maltreatment in the prisons of Madrid, Barcelona, and Valencia. It is interesting to note in this connection that the conventions of honorable capture and humane treatment of prisoners of war^{were} disregarded even more thoroughly by the Spaniards among themselves. This attitude was prevalent even among the top-level commanders of both the Red and the Nationalist forces."

Colonel a.D. Freiherr von Beust also mentions the first loss suffered by the bomber group -- flying in bad weather, a bomber crashed in the Sierra de Grandos range at the beginning of December 1936; the commander of the 1st Squadron was killed on this occasion.

Chapter IV

The Experience Gained during the Employment of the Condor LegionI. Evaluation of the Experience Gained, within the Condor Legion Itself and within the Luftwaffe as a Whole²²

Apart from the political objectives Hitler hoped to achieve, the main purpose behind the employment of the Condor Legion was the gathering of information and experience in regard to leadership, commitment, training, and equipment. In addition, it was hoped that employment under actual wartime conditions would firm up the structure of the young German Luftwaffe and establish a cadre of combat-experienced flyers, antiaircraft artillery, and signal communications personnel of all ranks and specialties.

Within the Legion itself, the experience gained was evaluated without delay and without the application of time-consuming formalities, and recognized deficiencies and errors were corrected without further ado. During the first six months of its employment, for example, a good many improvements were made in respect to organization, command channels, signal communications lines, etc., so that previously necessary improvisations and stop-gap measures could soon be dropped, permitting a more purposeful and economical method of commitment. Such improvements were made above all in the fields of supply, airfield construction and enlargement, telephone and radio communication, distribution of motor vehicles to the various units, and equipment of aircraft and crews, as well as on the logistics and troop welfare sectors.

In Germany (Wunstorf), an especially created "Spanish Training Squadron for the Bomber and Long-Range Reconnaissance Forces" (the 10th Squadron, 27th Bomber Wing) trained the bomber crews in accordance with the experienced already gained in Spain before they were sent to join the Legion.

22 - The material contained in this Section is based of the following sources:

Footnote ZZ (cont)

Von Heust, op. cit., Part A, pages 83 and 84; Part C, pages 95 and 96; and Appendix 2.

Colonel a.D. Aldinger, "Bereitstellung und Einsatz deutscher Flakartillerie in Spanien" (The Deployment and Commitment of German Antiaircraft Artillery Forces in Spain) (Karlsruhe Document Collection).

This training covered the following:

- 1 - Special training in the operation of the He-111 for crews coming from the Do-17, Ju-86, or Ju-52 units. This included technical orientation as well as training in the operation of weapons and equipment.
- 2 - Practice flights in unit formation, practice with live bombs, navigation flights, night take-offs. During the course of this training the crew members learned to work smoothly as a unit.
- 3 - Theoretical Training: (concurrent with practical training) tactics and principles of employment applicable to Spain; ground combat instruction and orientation on the ground situation in Spain; recent experience gained in commitment in Spain; geography, the country, and the people; association with the population and language lessons.

After three to four weeks the crews were reported ready for assignment. It goes without saying that the squadron was provided with the most up-to-date information on experience gained in Spain and on the military situation at any given time. Both the director of the training squadron and all its instructors were personnel who had had experience in Spain.

Altogether a total of approximately 200 crews were prepared for assignment with the Condor Legion by the German training squadron.

The fighter forces, too, had such a training squadron for the fighter pilots scheduled for assignment in Spain.

There was no special training agency to orient the members of the antiaircraft artillery units in accordance with the experience gained in Spain. But a number of artillery officers returning from Spain were assigned to the training center at Herik.

The officers and enlisted men of the Condor Legion had been requested to keep complete records of the experience gathered during operations and to make suggestions when appropriate. The reports were immediately transmitted to the Commander

in Chief of the Luftwaffe in Germany for evaluation and study, and the conclusions drawn from them were put into effect without delay in the organization and training of the Luftwaffe.

Officers and even whole staffs from the German Luftwaffe frequently visited Spain in order to observe operations there for themselves.

These visits, which were not very popular with the Condor Legion, often failed in their purpose due to the fact that the visitors frequently accepted fleeting impressions and unique occurrences as generally valid experience.

After each rotation of personnel, the home-coming Legionaires were questioned in regard to experiences, operations, and impressions gained. Steps were then taken to ensure that information acquired in one unit should be made generally available to all.

Between April and October 1937, the period during which the entire Legion was gradually replaced, the build-up of the Luftwaffe in Germany was in full swing. This build-up was not only a build-up in terms of strength (the number of units and aircraft, the growth of the ground organization, etc.), but also a development in terms of planning, the establishment of operational and training guidelines, the expansion of technology and organization -- all aspects which had not been fully worked out during the previous three or four years of build-up activity but which were still in process of development.

Under these circumstances, it is understandable that the reports from Spain, which became available in ever greater number as more and more Legionaires returned to Germany after a year's combat experience, were accorded much greater importance than would have been the case if the German Luftwaffe had already been an established entity. A good many aspects of the tactical, organizational, and technical experience gained in Spain were arbitrarily made into basic principles of Luftwaffe commitment. In this process one thing was frequently overlooked -- namely that all this experience was based on the conditions peculiar to the war in Spain and had been gathered by a few relatively weak air units, operating at group strength at most, and by a force of special composition and unusually high quality.

In any case the principles of commitment and organization incorporated into the German Luftwaffe between 1937 and the beginning of World War II had far-reaching effects and remained significant until 1945, when World War II came to an end.

The returning Legionnaires took their places in all the Luftwaffe units, where most of them were assigned as instructors for the entire unit. They held positions of comparable influence in the Luftwaffe High Command, in higher-level Luftwaffe staffs, in schools and training centers, and within the antiaircraft artillery and signal communications forces.

During the course of the Spanish Civil War, the exchange of information and experience between the Condor Legion and the Luftwaffe High Command had developed into such a smoothly functioning procedure that it is really no wonder that the entire German Luftwaffe was strongly adapted in every respect to the commitment of the Condor Legion and the conclusions drawn therefrom. After all, apart from the political considerations which motivated Germany's participation in the Spanish Civil War, the main military purpose was surely to put into practice the theoretical principles worked out by Luftwaffe leaders prior to 1936. As we have already demonstrated, this purpose was completely fulfilled; in addition to the many positive results, there were also some which turned out to be negative in the long run, as we have just seen.

II. The Experience Gained by the Condor Legion and its Effects on the Growth, Organization, Equipment, Training, and Commitment of the Individual Luftwaffe Branches

Flying Units

1) Aerial Reconnaissance Forces²³

The aerial reconnaissance squadron (A/88) of the Condor Legion had a dual mission, namely the carrying out of reconnaissance activity for the command headquarters in charge of ground operations and for the Legion itself.

The mission on behalf of the army forces included tactical, strategic, and combat reconnaissance as well as artillery reconnaissance.

The mission for the Legion itself consisted primarily in target reconnaissance and in assessing the effectiveness of bombing attacks. The reconnoitering of enemy airfields, which was made extremely difficult by the enemy's practice of switching from one field to another, was a specialized aspect of the Legion mission.

The squadron was not fully occupied by reconnaissance activity, partly because of the lack of recognizable targets in view of the particular kind of warfare being waged in Spain and partly because there was less need of such services, since the Spanish military leaders were already fairly familiar with the lay of the land, and thus already had at their disposal a good deal of data and exact information which, in a normal war, would have had to be obtained by means of aerial and other reconnaissance. Since there were Nationalist sympathizers among the population everywhere, with whom contact could more or less be maintained, and since the agents of the Nationalist espionage service were able to provide a good deal of information, there was all the less need for aerial reconnaissance.

As a result, the aerial reconnaissance squadron could also be employed in

²³ - The material contained in this section is based on the following sources:
Beumelburg, op. cit., passim and especially pages 60, 61, and 174.
Volkman, op. cit., page 11

Footnote 23 (cont)

Jaenecke, "Angriffe auf die Elektrizitätswerke in den Pyrenäen" (Attacks on the Power Plants in the Pyrenees), excerpt from a letter to General der Flieger a.D. Deichmann, dated 13 November 1956.

bomber missions, and its organization reflected this duality of activity, viz:

- 1 flight for long-range reconnaissance
- 1 flight for close-range reconnaissance
- 3 flights for bomber missions.

Frequently it happened that all available aircraft, including the two reconnaissance flights, were temporarily assigned to bombardment activity.

One of the most noteworthy successes achieved by the reconnaissance squadron was the identification of an enemy force consisting of at least six divisions being assembled near Tortosa (on the eastern bank of the lower course of the Ebro) in mid-July 1938, during the Nationalist offensive against Valencia. Thanks to the reconnaissance squadron, the danger of a surprise assault of the Red troops against the rear of the Nationalist attackers could be eliminated.

The long-range reconnaissance mission carried out by Squadron Captain First Lieutenant von Kessel on 1 March 1937 deserves special mention. On this occasion the squadron had been requested to find out whether the newly established railway line between Utiel and Cuenza (midway between Valencia and Madrid) were ready for use. At 0900 hours, First Lieutenant von Kessel took off in his He-70 from the Seville airfield, intending to cross the front line near Granada (in order to avoid the enemy air defenses over Madrid) and then to approach the target from the south. Because of poor weather (danger of icing), however, and inadequate fuel, he was forced to land in Teruel, at the field held by the Nationalists there. Radio communication with his home base had also failed. The Spaniards at Teruel, however, seemed to be somewhat suspicious and refused to authorize his take off before having checked with their headquarters in Zaragoza, which certainly would have taken some time. Thus, First Lieutenant von Kessel, after having refueled his machine, simply took off from the fuel station before the eyes of the astounded Spaniards. In the meantime, the ~~in~~ cloud cover had grown denser and the danger of icing had increased. Despite these obstacles, the crew of the He-70 took their time about covering the

entire stretch between Utiel and Cuenza, taking photographs. They ran into heavy enemy machine-gun fire over Cuenza, and were forced to slip through enemy territory under an extremely low-hanging cloud cover; at 1900 hours, after having crossed the enemy lines north of the Guadarrama Mountains -- all by compass -- they landed safely in Salamanca, where they were received with rejoicing by their comrades, who had already given them up for lost.

During the summer and autumn of 1936, the He-45's of the reconnaissance squadron were employed with great success in directing both flat and high-angle fire from the Nationalist artillery batteries. On the whole, however, artillery reconnaissance was a very small part of the mission of the squadron, possibly because the training standard among the Spanish artillery units was too inadequate to permit them to take full advantage of such carefully planned coordination; the training standard, as a matter of fact, was not even adequate to fit the Spanish units for perfectly normal, but slightly more difficult artillery missions. It was also technically difficult to establish and maintain adequate contact between the aircraft and the Spanish artillery.

The inadequacy of the airborne armaments of the long-range reconnaissance aircraft (especially the He-70) made its employment difficult and often necessitated a fighter escort. The old-fashioned He-45 was even worse in this respect and could be employed only with fighter escort.

German Luftwaffe leaders, however, failed to draw the proper conclusions from the Legion's experience in this regard. To be sure, by the beginning of World War II the He-70 had been replaced by the much more suitable Do-17 in the long-range reconnaissance units, but the close-range reconnaissance units of the Army were still equipped with the out-of-date He-45 and He-46 even during the campaign in Poland, so that their record of losses suffered was the highest of all the flying units. Despite the experience gathered in Spain, the close-range reconnaissance units were committed without fighter escort, which, as a matter of fact, was also contrary to the usual practice during World War I. At the focal points of action at the very least,

fighter escorts ought to have been employed.

The documentary material available makes no mention of night reconnaissance flights. Presumably these were not necessary during the Spanish Civil War.

The activity of the aerial reconnaissance of the Condor Legion brought no completely new revelations, either in the employment or in the organization of such forces. Close-range reconnaissance units (in contrast to the bomber units, which were just beginning to develop) had already brought a wealth of experience from World War I, experience which was carefully evaluated and applied by the National Army (Weichswehr) in Germany. Thus, apart from certain revelations on the technological sector, the experience gained during the Spanish Civil War was not new.

It may be interesting at this point to mention the mission flown by an A/88 flight under the command of Second Lieutenant Runza. The flight had been ordered to attack the power plants on the southern slopes of the Pyrenees in order to disrupt electrical power production. The three participating aircraft, fully loaded, flew over the high mountains several times and, in low-level attacks, managed to destroy transformer stations and feeder lines so effectively that the plants were knocked out of operation for three weeks. This was undoubtedly a strategic success; it was never repeated, however, presumably because Nationalist leaders, who hoped to be able to capture the area soon, wanted to leave the plants undamaged so that they might use them themselves. Nevertheless, one wonders why Nationalist leaders failed to order such strategically effective attacks at an earlier point (especially since it was clear that the war was going to be a long-term one) in order to disrupt the supplies of electrical power to the industries in Catalonia, for after all the Reds were fairly dependent upon these industries.

German Luftwaffe leaders concluded from this successful mission that it must be possible to achieve like results with aircraft of a single type (i.e. not with mixed units) operating in very small groups. As the Chief of the Luftwaffe General Staff pointed out in June 1939 during a General Staff trip, this possibility had to be exploited as fully as possible. On the basis of the Spanish mission it was assumed that even the smallest units were capable of achieving a high degree of effectiveness.

Thus, from this point of view, the Condor Legion did have a certain amount of influence on the later conduct of strategic air operations, although the scope of this type of activity in Spain had been very small indeed.

2) Bomber Forces²⁴

Strategic Bombardment Missions

The instances of strategic bombardment by the bomber group (K/88) of the Condor Legion are extremely rare. The first examples were probably the attacks on Cartagena and Alicante as well as some of the Ju-52 night attacks on the rear area of the enemy forces near Madrid during the winter of 1936/37. Later on, until the end of the war, in fact, there were only sporadic attacks (carried out during daylight hours by the He-111 units) against enemy harbors, rear area communications lines, etc., and only a few of these were of real strategic significance.

Nocturnal Missions

It is clear from the above that the experience of the Condor Legion in strategic air operations was primarily in the field of night missions. The Legion's bomber group was the first to discover a good many of the factors which go to make up the problems and the prerequisites for success of nocturnal bomber activity, to deal with these factors on the spot, and to improve the traditional methods of employment through constant evaluation and application of the experience gained.

As a result of the Legion's activity in Spain, more and more emphasis was placed on the training of bomber crews for night missions after 1938. Prior to this time it had happened all too often that German flying personnel --

24 - Von Beust, op. cit., Part C.

especially the pilots -- who were absolutely reliable for daytime missions and thus carried on the unit books as fully capable of immediate commitment, were completely unfit for night operations. The fault, of course, lay with the training program of the schools and in the Luftwaffe units, a program which tended to avoid the whole problem of night flying and contented itself with giving the students one or two night take-offs and a very few navigation practice flights at night.

Cross-country flying, bad-weather flying, bombing practice, and practice flights under simulated combat conditions were all either ignored completely or sadly neglected in the night flight training program. Moreover, some top-level leaders were of the opinion that the fast bombers such as the He-111 were completely unsuited to night employment from the standpoint of technical operation and that they should be restricted -- for reasons of flight safety -- to daylight employment.

This situation changed radically after Spain. Any crew booked as fully capable of employment at the front was expected to have mastered all the problems of nighttime flying. In accordance with this new requirement, the training of bomber personnel was corrected and expanded.

The missions of the Condor Legion had proved beyond a doubt that the bombers, if they should be prevented by inferior performance, heavy enemy defenses, or any other reason from operating over enemy territory during the day, could fulfill their missions just as well and just as successfully during the night, perhaps even with less difficulty than during the day -- in any case, at least, with fewer losses.

The bomber group of the Legion was the first to demonstrate the possibility of the concentrated employment of bomber aircraft during the night and to develop this principle. Fundamentally, it was the procedure developed in Spain which was used during the long period of German night bombardment attacks on England during 1940/41. Thus, four years later, in spite of the changed conditions and the more advanced weapons technology, the experience gained and the procedures developed in Spain very definitely made themselves felt.

A prerequisite for the successful employment of bomber aircraft during the night was the number and location of airfields available to the unit as emergency, jump-off, or alternate landing fields. In addition to those factors pertaining exclusively to the ground organization (size and surfacing of the runways, supply and billeting facilities, etc.), the following tactical factors were of paramount importance: distance from the target area, approach routes over friendly and enemy territory, navigational aspects, geographical location of the emergency airfield concerned (nearness to mountains), weather conditions, distance away from other alternate fields, and things of this sort.

In Spain it was almost never possible to meet all of these conditions satisfactorily in accordance with the views which prevailed at that time regarding the optimum conditions for night bomber activity. As a result the bomber units learned to overcome the obstacles placed in their way and to get along with improvised solutions without jeopardizing thereby the effectiveness of the mission concerned.

The crews learned to take off and to land ~~on~~ with fully laden aircraft on runways that were too narrow and to get along without the usual obstacle lights and signal lights they were accustomed to at the airfields. Despite the nearness to the high mountains and the extremely limited radio and flight safety facilities, bad-weather flights and landings had to be carried out. The practical knowledge and experience in the carrying out of concentrated bombardment missions during the night under the most primitive of conditions stood them in good stead later on. And all this experience was evaluated by German Luftwaffe leaders and then applied in the ^{program} training/and in the planning of commitment, so that it was able to make itself felt during World War II -- especially during situations which had become critical as a result of enemy activity and which thus required the mastering of unforeseen difficulties.

In Spain the bomber units became accustomed to taking off in group strength (25 - 30 aircraft) within about half an hour from a single airfield. Approach routes

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and altitudes, turning points, and all the details of the attack itself were carefully coordinated in advance, particularly in regard to timing, and had to be followed exactly by each individual crew. This procedure, in part at least, represented an innovation at that time;

later on, during World War II, it was regarded as the standard procedure for the accomplishment of concentrated nocturnal bombardment attacks. The bomber group in Spain proved that attacks of this kind, provided that they were well planned and well executed, were just as effective as concentrated daytime attacks.

Individual attacks, or attacks spread over a period of several hours, of the traditional type were soon abandoned in Spain, except of course in the case of harassing actions such as the repeated bombardment of an enemy supply route or repeated attacks on enemy troops and troop assembly areas. These, in any case, were tactical targets, and the attacks on them can hardly be classified as strategic air operations.

Complete mastery of instrument flight and extreme care in the navigational preparation and execution of the flight were of paramount importance. The units and the individual crews were forced to excel in these aspects by the difficult climatic and geographical conditions, coupled with the inadequate radio communication facilities; on the other hand, this provided them with a good deal of excellent practice in mastering the difficulties of night flying.

It is true, of course, that the inadequacy of radio communication facilities and the difficulties resulting therefrom (the need for aircraft-based direction finding, radio beacons, localizer beams, etc.) were recognized and, although the situation in Spain could no longer be improved, the conclusions drawn were applied in the training programs in Germany, thus making themselves felt in World War II.

In Spain the practice of setting up blinker lights and directional searchlights was adopted in an attempt to facilitate aerial navigation and target location and to mark important turning points and the front lines. In some cases even, when the target was big enough to warrant it, it was illuminated by scout aircraft which released incendiary bombs over it in order to start fires.

As far as the bombardment attack itself was concerned, planning was limited to establishing a general line of attack. In order to obviate the danger of collision in the air (a danger which was quite overrated at that time), the altitude at which each aircraft was to release its bombs was carefully established and had to be exactly adhered to.

To begin with in Spain, there was little need for eliminating enemy defenses over the target area during the night. Nevertheless, with time the Condor Legion even gathered a certain amount of experience in this field, at Brunete, for example, where the enemy antiaircraft artillery and searchlight defenses were highly concentrated and thus much more effective than ever before and where enemy night fighter aircraft even appeared occasionally.

In addition a good deal of experience was gained in respect to the loading capacity of the aircraft, the need for reserve fuel during bad-weather flights, the most economical cruising speeds, etc. Certain safety factors, which had been accepted as absolutely valid previously, were proved to be irrelevant in practice, whereas others were discovered to be indispensable and were incorporated henceforth into the principles of employment.

Despite the technical developments which had taken place in the meantime, all these principles of employment were applied in strategic bomber operations during World War II. The nocturnal bombardment attacks on the British Isles and, later, in the East (on the Gorki tank factory, for example) represented only a refined and modernized application of the night bombardment methods used by the bomber group of the Condor Legion in Spain -- on a larger scale, of course.

Daytime Missions

We are now ready to examine the daytime strategic bomber missions in Spain, the experience gained during them, and the effects of this experience for the future. The employment of Ju-52 units in daytime attacks against well-protected targets in the enemy hinterland soon proved to be uneconomical and was thus discontinued, except in emergency situations.

But it was precisely in this type of employment that a great deal of valuable experience was gained, simply because the relationship between bomber and enemy air defenses showed up much more clearly in the commitment of the Ju-52, far inferior from the point of view of technical performance, than in the commitment of the later He-111 units.

It was recognized that the prerequisite for a successful mission of this kind was the assignment of a bomber unit in formation, which remained in formation during the approach flight, over enemy territory, and over the target. Only in this way could the losses inflicted by enemy fighter aircraft be kept within a tolerable limit and the attack itself have any prospect of success. As far as the Ju-52 units were concerned, there were a good many factors which made it difficult for them to remain in formation -- the lack of intercom and air-to-air communication facilities, the low degree of reserve power, the poor climbing ability and inadequate maneuverability of the aircraft, etc. Thus, under bad weather conditions, for example, it was often almost impossible to guide a heavily laden unit of Ju-52's over the high mountains to their target in close formation; nevertheless this remained the goal of all unit leaders. Gradually the bomber crews in Spain came to regard the enemy antiaircraft artillery forces (for which a group of aircraft in close formation provided an extremely rewarding target, of course) as a lesser evil than the Red fighter aircraft.

A second, no less important prerequisite was the provision of fighter aircraft to escort the bomber units. Here, too, it was often difficult to find a suitable means of coordination. Neither the fighter nor the bomber pilots had had very much experience in locating rendezvous points at a given time, the fighter aircraft were numerically too weak to provide effective protection, the communications facilities were poor, and -- finally -- the Ju-52's were simply too slow. Nevertheless, an attempt was always made to see that the bombers had a few escort fighters to accompany them, at least until they had crossed the line into enemy territory; if the target lay close to the front lines, the fighters might even be able to remain with them

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during the bombardment itself. In order to simplify the rendezvous problem, the bomber units were routed over the fighter airfields whenever weather conditions and distance factors permitted. Otherwise a rendezvous point in the air had to be established, but for the reasons detailed above this procedure was usually unsuccessful.

The need for more complete fighter protection, for example by a series of fighter units relieving one another in the escort of the bombers from the moment they entered enemy territory until they had completed their return flight, was clearly recognized, but could not be met in view of the conditions prevailing in Spain. This particular phase of operations brought no experience of significance.

As far as the method of fighter protection is concerned, we might mention that the procedure followed was the usual one, with the fighters flying above and slightly behind the bombers.

After 1937 only the He-111 units were employed in daytime missions, and the problem of a fighter escort was no longer so serious, not even during attacks on strategic targets. Thanks to its speed and airborne armaments, which were at least a match for the enemy fighters, the He-111 -- even in flight or squadron strength -- could defend itself sufficiently well to dispense with a fighter escort altogether.

This resulted in a shift in the missions of the German fighters in Spain, which, after 1937, were employed primarily in free fighter operations or in air support operations for the ground forces. This development, which may very well have been justified by the conditions prevailing in Spain at that time, was taken up by the Reich and applied in such a way as to be often unfavorable, for the following reasons:

a) German Luftwaffe leaders had come to consider the bomber per se (and the bomber in World War II was still the He-111 used in Spain, with a few improvements, or the Ju-88, which was only a little more powerful than the He-111) was capable of operating deep in the enemy hinterland without a fighter escort. They believed that a bomber unit in close formation was well able to defend itself against attack by enemy fighter aircraft. As a result, during the years 1938 to 1940, there was hardly any training in coordination between bomber crews and fighter pilots. As early as during the campaign in Poland, and even more during the campaign in France, this -- in turn -- resulted in far higher losses for the bomber units than would otherwise have been necessary. The full scope of this error in thinking became apparent in

August 1940, during the air operations against England, when technical inferiority (the range of the fighters) and inadequate training made it impossible for the Luftwaffe to carry out the missions set for it and when the losses mounted to an all-time high. From that point on, the Luftwaffe -- at least on the Western front -- carried out its strategic air missions only under cover of darkness; it had no choice but to renounce completely the one kind of mission which might have won the Battle of Britain -- daytime strategic attacks on the enemy hinterland (later demonstrated in their full effectiveness by the US Air Force).

b) There were two fundamental missions of any fighter arm, namely the protection of friendly bomber units and the defense of the home area against enemy air attack, which were completely relegated to the background in Spain. As a result, these tasks were often neglected or overlooked completely in subsequent training programs and commitment planning. This fact had its effects during World War II, first in the Luftwaffe's inability to carry out strategic air operations against the enemy (as mentioned above), and second in its inability to provide effective defenses for the home area in the face of enemy bombardment.

It goes without saying, of course, that the employment of the Condor Legion in Spain provided still other experience in the field of bomber operations -- for example, the cross-country flights between Germany and Spain in the initial transport operations and in subsequent courier flights provided excellent training for the crews who participated. But it is not possible to deal with all these aspects within the framework of the present study.

Nevertheless, in summary it should be mentioned that the experience gained in strategic bomber employment in Spain, and the far-reaching effects of this experience, must be rated as negative rather than positive. The experience gained in night employment is perhaps an exception. The real reason for this, of course, is simply that the idea of strategic air operations was never developed in Spain but always had to take second place behind the need for tactical air operations.

Tactical Bomber Missions

The experience gathered in Spain in respect to the tactical employment of bomber units is of paramount importance, in regard to both its intrinsic significance and its effects on the future.

It must be admitted, of course, that the peculiar conditions prevailing in the Spanish theater of operations (the lack of artillery and tanks, the strength ratio of the forces involved, the inadequacy of the supply and communications systems, etc.) very often created critical situations in which the ground forces needed and wanted air support by the German bombers. For a long time the bombers (Ju-52 and He-111) were the only substitute, or supplement, for the heavy weapons which the Nationalists did not have -- although it is clear, of course, that bomber aircraft are neither created for nor actually suited to this role.

In the beginning (Von Moreau's bomber unit during 1936 and the K/88 in 1936/37) the bombers were only occasionally employed in missions directly over the front, and this only when the situation could not be otherwise resolved; after the start of the offensive on the northern front on 1 April 1937, however, the situation changed radically. This was not the result of any particular critical situation; instead the offensive was based on the carefully planned coordination of air and ground forces. Thus 1 April 1937 may be viewed as the birthday of the principle of the tactical employment of air forces within the framework of ground operations. The pattern which characterized the offensive on the northern front from beginning to end was repeated again and again in the future, both in Spain and in World War II (particularly in the East during the period from 1941 to 1943):

On the first day, just before the ground forces launch their attack, all the available air units carry out a concentrated blow against the enemy fortifications which are to be assaulted on the ground. This is followed by a series of attacks, sometimes going on for days, on enemy pockets of resistance, enemy reserves, enemy supply and troop assembly areas in the vicinity of the front -- all this in

close coordination with the advance of the ground forces. The advantages of this all-out tactical effort by the air forces for the ground troops are obvious and have been pointed out time and time again; thus it is perhaps quite natural that every army -- and this applies not only to those of Spain and Germany -- immediately appoints itself as the promoter and champion of this new air force tactic and thus has a certain amount of influence on its further development.

After the new tactics had proved so satisfactory on the northern front in Spain (the operations against the Iron Belt of Bilbao, against Santander, and against Gijon were carried out according to exactly the same pattern), they were regarded as having successfully passed the experimental stage and were systematically improved and developed. Von Richthofen, who originated the idea, remained its champion for many years to come.

In the beginning, of course, there were still a good many deficiencies to be overcome and improvements to be made, and the conditions prevailing along the northern front in Spain, where the Condor Legion and its Spanish allies clearly had air superiority, were ideal for this. Above all the air units had to be oriented in their new missions and in the requirements they entailed. The bomber forces especially were unused to navigating according to landmarks, identifying and hitting small and mobile targets, and taking the course of the front line into consideration. The navigation according to dead reckoning which they had learned during their training, and their high-altitude ^{flight experience} (approximately 13,000 feet) were completely useless to the bomber crews in this new mission, which very rarely involved bad-weather or navigation problems. The bombers had to fly according to landmarks during the approach flight (usually quite short) and over the target; sometimes these flights had to be done at very low altitude, which increased the danger and difficulty involved. The crews were expected to be extremely flexible, in the operation of their aircraft, in the release of their bomb-loads, and, in fact, in every respect. For example, in view of the number of missions to be flown per day, there was rarely time to discuss

the orders in detail or to make careful preparations for the mission; last-minute changes in the target, the military situation, and the course of the front were the order of the day. The highly qualified crews of the Legion's bomber group made the necessary adjustment quickly and passed their first test, at Brunete, with flying colors. Here conditions were particularly difficult because the tactical bombardment missions had to be flown in the face of heavy enemy air defenses and -- for the first time -- in support of defensive operations rather than in coordination with an advance on the ground.

Detailed Treatment of the Various Problems Connected with the Tactical

Employment of Bomber Forces

Targets; Attack and Bomb-Release Tactics

The main targets in Spain were enemy emplacements in the vicinity of the front, identified enemy troop assemblies and columns, and, in cases where there was no possibility of recognizing troop activity from the air, smaller villages, wooded areas or areas otherwise limited in which -- according to aerial reconnaissance or ground observation reports -- there ~~might~~ be enemy troops. The last-named targets, of course, were easier to handle and consequently more popular. But in all cases the targets had to be located by landmark and with the help of appropriate maps and charts, which meant that the attacking aircraft had to remain at altitudes lower than 10,000 feet.

If the target was to be smothered by bombs, the attacking unit came in in close formation and dropped its bombs all at once; if the target was very large or if it was to be attacked at various times and at various points, the bomber unit separated into groups of about six aircraft each, each group having been assigned a certain part of the target for which it was independently responsible and which it attacked repeatedly if necessary.

Aiming and bomb-release activity was often based more on practical skill and

experience than on the technical efficacy of the aiming equipment, for the latter was designed for higher altitudes and calibrated for a steady and level approach flight. After a short time, however, even the trial and error method was yielding excellent results.

The bomb-load was selected in accordance with the target to be attacked. While over the target the crews could rarely tell how effective their attack had been, which, of course, was a decided disadvantage. There is no doubt, for example, that the morale-lifting effects of an attack on targets located near the front line were usually greater than its material effectiveness. Even so, an increase in morale was also a decided help to the ground troops and provided a boost for their operations.

Enemy Air Defenses; Fighter Escorts

The crew of a bomber being employed in tactical missions was faced with entirely different conditions as regarded enemy air defenses. In the first place, the fact that it remained over enemy territory for such a short time -- sometimes only a matter of minutes -- reduced the chances of successful enemy air defense activity and thus the potential loss of the bomber itself. In addition, it had a better chance of escaping and landing safely in its own territory, even if it should be ^mdamaged by enemy fire.

The enemy heavy antiaircraft artillery, which in any case was employed only in focal areas near the front, had little chance of success against a low-flying and constantly moving aircraft unit which kept changing its altitude and direction. To make up for this, the medium and light antiaircraft artillery were extremely unpleasant, since a low-flying bomber presented a relatively large and slow-moving target. And if -- because of the weather or for some other reason -- the bombers had to fly lower than 3,300 feet (as often happened), the antiaircraft machine-gun and rifle fire of the enemy was a very real danger. Under these circumstances, the bomber unit was extremely vulnerable and was forced to maneuver about or even to separate, which, of course, had an adverse effect on the bomb-release accuracy.

Later on, in areas with heavy enemy antiaircraft defenses, the close-support aircraft were sent in ahead of the bombers to hold down antiaircraft artillery fire with small bombs and airborne armament fire. This was done for the first time at Brunete, and this division of labor did much to relieve the bomber units.

On some of the combat sectors there was a very real danger of attack by enemy fighter aircraft since the Reds often had their fighter units either standing by in the air over focal points of action or alerted for immediate action at bases located near the front lines. Still, the bombers were usually able to defend themselves effectively against enemy fighter attacks for the short time they spent over enemy territory, even when they operated in small groups of three or four aircraft. In addition the fact that the bombers spent so little time over their targets made it difficult for the enemy fighters to get in close enough for effective attack.

Consequently, while a fighter escort was always desirable and useful, it was not absolutely a prerequisite for the successful accomplishment of tactical bomber operations. Often enough the fighter escort could be dispensed with when weather conditions were favorable or enemy defenses weak, and sometimes, of course, it had to be dispensed with when there were simply no fighters available for escort duty.

Ordinarily there was no direct escort duty in Spain, i.e. with the fighters flying right along with the bomber unit; it was sufficient to have the fighters standing by over the target area during the attack so that they could ward off enemy fighters if necessary.

Experience Gained in Combat on the Technical Sector

The most important conclusions to be drawn from the experience gained in the field of technical flight performance had already been mentioned in the foregoing account. During the three years which the Spanish Civil War lasted, it is clear that a good deal of information was acquired in respect to the bomber aircraft as such -- their airborne armaments, the types of bombs employed, the effectiveness of aiming devices and radio equipment, etc. All this was carefully evaluated by the various

technical offices and testing stations in Germany and the results, already tested and approved for the front, had been incorporated into the training of the bomber units with which the German Luftwaffe entered the war in 1939.

The He-111 -- doubtless quite properly -- was considered the ideal bomber model for the conditions prevailing at that time (just as the Ju-52 had come to be recognized as the ideal transport aircraft). A few improvements were made in the He-111-B, which had been employed in Spain, resulting in the He-111-P and He-111-H, which were available by the outbreak of World War II; no basic changes had been made, but the modifications had resulted in better performance, as follows:

- a) flight duration had been raised from three to approximately five hours by the installation of larger fuel tanks
- b) bomb-loading capacity had been increased to two tons (maximum load)
- c) installation of a turret with full-field view and additional machine-gun stations
- d) increased stability of the aircraft by shortening the wings and strengthening the fuselage and landing gear to make up for the added flying weight
- e) stronger engines with better altitude performance
- f) installation of the Lotfe 7c, expansion and improvement of radio equipment

Together with the Ju-88, the He-111 was to remain the Luftwaffe's standard bomber model until the end of the war in 1945; the few minor changes effected during the course of the war are insignificant. One idea which Luftwaffe leaders had picked up again and again ever since Spain turned out to be a fallacy with negative results -- the creation of an all-purpose bomber equally suited to strategic air operations and to tactical employment. And in the last analysis, it would seem that there is no such thing; the result of such experiments is bound to be a hybrid, incapable of fulfilling either mission properly.

Experience Gained in the Field of Training

From the very beginning it was recognized that the most important experience

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gained during the Spanish Civil War was that which pertained to the standard of training which should be required of bomber crews and to the concepts of readiness for front combat and combat preparedness.

The employment of the K/88 in Spain can be regarded as having brought the most valuable experience in this connection in that it helped to increase the degree of success achieved by the German bomber units, especially during the first years of World War II, and -- without doubt -- to decrease the losses suffered by them.

Consumption of Ammunition²⁵

During the period from 1 November 1937 to 31 October 1938, the following number of bombs was utilized by the Legion's bomber group in Spain:

22.05-lb bombs	13,548	
110.25-lb bombs	165,727	
551.25-lb bombs	11,563	
1,102.50-lb bombs	<u>611</u>	a total of 11,618.08 tons

3) Fighter Forces²⁶

In the beginning the effectiveness of the fighter forces in Spain was adversely influenced by the lack of adequate equipment (He-51's); after the fighter units had been converted to the new Me-109, their effectiveness -- as fighter units -- improved only very slightly due to the fact that the Red pilots consistently avoided aerial combat with them, so that the only real fighter combat took place when the German units were employed far behind the enemy lines. With the Me-109, the German fighter pilot was invariably superior to ~~the~~ his Red assailant.

The missions assigned to the fighter units were the following:

- a) Defense of the Nationalist combat front and hinterland against enemy air attack
- b) Provision of fighter escorts for the German bomber units

25 - Volkmann, op. cit., page 21.

26 - The material contained in this subsection is based on the following sources: Grabmann, "Die Erfahrungen beim Einsatz deutscher Flieger und Flakverbände in Spanien" (The Employment of German Flying Units and Antiaircraft Artillery Forces in Spain).

Volkmann, op. cit., pages 9 and 10

Freiherr von Beust, op. cit., Part C, pages 105-107, 111-113.

c) Carrying out of low-level attacks (close-support operations).

Re a), above: Once the conversion of the fighter units to the Me-109 (which began in the spring of 1937 and encompassed two of the fighter squadrons) had been completed, i.e. in the fall of 1937, aerial combat with the Red fighters was no longer a problem.

Although the Reds occasionally employed the few bombers at their disposal against targets located on the front lines, usually with a strong fighter escort, there was little chance of the German fighter units' being able to provide effective defenses, since the period between the time the aircraft observation stations along the front reported the approach of Red bombers and the actual beginning of the attack amounted to no more than five to eight minutes, which, of course, was not long enough to allow for the fighter scramble and subsequent attack. This problem was solved by the assignment of patrol groups consisting of two to five Me-109's to keep the front sector under continuous surveillance. Thanks to this system, it often happened that a relatively small group of Me-109's was able to attack and scatter a Red bomber group on its way to the front. In this way the Red bombers were forced to release their bombs over their own territory before they turned tail and headed back into the direction from which they had come; the accompanying fighters dived to a low altitude and made their way back to their bases singly.

The Red fighter pilots reacted in the same way even when they appeared over the front in groups of fifty to one hundred aircraft in order to demonstrate Red air strength.

The demoralizing effects of the superiority of the Me-109 were so obvious that the Legion commanders even dared to employ their bomber units in attacks on the harbor of Barcelona, some ninety-two miles from the front, as long as they were accompanied by an escort of Me-109's. The Red fighters were sent up at the approach of these units, but as soon as they realized that the fighter escort was made up of Me-109's, they veered off and refused to let themselves be engaged in aerial combat.

The employment of German fighter units in Spain did not result in any radically new conclusions. It did, however, substantiate the fact that one prerequisite for success in the defense of front-line targets against enemy bomber attack was a smoothly functioning aircraft reporting service and that the fighter aircraft to be employed in defense operations of this kind should be stationed as close as possible to the front. This was, in any case, a prerequisite which the Condor Legion always tried to fulfill.

The employment of the J/88 group in Spain also substantiated the fact that -- particularly in the case of fighter aircraft -- the superiority of the fighter aircraft per se is an extremely important factor, and that a fighter which is even only slightly inferior to the enemy model becomes easy game for the latter. The most important qualities of a fighter in this respect proved to be speed and climbing ability. In the event that the aircraft of both sides are equal in technical performance, the training standard and fighting morale of the pilots are the deciding factors.

No new discoveries were made in the field of the airborne armaments of fighter aircraft, since the aircraft on both sides were equipped with approximately the same type of armaments, including machine-guns.

As regards the night employment of fighter aircraft, the Spanish Civil War failed to provide any experience whatsoever, for the simple reason that the Red fighter pilots and bomber crews refused to provide any opportunity for night fighter operations.

Re b), above: In the beginning, the bomber group of the Condor Legion, equipped with the Ju-52, which was relatively slow and poorly armed for self-defense, could be employed in daytime operations, especially against targets located in the enemy rear area, only when it was accompanied by a strong fighter escort, in view of the fact that enemy fighter defenses were gradually being strengthened. Even after the group had been converted to the He-111, it could not dispense entirely with a fighter escort. It was difficult, however, to find the proper method of coordina-

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ting bomber and fighter operations in each particular action. This problem has been discussed in the foregoing subsection concerning the bomber forces. It should be mentioned here briefly that a fighter aircraft such as the Me-109-B, with a flight duration of eighty-five minutes at the most, was not suited to bomber escort duty. On the basis of the experience gained in Spain, the Me-109-D model was soon developed, with a flight duration of 125 minutes, in other words thirty minutes more than its predecessor. As a result of the increase in its penetration depth, the Me-109-D

acquired additional maneuverability, which made it more effective in employment at the focal point of air defense operations as well as in commitment as an escort fighter for the bombers or reconnaissance aircraft over the front.

The view prevailing among Luftwaffe leaders, to the effect that a bomber unit flying in close formation was well able to defend itself against enemy fighter aircraft and could thus dispense with a fighter escort, was not substantiated by the experience of the German fighter forces in Spain; this, unfortunately, was not accepted by German air leaders at that time. The single-seater fighter aircraft, with its restricted radius of operation, was simply not suited to strategic air actions. As a result, Luftwaffe leaders hurried to develop a "heavy fighter", or "twin-engine fighter", the Me-110-B. This was a twin-engine machine operated by a crew of two, which was developed first by the German Luftwaffe. With a radius of action of approximately 500 miles, the aircraft was still imperfect in a number of respects. It was not employed during the Spanish Civil War.

Thus the experience gained through the operations of the Condor Legion in Spain did provide an impetus for the development of a fighter aircraft model capable of employment in strategic air actions.

Re c), above: The carrying out of low-level attacks in Spain was assigned primarily to the two close-support squadrons (equipped with He-51's) of the J/88, which will be referred to as "close-support" units hereafter. Close-support operations, however, were not restricted to the He-51 units, but were also assigned to the other fighter squadrons (Me-109) whenever the military situation required -- and permitted -- the employment of fighter aircraft in such operations.

4) Close-Support Forces²⁷

This branch of the flying forces, which had played a significant role in World War I (by the end of the war in 1918 there were a total of thirty-nine close-support squadrons in existence), was reborn during the Spanish Civil War.

German Luftwaffe leaders had not actually envisioned the establishment of a special close-support arm. In Luftwaffe Manual (Luftwaffen-Druckvorschrift) No. 16, the basic guidelines for command and commitment, no mention is made of the concept of "close-support air units"; it is simply stated that all air units are to be assigned to support ground operations if necessary. Following the precepts of Douhet regarding the efficacy of strategic air warfare, German air leaders ignored the field of close-support air operations during the build-up period of the Luftwaffe.

The operations in Spain marked the rebirth of the close-support force. In the beginning this happened quite by chance; since the fighter aircraft, the He-51, proved to be too slow and too vulnerable to attack by enemy fighters, it was employed in low-level attacks with bombs and machine-gun fire against ground targets, particularly pinpoint targets which the more cumbersome bombers could not locate and hit so effectively, ~~and~~ against enemy troop movements along the highways, and against enemy airfields. These fighter attacks were highly successful. The tactics applied were as follows:

In order to be able to exploit the surprise factor fully, the close-support pilots -- whenever terrain conditions permitted -- approached at very low level, following the course of the valleys. Shortly before reaching their targets, they began to climb until they attained an altitude at which they were able to orient themselves regarding the terrain and the position of the enemy. While half the attacking squadron carried out its attack on the assigned target, the other half stood by in the air to protect the attackers and to reconnoiter new targets,

27 - The material in this subsection is based on the following sources:
Von Beust, op. cit., Part A, page 57; Part C, pages 92 and 98

Footnote 27 (cont)

Volkman, op. cit., pages 8 and 9

"Lehren aus dem Einsatz in Spanien, Einsatz von Schlachtfliegern" (Lessons Learned from Operations in Spain, Operations of the Close-Support Units), Excerpt from a study prepared by Branch VIII (Military History) of the Luftwaffe General Staff, 1944.

After May 1938, when the enemy had set up a strong and well-organized defense system of 20 mm and 45 mm antiaircraft artillery right behind the forward line, the losses suffered by the German close-support units were quite high. These losses would certainly have been much less serious if the Condor Legion had had at its disposal an aircraft model specifically designed for this kind of operation, one with sufficiently strong armor plating to provide some measure of protection at least for the pilot and the fuel tanks, for the majority of losses were due to injured pilots and punctured fuel tanks rather than to damage to any other part of the aircraft.

The two He-51 squadrons of the J/88, which had retained this aircraft type in keeping with their close-support assignments, were employed with great success. In the summer of 1938, however, one of these two squadrons was converted to the Me-109.

On an experimental basis, the first Ju-87's and Hs-123's (dive bomber aircraft) were tested by the Legion as close-support aircraft.

Freiherr von Richthofen was the driving power behind the development of a close-support arm. By the outbreak of World War II, thanks to him, Germany had at her disposal one close-support group with a total of forty aircraft, which proved to be of very great value during the campaign in Poland. During the course of the campaign in Russia, the group was enlarged again and again, and was assigned the new mission of combatting enemy tanks.

One is tempted to ask whether the establishment and enlargement of the close-support units was really purposeful in view of the Luftwaffe as a whole. For in the last analysis, it was the fighter units which provided the necessary personnel and materiel. It is true, of course, that the campaigns in Poland and France would probably have been won even without the close-support units, whereas a painful lack of fighter units was noted during the operations against England, in the campaign in the East, and in home air defense operations.

5) Dive-Bomber Forces²⁸

Primarily because of the close coordination between the air units and the ground forces, the Spanish Civil War -- in addition to bringing about a rebirth of the close-support forces -- also marked the introduction of a completely new weapon in the field of close-support operations -- the dive bomber. The idea of releasing bombs from a diving aircraft probably originated in the United States; in any case, Udet, later to become Chief of the Luftwaffe Technical Office, brought it with him upon his return from a visit to that country. US air leaders had envisioned the employment of dive bombers against naval targets. Udet promoted the development of such aircraft for use against pinpoint ground targets as well, and von Richthofen arranged to have the first models, the Ju-87 and the Hs-123, sent to Spain for tactical and technical testing. In the beginning their technical performance was below the standards set and, in addition, their hitting accuracy against pinpoint targets was far from adequate. It was at this point that the overpowering effectiveness of the 1,102.5-lb bomb was realized.

The Ju-87 was improved to the extent that the dive-bomber flight of the Legion's bomber group could be employed (together with the bomber squadrons) at the front on a number of occasions -- for the first time on 17 February 1938 in the battle of Teruel. On 9 March 1938, during the opening phase of the Nationalist offensive against the Mediterranean coast, the dive-bomber flight was employed to attack the enemy front line and the enemy reserve forces being assembled at Belchite and Azuara. On 15 January 1939, the flight managed to destroy three enemy steamers in the harbor of Tarragona.

28 - The material in this subsection is based on the following sources:

Beumelburg, op. cit., pages 201, 209, and 283.

Volkman, op. cit., page 11.

Freiherr von Beust, op. cit., Part C, pages 92 and 98, as well as Appendix 1, I.

The operations in Spain served to demonstrate the usefulness of a dive-bomber force to carry out missions which could be accomplished by the normal bomber units either not at all or with indifferent success. As a result, German Luftwaffe leaders championed the development of this new force, and by the time World War II began a total of nine dive-bomber groups, with 336 aircraft, were available for employment. The new weapon, under the command of von Richthofen, experienced its first spectacular success during the campaign in Poland, in 1939, and the operations in France, in 1940. The dive bombers were particularly effective in shattering the enemy fortifications along the Maginot Line.

The staffing and equipping of the dive-bomber units, of course, had to be done at the expense of the bomber forces. And this, in turn, brings us to the question whether it might not have been better to dispense with the establishment of a dive-bomber arm and to strengthen the standard bomber arm instead. The Maginot Line would probably have been overcome even without the assistance of the dive-bomber units, and the missions subsequently assigned to them could probably have been accomplished just as effectively by horizontal bombers. The nine extra bomber units (making a total of thirty-nine in all) which could have been set up instead of the dive-bomber units and which could also have been used in strategic air operations (which the dive-bomber units could not) might have been of decisive importance in the Battle of Britain.

In addition to the above, the dive-bomber principle made deep incursions into the thinking of German air leaders and finally led to the attempt to combine the advantages of horizontal and diving attack in a single aircraft (the Ju-88). The attempt to unite these two aspects of performance in one machine was never successful (as, indeed, the attempt to create an all-purpose aircraft is usually a failure); instead, it simply resulted in uncertainty as to the proper method of attack and probably prevented the development of a long-range strategic bomber.

6) Transport Forces²⁹

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The airlift carried out by the twenty German Ju-52's succeeded in bringing a total of 13,523 troops and 593,914 lbs of military materiel, including thirty-six artillery pieces and 127 machine-guns, from Africa to Spain -- in other words, they carried out an air transport operation never before attempted in such large scope. During the three months of its existence, this airlift provided countless new and fundamental items of experience pertaining to the air transport arm of the German Luftwaffe.

The air supply operation at Toledo and the cross-country flights of the courier and aircraft ferry services between Spain and Germany (the technical aspects of which have already been dealt with) also served to point out the potentialities of this type of air operation.

German Luftwaffe leaders did not hesitate to make use of all this experience in the build-up of the air transport forces, which was just beginning in 1937. Three years later, during the beginning of the offensive in France, the new weapon was employed for the first time, with spectacular military results.

The operations of the transport aircraft in Spain had already provided ample proof of the significance of air transport and of the potential application of air transport and air supply actions under appropriate circumstances. The units in Spain gathered valuable information regarding the loading capacities of the Ju-52 and, later, of the He-111 and the best possible way to utilize these capacities effectively in air transport operations. At the same time, the indispensable prerequisites and basic conditions necessary for the systematic and successful accomplishment of air transport operations were recognized.

At this point let us list the most important items of experience which were gained during operations in Spain, the conclusions from which were immediately put into practice there:

29 - Freiherr von Beust, op. cit., Part C, pages 116 and 117.

a) It was absolutely necessary that the pilots be expert in the operation of the heavily laden aircraft in every conceivable situation. They must, of course, have had experience in instrument flight and in bad-weather flying, for it is clear that if a transport pilot should make a serious mistake in this regard, he would be endangering a good deal more than the pilot of any other type of aircraft. The losses in human life might be extremely serious.

b) The equipment of the aircraft had to be designed with a view to saving as much weight as possible, thus permitting a greater pay-load. This meant: the smallest possible crew number, no radio equipment, no airborne armaments, very little reserve fuel, and no parachutes -- whenever possible. On the other hand, in case of need, it had to be possible to install the required equipment without delay.

c) The choice of airfields was extremely important; the closer the take-off base was to the final destination, the more missions could be flown and the greater was the volume of cargo delivered. The transport pilots had to learn to land on tiny, primitive runways and to take off again in accordance with exact schedules in order not to jeopardize the timing of the operation.

d) It was imperative that loading and unloading operations be carried out smoothly and quickly by trained squads capable of handling the troops and supplies to be loaded or unloaded efficiently and without delay.

e) Tactical planning was important in cases in which the transport aircraft had to cross enemy territory or in which enemy activity was anticipated; this was especially true, of course, in the case of transport flights to deliver supplies to advance or encircled forces. Under these circumstances, such things as flight route, flight altitude, flight formation, the installation of airborne armaments, and the provision of a fighter escort had to be given due consideration before the action concerned.

It was demonstrated quite clearly that the standard bomber units could not be expected to take on the task of providing air transport in addition to their other

duties; thus an independent air transport arm was established, and its later significance needs no special mention. The airlift in Spain was the prelude to the subsequent air transport operations in Holland, Crete, and Stalingrad and to the air supply actions on behalf of the Africa Corps and numerous German units on the Eastern front.

7) Cooperation Between the Air Units and the Army³⁰

In this respect, the primarily tactical operations in Spain yielded a wealth of new and extremely valuable experience, particularly in connection with the employment of the bombers, which had never before been utilized in such close coordination with ground forces, and with the close-support units, which, as we have seen, began their real development in Spain. In operations of this kind, an exceedingly close coordination between air and ground forces was the primary prerequisite for success, as was clearly demonstrated in Spain. Understandably, there were a great many difficulties to be overcome in the beginning precisely on this sector, difficulties which could be traced back to a lack of experience as well as to the inadequacy of the available technological facilities, especially signal communications facilities. Thus a certain number of miscalculations regarding the course of the front, the development of military operations, the position of friendly troops, and the location of the targets to be attacked simply could not be avoided, and it happened occasionally that bombs were dropped over friendly territory. The Condor Legion soon learned to profit from these early mistakes and to eliminate them at their source.

Both the air units and the ground forces were forced to familiarize themselves to a hitherto unknown extent with the methods of operation used by both. The ground forces, especially, had to be trained in the identification of friendly and enemy aircraft models,

30 - The material in this subsection is based on the following sources:
Freiherr von Beust, op. cit., Part C, pages 113-115
Volkman, op. cit., pages 13 and 14.

which -- from the point of view of the pilots -- seemed to be an extraordinarily difficult undertaking; it often happened in Spain, and also later, during World War II, that the Nationalists shot at German aircraft. It was also deemed to be very useful for the ground forces to have some idea of the method of attack and bombardment as well as of the general tactics employed by the bomber units.

Even more extensive was the information which the air units were expected to acquire regarding the method of operation of the various branches of the ground forces, information which had previously been of use only to the close-range aerial reconnaissance units.

During the offensive on the northern front and during the battle of Brunete, a great deal of experience was acquired in connection with ^{the} tactical employment of air units and the principles of coordination between air and ground forces, experience which was applied immediately. The most important points are the following:

- a) Whenever possible, the commanders of the flying units were oriented right in the combat area and were urged to remain on hand to observe the execution and effectiveness of the air attacks carried out.
- b) All planning and preparations, as well as the issuance of operational orders, on the part of higher-level Army headquarters were carried out in conference with Condor Legion representatives.
- c) Air liaison officers were assigned to the Army command headquarters, where they could observe for themselves -- often from posts located right on the front line -- the development of operations on the ground. The commander of the Condor Legion, or a high-ranking officer authorized to represent him, could usually be found at the focal point of operations. This procedure was entirely new in Spain; later on, during World War II, it became standard procedure, especially on the Eastern front.

d) Direct radio and telephone communication lines had to be provided between the command posts of the air units and those of the ground forces. Only in this way could the air missions be carried out quickly, efficiently, and effectively, based on the very latest developments in the action at the front.

e) An "identification service" was set up in Spain to mark the course of the front line, the Nationalist forward line, and the direction of attack with cloth and light signals (directional searchlights and blinker lights were used at night). This service was carefully tested and constantly improved.

f) When the bomber units had to be assigned to tactical missions during the night, certain special precautions had to be taken. These have already been discussed in the subsection dealing with the night employment of bomber aircraft.

During their participation in ground operations, the bomber units were directed from a command post located to afford a good view over the area of combat; the post was usually set up either along the forward line or in the vicinity of the command post from which ground operations were conducted. It was useful that the majority of the officers on the Legion staff had at one time or another in their careers acquainted themselves with the combat methods of the ground forces, so that they were able to provide effective support and sometimes even valuable advice for the Army command staffs. A certain degree of familiarity with ground operations on the part of the air commanders, coupled with smoothly functioning communication services, would seem to be a prerequisite for effective air intervention in ground operations.

One result of the experience gained by the Legion in Spain in the provision of direct air support for ground operations was the establishment, in the summer of 1939, of the office of the Special Duty Air Commander (Fliegerführer z.b.V.). This led to the development of a regular close-support division, equipped with dive bombers, twin-engine fighters, a close-support group, and single-engine fighters. From the point of view of the "blitzkrieg", it is clear that the concept of a special close-support force, with its organizational and operational ramifications, was one of the most

important ever evolved by the German Luftwaffe. Since the Luftwaffe could afford to set up only one close-support division, the overwhelming demand for such services inevitably took some of the strategic air units away from their primary missions in the depths of enemy territory. Thus, on occasion, the other air divisions as well were required to take over the task of providing air support for Army operations, although their commanders were naturally inexperienced and their aircraft models (usually twin-engine bombers of the He-111 and Do-17 types) not really suited to operations of this kind.

It was Generalmajor Freiherr von Richthofen who was responsible for systematically gathering and evaluating experience in close-support missions in Spain and for seeing that it was utilized by Luftwaffe leaders in Germany. Von Richthofen himself was an expert in the command of such operations.

Of all the experience gained by the Condor Legion in Spain, it was that pertaining to the methods of tactical air employment which was most significant and most far-reaching in its effects.

During the campaigns in Poland and France, this experience was applied and developed further; the campaign in the East, from 1941 to 1943, provided countless classic instances of the application of close-support air tactics, which -- especially within the framework of an offensive operation -- nearly always resulted in immediate and spectacular success. In the meantime these tactics had also been tested and applied to other types of ground operations, to defensive actions, for example.

As we have already indicated, the development of this entirely new method of operation and the shift from strategic to tactical thinking had a profound influence on training, technological, and organizational developments within the German Luftwaffe. The creation of new air arms, specifically the dive-bomber and close-support units, and a shift in the missions traditionally assigned to bomber, fighter, and aerial reconnaissance units, as well as to the antiaircraft artillery, are the most apparent results. Above all, the subordination of air employment to the needs and

requirements of the ground forces gradually led to a fundamental change in the ratio of strength existing between the Luftwaffe and the Army, and this inevitably had an adverse effect on the overall development of the Luftwaffe.

8) The Struggle for Air Superiority³¹

Before we turn to a discussion of this subject, it may be useful to present a brief summary of the characteristics of the Red air forces and their method of employment.

On the average, it can be estimated that the number of combat aircraft available to the Reds in Spain was approximately 200. Thus, from the numerical standpoint, both sides were about equal (i.e. the Red air forces on the one hand, and the combined units of the Condor Legion, the Nationalists, and the Italians on the other). The Reds, however, had placed the main emphasis on fighter aircraft, and in the beginning were even numerically superior to the Nationalists in this respect, while they had rather neglected the bomber sector. This ratio was not only important as far as numbers were concerned but naturally also had its effects on the equipment, training, and employment of the bomber units. The reason for the unequal ratio between fighters and bombers probably lay in the fact that the constant Nationalist bomber attacks forced the Reds to emphasize the defensive aspect; the fact that fighter pilots could be trained more quickly than bomber crews may also have played a role.

The twin-engine bombers used by the Reds, the Martin and the Potez, were far inferior in performance to the German He-111.

31 - The material in this subsection is based on the following sources:

Lt Col Douglas Pitcairn, "Russische Flieger im Spanieneinsatz" (Russian Pilots in Spain), 1955

General a.D. Grabmann, "Die Erfahrungen beim Einsatz deutscher Flieger- und Flakverbände in Spanien" (The Experience Gained during the Employment of German Flying Units and Antiaircraft Artillery Forces in Spain), an excerpt from Study No. 164, "Die deutsche Luftverteidigung 1933-45" (German Air Defense Operations from 1933 to 1945)

Volkman, op. cit.

Von Beust, op. cit., Part A, page 34

Footnote 31 (cont)

Evaluation of the "Air Exercise on Rügen" of the Naval Air Squadron, Condor
Legion, Part III, pages 38-40.

The few bomber aircraft the Reds had at their disposal were employed only infrequently and always with a strong fighter escort. They were used only against targets along the front; the enemy hinterland was avoided. During these missions over the front, both the bombers and fighter aircraft utilized the low-altitude attack method, a tribute to the superiority of the German Me-109's at high altitudes and to the efficacy of the Legion's 88 mm antiaircraft artillery. The Red bomber crews had had neither training nor experience in navigation, bad-weather flying, or night flying (they hardly ever appeared during the night), nor were they adept in flying in formation; they usually attacked in groups of one or two flights at most. The target accuracy of the Red bombardiers could only be described as indifferent.

The Red fighters, on the other hand, were superior to the German He-51's in every respect. Once the Legion's fighter group had been converted to the Me-109, however, the situation was reversed. The Red fighter pilots usually attacked singly, and when they encountered a German bomber unit flying with fighter escort, they attacked both the bombers and the fighters indiscriminately. Once they had completed one mission of this kind, they ordinarily did not reappear to follow it up. Later on, the Red fighters began to appear in groups of five or six.

The Red fighter pilots seemed eager to attack and, in fact, often approached larger units of German aircraft, but they never tried to pursue their quarry across the front lines into Nationalist territory. Primarily they were employed in warding off Nationalist attackers; they never operated according to the "free hunt" method.

The Red fighters were occasionally employed during the night -- this happened for the first time during the night of 9/10 July 1937, during the battle of Brunete, when the Legion's entire bomber force was employed in an attack on enemy airfields during which the enemy night fighters suffered serious losses. The Red pilots flew according to visual landmarks and thus were restricted to good-weather periods for night employment.

Aerial reconnaissance was apparently a field in which the Reds were not very

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interested; reconnaissance seemed to be limited to the minimum necessary in preparation for Red bomber raids.

The ground organization installations of the Red air forces were very skillfully camouflaged, presumably due to the influence of the Russians, who are extremely gifted in this respect. As a result it was extremely difficult

for the Legion's reconnaissance aircraft to discover the Red airfields; and even after they had been discovered, the presence of enemy aircraft was only rarely noted. The fighter bases, in particular, were so cleverly camouflaged that the Legion was often unable to tell the airfield, or even the general area, from which the fighters were operating. During the defense of Madrid, for example, Legion commanders had no idea where the Red fighters were taking off until a Legion fighter pilot happened to discover that they were taking off from the city itself, from the main highway, which ran from north to south. The Red fighters were landing at previously determined airfields, but these were so well camouflaged that it was seldom possible to tell from the air whether there were aircraft parked there or not. The maneuverability displayed by the Red fighter units in shifting from one landing field to another was astounding for the conditions prevailing at that time.

The practice of changing airfields so frequently also had a definite disadvantage in that it increased the risk of losing aircraft as a result of crash landings or inadequate maintenance.

As far as antiaircraft artillery was concerned, the Red hinterland -- apart from certain strategically important points and areas -- was practically without defenses. The area around Madrid was protected by a strong belt of antiaircraft artillery of all calibers, reinforced by searchlights. In addition, antiaircraft artillery units were stationed at the city of Guadalajara, the airfield at Alcala de Henares (which was an important supply base as well as an important Red fighter concentration point), along the highway between Valencia and Madrid (a vital supply line), and around the harbors of Cartagena, Valencia, Barcelona, Mahon (Minorca), and Rosas, which were protected by modern antiaircraft artillery of 76 mm and 88 mm, as well as by heavy and light ship-based antiaircraft artillery and searchlights. The Red heavy antiaircraft artillery, however, failed to achieve very much success. The target location, aiming, and firing procedures were so poor, especially at night, that even the slow and cumbersome Ju-52's, at their usual operating altitude of between 6,500 and 13,000 feet, were quite safe. Even the He-59's, which were extremely slow, suffered not a single

loss at the hands of Red heavy antiaircraft artillery, since the latter never succeeded in scoring a direct hit.

The Red antiaircraft artillery stationed at the focal points of the ground action, on the other hand, i.e. the light antiaircraft artillery (20 to 47 mm caliber) and the machine-gun units, were very definitely a problem. These forces brought down a good many Nationalist aircraft and damaged even more during low-level attack operations. The fact that the close-support units were almost always employed at low altitudes resulted in their having the highest record of losses of all air units. During the Nationalist advance on Valencia, at the end of April 1939, Red antiaircraft artillery often interfered seriously with the Nationalist air attacks.

All in all, despite their numerical superiority over the German He-51 fighter units, the Red air forces were inferior to the Condor Legion in respect to leadership, striking power, and standard of training. Once the German fighter units had been equipped with the Me-109, German air superiority was assured for the balance of the war, even though the Red fighters were still superior in number.

From the very beginning of operations, the Condor Legion devoted its attention to winning the struggle for air superiority, and this goal was never neglected in spite of all the other missions to be carried out.

The Legion's attacks on the enemy air forces on the ground were never particularly successful. As we have already mentioned, the Red ground organization was skillfully camouflaged, very simple in organization, and widely dispersed. Moreover, the Reds were very clever about transferring their aircraft to a safer place whenever an attack threatened.

As the following examples will show, the Legion varied its method of attack on the enemy airfields.

a) At the very beginning of their employment in Spain, the German fighter units had to wage a bitter and costly struggle against the qualitatively superior enemy forces. In the area of Madrid alone, Legion pilots counted more than fifty modern

French and Russian machines in the air at once. And often enough, the Reds mustered more than a hundred of these aircraft over the capital. Again and again the Reds managed to break through to attack the Nationalist infantry troops. Thereupon the commander of the Condor Legion ordered a massed attack by all available bomber and fighter units on the Red fighter bases northeast of Madrid. The first attacks were successful, but very soon the Red fighters moved to other bases, leaving only a few aircraft at the old bases -- and even these few aircraft frequently moved from one field to another. And when even these tactics failed to discourage the German attackers, the exemplary Red espionage service (which functioned on both sides of the front, utilizing those communications facilities still in operation) always succeeded in warning the enemy fighter units of a coming attack in time for them to take to the air and thus escape destruction on the ground. German air commanders had no alternative but to order night attacks on the enemy airfields. It was a game of hide-and-seek which lasted for weeks on end. The question of air supremacy was ~~ER~~ never decided.

It is incomprehensible that the tactic of night attacks on enemy airfields was not employed more frequently, since it would certainly have been capable of further development.

b) On 12 February 1937 the German bomber units, assigned to carry out a number of attacks on enemy airfields, bombarded one airfield near Alcala de Henares (some thirteen miles northeast of Madrid), where twenty-four enemy bombers were parked, and a second one, with twenty fighter aircraft. The bomber mission, flown with an escort of German fighters, was highly successful in both instances.

c) On the afternoon of 15 August 1937, during the offensive against Santander, the bomber squadrons of the Condor Legion attacked the Red airfields in the area of Santander, accompanied by a German fighter escort. Twelve enemy machines were destroyed on the ground. During the ensuing aerial combat, three Curtiss¹ and two Ratas were shot down.

d) In connection with the decision, at the end of November 1937, to discontinue preparations for the offensive against Catalonia and to prepare for a battle of decision in the area northeast of Madrid, a great deal of consideration was given to the fact that

a very strong Red air force (estimated at more than 100 aircraft) was assembled behind the Red front in Aragon, stationed at airfields southeast of Zaragoza on either side of the Ebro. The assembled Nationalist air force consisted of sixteen bomber units and thirteen fighter units (all of squadron strength), a total of approximately 250 aircraft. The air offensive staged in preparation of the attack on the ground lasted three days, as follows:

On 10 December all the available German, Spanish, and Italian bomber forces, together with a fighter escort, were sent up to attack the enemy airfields. Only a few of the bombers located their assigned targets in time and were thus able to score at least some success; the majority arrived too late as a result of the too-long distance to be covered or because of faulty navigation. And when they arrived over the enemy airfields assigned to them, they found them deserted! The Red bomber units had already taken to the air, and the Red fighter aircraft attacked the fighter escort of the Nationalist bomber force -- seventy Ratas were sighted in the air at one time. The Nationalist fighters were unable to engage in aerial combat, however, since they did not have enough fuel to remain over the target area any longer.

There are a number of lessons to be learned from this mission -- to begin with, the command function and the effective coordination of such a large force were made very difficult by the fact that it was made up of three separate air forces with completely different equipment. In addition, the participating aircraft took off from widely dispersed bases. The standard of training was not adequate to the type of mission involved. The surprise factor could not be exploited as fully as had been anticipated, and the radius of action of the Me-109's was so limited that they had to turn around and head for home just as they should have been engaging in aerial combat with the enemy fighters. Combined operations of this kind were not usual in the German Luftwaffe at that time; they were undertaken only by the Training Division, with its specially selected and specially trained personnel.

For the following day, a different tactic had been selected. The bomber

were to fly without a fighter escort, bombarding the enemy airfields from a high altitude, and then withdrawing across the front line. It was hoped that the Red fighters would then follow them into the range of the German anti-aircraft artillery units and into the area where the Nationalist fighters were being held on alert. The Red fighters, however, refused to accept the invitation and remained on their own side of the front line. The bomber units were moderately successful in their attacks and returned without any losses.

The only lesson to be learned from this particular mission was the fallacy of relying on a potential development; the Legion counted upon the Red fighters' reacting in a way which was certainly possible but not a foregone conclusion by any means. In this case, they happened to guess wrong.

The Legion tried its luck for the last time on 12 December, this time with still another tactical plan. The Nationalist bomber units were to drive the Red bombers and fighters from their bases into the air and to keep them there until they had no choice but to land in order to refuel. The moment the enemy aircraft landed, they were to be smothered by a concentrated attack by the Nationalist air forces. This time it was the weather which upset Nationalist plans; ground fog and snow flurries prevented most of the Nationalist aircraft from taking off, and the rest returned without having accomplished anything.

The three-day struggle against the Red air forces had cost a great deal of effort on the part of the Nationalist air units and had failed to lead to any tangible result. On the contrary, the Reds had demonstrated a degree of reserve which was entirely unexpected.

e) During the offensive in the Teruel-Zaragoza area, which began on 9 March 1938 and whose goal was a breakthrough to the Mediterranean, all available Nationalist air units were employed in attacks against enemy emplacements and enemy reserve forces located along the front. The following day, 10 March, they carried out a successful surprise attack against Red airfields.

f) During the offensive in Catalonia, the Nationalist air units carried out a carefully-planned operation which was intended to deliver a serious blow against the Red air forces. Execution of this operation was entrusted to the fighter group of the Condor Legion. At dawn on 12 January 1939, approximately thirty-five Me-109's

fighter forces than in the bomber forces, which had always dominated the picture until then, may well have had its origin in the experience of the Condor Legion. The plans called for a doubling of the strength of both forces, so that by 1 April 1937 the ratio between the two was no longer one fighter group to three bomber groups, but rather ~~three~~ one to two³².

We have no overall figures available regarding the success achieved by the Legion's flying units in aerial combat against enemy aircraft. We only know that from the initial appearance of the German air units in Spain until 31 October 1938 -- in other words during the first thirteen months of operations -- a total of 277 Red aircraft were brought down by the German units³³.

There is no way of determining whether this figure includes Red aircraft destroyed on the ground and, if so, to what extent.

The German antiaircraft artillery forces also contributed their share to the establishment of air superiority. During the first thirteen months of operations, they brought down a total of fifty-eight enemy aircraft³⁴.

It is probably that the majority of these aircraft were downed by the light antiaircraft artillery, employed along the front lines against low-flying enemy aircraft. As has been pointed out, the Red pilots usually avoided the heavy batteries by remaining at higher altitudes and very rarely dared to attack targets in the Nationalist hinterland. In general only about half the antiaircraft artillery batteries of the Legion were employed at the front, ~~which~~ while the rest were assigned to protect the Legion's airfields, which, however, were never subjected to serious attack. In view of their small numbers, the record scored by the units at the front is all the more remarkable.

The systematic coordination of antiaircraft artillery and fighter aircraft was never attempted in Spain, since the Red air forces never attacked in large units.

32 - Grabmann, op. cit., pages 11 and 12.

33 - Volkman, op. cit., pages 20 and 21.

34 - Ibid., page 21.

took off from their base at La Cenia, at the mouth of the Ebro, flew far out to sea towards the northeast, keeping low over the water, and, when they reached a point carefully predetermined from the point of view of course and time, veered off towards the west in order to surprise the Red airfields near Tarragona, Reus, and Valls with a low-level attack. The Rata group stationed at Reus was just taking off as the Me-109's started to gain altitude prior to attacking the field. The Ratas, once in the air, scattered into all directions and managed to escape. At the other two fields, however, the attacks were a complete surprise, as attested by the burned-out wrecks of twelve enemy fighter aircraft.

g) On 6 February 1939, shortly before the conclusion of the campaign to liberate Catalonia, the fighter group of the Condor Legion succeeded in destroying the last twenty-seven enemy fighters in a low-level dawn attack on an enemy airfield in the vicinity of Figueras, in the northeastern corner of the province.

This spectacular success was probably due not only to the growing experience of the Legion fighter units in the execution of such operations but also to the demoralized state of the Red pilots, who were so convinced of their coming defeat that they hardly bothered to fight.

The tactics employed in establishing air superiority by means of aerial combat against enemy aircraft had already been dealt with adequately in the sections on "fighter forces" and, in part, "bomber forces", so that here we need give only a brief summary of the experience gained on this sector and its effects on the German fighter arm.

1) Air superiority cannot be achieved by offensive operations only (i.e. by air attack on the enemy airfields; defensive operations of the fighter units are of equal importance in this respect.

2) Air superiority does not depend primarily on the number of fighter aircraft available, but rather on the quality of both machines and crews.

The fact that the year 1937 was marked by a greater increase in the Luftwaffe's

9) The Naval Air Squadron and the Coordination of its Employment with that of the Navy³⁵

In the beginning the naval air squadron of the Condor Legion (AS/88) was stationed at Cadiz and later, after July 1936, at Pollensa on the island of Mallorca. Its personnel strength was 110 men.

The squadron was subordinate in all respects to the commander of the Condor Legion, although it was assigned to work together with Spanish and Italian agencies. These Spanish agencies were the Air Command Headquarters (Jefatura del Aire), under Teniente Coronel Franco (a brother of the Generalissimo), and the Naval Headquarters (Base Naval); the Italian one was the Air Legion Headquarters (Aviacion Legionaria). As chief of the Military Command Post (Comandancia Militar), the commander of the island held a general's rank. Later on a very necessary organizational change was made, and Almirante Morano, who was in charge of blockade operations, was appointed chief of the fleet, chief of the Naval Headquarters, and ranking commander of the island of Mallorca. A Navy liaison officer^s, who had had very little experience in the field of aviation, was permanently assigned to the Air Command Headquarters to handle the Navy's requests for the services of the German, Italian, and Spanish air units.

35 - The material contained in this subsection is based on the following sources:
 Evaluation of the "Air Exercise on Rügen" of the Naval Air Squadron, Condor Legion, during the Period from mid-July until the End of December 1937
 Volkmann, op. cit., pages 14 and 15
 The Naval Air Units (excerpt from the book Rise and Fall of the German Air Force, published in 1946 by the British Air Ministry)
 Generaloberst a.D. Jaeneck^s's report on his inspection visit to the Condor Legion in Spain (from a letter dated 13 November 1936 to General Deichmann).

This liaison activity was somewhat difficult in that orders from Salamanca required that the requests for air services from the Air Command Headquarters and from the Naval Headquarters had to be passed on separately to the squadron, which -- with the few aircraft it had at its disposal (seven, on the average, five of which were usually ready to take off immediately) -- did its best to fulfill all the requests. The captain of the naval air squadron had the right to decide between two conflicting missions.

A certain amount of difficulty was experienced in the beginning, until the Spanish agencies had become accustomed to the independent status of the naval air squadron, and later on there was some friction due to differences of opinion between the two Spanish agencies. The squadron captain needed all his skill and tact to make decisions between the two without jeopardizing friendly relations. A further problem lay in the fact that the requests submitted by the two Spanish agencies did not always conform to the military requirements of the squadron. For instance, there were often impulsive rush requests for aerial reconnaissance to confirm certain vague reports which were obviously untrue to begin with. Sometimes these requests were complied with so that squadron leaders could confirm to the Spaniards ^{that} their predictions as to the unreliability of the reports were accurate; later, the squadron simply acted independently in accordance with its own sources of information. The Spanish Air Command Headquarters kept the squadron well supplied with maps, aerial photographs, situation plans, etc.; its requests for air services sometimes went so far, however, as to call for the bombardment of telephone switchboards, for example, or other such targets too trivial to justify an air attack. Requests such as these were disapproved, of course, and the flying hours available to the squadron put to better use.

The missions which gradually evolved for the naval air squadron were the following:

- a) reconnaissance of and attacks on the Red fleet
- b) reconnaissance of and attacks on Red commercial shipping

c) attacks on enemy harbors and coastal targets (also in conjunction with ground operations)

d) support of the German naval forces during retaliatory actions.

The wide variety of missions, coupled with the numerical inadequacy of the squadron, resulted in extremely careful evaluation of which missions were the most important and which could best be fulfilled effectively with the means at hand. To fulfill all of them with equal effectiveness was an impossibility from the standpoints of materiel and time -- this would have required at least three to four times as many aircraft as the squadron had at its disposal. The squadron could not even carry out constant aerial reconnaissance over the coastal sector between Valencia and Barcelona without neglecting its other missions.

Coordination with the Spanish reconnaissance squadron, also stationed at Pol-lensa, provided no appreciable relief or support. Thus the squadron captain decided that it was better to aim for the partial fulfillment of all the missions at a given time than to select one task, such as reconnaissance, for example, as the most important and to work on it to the exclusion of the rest. As a result of outside factors such as weather conditions, enemy defenses, the phase of the moon, etc. it was natural that certain missions took precedence during certain periods.

Re a), above: The Red fleet was a collection of poorly equipped vessels, manned by crews whose discipline and morale were extremely poor. The fleet avoided combat whenever it possibly could. Its home port was the harbor of Cartagena. Its primary mission, to make certain that supply transports from abroad reached the Red harbors in safety, did not require it to engage in combat with the Nationalist fleet, which, in any case, was unable to stop the supply shipments effectively. Besides, the British and French battleships, in accordance with the provisions of the Nyon Agreement, carried out this mission vastly more efficiently than the Red fleet could have done.

With its slow He-59's, the naval air squadron could have attacked the harbor of Cartagena only during the night, since it was protected by a ring of eight heavy antiaircraft artillery batteries with efficient fire direction. A night attack, on the other hand, was impossible because of the inadequate range of the He-59's when heavily loaded. The idea of starting an attack from the island of Ibiza was also

out of the question because of the deficiencies of the ground organization there, particularly in terms of night operations.

Re 5), above: In the beginning the Spanish Navy authorized attacks on other than Red Spanish shipping discovered within the three-mile limit; later, however, such attacks were restricted more and more as protests were received from the admirals of the countries concerned, which refused to recognize the three-mile limit imposed by the Nationalists. These protests were a source of concern to the Spanish blockade chief and to the government in Salamanca. The blockade chief reserved the right to deal with ^{each} case independently, i.e. to hold a vessel found within the established limit or to release it, according to the nation concerned. The delay caused by the need to request permission to attack before taking any action was sufficient in some cases to permit the potential victim to escape. In four instances the naval air squadron itself gave the order to attack, since the ships concerned were obviously carrying contraband and since it would have taken too long to obtain permission from Palma. The subsequent investigations carried out by the Spanish Navy in connection with a steamer which had been attacked and sunk made it abundantly clear that the British and French were making ever greater inroads into the freedom of action of the men in charge of blockade activity. Later on no British vessel was permitted to be attacked or even searched, even if it happened to be in a Spanish port or within the three-mile limit. As a result, all vessels, no matter what their nationality, began to display the British flag, and the delivery of war material and food supplies to Red seaports flourished as never before. The imposing of a blockade and the warning that mines would be laid were theoretical deterrents only; in practice the British ships, which probably knew very well the location of the few mines which had actually been planted, continued to sail in and out of the Red seaports unhindered. The French ocean traffic between Marseille and Spain did ~~increase~~ drop off somewhat, but to make up for it supply deliveries across the French border increased day by day.

In view of the relations between France and the Spanish Reds and the inefficacy of the restrictions imposed by the Nationalists, there was very little chance of disrupting the Red supply lines effectively.

Re c), above: As the difficulties mentioned in the preceding paragraph developed, the attacks on Red port installations were also subjected to increasing restrictions. No attack could be carried out as long as British ships were unloading or British military vessels happened to be in the harbor concerned. Occasionally, attacks on specific ports were banned during periods when it was known that ships were entering or leaving the harbor.

There were no restrictions imposed on attacks against targets along the coast. In addition to the material destruction they caused in the enemy rear area and to their devastating effects on enemy morale, these attacks were highly successful in that the enemy shifted more and more of his antiaircraft defense forces to the coastal areas, forces which could have been put to very good use along the inland fronts. The main target of these attacks was the railway depot at Port Bou, the channel by which the French supply shipments entered Spain. In addition attacks were also carried out on rail and highway systems, bridges, etc. The operations against rail and highway facilities in the region between Tortosa and Sagunto were carried out in connection with the start of the offensive on the ground; their purpose was to deceive the enemy as regarded the direction in which the offensive was to develop and to make it difficult for the enemy to utilize these facilities for the transport of troops and equipment to the north or south.

Generaloberst a.D. Jaenecke describes the operations of the naval air squadron against enemy rail facilities as follows:

"The success achieved by the naval air squadron was uncanny. As I saw with my own eyes, there was hardly a railway station along the Barcelona-Valencia line where there wasn't at least one wrecked ammunition train, surrounded by mountains of burned-out shells and cartridges. Truly an impressive sight.

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The German naval squadron pilots were known as the "railroad men" all along the coast, because they appeared each evening, regular as clock-work, sweeping in from the sea over the railway lines along the coast to attack and destroy the almost defenseless Red transport trains. The Reds tried all the tricks they knew

and regrouped their antiaircraft artillery constantly in an effort to ward off these devastating attacks, but apart from one or two direct hits they were not particularly successful. There is no doubt that the German naval squadron pilots had discovered the secret of an operational method which was dangerous -- decisively dangerous, in fact -- to the Reds.

Occasionally the other Legion units had tried out the method of attacking the longer-distance rail lines in an attempt to damage the locomotives of moving trains so badly that all rail traffic came to a standstill. Seidemann, as I remember, was a past master at this sort of operation. But these were mere pinpricks in comparison with the successes scored by the naval air squadron."

Re d), above: The naval air squadron was never called upon to support the German naval forces in retaliatory actions for the simple reason that such actions were unnecessary.

Cooperation with the Italian air forces was anything but ideal in the beginning, since the Italians were hardly enthusiastic about the presence of a rival force on the island. The missions assigned to the two forces, the assignment of specific reconnaissance and attack sectors, individual air missions, timing, etc. were all determined in joint conferences with the Spanish admiral and his staff; the initial reaction of the Italians was either to refuse to accept the assignments given them or to accept them and then simply not carry them out. During July and August 1937, the Italian air forces stationed on the island consisted of one bomber squadron (nine Savoias 81) and one fighter squadron (nine Fiats). During this period the Italian air force, under Colonel Abri, made itself rather unpopular with the Spanish by its practice of constant talk and very little action. As a rule, those targets which it was important to hit were assigned to the naval air squadron, since the Spaniards had little confidence that the Italians would really carry out the assignments given; they had been too often disappointed by inaccurate Italian reports regarding the success of certain missions. It should be emphasized that the Italian fighter pilots displayed a very

high standard of training, which unfortunately was not true of the bomber crews. The majority of the losses sustained by the bomber squadron were traceable to insufficient training (faulty navigation, radio communications difficulties, etc.). Occasionally, when the bomber pilots were unable to locate their target, or an attack seemed too dangerous to risk, the bombs were simply unloaded over the ocean. There were two instances in which aircraft from the German naval air squadron, which happened to be in the area, were seriously endangered. One Italian bombardier attacked an Italian steamship by mistake; another dropped his bombs over Ibiza during a night raid, thinking that he was over Minorca. On three occasions, the naval air squadron was called upon to go out and search for overdue Italian aircraft.

Under Colonel Abri's successor, Colonel Morelli (pseudonym), cooperation between the two forces was much better and, as a result, there was more friendly personal contact among the squadron members. During this period, the Italian force on Mallorca was augmented by two more bomber squadrons (equipped with up-to-date Savoia-79's) and two more fighter squadrons (equipped with a newer model Fiat with auxiliary fuel tanks permitting a radius of action of two and three-quarter hours). These Fiats were capable of accompanying the bombers all the way to the Red mainland. In November six Savoia-81's and three fighter aircraft were transferred to Aloudia, and the three fighters were utilized at the same time in air defense operations over Pollensa. In December, one of the Italian bomber squadrons was transferred from Palma to the mainland.

As far as the Spanish air forces were concerned, to begin with there were only five flying boats of Italian origin (Cant-C models) stationed in Pollensa; they were manned by Spanish crews. As a rule only two of these craft could be counted upon to be ready for action at any given time, chiefly as a result of missing spare parts for the engines or air frames. Later on one Dornier-Wal squadron was assigned to Aloudia. These Spanish aircraft took care of aerial reconnaissance in regularly assigned sectors and zones. Coordination with them provided little relief for the naval air

squadron. In the first place, the German squadron rarely received the reconnaissance reports brought in by the Spanish, and in the second place those reports which they did receive proved to be unreliable. On a number of occasions the naval air squadron took the Spanish pilots along during their attacks on the Mainland coast.

Despite the frequent air raid alarms at Pollensa, the Red bomber forces did not attack the city. Its antiaircraft artillery defenses consisted of two 105 mm cannon of Italian manufacture, operated without fire-control devices by Spanish crews. A few machine-guns supplemented the antiaircraft artillery. Palma was raided three times by Red bombers (the second time by a force of twelve, and the third time by a force of twenty-two Martin bombers). The number of enemy bombers brought down was reported as four by the Italian fighter aircraft and nine by the antiaircraft artillery. We have no way of checking the accuracy of these figures.

Tactical Experience Gained in Operations against Naval and Coastal Targets

a) The Red Fleet

1) During the reporting period the Red fleet was made up of the following vessels: the Jaime I (not available for immediate employment; later sunk in the harbor of Cartagena), the Libertad and the Mendez Nunes (usually ready for immediate employment), (12) 6 destroyers of the Churruca class (two of them assigned to the northern front), 2 destroyers of the Lazaga class, the gunboat Laya, 4 submarines (C-model) (three of them assigned to the northern front), 4 submarines (B-model), and a number of speedboats (the exact figure varies); the majority of the submarines were of French and British manufacture; there were also 5 ancient torpedo boats and a seaplane tender which was out of date and no longer usable; countless armed fishing boats had been pressed into service as patrol vessels. There were unconfirmed rumors of Russian and French submarines; one Russian submarine was reported repeatedly to be at anchor in Cartagena harbor, but apparently it was not available for employment. The home port of the fleet was Cartagena. The submarines, some of the destroyers, and the Laya were usually assigned to patrol the waters off Barce-

lona, Valencia, Alicante, Almeria, and -- occasionally -- Mahon.

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2) The primary mission of the fleet consisted in the employment of destroyers or patrol boats to pick up convoys coming from Algiers or Mastagenem. In addition, the ships were often moved around from harbor to harbor to demonstrate Red naval strength. At the beginning of the period with which we are concerned here, submarines were apparently operating from bases near Mahon.

Without taking into account the reasons (such as standard of training, condition of equipment, lack of ammunition, etc.), we can summarize the activity of the Red fleet as follows:

The military value of its operations was extremely slight, for the Red naval units were totally incapable of protecting their convoys in case of an encounter with Nationalist naval or air forces. In such cases, the merchant vessels were left to their own devices, and the escort units turned tail and fled. This happened once off the coast of Algiers, when a Nationalist cruiser attacked the convoy (on this occasion the "J.J. Sister" and the "Jaime II" were captured), and once near Calella, when a convoy was attacked by the naval air squadron. In the meantime there were constant rumors to the effect that the Red fleet was being reorganized, that torpedo carriers (submarines, speedboats, and torpedo aircraft) were being purchased, and that "important developments" were "in the offing", developments which would change the entire picture -- but which never came about.

3) Under the prevailing circumstances, the naval air squadron had little opportunity to come into contact with the Red fleet, which was being held back so carefully. Red naval units were attacked only when they were involved in operations against merchant shipping or when the Nationalist fleet requested air support of the squadron. As the Nationalists intensified their efforts to disrupt the Red supply lines, it became apparent that the Red fleet was no longer capable of fulfilling its task; in accordance with the provisions of the Nyon Agreement, British and French destroyers took over the job of escorting the convoys and carried it out with far greater efficiency. The following engagements took place between the naval air squadron and the Red naval forces:

30 July 1937: Two aircraft bombarded two escort destroyers off the coast of Calella (after the steamship being escorted had already moved inshore). One direct hit (with a 110-lb bomb) on the port side of one of the destroyers was reported.

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The aircraft also attacked the speedboats (which had apparently been guarding the stranded steamship against submarines) with low-level machine-gun fire, whereupon they fled in a zig-zag course. One of the speedboats, trying to escape in the direction of Barcelona, was driven in to shore and set ~~afire~~ afire by machine-gun fire.

14 September 1937: The Red patrol boat "Llobregat" was attacked with airborne armament fire.

7 September 1937: One torpedo aircraft and three bombers from the naval air squadron attacked Red fleet units off the coast of Algiers in support of the Nationalist cruiser "Balears", which had become involved in combat with them during the forenoon.

b) Operations Against Enemy Shipping

1) General

Even from the base at Pollensa, operations against enemy shipping had formed only a small part of the mission of the naval air squadron. For this reason they were rarely carried on for more than a week at a time, and then usually in connection with attacks on targets along the mainland coast.

Political Difficulties and Restrictions

In respect to the method of attack (previous warning, interpretation of the three-mile limit in terms of "long miles" or "short miles"), the ships of different nations had to be treated differently. Sometimes there were even bans on operations against the ships of specific nations. As a result, the nationality and the name of each ship had to be carefully identified before any action could be undertaken. Inasmuch as Red Spanish and Russian steamships were also abroad at the same time, this investigation was often dangerous. The problem was made even more difficult by the frequent changes in flags (Greek ships and other runners of contraband often sailing under British flag), abuses of flag privileges, and changes in names. The chief of blockade operations was the one to decide whether or not to attack, and he had to be asked before any action was taken. In one or two instances the captain of the naval air squadron gave the order to attack, since the delay involved in checking first with Palma would have resulted in the loss of the opportunity.

The Three-Mile Limit

It was only the waters within the three-mile limit which (apart from a temporary restriction) were not subject to limitations of any sort. Here attacks could be carried out without prior investigation, and investigation so close to the Red coast would have been extremely dangerous in any case since there was always the risk that

Red fighter aircraft might appear on the scene. Thus the three-mile limit might be described as a miniature theater of war, but when it happened to be located off the coast of a large harbor protected by anti-aircraft artillery and fighter aircraft, it was too small to intercept and attack a steamship making for port. After the ban on operations against the ships of certain nations,

issued on 21 November 1937, unrestricted warfare on enemy shipping was no longer possible in this zone, since the instructions issued by the nations concerned to their ship captains, to the effect that they were to avoid the three-mile zone along the coast of Red Spain, had nothing to do with it. It was fortunate that Red shipping (and probably the ships of pro-Red contraband runners and other smugglers as well) and Red coastal traffic had obviously been ordered to keep as close as possible to the Red coastline and to head for shore in case of attack. In this way an aircraft was sometimes able to destroy a ship ^{even without bombing it} by driving it to ground along the rocky part of the coast or at least to make it founder by driving it in too close to a sandy beach. Either one of these actions prepared the way for its complete destruction in a subsequent attack by several aircraft.

Signal Fires

In connection with other missions over the Red coast, the naval air squadron often attempted to put lighthouses out of commission by low-level attacks with airborne armament and machine-gun fire in order to make it more difficult for ocean traffic to navigate the Red coast during the night. Finally, probably as a result of these attacks, the Reds began to set up strong searchlights on the higher inland hills, presumably to aid the ships navigating by night.

2) Reconnaissance

As we have already mentioned, the reconnaissance of shipping was very rarely the only mission of a naval air squadron flight. It was usually combined with the reconnoitering of coastal targets and harbors -- in preparation for subsequent night or dusk bomber attacks -- or with evening reconnaissance missions in which the aircraft concerned attacked coastal targets themselves (in the absence of enemy shipping). On the other hand, every flight over water was also used for the reconnaissance of enemy shipping, provided time permitted. Unless specific orders had been issued to the contrary, potential attacks on enemy shipping were always given priority over attacks on coastal targets.

The limited number of aircraft available and the variety of missions which they were expected to accomplish made it impossible to keep any one ocean area, such as the Gulf of Lion or the approaches to Barcelona, for example, under constant surveillance. There was little point in asking the Spanish flying boat squadron to help in this undertaking because of the completely different radio communications equipment (different wavelengths, codes, and procedures). Other factors which argued against coordination were the small percentage of flying boats available for employment at any given time, the inability of the Spanish crews to carry out reconnaissance activity during bad weather, and the -- from the German point of view -- generally poor standard of training of the Spanish crews. The naval air squadron considered the Spanish reconnaissance reports to be very poor in terms of accuracy and reliability. This attitude is substantiated by the reports of certain reconnaissance missions over specific ocean areas and over enemy harbor installations which were flown by both the German and the Spanish squadrons. The naval air squadron scheduled regular missions to check on enemy shipping whenever reports were received to the effect that a number of ships were ready to leave port or were already under way. From time to time the squadron also reconnoitered the Catalonian coast, the Gulf of Lion, or the western waters of the Mediterranean as far as the Colombrète. On one or two occasions, at the urgent request of the blockade chief, reconnaissance missions with one or more aircraft were flown over the sea lanes along the French Moroccan coast and over the approaches to the harbors of Cartagena, Alicante, and Valencia. These patrol missions were usually carried out jointly with the Nationalist naval forces; each time they took up a good deal of flying time and brought no results whatsoever. The reason for requesting them in each case was the receipt of unclear information or uncertain reconnaissance reports (for example, older reports received from the Italians and referring to the waters around Sicily). One has the impression that the Spanish naval staff let its blockade operations be guided by the reports of the espionage services. It might have been wiser if they had limited themselves to

blocking only one sea lane, but to blocking it effectively and successfully by means of intensive and systematic reconnaissance. Instead, although the resources of the naval air squadron were strictly limited, the naval staff requested it to obtain confirmation for each doubtful report received from espionage service sources. It is true, of course, that sometimes these missions were crowned with success, but only as a result of the systematic reconnaissance activity initiated by the squadron after the initial check had failed to elicit results. Yet the Spanish kept on turning up

with alarming bits of information and the request that the squadron take steps to confirm it immediately. In the vast majority of cases, the information turned out to be inaccurate. The Spanish have no talent for routine, systematic work unless it shows results immediately, although the ratio between success and effort is surely greater in the long run.

The three-mile zone was the primary target of reconnaissance activity. Early-morning reconnaissance along the Red coast began at dawn. In the first place, the steamships often selected the hour of daybreak to make their run to the coast, and in the second place, at this hour reconnaissance of the more heavily protected Red ports (such as Barcelona and Rosas) could be carried out with the least effort, i.e. by singly flying aircraft. Evening reconnaissance missions were flown according to the phases of the moon, i. e. when the hour of moon rise was favorable, first so that -- if an enemy ship should be sighted -- the target could be bombed by moonlight, second so that the aircraft could unload their bombs on some coastal target before returning, and third because the return flight and landing were easier to accomplish by moonlight. Daylight reconnaissance during bad-weather periods was usually rewarding since there were nearly always steamships which tried to take advantage of weather conditions to slip through the danger zone. At the same time, bad weather almost completely eliminated the danger of attack by enemy fighter aircraft.

Normally, the reconnaissance aircraft were provided with twenty 110-lb bombs as well as airborne cannon; for longer-range flights, they carried auxiliary fuel tanks and five 110-lb bombs. The larger bomb-load made it possible to launch an immediately successful attack against an enemy ship, crippling it so that it could not get away before the next attackers could arrive. Reconnaissance in pairs (one bomber and one torpedo aircraft) was tried out on an experimental basis on several occasions, but it used up so many flying hours that it could not be introduced regularly.

The prerequisites for operations against enemy shipping, and thus for the re-

connaissance of enemy shipping, were most favorable as long as unrestricted warfare was permitted within the three-mile limit. Nevertheless, even at that time careful identification of vessels was imperative, for they were usually sighted before they entered the zone. The aircraft commanders carried a list indicating the steamships regarded as suspicious and the refugee ships, which, of course, were not to be attacked. Thus they were able to tell whether any ship making its way towards the coast could be attacked or not. In case an attackable ship was identified, a radio message went out to the blockade chief asking for permission to attack. The authorization to attack often included confidential instructions as to strict or lenient interpretation of attack procedures. Inside the three-mile limit, the reconnaissance pilot himself could decide whether or not to attack.

In summary it must be admitted that the commander of the squadron was given a fair degree of freedom of action. In many cases he himself was responsible for evaluating the situation. The specific conditions and the prospects of success could hardly be transmitted adequately by radio, nor could the instructions of the agency on the ground. The squadron commander, however, was in a position to weigh the conditions and the prospects of success against the political repercussions which might arise and to decide whether to order an immediate attack in the assumption that radio authorization would have been given if requested, thus taking advantage of an opportunity which might otherwise have been lost, or to dispense with an attack which had little prospect of success, thus avoiding the political consequences which certainly would have arisen. All these difficulties could have been avoided if the theater of operations had been more clearly defined; this would have made the operations against enemy shipping much simpler and would have increased the chances of ultimate success.

The Attacks on Enemy Shipping

A total of ten merchant vessels were attacked at sea with bombs or torpedos. Three were sunk (Edith, Uod-Mellich, Jean Weems), and two were driven in to shore,

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where they foundered (one near Calella and one near Tossa). In five instances, the first attack with bombs or torpedos was unsuccessful. In two cases a second attack by other aircraft was prevented by the approach of "Nyon" destroyers (the two

vessels which escaped in this fashion were the Cervantes and the La Corse), and in the other cases (the Noom-Julia, two steamers with an escort of patrol boats near Cabo Greus, and three sailboats off the coast of Castellon) a subsequent attack was prevented by other factors. In three instances, sailboats were attacked with airborne armament and machine-gun fire. One steamship (the Cassadaique) was brought into Palma but had to be released again at the order of the French admiral.

Usually it was the first attack, by the reconnaissance aircraft, which was decisive, and for this reason the aircraft were equipped whenever possible with a full load of twenty 110-lb bombs and with airborne armaments. With this equipment the reconnaissance pilot could usually put the steamship out of commission, either by forcing the crew to leave the ship in lifeboats, by scoring a direct hit, or by driving the ship to the coast. Bombs of larger caliber were avoided because of their low hitting accuracy in an initial attack, and torpedos were avoided for the same reason, coupled with the fact that they often turned out to be duds. Airborne armament fire across the bow served as a signal to the ship to show its flag, to stop, or to stand by for further instructions. Additional fire into the supplies loaded on the decks usually accelerated the process of getting out the lifeboats. In the case of larger ships, however, the fire from 20 mm airborne armaments and machine-guns was incapable of damaging any more than the supplies piled on deck and the superstructures of the vessel. The ship's water-line, rudder, and propeller were fired at repeatedly, but without appreciable success. The Varta signal lamp proved useful for the transmission of orders.

Attacks with 110-lb bombs were generally carried out from a low altitude (985 feet) with the aid of a night bomb-sight. The bombs were aimed carefully to hit the ship diagonally against the wind (more favorable when the ship was stopped and drifting diagonally with the wind). Aiming was tested first with single bombs and any necessary corrections were made by altering the range angle or the angle of impact, so that the bomb would land just barely short of the ship. Then the bombs were released

in groups of five. The most favorable method seemed to be to release the groups of bombs at very close intervals and to aim them at the side of the ship in such a way as to concentrate their effect on one particular point. Apparently because of the slight delay involved, direct hits on the deck itself usually damaged nothing but the superstructures or any supplies piled on deck; they did not penetrate into the hold area. On the other hand they often managed to start fires. Delaying the fuse action, of course, increased the damaging effects of any bombs which landed just short of the side of the ship.

Attacks with 550-lb bombs were carried out from medium altitudes (3,300 to 6,500 feet) with Boykow tubes. The only confirmed direct hit by a 550-lb bomb, on the fore-castle of a steamship, led -- together with hits by two 110-lb bombs -- to the sinking of the ship.

On one occasion a depth bomb was employed against a steamship. Since the crew using it was not yet entirely familiar with its operation, they failed to allow for drift and it exploded short of the target. Since there were no more depth bombs available, the experiment could not be repeated. It is probable that this weapon would have been very effective against smaller steamships (causing leaks), and that it could also have been employed to good effect in harbors which were not so heavily defended ^{the} that/day or night low-level attacks needed to distribute them could not have been carried out. There was no opportunity to try out bombs equipped with the type 15 fuse in low-level attacks. It can be assumed, however, that the low force of penetration, occasioned by the shorter trajectory, would have limited the effects of the bomb to the superstructures of a ship. The higher rate of hitting accuracy in the use of 550-lb or 1,100-lb bombs, however, would have made up for this defect. At the very least the vessel would be set on fire or crippled by the destruction of its superstructures.

The most efficient offensive weapon against stationary vessels is without doubt the torpedo. At that time, however, torpedos were still so unreliable that they

could not be compared with bombs in terms of usefulness at the front. Developed to the point of full readiness for front employment, torpedos are certainly preferable to bombs, even against ships lying at anchor in a harbor, provided that specific conditions (depth of the water, position of the ship, geographic characteristics of the harbor concerned) are favorable.

Operations Against Coastal Targets

1) General

After the German naval air squadron had been successfully transferred to Polensa, the following situation obtained in respect to operations against targets located along the coast of the mainland:

a) The most important Red supply centers and routes (both water and land), as well as a number of vital industries, were located along the coast. From the military point of view, these targets were not adequately protected.

b) The Nationalist forces carried out the following operations against enemy targets on the coast: occasional attacks by Nationalist naval forces (the purpose here was rather a demonstration of strength than an attempt to destroy), and sporadic raids on coastal targets by the Italian bomber units stationed at Palma.

It was imperative that the operations against enemy shipping, seriously hampered in their potential effectiveness by the need to consider political repercussions, be supplemented by attacks on the Red supply harbors.

2) The Legion's naval air squadron contributed its share to this project in the form of attacks on the harbors of Catalonia. Most of these raids were directed against the ports located along the coast from Port Bou to Tarragona, while the sector from Tarragona to Cartagena was assigned to the Italian air forces. At the request of the Nationalist commanders, one joint attack was carried out by the naval air squadron and the Italian units against the harbor of Valencia. Within the coastal sectors assigned, the forces responsible established their own priorities in accordance with reconnaissance reports and the reports of the intelligence services.

3) When the Reds began to route some of the supplies previously received by ship over land along the Corbore - Port Bou line, the Nationalists added the only fully operable rail connection between France and Red Spain to their list of coastal targets. The transshipment depots at Port Bou and at the Cullera bridge (south-east of Valencia) were regarded as the most vulnerable points of the line.

4) In November, with the concurrence of the blockade chief, all operations against enemy ocean traffic were suspended, and when they were resumed later on they were made subject to crippling restrictions, which, of course, considerably diminished their prospects of success. During this period the operations staff of the German naval air squadron ordered a series of raids on the communications lines between Catalonia and Valencia, particularly those in the sector between the Ebro and Sagunto,

in support of a planned Nationalist offensive. These raids were assigned top priority during late November and December, and other missions were carried out as time permitted.

5) Occasionally, at the explicit request of the Nationalist commanders, the naval air squadron carried out attacks on targets which lay outside the limits of the sector assigned to it (the blast furnaces at Sagunto, the bacteriology laboratories at Masnou).

Method of Employment and Attack

1) The method of employment utilized during operations against coastal targets was characterized by the following:

a) Advantages

- The possibility of carrying out attacks along the forward line, which meant that alternate targets could quickly be substituted for the primary ones.
- The possibility, in view of the way in which operations were conducted during the Civil War, of obtaining a clear picture of the situation in the operational area, plus the availability of an intelligence service whose reports were extremely detailed, though often exaggerated.
- The slowness of the Reds to set up adequate antiaircraft defenses and to get their fighter aircraft into the air.

b) Disadvantages

- The numerical inadequacy of the available aircraft, which were never enough to take care of all the available targets.
- The fact that the squadron was equipped with an out-of-date, very slow aircraft model, incapable of employment under all conditions.
- The lack of a fighter escort.

2) The operations against coastal targets were strategic in nature, as evidenced by the fact that many attacks were carried out against power plants and supply lines in the enemy hinterland. In keeping with the character of civil warfare, the popu-

lation was spared whenever possible.

3) In view of the type of aircraft the naval air squadron had at its disposal and the number available, the squadron had no choice but to avoid enemy defenses whenever it could, only going in to meet them when there was a known weakness which could be exploited. Once a target had been attacked so often that one could assume, in view of the sluggishness typical of the Reds in the establishment of their anti-aircraft defenses, that such defenses were finally ready for action,

or when the readiness of these defenses was confirmed by reconnaissance reports (as was usually the case), the squadron left that particular target alone for a while and concentrated on other areas of the coast -- only to descend upon the original target in a subsequent, unexpected attack. During the periods when such targets as these were being deliberately avoided, operations against enemy shipping were often given temporary priority.

4) The attacks of the squadron were planned in accordance with the anticipated strength of enemy antiaircraft defenses. When enemy fighter aircraft were expected, attacks in full formation or attacks at dusk were planned; when antiaircraft automatic weapons were expected, the squadron dispensed with low-level attacks and restricted itself to horizontal bombardment; in the latter case the bombers remained at altitudes above 6,500 feet, as they did in the case of anticipated enemy antiaircraft artillery. Whenever the enemy defenses permitted, however, the squadron selected that method of attack which gave the greatest promise of success. Bombardment attacks were often carried out in connection with harbor reconnaissance missions or subsequent to shipping reconnaissance missions, when no enemy shipping could be discovered. Since reconnaissance flights of this type were always carried out by singly flying aircraft, whenever enemy defense activity seemed fairly strong, the combination between reconnaissance and bombardment could be accomplished only by aircraft flying in groups of at least two or by singly flying aircraft during dusk missions. Night bombardment missions without benefit of previous weather reconnaissance usually resulted in the bombardment of alternate targets. The majority of daytime bombardment attacks were carried out in the early evening hours.

General Experience in the Field of Tactics

Night Bombardment

Of a total of 121.65 tons of bombs, 45.75 tons were dropped during the night. Bombardment of this type was restricted to moonlight nights. Night bombardment with the use of aircraft parachute flares to illuminate the target was not attempted.

The advantages of night bombardment missions by moonlight are the following:

a) Aircraft Operation: Taking off, landing, flying in formation, and the accomplishment of the flight are easier.

b) Bomb Release: As long as the moon is bright and the cloud cover slight, the attack of pinpoint targets is just as easy as during the day. Coastal targets, especially harbors, are easy to identify because of the light and dark contrast between water and land; docks and ships can also be easily identified.

c) Enemy Antiaircraft Defenses: Searchlights are of limited effectiveness.

We have no information as to whether or not bright moonlight is an advantage in night fighter operations. There are intelligence reports referring to the employment of Red night fighters over Valencia and Barcelona; one Nationalist bomber is supposed to have been shot down over Barcelona and a second damaged by a number of hits. The naval air squadron never encountered enemy fighter aircraft during its night operations.

During a period beginning two or three days before and lasting two or three days after full moon, the moon provided sufficient light until about two hours before it set -- even longer if the weather was particularly clear or if the hour of setting was propitious. The water, of course, ~~was~~ reflected the light of the moon, so that docks, coastline, or ships were easily visible as silhouettes.

From the standpoint of the target, the approach and departure flights were carried out with the direction of the moon, so that the effectiveness of the enemy searchlights was greatly diminished. Night bombardment attacks without moonlight (or aircraft parachute flares) on well-darkened targets would probably be effective only in the case of large-area targets such as cities. The lack of information on weather conditions (especially cloud cover) over the target was a source of difficulty for the naval air squadron. The fact that there were no weather reports pertaining to Red territory available made any weather forecasting very uncertain. Whenever a night bombing attack was planned, it was preceded -- whenever possible -- by an evening reconnaissance flight which also attempted to check on weather conditions over

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the contemplated target. In the event that several aircraft were to participate in the attack, the second aircraft waited to take off until the first had reported on weather conditions along the route.

But even these reports were not always accurate, for the coast of Spain is noted for the rapidity with which low-level fogs or low-lying cloud covers make their appearance during the night, so that sometimes within an hour

a target which had been perfectly visible before might be shrouded in fog or clouds. Under these circumstances, there were a number of factors which might combine to make the bombardment mission a failure -- mountain peaks appearing out of the cloud cover, enemy defense operations, faulty orientation, or the release altitude required by the bombs being utilized.

In these cases it was a good thing that the Reds put their searchlights and barrage fire into operation as soon as they heard the aircraft approaching. Since the German pilots had access to intelligence reports on the location of the searchlights, they were able to use them as navigation aids. When the pilots came in close enough, they could see not only the bright spot cast by the searchlight cone against the cloud cover, but also the searchlight itself (a small blue light), and this, of course, helped in the aiming of the bombs. The brightness of the moon was not affected as long as the cloud cover remained lower than 5/10; thus the bombers sometimes waited until the cloud shadows had left the target and then took off in spite of the clouds. High-level clouds and medium-level clouds, as long as they let the moonlight through, have no adverse effect on visibility. In some cases night bombardment attacks were flown in formation, the rest of the aircraft taking off after receipt of a radio message, signal flare, or -- the simplest and surest -- PFC⁺ flare from the lead aircraft. Other missions were flown in groups of two or in single flight, with one-half hour or one hour intervals between take-offs. The use of different approach routes, or detours due to faulty navigation may easily result in the aircraft appearing in too quick succession over the target. The bombardment of a previous aircraft could be recognized easily by the activity of the antiaircraft defense forces or by the effect of the bombs themselves. Poor weather conditions, storms, icing (with the resultant failure of radio communication) often resulted in situations in which air traffic could no longer be controlled effectively, so that the attack had to be discontinued or the aircraft routed to alternate targets. The majority of attacks were flown by single aircraft or aircraft in groups of two, with the par-

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ticipating aircraft assembling for the approach flight in formation. Once arrived
over the target, the formation broke up or (provided that ^{both} ~~xxxxx~~ aircraft followed
the same approach route) loosened as long as the bombs were being released, and then
assembled once more for the return flight on a previously determined course and at
a previously determined altitude. Since each pilot was able to observe the other
during the bomb-release operation,

+ - Translator's Note: Sorry, but I was unable to find this abbreviation defined
anywhere.

the assembly maneuver usually succeeded. As far as timing was concerned, the majority of attacks took place either just before the moon rose or just before it set. The altitude was selected in accordance with anticipated enemy defenses, the type of bomb being used, and the altitude of the clouds, if any. Because of enemy monitoring activity, it was always a good idea for the aircraft to approach the target at a high altitude, with their engines cut off; in this way it was sometimes possible to delay the enemy alarm until the bombs had already exploded, or at least to make it difficult for the monitoring service to determine the exact location of the target to be attacked.

Considering the night bomb-sight in use at that time, it took a great deal of practice to release the bombs successfully over the target after a glide. Once the bombs had been released, the aircraft turned abruptly and departed from the area with the engines throttled back (to avoid exhaust flames), sometimes flying in zig-zag curves. The approach route was selected in accordance with the extent of the target, the degree of illumination (with or against the moon, depending upon its brightness), enemy defenses, and wind direction. The direction of piers and quais was determined ahead of time from aerial photos of the harbor concerned and compass readings computed. It was a good idea to set the selected approach course on the telecompass, since the latter provided a simple and constant method of control, particularly useful for rudder corrections just before reaching the target area. Ordinarily three 550-lb bombs or one 1,100-lb and one 550-lb bomb were released at once. In the case of targets stretching over a large area, a series of fifteen 110-lb bombs was often utilized. In the case of target complexes such as Barcelona, the approach route was selected in such a way that the bombs could be released in three separate groups, from the same approach direction, on three separate targets. The night bomb-sight was used almost invariably. In the case of targets which were not well protected by enemy antiaircraft defenses, the attacking aircraft made several approach flights, correcting the lead angle each time in accordance with the position of im-

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pact. When such attacks were carried out by a group of aircraft following one another in the same approach course, the correction angle was computed by the lead aircraft and radioed to the others. The following aircraft did not take time to calibrate the correction to their individual courses; ordinarily they had no time to do so.

The prospects of success were better if they got rid of their bombs immediately over the target before it could be blacked out and simply corrected their aim according to the point of impact of the first bombs. The basic flight speed was calculated in accordance with navigational factors characterizing the approach route. In the beginning the Lotfe-6 was employed on a number of occasions. Its suspension in the He-59 was a rather makeshift affair, however, and its perpendicular adjustment was not reliable. In addition there were difficulties due to the wiring. In the older model of the He-59, with an airborne battery, the electrical power often failed at the moment the bombs were to be released, so that the motor refused to function and the guide light went out. There was still another difficulty -- since the bombs were not released automatically, the lights behind the scale dial and the rhombus had to be turned on, and when the target itself was only weakly illuminated they were strong enough to blind the bombardier. Thus, after the necessary calculations had been made at the beginning of the run, the bombs were prepared for release, and the sight motor and scale dial light turned off, leaving only a weak light to illuminate the cross hairs. The bombs were then released the second the target appeared at the intersection of the cross hairs. Because of the difficulties it involved, the use of the Lotfe sight was later discontinued during night bombardment operations. Successful navigation during night bomber flights under uncertain weather conditions required a great deal of skill in direction finding from the aircraft. Without the help of radio navigation techniques, the frequent night missions could not have been carried out except at a grave risk to aircraft and crews.

The Tactics Employed in Low-Level Attacks with 20 mm Cannon and Machine-Guns

General: Low-level attacks with airborne cannon and machine-guns were often carried out as a secondary mission in connection with bombardment operations against enemy shipping and coastal targets. They were never planned as primary missions in themselves. In general, the low-altitude attacks were carried out after bombardment, in order to avoid the risk entailed in flying too close to the ground with a loaded aircraft.

Targets: As in the case of the bombardment attacks, the target of low-level raids was also the materiel of the enemy. The choice of targets was a determining factor in the success of the raid, for airborne armaments can be used effectively only against easily accessible and inflammable objects, such as fuel depots, trucks and passenger vehicles, truck columns, railway trains, locomotives, and speedboats. When low-level attacks were carried out on large vessels, their purpose was to force the crew to abandon ship. In one case a low-level attack resulted indirectly in the destruction of a steamer, when its crew ran it aground. Low-level attacks were not undertaken against living targets.

Preparations: While preparations for daylight attacks were often made simply as a matter of routine, without any specific targets in mind, the preparations for night missions had to be carried out in minute detail. The pilots concerned were carefully oriented with the help of maps and photographs. On-the-spot control by means of signals given by the lead aircraft is extremely difficult under wartime conditions, and it rarely proved successful. Predetermined assembly points ought to have been established.

Enemy Antiaircraft Defenses: Targets protected by machine-guns or antiaircraft machine-guns were never attacked during the day, and during the night only when conditions were unusually favorable. The strength of enemy defenses was either already known to the attackers or was ascertained from a safe altitude during the bombardment attack which preceded. As a rule, the attacking aircraft passed over an area guarded by antiaircraft machine-guns at a safe altitude, though on several occasions it happened that aircraft flying at a lower altitude were recognized only with difficulty, so that the fire returned automatically by the airborne gunner could hardly be very effective. In most cases returning the enemy's fire was enough to keep down the antiaircraft defenses. While over the area itself, the airborne gunner took cover and did not return to his gun until the aircraft departed. When a number of aircraft participated in the attack, their combined fire was usually sufficient to keep down

enemy antiaircraft fire. Unless the enemy batteries were using tracer ammunition, their positions could not be identified. For this reason low-level attacks on cities, harbors, and railway stations were avoided; targets located along an open railway line or highway were preferred. If the enemy sent up fighter aircraft, the low-level attack was broken off, and the aircraft departed at a low altitude to decrease their chances of being seen by the higher flying enemy fighters.

Method of Employment: Low-level attacks were carried out during the day or at dusk and, during moonlight periods, also at night, by singly flying aircraft or by groups of up to three aircraft. A group of two aircraft proved to be most favorable. Ordinarily the aircraft separated for the attack itself, since more than one run over the target was usually necessary. Group attacks were carried out in loose formation, but were possible only when one target run was sufficient, for banking and turning in formation at a low altitude is an extremely difficult maneuver. Targets protected by antiaircraft artillery required the employment of two or three aircraft. Provided they followed one another in close succession, their return fire could be counted upon to hold down that of the enemy. The problem of assembly in case of an attack by enemy fighters had to be given a good deal of consideration. The chief difficulty was the near impossibility of recognizing the lead aircraft as such. Thus blinker signals were worked out. It need not be emphasized that independence and resourcefulness on the part of the individual pilots were a sine qua non for the success of such an assembly maneuver.

Transmission of Orders: The use of intercommunication facilities for the transmission of orders from the crew captain to the pilot and to other crew members was possible only within limitations while the aircraft was engaged in a low-level attack or when it was attacked itself by enemy fighters. Thus the pilot had to be so familiar with the various methods of approach that, after the previous detailed briefing, only a word or two were necessary. Most of the communication between the captain and the pilot took the form of visual signals. Radio communication or blinker signals

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from the lead aircraft to the other aircraft of the group were hardly feasible. Besides, even during group attacks the flight formation was so dispersed that the following aircraft were practically independent. Thus their pilots were in a position to take advantage independently of any unexpected favorable developments. When the group was made up of two aircraft,

the second one could veer off to the right or to the left of the lead aircraft, depending upon which seemed most promising. In the case of groups of three aircraft, the order of approach was established ahead of time, unless the wedge formation was to be retained during the target run.

Weapons: The weapons of all the aircraft's gun stations could be used in operations against ground targets. The main weapon was the machine-gun or airborne cannon installed in the nose, since it had the clearest field of vision and thus the best chance of success. The target approach route was computed with this weapon in mind. The gun in the belly station could be fired downwards to the rear. The guns mounted in the lateral stations were of limited effectiveness only, since the gunner could not see the target until it was too late. Thus he had to know in advance whether the attack was such that he was likely to have a chance to fire and then to watch carefully for the opening of fire by the nose gunner. The tail gunner had the poorest chance of all, since his field of fire was only downwards; he could also fire towards the sides, but moving the gun into position was such a complicated maneuver that there was little point in it. A weapon installed above and to the rear is only rarely effective against ground targets, and the tail gun station was utilized primarily against enemy antiaircraft defenses. The ammunition for the weapons was selected in accordance with the type of target to be attacked. In general, high-explosive ammunition proved to be the most effective. Armor-piercing shells were used against targets such as tanks and locomotives. Phosphorus bullets with steel core proved to be the best machine-gun ammunition, since they combined armor-piercing and incendiary effects.

Approach Method: The aircraft approached the target with their engines throttled, gliding at an angle of about 20° from an altitude of approximately 6,500 feet. This method of approach was often applied in attacks against specific targets during the night or at dusk. It was useful in that it combined the advantage of surprise with the opportunity to get a more complete picture of the situation. An easily identifiable landmark about ¹⁵~~nine~~ miles short of the target was selected in advance.

When the aircraft reached this landmark, at an altitude of about 6,500 feet, they cut their engines and approached their target in a glide, adhering carefully to a previously calculated rate of so many feet per second. All the available aids, such as telecompass and variometer, were used in this maneuver. The relatively short duration of the low-level flight was a decided advantage. A number of fuel tank installations were attacked by this method, but

with the approach glide at a low altitude (165 feet). This was also the method used in strafing a highway or railway line, with the approach at a relatively low altitude (656 - 1640 feet); the limited view of the target was, of course, a disadvantage. Normally a low-level attack was launched from an altitude of 656 to 1,640 feet. In the case of highway or railway strafing attacks, the targets were identified early enough that an immediate attack could be carried out. There was, of course, some danger that the aircraft might unexpectedly run into enemy antiaircraft artillery.

Method of Attack: The aircraft, its guns rigid, flew directly at the target in order to provide the best possible conditions for the nose gunner (i.e., avoidance of linear travel of the target). The gunner opened adjustment fire at a range of approximately 2,424 feet, or 1,212 feet in the case of smaller targets. Corrections were made in accordance with the impact point of the shells. The sight was fixed at a range of 1,212 feet. The range was reduced for machine-gun fire. If the aircraft flew directly over the target, the belly gunner had a good opportunity to fire effectively. No attempt was made to use the weapon mounted above and to the rear, since its field of fire was totally unsuited to operations of this kind. If the aircraft flew past the target, instead of directly over it, the belly gunner had no chance to fire because his lateral field of fire was very limited. In the case of a lateral attack, only the nose and tail gunners had a chance to fire, and both had to contend with linear travel of the target at the moment of their fire for effect. This linear travel was greater and more of a problem than the perpendicular travel noted directly over the target. If the aircraft veered off just before the target, the two rear gunners had a brief chance to fire, one after the other. If the aircraft veered off directly over the target, on the other hand, they had very little chance. The best possible directions of attack had been worked out for each of the situations described above.

Highway Strafing: The aircraft flew along directly over the highway, so that -- in a single run -- the nose and belly gunners could fire on each vehicle making up the column. The danger space of the weapons was fully exploited due to the length

of the target. If a second attack was to be carried out, the aircraft had to be sure to move off far enough from the highway before turning. After a 180° turn, the second attack was carried out just like the first.

Moving vehicles usually failed to hear the approach of the attacking aircraft. If there were two attackers, the second aircraft flew over the highway while the lead aircraft flew out in front along the highway; in this way each kept out of the other's way. Attacks by a group of three aircraft flying in formation proved to be not very effective.

Attacks on Railway Trains: In the case of moving trains, the attack was carried out from the rear along the length of the train, in order to avoid linear travel of the target insofar as possible. In the case of stationary locomotives, a diagonal attack was better, because the target area was greater.

Attacks on Ships: Ships were ordinarily attacked with airborne cannon from the diagonal, since it was easier this way to hit the waterline and the vulnerable points (such as the bridge) from relatively far away. An attack along the entire length of the ship, carried out by singly flying aircraft following each other in close succession, had the advantage that the entire deck area could be hit again and again by machine-gun fire.

Night Attacks in Groups of Three Aircraft: Proper illumination was the main prerequisite for night attacks carried out in formation. During the approach flight, the formation loosened up and each aircraft assumed the position assigned to it. If it was necessary to turn over the target, the following aircraft had to deviate left or right depending upon the direction of turn. This was necessary in order to avoid their getting into each other's or the lead aircraft's way during the departure flight. It was a good idea to agree in advance on the departure flight route, since this facilitated the assembly maneuver.

Effectiveness: Several tanks of two large fuel depots were set on fire by the airborne armament and machine-gun fire of low-level attackers. Approximately twenty

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locomotives were so badly damaged by airborne cannon and machine-gun fire that -- as confirmed from the air -- steam began to escape from their boilers at several points. Thus it could be assumed that they would be out of action for some time. About ten of the vehicles attacked

went up in flames; no information on the fate of the rest is available. The incendiary effect was due to the use of phosphorus bullets with steel core. Two speedboats were set on fire by airborne armament and machine-gun fire, and one steamship was driven aground by airborne armament fire.

Tactics Employed During Attacks by Enemy Fighter Aircraft

General: As a rule the naval air squadron could assume that it would have to contend with only one of the two types of enemy antiaircraft defenses (antiaircraft artillery and fighter aircraft). The squadron never encountered both types at the same target. During the day the squadron carried out no low-level attacks against targets protected by antiaircraft artillery, and during reconnaissance missions the aircraft were able to identify enemy batteries before they came into firing range. Thus daytime defenses necessarily took the form of fighter aircraft defenses. And since enemy night fighters (contrary to reports) were never encountered, conditions at night were just the reverse. While the squadron encountered only a very few enemy fighter aircraft in the beginning, this situation changed later on so that it had to be on the lookout for Red fighters even along the coast. The planning, preparation, and accomplishment of missions naturally had to take these factors into account.

Evaluation of the Enemy Fighter Forces: The only enemy fighter aircraft to appear were the single-seater Curtiss and Boeing (Rata) models. The Nieuport, identified during the initial phase of operations, soon disappeared from the scene of action. No twin-seater fighter aircraft were observed. On one occasion, however, a group of three He-59's was attacked -- without success -- by a Red Martin bomber. The Red fighters had at their disposal at least two, but usually four, rigidly mounted machine-guns. Tracer ammunition was employed. There was no indication that the enemy was using phosphorus bullets, and judging from the effectiveness of his hits, this is extremely unlikely. The Red fighter aircraft were not equipped with airborne cannon. The enemy fighter pilots were anything but expert in night flying; they invariably left the scene of action as soon as it began to grow dark. The crews of the German

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naval air squadron, however, were prepared for enemy night fighter attacks, for the Italian air forces had reported that one of its bombers had been shot down during the night over Barcelona by an enemy night fighter aircraft.

Their own observations had taught the pilots of the naval air squadron that they had to be alert for dawn attacks by enemy fighter aircraft which had taken off during the night.

The enemy aircraft either flew singly or in groups of five, in the latter case in very loose formation. They dispersed for the attack. Their attacks were not based on coordinated action, although some rudimentary attempts in this direction were made. For example, when several enemy fighters were involved in an attack, one of their number often headed out over the water in order to cut off the escape of the He-59 under attack. The fighter aircraft out over the water then usually stood by, while the rest kept out of the range of the He-59's (6,560 feet), coming in for occasional attacks from above and behind. On one occasion the Red fighters tried a kind of pincer operation in the air, with two aircraft coming up on each side of the victim. Another time two Red fighters attacked from the front while two others attacked simultaneously from the rear. One singly flying Red fighter carried out a successful attack by approaching from the direction of the sun; others took skillful advantage of the dead angle occasioned by the tail assembly of the aircraft under attack. The undeniable superiority of the Red fighters over the He-59 in terms of speed made it easy for them to pick up a He-59 and to remain on its tail. Sometimes they followed the He-59's as far as eighteen miles out to sea, and on one occasion a Red fighter tried as many as seven attacks over water. In attacking a group of two or three He-59's, especially when the latter opened fire with their airborne cannon, they were extremely cautious, and usually veered off as soon as they came within 1,312 feet of them. Their skill in firing was anything but outstanding, yet they usually succeeded in scoring up to three direct hits per attack. Still, in view of the fire cones, whose impact on the water could be observed, their results should have been much better.

Enemy Strength and Aircraft Reporting Service: The number of fighter aircraft assigned exclusively to the Catalonian coast as far south as Valencia can only be estimated roughly on the basis of agents' reports and personal observation. In any

case, there was always danger of encountering enemy fighters over Rosas, Barcelona, Tarragona, and ~~Vaksmáza~~ Valencia. It is extremely difficult to evaluate the effectiveness of the enemy's aircraft reporting service, since presumably not every alarm led to a fighter scramble and subsequent encounter and since it is likely that the fighter aircraft were often held back at those targets considered most vitally in need of defense. Nevertheless, the blackout of coastal targets during the night was an indication of the growing efficiency of the service. It was, of course, a great advantage for the naval air squadron pilots that they could approach their targets from the sea, although there was always a chance that their take-off might have been reported by secret transmitter from Mallorca. Targets which the enemy expected to be attacked were often guarded by fighter patrols. For example, a steamship which the squadron had driven onto the beach was guarded by enemy fighters the following day, although enemy antiaircraft defenses in that area were otherwise very inactive. It must be taken into account, of course, that the defenders were in a very difficult position due to the large number of targets to be protected.

The Employment of the Naval Air Squadron: The missions of the squadron were scheduled for periods during which there was assumed to be little danger of attack by enemy fighter aircraft. Since timing also depended upon other factors, such as reconnaissance and weather conditions, this meant that missions sometimes had to be set up for unfavorable times. Since coastal reconnaissance and the reconnoitering of the most important harbors took approximately one hour and since these missions had to be carried out during daylight hours, the reconnaissance aircraft was inevitably exposed to attack by enemy fighters. And, as a matter of fact, the reconnaissance aircraft were the ones most frequently attacked. Enemy fighters did not appear during the dawn missions, i.e. when the reconnaissance aircraft reached the Spanish coast just as it was beginning to get light and left half an hour later. If the Red fighters were abroad at this time, then obviously they had difficulty in locating the reconnaissance aircraft. Needless to say, it took a good deal of skill, in

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view of the long approach flight, to arrive at the Spanish coast just at the right moment. Sometimes the reconnaissance aircraft had to wait outside listening range before going in. Dusk reconnaissance missions were advantageous in that the enemy fighters broke off combat early in order to be able to land while it was still light. This still left sufficient time -- and daylight -- for the accomplishment of the re-

connaissance mission involved. Usually it was quite easy to shake off enemy fighters by flying out to sea. During daylight missions it was even more important than during night missions to avoid being reported ahead of time, which meant that the squadron pilots had to detour around known aircraft reporting stations. The missions themselves had to be accomplished as quickly as possible, for it was almost certain that enemy fighters would appear during a lengthy low-level attack following bombardment. During the last phases of operations daylight missions were undertaken only in groups of two or three aircraft, accompanied by a bomber whenever possible.

Preparations: The preparations for an engagement with enemy fighter defenses were made up of countless small details, any one of which might turn out to be decisive. One of the most important prerequisites for success was the sighting of the enemy aircraft in time to open fire from an effective range.

Each crew member was ordered to have with him, and use when necessary, dark glasses during daytime missions; the crew captain assigned observation sectors and ordered all crew members to stand by as the aircraft entered the danger area. By this time all the guns were manned. The radioman had cut off contact with the ^{ground} belly ~~gunstation~~, and from that point on radio communication was held to a minimum. Upon receipt of a message from the radioman (in the tail station), the mechanic (assigned to the belly station) had to go up and take over observation to the rear because the view was more comprehensive from here than from the belly station. The machine-guns and cannon were loaded with the proper ammunition for aerial combat (Pal - ? and high explosive shells) rather than with that used for low-level attacks. The inter-communication system was switched to "conference", so that each crew member could hear and talk with all the others. As soon as an enemy fighter was sighted, the alarm was given through the interroom and by Bosch horn and, when possible, was relayed by radio to any following aircraft and to the ground station. During night missions, especially when the moon was bright, the radioman and mechanic held a signal gun in readiness in order to blind the attacking pilot with its white flash.

Once the signal gun had been fired and the alarm given, it was up to the crew captain to direct the rest of the engagement.

The Qualities of the He-59 in Aerial Combat: Because the He-59 was so slow, it was relatively easy for an enemy fighter to catch up with it. Nor could the He-59 count on avoiding intermediate aircraft reporting stations after the first report had gone in until it had completed its mission and was on its way back out to sea. Once the enemy fighters had contacted an He-59, they should have had no difficulty in keeping close to it and in maneuvering into a favorable attack position. As a matter of fact, this possibility was exploited by only a few of the more skillful Red pilots. The firing of weapons and the actual operation of the aircraft during aerial combat can hardly have been problems for the Red fighter crews. The excellent flight characteristics of their aircraft, particularly their high degree of maneuverability, made it easy for them to outmaneuver an enemy by turning and changing their speed during the approach and at the moment of firing. The fact that the engines of the He-59 were relatively quiet probably meant that it was picked up late by the reporting stations and thus reported late. The He-59's stability under fire is a point which ought to be emphasized. The firing fields of the nose and tail guns were adequate for a biplane. The belly gun would have been much more effective if its rear and lateral firing fields had been more comprehensive. The same is true of the field of vision. When the airborne cannon was installed, however, the captain's starboard vision was seriously hampered. The gliding and climbing qualities of the He-59 were such that it could gain altitude quickly only when the fighters were quite close. In almost all cases, however, it proved to be able to glide well enough to reach low altitudes quickly. Only one Red fighter pilot ever succeeded in carrying out a successful ^{surprise} attack from below. Strangely enough, this happened in the beginning, before the squadron had had very much to do with enemy fighters. The He-59 was unable to take sudden refuge in the clouds, unless it had been flying just under the cloud cover.

Fire Discipline and Combat Range: Even at relatively long range (over 3,300 ft), the gun flash of the machine-guns was visible so that the enemy pilot knew immediately when he was being fired upon. When tracer ammunition or phosphorus bullets were used, the fire cone was visible even in the daylight. In anti-fighter defense operations the actual effectiveness of fire was less important than its effect as a morale-shaking factor. Defensive fire was intended to hold the enemy at a distance. This it was important that the defending aircraft open fire (in fire salvos of approximately five shells at a time) on the enemy at maximum effective range, so that the enemy pilot realized that his presence had been noted. From the very beginning, each naval air squadron gunner was trained to watch his ammunitions supplies carefully. There were 825 to 900 rounds for each machine-gun, and 200 rounds for each airborne cannon. In long-range defensive fire from airborne cannon, it was important to make sure that the shells actually burst at 3,000 feet. The burst of high-explosive shells as well as the flash of the tracer ammunition were easily visible, so that the enemy pilot was bound to realize instantly that he was being fired upon by airborne cannon. Armor-piercing and high-explosive ammunition was used for ranges beyond 3,000 feet, fired in salvos of three shells each. More intensive fire (fire for effect) was begun at shorter range, approximately 1,300 feet. The gunners were expected to wait for the best opportunities to fire, either when the enemy target was relatively stationary or when its linear travel was at a minimum. Extended salvos to barrage fire strength were recommended. When the enemy was using his rigidly mounted machine-guns, the bearing was relatively stationary, which meant that the defending gunner had a better chance of scoring a hit. Sometimes a sudden burst of fire was successful in forcing the enemy aircraft to veer off, even though its engines provided a certain measure of protection. The critical moment in any fighter attack from the rear is the moment in which the attacker is forced to turn; there is always one point at which the bearing is stationary and at which the attacking aircraft presents almost its entire length as a target, and a target at fairly close range. This was the mo-

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ment for which the defending gunner had to be prepared, in other words he he had to be certain to save up enough shells for it. The distance between the aircraft at this moment varied from 1,600 to 330 feet, and in some cases was even less.

During the pauses in the fighting, the ammunition supplies had to be equalized among the various gun stations. Usually it was the tail station which used up all its ammunition first.

Defensive Maneuvers: As a matter of principle, the aircraft of the naval air squadron avoided combat with enemy fighters when they could. When enemy fighters were sighted, the squadron aircraft turned out to sea in order to shake them off, and then returned to complete their mission. When the squadron aircraft were flying in groups of two or three, this maneuver was not always necessary. In turning out to sea, the direction of the sun and the tailwind were fully exploited. Frequently the squadron aircraft were able to escape over the water without the enemy fighters' even catching sight of them. Against a cloudless sky, the squadron aircraft -- even when they were flying at fairly high altitudes (3,300 to 6,560 feet) -- dipped down to 330 to 656 feet above the ground or the water. This maneuver proved to be very effective indeed; in the first place it is extremely difficult to sight and locate, from above, an aircraft flying low over the ground or water, and in the second place, even if the enemy fighter pilot did manage to locate it, he had no way of maneuvering into a favorable attack position (i.e. below his victim). In short, this maneuver put the enemy into a difficult position. If he attacked from above, he ~~he~~ could not go down low enough to turn under the aircraft under attack without jeopardizing the firing chances of his flexibly mounted machine-guns. A turn was always carried out either at the same altitude or at a higher altitude. The impact of the shells on the water, which could also be observed by the pilot of the aircraft under attack, served the attacker as guides in placing his fire. In case there were clouds, the ^{aircraft} attacked ~~could~~ could detour into them, in order to escape pursuit. On one occasion, when a singly flying squadron aircraft was being attacked by four enemy fighters, it got rid of its bomb-load in order to increase its climbing ability. This type of maneuver was carried out automatically whenever enemy fighters were reported approaching. Other maneuvers were possible, depending upon the type and direction of attack. Most of these attacks

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came from behind and above. Once in a while, however, an enemy fighter attacked from the front. This method of attack was dangerous, although of very short duration, because it came so surprisingly; it could be assumed, though, that this method would be tried no more than once during an aerial engagement.

The tail gun station was the most important in defensive aerial combat, and usually had the best chance to fire. The machine-gun or airborne cannon mounted in the nose could only rarely be fired above the top wing. It was used primarily during a turn into the direction of the target. A fast-moving fighter aircraft coming up close to the machine under attack moved into the range of the nose gun, and banking towards the attacker increased the gunner's chances. Thus, as the enemy fighter veered off, he was automatically caught in the fire of two guns. The belly gunner, of course, hardly ever had a chance to fire while the aircraft was moving low above the water. If the He-59 had a cannon mounted in the nose station, it was always worthwhile to bank slightly (45°), in order to increase the chances of catching any fighter aircraft which might be standing by. In addition to increasing the chances of the airborne weapons, banking was also useful in that it forced the attacking aircraft to bank as well, thus jeopardizing its own chances of landing a hit. The effectiveness of this maneuver was enhanced by a temporary throttling of the engines. Coordination between the crew captain and the pilot was extremely important during this maneuver. Normally intercommunication facilities could not be utilized, because the crew captain and the radioman were (+). The crew captain was in a position to keep an eye on all the attacking fighters; he could follow their approach, see when they started to wing over, and direct the pilot accordingly. His observation area was usually towards the rear. The pilot, up in front, was able to follow the course of the attack fairly well by turning around occasionally, and to maneuver accordingly. These evasion curves were limited to approximately 45° , with the basic course, out to sea, remaining in effect. Deviation from the basic course had to be undertaken from time to time even though there were no enemy fighters attacking in order to bring any enemy aircraft which might be lurking behind the tail assembly into the sighting range of the tail machine-gun. The Red fighter pilots became more and more reluctant to attack squadron aircraft flying in groups of two or three. The ratio of strength was approximately 1:5.3:10. In principle the evasion maneuvers were always the same. In the event

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of an attack by enemy fighter aircraft, the following aircraft had orders to close the gap between themselves and the lead aircraft as quickly as possible, unless, of course, the attackers seemed timid, in which case a looser formation was permissible. Under these circumstances, the accomplishment of the various maneuvers necessary was

+ - Translator's Note: Sorry, but I'm stumped! The German text has "...da Kommandant und Funker im Luftstrom standen", which - according to all the sources available to me, means "...since the crew captain and radioman were in the air current or air flow". Perhaps you can make better sense out of it!

much simpler. The lead aircraft had no way of guiding the others by means of signals or radio communication. In banking to aim the airborne cannon, it was better to keep the target on the outside curve so that the aircraft could not interfere with each other's fire.

Conclusions: It is clear that the available fire power can be better distributed during low-level flight. Machine-gun defensive fire to the rear and upwards is ineffective, and the belly gunner has hardly any opportunity to fire. The situation might be improved if the mechanic could take over a second machine-gun mounted above in the rear of the aircraft. This gun should be mounted not on a rotating gun ring, but rather on something like a ventral gun-mount. Nowadays, in order to increase the fire power to the rear, airborne cannon are being installed in the tail gun station. In the case of a group of two aircraft, the lead aircraft would have its airborne cannon in the nose, and the following aircraft would have it in the tail. The technological specifications are ingenious; no practical experience is available as yet. Communication via intercom proved to be too poor, when the gunners were in the air stream⁺. Despite the use of phosphorus bullets with steel core, the machine-gun ammunition proved to be too ineffective. The training of the gunners was inadequate for the demands of aerial combat; they were often unsure of themselves as regards the most favorable firing possibilities and the firing technique itself. The sighting devices used with the machine-guns proved poorly suited to air-to-air firing.

+ - Please see Translator's Note on the preceding page.

10) The Ground Organization³⁶

In this particular sector a good deal of very valuable experience was gained during the course of the Condor Legion's operations in a foreign, though friendly, country. For the ground organization in Spain had to adapt itself to the conditions prevailing at that time in that particular place if it was to meet the demands made upon it. The most valuable experience for later developments lay in the demonstration of the fact that it was possible to conjure up runways and emergency airfields under the most difficult of conditions and -- in fact -- from scratch and to prepare a ground organization for effective operation within the shortest possible time. The ground organization personnel in Spain often had to resort to improvised solutions for their many problems, solutions which later proved to be extremely practical and useful; When their improvisations proved worthless, they had no choice but to keep on experimenting until they found a way to operate effectively.

It is obvious, of course, that the bomber units in particular posed a good many problems in connection with the organization of ground organization services. It is also important to note that the flying units in Spain learned to help in the establishment of their own ground organization installations; in some instances, in fact, it was the flying units which set up the ground organization entirely on their own, in addition to carrying out their flying missions on the side. The sharp distinction between the flying units, on the one hand, and the ground organization units, on the other, which had existed for some time in Germany, was unknown in Spain. There there were no airfield companies detached from the flying units to take care of ground organization matters. Instead, each squadron had its full complement of ground personnel and each squadron captain was charged with full responsibility for ground organization effectiveness. This system proved very satisfactory during the Spanish Civil War. Nevertheless, Luftwaffe leaders were quite right in refusing to apply it to

36 - The material in this subsection is based on the following sources:
Freiherr von Beust, op. cit., Part C, pages 119 and 120
Volkman, op. cit., page 18.

the Luftwaffe as a whole, where, with the exception of the air units attached to the Army, the ground organization remained separate from the flying units.

Yet the experience gained by the Condor Legion in Spain bore definite fruit during World War II, again especially in the Eastern theater of operations; in many cases the smooth and efficient accomplishment of air missions could be traced back to ground organization systems which had profited from the experience gained in Spain.

11) Supply and Logistics³⁷

The fundamental supply problem encountered during the operations in Spain, namely the shipment of all Condor Legion supplies from Germany to Spain, has already been dealt with in Chapter II of this study.

Thus, at this point we need concern ourselves only with the question of how the various Legion bases were supplied with fuel, bombs, ammunition, spare parts, and technical equipment, and what experience was gained in the process.

To begin with, there were certain logistical missions (such as the provision of billets and food) which the flying units had to solve for themselves. In addition, until the ground organization system was functioning smoothly, they also procured their own supplies of spare parts and equipment. Thus the airfield commander had only to take care of procuring fuel and bomb supplies -- and this had to be done with any and all means at hand, in some cases even with the help of horse-drawn carts! In this respect, too, it was the need to operate under the most primitive of conditions which yielded the most valuable experience.

In spite of the difficulties occasioned by the inadequacy of supply and transport facilities, all supply requirements, including billets and food, were always met effectively enough that the operations of the flying units could be carried out smoothly and according to schedule. This was due not only to

37 - Freiherr von Beust, op. cit., page 120.

the carefully thought-out organization of supply activity, which was wholeheartedly supported by the German Reich and by the Spanish agencies, but also to a talent for improvisation and the will to succeed on the part of the troops concerned.

It must be remembered that at no time during the Spanish Civil War were the Reds able to disrupt or even threaten the Legion's supply system by their air attacks.

The Legion's requirements in terms of personnel, aircraft, weapons, spare parts, and ammunition rarely rarely came up to the estimates made originally, since -- as has been pointed out in Chapter III -- personnel and materiel losses were unexpectedly low; thus replacement supplies of the categories listed above could be reduced in favor of increased supplies of fuel and extra weapons and ammunition.

Antiaircraft Artillery³⁸

X In the summer of 1936, twenty light antiaircraft artillery pieces arrived in Spain. Originally they were to be used only in the training of Spanish soldiers in antiaircraft artillery operations, but later on they were released for employment at the front. Part of them were used in the defense of the Legion air base at Seville, and the rest were employed to provide antiaircraft cover for the Nationalist troops during their advance towards the north. This latter mission, of course, provided ample opportunity to test the commitment of antiaircraft artillery against enemy pockets of resistance in direct support of ground operations. The flat trajectory and high aiming accuracy of the 20 mm guns were responsible for the first successes achieved by these weapons in ground operations.

X In September 1936 the first heavy antiaircraft artillery battery arrived in Spain and was immediately assigned to the focal point of operations, i.e. in the protection of the Nationalist troops fighting around the capital. It soon became apparent that the 88 mm gun was an exceedingly good weapon and that the firing tactics and techniques used by the German Luftwaffe were appropriate and effective. Although the battery was somewhat hampered by the fact that its crews were made up half of German personnel and half of poorly trained Spanish personnel, its performance during this first engagement was very good. Naturally it was impossible for a single modern antiaircraft artillery battery (the Nationalists had only old-fashioned, ~~and~~ inefficient guns at their disposal) to keep the airspace over Madrid free of enemy aircraft, especially since the Reds were fully aware of how dangerous it was to their operations and thus subjected it to repeated attack, as a result of which it was forced to keep changing position continuously.

38 - The material contained in this section is based on the following sources:

Aldinger, op. cit.

Adolf Galland, Die Ersten und die Letzten (The First and the Last), Franz Schneekluth, Darmstadt (the section dealing with the repercussions of the employment of the Condor Legion on the German Luftwaffe)

Footnote 38 (cont)

Grabmann, op. cit., pages 8-10, 12, 14, 15, and 20

Veith, "Flakeinsatz während des Feldzuges in Spanien" (The Employment of Anti-aircraft Artillery Forces during the Spanish Civil War)

Volkman, op. cit., pages 11 and 12.

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Nevertheless, the initial success it achieved in bringing down enemy aircraft did provide a certain measure of relief for the Nationalist troops, for the Red bombers very soon began to drop their bombs from a respectful altitude of 13,000 feet and to disappear immediately as soon as the German antiaircraft artillery guns started to fire. Even so, it was obvious that a number of batteries would have to be concentrated around the Madrid area if a truly effective cover was to be provided.

By the end of the Spanish Civil War the Legion had a total of five heavy and two light batteries at its disposal. Approximately half of them were employed in the Nationalist rear area to provide protection for the Legion's airfields, while the other half was utilized at the focal points of the ground fighting. It soon became obvious that batteries which remained inactive too long gradually lost their ability to concentrate effectively in action. This problem was solved by frequent rotation between the rear area and front batteries; this measure also enhanced the spirit of competition and thus resulted in better and better records of enemy aircraft downed.

As has already been pointed out, both the heavy and light antiaircraft artillery batteries proved to be extremely effective in operations against enemy aircraft, at the front as well as in the rear area. For example, the record of eleven enemy aircraft brought down in five days during the battle of Brunete is certainly remarkable in view of the fact that the Red air forces had only about 200 aircraft at their disposal.

Despite the excellent results achieved against air targets, even at that time it had to be admitted that the 88 mm guns rarely succeeded in scoring direct hits against very fast aircraft, that the danger of being taken by surprise by high-flying aircraft was great, and that the range of the guns was not long enough to enable them to reach aircraft flying at a high altitude.

To an ever increasing degree the light and heavy antiaircraft artillery batteries, which were not employed to capacity in antiaircraft defense operations, were pressed into service in ground operations. Their employment against ground targets

gradually took precedence over all other missions, as is evidenced by the war diary kept by the antiaircraft artillery units in Spain. During a total of 277 days of combat (including 104 days devoted to airfield defense operations), the antiaircraft artillery units were involved in 377 engagements; only 31 of these were directed against air targets, while the remaining 346 represented operations against targets on the ground⁵⁹.

The employment of the German antiaircraft artillery units in ground operations was also necessitated by the fact that the Spanish artillery, in terms of both the number and type of available guns and the training standard of the gun crews, was completely incapable of fulfilling the requirements of modern artillery operations. The German units, the light as well as the heavy batteries, were equipped with particularly effective weapons, which were even spectacularly successful against the tanks which were appearing more and more frequently on the Red side. It was discovered that the 88 mm guns, originally designed and mounted for vertical fire, ~~xxx~~ were just as effective in horizontal fire against tanks. Their extremely high degree of aiming accuracy and the ^{high} muzzle velocity of their shells ensured their successful employment as antitank weapons, without any danger of damaging the mounting of the guns.

While the light batteries, in operations against both ground and air targets, usually fired directly by platoon, the heavy batteries were ordinarily employed in full battery strength. Sometimes, however, the front was so narrow that even the heavy batteries were broken down into groups of two guns each. In this type of employment the positions of the two guns were so selected that each was able to support the fire of the other. Sometimes a group of four guns was employed as a unit, with three of them firing at one target while the fourth was utilized against a secondary target, such as a highway intersection. By firing on two targets simultaneously, the units created an impression of greater artillery strength. Fire was usually directed from an observation post, although direct fire was ordered occasionally.

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against such targets as tanks, enemy machine-guns installed in bunkers or caves, etc.

39 - Veith, op. cit., page 1.

Apart from harassing fire on enemy supply transports, there were no night operations against ground targets.

The lessons learned and the experience gained by the antiaircraft artillery batteries employed during the Spanish Civil War affected the development and employment of the German Luftwaffe in the following ways:

1) A certain tendency to overrate the effectiveness of antiaircraft artillery (a tendency which had already come into being in Germany as a result of antiaircraft artillery testing results) led to the prevailing opinion that the antiaircraft artillery was the weapon to be used in antiaircraft defense operations, while the role of the fighter aircraft was relegated to the background. World War II, particularly in respect to German home air defense operations, proved that this attitude was erroneous.

2) On the other hand the high opinion of the antiaircraft artillery on the part of Luftwaffe leaders had a favorable result in that the antiaircraft artillery forces were doubled in strength as a part of the third phase of the expansion program in October 1937. This included the establishment of another antiaircraft artillery training regiment.

3) The successful employment of light and heavy antiaircraft artillery against ground targets, especially fortifications and tanks, led to the establishment of the antiaircraft artillery corps, which played such a significant role in the breakthrough of the Maginot Line fortifications and in the advances made by the German panzer forces during the campaign in the West in 1940 and in later campaigns.

The Signal Communications Forces⁴⁰

The employment of the Luftwaffe signal communications units in Spain was exceedingly varied. In the fields of aircraft reporting, air traffic control, and radio communication, they carried out the same missions they had been trained to do in Germany -- but over far larger areas and under far more difficult conditions.

The radio intercept service functioned rapidly and with exemplary efficiency, so that enemy radio messages were sometimes intercepted, deciphered, translated, and delivered to the appropriate command headquarters within a space of twenty minutes.

The telephone network in Spain was vast (its terminal points during the period from May through September 1938 were Cadiz, Leon, Burgos, and Benicarlo) and extremely complicated. In addition there a great many disturbances to be dealt with, occasioned by sabotage and damage in the combat areas. Together with the telegraph network, the telephone network proved a valuable aid to the agencies entrusted with the conduct of operations.

At the Legion headquarters, the commander usually had at his disposal two telephone lines, one telegraph channel, one radio channel and one ground-to-air communication channel.

The aircraft reporting service proved to be immensely valuable. The aircraft reporting company was employed on whatever sector of the front was necessary in order to guarantee an early-warning zone out in front of the Legion's rear area airfields. In consequence of the inadequate telephone communications, the company gained a great deal of very useful experience in the operation of an aircraft reporting network based almost exclusively on radio communication.

Ever since 1935 German air leaders had insisted that motorized aircraft reporting units would be an absolutely necessary part of the signal communications forces in the event of war, since the functioning of a reporting network based on radio communication depends upon the availability of a troop well trained in the operation of such equipment, a troop kept constantly up to date and in practice. The accuracy

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of their contention was amply illustrated by the experience gained by the signal communications units in Spain.

40 - The material contained in this section is based on the following sources:

Grabmann, op. cit., pages 10 and 11

Volkman, op. cit., pages 12 and 13.

Other Forces1) The Meteorological Service⁴¹

The source materials available to the author do not give any indication of the way in which the meteorological service obtained the information needed for its weather reports and weather forecasts. Presumably the weather staff collected all the information to be had from Nationalist Spanish sources and also made use of whatever reports could be obtained from abroad. There were, of course, no reports available from the Red-occupied area of Spain, and only very few from France, North Africa, and England.

The lack of reliable reports naturally injected a significant factor of uncertainty into meteorological forecasting, quite apart from the fact that Spain, as a peninsula projecting far out into the Atlantic, has a very inconsistent climate and weather conditions which can never be predicted very far ahead. During the winter months, the high plateaus, such as the one surrounding Madrid, are very cold. In addition, the warm sea air coming from the Atlantic banks up against the coastal mountains of the Sierra de Gredos, Sierra de Guadarrama, the Cantabrian range, the Pyrenees, and -- in the south -- the Sierra Nevada, bringing fog, clouds, and the danger of icing.

As a result whenever the German pilots had to cross a mountain range, they were suddenly confronted by unexpected weather conditions and were sometimes in for an unpleasant surprise. Their commanders (as, for example, during the winter battle of Teruel, which we have already described) could not afford to be as considerate as they would have liked and often had to insist on a mission's being accomplished regardless of weather conditions. Consequently losses occurred which might otherwise have been avoided. Even very experienced crews sometimes crashed or had to make emergency landings with their bomb-loads due to the effects of icing.

41 - The material contained in this subsection is based on the following sources:
Freiherr von Beust, op. cit., pages 31 and 32
Jaenecke, op. cit., pages 120 and 121.

Even ~~the~~^{an} combat-seasoned squadron captain (1st Squadron, K/88) crashed over the Sierra de Gredos, his bomb-load exploding at the impact. It took three days for the rescue expedition to work its way up the snow-covered mountains to the site of the crash. All the rescuers found were the remnants of his body, which the wolves had already discovered in the meantime.

Thus climatic difficulties in Spain naturally resulted in a feeling of uneasiness on the part of all the flying personnel, uneasiness which was intensified at the thought of the dreadfully brutal treatment they could expect in case they should be forced to land in or ^{be} shot down over Red-held territory.

It was also unfortunate that the units had to fly at such a high safety altitude over the mountains, since this meant that they were flying in the clouds during the last lap before entering enemy territory. Since the formation automatically dispersed in the clouds, this meant in turn that the aircraft lost their concentrated offensive and defensive power and also that it was difficult, if not impossible, to make the rendezvous with their fighter escorts, which were usually standing by in Avila, Talavera, Maqueda, or Toledo.

On the other hand, of course, all these difficulties represented a harsh school of experience, and the German pilots rapidly perfected their skills in aircraft operation and in navigation. This stood them in good stead later on, during the long period of night missions and during bad-weather operations.

III. The Repercussions of the Experience Gained by the Condor Legion on the Command and Employment of the German Luftwaffe as a Whole during World War II⁴²

During the early phases of World War II, the repercussions of the Legion's experience in Spain were almost exclusively favorable.

The commitment of the Legion in Spain had given German Luftwaffe leaders a clear idea of the conduct of an -- admittedly limited -- air war over and beyond the front lines; the German air units and the antiaircraft artillery and signal communications forces possessed a cadre of personnel familiar at first hand with the tactical and technical experience garnered during the Spanish Civil War, and they possessed equipment which had been thoroughly tested under actual military conditions.

The negative repercussions of the experience gained in Spain, i.e. the erroneously interpreted or wrongly applied theories of command and commitment and the mistaken technical developments which they dictated, did not make themselves felt until later -- but then all the more painfully.

Germany was not the only nation forced to learn how dangerous it is ^{to} transplant the experience and conclusions gained in one war indiscriminately to another, or -- as a matter of fact -- even from one theater of operations to another.

At the outbreak of World War II, Italy, too, was still too firmly under the influence of the experience gained by her forces in Spain and Ethiopia. And Russia, in 1941, still adhered to the criteria applicable to operations in Spain and in the locally limited wars in Finland.

The danger inherent in comparing a civil war, a colonial war, or a locally limited conflict on the one hand with a global war on the other is, of course, quite clear. Command, planning, and technical developments can be all too easily guided into the wrong direction by the assumption of false premises, and the clarity of vision needed to recognize the demands of reality and the potential developments of the future is all too easily distracted or dimmed. Errors in planning, in tech-

42 - Freiherr von Beust, op. cit., Part C, pages 87-94.

nical development, and in the delineation of strategy often do not begin to take effect until later, when their origin has long since been forgotten; by then, unfortunately, it is usually too late to correct the original mistakes.

This is by no means intended to imply that German Luftwaffe leaders were in any way remiss in evaluating the experience gained during the Spanish Civil War or that the useful aspects of this experience were not fully exploited. It is quite possible that, if World War II had ended in 1941 or 1942, the negative effects might never have made themselves felt. It would also be fallacious, of course, to blame the experience of the Condor Legion in Spain for all the later defects noted in the German Luftwaffe. It is common knowledge that there were also other factors -- shortsightedness in the evaluation of military developments, underestimation of the enemy, political rivalries, etc. -- which played an important role. It cannot be ignored, however, that there are at least three factors which were to have disastrous repercussions during the later years of World War II which had their origin in the Spanish Civil War.

1) The principle of strategic bomber operations as a primary factor in bringing about a decision was relegated to the background.

Until 1936, in the opinion of the first General Staff Chief of the German Luftwaffe, the bomber aircraft was an instrument to be employed against the nerve centers of the enemy, his industries, his transport and communications networks, and his supply system. In the light of the experience gained in Spain, the bomber was degraded to a purely tactical instrument -- a function entirely unsuited to its purpose.

During World War II, the Western Allies proved the fallacy of the shift in German thinking. Today, the bomber aircraft is recognized -- even outside the framework of air operations themselves -- as one of the most important instruments in the military and political conduct of warfare.

2) The overwhelmingly frequent employment of the entire German Luftwaffe (i.e. not only bombers, but also fighter aircraft, reconnaissance aircraft, and antiair-

craft artillery) in connection with the operations of the Army on limited sectors of the front had the effect of practically subordinating an independent Wehrmacht branch to the Army, in complete disregard of its original missions and its potentialities.

3) Blinded by reasoning of this kind, German air leaders failed almost completely to recognize the potential effectiveness of the operations of a strong enemy air force (particularly strategic air operations) against the German hinterland. Failing to recognize it, they also failed to take it into consideration, thus underestimating it completely. The result was a neglect of home air defense measures.

The events of the Spanish Civil War had led to the establishment of certain principles, principles which were valid and applicable in Spain but definitely not suited to generalization. Yet as early as 1937 German air leaders began to shape their thinking and planning on the basis of the experience gained in Spain, and this attitude was firmly established by the time the war began. And during the last years of the war, when they gradually came to realize that they had made a mistake, they hesitated to draw the appropriate conclusions. In substantiation of this statement, let us refer to one example on the technical sector: the lack of a powerful long-range bomber and the constant dissipation of the He-111 and Ju-88 units in tactical missions along the front. The fiasco of the He-177 (a heavy bomber which was never completed) also serves to support the above statement, as do the desperate stop-gap solutions in the form of the "Mistel" or the bomb-carrying jet fighter (the "Blitz-bomber Me-262").

Understandably enough, the methods brought from Spain were also applicable in World War II, wherever the operations concerned were limited in terms of time and geographical extent, as for example in Poland (1939) and in France (1940). In these two campaigns, the Luftwaffe -- as in Spain -- was faced with a weak enemy air force, which could be presumed to ~~have~~ offer neither effective defenses nor independent offensive operations, in other words it was quite possible to dispense with operations against strategic targets in favor of tactical operations in support of the ground offensives.

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Air attacks, such as those carried out against Warsaw, Paris, and a few other strategic targets were the exception rather than the rule, and as such cannot be considered in an overall evaluation of operations.

It was not until the Battle of Britain that the weakness of this development became apparent, when the strategic air units of the German Luftwaffe proved hopelessly incapable -- in terms of strength, technical equipment, and standard of training -- of fulfilling the mission assigned to them, namely to decide the outcome of the war against Great Britain by destroying her industries, her supply system, and -- no less important -- the morale of her population.

The next awakening came during the campaign in the East, when German military leaders were convinced that they could defeat Soviet Russia without an air force capable of strategic air warfare. By the time they realized that this was impossible, the prerequisites, the resources, and the opportunity needed to shift successfully to strategic operations were no longer available. The only instance -- brief but exceedingly successful -- of strategic air operations on the Eastern front was the air attack on Gorki and on Russian industries during the summer of 1943. The spectacular success of this one operation only serves to substantiate the statements made above.

During the various phases of the campaign in Africa as well, consistent strategic air operations over the enemy hinterland (specifically against naval targets and seaports) would certainly have had a favorable influence on the course of events.

A catastrophic concomitant of the lack of strategic thinking on the part of Germany's air leaders was their consequent inability to evaluate properly the strategy of the enemy and its potential results.

The impressive demonstration of British and American air strength over Germany was an unmistakable lesson -- and a bitter pill. Great Britain and the United States, unhampered by the heritage of previous wars and their resources unimpaired by the early stages of World War II, had recognized the requirements of modern, total warfare and despite a number of difficulties, particularly in the case of Great Britain, had transformed this recognition into action.

Germany, on the other hand, had not only neglected the potentialities of strategic air warfare for her own conduct of operations, but had also failed to take into

account, first, the enemy's thinking in this respect and, second, the enemy's capability of transforming his thinking into effective action. The errors of omission committed in connection with Germany's home air defense system and the constant dissipation and exhaustion of the appropriate air defense weapons (the fighter aircraft and the antiaircraft artillery) in tactical operations designed to support ground actions at the front can be traced back to this cardinal failure. Quite probably German air leaders were still too firmly under the influence of conditions in Spain, where there had never been reason to fear Red air attacks on the Legion's rear area.

Luftwaffe command circles, both before and during the second world war, were greatly influenced by the strong personality of Freiherr von Richthofen. The units under his command during World War II (the Close-Support Air Division during the campaign in the West in 1940; the air corps assigned to the middle sector of the front during the campaign in Russia in 1941/42; and the Air Fleet assigned to the southern sector of the Eastern front during 1942/43) were always the ones sent into action at the critical points in the ground operations. In his own method of operation, in the organization of his staffs and their subordinate agencies, and in the command of his units, von Richthofen was a firm adherent of "close-support tactics at all costs". Without exception he employed all his units in close-support operations on behalf of the Army, regardless of their degree of combat readiness or their suitability and usefulness for this type of operation. This also applied to the antiaircraft artillery. Again and again he employed them in large-scale operations requiring the participation of all available forces. The resultant attrition of forces, the losses, and the consequent need for replacements were all at the expense of other sectors of the front and other areas of operation; in the last analysis, of course, they made deep inroads into the substance of the Luftwaffe as a whole. It cannot be denied that von Richthofen's methods brought some spectacular results. Though often limited in terms of time and area, these results were undeniably tangible and thus very welcome to the Army, which, after all, benefited most by them. The inevitable consequence

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of this state of affairs was that close-support tactics were strongly propagated within the Luftwaffe and, during lengthy periods throughout the war, were applied as a general practice, often against the better judgment of the commanders in charge and the leaders of the individual units.

After the Battle of Britain, the first negative aspects of this development began to become apparent on the Eastern front, during the autumn of 1942. Although they suffered tremendous losses at the front, the Russians were able to make them up and even to reinforce their strength because their industries, their oil refineries, their transport and communications networks, and their supply system in the hinterland had hardly been subjected to air attack, not even at a time when the German bombers would have been fully capable, in terms of range and strength, of delivering destructive blows against these targets.

In 1943, when it was apparent to all concerned that a fundamental error had been committed, it was too late to change the method of employment of the Luftwaffe. While close-support tactics had been employed by choice up to this point, after 1943 they continued to be employed by necessity, since the overall military situation permitted nothing else. This was true not only of the Eastern front but also of all the other theaters of operation and the home front. From this time on, von Richthofen's influence began to diminish, and the method of employment he developed in Spain was recognized to be out of date. It would, of course, be unfair to von Richthofen as a personality to evaluate his very real accomplishments in Spain and during World War II and his many contributions to the general field of "coordinated operations of Luftwaffe and Army" exclusively from the point of view of the negative aspects described above. After all, it was the responsibility of the Luftwaffe top-level command to keep the tactical employment of the air units within a reasonable limit without losing sight of the need for strategic air operations as well.

s/ Karl Drum

Nussdorf, 12 April 1957

General der Flieger a.D.